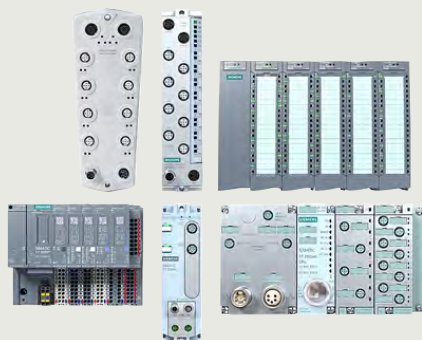


I/O systems



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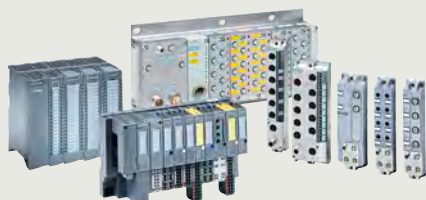
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SIMATIC ET 200 offers the right solution for every application

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: digital and analog inputs/outputs, intelligent modules with CPU functionality, safety engineering, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC Controllers and HMI units prove the unique integration of Totally Integrated Automation.

MultiFieldbus

With the MultiFieldbus you can easily and flexibly use different fieldbus systems with SIMATIC ET 200. Due to support of the PROFINET, EtherNet/IP and Modbus/TCP protocols, the MultiFieldbus is designed for use on a wide range of Ethernet controllers.

PROFINET

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (IO devices) and controllers (IO Controllers), up to and including the solution of isochronous drive controls for Motion Control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

PROFIBUS

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a high-performance, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

PROFIBUS DP (distributed I/O)

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

AS-Interface

AS-Interface is the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators for the field level by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. This makes the AS-Interface the ideal partner for PROFINET and PROFIBUS DP.

AS-i communications modules in ET 200SP enable the flexible combination of AS-Interface and distributed I/O. AS-Interface transmits standard data and safety data up to PL e / SIL 3 in the same AS-i network. AS-Interface is not only suitable for efficient transmission of digital and analog standard I/O signals but also ideal for the user-friendly connection of EMERGENCY STOP buttons and protective doors.

IO-Link

The communication standard IO-Link permits the intelligent connection of sensors and switchgear to the control level. IO-Link facilitates the integration of all components in the control cabinet and on the field level - for maximum integration and seamless communication on the final meters to the process.

IO-Link solutions from Siemens ensure maximum precision and cost-effectiveness in any production system. IO-Link is completely integrated in Totally Integrated Automation (TIA) and offers many advantages.

- The open standard permits the networking of devices from different manufacturers
- Simple wiring facilitates the installation process
- Reduced wiring effort saves time and money during installation
- Efficient engineering facilitates configuration and commissioning
- High-speed diagnostics ensures short plant standstill times and high plant availability
- High process transparency permits, for example, efficient energy management

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Overview



SIMATIC ET 200SP video

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SIMATIC ET 200SP



The scalable SIMATIC ET 200SP I/O system is a highly flexible, modular I/O system with degree of protection IP20. Via interface modules, it can exchange IO data of the connected I/O modules with a higher-level PLC. The following interface variants are available for this purpose:

- MultiFieldbus: IM 155-6MF with the Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP
- PROFINET: IM 155-6 PN
- PROFIBUS: IM 155-6 DP

Alternatively, as further head-end stations, various PLC, F-PLC and Open Controllers are available as compact S7-1500 Controllers (Distributed Controllers). ET 200SP components in SIPLUS version meet extreme requirements and have a high degree of robustness.

An extensive range of I/O modules, including fail-safe and Ex versions, enable the flexible connection of sensors and actuators:

- Digital input modules (DI), with color coding white
- Digital output modules (DQ), with color coding black
- Analog input modules (AI), with color coding light blue
- Analog output modules (AQ), with color coding dark blue
- Technology modules (TM), with color coding turquoise
- Communications modules (CM), with color coding light gray
- Special modules, with color coding mint green
- Motor starters as direct-on-line starters (DS) and reversing starters (RS), also as F-variant in each case
- Pneumatics

Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units.

The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

Compact design

- Modular configuration with up to 64 modules
- System-integrated, self-assembling potential groups, potential group supply without power module with infeed of supply voltage via light BaseUnits
- Small size and highly flexible due to the modular design and comprehensive product range
- Up to 16 channels per module
- Permanent wiring
- Hot swapping: Module replacement without tools in RUN
- Startup and operation with slot gaps (free spaces)

Flexible connection system

- Flexible fieldbus connection via BusAdapter (RJ45, M12, FastConnect, plastic or glass fiber-optic cables single-mode or multimode), also as integrated media converter
- Push-in terminals for cross-sections up to 1.5 mm² with wire end ferrule, and up to 2.5 mm² without wire end ferrule
- BaseUnits for 1-wire or direct multi-wire connection
- PotDis module for system-integrated and space-saving provision of additional potential terminals
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- System-integrated, space-saving shielding for installation without tools



SIMATIC ET 200SP shielding video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6196729280001

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Overview

Safety Integrated

- Easy integration of fail-safe modules
- Easy F parameter assignment via software
- Group-by-group disconnection of non-fail-safe modules

High performance

- Isochronous PROFINET
- Internal data transfer with up to 100 Mbps
- Record analog values and output as of 50 µs
- Record digital values and output as of 1 µs

High-performance technology

- Modules for the functions Servodrive, Counting, Positioning, Weighing, Output cams, PWM, Force measurement, Flow measurement, etc.

Energy efficiency

- Energy Meter for recording electrical variables
- System-integrated PROFIenergy with interval substitute values

Extended functions

- Configuration control: application-based adaptation of the actual configuration via user software (option handling)
- Time-based IO: time stamping of the signals to the µs
- MSI/MSO: Simultaneous access to I/O data from up to 4 PLCs
- MtM: Direct data exchange between IO modules (**M**odule-**t**o-**M**odule communication)
- Oversampling: n-fold acquisition or output of digital and analog signals within a PN cycle
- Adaptation of measuring range: increased resolution by adapting the measuring range to a limited section of a measuring range supported by the analog input module
- Scaling of measured values: permits the transmission of the analog value normalized to the required physical value as a REAL value (32-bit floating point)

Communication standards

- PROFINET IO
- EtherNet/IP
- Modbus TCP
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- CAN
- DALI
- AS-Interface
- Point-to-point (RS232, RS485, RS422)
- Freeport
- 3964(R)
- USS
- DMX
- Modbus RTU (master/slave)

CPU

- PROFINET connection with 3 ports
- IO Controller and PN IO device
- Optional expansion as DP master/slave
- Also as fail-safe variant and Open Controller

Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
 - Module type in plain text including function class, e.g. "DI 8x24VDC HF"
 - Article No.
 - 2D matrix code with article and serial number (with call via the "Industry Online Support" app, direct link to the support page of the module)
 - Hardware functional status and firmware version
 - Suitable BU type for the respective I/O module
 - Color code of the suitable color-coding plate
 - Connection diagram
- Optionally expandable with
 - Labeling strips
 - Equipment labeling plate

Overview of ET 200SP components

Basic components	Function
CPU	The CPU: • Executes the user program • Is used as IO Controller, I-Device on PROFINET IO, or as standalone CPU • Connects the ET 200SP with the IO devices or the IO Controller • Exchanges data with the I/O modules via the backplane bus. Further functions of the CPU: • Communication via PROFIBUS DP (in combination with the CM DP communications module, the CPU can be used as DP master or slave) • Integrated web server • Integrated technology • Integrated trace functionality • Integrated system diagnostics • Integrated safety

Basic components	Function
Open Controller	As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based Software Controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device. • All in one • High system availability • Compact and modular • Rugged • User-friendly design • Efficient engineering in TIA Portal
Interface modules with MultiFieldbus interface (IM 155-6 MF)	The MF interface module: • Supports the three Ethernet protocols PROFINET IO, EtherNet/IP and Modbus TCP • Is easy to configure via MultiFieldbus Configuration Tool (MFCT) • Connects ET 200SP with the IO Controller • Exchanges data with the I/O modules via the backplane bus.

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SIMATIC ET 200SP

Overview

Basic components	Function	Basic components	Function
Interface modules for PROFINET IO (IM 155-6 PN)	The interface module: - Is used as IO Device on PROFINET IO - Connects ET 200SP with the IO Controller - Exchanges data with the I/O modules via the backplane bus.	Potential distributor modules (PotDis BU, PotDis TB)	With the potential distributor modules for SIMATIC ET 200SP, additional potentials required within an ET 200SP station can be set up quickly and in a space-saving manner. Due to the free combinability of PotDis-BUs and PotDis-TBs, the potential distributor modules allow a large number of design variants and thus simple adaptation to individual needs. Within the station, existing potentials can be multiplied or even new potential groups can be formed. With 36 terminals per 15 mm width, the PotDis modules require very little space without compromising on the conductor cross-sections (maximum 2.5 mm ²). They allow the connection of voltages up to 48 V DC with a maximum current carrying capacity of 10 A, and with the PotDis TB-BR-W even up to 230 V AC/10 A as well as the possibility to connect a protective conductor.
Interface module for PROFIBUS DP (IM 155-6 DP)	The interface module: - Is used as DP slave on PROFIBUS DP - Connects ET 200SP with the DP master - Exchanges data with the I/O modules via the backplane bus.	I/O modules and fail-safe I/O modules	The I/O module determines the function at the terminals. The PLC detects the current process state via the connected sensors and triggers corresponding responses via the connected actuators. Some I/O modules feature extended functions, in part they are also designed as individual operating mode. I/O modules are divided into the following module types; the fail-safe versions are identified by a preceding 'F-' and a yellow module case: - DI (digital input) - DQ (digital output) - AI (analog input) - AQ (analog output) - TM (technology modules) - CM (communications modules) - SM (special modules)
SIMATIC BusAdapter (BA)	SIMATIC BusAdapters permit the free selection of the connection system and physical connection for head-end stations with PROFINET or MultiFieldbus interface. Various variants are available for the connection of copper cables or plastic and glass fiber-optic cables. Hybrid copper/fiber-optic variants are also available as integrated media converters. Cable length between 2 stations: max. 100 m (copper), max. 50 m (POF), max 100 m (PCF), max. 3 km (multimode glass fiber-optic cable), max. 20 km (single-mode glass fiber-optic cable). For expanding the station with the I/O system ET 200AL via ET connection, the BA-Send BusAdapter is available	Protective cover (BU cover)	The ET 200SP system can be operated with any number of slot gaps (BU slot without I/O module). Applications for this include: - partial commissioning - prewired, and currently unequipped options To protect against damage, such slot gaps must be covered by a BU cover. Within the BU cover, an equipment labeling plate can be kept for the possible later use of an I/O module. Versions: - for BaseUnits with a width of 15 mm - for BaseUnits with a width of 20 mm
BaseUnit (BU)	The BaseUnits provide the electrical and mechanical connection for the ET 200SP components. - Bright BaseUnits permit a new potential group up to max. 10 A - Dark BaseUnits forward the self-assembling voltage busbars P1, P2 and AUX from the left to the right BaseUnit. - Suitable BaseUnits with 12 to 28 terminals are available for different connection systems (single or direct multi-conductor connection) and functions. - The I/O module is plugged onto the desired BaseUnit and determines the potential assignment of the terminals on the BaseUnit. - For expanding the station with the I/O system ET 200AL via ET connection, the BaseUnit BU-Send is available.		

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SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

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Basic components	Function
Server module	The server module concludes the setup of an ET 200SP station. On the server module there are holders for 3 spare fuses (5 × 20 mm). The server module is included in the scope of supply of all head-end stations.
DIN rail according to EN 60715	The DIN rail is the module rack of the ET 200SP I/O system. ET 200SP is mounted on the DIN rail.
SIMATIC system rail	For a redundant R1 setup of the ET 200SP I/O system, mounting on the SIMATIC system rail is mandatory.
Coding element	When plugging an I/O module onto a BaseUnit for the first time, the coding element moves from the I/O module to the BaseUnit. There it prevents the destruction of the ET 200SP components in the event of a subsequent module replacement with incorrectly selected I/O module. The coding element is available in two versions: • Mechanical coding element • Electronic coding element: additionally features an electronic, re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules, parameter data for IO-Link master). Thus these data are automatically backed up during a module replacement.
System-integrated shield connection	The shield connection permits the connection of cable shields. Compared to external shield supports, the system offers the following advantages: • Quick installation without tools by plugging the shield connection element onto the BaseUnit • Automatic low-impedance connection to the functional grounding (DIN rail) • Optimized EMC properties by separating the supply voltage lines from the signal cables by means of the shield connection element and short, unshielded cable lengths • Requires little space
Labeling strips	Optionally, for system-specific marking the head-end stations and I/O modules can be equipped with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow: • 500 strips on the roll, for printing on thermal-transfer printers. Core diameter 40 mm, outer diameter 70 mm, width 62 mm. • 10 DIN A4 sheets with 100 strips each, card 180 g/mm², perforated, for printing with a laser printer direct from TIA Portal or via print templates.

Basic components	Function
Equipment labeling plate	Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, potential distributor modules (PotDis BU and PotDis TB), and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly: • The inscription on the front is not covered • Simple label replacement when replacing a module • No parallax errors when marking the BaseUnits on the mounting plate The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H)
Color-coded labels	The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals as well as potential distributor modules can also be marked using color-coded labels. Color-coded labels are supplied in packs of 10 or 50 labels. Advantages of the color-coded labels: • Quick installation (one label for marking up to 16 terminals) • Avoidance of wiring errors • Simple detection of potentials during servicing

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SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Overview



SIMATIC ET 200SP MultiFieldbus video
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Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single Hot Swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user program)
- Device replacement without programming device, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable. Can also be used for interface modules with MultiFieldbus interface.
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Listed below is a short overview of the interface modules available for the ET 200SP, showing the essential differences. An up-to-date, clear and more precise comparison of functions of the different interface modules is offered by the TIA Selection Tool.

SIMATIC IM 155-6 DP High Feature with PROFIBUS connection

- Max. 32 I/O modules, also PROFIsafe modules with complete diagnostic support.
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 244 bytes in each case for input and output data per module and per station
- Data update time: typ. 5 ms
- PROFIBUS connection via 9-pin D-sub socket
- Package includes server module and PROFIBUS connector with PG socket

SIMATIC IM 155-6 PN Basic with PROFINET connection

- Max. 12 I/O modules, no PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and per station
- Data update time: typ. 1 ms
- PROFINET connection via 2 integrated RJ45 sockets (integrated 2-port switch)
- Package includes server module

SIMATIC IM 155-6 PN Standard with a PROFINET interface for SIMATIC BusAdapters

- Two types of delivery:
 - As package with IM155-6PN ST, with pre-assembled BA 2xRJ45 BusAdapter, including server module
 - As package with IM155-6PN ST, without BusAdapter, including server module
- Max. 32 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Data update time: typ. 1 ms
- Selection of the type of connection of the PROFINET by means of SIMATIC BusAdapter (BusAdapter for copper cables only)

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Interface modules > IM 155-6

Overview

SIMATIC IM 155-6 PN/2 High Feature, 2-port IM with one slot for SIMATIC BusAdapters

- Max. 64 I/O modules, also PROFI-safe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Fast data refresh time from 250 µs, also in isochronous mode
- S2 system redundancy
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

SIMATIC IM 155-6 MF High Feature, MultiFieldbus IM with two slots for SIMATIC BusAdapters

Differences from the 2-port IM 155-6 PN/2 High Feature:

- Multi-protocol capability
Operation on Ethernet controllers via the PROFINET, EtherNet/IP and Modbus protocols
- Compatible with IM 155-6 MF High Feature (as of 6ES7155-6AU01-0CN0);
Exception: Isochronous mode and prioritized startup
- Shared device:
Simultaneous access from different controllers via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP
- Local data links:
Deterministic, easy-to-configure data exchange between controllers, also via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP

SIMATIC IM 155-6 PN/3 High Feature, 3-port IM with two slots for SIMATIC BusAdapters

Additional functions compared with 2-port IM 155-6 PN/2 High Feature:

- Second slot for SIMATIC BusAdapter, max. 3 ports can be used
- Local IO data coupling between up to 4 controllers

SIMATIC IM 155-6 PN High Speed with a PROFINET interface for SIMATIC BusAdapters

- Max. 30 I/O modules, also PROFI-safe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and max. 968 bytes per station (depending on configuration)
- Fast data refresh time from isochronous mode from 125 µs
- Performance upgrade for PROFINET
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

SIMATIC IM 155-6 PN R1 redundant interface module



SIMATIC ET 200SP R1 with two IM 155-6 PN R1, BaseUnit M0, BusAdapter, and system rail

- Can be used for high availability applications in combination with SIMATIC S7-1500H and TIA Portal
- Redundancy via two identical ET 200SP interface modules, which are selected as required
- Interface module switchover possible during operation
- SIMATIC system rail absolutely necessary

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Ordering data	Article No.		Article No.
MultiFieldbus IM 155-6 MF High Feature interface module With server module, without SIMATIC BusAdapter; PROFINET, EtherNet/IP and Modbus TCP; isochronous mode; PROFINET Security Class 1	6ES7155-6MU01-0CN0	SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP20-0AA0
PROFINET IM 155-6 PN Basic interface module With server module; two integrated RJ45 sockets	6ES7155-6AR01-0AN0	SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP40-0AA0
PROFINET IM 155-6 PN Standard interface module With server module - With mounted SIMATIC BA 2xRJ45 BusAdapter - Without SIMATIC BusAdapter	6ES7155-6AA02-0BN0 6ES7155-6AU02-0BN0		
PROFINET IM 155-6 PN/2 High Feature interface module 2-port IM, with server module, without SIMATIC BusAdapter	6ES7155-6AU01-0CN0	SIMATIC BA 2XLC BusAdapter For PROFINET interface modules from High Feature function class or above; with LC fiber-optic connection; for increased vibration and EMC load capacity; max. cable length 2 km	6ES7193-6AG00-0AA0
PROFINET IM 155-6 PN/3 High Feature interface module 3-port IM, with server module, without SIMATIC BusAdapter	6ES7155-6AU30-0CN0	SIMATIC BA LC/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	6ES7193-6AG20-0AA0
PROFINET IM 155-6 PN High Speed interface module With server module, without SIMATIC BusAdapter	6ES7155-6AU00-0DN0	SIMATIC BA LC/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	6ES7193-6AG40-0AA0
PROFIBUS IM 155-6 DP High Feature interface module With server module, with PROFIBUS plug with PG socket	6ES7155-6BA01-0CN0	SIMATIC BA 2xLC-LD BusAdapter For IM 155-6 PN HF, IM 155-6 PN R1; 2 x LC-LD connections	6ES7193-6AG50-0AA0
Redundant PROFINET IM 155-6 PN R1 interface module 2-port IM, with server module, without SIMATIC BusAdapter, R1 redundancy	6ES7155-6AU00-0HM0	SIMATIC BA LC-LD/RJ45 BusAdapter For IM 155-6 PN HF, IM 155-6 PN R1; with media converter glass FOC - copper; 1 x LC-LD connection, 1 x RJ45 connection	6ES7193-6AG60-0AA0
Accessories		SIMATIC BA LC-LD/M12 BusAdapter For IM 155-6 PN HF, IM 155-6 PN R1; with media converter glass FOC - copper; 1 x LC-LD connection, 1 x M12 connection	6ES7193-6AG70-0AA0
Strain relief for the PROFINET cable System-integrated strain relief for High Feature PN interface modules (5 units)	6ES7193-6RA00-1AN0	Station expansion with IP67 I/O system ET 200AL	
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, Standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0	ET 200SP BA-Send 1 x FC BusAdapter	6ES7193-6AS00-0AA0
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, Standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0	BaseUnit BU-Send	6ES7193-6BN00-0NE0
BA 2xM12 BusAdapter For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	6ES7193-6AM00-0AA0		
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP00-0AA0		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > IM 155-6

Ordering data	Article No.		Article No.
Other accessories		SIMATIC Manual Collection DL in 5 languages	6ES7998-8XE01-8YE0
Unlatching strap 10 units, for push-pull PROFINET plug, e. g. when using the BA 2xM12 BusAdapter	6ES7193-6DL00-2AA0	All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	
BU cover for covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	SIMATIC Manual Collection DL in 5 languages	6ES7998-8XE01-8YE2
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0	Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0	Spare parts	
SIMATIC system rail With DIN rail according to EN 60715 (35 × 7.5), with 6 mm profile grooves, B-type • Length: 482.6 mm for 19" cabinets • Length: 530 mm for 600 mm cabinets • Length: 830 mm for 900 mm cabinets • Length 2 m	6ES7193-6MR00-0AA0 6ES7193-6MR00-0BA0 6ES7193-6MR00-0CA0 6ES7193-6MR00-0DA0	Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules, CPUs and Open Controllers	6ES7193-6PA00-0AA0
DIN rail 35 mm • Length: 483 mm for 19" cabinets • Length: 530 mm for 600 mm cabinets • Length: 830 mm for 900 mm cabinets • Length 2 m	6ES5710-8MA11 6ES5710-8MA21 6ES5710-8MA31 6ES5710-8MA41	Power supply connector for ET 200SP head-end stations (interface module, CPU and Open Controller) For connecting the 24 V DC supply voltage, push-in variant; included in scope of supply of the head-end station With push-in terminals (10 units)	6ES7193-4JB00-0AA0
Manuals for ET 200SP distributed I/O system SIMATIC ET 200SP Manual Collection: PDF file with the following content: • Basic information System manual, product information, overview tables, correction information or manual supplements • Device-specific information Device manuals for the interface modules, PLC, OC and I/O modules, including fail-safe and motor starters • Comprehensive information Function manuals The ET 200SP Manual Collection can be downloaded from the Internet as a PDF file under https://support.industry.siemens.com/cs/ww/en/view/84133942 .			

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6AR01-0AN0 ET 200SP, IM 155-6 PN Basic	6ES7155-6AA02-0BN0 ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	6ES7155-6AU02-0BN0 ET 200SP, IM 155-6 PN ST	6ES7155-6MU01-0CN0 ET 200SP, IM 155-6 MF HF
General information				
Product type designation	IM 155-6 PN BA	IM 155-6 PN ST incl. BA 2x RJ45 and server module	IM 155-6 PN ST	IM 155-6 MF HF
Product function				
• I&M data	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4	Yes; I&M0 to I&M4
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Isochronous mode	No	No	No	Yes
• IRT	No	Yes		Yes
• Tool changer				Yes; Docking station and docking unit
• Local coupling, IO data - Number of coupling modules		6; 1x output + max. 5x input	6; 1x output + max. 5x input	6; 1x output + max. 5x input
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V19	V20	V19	V20
• STEP 7 configurable/integrated from version	V5.7 SP3	V5.7 SP3	V5.7 SP3	V5.7 SP3
• PROFINET from GSD version/GSD revision	GSDML V2.43	GSDML V2.45	GSDML V2.43	GSDML V2.45
• Multi Fieldbus Configuration Tool (MFCT)				V1.5.2.0 or higher
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes
Input current				
Current consumption (rated value)	200 mA	350 mA	350 mA	550 mA
Address area				
Address space per station				
• Address space per station, max.	128 byte	1 440 byte	1 440 byte	1 440 byte
Hardware configuration				
Rack				
• Quantity of operable ET 200SP modules, max.	16	32	32	64
• Quantity of operable ET 200AL modules, max.	0	16	16	16
Submodules				
• Number of submodules per station, max.		256	256	256
Interfaces				
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; 2 integrated RJ45 ports	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter
• Number of ports	2; integrated RJ45 ports	2; with BusAdapter	2; with BusAdapter	2; with BusAdapter
• integrated switch	Yes	Yes	Yes	Yes
• BusAdapter (PROFINET)	No	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12	Yes; BA 2x RJ45, BA 2x M12, BA 2x FC
Protocols				
• PROFINET IO Device	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client
PROFINET IO Device				
Services				
- IRT	No	Yes; 1 ms to 4 ms at an interval of 125 µs	Yes; 1 ms to 4 ms at an interval of 125 µs	Yes; 250 µs to 4 ms in 125 µs frame
- Dynamic Frame Packing (DFP)		Yes		Yes
- Fast Forwarding		Yes		Yes
- Fragmentation		Yes		Yes
- PROFIenergy	Yes	Yes	Yes	Yes
- Prioritized startup	No	Yes	Yes	Yes
- Shared device	No	Yes	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6AR01-0AN0	6ES7155-6AA02-0BN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	ET 200SP, IM 155-6 PN Basic	ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	ET 200SP, IM 155-6 PN ST	ET 200SP, IM 155-6 MF HF
- Number of IO Controllers with shared device, max.		4	4	14; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes
Protocols				
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes
PROFIsafe	No	Yes	Yes	Yes
PROFIBUS	No	No	No	No
EtherNet/IP	No	No	No	Yes
Modbus TCP	No	No	No	Yes
Number of connections				
• Number of MtM communication relationships/connections, max.				16
Redundancy mode				
• PROFINET system redundancy (S2)	No	No	No	Yes; NAP S2
• H-Sync forwarding				Yes
Media redundancy				
- MRP	Yes	Yes	Yes	Yes
- MRPD	No	Yes	Yes	Yes
EtherNet/IP				
Services				
- CIP Implicit Messaging				Yes
- CIP Explicit Messaging				Yes
- CIP Safety				No
- Configuration control via Explicit Messaging				No
- Shared device				Yes; 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.				2
Updating times				
- Requested Packet Interval (RPI)				2 ms
Address area				
- Address space per module, max.				288 byte; (246 byte outputs / 288 byte inputs)
- ForwardOpen (Class1 & 32 bit Header)				500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)				4 002 byte
Connections				
- Number of rack connections				2
Modbus TCP				
Services				
- read coils (code=1)				Yes
- read discrete inputs (code=2)				Yes
- Read Holding Registers (Code=3)				Yes
- Read Input Register (Code=4)				Yes
- write single coil (code=5)				Yes
- Write Single Register (Code=6)				Yes
- write multiple coils (code=15)				Yes
- Write Multiple Registers (Code=16)				Yes
- Read/Write Multiple Registers (Code=23)				Yes
- Parameter change by master				Yes
- Modbus TCP Security Protocol				No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6AR01-0AN0	6ES7155-6AA02-0BN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	ET 200SP, IM 155-6 PN Basic	ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	ET 200SP, IM 155-6 PN ST	ET 200SP, IM 155-6 MF HF
Address space per station				
- Address space per station, max.				500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space				250 byte; (246 byte outputs / 250 byte inputs)
Updating time				
- I/O request interval				2 ms
Connections				
- number of connections per device				9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication				
• TCP/IP	Yes	Yes	Yes	Yes
• UDP		Yes		Yes
• SNMP	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes
• ARP		Yes		Yes
• IGMP		Yes		Yes
• Multicast		Yes		Yes
• Broadcast		Yes		Yes
• IPv4		Yes		Yes
• IPv6		No		No
Isochronous mode				
Equidistance				Yes
shortest clock pulse				250 µs
max. cycle				4 ms
Bus cycle time (TDP), min.				250 µs
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• NS LED				Yes; green/red LED
• MS LED				Yes; green/red LED
• IO LED				Yes; red-green-yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates				
Network loading class	3	3	3	3
product functions / security / header				
PROFINET Security Class	1	1	1	1
signed firmware update	Yes	Yes	Yes	Yes
Secure Boot	No			No
safely removing data	Yes	Yes	Yes	Yes
data integrity	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6AR01-0AN0 ET 200SP, IM 155-6 PN Basic	6ES7155-6AA02-0BN0 ET 200SP, IM 155-6 PN ST incl. BA 2xRJ45	6ES7155-6AU02-0BN0 ET 200SP, IM 155-6 PN ST	6ES7155-6MU01-0CN0 ET 200SP, IM 155-6 MF HF
Altitude during operation relating to sea level • Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
connection method				
ET-Connection • via BU/BA Send	No	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules
Mechanics/material				
Strain relief	No	Yes; Optional	Yes; Optional	Yes; Optional
Dimensions				
Width	35 mm	50 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
Weights				
Weight, approx.	125 g	120 g; without BusAdapter	120 g; without BusAdapter	120 g; without BusAdapter
Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0HM0 ET 200SP, IM 155-6 PN R1	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS
General information				
Product type designation	IM 155-6 PN/2 HF	IM 155-6 PN/3 HF	IM 155-6 PN R1	IM 155-6 PN HS
Product function • I&M data • Module swapping during operation (hot swapping) • Isochronous mode • IRT • Tool changer • Local coupling, IO data - Number of coupling modules - Number of coupling submodules per module	Yes; I&M0 to I&M3 Yes; Multi-hot swapping Yes Yes Yes; Docking station and docking unit Yes - Number of coupling modules - Number of coupling submodules per module	Yes; I&M0 to I&M3 Yes; Multi-hot swapping Yes Yes; Docking station and docking unit Yes 16 4	Yes; I&M0 to I&M4 Yes; Multi-hot swapping No No	Yes; I&M0 to I&M3 Yes; Multi-hot swapping Yes Yes
Engineering with • STEP 7 TIA Portal configurable/integrated from version • STEP 7 configurable/integrated from version • PROFINET from GSD version/GSD revision	V15.1 use GSD file GSDML V2.34	V15.1 use GSD file GSDML V2.34	V19 use GSD file GSDML V2.45	V14 V5.5 SP4 GSDML V2.32
CiR - Configuration in RUN Reparameterization possible in RUN reconfiguration possible in RUN			Yes Yes	
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes
Input current Current consumption (rated value)		175 mA; At 24 V, 2 slots 2x RJ45 BusAdapter, no I/O modules		
Address area				
Address space per station • Address space per station, max.	1 440 byte	1 440 byte	1 440 byte	968 byte
Hardware configuration				
Rack • Quantity of operable ET 200SP modules, max. • Quantity of operable ET 200AL modules, max.	64 16	64 16	64 0	30 0
Submodules • Number of submodules per station, max.	256	256	256	125

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6AU01-0CNO ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CNO ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0HMO ET 200SP, IM 155-6 PN R1	6ES7155-6AU00-0DNO ET 200SP, IM155-6PN HS
Interfaces				
Number of PROFINET interfaces	1; 2 ports (switch)	1; 3 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface				
Interface types				
• RJ 45 (Ethernet)	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter	Yes; with BusAdapter
• Number of ports	2; with BusAdapter	3; with 2 compatible BusAdapters:	2; with BusAdapter	2; with BusAdapter
• integrated switch	Yes	Yes	Yes	Yes
• BusAdapter (PROFINET)	Yes; BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC	Yes; BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC	Yes; BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x LC-LD, BA LC-LD/RJ45, BA LC-LD/M12	Yes; BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC, BA 2x LC, BA LC/RJ45, BA LC/FC
Protocols				
• PROFINET IO Device	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client / HRP client
PROFINET IO Device Services				
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame	No	Yes; 125 µs to 4 ms in 125 µs frame
- PROFinergy	Yes	Yes	No	Yes
- Prioritized startup	Yes	Yes	No	Yes
- Shared device	Yes	Yes	No	Yes
- Number of IO Controllers with shared device, max.	4	4		4
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes
Protocols				
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes
PROFIsafe	Yes	Yes	Yes	Yes
PROFIBUS	No	No	No	No
EtherNet/IP	No	No	No	No
Modbus TCP	No	No	No	No
Number of connections				
• Number of MtM communication relationships/connections, max.	16	16		
Redundancy mode				
• PROFINET system redundancy (S2)	Yes; NAP S2	Yes; NAP S2	No	No
• PROFINET system redundancy (R1)			Yes	
• H-Sync forwarding	Yes	Yes	Yes	Yes
Media redundancy				
- MRP	Yes	Yes	Yes	Yes
- MRPD	No	No	No	Yes
Open IE communication				
• TCP/IP	Yes	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes
Isochronous mode				
Equidistance	Yes	Yes		Yes
shortest clock pulse	250 µs	250 µs		125 µs
max. cycle	4 ms	4 ms		4 ms
Bus cycle time (TDP), min.	250 µs	250 µs		125 µs

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0HM0 ET 200SP, IM 155-6 PN R1	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• ACT LED			Yes; green LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates				
Network loading class	3	3		3
product functions / security / header				
signed firmware update			Yes	
Secure Boot			No	
safely removing data			No	
data integrity			Yes	
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-25 °C; No condensation
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	-30 °C; No condensation	-25 °C; No condensation
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
connection method				
ET-Connection				
• via BU/BA Send	Yes; + 16 ET 200AL modules	Yes; + 16 ET 200AL modules	No	No
Mechanics/material				
Strain relief	Yes; Optional	Yes; Optional		
Dimensions				
Width	50 mm	100 mm	50 mm	50 mm
Height	117 mm	117 mm	138 mm	117 mm
Depth	74 mm	74 mm	89 mm	74 mm
Weights				
Weight, approx.	120 g; without BusAdapter	220 g; without BusAdapter	192 g; without BusAdapter	147 g; without BusAdapter

Article number	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
General information	
Product type designation	IM 155-6 DP HF
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V15 SP1
• STEP 7 configurable/integrated from version	As of V5.5 SP4, only up to FW V3.1
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher

Article number	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Address area	
Address space per station	
• Address space per station, max.	244 byte
Hardware configuration	
Rack	
• Quantity of operable ET 200SP modules, max.	32
• Quantity of operable ET 200AL modules, max.	16

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > IM 155-6

Technical specifications

Article number	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
Interfaces	
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
• RS 485	Yes
• Output current of the interface, max.	90 mA
Protocols	
• PROFIBUS DP device	Yes
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
Supports protocol for PROFINET IO	No
PROFIsafe	Yes
PROFIBUS	Yes
EtherNet/IP	No
Modbus TCP	No
Open IE communication	
• TCP/IP	No
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV0	Yes
- DPV1	Yes

Article number	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection display DP	Yes; green DP LED
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
connection method	
ET-Connection	
• via BU/BA Send	Yes; + 16 ET 200AL modules
Dimensions	
Width	50 mm
Height	117 mm
Depth	74 mm
Weights	
Weight, approx.	150 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Interface modules > SIPLUS interface modules

Overview



Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single Hot Swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user program)
- Device replacement without programming device, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable. Can also be used for interface modules with MultiFieldbus interface.
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS PROFINET IM 155-6 PN Standard interface module

(Extended temperature range and exposure to environmental substances)

IM 155-6 PN ST, max. 32 I/O modules, 16 ET 200AL modules, multi hot swap

6AG1155-6AA02-7BN0

IM 155-6PN ST, including server module, without BusAdapter, plus extended mains buffering time

6AG1155-6AU02-7BN0

SIPLUS High Feature interface module

(Extended temperature range and exposure to environmental substances)

IM 155-6 DP HF, with server module, with multi-hot swap, including PROFIBUS connector

6AG1155-6BA01-7CN0

IM 155-6 PN HF, incl. server module, without BusAdapter

6AG1155-6AU01-2CN0

IM155-6 MF HF, max. 64 I/O modules and 16 ET 200AL modules, multi hot swap

6AG1155-6MU01-2CN0

IM155-6 MF HF, max. 64 I/O modules and 16 ET 200AL modules, multi hot swap

6AG1155-6MU01-7CN0

Redundant SIPLUS PROFINET IM 155-6 PN R1 interface module

2-port interface module, with server module, without SIMATIC BusAdapter, R1 redundancy

6AG1155-6AU00-7HM0

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC ET 200SP, IM 155-6 interface module, page 10/11

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Interface modules > SIPLUS interface modules

Technical specifications

Article number	6AG1155-6AA02-7BN0	6AG1155-6AU00-7HMO	6AG1155-6AU01-2CN0	6AG1155-6BA01-7CN0
Based on	6ES7155-6AA02-0BN0	6ES7155-6AU00-0HMO	6ES7155-6AU01-0CN0	6ES7155-6BA01-0CN0
	SIPLUS ET 200SP IM155-6PN ST / BA	SIPLUS ET 200SP IM155-6PN R1	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6DP HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; +85 °C for 10 min (OT4, ST1/ST2 acc. to EN 50155)	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude		Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)		Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)		Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Interface modules > SIPLUS interface modules

Technical specifications

Article number	6AG1155-6AA02-7BN0	6AG1155-6AU00-7HM0	6AG1155-6AU01-2CN0	6AG1155-6BA01-7CN0
Based on	6ES7155-6AA02-0BN0 SIPLUS ET 200SP IM155-6PN ST / BA	6ES7155-6AU00-0HM0 SIPLUS ET 200SP IM155-6PN R1	6ES7155-6AU01-0CN0 SIPLUS ET 200SP IM155-6PN HF	6ES7155-6BA01-0CN0 SIPLUS ET 200SP IM155-6DP HF
Usage in industrial process technology	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 * The supplied plug covers must remain in place over the unused interfaces during operation!	- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 * The supplied plug covers must remain in place over the unused interfaces during operation!	- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 * The supplied plug covers must remain in place over the unused interfaces during operation!	- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 * The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A
Article number	6AG1155-6MU01-2CN0	6AG1155-6AU02-7BN0	6AG1155-6MU01-7CN0	
Based on	6ES7155-6MU01-0CN0 SIPLUS ET 200SP IM155-6 MF HF	6ES7155-6AU02-0BN0 SIPLUS ET 200SP IM155-6PN ST	6ES7155-6MU01-0CN0 SIPLUS ET 200SP IM155-6 MF HF	
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)	

I/O systemsSIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP**Interface modules > SIPLUS interface modules****Technical specifications**

Article number	6AG1155-6MU01-2CN0	6AG1155-6AU02-7BN0	6AG1155-6MU01-7CN0
Based on	6ES7155-6MU01-0CN0	6ES7155-6AU02-0BN0	6ES7155-6MU01-0CN0
	SIPLUS ET 200SP IM155-6 MF HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6 MF HF
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input modules

Overview



- 4, 8 and 16-channel digital input (DI) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)

- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sinking input) and NPN (sourcing input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
 - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Parameterizable input delay time
 - Isochronous mode (simultaneous equidistant reading of all input channels)
 - Hardware interrupts
 - Pulse stretching
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the input signal in the process image)
 - Supports the PROFIenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Overview of digital input modules

Digital input	Pkg. unit	Article No.	CC code	BU type
DI 16 x 24 V DC ST	1	6ES7131-6BH01-0BA0	CC00	A0
DI 16 x 24 V DC ST	10	6ES7131-6BH01-2BA0	CC00	A0
DI 8 x 24 V DC BA	1	6ES7131-6BF01-0AA0	CC01	A0
DI 8 x 24 V DC BA	10	6ES7131-6BF01-2AA0	CC01	A0
DI 8 x 24 V DC SRC BA	1	6ES7131-6BF61-0AA0	CC02	A0
DI 8 x 24 V DC ST	1	6ES7131-6BF01-0BA0	CC01	A0
DI 8 x 24 V DC ST	10	6ES7131-6BF01-2BA0	CC01	A0
DI 8 x 24 V DC HF	1	6ES7131-6BF00-0CA0	CC01	A0
DI 8 x 24 V DC HF	10	6ES7131-6BF00-2CA0	CC01	A0
DI 8 x NAMUR HF	1	6ES7131-6TF00-0CA0	CC01	A0
DI 8 x 24 V DC HS With three operating modes: • High-speed isochronous DI • 4 pulse counters, 32-bit, 10 kHz • Oversampling	1	6ES7131-6BF00-0DA0	CC01	A0
DI 4 x 120 ... 230 V AC ST	1	6ES7131-6FD01-0BB1	CC41	B1
DI 8 x 24 V AC ... 48 V UC	1	6ES7131-6CF00-0AU0	CC20	U0

I/O systems

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I/O modules > Digital input modules

Overview

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC00 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC00 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC00 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC00 to CC05	--
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

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Overview

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-ODP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-OBP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-ODP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-OBP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-OTP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-OTP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-OTP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-OTN0	CC10

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Ordering data

Digital input modules

Types of delivery:
Apart from the standard type of delivery in single-unit package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.
The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital input module
DI 8x24VDC Basic, BU type A0, color code CC01

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10

Digital input module
DI 8x24VDC Source Input, Basic, BU type A0, color code CC02; Pkg. unit: 1 unit

Article No.

6ES7131-6BF01-0AA0
6ES7131-6BF01-2AA0

6ES7131-6BF61-0AA0

Digital input module
DI 8x24VDC Standard, BU type A0, color code CC01

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10

Digital input module
DI 16 x 24 V DC Standard, BU type A0, color code CC00

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10

Digital input module DI 8x24VDC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI); Pkg. unit: 1 unit

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10

Article No.

6ES7131-6BF01-0BA0
6ES7131-6BF01-2BA0

6ES7131-6BH01-0BA0
6ES7131-6BH01-2BA0

6ES7131-6BF00-0CA0
6ES7131-6BF00-2CA0

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Ordering data	Article No.		Article No.
Digital input module DI 8x24VDC High Speed, BU type A0, color code CC01; 3 operating modes (fast isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); Pkg. unit: 1 unit	6ES7131-6BF00-0DA0	BU20-P12+A0+4B BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the potential group; 1 unit • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP20-0BB1 6ES7193-6BP20-2BB1
Digital input module DI 8xNAMUR High Feature, BU type A0, color code CC01; Pkg. unit: 1 unit	6ES7131-6TF00-0CA0		
Digital input module DI 4x120VAC-230VAC Standard, BU type B1, color code CC41; Pkg. unit: 1 unit	6ES7131-6FD01-0BB1	BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0
Digital input module DI 8x24VAC-48VUC Basic, BU type U0, color code CC20, module diagnostics, Pkg. unit: 1 unit	6ES7131-6CF00-0AU0		
Suitable BaseUnits			
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	Potential distributor modules	
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	PotDis BU PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A) PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A) PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	6ES7193-6UP00-0DP1 6ES7193-6UP00-0BP1 6ES7193-6UP00-0DP2 6ES7193-6UP00-0BP2
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	PotDis TB PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A) PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A) PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A) PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TP0 6ES7193-6TP00-0TP1 6ES7193-6TP00-0TP2 6ES7193-6TP00-0TN0

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Ordering data	Article No.	Article No.
Accessories		
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0	
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	
BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0	
Color-coded labels for 15 mm-wide BaseUnits Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	6ES7193-6CP00-2MA0 6ES7193-6CP00-4MA0 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP73-4AA0	
Color-coded labels for 20 mm-wide BaseUnits Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units		6ES7193-6CP41-2MB0
Color-coded labels for PotDis BU Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units		6ES7193-6CP62-2MA0 6ES7193-6CP63-2MA0
Color-coded labels for PotDis TB Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units		6ES7193-6CP10-2MT0 6ES7193-6CP11-2MT0 6ES7193-6CP12-2MT0 6ES7193-6CP13-2MT0
Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units Type A Type B Type C Type D		6ES7193-6KA00-3AA0 6ES7193-6KB00-3AA0 6ES7193-6KC00-3AA0 6ES7193-6KD00-3AA0

I/O systems

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SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
General information				
Product type designation	DI 8x24VDC BA	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24VDC ST
Product function				
• Isochronous mode	No	No	No	No
• suitable for operation on PROFINET R1 IMs	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V14	V14	V14	V14
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 or higher	V5.5 SP3
• PCS 7 configurable/ integrated from version			V8.1 SP1	V8.1 SP1
• PCS neo can be configured/integrated from version			V3.1	from V1.0.0
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DI	Yes	Yes	Yes	Yes
• Counter	No	No	No	No
• Oversampling	No	No	No	No
• MSI	No	No	No	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Encoder supply				
Number of outputs	8		8	
Short-circuit protection	Yes; per module	No	Yes; per module	
24 V encoder supply				
• 24 V	Yes		Yes	No
• Short-circuit protection	Yes		Yes	
• Output current, max.			700 mA	
• Output current per channel, max.	700 mA		700 mA	
• Output current per module, max.	700 mA		700 mA	
Digital inputs				
Number of digital inputs	8	8	8	16
Digital inputs, parameterizable	Yes	Yes	Yes	Yes
Source/sink input	P-reading	Sourcing	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes	Yes
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	30 V to -5 V (reference potential is L+)	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V
Input current				
• for signal "1", typ.	6.8 mA	6 mA	2.5 mA	2.5 mA
Input delay (for rated value of input voltage) for standard inputs				
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)

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I/O modules > Digital input modules

Technical specifications

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
Encoder				
Connectable encoders				
2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 2 mA	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
- Diagnostic information readable - Monitoring the supply voltage - parameterizable - Monitoring of encoder power supply	Yes Yes Yes No	Yes Yes Yes No	Yes Yes Yes Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	Yes Yes Yes No
Wire-break	No	No	Yes; Module-wise	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm
- Short-circuit - Group error	No Yes	No	Yes; Module-wise	No Yes
Diagnostics indication LED				
- Monitoring of the supply voltage (PWR-LED) - Channel status display - for channel diagnostics - for module diagnostics	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-30 °C; < 0 °C as of FS03 60 °C -30 °C; < 0 °C as of FS03 50 °C	-30 °C; < 0 °C as of FS02 60 °C -30 °C; < 0 °C as of FS02 50 °C	-30 °C; < 0 °C as of FS02 60 °C -30 °C; < 0 °C as of FS02 50 °C	-30 °C; < 0 °C as of FS02 60 °C -30 °C; < 0 °C as of FS02 50 °C
Altitude during operation relating to sea level				
Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	28 g	28 g	28 g	28 g

I/O systems

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SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120...230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC...48VUC BA, PU 1
General information					
Product type designation	DI 8x24 V DC HF	DI 8x24 V DC HS	DI 8xNAMUR HF	DI 4x120 ... 230 V AC ST	DI 8x24VAC/48VUC BA
Product function					
• Isochronous mode	Yes	Yes	No	No	No
• suitable for operation on PROFINET R1 IMs	Yes	Yes	Yes	Yes	Yes
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1	V19	V14	V15
• STEP 7 configurable/ integrated from version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3	V5.6
• PCS 7 configurable/ integrated from version	V8.1 SP1	V10.0			
• PCS neo can be configured/ integrated from version	from V1.0.0	V3.1.1			
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.42	GSDML V2.3	GSDML V2.3
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	Yes	Yes	No	No
• Oversampling	No	Yes	No	No	No
• MSI	Yes	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V		48 V
Rated value (AC)				230 V	48 V; 24 V/48 V; 50 Hz/60 Hz
Reverse polarity protection	Yes	Yes	Yes	No	Yes
Encoder supply					
Number of outputs	8		8	4	8
Short-circuit protection	Yes		Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Yes; Per module, 5x 20 mm fuse, 2 A/250 V, quick-response, replaceable
Output current					
• up to 60 °C, max.				10 A	1 A
24 V encoder supply					
• 24 V	Yes	Yes	No		No
• Short-circuit protection	Yes; per channel, electronic	Yes; per module, electronic	No		
• Output current, max.		700 mA			
• Output current per channel, max.	700 mA				
• Output current per module, max.	700 mA				
NAMUR encoder supply					
• 8.2 V			Yes		
• Short-circuit protection			Yes		
• Output current per channel, max.			8 mA		
• Output current per module, max.			64 mA		
Digital inputs					
Number of digital inputs	8	8	8; NAMUR	4	8
Digital inputs, parameterizable	Yes		Yes	Yes	
Source/sink input	P-reading	P-reading			P-reading
Input characteristic curve in accordance with IEC 61131, type 1					Yes
Input characteristic curve in accordance with IEC 61131, type 2					No
Input characteristic curve in accordance with IEC 61131, type 3	Yes			Yes	No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120...230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC...48VUC BA, PU 1
Pulse extension	Yes; Pulse duration from 4 µs	Yes	Yes; 0.5 s, 1 s, 2 s		No
• Length	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Edge evaluation	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change		
Signal change flutter			Yes; 2 to 32 signal changes		
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps		
Digital input functions, parameterizable					
• Gate start/stop		Yes	Yes		
• Freely usable digital input		Yes	Yes		
• Counter		Yes	Yes		
• Digital input with oversampling		Yes			
Input voltage					
• Rated value (DC)	24 V	24 V	8.2 V		
• Rated value (AC)				230 V	
• for signal "0"	-30 to +5 V	-30 to +5 V		0V AC to 40V AC	AC/DC < 10 V
• for signal "1"	+11 to +30V	+11 to +30V		74 V AC to 264 V AC	AC > 14 V, DC > 34 V
Input current					
• for signal "1", typ.	2.5 mA	6 mA		10.8 mA	3.5 mA
for 10 k switched contact					
- for signal "0", min.			0.35 mA		
- for signal "0", max.			1.2 mA		
- for signal "1", min.			2.1 mA		
- for signal "1", max.			7 mA		
for unswitched contact					
- for signal "0", max. (permissible quiescent current)			0.5 mA		
- for signal "1", typ.			8 mA		
for NAMUR encoders					
- for signal "0", min.			0.35 mA		
- for signal "0", max.			1.2 mA		
- for signal "1", min.			2.1 mA		
- for signal "1", max.			7 mA		
Input delay (for rated value of input voltage)					
• tolerated changeover time for changeover contacts			300 ms		
for standard inputs					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
for interrupt inputs					
- parameterizable		Yes			
for technological functions					
- parameterizable		Yes			
for NAMUR inputs					
- at "0" to "1", max.			20 ms; See manual for details		
- at "1" to "0", max.			20 ms; See manual for details		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules

Technical specifications

Article number	6ES7131-6BF00-0CA0	6ES7131-6BF00-0DA0	6ES7131-6TF00-0CA0	6ES7131-6FD01-0BB1	6ES7131-6CF00-0AU0
	ET 200SP, DI 8x24VDC HF, PU 1	ET 200SP, DI 8x24VDC High Speed	ET 200SP, DI 8xNAMUR HF	ET 200SP, DI 4x 120...230V AC ST	ET 200SP, DI 8x 24VAC...48VUC BA, PU 1
Encoder					
Connectable encoders					
• NAMUR encoder/changeover contact according to EN 60947			Yes		
• Single contact / changeover contact unconnected			Yes		
• Single contact / changeover contact connected with 10 kΩ			Yes		
• 2-wire sensor	Yes	Yes		Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA			
Isochronous mode					
Filtering and processing time (TCI), min.	420 μs				
Bus cycle time (TDP), min.	500 μs	125 μs			
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes		Yes
Alarms					
• Diagnostic alarm	Yes; channel by channel	Yes	Yes; channel by channel	No	Yes
• Maintenance interrupt				No	
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes	Yes; Parameterizable, channels 0 to 7	No	
Diagnoses					
• Diagnostic information readable	Yes	Yes	Yes		Yes
• Monitoring the supply voltage	Yes	Yes	Yes	No	Yes
- parameterizable	Yes	Yes	Yes		
• Monitoring of encoder power supply	Yes; channel by channel	Yes; Module-wise	No		Yes
• Wire-break	Yes; Channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	Yes; channel by channel	No	
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	
• Group error					Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	No	Yes; red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS04	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS04	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input modules**Technical specifications**

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Altitude during operation relating to sea level • Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	28 g	28 g	32 g	36 g	40 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Overview



- 4, 8 and 16-channel digital output (DQ) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DQ (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting actuators with rated load voltages of up to 120 V DC or 230 V AC and load currents of up to 5 A (depending on module)

- Relay modules
 - NO contact or changeover contact
 - for load or signal voltages (coupling relay)
 - with manual operation (as simulation module for inputs and outputs, jog mode for commissioning or emergency operation on failure of PLC)
- PNP (sourcing output) and NPN (sinking output) versions
- Clear labeling on front of module
- LED displays for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSO operating mode (simultaneous reading of output data from as many as three other PLCs)
 - Pulse width modulation operating mode (output value as pulse-pause ratio of between 0.0% and 100.0% for controlling the output current)
 - Oversampling operating mode (n-fold equidistant output of digital values within a PN cycle for the precise time control of an output or a sequence of output values)
 - Isochronous mode (simultaneous equidistant output of all output channels)
 - Output of substitute value in the event of communication interruptions (0, 1 or last value retained)
 - Re-parameterization during operation
 - Firmware update
 - Valve control (output signal does not switch automatically after a set pickup time to a current-saving PWM output)
 - Diagnostics of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the output signal in the process image)
 - Supports the PROFIenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the different DQ modules is offered by the TIA Selection Tool.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules**Overview**

Overview of digital output modules

Digital output	Pkg. unit	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A BA	1	6ES7132-6BH00-0AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A BA	10	6ES7132-6BH00-2AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	1	6ES7132-6BH01-0BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	10	6ES7132-6BH01-2BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A HF	1	6ES7132-6BH00-0CA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BF61-0AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A BA	1	6ES7132-6BF01-0AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A BA	10	6ES7132-6BF01-2AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	1	6ES7132-6BF01-0BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	10	6ES7132-6BF01-2BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF00-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF00-2CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF01-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF01-2CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD20-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD20-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD21-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD21-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD20-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD21-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HS With three operating modes: • Fast isochronous DQ with valve control • Pulse width modulation • Oversampling	1	6ES7132-6BD20-0DA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A ST	1	6ES7132-6FD00-0BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A ST	10	6ES7132-6FD00-2BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A HF With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control	1	6ES7132-6FD00-0CU0	CC20	U0
RQ 4 x 24 V UC/2 A CO ST	1	6ES7132-6GD51-0BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6ES7132-6HD01-0BB1	--	B0, B1
RQ 4 x 120 V DC-230 V AC/5 A NO ST	10	6ES7132-6HD01-2BB1	--	B0, B1
RQ MA 4 x 120 V DC ... 230 V AC/5 A NO ST	1	6ES7132-6MD00-0BB1	--	B0, B1

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--

I/O systems

SIMATIC ET 200 systems for the control cabinet

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I/O modules > Digital output modules**Overview**

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type B0 • Forwarding of the potential group (dark) • 12 process terminals • With 4 AUX terminals	1	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B0 • Forwarding of the potential group (dark) • 12 process terminals • With 4 AUX terminals	10	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of the potential group (dark) • 12 process terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC20	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC20	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC20	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC20	--

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Overview

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Ordering data

Digital output modules

Types of delivery:
Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.

Digital output module
DQ 16x24VDC/0.5A Basic,
BU type A0, color code CC00

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this Article No. with an order quantity of 10.

6ES7132-6BH00-0AA0
6ES7132-6BH00-2AA0

Digital output module
DQ 16x24VDC/0.5A Standard,
sourcing output, BU type A0,
color code CC00

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this Article No. with an order quantity of 10.

6ES7132-6BH01-0BA0
6ES7132-6BH01-2BA0

Digital output module
DQ 16x24VDC/0.5A High Feature,
sourcing output, BU type A0,
color code CC00

- Pack of 1 unit

6ES7132-6BH00-0CA0

Digital output module
DQ 8x24VDC/0.5A Sink output,
Basic, BU type A0, color code CC01

- Pack of 1 unit

6ES7132-6BF61-0AA0

Digital output module
DQ 8x24VDC/0.5A Basic,
BU type A0, color code CC02

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this Article No. with an order quantity of 10.

6ES7132-6BF01-0AA0
6ES7132-6BF01-2AA0

I/O systems

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I/O modules > Digital output modules

Ordering data	Article No.	Article No.
Digital output module DQ 8x24VDC/0.5A Standard, BU type A0, color code CC02 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7132-6BF01-0BA0 6ES7132-6BF01-2BA0	
Digital output module DQ 8x24VDC/0.5A High Feature, BU type A0, color code CC02 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7132-6BF00-0CA0 6ES7132-6BF00-2CA0	6ES7132-6FD00-0CU0
Digital output module DQ 8x24VDC/0.5A High Feature, BU type A0, color code CC02 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7132-6BF01-0CA0 6ES7132-6BF01-2CA0	6ES7132-6HD01-0BB1 6ES7132-6HD01-2BB1
Digital output module DQ 4x24VDC/2A Standard, BU type A0, color code CC02 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7132-6BD20-0BA0 6ES7132-6BD20-2BA0	6ES7132-6MD00-0BB1
Digital output module DQ 4x24VDC/2A Standard, BU type A0, color code CC02 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7132-6BD21-0BA0 6ES7132-6BD21-2BA0	6ES7132-6HC50-0BU0
Digital output module DQ 4x24VDC/2A Standard, BU type A0, color code CC02 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7132-6HC70-0BU0
Digital output module DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, channel-specific diagnostics, isochronous mode, shared output (MSO) • Pack of 1 unit	6ES7132-6BD20-0CA0	
Digital output module DQ 4x24VDC/2A High Feature, BU type A0, color code CC02, channel-specific diagnostics, isochronous mode, shared output (MSO) • Pack of 1 unit	6ES7132-6BD21-0CA0	
Digital output module DQ 4x24VDC/2A High Speed, BU type A0, color code CC02, 3 operating modes (fast isochronous DQ with valve control, pulse width modulation, oversampling) • Pack of 1 unit	6ES7132-6BD20-0DA0	
Digital output module DQ 4x24VAC...230VAC/2A Standard for BU type B1, color code CC41 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7132-6FD00-0BB1 6ES7132-6FD00-2BB1	
Digital output module DQ 4x24VAC...230VAC/2A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control) • Pack of 1 unit		6ES7132-6FD00-0CU0
Signal relay module RQ CO 4x24VUC/2A Standard, changeover contact, BU type A0, color code CC00 • Pack of 1 unit		6ES7132-6GD51-0BA0
Relay module RQ NO 4x120VDC-230VAC/5A Standard, NO contact, BU type B0, B1 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7132-6HD01-0BB1 6ES7132-6HD01-2BB1
Relay module RQ NO 4x120VDC-230VAC/5A Standard, NO contact, with manual operation, BU type B0, B1 • Pack of 1 unit		6ES7132-6MD00-0BB1
Relay module RQ CO 3x120V DC..230VAC/5A Standard, changeover contact, isolated, BU type U0, color code CC20 • Pack of 1 unit		6ES7132-6HC50-0BU0
Relay module RQ Coni 3x120V DC..230VAC/5A Standard, changeover contact, non-isolated, BU type U0, color code CC20 • Pack of 1 unit		6ES7132-6HC70-0BU0
Suitable BaseUnits		
BU15-P16+A10+2D		
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0
BU15-P16+A0+2D		
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0
BU15-P16+A10+2B		
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0

I/O systems

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SIMATIC ET 200SP

I/O modules > Digital output modules

Ordering data	Article No.	Article No.	
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	PotDis TB PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A) PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A) PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A) PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TP0 6ES7193-6TP00-0TP1 6ES7193-6TP00-0TP2 6ES7193-6TP00-0TN0
BU20-P12+A4+0B BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0BB0 6ES7193-6BP20-2BB0	Accessories Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
BU20-P12+A0+4B BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0BB1 6ES7193-6BP20-2BB1	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0	BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0	Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0
Potential distributor modules		Color-coded labels for 15 mm-wide BaseUnits Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	6ES7193-6CP00-2MA0 6ES7193-6CP00-4MA0 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0
PotDis BU PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A) PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A) PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	6ES7193-6UP00-0DP1 6ES7193-6UP00-0BP1 6ES7193-6UP00-0DP2 6ES7193-6UP00-0BP2		

I/O systems

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Ordering data	Article No.		Article No.
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0	Color-coded labels for PotDis TB Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0		6ES7193-6CP11-2MT0
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0		6ES7193-6CP12-2MT0
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	6ES7193-6CP73-4AA0		6ES7193-6CP13-2MT0
Color-coded labels for 20 mm-wide BaseUnits		Mechanical coding elements	
Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	6ES7193-6CP41-2MB0	For automatic coding of I/O modules; spare part. 20 units	
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units	6ES7193-6CP81-2AB0	Type A	6ES7193-6KA00-3AA0
		Type B	6ES7193-6KB00-3AA0
		Type C	6ES7193-6KC00-3AA0
		Type D	6ES7193-6KD00-3AA0
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	6ES7193-6CP82-2AB0		
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	6ES7193-6CP83-2AB0		
Color-coded labels for PotDis BU			
Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0		
Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP63-2MA0		

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Technical specifications

Article number	6ES7132-6BF61-0AA0	6ES7132-6BH00-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF01-0AA0	6ES7132-6BF01-0BA0	6ES7132-6BH00-0CA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16x24VDC/0,5A BA, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 16x24VDC/0,5A HF, PU 1
General information						
Product type designation	DQ 8x24VDC/0,5A SNK BA	DQ 16x24VDC/0,5A BA	DQ 16x24VDC/0,5 ST	DQ 8x24VDC/0,5A BA	DQ 8x24VDC/0,5A ST	DQ 16x24VDC/0,5A HF
Product function						
• Isochronous mode	No	No	No	No	No	Yes
Engineering with						
• STEP 7 TIA Portal configurable/ integrated from version	V14	V14	STEP 7 TIA V14 with HSP0222 / integrated as of TIA V15	V14	STEP 7 TIA V14 with HSP0222 / integrated as of TIA V15	STEP 7 V18 or higher with HSP 0416
• STEP 7 configurable/ integrated from version	V5.5 SP3	STEP 7 V5.5 or higher	V5.5 SP3 with HSP0230 V7.0 / integrated as of V5.6 SP1	V5.5 SP3	V5.5 SP3 with HSP0230 V7.0 / integrated as of V5.6 SP1	V5.5 SP3 or higher
• PCS 7 configurable/ integrated from version			V8.1 SP1		V8.1 SP1	
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.43

I/O systems

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SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF61-0AA0	6ES7132-6BH00-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF01-0AA0	6ES7132-6BF01-0BA0	6ES7132-6BH00-0CA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16x 24VDC/0,5A BA, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 16x 24VDC/0,5A HF, PU 1
Operating mode						
• DQ	Yes	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No	No
• PWM	No	No	No	No	No	No
• Cam control (switching at comparison values)						No
• Oversampling	No	No	No	No	No	No
• MSO	No	No	No	No	No	Yes
Supply voltage						
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection		Yes	Yes	Yes	Yes	Yes
Digital outputs						
Type of digital output	Sink output (NPN)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	8	16	16	8	8	16
Current-sinking	Yes	No	No		No	No
Current-sourcing		Yes	Yes	Yes	Yes	Yes
Digital outputs, parameterizable output type acc. to IEC 61131, type 0.5	Yes	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes; Electronic	Yes; per channel, electronic	Yes; Electronic	Yes; Electronic
Open-circuit detection		No	Yes		Yes	Yes
Limitation of inductive shutdown voltage to	Typ. 47 V	Typ. L+ (-53 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs						
• with resistive load, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• with inductive load, max.			0.5 A		0.5 A	0.5 A
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
Load resistance range						
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	3 400 Ω	100 kΩ	12 kΩ	100 kΩ	12 kΩ	12 kΩ
Output current						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	5 μA	30 μA	0.1 mA	10 μA	0.1 mA	0.1 mA
Output delay with resistive load						
• "0" to "1", typ.		80 μs; at rated load	50 μs			50 μs
• "0" to "1", max.	300 μs	150 μs; at rated load		100 μs; at rated load	50 μs; at rated load	
• "1" to "0", typ.		100 μs; at rated load	100 μs			100 μs
• "1" to "0", max.	600 μs	200 μs; at rated load		150 μs; at rated load	100 μs; at rated load	
Parallel switching of two outputs						
• for uprating	No	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes	Yes
Switching frequency						
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF61-0AA0 ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	6ES7132-6BH00-0AA0 ET 200SP, DQ 16x24VDC/0,5A BA, PU 1	6ES7132-6BH01-0BA0 ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	6ES7132-6BF01-0AA0 ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	6ES7132-6BF01-0BA0 ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	6ES7132-6BH00-0CA0 ET 200SP, DQ 16x24VDC/0,5A HF, PU 1
Total current of the outputs • Current per channel, max. • Current per module, max.	0.5 A 4 A	0.5 A 8 A	0.5 A 8 A; see Equipment Manual "Derating curve"	0.5 A 4 A	0.5 A 4 A	0.5 A 8 A
Total current of the outputs (per module) horizontal installation - up to 40 °C, max. - up to 50 °C, max. - up to 60 °C, max.	4 A	8 A	8 A 6 A 4 A	4 A	4 A	8 A 6 A 4 A
vertical installation - up to 30 °C, max. - up to 40 °C, max. - up to 50 °C, max.	4 A	8 A	8 A 6 A 4 A	4 A	4 A	8 A 6 A 4 A
Isochronous mode Execution and activation time (TCO), min. Bus cycle time (TDP), min.						48 µs 500 µs
Interrupts/diagnostics/ status information Diagnostics function Substitute values connectable	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Alarms • Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes
Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit • Short-circuit to M • Short-circuit to L+ • Group error	Yes No No Yes	Yes No No Yes	Yes Yes; Module-wise Yes; Module-wise Yes; Module-wise Yes	Yes No No Yes	Yes Yes; Module-wise Yes; Module-wise Yes; Module-wise Yes	Yes Yes; channel by channel Yes; channel by channel Yes; channel by channel Yes
Diagnostics indication LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green LED No Yes; green/red DIAG LED	Yes; green PWR LED Yes; green PWR LED No Yes; green PWR LED	Yes; green PWR LED Yes; green LED Yes; green LED, see Alarms/diagnostics Yes; green/red DIAG LED
Potential separation Potential separation channels • between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates Suitable for safety functions Suitable for safety-related tripping of standard modules	No No	No No	No No	No Yes; see FAQ Entry ID: 39198632	No No	No Yes; see FAQ Entry ID: 39198632
Highest safety class achievable in safety mode • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508				PL d SIL 2		

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SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF61-0AA0	6ES7132-6BH00-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF01-0AA0	6ES7132-6BF01-0BA0	6ES7132-6BH00-0CA0
	ET 200SP, DQ 8x 24VDC/0,5A SINK BA, PU 1	ET 200SP, DQ 16x24VDC/0,5A BA, PU 1	ET 200SP, DQ 16x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 8x 24V DC/0,5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0,5A ST, PU 1	ET 200SP, DQ 16x24VDC/0,5A HF, PU 1
Highest safety class achievable for safety-related tripping of standard modules						PL d
- Performance level according to ISO 13849-1 - Category according to ISO 13849-1 - SIL acc. to IEC 62061						Cat. 3 SIL 2
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-25 °C	-30 °C	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C	-30 °C	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS02	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions						
Width	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm
Weights						
Weight, approx.	30 g	30 g	30 g	30 g	30 g	26 g

Article number	6ES7132-6BF00-0CA0	6ES7132-6BF01-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD21-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD21-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	ET 200SP, DQ 8x24VDC/0,5A HF, PU 1	ET 200SP, DQ 4x24VDC/2A ST	ET 200SP, DQ 4x24VDC/2A ST, PU 1	ET 200SP, DQ 4x24VDC/2A HF	ET 200SP, DQ 4x24VDC/2A HF, PU 1	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24..230VAC/2A ST
General information								
Product type designation	DQ 8x24 V DC/0.5 A HF	DQ 8x24 V DC/0.5A HF	DQ 4x24 V DC/2 A ST	DQ 4x24 V DC/2A ST	DQ 4xDC 24 V/2 A HF	DQ 4x24V DC/2A HF	DQ 4x24 V DC/2 A HS	DQ 4x24 ... 230 V AC/ 2 A ST
Product function								
• Isochronous mode	Yes	Yes	No	No	Yes	Yes	Yes; Operating modes DQ and OVS only	No
Engineering with								
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	as of TIA Portal V19 with HSP0428 / integrated as of TIA Portal V20	V11 SP2 / V13	STEP 7 V19 or higher with HSP0425 / integrated as of TIA Portal V20	V13 SP1 / -	as of TIA Portal V19 with HSP0426 / integrated as of TIA Portal V20	STEP 7 V15.1 or higher	V13 / V13
• STEP 7 configurable/ integrated from version	V5.5 / -	as of STEP 7 V5.5 SP3 with HSP0230 V11.0 / integrated as of STEP 7 V5.7 SP3	V5.5 SP3 / -	as of STEP 7 V5.5 SP3 with HSP0230 V11.0 / integrated as of STEP 7 V5.7 SP3	V5.5 / -	as of STEP 7 V5.5 SP3 with HSP0230 V11.0 / integrated as of STEP 7 V5.7 SP3	via GSD as of V5.6 HF4	V5.5 SP3 / -
• PCS 7 configurable/ integrated from version	V8.1 SP1		V8.1 SP1					
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF00-0CA0	6ES7132-6BF01-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD21-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD21-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	ET 200SP, DQ 4x24VDC/ 2A ST	ET 200SP, DQ 4x24VDC/ 2A ST, PU 1	ET 200SP, DQ 4x24VDC/ 2A HF	ET 200SP, DQ 4x24VDC/ 2A HF, PU 1	ET 200SP, DQ 4x24VDC/ 2A High Speed, PU 1	ET 200SP, DQ 4x24..230VAC/ 2A ST
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.43	GSDML V2.3	GSDML V2.43	GSDML V2.3	GSDML V2.43	GSDML V2.33	GSDML V2.3
Operating mode								
• DQ	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No	No	Yes; Valve control	No
• PWM	No	No	No	No	No	No	Yes	No
• Cam control (switching at comparison values)							Yes; Via MtM (module-to-module communication)	
• Oversampling	No	No	No	No	No	No	Yes	No
• MSO	Yes	Yes	No	No	Yes	Yes	No	No
Supply voltage								
Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V	24 V	
Rated value (AC)								230 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Digital outputs								
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Triac with zero point detection
Number of digital outputs	8	8	4	4	4	4	4	4
Current-sinking	No	No	No	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes	Yes	Yes	Yes; Push-pull output	Yes
Digital outputs, parameterizable output type acc. to IEC 61131, type 0.5	Yes	Yes Yes	Yes	Yes	Yes	Yes	Yes	No
output type acc. to IEC 61131, type 2			Yes	Yes	Yes	Yes		
Short-circuit protection	Yes	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes; Electronic	Yes	No; When using BU type B1, a miniature, quick-response fuse with 10 A tripping current must be provided
Open-circuit detection		Yes	Yes	Yes		Yes		
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	Typ. L+ (-50 V)	L+ (-37 to 41V)	Typ. L+ (-50 V)	M (-1 V)	
Controlling a digital input	Yes	Yes	Yes	Yes; supports input type 3 according to IEC 61131-2	Yes; Minimum current consumption 7 mA	Yes	No	Yes
Size of motor starters according to NEMA, max.								5
Digital output functions, parameterizable								
• Switching tripped by comparison values							Yes	
- Number of cam tracks, max.							4	
• Freely usable digital output							Yes	
• PWM output							Yes	
- Number, max.							4	
• Digital output with oversampling							Yes	
- Number, max.							4	
Switching capacity of the outputs								
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A	2 A	2 A	2 A
• with inductive load, max.		0.5 A		2 A		2 A		
• on lamp load, max.	5 W	5 W	10 W	10 W	10 W	10 W	10 W	100 W

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF00-0CA0	6ES7132-6BF01-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD21-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD21-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	ET 200SP, DQ 4x24VDC/ 2A ST	ET 200SP, DQ 4x24VDC/ 2A ST, PU 1	ET 200SP, DQ 4x24VDC/ 2A HF	ET 200SP, DQ 4x24VDC/ 2A HF, PU 1	ET 200SP, DQ 4x24VDC/ 2A High Speed, PU 1	ET 200SP, DQ 4x24VDC/ 2A ST
Load resistance range								
• lower limit	48 Ω	48 Ω	12 Ω	12 Ω	12 Ω	12 Ω	12 Ω	
• upper limit	12 kΩ	12 kΩ	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω	3 400 Ω	
Output voltage								
• for signal "1", min.								20.4 V
Output current								
• for signal "1" rated value	0.5 A	0.5 A	2 A	2 A	2 A	2 A	2 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA	0.1 mA	0.1 mA	0.1 mA	0.1 mA	0.1 mA	460 µA
Output delay with resistive load								
• "0" to "1", typ.	50 µs	50 µs	50 µs	50 µs	50 µs	50 µs		
• "0" to "1", max.			50 µs				1 µs	10 ms
• "1" to "0", typ.	100 µs	100 µs	100 µs	100 µs	100 µs	100 µs		
• "1" to "0", max.			100 µs				1 µs	10 ms
Parallel switching of two outputs								
• for logic links	No	No	No	No	No	No	No	No
• for uprating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• for redundant control of a load								
Switching frequency								
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz	5 kHz	10 Hz
• with inductive load, max.	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	2 Hz	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"	5 kHz	0.5 Hz; Higher frequencies are possible, see Equipment Manual / Product Information
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	5 kHz	1 Hz
Total current of the outputs								
• Current per channel, max.	0.5 A	0.5 A	2 A	2 A	2 A	2 A	2 A	2 A
• Current per module, max.	4 A	4 A	8 A	8 A; see Equipment Manual "Derating curve"	8 A	8 A; see Equipment Manual "Derating curve"	8 A	8 A
Total current of the outputs (per module)								
horizontal installation								
- up to 30 °C, max.				8 A		8 A	8 A; DQ mode	
- up to 40 °C, max.			8 A	8 A	8 A	8 A	6.9 A; DQ mode	8 A
- up to 50 °C, max.			6 A	6 A	6 A	6 A	4.7 A; DQ mode	6 A
- up to 60 °C, max.	4 A	4 A	4 A	4 A	4 A	4 A	2.5 A; DQ mode	4 A
vertical installation								
- up to 30 °C, max.			8 A	8 A	8 A	8 A	7.2 A; DQ mode	8 A
- up to 40 °C, max.			6 A	6 A	6 A	6 A	5.6 A; DQ mode	6 A
- up to 50 °C, max.	4 A	4 A	4 A	4 A	4 A	4 A	4 A; DQ mode	4 A
- up to 60 °C, max.			4 A					
Isochronous mode								
Execution and activation time (TCO), min.	48 µs	48 µs				75 µs	40 µs	
Bus cycle time (TDP), min.	500 µs	500 µs			500 µs	500 µs	125 µs	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF00-0CA0	6ES7132-6BF01-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD21-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD21-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	ET 200SP, DQ 4x24VDC/ 2A ST	ET 200SP, DQ 4x24VDC/ 2A ST, PU 1	ET 200SP, DQ 4x24VDC/ 2A HF	ET 200SP, DQ 4x24VDC/ 2A HF, PU 1	ET 200SP, DQ 4x24VDC/ 2A High Speed, PU 1	ET 200SP, DQ 4x24...230VAC/ 2A ST
Interrupts/diagnostics/ status information								
Diagnostics function	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alarms								
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Diagnoses								
• Diagnostic information readable							Yes	
• Monitoring the supply voltage - parameterizable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
• Wire-break	Yes; channel by channel	Yes; channel by channel	Yes; Module-wise	Yes; Module-wise	Yes; channel by channel	Yes; channel by channel	No	No
• Short-circuit	Yes; channel by channel		Yes; Module-wise				Yes; Module-wise	No
• Short-circuit to M		Yes; channel by channel		Yes; Module-wise	Yes; channel by channel	Yes; channel by channel		
• Short-circuit to L+		Yes; channel by channel		Yes; Module-wise	Yes; channel by channel	Yes; channel by channel		
• Group error	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED								
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	No	No	Yes; red LED	Yes; red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation								
Potential separation channels								
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates								
Suitable for safety functions	No	No	No	No	No	No	No	No
Suitable for safety-related tripping of standard modules	No; see FAQ Entry ID: 39198632	Yes; see FAQ Entry ID: 39198632	Yes; see FAQ Entry ID: 39198632		Yes; see FAQ Entry ID: 39198632	Yes; see FAQ Entry ID: 39198632	No	
Highest safety class achievable in safety mode								
• Performance level according to ISO 13849-1			PL d		PL d			
• SIL acc. to IEC 61508			SIL 2		SIL 2			
Highest safety class achievable for safety-related tripping of standard modules								
• Performance level according to ISO 13849-1		PL d				PL d		
• Category according to ISO 13849-1		Cat. 3				Cat. 3		
• SIL acc. to IEC 62061		SIL 2				SIL 2		
Ambient conditions								
Ambient temperature during operation								
• horizontal installation, min.	-30 °C; < 0 °C as of FS07	-30 °C	-30 °C; < 0 °C as of FS08	-30 °C	-30 °C; < 0 °C as of FS06	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS07	-30 °C	-30 °C; < 0 °C as of FS08	-30 °C	-30 °C; < 0 °C as of FS06	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C	60 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6BF00-0CA0 ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	6ES7132-6BF01-0CA0 ET 200SP, DQ 8x24VDC/ 0,5A HF, PU 1	6ES7132-6BD20-0BA0 ET 200SP, DQ 4x24VDC/ 2A ST	6ES7132-6BD21-0BA0 ET 200SP, DQ 4X24VDC/ 2A ST, PU 1	6ES7132-6BD20-0CA0 ET 200SP, DQ 4x24VDC/ 2A HF	6ES7132-6BD21-0CA0 ET 200SP, DQ 4x24VDC/ 2A HF, PU 1	6ES7132-6BD20-0DA0 ET 200SP, DQ 4x24VDC/ 2A High Speed, PU 1	6ES7132-6FD00-0BB1 ET 200SP, DQ 4x24...230VAC/ 2A ST
Altitude during operation relating to sea level Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions								
Width	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm	15 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm
Weights								
Weight, approx.	30 g	30 g	30 g	30 g	30 g	30 g	31 g	50 g
Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24...230VAC/2A HF, PU 1		6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1		6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC...230VAC/5A, PU1		6ES7132-6MD00-0BB1 ET 200SP, RQ NO-mA 4x120VDC...230VAC/5A ST	
General information								
Product type designation	DQ 4x24 ... 230 V AC/2 A HF		RQ CO 4x24VDC/2A ST		RQ 4x120 VDC ... 230 VAC/ 5 A NO ST		RQ 4x120 V DC ... 230 V AC/ 5 A NO MA ST	
Product function Isochronous mode	No		No		No			
Engineering with - STEP 7 TIA Portal configurable/ integrated from version - STEP 7 configurable/ integrated from version - PCS 7 configurable/ integrated from version - PROFIBUS from GSD version/ GSD revision - PROFINET from GSD version/ GSD revision	V14 STEP 7 V5.5 or higher GSD as of Revision 5 GSDML V2.3		V14 V5.5 SP3 One GSD file each, Revision 3 and 5 and higher GSDML V2.3		V14 V5.5 SP3 V8.1 SP1 One GSD file each, Revision 3 and 5 and higher GSDML V2.3		V13 SP1 V5.5 SP3 / - One GSD file each, Revision 3 and 5 and higher GSDML V2.3	
Operating mode - DQ - DQ with energy-saving function - PWM - Oversampling - MSO - Phase control - Trailing-edge phase - Half-wave - Full-wave	Yes Yes No No No Yes; Control area: 8.5 ... 100% of the phase angle No Yes Yes		Yes No No No No		Yes No No No No		Yes No No No No	
Supply voltage								
Rated value (DC)			24 V		24 V		24 V	
Rated value (AC)	230 V; 47 ... 63 Hz, max. rate of change of frequency 1 mHz/s							
Reverse polarity protection			Yes		Yes		Yes	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-mA 4x120VDC..230VAC/5A ST
Digital outputs				
Type of digital output	Triac	Relays	Relays	Relays
Number of digital outputs	4	4	4	4
Current-sinking	No	Yes	Yes	
Current-sourcing	Yes	Yes	Yes	
Digital outputs, parameterizable	Yes	Yes	Yes	
Short-circuit protection	No; external fusing necessary	No	No	No
Open-circuit detection	Yes; channel by channel			
Overload protection	No; A miniature fuse with 10 tripping current and tripping characteristic "quick response" must be provided in the module supply			
Controlling a digital input	Yes			
Switching capacity of the outputs				
• with resistive load, max.	2 A; Max. 4 A, see additional description in manual			
• with inductive load, max.	2 A			
• on lamp load, max.	100 W; Tungsten rating in accordance with UL; for thermistors with higher power ratings, see the notes in the manual			
Output voltage				
• for signal "1", min.	20.4 V			
Output current				
• for signal "1" rated value	2 A			
• for signal "0" residual current, max.	3 mA			
Output delay with resistive load				
• "0" to "1", max.	40 ms; 2 AC cycles			
• "1" to "0", max.	20 ms; 1 AC cycle			
Parallel switching of two outputs				
• for logic links	No	Yes	Yes	
• for uprating	No	No	No	
• for redundant control of a load	Yes	Yes	Yes	
Switching frequency				
• with resistive load, max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	2 Hz	2 Hz	2 Hz
• with inductive load (acc. to IEC 60947-5-1, DC13), max.			0.5 Hz; provide one freewheeling diode for switching frequencies higher than 0.1 Hz	0.5 Hz; provide one freewheeling diode for switching frequencies higher than 0.1 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode		0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz; Applies to DQ mode; limited by line frequency in PC mode		2 Hz	2 Hz
Total current of the outputs				
• Current per channel, max.	2 A; Max. 4 A, see additional description in manual	2 A	5 A	5 A
• Current per module, max.	8 A	8 A	20 A	20 A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/5A, PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-mA 4x120VDC..230VAC/5A ST
Total current of the outputs (per module)				
horizontal installation				
- up to 40 °C, max.	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	20 A	20 A
- up to 60 °C, max.	4 A	4 A	16 A	16 A
vertical installation				
- up to 30 °C, max.	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	20 A	20 A
- up to 50 °C, max.	4 A	4 A	16 A	16 A
Relay outputs				
• Number of relay outputs		4	4	4
• Rated supply voltage of relay coil L+ (DC)		24 V	24 V	24 V
• Current consumption of relays (coil current of all relays), max.		40 mA	40 mA	40 mA
• external protection for relay outputs			Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic	Yes, with miniature fuse max. 6 A tripping current and quick-response tripping characteristic
• Number of operating cycles, max.		500 000	7 000 000; see additional description in the manual	7 000 000; see additional description in the manual
Switching capacity of contacts				
- with inductive load, max.			2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.		2 A	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.		2 A	5 A; Max. 1 385 VA, 150 W	5 A
- Switching current, min.		1 mA; 5 V DC	100 mA; 5 V DC	100 mA; 5 V DC
- Rated switching voltage (DC)		24 V	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)		24 V	24V AC to 230V AC	24V AC to 230V AC
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
• Diagnostic information readable	Yes			
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	No	No	No
• Short-circuit	No	No	No	No
• Group error	Yes			Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24...230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC...230VAC/5A, PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-mA 4x120VDC...230VAC/5A ST
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	20 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	50 g	30 g	40 g	45 g
Article number	6ES7132-6HC50-0BU0 ET 200SP, RQ CO 3x120VDC.230VAC/5A ST		6ES7132-6HC70-0BU0 ET 200SP, RQ COni 3x120VDC.230VAC/5A ST	
General information				
Product type designation	RQ 3x120VDC-230VAC/5A CO ST		RQ 3x120VDC-230VAC/5A CO n.i. ST	
Product function				
• Isochronous mode	No		No	
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V16 or higher		TIA V19 or higher with HSP0463 / integrated as of TIA V20	
• STEP 7 configurable/ integrated from version	Configurable via GSD file			
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher		One GSD file each, Revision 3 and 5 and higher	
• PROFINET from GSD version/ GSD revision	GSDML V2.34		GSDML V2.45	
Supply voltage				
Rated value (DC)	24 V		24 V	
Reverse polarity protection	Yes		Yes	
Digital outputs				
Type of digital output	Relays		Relays	
Number of digital outputs	3		3	
Current-sinking	Yes		Yes	
Current-sourcing	Yes		Yes	
Digital outputs, parameterizable	Yes		Yes	
Short-circuit protection	No		No	
Switching capacity of the outputs				
• with resistive load, max.	5 A; for an additional description, see the Technical Data in the Equipment Manual		5 A; for an additional description, see the Technical Data in the Equipment Manual	
• with inductive load, max.	2 A; for an additional description, see the Technical Data in the Equipment Manual		2 A; for an additional description, see the Technical Data in the Equipment Manual	
Parallel switching of two outputs				
• for logic links	Yes		Yes	
• for uprating	No		No	
• for redundant control of a load	Yes		Yes	
Switching frequency				
• with resistive load, max.	2 Hz		2 Hz	
• with inductive load, max.	0.5 Hz		0.5 Hz	
• on lamp load, max.	2 Hz		2 Hz	
Total current of the outputs				
• Current per channel, max.	5 A		5 A	
• Current per module, max.	15 A		5 A	
Total current of the outputs (per module)				
horizontal installation				
- up to 50 °C, max.	15 A		5 A	
- up to 60 °C, max.	12 A; maximum channel current 4A		5 A	
vertical installation				
- up to 40 °C, max.	15 A		5 A	
- up to 50 °C, max.	12 A; maximum channel current 4A		5 A	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital output modules

Technical specifications

Article number	6ES7132-6HC50-0BU0 ET 200SP, RQ CO 3x120VDC.230VAC/5A ST	6ES7132-6HC70-0BU0 ET 200SP, RQ COni 3x120VDC.230VAC/5A ST
Relay outputs		
• Number of relay outputs	3; changeover contact, isolated	3; Changeover contact, non-floating
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V
• Current consumption of relays (coil current of all relays), max.	30 mA	40 mA
• external protection for relay outputs	yes, with miniature fuse max. 6.3 A tripping current, quick-response tripping characteristic and 1 500 A breaking capacity	yes, with miniature fuse max. 6.3 A tripping current, quick-response tripping characteristic and 1 500 A breaking capacity
• Number of operating cycles, max.	1 000 000; see additional description in the manual	1 000 000; see additional description in the manual
Switching capacity of contacts		
- with inductive load, max.	2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.	5 A; Max. 1 385 VA, 150 W	5 A; Max. 1 385 VA, 150 W
- Switching current, min.	10 mA; 5 V DC	10 mA; 5 V DC
- Rated switching voltage (DC)	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)	24V AC to 230V AC	24V AC to 230V AC
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	No	No
• Short-circuit	No	No
Diagnostics indication LED		
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	40 g	40 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input/output modules

Overview



- Digital hybrid module with 8 digital inputs and 8 digital outputs
- For different requirements, the digital input/output modules offer
- Function class standard
 - BaseUnits for single or multiple-conductor connection with automatic slot coding
 - Potential distributor modules for system-integrated expansion with potential terminals
 - Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
 - Option of connecting sensors compliant with IEC 61131 type 1 and 3 (module-dependent) for rated voltages of up to 24 V DC

- PNP (sinking input) variants
- PNP (sourcing output) variants
- Clear labeling on front of module
- LED displays for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - Output of substitute value in the event of communication interruptions (0, 1 or last value retained)
 - Hardware interrupts
 - Pulse stretching
 - Re-parameterization during operation
 - Firmware update
 - Diagnostics of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the output signal in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the different DI/DQ modules is offered by the TIA Selection Tool

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Digital input/output modules

Overview

Overview of digital input/output modules

Digital input/output modules	Pkg. unit	Article No.	CC code	BU type
DI 8x/DQ 8x24VDC/0.5A ST	1	6ES7133-6BH00-0BA0	CC00	A0

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Digital input/output modules

Overview

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Ordering data

Article No.	Article No.
Digital input/output modules Digital input/output module DI 8x/DQ 8x24VDC/0.5A ST, BU type A0, color code CC00 • Pack of 1 unit 6ES7133-6BH00-0BA0	Potential distributor modules PotDis BU PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A) 6ES7193-6UP00-0DP1 PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group 6ES7193-6UP00-0BP1 PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A) 6ES7193-6UP00-0DP2 PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group 6ES7193-6UP00-0BP2
Suitable BaseUnits BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10. 6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	PotDis TB PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A) 6ES7193-6TP00-0TP0 PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A) 6ES7193-6TP00-0TP1 PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A) 6ES7193-6TP00-0TP2 PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX 6ES7193-6TP00-0TN0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10. 6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	Accessories Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter 6ES7193-6LF30-0AW0
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10. 6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AA0 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AG0 1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer 6ES7193-6LA10-0AA0 1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer 6ES7193-6LA10-0AG0
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10. 6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide 6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0

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I/O modules > Digital input/output modules

Ordering data	Article No.		Article No.
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0	Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units	6ES7193-6CP81-2AB0
Color-coded labels for 15 mm-wide BaseUnits Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	6ES7193-6CP00-2MA0 6ES7193-6CP00-4MA0 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP73-4AA0	Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units Color-coded labels for PotDis BU Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units Color-coded labels for PotDis TB Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units Type A	6ES7193-6CP82-2AB0 6ES7193-6CP83-2AB0 6ES7193-6CP62-2MA0 6ES7193-6CP63-2MA0 6ES7193-6CP10-2MT0 6ES7193-6CP11-2MT0 6ES7193-6CP12-2MT0 6ES7193-6CP13-2MT0 6ES7193-6KA00-3AA0
Color-coded labels for 20 mm-wide BaseUnits Color code CC41, for 16 process terminals, BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	6ES7193-6CP41-2MB0		

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Technical specifications

Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/ 0,5A ST, PU1	Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/ 0,5A ST, PU1
General information		Operating mode	
Product type designation	DI 8x/DQ 8x24VDC/0,5A ST	• DI	Yes
Product function		• DQ	Yes
• Isochronous mode	No	• DQ with energy-saving function	No
Engineering with		• PWM	No
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V18 or higher with HSP 0401	• Oversampling	No
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	• MSO	No
• PROFINET from GSD version/ GSD revision	GSDML V2.42	Supply voltage	
		Rated value (DC)	24 V
		Reverse polarity protection	Yes

I/O systems

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I/O modules > Digital input/output modules

Technical specifications

Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/ 0,5A ST, PU1
Digital inputs	
Number of digital inputs	8
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital outputs	
Type of digital output	Source output (PNP, current-sourcing)
Number of digital outputs	8
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• with inductive load, max.	0.5 A; max. 1 H inductance
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
• "0" to "1", max.	50 μs
• "1" to "0", max.	100 μs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz; higher frequencies are possible, see Equipment Manual "Maximum permitted switching frequency of inductive loads"
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
• Current per module, max.	4 A

Article number	6ES7133-6BH00-0BA0 ET 200SP, DI8x+DQ8x 24V DC/ 0,5A ST, PU1
Total current of the outputs (per module)	
horizontal installation	
- up to 60 °C, max.	4 A
vertical installation	
- up to 50 °C, max.	4 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; module-by-module, for DI: optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kΩm to 45 kΩm
• Short-circuit to M	Yes; module-by-module for DQ
• Short-circuit to L+	Yes; module-by-module for DQ
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
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I/O modules > Analog input modules

Overview

Energy Meter HF module for SIMATIC ET 200SP

Energy Meter HF module for SIMATIC ET 200SP video
https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=5848889024001



- 2, 4 and 8-channel analog input (AI) modules
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting current, voltage and resistance sensors, as well as thermocouples
- Option of connecting force and torque sensors

- Energy Meter for recording up to 600 electrical variables
- Clear labeling on front of module
- LED displays for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Oversampling operating mode (n-fold equidistant acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Isochronous mode (simultaneous equidistant reading in of all analog values)
 - Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
 - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
 - Internal compensation of the line resistance for thermocouples by means of terminal temperature measurement in the BaseUnit for BU type A1
 - Internal compensation also for 2-wire resistance test by means of adjustable line resistance
 - Calibration during runtime
 - Single-channel galvanic isolation
 - HART communication
 - Re-parameterization during operation
 - Firmware update
 - Diagnostics of wire break, short-circuit, overflow, underflow
 - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
 - Value status (optional binary validity information of the analog value in the process image)
 - Supports the PROFenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

I/O systems

SIMATIC ET 200 systems for the control cabinet

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I/O modules > Analog input modules

Overview

Overview of analog input modules

Analog input	Pkg. unit	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6ES7134-6GF00-0AA1	CC01	A0, A1
AI 2 x U ST	1	6ES7134-6FB00-0BA1	CC00	A0, A1
AI 8 x U BA	1	6ES7134-6FF00-0AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6ES7134-6HD00-0BA1	CC03	A0, A1
AI 4 x U/I 2-wire ST	10	6ES7134-6HD00-2BA1	CC03	A0, A1
AI 2 x I 2/4-wire ST	1	6ES7134-6GB00-0BA1	CC05	A0, A1
AI 4 x I 2/4-wire ST	1	6ES7134-6GD00-0BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	10	6ES7134-6GD00-2BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6ES7134-6TD00-0CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6ES7134-6HB00-0CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS With two operating modes: • High-speed isochronous AI • Oversampling	1	6ES7134-6HB00-0DA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	1	6ES7134-6JF00-0CA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	10	6ES7134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6ES7134-6JD00-0CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	10	6ES7134-6JD00-2CA1	CC00	A0, A1
AI 4 x TC High Speed	1	6ES7134-6JD00-0DA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	7MH4134-6LB00-0DA0	CC00	A0
AI Energy Meter CT ST	1	6ES7134-6PA01-0BU0	--	U0
AI Energy Meter RC ST	1	6ES7134-6PA21-0BU0	--	U0
AI Energy Meter CT HF	1	6ES7134-6PA01-0CU0	--	U0
AI Energy Meter RC HF	1	6ES7134-6PA21-0CU0	--	U0

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--

I/O systems

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I/O modules > Analog input modules

Overview

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63

I/O systems

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I/O modules > Analog input modules

Overview

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Ordering data

Analog input modules

Types of delivery:
Apart from the standard type of delivery in a single-unit package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.

Analog input module
AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01

6ES7 134-6GF00-0AA1

Analog input module
AI 2xU ST, BU type A0 or A1, color code CC00

6ES7134-6FB00-0BA1

Analog input module
AI 8xU BA, BU type A0 or A1, color code CC02

6ES7 134-6FF00-0AA1

Analog input module
AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, $\pm 0.3\%$

6ES7134-6HD01-0BA1
6ES7134-6HD01-2BA1

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

Analog input module AI 2xI 2/4-wire Standard, BU type A0 or A1, color code CC05, 16-bit

- Pack of 1 unit

6ES7134-6GB00-0BA1

Analog input module
AI 4xI 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, $\pm 0.3\%$

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7134-6GD01-0BA1
6ES7134-6GD01-2BA1

Analog input module
AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03

6ES7134-6TD00-0CA1

Analog input module
AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, $\pm 0.1\%$, independent channel galvanic isolation, isochronous mode above 1 ms

6ES7134-6HB00-0CA1

Analog input module
AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$, isochronous mode above 250 μ s, oversampling above 50 μ s

6ES7134-6HB00-0DA1

Analog input module
AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$, scalable measuring range

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7134-6JF00-0CA1
6ES7134-6JF00-2CA1

Analog input module
AI 4xRTD/TC 2/3/4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$, scalable measuring range

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7134-6JD00-0CA1
6ES7134-6JD00-2CA1

10

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog input modules

Ordering data	Article No.		Article No.
Analog input module AI 4xTC High Speed, BU type A0 or A1, color code CC00, 16-bit, channel diagnostics	6ES7134-6JD00-0DA1	BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0
Analog input module AI 2x SG, 4/6-wire High Speed, BU type A0, color code CC00, channel diagnostics, 28/16-bit, ±0.05%, for DMS full bridges; for connecting force and torque sensors	7MH4134-6LB00-0DA0	Suitable type A1 BaseUnits (temperature detection)	
Analog input module AI Energy Meter CT ST, BU type U0	6ES7134-6PA01-0BU0	BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)	6ES7193-6BP40-0DA1
Analog input module AI Energy Meter RC ST, BU type U0	6ES7134-6PA21-0BU0	BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	6ES7193-6BP00-0DA1
Analog input module AI Energy Meter CT HF, for 1 A or 5 A current transformers, with line analysis functions, channel diagnostics; BU type U0	6ES7134-6PA01-0CU0	BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group	6ES7193-6BP40-0BA1
Analog input module AI Energy Meter RC HF, for Rogowski coils or 333 mV current/voltage transformers, with line analysis functions, channel diagnostics; BU type U0	6ES7134-6PA21-0CU0	BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	6ES7193-6BP00-0BA1
Suitable type A0 BaseUnits		Suitable type U0 BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0		
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0		

I/O systems

SIMATIC ET 200 systems for the control cabinet
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I/O modules > Analog input modules

Ordering data	Article No.		Article No.
BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0	Color-coded labels Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units Color code CC01, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units Color code CC02, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units Color code CC03, for 16 process terminals, BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16); 10 units Color code CC05, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16); 10 units Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	6ES7193-6CP00-2MA0 6ES7193-6CP00-4MA0 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0 6ES7193-6CP03-2MA0 6ES7193-6CP05-2MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP74-2AA0
Potential distributor modules PotDis BU PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A) PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A) PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	6ES7193-6UP00-ODP1 6ES7193-6UP00-OBP1 6ES7193-6UP00-ODP2 6ES7193-6UP00-OBP2		
PotDis TB PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A) PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A) PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A) PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TP0 6ES7193-6TP00-0TP1 6ES7193-6TP00-0TP2 6ES7193-6TP00-0TN0		
Accessories Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0		
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0	Color-coded labels for PotDis BU Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0 6ES7193-6CP63-2MA0
BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	Color-coded labels for PotDis TB Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0 6ES7193-6CP11-2MT0
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Ordering data

Article No.

Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units

6ES7193-6CP12-2MT0

Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units

6ES7193-6CP13-2MT0

Mechanical coding elements

For automatic coding of I/O modules; spare part.
20 units

Type A

Type B

Type C

Type D

Article No.

6ES7193-6KA00-3AA0

6ES7193-6KB00-3AA0

6ES7193-6KC00-3AA0

6ES7193-6KD00-3AA0

Technical specifications

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8xI 2-/4-Wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
General information					
Product type designation	AI 8xI 2-/4-wire BA	AI 2xU ST	AI 8xU BA	AI 4x U/I 2-wire	AI 2xI 2-/4-wire ST
Product function					
• Isochronous mode	No	No	No	No	No
• Measuring range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1	V13 SP1	V13 SP1	V14 / -	V13 SP1
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.6 and higher	V5.5 SP3
• PCS 7 configurable/ integrated from version				V8.1 SP1	
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	V2.3 / -
Operating mode					
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog inputs					
Number of analog inputs	8; Single-ended	2	8; Single-ended	4; Differential inputs	2
• For current measurement	8				2
• For voltage measurement		2	8		
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V	30 V	
permissible input current for current input (destruction limit), max.	50 mA			50 mA	50 mA
Cycle time (all channels), min.	1 ms; per channel	500 µs	1 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	500 µs
Input ranges (rated values), voltages					
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V		Yes; 15 bit		Yes; 15 bit	
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -5 V to +5 V		Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6GF00-0AA1	6ES7134-6FB00-0BA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GB00-0BA1
	ET 200SP, AI 8xI 2-/4-Wire Basic	ET 200SP, AI 2xU Standard, PU 1	ET 200SP, AI 8xU Basic	ET 200SP, AI 4xU/I 2-Wire ST, PU 1	ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
Input ranges (rated values), currents					
• 0 to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes				Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
Cable length					
• shielded, max.	200 m	200 m	200 m	1 000 m; 200 m for voltage measurement	1 000 m
Analog value generation for the inputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz / off	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 250 µs without filter	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 500 µs without filter
Smoothing of measured values					
• Number of smoothing levels	4	4	4	4; None; 4/8/16 times	4
• parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	No	Yes	Yes	Yes	
• for current measurement as 2-wire transducer	Yes			Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω			650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		No	No	Yes
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)		0.3 %	0.3 %	0.3 %	
• Current, relative to input range, (+/-)	0.3 %			0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB
• Common mode voltage, max.		10 V		10 V	10 V
• Common mode interference, min.		90 dB		90 dB	90 dB
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8xI 2-/4-Wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2-/4-Wire ST, PU 1
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 4 to 20 mA	No	No	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; at 1 to 5 V	No	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Short-circuit of the encoder supply
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes; Module-wise	Yes; Module-wise	Yes; Module-wise	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262	
Suitable for applications according to CQI-9				Yes	
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS04
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS04	-30 °C; < 0 °C as of FS02	-30 °C; < 0 °C as of FS04
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	32 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4xI 2-/4-Wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4xI 2-WIRE 4...20mA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
General information				
Product type designation	AI 4xI 2-/4-wire ST	AI 4xI 2-wire HART	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS
Product function				
• Isochronous mode	No	No	Yes	Yes
• Measuring range scalable	No	No	No	No
• Scalable measured values				No
• Adjustment of measuring range				No
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V14 / -	V13 SP1	V13	V13 SP1
• STEP 7 configurable/ integrated from version	V5.6 and higher	V5.5 SP4 and higher	V5.5 / -	V5.5 SP3 / -
• PCS 7 configurable/ integrated from version	V8.1 SP1	V8.1 SP1	V8.1 SP1	
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• Oversampling	No	No	No	Yes; 2 channels per module
• MSI	No	No	Yes	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Analog inputs				
Number of analog inputs	4; Differential inputs	4; Differential inputs	2; Differential inputs	2; Differential inputs
• For current measurement		4	2	2
• For voltage measurement			2	2
permissible input voltage for voltage input (destruction limit), max.			30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA	50 mA	50 mA	50 mA
Cycle time (all channels), min.				125 µs
Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)				
Analog input with oversampling			No	Yes
• Values per cycle, max.				16
• Resolution, min.				50 µs
Standardization of measured values			Yes	
Input ranges (rated values), voltages				
• 0 to +10 V			Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V			Yes; 15 bit	Yes; 13 bit
• -10 V to +10 V			Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -5 V to +5 V			Yes; 16 bit incl. sign	Yes; 15 bit incl. sign
Input ranges (rated values), currents				
• 0 to 20 mA	Yes; 16 bit incl. sign	No	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes	No	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit + sign	Yes; 15 bit	Yes; 14 bit
Cable length				
• shielded, max.	1 000 m	800 m	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2-/4-Wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Analog value generation for the inputs				
Integration and conversion time/resolution per channel				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes; channel by channel	Yes	
• Integration time (ms)			67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms	
• Basic conversion time, including integration time (ms)			68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms	
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	10 / 50 / 60 Hz	16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800	No
• Conversion time (per channel)	180 / 60 / 50 ms		68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms	10 µs
• Basic execution time of the module (all channels released)			1 ms	
Smoothering of measured values				
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	6; none; 2-/4-/8-/16-/32-fold	7; none; 2-/4-/8-/16-/32-/64-fold
• parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement	No	No	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω		650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		Yes	Yes
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)			0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
• Current, relative to input range, (+/-)	0.3 %	0.3 %	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	60 dB		
• Common mode voltage, max.	10 V		35 V	35 V
• Common mode interference, min.	90 dB		90 dB	90 dB
Isochronous mode				
Filtering and processing time (TCI), min.			800 µs	80 µs
Bus cycle time (TDP), min.			1 ms	125 µs; Starting from firmware Version V2.0.1
Interrupts/diagnostics/status information				
Diagnostics function	Yes	Yes	Yes	
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	Yes	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2-/4-Wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; Measuring range 4 to 20 mA only	Yes; channel-by-channel, at 4 to 20 mA only
• Short-circuit	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply
• Group error	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes; channel by channel	Yes	Yes; channel by channel
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; < 0 °C as of FS02	-30 °C	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS07
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS02	-30 °C	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS07
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	31 g	31 g	32 g	32 g
Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS	
General information				
Product type designation	AI 8xRTD/TC 2-wire HF	AI 4xRTD/TC 2-/3-/4-wire HF	AI 4xTC HS	
Product function				
• Isochronous mode	No	No	No	
• Measuring range scalable	Yes		Yes	
• Adjustment of measuring range		Yes		
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V16, V17 / V18	V12 SP1 / V13	V15 with HSP 265/integrated as of V15.1	
• STEP 7 configurable/ integrated from version	V5.5 SP3 / V5.5 SP4	V5.5 SP3 / V5.5 SP4	V5.5 SP3 or higher	
• PCS 7 configurable/ integrated from version	V8.1 SP1	V8.1 SP1		
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	
• PROFINET from GSD version/ GSD revision	GSDML V2.35	GSDML V2.3	GSDML V2.3	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
Operating mode			
• Oversampling	No	No	No
• MSI	No	No	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog inputs			
Number of analog inputs	8	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA	2 mA	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	5 ms; Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K
Input ranges (rated values), voltages			
• -1 V to +1 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -250 mV to +250 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -50 mV to +50 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -80 mV to +80 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), thermocouples			
• Type B	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type C	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type E	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type J	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type K	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type L	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type N	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type R	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type S	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type T	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type U	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer			
• Cu 10		Yes; 16 bit incl. sign	
• Ni 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• LG-Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 120	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	

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Technical specifications

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 300 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 600 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 3000 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 6000 ohms	Yes; 15 bit	Yes; 15 bit	
• PTC	Yes; 15 bit	Yes; 15 bit	
Thermocouple (TC)			
Temperature compensation			
- parameterizable	Yes	Yes	Yes
Cable length			
• shielded, max.	200 m; 50 m with thermocouples	200 m; 50 m with thermocouples	200 m; 100 m for thermocouples
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 / 1.25 ms
Smoothing of measured values			
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	4; None; 4/8/16 times
• parameterizable	Yes	Yes	Yes
Encoder			
Connection of signal encoders			
• for voltage measurement	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes	Yes	
• for resistance measurement with three-wire connection	No	Yes	
• for resistance measurement with four-wire connection	No	Yes	
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.05 %	0.05 %	0.05 %; 0.2 % when SFU OFF
• Resistance, relative to input range, (+/-)	0.05 %	0.05 %	
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, $f1 = \text{interference frequency}$			
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB
• Common mode voltage, max.	10 V	10 V	60 V; DC
• Common mode interference, min.	90 dB	90 dB	90 dB
Interrupts/diagnostics/status information			
Diagnostics function		Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case

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Technical specifications

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
Diagnoses			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes	Yes
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS02
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C; < 0 °C as of FS08	-30 °C; < 0 °C as of FS02
• vertical installation, max.	50 °C	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP System Manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.			33 g

I/O systems

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Technical specifications

Article number	7MH4134-6LB00-0DA0 Analog input module AI 2xSG 4-/6-wire HS
General information	
Product type designation	AI 2xSG 4-/6-wire HS
Product function	
• Isochronous mode	Yes
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	Yes; $\pm 0.5 \dots 320$ mV/V
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V14 SP1
• STEP 7 configurable/ integrated from version	V5.6
• PROFIBUS from GSD version/ GSD revision	V03.01.105
• PROFINET from GSD version/ GSD revision	GSDML V2.33
Operating mode	
• Oversampling	Yes; 2 channels per module
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Short-circuit protection	Yes
Analog inputs	
Number of analog inputs	2; Differential inputs
Cycle time (all channels), min.	100 μ s
Analog input with oversampling	Yes
• Values per cycle, max.	14
• Resolution, min.	100 μ s
Input ranges	
• Strain gauges (full bridges)	Yes
Cable length	
• shielded, max.	500 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	28 bit; 16 bits with oversampling
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	60 / 50 Hz / no
• Conversion time (per channel)	100 μ s
Smoothing of measured values	
• IIR low-pass filter frequency	0.01 ... 600 Hz
• IIR low-pass filter ordinal number	1 ... 4
• Notch filter frequency	0.1 ... 1 000 Hz
• Notch filter quality	5.00 ... 250.00
• Average value filter	0.1 ... 655.3 ms
Encoder	
Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	80 Ω
• Resistance of full bridge, max.	5 000 Ω

Article number	7MH4134-6LB00-0DA0 Analog input module AI 2xSG 4-/6-wire HS
Errors/accuracies	
Temperature coefficient, zero point	$\leq \pm 0.25$ μ V/K
Temperature coefficient, span, 4-wire connection (in relation to end value)	$\leq \pm 5$ ppm/K
Temperature coefficient, span, 6-wire connection (in relation to end value)	$\leq \pm 10$ ppm/K
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %; See manual for details
Isochronous mode	
Filtering and processing time (TCI), min.	87 μ s
Bus cycle time (TDP), min.	125 μ s
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Diagnostic alarm
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
• Overflow/underflow	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

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Technical specifications

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
General information				
Product type designation	AI Energy Meter CT ST	AI Energy Meter RC ST	AI Energy Meter CT HF	AI Energy Meter RC HF
Product function				
• Voltage measurement	Yes	Yes	Yes	Yes
- without voltage transformer	Yes	Yes	Yes	Yes
- with voltage transformer	Yes	Yes	Yes	Yes
• Current measurement	Yes; max. 3 + neutral conductor	Yes; max. 3 + neutral conductor	Yes; Max. 4	Yes; Max. 4
- without current transformer	No	No	No	No
- with current transformer	Yes; 1 A or 5 A current transformer	No	Yes; 1 A or 5 A current transformer	No
- With Rogowski coil	No	Yes	No	Yes
- With current-voltage-converter	No	Yes; 333 mV interface	No	Yes; 333 mV interface
• Energy measurement	Yes	Yes	Yes	Yes
• Frequency measurement	Yes	Yes	Yes	Yes
• Power measurement	Yes	Yes	Yes	Yes
• Active power measurement	Yes	Yes	Yes	Yes
• Reactive power measurement	Yes	Yes	Yes	Yes
• Power factor measurement	Yes	Yes	Yes	Yes
• Active factor measurement	Yes	Yes	Yes	Yes
• Reactive power compensation	Yes	Yes	Yes	Yes
• Line analysis	No	No	Yes	Yes
- Monitoring of instantaneous and half-wave values			Yes	Yes
- THD measurement for current and voltage			Yes	Yes
- Harmonics for current and voltage			Yes	Yes
- Voltage dip (DIP)			Yes	Yes
- Voltage swell			Yes	Yes
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	No
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP	STEP 7 V16 or higher with HSP
• STEP 7 configurable/integrated from version	Configurable via GSD file	Configurable via GSD file	V5.5 SP3 or higher	V5.5 SP3 or higher
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	V2.3	V2.3	V2.3	V2.3
Operating mode				
• Switching between operating modes in RUN	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user
• Cyclic measured value access	Yes	Yes	Yes	Yes
• Acyclic measured value access	Yes	Yes	Yes	Yes
• Fixed measured value sets	Yes	Yes	Yes	Yes
• Freely definable measured value sets	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access
Installation type/mounting				
Mounting position	any	any	any	any
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V

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Technical specifications

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
Analog inputs				
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)
Cable length				
• shielded, max.	200 m	200 m	200 m	200 m
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Diagnoses				
• Line quality			Yes	Yes
• Supply voltage	Yes	Yes	Yes	Yes
• Hardware interrupt lost	Yes	Yes	Yes	Yes
• Parameter assignment error	Yes	Yes	Yes	Yes
• Module fault	Yes	Yes	Yes	Yes
• Channel not available	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes
• Overload current	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes	Yes	Yes
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Integrated Functions				
Measuring functions				
• Measuring procedure for voltage measurement	TRMS	TRMS	TRMS	TRMS
• Measuring procedure for current measurement	TRMS	TRMS	TRMS	TRMS
• Type of measured value acquisition	seamless	seamless	seamless	seamless
• Curve shape of voltage	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted
• Buffering of measured variables	Yes	Yes	Yes	Yes
• Parameter length	128 byte	128 byte	128 byte	128 byte
• Bandwidth of measured value acquisition	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz
Measuring range				
- Frequency measurement, min.	40 Hz	40 Hz	40 Hz	40 Hz
- Frequency measurement, max.	70 Hz	70 Hz	70 Hz	70 Hz
Measuring inputs for voltage				
- Measurable line voltage between phase and neutral conductor	277 V	277 V	277 V	277 V
- Measurable line voltage between the line conductors	480 V	480 V	480 V	480 V
- Measurable line voltage between phase and neutral conductor, min.	3 V	3 V	3 V	3 V
- Measurable line voltage between phase and neutral conductor, max.	300 V	300 V	300 V	300 V
- Measurable line voltage between the line conductors, min.	6 V	6 V	6 V	6 V
- Measurable line voltage between the line conductors, max.	519 V	519 V	519 V	519 V

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Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
- Internal resistance line conductor and neutral conductor	1.5 MΩ	1.5 MΩ	1.5 MΩ	1.5 MΩ
- Power consumption per phase	60 mW; 300 V AC	60 mW; 300 V AC	60 mW; 300 V AC	60 mW; 300 V AC
- Impulse voltage resistance 1,2/50μs	2.5 kV	2.5 kV	2.5 kV	2.5 kV
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II		CAT II	
- Overvoltage category		CAT II according to IEC 61010 Part 1		CAT II according to IEC 61010 Part 1
Measuring inputs for current				
- measurable relative current (AC), min.	1 %; Relative to measuring range; 1 A, 5 A		1 %; Relative to measuring range; 1 A, 5 A	
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A		120 %; Relative to the secondary rated current 5 A	
- Continuous current with AC, maximum permissible	5 A		5 A; 6 A permanent thermal overload	
- Apparent power consumption per phase for measuring range 5 A	0.6 VA		0.6 VA	
- Rated value short-time withstand current restricted to 1 s	100 A		100 A	
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal		25 mΩ; At the terminal	
- Surge strength	10 A; for 1 minute		10 A; for 1 minute	
- Zero point suppression	0 ... 20%, referred to the nominal current		0 ... 20%, referred to the nominal current	
Measuring inputs for current (Rog. or I/U converter)				
- Measurable current at AC, max.		424 mV		424 mV
- Continuous voltage, maximum permissible		2 V		2 V
- Rated value, short-time withstand voltage restricted to 1 s		30 V		30 V
- Input resistance		120 kΩ		120 kΩ
- Zero point suppression		Yes; 0 ... 20%, referred to the nominal current		Yes; 0 ... 20%, referred to the nominal current
Accuracy class according to IEC 61557-12				
- Measured variable voltage	0,2	0,2	0,2	0,2
- Measured variable current	0,2	0,2	0,2	0,2
- Measured variable apparent power	0.5	0.5	0.5	0.5
- Measured variable active power	0.5	0.5	0.5	0.5
- Measured variable reactive power	1	1	1	1
- Measured variable power factor	0.5	0.5	0.5	0.5
- Measured variable active energy	0.5	0.5	0.5	0.5
- Measured variable reactive energy	1	1	1	1
- Measured variable neutral current	0,2	0,2	0,2	0,2
- Measured variable phase angle	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12
- Measured variable frequency	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range	0.05; only valid for the permissible voltage measuring range
- Measured variable harmonic			1	1
- Measured variable THDU			1	1
- Measured variable THDI			1	1

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog input modules

Technical specifications

Article number	6ES7134-6PA01-0BU0 ET 200SP AI Energy Meter CT ST	6ES7134-6PA21-0BU0 ET 200SP AI Energy Meter RC ST	6ES7134-6PA01-0CU0 ET 200SP AI Energy Meter CT HF	6ES7134-6PA21-0CU0 ET 200SP AI Energy Meter RC HF
Accuracy class line analysis acc. to IEC 61000-4-30				
- Measured variable voltage			Class S	Class S
- Measured variable current			Class S	Class S
- Measured variable frequency			Class S	Class S
- Measured variable voltage interruption			Class S	Class S
- Measured variable voltage dip and swell			Class S	Class S
- Measured variable harmonic voltage			Class S	Class S
- Measured variable harmonic current			Class S	Class S
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	45 g	45 g	45 g	45 g
Other				
Data for selecting a voltage transformer				
• Secondary side, max.	300 V	300 V	300 V	300 V
Data for selecting a current transformer				
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual		As a function of cable length and cross section, see device manual	
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual		As a function of cable length and cross section, see device manual	

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog output modules

Overview



- 2 and 4-channel analog output (AQ) modules
 - Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.
- For different requirements, the analog output modules offer:
- Function classes Standard, High Feature and High-Speed
 - BaseUnits for single or multiple-conductor connection with automatic slot coding
 - Potential distributor modules for system-integrated expansion with potential terminals
 - Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)

- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
 - Isochronous mode (simultaneous equidistant output of analog values)
 - Output of substitute value in the event of communication interruptions (shutdown, output adjustable substitute value, or keep last value)
 - Calibration during runtime
 - Re-parameterization during operation
 - Firmware update
 - Diagnostics of wire break, short-circuit, overflow, underflow
 - Value status (optional binary validity information of the analog value status in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	Pkg. unit	Article No.	CC code	BU type
AQ 2 x U ST	1	6ES7135-6FB00-0BA1	CC00	A0, A1
AQ 2 x I ST	1	6ES7135-6GB00-0BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6ES7135-6HD00-0BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6ES7135-6HB00-0CA1	CC00	A0, A1
AQ 2xU/I HS	1	6ES7135-6HB00-0DA1	CC00	A0, A1
With two operating modes:				
• High-speed isochronous AQ				
• Oversampling				
AQ 4xI HART HF	1	6ES7135-6TD00-0CA1	CC00	A0, A1

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Overview

Overview of BaseUnits

BaseUnit	Pkg. unit	Article No.	CC codes for process terminals	CC codes for AUX terminals
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New potential group (light) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of the potential group (dark) • 16 process terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New potential group (light) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of the potential group (dark) • With temperature sensor • 16 process terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Overview

Overview of potential distributor modules

Potential distributor module	Pkg. unit	Article No.	CC codes for process terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog output modules

Ordering data	Article No.	Article No.
Analog output modules		
Analog output module AQ 2xU Standard, BU type A0 or A1, color code CC00, 16-bit	6ES7135-6FB00-0BA1	
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	6ES7135-6GB00-0BA1	
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$	6ES7135-6HD00-0BA1	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$	6ES7135-6HB00-0CA1	
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$	6ES7135-6HB00-0DA1	
Analog output module AQ 4xI HART High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$	6ES7135-6TD00-0CA1	
Suitable type A0 BaseUnits		
Types of delivery: Apart from the standard type of delivery in a single-unit package, selected BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The pack type is selected by selecting the Article No. Packs of 10 can therefore only be ordered in integer multiples of 10.		
BU15-P16+A10+2D		
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	
BU15-P16+A0+2D		
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	
BU15-P16+A10+2B		
BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0
BU15-P16+A0+2B		
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0
Suitable type A1 BaseUnits (temperature detection)		
BU15-P16+A0+12D/T		6ES7193-6BP40-0DA1
BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)		
BU15-P16+A0+2D/T		6ES7193-6BP00-0DA1
BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)		
BU15-P16+A0+12B/T		6ES7193-6BP40-0BA1
BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group		
BU15-P16+A0+2B/T		6ES7193-6BP00-0BA1
BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Analog output modules

Ordering data	Article No.		Article No.
Potential distributor modules		Shield connection	6ES7193-6SC20-1AM0
PotDis BU		5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new potential group (max. 10 A)	6ES7193-6UP00-0DP1	Color-coded labels	6ES7193-6CP00-2MA0
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the potential group	6ES7193-6UP00-0BP1	Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new potential group (max. 10 A)	6ES7193-6UP00-0DP2	Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	6ES7193-6CP00-4MA0
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the potential group	6ES7193-6UP00-0BP2	Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	6ES7193-6CP71-2AA0
PotDis TB		Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	6ES7193-6CP72-2AA0
PotDis TB, type BR-W, 18x internally bridged terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	6ES7193-6TP00-0TP0	Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP73-2AA0
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	6ES7193-6TP00-0TP1	Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	6ES7193-6CP74-2AA0
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	6ES7193-6TP00-0TP2	Color-coded labels for PotDis BU	
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	6ES7193-6TP00-0TN0	Color code CC62, for 16 process terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	6ES7193-6CP62-2MA0
Accessories		Color code CC63, for 16 process terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	6ES7193-6CP63-2MA0
Equipment labeling plate	6ES7193-6LF30-0AW0	Color-coded labels for PotDis TB	
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter		Color code CC10, for 18 process terminals, PotDis TB, gray (terminals 1 to 18); 10 units	6ES7193-6CP10-2MT0
Labeling strips		Color code CC11, for 18 process terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	6ES7193-6CP11-2MT0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Color code CC12, for 18 process terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	6ES7193-6CP12-2MT0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Color code CC13, for 18 process terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	6ES7193-6CP13-2MT0
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AA0	Mechanical coding elements	
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LA10-0AG0	For automatic coding of I/O modules; spare part. 20 units	
BU cover		Type A	6ES7193-6KA00-3AA0
For covering empty slots (gaps); 5 units	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	Type B	6ES7193-6KB00-3AA0
• 15 mm		Type C	6ES7193-6KC00-3AA0
• 20 mm		Type D	6ES7193-6KD00-3AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Technical specifications

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, AQ 4xU/I ST	6ES7135-6HB00-0DA1 ET 200SP, AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 ET 200SP, AQ 2 X U/I High Feature
General information					
Product type designation	AQ 2xU ST	AQ 2xI ST	AQ 4xU/I ST	AQ 2xU/I HS	AQ 2xU/I HF
Product function					
• Isochronous mode	No	No	No	Yes	Yes
• Output range scalable	No	No	No		
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	V11 SP2 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/ integrated from version			V8.1 SP1		V8.1 SP1
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• Oversampling	No	No	No	Yes; 2 channels per module	No
• MSO	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Analog outputs					
Number of analog outputs	2	2	4	2	2
Cycle time (all channels), min.	1 ms	1 ms	5 ms	125 µs	750 µs
Analog output with oversampling	No	No	No	Yes	
• Values per cycle, max.				16	
• Resolution, min.				45 µs; (2 channels), 35 µs (1 channel)	
Output ranges, voltage					
• 0 to 10 V	Yes; 15 bit		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit		Yes; 13 bit	Yes; 13 bit	Yes; 13 bit
• -5 V to +5 V	Yes; 15 bit incl. sign		Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Output ranges, current					
• 0 to 20 mA		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA		Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
Connection of actuators					
• for voltage output two-wire connection	Yes		Yes	Yes	Yes
• for voltage output four-wire connection	No		Yes	Yes	Yes
• for current output two-wire connection		Yes	Yes	Yes	Yes
Load impedance (in rated range of output)					
• with voltage outputs, min.	2 kΩ		2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF		1 µF	1 µF	1 µF
• with current outputs, max.		500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.		1 mH	1 mH	1 mH	1 mH
Cable length					
• shielded, max.	200 m	1 000 m	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Technical specifications

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, AQ 4xU/I ST	6ES7135-6HB00-0DA1 ET 200SP, AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 ET 200SP, AQ 2 X U/I High Feature
Analog value generation for the outputs					
Integration and conversion time/resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
Settling time					
• for resistive load	0.1 ms	0.1 ms; Typical value	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms		1 ms	0.05 ms; Max. 47 nF and 20 m cable length	0.05 ms; Max. 47 nF and 20 m cable length
• for inductive load		0.5 ms	0.5 ms	0.05 ms	0.05 ms
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
Isochronous mode					
Execution and activation time (TCO), min.				70 µs	500 µs
Bus cycle time (TDP), min.				125 µs	750 µs
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnoses					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes; Module-wise		Yes	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes; Module-wise	Yes; Module-wise	Yes; Module-wise	Yes	Yes; channel by channel
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS04
• horizontal installation, max.	60 °C	60 °C	60 °C; Observe derating	60 °C	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS03	-30 °C; < 0 °C as of FS07	-30 °C; < 0 °C as of FS06	-30 °C; < 0 °C as of FS04
• vertical installation, max.	50 °C	50 °C	50 °C; Observe derating	50 °C	50 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Analog output modules

Technical specifications

Article number	6ES7135-6FB00-0BA1 ET 200SP, AQ 2xU Standard, PU 1	6ES7135-6GB00-0BA1 ET 200SP, AQ 2xI Standard, PU 1	6ES7135-6HD00-0BA1 ET 200SP, AQ 4xU/I ST	6ES7135-6HB00-0DA1 ET 200SP, AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 ET 200SP, AQ 2 X U/I High Feature
Altitude during operation relating to sea level • Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	31 g
Article number	6ES7135-6TD00-0CA1 ET 200SP, AQ 4xI HART HF				
General information					
Product type designation	AQ 4xI HART HF				
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V15 SP1				
• STEP 7 configurable/ integrated from version	V5.6 and higher				
• PCS 7 configurable/ integrated from version	V9.0 SP1				
• PROFIBUS from GSD version/ GSD revision	V04.02.14				
• PROFINET from GSD version/ GSD revision	GSDML V2.34				
Supply voltage					
Rated value (DC)	24 V				
Reverse polarity protection	Yes				
Analog outputs					
Number of analog outputs	4				
Cycle time (all channels), min.	3 ms				
Output ranges, current					
• 0 to 20 mA	Yes; 16 bit incl. sign				
• -20 mA to +20 mA	No				
• 4 mA to 20 mA	Yes; 16 bit incl. sign				
Connection of actuators					
• for current output two-wire connection	Yes				
Load impedance (in rated range of output)					
• with current outputs, max.	750 Ω				
• with current outputs, inductive load, max.	10 mH				
Cable length					
• shielded, max.	800 m				
Analog value generation for the outputs					
Settling time					
• for resistive load	2 ms; 750 ohm				
• for capacitive load	2 ms				
• for inductive load	2 ms				
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Current, relative to output range, (+/-)	0.1 %				
Protocols					
HART protocol	Yes				
Article number	6ES7135-6TD00-0CA1 ET 200SP, AQ 4xI HART HF				
Interrupts/diagnostics/ status information					
Diagnostics function	Yes				
Substitute values connectable	Yes				
Alarms					
• Diagnostic alarm	Yes				
Diagnoses					
• Monitoring the supply voltage	Yes; Module-wise				
• Wire-break	Yes; channel by channel				
• Short-circuit	Yes				
• Overflow/underflow	Yes; channel by channel				
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED				
• Channel status display	Yes; green LED				
• for channel diagnostics	Yes; red LED				
• for module diagnostics	Yes; green/red DIAG LED				
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes				
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C				
• horizontal installation, max.	60 °C				
• vertical installation, min.	-30 °C				
• vertical installation, max.	50 °C				
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual				
Dimensions					
Width	15 mm				
Height	73 mm				
Depth	58 mm				
Weights					
Weight, approx.	31 g				

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital inputs

Overview



- 4, 8 and 16-channel digital input (DI) modules

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distribution modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sink input) and NPN (sourcing input) versions
- Clear labeling on front of module

- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Counting operating mode (multi-channel counter for pulse generators with 32-bits counting width and up to 10 kHz counting frequency)
 - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Parameterizable input delay time
 - Isochronous mode (simultaneous equidistant reading of all input channels)
 - Hardware interrupt pulse stretching
 - Re-parameterization during operation
 - Firmware update
 - Diagnosis of wire break and short-circuit (on channel or module basis)
 - Value status (optional binary validity information of the input signal in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS digital input modules

(Extended temperature range and exposure to environmental substances)

DI 8x24VDC Standard, BU type A0, color code CC01

6AG1131-6BF01-7BA0

DI 8x24VDC Source Input, Basic, BU type A0, color code CC02

6AG1131-6BF61-7AA0

DI 16x24VDC Standard, BU type A0, color code CC00

6AG1131-6BH01-7BA0

DI 8x24VDC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI)

6AG1131-6BF00-7CA0

DI 4x120VAC-230VAC Standard, BU type B1, color code CC41

6AG1131-6FD01-7BB1

DI 8xNAMUR High Feature, BU type A0, color code CC01

6AG1131-6TF00-7CA0

DI 8x24VAC-48VUC Basic, BU type U0, color code CC20, module diagnostics

6AG1131-6CF00-7AU0

Article No.

Suitable SIPLUS BaseUnits

BU15-P16+A0+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital inputs

Technical specifications

Article number Based on	6AG1131-6BF61-7AA0 6ES7131-6BF61-0AA0 SIPLUS ET 200SP DI 8x24VDC SOURCE BA	6AG1131-6BF01-7BA0 6ES7131-6BF01-0BA0 SIPLUS ET 200SP DI 8x24VDC ST	6AG1131-6BH01-7BA0 6ES7131-6BH01-0BA0 SIPLUS ET 200SP DI 16x24VDC ST
Use on ships/at sea - to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology - Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark - Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating • Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

Article number Based on	6AG1131-6BF00-7CA0 6ES7131-6BF00-0CA0 SIPLUS ET 200SP DI 8x24VDC HF	6AG1131-6FD01-7BB1 6ES7131-6FD01-0BB1 SIPLUS ET 200SP DI 4X120...230VAC ST	6AG1131-6TF00-7CA0 6ES7131-6TF00-0CA0 SIPLUS ET 200SP DI 8XNAMUR HF	6AG1131-6CF00-7AU0 6ES7131-6CF00-0AU0 SIPLUS ET 200SP DI 8x48VUC BA
Ambient conditions				
Ambient temperature during operation • horizontal installation, min. • horizontal installation, max.	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax; > +60 °C encoder supply output current max. 350 mA per channel	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4 (no adjacent points)	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax
Altitude during operation relating to sea level • Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity • With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital inputs

Technical specifications

Article number	6AG1131-6BF00-7CA0	6AG1131-6FD01-7BB1	6AG1131-6TF00-7CA0	6AG1131-6CF00-7AU0
Based on	6ES7131-6BF00-0CA0	6ES7131-6FD01-0BB1	6ES7131-6TF00-0CA0	6ES7131-6CF00-0AU0
	SIPLUS ET 200SP DI 8x24VDC HF	SIPLUS ET 200SP DI 4x120...230VAC ST	SIPLUS ET 200SP DI 8xNAMUR HF	SIPLUS ET 200SP DI 8x48VUC BA
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single conductor or multiple-conductor connection
- Function classes Basic, Standard, High Feature and High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable nameplate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
 - Labeling strips
 - Equipment marking label
 - Color-coded label with module-specific CC code
 - Shield terminal

Overview of digital output modules

Digital output	Pkg. unit	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A ST	1	6AG1132-6BH01-7BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6AG1132-6BF61-7AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A ST	1	6AG1132-6BF01-7BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6AG1132-6BF01-7CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6AG1132-6BD21-7BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6AG1132-6BD21-7CA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A HF With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control	1	6AG1132-6FD00-7CU0	CC20	U0
RQ 4 x 24 V UC/2 A CO ST	1	6AG1132-6GD51-7BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6AG1132-6HD01-7BB1	--	B0, B1

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Technical specifications

Article number	6AG1132-6BF61-7AA0	6AG1132-6BF01-7BA0	6AG1132-6BD21-7BA0
Based on	6ES7132-6BF61-0AA0	6ES7132-6BF01-0BA0	6ES7132-6BD21-0BA0
	SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	SIPLUS ET 200SP DQ 8x24VDC/0,5A ST	SIPLUS ET 200SP DQ 4x24VDC/2A ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; > +60 °C max. total current 2 A
• vertical installation, min.			-40 °C; = Tmin
• vertical installation, max.			50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0//6AG1193-6AB00-0AA0)
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Technical specifications

Article number	6AG1132-6BF61-7AA0	6AG1132-6BF01-7BA0	6AG1132-6BD21-7BA0
Based on	6ES7132-6BF61-0AA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A SNK BA	6ES7132-6BF01-0BA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A ST	6ES7132-6BD21-0BA0 SIPLUS ET 200SP DQ 4x24VDC/2A ST
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1132-6BH01-7BA0	6AG1132-6GD51-7BA0	6AG1132-6BF01-7CA0
Based on	6ES7132-6BH01-0BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6ES7132-6GD51-0BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST	6ES7132-6BF01-0CA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A HF
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; > +60 °C max. total current 3 A
• vertical installation, min.			-40 °C; = Tmin
• vertical installation, max.			50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Technical specifications

Article number Based on	6AG1132-6BH01-7BA0 6ES7132-6BH01-0BA0 SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	6AG1132-6GD51-7BA0 6ES7132-6GD51-0BA0 SIPLUS ET 200SP RQ 4x24VDC/2A CO ST	6AG1132-6BF01-7CA0 6ES7132-6BF01-0CA0 SIPLUS ET 200SP DQ 8x24VDC/0,5A HF
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number Based on	6AG1132-6HD01-7BB1 6ES7132-6HD01-0BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 6ES7132-6FD00-0CU0 SIPLUS ET 200SP DQ 4X24...230VAC/2A HF	6AG1132-6BD21-7CA0 6ES7132-6BD21-0CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating Based On (e.g. manual), additionally Tmax > 60 °C max. continuous current of 3 A per relay	70 °C; = Tmax	70 °C
• vertical installation, min.	-40 °C; in all other mounting positions		-40 °C; = Tmin
• vertical installation, max.	50 °C; in all other mounting positions		50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m	2 000 m	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS digital outputs

Technical specifications

Article number Based on	6AG1132-6HD01-7BB1 6ES7132-6HD01-0BB1 SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	6AG1132-6FD00-7CU0 6ES7132-6FD00-0CU0 SIPLUS ET 200SP DQ 4X24...230VAC/2A HF	6AG1132-6BD21-7CA0 6ES7132-6BD21-0CA0 SIPLUS ET 200SP DQ 4x24VDC/2A HF
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Overview



- 2, 4 and 8-channel analog input (AI) modules.
- Apart from the standard type of delivery in single-unit packaging, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated potential group formation with self-assembling voltage busbars (a separate power module is no longer required for ET 200SP)
- Option of connecting current, voltage and resistance sensors, as well as thermocouples
- Option of connecting force and torque sensors
- Energy Meter for recording up to 600 electrical variables

- Clear labeling on front of module
- LED displays for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
 - Oversampling operating mode (n-fold isochronous acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
 - Isochronous mode (simultaneous isochronous reading of analog values)
 - Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
 - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
 - Internal compensation of the line resistance for thermocouples by means of terminal temperature measurement in the BaseUnit for BU type A1
 - Internal compensation also for 2-wire resistance test by means of adjustable line resistance
 - Calibration during runtime
 - Single-channel galvanic isolation
 - HART communication
 - Re-parameterization during operation
 - Firmware update
 - Diagnostics of wire break, short-circuit, overflow, underflow
 - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
 - Value status (optional binary validity information of the analog value in the process image)
 - Supports the PROFenergy profile
- Optional accessories:
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

Overview of SIPLUS analog input modules

Analog input	Pkg. unit	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6AG1134-6GF00-7AA1	CC01	A0, A1
AI 8 x U BA	1	6AG1134-6FF00-2AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6AG1134-6HD01-7BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	1	6AG1134-6GD01-7BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6AG1134-6TD00-2CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6AG1134-6HB00-2CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS	1	6AG1134-6HB00-2DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AI • Oversampling				
AI 8 x RTD/TC 2-wire HF	10	6AG1134-6JF00-2CA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	6AG1134-6LB00-2DA0	CC00	U0
AI 4 x RTD/TC 2/3/4-wire HF	10	6AG1134-6JD00-2CA1	CC00	A0, A1
AI 4 x TC High Speed	1	6AG1134-6JD00-2DA1	CC00	A0, A1
AI Energy Meter CT ST, for 1 A or 5 A current transformers	-	6AG1134-6PA01-7BU0	--	U0

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Ordering data	Article No.		Article No.
SIPLUS analog input modules (Extended temperature range and exposure to environmental substances) Analog input module AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01 Analog input module AI 8xU BA, BU type A0 or A1, color code CC02 Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, $\pm 0.3\%$ Analog input module AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, $\pm 0.3\%$ Analog input module AI 4xRTD/TC 2/3/4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$, scalable measuring range Analog input module AI 4xTC High Speed, BU type A0 or A1, color code CC00, channel diagnostics, 16-bit, $\pm 0.1\%$ Analog input module AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03 Analog input module AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, $\pm 0.1\%$, independent channel galvanic isolation, isochronous mode above 1 ms Analog input module AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$, isochronous mode above 250 μs , oversampling above 50 μs Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$, scalable measuring range Analog AI 2xSG 4/6 wire HS, 4/6-wire High Speed, two-channel analog input module for strain gauges (full bridges), color code CC00, module diagnostics, 28/16 bit, 2xLC load cell interface (1-4 mV/V), suitable for BU type U0 Analog input module AI Energy Meter CT ST, for 1 A or 5 A current transformers	6AG1134-6GF00-7AA1 6AG1134-6FF00-2AA1 6AG1134-6HD01-7BA1 6AG1134-6GD01-7BA1 6AG1134-6JD00-2CA1 6AG1134-6JD00-2DA1 6AG1134-6TD00-2CA1 6AG1134-6HB00-2CA1 6AG1134-6HB00-2DA1 6AG1134-6JF00-2CA1 6AG1134-6LB00-2DA0 6AG1134-6PA01-7BU0	BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group Suitable SIPLUS BaseUnits type A1 (temperature detection) BU15-P16+A0+2D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) BU15-P16+A0+2B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group BU15-P16+A0+12D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A) BU15-P16+A0+12B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6AG1193-6BP20-7DA0 6AG1193-6BP20-7BA0 6AG1193-6BP00-7DA1 6AG1193-6BP00-7BA1 6AG1193-6BP40-7DA1 6AG1193-6BP40-7BA1
Suitable SIPLUS BaseUnits type A0		Accessories	
BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA0	SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	6AG1193-6AA00-0AA0
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0	SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.	6AG1193-6AB00-0AA0
		Other accessories	See SIMATIC ET 200SP, Analog input modules, page 10/63

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications

Article number	6AG1134-6GF00-7AA1	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6GF00-0AA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GD01-0BA1	6ES7134-6TD00-0CA1
	SIPLUS ET 200SP AI 8XI 2-/4-WIRE BA	SIPLUS ET 200SP AI 8xU BASIC	SIPLUS ET 200SP AI 4xU/I 2-w ST	SIPLUS ET 200SP AI 4xI 2-/4-w ST	SIPLUS ET 200SP AI 4XI 2-WIRE 4...20mA H
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	70 °C; = Tmax; > 60 °C max. 1x ±20 mA or 4x ±10 V permissible	70 °C; = Tmax; > 60 °C max. 1x ±20 mA permissible	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.			-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost); start-up @ -30 °C
• vertical installation, max.			50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications

Article number	6AG1134-6GF00-7AA1	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6GF00-0AA1	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GD01-0BA1	6ES7134-6TD00-0CA1
	SIPLUS ET 200SP AI 8xI 2-/4-WIRE BA	SIPLUS ET 200SP AI 8xU BASIC	SIPLUS ET 200SP AI 4xU/I 2-w ST	SIPLUS ET 200SP AI 4xI 2-/4-w ST	SIPLUS ET 200SP AI 4xI 2-WIRE 4...20MA H
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6LB00-2DA0	6AG1134-6JD00-2CA1	6AG1134-6JD00-2DA1
Based on	6ES7134-6HB00-0CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6HB00-0DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6JF00-0CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6ES7134-6LB00-0DA0 SIPLUS ET 200SP AI 2xSG 4/6 wire HS	6ES7134-6JD00-0CA1 SIPLUS ET 200SP AI 4xRTD/TC HF	6ES7134-6JD00-0DA1 SIPLUS ET 200SP AI 4x TC HS
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module including derating of the encoder supply to max. 50 mA per channel	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the module
• vertical installation, min.			-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.			50 °C; = Tmax	40 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m		5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa ... (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa ... (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa ... (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa ... (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa ... (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa ... (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity						
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/ frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/ frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/ frost (no commissioning under condensation conditions)
Resistance						
Coolants and lubricants						
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6LB00-2DA0	6AG1134-6JD00-2CA1	6AG1134-6JD00-2DA1
Based on	6ES7134-6HB00-0CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6HB00-0DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6JF00-0CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6ES7134-6LB00-0DA0 SIPLUS ET 200SP AI 2xSG 4/6 wire HS	6ES7134-6JD00-0CA1 SIPLUS ET 200SP AI 4xRTD/TC HF	6ES7134-6JD00-0DA1 SIPLUS ET 200SP AI 4x TC HS
Use in stationary industrial systems						
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea						
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust, *	Yes; Class 6S3 incl. sand, dust, *	Yes; Class 6S3 incl. sand, dust, *	Yes	Yes; Class 6S3 incl. sand, dust, *	Yes; Class 6S3 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology						
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark						
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!		* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog inputs

Technical specifications

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6LB00-2DA0	6AG1134-6JD00-2CA1	6AG1134-6JD00-2DA1
Based on	6ES7134-6HB00-0CA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	6ES7134-6HB00-0DA1 SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	6ES7134-6JF00-0CA1 SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	6ES7134-6LB00-0DA0 SIPLUS ET 200SP AI 2xSG 4/6 wire HS	6ES7134-6JD00-0CA1 SIPLUS ET 200SP AI 4xRTD/TC HF	6ES7134-6JD00-0DA1 SIPLUS ET 200SP AI 4x TC HS
Conformal coating						
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1134-6PA01-7BU0
Based on	6ES7134-6PA01-0BU0 SIPLUS ET 200SP AI EM CT ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)

Article number	6AG1134-6PA01-7BU0
Based on	6ES7134-6PA01-0BU0 SIPLUS ET 200SP AI EM CT ST
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog outputs

Overview



- 2 and 4-channel analog output (AQ) modules

For different requirements, the digital output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)

- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LED displays for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable nameplate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
 - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
 - Isochronous mode (simultaneous equidistant output of analog values)
 - Output of substitute value in the event of communication interruptions (shutdown, output adjustable substitute value, or keep last value)
 - Calibration during runtime
 - Re-parameterization during operation
 - Firmware update
 - Diagnostics of wire break, short-circuit, overflow, underflow
 - Value status (optional binary validity information of the analog value in the process image)
 - Supports the PROFlenergy profile
- Optional accessories
 - Labeling strips (film or card)
 - Equipment labeling plate
 - Color-coded label with module-specific CC code
 - Shield terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	Pkg. unit	Article No.	CC code	BU type
AQ 2 x I ST	1	6AG1135-6GB00-7BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6AG1135-6HD00-7BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6AG1135-6HB00-7CA1	CC00	A0, A1
AQ 2 x U/I HS	1	6AG1135-6HB00-2DA1	CC00	A0, A1
With two operating modes: • High-speed isochronous AQ • Oversampling				
AQ 4xI HART HF	1	6AG1135-6TD00-2CA1	CC00	A0, A1

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog outputs

Ordering data	Article No.	Article No.
SIPLUS analog output modules (Extended temperature range and exposure to environmental substances) Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC03 Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.1\%$ Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$ Analog output module AQ 4xI HART High Feature, BU type A0 or A1, color code CC00, 16-bit, $\pm 0.3\%$	6AG1135-6GB00-7BA1 6AG1135-6HD00-7BA1 6AG1135-6HB00-7CA1 6AG1135-6HB00-2DA1 6AG1135-6TD00-2CA1	Suitable SIPLUS BaseUnits type A1 (temperature detection) BU15-P16+A0+2D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) BU15-P16+A0+2B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group BU15-P16+A0+12D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A) BU15-P16+A0+12B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group
Suitable SIPLUS BaseUnits type A0 BU15-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group BU15-P16+A10+2D (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) BU15-P16+A10+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group	6AG1193-6BP00-7DA0 6AG1193-6BP00-7BA0 6AG1193-6BP20-7DA0 6AG1193-6BP20-7BA0	Accessories SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0. Other accessories
		6AG1193-6BP00-7DA1 6AG1193-6BP00-7BA1 6AG1193-6BP40-7DA1 6AG1193-6BP40-7BA1 6AG1193-6AA00-0AA0 6AG1193-6AB00-0AA0 See SIMATIC ET 200SP, Analog output modules, page 10/82

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > SIPLUS analog outputs

Technical specifications

Article number	6AG1135-6GB00-7BA1	6AG1135-6HD00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1	6AG1135-6TD00-2CA1
Based on	6ES7135-6GB00-0BA1 SIPLUS ET 200SP AQ 2xI Standard	6ES7135-6HD00-0BA1 SIPLUS ET 200SP AQ 4xU/I ST	6ES7135-6HB00-0DA1 SIPLUS ET 200SP AQ 2 X U/I High Speed	6ES7135-6HB00-0CA1 SIPLUS ET 200SP AQ 2xU/I HF	6ES7135-6TD00-0CA1 SIPLUS ET 200SP AQ 4xI HART High Feature
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. 2x ±10 V permissible	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	70 °C; = Tmax	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.		-40 °C; = Tmin		-40 °C; = Tmin	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.		50 °C; = Tmax		60 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > SIPLUS analog outputs

Technical specifications

Article number	6AG1135-6GB00-7BA1	6AG1135-6HD00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1	6AG1135-6TD00-2CA1
Based on	6ES7135-6GB00-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1	6ES7135-6TD00-0CA1
	SIPLUS ET 200SP AQ 2xI Standard	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2 X U/I High Speed	SIPLUS ET 200SP AQ 2xU/I HF	SIPLUS ET 200SP AQ 4xI HART High Feature
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/ 6AG1193-6AB00-0AA0)
Usage in industrial process technology					
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Count 1x24V counter module

Overview



Technical properties

- Counter module for ET 200SP
- Interfaces:
 - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
 - 24 V encoder supply output, short-circuit proof
 - 3 digital inputs for controlling the count operation, for saving or for setting the count value
 - 2 digital outputs for fast reactions depending on the counter status or measured value

- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31-bit
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- 24 V incremental encoder with and without N signal
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Ordering data

Article No.

Article No.

TM Count 1x24V counter module

With one channel, max. 200 kHz;
for 24 V encoder

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

6ES7138-6AA01-0BA0
6ES7138-6AA01-2BA0

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with
16 process terminals (1 ... 16)
to the module and an additional
10 internally jumpered
AUX terminals (1 A to 10 A);
for starting a new load group
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with
16 process terminals to the module;
for starting a new load group
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with
16 process terminals (1 ... 16)
to the module and an additional
10 internally jumpered
AUX terminals (1 A to 10 A);
for continuing the load group

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with
16 process terminals to the module;
for continuing the load group

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Count 1x24V counter module

Ordering data	Article No.		Article No.
Accessories		Color-coded labels	
Equipment labeling plate	6ES7193-6LF30-0AW0	Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	6ES7193-6CP71-2AA0
10 sheets of 16 labels		Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	6ES7193-6CP72-2AA0
Labeling strips	6ES7193-6LR10-0AA0	Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	6ES7193-6CP73-2AA0
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer		Mechanical coding elements	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	For automatic coding of I/O modules; spare part. 20 units	
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0	Type A	6ES7193-6KA00-3AA0
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0	Type B	6ES7193-6KB00-3AA0
BU cover		Type C	6ES7193-6KC00-3AA0
For covering empty slots (gaps); 5 units		Type D	6ES7193-6KD00-3AA0
15 mm wide 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0		
Shield connection	6ES7193-6SC20-1AM0		
5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding			

Technical specifications

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V	Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
General information		Digital input functions, parameterizable	
Product type designation	TM Count 1x24V	- Gate start/stop - Capture - Synchronization - Freely usable digital input - Probe	Yes Yes Yes Yes Yes
Product function		Input voltage	
- I&M data - Isochronous mode	Yes; I&M0 to I&M3 Yes	- Rated value (DC) - for signal "0" - for signal "1" - permissible voltage at input, min. - permissible voltage at input, max.	24 V -5 ... +5 V +11 to +30V -30 V; -5 V continuous, -30 V brief reverse polarity protection 30 V
Engineering with		Input current	
- STEP 7 TIA Portal configurable/ integrated from version - STEP 7 configurable/ integrated from version - PROFIBUS from GSD version/ GSD revision - PROFINET from GSD version/ GSD revision	STEP 7 V15 SP1 or higher V5.6 and higher One GSD file each, Revision 3 and 5 and higher GSDML V2.34	for signal "1", typ.	2.5 mA
Supply voltage		Input delay (for rated value of input voltage) for standard inputs	
Rated value (DC)	24 V	- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Load voltage L+		for technological functions	
- Rated value (DC) - Reverse polarity protection	24 V Yes	- parameterizable	Yes
Encoder supply		Digital outputs	
Number of outputs	1	Type of digital output	Transistor
24 V encoder supply		Number of digital outputs	2
24 V - Short-circuit protection - Output current, max.	Yes; L+ (-0.8 V) Yes; electronic/thermal 300 mA	Digital outputs, parameterizable	Yes
Digital inputs		Short-circuit protection	Yes; electronic/thermal
Number of digital inputs	3	Limitation of inductive shutdown voltage to	L+ (-53 V)
Digital inputs, parameterizable	Yes	Controlling a digital input	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Count 1x24V counter module

Technical specifications

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Count 1x24V counter module

Technical specifications

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No

Article number	6ES7138-6AA01-0BA0 ET 200SP, TM Count 1x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM PosInput 1 counter and position detection module

Overview



- Counter frequency 1 MHz (4 MHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Technical properties

- Counter and position detection module for ET 200SP
- Interfaces:
 - Encoder signals A, B and N for 5 V TTL or RS422 differential signals
 - SSI interface with clock and data for RS422 differential signals
 - 24 V encoder supply, short-circuit proof
 - 5 V encoder supply, short-circuit proof
 - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
 - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value

10

Ordering data

Article No.

Article No.

TM PosInput 1 counter and position detection module

With one channel, max. 1 MHz for 5 V TTL or RS422 differential signals or SSI absolute encoder

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7138-6BA01-0BA0
6ES7138-6BA01-2BA0

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM PosInput 1 counter and position detection module

Ordering data	Article No.	Article No.
Accessories		
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0	6ES7193-6CP71-2AA0
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	6ES7193-6CP72-2AA0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	6ES7193-6CP73-2AA0
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0	
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0	
BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0	
		Color-coded labels - Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units - Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units - Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units Type A Type B Type C Type D

Technical specifications

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1	Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
General information		Input characteristic curve in accordance with IEC 61131, type 3	Yes
Product type designation	TM PosInput 1	Digital input functions, parameterizable	
Product function		• Gate start/stop	Yes; only for pulse and incremental encoders
• I&M data	Yes; I&M0 to I&M3	• Capture	Yes
• Isochronous mode	Yes	• Synchronization	Yes; only for pulse and incremental encoders
Engineering with		• Freely usable digital input	Yes
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V16 or higher	Input voltage	
• STEP 7 configurable/integrated from version	V5.6 (use previous version *6BA00*)	• Rated value (DC)	24 V
• PROFIBUS from GSD version/GSD revision	GSD Revision 5	• for signal "0"	-5 ... +5 V
• PROFINET from GSD version/GSD revision	GSDML V2.34	• for signal "1"	+11 to +30V
Supply voltage		• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
Rated value (DC)	24 V	• permissible voltage at input, max.	30 V
Load voltage L+		Input current	
• Rated value (DC)	24 V	• for signal "1", typ.	2.5 mA
• Reverse polarity protection	Yes	Input delay (for rated value of input voltage) for standard inputs	
Encoder supply		- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Number of outputs	2	for technological functions	
5 V encoder supply		- parameterizable	Yes
• 5 V	Yes		
• Short-circuit protection	Yes; electronic/thermal		
• Output current, max.	300 mA; Total current of all encoders		
24 V encoder supply			
• 24 V	Yes; L+ (-0.8 V)		
• Short-circuit protection	Yes; electronic/thermal		
• Output current, max.	300 mA; Total current of all encoders		
Digital inputs			
Number of digital inputs	2		
Digital inputs, parameterizable	Yes		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Posinput 1 counter and position detection module

Technical specifications

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max.; 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 μs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
• Group error	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Posinput 1 counter and position detection module

Technical specifications

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator forward counting (green)	Yes
• Status indicator backward counting (green)	Yes
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	6ES7138-6BA01-0BA0 ET 200SP, TM Posinput 1
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Timer DIDQ 10x24V time-based IO module

Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with μs accuracy
- Outputs for outputting the switching signals with μs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Ordering data

TM Timer DIDQ 10x24V time-based IO module

4 time-controlled inputs,
6 time-controlled outputs

Article No.

6ES7138-6CG00-0BA0

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

Article No.

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

Accessories

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0
6ES7133-6CV20-1AM0

Shield connection

5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding

6ES7193-6SC20-1AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Timer DIDQ 10x24V time-based IO module

Ordering data

Color-coded labels

- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

Article No.

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

Article No.

Mechanical coding elements

For automatic coding of I/O modules; spare part.
20 units

Type A

Type B

Type C

Type D

6ES7193-6KA00-3AA0

6ES7193-6KB00-3AA0

6ES7193-6KC00-3AA0

6ES7193-6KD00-3AA0

Technical specifications

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
General information	
Product type designation	TM Timer DIDQ 10x24V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 Update 3
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
Digital inputs	
Number of digital inputs	4
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp - Number, max.	Yes 4
• Counter - Number, max.	Yes 3
• Counter for incremental encoder - Number, max.	Yes 1
• Digital input with oversampling - Number, max.	Yes 4
• HW enable for digital input - Number, max.	Yes 1
• HW enable for digital output - Number, max.	Yes 3

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	6
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Digital output functions, parameterizable	
• Digital output with time stamp - Number, max.	Yes 6
• PWM output - Number, max.	Yes 6
• Digital output with oversampling - Number, max.	Yes 6
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Timer DIDQ 10x24V time-based IO module

Technical specifications

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	3.5 A; Observe derating
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• pulse encoder	Yes
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Bus cycle time (TDP), min.	375 µs

Article number	6ES7138-6CG00-0BA0 ET 200SP, TM Timer DIDQ 10x24V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
• Number of counters	3
• Counting frequency, max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Pulse 2x24V pulse output module

Overview



2-channel pulse output module for ET 200SP

- Operating modes:
 - Single pulse with defined length
 - Pulse chain with defined number of pulses
 - Pulse width modulation (with flexible ON period, optional current control and dither function)
 - PWM signal for controlling a DC motor
 - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
 - Frequency output with defined output frequency
- Hardware:
 - 2 channels 24 V, 2 A output current
 - Parallel switching for enhanced performance on 4 A output current
 - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
 - Push-pull output driver for especially steep edges at the outputs
 - Polarity change in DC motor operation for direction reversal
 - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
 - HW enable; start of signal output with the onboard digital input
 - Parameterizable ON delay; for precise delay between the HW enable and the start of output
 - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. This allows you to compensate for the effect of temperature on the actuator resistance.
 - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
 - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
 - Firmware update
 - Identification data I&M

Ordering data

Article No.

TM Pulse 2x24V pulse output module

PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors

6ES7138-6DB00-0BB1

Suitable BaseUnits

BU20-P12+A0+4B

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

6ES7193-6BP20-0BB1

Accessories

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

BU cover

For covering empty slots (gaps); 5 units

- 15 mm wide
- 20 mm wide

6ES7133-6CV15-1AM0

6ES7133-6CV20-1AM0

Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM Pulse 2x24V pulse output module

Technical specifications

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
General information	
Product type designation	TM Pulse 2x24 V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 + HSP
• STEP 7 configurable/ integrated from version	V5.5 SP4 and higher
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.31
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	2; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Freely usable digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Digital outputs	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Freely usable digital output	Yes
• PWM output	Yes
- Number, max.	2; 1 per channel
- Cycle duration, parameterizable	Yes; Max. 85 s
• Connection of a proportional valve	Yes
• Dithering	Yes
• Current measurement	Yes
• Current control	Yes
• Connection of a DC motor	Yes
• ON-delay	Yes
• OFF-delay	Yes
• Frequency output	Yes
• Pulse train	Yes
• Pulse output	Yes
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W; 1 W with High Speed output
Load resistance range	
• lower limit	12 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A; 0.1 A with High Speed output, observe derating
Output delay with resistive load	
• "0" to "1", typ.	0 μs; With High Speed output, 4.5 μs with Standard output
• "0" to "1", max.	0.8 μs; With High Speed output, 9 μs with Standard output
• "1" to "0", typ.	0 μs; With High Speed output, 4.5 μs with Standard output
• "1" to "0", max.	0.8 μs; With High Speed output, 9 μs with Standard output
Parallel switching of two outputs	
• for uprating	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM Pulse 2x24V pulse output module

Technical specifications

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Switching frequency	
• with resistive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• with inductive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
• Current per group, max.	4 A
• Current per module, max.	4 A
Isochronous mode	
Bus cycle time (TDP), min.	250 µs; with 1 channel configuration, 375 µs with 2 channel configuration
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	No
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	No

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM PTO 2x24V interface module for PTO (Pulse Train Output)

Overview



- 2-channel interface module in ET 200SP for PTO (Pulse Train Output)
- Signal interface for speed and direction: 24 V asymmetrical up to 200 kHz
- 3 signal types can be configured:
 - **PTO pulse/direction:**
The pulse signal defines the speed and distance and the direction signal determines the direction.
 - **PTO count up/ count down:**
A signal defines the pulses in the forward direction and the other signal defines the pulses in the reverse direction.
 - **PTO A/B phase-shifted:**
2 tracks are output, whose signals are phase-shifted by 90°. Based on the signal sequence, the direction, the distance and the speed can be determined. It can be selected whether a full period lasts for 1 increment or whether all 4 edge transitions will be counted.
- The pulses output are also counted internally in the module and signaled to the CPU as the current actual position.
- Supported technology objects:
 - Speed axis (S7-1500, S7-1500T)
 - Positioning axis (S7-1200, S7-1500, S7-1500T)
 - Synchronous axis (S7-1500, S7-1500T)
 - Measuring input (S7-1500, S7-1500T)

Ordering data

Article No.

TM PTO 2x24V interface module for PTO (Pulse Train Output)

6ES7138-6EB00-0BA0

With two channels for Pulse Train Output PTO, 24 V; 2 DQ PTO, 3 DI 24 V and 1 DQ 24 V per channel

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM PTO 2x24V interface module for PTO (Pulse Train Output)

Ordering data	Article No.	Article No.
Accessories		Mechanical coding elements
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0	For automatic coding of I/O modules; spare part. 20 units
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	Type A 6ES7193-6KA00-3AA0
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	Type B 6ES7193-6KB00-3AA0
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0	Type C 6ES7193-6KC00-3AA0
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0	Type D 6ES7193-6KD00-3AA0
BU cover For covering empty slots (gaps); 5 units		SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.
• 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Period of delivery and service: 1 year from date of invoice Consignee email address required for delivery.
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0	6ES7998-8XE01-8YE0 6ES7998-8XE01-8YE2
Color-coded labels • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0	

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Technical specifications

Article number	6ES7138-6EB00-0BA0 ET 200SP, TM PTO 2x24V	Article number	6ES7138-6EB00-0BA0 ET 200SP, TM PTO 2x24V
General information		Digital input functions, parameterizable	
Product type designation	TM PTO 2x24V	• Synchronization	Yes
Product function		• Probe	Yes
• I&M data	Yes; I&M0 to I&M3	• Drive ready	Yes
• Isochronous mode	Yes	Input voltage	
Engineering with		• Rated value (DC)	24 V
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V17 with HSP or higher	• for signal "0"	-5 ... +5 V
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher	• for signal "1"	+11 to +30V
• PROFINET from GSD version/GSD revision	GSDML V2.35	• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
Supply voltage		• permissible voltage at input, max.	30 V
Rated value (DC)	24 V	Input current	
Load voltage L+		• for signal "1", typ.	2.5 mA
• Rated value (DC)	24 V	Input delay (for rated value of input voltage) for standard inputs	
• Reverse polarity protection	Yes	- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Digital inputs			
Number of digital inputs	6; 3 per channel		
Digital inputs, parameterizable	Yes		
Input characteristic curve in accordance with IEC 61131, type 3	Yes		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM PTO 2x24V interface module for PTO (Pulse Train Output)

Technical specifications

Article number	6ES7138-6EB00-0BA0 ET 200SP, TM PTO 2x24V
Digital outputs	
Number of digital outputs	6; 3 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Controlling a digital input	Yes
Digital output functions, parameterizable	
• PTO (pulse train output) signal interface	Yes
- 24 V asymmetrical	Yes
• PTO (pulse train output) signal type	
- Pulse and direction	Yes
- Count up, count down	Yes
- Incremental encoder (A, B phase shift)	Yes
- Incremental encoder (A, B phase shift, quadruple)	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.1 A; 0.5 A for CHn.ED
• on lamp load, max.	1 W; 5 W for CHn.ED
Load resistance range	
• lower limit	240 Ω; 48 ohms for CHn.ED
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-1.3 V), L+ (-0.8 V) for CHn.ED
Output current	
• for signal "1" rated value	0.1 A; 0.5 A for CHn.ED
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz
• For signal interface 24 V asymmetrical	200 kHz; For 24 V PTO outputs
Total current of the outputs	
• Current per module, max.	1.4 A

Article number	6ES7138-6EB00-0BA0 ET 200SP, TM PTO 2x24V
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; Via control and feedback interface
to standard PROFINET controller	Yes; Via control and feedback interface
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM StepDrive 24...48V/5A stepper motor control (Phytron Co.)

Overview



The TM StepDrive module from Phytron is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200SP distributed I/O system. It is the 1-step-drive successor model for SIMATIC ET 200S.

The module can be used together with system and I/O components of the ET 200SP distributed I/O system. Operation is possible with the following head modules:

- IM PROFIBUS
- IM PROFINET
- ET 200SP CPU

Corresponding GSD files and an HSP are available.

The ET 200SP TM StepDrive 24...48V/5A is a product of our Phytron GmbH product partner and is only available from the Phytron GmbH company.

Note

Product partners are external companies outside Siemens AG and its associated companies. Information about and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners.

Ordering data

Article No.

TM StepDrive stepper motor control

More information and ordering options via Phytron under <http://www.phytron.com/tm-stepdrive>.

High-precision stepper motor control for ET 200SP

Suitable BaseUnits

BU20-P12+A0+4B

6ES7193-6BP20-0BB1

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

Accessories

Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

Technical specifications

- Suitable for bipolar control of 2-phase stepper motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Supply voltage from 24 to 48 V DC
- Up to 1/256 micro step (physical resolution: approx. 51 200 positions per revolution (0.007°/step)).
- Maximum stepping rate: 250 000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running ...)
- Short-circuit-proof, overload-proof
- Data record transfer for power output stage parameter assignment and diagnostics during runtime
- Booster: Enhanced torque during acceleration or braking
- Adjustable response to CPU stop

More information

You can find more information on the module and associated contact information on the internet under <https://www.phytron.eu/tm-stepdrive>.

Here you will also find the manual, the data sheet, the HSP, a link to the GSD files as well as sample function blocks for SIMATIC.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > F-TM ServoDrive HF

Overview



SIMATIC MICRO-DRIVE F-TM ServoDrive HF with BaseUnit

In combination with EC Motors and stepper motors up to 280 W the ET 200SP technology module F-TM ServoDrive HF allows positioning and speed control in very confined spaces. The triple overload capability and the support of BiSS-C multi-turn encoders extend the scope of applications of the TM Drive product family.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

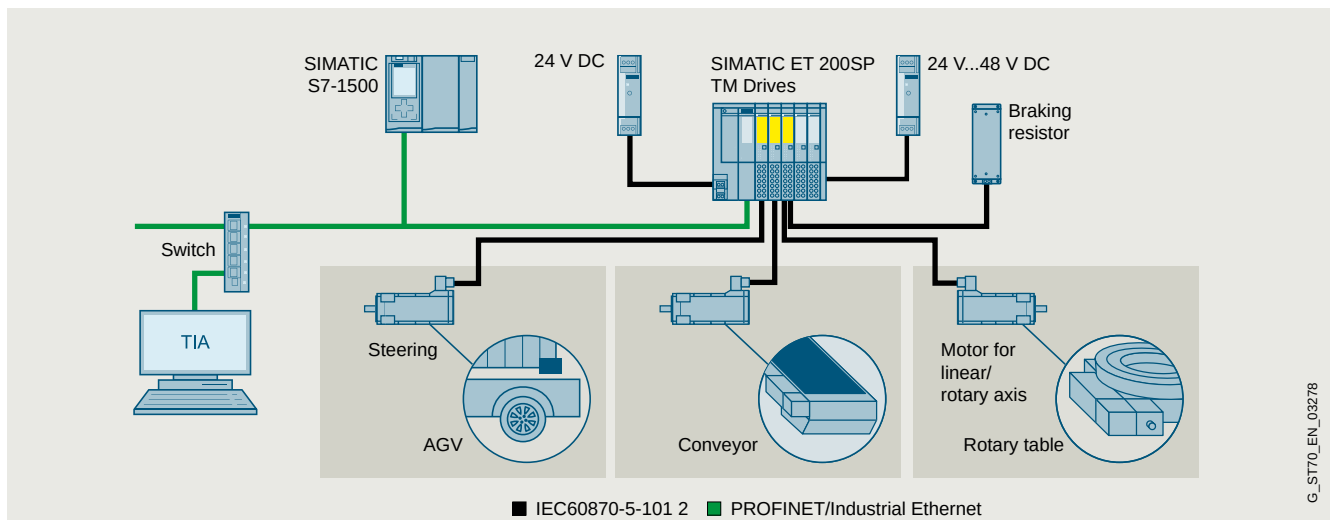
The new drive system consists of:

- The F-TM ServoDrive HF,
- The BaseUnit (U0),
- Motors with gearbox for flexible use and
- Connecting cables.

Further information on the distributed I/O system SIMATIC ET 200SP is available in the ST 70 Catalog and on the internet at <https://www.siemens.com/et200sp>

Characteristics

- PROFINET RT/IRT from firmware FW2.1
- Hardware-STO (SIL 3)
- Triple overload
- Digital input
- Integrated braking chopper
- Encoder connection for
 - IQ encoders
 - Incremental encoders
 - BiSS-C encoders
 - Hall encoder



Application example TM Drives

Variant	Power	Peak power	Device width
High Feature	280 W	840 W	20 mm

More information:

<https://www.siemens.com/micro-drive>

Ordering data

Article No.

F-TM ServoDrive HF for SIMATIC MICRO-DRIVE

- High Feature V1; 24 ... 48 V, 5 A with hardware STO and integrated braking chopper

6BK1136-6AB01-0CU0

Accessories

ET 200SP BaseUnit type U0

- For constructing a new potential group (white)
- For continuing an existing potential group (gray)

Shield connection for ET 200SP
Includes 5 shield connections

Article No.

6ES7193-6BP00-0DU0
6ES7193-6BP00-0BU0

6ES7193-6SC20-1AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > F-TM ServoDrive HF

Technical specifications

Article number	6BK1136-6AB01-0CU0 F-TM ServoDrive HF
General information	
Product type designation	F-TM ServoDrive HF
Product description	control of EC and stepper motors
Product function	
• I&M data	Yes
• Isochronous mode	Yes
• Four-quadrant operation	Yes
• Speed control with encoder	Yes
• Speed control without encoder	No
• Safety Functions	Yes; Drive controller with hardwired STO
Protection function	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
Installation type/mounting	
Type of ventilation	Convection cooling
Supply voltage	
Design of the power supply	24 ... 48 V DC, SELV / PELV
Output voltage	
Rated value, min.	24 V
Rated value, max.	48 V
Output current	
Current output (rated value)	5 A
Output current, max.	15 A
Output frequency	599 Hz; 1 500 Hz with stepper motors
Encoder supply	
Number of outputs	1
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	150 mA
Digital inputs	
Number of digital inputs	1; input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
• Absolute encoder (SSI)	Yes; BiSS-C
• Hall encoder	Yes
• BiSS-C encoder	Yes
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Telegram error at SSI encoder	Yes; BiSS-C
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
Integrated Functions	
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes

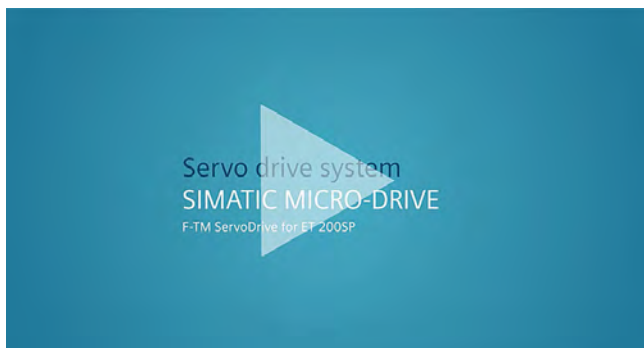
Article number	6BK1136-6AB01-0CU0 F-TM ServoDrive HF
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL acc. to IEC 61508	SIL 3
• SIL according to DIN EN 61800-5-2	SIL 3
Ambient conditions	
Pollution degree during storage and transport	2
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
Ambient temperature during storage/transportation	
• Storage, min.	-30 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m
Cables	
Cable length for motor, shielded, max.	10 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g
Other	
Brake design	holding brake control via the process image
Braking chopper	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > F-TM ServoDrive ST

Overview



SIMATIC MICRO-DRIVE F-TM ServoDrive ST video

https://players.brightcove.net/1813624294001/70fec0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6136815418001



In combination with EC motors, the ET 200SP technology module F-TM ServoDrive ST allows positioning and speed control of EC motors up to 280 W in very confined spaces.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

The new drive system consists of

- The F-TM ServoDrive ST
- The BaseUnit (U0)
- Motors with gearbox for flexible use and
- Connecting cables.

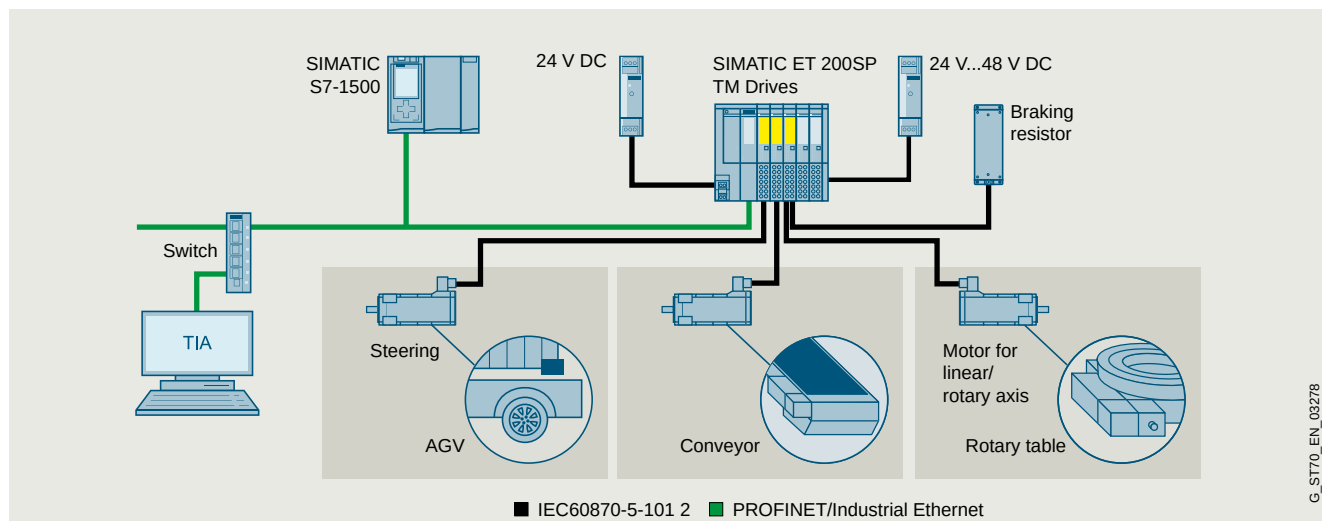
Further information on the distributed I/O system SIMATIC ET 200SP is available in the ST 70 Catalog and on the internet at

<http://www.siemens.com/et200sp>

Characteristics

- PROFINET RT/IRT from firmware FW2.1
- Hardware STO (SIL 2)
- Double overload
- Digital input
- Integrated braking chopper
- Encoder connection for
 - IQ encoders
 - Incremental encoders
 - Hall encoder

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Application example TM Drives

Variant	Power	Device width
Standard	280 W	20 mm

More information:

<https://www.siemens.com/micro-drive>

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > F-TM ServoDrive ST

Ordering data	Article No.	Article No.
F-TM ServoDrive ST for SIMATIC MICRO-DRIVE Standard V1; 24 ... 48 V, 5 A with hardware STO and integrated braking chopper	6BK1136-6AB01-0BU0	Accessories SIMATIC F-TM ServoDrive ST Starter Kit Scope of supply: - SIMATIC MICRO-DRIVE F-TM ServoDrive ST - SIMATIC ET 200SP PROFINET IM 155-6PN ST Interface Module - SIMATIC ET 200SP BaseUnit type U0 - All-in-one plug-in cable CSD_LAI02, length 1.5 m - ebm-papst motor ECi42.20 24 V ET 200SP BaseUnit type U0 - For constructing a new potential group (white) - For continuing an existing potential group (gray) Shield connection for ET 200SP Includes 5 shield connections
		6BK1637-6AB00-0BU0
		6ES7193-6BP00-0DU0 6ES7193-6BP00-0BU0
		6ES7193-6SC20-1AM0

Technical specifications

Article number	6BK1136-6AB01-0BU0	Article number	6BK1136-6AB01-0BU0
	F-TM ServoDrive ST		F-TM ServoDrive ST
General information		Digital inputs	
Product type designation	F-TM ServoDrive ST	Number of digital inputs	1; input for message signal
Product description	Control of EC motors	Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
Product function		Encoder	
• I&M data	Yes	Connectable encoders	
• Isochronous mode	Yes	• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
• Four-quadrant operation	Yes	• Hall encoder	Yes
• Speed control with encoder	Yes	Interrupts/diagnostics/status information	
• Speed control without encoder	No	Alarms	
• Safety Functions	Yes; Drive controller with hardwired STO	• Diagnostic alarm	Yes
Protection function		• Hardware interrupt	No
• Undervoltage protection	Yes	Diagnoses	
• Overvoltage protection	Yes	• Monitoring the supply voltage	Yes
• Overload protection	Yes	• Wire-break	Yes
• Ground-fault protection	No	• Short-circuit	Yes
• Short-circuit protection	Yes	• Group error	Yes
Installation type/mounting		Diagnostics indication LED	
Type of ventilation	Convection cooling	• RUN LED	Yes
Supply voltage		• ERROR LED	Yes
Design of the power supply	24 ... 48 V DC, SELV / PELV	Integrated Functions	
Output voltage		Position detection	
Rated value, min.	24 V	• Incremental acquisition	Yes
Rated value, max.	48 V	• Absolute acquisition	No
Output current		• Suitable for S7-1500 Motion Control	Yes
Current output (rated value)	5 A	Potential separation	
Output current, max.	10 A	Potential separation channels	
Output frequency	599 Hz	• between the channels and backplane bus	Yes
Encoder supply		Degree and class of protection	
Number of outputs	1	IP degree of protection	IP20
5 V encoder supply			
• 5 V	Yes		
• Short-circuit protection	Yes		
• Output current, max.	150 mA		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > F-TM ServoDrive ST

Technical specifications

Article number	6BK1136-6AB01-0BU0 F-TM ServoDrive ST
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
Highest safety class achievable in safety mode	
- Performance level according to ISO 13849-1 - SIL acc. to IEC 61508 - SIL according to DIN EN 61800-5-2	Category 3, performance level d, according to EN ISO 13849-1:2015 SIL 3 SIL 3

Article number	6BK1136-6AB01-0BU0 F-TM ServoDrive ST
Ambient conditions	
Pollution degree during storage and transport	2
Ambient temperature during operation	
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted. 60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data! -30 °C; No condensation, splash water, icing, salt spray or oil mist permitted. 50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
Ambient temperature during storage/transportation	
- Storage, min. - Storage, max.	-30 °C 70 °C
Altitude during operation relating to sea level	
Installation altitude above sea level, max.	3 000 m
Cables	
Cable length for motor, shielded, max.	10 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g
Other	
Brake design	holding brake control via the process image
Braking chopper	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > F-TM StepDrive ST

Overview



The ET 200SP technology module F-TM StepDrive ST allows positioning and speed control of stepper motors up to 10 A peak current in very confined spaces.

Engineering in the TIA Portal stands for consistency in a single tool. This facilitates drive dimensioning, commissioning and servicing.

The new drive system consists of

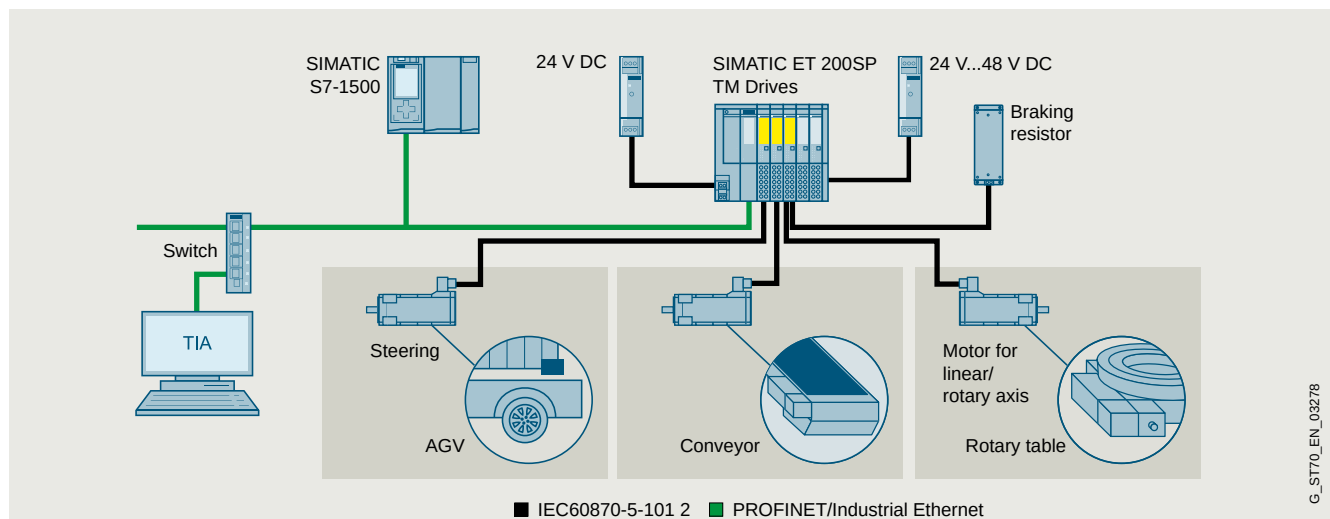
- The F-TM StepDrive ST,
- The BaseUnit (U0)

Further information on the distributed I/O system
SIMATIC ET 200SP is available in the ST 70 Catalog
and on the internet at

<http://www.siemens.com/et200sp>

Characteristics

- Bipolar stepper motors
- PROFINET RT/IRT from firmware FW2.1
- Hardware STO (SIL3)
- Digital input
- Encoderless open-loop controlled operation
- Closed-loop operation with encoder feedback
- Encoder connection for
 - Incremental encoders
 - BiSS-C encoders



Application example TM Drives

Variant	Power	Device width
Standard	280 W	20 mm

More information:

<https://www.siemens.com/micro-drive>

Ordering data	Article No.
F-TM StepDrive ST for SIMATIC MICRO-DRIVE Standard V1; 24 ... 48 V, 5 A with hardware STO	6BK1136-6SB01-0BU0
Accessories	
ET 200SP BaseUnit type U0 - For constructing a new potential group (white) - For continuing an existing potential group (gray)	6ES7193-6BP00-0DU0 6ES7193-6BP00-0BU0
Shield connection for ET 200SP Includes 5 shield connections	6ES7193-6SC20-1AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > F-TM StepDrive ST

Technical specifications

Article number	6BK1136-6SB01-0BU0 F-TM StepDrive ST
General information	
Product type designation	F-TM StepDrive ST
Product description	control of stepper motors
Product function	
• I&M data	Yes
• Isochronous mode	Yes
• Four-quadrant operation	Yes
• Speed control with encoder	Yes
• Speed control without encoder	No
• Safety Functions	Yes; Drive controller with hardwired STO
Protection function	
• Undervoltage protection	Yes
• Overvoltage protection	Yes
• Overload protection	Yes
• Ground-fault protection	No
• Short-circuit protection	Yes
Installation type/mounting	
Type of ventilation	Convection cooling
Supply voltage	
Design of the power supply	24 ... 48 V DC, SELV / PELV
Output voltage	
Rated value, min.	24 V
Rated value, max.	48 V
Output current	
Current output (rated value)	5 A
Output current, max.	10 A
Output frequency	1 500 Hz
Encoder supply	
Number of outputs	1
5 V encoder supply	
• 5 V	Yes
• Short-circuit protection	Yes
• Output current, max.	150 mA
Digital inputs	
Number of digital inputs	1; input for message signal
Number of safety inputs	1; For STO, antivalent (2-pin) - 24 V DC
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 500 Hz per channel
Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
Integrated Functions	
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	No
• Suitable for S7-1500 Motion Control	Yes

Article number	6BK1136-6SB01-0BU0 F-TM StepDrive ST
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UKCA mark	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
China RoHS compliance	Yes
Standard for EMC according to EN 61800-3	Yes
Standard for drive acc. to EN 61800-5-1	Yes
Standard for drive acc. to EN 61800-5-2	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 3, performance level d, according to EN ISO 13849-1:2015
• SIL acc. to IEC 61508	SIL 3
• SIL according to DIN EN 61800-5-2	SIL 3
Ambient conditions	
Pollution degree during storage and transport	2
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• horizontal installation, max.	60 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
• vertical installation, min.	-30 °C; No condensation, splash water, icing, salt spray or oil mist permitted.
• vertical installation, max.	50 °C; No condensation, splash water, icing, salt spray or oil mist permitted. Note the derating data!
Ambient temperature during storage/transportation	
• Storage, min.	-30 °C
• Storage, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m
Cables	
Cable length for motor, shielded, max.	10 m
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	55 g
Other	
Brake design	holding brake control via the process image
Braking chopper	No

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Overview

SIPLUS and SIMATIC Electrical Charging Controllers are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
 - Ready for charging
 - Charging
 - Charging with ventilation
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP.

ET 200SP TM ECC 2xPWM ST AC module



- Control of charging outputs according to IEC 61851 by parameterizable SIMATIC ET 200SP TM ECC 2xPWM ST charging controller
- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status

ET 200SP TM ECC PL ST DC module



- The SIMATIC ET 200SP TM ECC PL ST charging controller fully controls a DC charging process according to DIN SPEC 70121.
- The following sequences are performed:
 - Session Setup
 - Service Discovery
 - Service and Payment Selection
 - Contract Authentication
 - Charge Parameter Discovery
 - Power Delivery
 - Charging Status
 - Cable Check
 - Pre Charging
 - Current Demand
 - Welding Detection
 - Session Stop

Accessories: Calibration Kit TM ECC CCS2

Expansion kit for calibration of the power line signal strength of an EVSE.

- According to DIN SPEC 70121 / ISO15118 or design guidelines for CCS charging stations Type 2
- Suitable for the SIMATIC ET 200SP TM ECC PL ST technology module

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6AG1242-6TM10-2BB1 SIPLUS ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
Digital inputs			
Number of digital inputs	2; 1 per channel		0
Digital inputs, parameterizable	Yes; 12 V / 24 V		No
Digital input functions, parameterizable			
• Freely usable digital input	No; Readback contact contactor / connector lock		
Input voltage			
• Type of input voltage	DC		
• for signal "0"	<0.2 V (nom)		
• for signal "1"	>0.6 V (nom)		
• permissible voltage at input, min.	0 V		
• permissible voltage at input, max.	30 V		
Cable length			
• shielded, max.			10 m
• unshielded, max.	30 m		
Digital outputs			
Type of digital output	Transistor		
Number of digital outputs	2; 1 per channel		2; 1x digital out TRIP function as open collector, 1x digital out (DQ P) as open collector
Current-sinking			Yes
short-circuit proof	Yes		
Short-circuit protection	Yes; electronic/thermal		
Digital output functions, parameterizable			
• PWM output	Yes; According to IEC 61851		Yes; acc. to DIN SPEC 70121 and ISO 15118
- Number, max.	2; 1 per channel		1; 1 per channel
• Connection of a DC motor	Yes; ACT p/n connector locking		No; Only fixed charging cables are permitted for DC charging systems
Switching capacity of the outputs			
• with resistive load, max.	1.3 A		0.6 A; Per digital output
Output voltage			
• Type of output voltage	DC		
• Rated value (DC)	24 V		
Cable length			
• unshielded, max.	30 m; when using a PROFIBUS line	30 m	10 m
Analog inputs			
Number of analog inputs			1; plug present according to IEC 61851
Analog outputs			
Number of analog outputs	2; Control pilot acc. to IEC 61851-1 and/or SAE J1772		1
Type of analog output			Control pilot including Powerline Green Phy, acc. to DIN SPEC 70121
Connection of a DC motor	Yes; Motor for connector lock		No
Protocols			
Bus communication	Yes		Yes; Backplane bus
Vehicle communication according to IEC 61851	Yes; MODE 3		Yes; Mode 4
Interrupts/diagnostics/ status information			
Alarms			
• Diagnostic alarm	Yes		
Diagnoses			
• Monitoring the supply voltage	No		No; Supply voltage diagnostics
• Wire-break			No
• Short-circuit	Yes		No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6AG1242-6TM10-2BB1 SIPLUS ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
Diagnostics indication LED			
• ERROR LED	Yes; red LED		No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED		
• Channel status display	Yes; green LED		
• for module diagnostics	Yes; green/red DIAG LED		
Potential separation			
Potential separation channels			
• between the channels	No		No; Only one channel is available
• between the channels and backplane bus	Yes		
EMC			
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines		
Conducted interference due to surge acc. to IEC 61000-4-5	On DC supply lines: 0.5 kV symmetrical and asymmetrical		
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		
Degree and class of protection			
IP degree of protection	IP20		
Standards, approvals, certificates			
Certificate of suitability	CE / RCM / EAC / UL / KC	CE	CE / RCM / EAC / UL / KC
Ambient conditions			
Ambient temperature during operation			
• min.	-30 °C		-30 °C
• max.	60 °C		60 °C
• horizontal installation, min.	-30 °C	-30 °C; = Tmin	-30 °C
• horizontal installation, max.	60 °C	60 °C; = Tmax	60 °C
• vertical installation, min.	-30 °C	-30 °C; = Tmin	-30 °C
• vertical installation, max.	50 °C	50 °C; = Tmax	50 °C
Ambient temperature during storage/transportation			
• Storage, min.	-40 °C		
• Storage, max.	70 °C		
• Transportation, min.	-40 °C		
• Transportation, max.	70 °C		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• Operation, min.	5 %		5 %
• Operation, max.	95 %; no condensation		95 %; no condensation
• With condensation, tested in accordance with IEC 60068-2-38, max.		100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	
Vibrations			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
Shock testing			
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications

Article number	6FE1242-6TM10-0BB1 SIMATIC ET 200SP TM ECC 2xPWM ST	6AG1242-6TM10-2BB1 SIPLUS ET 200SP TM ECC 2xPWM ST	6FE1242-6TM20-0BB1 SIMATIC ET 200SP TM ECC PL ST
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants		Yes; Incl. diesel and oil droplets in the air	
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3		Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	
- to chemically active substances according to EN 60721-3-3		Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-3		Yes; Class 3S4 incl. sand, dust, *	
- Against mechanical environmental conditions acc. to EN 60721-3-3		Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4		Yes; Class 3 (excluding trichlorethylene)	
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04		Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04		* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086		Yes; Class 2 for high reliability	
• Protection against fouling acc. to EN 60664-3		Yes; Type 1 protection	
• Military testing according to MIL-I-46058C, Amendment 7		Yes; Discoloration of coating possible during service life	
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A		Yes; Conformal coating, Class A	
Decentralized operation			
to SIMATIC S7-1500	Yes		
Dimensions			
Width	20 mm		
Height	73 mm		
Depth	58 mm		
Weights			
Weight, approx.	32 g		51 g
Other			
Note:			The Tone Mask of the Green Phy defined in DIN 70121 for North America applies

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > SIMATIC ET 200SP ECC charging controllers

Technical specifications

Article number	6FE1244-0AD10-0AA0 SIMATIC Calibration Kit TM ECC CCS2
General information	
Product type designation	Calibration kit TM ECC CCS2
Product description	Expansion kit for adjusting the powerline signal strength of an EVSE in accordance with DIN SPEC 70121/ISO 15118 or design guidelines for CCS charging stations
Installation type/mounting	
Mounting type	standard rail
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V; Optional: external infeed
Reverse polarity protection	Yes
Load voltage L+	
• Short-circuit protection	Yes
• Reverse polarity protection	Yes
Input current	
Current consumption, max.	0.5 A
Interfaces	
Number of other interfaces	2; 1x CCS (Combined Charging System) acc. to IEC 62196 1x power supply DC adapter (5.50 mm x 2.10 mm x 9.5 mm) 24 V
Protocols	
Vehicle communication according to IEC 61851	Yes; Mode 4
EMC	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Degree and class of protection	
IP degree of protection	IP30
Standards, approvals, certificates	
Certificate of suitability	CE

Article number	6FE1244-0AD10-0AA0 SIMATIC Calibration Kit TM ECC CCS2
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	40 °C
Ambient temperature during storage/transportation	
• Storage, min.	-30 °C
• Storage, max.	85 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Up to max. 2 000 m
Relative humidity	
• Operation, min.	5 %
• Operation, max.	95 %
Mechanics/material	
Material of housing	Plastic: polycarbonate, abbreviation: PC- GF 10 FR
Dimensions	
Width	250 mm
Height	122 mm
Depth	160 mm
Weights	
Weight, approx.	1.5 kg

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP321 ST weighing electronics

Overview



SIWAREX WP321 is a versatile and flexible weigh beam for the seamless integration of a static scale into the SIMATIC automation environment.

The weighing electronics are integrated within the SIMATIC ET 200SP system series and use all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostics units and the project planning tools in the TIA portal, SIMATIC Step 7, WinCC flexible and PCS 7.

In conjunction with the digital SIWAREX DB junction box, up to four connected load cells can be diagnosed separately. This enables the weigh beam module to detect the failure of individual load cells and, in the event of an error, to provide relevant load cell data such as order number and location designation directly in the CPU or at the HMI. This increases the operational reliability of the scale, reduces downtimes, makes commissioning easier and simplifies servicing.

All messages and process values of the individual load cell channels are of course available in the SIMATIC controller.

Ordering data

Article No.

TM SIWAREX WP321 weighing electronics

Single-channel, for platform scales or hopper scales with analog load cells (1 ... 4 mV/V), 1 × LC, 1 × RS 485

7MH4138-6AA00-0BA0

SIWAREX WP321 Equipment Manual

Available in a range of languages

Free download on the Internet at: <http://www.siemens.com/weighing/documentation>

SIWAREX WP321 "Ready-for-use"

TIA Portal and SIMATIC Manager sample configuration

Free download on the Internet at: <http://www.siemens.com/weighing/documentation>

SIWATOOL V4 & V7

Service and commissioning software for SIWAREX weighing modules

7MH4900-1AK01

SIWAREX PCS 7 AddOn Library for PCS7 V8.x and V9.0

Supports PROFINET

APL faceplates and function blocks for:

- SIWAREX U
- SIWAREX FTA
- SIWAREX FTC_B (belt scale)
- SIWAREX WP321

Classic faceplate and function block for:

- SIWAREX FTC_L (Loss-in-weight)

7MH4900-1AK61

Accessories (mandatory requirement)

BaseUnit (Type A0 – one BaseUnit required for each WP321)

For opening a new potential group

- BU15P-16+A0+2D
- BU15P-16+A10+2D

6ES7193-6BP00-0DA0
6ES7193-6BP20-0DA0

For continuing the potential group

- BU15P-16+A0+2B
- BU15P-16+A10+2B

6ES7193-6BP00-0BA0
6ES7193-6BP20-0BA0

Shield connection for BaseUnit (5 units / for 5 scales)

For laying load cell cable

6ES7193-6SC20-1AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP321 ST weighing electronics

Ordering data	Article No.		Article No.
Accessories (optional)		Cable (optional)	
SIWAREX EB extension box For extending sensor cables	7MH4710-2AA	Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. • Sheath color: orange • Sheath color (for hazardous atmospheres): blue	7MH4702-8AG 7MH4702-8AF
SIWAREX JB junction box, aluminum enclosure For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	7MH5001-0AA20		
SIWAREX JB junction box, stainless steel enclosure For connecting up to 4 load cells in parallel	7MH5001-0AA00		
SIWAREX JB junction box, stainless steel enclosure (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate)	7MH5001-0AA01		
SIWAREX DB digital junction box For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics Enclosure made of: • Aluminum • Stainless steel	7MH5001-0AD20 7MH5001-0AD01	RS 485/USB interface converter Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI https://www.cti-shop.com/en/rs485-converter/usb-nano-485	
SIWAREX IS Ex interface For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately. Approved for use in the EU • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	7MH4710-5BA 7MH4710-5CA	Remote display The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX WP321 via an RS 485 interface. Siebert Industrie Elektronik GmbH PO Box 1180D-65565 Eppelborn, Germany Tel: +49 6806/980-9 Fax: +49 6806/980-999 https://www.siebert-group.com/en/ Detailed information is available from the manufacturer.	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP321 ST weighing electronics

Technical specifications

SIWAREX WP321	
Integration in automation systems	
SIMATIC S7-300, S7-400, S7-1200 and S7-1500	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Other manufacturers (with restrictions)	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Communication interfaces	• SIMATIC ET 200SP backplane bus • RS 485 (SIWATOOL, Siebert remote display)
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC CPU / Touch Panel
Measuring accuracy	
According to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	± 2 million parts
Measuring frequency	100 / 120 / 600 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	• Non-automatic weighing instruments • Force measurements • Fill-level monitoring • Belt tension monitors
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 × min/max • Empty
Zeroing	Via command by controller or HMI
Tare	Via command by controller or HMI
External tare specification	Via command by controller or HMI
Calibration commands	Via command by controller or HMI

SIWAREX WP321	
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled)	4.85 V DC ±2%
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-21.3 ... +21.3 mV
Max. distance of load cells	1000 m (459.32 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • FM • EAC • KCC • IECEx • RCM
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	Typ. 0.1 A @ 24 V DC (0.2 A max.)
Max. power consumption SIMATIC Bus	30 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)} \dots T_{max(IND)}$ (operating temperature)	
• Vertical installation in SIMATIC S7 ¹⁾	-25 ... +50 °C (-13 ... 122 °F)
• Horizontal installation in SIMATIC S7 ¹⁾	-25 ... +60 °C (-13 ... 140 °F)
EMC requirements	According to IEC 61000-6-2, IEC 61000-6-4, OIML R76-1
Dimensions (width)	15 mm (0.6 inch)

¹⁾ The S7 standard modules may not be operated at temperatures below 0 °C (32 °F). For operating conditions below 0 °C (32 °F), SIMATIC modules from the SIPLUS series must be used.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP341 HF weighing electronics

Overview



The SIWAREX WP341 is a compact, precise weighing electronics in the SIMATIC ET 200SP format.

With a width of just 20 mm it is one of the slimmest weighing electronics on the market, yet its firmware includes the functionalities of a continuous belt weighing electronics. Optionally the WP341 can be used for operation of solids flowmeters.

The load cells and the speed sensor are directly connected to the ET 200SP Base Unit (type U0) and therefore the complete system is directly integrated into the automation system.

Ordering data

Article No.

TM SIWAREX WP341 weighing electronics
7MH4138-6CA00-0CU0

SIMATIC ET 200SP,
TM SIWAREX WP341 HF, weighing
electronics for continuous belt
weighing applications

**SIWAREX WP341
Equipment Manual**

Available in a range of languages

Free download on the Internet at:

[http://www.siemens.com/weighing/
documentation](http://www.siemens.com/weighing/documentation)

**SIWAREX WP341 "Getting Started"
sample project**

Sample software shows beginners
how to program the scales in
TIA Portal V16

Free download on the Internet at:

[https://support.industry.siemens.com/
cs/products?dtp=Download&mf=ps
&pnid=17781&lc=en-WW](https://support.industry.siemens.com/cs/products?dtp=Download&mf=ps&pnid=17781&lc=en-WW)

ET 200SP BaseUnit type U0

- For opening a new potential group (white)
- For continuing an existing potential group (gray)

6ES7193-6BP00-0DU0

6ES7193-6BP00-0BU0

**Shield connection for BaseUnit
(5 units/for 5 scales)**

6ES7193-6SC20-1AM0

For laying load cell cable

Accessories

SIWAREX EB extension box

7MH4710-2AA

For extending sensor cables

**SIWAREX JB junction box,
aluminum enclosure**

7MH5001-0AA20

For connecting up to 4 load cells in
parallel, and for connecting multiple
terminal boxes.

**SIWAREX JB junction box,
stainless steel enclosure**

7MH5001-0AA00

For connecting up to 4 load cells in
parallel.

**SIWAREX JB junction box,
stainless steel enclosure (ATEX)**

7MH5001-0AA01

For parallel connection of up to 4 load
cells (for zone allocation, see manual
or prototype test certificate).

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP341 HF weighing electronics

Ordering data	Article No.	Article No.
SIWAREX DB digital junction box For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics. Enclosure made of: - Aluminum - Stainless steel incl. ATEX and IECEx approval II 3 G Ex ec IIC T4 Gc and II 3 D Ex tc IIIC T120 °C Dc	7MH5001-0AD20 7MH5001-0AD01	Cable (optional) Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter. - Sheath color: orange - Sheath color (for hazardous atmospheres): blue
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX weighing electronics. Compatibility of load cells must be checked separately. - With short-circuit current < 199 mA DC - With short-circuit current < 137 mA DC	7MH4710-5BA 7MH4710-5CA	7MH4702-8AG 7MH4702-8AF

Technical specifications

Article number	7MH4138-6CA00-0CU0	Article number	7MH4138-6CA00-0CU0
General information		Digital outputs	
Product type designation	TM SIWAREX WP341 HF	Number of digital outputs	3
Product function		Digital outputs, parameterizable	Yes
• I&M data	Yes; I&M0 to I&M3	Short-circuit protection	Yes
• Isochronous mode	No	Digital output functions, parameterizable	
• Adjustment of measuring range	Yes; ±0 ... 4 mV/V	• Freely usable digital output	Yes
Engineering with		Switching capacity of the outputs	
• STEP 7 TIA Portal configurable/ integrated from version	V16	• with resistive load, max.	0.5 A
• STEP 7 configurable/ integrated from version	- / -	Output voltage	
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	• Type of output voltage	DC
• PROFINET from GSD version/ GSD revision	GSDML V2.34	Output delay with resistive load	
Supply voltage		• "0" to "1", typ.	20 µs
Load voltage L+		• "1" to "0", typ.	30 µs
• Rated value (DC)	24 V	Parallel switching of two outputs	
• Short-circuit protection	Yes	• for uprating	No
• Reverse polarity protection	Yes	Switching frequency	
Digital inputs		• with resistive load, max.	500 Hz
Number of digital inputs	3	Total current of the outputs	
Digital inputs, parameterizable	Yes	• Current per channel, max.	0.5 A; the total current of all outputs ≥ 0.6 A, the ambient temperature is reduced by -1 °C per 100 mA
Input characteristic curve in accordance with IEC 61131, type 3	Yes	• Current per module, max.	1.5 A; Observe derating
Input voltage		Encoder	
• Type of input voltage	24 V DC	Connection of signal encoders	
• Rated value (DC)	24 V	• For strain gauges (full bridges) with 4-conductor connection	Yes
• for signal "0"	< 5 V DC	• For strain gauges (full bridges) with 6-conductor connection	Yes
• for signal "1"	+11 to +30V	• Resistance of full bridge, min.	56 Ω; when using SIWAREX IS 87 ohm for 7MH4710-5BA; 180 ohm when using 7MH4710-5CA
• permissible voltage at input, min.	-30 V	• Resistance of full bridge, max.	4 100 Ω
• permissible voltage at input, max.	30 V		
Input current			
• for signal "1", typ.	1.6 mA		
Input delay (for rated value of input voltage) for technological functions			
- parameterizable	Yes		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP341 HF weighing electronics

Technical specifications

Article number	7MH4138-6CA00-0CU0
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.001 %
Error limit according to DIN 1319-1	0.002 %; of full-scale value
Accuracy class	III
Temperature coefficient, zero point	≤ ±0.015 µV/K
Temperature coefficient, span	≤ ±5 ppm/K
1. Interface	
Interface types	
• RS 485	Yes; Terminated internally with 390 Ω / 220 Ω / 390 Ω
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; 10/100 Mbit/s
• Number of ports	1
Protocols	
• IP protocol	Yes; IPv4
• Web server	Yes
Interface types	
RJ 45 (Ethernet)	
• Autonegotiation	Yes
• Autocrossing	Yes
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 000 m; ≤ 115 kbps, shielded cable
Protocols	
Web server	
• HTTP	Yes
• HTTPS	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Diagnostic alarm
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes; green/red DIAG LED
Diagnostics indication LED	
• ERROR LED	Yes; green/red DIAG LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED

Article number	7MH4138-6CA00-0CU0
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	8 kHz
Load cell	
• permissible input signal per verification interval, min.	0.4 µV/e
• Sampling rate	1 024 Hz
• Resolution of input signal	±20 000 000 parts at 0 ... 4 mV/V
• Common mode voltage, min.	2.8 V
• Common mode voltage, max.	7.7 V
• input resistance of signal line, typ.	8 MΩ
• input resistance of sense line, typ.	300 MΩ
• Cable length, max.	500 m; when using the SIWAREX 7MH4702-8AG cable
Measuring functions	
Measuring range	
- -1 mV/V to +1 mV/V	Yes
- -2 mV/V to +2 mV/V	Yes
- -4 mV/V to +4 mV/V	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; more than 2 000 m above sea level, the ambient temperature is reduced by -1 °C per 100 m
• Ambient air temperature-barometric pressure-altitude	1 080 ... 533 hPa (-1 000 ... 5 000 m above sea level)
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	57 mm
Depth	72 mm
Weights	
Weight, approx.	50 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP351 HF weighing electronics

Overview



The SIWAREX WP351 is a compact, precise weighing module in the SIMATIC ET 200SP format.

With a width of just 20 mm it is one of the slimmest weighing modules on the market, yet its firmware includes the functionalities of an automatic totalizing weighing instrument and checking, bagging and filling scale.

All operation modes are part of the firmware and certified according to OIML R-51, R-61, R-76 and R-107. This means the WP351 can be used in both scales requiring official calibration and those that do not, where demands are high regarding speed and accuracy.

Ordering data

Article No.

Shield connection for BaseUnit (5 units/for 5 scales) **6ES7193-6SC20-1AM0**

For laying load cell cable

SIWAREX EB extension box **7MH4710-2AA**

For extending sensor cables.

SIWAREX JB junction box, aluminum enclosure **7MH5001-0AA20**

For connecting up to 4 load cells in parallel, and for connecting multiple terminal boxes.

SIWAREX JB junction box, stainless steel enclosure **7MH5001-0AA00**

For connecting up to 4 load cells in parallel.

SIWAREX JB junction box, stainless steel enclosure (ATEX) **7MH5001-0AA01**

For parallel connection of up to 4 load cells (for zone allocation, see manual or prototype test certificate).

SIWAREX IS Ex interface

For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing systems. Compatibility of load cells must be checked separately.

- With short-circuit current < 199 mA DC
- With short-circuit current < 137 mA DC

7MH4710-5BA

7MH4710-5CA

Cable (optional)

Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY

For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes.

For permanent installation. Occasional bending is possible.

External diameter: approx. 10.8 mm (0.43 inch)

Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F)

Sold by the meter.

- Sheath color: orange
- Sheath color (for hazardous atmospheres): blue

7MH4702-8AG

7MH4702-8AF

Ordering data

Article No.

TM SIWAREX WP351 HF weighing electronics

7MH4138-6BA00-0CU0

SIMATIC ET 200SP, TM SIWAREX WP351 HF, legal-for-trade weighing module for automatic dosing, filling and checking scales and totalizing weighing instruments

SIWAREX WP351 Equipment Manual

Available in a range of languages

Free download on the Internet at:

<http://www.siemens.com/weighing/documentation>

SIWAREX WP351 "Getting Started" sample project

Sample software shows beginners how to program the scales in TIA Portal V15.1

Free download on the Internet at:

<http://www.siemens.com/weighing/documentation>

Calibration set SIWAREX WP351

7MH4138-6BA00-0AY0

For verification of up to 3 scales, comprising:

- 3 × inscription foil for ID label
- 1 × protective film
- 3 × unlocking protection
- 6 × screw

For applications requiring official calibration, follow the calibration regulations of the country of destination.

ET 200SP BaseUnit type U0

- For constructing a new potential group (white)
- For continuing an existing potential group (gray)

6ES7193-6BP00-0DU0

6ES7193-6BP00-0BU0

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > Technology modules > TM SIWAREX WP351 HF weighing electronics

Technical specifications

SIWAREX WP351	
Firmware version	V1.0
• FW update possible	Yes
Usable BaseUnits	BU type U0
Reliability	
Mean time between failures (MTBF)	62 years @ TA = 40 °C
Product function	
I&M data	Yes, I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal can be configured/ integrated	Configurable as of V15 using HSP0281
• PROFIBUS as of GSD version/ GSD revision	GSD V04.02.41
• PROFINET as of GSD version/ GSD revision	GSDML V2.34
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Permissible range, low limit, static (DC)	19.2 V
• Permissible range, high limit, static (DC)	28.8 V
• Permissible range, low limit, dynamic (DC)	18.5 V
• Permissible range, high limit, dynamic (DC)	30.2 V
• Reverse polarity protection	Yes
• Non-periodic overvoltages	35 V DC for 500 ms with a recovery time of 50 s
Input current	
Current consumption, max.	Max. 140 mA @ 24 V DC + [DQ 3 × 0.5 A]
Power loss	
Typical power loss	1.7 W
Address range	
Assigned address range	
• Inputs	32 bytes
• Outputs	32 bytes
Power supply from SIMATIC S7 backplane bus	
Current consumption from ET 200SP backplane bus	Max. 27 mA @ 3.5 V (SBK4)
Analog load cell interface connection	
Error limit according to DIN 1319-1 at 20 °C (-4 °F) +/-10 K	≤ 0.002% of end value
Relative accuracy (absolute accuracy can only be achieved with local calibration using calibration standards)	
Measuring accuracy in accordance with OIML R76-1:2006/EN 45501:2015	
• Class	III
• Resolution (d=e)	3 × 6000 d
• Error percentage pi	0.4
• Step voltage	0.4 µV/e

SIWAREX WP351	
Accuracy delivery state	Typ. 0.1% of end value
The accuracy is relevant for module exchange or theoretical adjustment	
Sampling rate	1.024 ms
Input signal resolution	± 20 000 000
Measuring ranges	0 ... ±1 mV/V 0 ... ±2 mV/V 0 ... ±4 mV/V
Common mode voltage range	+2.8 ... 7.7 V
Strain gauge supply (constant voltage)	10 V DC (+1 % / -3 %) at the EXC terminals
Short-circuit and overload protection	Yes
Connection	6-wire or 4-wire (parameterizable)
Sensor voltage monitoring	Typ. ≤ 5.0 V
Min. strain gauge input resistance per channel	
• Without SIWAREX IS Ex-i interface	56 Ω
• With SIWAREX IS Ex-i interface	Lower impedance by means of external supply possible 87 Ω @ type 7MH4710-5BA 180 Ω @ type 7MH4710-5CA
Max. strain gauge resistance	4 100 Ω
Temperature coefficient range	≤ ±5 ppm/K
Temperature coefficient zero point	≤ ±0.015 µV/K
Linearity error	≤ 0.001%
Measured value filtering	Low-pass and average value filter configurable (DR3)
Galvanic isolation	500 V AC
50 Hz / 60 Hz noise suppression CMRR	> 80 dB
Input resistance	
• Signal line	Typ. 8*10 ⁶ Ω
• Sense line	Typ. 300*10 ⁶ Ω
Cable length	
• When using SIWAREX cable 7MH4702-8AG	Max. 500 m
Ambient conditions	
Ambient temperature in operation	
• Horizontal mounting position *	Min. -30 °C Max. +60 °C
• Vertical mounting position *	Min. -30 °C Max. +50 °C
Storage and transport temperature	-40 ... +70 °C (-40 ... +158 °F)

1) At a height of more than 2 000 m above sea level, a derating of the ambient temperature of -1 °C / 100 m has to be adhered to. The maximum permissible height is 5 000 meters above sea level. At over 0.6 A total current of the digital outputs DQ, a derating of the ambient temperature of -1 °C per 100 mA has to be adhered to. The max. permissible total current is 1.5 A.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Count 1x24V counter module

Overview



Technical properties

- Counter module for ET 200SP
- Interfaces:
 - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
 - 24 V encoder supply output, short-circuit proof
 - 3 digital inputs for controlling the count operation, for saving or for setting the count value
 - 2 digital outputs for fast reactions regardless of the counter status or measured value

- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

Article No.

SIPLUS TM Count 1x24V counter module

(Extended temperature range and exposure to environmental substances)

With one channel, max. 200 kHz; for 24 V encoder

6AG1138-6AA01-2BA0

Suitable BaseUnits

(Extended temperature range and exposure to environmental substances)

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

Article No.

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC TM Count 1x24V counter module, page 10/108

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Count 1x24V counter module

Technical specifications

Article number	6AG1138-6AA01-2BA0
Based on	6ES7138-6AA01-0BA0 SIPLUS ET 200SP TM Count 1X24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1138-6AA01-2BA0
Based on	6ES7138-6AA01-0BA0 SIPLUS ET 200SP TM Count 1X24V
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM PosInput 1 counter and position detection module

Overview



Technical properties

- Counter and position detection module for ET 200SP
- Interfaces:
 - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
 - SSI interface with clock and data for RS 422 differential signals
 - 24 V encoder supply output, short-circuit-proof
 - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
 - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counter frequency 1 MHz (4 MHz with fourfold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a telegram length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS TM PosInput 1 counter and position detection module

(Extended temperature range and exposure to environmental substances)

For RS-422 incremental encoders or SSI absolute encoders, 2DI, 2DQ suitable for BU type A0, ambient temperature -40 °C...60 °C;

6AG1138-6BA01-2BA0

Suitable BaseUnits

(Extended temperature range and exposure to environmental substances)

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See TM PosInput 1 counter and position detection module, page 10/112

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Posinput 1 counter and position detection module

Technical specifications

Article number	6AG1138-6BA01-2BA0
Based on	6ES7138-6BA01-0BA0 SIPLUS ET 200SP TM Posinput 1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1138-6BA01-2BA0
Based on	6ES7138-6BA01-0BA0 SIPLUS ET 200SP TM Posinput 1
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Timer DIDQ 10x24 V time-based IO module

Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with μ s accuracy
- Outputs for outputting the switching signals with μ s accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

Article No.

SIPLUS TM Timer DIDQ 10x24 V time-based IO module

(Extended temperature range and exposure to environmental substances)

4 time-controlled inputs,
6 time-controlled outputs

6AG1138-6CG00-2BA0

Suitable BaseUnits

(Extended temperature range and exposure to environmental substances)

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC TM Timer DIDQ 10x24V time-based IO module, page 10/115

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Timer DIDQ 10x24 V time-based IO module

Technical specifications

Article number	6AG1138-6CG00-2BA0
Based on	6ES7138-6CG00-0BA0 SIPLUS ET 200SP TM Timer DIDQ 10x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1138-6CG00-2BA0
Based on	6ES7138-6CG00-0BA0 SIPLUS ET 200SP TM Timer DIDQ 10x24V
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Pulse 2x24V pulse output module

Overview



2-channel pulse output module for SIPLUS ET 200SP

- Operating modes:
 - Single pulse with defined length
 - Pulse chain with defined number of pulses
 - Pulse width modulation (with flexible ON period, optional current control and dither function)
 - PWM signal for controlling a DC motor
 - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
 - Frequency output with defined output frequency
- Hardware:
 - 2 channels 24 V, 2 A output current output current can be switched in parallel to boost performance to 4 A of output current
 - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
 - Push/pull output driver for especially steep edges at the outputs
 - Polarity change in DC motor operation for direction reversal
 - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
 - HW enable; Start of signal output with the onboard digital input
 - Parameterizable ON delay; for precise deceleration between the HW enable and the start of output
 - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. Temperature influences can thus be balanced to the resistance of the actuator.
 - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
 - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
 - Firmware update
 - Identification data I&M

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS TM Pulse 2x24V pulse output module

6AG1138-6DB00-2BB1

(Extended temperature range and exposure to environmental substances)

PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors

Suitable BaseUnits

(Extended temperature range and exposure to environmental substances)

BU20-P12+A0+4B

6AG1193-6BP20-7BB1

BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC TM Pulse 2x24V pulse output module, page 10/118

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS TM Pulse 2x24V pulse output module

Technical specifications

Article number	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM Pulse 2x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM Pulse 2x24V
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS ET 200SP ECC charging controllers

Overview



SIPLUS Electrical Charging Controllers are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
 - Ready for charging
 - Charging
 - Charging with ventilation
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP

SIPLUS ET 200SP TM ECC 2xPWM ST AC module

- Control of charging outputs according to IEC 61851 by parameterizable SIPLUS ET 200SP TM ECC 2xPWM ST charging controller
- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

SIPLUS ET 200SP TM ECC 2xPWM ST charging controller

(Exposure to environmental substances)

Designed for controlling charging outputs according to IEC 61851 and parameterizable, with 2 charging outputs, ambient temperature -30 °C ... 60 °C;

2x control pilot, 2x plug present, 2x DQ switching contact for load contactor as open collector, 2x DI for load contactor feedback or connector lock;

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Article No.

6AG1242-6TM10-2BB1

6AG1193-6AA00-0AA0

6AG1193-6AB00-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS ET 200SP ECC charging controllers

Technical specifications

Article number	6AG1242-6TM10-2BB1
Based on	6FE1242-6TM10-0BB1 SIPLUS ET 200SP TM ECC 2xPWM ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Vibrations	
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
Shock testing	
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	6AG1242-6TM10-2BB1
Based on	6FE1242-6TM10-0BB1 SIPLUS ET 200SP TM ECC 2xPWM ST
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS SIWAREX WP321

Overview



SIPLUS WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The weighing electronics system is integrated in the SIPLUS ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostic system and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS 7.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information has been added.

Ordering data

SIPLUS WP321 weighing module

Single-channel, for platform or hopper scales with analog load cells (1–4 mV/V), 1 x LC, 1 x RS 485.

Extended temperature range and exposure to environmental substances

Accessories

Mandatory

Suitable SIPLUS BaseUnit

Type A0 – one BaseUnit required for each WP321

- For opening a new potential group
 - BU15P-16+A0+2D or
 - BU15P-16+A10+2D
- For continuing the potential group
 - BU15P-16+A0+2B
 - BU15P-16+A10+2B

Consumables

Shield connection for BaseUnit

Set for 5 shield connections, with 5 shield connection clamps, 5 supports, 5 support elements

Shield connection element

Sufficient for one SIWAREX FTA module

SIWAREX JB junction box, aluminum casing

For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes

Article No.

6AG1138-6AA00-2BA8

6ES7193-6BP00-0DA0

6ES7193-6BP20-0DA0

6ES7193-6BP00-0BA0

6ES7193-6BP20-0BA0

6ES7193-6SC20-1AM0

6ES7390-5AA00-0AA0

7MH5001-0AA20

Article No.

SIWAREX JB junction box, stainless steel enclosure

For connecting up to 4 load cells in parallel.

SIWAREX JB junction box, stainless steel enclosure (ATEX)

For parallel connection of up to 4 load cells (for zone allocation, see manual or prototype test certificate).

Ex interface, type SIWAREX IS

For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX weighing electronics. Compatibility of the load cells must be checked separately.

- With short-circuit current < 199 mA DC
- With short-circuit current < 137 mA DC

Cables (optional)

Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath

For connecting SIWAREX weighing electronics to junction boxes (JB), extension boxes (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is permitted.

Outer diameter: approx. 10.8 mm (0.43 inch)

Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F)

Sold by the meter

- Sheath color: orange
- For hazardous areas. Sheath color: blue

7MH5001-0AA00

7MH5001-0AA01

7MH4710-5BA

7MH4710-5CA

7MH4702-8AG

7MH4702-8AF

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Technology modules > SIPLUS SIWAREX WP321

Ordering data	Article No.	Article No.
Configuration software SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	7MH4900-1AK01	Documentation SIWAREX WP321 Equipment Manual Available in a range of languages Free download from the Internet at https://www.siemens.com/weighing/documentation .
SIWAREX PCS 7 AddOn Library for PCS 7 V8.x and V9.0 • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	7MH4900-1AK61	SIWAREX WP321 "Ready for use" TIA Portal and SIMATIC Manager sample configuration Free download from the Internet at https://www.siemens.com/weighing/documentation .

Technical specifications

Article number	6AG1138-6AA00-2BA8	Article number	6AG1138-6AA00-2BA8
Based on	7MH4138-6AA00-0BA8 SIPLUS WP321	Based on	7MH4138-6AA00-0BA8 SIPLUS WP321
Ambient conditions		Use on ships/at sea	
Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max.	-40 °C; = Tmin (incl. condensation/frost) 60 °C -40 °C; = Tmin (incl. condensation/frost) 50 °C	- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Altitude during operation relating to sea level • Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude	5 000 m Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Usage in industrial process technology - Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Relative humidity • With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	Remark - Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Resistance Coolants and lubricants - Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Conformal coating • Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A
Use in stationary industrial systems - to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3 - Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM PtP serial interface

Overview



SIMATIC ET 200SP CM PtP video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6136809673001



- CM PtP communications module; module for serial communication connections with RS232, RS422 and RS485 interfaces for the Freeport, 3964(R), Modbus RTU, USS and DMX512 protocols, max. 250 kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
 - Freeport: User-parameterizable frame format for universal communication, also known as ASCII frame
 - 3964(R) for improved transmission reliability
 - Modbus RTU master (requires instructions in SIMATIC S7)
 - Modbus RTU slave (requires instructions in SIMATIC S7)
 - USS, implemented through instructions
 - DMX512, can be implemented through instructions
- Interface properties
 - RS232 with auxiliary signals
 - RS422 for full-duplex connections
 - RS485 for half-duplex and multi-point connections
 - Transmission rates from 300 to 115200 bps for RS232 and RS422
 - Transmission rates from 300 to 250000 bps for RS485
- Frame lengths
 - In universal operation: 2 KB each in send and receive direction
 - In performance-optimized operation: 30 bytes in send direction, 24 bytes in receive direction
- Diagnostic trace: simple determination of the causes of connection faults
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (article and serial number)
 - Connection diagram
 - Color coding of the module type
 - Hardware and firmware version
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional system-integrated shield connection

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM PtP serial interface

Ordering data	Article No.		Article No.	
CM PtP communications module For serial communication connections with RS232, RS422, RS485 interfaces, BU type A0, color code CC00 • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10	6ES7137-6AA01-0BA0 6ES7137-6AA01-2BA0		BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0
Accessories				
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0		Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0
			Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
			Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	6ES7193-6SC20-1AM0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0		Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
			Type A	6ES7193-6KA00-3AA0
			Type B	6ES7193-6KB00-3AA0
			Type C	6ES7193-6KC00-3AA0
			Type D	6ES7193-6KD00-3AA0
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0			

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM PtP serial interface

Technical specifications

Article number	6ES7137-6AA01-0BA0 ET 200SP, CM PTP, PU 1
General information	
Product type designation	CM PtP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher
• STEP 7 configurable/ integrated from version	via GSD as of V5.6 HF4
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
• RS 422	Yes
• RS 232	Yes
• Design of the connection	Push-in terminal
Interface types	
RS 232	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD
RS 485	
• Transmission rate, max.	250 kbit/s
• Cable length, max.	1 200 m; 100 to 1200 m, depending on transmission speed
RS 422	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes
Protocols	
Integrated protocols	
Freeport	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
3964 (R)	
- Telegram length, max.	2 kbyte; performance mode: receive data max. 24 byte and send data max. 30 byte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any

Article number	6ES7137-6AA01-0BA0 ET 200SP, CM PTP, PU 1
Modbus RTU master	
- Address area	1 to 247, extended 1 to 65535
- max. number of devices	32
Protocols / Modbus RTU device	
- Address area	1 to 247, extended 1 to 65535
Telegram buffer	
• Buffer memory for telegrams	4 kbyte
• Number of telegrams which can be buffered	255
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Wire-break	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM 4x IO-Link

Overview



- CM 4x IO-Link communications module
Serial communications module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Time-based IO
Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities.
- Supported data transfer rates
 - COM1 (4.8 kbps)
 - COM2 (38.4 kbps)
 - COM3 (230.4 kbps)

- Expansion limits
 - Length of cable: Max. 20 m
 - Max. 32 bytes of input and output data per port
 - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
 - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
 - Re-parameterization during operation
 - Identification data I&M
 - Firmware update
 - PROFIenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LED indicators
 - DIAG: Operating state indicator (green/red) of the module
 - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
 - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
 - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
 - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color-coding of the CM module class: silver
 - Hardware and firmware version
 - Complete Article No.
- Optional accessories
 - Labeling strips
 - Equipment labeling plate
 - Color-coding plate with color code CC04
- Optional system-integrated shield connection

Overview of CM 4x IO-Link

Communications module	Article No.	CC code	BU type	Pkg. unit
CM 4x IO-Link	6ES7137-6BD00-0BA0	CC04	A0	1

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > CM 4x IO-Link**Overview**

Overview of BaseUnits

BaseUnit	Article No.	CC codes for process terminals	CC codes for AUX terminals	Pkg. unit
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 process terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM 4x IO-Link

Ordering data	Article No.		Article No.
CM 4x IO-Link master V1.1 Standard communications module Serial communications module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	6ES7137-6BD00-0BA0	Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 1 000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer 1 000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
Accessories			
Suitable type A0 BaseUnits			
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	Color-coded labels Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16); 10 units Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	6ES7193-6CP04-2MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0		
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	Spare parts Electronic coding element type H Pack of 5 units; included in scope of supply of CM 4x IO-Link module Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units Type A Type B Type C Type D	6ES7193-6EH00-1AA0 6ES7193-6KA00-3AA0 6ES7193-6KB00-3AA0 6ES7193-6KC00-3AA0 6ES7193-6KD00-3AA0
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0		
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0		

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > Communication > CM 4x IO-Link

Technical specifications

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
General information	
Product type designation	CM 4 x IO-Link ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15 or higher
• STEP 7 configurable/ integrated from version	STEP 7 V5.5 or higher
• PROFIBUS from GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/ GSD revision	GSDML V2.3
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA per channel
Supply voltage	
Rated value (DC)	24 V
Encoder supply	
Number of outputs	4
Output current	
• Rated value	700 mA; Per channel
24 V encoder supply	
• Short-circuit protection	Yes
• Output current, max.	2.1 A
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Cycle time, min.	2 ms; dynamic, depending on user data length
Size of process data, input per port	32 byte; max.
Size of process data, input per module	144 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	128 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m
Time Based IO	
• TIO IO-Link IN	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
• TIO IO-Link OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
• TIO IO-Link IN/OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1

Article number	6ES7137-6BD00-0BA0 ET 200SP, CM 4 X IO-Link ST
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
• via three-wire connection	Yes
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	13 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM 1xDALI

Overview



SIMATIC ET 200SP DALI video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6153144008001



- DALI 2 multimaster module for 1 bus strand
- Allows the control, diagnostics and parameter assignment of up to 64 luminaires and 63 sensors via a 2-wire bus line
- Typical areas of application: Lighting in tunnels, (factory) halls or ships
- Realization of the control via prefabricated blocks of a function block library in TIA Portal
- DALI (Digital Addressable Lighting Interface) certification according to DALI V2 for IEC 62386-101/-103 parts
- Different DALI device types, such as LED modules, fluorescent lamps, discharge lamps, low-voltage halogen lamps and others, can be used

Ordering data

Article No.

CM 1xDALI, DALI V2 multimaster module

For control of lighting solutions with DALI V2, BU type U0, color code CC20

6ES7137-6CA00-0BU0

Accessories

Suitable type U0 BaseUnits

BU20-P16+A0+2D

BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0DU0
6ES7193-6BP00-2DU0

BU20-P16+A0+2B

BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0BU0
6ES7193-6BP00-2BU0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > CM 1xDALI

Technical specifications

Article number	6ES7137-6CA00-0BU0 ET 200SP, CM 1x DALI
General information	
Product type designation	CM 1xDALI
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15.1 or higher
• PROFIBUS from GSD version/ GSD revision	GSD Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.34
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Interface types	
DALI	
• Integrated power supply	Yes
- Supply current, min.	160 mA
- Supply current, max.	250 mA
- Can be switched off	Yes
• Cable length, max.	300 m
Protocols	
DALI	
• Standard according to DALI	DALI V2 Multi-Master
Supported operating devices	
- Fluorescent lamps (device type 0)	Yes
- Emergency lighting with single battery (device type 1)	Yes
- Discharge lamps (device type 2)	Yes
- Low-voltage halogen lamps (device type 3)	Yes
- Incandescent lamps (device type 4)	Yes
- Direct voltage (device type 5)	Yes
- LED modules (device type 6)	Yes
- Switching function (device type 7)	Yes
- Color control (device type 8)	Yes
- Further operating devices	Yes; general device type
Supported input devices	
- Pushbuttons	Yes
- Absolute input devices	Yes
- Presence detector	Yes
- Light sensor	Yes
- Further input devices	Yes; general device type

Article number	6ES7137-6CA00-0BU0 ET 200SP, CM 1x DALI
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Short-circuit	Yes; On DALI bus
Diagnostics indication LED	
• ERROR LED	Yes
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Receive RxD	Yes; green LED
• Transmit TxD	Yes; green LED
Potential separation	
between backplane bus and interface	Yes
Standards, approvals, certificates	
CE mark	Yes
RoHS conformity	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Decentralized operation	
to SIMATIC S7-1200	Yes; FW V4.0 or higher
to SIMATIC S7-1500	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM CAN

Overview



- For data exchange between an ET 200SP system and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
 - Node / lifeguarding
 - Heartbeat
 - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V15.1 or higher
- CAN connection with push-in terminals
- Integrated CAN bus terminating resistor
- Up to 60 CAN nodes
- 128 receiver and 128 transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Optionally with function block SIMATIC ECC CHAdEMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdEMO standard

Ordering data

Article No.

ET 200SP CM CAN communications modules

To connect ET 200SP with CAN bus or CANopen networks CAN bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302

6ES7137-6EA00-0BA0

Accessories

SIMATIC ECC CHAdEMO function block

For realization of digital communication between a DC charging station and an electric vehicle according to CHAdEMO 1.x-2.0 specification; can be used with TIA Portal as of V15.1; Single license

6FE1263-8FB10-0AA0

Suitable type A0 BaseUnits

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this article number with an order quantity of 10.

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > CM CAN

Technical specifications

Article number	6ES7137-6EA00-0BA0 ET 200SP CM CAN
General information	
Product type designation	CM 1x CAN ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V15.1 or higher
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	Push-in terminal
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	10 kbit/s
• Transmission rate, max.	1 000 kbit/s
• max. number of devices	60
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	128; Send / receive
Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED

Article number	6ES7137-6EA00-0BA0 ET 200SP CM CAN
Potential separation	
between backplane bus and interface	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes; Reg. No.: R-R-S49-ET200SPCMCAN
EAC (formerly Gost-R)	Yes
RoHS conformity	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
Decentralized operation	
to SIMATIC S7-300	No
to SIMATIC S7-400	No
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	32 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

Overview



CM AS-i Master ST for SIMATIC ET 200SP



Video: AS-Interface – Powerful integration in SIMATIC ET 200SP,
https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6136807004001

More information

Equipment Manual, see
<https://support.industry.siemens.com/cs/ww/en/view/71756485>

SIMATIC ET 200SP Manual Collection, see
<https://support.industry.siemens.com/cs/ww/en/view/84133942>

Diagnostics blocks with visualization, see
<https://support.industry.siemens.com/cs/ww/en/view/109479103>

AS-Interface block library for SIMATIC PCS 7
for easy connection of AS-Interface to PCS 7, see
<https://support.industry.siemens.com/cs/ww/en/view/109759605>

Released combinations of the AS-i modules for ET 200SP, see
<https://support.industry.siemens.com/cs/ww/en/view/103624653>

AS-Interface I/O modules and other AS-Interface system components
see Catalog IC 10, <https://www.siemens.com/ic10>

More information see <https://www.siemens.com/as-interface>

The CM AS-i Master ST communications module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- Connection of up to 62 AS-Interface slaves
- Supports all AS-Interface master functions according to the AS-Interface specification V3.0
- User-friendly configuration with graphic or tabular display of the AS-i line in TIA Portal or STEP 7 (Classic) or via GSD in other systems
- Supply via AS-Interface cable
- Suitable for AS-i Power24V and for AS-Interface with 30 V voltage
- Extended temperature range from -25 °C (from hardware functional status FS20 onwards)
- Integrated ground fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST)
- Integrated analog value processing

AS-i gateways with ET 200SP

An AS-i gateway or AS-i link enables access to the AS-Interface data via PROFINET, PROFIBUS, EtherNet/IP, or Modbus TCP.

With the CM AS-i Master ST module, flexible and powerful solutions or autonomous ET 200SP CPU stations with an AS-i connection are set up. Depending on the requirements, even several AS-i masters can be plugged into one ET 200SP station, so that the setup can easily be extended from a single master to double masters or multiple masters.

The maximum number of modules is determined by the ET 200SP interface module (IM): Up to 32 AS-i masters with PROFINET IM 155-6PN Standard (6ES7155-6AU02-0BN0), up to 43 AS-i masters with IM 155-6PN High Feature, or a single AS-i master with IM 155-6PN Basic. For the connection to PROFIBUS, the IM 155-6DP HF interface module with up to 7 AS-i master modules is used. With the MultiFieldbus interface module IM 155-6MF, the AS-i master modules are connected to PROFINET, EtherNet/IP, and Modbus TCP.

Since in many plants an ET 200SP station is provided with I/O, motor starter or other peripheral modules, the AS-i master modules are simply plugged in without any additional effort. There are countless possible combinations.

An AS-i Safety gateway can also be implemented without any problems by adding the safety-related module F-CM AS-i Safety ST in the ET 200SP station. This greatly simplifies the cabling and connection of distributed EMERGENCY-STOP buttons and protective door monitoring systems to a Failsafe CPU. The AS-i Safety application is completely configured in TIA Portal/STEP 7.

The ET 200SP modules CM AS-i Master ST and F-CM AS-i Safety ST (see page 10/245 onwards) can of course also be used directly on an ET 200SP CPU or F-CPU, so that an extremely compact SIMATIC control system with AS-i bus connection can be set up.

For further application possibilities, see the brochure "The modular AS-i Master" at
<https://assets.new.siemens.com/siemens/assets/api/uuid:224667a8-5f20-4a68-8bfd-ae33dfac7a2/dfcp-b10157-00-as-i-master-144.pdf>.

More information, see
SIMATIC ET 200SP Manual Collection,
<https://support.industry.siemens.com/cs/ww/en/view/84133942>.

Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The communications module has LED displays for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative module inscription on the front for

- Plain-text marking of the module type and function class
- 2D matrix code (article number and serial number)
- Circuit diagram
- Color coding module type communications module: light gray
- Hardware and firmware version
- Supported BaseUnit type BU: C0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

Overview

Function

The CM AS-i Master ST communications module supports all specified functions of the AS-Interface specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves are accessible via the cyclic process image or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the online functions in STEP 7/TIA Portal.

For the implementation of modular machine concepts, the AS-i slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine setups and tool changing with integrated input/output modules during ongoing operation. AS-i input/output modules can be added to the system without deactivating the controller.

An existing AS-i installation can be read into the STEP 7 hardware configuration and adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 bytes (depending on the interface module (IM) used).

Diagnostic information is accessed via automatic alarm indications, via the status information in the process image or via the graphical status display in the online diagnostics of the TIA Portal. The transmission quality of the AS-i network can also be read out. To avoid configuration errors, duplicate addresses can be detected on the AS-i network.

Configuration is possible with SIMATIC CPUs S7-400 up to S7-1500 and with a SINUMERIK or other controller.

The online diagnostic status of the AS-i slaves can be displayed directly on the slaves in the network view in TIA Portal.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see <https://www.siemens.com/cybersecurity-industry>.

Configuration

The following software is required for configuration of the CM AS-i Master ST module:

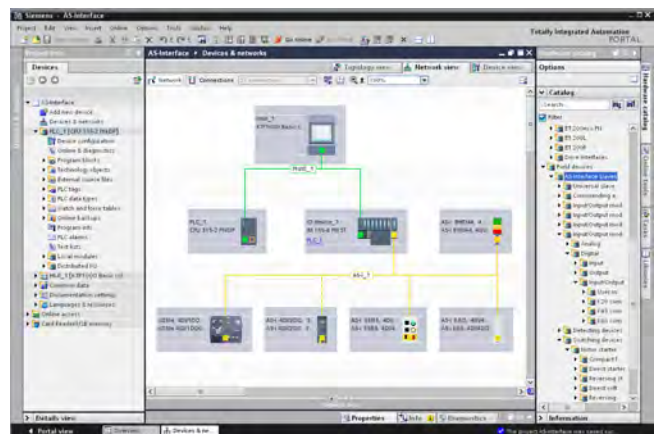
- STEP 7 (TIA Portal) or
- STEP 7 (Classic) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the TARGET configuration at the "touch of a button" via the online function integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.

In the default setting, the CM AS-i Master ST module occupies 32 input/output bytes. To adapt the number and type of AS-i slaves used, the I/O address space can be reduced, or expanded up to 288 bytes.

Together with an ET 200SP CPU 1510SP, 1512SP, 1514SP or 1515SP PC, preprocessing of safe AS-i signals directly in the ET 200SP station and setting up of an independent AS-i station without a higher-level CPU are possible.



Configuration of an AS-Interface network with CM AS-i Master ST via the TIA Portal

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

Benefits

The CM AS-i Master ST communications module for ET 200SP enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to 32 CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6PN Standard. When using the IM 155-6PN High Feature, the number of CM AS-i Master ST in the ET 200SP station can be further increased. The maximum configuration depends on the interface module used. Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/AS-i link or PROFIBUS/AS-i link can be assembled.

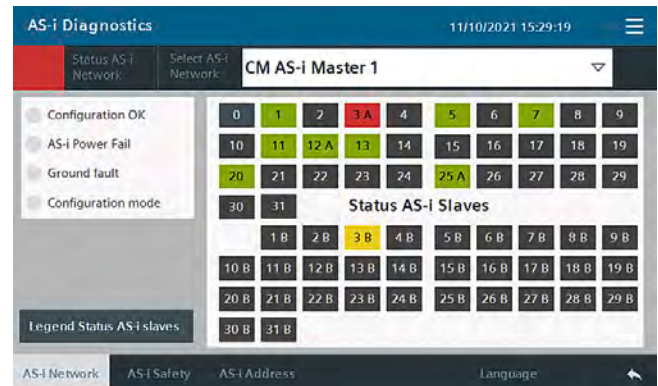
For the connection of an AS-i network to systems with EtherNet/IP and Modbus TCP, the ET 200SP MultiFieldbus interface module IM 155-6MF in combination with the CM AS-i Master ST module is available.

Using TIA Portal/STEP 7, the AS-i network in the SIMATIC controller is consistently configured and programmed with only one configuration tool.

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU; see <https://www.siemens.com/proneta>.

The CM AS-i Master ST module can be used in a system with PROFINET system redundancy S2. Furthermore, the CM AS-i Master ST module (from FW version V1.1.11 onwards or from FW version 2.0 onwards) can be used in a system with PROFINET system redundancy R1 with SIMATIC S7-1500R/H CPU.

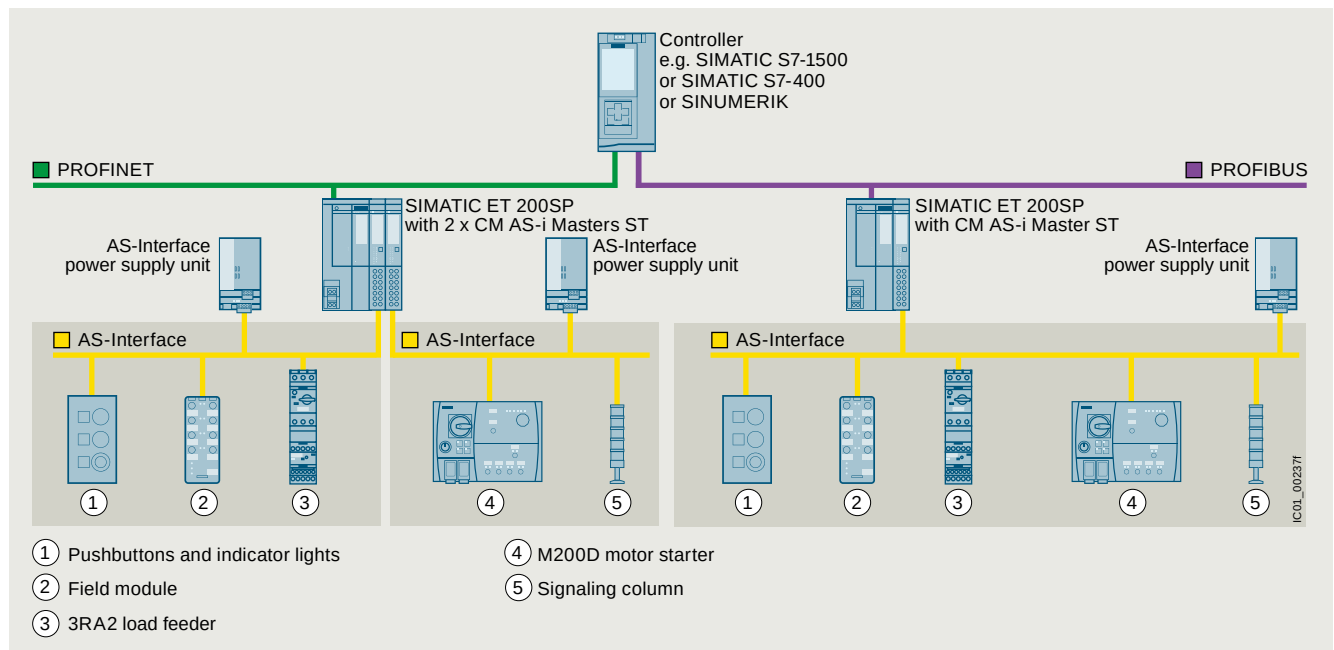
For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



CM AS-i Master ST diagnostics block

Application

Configuration examples of AS-Interface networks with CM AS-i Master ST for SIMATIC ET 200SP



Configuration of AS-Interface networks under a SIMATIC ET 200SP

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM AS-i Master ST for SIMATIC ET 200SP

Ordering data	Article No.		Article No.
CM AS-i Master ST communications module - AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0 - Corresponds to AS-Interface specification V3.0 - Dimensions (W x H x D) mm: 20 x 73 x 58	3RK7137-6SA00-0BC1	PROFIBUS interface module IM 155-6DP High Feature Max. 32 I/O modules, max. 244 bytes I/O data per station Including server module and PROFIBUS plug	6ES7155-6BA01-0CN0
Accessories		MultiFieldbus interface module IM 155-6MF High Feature For operation on PROFINET, EtherNet/IP or Modbus TCP controllers, one slot for BusAdapter, max. 64 I/O modules, max. 1 440 bytes of I/O data per station Including server module (BusAdapter must be ordered separately, see below) For more information, see https://support.industry.siemens.com/cs/ww/en/view/109779189.	6ES7155-6MU01-0CN0
BaseUnit BU20-P6+A2+4D - BaseUnit (light), BU type C0 - Suitable for the CM AS-i Master ST module - For connection of the AS-Interface cable to the CM AS-i Master ST - Start of an AS-i network, isolation of the AS-i voltage from the left-hand module - With spring-loaded terminals	6ES7193-6BP20-0DC0	BusAdapters for PROFINET/Ethernet/Modbus For connection of the Ethernet cable to the PROFINET IM 155-6PN interface module and the MultiFieldbus IM 155-6MF interface module - Connection 2 x RJ45 (supplied without RJ45 plug) - Connection 2 x FC (FastConnect) For more BusAdapters with fiber-optic cable connection, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10147556.	6ES7193-6AR00-0AA0 6ES7193-6AF00-0AA0
PROFINET interface module IM 155-6PN Basic Max. 12 I/O modules, max. 32 bytes of I/O data per station Including server module and 2 x RJ45 ports (supplied without RJ45 plug)	6ES7155-6AR00-0A00		
PROFINET interface modules IM 155-6PN Standard Max. 32 I/O modules, max. 1 440 bytes I/O data per station - Including server module and BusAdapter 2 x RJ45 (supplied without RJ45 plug) - Including server module (BusAdapter must be ordered separately, see right)	6ES7155-6AA02-0BN0 6ES7155-6AU02-0BN0		
PROFINET interface modules IM 155-6PN High Feature Max. 64 I/O modules, max. 1 440 bytes I/O data per station IM 155-6PN/2 High Feature 2-port IM with a BusAdapter slot, including server module (BusAdapter must be ordered separately, see right) IM 155-6PN/3 High Feature 3-port IM with two BusAdapter slots, including server module (BusAdapter must be ordered separately, see right)	6ES7155-6AU01-0CN0 6ES7155-6AU30-0CN0	AS-Interface addressing unit V3.0 - For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i specification V3.0 - For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) - With input/output test function and many other commissioning functions - Battery operation with four type AA batteries (IEC LR6, NEDA 15) - Degree of protection IP40 - Dimensions (W x H x D) mm: 84 x 195 x 35 - Scope of supply: - Addressing unit with four batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	3RK1904-2AB02
PROFINET interface module IM 155-6PN High Speed Max. 30 I/O modules, max. 968 bytes I/O data per station Including server module (BusAdapter must be ordered separately, see right)	6ES7155-6AU00-0DN0		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CM DP for ET 200SP CPU

Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 Kbps to 12 Mbps
- Communication services:
 - PROFIBUS DP
 - PG/OP communication
 - S7 communication:

This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

Ordering data

Article No.

CM DP for ET 200SP CPU

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

6ES7545-5DA00-0AB0

Accessories

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

Labeling strips

500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AA0

500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer

6ES7193-6LR10-0AG0

1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer

6ES7193-6LA10-0AA0

1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LA10-0AG0

PROFIBUS DP RS 485 bus connector

With 90° cable outlet, max. transfer rate 12 Mbps

- without PG interface
- with PG interface

6ES7972-0BA12-0XA0
6ES7972-0BB12-0XA0

With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps

- without PG interface, 1 unit
- without PG interface, 100 units
- with PG interface, 1 unit
- with PG interface, 100 units

6ES7972-0BA52-0XA0
6ES7972-0BA52-0XB0
6ES7972-0BB52-0XA0
6ES7972-0BB52-0XB0

FastConnect bus cable

Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

6XV1830-0EH10

Mechanical coding elements

For automatic coding of I/O modules; spare part. 20 units

Type A

6ES7193-6KA00-3AA0

Type B

6ES7193-6KB00-3AA0

Type C

6ES7193-6KC00-3AA0

Type D

6ES7193-6KD00-3AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > CM DP for ET 200SP CPU

Technical specifications

Article number	6ES7545-5DA00-0AB0 ET 200SP, CM DP for ET 200SP CPU
General information	
Product type designation	CM PROFIBUS DP
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V13 Update 3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125
Services	
- PG/OP communication	Yes
- Equidistance	No
- Isochronous mode	No
- activation/deactivation of DP devices	Yes
1st interface / PROFIBUS DP device	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte
Services	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to- slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
Transfer memory	
- Inputs	244 byte
- Outputs	244 byte
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
Protocols	
SIMATIC communication	
• S7 routing	Yes
• Data record routing	Yes

Article number	6ES7545-5DA00-0AB0 ET 200SP, CM DP for ET 200SP CPU
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	35 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	80 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

The CP 1542SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
 - Sending emails via SMTP for authentication on an email server (also with IPv6)
 - SNMPv1 for transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Ordering data

Article No.

CP 1542SP-1 communications processor

For connection of SIMATIC S7 ET 200SP to Industrial Ethernet, open IE communication (TCP/IP, ISO-ON-TCP, UDP), PG/OP, S7 routing, IP broadcast/multicast, SNMPv1, DHCP, email, IPv4/IPv6, time synchronization via NTP, access to web server of CPU, BusAdapter required

6GK7542-6UX00-0XE0

Accessories

SIMATIC BA 2xRJ45 BusAdapter
For PROFINET interface modules, standard function class or above; max. cable length 50 m

6ES7193-6AR00-0AA0

SIMATIC BA 2xFC BusAdapter
For PROFINET interface modules, standard function class or above; for increased vibration and EMC load rating; max. cable length 50 m

6ES7193-6AF00-0AA0

SIMATIC BA 2xSCRJ BusAdapter
For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF);

6ES7193-6AP00-0AA0

SIMATIC BA SCRJ/RJ45 BusAdapter
For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF);

6ES7193-6AP20-0AA0

SIMATIC BA SCRJ/FC BusAdapter
For PROFINET interface modules, High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC load rating; max. cable length 50 m (POF, copper) or 100 m (PCF)

6ES7193-6AP40-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1

Ordering data	Article No.		Article No.
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	Labeling strips 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer 500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6 _A) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB12-2AA0 6GK1901-1BB12-2AB0 6GK1901-1BB12-2AE0	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10	Spare parts Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	6ES7193-6PA00-0AA0
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m • AWG22, for connection to IE FC RJ45 modular outlet • AWG24, for connection to IE FC RJ45 plug 4 x 2	6XV1870-2E 6XV1878-2A	PE connection element for mounting rail 2000 mm 20 units	6ES7590-5AA00-0AA0
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Power supply connector Spare part; for connecting the 24 V DC supply voltage with push-in terminals	6ES7193-4JB00-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1

Technical specifications

Article number	6GK7542-6UX00-0XE0
product type designation	CP 1542SP-1
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	2
• note	2 CPs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16

Article number	6GK7542-6UX00-0XE0
product type designation	CP 1542SP-1
performance data multi-protocol mode	
number of active connections with multi-protocol mode	32
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via ET 200SP CPU
product functions security	
product function	
• blocking of communication via physical ports	Yes
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	No
protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes
standards, specifications, approvals	
reference code	
• according to IEC 81346-2:2019	KEC
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	207.05 kg
• during manufacturing	19.13 kg
• during operation	187.74 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAX-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1543SP-1

Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

The CP 1543SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols (e.g. SNMPv3), the communications processor protects individual ET 200SP distributed controllers or even entire automation cells against unauthorized access.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions can be configured with STEP 7 Professional, V14 (TIA Portal) and higher.

The CP 1543SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
 - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
- Support of SINEMA Remote Connect with autoconfiguration
- Security Integrated
 - Stateful Packet Inspection Firewall
 - Secure communication via VPN (IPsec)
- Protocols for secure communication
 - Secure access to the web server of the CPU via the HTTPS protocol
 - Secure transfer of the time of day (NTP)
 - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Ordering data

Article No.

CP 1543SP-1 communications processor

CP 1543SP-1 communications processor for connecting SIMATIC S7 ET 200SP to Industrial Ethernet, Security (firewall and VPN), open IE communication (TCP/IP, ISO-on-TCP, UDP) PG/OP, S7 routing, IP broadcast/multicast, SNMPv1/v3, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, BusAdapter required

6GK7543-6WX00-0XE0

Accessories

SIMATIC BA 2xRJ45 BusAdapter

For PROFINET interface modules, standard function class or above; max. cable length 50 m

6ES7193-6AR00-0AA0

SIMATIC BA 2xFC BusAdapter

For PROFINET interface modules, standard function class or above; for increased vibration and EMC load rating; max. cable length 50 m

6ES7193-6AF00-0AA0

SIMATIC BA 2xSCRJ BusAdapter

For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP00-0AA0

SIMATIC BA SCRJ/RJ45 BusAdapter

For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load rating; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP20-0AA0

SIMATIC BA SCRJ/FC BusAdapter

For PROFINET interface modules, High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC load rating; max. cable length 50 m (POF, copper) or 100 m (PCF)

6ES7193-6AP40-0AA0

IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > CP 1543SP-1

Ordering data	Article No.		Article No.	
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6 _A) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface • 1 pack = 1 unit • 1 pack = 10 units • 1 pack = 50 units	6GK1901-1BB12-2AA0 6GK1901-1BB12-2AB0 6GK1901-1BB12-2AE0		IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00
			Labeling strips 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	6ES7193-6LR10-0AA0
			500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	6ES7193-6LR10-0AG0
			1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	6ES7193-6LA10-0AA0
			1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	6ES7193-6LA10-0AG0
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10		Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m • AWG22, for connection to IE FC RJ45 modular outlet • AWG24, for connection to IE FC RJ45 plug 4 x 2	6XV1870-2E 6XV1878-2A		Spare parts	
			Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	6ES7193-6PA00-0AA0
			PE connection element for mounting rail 2000 mm 20 units	6ES7590-5AA00-0AA0
			Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	6ES7193-4JB00-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

I/O modules > Communication > CP 1543SP-1

Technical specifications

Article number	6GK7543-6WX00-0XE0
product type designation	CP 1543SP-1
transfer rate	
transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
interfaces	
number of interfaces according to Industrial Ethernet	1
number of electrical connections	
• at the 1st interface according to Industrial Ethernet	2
type of electrical connection	
• at the 1st interface according to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
supply voltage, current consumption, power loss	
type of voltage of the supply voltage	DC
supply voltage	24 V
supply voltage	19.2 ... 28.8 V
power loss [W]	6 W
ambient conditions	
ambient temperature	
• for vertical installation during operation	-30 ... +50 °C
• for horizontally arranged busbars during operation	-30 ... +60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
relative humidity	
• at 25 °C without condensation during operation maximum	95 %
protection class IP	IP20
design, dimensions and weights	
width	60 mm
height	117 mm
depth	74 mm
net weight	0.18 kg
fastening method	
• 35 mm DIN-rail mounting	Yes
product features, product functions, product components general	
number of units	
• per CPU maximum	2
• note	2 CPUs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
performance data open communication	
number of possible connections for open communication	
• by means of T blocks maximum	32
data volume	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
performance data S7 communication	
number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
performance data multi-protocol mode	
number of active connections with multi-protocol mode	32
performance data IT functions	
number of possible connections	
• as email client maximum	1

Article number	6GK7543-6WX00-0XE0
product type designation	CP 1543SP-1
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	
• I&MO - device-specific information	Yes
• I&M1 - higher level designation/location designation	Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via ET 200SP CPU
product functions security	
firewall version	stateful inspection
product function with VPN connection	IPsec, SINEMA RC
type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
type of hashing algorithms with VPN connection	MD5, SHA-1
number of possible connections with VPN connection	4
product function	
• switch-off of non-required services	Yes
• blocking of communication via physical ports	Yes
• log file for unauthorized access	Yes
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	No
protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
standards, specifications, approvals	
reference code	
• according to IEC 81346-2:2019	KEC
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	207.05 kg
• during manufacturing	19.13 kg
• during operation	187.74 kg
• after end of life	0.18 kg
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to website: Industrial communication	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAX-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1 IRC

Overview



ISO	TCP/UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

The CP 1542SP-1 IRC communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. In addition, control centers can be connected using various telecontrol protocols.

The CP is characterized by the following:

- Ethernet-based connection to TeleControl Server Basic, e.g. via internet
- Ethernet-based connection to the control center via SINAUT ST7, IEC 60870-5-104 or DNP3 protocol
- Data transfer of measured values, control variables or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 100,000 values ensures a secure database, even with temporary connection failures
- Clearly laid out LED signaling for fast and easy diagnostics
- Fast commissioning thanks to easy configuration using STEP 7

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 IRC supports the following communications services:

- Support of multiple telecontrol protocols such as SINAUT ST7, DNP3, IEC 60870-5-104 and TeleControl Basic
- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
 - Sending emails via SMTP or SMTPS with "SMTP-Auth" for authentication on an email server (also with IPv6)
 - Email transfer with addressing by program block
 - Email transfer via "Notifications" (alerts)
- Support of SINEMA Remote Connect with autoconfiguration

Ordering data

Article No.

CP 1542SP-1 IRC communications processor

CP 1542SP-1 IRC communications processor for connection of SIMATIC S7-ET 200SP to Industrial Ethernet, TeleControl Server Basic, IEC 60870-5-104 or DNP3 protocol to a control center; open IE communication (TCP/IP, ISO-on-TCP, UDP), IP broadcast/multicast, SNMPV1, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, BusAdapter required

6GK7542-6VX00-0XE0

Accessories

SIMATIC BA 2xRJ45 BusAdapter

For PROFINET interface modules, standard function class or above; max. cable length 50 m

6ES7193-6AR00-0AA0

SIMATIC BA 2xFC BusAdapter

For PROFINET interface modules, standard function class or above; for increased vibration and EMC load rating; max. cable length 50 m

6ES7193-6AF00-0AA0

SIMATIC BA 2xSCRJ BusAdapter

For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP00-0AA0

SIMATIC BA SCRJ/RJ45 BusAdapter

For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)

6ES7193-6AP20-0AA0

SIMATIC BA SCRJ/FC BusAdapter

For PROFINET interface modules, High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC load rating; max. cable length 50 m (POF, copper) or 100 m (PCF)

6ES7193-6AP40-0AA0

IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1 IRC

Ordering data	Article No.		Article No.
IE FC RJ45 plug 4 x 2 RJ45 plug-in connector for Industrial Ethernet (10/100/1000/10000 Mbps, Cat6 _A) with rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPU with Industrial Ethernet interface 1 pack = 1 unit 1 pack = 10 units 1 pack = 50 units	6GK1901-1BB12-2AA0 6GK1901-1BB12-2AB0 6GK1901-1BB12-2AE0	Labeling strips 500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer 500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer 1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer 1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	6ES7193-6LR10-0AA0 6ES7193-6LR10-0AG0 6ES7193-6LA10-0AA0 6ES7193-6LA10-0AG0
IE FC TP standard cable GP 2 x 2 (type A) 4-core, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-2AH10	Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
IE FC TP standard cable GP 4 x 2 8-core, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m - AWG22, for connection to IE FC RJ45 modular outlet - AWG24, for connection to IE FC RJ45 plug 4 x 2	6XV1870-2E 6XV1878-2A	Spare parts Server module Terminates an ET 200SP station; included in the scope of supply of the interface modules	6ES7193-6PA00-0AA0 PE connection element for mounting rail 2000 mm 20 units
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Power supply connector Spare part; for connecting the 24 V DC supply voltage with push-in terminals	6ES7193-4JB00-0AA0

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Technical specifications

Article number	6GK7542-6VX00-0XE0	Article number	6GK7542-6VX00-0XE0
product type designation	CP 1542SP-1 IRC	product type designation	CP 1542SP-1 IRC
transfer rate		ambient conditions	
transfer rate		ambient temperature	
at the 1st interface	10 ... 100 Mbit/s	- for vertical installation during operation - for horizontally arranged busbars during operation - during storage - during transport	-30 ... +50 °C -30 ... +60 °C -40 ... +70 °C -40 ... +70 °C
interfaces		relative humidity	
number of interfaces according to Industrial Ethernet	1	at 25 °C without condensation during operation maximum	95 %
number of electrical connections		protection class IP	IP20
at the 1st interface according to Industrial Ethernet	2	design, dimensions and weights	
type of electrical connection		width	60 mm
at the 1st interface according to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch	height	117 mm
supply voltage, current consumption, power loss		depth	74 mm
type of voltage of the supply voltage	DC	net weight	0.18 kg
supply voltage	24 V	fastening method	
supply voltage	19.2 ... 28.8 V	35 mm DIN-rail mounting	Yes
power loss [W]	6 W		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > CP 1542SP-1 IRC

Technical specifications

Article number	6GK7542-6VX00-0XE0
product type designation	CP 1542SP-1 IRC
product features, product functions, product components general	
number of units	2
- per CPU maximum - note	2 CPs can be plugged in per CPU, simultaneous operation with BA Send and CM DP is possible
performance data open communication	
number of possible connections for open communication	32
- by means of T blocks maximum data volume - as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
performance data S7 communication	
number of possible connections for S7 communication	16
- maximum - with OP connections maximum	16
performance data multi-protocol mode	
number of active connections with multi-protocol mode	32
performance data IT functions	
number of possible connections	1
as email client maximum	1
performance data telecontrol	
suitability for use	No
- node station - substation - TIM control center	Yes Yes No
control center connection	IEC 60870-5, DNP3, (Modbus TCP by block solutions of the CPU) capable control stations, connection to Telecontrol Server Basic and ST7 capable control station
- by means of a permanent connection - by means of demand-oriented connection - note	supported supported Connection to SCADA system by IEC 60870-5 104, DNP3, Telecontrol Server Basic and ST7 capable control center
protocol is supported	Yes
- DNP3 - IEC 60870-5 - SINAUT ST7 protocol	Yes Yes Yes
product function data buffering if connection is aborted	Yes; TCSB 64000 events, SINAUT ST7 32000 telegrams, DNP3 100000 events, IEC 60870-5 100000 events
number of data points per station maximum	1 500
number of stations for direct communication with Telecontrol Server Basic	3
- in send direction maximum - in receive direction maximum	3 15

Article number	6GK7542-6VX00-0XE0
product type designation	CP 1542SP-1 IRC
product functions management, configuration, engineering	
product function MIB support	Yes
protocol is supported	Yes
- SNMP v1 - SNMP v3 - DCP - LLDP	Yes Yes Yes Yes
configuration software	STEP 7 Professional V14 (TIA Portal) or higher
required	STEP 7 Professional V14 (TIA Portal) or higher
identification & maintenance function	Yes
- I&M0 - device-specific information - I&M1 - higher level designation/location designation	Yes Yes
product functions diagnostics	
product function web-based diagnostics	Yes; via ET 200SP CPU
product functions security	
product function with VPN connection	SINEMA RC
blocking of communication via physical ports	Yes
product functions time	
product function SICLOCK support	Yes
product function pass on time synchronization	Yes
protocol is supported	Yes
- NTP - NTP (secure)	Yes No
time synchronization	Yes
- from NTP-server - from control center	Yes Yes
standards, specifications, approvals	
reference code	KEC
according to IEC 81346-2:2019	KEC
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	207.05 kg
- total - during manufacturing - during operation - after end of life	19.13 kg 187.74 kg 0.18 kg
further information internet links	
internet link	https://support.industry.siemens.com/cs/ww/en/view/109766358
- to website: Selection guide for cables and connectors - to web page: selection aid TIA Selection Tool - to website: Industrial communication - to web page: SiePortal - to website: Image database - to website: CAX-Download-Manager - to website: Industry Online Support	https://www.siemens.com/tstcloud https://www.siemens.com/simatic-net https://sieportal.siemens.com/ https://www.automation.siemens.com/bilddb https://siemens.com/cax https://support.industry.siemens.com

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet

Overview



- Space-saving access point, suitable for applications where the device is to be mounted in the control cabinet

Ordering data

Article No.

SCALANCE W761 access points

IWLAN access point with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; degree of protection IP20 (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24 V DC; manual on CD-ROM; German/English

SCALANCE W761-1 RJ45

IWLAN access point with one built-in wireless interface

- Country approvals for operation outside the USA
- Country approvals for operation within the USA¹⁾

6GK5761-1FC00-0AA0

6GK5761-1FC00-0AB0

Accessories

IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC standard cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC RJ45 outlet plug/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

6XV1840-2AH10

IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

Antennas and additional IWLAN accessories

See Industrial Wireless LAN/Accessories

¹⁾ Please note country approvals under <http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet

Technical specifications

Article number	6GK5761-1FC00-0AA0	6GK5761-1FC00-0AB0
product type designation ¹⁾	W761-1 RJ45	W761-1 RJ45 (USA)
transfer rate		
transfer rate		
• with WLAN maximum	150 Mbit/s	150 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet		
• minimum	10 Mbit/s	10 Mbit/s
• maximum	100 Mbit/s	100 Mbit/s
interfaces		
number of electrical connections		
• for network components or terminal equipment	1	1
• for power supply	1	1
• for redundant voltage supply	0	0
type of electrical connection		
• for network components or terminal equipment	RJ45 socket	RJ45 socket
• for power supply	3-pole screw terminal	3-pole screw terminal
memory		
design of the removable storage		
• C-PLUG	No	No
• KEY-PLUG	No	No
interfaces wireless		
number of radio cards permanently installed	1	1
number of electrical connections for external antenna(s)	1	1
type of electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes	Yes
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
consumed current		
• at DC at 24 V typical	0.15 A	0.15 A
power loss [W]		
• at DC at 24 V typical	3.6 W	3.6 W
supply voltage 1		
• from terminal block	19.2 V	19.2 V
supply voltage 2		
• from terminal block	28.8 V	28.8 V
ambient conditions		
ambient temperature		
• during operation	0 ... 55 °C	0 ... 55 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP20	IP20

Please note country approvals under
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet

Technical specifications

Article number product type designation ¹⁾	6GK5761-1FC00-0AA0 W761-1 RJ45	6GK5761-1FC00-0AB0 W761-1 RJ45 (USA)
design, dimensions and weights		
width	50 mm	50 mm
height	114 mm	114 mm
depth	74 mm	74 mm
width of the enclosure without antenna	50 mm	50 mm
height of the enclosure without antenna	114 mm	114 mm
depth of the enclosure without antenna	74 mm	74 mm
net weight	0.13 kg	0.13 kg
fastening method		
• S7-300 rail mounting	No	No
• S7-1500 rail mounting	No	No
• 35 mm DIN-rail mounting	Yes	Yes
• wall mounting	No	No
radio frequencies		
operating frequency		
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general		
product function Access Point Mode	Yes	Yes
product function client Mode	Yes	Yes
number of SSIDs	1	1
product function		
• iPCF Access Point	No	No
• iPCF client	No	No
• iPCF-MC Access Point	No	No
• iPCF-MC client	No	No
product function iREF	No	No
product function iPRP	No	No
product functions management, configuration, engineering		
number of manageable IP addresses in client	4	4
product function		
• CLI	Yes	Yes
• web-based management	Yes	Yes
• MIB support	Yes	Yes
• TRAPs via email	Yes	Yes
• configuration with STEP 7	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes
• operation with IWLAN controller	No	No
• operation with Enterasys WLAN controller	No	No
• forced roaming on IP down with IWLAN	Yes	Yes
• forced roaming on link down with IWLAN	Yes	Yes
• WDS	Yes	Yes
protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• ICMP	Yes	Yes
• Telnet	Yes	Yes
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• TFTP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes

Please note country approvals under
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet**Technical specifications**

Article number	6GK5761-1FC00-0AA0	6GK5761-1FC00-0AB0
product type designation ¹⁾	W761-1 RJ45	W761-1 RJ45 (USA)
identification & maintenance function		
• I&M0 - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes
product function is supported	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
identification link		
product functions diagnostics		
product function		
• PROFINET IO diagnosis	No	No
• link check	No	No
• connection monitoring IP-Alive	No	No
• localization via Aeroscout	No	No
• SysLog	Yes	Yes
protocol is supported		
• SNMP v1	Yes	Yes
• SNMP v2	Yes	Yes
• SNMP v3	Yes	Yes
product functions VLAN		
product function		
• function VLAN with IWLAN	Yes	Yes
product functions DHCP		
product function		
• DHCP client	Yes	Yes
• DHCP server	Yes	Yes
• DHCP Option 82	Yes	Yes
product functions redundancy		
protocol is supported		
• STP/RSTP	Yes	Yes
• MSTP	Yes	Yes
• RSTP	Yes	Yes
product functions security		
product function		
• ACL - MAC-based	Yes	Yes
• management security, ACL-IP based	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes
• NAT/NAPT	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes
• WPA/WPA2	Yes	Yes
• TKIP/AES	Yes	Yes
protocol is supported		
• SSH	Yes	Yes
• RADIUS	Yes	Yes
product functions time		
protocol is supported		
• NTP	Yes	Yes
• SNTP	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes

Please note country approvals under
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet

Technical specifications

Article number	6GK5761-1FC00-0AA0	6GK5761-1FC00-0AB0
product type designation ¹⁾	W761-1 RJ45	W761-1 RJ45 (USA)
standards, specifications, approvals		
standard		
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X
• for safety from CSA and UL certificate of suitability	UL 60950-1 E115352, CSA C22.2 No. 60950-1	UL 60950-1 E115352, CSA C22.2 No. 60950-1
• EC Declaration of Conformity	Yes	Yes
• CE marking	Yes	Yes
• C-Tick	Yes	Yes
• E1 approval	No	No
• railway application in accordance with EN 50155	No	No
• railway application in accordance with EN 50121-4	No	No
• NEMA TS2	No	No
• IEC 61375	No	No
• IEC 61850-3	No	No
• NEMA4X	No	No
• Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af	No	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No	No
standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11e	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11i	Yes	Yes
• IEEE 802.11n	Yes	Yes
wireless approval	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals
reference code		
• according to IEC 81346-2:2019	KFE	KFE
standards, specifications, approvals marine classification		
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• French marine classification society (BV)	No	No
• DNV GL	No	No
• Korean Register of Shipping (KRS)	No	No
• Lloyds Register of Shipping (LRS)	No	No
• Nippon Kaiji Kyokai (NK)	No	No
• Polski Rejestr Statkow (PRS)	No	No
• Royal Institution of Naval Architects (RINA)	No	No
standards, specifications, approvals hazardous environments		
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480
certificate of suitability CCC for hazardous zone according to GB standard	Yes; GB3836.1, GB3836.8	Yes; GB3836.1, GB3836.8
• as marking	Ex nA IIC T4 Gc	Ex nA IIC T4 Gc
Please note country approvals under http://www.siemens.com/wireless-approvals		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W761 RJ45 for the control cabinet

Technical specifications

Article number	6GK5761-1FC00-0AA0	6GK5761-1FC00-0AB0
product type designation ¹⁾	W761-1 RJ45	W761-1 RJ45 (USA)
standards, specifications, approvals		
Environmental Product Declaration		
global warming potential [CO2 eq]		
• total		125.8 kg
• during manufacturing		12.97 kg
• during operation		112.66 kg
• after end of life		0.17 kg
accessories		
accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: WLAN country approval	https://www.siemens.com/wireless-approvals	https://www.siemens.com/wireless-approvals
• to the website: IWLAN	https://www.siemens.com/iwlan	https://www.siemens.com/iwlan
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAX-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
	0.15 A	0.15 A

Please note country approvals under
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Overview



- Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet
- Equipped with iFeatures



ET 200SP station with SCALANCE W722 RJ45

Ordering data

Article No.

SCALANCE W722 client modules

IWLAN Ethernet client modules with iFeatures support and built-in wireless interface; wireless networks IEEE 802.11a/b/g/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; degree of protection IP20 (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24 V DC; manual on CD-ROM; German/English

SCALANCE W722-1 RJ45

For managing the radio link with iFeatures from a connected device with Industrial Ethernet connection

- Country approvals for operation outside the USA
- Country approvals for operation within the USA¹⁾
- Country approvals for operation in Israel¹⁾

6GK5722-1FC00-0AA0

6GK5722-1FC00-0AB0

6GK5722-1FC00-0AC0

Accessories

IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC standard cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC RJ45 outlet plug/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

6XV1840-2AH10

IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

Antennas and additional IWLAN accessories

See Industrial Wireless LAN/Accessories

¹⁾ Please note country approvals under <http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Technical specifications

Article number product type designation ¹⁾	6GK5722-1FC00-0AA0 W722-1 RJ45	6GK5722-1FC00-0AB0 W722-1 RJ45 (USA)	6GK5722-1FC00-0AC0 W722-1 RJ45 (ISR)
transfer rate			
transfer rate			
• with WLAN maximum	150 Mbit/s	150 Mbit/s	150 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet			
• minimum	10 Mbit/s	10 Mbit/s	10 Mbit/s
• maximum	100 Mbit/s	100 Mbit/s	100 Mbit/s
interfaces			
number of electrical connections			
• for network components or terminal equipment	1	1	1
• for power supply	1	1	1
• for redundant voltage supply	0	0	0
type of electrical connection			
• for network components or terminal equipment	RJ45 socket	RJ45 socket	RJ45 socket
• for power supply	3-pole screw terminal	3-pole screw terminal	3-pole screw terminal
memory			
design of the removable storage			
• C-PLUG	No	No	No
• KEY-PLUG	No	No	No
interfaces wireless			
number of radio cards permanently installed	1	1	1
number of electrical connections for external antenna(s)	1	1	1
type of electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes	Yes	Yes
supply voltage, current consumption, power loss			
type of voltage of the supply voltage	DC	DC	DC
consumed current			
• at DC at 24 V typical	0.15 A	0.15 A	0.15 A
power loss [W]			
• at DC at 24 V typical	3.6 W	3.6 W	3.6 W
supply voltage 1			
• from terminal block	19.2 V	19.2 V	19.2 V
supply voltage 2			
• from terminal block	28.8 V	28.8 V	28.8 V
ambient conditions			
ambient temperature			
• during operation	0 ... 55 °C	0 ... 55 °C	0 ... 55 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %	95 %	95 %
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP20	IP20	IP20

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Technical specifications

Article number	6GK5722-1FC00-0AA0	6GK5722-1FC00-0AB0	6GK5722-1FC00-0AC0
product type designation ¹⁾	W722-1 RJ45	W722-1 RJ45 (USA)	W722-1 RJ45 (ISR)
design, dimensions and weights			
width	50 mm	50 mm	50 mm
height	114 mm	114 mm	114 mm
depth	74 mm	74 mm	74 mm
width of the enclosure without antenna	50 mm	50 mm	50 mm
height of the enclosure without antenna	114 mm	114 mm	114 mm
depth of the enclosure without antenna	74 mm	74 mm	74 mm
net weight	0.13 kg	0.13 kg	0.13 kg
fastening method			
• S7-300 rail mounting	No	No	No
• S7-1500 rail mounting	No	No	No
• 35 mm DIN-rail mounting	Yes	Yes	Yes
• wall mounting	No	No	No
radio frequencies			
operating frequency			
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general			
product function Access Point Mode	No	No	No
product function client Mode	Yes	Yes	Yes
product function			
• iPCF client	Yes	Yes	Yes
• iPCF-MC client	Yes	Yes	Yes
number of iPCF-capable radio modules	1	1	1
product function iPRP	Yes	Yes	Yes
product functions management, configuration, engineering			
number of manageable IP addresses in client	4	4	4
product function			
• CLI	Yes	Yes	Yes
• web-based management	Yes	Yes	Yes
• MIB support	Yes	Yes	Yes
• TRAPs via email	Yes	Yes	Yes
• configuration with STEP 7	Yes	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes	Yes
• WDS	No	No	No
protocol is supported			
• Address Resolution Protocol (ARP)	Yes	Yes	Yes
• ICMP	Yes	Yes	Yes
• Telnet	Yes	Yes	Yes
• HTTP	Yes	Yes	Yes
• HTTPS	Yes	Yes	Yes
• TFTP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	No	No	No
identification & maintenance function			
• I&MO - device-specific information	Yes	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes	Yes
product function is supported	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
identification link			

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Technical specifications

Article number	6GK5722-1FC00-0AA0	6GK5722-1FC00-0AB0	6GK5722-1FC00-0AC0
product type designation ¹⁾	W722-1 RJ45	W722-1 RJ45 (USA)	W722-1 RJ45 (ISR)
product functions diagnostics			
product function			
• PROFINET IO diagnosis	Yes	Yes	Yes
• link check	No	No	No
• connection monitoring IP-Alive	No	No	No
• SysLog	Yes	Yes	Yes
protocol is supported			
• SNMP v1	Yes	Yes	Yes
• SNMP v2	Yes	Yes	Yes
• SNMP v3	Yes	Yes	Yes
product functions VLAN			
product function			
• function VLAN with IWLAN	No	No	No
product functions DHCP			
product function			
• DHCP client	Yes	Yes	Yes
• DHCP server	Yes	Yes	Yes
• DHCP Option 82	Yes	Yes	Yes
product functions redundancy			
protocol is supported			
• STP/RSTP	Yes	Yes	Yes
• MSTP	Yes	Yes	Yes
• RSTP	Yes	Yes	Yes
product functions security			
product function			
• ACL - MAC-based	Yes	Yes	Yes
• management security, ACL-IP based	Yes	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes	Yes
• NAT/NAPT	Yes	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes	Yes
• WPA/WPA2	Yes	Yes	Yes
• TKIP/AES	Yes	Yes	Yes
protocol is supported			
• SSH	Yes	Yes	Yes
• RADIUS	Yes	Yes	Yes
product functions time			
protocol is supported			
• NTP	Yes	Yes	Yes
• SNTP	Yes	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes	Yes
standards, specifications, approvals			
standard			
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X
• for safety from CSA and UL	UL 60950-1 E115352, CSA C22.2 No. 60950-1	UL 60950-1 E115352, CSA C22.2 No. 60950-1	UL 60950-1 E115352, CSA C22.2 No. 60950-1

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Technical specifications

Article number	6GK5722-1FC00-0AA0	6GK5722-1FC00-0AB0	6GK5722-1FC00-0AC0
product type designation ¹⁾	W722-1 RJ45	W722-1 RJ45 (USA)	W722-1 RJ45 (ISR)
certificate of suitability			
• EC Declaration of Conformity	Yes	Yes	No
• CE marking	Yes	Yes	No
• C-Tick	Yes	Yes	Yes
• E1 approval	No	No	No
• railway application in accordance with EN 50155	No	No	No
• NEMA TS2	No	No	No
• IEC 61375	No	No	No
• IEC 61850-3	No	No	No
• NEMA4X	No	No	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No	No	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No	No	No
standard for wireless communication			
• IEEE 802.11a	Yes	Yes	Yes
• IEEE 802.11b	Yes	Yes	Yes
• IEEE 802.11e	Yes	Yes	Yes
• IEEE 802.11g	Yes	Yes	Yes
• IEEE 802.11h	Yes	Yes	Yes
• IEEE 802.11i	Yes	Yes	Yes
• IEEE 802.11n	Yes	Yes	Yes
wireless approval	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals
reference code			
• according to IEC 81346-2:2019	KFE	KFE	KFE
standards, specifications, approvals			
marine classification			
Marine classification association			
• American Bureau of Shipping Europe Ltd. (ABS)	No	No	No
• French marine classification society (BV)	No	No	No
• DNV GL	No	No	No
• Korean Register of Shipping (KRS)	No	No	No
• Lloyds Register of Shipping (LRS)	No	No	No
• Nippon Kaiji Kyokai (NK)	No	No	No
• Polski Rejestr Statkow (PRS)	No	No	No
• Royal Institution of Naval Architects (RINA)	No	No	No
standards, specifications, approvals			
hazardous environments			
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480
certificate of suitability CCC for hazardous zone according to GB standard	Yes; GB3836.1, GB3836.8	Yes; GB3836.1, GB3836.8	
• as marking	Ex nA IIC T4 Gc	Ex nA IIC T4 Gc	
standards, specifications, approvals			
Environmental Product Declaration			
Environmental Product Declaration	Yes	Yes	Yes
global warming potential [CO2 eq]			
• total	200.91 kg	200.91 kg	200.91 kg
• during manufacturing	12.97 kg	12.97 kg	12.97 kg
• during operation	187.77 kg	187.77 kg	187.77 kg
• after end of life	0.17 kg	0.17 kg	0.17 kg

¹⁾ You will find the current list of countries at: <http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W722 RJ45 for the control cabinet

Technical specifications

Article number	6GK5722-1FC00-0AA0	6GK5722-1FC00-0AB0	6GK5722-1FC00-0AC0
product type designation ¹⁾	W722-1 RJ45	W722-1 RJ45 (USA)	W722-1 RJ45 (ISR)
accessories			
accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery
further information internet links			
internet link			
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: WLAN country approval	https://www.siemens.com/wireless-approvals	https://www.siemens.com/wireless-approvals	https://www.siemens.com/wireless-approvals
• to the website: IWLAN	https://www.siemens.com/iwlan	https://www.siemens.com/iwlan	https://www.siemens.com/iwlan
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com	https://support.industry.siemens.com
	0.15 A	0.15 A	0.15 A

You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Overview



- Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet

Ordering data

Article No.

SCALANCE W721 client modules

IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; degree of protection IP20 (0 °C to +55 °C); scope of delivery: Mounting hardware, 3-pin screw terminal for 24 V DC; manual on CD-ROM; German/English

SCALANCE W721-1 RJ45

For managing the radio link from a connected device with Industrial Ethernet connection

- Country approvals for operation outside the USA
- Country approvals for operation within the USA¹⁾

6GK5721-1FC00-0AA0

6GK5721-1FC00-0AB0

Accessories

IE FC RJ45 plug 180 2 x 2

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface

- 1 pack = 1 unit
- 1 pack = 10 units
- 1 pack = 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

IE FC standard cable GP 2 x 2

4-core, shielded TP installation cable for connection to IE FC RJ45 outlet plug/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

6XV1840-2AH10

IE FC stripping tool

Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables

6GK1901-1GA00

Antennas and additional IWLAN accessories

See Industrial Wireless LAN/Accessories

¹⁾ Please note country approvals under <http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Technical specifications

Article number	6GK5721-1FC00-0AA0	6GK5721-1FC00-0AB0
product type designation ¹⁾	W721-1 RJ45	W721-1 RJ45 (USA)
transfer rate		
transfer rate		
• with WLAN maximum	150 Mbit/s	150 Mbit/s
• for Industrial Ethernet	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
transfer rate for Industrial Ethernet		
• minimum	10 Mbit/s	10 Mbit/s
• maximum	100 Mbit/s	100 Mbit/s
interfaces		
number of electrical connections		
• for network components or terminal equipment	1	1
• for power supply	1	1
• for redundant voltage supply	0	0
type of electrical connection		
• for network components or terminal equipment	RJ45 socket	RJ45 socket
• for power supply	3-pole screw terminal	3-pole screw terminal
memory		
design of the removable storage		
• C-PLUG	No	No
• KEY-PLUG	No	No
interfaces wireless		
number of radio cards permanently installed	1	1
number of electrical connections for external antenna(s)	1	1
type of electrical connection for external antenna(s)	R-SMA (socket)	R-SMA (socket)
product feature external antenna can be mounted directly on device	Yes	Yes
supply voltage, current consumption, power loss		
type of voltage of the supply voltage	DC	DC
consumed current		
• at DC at 24 V typical	0.15 A	0.15 A
power loss [W]		
• at DC at 24 V typical	3.6 W	3.6 W
supply voltage 1		
• from terminal block	19.2 V	19.2 V
supply voltage 2		
• from terminal block	28.8 V	28.8 V
ambient conditions		
ambient temperature		
• during operation	0 ... 55 °C	0 ... 55 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
protection class IP	IP20	IP20

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Technical specifications

Article number	6GK5721-1FC00-0AA0	6GK5721-1FC00-0AB0
product type designation ¹⁾	W721-1 RJ45	W721-1 RJ45 (USA)
design, dimensions and weights		
width	50 mm	50 mm
height	114 mm	114 mm
depth	74 mm	74 mm
width of the enclosure without antenna	50 mm	50 mm
height of the enclosure without antenna	114 mm	114 mm
depth of the enclosure without antenna	74 mm	74 mm
net weight	0.13 kg	0.13 kg
fastening method		
• S7-300 rail mounting	No	No
• S7-1500 rail mounting	No	No
• 35 mm DIN-rail mounting	Yes	Yes
• wall mounting	No	No
radio frequencies		
operating frequency		
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz; depending on the country approvals	2.41 ... 2.48 GHz; depending on the country approvals
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz; depending on the country approvals	4.9 ... 5.8 GHz; depending on the country approvals
product features, product functions, product components general		
product function Access Point Mode	No	No
product function client Mode	Yes	Yes
product function		
• iPCF client	No	No
• iPCF-MC client	No	No
product function iREF	No	No
product function iPRP	No	No
product functions management, configuration, engineering		
number of manageable IP addresses in client	4	4
product function		
• CLI	Yes	Yes
• web-based management	Yes	Yes
• MIB support	Yes	Yes
• TRAPs via email	Yes	Yes
• configuration with STEP 7	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes
• WDS	No	No
protocol is supported		
• Address Resolution Protocol (ARP)	Yes	Yes
• ICMP	Yes	Yes
• Telnet	Yes	Yes
• HTTP	Yes	Yes
• HTTPS	Yes	Yes
• TFTP	Yes	Yes
• DCP	Yes	Yes
• LLDP	No	No
identification & maintenance function		
• I&MO - device-specific information	Yes	Yes
• I&M1 - higher level designation/location designation	Yes	Yes
product function is supported	Yes; acc. to IEC 61406-1:2022	Yes; acc. to IEC 61406-1:2022
identification link		

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Technical specifications

Article number	6GK5721-1FC00-0AA0	6GK5721-1FC00-0AB0
product type designation ¹⁾	W721-1 RJ45	W721-1 RJ45 (USA)
product functions diagnostics		
product function		
• PROFINET IO diagnosis	No	No
• link check	No	No
• connection monitoring IP-Alive	No	No
• SysLog	Yes	Yes
protocol is supported		
• SNMP v1	Yes	Yes
• SNMP v2	Yes	Yes
• SNMP v3	Yes	Yes
product functions VLAN		
product function		
• function VLAN with IWLAN	No	No
product functions DHCP		
product function		
• DHCP client	Yes	Yes
• DHCP server	Yes	Yes
• DHCP Option 82	Yes	Yes
product functions redundancy		
protocol is supported		
• STP/RSTP	Yes	Yes
• MSTP	Yes	Yes
• RSTP	Yes	Yes
product functions security		
product function		
• ACL - MAC-based	Yes	Yes
• management security, ACL-IP based	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes
• NAT/NAPT	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes
• WPA/WPA2	Yes	Yes
• TKIP/AES	Yes	Yes
protocol is supported		
• SSH	Yes	Yes
• RADIUS	Yes	Yes
product functions time		
protocol is supported		
• NTP	Yes	Yes
• SNTP	Yes	Yes
• SIMATIC time synchronization (SIMATIC Time)	Yes	Yes
standards, specifications, approvals		
standard		
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4, FM16US0205X
• for safety from CSA and UL	UL 60950-1 E115352, CSA C22.2 No. 60950-1	UL 60950-1 E115352, CSA C22.2 No. 60950-1

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet**Technical specifications**

Article number	6GK5721-1FC00-0AA0	6GK5721-1FC00-0AB0
product type designation ¹⁾	W721-1 RJ45	W721-1 RJ45 (USA)
certificate of suitability		
• EC Declaration of Conformity	Yes	Yes
• CE marking	Yes	Yes
• C-Tick	Yes	Yes
• E1 approval	No	No
• railway application in accordance with EN 50155	No	No
• NEMA TS2	No	No
• IEC 61375	No	No
• IEC 61850-3	No	No
• NEMA4X	No	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No	No
standard for wireless communication		
• IEEE 802.11a	Yes	Yes
• IEEE 802.11b	Yes	Yes
• IEEE 802.11e	Yes	Yes
• IEEE 802.11g	Yes	Yes
• IEEE 802.11h	Yes	Yes
• IEEE 802.11i	Yes	Yes
• IEEE 802.11n	Yes	Yes
wireless approval	You will find the current list of countries at: http://www.siemens.com/wireless-approvals	You will find the current list of countries at: http://www.siemens.com/wireless-approvals
reference code		
• according to IEC 81346-2:2019	KFE	KFE
standards, specifications, approvals		
marine classification		
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• French marine classification society (BV)	No	No
• DNV GL	No	No
• Korean Register of Shipping (KRS)	No	No
• Lloyds Register of Shipping (LRS)	No	No
• Nippon Kaiji Kyokai (NK)	No	No
• Polski Rejestr Statkow (PRS)	No	No
• Royal Institution of Naval Architects (RINA)	No	No
standards, specifications, approvals		
hazardous environments		
standard for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• from CSA and UL	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480	ANSI/ISA 12.12.01-2013, CAN/CSA C22.2 No.213-M1987, Cl. 1, div. 2, GP. A, B, C, D, T4 / Cl. 1, Zone 2, GP IIC E240480
certificate of suitability CCC for hazardous zone according to GB standard	Yes; GB3836.1, GB3836.8	Yes; GB3836.1, GB3836.8
• as marking	Ex nA IIC T4 Gc	Ex nA IIC T4 Gc
standards, specifications, approvals		
Environmental Product Declaration		
Environmental Product Declaration global warming potential [CO2 eq]	Yes	Yes
• total	200.91 kg	200.91 kg
• during manufacturing	12.97 kg	12.97 kg
• during operation	187.77 kg	187.77 kg
• after end of life	0.17 kg	0.17 kg
accessories		
accessories	24 V DC screw terminal included in scope of delivery	24 V DC screw terminal included in scope of delivery

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SCALANCE W721 RJ45 for the control cabinet

Technical specifications

Article number	6GK5721-1FC00-0AA0	6GK5721-1FC00-0AB0
product type designation ¹⁾	W721-1 RJ45	W721-1 RJ45 (USA)
further information internet links		
internet link		
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: WLAN country approval	https://www.siemens.com/wireless-approvals	https://www.siemens.com/wireless-approvals
• to the website: IWLAN	https://www.siemens.com/iwlan	https://www.siemens.com/iwlan
• to website: Industrial communication	https://www.siemens.com/simatic-net	https://www.siemens.com/simatic-net
• to web page: SiePortal	https://sieportal.siemens.com/	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
	0.15 A	0.15 A

¹⁾ You will find the current list of countries at:
<http://www.siemens.com/wireless-approvals>

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM PtP serial interface

Overview



- Communications module CM PtP;
Module for serial communication connections with RS232, RS422, RS485 interfaces for the Freeport, 3964(R), Modbus RTU master and USS protocols, max. 250 kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
 - Freeport: User-parameterizable frame format for universal communication
 - 3964(R) for improved transmission reliability
 - Modbus RTU master (requires instructions in SIMATIC S7)
 - Modbus RTU slave (requires instructions in SIMATIC S7)
 - USS, implemented through instructions
 - DMX512, can be implemented through instructions
- Interface properties
 - RS232 with auxiliary signals
 - RS422 for full-duplex connections
 - RS485 for half-duplex and multi-point connections
 - Transfer rates from 300 to 115 200 bps for RS232 and RS422
 - Transfer rates from 300 to 250 000 bps for RS485
- Frame lengths
 - In universal operation: 2 KB each in send and receive direction
 - In performance-optimized operation: 30 bytes in send direction, 24 bytes in receive direction
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the CM module type: silver
 - Hardware and firmware version
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional system-integrated shield connection

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS ET 200SP CM PtP communications module

With conformal coating (-40 ... +70 °C)
For serial connection with RS-422, RS-485 and RS-232, Freeport, 3964 (R), USS, MODBUS RTU master, slave, max. 250 Kbps, suitable for BU type A0, pack quantity: 1 unit

6AG1137-6AA01-7BA0

Accessories

SIPLUS BaseUnits type A0

(Extended temperature range and exposure to environmental substances)

BU15-P16+A0+2D

6AG1193-6BP00-7DA0

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

BU15-P16+A0+2B

6AG1193-6BP00-7BA0

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

BU15-P16+A10+2D

6AG1193-6BP20-7DA0

BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

BU15-P16+A10+2B

6AG1193-6BP20-7BA0

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC CM PtP, page 10/159

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM PtP serial interface

Technical specifications

Article number	6AG1137-6AA01-7BA0
Based on	6ES7137-6AA01-0BA0 SIPLUS ET 200SP CM PTP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on land craft, rail vehicles and special-purpose vehicles	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1137-6AA01-7BA0
Based on	6ES7137-6AA01-0BA0 SIPLUS ET 200SP CM PTP
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM 4x IO-Link

Overview



- SIPLUS CM 4x IO-Link communications module
Serial communications module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Time-based IO
Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or liquids dosed in precise quantities.
- Supported data transfer rates
 - COM1 (4.8 kBd)
 - COM2 (38.4 kBd)
 - COM3 (230.4 kBd)
- Expansion limits
 - Cable length: Max. 20 m
 - Max. 32 bytes of input and output data per port
 - Max. 144 bytes of input data and 128 bytes of output data per module

- Supported ET 200SP system functions
 - Replacement without PG with automatic backup without the engineering tool of the IO-Link Device Parameter (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
 - Re-parameterization during operation
 - Identification data I&M
 - Firmware update
 - PROFlenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LED displays
 - DIAG: Operating state display (green/red) of the module
 - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
 - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
 - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
 - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color-coding of the module class CM: silver
 - Hardware and firmware version
 - Complete Article No.
- Optional accessories
 - Labeling strips
 - Equipment labeling plate
 - Color-coded label with color code CC04
- Optional system-integrated shield connection

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

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Ordering data

Article No.

SIPLUS CM 4x IO-Link master V1.1 Standard communications module

(Extended temperature range and exposure to environmental substances)

Serial communications module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04

6AG1137-6BD00-2BA0

DALI master module SIPLUS ET 200SP CM DALI

(Extended temperature range and exposure to environmental substances)

Integrated DALI bus power supply, 160 mA, up to 64 operating devices, 63 control units, color code CC20, suitable for BU type U0

6AG1137-6CA00-7BU0

Article No.

Suitable type A0 BaseUnits

BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged UX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A0+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM 4x IO-Link

Ordering data	Article No.	Article No.
BU15-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA0	Accessories SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm 6AG1193-6AA00-0AA0 SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0. Other accessories See SIMATIC CM 4x IO-Link, page 10/163

Technical specifications

Article number	6AG1137-6BD00-2BA0	Article number	6AG1137-6BD00-2BA0
Based on	6ES7137-6BD00-0BA0 SIPLUS ET 200SP CM 4xIO-LINK	Based on	6ES7137-6BD00-0BA0 SIPLUS ET 200SP CM 4xIO-LINK
Ambient conditions		Use on ships/at sea	
Ambient temperature during operation		- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module -40 °C; = Tmin 50 °C; = Tmax		
Altitude during operation relating to sea level		Usage in industrial process technology	
- Installation altitude above sea level, max. - Ambient air temperature-barometric pressure-altitude	5 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Relative humidity		Remark	
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Resistance		Conformal coating	
Coolants and lubricants		- Coatings for printed circuit board assemblies acc. to EN 61086 - Protection against fouling acc. to EN 60664-3 - Military testing according to MIL-I-46058C, Amendment 7 - Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3 - Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM 4x IO-Link

Technical specifications

Article number	6AG1137-6CA00-7BU0
Based on	6ES7137-6CA00-0BU0 SIPLUS ET 200SP CM DALI
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3)
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)

Article number	6AG1137-6CA00-7BU0
Based on	6ES7137-6CA00-0BU0 SIPLUS ET 200SP CM DALI
Use on land craft, rail vehicles and special-purpose vehicles	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75%) incl. salt spray acc. to EN 60068-2-52 (severity degree 3).
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0// 6AG1193-6AB00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS ET 200SP CM CAN

Overview



- For data exchange between an ET 200SP system and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
 - Node / lifeguarding
 - Heartbeat
 - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V15.1 or higher
- CAN connection with push-in terminals
- Integrated CAN bus terminating resistor
- Up to 60 CAN nodes
- 128 receiver and 128 transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Optionally with function block SIMATIC ECC CHAdEMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdEMO standard

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS ET 200SP CM CAN communications module

6AG1137-6EA00-2BA0

With conformal coating, -40...+60 °C

To connect ET 200SP with CAN or CANopen networks CAN 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302

Accessories

Suitable SIPLUS extreme BaseUnits, type A0

BU15-P16+A10+2D

6AG1193-6BP20-7DA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

BU15-P16+A0+2D

6AG1193-6BP00-7DA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

BU15-P16+A10+2B

6AG1193-6BP20-7BA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

BU15-P16+A0+2B

6AG1193-6BP00-7BA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC ET 200SP CM CAN, page 10/167

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS ET 200SP CM CAN

Technical specifications

Article number	6AG1137-6EA00-2BA0
Based on	6ES7137-6EA00-0BA0 SIPLUS ET 200SP CM CAN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1137-6EA00-2BA0
Based on	6ES7137-6EA00-0BA0 SIPLUS ET 200SP CM CAN
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM DP for ET 200SP CPU

Overview



- PROFIBUS DP device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 kbps to 12 Mbps
- Communications services:
 - PROFIBUS DP
 - PG/OP communication
 - S7 communication:

This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data record routing

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS CM DP for ET 200SP CPU

6AG1545-5DA00-2AB0

(Extended temperature range and exposure to environmental substances)

PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

see SIMATIC CM DP, page 10/173

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

I/O modules > Communication > SIPLUS CM DP for ET 200SP CPU

Technical specifications

Article number	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0 SIPLUS ET 200SP CM DP
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-input modules

Overview



SIMATIC ET 200SP Safety F-DI video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6151017420001



Digital fail-safe input module:
F-DI 8x24VDC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integrated discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into Type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

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Ordering data	Article No.	Article No.
Digital F-input modules		
F-DI 8x24VDC High Feature, BU type A0, color code CC01	6ES7136-6BA01-0CA0	
Spare parts		
E-coding elements, type F	6ES7193-6EF00-1AA0	
5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI		
Suitable BaseUnits		
BU15-P16+A10+2D		
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)		
• Pack of 1 unit	6ES7193-6BP20-0DA0	
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-2DA0	
BU15-P16+A10+2B		
BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group		
• Pack of 1 unit	6ES7193-6BP20-0BA0	
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-2BA0	
BU15-P16+A0+2D		
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)		
• Pack of 1 unit	6ES7193-6BP00-0DA0	
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-2DA0	

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-input modules

Ordering data	Article No.		Article No.
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0		Equipment labeling plate 10 sheets of 16 labels 6ES7193-6LF30-0AW0
Accessories S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used Floating license for 1 user, software and documentation on DVD; license key on USB flash drive Floating license for 1 user, software, documentation and license key for download ¹⁾ ; Email address required for delivery	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5		Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AA0 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer 6ES7193-6LR10-0AG0 1000 labeling strips DIN A4, light gray, card, for inscription with laser printer 6ES7193-6LA10-0AA0 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer 6ES7193-6LA10-0AG0
S7 Distributed Safety upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YE5		BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide 6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
STEP 7 Safety Advanced V20 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V20 <u>Note:</u> As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case. Floating license for 1 user; license key on USB flash drive Floating license for 1 user; license key for download ¹⁾ ; Email address required for delivery	6ES7833-1FA24-0YA5 6ES7833-1FA24-0YH5		Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding 6ES7193-6SC20-1AM0
			Color-coded labels • Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units • Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units • Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units • Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units • Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units 6ES7193-6CP01-2MA0 6ES7193-6CP01-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-input modules

Technical specifications

Article number	6ES7136-6BA00-0CA0 ET 200SP, EI-Mod., F-DI 8x24VDC HF	6ES7136-6BA01-0CA0 ET 200SP, F-DI 8x24V DC HF
General information		
Product type designation	F-DI 8x24VDC HF	F-DI 8x24VDC HF
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V12	SIMATIC Safety V17 with HSP 0360 or higher
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -	as 6ES7136-6BA00-0CA0
• PROFINET from GSD version/ GSD revision	V2.31	GSDML V2.35
Operating mode		
• DI		Yes
• Counter		Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Encoder supply		
Number of outputs	8	8
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)	
Output current		
• up to 60 °C, max.	0.3 A	
24 V encoder supply		
• 24 V	Yes; min. L+ (-1.5 V)	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes	Yes; Electronic (response threshold 0.7 A to 1.8 A)
• Output current, max.	800 mA; Total current of all encoders	
• Output current per channel, max.		300 mA
• Output current per module, max.		800 mA; Total current of all encoders
Digital inputs		
Number of digital inputs	8	8
Digital inputs, parameterizable		Yes
Source/sink input	Yes; P-reading	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Digital input functions, parameterizable		
• Counter		Yes
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+15 to +30 V	+15 to +30 V
Input current		
• for signal "1", typ.	3.7 mA	3.7 mA
Input delay (for rated value of input voltage)		
for standard inputs		
- parameterizable	Yes	Yes
for technological functions		
- parameterizable	No	No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-input modules

Technical specifications

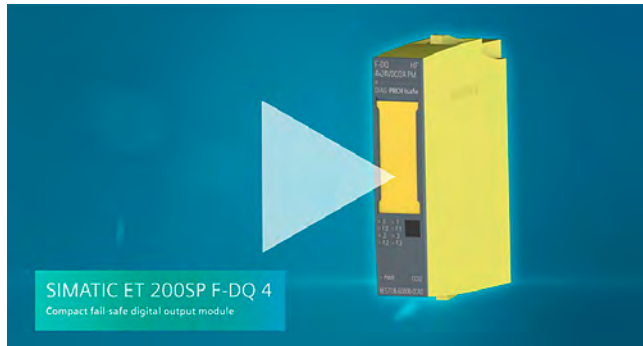
Article number	6ES7136-6BA00-0CA0 ET 200SP, EI-Mod., F-DI 8x24VDC HF	6ES7136-6BA01-0CA0 ET 200SP, F-DI 8x24V DC HF
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Hardware interrupt	No	No
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	Yes	Yes
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	4 000 m; Restrictions for installation altitudes > 2 000 m, see manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	49 g	29 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

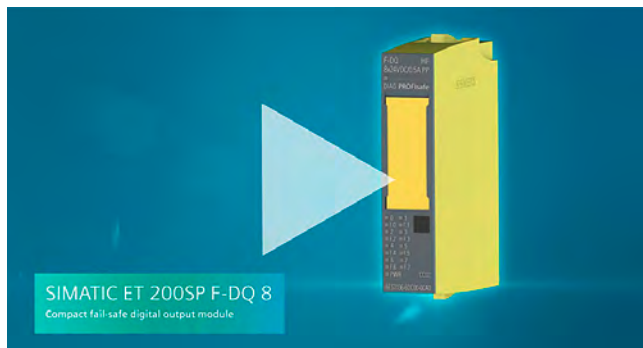
Fail-safe I/O modules > Digital F-output modules

Overview



SIMATIC ET 200SP Safety F-DQ 4 video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6154332510001



SIMATIC ET 200SP Safety F-DQ 8 video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6154329323001



Digital fail-safe output modules:

- F-DQ 4x24VDC/2A PM High Feature
- F-DQ 8x24VDC/0.5A PP High Feature

Important properties:

- 4 and 8-channel digital fail-safe output modules for the ET 200SP
- Fail-safe 2-channel activation (switching to P/M potential or switching to P/P potential) of actuators
- Actuators can be controlled up to 2 A or 0.5 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the DQ module type: black
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Ordering data	Article No.	Article No.
Digital F-output modules F-DQ 4X24 V DC/2A, 15 mm width, up to PL E (ISO 13849) up to SIL 3 (IEC 61508) F-DQ 4x24 V DC/2 AHF, 15 mm width, up to PL e (ISO 13849), up to SIL 3 (IEC 61508) F-DQ 8x24VDC/0.5A PP HF, 15 mm width, up to PL E (ISO 13849) up to SIL 3 (IEC 61508)	6ES7136-6DB00-0CA0 6ES7136-6DB01-0CA0 6ES7136-6DC00-0CA0	Accessories S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used Floating license for 1 user, software and documentation on DVD; license key on USB flash drive Floating license for 1 user, software, documentation and license key for download ¹⁾ ; Email address required for delivery
Spare parts E-coding elements, type F 5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI	6ES7193-6EF00-1AA0	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5
Suitable BaseUnits BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	S7 Distributed Safety upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	STEP 7 Safety Advanced V20 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco Requirement: STEP 7 Professional V20 Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	Floating license for 1 user; license key on USB flash drive Floating license for 1 user, license key for download ¹⁾ ; Email address required for delivery
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	6ES7833-1FA24-0YA5 6ES7833-1FA24-0YH5
BU20-P12+A4+0B BU type B0; BaseUnit (dark) with 12 process terminals (1 ... 12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group	6ES7193-6BP20-0BB0	

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Ordering data	Article No.	Article No.
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0	Color-coded labels - Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units - Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units - Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units - Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units - Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0	
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0	
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0	
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0	
BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0	6ES7193-6CP02-2MA0 6ES7193-6CP02-4MA0 6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0
Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0	

Technical specifications			
Article number	6ES7136-6DB00-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DB01-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x24VDC/0.5A PP HF
General information			
Product type designation	F-DQ 4x24VDC/2A PM HF	F-DQ 4x 24 V DC/2 A PM HF	F-DQ 8x24 V DC/0.5 A PP HF
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version	V12		V14 SP1 with HSP 202
• STEP 7 configurable/ integrated from version	V5.5 SP3 / -		V5.5 SP4 HF5
• PROFINET from GSD version/ GSD revision	V2.31	GSDML V2.45	V2.31
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Digital outputs			
Type of digital output	Transistor	Transistor	Transistor
Number of digital outputs	4	4	8
Digital outputs, parameterizable	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes
Open-circuit detection	Yes	Yes	No
Overload protection	Yes	Yes	
Limitation of inductive shutdown voltage to	Typ. -2x 47 V	sourcing output: -39 V DC in relation to 2M, sinking output: +47 V DC in relation to 2M	Typ. -39 V
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2	Yes; digital output, according to IEC 61131-2, type 2	Yes; digital output, according to IEC 61131-2, type 0.5
Switching capacity of the outputs			
• with resistive load, max.	2 A	2 A	0.5 A
• on lamp load, max.	10 W	10 W	2 W
Load resistance range			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	2 000 Ω	2 000 Ω	12 000 Ω

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules

Technical specifications

Article number	6ES7136-6DB00-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DB01-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x24VDC/0.5A PP HF
Output voltage • for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
Output current • for signal "1" rated value • for signal "0" residual current, max.	2 A 0.5 mA	2 A 0.5 mA	0.5 A 0.5 mA
Switching frequency • with resistive load, max. • with inductive load, max. • with capacitive load, max. • on lamp load, max.	30 Hz; Symmetrical 0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical 10 Hz; Symmetrical	30 Hz; Symmetrical 0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical 30 Hz; observe chapter "Switching of capacitive loads" in the manual 10 Hz; Symmetrical	30 Hz; Symmetrical 0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical 2 Hz; Symmetrical 10 Hz; Symmetrical
Total current of the outputs • Current per channel, max. • Current per module, max.	2 A; note derating data in the manual 6 A; note derating data in the manual	2 A; note derating data in the manual 6 A; note derating data in the manual	0.5 A; note derating data in the manual 3 A; note derating data in the manual
Total current of the outputs (per module) horizontal installation - up to 40 °C, max. - up to 50 °C, max. - up to 60 °C, max. vertical installation - up to 50 °C, max.			3 A 2.5 A 2 A 2 A
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable	No	No	No
Alarms • Diagnostic alarm • Hardware interrupt	Yes Yes	Yes No	Yes
Diagnostics indication LED • RUN LED • ERROR LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics	Yes; green LED Yes; red LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED	Yes; green LED Yes; red LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED	Yes; green LED Yes; red LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED
Potential separation Potential separation channels • between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates Suitable for safety functions	Yes	Yes	Yes
Highest safety class achievable in safety mode • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508	PLe SIL 3	PLe SIL 3	PLe SIL 3
Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max.	0 °C 60 °C 0 °C 50 °C	0 °C 60 °C 0 °C 50 °C	0 °C 60 °C 0 °C 50 °C
Altitude during operation relating to sea level • Installation altitude above sea level, max.	4 000 m; Restrictions for installation altitudes > 2 000 m, see manual	4 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	4 000 m; with derating

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Digital F-output modules**Technical specifications**

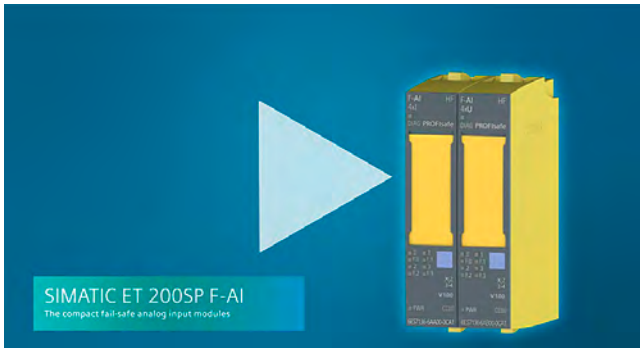
Article number	6ES7136-6DB00-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DB01-0CA0 ET 200SP, F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 ET 200SP, F-DQ 8x24VDC/0.5A PP HF
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	57 g	30 g	48 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

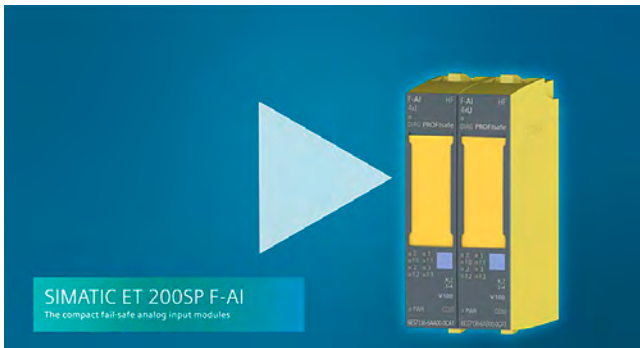
Fail-safe I/O modules > Analog F-input modules

Overview



SIMATIC ET 200SP Safety F-AI-4xU video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6204918698001



SIMATIC ET 200SP Safety F-AI-4xI video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6204919583001



Analog fail-safe input modules:

- F-AI 4xI 0(4)..20 mA 2/4-wire High Feature for BU types A0 and A1, color code CC00
- F-AI 4xU 0..10 V HF, BU type A0, A1, color code CC00

Important features:

- 4-channel analog fail-safe digital inputs for ET 200SP
- 4 analog inputs with galvanic isolation between channels and backplane bus
- Measuring ranges: (0)4...20 mA and 0..10 V
- Possibility of connecting current and voltage sensors for measuring temperature, pressure, flow, level, distance measurement, etc.
- Short-circuit-proof power supply for analog sensors
- Resolution: 16 bits including sign
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)
- LED display for error, operation, supply voltage and status
- Interference frequency suppression, smoothing
- Diagnostics: wire break, short-circuit, high/low limit violation
- Firmware update
- Identification data I&M
- Value status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Analog F-input modules

Ordering data	Article No.		Article No.
Analog F-input module		BU15-P16+A0+12B/T	6ES7193-6BP40-0BA1
F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00	6ES7136-6AA00-0CA1	BU type A1; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
F-AI 4xU 0...10 V High Feature, BU type A0, A1, color code CC00	6ES7136-6AB00-0CA1		
Spare parts		BU15-P16+A0+2B/T	6ES7193-6BP00-0BA1
E-coding elements, type F	6ES7193-6EF00-1AA0	BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	
5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI		Accessories	
5x e-coding elements, type H	6ES7193-6EH00-1AA0	STEP 7 Safety Advanced V20	
5 units, for ET 200SP F-AI 4xU, F-TM Count, F-CM AS-i		Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe I/O ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco	
Suitable BaseUnits		Requirement: STEP 7 Professional V20	
BU15-P16+A10+2D		Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.	
BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	6ES7193-6BP20-0DA0 6ES7193-6BP20-2DA0	Floating license for 1 user; license key on USB flash drive	6ES7833-1FA24-0YA5
• Pack of 1 unit		Floating license for 1 user; license key for download ¹⁾ ; Email address required for delivery	6ES7833-1FA24-0YH5
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.			
BU15-P16+A0+2D		Equipment labeling plate	6ES7193-6LF30-0AW0
BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6ES7193-6BP00-0DA0 6ES7193-6BP00-2DA0	10 sheets of 16 labels	
• Pack of 1 unit		Labeling strips	
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
BU15-P16+A10+2B		500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
BU type A0; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	6ES7193-6BP20-0BA0 6ES7193-6BP20-2BA0	1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0
• Pack of 1 unit		1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		BU cover	
BU15-P16+A0+2B		For covering empty slots (gaps); 5 units	6ES7133-6CV15-1AM0
BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6ES7193-6BP00-0BA0 6ES7193-6BP00-2BA0	• 15 mm wide	
• Pack of 1 unit		Shield connection	6ES7193-6SC20-1AM0
• Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.		5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
BU15-P16+A0+12D/T	6ES7193-6BP40-0DA1		
BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)			
BU15-P16+A0+2D/T	6ES7193-6BP00-0DA1		
BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)			

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Analog F-input modules

Ordering data

Article No.

Article No.

Color-coded labels

- Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); A1; 10 units

6ES7193-6CP00-2MA0

- Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); A1; 50 units

6ES7193-6CP00-4MA0

Technical specifications

Article number	6ES7136-6AA00-0CA1 ET 200SP, F-AI 4XI 0(4)..20mA HF	6ES7136-6AB00-0CA1 ET 200SP, F-AI 4xU 0..10V HF
General information		
Product type designation	F-AI 4xI 0(4)..20mA 2-/4-wire HF	F-AI 4xU 0..10V HF
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V15 with HSP 203	V16 with HSP 308
Operating mode		
• cyclic measurement		Yes
• Oversampling		No
• MSI		No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Analog inputs		
Number of analog inputs	4	4
• For current measurement	4	
• For voltage measurement		4
permissible input voltage for voltage input (destruction limit), max.		36 V
permissible input current for current input (destruction limit), max.	35 mA	
Input ranges (rated values), voltages		
• 0 to +10 V		Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Cable length		
• shielded, max.	1 000 m	200 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	20 / 16,667	20 / 16,667
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz	50 / 60 Hz
Smoothing of measured values		
• Number of smoothing levels	7	7
• parameterizable	Yes	Yes
• Average value filter		Yes
Encoder		
Connection of signal encoders		
• for voltage measurement		Yes
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	650 Ω	
• for current measurement as 4-wire transducer	Yes	

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SIMATIC ET 200SP

Fail-safe I/O modules > Analog F-input modules

Technical specifications

Article number	6ES7136-6AA00-0CA1 ET 200SP, F-AI 4XI 0(4)..20mA HF	6ES7136-6AB00-0CA1 ET 200SP, F-AI 4xU 0..10V HF
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)		0.1 %
• Current, relative to input range, (+/-)	0.1 %	
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 = \text{interference frequency}$		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode voltage, max.		10 V
• Common mode interference, min.	70 dB	70 dB
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	No	No
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes	
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)		
- Low demand mode: PFDavg in accordance with SIL3	< 5.00E-05	< 5.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h	< 1.00E-09 1/h
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	48 g	48 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Special fail-safe modules

Overview



SIMATIC ET 200SP Safety F-PM-E video
https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6154262749001



Digital fail-safe power module:
F-PM-E PPM 24 VDC/8A for BU type C0,
color code CC52

Important properties:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (switching to PPM potential, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply switching to PP or PM potential can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC 61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Special fail-safe modules

Ordering data	Article No.		Article No.
F-PM-E 24 VDC/8A PPM Standard digital F power module BU type C0, color code CC52. 2 inputs, 1 output, SIL 3/Cat. 4/PL e	6ES7136-6PA00-0BC0	BU cover For covering empty slots (gaps); 5 units • 20 mm wide	6ES7133-6CV20-1AM0
Spare parts		Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0
E-coding elements, type F 5 units, for ET 200SP F-DI, F-DQ, F-PM E, F-AI 4xI	6ES7193-6EF00-1AA0	Color-coded labels • Color code CC52, module-specific, for 8 push-in terminals; 10 units	6ES7193-6CP52-2MC0
Suitable BaseUnits		Mechanical coding elements For automatic coding of I/O modules; spare part. 20 units	
Type C0 BaseUnits		Type A	6ES7193-6KA00-3AA0
BU20-P6+A2+4D BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	6ES7193-6BP20-0DC0	Type B	6ES7193-6KB00-3AA0
Accessories		Type C	6ES7193-6KC00-3AA0
Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0	Type D	6ES7193-6KD00-3AA0
Labeling strips 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0		

Technical specifications

Article number	6ES7136-6PA00-0BC0 ET 200SP, F-PM-E PPM, 24V DC
General information	
Product type designation	F-PM-E 24 V DC/8 A PPM ST
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V12
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFINET from GSD version/GSD revision	V2.31
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	2
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	600 mA; Total current of all encoders
Digital inputs	
Number of digital inputs	2
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes

Article number	6ES7136-6PA00-0BC0 ET 200SP, F-PM-E PPM, 24V DC
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes
for technological functions	
- parameterizable	No
Digital outputs	
Number of digital outputs	1
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	Max. -1.5 V
Switching capacity of the outputs	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
Load resistance range	
• lower limit	3 Ω
• upper limit	2 000 Ω

I/O systems

SIMATIC ET 200 systems for the control cabinet

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Fail-safe I/O modules > Special fail-safe modules

Technical specifications

Article number	6ES7136-6PA00-0BC0 ET 200SP, F-PM-E PPM, 24V DC
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	8 A
• for signal "0" residual current, max.	1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
Switching frequency	
• with resistive load, max.	10 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
Total current of the outputs	
• Current per channel, max.	8 A; note derating data in the manual
• Current per module, max.	8 A; note derating data in the manual
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; See Chapter "Alarms/diagnostic messages" in the manual
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED

Article number	6ES7136-6PA00-0BC0 ET 200SP, F-PM-E PPM, 24V DC
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL2	< 2.00E-04
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL2	< 1.00E-08 1/h
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	70 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe technology modules

Overview



Fail-safe technology module:
F-TM Count, 1x1Vpp sin/cos High Feature for BU type A0,
color code CC00

Important properties:

- Technological, fail-safe counter module for ET 200SP
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- 1x sin/cos interface for recording sin/cos differential encoder signals A, A/, B, B/, N and N/
- Option to connect sin/cos differential encoders
- Short-circuit-proof 5 V DC encoder supply
- High-speed count input up to 200 kHz
- Counting range: 32-bit (-2.147.483.648 to +2.147.483.647)
- SW gate for counter control

- Measured values:
 - Speed
 - Frequency
 - Period duration
- Integrated safety functions:
 - SOS (Safe Operation Stop)
 - SLS (Safely Limited Speed)
 - SDI (Safe Direction)
- Can be plugged onto type A0 BaseUnits (BU)
- LED display for error, operation, supply voltage and status
- Monitoring of encoder signals for wire break, short-circuit and signal strength
- Firmware update
- Identification data I&M
- Value status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories:
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

Ordering data

Article No.

**F-TM Count
fail-safe technology module**
1 x 1Vpp sin/cos High Feature,
BU type A0, color code CC00

6ES7136-6CB00-0CA0

Spare parts

E-coding elements, type H

5 units, for ET 200SP F-AI 4xU,
F-TM Count, F-CM AS-i

6ES7193-6EH00-1AA0

Suitable BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with
16 process terminals (1 ... 16)
to the module and an additional
10 internally jumpered
AUX terminals (1 A to 10 A);
for starting a new load group
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

**6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0**

Article No.

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with
16 process terminals to the module;
for starting a new load group
(max. 10 A)

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

**6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0**

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with
16 process terminals (1 ... 16)
to the module and an additional
10 internally jumpered
AUX terminals (1 A to 10 A);
for continuing the load group

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

**6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0**

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with
16 process terminals to the module;
for continuing the load group

- Pack of 1 unit
- Pack of 10 units;
to order a pack, please order this
Article No. with an order
quantity of 10.

**6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0**

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe technology modules

Ordering data	Article No.		Article No.
Accessories		Equipment labeling plate	6ES7193-6LF30-0AW0
S7 Distributed Safety V5.4 SP5 Update 2 programming tool		10 sheets of 16 labels	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP		Labeling strips	
Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used		500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AA0
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YA5	500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	6ES7193-6LR10-0AG0
Floating license for 1 user, software, documentation and license key for download ¹⁾ ; Email address required for delivery	6ES7833-1FC02-0YH5	1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	6ES7193-6LA10-0AA0
S7 Distributed Safety upgrade		1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	6ES7193-6LA10-0AG0
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FC02-0YE5	BU cover	
STEP 7 Safety Advanced V20		For covering empty slots (gaps); 5 units	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O		Shield connection	6ES7193-6SC20-1AM0
Requirement: STEP 7 Professional V20		5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	
Note: As of TIA Portal V16, the SIMATIC STEP 7 Safety software is an integral component of the SIMATIC STEP 7 product setup. The functionality of SIMATIC STEP 7 Safety is activated by means of the license key supplied in each case.		Color-coded labels	
Floating license for 1 user; license key on USB flash drive	6ES7833-1FA24-0YA5	• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	6ES7193-6CP01-2MA0
Floating license for 1 user; license key for download ¹⁾ ; Email address required for delivery	6ES7833-1FA24-0YH5	• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	6ES7193-6CP01-4MA0
		• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	6ES7193-6CP71-2AA0
		• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	6ES7193-6CP72-2AA0
		• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	6ES7193-6CP73-2AA0

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe technology modules

Technical specifications

Article number	6ES7136-6CB00-0CA0 ET 200SP, F-TM Count 1x1Vpp sin/cos HF
General information	
Product type designation	F-TM Count 1x1Vpp sin/cos HF
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	Step 7 V17 or higher: use GSDML for prior versions
Supply voltage	
Rated value (DC)	24 V
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
5 V encoder supply	
• 5 V	Yes; 5.1 V $\pm 3.5\%$
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	1; (counter input)
Digital inputs, parameterizable	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Counter for incremental encoder	Yes
- Number, max.	1
Input voltage	
• Type of input voltage	sin/cos 1 Vpp
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	2.5 μ s for parameterization "none"
for technological functions	
- parameterizable	Yes
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; up to 200 kHz depending on cable type and length
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	1 Vpp, centered at 2.5 V offset
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	150 m
• Incremental encoder with A/B tracks, 90° phase offset	Yes; sin/cos
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes; sin/cos/zero

Article number	6ES7136-6CB00-0CA0 ET 200SP, F-TM Count 1x1Vpp sin/cos HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; see chapter "Diagnostic Messages" in the manual
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	800 kHz; with quadruple evaluation
Safety monitoring functions	
• Safe Operating Stop (SOS)	Yes
• Safely-Limited Speed (SLS)	Yes
• Safe Direction (SDI)	Yes
• Safe Speed Monitor (SSM)	Yes
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Software gate	Yes
• Counting range, parameterizable	Yes
Measuring functions	
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz; with quadruple evaluation
- Cycle duration measurement, min.	1 μ s
- Cycle duration measurement, max.	25 s
- Velocity measurement, min.	0 (speed in configured units per selected time basis - speed*1 000)
- Velocity measurement, max.	2 147 483 (speed in configured units per selected time basis - speed*1 000)

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe technology modules

Technical specifications

Article number	6ES7136-6CB00-0CA0 ET 200SP, F-TM Count 1x1Vpp sin/cos HF
Accuracy	
- Frequency measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Cycle duration measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
- Velocity measurement	up to 100 ppm; depending on measuring interval and signal evaluation; at low frequency external noise may have an effect on accuracy (reference the graph in 2.2.3)
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Cat. 4, PLe
• SIL acc. to IEC 61508	SIL 3

Article number	6ES7136-6CB00-0CA0 ET 200SP, F-TM Count 1x1Vpp sin/cos HF
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	42 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-input modules

Overview



Digital fail-safe input module:
F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important properties:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS digital F-input modules

(Extended temperature range and exposure to environmental substances)

F-DI 8x24VDC High Feature,
BU type A0, color code CC01

-40...+60 °C

6AG1136-6BA01-2CA0

Suitable BaseUnits

BU15-P16+A0+2D

6AG1193-6BP00-7DA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

BU15-P16+A0+2B

6AG1193-6BP00-7BA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

BU15-P16+A10+2D

6AG1193-6BP20-7DA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

BU15-P16+A10+2B

6AG1193-6BP20-7BA0

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC ET 200SP, Digital F-input modules, page 10/212

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-input modules

Technical specifications

Article number	6AG1136-6BA01-2CA0
Based on	6ES7136-6BA01-0CA0 SIPLUS ET 200SP F-DI 4/8x24VDC HF
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on land craft, rail vehicles and special-purpose vehicles	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1136-6BA01-2CA0
Based on	6ES7136-6BA01-0CA0 SIPLUS ET 200SP F-DI 4/8x24VDC HF
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-output modules

Overview



Digital fail-safe output module:
F-DQ 4x24VDC High Feature, BU type A0, color code CC01

Important properties:

- 4-channel digital fail-safe output module for the ET 200SP
- Fail-safe 2-channel activation (switching to P/M potential) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS digital F-output modules

(Extended temperature range and exposure to environmental substances)

F-DQ 4x24VDC High Feature, BU type A0, color code CC01

6AG1136-6DB00-2CA0

F-DQ 8x24VDC High Feature, switching to PP potential, BU type A0, color code CC01

6AG1136-6DC00-2CA0

Suitable BaseUnits

BU15-P16+A0+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

BU20-P12+A4+0B

(Extended temperature range and exposure to environmental substances)

BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group; 1 unit

6AG1193-6BP20-7BB0

Accessories

SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm

6AG1193-6AA00-0AA0

SIPLUS Mounting Kit ET 200SP with maximum width of 19"

6AG1193-6AB00-0AA0

Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0.

Other accessories

See SIMATIC ET 200SP, Digital F-output modules, page 10/216

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-output modules

Technical specifications

Article number	6AG1136-6DB00-2CA0	6AG1136-6DC00-2CA0
Based on	6ES7136-6DB00-0CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
Ambient conditions		
Ambient temperature during operation		
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-30 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module -30 °C; = Tmin 50 °C; = Tmax	-30 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module -30 °C; = Tmin 50 °C; = Tmax
Altitude during operation relating to sea level		
- Installation altitude above sea level, max. - Ambient air temperature-barometric pressure-altitude	4 000 m Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992	4 000 m Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3 - Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust, * Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on land craft, rail vehicles and special-purpose vehicles		
- Against mechanical environmental conditions acc. to EN 60721-3-5 - against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0) Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6 - Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; * Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-output modules

Technical specifications

Article number	6AG1136-6DB00-2CA0	6AG1136-6DC00-2CA0
Based on	6ES7136-6DB00-0CA0 SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	6ES7136-6DC00-0CA0 SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-output module relay

Overview



- The 1 F-RQ digital F electronic module relay DC 24VDC/24.230VAC/5 A has the following characteristics:
- 1 relay output (2 NO contacts)
 - Total output current 5 A
 - Rated load voltage 24 V DC and 24 ... 230 V AC
 - The control circuit of the two safety relays must be routed from the outside to the respective terminals

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS 1 F-RQ digital F-output module relay (Extended temperature range and exposure to environmental substances) BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Category 4/PL e if controlled via F-DQ	6AG1136-6RA00-2BF0
Suitable BaseUnits BU20-P8+A4+0B (Extended temperature range and exposure to environmental substances) BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group	6AG1193-6BP20-2BF0
Accessories	See SIMATIC ET 200SP, Digital F-output module relay, page 10/220

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS digital F-output module relay

Technical specifications

Article number	6AG1136-6RA00-2BF0
Based on	6ES7136-6RA00-0BF0 SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1136-6RA00-2BF0
Based on	6ES7136-6RA00-0BF0 SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS analog F-input modules

Overview



Analog fail-safe input module:
SIPLUS F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature
for BU type A0 and A1, color code CC00

F-AI 4xU 0..10 V High Feature, BU type A0, A1, color code CC00

Important properties:

- 4 analog inputs with galvanic isolation between channels and backplane bus (up to SIL 3/Cat. 4/PL d)
- Short-circuit proof power supply of 2 or 4-wire transducers
- Measuring ranges: 0 ... 20 mA and 4 ... 20 mA
- Resolution: 16 bits including sign
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)

- LED display for error, operation, supply voltage and status
- Interference frequency suppression, smoothing
- Diagnostics: wire break, short-circuit, high/low limit violation
- Firmware update
- Identification data I&M
- Value status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color coding of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFI-safe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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Ordering data

Article No.

Article No.

SIPLUS analog F-input module

(Extended temperature range and exposure to environmental substances)

F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00

6AG1136-6AA00-2CA1

F-AI 4xU 0..10 V High Feature, BU type A0, A1, color code CC00

6AG1136-6AB00-2CA1

Suitable BaseUnits

BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A0+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

BU15-P16+A0+12D/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)

6AG1193-6BP40-7DA1

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS analog F-input modules

Ordering data	Article No.		Article No.
BU15-P16+A0+2D/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DA1	BU15-P16+A0+2B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BA1
BU15-P16+A0+12B/T (Extended temperature range and exposure to environmental substances) BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	6AG1193-6BP40-7BA1	Accessories SIPLUS Mounting Kit ET 200SP Mounting accessories for use with increased mechanical vibration and shock loads. Other accessories	6AG1193-6AA00-0AA0 See SIMATIC ET 200SP, Analog F-input modules, page 10/223

Technical specifications

Article number	6AG1136-6AA00-2CA1	6AG1136-6AB00-2CA1
Based on	6ES7136-6AA00-0CA1 SIPLUS ET 200SP F-AI 4x1 2-/4-wire HF	6ES7136-6AB00-0CA1 SIPLUS ET 200SP F-AI 4xU 0...10V HF
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	4 000 m	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on land craft, rail vehicles and special-purpose vehicles		
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS analog F-input modules

Technical specifications

Article number	6AG1136-6AA00-2CA1	6AG1136-6AB00-2CA1
Based on	6ES7136-6AA00-0CA1 SIPLUS ET 200SP F-AI 4xI 2-/4-wire HF	6ES7136-6AB00-0CA1 SIPLUS ET 200SP F-AI 4xU 0..10V HF
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS special fail-safe modules

Overview



Digital fail-safe power module:
F-PM-E PPM 24 V DC/8 A for BU type C0,
color code CC52

Important properties:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (switching to PPM potential, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply switching to PP or PM potential can be parameterized

- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
 - Plain text identification of the module type and function class
 - 2D matrix code (order and serial number)
 - Connection diagram
 - Color coding of the module type DI: white
 - Hardware and firmware version
 - Color code CC for module-specific color coding of the potentials at the terminals of the BU
 - Complete Article No.
- Optional labeling accessories
 - Labeling strips
 - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

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Ordering data	Article No.	Article No.
SIPLUS F-PM-E 24VDC/8A PPM Standard digital F-power module (Extended temperature range and exposure to environmental substances) BU type C0, color code CC52. 2 inputs, 1 output, SIL 3/Cat. 4/PL e	6AG1136-6PA00-2BC0	Accessories SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm 6AG1193-6AA00-0AA0
Type C0 BaseUnits BU20-P6+A2+4D (Extended temperature range and exposure to environmental substances) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	6AG1193-6BP20-7DC0	SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1, without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0. 6AG1193-6AB00-0AA0
		Other accessories See SIMATIC ET 200SP, Special fail-safe modules, page 10/227

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Fail-safe I/O modules > SIPLUS special fail-safe modules

Technical specifications

Article number	6AG1136-6PA00-2BC0
Based on	6ES7136-6PA00-0BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; +70 °C with spacing modules (6AG1193-6BN00-7BA0) or configured slots to the left and right of the module
• vertical installation, min.	-30 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	4 000 m
• Ambient air temperature-barometric pressure-altitude	Restrictions for installation altitudes > 2 000 m, see entry ID: 109771992
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on land craft, rail vehicles and special-purpose vehicles	
- Against mechanical environmental conditions acc. to EN 60721-3-5	Yes; Class 5M2 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
- against mechanical environmental conditions in agriculture acc. to ISO 15003	Yes; level 1 (Location LE) using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)

Article number	6AG1136-6PA00-2BC0
Based on	6ES7136-6PA00-0BC0 SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Dimensions	
Width	20 mm
Height	72 mm
Depth	55 mm
Weights	
Weight, approx.	70 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe communication > F-CM AS-i Safety ST for SIMATIC ET 200SP

Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

More information

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/90265988>

SIMATIC ET200SP Manual Collection, see <https://support.industry.siemens.com/cs/ww/en/view/84133942>

Diagnostics blocks with visualization, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>

Released combinations of the AS-i modules for ET 200SP, see <https://support.industry.siemens.com/cs/ww/en/view/103624653>

AS-Interface I/O modules and other AS-Interface system components see Catalog IC 10, <https://www.siemens.com/ic10>

More information see <https://www.siemens.com/as-interface>

The F-CM AS-i Safety ST fail-safe communications module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communications module for the ET 200SP
 - 31 fail-safe input channels in the process image
 - 16 fail-safe output channels in the process image
 - Certified up to SIL 3 (IEC 62061)/PL e (ISO 13849-1)
 - Parameterization conforms with other Failsafe I/O modules of the ET 200SP
- The communications module supports PROFIsafe in PROFINET and PROFIBUS configurations. Can be used with fail-safe SIMATIC S7-400F CPUs and S7-1500F CPUs and also the Failsafe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F, 1512SP F, 1514SP F or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
 - Two sensor inputs/signals for each fail-safe AS-i input slave
 - Adjustable evaluation of sensor signals: 2-channel or 2 x 1-channel
 - Integrated discrepancy evaluation in the case of 2-channel signals
 - Integrated AND operation in the case of 2 x 1-channel signals
 - Input delay configurable
 - Start-up test can be set
 - Sequence monitoring can be activated

- For control of up to 16 fail-safe AS-i output circuit groups
 - The output circuit groups are controlled independently of one another.
 - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously).
 - The F-CM AS-i Safety ST module transmits the switching command of the output circuit group to the AS-i cable. A safe AS-i output module that is installed at any point on the AS-i cable receives the switching command and switches the actuator (e.g. contactor).
 - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element
- Comprehensive diagnostic options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Informative automatic alarm indications
- Supply via AS-Interface voltage
- Eight LED displays for diagnostics, operating state, fault indication and supply voltage
- Informative module inscription on the front
 - Plain-text marking of the module type and function class
 - 2D matrix code (article number and serial number)
 - Circuit diagram
 - Color coding module type communications module: light gray
 - Hardware and firmware version
 - Supported BaseUnit type BU: C1, C0

Design

The fail-safe F-CM AS-i Safety ST module has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i specification V3.0 and safe AS-i input slaves and/or safe AS-i output modules are needed for operation. The CM AS-i Master ST communications module (article number 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, see [page 10/169 onwards](#).

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-related gateway between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.



Combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe communication > F-CM AS-i Safety ST for SIMATIC ET 200SP

With the digital and analog I/O modules of the ET 200SP, additional local inputs and outputs can be realized so as to ensure that the modular AS-i gateway complies precisely with customer requirements. Expansion variants for almost every application are possible thanks to the selection of standard and Failsafe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.

Supported BaseUnits

With the combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, immediately to the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens products and solutions represent one component of such a concept.

For more information on industrial cybersecurity, see <https://www.siemens.com/cybersecurity-industry>.

Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (TIA Portal) and Safety Advanced or
- STEP 7 (Classic) and Distributed Safety or F-Configuration Pack SP11 or SIMATIC S7 F/FH systems

In other PROFIsafe-enable systems, configuration via GSD is possible. Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

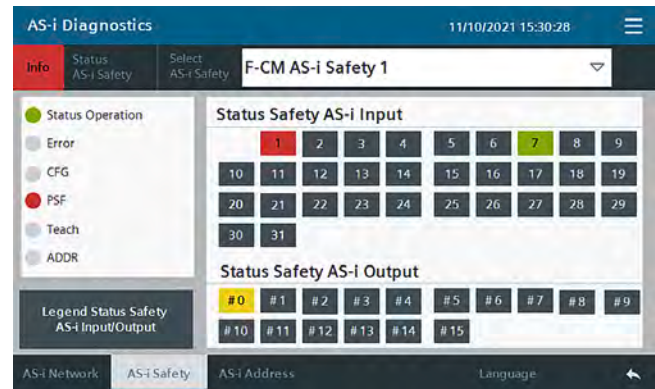
Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

The input and output channels are assigned to the process image automatically and manual linking via configuration blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see <https://support.industry.siemens.com/cs/ww/en/view/109479103>.



Diagnostics block for F-CM AS-i Safety ST

Application

Thanks to use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFIsafe.

The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety, S7 F/FH Systems or Safety Advanced. The fail-safe input signals of the ASIsafe input modules are read via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

The fail-safe F-CM AS-i Safety ST module can be configured independently of the AS-i master. In this way, the F-CM AS-i Safety ST module can be connected to any AS-i network as required to evaluate the Safety data of the safe AS-i input modules and forward them to the F-CPU. In this case, the fail-safe module is plugged into a light BaseUnit of type C0.

The fail-safe output signals can be output via safe SIMATIC output modules or also directly via fail-safe AS-i output modules. No special functions are required for this in the program.

Together with an ET 200SP station with ET 200SP F-CPU 1510SP F, 1512SP F, 1514SP F or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

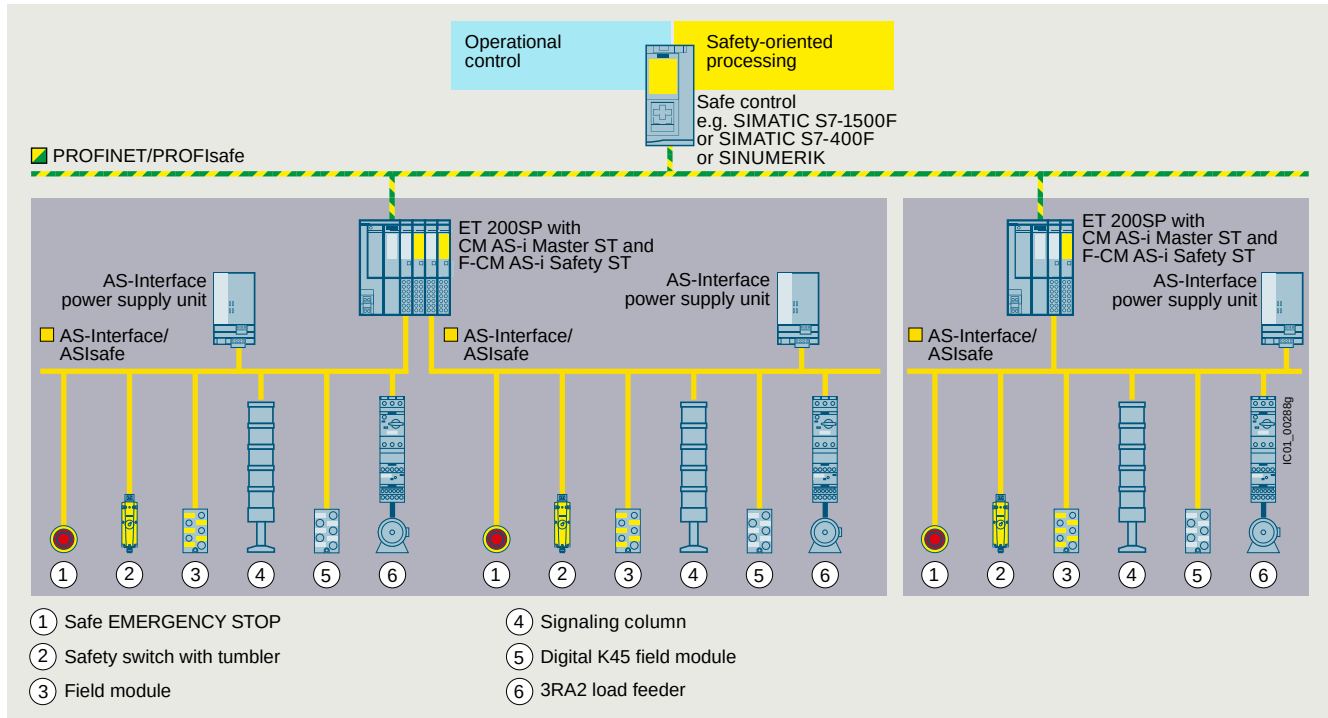
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Fail-safe I/O modules > Fail-safe communication > F-CM AS-i Safety ST for SIMATIC ET 200SP

Configuration examples of AS-Interface networks with CM AS-i Master ST and F-CM AS-i Safety ST for SIMATIC ET 200SP



AS-Interface configuration comprising an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

Ordering data

Article No.

F-CM AS-i Safety ST communications module

- Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0)
- Operation requires an AS-i master, e.g. CM AS-i Master ST (see [page 10/169 onwards](#))
- Can be used up to SIL 3 (IEC 62061)/PL e (ISO 13849-1)
- Coding element type H (included in scope of supply)
- Dimensions (W x H x D) mm: 20 x 73 x 58

3RK7136-6SC00-0BC1

Article No.

Accessories

BaseUnit BU20-P6+A2+4B

- BaseUnit (dark), BU type C1
- Suitable for the F-CM AS-i Safety ST fail-safe communications module
- Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module
- With spring-loaded terminals

6ES7193-6BP20-0BC1

Coding elements type H (spare part)

- For the ET 200SP modules F-CM AS-i Safety ST and CM 4xIO-Link
- With spring-loaded terminals
- Packing unit 5 items

6ES7193-6EH00-1AA0

More accessories

see CM AS-i Master ST communications module, [page 10/172](#)

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Ex I/O modules

Overview



ET200SP_Ex_IO_withPM

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1. 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and Configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

Ordering data

Article No.

SIMATIC ET 200SP HA Ex digital modules

Digital Ex-i input module, Ex-DI 4xNAMUR

Suitable for BaseUnit type X1,
channel diagnostics

6DL1131-6TD00-0HX1

Digital Ex-i output module, Ex-DQ 2x23,1VDC/20 mA

Suitable for BaseUnit type X1,
channel diagnostics

6DL1132-6EB00-0HX1

Digital Ex-i output module, Ex-DQ 2x17,4VDC/27 mA

Suitable for BaseUnit type X1,
channel diagnostics

6DL1132-6CB00-0HX1

SIMATIC ET 200SP HA Ex analog modules

Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART

Suitable for BaseUnit type X1,
channel diagnostics, 16 bits,
+/-0.3%

6DL1134-6TB00-0HX1

Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire

Suitable for BaseUnit type X1,
channel diagnostics, 16 bits,
+/-0.05%

6DL1134-6JD00-0HX1

Analog Ex-i HART output module, Ex-AQ 2xI HART HF

Suitable for BaseUnit type X1,
channel diagnostics, 16 bits,
+/-0.3%

6DL1135-6TB00-0HX1

Power module and BaseUnits

Power module Ex-PM E

24 V 0.8 A, W x H: 50 mm x 117 mm,
suitable for BaseUnit type W0

6DL1133-6PX00-0HW0

BU type X1 for I/O modules

Push-in terminals, W x H:
20 mm x 117 mm

6DL1193-6BP00-0BX1

BU type W0 for Ex power module PM-E

W x H: 50 mm x 117 mm

6DL1193-6BP00-0DW0

Technical specifications

Technical specifications see ET 200SP HA, Ex I/O modules,
page 10/335.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RA8 intelligent load feeders

Overview



SIRIUS 3RA8 intelligent load feeder

More information

Homepage, see <https://www.siemens.com/sirius-ilm>

SiePortal, see https://www.siemens.com/product_catalog_siep?3RA8

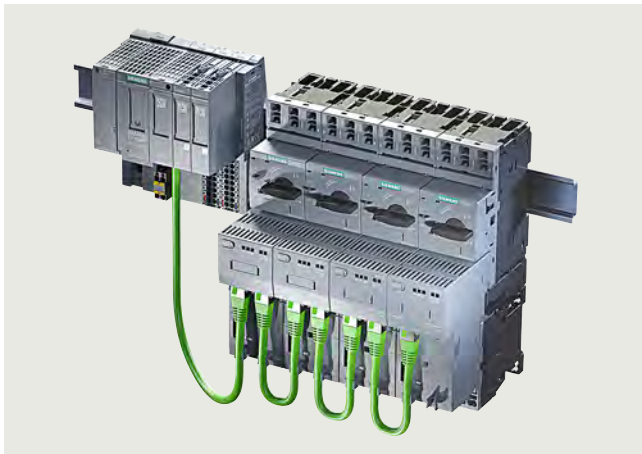
Further components in the ET 200SP I/O system see page 10/5 onwards or <https://www.siemens.com/et200sp>

Catalog IC 10 see <https://www.siemens.com/ic10>

The 3RA8 intelligent load feeders consist of 3RV23 motor starter protectors and 3RT2 electromechanical contactors. These are electrically and mechanically connected to each other with the 3RC7 intelligent link module.

The 3RA8 intelligent load feeders are connected to the SIMATIC ET 200SP via the flexible station extension (ET connection) using the BA-Send BusAdapter.

Configuration, parameterization, and diagnostics of the feeder can be performed directly in STEP 7 (TIA Portal). The BA-Send BusAdapter supports up to 16 intelligent load feeders.



Part of the SIMATIC ET 200SP automation system

12 preassembled 3RA8 combinations can be ordered for direct-on-line and reversing starting of standard three-phase motors up to 32 A.

The feeders are equipped with either the Standard or the High Feature version of the 3RC7 intelligent link module, see also the overview of functions of the 3RC7 intelligent link modules on page 10/256.

In the 3RA8 intelligent load feeder, the 3RV23 motor starter protector provides short-circuit protection. Overload protection is provided by the 3RC7 intelligent link module. The intelligent load feeders are available with setting ranges from 0.4 to 32 A in sizes S00 and S0.

The table below lists the maximum power of the three-phase motor for pre-assembled 3RA8 intelligent load feeders based on the type of coordination at a voltage of 400 V AC:

Size	Type of coordination	Type	Adjustable current response value of the inverse-time delayed overload release A	Power of three-phase motor kW
S00	"2"	3RA8.12-1EE.0	0.4 ... 4	0.12 ... 1.5
	"1"	3RA8.11-1KE.0	1.2 ... 12	0.55 ... 5.5
S0	"2"	3RA8.22-4EE.0	3.5 ... 32	1.5 ... 15

Operating conditions

The 3RA8 intelligent load feeders are climate-proof. They are intended for use in enclosed rooms in which no harsh operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

Behavior in the event of short circuit

EN 60947-4-1 (VDE 0660 Part 102) and IEC 60947-4-1 make a distinction between two different types of coordination, which are referred to as type of coordination "1" and type of coordination "2". Any short circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the device by a short circuit.

Type of coordination "1"

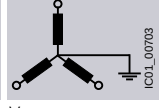
The load feeder may be non-operational after a short-circuit trip. Damage to the contactor or to the overload release is permissible.

Type of coordination "2"

There must be no damage to the overload release or to any other components after a short-circuit trip. The load feeder can resume operation without needing to be renewed. At most, welding of the contactor contacts is permissible if they can be disconnected easily without any significant deformation.

Voltage data

The data for 3-phase power systems according to IEC 60947-4-1 are valid for the following line system configurations:

Voltage U_e	Line system configuration
	Three-phase four-wire systems
	
V	V
230	--
400	230/400
440	260/440
500	--
690	400/690
-- Not specified	

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RA8 intelligent load feeders

Tripping times

In the 3RA8 intelligent load feeder, thermal motor protection is ensured by the 3RC7 intelligent link module. The trip class (CLASS 10E or 20E) can be configured via STEP 7 (TIA Portal).

Connection methods

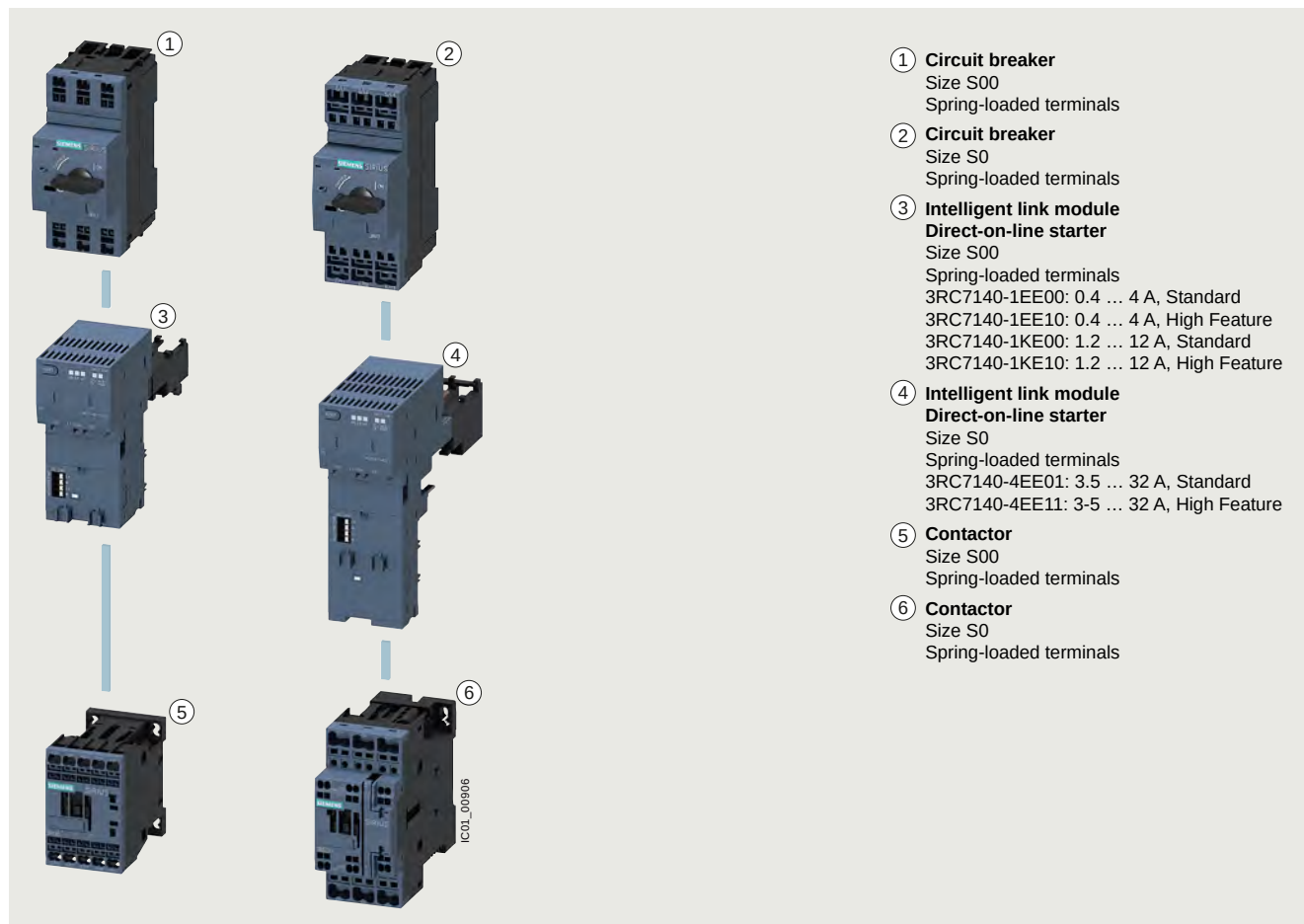
The 3RA8 intelligent load feeders are all provided with spring-loaded terminals.

Mounting

The 3RA8 intelligent load feeders are suitable for the following types of mounting:

- For mounting on TH 35-15 DIN rail according to IEC 60715
- For mounting on busbar adapters (busbar center-to-center clearance 60 mm, busbar thickness 5 to 10 mm with beveled edges), [see Catalog IC 10, chapter 8](#)
- For screw fixing with 3RV2928-0B push-in lug, [see Catalog IC 10, chapter 8](#)
- For installation with the 3RV29 infeed system, [see 3RA2 load feeders, Catalog IC 10, chapter 8](#). For the 3RV29 infeed system, [see Catalog IC 10, chapter 7](#).

Direct-on-line starter • Sizes S00 and S0



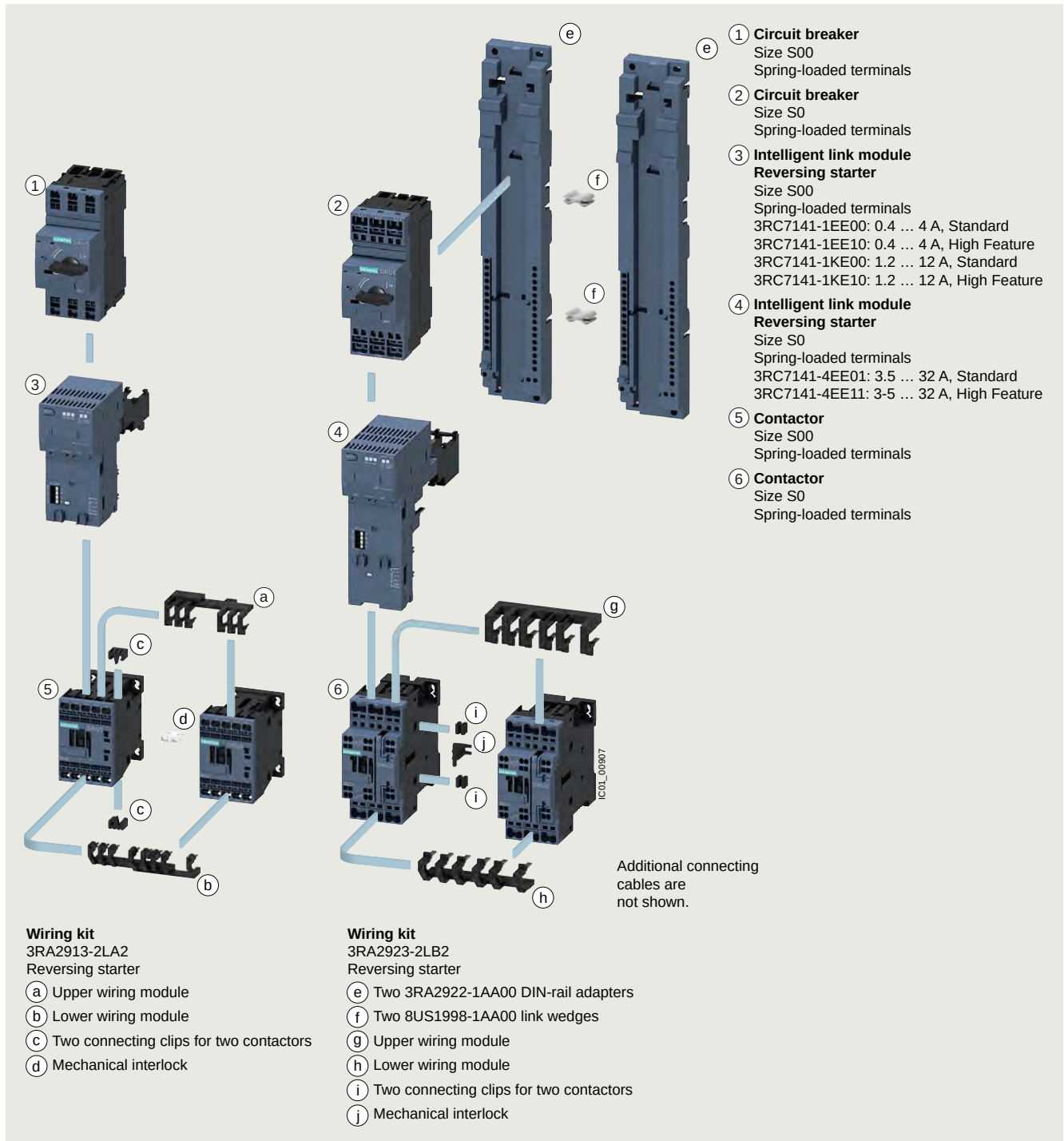
Left: 3RA8 intelligent load feeder for direct-on-line starting with spring-loaded terminals, size S00
Right: 3RA8 intelligent load feeder for direct-on-line starting with spring-loaded terminals, size S0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RA8 intelligent load feeders

Reversing starter • Sizes S00 and S0



Left: 3RA8 intelligent load feeder for reversing starting in size S00

Right: 3RA8 intelligent load feeder for reversing starting and DIN-rail mounting in size S0

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RA8 intelligent load feeders

Article number scheme

Product versions		Article number									
SIRIUS intelligent load feeders		3RA8	□	□	□	–	□	□	□	□	0
Product function	Direct-on-line starters	4									
	Reversing starters	5									
Size	S00	1									
	S0	2									
Type of coordination	"1"	1									
	"2"	2									
Current range	0.4 ... 4 A						1	E			
	1.2 ... 12 A						1	K			
	3.5 ... 32 A						4	E			
Connection methods	Spring-loaded terminals							E			
Version	Standard								0		
	High Feature								1		
Example		3RA8	4	1	2	–	1	E	E	0	0

Note:

The article number scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

Part of the SIMATIC automation system

- One engineering tool for the entire automation system
- Configuration and parameterization in STEP 7 (TIA Portal)
- Easy reading of status and current values
- Error and maintenance demands with stored plain text messages through integrated system diagnostics in the SIMATIC environment

Transparency down to the field level

- Measurement of current, voltage, and power (including power factor)
- Load diagnostics (1 or 3-phase)

Proactive protection

- Extended wide setting range of the overload protection function
- Preventive maintenance by detecting faults and discrepancies

Minimal effort

- Reduced wiring costs
- Standardized design due to fewer versions
- Extensive accessories

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

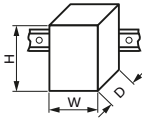
SIRIUS 3RA8 intelligent load feeders

Technical specifications

More information

SiePortal, see https://www.siemens.com/product_catalog_siep?3RA8

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/109823514>

Article number		3RA8412-1EE.0	3RA8512-1EE.0	3RA8411-1KE.0	3RA8511-1KE.0	3RA8422-4EE.0	3RA8522-4EE.0
General technical specifications							
Width x height x depth	 mm	45 x 198 x 131	90 x 204 x 131	45 x 198 x 131	90 x 204 x 131	45 x 243 x 150	90 x 269 x 174
Installation altitude at height above sea level, maximum	m	2 000					
Ambient temperature							
• During operation	°C	-20 ... +60					
• During storage	°C	-40 ... +80					
• During transport	°C	-40 ... +80					
Vibration resistance		5 ... 8.4 Hz, 3.5 mm; 8.4 ... 150 Hz, 1 g; 10 cycles/10 ... 60 Hz, 0.35 mm; 60 ... 500 Hz, 5 g; 10 cycles					
Shock resistance	According to IEC 60068-2-27	6 g/11.0 ms (3 shocks); 10 g/6.0 ms (1 000 shocks)					
Degree of protection IP on the front		IP20					
Touch protection on the front	According to IEC 60529	Finger-safe					
Electrical specifications							
Adjustable current response value of the inverse-time delayed overload release	A	0.4 ... 4		1.2 ... 12		3.5 ... 32	
Operational voltage at AC-3, rated value, maximum	V	690					
Operating frequency	Hz	50 ... 60					
Impulse withstand voltage	kV	6					
Conditional short-circuit current (I _q) at 400 V	According to IEC 60947-4-1	150 000					
Power loss (W) at rated current at AC in the warm operating state per pole	W	2.6		3.6		6.7	
Trip class		CLASS 10E/CLASS 20E					
Type of coordination		"2"		"1"		"2"	
Conductor cross-sections							
Connection of the electrical connection for the main circuit, spring-loaded terminals							
Type of connectable conductor cross-sections							
• For main contacts							
- Solid		2 x (0.5 ... 4 mm ²)				2 x (1 ... 10 mm ²)	
- Stranded		2 x (0.5 ... 4 mm ²)				2 x (1 ... 10 mm ²)	
- Finely stranded with end sleeve		2 x (0.5 ... 2.5 mm ²)				2 x (1 ... 6 mm ²)	
- For AWG cables		2 x 20 ... 12				2 x 18 ... 8	
Type of electrical connection for infeed of the supply voltage, spring-loaded terminals (push-in)							
Type of connectable conductor cross-sections							
• At the inputs for supply voltage							
- Solid		0.2 ... 1.5 mm ²					
- Finely stranded without end sleeve		0.2 ... 1.5 mm ²					
- Finely stranded with end sleeve		0.2 ... 1.0 mm ²					
- Solid for AWG cables		24 ... 16					

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RA8 intelligent load feeders

Selection and ordering data

Size of the load feeder	Adjustable current response value of the inverse-time delayed overload release	Type of coordination	Article No.
A			

Intelligent load feeders with spring-loaded terminals

Direct-on-line starters

Standard

S00	0.4 ... 4	"2"	3RA8412-1EE00
	1.2 ... 12	"1"	3RA8411-1KE00
S0	3.5 ... 32	"2"	3RA8422-4EE00



3RA8412-1EE00

High Feature

S00	0.4 ... 4	"2"	3RA8412-1EE10
	1.2 ... 12	"1"	3RA8411-1KE10
S0	3.5 ... 32	"2"	3RA8422-4EE10



3RA8412-4EE10

Reversing starters

Standard

S00	0.4 ... 4	"2"	3RA8512-1EE00
	1.2 ... 12	"1"	3RA8511-1KE00
S0	3.5 ... 32	"2"	3RA8522-4EE00



3RA8512-1EE00

High Feature

S00	0.4 ... 4	"2"	3RA8512-1EE10
	1.2 ... 12	"1"	3RA8511-1KE10
S0	3.5 ... 32	"2"	3RA8522-4EE10



3RA8522-4EE10

Notes:

Individual components of the 3RA8 intelligent load feeders,
[see table on page 10/257](#).

Accessories, [see page 10/261 onwards](#).

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

Overview



SIRIUS 3RC7 intelligent link module

More information

Homepage, see <https://www.siemens.com/sirius-ilm>

SiePortal, see https://www.siemens.com/product_catalog_siep?3RC7

Further components in the ET 200SP I/O system see page 10/5 onwards or <https://www.siemens.com/et200sp>

Catalog IC 10 see <https://www.siemens.com/ic10>

The SIRIUS 3RC7 intelligent link module is the perfect connection between the Siemens SIRIUS and SIMATIC product families. The 3RC7 intelligent link module turns conventional load feeders into digital load feeders. The SIRIUS modular system becomes a communication-capable and configurable system with SIMATIC.

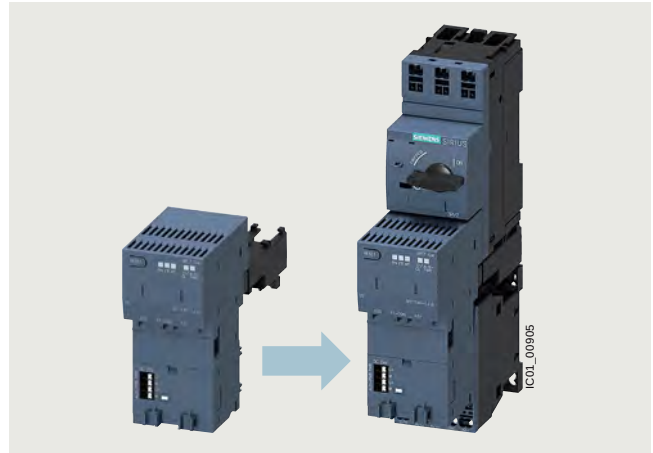


Video: SIRIUS Modular System goes digital
https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6360028361112

Part of the SIRIUS modular system

The 3RC7 intelligent link module connects the 3RV2 motor starter protectors/circuit breakers and the 3RT2 contactors to form an intelligent load feeder. Intelligent load feeders can also be ordered as a 3RA8 complete unit, see page 10/254.

Control, protection, and monitoring of all AC load types are possible up to a rated current of 32 A. 1- or 3-phase loads can be operated.



SIRIUS 3RC7 intelligent link module combined with the 3RV2 motor starter protector/circuit breaker and 3RT2 contactor

The 3RC7 intelligent link module is available for direct-on-line and reversing starters (Standard or High Feature):

- Size S00: Current ranges 0.4 to 4 A and 1.2 to 12 A
- Size S0: Current range 3.5 to 32 A

The intelligent link modules are offered with spring-loaded terminals and permit very fast mounting of the load feeders and a vibration-resistant design.

Mounting

Load feeders with 3RC7 intelligent link modules are suitable for the following types of mounting:

- For 1- or 2-row mounting on TH 35-15 DIN rail according to IEC 60715 (adapter for stand-alone installation, see page 10/261)
- For mounting on busbar adapters (busbar center-to-center clearance 60 mm, busbar thickness 5 to 10 mm with beveled edges), see Catalog IC 10, chapter 8
- For screw fixing with 3RV2928-0B push-in lug, see Catalog IC 10, chapter 8
- For installation with the 3RV29 infeed system, see 3RA2 load feeders, Catalog IC 10, chapter 8. 3RV29 infeed system, see Catalog IC 10, chapter 7.

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

Overview of functions

The 3RC7 intelligent link module controls the 3RT2 contactor, following the commands of the controller. In the event of a fault, e.g. overload, undervoltage, or phase asymmetry, the intelligent link module switches off the 3RT2 contactor.

With the help of current and voltage measurement, detailed diagnostics of the load can be performed.

Function	3RC7 ILM Standard	3RC7 ILM High Feature
Control (contact block)	✓	✓
Electronic motor overload protection	CLASS 10E/ CLASS 20E ¹⁾	CLASS 10E/ CLASS 20E ¹⁾
RESET	✓	✓
Current measurement and monitoring	✓	✓
Current phase asymmetry	✓	✓
Line voltage detection	✓	✓
Line voltage measurement and monitoring	--	✓
Supply voltage monitoring for electronics (PWR)	✓	✓
Supply voltage monitoring for contact block (AUX-PWR)	✓	✓
Starting time monitoring	✓	✓
Power measurement	--	✓
EMERGENCY START	✓	✓
Operating temperature measurement and monitoring	✓	✓
Group diagnostics	✓	✓
Cold start	✓	✓

✓ Available

-- Not available

¹⁾ CLASS 20E to 20 A.

The intelligent link module in the standard version detects the voltage at its input side.

The High Feature version can also be used to measure the phase voltage and the power (including power factor) of the connected load.

With the help of the 3RC7 intelligent link module, the operating hours of the load feeder as well as of the load can be recorded. Moreover, fault-induced shutdowns can be documented.

Part of the SIMATIC ET 200SP automation system

The 3RC7 intelligent link modules are connected to the SIMATIC ET 200SP via the flexible station extension (ET connection) using the BA-Send BusAdapter.

Configuration, parameterization, and diagnostics of the intelligent load feeder can be performed directly in STEP 7 (TIA Portal).



Video: Configuration and parameterization in STEP 7 (TIA Portal)
https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6357110552112

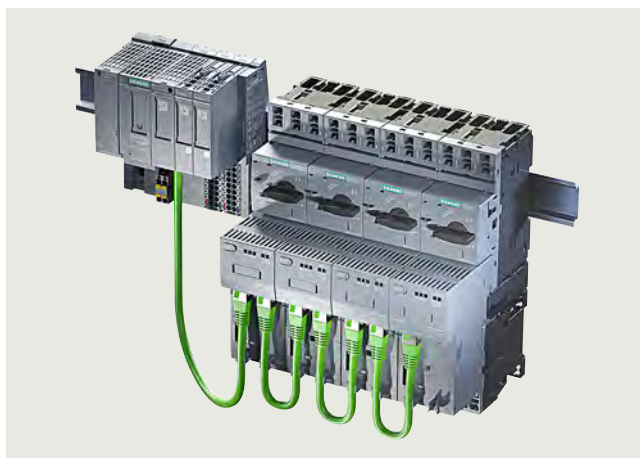
The ET 200SP BA-Send BusAdapter supports up to 16 intelligent load feeders. The distance between the BA-Send BusAdapter and the first 3RC7 intelligent link module can be up to 10 m.

Distances of up to two meters are possible between the individual intelligent load feeders.

The following devices are required for integration of the 3RC7 intelligent link module into the SIMATIC ET 200SP automation system:

- SIMATIC ET 200SP interface modules and CPUs
- BA-Send BusAdapter (6ES7193-6AS00-0AA0)
- BU-Send BaseUnit (6ES7193-6BN00-0NE0)

For more information on SIMATIC ET 200SP, [see page 10/5 onwards](#) or <https://www.siemens.com/et200sp>.



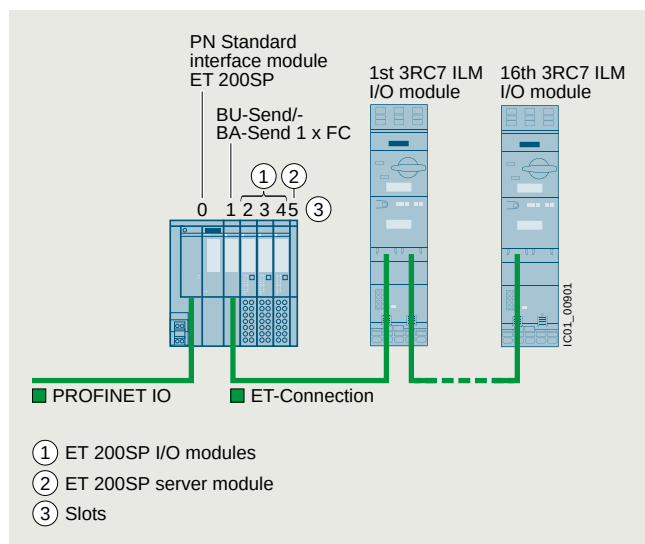
Part of the SIMATIC ET 200SP automation system

The 3RC7 intelligent link modules enable a high level of data transparency down to the field level and connect the operational technology (OT) with the overarching information technology (IT). By exchanging and using real-time data, operating processes can be optimized (condition monitoring, preventive maintenance) and the operational efficiency of the plant can be increased in a targeted manner.

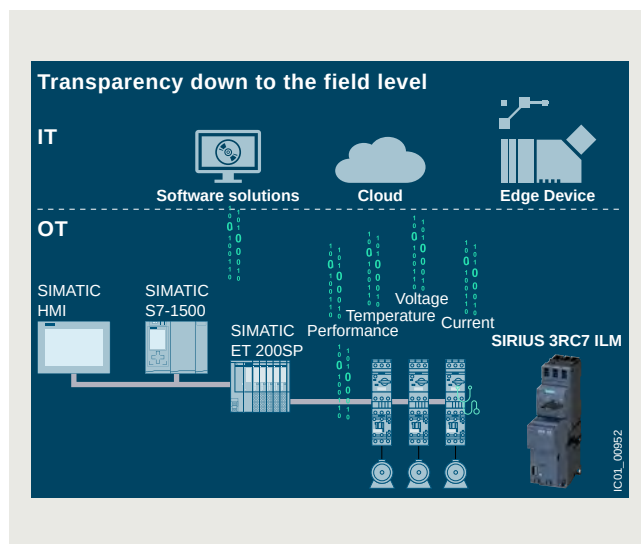
I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules



System overview using the example of PROFINET IO



Connectivity and transparency in the manufacturing environment

Building intelligent load feeders from individual components

Recommended combinations

Size	Type of coordination	Consisting of the following individual components, which are to be ordered separately				Corresponds to the following 3RA8 load feeder see page 10/254	
		Motor starter protector (without overload) see Catalog IC 10, chapter 7	Contactors see Catalog IC 10, chapter 3	3RC7 intelligent link module I_e in A see page 10/260	Mounting kit see page 10/262		
Intelligent load feeder for direct-on-line starting							
S00	"2"	3RV2311-1EC20	3RT2017-2BB42	0.4 ... 4	3RC714.-1EE.0 ¹⁾	--	3RA8412-1EE.0
	"1"	3RV2311-1KC20		1.2 ... 12	3RC714.-1KE.0 ¹⁾	--	3RA8411-1KE.0
S0	"2"	3RV2321-4EC20	3RT2027-2BB40	3.5 ... 32	3RC714.-4EE.1 ¹⁾	--	3RA8422-4EE.0
Intelligent load feeder for reversing starting							
S00	"2"	3RV2311-1EC20	3RT2017-2BB42 (2 x)	0.4 ... 4	3RC714.-1EE.0 ¹⁾	3RA2913-2LA2	3RA8512-1EE.0
	"1"	3RV2311-1KC20		1.2 ... 12	3RC714.-1KE.0 ¹⁾		3RA8511-1KE.0
S0	"2"	3RV2321-4EC20	3RT2027-2BB40 (2 x)	3.5 ... 32	3RC714.-4EE.1 ¹⁾	3RA2923-2LB2 ²⁾ / 3RA2923-2MB2 ³⁾	3RA8522-4EE.0

¹⁾ 3RC7 ILM can be used as a Standard or High Feature version.

²⁾ To build an intelligent load feeder for reversing starting of size S0, the 3RA2923-2LB2 assembly kit must be used. The DIN-rail adapters included in the assembly kit are essential for DIN-rail mounting.

³⁾ To build an intelligent load feeder for reversing starting of size S0 in the 3RV29 infeed system or on the 8US busbar adapter, the 3RA2923-2MB2 assembly kit must be used.

Note:

For graphic overviews of the recommended 3RA8 load feeders, see pages 10/250 and 10/251.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

Possible combinations for 400 V AC, CLASS 10E

Size	Type of coordination	Conditional short-circuit current	Rated current	Consisting of the following individual components, which are to be ordered separately			
		I_q in kA	I_n in A	Motor starter protector (without overload) see Catalog IC 10, chapter 7	Contactor see Catalog IC 10, chapter 3	3RC7 intelligent link module see page 10/260	I_e in A
S00	"2"	150	0.5 0.63 0.8 1 1.25 1.6 2 2.5 3.2 4	3RV2311-0FC20 3RV2311-0GC20 3RV2311-0HC20 3RV2311-0JC20 3RV2311-0KC20 3RV2311-1AC20 3RV2311-1BC20 3RV2311-1CC20 3RV2311-1DC20 3RV2311-1EC20	3RT2015-2BB42	0.4 ... 4	3RC714.-1EE.0
	"1"	150	1.6 2 2.5 3.2 4 5 6.3 8 10 12.5	3RV2311-1AC20 3RV2311-1BC20 3RV2311-1CC20 3RV2311-1DC20 3RV2311-1EC20 3RV2311-1FC20 3RV2311-1GC20 3RV2311-1HC20 3RV2311-1JC20 3RV2311-1KC20	3RT2015-2BB42 3RT2016-2BB42 3RT2017-2BB42	1.2 ... 12	3RC714.-1KE.0
S0	"2"	150	4 5 6.3 8 10 12.5 16 20 22 25 28 32	3RV2321-1EC20 3RV2321-1FC20 3RV2321-1GC20 3RV2321-1HC20 3RV2321-1JC20 3RV2321-1KC20 3RV2321-4AC20 3RV2321-4BC20 3RV2321-4CC20 3RV2321-4DC20 3RV2321-4NC20 3RV2321-4EC20	3RT2024-2BB40 3RT2026-2BB40 3RT2027-2BB40	3.5 ... 32	3RC714.-4EE.1

Note:

For possible combinations with ATEX approval, see Equipment Manual, <https://support.industry.siemens.com/cs/ww/en/view/109823514>.

Article number scheme

Product versions		Article number									
SIRIUS intelligent link modules		3RC7	1	4	☐	-	☐	☐	☐	☐	☐
Communication	ET 200SP ET connection	1	4								
Product function	Direct-on-line starters	0									
	Reversing starters	1									
Current range	0.4 ... 4 A				1	E					
	1.2 ... 12 A				1	K					
	3.5 ... 32 A				4	E					
Connection methods	Spring-loaded terminals					E					
Version	Standard					0					
	High Feature					1					
Size	S00						0				
	S0						1				
Example		3RC7	1	4	1	-	4	E	E	1	1

Note:

The article number scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

Benefits

Part of the SIMATIC automation system

- One engineering tool for the entire automation system
- Configuration and parameterization in STEP 7 (TIA Portal)
- Easy reading of status and current values
- Error and maintenance demands with stored plain text messages through integrated system diagnostics in the SIMATIC environment

Transparency down to the field level

- Measurement of current, voltage, and power (including power factor)
- Load diagnostics (1- or 3-phase)

Proactive protection

- Extended wide setting range of the overload protection function
- Preventive maintenance by detecting faults and discrepancies

Minimal effort

- Reduced wiring costs
- Standardized design due to fewer versions
- Extensive accessories

Technical specifications

More information

SiePortal, see https://www.siemens.com/product_catalog_siep?3RC7

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/109823514>

Article number		3RC7140-1EE.0, 3RC7141-1EE.0	3RC7140-1KE.0, 3RC7141-1KE.0	3RC7140-4EE.1, 3RC7141-4EE.1
General data				
Installation altitude at height above sea level, maximum	m	2 000		
Ambient temperature				
• During operation	°C	-20 ... +60		
• During storage	°C	-40 ... +80		
• During transport	°C	-40 ... +80		
Vibration resistance		5 ... 8.4 Hz, 3.5 mm; 8.4 ... 150 Hz, 1 g; 10 cycles/10 ... 60 Hz, 0.35 mm; 60 ... 500 Hz, 5 g; 10 cycles		
Shock resistance	According to IEC 60068-2-27	6 g/11.0 ms (3 shocks); 10 g/6.0 ms (1 000 shocks)		
Degree of protection IP		IP20		
Touch protection on the front	According to IEC 60529	Finger-safe		
EMC interference immunity		Environment A		
Conducted interference due to burst	According to IEC 61000-4-4	kV	2	
Frequency of operation, maximum	1/h	3 600		
Main circuit				
Adjustable current response value of the inverse-time delayed overload release	A	0.4 ... 4	1.2 ... 12	3.5 ... 32
Operational voltage at AC-3e, rated value, maximum	V	690		
Type of current for monitoring		AC		
Operating frequency, rated value	Hz	50 ... 60		
Impulse withstand voltage	kV	6		
Trip class		CLASS 10E/CLASS 20E		
Auxiliary circuit				
Supply voltage at DC	V	24		
Auxiliary voltage at DC	V	24		
Connections				
Type of electrical connection for infeed of the supply voltage, spring-loaded terminals (push-in)				
Type of connectable conductor cross-sections on the inputs for supply voltage				
• Solid		0.2 ... 1.5 mm ²		
• Finely stranded with end sleeve		0.2 ... 1.0 mm ²		
• Solid for AWG cables		24 ... 16		

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

Selection and ordering data

Size	Adjustable current response value of the inverse-time delayed overload release	Article No.
A		

3RC7 intelligent link modules with spring-loaded terminals (push-in)

Direct-on-line starters

Standard

S00	0.4 ... 4	3RC7140-1EE00
	1.2 ... 12	3RC7140-1KE00
S0	3.5 ... 32	3RC7140-4EE01



3RC7140-1EE00



3RC7140-4EE11

High Feature

S00	0.4 ... 4	3RC7140-1EE10
	1.2 ... 12	3RC7140-1KE10
S0	3.5 ... 32	3RC7140-4EE11

Reversing starters

Standard

S00	0.4 ... 4	3RC7141-1EE00
	1.2 ... 12	3RC7141-1KE00
S0	3.5 ... 32	3RC7141-4EE01



3RC7141-1EE00



3RC7141-4EE11

High Feature

S00	0.4 ... 4	3RC7141-1EE10
	1.2 ... 12	3RC7141-1KE10
S0	3.5 ... 32	3RC7141-4EE11

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

Product version		Article No.
Accessories		
 3RC7940-2TE00	Adapters for stand-alone installation with spring-loaded terminals • For 3RC7 with contactor size S00 • For 3RC7 with contactor size S0	3RC7940-2TE00 3RC7940-2TE01
	Communication cables between ET 200SP BusAdapter and 3RC7 ILM • Length 0.5 m • Length 2 m • Length 5 m • Length 10 m	3RC7940-0TE10 3RC7940-0TE20 3RC7940-0TE30 3RC7940-0TE40
 3RC7940-0TE01	From 3RC7 ILM to 3RC7 ILM • For direct-on-line starters (side-by-side mounting) • For reversing starters (side-by-side mounting) • Length 0.75 m • Length 1.5 m • Length 2 m	3RC7940-0TE01 3RC7940-0TE02 3RC7940-0TE03 3RC7940-0TE04 3RC7940-0TE05
 3RC7940-1TE01	Power Cables • For direct-on-line starters • For reversing starters	3RC7940-1TE01 3RC7940-1TE02

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIRIUS 3RC7 intelligent link modules

For contactor		Product version	Article No.
Size			
Wiring kits for reversing starters with spring-loaded terminals			
 3RA2913-2LA2	S00	RH mounting kit for spring-loaded terminals Mounting on a DIN rail, 60 mm 8US busbar system or 3RV29 infeed system	3RA2913-2LA2
	S0	Mounting on DIN rail	3RA2923-2LB2
		Mounting on 60 mm 8US busbar system or 3RV29 infeed system	3RA2923-2MB2

Further accessories [see Catalog IC 10, chapter 8:](#)

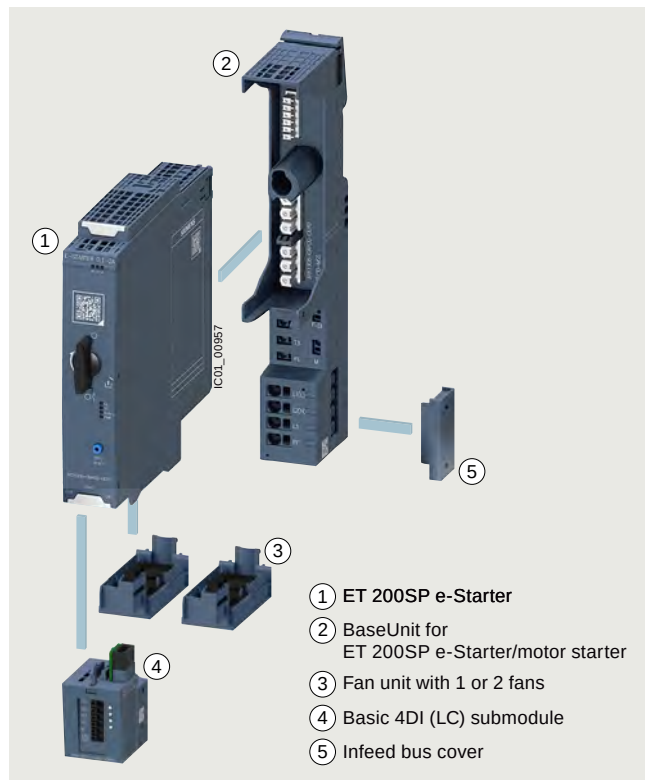
- DIN-rail adapters
- Push-in lugs for screw fixing
- Busbar adapters
- Miscellaneous accessories

I/O systems

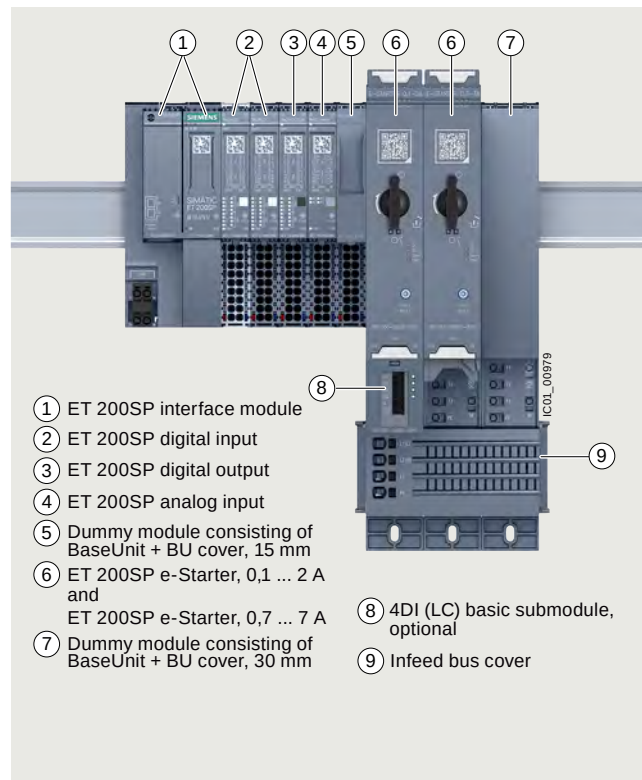
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

ET 200SP e-Starter

Overview



ET 200SP e-Starter, BaseUnit, fan and Basic 4DI (LC) submodule



ET 200SP e-Starter 3RD1000 in the ET 200SP I/O system

10

More information

Homepage, see <https://www.siemens.com/e-Starter>

SiePortal see https://www.siemens.com/product_catalog_siep?3RD1000

TIA Selection Tool, see <https://www.siemens.com/TST>

Decision support for motor start – Starting and operating three-phase asynchronous motors efficiently, see <https://www.siemens.com/motorstart-guide>

SiePortal topic page, see

<https://support.industry.siemens.com/cs/ww/en/view/109977551>

Equipment Manual, see

<https://support.industry.siemens.com/cs/ww/en/view/109972909>

Further components in the ET 200SP I/O system see page 10/5 onwards or <https://www.siemens.com/et200sp>

Catalog IC 10 see <https://www.siemens.com/ic10>

ET 200SP e-Starter

ET 200SP is a scalable and extremely flexible modular I/O system with degree of protection IP20.

As I/O modules, the ET 200SP e-Starters are an integral part of this I/O system. They are fully electronic switching and protection devices for 1-phase and 3-phase loads with fully electronic short-circuit protection, reversing functionality and optimized start properties.



Video: SIMATIC ET 200SP e-Starter - Fully electronic switching and protection, https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6364283740112

Basic functionality

All versions of the ET 200SP e-Starter feature the following functionality:

- Fully pre-wired e-Starter for switching and protecting any AC loads up to 3 kW from 48 to 480 V AC
- Fully electronic, resettable short-circuit protection in less than 5 µs to 100 kA

- Self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of ET 200SP e-Starters
- All supply voltages connected only once, i.e. when modules are added, they are automatically connected to the next module
- Hot swapping permissible
- Digital inputs can be used optionally via a 4DI (LC) submodule.
- Control of the SIMATIC ET 200SP e-Starter from the control system and of the diagnostics status via the cyclic process image
- Diagnostics-capable for active monitoring of the switching and protection functions
- The signal states in the process image of the e-Starter provide information about protective devices (short circuit or overload), the switching states of the ET 200SP e-Starter and system faults.
- Smart Start function to avoid high starting current peaks and torque surges
- Phase-optimized connection to avoid inrush currents
- Upgradeable to include future functions

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

ET 200SP e- Starter

Use of fan

All ET 200SP e-Starters are supplied as standard with a single-fan unit. For applications subject to harsh ambient or load conditions, a fan unit with two fans can also be ordered as an optional accessory (see [Accessories](#)). For information on these boundary conditions, see [Equipment Manual](#), <https://support.industry.siemens.com/cs/ww/en/view/109972909>.

Interference-proof setup of ET 200SP e- Starter

For interference-proof operation of the ET 200SP station in accordance with the IEC 60947-4-2 standard, use a dummy module upstream of the first ET 200SP e- Starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 15 mm BU cover.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

Electromechanical switchgear in series with ET 200SP e-Starters

Switching an inductive load - in particular of motors <1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the ET 200SP e- Starter or by using EMC suppression modules:

- 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor (see [Catalog IC 10, chapter 3, Accessories for SIRIUS 3RT2 contactors and SIRIUS 3RH2 contactor relays - Miscellaneous](#))
- For motor suppression modules that are fitted in the main circuit, (see [Motor suppression module, page 10/270](#))

Note:

For more information, see <https://support.industry.siemens.com/cs/ww/en/view/109758696>.

Basic 4DI (LC) submodule, optional

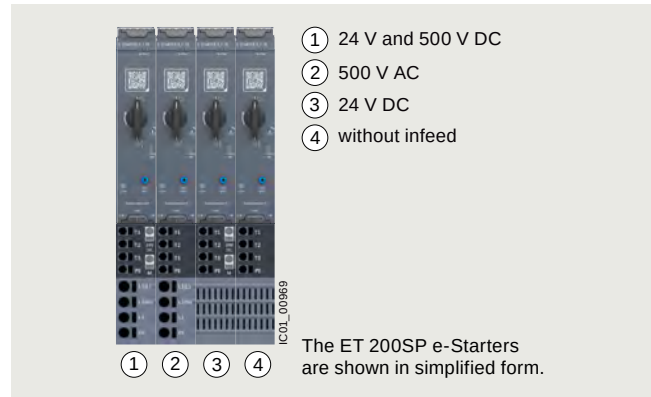


Basic 4DI (LC) submodule

This is an optional, digital input module with four inputs for local motor starter functions such as "manual local operation", "implementation of fast inputs" or "end position disconnection". For a list of all the functions provided by the Basic 4DI (LC) submodule, see [chapter Functions in the Equipment Manual](#), <https://support.industry.siemens.com/cs/ww/en/view/109972909>.

The module is plugged into the front of the ET 200SP e- Starter, which supplies it with a 24 V DC operational voltage.

BaseUnits for ET 200SP e- Starter



View of the BaseUnit infeeds for the ET 200SP e-Starters

BaseUnits are components used for mounting the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the BaseUnits reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with a loop-through.

The rugged design and positively driven connection technology enables use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the SIMATIC ET 200SP e-Starters.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP e- Starter

Article number schemes

Product versions		Article number	
ET 200SP e-starters		3RD1000 – 0 B □ 0 0 – 0 E P 0	
Current range	0.1 ... 2 A	A	Rated operational current 2 A
	0.7 ... 7 A	B	Rated operational current 7 A
Example		3RD1000 – 0 B A 0 0 – 0 E P 0	
Product versions		Article number	
BaseUnits		3RK1304 – 0 A P 0 0 – 0 □ P 0	
BU infeed	24 V DC and 500 V AC	A	
	24 V DC	B	
	500 V AC	C	
	Without infeed	D	
Example		3RK1304 – 0 A P 0 0 – 0 A P 0	

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

The ET 200SP e-Starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- Extremely fast, fully electronic and resettable short-circuit protection
- Phase-optimized switching on to reduce inrush currents
- Integrated reversing functionality
- Simple integrated transmission of measured values (current, voltage, power, etc.)
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Long service life and low wear thanks to fully electronic switching
- Less space required in the control cabinet (20 to 80%) as a result of greater functional density

- Comprehensive diagnostics, information and limit value monitoring for preventive maintenance
- Optional, configurable inputs via 4DI (LC) submodule
- Less wiring and testing required as a result of integrating several functions into a single device
- Reduced stock-keeping and configuration costs due to reduced variance due to high functional density and wide setting range of the rated operational current
- Compatibility mode for direct replacement of the hybrid ET 200SP e-Starter without having to stop the CPU
- Smart Start function to prevent torque surges during the starting process of asynchronous motors

Standards and approvals

- IEC/EN 60947-4-2
- cULus 60947-4-2
- CCC approval for China

Application

The ET 200SP e-Starters are suitable for the following applications:

- Switching, protecting and monitoring of
 - 3-phase motors with overload and fully electronic short-circuit protection
 - 1-phase motors with overload and fully electronic short-circuit protection (e.g. 230 V motors for pump applications)
 - Ohmic loads with overload and short-circuit protection (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems:

Drive belt monitoring and blocking monitoring are possible by means of the phase asymmetry and residual current detection during current measurement, for example.

- Track switching and lifting table control in conveyor systems:

Track switches can be implemented by means of the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of the drive from main power supply:

The isolating functions according to IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP e-Starter

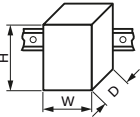
Technical specifications

More information

SiePortal, see https://www.siemens.com/product_catalog_siep?3RD1000

Equipment Manual, see <https://support.industry.siemens.com/cs/ww/en/view/109972909>

ET 200SP e-Starter

Article number		3RD1000-0BA00-0EP0	3RD1000-0BB00-0EP0
General technical data			
Width x height x depth	mm	30 × 151 × 167	
			
Design of the switching contact		Solid-state	
Type of the motor protection		Solid-state	
Design of short-circuit protection	m	Fully electronic	
Installation altitude at height above sea level maximum		4 000; For derating see Manual, https://support.industry.siemens.com/cs/ww/en/view/109972909	
Mounting position		Vertical, horizontal (observe derating)	
Fastening method		Pluggable into BaseUnit	
Ambient temperature			
• During operation	°C	-25 ... +60	
• During transport	°C	-40 ... +70	
• During storage	°C	-40 ... +70	
Relative humidity during operation	%	10 ... 95	
Vibration resistance		$f = 5 \dots 8.5 \text{ Hz}$, $d_{\text{max}} = 3.5 \text{ mm}/f = 8.5 \dots 26.9 \text{ Hz}$, $A_{\text{max}} = 10 \text{ m/s}^2$; $f = 26.9 \dots 60.1 \text{ Hz}$, $d_{\text{max}} = 0.35 \text{ mm}/f = 60.1 \dots 500 \text{ Hz}$, $A_{\text{max}} = 50 \text{ m/s}^2/10 \text{ cycles}$	
Shock resistance		6 g, 11 ms (3 shocks)/9 g, 6 ms (1 000 shocks)	
Protection class IP on the front according to IEC 60529		IP20	
Type of coordination		2	
Electrical data			
Supply voltage at DC rated value	V	24	
Operating power at AC-53a at 400 V rated value	kW	0.75	3
Operating frequency rated value		50 ... 60	
Maximum short-circuit current breaking capacity (I_{cu})			
• At 400 V rated value	kA	100	
• At 500 V rated value	kA	100	
Adjustable current response value current of the current-dependent overload release		0.1 ... 2	0.7 ... 7
Ampacity when starting maximum	A	14.4	50.4
Maximum permissible voltage for protective separation between main and auxiliary circuit	V	500	
Insulation voltage rated value	V	500	
Trip class		CLASS 10A/10E/20E	

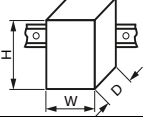
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP e-Starter

BaseUnits for ET 200SP e-Starter

Article number		3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0	3RK1908-0AP00-0DP0
Product designation		BaseUnit			
General technical data					
Width x height x depth	mm	30 × 215 × 75			
					
Ambient temperature					
• During operation	°C	-25 ... +60			
• During transport	°C	-40 ... +70			
• During storage	°C	-40 ... +70			
Protection class IP on the front according to IEC 60529		IP20			
Touch protection on the front according to IEC 60529		Finger-safe			
Connections/Terminals					
Type of connectable conductor cross-sections					
• At the inputs for supply voltage					
- Solid		1 x 0.5 ... 2.5 mm ²	--		
- Finely stranded with core end processing		1 x 0.5 ... 2.5 mm ²	--		
- Finely stranded without core end processing		1 x 0.5 ... 2.5 mm ²	--		
- For AWG cables solid		1 x 20 ... 12	--		
• For supply					
- Solid		1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ²	--
- Finely stranded with core end processing		1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ²	--
- Finely stranded without core end processing		1 x 1 ... 6 mm ²	--	1 x 1 ... 6 mm ²	--
- For AWG cables		1 x 18 ... 10	--	1 x 18 ... 10	--
• For load-side outgoing feeder					
- Solid		1 x 0.5 ... 2.5 mm ²			
- Finely stranded with core end processing		1 x 0.5 ... 2.5 mm ²			
- Finely stranded without core end processing		1 x 0.5 ... 2.5 mm ²			
- For AWG cables		1 x 20 ... 12			
Type of electrical connection for auxiliary and control circuit		Spring-loaded terminals (push-in)			
Miscellaneous					
Shape of the screwdriver tip		Slot			
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm			

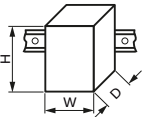
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP e-Starter

4DI (LC) submodul

Article number		3RD1000-1MB00-0BP0
Product designation		4DI (LC) submodule
General technical data		
Width x height x depth	mm	30 x 54.5 x 42.3
		
Number of digital inputs		4
Installation altitude at height above sea level, maximum	m	4 000
Mounting position		Vertical, horizontal
Fastening method		Can be plugged onto e-starters
Ambient temperature		
• During operation	°C	-25 ... +40
• During transport	°C	-40 ... +70
• During storage	°C	-40 ... +70
Connections/Terminals		
Connectable conductor cross-section for auxiliary contacts		
• Solid or stranded	mm ²	0.2 ... 1.5
• Finely stranded with end sleeve	mm ²	0.25 ... 1.5
• Finely stranded without end sleeve	mm ²	0.2 ... 1.5
AWG number as coded connectable conductor cross section for auxiliary contacts		24 ... 16
Type of electrical connection for auxiliary and control circuit		Spring-loaded terminals (push-in)
Electrical data		
Control supply voltage at DC rated value	V	20.4 ... 28.8
Miscellaneous		
Shape of the screwdriver tip		Slot
Size of the screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm

Selection and ordering data

Adjustable rated operational current I_e	Article No.
A	

ET 200SP e-Starters

Reserving starters

- 0.1 ... 2



3RD1000-0BA00-0EP0

- 0.7 ... 7



3RD1000-0BB00-0EP0

3RD1000-0BA00-0EP0

3RD1000-0BB00-0EP0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP e-Starter

Product version	Operational voltage of the AC infeed	Supply voltage of the DC infeed	Article No.
	V	V	

BaseUnits with push-in terminals¹⁾

3RK1908-0AP00-0AP0

For ET 200SP e-Starters

• With AC/DC infeed	500	24
• With DC infeed	--	24
• With AC infeed	500	--
• Without infeed	--	--

3RK1908-0AP00-0AP0
3RK1908-0AP00-0BP0
3RK1908-0AP00-0CP0
3RK1908-0AP00-0DP0

¹⁾ The voltage is looped-through from BaseUnits with infeed to subsequent BaseUnits without infeed.

Product version	Supply voltage at DC rated value	Loop through the potential group from the left	Article No.
	V		

BaseUnits with push-in terminals

6ES7193-6BP00-0BA0

For dummy modules

• Dark, looping through the potential group	24	Yes
• Light, opening a new potential group	24	No

6ES7193-6BP00-0BA0
6ES7193-6BP00-0DA0

Product version	Product function	Article No.
	local control digital inputs configurable	
V		

4DI (LC) Submodules with push-in terminals

3RD1000-1MB00-0BP0

Basic	Yes	Yes

3RD1000-1MB00-0BP0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP e-Starter**Accessories**

	Product designation	Product version	Article No.
Accessories			
	BU covers 15 mm (Packing unit 5 items)	For BaseUnits Type A0 or A1	6ES7133-6CV15-1AM0
	BU cover 30 mm	For protection of empty slots, 30 mm	3RK1908-1CA00-0BP0
	Infeed bus covers (1 bag containing 10 covers)	For ET 200SP	3RK1908-1DA00-2BP0
	Additional mounting base unit	Mechanical, for ET 200SP	3RK1908-1EA00-1BP0
	Fan units • With 1 fan	Suitable for 3RD1000	3RD1000-1FS00-0BP0
	• With 2 fans		3RD1000-1FD00-0BP0
	Motor suppression modules • Square		3RK1911-6EA00
	• Round		3RK1911-6EB00

I/O systems

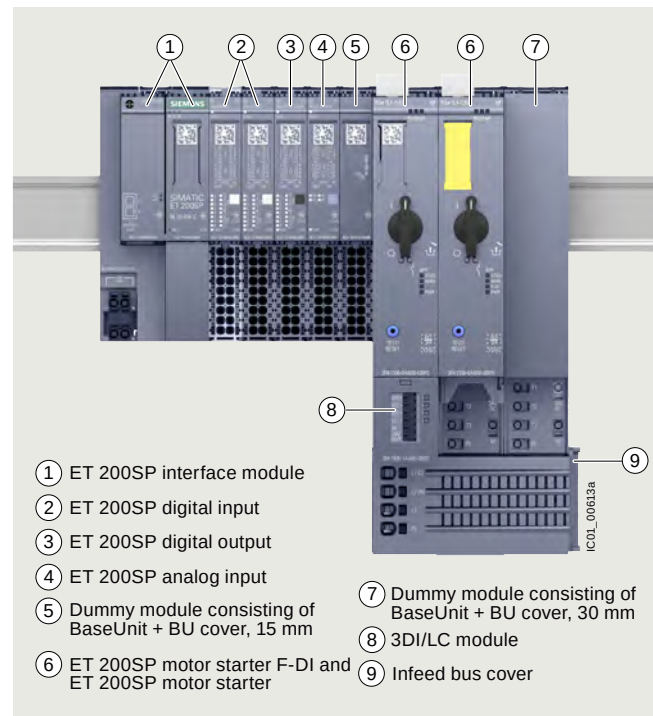
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

ET 200SP motor starters

Overview



Motor starter, BaseUnit, fan and 3DI/LC control module



3RK1308 motor starter in the ET 200SP I/O system

More information

Homepage [see https://www.siemens.com/sirius-motor-starter-et200sp](https://www.siemens.com/sirius-motor-starter-et200sp)
SiePortal [see https://www.siemens.com/product_catalog_siep?3RK1308](https://www.siemens.com/product_catalog_siep?3RK1308)
TIA Selection Tool [see https://www.siemens.com/TST](https://www.siemens.com/TST)
Decision support for motor start – Starting and operating three-phase asynchronous motors efficiently, [see https://www.siemens.com/motorstart-guide](https://www.siemens.com/motorstart-guide)

SiePortal topic page with information on the planning and operating phase, [see https://support.industry.siemens.com/cs/ww/en/view/109792664](https://support.industry.siemens.com/cs/ww/en/view/109792664)
Further components in the ET 200SP I/O system [see page 10/5 onwards](#) or <https://www.siemens.com/et200sp>
Catalog IC 10 [see https://www.siemens.com/ic10](https://www.siemens.com/ic10)

ET 200SP motor starters

ET 200SP is a scalable and extremely flexible modular I/O system with degree of protection IP20.

As I/O modules, the ET 200SP motor starters are an integral part of this I/O system. They are switching and protection devices for 1- and 3-phase loads and are available as direct-on-line or reversing starters.



Video: SIMATIC ET 200SP motor starter - Flexible, powerful, space-saving, https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=5857705611001

Basic functionality

All versions of the ET 200SP motor starter feature the following functionality:

- Fully pre-wired motor starters for switching and protecting any three-phase loads up to 5.5 kW from 48 V AC to 500 V AC
- Disconnection possible via fail-safe motor starters up to SIL 3 and PL e Cat. 4
- With self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of motor starters

- All control supply voltages connected only once, i.e. when modules are added, they are automatically connected to the next module
- Hot swapping is permissible
- Digital inputs can optionally be used via a 3DI/LC module.
- Control of the motor starter from the control system and diagnostics status via the cyclic process image
- Diagnostics-capable for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching states of the motor starter, and system faults.

Starter Kit

The 3RK1908-1SK00 starter kit is a favorably priced complete package for switching and monitoring motors in the ET 200SP system, [see page 10/279](#).

It contains:

- A 3RK1308-0BC00-0CP0 reversing starter (0.9 to 3 A)
- A 3RK1908-0AP00-0AP0 BaseUnit with 500 V and 24 V AC/DC infeed
- An EMC distance module (comprising 6ES7193-6BP00-0BA0 BaseUnit plus 6ES7133-6CV15-1AM0 BU cover 15 mm)

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

ET 200SP motor starters

Use of fan

For motor starters with a 12 A rated current, the 3RW4928-8VB00 fan is included in the scope of supply.

This fan can also be ordered as an option for motor starters with lower rated currents, if the boundary conditions demand this. For information on the ambient conditions for the use of motor starters, see [chapter Product features in the Equipment Manual](https://support.industry.siemens.com/cs/ww/en/view/109479973/149504448395), <https://support.industry.siemens.com/cs/ww/en/view/109479973/149504448395>.

Designing interference-free motor starters

For interference-free operation of the ET 200SP station in accordance with IEC 60947-4-2 standard, use a dummy module before the first motor starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 15 mm BU cover.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load – in particular of motors <1 kW with high inductance – with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- For 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor, see <https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10049450>
- For motor suppression modules that are fitted in the main circuit, see [page 10/279](#)

Note:

For more information, see <https://support.industry.siemens.com/cs/ww/en/view/109758696>.

3DI/LC control module

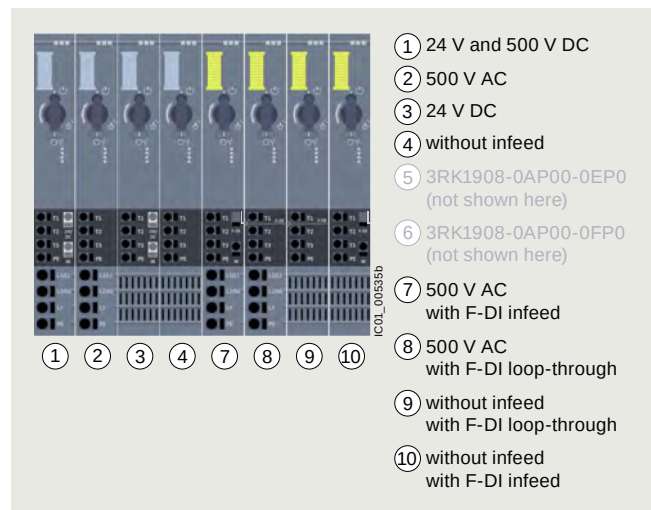


3DI/LC control module

This is a digital input module with three inputs for local motor starter functions such as "manual local operation", "implementation of fast inputs" or "end position disconnection". For a list of all the functions permitted by the 3DI/LC module, see [chapter Functions in the Equipment Manual](https://support.industry.siemens.com/cs/ww/en/view/109479973/95153659275), <https://support.industry.siemens.com/cs/ww/en/view/109479973/95153659275>.

The module is plugged into the front of the motor starter from which it is supplied with an operational voltage of 24 V DC.

BaseUnits for motor starters



View of the BaseUnit infeeds for the motor starters

BaseUnits are components used for mounting the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the BaseUnits reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with a loop-through.

The rugged design and positively driven connection technology enables use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the motor starters.

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

ET 200SP motor starters

Article number scheme

Product versions		Article number	
Motor starters		3RK1308 – 0 □ □ 0 0 – 0 C P 0	
Product function	Direct-on-line starters	A	For motor standard output 0.09 ... 5.5 kW ¹⁾
	Reversing starters	B	For motor standard output 0.09 ... 5.5 kW ¹⁾
	Fail-safe direct-on-line starters	C	For motor standard output 0.09 ... 5.5 kW ¹⁾
	Fail-safe reversing starters	D	For motor standard output 0.09 ... 5.5 kW ¹⁾
Current range	0.1 ... 0.4 A	A	Maximum current-carrying capacity when starting 4 A
	0.3 ... 1 A	B	Maximum current-carrying capacity when starting 10 A
	0.9 ... 3 A	C	Maximum current-carrying capacity when starting 30 A
	2.8 ... 9 A	D	Maximum current-carrying capacity when starting 90 A
	4 ... 12 A	E	Including fan (3RW4928-8VB00), maximum current-carrying capacity when starting 100 A

Example **3RK1308 – 0 A D 0 0 – 0 C P 0**

¹⁾ For standard motors: Three-phase asynchronous motors, 1-phase or 3-phase; 1-phase AC motors; 1-phase asynchronous motors, at 400 V AC and 500 V AC; the actual starting and rated data of the motor to be protected must be considered when selecting the units.

Product versions		Article number	
BaseUnits		3RK1908 – 0 A P 0 0 – 0 □ P 0	
BU infeed	24 V DC and 500 V AC	A	
	24 V DC	B	
	500 V AC	C	
	Without infeed	D	
	500 V AC	G	With F-DI infeed
	500 V AC	H	With F-DI loop-through
	Without infeed	J	With F-DI loop-through
	Without infeed	K	With F-DI infeed

Example **3RK1908 – 0 A P 0 0 – 0 A P 0**

Note:

The Article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

Benefits

The ET 200SP motor starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or 3SK safety relays up to SIL 3 and PL e Cat.4
- Simple, integrated current value transmission
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (20 to 80%) thanks to high functional density (direct-on-line and reversing starters in same width)
- Extensive diagnostics and information for preventive maintenance
- Configurable inputs via 3DI/LC control module
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:3)
- Technology has lower inherent power losses than speed-controlled drive systems, so that less cooling (and smaller footprint) are possible

Standards and approvals

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 62061: SIL 3
- ISO 13849-1: PL e
- CCC approval for China

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

ET 200SP motor starters

Application

The ET 200SP motor starters are suitable for the following applications:

- Switching and monitoring of
 - 3-phase motors with overload and short-circuit protection (e.g. 400 V asynchronous motors for secondary drives in conveyor systems)
 - 1-phase motors with overload and short-circuit protection (e.g. 230 V motors for pump applications)
 - Resistive loads by means of current value and diagnostics via the maintenance function (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems:
Drive belt monitoring and blocking monitoring are possible by means of the phase asymmetry and residual current detection during current measurement, for example.

- Track switching and lifting table control in conveyor systems: Track switches can be implemented by means of the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of drive from main power supply: The isolating functions in accordance with IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

Motor starters in the process industry

For the ET 200SP motor starters, special 3RK1908-0AP00-0.H0 BaseUnits are available that enable the device to be also used in the ET 200SP HA I/O system. This is typically used in process engineering applications.

For more information, see <https://mall.industry.siemens.com/mall/ww/en/Catalog/Products/10398144?tree=CatalogTree>.

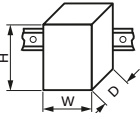
Technical specifications

More information

SiePortal see https://www.siemens.com/product_catalog_sieportal?3RK1308
Equipment Manual see <https://support.industry.siemens.com/cs/ww/en/view/109479973>

FAQs see <https://support.industry.siemens.com/cs/ww/en/ps/21800/faq>

ET 200SP Motor starters

Article number		3RK1308-0.A00-0CP0 3RK1308-0.B00-0CP0	3RK1308-0.C00-0CP0 3RK1308-0.D00-0CP0
Product category		Motor starter	
General technical specifications			
Width x height x depth	mm	30 × 142 × 150	
			
Design of the switching contact		Hybrid	
Design of the motor protection		Electronic	
Installation altitude at height above sea level, maximum	m	4 000; For derating see Equipment Manual, https://support.industry.siemens.com/cs/ww/en/view/109479973	
Mounting position		Vertical, horizontal (observe derating)	
Type of mounting		Can be plugged into BaseUnit	
Ambient temperature			
• During operation	°C	-25 ... +60	
• During transport	°C	-40 ... +70	
• During storage	°C	-40 ... +70	
Relative humidity during operation	%	10 ... 95	
Vibration resistance		15 mm to 6 Hz; 2 g up to 500 Hz	
Shock resistance		6 g / 11 ms	
Degree of protection IP on the front according to IEC 60529		IP20	
Touch protection on the front according to IEC 60529		Finger-safe	
Performance Level (PL) according to ISO 13849-1		--	e
Safety Integrity Level (SIL) according to IEC 62061		--	3
Type of coordination		1	

I/O systems

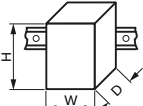
SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP motor starters

Article number		3RK1308-0.A00-0CP0	3RK1308-0.B00-0CP0	3RK1308-0.C00-0CP0	3RK1308-0.D00-0CP0	3RK1308-0.E00-0CP0
Product category		Motor starter				
Electrical specifications						
Supply voltage at DC rated value	V	24				
Operating power at AC-53a at 400 V rated value	kW	0.12	0.25	1.1	4	5.5
Operating frequency rated value	Hz	50 ... 60				
Ultimate short-circuit current breaking capacity (I_{cu})						
• at 400 V rated value	kA	55				
• at 500 V rated value	kA	55				
Adjustable current response value of the inverse-time delayed overload release	A	0.1 ... 0.4	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current-carrying capacity on starting	A	4	10	30	90	100
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500				
Insulation voltage, rated value	V	500				
Trip class		CLASS OFF/5/10 adjustable				

BaseUnits for motor starter

Article number	3RK1908-0AP00-0AP0		3RK1908-0AP00-0BP0		3RK1908-0AP00-0CP0 3RK1908-0AP00-0GP0 3RK1908-0AP00-0HP0		3RK1908-0AP00-0DP0 3RK1908-0AP00-0JP0 3RK1908-0AP00-0KP0	
Product category	BaseUnit							
General technical specifications								
Width x height x depth	mm	30 × 215 × 75						
								
Ambient temperature								
• During operation	°C	-25 ... +60						
• During transport	°C	-40 ... +70						
• During storage	°C	-40 ... +70						
Degree of protection class IP on the front	IP20							
according to IEC 60529								
Touch protection on the front	Finger-safe							
according to IEC 60529								
Connections/Terminals								
Type of connectable conductor cross-sections								
• At the inputs for supply voltage								
- Solid		1 x 0.5 ... 2.5 mm ²		--				
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm ²		--				
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm ²		--				
- Solid for AWG cables		1 x 20 ... 12		--				
• For infeed								
- Solid		1 x 1 ... 6 mm ²	--		1 x 1 ... 6 mm ²	--		
- Finely stranded with end sleeve		1 x 1 ... 6 mm ²	--		1 x 1 ... 6 mm ²	--		
- Finely stranded without end sleeve		1 x 1 ... 6 mm ²	--		1 x 1 ... 6 mm ²	--		
- For AWG cables		1 x 18 ... 10	--		1 x 18 ... 10	--		
• For load-side outgoing feeder								
- Solid		1 x 0.5 ... 2.5 mm ²						
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm ²						
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm ²						
- For AWG cables		1 x 20 ... 12						
Type of electrical connection for auxiliary and control circuit	Spring-loaded terminals (push-in)							
Miscellaneous								
Type of screwdriver tip	Slotted							
Size of screwdriver tip	Standard screwdriver 0.6 mm x 3.5 mm							

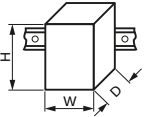
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP motor starters

3DI/LC control module

Article number		3RK1908-1AA00-0BP0
Product designation		3DI/LC control module
General technical specifications		
Width x height x depth	mm	30 × 54.5 × 42.3
		
Product version		Accessories
Number of digital inputs		4
Installation altitude at height above sea level, maximum	m	2 000
Mounting position		Vertical, horizontal, flat
Type of mounting		Can be plugged onto motor starters
Ambient temperature		
• During operation	°C	-25 ... +60
• During transport	°C	-40 ... +70
• During storage	°C	-40 ... +70
Connections/Terminals		
Connectable conductor cross-section for auxiliary contacts		
• solid or stranded	mm ²	0.2 ... 1.5
• finely stranded with end sleeve	mm ²	0.25 ... 1.5
• finely stranded without end sleeve	mm ²	0.2 ... 1.5
AWG number as coded connectable conductor cross-section for auxiliary contacts		24 ... 16
Type of electrical connection for auxiliary and control circuit		Spring-loaded terminals (push-in)
Electrical specifications		
Type of voltage of the control supply voltage		DC
Control supply voltage at DC rated value	V	20.4 ... 28.8
Miscellaneous		
Type of screwdriver tip		Slotted
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

ET 200SP motor starters **IE3/IE4 ready**

Selection and ordering data

Adjustable current response value of the inverse-time delayed overload release		Max. current-carrying capacity on starting	Article No.
A		A	
Motor starters			
Direct-on-line starters			
	0.1 ... 0.4	4	3RK1308-0AA00-0CP0
	0.3 ... 1	10	3RK1308-0AB00-0CP0
	0.9 ... 3	30	3RK1308-0AC00-0CP0
	2.8 ... 9	90	3RK1308-0AD00-0CP0
	4 ... 12	120	3RK1308-0AE00-0CP0
Reversing starters			
	0.1 ... 0.4	4	3RK1308-0BA00-0CP0
	0.3 ... 1	10	3RK1308-0BB00-0CP0
	0.9 ... 3	30	3RK1308-0BC00-0CP0
	2.8 ... 9	90	3RK1308-0BD00-0CP0
	4 ... 12	120	3RK1308-0BE00-0CP0
Fail-safe direct-on-line starters			
	0.1 ... 0.4	4	3RK1308-0CA00-0CP0
	0.3 ... 1	10	3RK1308-0CB00-0CP0
	0.9 ... 3	30	3RK1308-0CC00-0CP0
	2.8 ... 9	90	3RK1308-0CD00-0CP0
	4 ... 12	120	3RK1308-0CE00-0CP0
Fail-safe reversing starters			
	0.1 ... 0.4	4	3RK1308-0DA00-0CP0
	0.3 ... 1	10	3RK1308-0DB00-0CP0
	0.9 ... 3	30	3RK1308-0DC00-0CP0
	2.8 ... 9	90	3RK1308-0DD00-0CP0
	4 ... 12	120	3RK1308-0DE00-0CP0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP motor starters

Product version	Operational voltage of the AC infeed	Supply voltage of the DC infeed	Article No.
	V	V	

BaseUnits with push-in terminals¹⁾

3RK1908-0AP00-0AP0

For motor starters

• With AC/DC infeed	500	24	3RK1908-0AP00-0AP0
• With DC infeed	--	24	3RK1908-0AP00-0BP0
• With AC infeed	500	--	3RK1908-0AP00-0CP0
• Without infeed	--	--	3RK1908-0AP00-0DP0

For fail-safe motor starters

• With AC infeed, with F-DI infeed	500	--	3RK1908-0AP00-0GP0
• With AC infeed, with F-DI loop-through	500	--	3RK1908-0AP00-0HP0
• Without AC/DC infeed, with F-DI loop-through	--	--	3RK1908-0AP00-0JP0
• Without AC/DC infeed, with F-DI infeed	--	--	3RK1908-0AP00-0KP0

¹⁾ The voltage is looped-through from BaseUnits with infeed to subsequent BaseUnits without infeed.

Product version	Supply voltage at DC rated value	Loop through the potential group from the left	Article No.
	V		

BaseUnits with push-in terminals

6ES7193-6BP00-0BA0

For dummy modules

• Dark, looping through the potential group	24	Yes	6ES7193-6BP00-0BA0
• Light, opening a new potential group	24	No	6ES7193-6BP00-0DA0

10

Control supply voltage at DC rated value	Product function	Article No.
	local control digital inputs configurable	
V		

3DI/LC control modules with push-in terminals

3RK1908-1AA00-0BP0

20.4 ... 28.8	Yes	Yes	3RK1908-1AA00-0BP0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

ET 200SP motor starters

	Product designation	Product version	Article No.
Accessories			
	BU covers 15 mm (Packing unit 5 items)	For BaseUnits Type A0 or A1	6ES7133-6CV15-1AM0
	BU cover 30 mm	For protection of empty slots, 30 mm	3RK1908-1CA00-0BP0
	Infeed bus covers (1 bag containing 10 covers)	For ET 200SP	3RK1908-1DA00-2BP0
	Additional mounting base unit	Mechanical, for ET 200SP	3RK1908-1EA00-1BP0
	Fan	Can be used for 3RK1308	3RW4928-8VB00
	Motor suppression modules • Square • Round		3RK1911-6EA00
			3RK1911-6EB00
	Starter kit	Consists of 3RK1308-0BC00-0CP0 reversing starter (0.9 ... 3 A), 3RK1908-0AP00-0AP0 BaseUnit with 500 V and 24 V AC/DC infeed, and EMC distance module (consisting of 6ES7193-6BP00-0BA0 BaseUnit plus 6ES7133-6CV15-1AM0 BU cover 15 mm)	3RK1908-1SK00

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Pneumatics > AirLINE SP valve terminal type 8647 (Bürkert Co.)

Overview



- For pneumatic control of actuators with ET 200SP
- Can be used together with system and IO components of the ET 200SP distributed I/O system.
- Product of the product partner Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems.

Note

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the particular product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability and makes no guarantee for these products or for the connection with these products of the product partners. Also refer to the note on disclaimer/use of hyperlinks under "More information".

Benefits

- High process safety by using non-return valves and pneumatic infeed modules with pressure monitoring.
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (compact control cabinet is possible)
- Quick and easy installation due to full hardware integration: Physical interfaces of pneumatic and I/O components are fully compatible
- Fast and error-free configuration and diagnostics due to full software integration into the Siemens ecosystem (Step 7 Classic, PCS 7, PCS neo, TIA Portal): Bürkert pneumatic modules are treated like Siemens I/O modules in configuration and programming

Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from the Bürkert Co., the ET 200SP forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules. The valve terminal can also be attached to a control cabinet floor with an AirLINE Quick Adapter, which further reduces the space required in the control cabinet, and significantly simplifies the pneumatic installation.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly, see under <http://www.buerkert.com/en/type/8647>.

Disclaimer of liability

This information and the descriptions have been compiled with great care. However, it is not possible for Siemens to verify that the data supplied by product partners is complete, correct and up-to-date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the products for the user per se.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Power supplies > 1-phase, 24 V DC (for SIMATIC ET 200SP)

Overview



In terms of design and functionality, the SIMATIC ET 200SP PS single-phase load power supply with automatic range switching of the input voltage is perfectly matched to the SIMATIC ET 200SP. The SIMATIC component and the power supply are wired by means of uniform push-in terminal technology. The 24 V supply provides power to the ET 200SP system components such as the interface module, technology module and communication module, as well as the digital or analog inputs/outputs. Comprehensive certifications, such as UL or GL, facilitate universal use. Its extremely flat design also makes this power supply ideally suited for installation in compact on-site control boxes.

Ordering data

Article No.

SIMATIC ET 200SP PS

Stabilized power supply for
SIMATIC ET 200SP
Input: 120/230 V AC
Output: 24 V DC/5 A

6EP7133-6AB00-0BN0

SIMATIC ET 200SP PS

Stabilized power supply for
SIMATIC ET 200SP
Input: 120/230 V AC
Output: 24 V DC/10 A

6EP7133-6AE00-0BN0

Technical specifications

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
type of current supply	24 V/5 A	24 V/10 A
input		
type of the power supply network	1-phase AC	1-phase AC
supply voltage at AC	Automatic range selection	Automatic range selection
supply voltage	120 V/230 V	120 V/230 V
input voltage 1 at AC	85 ... 132 V	85 ... 132 V
input voltage 2 at AC	170 ... 264 V	170 ... 264 V
wide range input	No	No
overvoltage overload capability	2.3 × Vin rated, 1.3 ms	2.3 × Vin rated, 1.3 ms
buffering time for rated value of the output current in the event of power failure minimum	20 ms	20 ms
operating condition of the mains buffering	at Vin = 93/187 V	at Vin = 93/187 V
line frequency	50 Hz/60 Hz	50 Hz/60 Hz
line frequency	47 ... 63 Hz	47 ... 63 Hz
input current		
• at rated input voltage 120 V	2.16 A	4.34 A
• at rated input voltage 230 V	1.22 A	1.92 A
current limitation of inrush current at 25 °C maximum	45 A	60 A
I2t value maximum	3.15 A²·s	6.3 A²·s
fuse protection type	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
fuse protection type in the feeder	recommended LS switch: B/C 6 A/3 A	recommended LS switch: B/C 10 A/6 A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Power supplies > 1-phase, 24 V DC (for SIMATIC ET 200SP)**Technical specifications**

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
type of current supply	24 V/5 A	24 V/10 A
output		
voltage curve at output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
output voltage at DC rated value	24 V	24 V
output voltage		
• at output 1 at DC rated value	24 V	24 V
	24 V	24 V
output voltage adjustable	Yes; via potentiometer	Yes; via potentiometer
adjustable output voltage	22.8 ... 28 V	22.8 ... 28 V
relative overall tolerance of the voltage	3 %	3 %
relative control precision of the output voltage		
• on slow fluctuation of input voltage	0.1 %	0.1 %
• on slow fluctuation of ohm loading	1 %	1 %
residual ripple		
• maximum	150 mV	150 mV
• typical	50 mV	50 mV
voltage peak		
• maximum	240 mV	240 mV
• typical	150 mV	150 mV
display version for normal operation	Green LED for 24 V OK	Green LED for 24 V OK
type of signal at output	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"
behavior of the output voltage when switching on	Overshoot of Vout < 3 %	Overshoot of Vout < 3 %
response delay maximum	0.3 s	0.3 s
voltage increase time of the output voltage		
• typical	30 ms	30 ms
output current		
• rated value	5 A	10 A
• rated range	0 ... 6 A; 5 A up to +60°C; +60 ... +70 °C: Derating 3%/K 5 A	0 ... 12 A; 10 A up to +60°C; +60 ... +70 °C: Derating 3%/K 10 A
supplied active power typical	120 W	240 W
short-term overload current		
• on short-circuiting during the start-up typical	15 A	30 A
• at short-circuit during operation typical	15 A	30 A
duration of overloading capability for excess current		
• on short-circuiting during the start-up	800 ms	750 ms
• at short-circuit during operation	800 ms	800 ms
bridging of equipment	Yes	Yes
number of parallel-switched equipment resources	2	2
efficiency		
efficiency in percent	88 %	90 %
power loss [W]		
• at rated output voltage for rated value of the output current typical	17 W	26 W
• during no-load operation maximum	2.7 W	2.8 W

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Power supplies > 1-phase, 24 V DC (for SIMATIC ET 200SP)**Technical specifications**

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
type of current supply	24 V/5 A	24 V/10 A
closed-loop control		
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.3 %	0.3 %
relative control precision of the output voltage at load step of resistive load 10/90/10 % typical	3 %	3 %
setting time		
• load step 10 to 90% typical	1 ms	1 ms
• load step 90 to 10% typical	1 ms	1 ms
protection and monitoring		
design of the overvoltage protection	protection against overvoltage in case of internal fault $V_{out} < 31.8 \text{ V}$	protection against overvoltage in case of internal fault $V_{out} < 31.8 \text{ V}$
property of the output short-circuit proof	Yes	Yes
design of short-circuit protection	Constant current characteristic	Constant current characteristic
response value current limitation	7 ... 7.5 A	14 ... 15 A
overcurrent overload capability		
• in normal operation	overload capability 150 % I_{out} rated up to 5 s/min	overload capability 150 % I_{out} rated up to 5 s/min
enduring short circuit current RMS value		
• typical	7 A	14.1 A
safety		
galvanic isolation between input and output	Yes	Yes
galvanic isolation	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
operating resource protection class	Class I	Class I
leakage current		
• maximum	3.5 mA	3.5 mA
• typical	1 mA	1 mA
protection class IP	IP20	IP20
EMC		
standard		
• for emitted interference	EN 61000-6-3 Class B	EN 61000-6-3 Class B
• for mains harmonics limitation	EN 61000-3-2	EN 61000-3-2
• for interference immunity	EN 61000-6-2	EN 61000-6-2
standards, specifications, approvals		
certificate of suitability		
• CE marking	Yes	Yes
• UL approval	Yes; cULus-Listed (UL61010-2-201, CSA C22.2 No.142); cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	Yes; cULus-Listed (UL61010-2-201, CSA C22.2 No.142); cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
• CSA approval	Yes; cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	Yes; cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
• EAC approval	Yes	Yes
• NEC Class 2	No	No
type of certification		
• CB-certificate	Yes	Yes
MTBF at 40 °C	1 598 441 h	1 114 510 h
standards, specifications, approvals hazardous environments		
certificate of suitability		
• IECEx	Yes; IECEx Ex ec nC IIC T3 Gc	Yes; IECEx Ex ec nC IIC T3 Gc
• ATEX	Yes; ATEX (EX) II 3G Ex ec nC IIC T3 Gc	Yes; ATEX (EX) II 3G Ex ec nC IIC T3 Gc
• ULhazloc approval	Yes	Yes
• cCSAus, Class 1, Division 2	No	No
• UKEX	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Power supplies > 1-phase, 24 V DC (for SIMATIC ET 200SP)

Technical specifications

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
type of current supply	24 V/5 A	24 V/10 A
standards, specifications, approvals		
marine classification		
shipbuilding approval	Yes	Yes
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• French marine classification society (BV)	Yes	Yes
• Det Norske Veritas (DNV)	Yes	Yes
• Lloyds Register of Shipping (LRS)	No	No
standards, specifications, approvals		
Environmental Product Declaration		
Environmental Product Declaration	Yes	Yes
global warming potential [CO ₂ eq]		
• total	474.9 kg	725 kg
• during manufacturing	9.4 kg	13.2 kg
• during operation	465 kg	711.1 kg
• after end of life	0.35 kg	0.48 kg
ambient conditions		
ambient temperature		
• during operation	-30 ... +70; with natural convection	-30 ... +70; with natural convection
• during transport	-40 ... +85	-40 ... +85
• during storage	-40 ... +85	-40 ... +85
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation	Climate class 3K3, 5 ... 95% no condensation
connection method		
type of electrical connection	push-in terminals	push-in terminals
• at input	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm ² single-core/finely stranded	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm ² single-core/finely stranded
• at output	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm ²	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm ²
• for auxiliary contacts	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm ²	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm ²
• for signaling contact	2 push-in terminals for 0.2 ... 2.5 mm ²	2 push-in terminals for 0.2 ... 2.5 mm ²
removable terminal at input	Yes	Yes
removable terminal at output	Yes	Yes
mechanical data		
width × height × depth of the enclosure	160 mm × 117 mm × 74 mm	160 mm × 117 mm × 74 mm
installation width × mounting height	160 mm × 174 mm	160 mm × 174 mm
required spacing		
• top	50 mm	50 mm
• bottom	50 mm	50 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
fastening method	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
• DIN-rail mounting	Yes	Yes
• S7 rail mounting	No	No
• wall mounting	No	No
housing can be lined up	Yes	Yes
net weight	0.5 kg	0.7 kg
accessories		
electrical accessories	Redundancy module, buffer module, selectivity module, DC UPS	Redundancy module, buffer module, selectivity module, DC UPS

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

Power supplies > 1-phase, 24 V DC (for SIMATIC ET 200SP)**Technical specifications**

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
product brand name	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
type of current supply	24 V/5 A	24 V/10 A
further information internet links		
internet link		
• to website: Industry Mall	https://mall.industry.siemens.com	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop	https://siemens.com/sitop
• to website: CAX-Download-Manager	https://siemens.com/cax	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com	https://support.industry.siemens.com
additional information		
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)
	24 V	24 V
	24 V	24 V
	-30 °C	-30 °C
	70 °C	70 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BaseUnits

Overview



With the BaseUnits (BUs), the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel

- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (gaps without I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High EMC interference immunity:
 - self-assembling shielded backplane bus
 - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
 - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical and EMC loads
- Optional module-specific color identification of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one 'BU-Send' BaseUnit with a "BA-Send" BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

Ordering data

Article No.

Article No.

Type A0 BaseUnits

BU15-P16+A10+2D

BU type A0; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new potential group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0DA0
6ES7193-6BP20-2DA0

BU15-P16+A0+2D

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0DA0
6ES7193-6BP00-2DA0

BU15-P16+A10+2B

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0BA0
6ES7193-6BP20-2BA0

BU15-P16+A0+2B

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP00-0BA0
6ES7193-6BP00-2BA0

Type B0 BaseUnits

BU20-P12+A4+0B

BU type B0; BaseUnit (dark) with 12 process terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group; 1 unit

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0BB0
6ES7193-6BP20-2BB0

Type B1 BaseUnits

BU20-P12+A0+4B

BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the potential group; 1 unit

- Pack of 1 unit
- Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.

6ES7193-6BP20-0BB1
6ES7193-6BP20-2BB1

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BaseUnits

Ordering data	Article No.		Article No.
Type C0 BaseUnits		BaseUnits type U0	
BU20-P6+A2+4D BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new potential group	6ES7193-6BP20-0DC0	BU20-P16+A0+2D BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A) • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0DU0 6ES7193-6BP00-2DU0
Type C1 BaseUnits		BU20-P16+A0+2B BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group • Pack of 1 unit • Pack of 10 units; to order a pack, please order this Article No. with an order quantity of 10.	6ES7193-6BP00-0BU0 6ES7193-6BP00-2BU0
Type A1 BaseUnits (with temperature detection)		BaseUnit for redundant setup	
BU15-P16+A0+12D/T BU type A1; BaseUnit (light) with 16 process terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new potential group (max. 10 A)	6ES7193-6BP40-0DA1	BaseUnit type M0 With 2 slots to accommodate R1-capable interface modules IM 155-6 PN R1; incl. server module	6ES7193-6BR00-0HM0
BU15-P16+A0+2D/T BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new potential group (max. 10 A)	6ES7193-6BP00-0DA1	Station expansion with IP67 I/O system ET 200AL	
BU15-P16+A0+12B/T BU type A1; BaseUnit (dark) with 16 process terminals (1 ... 16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the potential group	6ES7193-6BP40-0BA1	BaseUnit BU-Send	6ES7193-6BN00-0NE0
BU15-P16+A0+2B/T BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the potential group	6ES7193-6BP00-0BA1	ET 200SP BA-Send 1 x FC BusAdapter	6ES7193-6AS00-0AA0
Type F0 BaseUnits		Accessories	
BU20-P8+A4+0B BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the potential group	6ES7193-6BP20-0BF0	Equipment labeling plate 10 sheets of 16 labels	6ES7193-6LF30-0AW0
		BU cover For covering empty slots (gaps); 5 units • 15 mm wide • 20 mm wide	6ES7133-6CV15-1AM0 6ES7133-6CV20-1AM0
		Shield connection 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BaseUnits

Ordering data

Color-coded labels

- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units
- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units
- Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units
- Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units
- Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units
- Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units

Article No.

6ES7193-6CP01-2MA0

6ES7193-6CP01-4MA0

6ES7193-6CP02-2MA0

6ES7193-6CP02-4MA0

6ES7193-6CP03-2MA0

6ES7193-6CP04-2MA0

6ES7193-6CP71-2AA0

6ES7193-6CP72-2AA0

6ES7193-6CP73-2AA0

- Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, BU type A1 with push-in terminals; 10 units
- Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units
- Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units
- Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units
- Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units
- Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units
- Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units
- Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units

Article No.

6ES7193-6CP74-2AA0

6ES7193-6CP81-2AB0

6ES7193-6CP82-2AB0

6ES7193-6CP83-2AB0

6ES7193-6CP41-2MB0

6ES7193-6CP84-2AC0

6ES7193-6CP85-2AC0

6ES7193-6CP86-2AC0

Technical specifications

Article number	6ES7193-6BP20-0DA0 BaseUnit Type A0, BU15-P16+A10+2D	6ES7193-6BP00-0DA0 BaseUnit Type A0, BU15-P16+A0+2D	6ES7193-6BP20-0BA0 BaseUnit Type A0, BU15-P16+A10+2B	6ES7193-6BP00-0BA0 BaseUnit Type A0, BU15-P16+A0+2B
General information				
Product type designation	BU type A0	BU type A0	BU type A0	BU type A0
Hardware configuration				
Slots				
• Number of slots	1; Type A0	1; Type A0	1; Type A0	1; Type A0
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14
• Number of process terminals to I/O module	16	16	16	16; Pro slot
• Number of terminals to AUX bus	10	0	10	0
• Number of add-on terminals	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2; Pro slot

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BaseUnits

Technical specifications

Article number	6ES7193-6BP20-0DA0 BaseUnit Type A0, BU15-P16+A10+2D	6ES7193-6BP00-0DA0 BaseUnit Type A0, BU15-P16+A0+2D	6ES7193-6BP20-0BA0 BaseUnit Type A0, BU15-P16+A10+2B	6ES7193-6BP00-0BA0 BaseUnit Type A0, BU15-P16+A0+2B
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	50 g	40 g	50 g	40 g

Article number	6ES7193-6BP20-0BB0 BaseUnit Type B0, BU20-P12+A4+0B	6ES7193-6BP20-0BB1 BaseUnit Type B1, BU20-P12+A0+4B, PU 1	6ES7193-6BP20-0DC0 BaseUnit Type C0, BU20-P6+A2+4D	6ES7193-6BP20-0BC1 BaseUnit Type C1, BU20-P6+A2+4B	6ES7193-6BP20-0BF0 BaseUnit Type F0, BU20-P8+A4+0B
General information					
Product type designation	BU type B0	BU type B1	BU type C0	BU type C1	BU type F0
Hardware configuration					
Slots					
• Number of slots	1	1	1	1; Type C1	1; Type F0
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
connection method					
Terminals					
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Yes; Optional
• system-integrated shield connection	Yes; Optional	No	Yes; Optional	Yes; Optional	
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	
• Number of process terminals to I/O module	12; Pro slot	12; Pro slot	12; Pro slot	16; Pro slot	
• Number of terminals to AUX bus	0	0	0	0	
• Number of add-on terminals	0	0	0	0	
• Number of terminals with connection to P1 and P2 bus	0; Pro slot	0; Pro slot	0; Pro slot	2; Pro slot	
Dimensions					
Width	20 mm	20 mm	20 mm	20 mm	20 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm
Weights					
Weight, approx.	48 g	48 g	47 g	47 g	48 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BaseUnits

Technical specifications

Article number	6ES7193-6BP40-0DA1 BaseUnit Type A1, BU15-P16+A0+12D/T	6ES7193-6BP00-0DA1 BaseUnit Type A1, BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 BaseUnit Type A1, BU15-P16+A0+12B/T	6ES7193-6BP00-0BA1 BaseUnit Type A1, BU15-P16+A0+2B/T
General information				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
Hardware configuration				
Slots				
• Number of slots	1; Type A1	1; Type A1	1; Type A1	1; Type A1
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26	0.14 mm²; AWG 26
• Conductor cross-section, max.	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14	2.5 mm²; AWG 14
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals to AUX bus	0	0	0	0
• Number of add-on terminals	2x5	0	2x5	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	50 g	40 g	50 g	40 g

Article number	6ES7193-6BP00-0DU0 BaseUnit Type U0, BU20-P16+A0+2D, PU 1		6ES7193-6BP00-0BU0 BaseUnit Type U0, BU20-P16+A0+2B, PU 1	
General information				
Product type designation	BU type U0		BU type U0	
Hardware configuration				
Slots				
• Number of slots	1		1	
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C		-30 °C	
• horizontal installation, max.	60 °C		60 °C	
• vertical installation, min.	-30 °C		-30 °C	
• vertical installation, max.	50 °C		50 °C	
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	3 000 m		3 000 m	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BaseUnits

Technical specifications

Article number	6ES7193-6BP00-0DU0 BaseUnit Type U0, BU20-P16+A0+2D, PU 1	6ES7193-6BP00-0BU0 BaseUnit Type U0, BU20-P16+A0+2B, PU 1
connection method		
Terminals		
• Terminal type	Push-in terminal	Push-in terminal
• system-integrated shield connection	Yes; Optional	Yes; Optional
• Conductor cross-section, min.	0.14 mm ² ; 0.2 mm ² without wire end ferrule	0.14 mm ² ; 0.2 mm ² without wire end ferrule
• Conductor cross-section, max.	2.5 mm ² ; 1.5 mm ² with wire end ferrule	2.5 mm ² ; 1.5 mm ² with wire end ferrule
• Number of process terminals to I/O module	16	16
• Number of terminals to AUX bus	0	0
• Number of add-on terminals	0	0
• Number of terminals with connection to P1 and P2 bus	2	2
Dimensions		
Width	20 mm	20 mm
Height	117 mm	117 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	50 g	50 g

Article number	6ES7193-6BR00-0HM0 BaseUnit Type M0
General information	
Product type designation	BU type M0
Hardware configuration	
Slots	
• Number of slots	2
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	100 mm
Height	141 mm
Depth	29 mm
Weights	
Weight, approx.	142 g

Article number	6ES7193-6BN00-0NE0 ET 200SP, BaseUnit BU-Send
Hardware configuration	
Slots	
• Number of slots	1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	20 mm
Height	117 mm
Depth	35 mm
Weights	
Weight, approx.	30 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIPLUS BaseUnits

Overview



With the BaseUnits (BUs), the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring

- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
 - self-assembling shielded backplane bus
 - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
 - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one BU-Send BaseUnit with a BA-Send BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS BaseUnits type A0

BU15-P16+A10+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)

6AG1193-6BP20-7DA0

BU15-P16+A0+2D

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA0

BU15-P16+A10+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 10 internally bridged AUX terminals (1 A to 10 A); for continuing the load group

6AG1193-6BP20-7BA0

BU15-P16+A0+2B

(Extended temperature range and exposure to environmental substances)

BU type A0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA0

Article No.

SIPLUS BaseUnits type A1 (with temperature detection)

BU15-P16+A0+12D/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)

6AG1193-6BP40-7DA1

BU15-P16+A0+2D/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)

6AG1193-6BP00-7DA1

BU15-P16+A0+12B/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (dark) with 16 process terminals (1...16) to the module and an additional 2x5 internally bridged additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group

6AG1193-6BP40-7BA1

BU15-P16+A0+2B/T

(Extended temperature range and exposure to environmental substances)

BU type A1; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group

6AG1193-6BP00-7BA1

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

SIPLUS BaseUnits

Ordering data	Article No.		Article No.
SIPLUS BaseUnits type B0		SIPLUS BaseUnits type U0	
BU20-P12+A4+0B (Extended temperature range and exposure to environmental substances) BU type B0; BaseUnit (dark) with 12 process terminals (1...12) to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	6AG1193-6BP20-7BB0	BU20-P16+A0+2D (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (light) with 16 process terminals to the module; for starting a new load group (max. 10 A)	6AG1193-6BP00-7DU0
SIPLUS BaseUnits type B1		BU20-P16+A0+2B (Extended temperature range and exposure to environmental substances) BU type U0; BaseUnit (dark) with 16 process terminals to the module; for continuing the load group	6AG1193-6BP00-7BU0
BU20-P12+A0+4B (Extended temperature range and exposure to environmental substances) BU type B1; BaseUnit (dark) with 12 process terminals to the module; for continuing the load group; 1 unit	6AG1193-6BP20-7BB1	SIPLUS BaseUnits type M0 (Extended temperature range and exposure to environmental substances) For redundant configuration, with 2 slots to accommodate R1-capable interface modules IM 155-6 PN R1; incl. server module	6AG1193-6BR00-7HM0
SIPLUS BaseUnits type C0		Accessories	
BU20-P6+A2+4D (Extended temperature range and exposure to environmental substances) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and 2 AUX terminals; new load group	6AG1193-6BP20-7DC0	SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	6AG1193-6AA00-0AA0
SIPLUS BaseUnits type F0		SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Can be used with SIPLUS BaseUnits with a height of up to 117 mm, types A0/A1 without AUX or add-on terminals, as well as types B0, B1, C0, C1, D0, U0	6AG1193-6AB00-0AA0
BU20-P8+A4+0B (Extended temperature range and exposure to environmental substances) BU type F0; BaseUnit (dark) with 8 process terminals to the module and an additional 4 internally bridged AUX terminals (1 A to 4 A); for continuing the load group	6AG1193-6BP20-2BF0	Other accessories	See SIMATIC ET 200SP BaseUnits, page 10/287

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Technical specifications

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0 SIPLUS ET 200SP BU15-P16+A0+2B	6ES7193-6BP00-0DA0 SIPLUS ET 200SP BU15-P16+A0+2D	6ES7193-6BP20-0BA0 SIPLUS ET 200SP BU15-P16+A10+2B	6ES7193-6BP20-0DA0 SIPLUS ET 200SP BU15-P16+A10+2D
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BaseUnits

Technical specifications

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0	6ES7193-6BP00-0DA0	6ES7193-6BP20-0BA0	6ES7193-6BP20-0DA0
	SIPLUS ET 200SP BU15-P16+A0+2B	SIPLUS ET 200SP BU15-P16+A0+2D	SIPLUS ET 200SP BU15-P16+A10+2B	SIPLUS ET 200SP BU15-P16+A10+2D
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BaseUnits

Technical specifications

Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1	6ES7193-6BP00-0DA1	6ES7193-6BP40-0BA1	6ES7193-6BP40-0DA1
	SIPLUS ET 200SP BU15-P16+A0+2B/T	SIPLUS ET 200SP BU15-P16+A0+2D/T	SIPLUS ET 200SP BU15-P16+A0+12B/T	SIPLUS ET 200SP BU15-P16+A0+12D/T
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BaseUnits**Technical specifications**

Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1 SIPLUS ET 200SP BU15-P16+A0+2B/T	6ES7193-6BP00-0DA1 SIPLUS ET 200SP BU15-P16+A0+2D/T	6ES7193-6BP40-0BA1 SIPLUS ET 200SP BU15-P16+A0+12B/T	6ES7193-6BP40-0DA1 SIPLUS ET 200SP BU15-P16+A0+12D/T
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A
Article number	6AG1193-6BP20-7BB0	6AG1193-6BP20-7BB1	6AG1193-6BP20-7DC0	
Based on	6ES7193-6BP20-0BB0 SIPLUS ET 200SP BU20-P12+A4+0B	6ES7193-6BP20-0BB1 SIPLUS ET 200SP BU20-P12+A0+4B	6ES7193-6BP20-0DC0 SIPLUS ET 200SP BU20-P6+A2+4D	
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max.	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax -40 °C 50 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C 70 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax	
Altitude during operation relating to sea level				
• Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude	3 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	3 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	3 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

SIPLUS BaseUnits

Technical specifications

Article number	6AG1193-6BP20-7BB0	6AG1193-6BP20-7BB1	6AG1193-6BP20-7DC0
Based on	6ES7193-6BP20-0BB0	6ES7193-6BP20-0BB1	6ES7193-6BP20-0DC0
	SIPLUS ET 200SP BU20-P12+A4+0B	SIPLUS ET 200SP BU20-P12+A0+4B	SIPLUS ET 200SP BU20-P6+A2+4D
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BaseUnits

Technical specifications

Article number	6AG1193-6BP20-2BF0	6AG1193-6BP00-7BU0	6AG1193-6BP00-7DU0	6AG1193-6BR00-7HM0
Based on	6ES7193-6BP20-0BF0	6ES7193-6BP00-0BU0	6ES7193-6BP00-0DU0	6ES7193-6BR00-0HM0
	SIPLUS ET 200SP BU20-P8+A4+0B	SIPLUS ET 200SP BU20-P16+A0+2B	SIPLUS ET 200SP BU20-P16+A0+2D	SIPLUS ET 200SP BU-Typ M0
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin			-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax			50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	2 000 m	2 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BaseUnits

Technical specifications

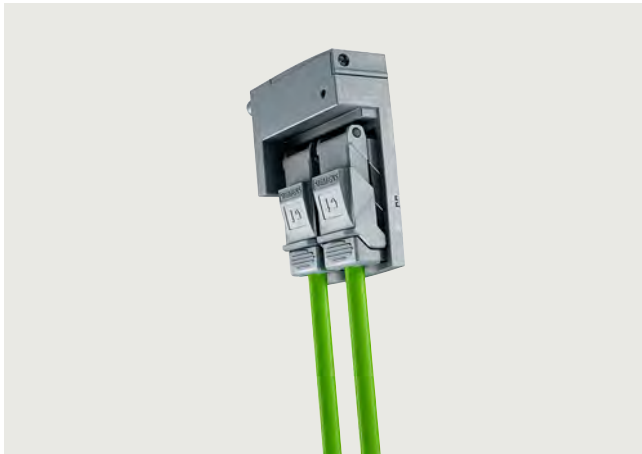
Article number	6AG1193-6BP20-2BF0	6AG1193-6BP00-7BU0	6AG1193-6BP00-7DU0	6AG1193-6BR00-7HM0
Based on	6ES7193-6BP20-0BF0	6ES7193-6BP00-0BU0	6ES7193-6BP00-0DU0	6ES7193-6BR00-0HM0
	SIPLUS ET 200SP BU20-P8+A4+0B	SIPLUS ET 200SP BU20-P16+A0+2B	SIPLUS ET 200SP BU20-P16+A0+2D	SIPLUS ET 200SP BU-Typ M0
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BusAdapters

Overview



SIMATIC BA 2xFC BusAdapter for direct laying of the PROFINET cable via FastConnect connection



SIMATIC BA LC-LD/M12 BusAdapter for use as a system-integrated media converter from copper (M12) to single-mode glass fiber (LC-LD).



SIMATIC BA 2xLC-LD BusAdapter with 2 LC-LD sockets, for use in redundant systems, max. cable length 20 km



ET 200SP BA-Send BusAdapter for expansion of an ET 200SP station with ET 200AL modules



SIMATIC BA LC/RJ45 BusAdapter for use as a system-integrated media converter from copper (RJ45) to multimode glass fiber (LC).

For SIMATIC ET 200SP, two types of BusAdapter (BA) are available for selection:

- ET 200SP "BA-Send" BusAdapter for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection
- SIMATIC BusAdapter for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface. One further advantage of the SIMATIC BusAdapter: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

BusAdapters

Ordering data	Article No.		Article No.
BA 2xRJ45 BusAdapter For IM 155-6 PN ST, HF, R1	6ES7193-6AR00-0AA0	M12-180/M12-180 IE connecting cable Preassembled with IE FC trailing cable GP, M12 plugs (D-coded, push-pull)	
BA 2xFC BusAdapter For IM 155-6 PN ST, HF, R1; for increased resistance to vibration and EMC loads	6ES7193-6AF00-0AA0	0.5 m	6XV1871-8AE50
BA 2xM12 BusAdapter For IM 155-6 PN ST, HF, R1; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	6ES7193-6AM00-0AA0	1.0 m	6XV1871-8AH10
BA 2xSCRJ BusAdapter For IM 155-6 PN HF, R1; fiber-optic cable connection for POF or PCF cables up to 250 m, with monitoring of attenuation	6ES7193-6AP00-0AA0	1.5 m	6XV1871-8AH15
BA SCRJ/RJ45 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x SCRJ glass fiber-optic cable connection, 1 x RJ45 connection	6ES7193-6AP20-0AA0	2.0 m	6XV1871-8AH20
BA SCRJ/FC BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x SCRJ glass fiber-optic cable connection, 1 x FastConnect connection	6ES7193-6AP40-0AA0	3.0 m	6XV1871-8AH30
BA 2xLC BusAdapter For IM 155-6 PN HF, R1; two glass fiber-optic cable connections	6ES7193-6AG00-0AA0	5.0 m	6XV1871-8AH50
BA LC/RJ45 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC connection, 1 x RJ45 connection	6ES7193-6AG20-0AA0	10 m	6XV1871-8AN10
BA LC/FC BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC connection, 1 x FastConnect connection	6ES7193-6AG40-0AA0	15 m	6XV1871-8AN15
BA 2xLC-LD BusAdapter For IM 155-6 PN HF, R1; two glass fiber-optic cable connections	6ES7193-6AG50-0AA0	MM FO CORD LC/LC Preassembled patch cable with 2x LC duplex connectors; 1.0 m	6XV1843-5EH10-0AA0
BA LC-LD/RJ45 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC-LD connection, 1 x RJ45 connection	6ES7193-6AG60-0AA0	SM FO CORD LC/LC Preassembled patch cable with 2x LC duplex connectors; 1.0 m	6XV1843-5FH10-0AA0
BA LC-LD/M12 BusAdapter For IM 155-6 PN HF, R1; with media converter glass fiber-optic cable - copper; 1 x LC-LD connection, 1 x M12 connection	6ES7193-6AG70-0AA0	FO standard cable 50/125 MM FO standard cable preassembled with 2x LC duplex connectors, 5.0 m	6XV1873-5AH50
		FO ROBUST CABLE 50/125 Robust MM FO cable preassembled with 2x LC duplex connectors, 10 m	6XV1873-5RN10
		FC IE stripping tool	6GK1901-1GA00
		IE FC RJ45 plug 2x2 Industrial Ethernet FastConnect RJ45 plug 180 2x 2, RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet; 1 unit	6GK1901-1BB10-2AA0
		Station expansion with IP67 I/O system ET 200AL	
		ET 200SP BA-Send 1 x FC BusAdapter	6ES7193-6AS00-0AA0
		BaseUnit BU-Send	6ES7193-6BN00-0NE0
		Accessories	
		Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
		Unlatching strap for M12 BA 10 units, for push-pull PROFINET plug, e. g. when using the BA 2xM12 BusAdapter	6ES7193-6DL00-2AA0

Note:

- ¹⁾ You will find information on further passive components at <https://www.siemens.com/fastconnect>.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BusAdapters

Technical specifications

Article number	6ES7193-6AR00-0AA0 ET 200SP, Busadapter BA 2xRJ45	6ES7193-6AF00-0AA0 ET 200SP, Busadapter BA 2XFC	6ES7193-6AM00-0AA0 SIMATIC Busadapter BA 2xM12	6ES7193-6AP00-0AA0 ET 200SP, Busadapter BA 2xSCRJ	6ES7193-6AP20-0AA0 ET 200SP, Busadapter BA SCRJ/RJ45
General information					
Product type designation	BA 2x RJ45	BA 2xFC	BA 2x M12	BA 2xSCRJ	BA SCRJ/RJ45
Interfaces					
Number of PROFINET interfaces	1; 2 ports (switch) 2x RJ45	1	1	1; 2 ports (switch) SCRJ FO	1; 2 ports (switch) SCRJ/RJ45
Supports protocol for PROFINET IO					
• Number of RJ45 ports	2				1
• Number of FC (FastConnect) connections		2			
• Number of SCRJ ports			2	2	1
• Number of M12 ports					
Cable length					
- PCF				100 m	100 m
- Plastic FOC (POF)				50 m	50 m
- Cu conductors	100 m	100 m	100 m		100 m
Ambient conditions					
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions					
Width	20 mm	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	73.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm	59 mm	59 mm
Weights					
Weight, approx.	46 g	53 g	59 g	50 g	50 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BusAdapters

Technical specifications

Article number	6ES7193-6AP40-0AA0 ET 200SP, Bus adapter BA SCRJ/FC		6ES7193-6AG00-0AA0 SIMATIC Busadapter BA 2XLC		6ES7193-6AG20-0AA0 SIMATIC Busadapter BA LC/RJ45		6ES7193-6AG40-0AA0 SIMATIC Bus adapter BA LC/FC		
General information									
Product type designation		BA SCRJ/FC		BA 2x LC		BA LC/RJ45		BA LC/FC	
Interfaces									
Number of PROFINET interfaces		1; 2 ports (switch) SCRJ/FC		1; 2 ports (switch) LC Multimode Glass Fibre		1; 2 ports (switch) LC / RJ45		1; 2 ports (switch) LC / FC	
Supports protocol for PROFINET IO									
• Number of RJ45 ports						1			
• Number of FC (FastConnect) connections		1						1	
• Number of SCRJ ports		1							
• Number of LC ports				2; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX		1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX		1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	
Cable length									
- PCF		100 m				100 m		100 m	
- Plastic FOC (POF)		50 m							
- Cu conductors		100 m							
- Multimode graded-index fiber 50/125 µm				3 km; min. transmit power - 23.5 dB, min. receiver sensitivity -31 dB		3 km; min. transmit power - 23.5 dB, min. receiver sensitivity -31 dB		3 km; min. transmit power - 23.5 dB, min. receiver sensitivity -31 dB	
- Multimode graded-index fiber 62.5/125 µm				3 km; min. transmit power - 20 dB, min. receiver sensitivity -31 dB		3 km; min. transmit power - 20 dB, min. receiver sensitivity -31 dB		3 km; min. transmit power - 20 dB, min. receiver sensitivity -31 dB	
Ambient conditions									
Altitude during operation relating to sea level									
• Installation altitude above sea level, max.		5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual		5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual		5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual		5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	
Dimensions									
Width		20 mm		20 mm		20 mm		20 mm	
Height		69.5 mm		69.5 mm		69.5 mm		69.5 mm	
Depth		59 mm		59 mm		59 mm		59 mm	
Weights									
Weight, approx.		50 g		40 g		32 g		50 g	

Article number	6ES7193-6AS00-0AA0 ET 200SP, Busadapter BA-Send BA1XFC	
General information		
Product type designation	BA-Send 1xFC	
Interfaces		
Supports protocol for PROFINET IO		
Cable length		
- Cu conductors		
15 m; from IM firmware V3.3: between BA-send and the first ET-CONNECTION bus node and between all other bus nodes		
ET-Connection		
• Number of interfaces ET connection		
1		
• FC (FastConnect)		
Yes		
Ambient conditions		
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.		
5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual		
Dimensions		
Width		
20 mm		
Height		
69.5 mm		
Depth		
59 mm		
Weights		
Weight, approx.		
44 g		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

BusAdapters

Technical specifications

Article number	6ES7193-6AG50-0AA0 SIMATIC Busadapter BA 2xLC-LD	6ES7193-6AG60-0AA0 SIMATIC Busadapter BA LC-LD/RJ45	6ES7193-6AG70-0AA0 SIMATIC Busadapter BA LC-LD/M12
General information			
Product type designation	BA 2x LC-LD		
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) 2x LC-LD single-mode fiber-optic cable	1	1
Supports protocol for PROFINET IO			
• Number of RJ45 ports		1	
• Number of LC ports	2; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX	1; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX	1; wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-LX
• Number of M12 ports			1
Cable length			
- Cu conductors		100 m	100 m
- single-mode fiber-optic cable 9/125 µm	20 km; 10 km for topology or IRT configuration; min. transmit power -15 dB, min. receiver sensitivity -28 dB	20 km	20 km
Ambient conditions			
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual	5 000 m; restrictions for installation altitudes > 2 000 m, see ET 200SP system manual
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	40 g	32 g	45 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BusAdapters

Overview



SIMATIC BA 2xFC BusAdapter for direct laying of the PROFINET cable via FastConnect connection.



SIMATIC BA LC-LD/M12 BusAdapter for use as a system-integrated media converter from copper (M12) to single-mode glass fiber (LC-LD).



SIMATIC BA 2xLC-LD BusAdapter with 2 LC-LD sockets, for use in redundant systems, max. cable length 20 km



SIMATIC BA LC/RJ45 BusAdapter for use as a system-integrated media converter from copper (RJ45) to multimode glass fiber (LC).



ET 200SP BA-Send BusAdapter for expansion of an ET 200SP station with ET 200AL modules.

- ET 200SP "BA-Send" BusAdapter for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection.
- SIMATIC BusAdapter for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface. Another advantage of the SIMATIC BusAdapters: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

Note

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BusAdapters

Ordering data	Article No.		Article No.
SIPLUS BA 2xRJ45 BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN ST, HF	6AG1193-6AR00-7AA0	SIPLUS BA 2xLC BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN HF; 2 glass FO connections	6AG1193-6AG00-2AA0
SIPLUS BA 2xFC BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	6AG1193-6AF00-7AA0	SIPLUS BA LC/RJ45 BusAdapter with conformal coating, media converter glass FO/CU, 1x LC FO connection and 1x RJ45 connection	6AG1193-6AG20-2AA0
BA 2xM12 BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN ST, HF; 2 x M12 push-pull sockets, D-coding, also suitable for standard M12. For PROFINET	6AG1193-6AM00-7AA0	SIPLUS BA 2xLC-LD BusAdapter With conformal coating, for single-mode optical fiber, up to 20 km	6AG1193-6AG50-2AA0
SIPLUS BA 2xSCRJ BusAdapter (extended temperature range and exposure to environmental substances) For IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of attenuation	6AG1193-6AP00-2AA0	Accessories Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	6ES7193-6LF30-0AW0
		SIPLUS Mounting Kit ET 200SP with maximum width of 172 mm	6AG1193-6AA00-0AA0
		SIPLUS Mounting Kit ET 200SP with maximum width of 19" Mounting accessories for use with increased mechanical vibration and shock loads. Not approved for SIPLUS 2xRJ45 BusAdapter	6AG1193-6AB00-0AA0

Technical specifications

Article number	6AG1193-6AF00-7AA0	6AG1193-6AG00-2AA0	6AG1193-6AG20-2AA0	6AG1193-6AG50-2AA0
Based on	6ES7193-6AF00-0AA0 SIPLUS ET 200SP BA 2XFC PN	6ES7193-6AG00-0AA0 SIPLUS ET 200SP BA 2XLC	6ES7193-6AG20-0AA0 SIPLUS ET 200SP BA LC/RJ45	6ES7193-6AG50-0AA0 SIPLUS ET 200SP BA 2xLC-LD
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200SP

SIPLUS BusAdapters

Technical specifications

Article number	6AG1193-6AF00-7AA0	6AG1193-6AG00-2AA0	6AG1193-6AG20-2AA0	6AG1193-6AG50-2AA0
Based on	6ES7193-6AF00-0AA0	6ES7193-6AG00-0AA0	6ES7193-6AG20-0AA0	6ES7193-6AG50-0AA0
	SIPLUS ET 200SP BA 2XFC PN	SIPLUS ET 200SP BA 2XLC	SIPLUS ET 200SP BA LC/RJ45	SIPLUS ET 200SP BA 2xLC-LD
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)
Usage in industrial process technology				
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BusAdapters

Technical specifications

Article number	6AG1193-6AM00-7AA0	6AG1193-6AP00-2AA0	6AG1193-6AR00-7AA0
Based on	6ES7193-6AM00-0AA0	6ES7193-6AP00-0AA0	6ES7193-6AR00-0AA0
	SIPLUS ET 200SP BA 2xM12	SIPLUS ET 200SP BA 2XSCRJ PN	SIPLUS ET 200SP BA 2xRJ45
Ambient conditions			
Ambient temperature during operation			
• min.		-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• max.		60 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
- Against mechanical environmental conditions acc. to EN 60721-3-3	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
- Against mechanical environmental conditions acc. to EN 60721-3-6	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP

SIPLUS BusAdapters**Technical specifications**

Article number	6AG1193-6AM00-7AA0	6AG1193-6AP00-2AA0	6AG1193-6AR00-7AA0
Based on	6ES7193-6AM00-0AA0 SIPLUS ET 200SP BA 2xM12	6ES7193-6AP00-0AA0 SIPLUS ET 200SP BA 2XSCRJ PN	6ES7193-6AR00-0AA0 SIPLUS ET 200SP BA 2xRJ45
Usage in industrial process technology			
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086 • Protection against fouling acc. to EN 60664-3 • Military testing according to MIL-I-46058C, Amendment 7 • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Accessories

Overview SIMATIC system rail



Redundant R1 applications place high demands on

- the mechanical fixation and
- the low-impedance functional grounding connection of the functional grounding

of the individual ET 200SP components. These requirements cannot be ensured with DIN rails according to EN 60715.

For this reason, the use of the specially developed SIMATIC system rail is mandatory for an R1 design of the ET 200SP.

The system rail has

- tight dimensional tolerances for operating conditions under high mechanical load
- long-term stable surface coating for optimum interference suppression
- sturdy design for cantilever construction
- integrated Bosch profile grooves for easy and flexible mounting of modules and accessories (mounting brackets and hinges, damping elements, shield connections, cable ducts, etc.)

This ensures the high availability of an ET 200SP in R1 operation.

Overview Labeling strips



The head-end stations and I/O modules can optionally be equipped with labeling strips (13 x 31 mm) for system-specific marking. The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:

- 500 strips on the roll, for printing on thermal transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm
- 10 DIN A4 sheets with 100 strips each, 180 g/sm card, perforated, for printing using a laser printer direct from TIA Portal or via print templates

Overview Equipment labeling plate



Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly:

- The inscription on the front is not covered
- Simple label replacement when replacing a module
- No parallax errors when marking the BaseUnits on the mounting plate

The size of the labels is 14.8 x 10.5 mm (W x H)

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Accessories

Overview BU cover



The ET 200SP system can be operated with any number of slot gaps (BU slot without inserted I/O module). Applications for this include:

- Partial commissioning
- Prewired but unequipped options

To protect against damage, such slot gaps must be covered by a BU cover.

Within the BU cover, an equipment labeling plate for identification of the I/O module planned for this slot can be stored.

Versions:

- For BaseUnits with a width of 15 mm (pack containing 5 BU covers)
- For BaseUnits with a width of 20 mm (pack containing 5 BU covers)

Overview Shield connection



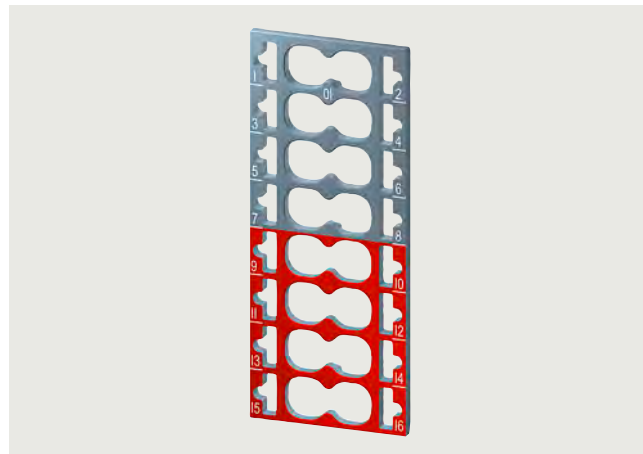
The shield connection permits the low-cost connection of cable shields. Compared to external shield supports, the system offers the following advantages:

- Quick installation without tools by plugging the shield connection element onto the BaseUnit
- Automatic low-impedance connection to the functional grounding (DIN rail)
- Optimized EMC properties by separating the signal lines from the supply voltage lines
- Short unshielded cable lengths
- Requires little space

Overview Unlatching strap

- For PROFINET push-pull plug, e.g. at BA 2xM12 BusAdapter
- Enables unlatching of the plug without disassembly of the BusAdapter

Overview Color-coded labels



The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the process terminals.

The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals can also be marked using color-coded labels. Advantages of the color-coded labels:

- Quick installation (one label for marking 16 terminals)
- Printed terminal numbers
- Avoidance of wiring errors
- Simple detection of potentials during servicing

Overview Server module



The server module is included in the scope of delivery of all head-end stations (interface module, CPU, Open Controller). It includes the setup of an ET 200SP station.

Overview SIPLUS server module

The SIPLUS server module is included in the scope of supply of all head-end stations (interface module, CPU, Open Controller). It includes the setup of a SIPLUS ET 200SP station.

I/O systems

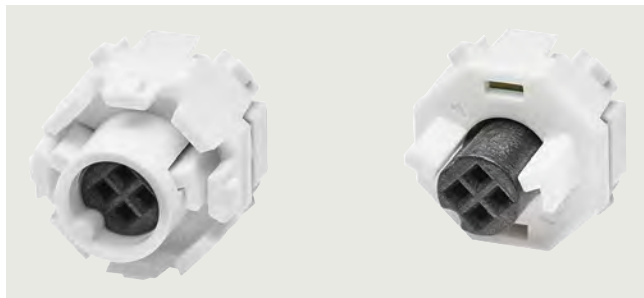
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Accessories

Overview SIPLUS spacing module

The Spacing Modules can be used instead of a SIPLUS BaseUnit with BU cover if a blank space is required. For example, empty spaces are required for some modules for operation at 70 °C.

Overview Coding elements



The operation of selected modules requires an electronic coding element that is always included in the scope of delivery of the I/O module. Apart from the mechanical coding function, this contains a re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules or parameter data in the case of the IO-Link master). In this way, this data is automatically backed up during a module replacement. This saves the user from having to set addresses manually or back up data when replacing modules.

At present, there are two types of electronic coding element:

- e-coding element (Type H), which can be used in the I/O modules:
 - CM IO-Link master
 - F-CM AS-i Safety
- e-coding element (Type F), which can be used in the I/O modules:
 - F-DI 8x24VDC HF
 - F-DQ 4x24VDC/2A PM HF
 - F-PM-E 24VDC/8A PPM ST

Ordering data

Article No.

SIMATIC system rail

- with DIN rail according to EN 60715 (35 × 7.5), with 6 mm profile grooves, B-type
- Length: 482.6 mm for 19" cabinets
 - Length: 530 mm for 600 mm cabinets
 - Length: 830 mm for 900 mm cabinets
 - Length 2 m

6ES7193-6MR00-0AA0
6ES7193-6MR00-0BA0

6ES7193-6MR00-0CA0

6ES7193-6MR00-0DA0

Labeling strips

- 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer
- 500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer
- 1000 labeling strips DIN A4, light gray, card, for inscription with laser printer
- 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer

6ES7193-6LR10-0AA0

6ES7193-6LR10-0AG0

6ES7193-6LA10-0AA0

6ES7193-6LA10-0AG0

Equipment labeling plate

10 sheets of 16 labels

6ES7193-6LF30-0AW0

BU cover

- for covering empty slots (gaps); 5 units
- 15 mm wide
 - 20 mm wide

6ES7133-6CV15-1AM0
6ES7133-6CV20-1AM0

Shield connection

5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding

6ES7193-6SC20-1AM0

Unlatching strap

10 units, for push-pull PROFINET plug, e. g. when using the BA 2xM12 BusAdapter

6ES7193-6DL00-2AA0

Module-specific color-coded labels

- Color code CC00, for 16 process terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)
- Pack containing 10 labels
 - Pack containing 50 labels
- Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), pack containing 10 labels
- Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16), pack containing 10 labels
- Color code CC03, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16), pack containing 10 labels
- Color code CC04, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16), pack containing 10 labels

6ES7193-6CP00-2MA0
6ES7193-6CP00-4MA0
6ES7193-6CP01-2MA0

6ES7193-6CP02-2MA0

6ES7193-6CP03-2MA0

6ES7193-6CP04-2MA0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP

Accessories

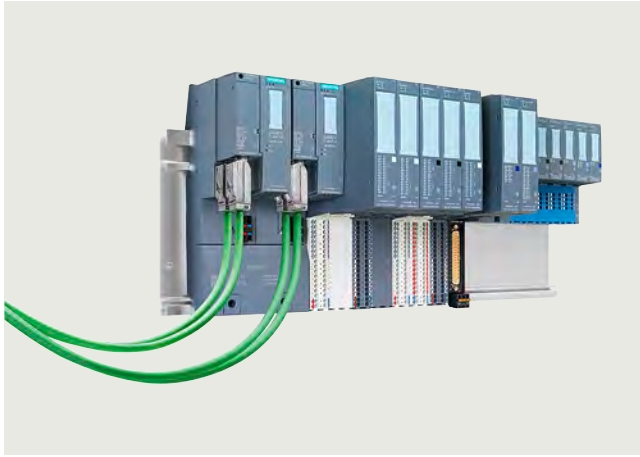
Ordering data	Article No.		Article No.
Module-specific color-coded labels Color code CC05, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16), pack containing 10 labels Color code CC41, for 16 push-in terminals; for BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12), pack containing 10 labels Color code CC42, for 12 push-in terminals, BU type F0, gray (terminals 1 to 8), red (terminals 9 to 10), blue (terminals 11 to 12), pack containing 10 labels Color code CC51, for 6 push-in terminals, for BU type C0, C1, gray (terminals 1 to 4), red (terminal 5), blue (terminal 6), pack containing 10 labels Color code CC51, for 6 push-in terminals, for BU type C0, gray (terminals 1, 2 and 5), red (terminals 3 and 4), blue (terminal 6), pack containing 10 labels Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16), pack containing 50 labels Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16), pack containing 50 labels	6ES7193-6CP05-2MA0 6ES7193-6CP41-2MB0 6ES7193-6CP42-2MB0 6ES7193-6CP51-2MC0 6ES7193-6CP52-2MC0 6ES7193-6CP01-4MA0 6ES7193-6CP02-4MA0	Color-coded labels for add-on terminals Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A), pack containing 10 labels Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A), pack containing 10 labels Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow-green, for BaseUnit type C0, C1, pack containing 10 labels Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0, C1, pack containing 10 labels Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0, C1, pack containing 10 labels Server module Spare part SIPLUS server module (Extended temperature range and exposure to environmental substances) Spare part SIPLUS Spacing Module (Extended temperature range and exposure to environmental substances) With conformal coating, no terminals, bridged to the left, WxH: 15 mm x 117 mm	6ES7193-6CP82-2AB0 6ES7193-6CP83-2AB0 6ES7193-6CP84-2AC0 6ES7193-6CP85-2AC0 6ES7193-6CP86-2AC0 6ES7193-6PA00-0AA0 6AG1193-6PA00-7AA0 6AG1193-6BN00-7BA0
Color-coded labels for add-on terminals Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A), pack containing 10 labels Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A), pack containing 10 labels Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A), pack containing 10 labels Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C), pack containing 10 labels Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A), pack containing 10 labels	6ES7193-6CP71-2AA0 6ES7193-6CP72-2AA0 6ES7193-6CP73-2AA0 6ES7193-6CP74-2AA0 6ES7193-6CP81-2AB0	Coding elements Type H; pack containing 5 electronic coding elements Type F; pack containing 5 electronic coding elements Type A; pack with 20 mechanical coding elements, for automatic coding, for I/O modules Type B; pack with 20 mechanical coding elements, for automatic coding, for I/O modules Type C; pack with 20 mechanical coding elements, for automatic coding, for I/O modules Type D; pack with 20 mechanical coding elements, for automatic coding, for I/O modules	6ES7193-6EH00-1AA0 6ES7193-6EF00-1AA0 6ES7193-6KA00-3AA0 6ES7193-6KB00-3AA0 6ES7193-6KC00-3AA0 6ES7193-6KD00-3AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Overview



ET 200SP HA with redundant interface module, standard modules, Ex modules and D-SUB terminal block.

Compact design, flexible connection possibilities and high system availability with redundant PROFINET connections: the SIMATIC ET 200SP HA distributed I/O system is perfectly suited to the requirements of the process industry. The new design allows up to 56 I/O modules per station. An impressively high concentration of up to 32 channels on a module that is only 22.5 mm wide allows for maximum economy in the control cabinet.

Redundant PROFINET connections allow the connection of high-availability controllers via two independent networks, with a choice of copper or fiber-optic cables. The system can be scaled and extended in small steps using a variety of available modules, for example with digital and analog I/Os as well as NAMUR, HART, and other protocols. All 24 V standard signals are connected via an identical terminal block type, which allows a high degree of standardization for the control cabinets.

SIMATIC ET 200SP HA is designed for use in the control cabinet as well as for hazardous areas up to hazardous zone 2. The extended temperature range from -40 to +70 °C and the conformal coating of all components allow direct installation in the field.

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Interface module

Overview



IM 155-6 PN HA

IM 155-6 PN HA interface module

The IM 155-6 PN HA together with the IM carrier module and the BusAdapter forms the interface of the ET 200SP HA. The interface is used for communication between the CPU and the connected ET 200SP HA I/O modules over PROFINET.

Ordering data

Article No.

Interface module	
PROFINET IM 155-6 PN interface module Max. 56 I/O modules, multi hot swap, no server module	6DL1155-6AU00-0PM0
Accessories	
IM cover Slot cover for interface module slots, to protect vacant slots Width 50 mm, 5 units	6DL1133-6CV50-0AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Interface module

Technical specifications

Article number	6DL1155-6AU00-0PM0 ET 200SP HA, IM155-6 PN
General information	
Product type designation	IM 155-6 PN
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V20
• PCS neo can be configured/ integrated from version	V6.0
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Address area	
Address space per station	
• Address space per station, max.	1 440 byte; 1 440 bytes R1 and S1 without CiR, otherwise 1 000 bytes
Hardware configuration	
Integrated power supply	Yes; 24 V DC
Rack	
• Modules per rack, max.	56; 56 slots for I/O modules + server module (width without IM ≤ 1.3 m)
Interfaces	
Number of PROFINET interfaces	1; 2 ports (switch)
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; as MRP client

Article number	6DL1155-6AU00-0PM0 ET 200SP HA, IM155-6 PN
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Redundancy mode	
• PROFINET system redundancy (S2)	Yes; S2, R1
Media redundancy	
- MRP	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• ACT LED	Yes; green LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	50 mm
Height	138 mm
Depth	89 mm
Weights	
Weight, approx.	192 g; without BusAdapter

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Digital I/O modules

Overview



- DI 16×24VDC HA digital input module
16 24 V DC digital inputs
- DI 32×24VDC HA digital input module
32 24 V DC digital inputs
- DI 16×NAMUR HA digital input module
16 NAMUR digital inputs
- DI 8×24...125VDC HA digital input module
8 24 ... 125 V DC digital inputs
- DI 8×230VAC HA digital input module
8 230 V AC digital inputs
- DQ 16×24VDC/0.5A HA digital output module
16 24 V DC digital outputs, 0.5 A
- DQ 32×24VDC/0.5A HA digital output module
32 24 V DC digital outputs, 0.5 A
- RQ 4×120VDC-230VAC/5A CO HA digital output module
4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A

Ordering data

Article No.

DI 16×24VDC HA digital input module 16 24 V DC digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics	6DL1131-6BH00-0PH1
DI 32×24VDC HA digital input module 32 24 V DC digital inputs, color code CC00, for terminal block type P0 and H1, channel diagnostics	6DL1131-6BL00-0PH1
DI 16×NAMUR HA digital input module 16 NAMUR digital inputs, color code CC01, for terminal block type H1 and M1, channel diagnostics	6DL1131-6TH00-0PH1
DI 8×24...125VDC HA digital input module 8 24 ... 125 V DC digital inputs, color code CC42, for terminal block type K0, channel diagnostics	6DL1131-6DF00-0PK0
DI 8×230VAC HA digital input module 8 230 V AC digital inputs, color code CC42, for terminal block type K0, module diagnostics	6DL1131-6GF00-0PK0
DQ 16×24VDC/0.5A HA digital output module 16 24 V DC digital outputs, 0.5 A, color code CC02, for terminal block type H1 and M1, channel diagnostics	6DL1132-6BH00-0PH1
DQ 32×24VDC/0.5A HA digital output module 32 24 V DC digital outputs, 0.5 A, color code CC00, for terminal block type N0 and H1, channel diagnostics	6DL1132-6BL00-0PH1
RQ 4×120VDC-230VAC/5A CO HA digital output module 4 24 ... 120 V DC, 24 ... 230 V AC relay outputs, 5 A, color code CC40, for terminal block type K0, module diagnostics	6DL1132-6HD50-0PK0

Article No.

Accessories

Labeling strips

For labeling the I/O modules

- Roll, light gray (with a total of 500 labeling strips), 1 unit
- DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)
- DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)

Color-coded labels

For push-in terminals

- Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)
- Color code CC02, 10 units gray (terminals 1 to 16), blue (terminals 17 to 32)
- Color code CC40, 10 units gray (terminals 1 to 16)
- Color code CC42, 10 units gray (terminals 1 to 8), blue (terminals 9 to 16)

Equipment labeling plates

10 sheets with 16 labels each

TM cover

Slot cover for I/O modules, to protect vacant I/O slots
Width 22.5 mm, 5 units

6DL1193-6LR00-0AA0

6DL1193-6LA00-0AA0

6DL1193-6LA00-0AG0

6DL1193-6CP01-2HH1

6DL1193-6CP02-2HH1

6DL1193-6CP40-2HK0

6DL1193-6CP42-2HK0

6ES7193-6LF30-0AW0

6DL1133-6CV22-0AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Digital I/O modules

Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8x230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16x24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8x24 ... 125VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32x24VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16xNAMUR
General information					
Product type designation	DI 8x230VAC HA	DI 16x24VDC HA	DI 8x24 ... 125 V DC HA	DI 32x24VDC HA	DI 16xNAMUR HA
Engineering with					
• STEP 7 TIA Portal configurable/ integrated from version	V16	V16	V16	V16	V16
• STEP 7 configurable/ integrated from version	V5.6	V5.6	V5.6	V5.6	V5.6
• PCS 7 configurable/ integrated from version	V9.0	V9.0	V9.0	V9.0	V9.0
• PCS neo can be configured/ integrated from version	V3.0	V3.0	V3.0	V3.0	V3.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter		No	No	No	No
• Oversampling		No	No	No	No
• MSI		No	No	No	No
Supply voltage					
Rated value (DC)		24 V	24 V	24 V	24 V
Rated value (AC)	230 V				
Reverse polarity protection		Yes	Yes	Yes	Yes
Encoder supply					
Number of outputs		16		32; When terminal block with encoder supply is used (type P0)	16
Short-circuit protection		Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable		Yes; When using TB type P0	Yes
Output current					
• up to 60 °C, max.		2 A; 1 A when mounted vertically; see derating information in Equipment Manual			
• up to 70 °C, max.		1 A; See derating information in Equipment Manual			

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Digital I/O modules

Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8X230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16X24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8X24 ... 125VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32X24VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16XNAMUR
24 V encoder supply • 24 V • Short-circuit protection		Yes Yes; electronic (response threshold 0.7 A to 1.3 A; for IO redundancy up to 2.6 A) Ensure sufficient low-resistance cable routing to the sensor/actuator in order to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable 0.5 A 2 A			
Digital inputs					
Number of digital inputs	8; Isolated	16	8	32	16; NAMUR
Digital inputs, parameterizable		Yes		Yes	Yes
Source/sink input		Yes; P-reading	Yes; P-reading	Yes; P-reading	
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes	
Input characteristic curve in accordance with IEC 61131, type 2		No		No	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes	
Pulse extension		Yes		No	Yes; 0.5 s, 1 s, 2 s
• Length		off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Time stamping	Yes; Resolution 10 ms	Yes; Resolution 10 ms	Yes; Resolution 10 ms		Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	No	Yes; Resolution 1ms	Yes; Resolution 1ms		No
Edge evaluation		Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change	Yes; rising edge, falling edge, edge change
Signal change flutter					Yes; 2 to 32 signal changes
Flutter observation window					Yes; 0.5 s, 1 s to 100 s in 1-s steps
Input voltage • Rated value (DC) • Rated value (AC) • for signal "0" • for signal "1"	230 V 0V AC to 40V AC 74 V AC to 264 V AC	24 V -30 to +5 V +11 to +30V	-125 ... +5 V +11 ... +125 V	24 V -30 to +5 V +11 to +30V	8.2 V
Input current • for signal "1", typ.	10.8 mA	2.5 mA	3.1 mA	2.5 mA	
for NAMUR encoders - for signal "0", min. - for signal "0", max. - for signal "1", min. - for signal "1", max.					0.35 mA 1.2 mA 2.1 mA 6.4 mA

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Digital I/O modules

Technical specifications

Article number	6DL1131-6GF00-0PK0	6DL1131-6BH00-0PH1	6DL1131-6DF00-0PK0	6DL1131-6BL00-0PH1	6DL1131-6TH00-0PH1
	ET 200SP HA, DI 8X230VAC	ET 200SP HA, DI 16X24VDC	ET 200SP HA, DI 8X24 ... 125VDC	ET 200SP HA, DI 32X24VDC	ET 200SP HA, DI 16XNAMUR
Input delay (for rated value of input voltage) tolerated changeover time for changeover contacts					300 ms
for standard inputs parameterizable		Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	No	
for NAMUR inputs - at "0" to "1", max. - at "1" to "0", max.					17 ms 25 ms
Encoder					
Connectable encoders - NAMUR encoder/changeover contact according to EN 60947 - Single contact / changeover contact unconnected - Single contact / changeover contact connected with 10 kΩ 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes	Yes 1.5 mA	Yes 1.5 mA	Yes 1.5 mA	Yes Yes Yes Yes; Acc. to NAMUR 1.2 mA
Interrupts/diagnostics/ status information					
Diagnostics function		Yes		Yes	
Alarms					
Diagnostic alarm	Yes	Yes; channel by channel	Yes	Yes; channel by channel	Yes; channel by channel
Hardware interrupt		Yes; channel by channel	Yes; Parameterizable, channels 0 to 7, rising/falling edge	Yes; channel by channel	Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnostics					
Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
Monitoring the supply voltage		Yes; Module-wise	Yes	Yes; Module-wise	Yes
- parameterizable		Yes		Yes	Yes
Monitoring of encoder power supply		Yes			Yes
Wire-break		Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kΩ to 18 kΩ	Yes; channel by channel	Yes; Channel-by-channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 15 kΩ to 18 kΩ	Yes
Short-circuit				No	Yes
Short-circuit to M		Yes; Encoder supply to M, channel by channel			
Group error			Yes		Yes
Changeover contact error					Yes
Diagnostics indication LED					
MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
Monitoring of the supply voltage (PWR-LED)		Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
for channel diagnostics		Yes; red LED	Yes; red LED	No	Yes; red LED
for module diagnostics	Yes; green/red DIAG LED	Yes; green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Digital I/O modules

Technical specifications

Article number	6DL1131-6GF00-0PK0 ET 200SP HA, DI 8X230VAC	6DL1131-6BH00-0PH1 ET 200SP HA, DI 16X24VDC	6DL1131-6DF00-0PK0 ET 200SP HA, DI 8X24 ... 125VDC	6DL1131-6BL00-0PH1 ET 200SP HA, DI 32X24VDC	6DL1131-6TH00-0PH1 ET 200SP HA, DI 16XNAMUR
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	22.5 mm	22.5 mm	22.5 mm	22.5 mm	22.5 mm
Height	115 mm	115 mm	115 mm	115 mm	115 mm
Depth	138 mm	138 mm	138 mm	138 mm	138 mm
Weights					
Weight, approx.	148 g	135 g	165 g	150 g	153 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Analog I/O modules

Overview



- AI 8xU/I/TC/4xRTD 2-/4-wire HA analog input module
8 analog inputs
Measuring range: Voltage: 1 ... 5 V, 0 ... 10 V, ± 50 mV, ± 80 mV, ± 250 mV, ± 500 mV, ± 1 V, ± 2.5 V, ± 5 V, ± 10 V; current: 4 ... 20 mA (2-/4-wire); and 0 ... 20 mA (4-wire), ± 20 mA (4-wire); TC elements: B, C, N, E, R, S, J, L, T, K, U, TXK; RTD elements: Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, LG-Ni1000 | resistance areas: 150, 300, 600, 3000, 6000 Ohm | PTC
- AI 16xI 2-wire HA analog input module
16 analog inputs
Measuring range 4 ... 20 mA; 0 ... 10 mA; 0 ... 20 mA
- AI 16xI 2-wire HART HA analog input module
16 analog inputs
Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART
- AI 16xTC/8xRTD 2-/3-/4-wire HA analog input module
16 analog inputs for thermocouples; alternatively
8 analog inputs for thermistors
- AI 16xI 2-wire HA analog input module
16 analog inputs
Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA
- AI 16xI 2-wire HA analog input module
8 analog inputs for voltage measurements. current measurements, thermocouples, alternatively
4 analog inputs for thermistors
- AQ 8xI HART HA analog output module
8 analog outputs
Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART
- AI 4XI 2-/4-wire HART ISOL analog input module
4 galvanically isolated analog inputs (2-/4-wire)
- Analog output module AQ 4XI HART ISOL
4 galvanically isolated analog outputs (2-wire)

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Ordering data

Article No.

Article No.

AI 8xU/I/TC/4xRTD 2-/4-wire HA analog input module 8 analog inputs

6DL1134-6AF00-0PH1

Measuring ranges:

- Voltage: 1 ... 5 V, 0 ... 10 V, ± 50 mV, ± 80 mV, ± 250 mV, ± 500 mV, ± 1 V, ± 2.5 V, ± 5 V, ± 10 V
- Current: 4 ... 20 mA (2-/4-wire); and 0 ... 20 mA (4-wire), ± 20 mA (4-wire)
- TC elements: B, C, N, E, R, S, J, L, T, K, U, TXK
- RTD elements: Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, LG-Ni1000 | resistance areas: 150, 300, 600, 3000, 6000 Ohm | PTC

Color code CC00, for terminal block type H1, N0 and H0, channel diagnostics, 16-bit

AI 16xI 2-wire HA analog input module 16 analog inputs

6DL1134-6GH00-0PH1

Measuring range 4 ... 20 mA; 0 ... 10 mA; 0 ... 20 mA

Color code CC01, for terminal block type H1 and P1, channel diagnostics, 16-bit

AI 16xI 2-wire HART HA analog input module 16 analog inputs

6DL1134-6TH00-0PH1

Measuring range 0 to 20 mA, 0 to 10 mA, 4 to 20 mA, 4 to 20 mA with HART

Color code CC01, for terminal block type H1 and M1, channel diagnostics, 16-bit

AI 16xTC/8xRTD 2-/3-/4-wire HA analog input module

6DL1134-6JH00-0PH1

16 analog inputs for thermocouples; alternatively
8 analog inputs for thermistors

Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit

AQ 8xI HART HA analog output module 8 analog outputs

6DL1135-6TF00-0PH1

Power output in the output ranges 0 to 10 mA, 0 to 20 mA, 4 to 20 mA and 4 to 20 mA HART

Color code CC00, for terminal block type H1 and M1, channel diagnostics, 16-bit

AI 4XI 2-/4-wire HART ISOL analog input module

6DL1134-6UD00-0PK0

14 analog inputs

Color code CC01, for terminal block type K0, L0, channel diagnostics, 16-bit, $\pm 0.1\%$

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Analog I/O modules

Ordering data	Article No.		Article No.
AQ 4XI HART ISOL analog output module 4 analog outputs Color code CC00, for terminal block type K0, L0, channel diagnostics, 16-bit, +/-0.1%	6DL1135-6UD00-0PK0	Color-coded labels For push-in terminals • Color code CC00, 10 units gray (terminals 1 to 32) • Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)	6DL1193-6CP00-2HH1 6DL1193-6CP01-2HH1
Accessories		Equipment labeling plates 10 sheets with 16 labels each	6ES7193-6LF30-0AW0
Labeling strips For labeling the I/O modules • Roll, light gray (with a total of 500 labeling strips), 1 unit • DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450) • DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)	6DL1193-6LR00-0AA0 6DL1193-6LA00-0AA0 6DL1193-6LA00-0AG0	TM cover Slot cover for I/O modules, to protect vacant I/O slots Width 22.5 mm, 5 units	6DL1133-6CV22-0AM0

Technical specifications

Article number	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA	Article number	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA
General information		Smoothing of measured values • parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Product type designation	AI 16xI 2-wire HA	Encoder	
Engineering with		Connection of signal encoders • for current measurement as 2-wire transducer	Yes
• STEP 7 TIA Portal configurable/ integrated from version	V18	Errors/accuracies	
• STEP 7 configurable/ integrated from version	V5.6	Basic error limit (operational limit at 25 °C) • Current, relative to input range, (+/-) 0.3 %	
• PCS 7 configurable/ integrated from version	V9.1 SP2	Interrupts/diagnostics/ status information	
• PCS neo can be configured/ integrated from version	V4.0	Alarms • Diagnostic alarm • Limit value alarm	Yes No
• PROFINET from GSD version/ GSD revision	GSDML V2.42 2023.01	Diagnoses • Monitoring the supply voltage • Wire-break	Yes Yes; channel-by-channel, at 4 to 20 mA only
Operating mode		• Short-circuit	No
• Oversampling	No	• Overflow/underflow	Yes; channel by channel
• MSI	No	Diagnostics indication LED • MAINT LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics	Yes; Yellow LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED
Supply voltage		Potential separation	
Rated value (DC)	24 V	Potential separation analog inputs • between the channels and backplane bus	Yes
Reverse polarity protection	Yes	Potential separation channels • between the channels and backplane bus	Yes
Encoder supply			
Number of outputs	16		
Short-circuit protection	Yes		
Analog inputs			
Number of analog inputs	16		
• For current measurement	16		
permissible input current for current input (destruction limit), max.	30 mA		
Cycle time (all channels), min.	400 ms		
Input ranges (rated values), currents			
• 0 to 20 mA	Yes; 16 bit incl. sign		
• 4 mA to 20 mA	Yes; 16 bit incl. sign		
Cable length			
• shielded, max.	800 m		
• unshielded, max.	200 m		
Analog value generation for the inputs			
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit; 15 bit at 0 ... 10 mA and 60 Hz interference suppression		
• Integration time, parameterizable	Yes; channel by channel		
• Integration time (ms)	16.6 / 20 / 100 ms		

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Analog I/O modules

Technical specifications

Article number	6DL1134-6GH00-0PH1 ET 200SP HA, AI 16xI 2-wire HA
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	148 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Analog/digital module

Overview



The I/O module AI-DI 16/DQ 16x24VDC HART HA is available in the following versions:

- DI 16/DQ 16x24VDC HA in digital-only mode
- AI-DI 16/DQ 16x24VDC HART HA as digital/analog module in mixed mode

Time stamping is available with configuration in mixed mode. High-precision time stamping (SoE: Sequence of Events) with a precision of 1 ms is available with configuration in digital-only mode.

In mixed mode, the 16 inputs can also be set channel by channel as either digital inputs or analog inputs with or without HART. HART is only available in mixed mode and with configuration in a measuring range of 4 to 20 mA.

Ordering data	Article No.
AI-DI 16/DQ 16x24VDC HART HA input/output module 16 channels, each with digital output and digital/analog input Color code CC01, for terminal block type H1 and M1	6DL1133-6EW00-0PH1
Accessories	
Labeling strips For labeling the I/O modules	
• Roll, light gray (with a total of 500 labeling strips), 1 unit	6DL1193-6LR00-0AA0
• DIN A4 sheet, light gray, 10 items per packing unit, 45 labeling strips per sheet (450)	6DL1193-6LA00-0AA0
• DIN A4 sheet, yellow, 10 items per packing unit, 45 labeling strips per sheet (450)	6DL1193-6LA00-0AG0
Color-coded labels For push-in terminals	
• Color code CC01, 10 units gray (terminals 1 to 16), red (terminals 17 to 32)	6DL1193-6CP01-2HH1
Equipment labeling plates 10 sheets with 16 labels each	6ES7193-6LF30-0AW0
Slot cover for I/O modules 22.5 mm wide	6DL1133-6CV22-0AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Analog/digital module

Technical specifications

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
General information	
Product type designation	AI-DI 16/DQ 16x24VDC HART HA
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V16
• STEP 7 configurable/ integrated from version	V5.6
• PCS 7 configurable/ integrated from version	V9.0
• PCS neo can be configured/ integrated from version	V3.0
• PROFINET from GSD version/ GSD revision	GSDML V2.3
Operating mode	
• DI	Yes
• Counter	Yes
• DQ	Yes
• DQ with energy-saving function	No
• PWM	No
• Oversampling	No
• MSI	No
• MSO	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	16
Short-circuit protection	Yes; per channel, electronic
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamping	Yes; Resolution 10 ms
Time stamp (with precision of 1 ms)	Yes; Resolution 1ms
Digital input functions, parameterizable	
• Gate start/stop	Yes; Partner channel of n+8 counter
• Freely usable digital input	Yes; Parameterizable input filter
• Counter	Yes; Incl. frequency measurement
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Digital outputs	
Number of digital outputs	16
Current-sinking	No
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; Response threshold 0.7 A to 1.3 A
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.7 mA
Output delay with resistive load	
• "0" to "1", typ.	50 µs
• "1" to "0", typ.	100 µs
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A
• Current per module, max.	2 A
Analog inputs	
Number of analog inputs	16
permissible input current for current input (destruction limit), max.	30 mA
Input ranges	
• Current	Yes; 0 ... 10 mA, 0 ... 20 mA, 4 ... 20 mA, 4 ... 20 mA HART
Input ranges (rated values), currents	
• 0 to 10 mA	Yes
• 0 to 20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; Resolution with overrange (bit including sign), max. 16 bits, exception: 15 bits at 60 Hz interference suppression and 0 to 10 mA
• Integration time, parameterizable	Yes; channel by channel
Smoothing of measured values	
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Analog/digital module

Technical specifications

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
• Hardware interrupt	Yes; Parameterizable, channels 0 to 15, rising/falling edge
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Short-circuit to M	Yes; Encoder supply to M, channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	No
• for channel diagnostics	No
• for module diagnostics	Yes; green/red DIAG LED

Article number	6DL1133-6EW00-0PH1 ET 200SP HA, AI-DI16/DQ16X24VDC HART
Integrated Functions	
Frequency measurement	Yes
• Number of frequency meters	8
Counting functions	
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes; Via partner channel (digital input n+8)
• Software gate	Yes
Measuring functions	
• Dynamic measurement period adjustment	Yes
Measuring range	
- Frequency measurement, min.	0.1 Hz
- Frequency measurement, max.	5 kHz
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C; Observe derating
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C; Observe derating
Dimensions	
Width	22.5 mm
Height	115 mm
Depth	138 mm
Weights	
Weight, approx.	150 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Technology modules

Overview

ET 200SP HA Fast Multi IO & Counter



- Analog/digital module, input/output, counter, speed measurement
- 8 analog outputs (up to 800 Hz)
Measuring range: 4x 0/4-20 mA, ± 20 mA, ± 50 mA and 4x ± 10 V
- 4 analog inputs
Measuring ranges: 0/4-20 mA, ± 20 mA, ± 30 mA, ± 10 V, 0-20 V, -20-0 V
- Sensor supply: ± 50 mA via digital output
- 4 digital inputs 24 V
- 3 counters up to 70 kHz
Counter functions: up/down, once/periodic, gate control, 32-bit
- 6 combined digital inputs and outputs (DI/DQ)

ET 200SP HA vibration protection



- Analog/digital module, input/output, vibration protection
- Vibration protection for rotating machinery (e.g. drives, compressors, gears, fans)
- 4 analog inputs (up to 50 kHz signal frequency)
Measuring ranges: 0/4-20 mA, ± 20 mA, ± 30 mA, ± 10 V, 0-20 V, -20-0 V
Suitable for electrodynamic and piezoelectric vibration sensors
- Sensor supply: ± 50 mA
- Integrated signal processing:
10 configurable function sequences for calculation of vibration-specific performance characteristics (simultaneous use 8 function sequences per module)
- 4 analog inputs
Measuring ranges: 0/4-20 mA, ± 20 mA, ± 30 mA, ± 10 V, 0-20 V, -20-0 V
- 8 analog outputs (up to 800 Hz)
Measuring range: 4x 0/4-20 mA, ± 20 mA, ± 50 mA and 4x ± 10 V
- Sensor supply: ± 50 mA via digital output
- 4 digital inputs 24 V
- 6 combined digital inputs and outputs (DI/DQ)

Ordering data

Article No.

**ET 200SP HA
TM Fast Multi IO & Counter**
4xAI, 8xAQ, 4xDI, 6xDI/DQ
Color code CC00,
terminal block type H1 and M1

6DL1138-6EA00-0EH1

ET 200SP HA vibration protection
4xAI, 8xAQ, 4xDI, 6xDI/DQ
Color code CC00,
terminal block type H1 and M1

6DL1138-6EC00-0EH1

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Technology modules

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
General information		
Product type designation	Fast Multi IO & Counter	Vibration protection module 4 channels
Product function		
• Isochronous mode	No	No
Engineering with		
• SPPA-T3000 can be configured/ integrated from version	V8.2 SP2	V8.2 SP2
Operating mode		
• DI	Yes	Yes
• Counter	Yes	
• DQ	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Encoder supply		
Number of outputs	6; max. depending on parameterization	6; max. depending on parameterization
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Digital inputs		
Number of digital inputs	10; Of these, 6 combined DI/DQ	10; Of these, 6 combined DI/DQ
Digital inputs, parameterizable	Yes	Yes
Source/sink input	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9	Yes; DI0 ... DI3 (param.); sinking DIDQ4 ... DIDQ9
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Pulse extension	Yes	Yes
• Length	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable		
• Gate start/stop	Yes; Selectable: Standard DI, encoder signals A, B, N, gate start, gate stop, set counter	
• Freely usable digital input	Yes	
• Counter	Yes	
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	0 ... 5 V	0 ... 5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ	2.6 mA; 2.6 mA DI, 3.5 mA DIDQ
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
for technological functions		
- parameterizable	Yes; Adjustable filter: 5 µs, 25 µs	
Digital outputs		
Number of digital outputs	6; max. depending on parameterization	6; max. depending on parameterization
Current-sinking	No	No
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	Yes
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ -(37 to 41V)	L+ -(37 to 41V)
Controlling a digital input	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Technology modules

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
Digital output functions, parameterizable		
• Switching tripped by comparison values	Yes; As output signal of a high-speed counter	
• Freely usable digital output	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
Load resistance range		
• lower limit	48 Ω	48 Ω
Output voltage		
• for signal "1", min.	18.1 V	18.1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
Output delay with resistive load		
• "0" to "1", typ.	1 ms	1 ms
• "1" to "0", typ.	100 µs	100 µs
Parallel switching of two outputs		
• for logic links	No	
• for uprating	No	
• for redundant control of a load	Yes	
Switching frequency		
• with resistive load, max.	800 Hz	800 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A	0.5 A
• Current per module, max.	2 A	2 A
Analog inputs		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA; Protection available against destruction	50 mA; Protection available against destruction
Cycle time (all channels), min.		1.25 ms; For up to 128 samples per channel
Input ranges		
• Voltage	Yes; 0 ... 10 V, -10 ... 10 V, 0 ... 20 V, -20 ... 0 V	Yes; 0 ... 10 V, -10 ... 10 V, 0 ... 20 V, -20 ... 0 V
• Current	Yes; 0 ... 20 mA, 4 ... 20 mA, -20 ... 20 mA, -30 ... 30 mA, -20 ... 0 mA	Yes; 0 ... 20 mA, 4 ... 20 mA, -20 ... 20 mA, -30 ... 30 mA, -20 ... 0 mA
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -10 V to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	Yes; 0 mA or 4 mA to 20 mA
• -20 mA to +20 mA	Yes	Yes
• 4 mA to 20 mA	Yes; and 0 to 20 mA	Yes; and 0 to 20 mA
Cable length		
• shielded, max.	600 m	600 m
Analog outputs		
Number of analog outputs	8; 4 AQ-I, 4 AQ-U	8; 4 AQ-I, 4 AQ-U
Cycle time (all channels), min.		625 µs
Current signal at analog output	Yes; -50 ... 50 mA	Yes; -50 ... 50 mA
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
• -20 mA to +20 mA	Yes; ±30 mA, ±50 mA	Yes; ±30 mA, ±50 mA
• 4 mA to 20 mA	Yes	Yes

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Technology modules

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
Connection of actuators • for voltage output two-wire connection	Yes	Yes
Load impedance (in rated range of output) • with current outputs, max.	330 Ω; 150 ohms at ±50 mA	330 Ω; 150 ohms at ±50 mA
Analog value generation for the inputs		
Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max.	24 bit	24 bit
Smoothing of measured values • parameterizable	Yes	Yes
Analog value generation for the outputs		
Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max.	16 bit	16 bit
Encoder		
Connection of signal encoders • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer	Yes Yes Yes	Yes Yes Yes
Connectable encoders • Single contact / changeover contact unconnected • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes Yes 1.5 mA	Yes Yes 1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms • Diagnostic alarm	Yes	Yes
Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit to M • Short-circuit to L+ • Group error • Overflow/underflow	Yes Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3 Yes; Encoder supply to M, channel by channel Yes; Analog inputs Yes Yes	Yes Yes; AI 4 ... 20 mA, AQ, DQ, DI 0 ... 3 Yes; Encoder supply to M, channel by channel Yes; Analog inputs Yes Yes
Diagnostics indication LED • RUN LED • MAINT LED • Monitoring of the supply voltage (PWR-LED) • for module diagnostics	Yes; green LED Yes; Yellow LED Yes; green PWR LED Yes; green/red DIAG LED	Yes; green LED Yes; Yellow LED Yes; green PWR LED Yes; green/red DIAG LED

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Technology modules

Technical specifications

Article number	6DL1138-6EA00-0EH1 ET 200SP HA FIO & Counter	6DL1138-6EC00-0EH1 ET200SP HA Vibration Protection
Integrated Functions		
Frequency measurement	Yes; Speed measurement	
Counting functions		
• Continuous counting	Yes	
• Counter response parameterizable	Yes	
• Hardware gate via digital input	Yes	
• Software gate	Yes	
Measuring functions		
• Dynamic measurement period adjustment	Yes; Speed measurement	
Measuring range		
- Frequency measurement, min.	0.1 Hz	
- Frequency measurement, max.	70 kHz; 70 kHz for DI; 7 kHz for DI/DQ; each for P/M encoder and 50 m cable length; 10 kHz for DI; 0.7 kHz for DI/DQ; each for P encoder and 50 m cable length	
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C; Observe derating	70 °C; Observe derating
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	3 500 m	3 500 m
Dimensions		
Width	22.5 mm	22.5 mm
Height	115 mm	115 mm
Depth	138 mm	138 mm
Weights		
Weight, approx.	200 g	200 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Fail-safe I/O-modules

Overview



Fail-safe I/O modules permit safety-related monitoring and thus, when required, bringing the plant to the defined safe state. The communication and integration into the process control system is enabled with the proven technology SIMATIC Safety Integrated. The fail-safe I/O modules for DI, DO and AI correspond to the size of the standard modules and are certified by the German Technical Inspectorate up to SIL 3 per channel. All fail-safe I/O modules can be set up in redundant configuration guaranteeing not only fail-safe operation but also highest availability. SIMATIC ET 200SP HA is perfectly adapted for demanding fail-safe and standard applications in the manufacturing and process industries when high availability and PROFINET R1 redundancy are imperative.

- <https://www.siemens.com/process-safety>

Ordering data

Article No.

F-DI 16x24VDC HA digital input module

16 digital inputs 24 V DC, color code CC01, for terminal block type H1 and M1, channel diagnostics

6DL1136-6BA00-0PH1

F-DO 10x24VDC/2A HA digital output module

10 digital outputs 24 V DC, 2 A, color code CC01, for terminal block type H1 and M1, channel diagnostics

6DL1136-6DA00-0PH1

F-AI 8xI 2-/4-wire HART HA analog input module

8 digital inputs, color code CC00, for terminal block type H1 and F1, channel diagnostics

6DL1136-6AA00-0PH1

Note:

The use of fail-safe modules requires SIMATIC S7 F systems.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Ex I/O modules

Overview



ET200SP_Ex_IO_withPM

The intrinsically safe ET 200SP HA Ex I/O modules extend the SIMATIC ET 200SP HA and SIMATIC ET 200SP distributed I/O systems with the option of integrating devices located in hazardous areas (intrinsically safe sensors, actuators and HART field devices) into the system.

The ET 200SP HA Ex I/O modules with device protection according to intrinsic safety "i" offer channel outputs in Zone 0 or 1. 2-channel HART analog input and output modules and 2/4-channel digital input and output modules with different characteristic curves as well as a power module for intrinsically safe power supply of the modules.

Separate Ex isolators with correspondingly complex wiring and high space requirements are no longer required. The I/O modules can be installed up to ATEX Zone 2 and offer intrinsically safe circuits in Ex ia design for field devices up to Zone 0.

The Ex modules offer channel diagnostics and Configuration in Run and are approved for ambient temperatures from -40 to +70 °C.

Ordering data

Article No.

SIMATIC ET 200SP HA Ex digital modules

Digital Ex-i input module, Ex-DI 4xNAMUR

6DL1131-6TD00-0HX1

Suitable for BaseUnit type X1, channel diagnostics

Digital Ex-i output module, Ex-DQ 2x23,1VDC/20 mA

6DL1132-6EB00-0HX1

Suitable for BaseUnit type X1, channel diagnostics

Digital Ex-i output module, Ex-DQ 2x17,4VDC/27 mA

6DL1132-6CB00-0HX1

Suitable for BaseUnit type X1, channel diagnostics

SIMATIC ET 200SP HA Ex analog modules

Analog Ex-i HART input module, Ex-AI 2xI 2-wire HART

6DL1134-6TB00-0HX1

Suitable for BaseUnit type X1, channel diagnostics, 16 bits, +/-0.3%

Analog Ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire

6DL1134-6JD00-0HX1

Suitable for BaseUnit type X1, channel diagnostics, 16 bits, +/-0.05%

Analog Ex-i HART output module, Ex-AQ 2xI HART HF

6DL1135-6TB00-0HX1

Suitable for BaseUnit type X1, channel diagnostics, 16 bits, +/-0.3%

Power module and BaseUnits

Power module Ex-PM E

6DL1133-6PX00-0HW0

24 V 0.8 A, W x H: 50 mm x 117 mm, suitable for BaseUnit type W0

BU type X1 for I/O modules

6DL1193-6BP00-0BX1

Push-in terminals, W x H: 20 mm x 117 mm

BU type W0 for Ex power module PM-E

6DL1193-6BP00-0DW0

W x H: 50 mm x 117 mm

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Ex I/O modules**Technical specifications**

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
General information		
Product type designation	Ex-AI 2xI 2-wire HART	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
Product function		
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16	V16
• PCS 7 configurable/ integrated from version	V9.1	V9.1
• PCS neo can be configured/ integrated from version	V3.1	V3.1
• PROFINET from GSD version/ GSD revision	GSDML V2.35	GSDML V2.35
Operating mode		
• MSI	Yes	Yes
Analog inputs		
Number of analog inputs	2; Differential inputs	
• For current measurement	2	4
• For voltage measurement		2
• For resistance/resistance thermometer measurement		4
• For thermocouple measurement		0.5 mA
Constant measurement current for resistance-type transmitter, typ.		Yes; °C/°F/K
Cycle time (all channels), min.	3 ms	
Technical unit for temperature measurement adjustable		
Input ranges (rated values), voltages		
• -1 V to +1 V		Yes; 16 bit incl. sign
• -250 mV to +250 mV		Yes; 16 bit incl. sign
• -50 mV to +50 mV		Yes; 16 bit incl. sign
• -80 mV to +80 mV		Yes; 16 bit incl. sign
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes; 15 bit + sign	
Input ranges (rated values), thermocouples		
• Type B		Yes; 16 bit incl. sign
• Type C		Yes; 16 bit incl. sign
• Type E		Yes; 16 bit incl. sign
• Type J		Yes; 16 bit incl. sign
• Type K		Yes; 16 bit incl. sign
• Type L		Yes; 16 bit incl. sign
• Type N		Yes; 16 bit incl. sign
• Type R		Yes; 16 bit incl. sign
• Type S		Yes; 16 bit incl. sign
• Type T		Yes; 16 bit incl. sign
• Type U		Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST		Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer		
• Cu 10		Yes; 16 bit incl. sign
• Ni 100		Yes; 16 bit incl. sign
• LG-Ni 1000		Yes; 16 bit incl. sign
• Ni 120		Yes; 16 bit incl. sign
• Ni 200		Yes; 16 bit incl. sign
• Ni 500		Yes; 16 bit incl. sign
• Pt 100		Yes; 16 bit incl. sign
• Pt 1000		Yes; 16 bit incl. sign
• Pt 200		Yes; 16 bit incl. sign
• Pt 500		Yes; 16 bit incl. sign

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Ex I/O modules

Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
Input ranges (rated values), resistors		
• 0 to 150 ohms		Yes; 15 bit
• 0 to 300 ohms		Yes; 15 bit
• 0 to 600 ohms		Yes; 15 bit
• 0 to 3000 ohms		Yes; 15 bit
• 0 to 6000 ohms		Yes; 15 bit
• PTC		Yes; 15 bit
Thermocouple (TC)		
Temperature compensation		
- parameterizable		Yes
Cable length		
• shielded, max.	500 m; Ex characteristic values must be observed	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
• unshielded, max.	300 m; Ex characteristic values must be observed	
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes; channel by channel	Yes; Channel-by-channel, results from the selected interference frequency suppression
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 Hz	16.6 / 50 / 60 Hz, channel-by-channel
• Conversion time (per channel)		180 / 60 / 50 ms, results from the selected interference frequency suppression
Smoothing of measured values		
• Number of smoothing levels	4; None; 4/8/16 times	
• parameterizable	Yes	Yes; none, weak, medium, strong, channel-by-channel
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	
- Burden of 2-wire transmitter, max.	750 Ω; At 20 mA input current	
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)		0.05 %
• Current, relative to input range, (+/-)	0.2 %	
• Resistance, relative to input range, (+/-)		0.05 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, $f1 =$ interference frequency		
• Common mode interference, min.		90 dB
Protocols		
HART protocol	Yes	

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Ex I/O modules

Technical specifications

Article number	6DL1134-6TB00-0HX1 ET 200SP HA, EX-AI 2xI 2-WIRE HART	6DL1134-6JD00-0HX1 ET 200SP HA, EX-AI 4xTC/2xRTD 2-/3-/4-W
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Limit value alarm	Yes	Yes; two upper and two lower limit values in each case
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	
• Group error	Yes	
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Ex(i) characteristics		
maximum values for connecting terminals for gas group IIC		
• U _o (no-load voltage), max.	26 V	5.9 V
• I _o (short-circuit current), max.	93 mA	18 mA
• P _o (power output), max.	605 mW	27 mW
• C _o (permissible external capacity), max.	99 nF	43 µF
• L _o (permissible external inductivity), max.	4 mH	110 mH
• U _i (intrinsically safe input voltage), max.	10 V	
• U _m (voltage at non-intrinsically safe connecting terminals), max.	60 V	60 V
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	55 g	55 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Carrier modules

Overview

DIN rails

The DIN rail is required for fitting an ET 200SP HA station in the control cabinet. The IM carrier modules for interface modules, the carrier modules for the I/O modules and the server module are attached to the DIN rail.

The DIN rails are available in lengths of 482 mm (for installation in a 19-inch rack) and 1 500 mm (for maximum configuration and vertical installation in a cabinet).



IM single carrier module



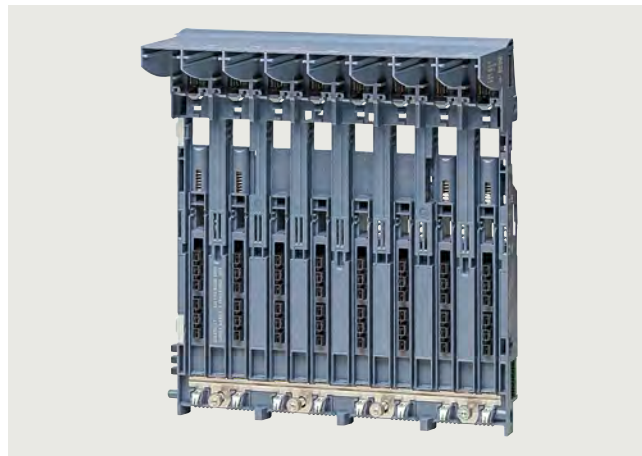
IM redundant carrier module

IM carrier modules for interface modules

Two variants of the IM carrier modules for interface modules are available:

- IM single carrier module for 1 interface module, for single connection to PROFINET
- IM redundant carrier module for 2 interface modules, for redundant connection to PROFINET

The IM carrier modules connect the interface module to the backplane bus. They enable data exchange with the I/O modules.



Carrier module for I/O modules, 8-slot



Carrier module for I/O modules, 2-slot

Carrier modules for I/O modules

The slots for the I/O modules are created by the connection of these carrier modules to the terminal blocks.

Carrier modules for I/O modules are available in the following variants:

- Carrier module, 2-slot, with 2 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules
- Carrier module, 8-slot, with 8 slots for I/O modules, without power bus function

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Carrier modules

Overview



ET 200SP HA, server module

Server module

Server module and power bus cover complete the design of the ET 200SP HA. A server module and a power bus cover are supplied with each IM carrier module for the interface module.

Ordering data

Article No.

DIN rails for ET 200SP HA

482 mm (approx. 19 inch) DIN rail
Including grounding screw and integrated DIN rail for fitting small components such as clamps, miniature circuit-breakers and relays

6DL1193-6MC00-0AA0

1 500 mm (approx. 59 inch) DIN rail
Including grounding screw and integrated DIN rail for fitting small components such as clamps, miniature circuit-breakers and relays

6DL1193-6MD00-0AA0

Grounding screw

For connecting PE to the DIN rail; essential for 1 500 mm DIN rail
20 units per packing unit

6ES7590-5AA00-0AA0

IM carrier modules for interface modules

Note:
A server module and a power bus cover are supplied with each IM carrier module for the interface module.

IM single carrier module

Rack for 1 SIMATIC ET 200SP HA interface module for single connection to PROFINET

6DL1193-6BH00-0SM0

IM redundant carrier module

Rack for 2 SIMATIC ET 200SP HA interface modules for redundant connection to PROFINET

6DL1193-6BH00-0RM0

Carrier modules for I/O modules

Carrier module, 2-slot

Rack for 2 SIMATIC ET 200SP HA I/O modules

6DL1193-6GA00-0NN0

Carrier module 8-slot

Rack for 8 SIMATIC ET 200SP HA I/O modules

6DL1193-6GC00-0NN0

Carrier module 8-slot

Carrier without Power Bus, can only be operated with light-gray or black terminal blocks, for holding 8 I/O modules of the SIMATIC ET 200SP HA

6DL1193-6GC00-8NN0

Spare parts

Server module (spare part) for ET 200SP HA

6DL1193-6PA00-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Carrier modules

Technical specifications

Article number	6DL1193-6GA00-0NN0 CARRIER MODULE TWOFOLD	6DL1193-6GC00-0NN0 CARRIER MODULE EIGHTFOLD	6DL1193-6GC00-8NN0 CARRIER MODULE EIGHTFOLD w/o PB
General information			
Product type designation	Carrier module 2 times	Carrier module 8 times	carrier module 8x without power bus
Product function			
• I&M data	Yes; Asset data	Yes; Asset data	Yes; Asset data
Hardware configuration			
Slots			
• Number of slots	2	8	8; for light gray and black terminal blocks
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C
Dimensions			
Width	52.5 mm; 45 mm when installed	187.5 mm; 180 mm when installed	187.5 mm; 180 mm when installed
Height	203 mm	203 mm	203 mm
Depth	79 mm	79 mm	79 mm
Weights			
Weight, approx.	111 g	450 g	270 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Terminal blocks

Overview

The slots for the I/O modules are created by connecting carrier modules and terminal blocks. The terminal blocks contain the process terminals for connecting sensors, actuators and other devices.

Select the terminal block for the slot of an I/O module based on the following dependencies:

The following table illustrates the terminal block / I/O module assignment (x = standard):

I/O modules in 24 V range (with push-in terminal blocks)

I/O module	TB type H1	TB type M1 (IO-RED)	TB type F1 (F-AI IO-RED)	TB type P0 (32x L+)	TB type N0 (32x M)
DI 16x24V	x	x			x ^{c)}
DI 32x24V	x ^{a)}			x	
DI 16xNAMUR	x	x			x ^{c)}
DQ 16x24V / 0.5A	x	x			x ^{c)}
DQ 32x24V / 0.5A	x ^{b)}				x
DI-AI 16x / DQ 16x HART	x	x			x ^{c)}
AI 16xI HART	x	x			x ^{c)}
AI 16xTC 8xRTD	x	x			
AQ 8xI HART	x	x			x ^{c)}
F-DI 16x24V	x	x			x ^{c)}
F-DQ 10x24V / 2A	x	x			x ^{c)}
F-AI 8xI HART	x		x		x ^{c)}
					
Power bus infeed	Light gray	Light gray		Light gray	Light gray
Power bus continuer	Dark gray	Dark gray		Dark gray	Dark gray
No power bus			Black		

a) Encoder supply must be realized separately

b) Ground points must be realized separately

c) Offers 32 additional ground points for field connection

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Terminal blocks

Overview

I/O modules in 24 V range (with D-sub terminal blocks)

I/O module	TB type H0 (D-sub)	TB type M0 (D-sub, IO-RED)	TB type F0 (D-sub, F-AI, IO-RED)
DI 16x24V	x	x	
DI 32x24V	x ^{a)}		
DI 16xNAMUR	x	x	
DQ 16x24V / 0.5A	x	x	
DQ 32x24V / 0.5A	x ^{b)}		
DI-AI 16x / DQ 16x HART	x	x	
AI 16xI HART	x	x	
AI 16xTC 8xRTD	x ^{c)}	x ^{c)}	
AQ 8xI HART	x	x	
F-DI 16x24V	x	x	
F-DQ 10x24V / 2A	x	x	
F-AI 8xI HART	x		x
			
Power bus infeed			
Power bus continuer			
No power bus	Black	Black	Black

^{a)} Encoder supply must be realized separately

^{b)} Ground points must be realized separately

^{c)} No temperature compensation for TC

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Terminal blocks

Overview

I/O modules with voltages >24 V (with push-in terminal blocks)

I/O modules with channel-selective isolation (with push-in and D-sub terminal blocks)

I/O module	TB type K0 (ISOL)	TB type L0 (ISOL, IO-RED)	TB type S0 (D-sub, ISOL)	TB type R0 (D-sub, ISOL, IO-RED)
DI 8x24 ... 125V DC	x			
DI 8x230VAC	x			
RQ 4x120-230V / 5A CO	x			
AI 4xI HART ISOL	x	x	x	x
AQ 4xI HART ISOL	x	x	x	x
				
Power bus infeed	Light gray	Light gray		
Power bus continuer	Dark gray			
No power bus			Black	Black

Potential groups/color type of the terminal blocks

To help you distinguish between potential groups on an ET 200SP HA station, the terminal blocks come in different colors:

- Light gray terminal blocks are for feeding in and start a new potential group.
- Dark gray terminal blocks forms a contact with the supply voltage of the terminal block to its left, thus extending the potential group.
- Black terminal blocks do not support any potential groups and must be fed in manually. Dark gray terminal blocks must not be inserted to the right of them.

Note the maximum permissible load current depending on the number of I/O modules:

Number of terminal blocks	Permissible load current in amperes
4	10 A
5	8 A
6	7 A
7	6 A
8	5 A
10	4 A
15	3 A
20	2 A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Terminal blocks

Ordering data

Article No.

Terminal blocks 24 V DC (push-in)

Terminal block type H1 light gray For starting a new potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	6DL1193-6TP00-0DH1
Terminal block type H1 dark gray For forwarding a potential group, with 32 push-in terminals, width 22.5 mm, with temperature compensation	6DL1193-6TP00-0BH1
Terminal block type M1 light gray For starting a new potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	6DL1193-6TP00-0DM1
Terminal block type M1 dark gray For forwarding a potential group, with 32 push-in terminals, width 45 mm, for redundant configurations, with temperature compensation	6DL1193-6TP00-0BM1
Terminal block, type F1, F-AI, IO-RED 32 push-in terminals, width 45 mm, for redundant configuration with fail-safe analog module F-AI, no power bus	6DL1193-6TP00-0DF1
Terminal block type P0 light gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specifically for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	6DL1193-6TP00-0DP0
Terminal block type P0 dark gray For forwarding a potential group, with 32 push-in terminals, additional 32 push-in terminals with encoder supply, width 45 mm, specifically for use with DI 32x24 V DC (6DL1131-6BL00-0PH1)	6DL1193-6TP00-0BP0
Terminal block type N0 light gray For starting a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	6DL1193-6TP00-0DN0
Terminal block type N0 dark gray For forwarding a new potential group, with 32 push-in terminals, additional 32 push-in terminals for ground connection, width 45 mm, for use with DQ 32x 24 V DC (6DL1132-6BL00-0PH1) and other modules	6DL1193-6TP00-0BN0

Article No.

Terminal blocks 24 V DC (D-sub)

Terminal block, type H0, D-sub D-sub plug 37-pin, 24 V infeed per TB, width 22.5 mm, no power bus	6DL1193-6TC00-0DH0
Terminal block, type M0, D-sub, IO-RED D-sub plug 37-pin, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	6DL1193-6TC00-0DM0
Terminal block, type F0, D-sub, F-AI, IO-RED D-sub plug 37-pin, for fail-safe analog input, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	6DL1193-6TC00-0DF0
Terminal block, type S0, D-sub, ISOL D-sub plug 37-pin, 24 V infeed per TB, width 22.5 mm	6DL1193-6TC00-0DS0
Terminal block, type R0, D-sub, ISOL, IO-RED D-sub plug 37-pin, 2 slots for I/O redundancy, 24 V infeed per slot, width 45 mm	6DL1193-6TC00-0DR0

Terminal blocks insulated (24 V DC / 125 V DC / 230 V AC)

Terminal block type K0 light gray For starting a new potential group, with 16 push-in terminals, width 22.5 mm	6DL1193-6TP00-0DK0
Terminal block type K0 dark gray For forwarding a potential group, with 16 push-in terminals, width 22.5 mm	6DL1193-6TP00-0BK0
Terminal block type L0 light gray For starting a new potential group, with 16 push-in terminals, width 45 mm	6DL1193-6TP00-0DL0

Accessories

Shield connection for terminal block 5 shield supports including support foot and shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional grounding	6ES7193-6SC20-1AM0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

Terminal blocks

Technical specifications

Article number	6DL1193-6TC00-0DH0 TERMINAL BLOCK, TYPE H0, D-SUB	6DL1193-6TC00-0DM0 TERMINALBLOCK, TYP M0, D-SUB, IO-RED	6DL1193-6TC00-0DF0 TERMINALBLOCK, TYP F0, D-SUB, F-AI, RED	6DL1193-6TC00-0DS0 TERMINALBLOCK, TYP S0, D-SUB, ISOL	6DL1193-6TC00-0DR0 TERMINALBLOCK, TYP R0, D-SUB, ISOL, RED
General information					
Product type designation	type H0, SUB-D	type M0, D-SUB, IO-RED	type F0, D-SUB, F-AI, IO-RED	type S0, D-SUB, ISOL	type R0, D-SUB, ISOL, IO-RED
Product function					
• I&M data	Yes; Asset data	Yes; Asset data	Yes; Asset data	Yes; Asset data	Yes; Asset data
Hardware configuration					
Slots					
• Number of slots	1	2; For IO redundancy	2; For IO redundancy	1	2; For IO redundancy
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• vertical installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
Dimensions					
Width	22.5 mm	45 mm	45 mm	22.5 mm	45 mm
Height	175 mm	175 mm	175 mm	175 mm	175 mm
Depth	77 mm	77 mm	77 mm	77 mm	77 mm
Weights					
Weight, approx.	92 g	158 g	156 g	92 g	158 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

BusAdapters

Overview



BA 2xRJ45, 2xFC and 2xLC BusAdapters

BusAdapters

A BusAdapter as a separate component allows a free choice of connection technology:

- BA 2xRJ45: 2 electrical connections for bus cable with standard RJ45 connector
- BA 2xFC: 2 electrical connections for direct connection of FastConnect bus cable
- BA 2xLC: 2 optical ports for fiber-optic cables
- BA LC/RJ45: 1 optical connection and 1 electrical connection for bus cable with standard RJ45 connector
- BA LC/FC: 1 optical connection and 1 electrical connection for direct connection of FastConnect bus cable
- BA 2xRJ45 (VD): 2 electrical connections for using PROFINET via existing PROFIBUS cables

Ordering data

Article No.

BusAdapters

2xRJ45 BusAdapter

2 × RJ45 sockets for PROFINET (standard Ethernet socket)

6DL1193-6AR00-0AA0

2xFC BusAdapter

2 × FastConnect (FC) connections for PROFINET

6DL1193-6AF00-0AA0

2xLC BusAdapter

2 × glass fiber-optic connections for PROFINET

6DL1193-6AG00-0AA0

BA LC/RJ45 BusAdapter

2 × glass fiber-optic connections

6DL1193-6AG20-0AA0

BA LC/FC BusAdapter

2 × glass fiber-optic connections

6DL1193-6AG40-0AA0

BA 2xRJ45 (VD) BusAdapter

2 × electrical connections for Ethernet communication via 2-, 4- or 8-wire copper cables and distances up to 500 m

6GK5991-2VA00-8AA2

Technical specifications

Article number	6DL1193-6AR00-0AA0 ET 200SP HA, BUSADAPTER BA 2XRJ45	6DL1193-6AF00-0AA0 ET 200SP HA, BUSADAPTER BA 2XFC	6DL1193-6AG00-0AA0 ET 200SP HA, BUSADAPTER BA 2XLC
General information			
Product type designation	BA 2x RJ45	BA 2xFC	BA 2xLC
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1; 2 ports (switch) FC	1; 2 ports (switch) LC Multimode Glass Fibre
Supports protocol for PROFINET IO			
• Number of RJ45 ports	2		
• Number of FC (FastConnect) connections		2	
• Number of LC ports			2
Cable length			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm			3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB
- Multimode graded-index fiber 62.5/125 µm			3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	65 °C; redundant design (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontal, max. 50 °C vertical. When using different I/O devices, the derating specified there must be observed

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200SP HA

BusAdapters

Technical specifications

Article number	6DL1193-6AR00-0AA0 ET 200SP HA, BUSADAPTER BA 2XRJ45	6DL1193-6AF00-0AA0 ET 200SP HA, BUSADAPTER BA 2XFC	6DL1193-6AG00-0AA0 ET 200SP HA, BUSADAPTER BA 2XLC
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	46 g	53 g	60 g

Article number	6DL1193-6AG20-0AA0 ET 200SP HA, BUSADAPTER BA LC/RJ45	6DL1193-6AG40-0AA0 ET 200SP HA, BUSADAPTER BA LC/FC
General information		
Product type designation	BA LC/RJ45	BA LC/FC
Interfaces		
Number of PROFINET interfaces	1; 2 ports (switch) LC / RJ45	1; 2 ports (switch) LC / FC
Supports protocol for PROFINET IO		
• Number of RJ45 ports	1	1
• Number of FC (FastConnect) connections		
• Number of LC ports	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
Cable length		
- Cu conductors	100 m	100 m
- Multimode graded-index fiber 50/125 µm	3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB
- Multimode graded-index fiber 62.5/125 µm	3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB
Standards, approvals, certificates		
RoHS conformity	Yes	Yes
China RoHS compliance	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	70 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 65 °C horizontally, max. 60 °C vertically. When using different IO Devices, the derating specified there must be observed.	65 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontally, max. 55 °C vertically. When using different IO Devices, the derating specified there must be observed.
Dimensions		
Width	20 mm	20 mm
Height	75 mm; Without protective caps (approx. 8 mm)	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm
Weights		
Weight, approx.	32 g	50 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Additional I/O modules

Overview

Extending the SIMATIC ET 200SP HA system with specific additional I/O modules from the SIMATIC ET 200SP system gives you more options and flexibility.

When these I/O modules are used, the following aspects need to be considered:

- Special slot rules apply (see System Manual for the SIMATIC ET 200SP HA)
- Module redundancy is not supported for the additional I/O modules
- Attention must be paid to the specific properties of the additional I/O modules, such as ambient temperature, painting, insulation protection. These are usually limited compared to the ET 200SP HA I/O modules
- Before use, check whether (Library) Support is already available for the desired purpose

Note:

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Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners.

Ordering data

Article No.

CM PtP communications module

For serial communication connections with RS232, RS422, RS485 interfaces, BU type A0, color code CC00

- CM PtP communications module (V2)

6ES7137-6AA01-0BA0

Analog input module

- AI Energy Meter CT HF, for 1 A or 5 A current transformers, with network analysis functions, channel diagnostics; BU type U0

6ES7134-6PA01-0CU0

- AI Energy Meter RC HF, for Rogowski coils or 333 mV current/voltage transformers, with network analysis functions, channel diagnostics; BU type U0

6ES7134-6PA21-0CU0

TM SIWAREX WP321 weighing module

Single-channel, for platform scales or hopper scales with analog load cells (1 - 4 mV/V), 1 × LC, 1 × RS 485.

7MH4138-6AA00-0BA0

TM SIWAREX WP351 HF weighing module

SIMATIC ET 200SP, TM SIWAREX WP351 HF, legal-for-trade weighing module for automatic dosing, filling and checking scales and totalizing weighing instruments

7MH4138-6BA00-0CU0

Motor starters

Direct starter

- Adjustment range 0.1 ... 0.4 A
- Adjustment range 0.3 ... 1 A
- Adjustment range 0.9 ... 3 A
- Adjustment range 2.8 ... 9 A
- Adjustment range 4 ... 12 A

3RK1308-0AA00-0CP0
3RK1308-0AB00-0CP0
3RK1308-0AC00-0CP0
3RK1308-0AD00-0CP0
3RK1308-0AE00-0CP0

Reversing starter

- Adjustment range 0.1 ... 0.4 A
- Adjustment range 0.3 ... 1 A
- Adjustment range 0.9 ... 3 A
- Adjustment range 2.8 ... 9 A
- Adjustment range 4 ... 12 A

3RK1308-0BA00-0CP0
3RK1308-0BB00-0CP0
3RK1308-0BC00-0CP0
3RK1308-0BD00-0CP0
3RK1308-0BE00-0CP0

SITRANS FCT070

Transmitter for ET 200SP

7ME4138-6AA00-0BB1

AirLINE SP valve terminal type 8647 for integration into ET 200SP HA

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:
<https://www.burkert-usa.com/en/type/8647>

* Disclaimer of liability

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I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200SP HA

Pneumatics > AirLINE SP valve terminal type 8647 for integration into ET 200SP HA

Overview



ET 200SP HA with Bürkert valve terminal AirLINE SP

- For pneumatic control of actuators with ET 200SP HA
- Can be used together with system and IO components of the ET 200SP HA distributed I/O system
- Product of the product partners Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems

Note:

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Benefits

- High degree of process safety by using non-return valves and pneumatic infeed modules with pressure monitoring
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (enabling compact control cabinet)
- Easy and fast installation thanks to full hardware integration: Physical interfaces of pneumatic and I/O components are fully compatible
- Fast and error-free configuration and diagnostics thanks to full software integration into the Siemens ecosystem (STEP 7 Classic, PCS 7, PCS neo, TIA Portal): The Bürkert pneumatic modules are handled like Siemens I/O modules in configuration and programming

Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from Bürkert Co., ET 200SP HA forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules. The valve terminal can also be attached to a control cabinet floor with an AirLINE Quick Adapter, which further reduces the space required in the control cabinet, and significantly simplifies the pneumatic installation.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly at <https://www.burkert.com/en/type/8647>.

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I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Overview



SIMATIC ET 200MP video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6147385583001



SIMATIC ET 200MP is a modular and scalable I/O system with degree of protection IP20 for universal use, and offers the same system advantages as SIMATIC S7-1500. SIMATIC ET 200MP permits extremely short bus cycle times and very fast response times, even with large quantity structures.

SIMATIC ET 200MP consists of the following components:

- Interface modules for connecting the S7-1500 I/O modules to PROFINET, Ethernet/IP, Modbus TCP and PROFIBUS; up to 30 modules can be connected to one interface module (up to 12 modules for PROFIBUS).
- S7-1500 I/O modules for connecting digital and analog signals, safety modules, technology modules and communications modules and processors.
- Load current supply (PM) for feeding the input and output circuit (load circuits) as well as the sensors and actuators.
- Optional system power supplies (PS) for converting AC or DC line voltages into the required operating voltages for the internal electronics of the SIMATIC S7-1500 I/O system if the power supply of the interface module is not sufficient
- U-connector for connecting the individual modules or active backplane bus for even higher performance and the option of removing and inserting modules during operation (HotSwap)
- S7-1500 mounting rail for securely fastening the I/O system in the control cabinet
- Additional accessories such as universal front connectors, cable grips and shielding sets, SIMATIC TOP connect to reduce cabling effort and variants with increased resistance to external influences (SIPLUS variants)
- Adapter solution for easy migration of S7-300 modules to S7-1500 IO (details on request)

The SIMATIC ET 200MP distributed I/O system is particularly easy to install, wire, and commission.

With its extended ambient conditions, SIMATIC ET 200MP can be used almost anywhere. Many modules can be operated in a temperature range from -30°C to +60°C and at altitudes up to 5,000 m as standard. A wide range of SIPLUS modules is available for requirements beyond this.

Highlights:

- Modular I/O system with degree of protection IP20 for PROFINET, Ethernet/IP, Modbus TCP, or alternatively for PROFIBUS
- Compact dimensions and high channel density
- High degree of user-friendliness due to the following design features:
 - High channel density through 35 mm wide modules with up to 64 digital and 16 analog channels
 - Standardized 40-pin front connector simplifies ordering, logistics, and stock-keeping
 - Standardized pin assignment per module type simplifies wiring and helps avoid errors
 - Integrated potential bridges simplify wiring and allow flexible subsequent modification of potential groups
 - The cable storage space grows along with the requirements and allows a uniform appearance even with insulated conductors with a large core cross-section and/or thick insulation
 - The prewiring position for the front connector allows convenient wiring during both first commissioning and when making changes during operation
 - The DIN rail integrated in the S7-1500 mounting rail allows snapping-on of many standard components such as additional terminals, miniature circuit breakers or small relays
 - The 1:1 assignment of channel status and diagnostics LED, terminal and inscription allows fast location and elimination of errors. Assistance is provided by the cabling diagram printed on the inside of the front doors
 - The integrated shielding concept for analog input and technology modules allows reliable and rugged operation, in particular with High Speed applications. Installation does not require any tools
 - Particularly space-saving and simple design with slim 25 mm modules and high-density modules; the maximum possible station configuration with power supply (PS), interface module (IM) and 30 I/O modules can be accommodated on a 830 mm wide S7-1500 mounting rail
- Extensive product portfolio comprising digital and analog input and output modules (incl. HART protocol for analog modules and connection of NAMUR encoders for digital input modules), technology modules, communications modules for IO-Link and point to point communication as well as F-modules up to SIL3.
 - Integrated technological functions in selected modules, such as counting, pulse width modulation (PWM) or integrated switching cycle counters, make cost-effective and convenient solutions possible.
 - Selected digital output modules enable safety-related load group shutdown in accordance with SIL 2 via an external safety relay.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Overview

- Extensive system functions
 - Integrated system diagnostics when operated with S7-1500 and TIA Portal
 - Integrated switching cycle counter for relay modules enables preventive maintenance
 - Integrated operating cycles counter at 24 V DC High Feature and TRIAC modules for preventive maintenance of connected actuators, e.g. solenoid valves or other mechanical switchgear
 - Suitable for simple counting tasks with digital input modules with up to 20 kHz.
 - Consistent use of identification and maintenance data IM0 to IM3 for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.)
 - ID-Link on the side of the module for fast identification using a smart phone.
 - Uniform firmware update for the interface module and all I/O modules for subsequent function extensions (investment security)
 - Bus cycle time $\geq 250 \mu\text{s}$ and coupling to the isochronous task permit implementation of applications with high performance requirements with PROFINET
 - Up to 30 I/O modules (PROFINET) or 12 I/O modules (PROFIBUS) within a station save on interface modules and installation time
 - MMC not required with PROFINET; automatic address assignment via LLDP or manually via TIA Portal or PST tool
 - Shared device on up to two (IM 155-5 PN BA and IM 155-5 PN ST) or four (IM 155-5 MF HF) IO controllers
 - Module shared input/module shared output as system function for all S7-1500 I/O modules
- High plant availability:
 - Increased communication availability by means of Media Redundancy Protocol (MRP, MRPD) on PROFINET as well as operation of the IM 155-5 MF HF on an S7-1500 R/H using S2 redundancy; in addition, the IM 155-5 MF HF High Feature interface modules can be operated on an S7-400H. Configuration is carried out with STEP 7 V5.5 SP3 and a GSDML file. The IM 155-5 MF HF also support operation on an S7-400H CPU (system redundancy).
 - Increased plant availability due to the active backplane bus for up to 12 I/O modules per station; allows reaction-free pulling and plugging of I/O modules in operation without a CPU STOP; allows holding of reserves (empty slots) for plant expansion at a later time.

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

Interface modules > IM 155-5

Overview



- Interface modules for connecting ET 200MP via PROFINET, Ethernet/IP, Modbus TCP or PROFIBUS
- These handle data exchange with the I/O controller in the controller
- Width 35 mm

Ordering data

Article No.

Article No.

IM 155-5 interface module

Degree of protection IP20,
module width 35 mm, installation on
S7-1500 mounting rail

SIMATIC ET 200MP, MultiFieldbus IM 155-5 MF HF interface module

PROFINET, flexible ports via
pluggable SIMATIC BusAdapters
(sold separately),
max. 30 I/O modules, multi hot
swap with active backplane sold
separately),
IRT with 250 µs, isochronous mode,
shared device with 4 controllers
(1440 bytes each),
256 bytes per I/O module, MRP,
MRPD, S2 redundancy,
PN Security Class 1,
optional cable grip
(sold separately)

SIMATIC ET 200MP PROFINET IO device IM 155-5 PN BA interface module

For ET 200MP electronic modules;
up to 12 IO modules;
integrated 2-port switch;
RJ45 shared device on
2 IO controllers;
MRP; FW update; I&M0...3

SIMATIC ET 200MP. PROFINET IO device IM 155-5 PN ST interface module

For ET 200MP electronic modules;
up to 12 IO modules without PS;
up to 30 IO modules with
additional PS;
integrated 2-port switch;
RJ45 shared device;
MRP; IRT >= 0.25 ms;
isochronous mode
FW update; I&M0...3;
FSU with 500 ms

SIMATIC ET 200MP. PROFIBUS IO device IM 155-5 DP ST interface module

PROFIBUS interface module for
max. 12 S7-1500 modules, incl.
PROFIBUS connection plug
(6ES7972-0BB70-0XA0)

6ES7155-5MU00-0CN0

6ES7155-5AA00-0AA0

6ES7155-5AA01-0AB0

6ES7155-5BA00-0AB0

Accessories

SIMATIC BA 2xRJ45 BusAdapter

For PROFINET interface modules,
Standard function class or above;
max. cable length 50 m

SIMATIC BA 2xFC BusAdapter

For PROFINET interface modules,
Standard function class or above;
for increased vibration and EMC
loads; max. cable length 50 m

BA 2xM12 BusAdapter

For IM 155-6PN ST, HF;
2 x M12 push-pull sockets,
D-coding, also suitable for standard
M12. For PROFINET

SIMATIC ET 200MP, spare part front door for IM 155-5 (6ES7155-5AA00-0AB0)

5 units per packing unit

SIMATIC S7-1500 mounting rail

Fixed lengths, with grounding
elements

SIMATIC S7-1500, mounting rail 160 mm (approx. 6.3 inches)

Incl. grounding screw, integrated
DIN rail for mounting small items
such as terminals, circuit breakers
and relays

SIMATIC S7-1500, mounting rail 245 mm (approx. 9.6 inches)

Incl. grounding screw, integrated
DIN rail for mounting small items
such as terminals, circuit breakers
and relays

SIMATIC S7-1500, mounting rail 482.6 mm (approx. 19 inches)

Incl. grounding screw, integrated
DIN rail for mounting small items
such as terminals, circuit breakers
and relays

SIMATIC S7-1500, mounting rail 530 mm (approx. 20.9 inches)

Incl. grounding screw, integrated
DIN rail for mounting small items
such as terminals, circuit breakers
and relays

6ES7193-6AR00-0AA0

6ES7193-6AF00-0AA0

6ES7193-6AM00-0AA0

6ES7528-0AA70-7AA0

6ES7590-1AB60-0AA0

6ES7590-1AC40-0AA0

6ES7590-1AE80-0AA0

6ES7590-1AF30-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Interface modules > IM 155-5

Ordering data	Article No.		Article No.
SIMATIC S7-1500, mounting rail 830 mm (approx. 32.7 inches) Incl. grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays For cutting to length by customer, without drill holes; grounding elements must be ordered separately	6ES7590-1AJ30-0AA0	Power supply connector Spare part; for connecting the 24 V DC supply voltage	
SIMATIC S7-1500, mounting rail 2000 mm (approx. 78.7 inches) Without grounding screw, integrated DIN rail for mounting small items such as terminals, circuit breakers and relays for cutting to length by customer, grounding screw (6ES7590-5AA00-0AA0, 20 units) must be ordered separately	6ES7590-1BC00-0AA0	Connector, socket, 2x2-pin, ET 200SP, interface module, KP32F, PN-PN coupler Grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	6ES7193-4JB00-0AA0
SIMATIC S7-1500, grounding screw For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail; 20 units per packing unit	6ES7590-5AA00-0AA0	SIMATIC S7-1500 / ET 200MP; active backplane bus 12 slots For plugging S7-1500 I/O modules for hot swapping; for use in the ET 200MP with IM 155-5 PN HF (from FW V4.4.1); please order S7-1500 mounting rail and slot covers separately	6ES7590-0BL00-0AA0
Strain relief For ET 200MP interface module IM 155-5 MF HF on SIMATIC BusAdapter; 5 units	6ES7590-5DA00-0AA0	PROFIBUS FastConnect RS485 bus connector with 90° cable outlet	
System power supply For supplying the S7-1500 backplane bus		SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method Without PG socket	6ES7972-0BA70-0XA0
SIMATIC S7-1500, system power supply PS 25 W 24 V DC Supplies operating voltage to the backplane bus of the S7-1500	6ES7505-0KA00-0AB0	SIMATIC DP, connection plug for PROFIBUS up to 12 Mbps 90° cable outlet, 15.8 x 72.2 x 36.4 mm (WxHxD), FastConnect insulation displacement method With PG socket	6ES7972-0BB70-0XA0
SIMATIC S7-1500, system power supply PS 60 W 24/48/60 V DC Supplies operating voltage to the backplane bus of the S7-1500	6ES7505-0RA00-0AB0	SIMATIC S7-1500 / ET 200MP; slot cover For the active backplane bus of the S7-1500 for protection against ESD as well as for mechanical fixation on the S7-1500 mounting rail. Unused slots must be provided with a slot cover! 5 units per packing unit	6ES7590-0CA00-0AA0
SIMATIC S7-1500, system power supply with buffer functionality PS 60 W 24/48/60 V DC HF Supplies operating voltage to the backplane bus of the S7-1500 and enables non-volatile retention of the work memory (data) by the CPU	6ES7505-0RB00-0AB0	PROFIBUS FastConnect stripping tool Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	6GK1905-6AA00
SIMATIC S7-1500, system power supply PS 60 W 120/230 V AC/DC Supplies operating voltage to the backplane bus of the S7-1500	6ES7507-0RA00-0AB0	PROFIBUS FastConnect bus cable • Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m • 20 m • 50 m • 100 m • 200 m • 500 m • 1000 m	6XV1830-0EH10 6XV1830-0EN20 6XV1830-0EN50 6XV1830-0ET10 6XV1830-0ET20 6XV1830-0ET50 6XV1830-0EU10
SIMATIC S7-1500 spare part, connector for system power supply modules (PS) and load current supply modules (PM) 10 units per packing unit	6ES7590-8AA00-0AA0	FC robust cable Bus cable with PUR sheath for use under ambient conditions of extreme mechanical stress or aggressive chemicals, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0JH10
Load current supply			
SIMATIC PM 1507 24 V/3 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A	6EP1332-4BA00		
SIMATIC PM 1507 24 V/8 A Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	6EP1333-4BA00		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Interface modules > IM 155-5

Ordering data	Article No.		Article No.
FC flexible cable PROFIBUS bus cable, flexible, with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1831-2K	Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 50 units.	6GK1901-1BB10-2AE0
FC trailing cable PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-3EH10	Industrial Ethernet FC TP standard cable, GP 2x2 (PROFINET type A) TP installation cable for connection to IE FC RJ45 2x2, for universal use, 4-wire, shielded Cat5e, sold by the meter, delivery unit maximum length of 4000 m minimum order quantity 20 m.	6XV1840-2AH10
FC bus cable PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-0GH10	Industrial Ethernet FC TP trailing cable, 2x2 (PROFINET type C) TP installation cable for connection to FC outlet RJ 45, for use in cable carriers, 4-wire, shielded, Cat5e, sold by the meter (4 million bending cycles), delivery unit max. 2000 m, minimum order quantity 20 m.	6XV1840-3AH10
FC underground cable PROFIBUS underground cable, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	6XV1830-3FH10	Industrial Ethernet FC TP marine cable TP installation cable for connection to FC outlet RJ45, marine certified, 4-wire, shielded, Cat5e, sold by the meter, delivery unit maximum length of 1000 m, minimum order quantity 20 m.	6XV1840-4AH10
FC FRNC cable PROFIBUS bus cable, flame-retardant and halogen-free, with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	6XV1830-0LH10	Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	6GK1901-1GA00
FC trailing cable IE FC RJ45 plug 180 180° cable outlet	6XV1831-2L		
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 1 unit.	6GK1901-1BB10-2AA0		
Industrial Ethernet FastConnect RJ45 plug 180 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 180° cable outlet 1 pack = 10 units.	6GK1901-1BB10-2AB0		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Interface modules > IM 155-5

Technical specifications

Article number	6ES7155-5BA00-0AB0 ET 200MP, IM155-5 DP ST	6ES7155-5AA00-0AA0 ET 200MP, IM 155-5 PN BA	6ES7155-5AA01-0AB0 ET 200MP, IM 155-5 PN ST	6ES7155-5MU00-0CN0 ET 200MP, IM 155-5 MF HF
General information				
Product type designation	IM 155-5 DP ST	IM 155-5 PN BA	IM 155-5 PN ST	IM 155-5 MF HF
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	No	No	No	Yes; In combination with active backplane bus
• Isochronous mode	No	No	Yes	Yes
• IRT	No	No	Yes	Yes
• Tool changer	No	No	No	Yes; Docking station
• Local coupling, IO data	No	No	No	Yes
- Number of coupling modules				6; 1x output + max. 5x input
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V13	V15.1	V15	V20 HSP0454
• STEP 7 configurable/ integrated from version	use GSD file	use GSD file	use GSD file	use GSD file
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1			
• PROFINET from GSD version/ GSD revision		GSDML V2.3	GSDML V2.3	GSDML V2.45
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes
Input current				
Current consumption (rated value)	0.2 A; at 24 V DC and without load	1 A; at 24 V DC and without load	0.2 A; at 24 V DC and without load	0.16 A; at 24 V DC and without load
Address area				
Address space per station				
• Address space per station, max.	244 byte; For input and output data respectively	64 byte; For input and output data respectively	512 byte; For input and output data respectively	1 440 byte; For input and output data respectively
Hardware configuration				
Integrated power supply	Yes; 14 W	Yes; 14 W	Yes; 14 W	Yes; 16 W
Rack				
• Modules per rack, max.	12; I/O modules	12; I/O modules	30; I/O modules	30; I/O modules
Submodules				
• Number of submodules per station, max.		108; 9 per I/O module	256; 9 per I/O module	256; 9 per I/O module
Interfaces				
Number of PROFINET interfaces		1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
Number of PROFIBUS interfaces	1; 1 port			
1. Interface				
Interface types				
• RJ 45 (Ethernet)		Yes	Yes	Yes; with BusAdapter
• RS 485	Yes			
• Number of ports	1	2	2	2; with BusAdapter
• integrated switch	No	Yes	Yes	Yes
• BusAdapter (PROFINET)	No	No	No	Yes; BA 2x RJ45, BA 2x FC, BA 2x M12
Protocols				
• PROFINET IO Device		Yes	Yes	Yes
• PROFIBUS DP device	Yes			
• Open IE communication		Yes	Yes	Yes
• Media redundancy		Yes; PROFINET MRP client	Yes; PROFINET MRP client	Yes; PROFINET MRP client / HRP client

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Interface modules > IM 155-5

Technical specifications

Article number	6ES7155-5BA00-0AB0 ET 200MP, IM155-5 DP ST	6ES7155-5AA00-0AA0 ET 200MP, IM 155-5 PN BA	6ES7155-5AA01-0AB0 ET 200MP, IM 155-5 PN ST	6ES7155-5MU00-0CN0 ET 200MP, IM 155-5 MF HF
PROFINET IO Device				
Services				
- IRT		No	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- PROFINergy		No	No	No
- Prioritized startup		No	Yes	No
- Shared device		Yes	Yes	Yes
- Number of IO Controllers with shared device, max.		2	2	4; for multi-fieldbus mixed operation: 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure		PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps		Yes	Yes	Yes
• Autonegotiation		Yes	Yes	Yes
• Autocrossing		Yes	Yes	Yes
RS 485				
• Transmission rate, max.	12 Mbit/s			
Protocols				
Supports protocol for PROFINET IO	No	Yes	Yes	Yes
PROFIsafe	Yes	Yes; FW V4.3.0 or higher	Yes	Yes
PROFIBUS	Yes	No	No	No
EtherNet/IP	No	No	No	Yes
Modbus TCP	No	No	No	Yes
Redundancy mode				
• PROFINET system redundancy (S2)		No	No	Yes; NAP S2
- on S7-1500R/H		No	No	Yes
- on S7-400H		No	No	Yes; use GSD file
• PROFINET system redundancy (R1)		No	No	No
• H-Sync forwarding		No	No	Yes
Media redundancy				
- MRP		Yes	Yes	Yes
- MRPD		No	No	Yes
EtherNet/IP				
Services				
- CIP Implicit Messaging				Yes
- CIP Explicit Messaging				Yes
- CIP Safety				No
- Configuration control via Explicit Messaging				No
- Shared device				Yes; for multi-fieldbus mixed operation: 2x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
- Number of scanners with shared device, max.				2
Updating times				
- Requested Packet Interval (RPI)				2 ms
Address area				
- Address space per module, max.				256 byte; 246 byte outputs / 256 byte inputs
- ForwardOpen (Class1 & 32 bit Header)				500 byte; (246 byte outputs / 500 byte inputs)
- LargeForwardOpen (Class3)				4 002 byte
Connections				
- Number of rack connections				2

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Interface modules > IM 155-5

Technical specifications

Article number	6ES7155-5BA00-0AB0 ET 200MP, IM155-5 DP ST	6ES7155-5AA00-0AA0 ET 200MP, IM 155-5 PN BA	6ES7155-5AA01-0AB0 ET 200MP, IM 155-5 PN ST	6ES7155-5MU00-0CN0 ET 200MP, IM 155-5 MF HF
Modbus TCP				
Services				
- read coils (code=1)				Yes
- read discrete inputs (code=2)				Yes
- Read Holding Registers (Code=3)				Yes
- write single coil (code=5)				Yes
- write multiple coils (code=15)				Yes
- Write Multiple Registers (Code=16)				Yes
- Parameter change by master				Yes
- Modbus TCP Security Protocol				No
Address space per station				
- Address space per station, max.				500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space				250 byte; (246 byte outputs / 250 byte inputs)
Updating time				
- I/O request interval				2 ms
Connections				
- number of connections per device				9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication				
• TCP/IP		Yes	Yes	Yes
• UDP				Yes
• SNMP		Yes	Yes	Yes
• LLDP		Yes	Yes	Yes
• ARP				Yes
• IGMP				Yes
• Multicast				Yes
• Broadcast				Yes
• IPv4				Yes
• IPv6				No
PROFIBUS DP				
Services				
- SYNC capability	Yes			
- FREEZE capability	Yes			
- DPV1	Yes			
Isochronous mode				
Equidistance		No	Yes	Yes
shortest clock pulse			250 µs	250 µs
max. cycle			4 ms	4 ms
Bus cycle time (TDP), min.			250 µs	250 µs
Interrupts/diagnostics/status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED				Yes; green/red LED
• MS LED				Yes; green/red LED
• IO LED				Yes; red-green-yellow LED
• Connection display LINK TX/RX		Yes; 2x green-yellow LEDs	Yes; 2x green-yellow LEDs	Yes; 2x green LEDs on BusAdapter
• Connection display DP	Yes; green LED			

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Interface modules > IM 155-5**Technical specifications**

Article number	6ES7155-5BA00-0AB0 ET 200MP, IM155-5 DP ST	6ES7155-5AA00-0AA0 ET 200MP, IM 155-5 PN BA	6ES7155-5AA01-0AB0 ET 200MP, IM 155-5 PN ST	6ES7155-5MU00-0CN0 ET 200MP, IM 155-5 MF HF
Standards, approvals, certificates				
Network loading class		2		3
Product functions / security				
PROFINET Security Class				1
signed firmware update				Yes
Secure Boot				Yes
safely removing data				Yes
data integrity				Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-25 °C; from FS04	-30 °C; From FS03	-25 °C; From FS03	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-25 °C; from FS04	-30 °C; From FS03	-25 °C; From FS03	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
connection method				
ET-Connection				
• via BU/BA Send	No		No	No
Mechanics/material				
Strain relief				Yes; Optional
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	360 g	236 g		260 g; without BusAdapter

I/O systems
SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

Interface modules > SIPLUS IM 155-5 PN

Overview



SIMATIC ET 200MP IM 155-5 MF HF



ET 200MP IM 155-5 PN BA interface module

- Interface modules for connecting ET 200MP via PROFINET, Ethernet/IP, Modbus TCP or PROFIBUS
- These handle data exchange with the I/O controller in the controller
- Width 35 mm

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

SIPLUS IM 155-5 PN interface module

(Extended temperature range and exposure to environmental substances)

Degree of protection IP20, module width 35 mm, installation on S7-1500 mounting rail

IM 155-5 PN ST, standard version

6AG1155-5AA01-7AB0

SIPLUS ET 200MP, IM155-5 MF MultiFieldbus interface module

(Extended temperature range and exposure to environmental substances)

For up to 30 I/O modules, S2 redundancy for operation on S7-400H

6AG1155-5MU00-7CN0

Accessories

See SIMATIC ET 200MP, IM 155-5 interface module, page 10/352

I/O systems

SIMATIC ET 200 systems for the control cabinet SIMATIC ET 200MP

Interface modules > SIPLUS IM 155-5 PN

Technical specifications

Article number	6AG1155-5AA01-7AB0	6AG1155-5MU00-7CN0
Based on	6ES7155-5AA01-0AB0 SIPLUS ET 200MP IM 155-5 PN ST	6ES7155-5MU00-0CN0 SIPLUS ET 200MP IM155-5 MF HF
Ambient conditions		
Ambient temperature during operation		
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax; ab > +60 °C no module permissible left of the IM -40 °C; = Tmin 40 °C	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax -40 °C; = Tmin 40 °C; = Tmax
Altitude during operation relating to sea level		
- Installation altitude above sea level, max. - Ambient air temperature-barometric pressure-altitude	5 000 m Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); from 2 000 m max. 132 V AC	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3 - to chemically active substances according to EN 60721-3-3 - to mechanically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6 - to chemically active substances according to EN 60721-3-6 - to mechanically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna) Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Class 3 (excluding trichlorethylene) Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
- Coatings for printed circuit board assemblies acc. to EN 61086 - Protection against fouling acc. to EN 60664-3 - Military testing according to MIL-I-46058C, Amendment 7 - Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A	Yes; Class 2 for high reliability Yes; Type 1 protection Yes; Discoloration of coating possible during service life Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

Interface modules > SIPLUS IM 155-5 DP

Overview



- Interface module for linking the ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS device in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IM0 ... IM3

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.	
SIPLUS IM 155-5 DP ST interface module	6AG1155-5BA00-2AB0
(Extended temperature range and exposure to environmental substances)	
IP 20 degree of protection, module width 35 mm, installation on S7-1500 DIN rail	
Accessories	See SIMATIC ET 200MP, IM 155-5 interface module, page 10/352

Technical specifications

Article number	6AG1155-5BA00-2AB0
Based on	6ES7155-5BA00-0AB0 SIPLUS ET 200MP IM155-5 DP ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax

Article number	6AG1155-5BA00-2AB0
Based on	6ES7155-5BA00-0AB0 SIPLUS ET 200MP IM155-5 DP ST
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200MP

I/O modules

Overview



I/O modules constitute the interface of SIMATIC ET 200MP to the process:

- Digital and analog modules provide exactly the inputs/outputs required for each task
- Technology modules for SIMATIC S7-1500 and ET 200MP
 - With integrated functions for high-speed counting and position detection
 - With integrated inputs and outputs for tasks at the process level and short response times
- Communications modules for SIMATIC S7-1500 and ET 200MP
 - For data exchange using point-to-point coupling
 - For connecting to PROFIBUS
 - For connecting to Industrial Ethernet
- Connection system for user-friendly, low-overhead wiring of the S7-1500 and ET 200MP modules

You can find additional information under [SIMATIC S7-1500, chapter 5](#).

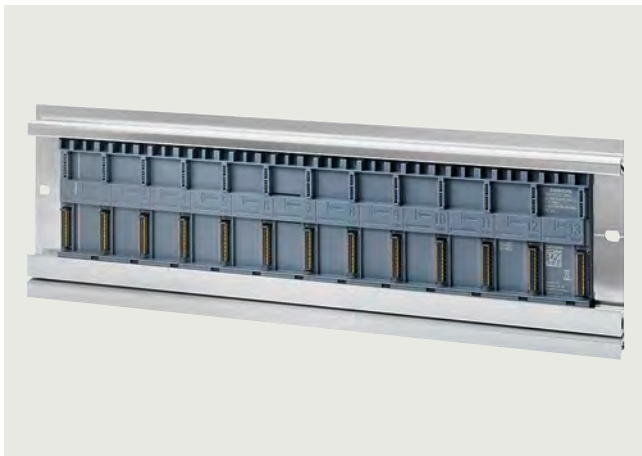
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Active backplane bus

Overview



Active backplane bus in S7-1500 DIN rail

- Considerably enhances system availability:
 - Reaction-free hot swapping of I/O modules during operation; system remains in RUN mode when replacing one or more I/O modules
 - Reserve capacity (= gaps in system configuration) for later use
- Can also be used exclusively with ET 200MP and PROFINET
- Can be inserted in the ET 200MP standard DIN rail, replaces the U connectors
- The comprehensive system functions of ET 200MP can still all be used
- Can be used with all PROFINET IO controllers by configuring via GSD file and PROFINET

Ordering data

Active backplane bus

for ET 200MP I/O modules for hot swapping; for insertion in the S7-1500 DIN rail.

Please order the S7-1500 DIN rail and slot covers separately.

- 4 slots
- 8 slots:
- 12 slots

Accessories

Slot cover for active backplane bus

To protect against electrostatic discharge as well as provide mechanical stability on the S7-1500 DIN rail;
5 units per packing unit

Article No.

6ES7590-0BD00-0AA0

6ES7590-0BH00-0AA0

6ES7590-0BL00-0AA0

6ES7590-0CA00-0AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

Active backplane bus

Technical specifications

Article number	6ES7590-0BD00-0AA0 SIMATIC S7-1500 active backplane/4 slot	6ES7590-0BH00-0AA0 SIMATIC S7-1500 act. backplane/8 slot	6ES7590-0BL00-0AA0 SIMATIC S7-1500 act. backplane/12 slot
General information			
Product type designation	Active Backplane ST 1+4 Slot	Active Backplane ST 1+8 Slot	Active backplane ST 1+12 slot
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	Yes	Yes	Yes
• Prioritized startup	Yes	Yes	Yes
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version	V16 / V17	V16 / V17	V16
• STEP 7 configurable/ integrated from version	V5.6 and higher	V5.6 and higher	V5.6 and higher
• PROFINET from GSD version/ GSD revision	V2.35 / -	V2.35 / -	V2.34 / -
Hardware configuration			
Slots			
• Grid size	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible	35 mm; Utilization of 25 mm-wide modules possible
• Number of slots	5	9	13
- of which for CPU, max.	1; for S7-1500H CPU with CPU firmware V3.1 or higher; interface modules up to V1.1.0 only (active backplane bus)	1; for S7-1500H CPU with CPU firmware V3.1 or higher; interface modules up to V1.1.0 only (active backplane bus)	0
- of which for IM, max.	1	1	1
- of which for PS, max.	4; Max. 2 PS per station	8; Max. 2 PS per station	12; Max. 2 PS per station
- of which for IO/CM/CP/TM, max.	4	8	12
- of which for F-IO, max.	4	8	12
• Number of single-width slots, max.	4	8	12
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions			
Width	154 mm	294 mm	434 mm
Height	99 mm	99 mm	99 mm
Depth	14 mm	14 mm	14 mm
Weights			
Weight, approx.	128 g	246 g	352 g

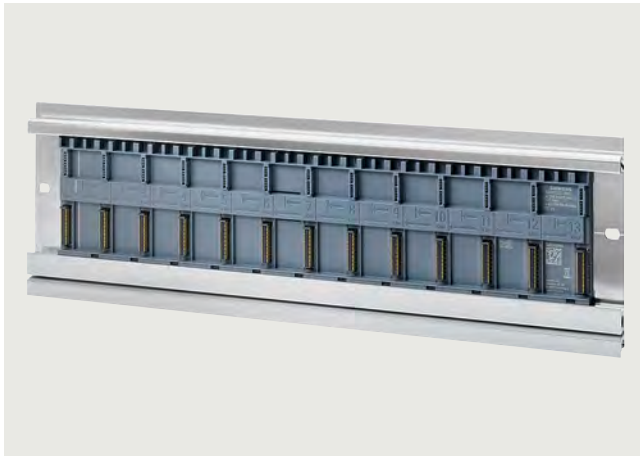
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

SIPLUS extreme active backplane bus

Overview



Active backplane bus in S7-1500 DIN rail

- Considerably enhances system availability:
 - Reaction-free hot swapping of I/O modules during operation; system remains in RUN mode when replacing one or more I/O modules
 - Reserve capacity (= gaps in system configuration) for later use
- Can also be used exclusively with ET 200MP and PROFINET
- Can be inserted in the ET 200MP standard DIN rail, replaces the U connectors
- The comprehensive system functions of ET 200MP can still all be used
- Can be used with all PROFINET IO controllers by configuring via GSD file and PROFINET

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Ordering data

Article No.

Active backplane bus

SIPLUS S7-1500 act. backpl. 8 slots

With 8 slots for inserting S7-1500 I/O modules for hot swapping; with conformal coating -40 ... +70 °C, for use in the ET 200MP. Please order S7-1500 mounting rail and slot covers separately

6AG1590-0BH00-7AA0

SIPLUS S7-1500 act. backpl. 12 slots

With 12 slots for inserting S7-1500 I/O modules for hot swapping; with conformal coating -40 ... +70 °C, for use in the ET 200MP. Please order S7-1500 mounting rail and slot covers separately

6AG1590-0BL00-7AA0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200MP

SIPLUS extreme active backplane bus**Technical specifications**

Article number	6AG1590-0BH00-7AA0	6AG1590-0BL00-7AA0
Based on	6ES7590-0BH00-0AA0	6ES7590-0BL00-0AA0
	SIPLUS S7-1500 act. backplane 8 slot	SIPLUS S7-1500 act. backplane 12 slot
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology		
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Overview



The ET 200iSP is a modular, intrinsically safe I/O system with IP30 degree of protection which can be operated in gas and dust atmospheres at ambient temperatures from -20 to +70 °C. It is optimized for use with SIMATIC PCS 7 and PCS neo, but can also be integrated in other systems such as SIMATIC S5 by means of GSD/GSDML file.

In accordance with ATEX directive 2014/34/EU, the ET 200iSP remote I/O stations can be installed directly in the hazardous zones 1 and 2 as well as in non-hazardous areas. The intrinsically safe sensors, actuators and HART field devices can also be located in zone 0 or 20 if necessary.

The modular design of the ET 200iSP makes it possible to optimally adapt the remote I/O stations to the respective automation task through individual configuration and flexible expansion. To increase plant availability, the pressure-encapsulated power supply and the intrinsically safe PROFINET or PROFIBUS DP connection of the stations can also be of redundant design. The intrinsically safe, optical PROFINET connection allows redundancy functions S2 and R1 as well as the setup of fail-safe MRP rings.

The modern architecture with hardwiring and automatic slot coding supports pre-wiring without the electronic modules, simple and reliable hot swapping of individual modules without a fire certificate as well as configuration in run (CiR).

In addition to analog and digital I/O modules for the automation of technological functions of the process (Basic Process Control), the range of electronic modules also includes fail-safe I/O modules for implementing safety applications. The various types of electronic module can be arranged mixed within a station. Comprehensive diagnostic options facilitate commissioning and troubleshooting.

Technical specifications

ET 200iSP – general

Degree of protection	IP30
Ambient temperature	
• Horizontal mounting position	-20 ... +70 °C
• Other mounting positions	-20 ... +50 °C
Exposure to environmental substances	According to ISA-S71.04 severity level G1; G2; G3 (except for NH3, only level G2 in this case)
EMC	Electromagnetic compatibility according to NE21
Vibration resistance	0.5 g continuously, 1 g periodically

Approvals, standards

• ATEX	II 2 G (1) GD I M2 Zone 1 Zone 1	Ex db eb [ia/ib] IIC T4 Ex db eb [ia/ib] I Ex db eb [ia/ib] IIC T4 BR-Ex db eb [ia/ib] IIC T4 NI Division 2, Groups A, B, C, D T4
• IECEX		
• INMETRO		
• cFMus		
• cULus	Class I, II, III Class I Class I, II, III Class I	AIS Division 1, Groups A, B, C, D, E, F, G Zone 1, AEx de [ia/ib] IIC T4 Division 2, Groups A, B, C, D T4 providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G Zone 1, AEx de [ia/ib] IIC T4
• CCC Ex	Ex de ib[ia] IIC T4 Ex de [ia/ib] IIC T4 EN 50170, Volume 2 IEC 61158 and IEC 61784 IEC 61131, Part 2 In accordance with ATEX directive 2014/34/EU, EMC Directive 2014/30/EU and LVD-guideline 2014/35/EU According to Regulations UKSI 2016:1107 Korea Certification Classification companies	
• PROFIBUS		
• PROFINET		
• IEC		
• CE		
• UKCA		
• KCC		
• Marine approval		
		• ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRS (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Power supply unit

Overview



An ET 200iSP power supply unit consists of a TM-PS terminal module (A or B) and a PS power supply module which is plugged onto this. Terminal modules and power supply modules can be ordered separately.

The power supply modules are suitable for both individual operation (standard) and redundant operation. Depending on the operating mode, they must be combined with the terminal modules as follows:

- Standard: 1 × PS on TM-PS-A UC
- Redundancy: 1 × PS on TM-PS-A UC (left) plus 1 × PS on TM-PS-B UC (right)

Power supply modules are available for supplies of 24 V DC and 120/230 V AC.

The operating state of the power supply modules is indicated by two LEDs on the IM 152 interface module (one for each module).

Ordering data

PS 24 V DC power supply module for ET 200iSP

Article No.

6ES7138-7EA01-0AA0

PS 120/230 V AC power supply module for ET 200iSP

6ES7138-7EC00-0AA0

Article No.

TM-PS-A UC terminal module

For standard operation

6ES7193-7DA20-0AA0

TM-PS-B UC terminal module

Additional terminal module for redundant operation

6ES7193-7DB20-0AA0

Technical specifications

Article number	6ES7138-7EA01-0AA0 ET200iSP, POWER SUPPLY MODULE	6ES7138-7EC00-0AA0 ET200iSP, POWER SUPPLY MOD. AC120/230V
Supply voltage		
Rated value (DC)	24 V	
Rated value (AC)		230 V; 120/230 V AC
Reverse polarity protection	Yes	
Line frequency		
• permissible range, lower limit		47 Hz
• permissible range, upper limit		63 Hz
Input current		
from supply voltage L+, max.	4 A	
from supply voltage L1, max.		1.04 A; at rated voltage 230 VAC:0.45A at rated voltage 120 VAC:0.75A
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
Alarms	No	No
Diagnoses		
• Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
Diagnostics indication LED		
• Group error SF (red)	No	No
Potential separation		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Power supply unit**Technical specifications**

Article number	6ES7138-7EA01-0AA0 ET200iSP, POWER SUPPLY MODULE	6ES7138-7EC00-0AA0 ET200iSP, POWER SUPPLY MOD. AC120/230V
Standards, approvals, certificates		
CE mark	CE 0344	CE 0344
UKCA mark	DEKRA 21UKEX0027 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0033 Importer UK: Siemens plc Manchester M20 2UR
BIS	Yes	Yes
Use in hazardous areas		
• ATEX marking	II 2 G Ex db eb [ib] IIC T4 Gb I M2 Ex db eb [ib] I Mb	
Dimensions		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	136.5 mm	136.5 mm
Weights		
Weight, approx.	2 700 g	2 700 g

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Interface modules

Overview



The IM 152 interface module realizes the connection of the ET 200iSP to a PROFINET network with an intrinsically safe multimode glass fiber-optic cable up to 100 Mbps or to PROFIBUS DP with intrinsically safe RS 485-iS transmission technology for transfer rates of up to 1.5 Mbps. A redundant connection is also possible. In this case, the ET 200iSP is connected via two interface modules to two redundant segments of a high-availability automation system (PROFINET R1 redundancy or PROFIBUS redundancy). Alternatively, the S2 redundancy function and the setup of fail-safe MRP rings is possible with PROFINET.

The IM 152 is plugged onto a special terminal module (to be ordered separately). The following terminal modules are available:

- TM-IM/IM terminal module for two interface modules (for device redundancy)
- TM-IM/EM60 terminal module for one interface module and one watchdog, reserve or electronic module (except 2 DQ relay)
 - with blue screw-type or spring-loaded terminals for hazardous environments
 - with black screw-type terminals for non-hazardous environments

Tasks of the IM 152-1PN interface module

- Connection of ET 200iSP to the intrinsically safe, optical PROFINET network
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Backup of electronic module parameters
- Time stamping of digital process signals with an accuracy of 20 ms

Tasks of the IM 152-1DP interface module

- Connection of ET 200iSP to the intrinsically safe PROFIBUS DP
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Backup of electronic module parameters
- Time stamping of digital process signals with an accuracy of 20 ms

The maximum address space of the interface module is 244 bytes for inputs, and 244 bytes for outputs.

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Interface modules

Ordering data	Article No.	Accessories	Article No.
ET 200iSP IM 152-1DP interface module	6ES7152-1AA00-0AB0	SFP transceiver Ex Spare part for IM 152-1PN, multimode glass fiber-optic cable, LC, 50/125 µm and 62.5/125 µm	A5E51793919
ET 200iSP IM 152-1PN interface module	6ES7152-1BA00-0AB0	PROFIBUS connection plug with selectable terminating resistor For connection of IM 152-1DP to PROFIBUS DP with RS 485-IS transmission technology	6ES7972-0DA60-0XA0
ET 200iSP TM-IM/EM60 terminal module For an IM 152 and a watchdog, reserve or electronic module (except 2 DQ relay), including termination module - For hazardous environments - TM-IM/EM60S (blue screw-type terminals) - TM-IM/EM60C (blue spring-loaded terminals) - For non-hazardous environments - TM-IM/EM60S (black screw-type terminals)	6ES7193-7AA00-0AA0	RS 485-IS coupler Isolating transformer for coupling PROFIBUS DP segments with RS 485 and RS 485-IS transmission technology	6ES7972-0AC80-0XA0
	6ES7193-7AA10-0AA0	Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 152	6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0
	6ES7193-7AA20-0AA0	S7-300 DIN rails 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	
ET 200iSP TM-IM/IM terminal module For two IM 152 modules (redundant operation), including termination module	6ES7193-7AB00-0AA0		6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0

Technical specifications

Article number	6ES7193-7AA00-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60S, SCREW	6ES7193-7AA10-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60C, SPRING	6ES7193-7AA20-0AA0 ET200iSP, TERM.-MOD. TM-IM/EM60S	6ES7193-7AB00-0AA0 ET200iSP, TERM.-MOD. TM-IM/IM F. TWO IM
Standards, approvals, certificates				
CE mark	CE 0344	CE 0344	CE 0344	CE 0344
UKCA mark	DEKRA 21UKEX0032 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0032 Importer UK: Siemens plc Manchester M20 2UR		DEKRA 21UKEX0032 Importer UK: Siemens plc Manchester M20 2UR
Use in hazardous areas				
• ATEX marking	II 2 G (1) G Ex eb [ia Ga/ib] IIC T4 Gb II 2 G (1) D Ex eb [ia IIIC Da] IIC T4 Gb I M2 Ex eb [ia/ib] I Mb	II 2 G (1) G Ex eb [ia Ga/ib] IIC T4 Gb II 2 G (1) D Ex eb [ia IIIC Da] IIC T4 Gb I M2 Ex eb [ia/ib] I Mb		
Dimensions				
Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm	52 mm
Weights				
Weight, approx.	235 g	235 g	235 g	195 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Digital electronic modules

Overview



Digital input modules

- 8-channel digital input module DI NAMUR EEx i, for evaluation of NAMUR sensors, connected and non-connected contacts, as well as for use as counter or frequency meter
Parameterizable connections:
 - NAMUR sensor on/off
 - NAMUR changeover contact
 - Single contact connected (mechanical NO contact)
 - Changeover contact connected (mechanical changeover contact)
 - Single contact non-connected (mechanical NO contact with single contact)
 - Changeover contact non-connected (mechanical changeover contact)
 - Counting function: optional use of 2 channels for recording counter pulses or for frequency measurement
 - Short-circuit and wire-break monitoring

Digital output modules

- 4-channel digital output modules DQ EEx i, 23.1 V DC/20 mA, 17.4 V DC/27 mA, 17.4 V DC/40 mA or 25.5 V DC/22 mA, with external actuator switch-off via High or Low signal (H/L switch-off)
 - Load-free switching of outputs via external intrinsically safe signal
 - Power boosting through parallel connection of two outputs for one actuator with 4 DQ 17.4 V DC/27 mA or 4 DQ 17.4 V DC/40 mA
 - Short-circuit and wire-break monitoring
- 2-channel digital output module DQ Relay EEx e, e.g. for switching solenoid valves, DC contactors or signaling lamps
 - Can be plugged onto TM-RM/RM terminal module
 - Output current up to 2 A with 60 V UC for each of the two relay outputs
 - Installation up to Ex zone 1
 - Intrinsically safe and non-intrinsically safe signals can be mixed in a station

Extra functions

Actuator shutdown function of the 4 DQ EEx i modules

The 4 DQ EEx i modules are equipped with a shutdown function. This permits implementation of an external actuator switch-off independent of the automation system (controller).

As soon as the intrinsically safe switch-off signal (High or Low) is present at the actuator switch-off input of the electronic module, its outputs are deactivated.

You can also combine several DQ modules into a switch-off group. The intrinsically safe power supply for the switch-off device is either via the watchdog module or a separate intrinsically safe source.

10

Ordering data

Article No.

Article No.

Digital input modules

Digital input modules EEx i

8 DI NAMUR

For evaluation of NAMUR sensors, connected/non-connected contacts, as well as for recording count pulses or measuring frequencies

- 8 × NAMUR (NAMUR sensor on/off, NAMUR changeover contact) or connected/non-connected inputs (single/changeover contact)
- 2 channels optionally usable as counters (max. 5 kHz) or frequency meters (1 Hz ... 5 kHz)
- Time tagging 20 ms, rising or falling edge
- Wire-break monitoring
- Short-circuit monitoring
- Sensor power supply monitoring
- Flutter monitoring

6ES7131-7RF00-0AB0

Digital output modules

Digital output modules EEx i with

H-switch-off

(external actuator disconnection via H-signal); for switching of solenoid valves, DC relays, indicator lights, actuators

4 DQ DC 23.1 V/20 mA

- 4 channels with 20 mA each
- Short-circuit monitoring
- Wire-break monitoring
- Configurable connection of substitute value in the event of CPU failure
- Load-free switching of outputs via external intrinsically safe signal

6ES7132-7RD01-0AB0

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Digital electronic modules

Ordering data	Article No.		Article No.
4 DQ DC 17.4 V/27 mA 4 channels with 27 mA each or 2 outputs connected in parallel with 54 mA each - Short-circuit monitoring - Wire-break monitoring - Configurable connection of substitute value in the event of CPU failure - Load-free switching of outputs via external intrinsically safe signal	6ES7132-7RD11-0AB0	Digital output modules EEx e For switching of solenoid valves, DC contactors or indicator lights	
4 DQ DC 17.4 V/40 mA 4 channels with 40 mA each or 2 outputs connected in parallel with 80 mA each - Short-circuit monitoring - Wire-break monitoring - Configurable connection of substitute value in the event of CPU failure - Load-free switching of outputs via external intrinsically safe signal	6ES7132-7RD22-0AB0	2 DQ Relay, 60 V UC, 2 A - Can be plugged onto TM-RM/RM terminal module - Output current up to 2 A with 60 V UC for each of the two relay outputs - Installation up to Ex zone 1 - Configurable connection of substitute value in the event of CPU failure	6ES7132-7HB00-0AB0
4 DQ DC 23.1 V/20 mA 4 channels with 20 mA each - Short-circuit monitoring - Wire-break monitoring - Configurable connection of substitute value in the event of CPU failure - Load-free switching of outputs via external intrinsically safe signal	6ES7132-7GD00-0AB0	Terminal modules ET 200iSP TM-EM/EM60 terminal module For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in) - For hazardous environments - TM-EM/EM60S (blue screw-type terminals) - TM-EM/EM60C (blue spring-loaded terminals) - For non-hazardous environments - TM-EM/EM60S (black screw-type terminals)	6ES7193-7CA00-0AA0 6ES7193-7CA10-0AA0 6ES7193-7CA20-0AA0
4 DQ DC 17.4 V/27 mA 4 channels with 27 mA each or 2 outputs connected in parallel with 54 mA each - Short-circuit monitoring - Wire-break monitoring - Configurable connection of substitute value in the event of CPU failure - Load-free switching of outputs via external intrinsically safe signal	6ES7132-7GD10-0AB0	ET 200iSP TM-RM/RM 60 terminal module For two modules (electronic module 2 DQ Relay and reserve module can be plugged in) TM-RM/RM60S (screw-type terminals)	6ES7193-7CB00-0AA0
4 DQ DC 17.4 V/40 mA 4 channels with 40 mA each or 2 outputs connected in parallel with 80 mA each - Short-circuit monitoring - Wire-break monitoring - Configurable connection of substitute value in the event of CPU failure - Load-free switching of outputs via external intrinsically safe signal	6ES7132-7GD21-0AB0	Accessories Reserve module For any electronic module Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151 - Petrol - Yellow	6ES7138-7AA00-0AA0 6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0
4 DQ DC 25.5 V/22 mA¹⁾ 4 channels with 22 mA each - Short-circuit monitoring - Wire-break monitoring - Configurable connection of substitute value in the event of CPU failure - Load-free switching of outputs via external intrinsically safe signal	6ES7132-7GD30-0AB0	Labels, inscribed For slot numbering, label size H x W (in mm): 5 x 7 204 labels, for slots 1 to 20 204 labels, for slots 1 to 40	8WA8361-0AB 8WA8361-0AC
		Labels, blank 136 labels for slot numbering, label size H x W (in mm): 5 x 7	8WA8348-2AY
		S7-300 DIN rails 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0

¹⁾ Can be used with SIMATIC PCS 7 V7.1+SP2 or higher

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Digital electronic modules

Technical specifications

Article number	6ES7132-7RD01-0AB0 ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	6ES7132-7RD11-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	6ES7132-7RD22-0AB0 ET200iSP, EL-MOD., 4DO, DC 17.4V, 40MA
General information			
Product type designation	4DQ 23.1 V DC/20 mA	4DQ 17.4 V DC/27 mA	4DQ 17.4 V DC/40 mA
Digital outputs			
Type of digital output	Transistor	Transistor	Transistor
Number of digital outputs	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown
Short-circuit protection	Yes	Yes	Yes
No-load voltage U_{ao} (DC)	23.1 V	17.4 V	17.4 V
Internal resistor R_i	275 Ω	150 Ω	167 Ω
Trend key points E			
• Voltage U_e (DC)	17.6 V	13.3 V	10.7 V
• Current I_e	20 mA	27 mA	40 mA; 80 mA when outputs connected in parallel
Output current			
• for signal "1" rated value	0.02 A	0.027 A	0.04 A
Output delay with resistive load			
• "0" to "1", max.	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms
Parallel switching of two outputs			
• for uprating	No; for Ex reasons not possible; nor for predecessor	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No	No
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break	Yes; $R > 10 \text{ kohms}$, $I < 100 \mu\text{A}$	Yes	Yes; $R > 10 \text{ kohms}$, $I < 100 \mu\text{A}$
• Short-circuit	Yes; $R < 80 \text{ Ohm}$ (one output), $R < 40 \text{ Ohm}$ (outputs connected in parallel)	Yes	Yes; $R < 80 \text{ Ohm}$ (one output), $R < 40 \text{ Ohm}$ (outputs connected in parallel)
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel
Ex(i) characteristics			
maximum values for connecting terminals for gas group IIC			
• U_o (no-load voltage), max.	25.6 V	19.4 V	19.4 V
• I_o (short-circuit current), max.	96 mA	132 mA	118 mA
• P_o (power output), max.	0.61 W	0.64 W	0.57 W
• C_o (permissible external capacity), max.	98 nF	0.23 μF	0.24 μF
• L_o (permissible external inductivity), max.	3 mH	1.9 mH	2.5 mH
• U_i (intrinsically safe input voltage), max.	28 V; switch input circuit	28 V; switch input circuit	28 V; switch input circuit
• P_i (intrinsically safe input power), max.	1.2 W; switch input circuit	1.2 W; switch input circuit	1.2 W; switch input circuit
• C_i (internal capacity), max.	3 nF; switch input circuit	3 nF; switch input circuit	3 nF; switch input circuit

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Digital electronic modules

Technical specifications

Article number	6ES7132-7RD01-0AB0 ET200iSP, EL-MOD., 4DO, DC 23,1V, 20MA	6ES7132-7RD11-0AB0 ET200iSP, EL-MOD., 4DO, DC 17,4V, 27MA	6ES7132-7RD22-0AB0 ET200iSP, EL-MOD., 4DO, DC 17.4V, 40MA
Potential separation			
Potential separation digital outputs • between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	CE 0344	CE 0344	CE 0344
UKCA mark	DEKRA 21UKEX0085 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0085 Importer UK: Siemens plc Manchester M20 2UR	DEKRA 21UKEX0085 Importer UK: Siemens plc Manchester M20 2UR
Highest safety class achievable in safety mode • SIL acc. to IEC 61508	No		No
Use in hazardous areas • ATEX marking	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb
Dimensions			
Width	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm
Weights			
Weight, approx.	255 g	255 g	255 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Analog electronic modules

Overview



Analog input modules

- 4-channel analog input module AI 2 WIRE HART EEx i for current measurement in the range 4 to 20 mA, suitable for connection of 2-wire transmitters (with/without HART functionality)
 - Resolution 12 bit + sign
 - Max. load of transmitter 750 Ω
 - Short-circuit and wire break monitoring
- 4-channel analog input module AI 4 WIRE HART EEx i for current measurement in the range 0/4 to 20 mA, suitable for connection of 4-wire transmitters (with/without HART functionality)
 - Resolution 12 bit + sign
 - Max. load of transmitter 750 Ω
 - Wire break monitoring

- 4-channel analog input module AI RTD EEx i for resistance testing and for temperature measurement by Pt100/Ni100 resistance thermometer
 - Resolution 15 bit + sign
 - 2, 3, or 4-wire connection possible
 - Resistance measurements 600 Ω absolute and 1 000 Ω absolute
 - Wire break monitoring
- 4-channel analog input module AI TC EEx i for thermoelectric EMF measurements and for temperature measurement by thermocouple, type B, E, N, J, K, L, S, R, T, U
 - Resolution 15 bit + sign
 - Internal temperature compensation possible using TC sensor module (included in scope of delivery of module)
 - External temperature compensation by means of a temperature value acquired at an analog module of the same ET 200iSP station
 - Wire break monitoring

Analog output modules

- 4-channel analog output module AO I HART EEx i for output of current signals in the range 0/4 to 20 mA to field devices (with/without HART functionality)
 - Resolution 14 bit
 - Parameterizable substitute value in case of CPU failure
 - Short-circuit and wire break monitoring

Extra functions

Temperature compensation

A TC sensor module for internal temperature compensation is provided with the 4 AI TC module, and is fitted on the corresponding terminals of the associated terminal module.

External temperature compensation is possible via a Pt100 on a 4 AI RTD module.

Ordering data

Article No.

Analog input modules

EEx i analog input modules

4 AI I 2 WIRE HART

For measuring currents with 2-wire transmitters with/without HART functionality

- 4 × 4 ... 20 mA, HART, 2-wire transmitter
- Transmitter load: max. 750 Ω
- Resolution 12 bit + sign
- Short-circuit monitoring
- Wire-break monitoring

6ES7134-7TD00-0AB0

4 AI I 4 WIRE HART

For measuring currents with 4-wire transmitters with/without HART functionality

- 4 × 0/4 ... 20 mA, HART, 4-wire transmitter
- Transmitter load: max. 750 Ω
- Resolution 12 bit + sign
- Wire-break monitoring

6ES7134-7TD50-0AB0

4 AI RTD

For measuring resistances as well as for temperature measurements with resistance thermometers

- 4 × RTD, resistance thermometer Pt100/Ni100
- 2, 3, 4-wire
- Resolution 15 bit + sign
- Short-circuit monitoring
- Wire-break monitoring

6ES7134-7SD51-0AB0

4 AI TC

For thermoelectric EMF measurements as well as for temperature measurements with thermocouples

- 4 × TC (thermocouples)
- Type B [PtRh-PtRh]
- Type N [NiCrSi-NiSi]
- Type E [NiCr-CuNi]
- Type R [PtRh-Pt]
- Type S [PtPh-Pt]
- Type J [Fe-CuNi]
- Type L [Fe-CuNi]
- Type T [Cu-CuNi]
- Type K [NiCr-Ni]
- Type U [Cu-CuNi]
- Resolution 15 bit + sign
- Internal compensation of reference junction temperature possible using TC sensor module (included in scope of supply of module)
- External temperature compensation via Pt100, connected to RTD module of same ET 200iSP station
- Wire-break monitoring

Article No.

6ES7134-7SD00-0AB0

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Analog electronic modules

Ordering data	Article No.	Article No.
Analog output modules		
Analog output modules EEx i		
4 AO I HART For output of currents to field devices with/without HART functionality 4 × 0/4 ... 20 mA, HART (max. load 750 Ω) - Resolution 14-bit - Short-circuit monitoring - Wire-break monitoring - Parameterizable substitute value in case of CPU failure	6ES7135-7TD00-0AB0	
Terminal modules		
ET 200iSP TM-EM/EM60 terminal module For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in) - For hazardous environments - TM-EM/EM60S (blue screw-type terminals) - TM-EM/EM60C (blue spring-loaded terminals) - For non-hazardous environments - TM-EM/EM60S (black screw-type terminals)	6ES7193-7CA00-0AA0 6ES7193-7CA10-0AA0 6ES7193-7CA20-0AA0	Accessories Reserve module For any electronic module 6ES7138-7AA00-0AA0 Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151 - Petrol - Yellow 6ES7193-7BH00-0AA0 6ES7193-7BB00-0AA0 S7-300 DIN rails 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box 6ES7390-1AF85-0AA0 6ES7390-1AJ85-0AA0

Technical specifications

Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20MA, HART	Article number	6ES7135-7TD00-0AB0 ET200iSP, EL-MOD., 4 AO, 4-20MA, HART
General information		Diagnoses	
Product type designation	4AQ I HART	- Diagnostic information readable - Wire-break - Short-circuit	Yes Yes; I load > 1 mA Yes; I load > 1 mA
Analog outputs		Diagnostics indication LED	
Number of analog outputs	4	Group error SF (red)	Yes
Cycle time (all channels) max.	3.6 ms	Ex(i) characteristics	
Output ranges, current		maximum values for connecting terminals for gas group IIC	
0 to 20 mA 4 mA to 20 mA	Yes Yes	- U_o (no-load voltage), max. - I_o (short-circuit current), max. - P_o (power output), max. - C_o (permissible external capacity), max. - L_o (permissible external inductivity), max.	27.6 V 88.2 mA 0.61 mW 83 nF 3 mH
Connection of actuators		Potential separation	
for current output two-wire connection	Yes	Potential separation analog outputs	
Load impedance (in rated range of output)		between the channels and backplane bus	Yes
with current outputs, max.	750 Ω	Standards, approvals, certificates	
Cable length		CE mark	CE 0344
shielded, max.	500 m	UKCA mark	DEKRA 21UKEX0091 Importer UK: Siemens plc Manchester M20 2UR
Analog value generation for the outputs		Use in hazardous areas	
Integration and conversion time/resolution per channel		ATEX marking	II 2 G (1) G Ex ib [ia Ga] IIC T4 Gb II 2 G (1) D Ex ib [ia IIIC Da] IIC T4 Gb I M2 Ex ib [ia] I Mb
Resolution with overrange (bit including sign), max.	14 bit	Dimensions	
Settling time		Width	30 mm
- for resistive load - for capacitive load - for inductive load	4 ms 40 ms 40 ms	Height	129 mm
Errors/accuracies		Depth	136.5 mm
Basic error limit (operational limit at 25 °C)		Weights	
Current, relative to output range, (+/-)	0.1 %	Weight, approx.	265 g
Interrupts/diagnostics/status information			
Substitute values connectable	Yes		
Alarms			
Diagnostic alarm	Yes		

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Safety-related electronic modules

Overview



The electronic modules of the SIMATIC ET 200iSP distributed I/O system equipped with safety functions can be used together with the safety-related automation systems (controllers) for the implementation of safety applications. The input modules record the process signals, evaluate them, and prepare them for additional processing by the automation system.

The output modules convert the safety-related signals output by the automation systems so that they are suitable for controlling the connected actuators.

F-digital input modules

- 8 F-DI Ex NAMUR
 - Safety-related digital input module for evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas
 - SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)
 - 8 short-circuit-proof sensor supplies (8 V DC) for 1 channel each
 - Inputs and sensor supplies electrically isolated from power bus and backplane bus
 - Diagnostics evaluation (deactivated for non-connected mechanical contacts)
 - Internal diagnostics buffer
 - Programmable diagnostics interrupt
 - Supports time stamping
 - Channel-selective passivation
 - Firmware update using HW Config possible
 - Exclusively for safety mode
 - LED displays for safety mode, group errors and channel status/fault

F-digital output modules

- 4 F-DO Ex DC 17.4 V/40 mA
 - Safety-related digital output module for controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lights
 - SIL3/Cat.3/PLe with 4 outputs, switching to P/P potential
 - Electrical isolation from power bus and backplane bus
 - Rated load voltage 17.4 V DC
 - Max. output current 40 mA
 - Performance enhancement through parallel connection of two digital outputs for one actuator
 - Short-circuit, overload and wire-break monitoring
 - Configurable diagnostics
 - Internal diagnostics buffer
 - Programmable diagnostics interrupt
 - Channel-selective passivation
 - Firmware update using HW Config possible
 - Exclusively for safety mode
 - LED displays for safety mode, group errors and channel status/fault

F-analog input modules

- 4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA)
 - Safety-related digital input module for evaluating the signals from current simulators in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices
 - SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation)
 - Measuring ranges: 0 ... 20 mA or 4 ... 20 mA
 - Resolution 15 bit + sign
 - HART communication in measuring range 4 ... 20 mA
 - 4 short-circuit-proof sensor supplies (min. 12 V DC; max. 26 V DC) for 1 channel each
 - Inputs and sensor supplies electrically isolated from backplane bus
 - Configurable diagnostics
 - Programmable diagnostics interrupt
 - Internal diagnostics buffer
 - Firmware update using HW Config possible
 - Exclusively for safety mode
 - LED displays for safety mode, group errors, channel faults and HART status per channel

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Safety-related electronic modules

Technical specifications

Article number	6ES7138-7FN00-0AB0 ET200iSP, 8F-DI NAMUR EX, FAILSAFE
General information	
Product type designation	8F-DI ExNAMUR
Encoder supply	
Number of outputs	8
Digital inputs	
Number of digital inputs	8
Input current	
• for signal "0", max. (permissible quiescent current)	1.2 mA
• for signal "1", min.	2.1 mA
• for signal "1", typ.	9.5 mA
Encoder	
Number of connectable encoders, max.	8
Connectable encoders	
• NAMUR encoder	Yes
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnoses	
• Diagnostic information readable	Yes
• Wire-break	Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Use in hazardous areas	
• ATEX marking	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	288 g

Article number	6ES7138-7FD00-0AB0 ET200iSP, 4F-DO 40MA EX, FAILSAFE
General information	
Product type designation	4F-DQ Ex(i) 17.4 V DC/40 mA
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4
Short-circuit protection	Yes
Controlling a digital input	No
No-load voltage U _{ao} (DC)	17.4 V
Internal resistor R _i	167 Ω
Load resistance range	
• lower limit	270 Ω
• upper limit	18 kΩ
Trend key points E	
• Voltage U _e (DC)	10.7 V
• Current I _e	40 mA
Output voltage	
• for signal "1", max.	17.4 V
Output current	
• for signal "0" residual current, max.	10 μA
Parallel switching of two outputs	
• for uprating	Yes
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	2 Hz
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
Potential separation	
Potential separation digital outputs	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	285 g

I/O systems

SIMATIC ET 200 systems for the control cabinet
SIMATIC ET 200iSP

Watchdog module

Overview



The watchdog module has two fundamental functions:

- Monitoring of the ET 200iSP remote I/O station for hardware failures (hardware lifebeat); external, applicative failure monitoring is also possible via an I/O address area of the module
- Intrinsically-safe power supply for external actuator switch-off

The watchdog module must be plugged onto a terminal module (order separately). The following terminal modules are suitable for this:

- TM-IM/EM60 terminal modules for one interface module and one watchdog, reserve or electronics module (for versions, see Interface module section)
- TM-EM/EM60 terminal modules with two slots for watchdog module, reserve module or electronics modules (except 2 DO relay):
 - with blue screw-type or spring-loaded terminals for hazardous environments
 - with black screw-type terminals for non-hazardous environments

The first slot directly next to the interface module is provided for the watchdog module.

Ordering data

Article No.

Watchdog module

Watchdog module

For failure monitoring and for the intrinsically safe power supply of an external actuator disconnection

6ES7138-7BB00-0AB0

Terminal modules

ET 200iSP TM-EM/EM60

terminal module

For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in)

- For hazardous environments
 - TM-EM/EM60S (blue screw-type terminals)
 - TM-EM/EM60C (blue spring-loaded terminals)
- For non-hazardous environments
 - TM-EM/EM60S (black screw-type terminals)

6ES7193-7CA00-0AA0

6ES7193-7CA10-0AA0

6ES7193-7CA20-0AA0

Accessories

Labeling sheet

DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151

- Petrol
- Yellow

6ES7193-7BH00-0AA0

6ES7193-7BB00-0AA0

Technical specifications

Article number	6ES7138-7BB00-0AB0 ET 200iSP, WATCHDOG MOD.
General information	
Product type designation	Watchdog module
Digital inputs	
Number of digital inputs	0
Interrupts/diagnostics/status information	
Diagnoses	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital input (green)	Yes
Ex(i) characteristics	
maximum values for connecting terminals for gas group IIC	
• U _o (no-load voltage), max.	12.7 V
• I _o (short-circuit current), max.	329 mA
• P _o (power output), max.	0.91 W
• C _o (permissible external capacity), max.	1 µF
• L _o (permissible external inductivity), max.	0.3 mH
Standards, approvals, certificates	
CE mark	CE 0344
UKCA mark	DEKRA 21UKEX0028 Importer UK: Siemens plc Manchester M20 2UR
Use in hazardous areas	
• ATEX marking	II 2 G Ex ib IIC T4 Gb I M2 Ex ib I Mb
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

RS 485-iS coupler

Overview



Tasks of the RS 485-iS coupler

- Conversion of the electrical PROFIBUS DP RS 485 transmission technology into the intrinsically-safe RS 485-iS transmission technology with a transmission rate of 1.5 Mbps
- Required to connect intrinsically-safe PROFIBUS DP stations, e.g. ET 200iSP or devices from other vendors with Ex i DP connection
- Acts as a safety barrier
- Additional use as a repeater in the hazardous area
- Passive bus station (no configuration necessary)
- Certified according to ATEX 100a

Ordering data

RS 485-iS coupler

Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission systems

Accessories

PROFIBUS connection plug with selectable terminating resistor

For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology

S7-300 DIN rails

Lengths:

- 160 mm
- 482 mm
- 530 mm
- 830 mm
- 2 000 mm

Article No.

6ES7972-0AC80-0XA0

6ES7972-0DA60-0XA0

6ES7390-1AB60-0AA0
6ES7390-1AE80-0AA0
6ES7390-1AF30-0AA0
6ES7390-1AJ30-0AA0
6ES7390-1BC00-0AA0

Article No.

PROFIBUS FastConnect standard cable, violet

Standard type with special design for fast mounting, 2-wire, shielded, cut-to-length

Specify length in m

Max. delivery unit 1 000 m, minimum order quantity 20 m

Preferred lengths

- 20 m
- 50 m
- 100 m
- 200 m
- 500 m
- 1 000 m

PROFIBUS FastConnect standard cable IS GP, blue

Cable type for use in potentially explosive atmospheres, with special design for fast mounting, 2-wire, shielded, cut-to-length

Specify length in m

Max. delivery unit 1 000 m, minimum order quantity 20 m

6XV1830-0EH10

6XV1830-0EN20
6XV1830-0EN50
6XV1830-0ET10
6XV1830-0ET20
6XV1830-0ET50
6XV1830-0EU10

6XV1831-2A

Technical specifications

Technical specifications - RS 485-iS coupler

Dimensions and weight

Dimensions W x H x D (mm) 80 x 125 x 130

Weight Approx. 500 g

Technical specifications - General

Degree of protection IP20

Ambient temperature - 20 ... + 60 °C

I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

RS 485-iS coupler

Technical specifications

Technical specifications - RS 485-iS coupler

Standards and approvals

• PROFIBUS	IEC 61784-1:2002 Ed1 CP 3/1
• EU directive	94/9/EG (ATEX 100a)
• CENELEC	II 3 (2) G EEx nA[ib] IIC T4
• UL and CSA	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• FM	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Division 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• IEC	IEC61131-2, Part 2
• CE	Conforming with 89/336/EWG Conforming with 73/23/EWG
• Ship-building certification	Classification companies •ABS (American Bureau of Shipping) •BV (Bureau Veritas) •DNV (Det Norske Veritas) •GL (Germanischer Lloyd) •LRD (Lloyds Register of Shipping) •Class NK (Nippon Kaiji Kyokai)

Module-specific Data

Transfer rate on PROFIBUS DP, PROFIBUS RS 485-iS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbps 1.5 Mbps
Bus-Protocol	PROFIBUS DP

Voltages, Currents, Potentials

Rated supply voltage of RS 485-iS coupler	24 V DC (20.4 ... 28.8 V)
• Reverse polarity protection	Yes
• Voltage failure bypass	Min. 5 ms
Electrical isolation of 24 V power supply	
• to PROFIBUS DP	Yes
- tested with	500 V DC
• to PROFIBUS RS 485-iS	Yes
- tested with	AC 500 V
Current consumption RS 485-iS coupler (24 V DC), max.	150 mA
Power loss of the module, typically	3 Watts

Status, alarms, diagnostics

Status display	No
Alarms	None
Diagnostic functions	Yes
• Bus monitoring PROFIBUS DP (primary)	Yellow LED "DP1"
• Bus monitoring PROFIBUS RS 485-iS (secondary)	Yellow LED "DP2"
• Monitoring 24 V power supply	Green LED "ON"

Technical safety notice

V_{DC}	± 4.2 V
I_{SC}	± 93 mA
P_0	0.1 Watts
V_{max}	± 4.2 V
L_I	0
C_i	0
U_m	AC 250 V
T_a	-25 ... +60 °C

RS 485-iS segment

permissible cable length on a single line	RS 485-iS	DP Ex i
• 9.6 to 187.5 Kbps	1 000 m	200 m
• 500 Kbps	400 m	200 m
• 1.5 Mbps	200 m	200 m
Number of PROFIBUS DP nodes that can be connected, max.	31	16
PROFIBUS RS 485-iS bus terminator switch	integrated, can be added	

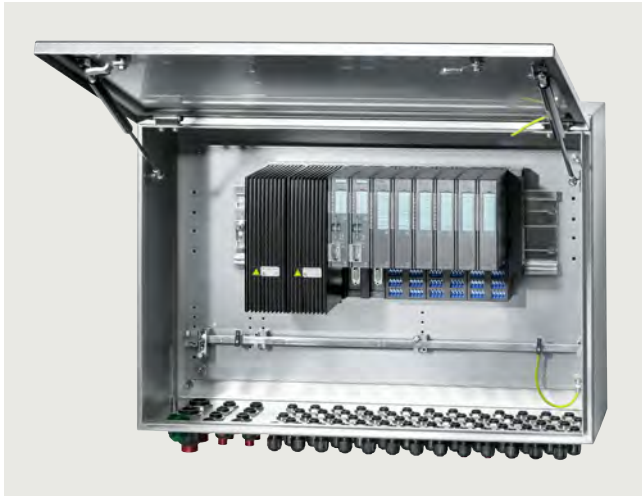
I/O systems

SIMATIC ET 200 systems for the control cabinet

SIMATIC ET 200iSP

Stainless steel wall enclosures

Design



ET 200iSP modules can also be installed in stainless steel wall enclosures designed to meet more exacting degree of protection requirements. The enclosures are available in various sizes. They comply with degree of protection IP65 and can be used in Ex zones 1 and 21.

Delivery can be an empty enclosure or include components, depending on the order.

Send your request to: cabinets.industry@siemens.com

Ordering data

Stainless steel enclosure IP65 for SIMATIC ET 200iSP	6DL2804-	■	■	■	■	■	
I/O enclosure							
Stainless steel Ex enclosure, max. IP66, with mounting plate and equipotential bonding rail, empty enclosure for installation of ET 200iSP components ¹⁾	0						
Stainless steel Ex device consisting of stainless steel enclosure with installed ET 200iSP components ²⁾	1						
Stainless steel Ex device consisting of stainless steel enclosure with installed ET 200iSP and pneumatic components ²⁾⁶⁾	2						
Device group							
Device group II, up to zone 1 (including zone 2)		A					
Device group II, up to zone 1 and zone 21 (including zone 2 and zone 22)		D					
Enclosure dimensions W × H × D (in mm)							
650 × 450 × 230, for up to 15 ET 200iSP modules			D				
950 × 450 × 230, for up to 25 ET 200iSP modules			E				
Cable entries/number							
M16 cable entries for signals, 3 rows, 39 or 66 units ³⁾ , 2 × M32 for supply voltage, 4 × M20 for bus cables					3		
M20 cable entries for signals, 3 rows, 36 or 57 units ³⁾ , 2 × M32 for supply voltage, 4 × M20 for bus cables					4		
M16 cable entries for signals, 5 rows, 65 or 110 units ³⁾ , 2 × M32 for supply voltage, 4 × M20 for bus cables					5		
M20 cable entries for signals, 5 rows, 60 or 95 units ³⁾ , 2 × M32 for supply voltage, 4 × M20 for bus cables					6		
Cable entries/material							
Cable entry in plastic, black						0	
Ambient operating temperatures: • Ex enclosure -40...+70 °C • Ex device -40 ... +xx °C ⁴⁾⁵⁾							
Cable entry in metal (nickel-plated brass)						1	
Ambient operating temperatures: • Ex enclosure -40...+70 °C • Ex device -40 ... +xx °C ⁴⁾⁵⁾							
Cable entry in plastic, blue						2	
Ambient operating temperatures: • Ex enclosure -40...+70 °C • Ex device -40 ... +xx °C ⁴⁾⁵⁾							

¹⁾ The supplied certificate is only valid for the empty enclosure.

²⁾ The supplied certificate is valid for the supplied enclosure, including the installed components.

³⁾ Number of cable entries/signals depends on enclosure dimensions

⁴⁾ Maximum temperature depends on installed components.

⁵⁾ Minus temperatures down to -40 °C when heater installed. This takes up 2 slots for ET 200iSP modules. The heating (6DL9910-8AA) must be ordered separately.

⁶⁾ Limited to enclosures with 950 mm width and M20 cable entries for signals

Note:

Depending on the cables used, other types and sizes of cable entries can be fitted (on request).

I/O systems

SIMATIC ET 200 systems without control cabinet

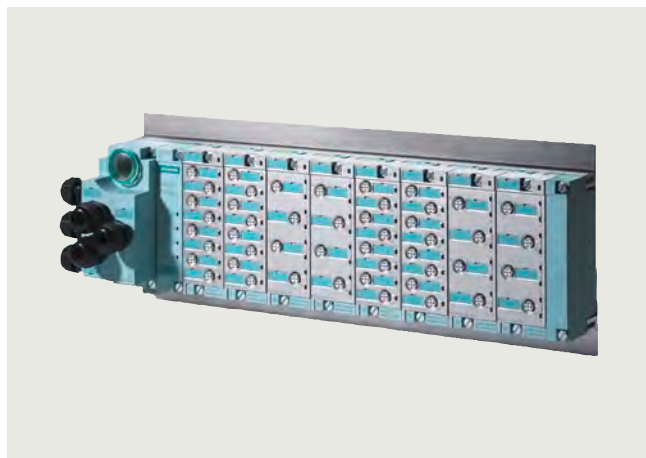
SIMATIC ET 200pro

Overview



SIMATIC ET 200pro video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6187716010001



- SIMATIC ET 200pro distributed I/O system with IP65/67 degree of protection for cabinet-free use at the machine
- Small, multifunctional complete solution: Digital inputs/outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technique: M12 7/8", M12 M12-L, direct, ECOFAST, push pull (CU, FO)
- Power module for easy implementation of load groups
- Module replacement during operation (hot swap)
- Easy installation as well as permanent wiring
- Transmission rate for PROFIBUS DP up to 12 Mbps
- Extensive diagnostics: module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
 - Versions: direct and reversing starters - Standard and High Feature
- Safety motor starters
- Fail-safe modules with safety-related signal processing according to PROFIsafe
- Frequency converters
- RFID communications modules
- Pneumatic interface modules
- IO-Link master

Technical specifications

General technical specifications

Electronic modules	• Digital inputs/outputs • Analog inputs • Analog outputs
Connections	M12 and M8 round connector with standard assignment for actuator/sensor
Transmission rate, max.	12 Mbps (PROFIBUS DP), 100 Mbps (PROFINET IO)
Supply voltage	24 V DC
Current consumption of ET 200pro (internal and sensor supply, non-switched voltage), up to 55 °C, max.	≤ 5 A
Load current for ET 200pro per incoming supply (IM, PM, switched voltage), up to 55 °C, max.	10 A
For overall configuration with looping through (multiple ET 200pros), up to 55 °C, max.	16 A (with terminal module, directly)
Degree of protection	IP65/66/IP67 for interface, digital and analog modules
Material	Thermoplastic (reinforced with glass fiber)
Ambient conditions	
Temperature	From -25 °C/0 °C to +55 °C
Relative humidity	From 5 to 100%
Air pressure	From 795 to 1080 hPa
Mechanical stress	
• Vibration	Vibration test according to IEC 60068, Part 2-6 (sinusoidal) • Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules • 2 g motor starters
• Shock	Shock test according to IEC 680068 Part 2-27, half-sine, 30 g, 18 ms duration for interface, digital and analog modules • 15 g, 11 ms duration for motor starters
Approvals	UL, CSA or cULus

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Interface modules > IM 154-1 and IM 154-2

Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

Ordering data

Article No.	Article No.
IM154-1 interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.	IM154-2 DP High Feature interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; supports PROFI-safe.
Accessories CM IM DP ECOFAST connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections.	CM IM DP direct connection module For connecting PROFIBUS DP and the 24 V power supply directly to PROFIBUS interface modules, up to six M20 cable glands.
CM IM DP M12, 7/8" connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8".	Accessories for CM IM DP ECOFAST PROFIBUS ECOFAST hybrid cable, preassembled With 2 ECOFAST connectors, trailable cable with 2 x Cu 0.64 mm ² and 4 x Cu 1.5 mm ² , in various lengths:
1.5 m 3.0 m 5.0 m 10 m 15 m 20 m	PROFIBUS ECOFAST hybrid cable, unassembled Trailable cable with 2 x Cu 0.64 mm ² and 4 x Cu 1.5 mm ² , sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.
Accessories for CM IM DP direct PROFIBUS ECOFAST hybrid connector 180 ECOFAST Cu, 2 x Cu, 4 x 1.5 mm ² , HANBRID connector	PROFIBUS ECOFAST hybrid connector angular ECOFAST Cu, 2 x Cu, 4 x 1.5 mm ² , HANBRID connector
• With pin insert, 5-pack • With socket insert, 5-pack	• With pin insert, 5-pack • With socket insert, 5-pack
Accessories for CM IM DP direct PROFIBUS trailing cable Max. acceleration 4 m/s ² , at least 3000000 bending cycles, bending radius at least 60 mm, 2-wire shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Interface modules > IM 154-1 and IM 154-2

Ordering data	Article No.		Article No.
PROFIBUS FC food bus cable With PE sheath for use in the food, beverages and tobacco industries, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-0GH10	M12 sealing cap For protection of unused M12 connections with ET 200pro.	3RX9802-0AA00
PROFIBUS FC robust bus cable With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	6XV1830-0JH10	7/8" sealing cap For protection of unused 7/8" connections with ET 200pro; 10 units per packing unit General accessories	6ES7194-3JA00-0AA0
Power cable 5-wire, 5 x 1.5 mm ² , trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m. Accessories for CM IM DP M12, 7/8"	6XV1830-8AH10	ET 200pro rack - Narrow, for interface, electronics and power modules 500 mm 1000 mm 2000 mm, can be cut to length - Compact, for interface, electronics and power modules 500 mm 1000 mm 2000 mm, can be cut to length - Wide, for interface, electronics, power modules and motor starters 500 mm 1000 mm 2000 mm, can be cut to length - Wide, for I/O modules and motor starters 500 mm 1000 mm 2000 mm	6ES7194-4GA00-0AA0 6ES7194-4GA60-0AA0 6ES7194-4GA20-0AA0 6ES7194-4GC70-0AA0 6ES7194-4GC60-0AA0 6ES7194-4GC20-0AA0
PROFIBUS M12 connecting cable Preassembled with two M12 plugs, 5-pin, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m	6XV1830-3DH15 6XV1830-3DH20 6XV1830-3DH30 6XV1830-3DH50 6XV1830-3DN10 6XV1830-3DN15	Spare fuse 12.5 A quick-response, for interface and power modules, 10 units per packing unit.	6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0 6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailable, preassembled with two 7/8" connectors, 5-pin, in various lengths: 1.5 m 2.0 m 3.0 m 5.0 m 10 m 15 m	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15	PROFIBUS FastConnect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m.	6XV1830-0EH10
M12 connection plug For ET 200eco, with axial cable outlet. - With pin insert, 5-pack - With socket insert, 5-pack	6GK1905-0EA00 6GK1905-0EB00	PROFIBUS hybrid standard cable GP Standard PROFIBUS hybrid cable with 2 power cables (1.5 mm ²) for supplying data and energy for ET 200pro.	6XV1860-2R
PROFIBUS M12 bus termination connector With pin insert.	6GK1905-0EC00	SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	6ES7998-8XE01-8YE0
7/8" connection plug For ET 200eco, with axial cable outlet. - With pin insert, 5-pack - With socket insert, 5-pack	6GK1905-0FA00 6GK1905-0FB00	SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	6ES7998-8XE01-8YE2

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-1 and IM 154-2

Technical specifications

Article number	6ES7154-1AA01-0AB0 ET 200pro, IM 154-1 DP	6ES7154-2AA01-0AB0 ET 200pro, IM154-2 DP HF
General information		
Product type designation	IM 154-1 DP	IM 154-2 DP HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; over exchangeable fuses	Yes; over exchangeable fuses
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	200 mA	200 mA
Address area		
Addressing volume		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
Interfaces		
Interfaces/bus type	PROFIBUS DP	PROFIBUS DP
Interface types		
RS 485		
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
• automatic detection of transmission rate	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	No	No
PROFIsafe	No	Yes
PROFIBUS	Yes	Yes
EtherNet/IP	No	No
PROFIBUS DP		
Services		
- SYNC capability	Yes	Yes
- FREEZE capability	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• For load voltage monitoring	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
Potential separation		
between supply voltage and electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Interface modules > IM 154-1 and IM 154-2

Technical specifications

Article number	6ES7154-1AA01-0AB0 ET 200pro, IM 154-1 DP	6ES7154-2AA01-0AB0 ET 200pro, IM154-2 DP HF
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	375 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN

Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

Ordering data

IM 154-3 PN High Feature interface module

For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFINsafe.

Connection module 6ES7194-4AK00-0AA0 must be ordered separately.

Article No.

6ES7154-3AB00-0AB0

IM 154-4 PN High Feature interface module

For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFINsafe.

Order connection module 6ES7194-4A .00-0AA0 separately.

6ES7154-4AB10-0AB0

Accessories

Connection modules for IM 154-3 PN High Feature

- **CM IM PN M12 connection module 7/8" S** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"

6ES7194-4AK00-0AA0

- **CM IM PN M12 connection module M12-L S** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2x M12-D and 2x M12-L

6ES7194-4AL00-0AA0

Connection modules for IM 154-4 PN High Feature

- **CM IM PN M12 connection module, 7/8"** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"
- **CM IM PN 2xRJ45 connection module** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector

6ES7194-4AJ00-0AA0

6ES7194-4AF00-0AA0

- **CM IM PN 2xSCRJ FO connection module** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector

6ES7194-4AG00-0AA0

Article No.

M12 sealing cap

For protection of unused M12 connections with ET 200pro.

3RX9802-0AA00

IE M12 connecting cables

Preassembled with two M12 plugs, up to 85 m, in various lengths:

0.3 m

6XV1870-8AE30

0.5 m

6XV1870-8AE50

1.0 m

6XV1870-8AH10

1.5 m

6XV1870-8AH15

2.0 m

6XV1870-8AH20

3.0 m

6XV1870-8AH30

5.0 m

6XV1870-8AH50

10 m

6XV1870-8AN10

15 m

6XV1870-8AN15

20 m

6XV1870-8AN20

30 m

6XV1870-8AN30

40 m

6XV1870-8AN40

50 m

6XV1870-8AN50

7/8" sealing caps

1 pack = 10 units

6ES7194-3JA00-0AA0

7/8" connecting cable to power supply

5-wire, 5 x 1.5 mm², trailable, preassembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths:

1.5 m

6XV1822-5BH15

2.0 m

6XV1822-5BH20

3.0 m

6XV1822-5BH30

5.0 m

6XV1822-5BH50

10 m

6XV1822-5BN10

15 m

6XV1822-5BN15

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN

Ordering data	Article No.		Article No.
Power cable 5-wire, 5 x 1.5 mm ² , trailable, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	6XV1830-8AH10		
7/8" connection plug For ET 200eco, with axial cable outlet. • With pin insert, 5-pack • With socket insert, 5-pack	6GK1905-0FA00 6GK1905-0FB00		
Industrial Ethernet FastConnect installation cables • IE FC TP standard cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE FC TP trailing cable 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE FC TP trailing cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE TP torsion cable GP 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m. • IE FC TP marine cable 2 x 2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.	6XV1840-2AH10 6XV1840-3AH10 6XV1870-2D 6XV1870-2F 6XV1840-4AH10		
IE RJ45 plug PRO RJ45 plug connector in degree of protection IP65/IP67 for on-site assembly, plastic enclosure, insulation displacement connection system, for SCALANCE X-200IRT PRO and ET 200pro: 1 pack = 1 unit.	6GK1901-1BB10-6AA0		
IE SC RJ POF plug PRO SC RJ plug connector for POF fibers in degree of protection IP65/IP67, for on-site assembly, plastic enclosure, for SCALANCE X- 200IRT PRO and ET 200pro 1 pack = 1 unit	6GK1900-0MB00-6AA0		
IE SC RJ PCF plug PRO SC RJ plug connector for PCF fibers in degree of protection IP65/IP67, for on-site assembly, plastic enclosure, for SCALANCE X-200IRT PRO 1 pack = 1 unit.	6GK1900-0NB00-6AA0		
Power plug PRO 5-pin power plug connector for 2 x 24 V power supply in degree of protection IP65/67, for on-site assembly, plastic enclosure, for SCALANCE X-200IRT and ET 200pro 1 pack = 1 unit.	6GK1907-0AB11-6AA0		
		IE Panel Feedthrough Control cabinet bushing for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20) • 1 pack = 5 units	6GK1901-0DM20-2AA5
		Push-pull connection plug For 1L+/ 2L+, unassembled	6GK1907-0AB11-6AA0
		Cover caps for push-pull RJ45 sockets 5 items per pack	6ES7194-4JD50-0AA0
		Cover caps for push-pull sockets power (1L+, 2L+) 5 units	6ES7194-4JA50-0AA0
		General accessories	
		ET 200pro rack • Narrow, for interface, electronics and power modules - 500 mm - 1000 mm - 2000 mm, can be cut to length • Compact, for interface, electronics and power modules - 500 mm - 1000 mm - 2000 mm, can be cut to length • Wide, for interface, electronics, power modules and motor starters - 500 mm - 1000 mm - 2000 mm, can be cut to length • Wide, for I/O modules and motor starters - 500 mm - 1000 mm - 2000 mm	6ES7194-4GA00-0AA0 6ES7194-4GA60-0AA0 6ES7194-4GA20-0AA0 6ES7194-4GC70-0AA0 6ES7194-4GC60-0AA0 6ES7194-4GC20-0AA0 6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0 6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
		Spare fuse 12.5 A quick-response, for interface and power modules, 10 units per packing unit.	6ES7194-4HB00-0AA0
		SIMATIC Manual Collection DL in 5 languages All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT Consignee email address required for delivery.	6ES7998-8XE01-8YE0
		SIMATIC Manual Collection DL in 5 languages Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice Consignee email address required for delivery.	6ES7998-8XE01-8YE2

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN

Technical specifications

Article number	6ES7154-3AB00-0AB0 ET 200pro, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET 200pro, IM 154-4 PN HF
General information		
Product type designation	IM 154-3 PN HF	IM 154-4 PN HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	300 mA	400 mA; Dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
Address area		
Addressing volume		
• Inputs	256 byte	256 byte
• Outputs	256 byte	256 byte
Interfaces		
Interfaces/bus type	PROFINET IO	PROFINET IO
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	Yes	Yes
PROFIBUS	No	No
EtherNet/IP	No	No
Protocols (Ethernet)		
• SNMP	Yes	Yes
• LLDP	Yes	
• ping	Yes	Yes
• ARP	Yes	Yes
Redundancy mode		
Media redundancy		
- MRP	Yes	Yes
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• MAINT LED	Yes	Yes
• LINK LED	Yes	Yes
• RX/TX LED	Yes	Yes
• For load voltage monitoring	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Interface modules > IM 154-3 PN and IM 154-4 PN**Technical specifications**

Article number	6ES7154-3AB00-0AB0 ET 200pro, IM 154-3 PN HF	6ES7154-4AB10-0AB0 ET 200pro, IM 154-4 PN HF
Potential separation		
between backplane bus and electronics	No	No
between supply voltage and electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	135 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	490 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Digital expansion modules

Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
 - Standard modules with module-specific diagnostics
 - High Feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8 DI and 8 DO module by selecting CM IO 4 x M12 or CM IO 8 x M12
- IO connection modules are available in metal and plastic versions

Ordering data

Article No.

8 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AA0
8 DI High Feature digital input module 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7141-4BF00-0AB0
16 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7194-4CB50-0AA0 must be ordered separately	6ES7141-4BH00-0AA0
4 DQ digital output module 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AA0
4 DQ High Feature digital output module 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BD00-0AB0
8 DQ digital output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7142-4BF00-0AA0
4 DI/4 DQ digital input and output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF50-0AA0
4 DIQ/4 DQ digital input and output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	6ES7143-4BF00-0AA0

Article No.

Accessories	
CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	6ES7194-4CA00-0AA0
CM IO 4 x M12 inverse connection module 4 M12 sockets for connection of digital actuators to ET 200pro (4 DQ and 4 DQ HF); 2 x M12 single assignment, 2 x M12 double assignment	6ES7194-4CA50-0AA0
CM IO 4 x M12 P connection module 4 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	6ES7194-4CA10-0AA0
CM IO 8 x M12 connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB00-0AA0
CM IO 8 x M12 P connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro; plastic version	6ES7194-4CB10-0AA0
CM IO 8 x M12D connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	6ES7194-4CB50-0AA0
CM IO 8 x M8 connection module 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	6ES7194-4EB00-0AA0
CM IO 2 x M12 connection module 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DQ, 24 V DC/0.5 A	6ES7194-4FB00-0AA0
CM IO 1 x M23 connection module 1 M23 socket; for use with: EM 8 DI, 24 V DC and 8 DQ, 24 V DC/0.5 A	6ES7194-4FA00-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Digital expansion modules

Ordering data	Article No.		Article No.
Module identification labels For color coding of the CM I/Os in the colors of white, red, blue and green; pack with 100 units each	6ES7194-4HA00-0AA0	M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	6ES7194-6KA00-0XA0
M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00	M8 sealing cap For IP67 modules	3RK1901-1PN00
M12 Y circular connector For double connection of sensors via a single cable, 5-pin; cannot be used for F-DI 4/8	6ES7194-1KA01-0XA0		

Technical specifications

Article number	6ES7141-4BF00-0AA0 ET 200pro, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET 200pro, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET 200pro, EM 16DI DC 24V
General information			
Product function			
• Isochronous mode	No	No	No
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
from supply voltage 1L+, max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	20 mA	20 mA
Encoder supply			
Number of outputs	8	8	8
Short-circuit protection	Yes; per module, electronic	Yes; per channel, electronic	Yes; per module, electronic
Output current			
• up to 55 °C, max.	1 A	1 A	1 A
Digital inputs			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	4 mA
Input delay (for rated value of input voltage) for standard inputs			
- parameterizable	No	Yes	No
Cable length			
• unshielded, max.	30 m	30 m	30 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Digital expansion modules

Technical specifications

Article number	6ES7141-4BF00-0AA0 ET 200pro, EM 8DI 24V DC	6ES7141-4BF00-0AB0 ET 200pro, EM 8DI 24V DC HF	6ES7141-4BH00-0AA0 ET 200pro, EM 16DI DC 24V
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes; channel by channel, parameterizable	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Hardware interrupt		Yes	
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; Monitoring, I < 0.3 mA; per channel	
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; channel by channel	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital inputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weights			
Weight, approx.	140 g	140 g	140 g
Article number	6ES7142-4BD00-0AA0 ET 200pro, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET 200pro, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET 200pro, EM 8DO DC24V/0.5A
Supply voltage			
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
Input current			
from load voltage 2L+ (without load), max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA	30 mA
Digital outputs			
Number of digital outputs	4	4	8
output type acc. to IEC 61131, type 0.5			Yes
output type acc. to IEC 61131, type 2	Yes	Yes	
Short-circuit protection	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes	Yes; Isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered
Switching capacity of the outputs			
• on lamp load, max.	10 W	10 W	5 W
Load resistance range			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Digital expansion modules

Technical specifications

Article number	6ES7142-4BD00-0AA0 ET 200pro, EM 4DO 24V DC/2.0A	6ES7142-4BD00-0AB0 ET 200pro, EM 4DO 24VDC/2.0A HF	6ES7142-4BF00-0AA0 ET 200pro, EM 8DO DC24V/0.5A
Parallel switching of two outputs			
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
Total current of the outputs (per group)			
all mounting positions			
- up to 55 °C, max.	4 A	4 A	4 A
Cable length			
• shielded, max.	30 m	30 m	30 m
• unshielded, max.	30 m	30 m	30 m
Interrupts/diagnostics/status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable		Yes	
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; channel by channel	
• Short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; channel by channel	Yes; Short-circuit of outputs to ground; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
• Channel fault indicator F (red)		Yes	
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital outputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2
Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weights			
Weight, approx.	140 g	140 g	140 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Digital expansion modules

Technical specifications

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
from supply voltage 1L+, max.		20 mA
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA
Encoder supply		
Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
Output current		
• up to 55 °C, max.	1 A	1 A
Digital inputs		
Number of digital inputs	4	4; 4 DIOs can be parameterized
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
all mounting positions		
- up to 55 °C, max.		4
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• unshielded, max.	30 m	30 m
Digital outputs		
Number of digital outputs	4	8; 4 DO fixed, 4 DIO parameterizable
• in groups of		4; 2 load groups for 4 outputs each
output type acc. to IEC 61131, type 0.5	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Digital expansion modules

Technical specifications

Article number	6ES7143-4BF50-0AA0 ET 200pro, EM 4DI / 4DO DC 24V, 0.5A	6ES7143-4BF00-0AA0 ET 200pro, EM 4 DIO / 4 DO DC 24V, 0.5A
Total current of the outputs (per group) all mounting positions - up to 55 °C, max.	2 A	2 A
Cable length • unshielded, max.	30 m	30 m
Encoder Connectable encoders • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA	Yes 1.5 mA
Interrupts/diagnostics/status information Diagnostics function	Yes	Yes
Alarms • Diagnostic alarm	Yes	Yes
Diagnoses • Diagnostic information readable • Short-circuit	Yes Yes; Short-circuit of outputs to ground; module by module	Yes Yes; Short-circuit of outputs to ground; module by module
Diagnostics indication LED • Group error SF (red) • Status indicator digital input (green) • Status indicator digital output (green)	Yes Yes Yes	Yes Yes Yes
Potential separation between backplane bus and all other circuit components	Yes	Yes
Potential separation digital inputs • between the channels • between the channels and backplane bus	No Yes	No Yes
Potential separation digital outputs • between the channels • between the channels and backplane bus	No Yes	Yes
Standards, approvals, certificates Suitable for safety-related tripping of standard modules		Yes
Highest safety class achievable for safety-related tripping of standard modules • Performance level according to ISO 13849-1 • Category according to ISO 13849-1 • SIL acc. to IEC 62061		PL d Cat. 3 SIL 2
Dimensions Width Height Depth	45 mm 130 mm 35 mm	45 mm 130 mm 35 mm
Weights Weight, approx.	140 g	140 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Analog expansion modules

Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostics functionality, limit values and substitute values

Ordering data

Article No.

Article No.

4AI U analog input module

High Feature, ± 10 V; ± 5 V; 0 to 10 V;
1 to 5 V, channel-specific
diagnostics, including bus module.
Connection module must be
ordered separately

6ES7144-4FF01-0AB0

4AI I analog input module

High Feature, ± 20 mA; 0 to 20 mA;
4 to 20 mA, channel-specific
diagnostics, including bus module.
Connection module must be
ordered separately

6ES7144-4GF01-0AB0

4AI RTD analog input module

High Feature; resistances:
150, 300, 600 and 3000 Ohm;
resistance thermometer: Pt100,
200, 500, 1000, Ni100, 120, 200,
500 and 1000; channel-specific
diagnostics, incl. bus module.
Connection module must be
ordered separately

6ES7144-4JF00-0AB0

4AI TC analog input module

High Feature; thermocouples:
Type B, E, J, K, L, N, R, S, T;
voltage measurement ± 80 mV;
channel diagnostics, including bus
module. Connection module must
be ordered separately

6ES7144-4PF00-0AB0

4AO U analog output module

High Feature, ± 10 V; 0 to 10 V;
1 to 5 V, channel-specific
diagnostics, including bus module.
Connection module must be
ordered separately

6ES7145-4FF00-0AB0

4AO I analog output module

High Feature, ± 20 mA; 0 to 20 mA;
4 to 20 mA, channel-specific
diagnostics, including bus module.
Connection module must be
ordered separately

6ES7145-4GF00-0AB0

Accessories

CM IO 4 x M12 connection module

4 M12 sockets for connecting
digital or analog sensors or
actuators to ET 200pro

6ES7194-4CA00-0AA0

M12 compensation connectors

With integral Pt100 for cold junction
compensation when connecting
thermocouples

6ES7194-4AB00-0AA0

Module identification labels

For color coding of the CM IOs in
the colors of white, red, blue and
green; pack with 100 units each

6ES7194-4HA00-0AA0

M12 sealing cap

For protection of unused M12
connections with ET 200pro

3RX9802-0AA00

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Analog expansion modules**Technical specifications**

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction	Yes; against destruction	Yes; against destruction
Input current				
from supply voltage 1L+, max.	40 mA; Typical	40 mA; Typical	27 mA; Typical	34 mA; Typical
from backplane bus 3.3 V DC, max.	12 mA; Typical	12 mA; Typical	10 mA; Typical	20 mA; Typical
Encoder supply				
Number of outputs	4	4		
Short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
Output current				
• up to 55 °C, max.	1 A	1 A		
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
permissible input current for current input (destruction limit), max.		40 mA		
Constant measurement current for resistance-type transmitter, typ.			1.25 mA; 1.25 / 0.5 mA depending on measuring range	
Cycle time (all channels) max.	5 ms	10 ms	83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable			Yes; Degrees Celsius/degrees Fahrenheit	Yes; °C/°F/K
Input ranges (rated values), voltages				
• 0 to +10 V	Yes			
• 1 V to 5 V	Yes			
• -10 V to +10 V	Yes			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
Input ranges (rated values), currents				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		
Input ranges (rated values), thermocouples				
• Type B				Yes
• Type E				Yes
• Type J				Yes
• Type K				Yes
• Type L				Yes
• Type N				Yes
• Type R				Yes
• Type S				Yes
• Type T				Yes
Input ranges (rated values), resistance thermometer				
• Cu 10			No	
• Ni 100			Yes	
• Ni 1000			Yes	
• Ni 120			Yes	
• Ni 200			Yes	
• Ni 500			Yes	
• Pt 100			Yes	
• Pt 1000			Yes	
• Pt 200			Yes	
• Pt 500			Yes	

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Input ranges (rated values), resistors				
• 0 to 150 ohms			Yes	
• 0 to 300 ohms			Yes	
• 0 to 600 ohms			Yes	
• 0 to 3000 ohms			Yes	
• PTC			Yes	
Thermocouple (TC)				
Temperature compensation				
- internal temperature compensation				Yes
- external temperature compensation with compensations socket				Yes
Characteristic linearization				
• parameterizable			Yes	
- for resistance thermometer			Ptxxx, Nixxx	
Cable length				
• shielded, max.	30 m	30 m	30 m	30 m
Analog value generation for the inputs				
Measurement principle	integrating	integrating	integrating	integrating
Integration and conversion time/resolution per channel				
• Resolution with overrange (bit including sign), max.	15 bit; 15 bit + sign at ± 10 V, at ± 5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; 15 bit + sign at ± 10 V, at ± 5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; at 150, 300, 600 and 3 000 ohms; otherwise 15 bits + sign	15 bit; + sign
• Integration time (ms)	0,3 / 16,7 / 20 / 60	0,3 / 16,7 / 20 / 60	20 / 16,667	2,5 / 16,67 / 20 / 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	16,67 / 50 / 60 / 3 600	16,67 / 50 / 60 / 3 600	50 / 60 Hz	10 / 50 / 60 / 400 Hz
• Conversion time (per channel)	1.1 ms	1.1 ms	20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	4.7/19/22/102 ms
Smoothing of measured values				
• parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement	Yes			Yes
• for current measurement as 2-wire transducer		Yes		
• for current measurement as 4-wire transducer		Yes		
• for resistance measurement with two-wire connection			Yes; Line resistances are also measured	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.0075 %	0.0075 %	0.05 %	0.01 %
Temperature error (relative to input range), (+/-)	0.00075 %/K	0.00075 %/K	0.002 %/K	0.0004 %/K; Positive temperature
Crosstalk between the inputs, min.	-70 dB	-70 dB	-50 dB	-90 dB; max.
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
Operational error limit in overall temperature range				
• Voltage, relative to input range, (+/-)	0.1 %			0.12 %; Positive temperature
• Current, relative to input range, (+/-)		0.1 %		
• Resistance thermometer, relative to input range, (+/-)			0.175 %	

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Basic error limit (operational limit at 25 °C)				
- Voltage, relative to input range, (+/-) - Current, relative to input range, (+/-) - Resistance thermometer, relative to input range, (+/-)	0.075 %	0.075 %	0.125 %	0.1 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, $f1 =$ interference frequency				
- Series mode interference (peak value of interference < rated value of input range), min. - Common mode interference (USS < 2.5 V), min.			50 dB 70 dB; Interference voltage < 5 V	42 dB 85 dB; Interference voltage < 10 V
Interference voltage suppression for $f = n \times (f1 \pm 0.5 \%)$, $f1 =$ interference frequency				
- Series mode interference (peak value of interference < rated value of input range), min. - Common mode interference (USS < 2.5 V), min.	60 dB 80 dB; Interference voltage < 10 V	60 dB 80 dB; Interference voltage < 5 V		
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
- Diagnostic alarm - Hardware interrupt	Yes; Parameterizable Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable Yes; (limit value alarm), can be parameterized for channel 0	Yes; Parameterizable No	Yes; Parameterizable No
Diagnoses				
- Diagnostic information readable - Wire-break - Short-circuit - Overflow/underflow	Yes Yes; at 1 to 5 V Yes; at 1 to 5 V	Yes Yes; at 4 to 20 mA Yes; at 4 to 20 mA	Yes Yes Yes	Yes Yes Yes
Diagnostics indication LED				
Group error SF (red)	Yes	Yes	Yes	Yes
Potential separation				
Potential separation analog inputs				
- between the channels - between the channels and backplane bus	No Yes	No Yes	No Yes	No Yes
Standards, approvals, certificates				
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9				Yes; Based on AMS 2750 E
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm	130 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	150 g	150 g	150 g	150 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications

Article number	6ES7145-4FF00-0AB0 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, EM 4 AO-I HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	65 mA	110 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Actuator supply		
Number of outputs	4	4
Short-circuit protection	Yes; per module	Yes; per module
Output current		
• up to 55 °C, max.	1 A	1 A
Analog outputs		
Number of analog outputs	4	4
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to frame
Voltage output, short-circuit current, max.	50 mA	
Current output, no-load voltage, max.		16 V
Cycle time (all channels) max.	3 ms	3 ms
Output ranges, voltage		
• 0 to 10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes
Connection of actuators		
• for voltage output two-wire connection	Yes	
• for voltage output four-wire connection	Yes	
• for current output two-wire connection		Yes
• for current output four-wire connection		Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	
• with voltage outputs, capacitive load, max.	1 μF	
• with current outputs, max.		600 Ω
• with current outputs, inductive load, max.		1 mH
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the outputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; at -10 to +10 V; 14 bit at 1 to 5 V; 15 bit at 0 to 10 V	15 bit; at ±20 mA; 14 bit at 0 to 20 mA; 15 bit at 4 to 20 mA
• Conversion time (per channel)	0.7 ms	0.7 ms
Settling time		
• for resistive load	0.1 ms	0.1 ms
• for capacitive load	6 ms	
• for inductive load		1 ms

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Analog expansion modules

Technical specifications

Article number	6ES7145-4FF00-0AB0 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, EM 4 AO-I HF
Errors/accuracies		
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %	0.1 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
Operational error limit in overall temperature range		
• Voltage, relative to output range, (+/-)	0.2 %	
• Current, relative to output range, (+/-)		0.2 %
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.15 %	
• Current, relative to output range, (+/-)		0.15 %
Interrupts/diagnostics/status information		
Diagnostics function		Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Wire-break	No	Yes; per channel, not in zero range
• Short-circuit	Yes; per channel, not in zero range	No
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
Potential separation		
Potential separation analog outputs		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	150 g	150 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > Technology modules > EM 2 SSI electronic module

Overview



- 2-channel position detection module for ET 200pro, incl. bus module
- For connecting gray and dual-coded SSI absolute encoders to ET 200pro
- SSI interface with clock and data for RS422 differential signals
- 24 V encoder supply, short-circuit-proof
- Parameterizable input filters for suppressing interferences at encoder inputs
- Supports SSI absolute encoder with a frame length of 10 to 40 bits, of which up to 25 bits position value
- Width 45 mm

Ordering data

SIMATIC DP, electronic module for ET 200pro EM 2xSSI

Position detection for 2 SSI absolute encoders
incl. bus module,
SSI CM connection module
6ES7194-4CC00-0AA0
must be ordered separately

Article No.

6ES7147-4BB00-0AA0

Accessories

SIMATIC DP SSI CM connection module

For technology module
ET 200pro EM 2xSSI 2xM12

6ES7194-4CC00-0AA0

AS-Interface accessory M12 cover

For IP67 modules, 15 mm outer diameter, with O-ring

3RK1901-1KA00

AS-Interface accessory M12 cover

For IP67 modules, tamper-proof version, 15 mm outer diameter, with O-ring

3RK1901-1KA01

AS-Interface accessory M12 cover

For IP67 modules, 12 mm outer diameter, without O-ring

3RX9802-0AA00

Device identification labels, for SIRIUS devices

20x7 mm, titanium gray,
package contents:
17 sheets with 20 labels each

3RT2900-1SB20

SIMATIC DP, module labels for ET 200 PRO

For color-coding of the IO connection modules;
Pack of 100 20x7 labels in the colors red, green, blue, white, yellow

6ES7194-4HA00-0AA0

SIMATIC DP, slim module rack for ET 200 PRO I/O modules

Length 500 mm

6ES7194-4GA00-0AA0

SIMATIC DP, slim module rack for ET 200 PRO I/O modules

Sold by the meter for self-configuration, length 2000 mm

6ES7194-4GA20-0AA0

Article No.

SIMATIC DP, slim module rack for ET 200 PRO I/O modules

Length 1000 mm, new drilling pattern

6ES7194-4GA60-0AA0

SIMATIC DP, module rack wide version for I/O modules and motor starter ET 200 PRO

Length 500 mm

6ES7194-4GB00-0AA0

SIMATIC DP, module rack wide version for I/O modules and motor starter ET 200 PRO

Sold by the meter for self-configuration, length 2000 mm

6ES7194-4GB20-0AA0

SIMATIC DP, module rack wide version for I/O modules and motor starter ET 200 PRO

Length 1000 mm, new drilling pattern

6ES7194-4GB60-0AA0

SIMATIC DP, compact module rack for ET 200 PRO I/O modules

Sold by the meter for self-configuration, length 2000 mm

6ES7194-4GC20-0AA0

SIMATIC DP, compact module rack for ET 200 PRO I/O modules

Length 1000 mm, new drilling pattern

6ES7194-4GC60-0AA0

SIMATIC DP, compact module rack for ET 200 PRO I/O modules

Length 500 mm, new drilling pattern

6ES7194-4GC70-0AA0

SIMATIC DP, module rack compact, wide version for I/O modules and motor starter ET 200 PRO

Length 500 mm

6ES7194-4GD00-0AA0

SIMATIC DP, module rack compact, wide version for I/O modules and motor starter ET 200 PRO

Length 1000 mm

6ES7194-4GD10-0AA0

SIMATIC DP, module rack compact wide version for I/O modules and motor starter ET 200 PRO

Sold by the meter for self-configuration, length 2000 mm

6ES7194-4GD20-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Technology modules > EM 2 SSI electronic module

Technical specifications

Article number	6ES7147-4BB00-0AA0 ET 200pro EM 2 SSI
General information	
Product function	
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V18.0.1.4 or higher
• PROFINET from GSD version/ GSD revision	GSDML V2.35
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from supply voltage 1L+, max.	30 mA; without output current for the 24 V Encoder supply
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	2
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	150 mA; Per channel
Encoder	
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	30 m; Up to 500 kHz
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• RS 422	Yes

Article number	6ES7147-4BB00-0AA0 ET 200pro EM 2 SSI
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes; Encoder supply to M, channel by channel
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• ERROR LED	Yes
• Channel status display	Yes
• for channel diagnostics	Yes
Integrated Functions	
Fast mode	Yes
Position detection	
• Absolute acquisition	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g
Article number	6ES7194-4CC00-0AA0 ET 200pro CM SSI 2 x M12
Dimensions	
Width	45 mm
Height	130 mm
Depth	39 mm
Weights	
Weight, approx.	340 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Technology modules > EM 2 Count 24V electronic module

Overview



- 2-channel counter module for ET 200pro, incl. bus module
- For the connection of 24 V incremental encoders to ET 200pro
- For counting tasks with incremental encoders or incremental position encoder with 24 V signals
- 24 V encoder supply, short-circuit-proof
- Parameterizable input filters for suppressing interferences at encoder inputs
- 25-bit counting width
- Width 45 mm

Ordering data

Ordering data	Article No.	Ordering data	Article No.
SIMATIC DP, electronic module For ET 200pro EM 2 Count 24V	6ES7147-4AB00-0AA0	SIMATIC DP, module rack, wide version for I/O modules and ET 200 PRO motor starter	6ES7194-4GB00-0AA0
Counter module for 2 24 V incremental encoders, Incl. bus module; ET 200pro Count 2 x M12 CM connection module, 6ES7194-4CC10-0AA0, order separately		Length 500 mm	
Accessories		SIMATIC DP, module rack, wide version for I/O modules and ET 200 PRO motor starter	6ES7194-4GB20-0AA0
SIMATIC DP, COUNT 2 x M12 CM connection module	6ES7194-4CC10-0AA0	Sold by the meter for self-configuration, length 2000 mm	
For technology module ET 200pro EM 2 Count 24V		SIMATIC DP, module rack, wide version for I/O modules and ET 200 PRO motor starter	6ES7194-4GB60-0AA0
AS-Interface accessory M12 cover	3RK1901-1KA00	Length 1000 mm, new drilling pattern	
For IP67 modules, 15 mm outer diameter, with O-ring		SIMATIC DP, module rack, compact version for ET 200 PRO I/O modules	6ES7194-4GC20-0AA0
AS-Interface accessory M12 cover	3RK1901-1KA01	Sold by the meter for self-configuration, length 2000 mm	
For IP67 modules, tamper-proof version, 15 mm outer diameter, with O-ring		SIMATIC DP, module rack, compact version for ET 200 PRO I/O modules	6ES7194-4GC60-0AA0
AS-Interface accessory M12 cover	3RX9802-0AA00	Length 1000 mm, new drilling pattern	
For IP67 modules, 12 mm outer diameter, without O-ring		SIMATIC DP, module rack, compact version for ET 200 PRO I/O modules	6ES7194-4GC70-0AA0
Device identification labels, for SIRIUS devices,	3RT2900-1SB20	Length 500 mm, new drilling pattern	
20x7 mm, titanium gray, package contents: 17 sheets with 20 labels each		SIMATIC DP, compact module rack, wide version for I/O modules and motor starter ET 200 PRO	6ES7194-4GD00-0AA0
SIMATIC DP, module labels for ET 200 PRO	6ES7194-4HA00-0AA0	Length 500 mm	
For color-coding of the I/O connection modules; Pack of 100 20x7 labels in the colors red, green, blue, white, yellow		SIMATIC DP, compact module rack, wide version for I/O modules and motor starter ET 200 PRO	6ES7194-4GD10-0AA0
SIMATIC DP, slim module rack for ET 200 PRO I/O modules	6ES7194-4GA00-0AA0	Length 1000 mm	
Length 500 mm		SIMATIC DP, compact module rack, wide version for I/O modules and motor starter ET 200 PRO	6ES7194-4GD20-0AA0
SIMATIC DP, slim module rack for ET 200 PRO I/O modules	6ES7194-4GA20-0AA0	Sold by the meter for self-configuration, length 2000 mm	
Sold by the meter for self-configuration, length 2000 mm			
SIMATIC DP, slim module rack for ET 200 PRO I/O modules	6ES7194-4GA60-0AA0		
Length 1000 mm, new drilling pattern			

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Technology modules > EM 2 Count 24V electronic module

Technical specifications

Article number	6ES7147-4AB00-0AA0 ET 200pro EM 2 Count 24V
General information	
Product type designation	EM 2 Count 24V
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V19 or higher
• PROFINET from GSD version/ GSD revision	GSDML V2.35
Supply voltage	
Rated value (DC)	24 V
Encoder supply	
Number of outputs	2
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	200 mA; Per channel
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz
• Cable length, shielded, max.	30 m
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Interface types	
• Source/sink input	Yes
• Input characteristic curve in accor- dance with IEC 61131, type 3	Yes

Article number	6ES7194-4CC10-0AA0 ET 200pro CM Count 2 x M12
Dimensions	
Width	45 mm
Height	130 mm
Depth	39 mm
Weights	
Weight, approx.	340 g

Article number	6ES7147-4AB00-0AA0 ET 200pro EM 2 Count 24V
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes; Encoder supply to M, channel by channel
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• ERROR LED	Yes
• Channel status display	Yes
• for channel diagnostics	Yes
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	800 kHz; with quadruple evaluation
Fast mode	Yes
Position detection	
• Incremental acquisition	Yes
Potential separation	
Potential separation channels	
• between the channels and back- plane bus	Yes
product functions / security / header	
signed firmware update	Yes
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Communication > IO-Link master modules

Overview



- 45 mm wide 4 IO-LINK HF electronic module
- 4 IO-Link ports according to IO-Link specification V1.1
- Port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (S7-PCT), version V3.4 and higher

Ordering data

Article No.

4 IO-Link HF electronic module

4 IO-Link ports according to IO-Link specification V1.1, port Class B; High Feature, channel-specific diagnostics, including bus module. Connection module must be ordered separately

6ES7147-4JD00-0AB0

Accessories

CM IO-Link 4 x M12 P connection module

4 M12 sockets for connecting IO-Link devices to ET 200pro electronic module 4 IO-Link HF

6ES7194-4CA20-0AA0

Module identification labels

For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each

6ES7194-4HA00-0AA0

M12 sealing cap

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

Technical specifications

Article number	6ES7147-4JD00-0AB0 ET200pro, EM 4 IO-Link HF
General information	
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction; load increasing

Article number	6ES7147-4JD00-0AB0 ET200pro, EM 4 IO-Link HF
Input current	
from supply voltage 1L+, max.	40 mA
from load voltage 2L+ (without load), max.	20 mA
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
• up to 55 °C, max.	2 A
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	possible with LIO-Link_Master function block
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: for X1 and X2 max. 2 A in total, for X3 and X4 max. 2 A in total
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
Diagnostics indication LED	
• Channel status display	Yes; One green LED for channel status Qn (SIO mode) and port status IO-Ln (IO-Link mode)
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes; combined with the IO-Link port status
Potential separation	
between the load voltages	Yes
between backplane bus and all other circuit components	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Fail-safe expansion modules > Fail-safe digital expansion modules

Overview



Fail-safe digital inputs/outputs with IP65/66/67 degree of protection for cabinet-free application on the machine level.

Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

Fail-safe digital outputs

- Fail-safe 2-channel activation (switching to P/M potential) of actuators
- Actuators can be controlled up to 2 A

All modules are certified up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with IM151-7 F-CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

Ordering data

Article No.

8/16 F-DI PROFIsafe fail-safe digital input module

24 V DC, including bus module.
Terminal module must be ordered separately

6ES7148-4FA00-0AB0

Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A

24 V DC, including bus module.
Terminal module must be ordered separately

6ES7148-4FC00-0AB0

Fail-safe electronic module F-Switch PROFIsafe

Three fail-safe outputs switching to PP potential for safe switching of the rear panel busbar (2L+, F0, F1); two fail-safe digital inputs, 45 mm; usable up to SIL3 (IEC 61508)

6ES7148-4FS00-0AB0

Accessories

Terminal module

For the fail-safe electronic module F-Switch PROFIsafe

6ES7194-4DA00-0AA0

Terminal module

For the fail-safe electronic module 4/8 F-DI/4 F-DO, 24 V DC/2 A

6ES7194-4DC00-0AA0

Terminal module

For the fail-safe electronic module 8/16 F-DI, 24 V DC

6ES7194-4DD00-0AA0

PROFIBUS DP IM154-2 interface module

Including termination module

6ES7154-2AA01-0AB0

PROFINET IM154-4 PN interface module

Including termination module

6ES7154-4AB10-0AB0

M12 sealing cap

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > Fail-safe expansion modules > Fail-safe digital expansion modules

Technical specifications

Article number	6ES7148-4FA00-0AB0 ET200PRO, EI-Mod., 8/16 F-DI 24V DC
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
from supply voltage 1L+, max.	120 mA; Typical
from backplane bus 3.3 V DC, max.	20 mA
Digital inputs	
Number of digital inputs	16
Input current	
• for signal *1*, typ.	3.7 mA

Article number	6ES7148-4FA00-0AB0 ET200PRO, EI-Mod., 8/16 F-DI 24V DC
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	e
• SIL acc. to IEC 61508	3
Dimensions	
Width	90 mm
Height	130 mm
Depth	65 mm

Article number	6ES7148-4FC00-0AB0 ET200PRO, EI-Mod., 4/8 F-DI/4 F-DO 24VDC/2A	6ES7148-4FS00-0AB0 ET200PRO, EI-Mod, F-Switch PROFIsafe
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from supply voltage 1L+, max.	100 mA; Typical	50 mA
from load voltage 2L+ (without load), max.	50 mA; Typical	25 mA; Typical
from backplane bus 3.3 V DC, max.	20 mA	40 mA
Digital inputs		
Number of digital inputs	8	2
Input current		
• for signal *1*, typ.	3.7 mA	3.5 mA
Digital outputs		
Number of digital outputs	4	3
Short-circuit protection	Yes	Yes
Controlling a digital input	Yes; digital output, according to IEC 61131-2, type 2	
Output current		
• for signal *1* rated value	2 A	
Total current of the outputs (per group)		
all mounting positions		
- up to 55 °C, max.		6 A
Dimensions		
Width	90 mm	45 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > PM-E power module

Overview



- PM-E DC 24 V power module

Ordering data

PM-E DC 24 V power module

For backfeed and group formation of the 24 V DC load voltage for electronic modules within an ET 200pro station.

Article No.

6ES7148-4CA00-0AA0

Accessories

CM PM-E ECOFAST connection module

For backfeed of 24 V load voltage, 1 ECOFAST Cu connection

6ES7194-4BA00-0AA0

CM PM-E direct connection module

For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands

6ES7194-4BC00-0AA0

CM PM-E 7/8" connection module

For backfeed of 24 V load voltage, 1 x 7/8"

6ES7194-4BD00-0AA0

CM PM-E PP connection module

For supplying 24 V load voltage, 2 x push-pull, with spare fuse

6ES7194-4BE00-0AA0

PM-E M12-L connection module

For backfeed of 24 V load voltage, 1x M12-L

6ES7194-4BL00-0AA0

Spare fuse

12.5 A quick-response, for interface and power modules, 10 items per package unit

6ES7194-4HB00-0AA0

Article No.

PROFIBUS ECOFAST hybrid cable, copper

Trailing-type cable (PUR sheath), with two shielded Cu wires for PROFIBUS DP plus four Cu wires of 1.5 mm², sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m

Preamsembled with ECOFAST plug and socket, fixed length

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m

6XV1830-7AH10

6XV1830-7BH15
6XV1830-7BH30
6XV1830-7BH50
6XV1830-7BN10
6XV1830-7BN15
6XV1830-7BN20

PROFIBUS ECOFAST hybrid cable GP

Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval

Preamsembled with ECOFAST plug and socket

- 1.5 m
- 3 m
- 5 m
- 10 m
- 15 m
- 20 m

6XV1860-3PH15
6XV1860-3PH30
6XV1860-3PH50
6XV1860-3PN10
6XV1860-3PN15
6XV1860-3PN20

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > PM-E power module

Ordering data	Article No.	Article No.
ECOFAST connection plug, for user assembly Socket; ordering unit 5 items	6GK1905-0CB00	Accessories for CM PM-E 7/8"
PROFIBUS ECOFAST hybrid plug, angled With 2 x shielded copper cores and 4 x 1.5 mm ² copper cores; 5 items; with assembly instructions; contact insert	6GK1905-0CD00	7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailing type, preassembled with two 7/8" connectors, 5-pin • 1.5 m long • 2.0 m long • 3.0 m long • 5.0 m long • 10 m long • 15 m long
Push-pull connection plug For 1L+/ 2L+, unassembled	6GK1907-0AB11-6AA0	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15
Cover caps for push-pull sockets 5 units Accessories for CM PM-E direct	6ES7194-4JA50-0AA0	7/8" connection plug With axial cable outlet • With contact insert, 5-pack
Power cable 5-wire, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	6XV1830-8AH10	6GK1905-0FB00

Technical specifications

Article number	6ES7148-4CA00-0AA0 ET 200pro, PM-E 24V DC	Article number	6ES7148-4CA00-0AA0 ET 200pro, PM-E 24V DC
Supply voltage		Potential separation	
Load voltage 2L+		between load voltage and backplane bus	Yes
• Rated value (DC)	24 V	Degree and class of protection	
• Short-circuit protection	Yes; via an exchangeable fuse in the power module	IP degree of protection	IP65/67
• Reverse polarity protection	Yes; against destruction	Dimensions	
Input current		Width	45 mm
from load voltage 2L+, max.	3 mA	Height	130 mm
Current carrying capacity		Depth	35 mm
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)	Weights	
Power loss		Weight, approx.	140 g
Power loss, typ.	0.1 W		
Interrupts/diagnostics/status information			
Diagnostics function	Yes		
Diagnoses			
• Diagnostic information readable	Yes		
• missing load voltage	Yes		
Diagnostics indication LED			
• For load voltage monitoring	Yes		
• Group error SF (red)	Yes		

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

I/O modules > PM-O power module output

Overview



PM-O 2 x 24 V DC power module with CM PM-O PP

- PM-O 2x 24 V DC power module

Ordering data	Article No.		Article No.
PM-O 2 x 24 V DC power module For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.	6ES7148-4CA60-0AA0	Push-pull cable connector For 1L+/ 2L+, unassembled	6GK1907-0AB11-6AA0
Accessories		Cover caps for push-pull female connectors 5 units	6ES7194-4JA50-0AA0
CM PM-O PP connection module For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector	6ES7194-4BH00-0AA0		

Technical specifications

Article number	6ES7148-4CA60-0AA0 ET200PRO, PM-O DC 2x24V	Article number	6ES7148-4CA60-0AA0 ET200PRO, PM-O DC 2x24V
Supply voltage		Potential separation	
Load voltage 2L+		between load voltage and backplane bus	Yes
• Rated value (DC)	24 V	Degree and class of protection	
• Short-circuit protection	Yes	IP degree of protection	IP65/67
• Reverse polarity protection	Yes; against destruction	Dimensions	
Input current		Width	45 mm
from load voltage 2L+, max.	3 mA	Height	130 mm
Current carrying capacity		Depth	35 mm
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)	Weights	
Power loss		Weight, approx.	150 g
Power loss, typ.	1.1 W		
Interrupts/diagnostics/ status information			
Diagnostics function	Yes		
Diagnoses			
• Diagnostic information readable	Yes		
• missing load voltage	No		
Diagnostics indication LED			
• For load voltage monitoring	No; Signalled in IM or in PM		
• Group error SF (red)	Yes		

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > ET 200pro pneumatic interface

Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

Ordering data

Article No.

Article No.

EM 148-P pneumatic interface

DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P

DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P

6ES7148-4EA00-0AA0

6ES7148-4EB00-0AA0

FESTO CPV 10 valve terminal

FESTO CPV 14 valve terminal

available from FESTO

available from FESTO

FESTO AG & Co
Ruiterstr. 82
D-73732 Esslingen

More addresses
on the Internet at:
<http://www.festo.com>

Technical specifications

Article number	6ES7148-4EA00-0AA0 ET200PRO, 16DO,Pneumatic Interface CPV10	6ES7148-4EB00-0AA0 ET200PRO, 16DO,Pneumatic Interface CPV14
Supply voltage		
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes
Input current		
from load voltage 2L+, max.	300 mA; Including valves	370 mA; Including valves
from backplane bus 3.3 V DC, max.	25 mA	25 mA
Power loss		
Power loss, typ.	2.6 W	3.7 W
Address area		
Address space per module		
• Address space per module, max.	2 byte	2 byte
Digital outputs		
Number of digital outputs	16	16
Load resistance range		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
Output current		
• for signal "1" rated value	12 mA	16 mA
Switching frequency		
• with inductive load, max.	25 Hz	20 Hz
Total current of the outputs (per group)		
all mounting positions		
- up to 55 °C, max.	250 mA; only up to 50 °C, limited by valves	330 mA; only up to 50 °C, limited by valves

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > ET 200pro pneumatic interface

Technical specifications

Article number	6ES7148-4EA00-0AA0 ET200PRO, 16DO,Pneumatic Interface CPV10	6ES7148-4EB00-0AA0 ET200PRO, 16DO,Pneumatic Interface CPV14
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnoses		
• Diagnostic information readable	Yes	Yes
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Pneumatics		
Number of connectable valves, max.	16	16
permissible working pressure, min.	3 bar	3 bar
permissible working pressure, max.	8 bar	8 bar
Rated flow rate	400 l/min	800 l/min
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Dimensions		
Width	90 mm	120 mm
Height	130 mm	152 mm
Depth	47 mm	47 mm

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > RF170C

Overview



The SIMATIC RF170C is a communications module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers of all RFID systems as well as the MV400 optical readers and MV300 optical handheld readers can be operated on the RF170C. In addition, the RF170C provides a universal RS232/ RS422 interface for connecting devices using the Freepoint protocol.

Thanks to the high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows it to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Ordering data

SIMATIC RF170C communications module

For connecting to the ET 200pro distributed I/O system

Article No.

6GT2002-0HD01

Accessories

Connection block for SIMATIC RF170C

For connecting 2 readers or other RS422/RS232 devices via an M12 connector

6GT2002-1HD01

Reader cable for SIMATIC RF200 / RF300 / RF600 / MV440

Or MOBY D extension cable and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, trailable

2 m, straight plug

6GT2891-4FH20

5 m, straight plug

6GT2891-4FH50

10 m, straight plug

6GT2891-4FN10

20 m, straight plug

6GT2891-4FN20

50 m, straight plug

6GT2891-4FN50

2 m, plug angled at reader

6GT2891-4JH20

5 m, plug angled at reader

6GT2891-4JH50

10 m, plug angled at reader

6GT2891-4JN10

Article No.

Connecting cable for SIMATIC RF1000

Prefabricated RS232, between RF1040R or RF1070R and a communications module; black, length 2 m

6GT2891-4UH20

Reader cable for MV300 handheld readers

Coiled cable with usable length of 1.6 m to 4 m for MV320, PUR material

6GT2191-0BH50

Plug for connection of other RS422/RS232 devices

8-pole M12 plug, male, screw connections for wires up to 0.5 mm². Order quantity 1 pack with 5 units

6GT2090-0BE00

M12 sealing caps for unused reader connections

Minimum order quantity 10 units, price per 100 units

3RX9802-0AA00

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

I/O modules > RF170C

Technical specifications

Article number	6GT2002-0HD01
product type designation	RF170C communication module
suitability for operation	ET 200pro distributed I/O together with RF200/300/1000, MV300/400/500, MOBY D/E//U and RS-232 devices
transfer rate	
transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
interfaces	
design of the interface for point-to-point connection	RS422/RS232 via connection block
number of readers connectable	2
type of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of Industrial Ethernet interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
design of the interface to the reader for communication	Internal plug to the connection block
mechanical data	
material	Thermoplastic (Valox 467, fiberglass reinforced)
color	IP Basic 714
tightening torque of the screw for securing the equipment maximum	1.5 N·m
supply voltage, current consumption, power loss	
supply voltage at DC	
• rated value	24 V
•	20 ... 30 V
consumed current	
• at DC at 24 V without connected devices typical	0.13 A
• from supply voltage 1L+ maximum	1 A
ambient conditions	
ambient temperature	
• during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
protection class IP	IP67
shock resistance	According to IEC 61131-2
shock acceleration	300 m/s ²
vibrational acceleration	100 m/s ²
design, dimensions and weights	
width	90 mm
height	130 mm
depth	35 mm
net weight	0.27 kg
fastening method	ET 200pro rack
wire length for RS 422 interface maximum	1 000 m

Article number	6GT2002-0HD01
product type designation	RF170C communication module
product features, product functions, product components general	
display version	(see connection block)
product function addressable	No
transponder file handler	
protocol is supported	
• S7 communication	Yes
product functions management, configuration, engineering	
type of parameterization	HSP
type of programming	FB 45, FB 55, ID profile, library with functions, (FC 45/55 with restricted functionality)
type of computer-switched communication	acyclic communication
standards, specifications, approvals	
certificate of suitability	CE, FCC, cULus
MTBF	77 a
reference code	
• according to IEC 81346-2:2019	KEC
product function is supported	No
identification link	
standards, specifications, approvals Environmental Product Declaration	
Environmental Product Declaration	Yes
global warming potential [CO2 eq]	
• total	101.43 kg
• during manufacturing	16 kg
• during operation	85.3 kg
• after end of life	0.13 kg
accessories	
accessories	Connection block for RF170C
further information internet links	
internet link	
• to website: Selection guide for cables and connectors	https://support.industry.siemens.com/cs/ww/en/view/109766358
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: identification and localization systems	https://www.siemens.com/ident
• to web page: SiePortal	https://sieportal.siemens.com/
• to website: Image database	https://www.automation.siemens.com/bilddb
• to website: CAx-Download-Manager	https://www.siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Power supplies > 3-phase, 24 V DC (ET200pro PS, IP67)

Overview



Power supply for ET200pro:

- 3-phase, 24 V DC/8 A

The SIMATIC ET200pro PS power supply unit with IP67 degree of protection is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a second connector for looping the input voltage.

Product highlights

- 3-phase, 24 V DC/8 A
- Wide-range input, input voltage 340 ... 550 V
- Up to 88% efficiency
- With signaling contact for "24 V OK" and "Overtemperature"
- Status indicator on the device by means of LED (green = "24 V OK")
- Temperature range from -25 °C to +55 °C

Ordering data

SIMATIC ET 200pro PS

Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67; Input: 400–480 V 3 AC Output: 24 V DC/8 A

Accessories

Power connector

For connecting to the distributed I/O system

- For X1 (6 mm²)
- For X2 (4 mm²)

Article No.

6ES7148-4PC00-0HA0

3RK1911-2BE30
3RK1911-2BF10

Article No.

National Fire Protection Association compatible

These devices are only approved for installation in industrial machinery according to the NFPA79 Electrical Standard for Industrial Machinery.

- For X1 SIMATIC ET 200pro PS 61 88 201 1003.xx (AWG10)*
- For X1 SITOP PSU300P 61 88 201 1000.xx / 61 88 201 1002.xx (AWG14)*
- For X2 SIMATIC ET 200pro PS 61 88 202 1010.xx (AWG10)*
supplied blanking cap for X2
- For X3 Phoenix-Contact SAC-5P-M12-M12FS
supplied blanking cap for X3

* <https://www.harting.com/US/en>

3RK1902-0CK00

Sealing cap

For 9-pin power sockets

- X2 (1 unit)
- X2 (10 units)

3RK1902-0CK00
3RK1902-0CJ00

Technical specifications

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC ET200pro PS
type of current supply	24 V/8 A
input	
type of the power supply network	3-phase AC
supply voltage at AC	
• minimum rated value	400 V
• maximum rated value	480 V
• initial value	340 V
• full-scale value	550 V
supply voltage at AC	320 ... 340 V for max. 1 min
wide range input	Yes
overvoltage overload capability	Implemented internally with varistors
buffering time for rated value of the output current in the event of power failure minimum	15 ms

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC ET200pro PS
type of current supply	24 V/8 A
operating condition of the mains buffering	at Vin = 400 V
line frequency	50 Hz/60 Hz
line frequency	45 ... 66 Hz
input current	
• at rated input voltage 400 V	0.5 A
current limitation of inrush current at 25 °C maximum	40 A
I2t value maximum	3.5 A ² ·s
fuse protection type	T 4 A
fuse protection type in the feeder	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Power supplies > 3-phase, 24 V DC (ET200pro PS, IP67)

Technical specifications

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC ET200pro PS
type of current supply	24 V/8 A
output	
voltage curve at output	Controlled, isolated DC voltage
output voltage at DC rated value	24 V
output voltage	
• at output 1 at DC rated value	24 V
	24 V
output voltage adjustable	No; -
relative overall tolerance of the voltage	3 %
relative control precision of the output voltage	
• on slow fluctuation of input voltage	0.5 %
• on slow fluctuation of ohm loading	0.5 %
residual ripple	
• maximum	200 mV
voltage peak	
• maximum	250 mV
display version for normal operation	Green LED for 24 V OK
type of signal at output	max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for V_{out} in range 21.3 ... 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)
behavior of the output voltage when switching on	Overshoot of $V_{out} < 2 \%$
response delay maximum	1.5 s
voltage increase time of the output voltage	
• typical	40 ms
output current	
• rated value	8 A
• rated range	0 ... 8 A
	5.1 ... 9.9 A
supplied active power typical	192 W
short-term overload current	
• on short-circuiting during the start-up typical	50 A
• at short-circuit during operation typical	50 A
duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
bridging of equipment	No
efficiency	
efficiency in percent	88 %
power loss [W]	
• at rated output voltage for rated value of the output current typical	25 W

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC ET200pro PS
type of current supply	24 V/8 A
closed-loop control	
relative control precision of the output voltage with rapid fluctuation of the input voltage by +/- 15% typical	0.5 %
relative control precision of the output voltage load step of resistive load 50/100/50 % typical	1 %
setting time	
• maximum	2 ms
protection and monitoring	
design of the overvoltage protection	< 33 V
property of the output short-circuit proof	Yes
design of short-circuit protection	Electronic shutdown, automatic restart
• typical	9.4 A
enduring short circuit current RMS value	
• maximum	10 A
safety	
galvanic isolation between input and output	Yes
galvanic isolation	Protective extra low output voltage V_{out} according to EN 60950-1 and EN 50178
operating resource protection class	Class I
leakage current	
• maximum	3.5 mA
• typical	0.4 mA
protection class IP	IP67
EMC	
standard	
• for emitted interference	EN 55022 Class A
• for mains harmonics limitation	-
• for interference immunity	EN 61000-6-2
standards, specifications, approvals	
certificate of suitability	
• CE marking	Yes
• UL approval	Yes; UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
• CSA approval	No; -
• EAC approval	Yes
• NEC Class 2	No
type of certification	
• CB-certificate	Yes
MTBF at 40 °C	196 354 h
standards, specifications, approvals hazardous environments	
certificate of suitability	
• IECEx	No
• ATEX	No
• ULhazloc approval	No
• cCSAus, Class 1, Division 2	No
• FM registration	No

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Power supplies > 3-phase, 24 V DC (ET200pro PS, IP67)

Technical specifications

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC ET200pro PS
type of current supply	24 V/8 A
standards, specifications, approvals	
marine classification	
shipbuilding approval	No
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• French marine classification society (BV)	No
• Det Norske Veritas (DNV)	No
• Lloyds Register of Shipping (LRS)	No
ambient conditions	
ambient temperature	
• during operation	-25 ... +55; with natural convection
• during transport	-40 ... +70
• during storage	-40 ... +70
environmental category according to IEC 60721	Climate class 3K3, 5 ... 95% no condensation
connection method	
type of electrical connection	screw terminal
• at input	L1, L2, L3, PE: Plug connector HAN Q4/2 (counterpart see "Electrical accessories")
• at output	L+, M: 2 x 1.5 mm ² each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm ²)
• for auxiliary contacts	Alarm signals: M12 plug-in connector 5-pin

Article number	6ES7148-4PC00-0HA0
product brand name	SIMATIC ET200pro PS
type of current supply	24 V/8 A
mechanical data	
width × height × depth of the enclosure	310 mm × 135 mm × 90 mm
fastening method	Can be mounted onto ET200pro mounting rail
• DIN-rail mounting	No
• S7 rail mounting	No
• wall mounting	Yes
housing can be lined up	No
net weight	2.8 kg
accessories	
electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm ²)) (Output: 3RK1911-2BF10 (4 mm ²))
further information internet links	
internet link	
• to website: Industry Mall	https://mall.industry.siemens.com
• to web page: selection aid TIA Selection Tool	https://www.siemens.com/tstcloud
• to web page: power supplies	https://siemens.com/sitop
• to website: CAX-Download-Manager	https://siemens.com/cax
• to website: Industry Online Support	https://support.industry.siemens.com
additional information	
other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified) 24 V 24 V -25 °C 55 °C

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > General data

Overview

ET 200pro motor starters in ET 200pro I/O system

SIMATIC ET 200pro is the modular I/O system with high degree of protection IP65/IP66/IP67 for cabinet-free use near the machine. The ET 200pro motor starters with the high degree of protection IP65 are an integral part of ET 200pro.



ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

ET 200pro motor starters (see pages 3/428 and 3/429)

- Only two variants up to 5.5 kW
- All settings can be configured by bus
- Comprehensive diagnostic messages
- Support for PROFlenergy
- Overload can be acknowledged by remote RESET
- Current asymmetry monitoring
- Stall protection
- EMERGENCY START function on overload
- Current value transmission by bus
- Current limit monitoring
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using Han Q4/2 plug-in connectors
- Motor feeder with Han Q8/0 connector
- Conductor cross-section up to 6 x 4 mm²
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on-board)
- Electromechanical switching and electronic switching
- Electronic direct-on-line starter or with integrated soft starter function
- Supplied with 400 V AC brake contact as an option
- Temperature sensor can be connected (Thermoclick or PTC type A)
- Provision of the motor current in PROFlenergy format to higher-level systems, motor current shutdown in dead times using PROFlenergy

More information

Homepage see <https://www.siemens.com/sirius-motor-starter-et200pro>
SiePortal see https://www.siemens.com/product_catalog_sieportal/ET200pro

Decision support for motor start – Starting and operating three-phase asynchronous motors efficiently, see <https://www.siemens.com/motorstart-guide>

Further components in the ET 200pro distributed I/O system:

- Interface modules, central processing units, I/O modules, ET 200pro PS, see from page 10/386 onwards
 - ET 200pro FC-2 frequency converter see page 3/438
- Catalog IC 10 see <https://www.siemens.com/ic10>

ET 200pro isolator modules (see page 3/430)

The isolator module with switch disconnecter function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications

PROFlsafe Safety Solution (see page 3/431)

With the PROFlsafe Safety modules

- F-Switch and
 - 400 V disconnecting module
- with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can also be reached.

Functionality

With the ET 200pro motor starters, any three-phase loads can be protected and switched.

The ET 200pro motor starters are available with mechanical and also electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line starters (DSe) and reversing starters (RSe) as **Standard** and **High Feature** versions. There are device versions with or without control for externally supplied brakes with 400 V AC.

Compared with the Standard motor starters, the **High Feature, mechanical** motor starter also has:

- Four digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSSte/sDSte) and reversing starters (sRSSSte/sRSte) in the High Feature version.

Compared with the High Feature mechanical motor starters, the **High Feature, electronic** motor starter also has:

- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

I/O systems

SIMATIC ET 200 systems without control cabinet SIMATIC ET 200pro

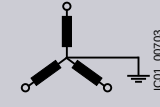
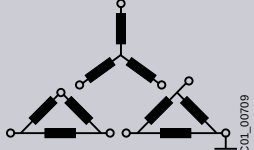
ET 200pro motor starters > General data

As a result of the protection concept with solid-state overload evaluation and the use of SIRIUS switching devices, size S00, additional advantages are realized with the Standard and High Feature motor starters – advantages that soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Plant configuration is made easier and flexibility is increased by the fine modular structure with ET 200pro. When using the ET 200pro motor starters, the bill of materials per load feeder is reduced to two main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveyor systems and in machine-tool construction.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation), a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are also optimized by the low level of variance (two units up to 5.5 kW).
- With four locally acting inputs available on the High Feature motor starter, autonomous special functions can be implemented that operate independently of the bus and the higher-level control system, e.g. as a quick stop on slide valve controls or end position disconnections. In parallel with this, the states of these inputs are signaled to the control system.

Voltage Data

The data for 3-phase systems according to IEC 60947-4-1 apply for the following line system configurations:

Voltage U_e	Line system configurations	
	Three-phase four-wire systems	Three-phase three-wire systems
		
V	V	V
230	--	230
400	230/400	400
440	260/440	440
500	--	500

-- Not specified

Article number schemes

Product versions		Article number					
Motor starters		3RK1304 - 5 □ S □ 0 - □ A A □					
Setting range	0.15 ... 2.0 A 1.5 ... 12 A	K L					
Product function	Direct-on-line starters DSe Reversing starters RSe Direct-on-line starters DSe Reversing starters RSe Direct-on-line starters sDSSSte/sDSte Reversing starters sDSSSte/sDSte	4 4 4 4 7 7	4 5 2 3 2 3				Standard Standard High Feature High Feature High Feature High Feature
Inputs/outputs	Without brake output With brake output					0 3	400 V AC, with High Feature + 4 inputs
Example		3RK1304 - 5 K S 4 0 - 4 A A 0					

Product versions		Article number					
Modules		3RK1304 - 0 H S 0 0 - □ A A 0					
Product function	Isolator modules 400 V disconnecting module					6 8	PROFIsafe Safety modules
Example		3RK1304 - 0 H S 0 0 - 6 A A 0					

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro motor starters > General data

Type		Standard motor starters	High Feature motor starters
Technology designation ¹⁾		DSe, RSe	DSe, RSe sDSSSte, sDSte, sRSSSte, sRSte
Device functions (firmware features)			
Configurable rated operational current		✓	
Integrated short-circuit protection		✓	
Configurable current limit values		--	✓ 2 limit values
Configurable response in case of current limit violation		--	✓
Zero current monitoring		✓	
Configurable response in case of zero current violation		✓	
Configurable current unbalance limit	%	-- Fixed limit value (30 x I_e)	✓ 30 ... 60 x I_e
Configurable response in case of asymmetry limit violation		✓	
Motor blocking monitoring		--	✓
Configurable blocking current limit	%	--	✓ 150 ... 1 000 x I_e
Configurable blocking time limit	s	--	✓ 1 ... 5
Current value transmission		✓	
Group warning diagnostics		--	✓ Configurable
Group diagnostics		✓ Configurable	
EMERGENCY START			
Digital inputs		--	✓ 4 inputs
• Configurable input signal		--	✓ Latching/non-latching
• Configurable input level		--	✓ NC/NO contacts
• Configurable input signal delay	ms	--	✓ 10 ... 80
• Configurable input signal extension	ms	--	✓ 0 ... 200
• Configurable input control actions		--	✓ 12 different actions
Brake output (400 V AC)		✓ Order option	
Configurable brake enabling delay	s	✓ -2.5 ... +2.5	
Configurable holding time of the brake during stopping	s	✓ 0 ... 25	
Configurable start up type		--	✓
Configurable ramp-down time		--	✓
Configurable starting voltage		--	✓
Configurable stopping voltage		--	✓
Local device interface		✓	
Firmware update		✓ By specialists	
Thermal motor model		✓	
Configurable trip class		-- CLASS 10 fixed	✓ CLASS 5, 10, 15, 20
Configurable response in case of overload of thermal motor model		--	✓ 3 possible states
Advance warning limit for motor heating	%	--	✓ Configurable 0 ... 95
Advance warning limit time-related trip reserve	s	--	✓ Configurable 0 ... 500
Configurable recovery time	min	--	✓ 1 ... 30
Configurable protection against voltage failure		-- Permanently integrated	✓
Reversing start function		✓ Order option	
Configurable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s
Integrated logbook functions		✓ 3 device logbooks	
Integrated statistics data memory		✓	
Configurable response in case of CPU/master stop		✓	
PROFenergy profile support			
• Disconnection of the motor current during dead times		✓	
• Measured motor current values		✓	
Device indications			
• Group fault		SF LED (red)	
• Switching state		STATE LED (red, yellow, green)	
• Device status		DEVICE LED (red, yellow, green)	
• Digital inputs		--	IN 1 ... IN 4, LED

✓ Function available

-- Function not available

- ¹⁾ DS Direct-on-line starters
 RS Reversing starters
 DSS .. Direct-on-line soft starters
 RSS .. Reversing soft starters
 e Electronic motor protection
 te Full motor protection (thermal + electronic)
 s Electronic switching with semiconductor.

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro motor starters > General data

Benefits

ET 200pro motor starters provide the following advantages:

- High flexibility thanks to a modular and compact design
- Low level of variance among all motor starter versions (two devices up to 5.5 kW)
- Extensive parameterization using STEP 7 HW Config
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Extensive diagnostics and information for preventive maintenance
- Configurable inputs for local control functions (High Feature)
- Cabinet-free design thanks to high degree of protection IP65

Application

The SIMATIC ET 200pro motor starters are ideal for the use of several spatially concentrated distributed drive solutions in which several motors, or digital or analog sensors and actuators are addressed from a distributed station. They are perfectly suited for protecting and switching any three-phase loads.

Application areas

The SIMATIC ET 200pro motor starters are suitable for numerous sectors of industry, e.g. machinery and plant engineering or conveying applications.

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro motor starters > General data

Technical specifications

More information			
Equipment Manual, see https://support.industry.siemens.com/cs/ww/en/view/22332388		Notes on security: System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation. For more information on the subject of industrial cybersecurity, see https://www.siemens.com/cybersecurity-industry .	
Type		Standard motor starters Mechanically switching without inputs	High Feature motor starters Mechanically switching with inputs Electronic switching with inputs and soft starter function
Technology designation ¹⁾		DSe, RSe	DSe, RSe sDSSSte, sDSte, sRSSSte, sRSte
Mechanics and environment			
Motor starters or modules that can be connected to ET 200pro With width of 110 mm		max. 8	
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters		mm	110 x 230 x 150 110 x 230 x 160
Permissible ambient temperature • During operation • During storage		°C	-25 ... +55, from +40 with derating -40 ... +70
Permissible mounting position			Vertical, horizontal
Vibration resistance according to IEC 60068-2-6		g	2
Shock resistance according to IEC 60068-2-27		g/ms	Half-sine 15/11
Degree of protection			IP65
Pollution degree			3, IEC 60664 (IEC 61131)
Electrical specifications			
Power consumption at 24 V DC • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)		mA	Approx. 40 Approx. 200
Rated operational current I_g for power bus		A	25
Rated operational voltage U_g • Approval according to EN 60947-1, Annex N • Approval according to CSA and UL		V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz) Up to 400 (50/60 Hz) Up to 480 (50/60 Hz)
Approval • DIN VDE 0106, Part 101 • CSA and UL approval		V V	Up to 400 Up to 600 Up to 480 Up to 480
Conductor cross-sections • Incoming power supply		mm ²	Max. 6 x 4
Touch protection			Finger-safe
Rated impulse withstand voltage U_{imp}		kV	6
Rated insulation voltage U_i		V	400
Rated operational current I_g for starters • AC-1, AC-2, AC-3, AC-3e at 40 °C - At 400 V - At 500 V • AC-4 at 40 °C - At 400 V		A A A	0.15 ... 2.0/1.5 ... 12.0 0.15 ... 2.0/1.5 ... 9.0 0.15 ... 2.0/1.5 ... 4.0 0.15 ... 2.0/1.5 ... 12.0 ²⁾
Rated short-circuit breaking capacity		kA	100 at 400 V
Type of coordination according to IEC 60947-4-1			1
Power of three-phase motors at 400 V		kW	Max. 5.5 Max. 5.5/4 ³⁾
Utilization categories			AC-1, AC-3, AC-3e, AC-4 AC-53a ⁴⁾ (max. 9 A with deactivated soft start function up to CLASS 10)
Protective separation between main and auxiliary circuits		V	400, according to EN 60947-1, Annex N
Endurance of contactor • Mechanical • Electrical		Operating cycles Operating cycles	30 million Up to 10 million; depending on the current loading (see Equipment Manual, https://support.industry.siemens.com/cs/ww/en/view/22332388) -- --
Permissible switching frequency			Depending on the current load, motor starting time, and relative ON period (see Equipment Manual, https://support.industry.siemens.com/cs/ww/en/view/22332388)
Operating times for 0.85 ... 1.1 x U_g • Closing delay • Opening delay		ms ms	11 ... 50 5 ... 45 -- --

¹⁾ DS Direct-on-line starters
RS Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e Electronic motor protection
te Full motor protection (thermal + electronic)
s Electronic switching with semiconductor.

²⁾ If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to CLASS 10.

³⁾ With parameterization as electronic starter max. 4 kW.

⁴⁾ 8-hour operation.

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > Standard motor starters **IE3/IE4 ready**

Overview

The functionality, device functions, and technical specifications of the Standard motor starter are described in ET 200pro motor starters, General data, (see page 3/423 onwards).

Selection and ordering data

Version		Article No.
Standard motor starters, mechanical Motor protection: thermal model		
 DSe Standard	Direct-on-line starters DSe¹⁾ - Without brake output - With brake output 400 V AC	3RK1304-5□S40-4AA0 3RK1304-5□S40-4AA3
	Reversing starters RSe¹⁾ - Without brake output - With brake output 400 V AC	3RK1304-5□S40-5AA0 3RK1304-5□S40-5AA3
	Setting range Rated operational current 0.15 ... 2.0 A 1.5 ... 12.0 A	K L

¹⁾ Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see Accessories for ET 200pro motor starters, page 3/437).

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro motor starters > High Feature motor starters **IE3/IE4 ready**

Overview

The functionality, device functions, and technical specifications of the High Feature motor starter are described in ET 200pro motor starters, General data ([see page 3/423 onwards](#)).

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-configurable digital inputs.

Selection and ordering data

Version		Article No.
High Feature motor starters, mechanical Motor protection: thermal model		
 RSe High Feature	Direct-on-line starters DSe¹⁾ - Without brake output and with 4 inputs - With brake output 400 V AC and 4 inputs	3RK1304-5□S40-2AA0 3RK1304-5□S40-2AA3
	Reversing starters RSe¹⁾ - Without brake output and with 4 inputs - With brake output 400 V AC and 4 inputs	3RK1304-5□S40-3AA0 3RK1304-5□S40-3AA3
	Setting range Rated operational current 0.15 ... 2.0 A 1.5 ... 12.0 A	K L
High Feature motor starters²⁾, electronic Full motor protection, comprising thermal motor protection and thermistor motor protection		
 sRSSSt High Feature	Direct-on-line starters sDSSSt/sDSt¹⁾²⁾ - Without brake output and with 4 inputs - With brake output 400 V AC and 4 inputs	3RK1304-5□S70-2AA0 3RK1304-5□S70-2AA3
	Reversing starters sRSSSt/sRSt¹⁾²⁾ - Without brake output and with 4 inputs - With brake output 400 V AC and 4 inputs	3RK1304-5□S70-3AA0 3RK1304-5□S70-3AA3
	Setting range Rated operational current 0.15 ... 2.0 A 1.5 ... 12.0 A	K L

¹⁾ Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately ([see Accessories for ET 200pro motor starters, page 3/437](#)).

²⁾ The electronic motor starters can be used not only as electronic motor starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and stopping. The changeover from motor starter to soft starter takes place through reparameterization in HW Config. Depending on the setting, this results in the following current ranges:

- Parameterization as electronic motor starter: 0.15 to 2 A and 1.5 to 9 A (4 kW).
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (5.5 kW).

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro motor starters > ET 200pro isolator modules **IE3/IE4 ready**

Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnecter function is used to safely disconnection of the 400 V operational voltage during repair work in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

Technical specifications

Type	Isolator modules	
General data		
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 170
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +55 -40 ... +70
Permissible mounting position	Any	
Vibration resistance according to IEC 60068-2-6	g	2
Shock resistance according to IEC 60068-2-27	g/ms	Half-sine 15/11
Power consumption • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA	Approx. 20 --
Rated operational current I_e for power bus	A	25
Rated operational voltage U_e	V	400
Approvals according to • DIN VDE 0106, Part 101 • CSA and UL	V V	Up to 500 Up to 600
Conductor cross-sections • Incoming power supply	mm ²	Max. 6 x 4

Type	Isolator modules	
Degree of protection	IP65	
Touch protection	Finger-safe	
Pollution degree	3, IEC 60664 (IEC 61131)	
Rated impulse withstand voltage U_{imp}	kV	6
Rated insulation voltage U_i	V	400
Rated operational current I_e for starters		
• AC-1, AC-2, AC-3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
Rated short-circuit breaking capacity	kA	50 at 400 V
Type of coordination according to IEC 60947-4-1	2	
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101
Device functions		
• Group diagnostics	Yes, configurable	
Device indications		
• Group fault	SF LED (red)	

Selection and ordering data

Version	Article No.

ET 200pro isolator modules, mechanical



3RK1304-0HS00-6AA0

Isolator module¹⁾

Rated operational current 25 A

3RK1304-0HS00-6AA0

¹⁾ Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see [Accessories for ET 200pro motor starters](#), page 3/437).

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro Solution PROFIsafe Safety motor starters > PROFIsafe Safety modules

Overview

PROFIsafe Safety Solution

With the PROFIsafe Safety modules

- F-Switch and
 - 400 V disconnecting module
- with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can be reached.

PROFIsafe F-Switch

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for cabinet-free use near the machine.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2V2 signals
- Internal sensor supplies (including testing) available

Fail-safe digital outputs

- Three fail-safe PP-switching outputs for safe switching of the backplane busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics. It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Note:

Safety characteristics, [see https://support.industry.siemens.com/cs/ww/en/view/109739348](https://support.industry.siemens.com/cs/ww/en/view/109739348).

Functionality

The PROFIsafe F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, fail-safe shutdown of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

400 V disconnecting module

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to SIL 3/PL e. For operation in a PROFIsafe Safety application it functions only in combination with the F-Switch.

Functionality

The 400 V disconnecting module can be used together with the F-Switch for PROFIsafe Safety applications. It contains two contactors connected in series for safety-related disconnection of the main circuit. The auxiliary circuit supply of the device is provided via a safety power rail in the backplane bus module. The 400 V disconnecting module can be used in conjunction with the F-Switch for safety applications up to SIL 3/PL e.

Technical specifications

Type	400 V disconnecting module	
General data		
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 150
Permissible ambient temperature • During operation • During storage	°C °C	-25 ... +55 -40 ... +70
Permissible mounting position		Any
Vibration resistance according to IEC 60068-2-6	g	2
Shock resistance according to IEC 60068-2-27	g/ms	Half-sine 15/11
Power consumption • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	mA	Approx. 20 --
Rated operational current I_e for power bus	A	25
Rated operational voltage U_e	V	400 (50/60 Hz)
Approval DIN VDE 0106, Part 101	V	Up to 500
CSA and UL approval	V	Up to 600
Conductor cross-sections Incoming power supply	mm ²	Max. 6 x 4
Degree of protection		IP65
Touch protection		Finger-safe
Pollution degree		3, IEC 60664 (IEC 61131)

Type	400 V disconnecting module	
Rated impulse withstand voltage U_{imp}	kV	6
Rated insulation voltage U_i	V	400
Rated operational current I_e for starters		
• AC-1, AC-2, AC-3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
Rated short-circuit breaking capacity	kA	50 at 400 V
Type of coordination according to IEC 60947-4-1		2
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101
Operating times at $0.85 \dots 1.1 \times U_s$		
• Closing delay	ms	25 ... 100
• Opening delay	ms	7 ... 10
Device functions		
• Group diagnostics		Yes, configurable
Device indications		
• Group fault		SF LED (red)

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro Solution PROFIsafe Safety motor starters > PROFIsafe Safety modules **IE3/IE4 ready**

Selection and ordering data

Version		Article No.
PROFIsafe Safety modules		
 3RK1304-0HS00-8AA0	400 V disconnecting module¹⁾²⁾ Rated operational current 25 A	3RK1304-0HS00-8AA0
 6ES7148-1FS00-0AB0	PROFIsafe F-Switch 24 V DC, including bus module <u>Note:</u> Connection module must be ordered separately.	6ES7148-4FS00-0AB0
	Connection module for F-Switch 24 V DC	6ES7194-4DA00-0AA0

¹⁾ The 400 V disconnecting module functions only when used together with the PROFIsafe F-Switch.

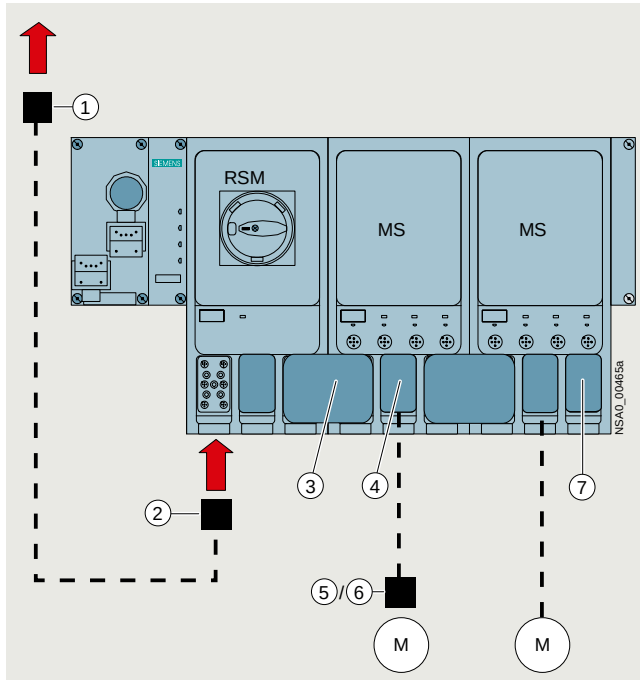
²⁾ The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see [Accessories for ET 200pro motor starters, page 3/437](#)).

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Accessories for ET 200pro motor starters

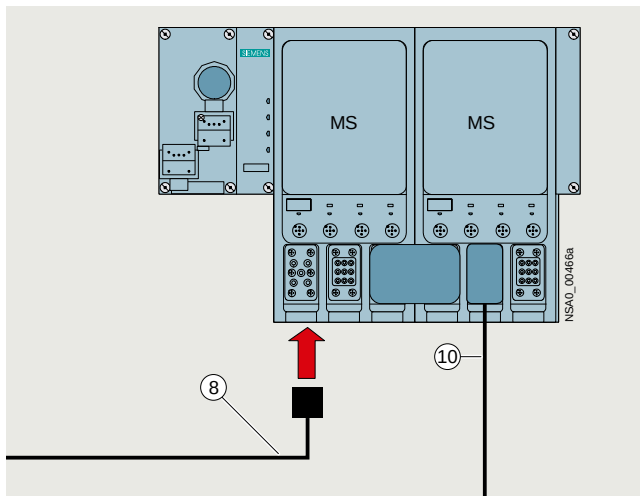
Overview



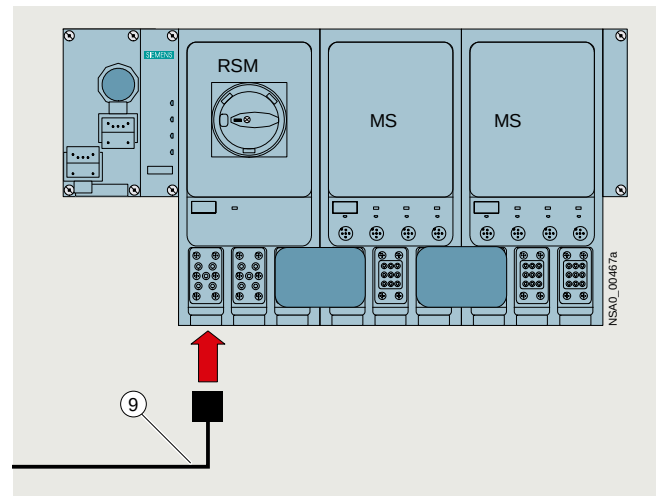
Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for energy

Legend:

- ① Power feeder plug (see page 3/435)
- ② Power connection plug (see page 3/435)
- ③ Power jumper plug (see page 3/435)
- ④ Motor connection plug (see page 3/435)
- ⑤ Motor plug (see page 3/435)
- ⑥ Motor plug with EMC suppressor circuit (see page 3/435)
- ⑦ Power loop-through plug (see page 3/435)
- ⑧ Power connection cable (see page 3/435)
- ⑨ Power connection cable for isolator module (see page 3/435)
- ⑩ Motor cable (see page 3/436)



Infeed on the ET 200pro motor starter



Infeed on the RSM isolator module

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

Accessories for ET 200pro motor starters

Power bus

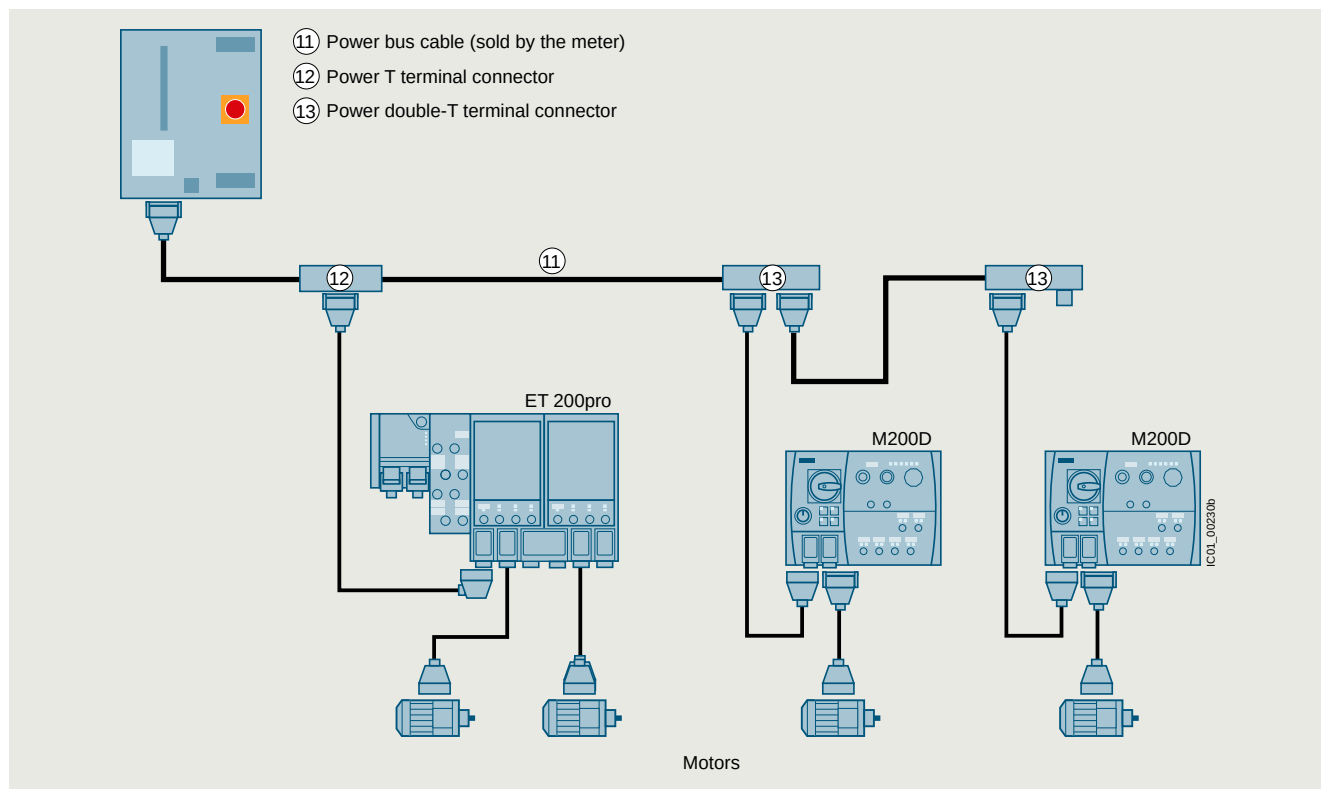
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

Feeders

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. the power bus is not interrupted when the components are plugged in.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

Motor control via PROFIBUS

The interface modules (IM) for PROFIBUS can be combined with two different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable gland
- M12, 7/8" connection
 - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
 - with 7/8" connecting cable and 7/8" plugs for the power supply

For the connection modules with the relevant accessories, see [Accessories for ET 200pro interface modules, page 10/386](#) or SiePortal: <https://www.siemens.com/sieportal>.

Motor control via PROFINET

For the connection modules with the relevant accessories, see [Accessories for ET 200pro interface modules, page 10/386](#) or SiePortal: <https://www.siemens.com/sieportal>.

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Accessories for ET 200pro motor starters

Selection and ordering data

Version	Article No.
Incoming power supply	
① Power feeder plugs Connector set for incoming power supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for Han Q4/2, incl. bushing • 5 contact pins, 2.5 mm² • 5 contact pins, 4 mm² • 5 contact pins, 6 mm²	3RK1911-2BS60 3RK1911-2BS20 3RK1911-2BS40
② Power connection plugs Connector set for incoming power supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, socket insert for Han Q4/2, including screw gland • 5 contact sockets, 2.5 mm² • 5 contact sockets, 4 mm² • 5 contact sockets, 6 mm²	3RK1911-2BE50 3RK1911-2BE10 3RK1911-2BE30
⑧ Power connecting cables, assembled at one end Power connecting cable for ET 200pro motor starters, open at one end, for Han Q4/2, angled, 4 x 4 mm ² • Length 1.5 m • Length 5.0 m	3RK1911-0DB13 3RK1911-0DB33
⑨ Power connection cables for isolator module, assembled at one end Power connecting cable for ET 200pro isolator modules, open at one end, for Han Q4/2, angled, insert turned at isolator module end, 4 x 4 mm ² • Length 1.5 m • Length 5.0 m	3RK1911-0DF13 3RK1911-0DF33
Power loop-through on the field device	
③ Power jumper plug	3RK1922-2BQ00
⑦ Power loop-through plugs Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angled outgoing feeder, pin insert for Han Q4/2, including screw gland • 4 contact pins, 2.5 mm² • 4 contact pins, 4 mm²	3RK1911-2BF50 3RK1911-2BF10
Motor cables	
④ Motor connection plugs Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angled outgoing feeder, pin insert for Han Q8/0, incl. screw gland • 8 contact pins, 1.5 mm² • 6 contact pins, 2.5 mm²	3RK1902-0CE00 3RK1902-0CC00
⑤ Motor plugs Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, sockets insert for Han 10e, including neutral bridge, including screw gland • 7 contact sockets, 1.5 mm² • 7 contact sockets, 2.5 mm²	3RK1911-2BM21 3RK1911-2BM22
⑥ Motor plugs with EMC suppressor circuit Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, sockets insert for Han 10e with EMC suppressor circuit, including neutral bridge, including screw gland • 7 contact sockets, 1.5 mm² • 7 contact sockets, 2.5 mm²	3RK1911-2BL21 3RK1911-2BL22

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Accessories for ET 200pro motor starters

Version	Article No.
Motor cables (continued)	
⑩ Motor cables, assembled at one end Open at one end, Han Q8, angled, length 5 m - For motor without brake, for ET 200pro, 4 x 1.5 mm² - For motor with brake for ET 200pro, 6 x 1.5 mm² - For motor without brake, with thermistor, for ET 200pro, 6 x 1.5 mm² - For motor with brake and thermistor for ET 200pro, 8 x 1.5 mm²	3RK1911-0EB31 3RK1911-0ED31 3RK1911-0EF31 3RK1911-0EG31
Power bus	
⑫ Power T terminal connectors For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments 2.5 mm²/4 mm² 4 mm²/6 mm²	3RK1911-2BF01 3RK1911-2BF02
⑬ Power double-T terminal connector For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible 4 mm²/6 mm²	3RK1911-2BG02
Sealing set (comprising 2 seals) For power T/power double-T terminal connectors - For power cables with Ø 10 ... 13 mm - For power cables with Ø 13 ... 16 mm - For power cables with Ø 16 ... 19 mm - For power cables with Ø 19 ... 22 mm - Blanking plugs	3RK1911-5BA00 3RK1911-5BA10 3RK1911-5BA20 3RK1911-5BA30 3RK1911-5BA50
Further accessories for power connections	
 Crimping tool for pins/sockets, 4 mm ² and 6 mm ² 3RK1902-0CW00	3RK1902-0CW00
 Dismantling tools - For contact pins and sockets for 9-pole Han Q4/2 inserts - For contact pins and sockets for 9-pole Han Q8 inserts	3RK1902-0AB00 3RK1902-0AJ00
 Sealing caps For 9-pole power sockets 1 unit per pack 10 units per pack 3RK1902-0CK00	3RK1902-0CK00 3RK1902-0CJ00

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Accessories for ET 200pro motor starters

Version		Article No.
Further accessories		
Module racks, wide¹⁾ - Length 500 mm - Length 1 000 mm - Length 2 000 mm		6ES7194-4GB00-0AA0 6ES7194-4GB60-0AA0 6ES7194-4GB20-0AA0
Module racks, wide, compact¹⁾ - Length 500 mm - Length 1 000 mm - Length 2 000 mm		6ES7194-4GD00-0AA0 6ES7194-4GD10-0AA0 6ES7194-4GD20-0AA0
Backplane bus module 110 mm²⁾		3RK1922-2BA00
Handheld device For ET 200pro motor starters (or for M200D motor starters) for local operation <u>Notes:</u> - The motor-starter-specific serial interface cables must be ordered separately. - The RS 232 interface cable 3RK1922-2BP00 is used for the ET 200pro motor starters.		3RK1922-3BA00
RS 232 interface cable Serial data connection between ET 200pro (or M200D) motor starters and the RS 232 interface of a PC/PG/ laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00		3RK1922-2BP00
USB interface cable, 2.5 m Serial data connection between ET 200pro (or M200D) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software)		6SL3555-0PA00-2AA0
M12 sealing caps For sealing unused M12 input or output sockets (one set contains ten sealing caps)		3RK1901-1KA00
Motor suppression modules RC element for installation in motor terminal box Angled design		3RK1911-6EA00
Round design		3RK1911-6EB00



3RK1922-3BA00



3RK1901-1KA00



3RK1911-6EA00



3RK1911-6EB00

¹⁾ The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, 400 V disconnecting module).

²⁾ The backplane bus module is a prerequisite for operation of the ET 200pro motor starters and the optional modules.

For more connection technology products, [see https://support.industry.siemens.com/cs/ww/en/view/65355810](https://support.industry.siemens.com/cs/ww/en/view/65355810).

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

SIMATIC ET 200pro FC-2 frequency converters

Overview



SIMATIC ET 200pro FC-2 frequency converter

The SIMATIC ET 200pro FC-2 frequency converter has the design of a SIMATIC ET 200pro module. It supplements the SIMATIC ET 200pro system range with distributed, speed-controlled drives. It is suitable for the open-loop and closed-loop control of asynchronous (induction) motors in a wide range of industrial applications. It is predestined for conveyor technology applications using drives networked via PROFIBUS and PROFINET, in particular in distributed designs without control cabinet with high degree of protection (IP65), when combining several drives. The modular, service-friendly concept is ideally suited to manufacturing processes with high plant standstill costs.

Reasons for using distributed drive systems

- Modular drive solutions – therefore standardized mechatronic elements that can be individually tested
- A control cabinet is not required, resulting in a smaller space requirement and lower cooling requirements
- Long motor cables between converter and motor are not required
 - Less power losses
 - Reduced noise radiation
 - Reduced costs for shielded cables
 - No additional filters
- Distributed configurations offer considerable benefits for conveyor systems with their extensive coverage (e.g. in the automotive and logistics sectors)

Siemens family of distributed drives

Siemens offers an innovative portfolio of frequency converters to optimally implement distributed drive solutions. The strengths of the individual members of the drive family permit simple adaptation to the widest range of application demands:

- Identical connection systems
- User-friendly commissioning and configuration tools

Products from the family of distributed drives:

- SINAMICS G115D distributed converters
- SINAMICS G120D frequency converters
- SIMATIC ET 200pro FC-2 frequency converters
- SIRIUS M200D motor starters

Safety Integrated

The distributed SIMATIC ET 200pro FC-2 frequency converters are already equipped with the integrated STO (Safe Torque Off) safety function, certified in accordance with IEC 61508 SIL 2 as well as ISO 13849-1 PL d and Category 3. It can be activated locally via the F-RSM or by means of PROFIsafe.

STARTER commissioning tool

The STARTER commissioning tool (V4.4 and higher) plus the corresponding SINAMICS Support Package (SSP) supports the commissioning and maintenance of SIMATIC ET 200pro FC-2 frequency converters.

The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

Engineering Framework STEP7 classic (V5.5 and higher)

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in STEP7 classic.

Engineering Framework TIA Portal (as from V13 SP1)

TIA Portal is a powerful engineering framework providing full access to the whole digitized automation.

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in TIA Portal.

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

SIMATIC ET 200pro FC-2 frequency converters

Ordering data	Article No.		Article No.
SIMATIC ET 200pro FC-2 frequency converter with integrated safety function STO (Safe Torque Off)	6SL3514-1KE13-5AE0	STARTER commissioning tool ¹⁾ on DVD-ROM	6SL3072-0AA00-0AG0
Backplane bus module for mounting the frequency converter (absolutely essential for operation of the converter)	6SL3260-2TA00-0AA0	PC converter connection kit 2 Mini USB interface cable for communication with a PC, 3 m (9.84 ft) long	6SL3255-0AA00-2CA0
Accessories		Connecting cable pre-assembled at one end Power supply cable, open at one end, for Q4/2, angled, 4 x 4 mm ²	
IOP-2 Handheld For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G120D SIMATIC ET 200pro FC-2 Included in the scope of delivery:	6SL3255-0AA00-4HA1	• 1.5 m (4.92 ft) long • 5 m (16.4 ft) long	3RK1911-0DB13 3RK1911-0DB33
• IOP-2 • Handheld housing • Rechargeable batteries (4 x AA) • Charging unit (international) • RS232 connecting cable 3 m (9.84 ft) long, can be used in combination with SINAMICS G120, SINAMICS G120C, SINAMICS G120P • USB cable 1 m (3.28 ft) long		Connector set for the power supply Q4/2	
		• 2.5 mm² • 4 mm² • 6 mm²	3RK1911-2BE50 3RK1911-2BE10 3RK1911-2BE30
RS232 connecting cable 2.5 m (8.20 ft) long, with optical interface for connecting the IOP-2 Handheld to SINAMICS G120D, SIMATIC ET 200pro FC-2	3RK1922-2BP00	Motor cables pre-assembled at one end for motors with brake and temperature sensor with Q8 plug, shielded	(HTG: supplied by Harting) (ZKT: supplied by KnorrTec)
<u>Memory Cards</u>		Cross-section	4 x 1.5 mm ² 2 x (2 x 0.75 mm ²)
SINAMICS SD card 512 MB	6SL3054-4AG00-2AA0	• 1.5 m (4.92 ft) long	HTG: 61 88 201 0288 ZKT: 70020501000150
<u>Optional firmware memory cards</u>		• 3 m (9.84 ft) long	HTG: 61 88 201 0289 ZKT: 70020501000300
SINAMICS SD card 512 MB + firmware V4.7 SP13 (Multicard V4.7 SP13)	6SL3054-7TG00-2BA0	• 5 m (16.4 ft) long	HTG: 61 88 201 0290 ZKT: 70020501000500
SINAMICS SD card 512 MB + firmware V4.7 SP14 (Multicard V4.7 SP14)	6SL3054-7TH00-2BA0	• 10 m (32.8 ft) long	HTG: 61 88 201 0299 ZKT: 70020501001000
		Connector set for motor cable Q8, shielded	HTG: 61 83 401 0131 ZKT: 10032001
		Power jumper plugs	3RK1922-2BQ00

¹⁾ The STARTER commissioning tool is also available on the internet at <http://www.siemens.com/starter>

Technical specifications

Distributed frequency converter	SIMATIC ET 200pro FC-2
Selection features	
Integrated safety functions acc. to IEC 61508 SIL 2 and ISO 13849-1 PL d and Category 3	• Safe Torque Off (STO) • Control of the integrated safety function via the Safety Local isolator module F-RSM or via F-Switch PROFIsafe
Electrical specifications	
Line voltage	380 ... 480 V 3 AC ±10 %
Power	
• With an ambient temperature of 0 ... 55 °C (32 °F ... 131 °F) • With an ambient temperature of 0 ... 45 °C (32 °F ... 113 °F)	1.1 kW 1.5 kW
Rated input current/output current	
• With an ambient temperature of 0 ... 55 °C (32 °F ... 131 °F) • With an ambient temperature of 0 ... 45 °C (32 °F ... 113 °F)	2 A/3.5 A 2.5 A/3.9 A
Line frequency	47 ... 63 Hz
Overload capability	• Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s • Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

SIMATIC ET 200pro FC-2 frequency converters

Technical specifications

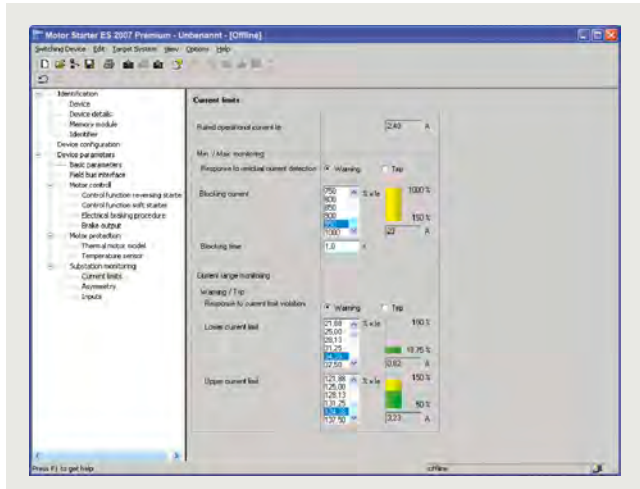
Distributed frequency converter	SIMATIC ET 200pro FC-2				
Output frequency	0 ... 550 Hz				
Pulse frequency	4 kHz (standard), 4 ... 16 kHz (in 2-kHz increments)				
Standard SCCR (Short Circuit Current Rating)	10 kA				
Skipped frequency range	1, parameterizable				
Converter efficiency	95 ... 97 %				
Interfaces	• Connection to PROFIBUS and PROFINET over the SIMATIC ET 200pro backplane bus • Mini USB interface for commissioning via PC (as from STARTER V4.4 plus SSP) • Optical interface for commissioning via the IOP-2 Handheld • Slot for an optional memory card (SD) for uploading or downloading parameter settings. Facilitates easy device replacement. • PTC, bimetal, KTY84, Pt1000 interface for motor temperature monitoring				
Functions					
Open-loop/closed-loop control methods	• V/f control – linear ($M \sim n$) with/without flux current control (FCC), quadratic ($M \sim n^2$) or parameterizable • Vector control – sensorless • Closed-loop torque control				
Operating functions	• Jogging • BICO technology • Automatic restart following interruptions in operation due to a power failure • Smooth connection of converter to rotating motor				
Braking functions	• Integrated regenerative feedback functionality • Control of an electromagnetic holding brake				
	Integrated brake control supplies DC power supply to the brake				
	Line voltage	380 V AC	400 V AC	440 V AC	480 V AC
	Rectified brake voltage	171 V DC	180 V DC	198 V DC	216 V DC
	Recommended brake coil voltage for Siemens motors	170 ... 200 V DC	170 ... 200 V DC 184 ... 218 V DC	184 ... 218 V DC	184 ... 218 V DC
Disconnection on the DC side permits "fast" braking.					
Protection functions	• Undervoltage • Overvoltage • Ground fault • Short-circuit • Stall protection • Thermal motor protection (I^2t or sensor) • Converter overtemperature • Motor blocking protection • Phase failure detection				
Connectable motors	• Low-voltage asynchronous (induction) motors • Motor cable lengths: max. 15 m (49 ft) (shielded)				
Mechanical specifications					
Degree of protection	IP65				
Operating temperature	0 ... 55 °C (32 ... 131 °F)				
Mounting position	Vertical wall mounting (vertical alignment of the cooling fins)				
Dimensions (W × H × D)	155 mm × 246 mm × 248 mm (6.10 in × 9.69 in × 9.76 in)				
Weight, approx.	4 kg (8.8 lb)				
Standards					
Certificates of suitability	UL508C, cUL, CE, UKCA, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU				

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro software > Motor Starter ES

Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

More information

SiePortal see https://www.siemens.com/product_catalog_siep?3ZS1

Technical specifications and system requirements, see

<https://support.industry.siemens.com/cs/ww/en/ps/16713/td>

Catalog IC 10 see <https://www.siemens.com/ic10>

Motor Starter ES is used for the commissioning, parameterization, diagnostics, documentation and preventive maintenance of SIMATIC ET 200S, ET 200pro, ECOFAST and M200D motor starters.

Interfacing is performed

- Via the local interface on the device
- With PROFIBUS DP-V1-capable motor starters from any point in PROFIBUS (applies to ET 200S DP V1/ET 200pro/ ECOFAST/M200D)
- With PROFINET-capable motor starters from any point in PROFINET (applies to ET 200S DP V1/ET 200pro/M200D).

Using Motor Starter ES, the communication-capable motor starters are easily parameterized during commissioning, monitored during normal operation and successfully diagnosed for service purposes. Preventative maintenance is supported by a function for reading out diverse statistical data (e.g. operating hours, operating cycles, cut-off currents, etc.). The user is supported during these procedures with comprehensive Help functions and plain text displays.

Motor Starter ES can either be used as a stand-alone program or it can be integrated into STEP 7 via an Object Manager.

Note:

The Motor Starter ES functionalities in relation to commissioning, parameterization and diagnostics are integrated directly in the TIA Portal from V18 and are accessible online for the SIMATIC ET 200pro, ET 200SP and M200D motor starters.

Efficient engineering with three program versions

The Motor Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Motor Starter ES	Basic	Standard	Premium
ET 200S High Feature	✓	✓	✓
PROFIBUS IM			
ET 200S High Feature	✓	✓	✓
PROFINET IM			
ECOFAST AS-Interface	✓	✓	--
High Feature			
ECOFAST PROFIBUS	✓	✓	✓
ET 200pro PROFIBUS IM	✓	✓	✓
ET 200pro PROFINET IM	✓	✓	✓
M200D AS-Interface Standard	✓	✓	(✓)
M200D PROFIBUS	✓	✓	✓
M200D PROFINET	✓	✓	✓

✓ Function available

(✓) Available with restricted functionality

-- Function not available

Motor Starter ES	Basic	Standard	Premium
Access via the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	--	✓	✓
Creation of templates	--	✓	✓
Comparison functions	--	✓	✓
Standard-compliant printout according to EN ISO 7200	--	✓	✓
Service data (min/max pointer, statistics data)	--	✓	✓
Access via PROFIBUS	--	--	✓
Access via PROFINET	--	--	✓
S7 routing	--	--	✓
Teleservice via MPI	--	--	✓
STEP 7 Object Manager ¹⁾	--	--	✓
Trace function	--	✓	✓

✓ Function available

-- Function not available

¹⁾ Only for STEP 7 V5.x

Additional functions

Standard-compliant printouts

The software tool greatly simplifies machine documentation. It enables parameterization printouts according to EN ISO 7200. The elements to be printed are easy to select and group as required.

Easy creation of templates

Templates can be created for devices and applications with only minimum differences in their parameters. These templates contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e.g. by the commissioning engineer.

Teleservice via MPI

The Motor Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

ET 200pro software > Motor Starter ES

Benefits

- Fast, error-free configuration and commissioning of motor starters even without extensive previous knowledge
- Transparent setting of the device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (included in the Motor Starter ES Standard and Premium software version for M200D PROFIBUS and PROFINET).

Selection and ordering data

Parameterization, commissioning and diagnostics software Motor Starter ES 2007

For ECOFAST Motor Starter, SIMATIC ET 200S High-Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-I Standard, PROFIBUS, PROFINET)

- Delivered without PC cable

Version		Article No.
Motor Starter ES 2007 Basic		
 3ZS1310-4CC10-0YA5	Floating license for one user Engineering software in limited-function version for diagnostics purposes, class A, 3 languages (German/English/French), communication via system interface <u>Type of delivery:</u> • Software and documentation on CD and floating license on USB flash drive	3ZS1310-4CC10-0YA5
	 3ZS1310-4CE10-0YB5	3ZS1310-4CE10-0YB5
Motor Starter ES 2007 Standard		
 3ZS1310-5CC10-0YA5	Floating license for one user Engineering software, class A, 3 languages (German/English/French), communication via system interface <u>Type of delivery:</u> • Software and documentation on CD and floating license on USB flash drive	3ZS1310-5CC10-0YA5
	 3ZS1310-5CE10-0YB5	3ZS1310-5CE10-0YB5
Motor Starter ES 2007 Premium		
 3ZS1310-6CC10-0YA5	Floating license for one user Engineering-Software, class A, 3 languages (German/English/French), communication via system interface or PROFIBUS/PROFINET, STEP 7 Object Manager <u>Type of delivery:</u> • Software and documentation on CD and floating license on USB flash drive	3ZS1310-6CC10-0YA5
	 3ZS1310-6CE10-0YB5	3ZS1310-6CE10-0YB5

For a description of the software versions, [see page 3/441](#).

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200pro

ET 200pro software > Motor Starter ES

Accessories

Version	Article No.
Optional accessories	
RS 232 interface cable Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	3RK1922-2BP00
USB interface cable Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	6SL3555-0PA00-2AA0
USB/serial adapter For connecting an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with ET 200S/ECOFAS/ET 200pro motor starters	3UF7946-0AA00-0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200pro

Add-on products for ET 200pro > EtherNet/IP interface module

Overview

An interface module (EtherNet/IP adapter) is available for operating ET 200pro on EtherNet/IP.

It can be used together with system and IO components of the ET 200pro distributed I/O system.

Ordering data

Article No.

Article No.

SIMATIC ET 200pro interface module for EtherNet/IP

ZNX:EIP200PRO

Including:

- Bus terminating module for ET 200pro
- Companion disk with the manuals and the Configuration Tool

Terminal module for EtherNet/IP

For connecting the interface module to EtherNet/IP

ZNX:EIP200PROC1

Technical specifications

Article number	ZNX:EIP200PRO
	Ethernet/IP Head Assembly for ET 200PRO
General information	
Product type designation	Ethernet/IP
Supply voltage	
Rated value (DC)	24 V
Input current	
from supply voltage 1L+, max.	400 mA
Address area	
Addressing volume	
• Inputs	255 byte
• Outputs	255 byte
Interface types	
M12 port	
• Autonegotiation	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	No
PROFIsafe	No
PROFIBUS	No
EtherNet/IP	Yes
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• For load voltage monitoring	Yes
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
Potential separation	
between backplane bus and electronics	Yes
between supply voltage and electronics	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C

Article number	ZNX:EIP200PRO
	Ethernet/IP Head Assembly for ET 200PRO
Dimensions	
Width	135 mm
Height	130 mm
Depth	59.3 mm
Weights	
Weight, approx.	490 g
Article number	ZNX:EIP200PROC1
	ET 200pro, CM IM DP M12 / 7/8"
Input current	
from supply voltage 1L+, max.	No current input, only infeed current, max. 8 A
from load voltage 2L+ (without load), max.	No current input, only infeed current, max. 8 A
Dimensions	
Width	90 mm
Height	130 mm
Depth	51 mm
Weights	
Weight, approx.	540 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Overview



SIMATIC ET 200AL video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6141316253001



Highlights

- Compact dimensions
- Low weight
- Safety-related collective shutdown of the outputs
- High degree of user-friendliness due to the following design features:
 - Flexible mounting in all positions possible due to screw fastening through the front or side
 - Direct installation on even surfaces or aluminum DIN rails
 - Labels for the identification of channels, modules and slots
 - Integrated cable tie opening
 - Clear and CAx-compliant interface designations
 - Uniform coloring of the system interfaces and system cables
 - 1:1 assignment of channel status LED, I/O socket and labeling strip
 - Pin assignment on the side
- I/O module portfolio comprising digital and analog modules, digital fail-safe module, IO-Link communications module and IO-Link I/O modules
- Ambient temperature range from -30 °C/-25 °C to +55 °C
- Extensive system functions
 - All interface and I/O modules support firmware update
 - Configuration control (option handling) via user software
 - System support of PROFlenergy for power saving purposes
 - Consistent use of identification and maintenance data IM0 to IM3/4 (electronic rating plate) for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).

- Modular, distributed I/O system with compact I/O modules in IP65/67.
- Especially easy and flexible installation, even in extremely confined spaces.
- Easy wiring
- Easy commissioning
- SIMATIC ET 200AL consists of the following components:
 - Interface module for communication with IO controllers using the Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP (MultiFieldbus).
 - Interface module for communication with IO controllers on PROFINET.
 - Interface module for communication with all masters on the PROFIBUS.
 - BusAdapter for connection to the ET 200SP I/O system.
 - Various I/O modules, 30 mm and 45 mm wide.
 - IO-Link I/O modules for connection to IO-Link Master
- Maximum configuration of an ET 200AL station:
 - Up to 32 I/O modules with PROFINET or PROFIBUS in any combination
 - Up to 16 I/O modules at the ET 200SP I/O system in any combination
- Connection of the modules via an internal backplane bus established using bus cables (ET connection).

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Interface modules > IM 157-1 MF

Overview



- Multi-protocol capability:
Operation of the ET 200AL interface module on Ethernet controllers via the PROFINET, EtherNet/IP and Modbus TCP protocols
- Max. 32 I/O modules can be connected
- Max. data volume of 1440 bytes, for input and output data respectively (depends on protocol)
- Shortest bus cycle time 250 µs (depends on protocol)
- Automatic start-up by means of topology discovery (depends on protocol)
- Shared device:

Simultaneous access from different controllers via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP

- Local data links:

Deterministic, easy-to-configure data exchange between controllers, also via different Ethernet protocols PROFINET, EtherNet/IP and Modbus TCP

- S2 system redundancy
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IMO ... IM4
- Autocrossover
- Firmware update
- Configuration management (option handling)
- PROFIenergy
- Security functions

Ordering data

Article No.

IM 157-1 MF interface module

For connecting ET 200AL to PROFINET

6ES7157-1MA00-0AB0

Accessories

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 plugs

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends,
2 M8 plugs, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end,
1 M8 plug

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

Article No.

M8 power cable

4-pin

Pre-assembled at both ends,
M8 plug and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends,
angled M8 plug and angled
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end,
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Interface modules > IM 157-1 MF

Ordering data	Article No.		Article No.
M8 plug for ET connection 4-pin, shielded	6ES7194-2AB00-0AA0	ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	6ES7194-2KA00-0AA0
M8 power connector Male contact insert, 4-pin Female contact insert, 4-pin	6ES7194-2AA00-0AA0 6ES7194-2AC00-0AA0	Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	6ES7194-2BA00-0AA0

Technical specifications

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF	Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
General information		Interface types	
Product type designation	IM 157-1 MF	M12 port	
Product function		• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• I&M data	Yes; I&M0 to I&M4	• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Isochronous mode	No	• Autonegotiation	Yes
• IRT	Yes	• Autocrossing	Yes
Engineering with		Protocols	
• STEP 7 TIA Portal configurable/integrated from version	STEP 7 V19 or higher	Supports protocol for PROFINET IO	Yes
• STEP 7 configurable/integrated from version	from V5.6	PROFIsafe	No
• PROFINET from GSD version/GSD revision	GSDML V2.4.x	PROFIBUS	No
• Multi Fieldbus Configuration Tool (MFCT)	from V1.5	EtherNet/IP	Yes
Supply voltage		Modbus TCP	Yes
Load voltage 1L+		PROFINET IO Device	
• Rated value (DC)	24 V	Services	
• Reverse polarity protection	Yes; against destruction	- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
Input current		- PROFINenergy	Yes
Current consumption (rated value)	80 mA	- Shared device	Yes
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	- Number of IO Controllers with shared device, max.	14; 4x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
from load voltage 2L+, max.	4 A; Maximum value	Redundancy mode	
Address area		• PROFINET system redundancy (S2)	Yes
Address space per module		- on S7-1500R/H	Yes
• Address space per module, max.	264 byte; For input and output data respectively	- on S7-400H	Yes
Address space per station		• PROFINET system redundancy (R1)	No
• Address space per station, max.	1 440 byte	• H-Sync forwarding	Yes
Hardware configuration		Media redundancy	
Submodules		- MRP	Yes
• Number of submodules per station, max.	125	- MRPD	Yes
Interfaces		EtherNet/IP	
Number of PROFINET interfaces	1; 2 ports (switch)	Services	
1. Interface		- CIP Implicit Messaging	Yes
Interface type	PROFINET	- CIP Explicit Messaging	Yes
Interface types		- CIP Safety	No
• M12 port	Yes; 2x M12 D-coded	- Configuration control via Explicit Messaging	No
• integrated switch	Yes	- Shared device	Yes; 4x PN controller + 2x EtherNet/IP scanner + 10x Modbus TCP master
Protocols		- Number of scanners with shared device, max.	2
• PROFINET IO Device	Yes	Updating times	
• Open IE communication	Yes	- Requested Packet Interval (RPI)	2 ms
		Redundancy mode	
		- DLR (Device Level Ring)	No
		Address area	
		- Address space per module, max.	264 byte
		- ForwardOpen (Class1 & 32 bit Header)	500 byte
		- LargeForwardOpen (Class3)	4 002 byte

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Interface modules > IM 157-1 MF

Technical specifications

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
Modbus TCP	
Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- Read Input Register (Code=4)	Yes
- write single coil (code=5)	Yes
- Write Single Register (Code=6)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Read/Write Multiple Registers (Code=23)	Yes
- Parameter change by master	Yes
- Modbus TCP Security Protocol	No
Address space per station	
- Address space per station, max.	500 byte; (246 byte outputs / 500 byte inputs)
- Access-consistent address space	250 byte; (246 byte outputs / 250 byte inputs)
Updating time	
- I/O request interval	2 ms
Connections	
- number of connections per device	9; (1x inputs / 2x outputs / 4x volatile registers / 2x Device Info)
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Connection display LINK TX/RX	Yes; 2x green LED

Article number	6ES7157-1MA00-0AB0 ET 200AL, IM 157-1 MF
Potential separation	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Product functions / security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
data integrity	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	215 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Interface modules > IM 157-1 PN

Overview



- Interface module for connecting ET 200AL to PROFINET
- Handles data exchange with the PROFINET I/O controller in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 1430 bytes, for input and output data respectively
- Shortest bus cycle 250 µs
- Automatic power-up by means of topology recognition
- Autocrossover
- Shared device on up to 4 IO controllers
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Firmware update
- Configuration management (option handling)
- PROFIenergy

Ordering data

Article No.	Article No.
IM 157-1 PN interface module For connecting ET 200AL to PROFINET	Power cable M8
Accessories	4-pin
Bus cable for backplane bus (ET connection)	Pre-assembled at both ends, M8 connector and M8 socket
4-pin, shielded	0.19 m
Pre-assembled at both ends, 2 M8 connectors	0.3 m
0.19 m	1 m
0.3 m	2 m
1 m	5 m
2 m	10 m
5 m	15 m
10 m	Pre-assembled at both ends, angled M8 connector and angled M8 socket
15 m	0.3 m
Pre-assembled at both ends, 2 M8 connectors, angled	1 m
0.3 m	2 m
1 m	5 m
2 m	10 m
5 m	15 m
10 m	Pre-assembled at one end, M8 socket
15 m	2 m
Pre-assembled at one end, 1 M8 connector	5 m
2 m	10 m
5 m	15 m
10 m	M8 connector for ET connection
15 m	4-pin, shielded
6ES7157-1AB00-0AB0	M8 power connector
6ES7194-2LH02-0AA0	Male contact insert, 4-pin
6ES7194-2LH03-0AA0	Female contact insert, 4-pin
6ES7194-2LH10-0AA0	ET connection FastConnect stripping tool
6ES7194-2LH20-0AA0	Stripping tool for stripping the ET connection bus cable
6ES7194-2LH50-0AA0	Labels
6ES7194-2LN10-0AA0	10 x 5 mm, RAL 9016; 5 frames with 40 labels each
6ES7194-2LN15-0AA0	
6ES7194-2LH03-0AB0	
6ES7194-2LH10-0AB0	
6ES7194-2LH20-0AB0	
6ES7194-2LH50-0AB0	
6ES7194-2LN10-0AB0	
6ES7194-2LN15-0AB0	
6ES7194-2LH20-0AC0	
6ES7194-2LH50-0AC0	
6ES7194-2LN10-0AC0	
6ES7194-2LN15-0AC0	
6ES7194-2AB00-0AA0	
6ES7194-2AA00-0AA0	
6ES7194-2AC00-0AA0	
6ES7194-2KA00-0AA0	
6ES7194-2BA00-0AA0	

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Interface modules > IM 157-1 PN

Technical specifications

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
General information	
Product type designation	IM 157-1 PN
Product function	
• I&M data	Yes; I&M0 to I&M4
• Isochronous mode	No
• IRT	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/ integrated from version	From V5.5 SP4 Hotfix 3
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	100 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	1 430 byte
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET
Interface types	
• M12 port	Yes; 2x M12 D-coded
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interface types	
M12 port	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
PROFIBUS	No
EtherNet/IP	No
PROFINET IO Device	
Services	
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Redundancy mode	
Media redundancy	
- MRP	Yes
- MRPD	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED
Potential separation	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	263 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Interface modules > IM 157-1 DP

Overview



- Interface module for connecting ET 200AL to PROFIBUS
- As DPV1 slave it handles the data exchange with the PROFIBUS master in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 244 bytes, for input and output data respectively
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 99; can be set by means of rotary switch
- Identification and maintenance data IM0 ... IM3
- Firmware update
- Configuration management (option handling)

Ordering data

IM 157-1 DP interface module

For connecting ET 200AL to PROFIBUS

Accessories

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors

0.19 m

0.3 m

1 m

2 m

5 m

10 m

15 m

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

1 m

2 m

5 m

10 m

15 m

Pre-assembled at one end,
1 M8 connector

2 m

5 m

10 m

15 m

Article No.

6ES7157-1AA00-0AB0

6ES7194-2LH02-0AA0

6ES7194-2LH03-0AA0

6ES7194-2LH10-0AA0

6ES7194-2LH20-0AA0

6ES7194-2LH50-0AA0

6ES7194-2LN10-0AA0

6ES7194-2LN15-0AA0

6ES7194-2LH03-0AB0

6ES7194-2LH10-0AB0

6ES7194-2LH20-0AB0

6ES7194-2LH50-0AB0

6ES7194-2LN10-0AB0

6ES7194-2LN15-0AB0

6ES7194-2LH20-0AC0

6ES7194-2LH50-0AC0

6ES7194-2LN10-0AC0

6ES7194-2LN15-0AC0

Article No.

M8 power cable

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.19 m

0.3 m

1 m

2 m

5 m

10 m

15 m

Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m

1 m

2 m

5 m

10 m

15 m

Pre-assembled at one end,
M8 socket

2 m

5 m

10 m

15 m

M8 connector for ET connection

4-pin, shielded

M8 power connector

Male contact insert, 4-pin

Female contact insert, 4-pin

ET connection FastConnect Stripping Tool

Stripping tool for stripping the
ET connection bus cable

Labels

10 x 5 mm, RAL 9016; 5 frames with
40 labels each

6ES7194-2LH02-1AA0

6ES7194-2LH03-1AA0

6ES7194-2LH10-1AA0

6ES7194-2LH20-1AA0

6ES7194-2LH50-1AA0

6ES7194-2LN10-1AA0

6ES7194-2LN15-1AA0

6ES7194-2LH03-1AB0

6ES7194-2LH10-1AB0

6ES7194-2LH20-1AB0

6ES7194-2LH50-1AB0

6ES7194-2LN10-1AB0

6ES7194-2LN15-1AB0

6ES7194-2LH20-1AC0

6ES7194-2LH50-1AC0

6ES7194-2LN10-1AC0

6ES7194-2LN15-1AC0

6ES7194-2AB00-0AA0

6ES7194-2AA00-0AA0

6ES7194-2AC00-0AA0

6ES7194-2KA00-0AA0

6ES7194-2BA00-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Interface modules > IM 157-1 DP

Technical specifications

Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
General information	
Product type designation	IM 157-1 DP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/ integrated from version	From V5.5 SP4 Hotfix 3
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	50 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	244 byte
Interfaces	
Number of PROFIBUS interfaces	1
1. Interface	
Interface type	PROFIBUS DP
Interface types	
• RS 485	Yes
• M12 port	Yes; 2x M12 B-coded
Protocols	
• PROFIBUS DP device	Yes
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
Supports protocol for PROFINET IO	No
PROFIsafe	No
PROFIBUS	Yes
EtherNet/IP	No
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes
- DPV1	Yes

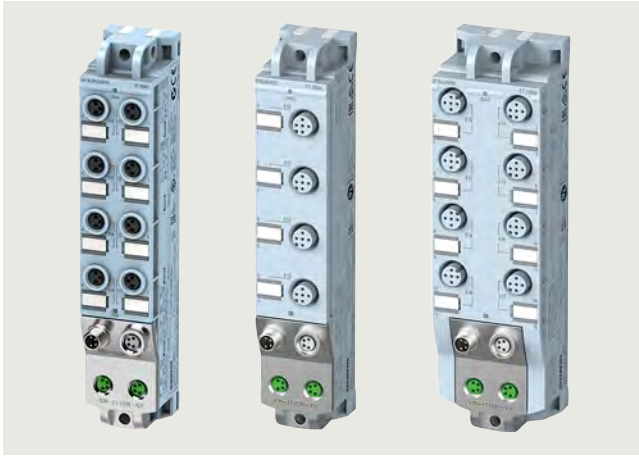
Article number	6ES7157-1AA00-0AB0 ET 200AL, IM 157-1 DP
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• Connection display DP	Yes; green LED
Potential separation	
between the load voltages	Yes
between PROFIBUS DP and all other circuit components	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	46 mm
Weights	
Weight, approx.	211 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Digital I/O modules

Overview



- 30 and 45 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 or M12 connection
- 16-channel digital input module with M12 connection
- 8-channel digital input/output module with M8 or M12 connection
- 16-channel digital input / output module with M12 connection
- 8-channel digital output module 2A with M12 connection

Ordering data

Digital input modules

DI 8X24VDC, 8XM8

6ES7141-5BF00-0BA0

DI 8X24VDC, 4XM12

6ES7141-5AF00-0BA0

DI 16X24VDC, 8XM12

6ES7141-5AH00-0BA0

Digital output modules

DQ 8X24VDC/2A, 8XM12

6ES7142-5AF00-0BA0

Digital input/output modules

4 DIQ / 4 DQ, 24 V DC, 0.5 A

6ES7143-5BF00-0BA0

DIQ 4+DQ 4X24VDC/0.5A, 4XM12

6ES7143-5AF00-0BA0

DIQ 8x24VDC/0.5A, 8XM8

6ES7143-5BF50-0BA0

DIQ 16x24VDC/0.5A, 8XM12

6ES7143-5AH00-0BA0

Accessories

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end,
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

Power cable M8

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end,
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

M8 connector for ET connection

6ES7194-2AB00-0AA0

4-pin, shielded

M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0

ET connection FastConnect stripping tool

6ES7194-2KA00-0AA0

Stripping tool for stripping the
ET connection bus cable

Labels

10 x 5 mm, RAL 9016; 5 frames with
40 plates each

6ES7194-2BA00-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8x24VDC, 8xM8	6ES7141-5AF00-0BA0 ET 200AL, DI 8x24VDC, 4xM12	6ES7141-5AH00-0BA0 ET 200AL, DI 16x24VDC, 8xM12
General information			
Product type designation	DI 8x24VDC	DI 8x24VDC	DI 16x24VDC
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
• STEP 7 configurable/ integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	25 mA; without load 4 A; Maximum value	25 mA; without load 4 A; Maximum value	30 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply			
Number of outputs	8	4	8
Digital inputs			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	3.2 mA	3.2 mA	3.2 mA
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/ status information			
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostics			
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications

Article number	6ES7141-5BF00-0BA0 ET 200AL, DI 8x24VDC, 8xM8	6ES7141-5AF00-0BA0 ET 200AL, DI 8x24VDC, 4xM12	6ES7141-5AH00-0BA0 ET 200AL, DI 16x24VDC, 8xM12
Potential separation			
between the load voltages	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No	No	No
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2
Product functions / security			
signed firmware update	Yes	Yes	Yes
data integrity	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	-30 °C	-30 °C	-30 °C
• max.	55 °C	55 °C	55 °C
Altitude during operation relating to sea level			
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
Weights			
Weight, approx.	145 g	145 g	184 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications

Article number	6ES7142-5AF00-0BA0 ET 200AL, DQ 8x24VDC/2A, 8xM12
General information	
Product type designation	DQ 8x24VDC/2A
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/ integrated from version	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
Current consumption (rated value)	40 mA; 40 mA (1L+) / 35 mA (2L+); without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Digital outputs	
Number of digital outputs	8
• in groups of	4; 2 load groups for 4 outputs each
output type acc. to IEC 61131, type 2	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.1 Hz; 0.25 Hz at 25 °C
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	4 A; For inductive load max. 2 channels per group

Article number	6ES7142-5AF00-0BA0 ET 200AL, DQ 8x24VDC/2A, 8xM12
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Short-circuit	Yes; Outputs to ground; module by module
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels, in groups of	4
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No; 4 channels are non-isolated and 4 channels are isolated from supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Product functions / security	
signed firmware update	Yes
data integrity	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	192 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
General information				
Product type designation	DIQ 4+DQ 4x24VDC/0.5A	DIQ 4+DQ 4x24VDC/0.5A	DIQ 8x24VDC/0.5A, 8xM8	DIQ 16x24VDC/0.5A
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M4	Yes; I&M0 to I&M3
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V18 or higher	STEP 7 V14 or higher
• STEP 7 configurable/ integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.6 and higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.4.x	GSDML V2.3.1
Operating mode				
• DI				Yes
• Counter				Yes
• DQ				Yes
Supply voltage				
Load voltage 1L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; against destruction	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current				
Current consumption (rated value)	40 mA; 40 mA (1L+) / 20 mA (2L+); without load	40 mA; 40 mA (1L+) / 20 mA (2L+); without load	20 mA; 20 mA (1L+) / 40 mA (2L+); without load	60 mA; 60 mA (1L+) / 40 mA (2L+); without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	3.25 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply				
Number of outputs	4	4	8	8
Digital inputs				
Number of digital inputs	4; Parameterizable as DIQ	4; Parameterizable as DIQ	8; Parameterizable as DIQ	16; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs				
all mounting positions				
- up to 55 °C, max.	4	4	8	16
Digital input functions, parameterizable				
• Freely usable digital input				Yes
• Counter				Yes
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V	+11 to +30V
Input current				
• for signal "1", typ.	3.2 mA	3.2 mA	2.4 mA	3 mA

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
Input delay (for rated value of input voltage) for standard inputs - parameterizable				Yes
for technological functions - parameterizable				Yes
Digital outputs				
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	8; 4 DQ fixed, 4 DIQ parameterizable	8	16; Parameterizable as DIQ
• in groups of	4; 2 load groups for 4 outputs each	4; 2 load groups for 4 outputs each		8; 2 load groups for 8 outputs each
output type acc. to IEC 61131, type 0.5	Yes	Yes	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)	L+ (-53 V)
Digital output functions, parameterizable				
• Switching tripped by comparison values				Yes
• Freely usable digital output				Yes
Switching capacity of the outputs				
• on lamp load, max.	5 W	5 W	5 W	5 W
Load resistance range				
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	4 kΩ
Output voltage				
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current				
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs				
• Current per group, max.	2 A	2 A		4 A
• Current per module, max.			4 A	
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/ status information				
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnoses				
• Short-circuit	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module
Diagnostics indication LED				
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED	Yes; green/red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Digital I/O modules

Technical specifications

Article number	6ES7143-5BF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 8xM8	6ES7143-5AF00-0BA0 ET 200AL, DIQ 4+DQ 4x24VDC/0,5A, 4xM12	6ES7143-5BF50-0BA0 ET 200AL, DIQ 8x24VDC/0,5A, 8xM8	6ES7143-5AH00-0BA0 ET 200AL, DIQ 16x24VDC/0,5A, 8xM12
Potential separation				
between the load voltages	Yes	Yes	Yes	Yes
Potential separation channels				
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels	4; DIQ channels are isolated from DQ channels		8
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	Yes	No; 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates				
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01		No
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL d	PL d		
• Category according to ISO 13849-1	Cat. 3	Cat. 3		
• SIL acc. to IEC 62061	SIL 2	SIL 2		
Product functions / security				
signed firmware update	Yes	Yes	Yes	Yes
data integrity	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-30 °C	-30 °C	-30 °C	-30 °C
• max.	55 °C	55 °C	55 °C	55 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method				
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M8, 3-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection				
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions				
Width	30 mm	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm	40 mm
Weights				
Weight, approx.	145 g	145 g	145 g	195 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Analog I/O modules

Overview



- 30 mm wide module with parameters and diagnostic functions
- For connecting analog actuators and sensors without additional amplifiers
- 4-channel analog input modules with M12 connection
- 4-channel analog output module with M12 connection

Ordering data

Analog input modules

AI 4xU/I/RTD, 4xM12

6ES7144-5KD00-0BA0

AI 4xRTD/TC, 4xM12

6ES7144-5KD50-0BA0

AQ 4xU/I, 4xM12

6ES7145-5ND00-0BA0

Accessories

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end,
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

Power cable M8

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end,
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

M8 connector for ET connection

4-pin, shielded

6ES7194-2AB00-0AA0

M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0

ET connection FastConnect stripping tool

Stripping tool for stripping the
ET connection bus cable

6ES7194-2KA00-0AA0

Labels

10 x 5 mm, RAL 9016; 5 frames with
40 labels each

6ES7194-2BA00-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Analog I/O modules

Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
General information		
Product type designation	AI 4xU/I/RTD	AI 4xRTD/TC
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher	STEP 7 V16 or higher
• STEP 7 configurable/ integrated from version	From V5.5 SP4 Hotfix 3	V5.5 SP4 and higher
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.34
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
Current consumption (rated value)	35 mA; without load	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value
Encoder supply		
Number of outputs	4	
Analog inputs		
Number of analog inputs	4	4
• For current measurement	4	
• For voltage measurement	4	4
• For resistance/resistance thermometer measurement	4	4
• For thermocouple measurement		4
permissible input voltage for voltage input (destruction limit), max.	30 V	15 V
permissible input current for current input (destruction limit), max.	50 mA	
Constant measurement current for resistance-type transmitter, typ.		230 ... 300 µA
Cycle time (all channels), min.	8 ms	90 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -80 mV to +80 mV		Yes; 16 bit incl. sign
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Analog I/O modules

Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
Input ranges (rated values), thermocouples - Type B - Type C - Type E - Type J - Type K - Type L - Type N - Type R - Type S - Type T - Type U		Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer - Ni 100 - Ni 1000 - Pt 100 - Pt 1000	Yes; Standard/climate Yes; Standard/climate	Yes; Standard/climate Yes; Standard/climate Yes; Standard/climate Yes; Standard/climate
Input ranges (rated values), resistors 0 to 150 ohms 0 to 300 ohms	Yes Yes	Yes Yes
Thermocouple (TC) Temperature compensation - parameterizable		Yes
Cable length shielded, max.	30 m	30 m
Analog value generation for the inputs		
Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max. - Integration time, parameterizable - Integration time (ms) - Basic conversion time, including integration time (ms) - Interference voltage suppression for interference frequency f1 in Hz - Conversion time (per channel)	16 bit Yes; channel by channel 0,3 / 16,7 / 20 / 60 3 600 / 60 / 50 / 16.7 2 / 18 / 21 / 61 ms	16 bit Yes; channel by channel 16.7 / 20 / 60 18 / 21 / 61 ms 60 / 50 / 16.7
Smoothering of measured values parameterizable	Yes	Yes
Encoder Connection of signal encoders - for voltage measurement - for current measurement as 2-wire transducer - for current measurement as 4-wire transducer - for resistance measurement with two-wire connection - for resistance measurement with three-wire connection - for resistance measurement with four-wire connection	Yes Yes Yes Yes Yes Yes	Yes Yes Yes Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Analog I/O modules

Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
Errors/accuracies		
Temperature error of internal compensation		±4 °C
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.25 %	0.25 %
• Current, relative to input range, (+/-)	0.25 %	
• Resistance, relative to input range, (+/-)	0.15 %	0.15 %
• Resistance thermometer, relative to input range, (+/-)	0.15 %	0.15 %
• Thermocouple, relative to input range, (+/-)		0.25 %
Interference voltage suppression for $f = n \times (f_1 \pm 0.5 \%)$, $f_1 = \text{interference frequency}$		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Wire-break	Yes; at 4 mA to 20 mA and 1 V to 5 V	Yes; Not for ±80 mV
• Short-circuit	Yes; Encoder supply to M, channel by channel	
• Overflow/underflow	Yes	Yes
Diagnostics indication LED		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
Potential separation		
between the load voltages	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; from FS01
Suitable for applications according to AMS 2750		Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9		Yes; Based on AMS 2750 E

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

I/O modules > Analog I/O modules

Technical specifications

Article number	6ES7144-5KD00-0BA0 ET 200AL, AI 4xU/I/RTD, 4xM12	6ES7144-5KD50-0BA0 ET 200AL, AI 4xRTD/TC, 4xM12
Highest safety class achievable for safety-related tripping of standard modules		
- Performance level according to ISO 13849-1 - Category according to ISO 13849-1 - SIL acc. to IEC 62061	PL d Cat. 3 SIL 2	PL d Cat. 3 SIL 2
Product functions / security		
signed firmware update	Yes	Yes
data integrity	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
- min. - max.	-30 °C 55 °C	-30 °C 55 °C
Altitude during operation relating to sea level		
Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method		
Design of electrical connection for the inputs and outputs	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole
ET-Connection		
ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions		
Width	30 mm	30 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
Weights		
Weight, approx.	168 g	168 g

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
General information	
Product type designation	AQ 4xU/I
Product function	
I&M data	Yes; I&M0 to I&M3
Engineering with	
- STEP 7 TIA Portal configurable/integrated from version - STEP 7 configurable/integrated from version - PROFIBUS from GSD version/GSD revision - PROFINET from GSD version/GSD revision	STEP 7 V14 or higher V5.5 SP4 Hotfix 7 or higher GSD as of Revision 5 GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
- Rated value (DC) - Reverse polarity protection	24 V Yes; Against destruction; actuator power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value) from load voltage 1L+ (unswitched voltage)	75 mA; without load 4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Actuator supply	
Number of outputs	4

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	24 mA
Current output, no-load voltage, max.	15 V
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
0 to 10 V 1 V to 5 V -10 V to +10 V	Yes; 15 bit Yes; 14 bit Yes; 16 bit incl. sign
Output ranges, current	
0 to 20 mA -20 mA to +20 mA 4 mA to 20 mA	Yes; 15 bit Yes; 16 bit incl. sign Yes; 14 bit
Connection of actuators	
- for voltage output two-wire connection - for voltage output four-wire connection - for current output two-wire connection - for current output four-wire connection	Yes Yes Yes Yes

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Analog I/O modules

Technical specifications

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
Settling time	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.15 %
• Current, relative to output range, (+/-)	0.15 %
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Wire-break	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes; Actuator supply module by module; channel by channel for output type "voltage"
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED

Article number	6ES7145-5ND00-0BA0 ET 200AL, AQ 4xU/I, 4xM12
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS03
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Product functions / security	
signed firmware update	Yes
data integrity	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	175 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Fail-safe I/O modules

Overview



The ET 200AL fail-safe I/O module expands the ET 200AL PN system family. It is incorporated seamlessly into the Safety Integrated concept of SIMATIC. It also supports safety-related communication via PROFI-safe. The functional safety is certified in accordance with IEC 61508. It is designed for safety-related use up to SIL 3 according to IEC 62061 and PL e according to ISO 13849. The following fail-safe I/O module with 4x digital inputs and 2x digital outputs with 45 mm width is available:

- F-DI 4+F-DQ 2x24VDC/2A, 4xM12 PROFI-safe

Ordering data

Article No.

Fail-safe digital input/output modules

F-DI 4+F-DQ 2x24VDC/2A, 4xM12

6ES7146-5FF00-0BA0

Accessories

M12 Y-cable

For connection of single-channel sensors (1oo1 evaluation), 5-pin

6ES7194-6KB00-0XA0

For joint connection of an F-DQ and an F-DI channel by means of an 8-pin M12 socket

6ES7194-6KC00-0XA0

E-coding plug (metal) for fail-safe ET 200 distributed I/O, IP65/67

6ES7194-6KB01-0AA0

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends, 2 M8 plugs

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends, 2 M8 plugs, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end, 1 M8 plug

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

Article No.

M8 power cable

4-pin

Pre-assembled at both ends, M8 plug and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends, angled M8 plug and angled M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end, M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

M8 plug for ET connection

4-pin, shielded

6ES7194-2AB00-0AA0

M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Contact insert, 4-pin

6ES7194-2AC00-0AA0

ET connection FastConnect stripping tool

Stripping tool for stripping the ET connection bus cable

6ES7194-2KA00-0AA0

Labels, yellow

10 x 5 mm; 5 frames with 40 labels each

6ES7194-2BB00-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Fail-safe I/O modules

Technical specifications

Article number	6ES7146-5FF00-0BA0 ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
General information	
Product type designation	F-DI 4+F-DQ 2x24VDC/2A, 4xM12
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher
Operating mode	
• DI	Yes
• DQ	Yes
Supply voltage	
Rated value (DC)	24 V
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; outputs applied with reversed polarity for loads connected between M-switch and 2L+ will conduct
Input current	
Current consumption (rated value)	55 mA (1L+) / 40 mA (2L+); without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	2
Digital inputs	
Number of digital inputs	4
Input characteristic according to IEC 61131	Type 1
Number of simultaneously controllable inputs	
all mounting positions - up to 55 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	4.85 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes
Digital outputs	
Number of digital outputs	2
• in groups of	2
Short-circuit protection	Yes; per channel, electronic
Open-circuit detection	Yes; per channel, only detects when output is off
Overload protection	Yes
Limitation of inductive shutdown voltage to	P-switch: -26 V DC referenced to 2M, M-switch: +48 V DC referenced to 2M

Article number	6ES7146-5FF00-0BA0 ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 kΩ
Output voltage	
• for signal "1", min.	L+ (-2.0 V), P-switch is L+ (-1.5 V), M-switch is 0.5 V
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per group, max.	4 A
Encoder	
Connectable encoders	
• 2-wire sensor	No
- permissible quiescent current (2-wire sensor), max.	0.5 mA
Interrupts/diagnostics/ status information	
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; outputs when off
• Short-circuit	Yes; inputs, outputs, encoder supply
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels, in groups of	4 DI channels are isolated from 2 DQ channels
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	DI channels are non-isolated from supply voltage 1L+ and DQ channels are isolated from the supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Fail-safe I/O modules

Technical specifications

Article number	6ES7146-5FF00-0BA0 ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
- Performance level according to ISO 13849-1 - SIL acc. to IEC 61508	PLd (DI single-channel), PLe (DI two-channel, DQ) SIL 2 (DI single-channel), SIL 3 (DI two-channel, DQ)
Ambient conditions	
Ambient temperature during operation	
- min. - max.	-30 °C 55 °C

Article number	6ES7146-5FF00-0BA0 ET 200AL, F-DI 4+F-DQ 2x24VDC/2A, 4xM12
connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pin
ET-Connection	
ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	220 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

I/O modules > Communication > CM IO-Link

Overview



- 30 mm wide CM IO-Link communications module
- For the connection of up to 4 IO-Link devices according to IO-Link Specification V1.0 and V1.1 and port Class B
- The IO-Link parameters are configured using the S7-PCT Port Configuration Tool, V3.2 and higher.

Ordering data

CM IO-Link

CM 4X IO-Link, 4XM12;
for the connection of up to
4 IO-Link devices
according to IO-Link Specification
V1.0 and V1.1 and port Class B

Article No.

6ES7147-5JD00-0BA0

Accessories

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end,
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

Power cable M8

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

Pre-assembled at one end,
M8 socket

2 m

6ES7194-2LH20-1AC0

5 m

6ES7194-2LH50-1AC0

10 m

6ES7194-2LN10-1AC0

15 m

6ES7194-2LN15-1AC0

M8 connector for ET connection

4-pin, shielded

6ES7194-2AB00-0AA0

M8 power connector

Male contact insert, 4-pin

6ES7194-2AA00-0AA0

Female contact insert, 4-pin

6ES7194-2AC00-0AA0

ET connection FastConnect stripping tool

Stripping tool for stripping the
ET connection bus cable

6ES7194-2KA00-0AA0

Labels

10 x 5 mm, RAL 9016;
5 frames with 40 labels each

6ES7194-2BA00-0AA0

I/O systems

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I/O modules > Communication > CM IO-Link

Technical specifications

Article number	6ES7147-5JD00-0BA0 ET 200AL, cm 4x IO-Link, 4xM12
General information	
Product type designation	CM 4x IO-Link
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/ integrated from version	From V5.5 SP4 Hotfix 3
• PROFIBUS from GSD version/ GSD revision	GSD as of Revision 5
• PROFINET from GSD version/ GSD revision	GSDML V2.3.1
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
Current consumption (rated value)	40 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	132 byte
Size of process data, output per port	32 byte
Size of process data, output per module	128 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: 1.6 A total current of all ports

Article number	6ES7147-5JD00-0BA0 ET 200AL, cm 4x IO-Link, 4xM12
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	145 g

I/O systems

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IO-Link I/O modules

Overview



The IO-Link communication standard enables and standardizes communication between machine and plant PLCs, on the one hand, and sensors, actuators and other field devices, on the other hand.

The IO-Link I/O modules enable the simple connection of binary standard sensors and actuators, whereby the signals and energy supply are transferred via IO-Link (IO-Link master).

The IO-Link I/O modules can be connected to any IO-Link masters and, in this way, fieldbus-independent and distributed I/O units can be formed. The universal usage of the IO-Link DIQ I/O modules enables additional flexibility here.

With the ET 200AL IO-Link I/O modules, a comprehensive portfolio of digital input, output and input/output modules with the design and system features of the ET 200AL is available.

Ordering data

Article No.

IO-Link digital input modules

- Degree of protection IP67
- DI 8x 24VDC, 8x M8
 - DI 16x 24VDC, 8x M12

6ES7141-5BF00-0BL0
6ES7141-5AH00-0BL0

IO-Link digital output modules

- Degree of protection IP67
- DQ 8x 24VDC/2A, 8x M12

6ES7142-5AF00-0BL0

IO-Link digital input/output modules

- Degree of protection IP67
- DIQ 4+DQ 4x 24VDC/0.5A, 8x M8
 - DIQ 16x24VDC/0.5A, 8x M12

6ES7143-5BF00-0BL0
6ES7143-5AH00-0BL0

Accessories

Control connecting cable 5 x 0.25

Flexible IO-Link cable with 5 copper cores (0.25 mm²) for connecting IO-Link sensors/actuators (IO-Link port class B); sold by the meter; max. delivery unit 1 000 m minimum order quantity 20 m

6XV1801-2C

M12 circular connector

Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A

- Straight
- Angled

3RK1902-4BA00-5AA0
3RK1902-4DA00-5AA0

Control line

Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm², A-coded, max. 4 A, PUR casing, black

- 1.5 m
- 5 m
- 10 m

3RK1902-4HB15-5AA0
3RK1902-4HB50-5AA0
3RK1902-4HC01-5AA0

Article No.

M12-180/M12-180 control connecting cable

Flexible 5-core cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket, both ends with a straight cable outlet, for connection of IO-Link sensors/actuators

- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1801-2CE50
6XV1801-2CH10
6XV1801-2CH15
6XV1801-2CH20
6XV1801-2CH30
6XV1801-2CH50
6XV1801-2CN10
6XV1801-2CN15

Power M12 cable connector PRO

Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit

6GK1906-0EB00

M12 sealing cap

For protection of unused M12 connections with ET 200pro

3RX9802-0AA00

M12 sealing cap for IP67 modules

15 mm outer diameter, with O-ring, 10 units

3RK1901-1KA00

M8 sealing cap

For IP67 modules

3RK1901-1PN00

M12 Y-cable

For double connection of I/O by means of a single cable to ET 200, 5-pin

6ES7194-6KA00-0XA0

Energy cable 4 x 1.5

Trailable power cable, with 4 copper cores (1.5 mm²) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m

6XV1801-2B

I/O systems

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IO-Link I/O modules

Ordering data	Article No.		Article No.	
M12-180/M12-180 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6DE50 6XV1801-6DH10 6XV1801-6DH15 6XV1801-6DH20 6XV1801-6DH30 6XV1801-6DH50 6XV1801-6DN10 6XV1801-6DN15		M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6GE50 6XV1801-6GH10 6XV1801-6GH15 6XV1801-6GH20 6XV1801-6GH30 6XV1801-6GH50 6XV1801-6GN10 6XV1801-6GN15
		Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	6ES7194-2BA00-0AA0	

Technical specifications

Article number	6ES7141-5BF00-0BL0 ET 200AL, IO-Link, DI 8x24VDC, 8xM8	6ES7141-5AH00-0BL0 ET 200AL, IO-Link, DI 16x24VDC, 8xM12
General information		
Product type designation	IO-Link DI 8x24VDC	IO-Link DI 16x24VDC
Engineering with		
• IODD file	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current		
Current consumption (rated value)	15 mA; without load	20 mA; without load
Encoder supply		
Number of outputs	8; Supply from 1Us+ of the IO-Link master	8; Supply from 1Us+ of the IO-Link master
Digital inputs		
Number of digital inputs	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
all mounting positions		
- up to 55 °C, max.	8	16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	3 mA	3 mA
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

I/O systems

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IO-Link I/O modules

Technical specifications

Article number	6ES7141-5BF00-0BL0 ET 200AL, IO-Link, DI 8x24VDC, 8xM8	6ES7141-5AH00-0BL0 ET 200AL, IO-Link, DI 16x24VDC, 8xM12
IO-Link		
IO-Link protocol 1.1	Yes	Yes
Transmission rate	38.4 kBd (COM2)	38.4 kBd (COM2)
Cycle time, min.	2.1 ms	2.5 ms
Size of process data, input per module	1 byte	2 byte
Size of process data, output per module	0 byte	0 byte
Supported IO-Link profiles	common profile	common profile
Cable length unshielded, max.	20 m	20 m
Connection of IO-Link devices		
• Port type A	Yes	Yes
Interrupts/diagnostics/status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
Diagnostics		
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
Diagnostics indication LED		
• Channel status display	Yes; green LED	Yes; green LED
• for module diagnostics	Yes; green/red LED	Yes; green/red LED
Potential separation		
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	55 °C	55 °C
connection method		
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Dimensions		
Width	30 mm	45 mm
Height	159 mm	159 mm
Depth	40 mm	40 mm
Weights		
Weight, approx.	124 g	155 g

I/O systems

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IO-Link I/O modules

Technical specifications

Article number	6ES7142-5AF00-0BL0 ET 200AL, IO-Link, DQ 8x24VDC/2A, 8xM12
General information	
Product type designation	IO-Link DQ 8x24VDC/2A
Engineering with	
• IODD file	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V; Supply via M12 connector L-coded
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
Current consumption (rated value) from load voltage 2L+, max.	12 mA; without load 8 A; Maximum value
Digital outputs	
Number of digital outputs	8
output type acc. to IEC 61131, type 2	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	4 kΩ
Output voltage	
• for signal *1*, min.	L+ (-0.8 V)
Output current	
• for signal *1* rated value	2 A (45 °C); 1 A (55 °C)
• for signal *0* residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.1 Hz; 0.25 Hz at 25 °C
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per module, max.	8 A
IO-Link	
IO-Link protocol 1.1	Yes
Transmission rate	38.4 kBd (COM2)
Cycle time, min.	2.1 ms
Size of process data, input per module	0 byte
Size of process data, output per module	1 byte
Supported IO-Link profiles	common profile
Cable length unshielded, max.	20 m
Connection of IO-Link devices	
• Port type A	Yes

Article number	6ES7142-5AF00-0BL0 ET 200AL, IO-Link, DQ 8x24VDC/2A, 8xM12
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Short-circuit	Yes; Outputs to ground; module by module
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Type of electrical connection for IO-Link	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	159 mm
Depth	45 mm
Weights	
Weight, approx.	168 g

I/O systems

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IO-Link I/O modules

Technical specifications

Article number	6ES7143-5BF00-0BL0 ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A
General information	
Product type designation	IO-Link DIQ 4+DQ 4x24VDC/0,5A
Engineering with	
• IODD file	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V; Supply from 1Us+ of the IO-Link master
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V; Supply from 2UA+ of the IO-Link master
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current	
Current consumption (rated value) from load voltage 2L+, max.	15 mA; without load 4 A; Maximum value
Encoder supply	
Number of outputs	8; Supply from 2UA+ of the IO-Link master
Digital inputs	
Number of digital inputs	4; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 55 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	3 mA
Digital outputs	
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-50 V)
Switching capacity of the outputs	
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per module, max.	4 A
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA

Article number	6ES7143-5BF00-0BL0 ET 200AL, IO-Link, DIQ 4+DQ 4x24VDC/0,5A
IO-Link	
IO-Link protocol 1.1	Yes
Transmission rate	38.4 kBd (COM2)
Cycle time, min.	2.4 ms
Size of process data, input per module	1 byte
Size of process data, output per module	1 byte
Supported IO-Link profiles	common profile
Cable length unshielded, max.	20 m
Connection of IO-Link devices	
• Port type B	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnoses	
• Short-circuit	Yes; outputs to ground; encoder supply to ground; module by module
Diagnostics indication LED	
• Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red LED
• For load voltage monitoring	Yes; green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
connection method	
Design of electrical connection for the inputs and outputs	M8, 3-pole
Type of electrical connection for IO-Link	M12, 5-pin, A-coded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	125 g

I/O systems

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Accessories > Cables and connectors

Overview

- Pre-assembled cables in various designs and lengths:
 - For connecting the interface modules and I/O modules via the internal backplane bus (ET connection).
 - For power supply.

Ordering data

Bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors

0.19 m

6ES7194-2LH02-0AA0

0.3 m

6ES7194-2LH03-0AA0

1 m

6ES7194-2LH10-0AA0

2 m

6ES7194-2LH20-0AA0

5 m

6ES7194-2LH50-0AA0

10 m

6ES7194-2LN10-0AA0

15 m

6ES7194-2LN15-0AA0

PUR line, pre-assembled at both
ends, 2 M8 connectors

0.19 m

6ES7194-2MH02-0AA0

0.3 m

6ES7194-2MH03-0AA0

1 m

6ES7194-2MH10-0AA0

2 m

6ES7194-2MH20-0AA0

5 m

6ES7194-2MH50-0AA0

10 m

6ES7194-2MN10-0AA0

15 m

6ES7194-2MN15-0AA0

PUR line, pre-assembled at both
ends, 2 M8 connectors, angled

0.3 m

6ES7194-2MH03-0AB0

1 m

6ES7194-2MH10-0AB0

2 m

6ES7194-2MH20-0AB0

5 m

6ES7194-2MH50-0AB0

10 m

6ES7194-2MN10-0AB0

15 m

6ES7194-2MN15-0AB0

Pre-assembled at both ends,
2 M8 connectors, angled

0.3 m

6ES7194-2LH03-0AB0

1 m

6ES7194-2LH10-0AB0

2 m

6ES7194-2LH20-0AB0

5 m

6ES7194-2LH50-0AB0

10 m

6ES7194-2LN10-0AB0

15 m

6ES7194-2LN15-0AB0

Pre-assembled at one end,
1 M8 connector

2 m

6ES7194-2LH20-0AC0

5 m

6ES7194-2LH50-0AC0

10 m

6ES7194-2LN10-0AC0

15 m

6ES7194-2LN15-0AC0

PUR line, pre-assembled at one
end, 1 M8 connector

2 m

6ES7194-2MH20-0AC0

5 m

6ES7194-2MH50-0AC0

10 m

6ES7194-2MN10-0AC0

15 m

6ES7194-2MN15-0AC0

Article No.

Connecting cable for bus cable for backplane bus (ET connection)

4-pin, shielded

Pre-assembled at both ends,
2 M8 connectors. 0.2 m

6ES7194-2LH02-0AD0

PUR line, pre-assembled at both
ends, 2 M8 connectors. 0.2 m

6ES7194-2MH02-0AD0

Power cable M8

4-pin

Pre-assembled at both ends,
M8 connector and M8 socket

0.19 m

6ES7194-2LH02-1AA0

0.3 m

6ES7194-2LH03-1AA0

1 m

6ES7194-2LH10-1AA0

2 m

6ES7194-2LH20-1AA0

5 m

6ES7194-2LH50-1AA0

10 m

6ES7194-2LN10-1AA0

15 m

6ES7194-2LN15-1AA0

PUR line, pre-assembled at both
ends, M8 connector and M8 socket

0.19 m

6ES7194-2MH02-1AA0

0.3 m

6ES7194-2MH03-1AA0

1 m

6ES7194-2MH10-1AA0

2 m

6ES7194-2MH20-1AA0

5 m

6ES7194-2MH50-1AA0

10 m

6ES7194-2MN10-1AA0

15 m

6ES7194-2MN15-1AA0

Pre-assembled at both ends,
angled M8 connector and angled
M8 socket

0.3 m

6ES7194-2LH03-1AB0

1 m

6ES7194-2LH10-1AB0

2 m

6ES7194-2LH20-1AB0

5 m

6ES7194-2LH50-1AB0

10 m

6ES7194-2LN10-1AB0

15 m

6ES7194-2LN15-1AB0

PUR line, pre-assembled at both
ends, angled M8 connector and
angled M8 socket

0.3 m

6ES7194-2MH03-1AB0

1 m

6ES7194-2MH10-1AB0

2 m

6ES7194-2MH20-1AB0

5 m

6ES7194-2MH50-1AB0

10 m

6ES7194-2MN10-1AB0

15 m

6ES7194-2MN15-1AB0

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Accessories > Cables and connectors

Ordering data	Article No.		Article No.
Pre-assembled at one end, M8 socket		M8 connector for ET connection	6ES7194-2AB00-0AA0
2 m	6ES7194-2LH20-1AC0	4-pin, shielded	
5 m	6ES7194-2LH50-1AC0	M8 power connector	
10 m	6ES7194-2LN10-1AC0	Male contact insert, 4-pin	6ES7194-2AA00-0AA0
15 m	6ES7194-2LN15-1AC0	Female contact insert, 4-pin	6ES7194-2AC00-0AA0
PUR line, pre-assembled at one end, M8 socket		ET connection FastConnect stripping tool	6ES7194-2KA00-0AA0
2 m	6ES7194-2MH20-1AC0	Stripping tool for stripping the ET connection bus cable	
5 m	6ES7194-2MH50-1AC0		
10 m	6ES7194-2MN10-1AC0		
15 m	6ES7194-2MN15-1AC0		

Technical specifications

Article number	6ES7194-2LH02-0AA0	6ES7194-2LH03-0AA0	6ES7194-2LH10-0AA0	6ES7194-2LH20-0AA0	6ES7194-2LH50-0AA0	6ES7194-2LN10-0AA0	6ES7194-2LN15-0AA0
	Bus Cable ET-Connection, 0,19m	Bus Cable ET-Connection, 0,3m	Bus Cable ET-Connection, 1,0M	Bus Cable ET-Connection, 2,0M	Bus Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
General information							
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation							
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm

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Technical specifications

Article number	6ES7194-2LH02-0AA0 Bus Cable ET-Connection, 0,19m	6ES7194-2LH03-0AA0 Bus Cable ET-Connection, 0,3m	6ES7194-2LH10-0AA0 Bus Cable ET-Connection, 1,0M	6ES7194-2LH20-0AA0 Bus Cable ET-Connection, 2,0M	6ES7194-2LH50-0AA0 Bus Cable ET-Connection, 5,0M	6ES7194-2LN10-0AA0 Bus Cable ET-Connection, 10m	6ES7194-2LN15-0AA0 Bus Cable ET-Connection, 15m
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE	PE	PE	PE
Material property							
• Halogen-free	No	No	No	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Article number	6ES7194-2MH02-0AA0 Bus Cable ET-Connection, 0,19m	6ES7194-2MH03-0AA0 Bus Cable ET-Connection, 0,3m	6ES7194-2MH10-0AA0 Bus Cable ET-Connection, 1,0M	6ES7194-2MH20-0AA0 Bus Cable ET-Connection, 2,0M	6ES7194-2MH50-0AA0 Bus Cable ET-Connection, 5,0M	6ES7194-2MN10-0AA0 Bus Cable ET-Connection, 10m	6ES7194-2MN15-0AA0 Bus Cable ET-Connection, 15m
General information							
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET- CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation							
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

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Article number	6ES7194-2MH02-0AA0 Bus Cable ET-Connection, 0,19m	6ES7194-2MH03-0AA0 Bus Cable ET-Connection, 0,3m	6ES7194-2MH10-0AA0 Bus Cable ET-Connection, 1,0M	6ES7194-2MH20-0AA0 Bus Cable ET-Connection, 2,0M	6ES7194-2MH50-0AA0 Bus Cable ET-Connection, 5,0M	6ES7194-2MN10-0AA0 Bus Cable ET-Connection, 10m	6ES7194-2MN15-0AA0 Bus Cable ET-Connection, 15m
Cables							
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN	2Y(ST)C11Y 2x2x0.5/1.0- 100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin- plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE	PE	PE	PE
Material property							
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Technical specifications

Article number	6ES7194-2LH03-0AB0	6ES7194-2LH10-0AB0	6ES7194-2LH20-0AB0	6ES7194-2LH50-0AB0	6ES7194-2LN10-0AB0	6ES7194-2LN15-0AB0
	Bus Cable ET-Con., angled, 0,3m	Bus Cable ET-Con., angled, 1,0M	Bus Cable ET-Con., angled, 2,0M	Bus Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
General information						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation						
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100- GN	2Y(ST)CY 1x4x0.5/1.0-100- GN	2Y(ST)CY 1x4x0.5/1.0-100- GN	2Y(ST)CY 1x4x0.5/1.0-100- GN	2Y(ST)CY 1x4x0.5/1.0-100- GN	2Y(ST)CY 1x4x0.5/1.0-100- GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm

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Article number	6ES7194-2LH03-0AB0	6ES7194-2LH10-0AB0	6ES7194-2LH20-0AB0	6ES7194-2LH50-0AB0	6ES7194-2LN10-0AB0	6ES7194-2LN15-0AB0
	Bus Cable ET-Con., angled, 0,3m	Bus Cable ET-Con., angled, 1,0M	Bus Cable ET-Con., angled, 2,0M	Bus Cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
Color of cable sheath	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE	PE	PE
Material property						
• Halogen-free	No	No	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes
Article number	6ES7194-2MH03-0AB0	6ES7194-2MH10-0AB0	6ES7194-2MH20-0AB0	6ES7194-2MH50-0AB0	6ES7194-2MN10-0AB0	6ES7194-2MN15-0AB0
	Bus cable ET-Con., angled, 0,3m	Bus cable ET-Con., angled, 1,0M	Bus cable ET-Con., angled, 2,0M	Bus cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
General information						
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation						
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100- GN	2Y(ST)C11Y 2x2x0.5/1.0-100- GN	2Y(ST)C11Y 2x2x0.5/1.0-100- GN	2Y(ST)C11Y 2x2x0.5/1.0-100- GN	2Y(ST)C11Y 2x2x0.5/1.0-100- GN	2Y(ST)C11Y 2x2x0.5/1.0-100- GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm	5 mm	5 mm

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Accessories > Cables and connectors

Technical specifications

Article number	6ES7194-2MH03-0AB0	6ES7194-2MH10-0AB0	6ES7194-2MH20-0AB0	6ES7194-2MH50-0AB0	6ES7194-2MN10-0AB0	6ES7194-2MN15-0AB0
	Bus cable ET-Con., angled, 0,3m	Bus cable ET-Con., angled, 1,0M	Bus cable ET-Con., angled, 2,0M	Bus cable ET-Con., angled, 5,0M	Bus Cable ET-Connection, angled, 10m	Bus Cable ET-Connection, angled, 15m
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE	PE	PE
Material property						
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH20-0AC0	6ES7194-2LH50-0AC0	6ES7194-2LN10-0AC0	6ES7194-2LN15-0AC0
	Bus Cable ET-Connection, 2,0M	Bus Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
General information				
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm

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Article number	6ES7194-2LH20-0AC0 Bus Cable ET-Connection, 2,0M	6ES7194-2LH50-0AC0 Bus Cable ET-Connection, 5,0M	6ES7194-2LN10-0AC0 Bus Cable ET-Connection, 10m	6ES7194-2LN15-0AC0 Bus Cable ET-Connection, 15m
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes
Article number	6ES7194-2MH20-0AC0 Bus Cable ET-Connection, 2,0M	6ES7194-2MH50-0AC0 Bus Cable ET-Connection, 5,0M	6ES7194-2MN10-0AC0 Bus Cable ET-Connection, 10m	6ES7194-2MN15-0AC0 Bus Cable ET-Connection, 15m
General information				
Product type designation	Bus cable	Bus cable	Bus cable	Bus cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm

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Article number	6ES7194-2MH20-0AC0	6ES7194-2MH50-0AC0	6ES7194-2MN10-0AC0	6ES7194-2MN15-0AC0
	Bus Cable ET-Connection, 2,0M	Bus Cable ET-Connection, 5,0M	Bus Cable ET-Connection, 10m	Bus Cable ET-Connection, 15m
Number of bending cycles	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	1 000 000; cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s ²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	green	green	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH02-1AA0	6ES7194-2LH03-1AA0	6ES7194-2LH10-1AA0	6ES7194-2LH20-1AA0	6ES7194-2LH50-1AA0	6ES7194-2LN10-1AA0	6ES7194-2LN15-1AA0
	Power Cable M8, 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
General information							
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation							
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y	4 Li9Y 0.50 mm ² Y
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm

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	Power Cable M8, 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
Number of bending cycles	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP	PP	PP	PP
Material property							
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Article number	6ES7194-2MH02-1AA0	6ES7194-2MH03-1AA0	6ES7194-2MH10-1AA0	6ES7194-2MH20-1AA0	6ES7194-2MH50-1AA0	6ES7194-2MN10-1AA0	6ES7194-2MN15-1AA0
	Power Cable M8 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
General information							
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection							
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions							
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation							
• min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables							
Cable designation	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²
Cable length	0.19 m	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm

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	Power Cable M8 0,19m	Power Cable M8, 0,3m	Power Cable M8, 1,0M	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
Number of bending cycles	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material							
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP	PP	PP	PP
Material property							
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH03-1AB0	6ES7194-2LH10-1AB0	6ES7194-2LH20-1AB0	6ES7194-2LH50-1AB0	6ES7194-2LN10-1AB0	6ES7194-2LN15-1AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
General information						
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation						
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm	5.2 mm

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Article number	6ES7194-2LH03-1AB0	6ES7194-2LH10-1AB0	6ES7194-2LH20-1AB0	6ES7194-2LH50-1AB0	6ES7194-2LN10-1AB0	6ES7194-2LN15-1AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
Number of bending cycles	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP	PP	PP
Material property						
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes
Article number	6ES7194-2MH03-1AB0	6ES7194-2MH10-1AB0	6ES7194-2MH20-1AB0	6ES7194-2MH50-1AB0	6ES7194-2MN10-1AB0	6ES7194-2MN15-1AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
General information						
Product type designation	Power cable	Power cable	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection						
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions						
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation						
• min.	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Cables						
Cable designation	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²
Cable length	0.3 m	1 m	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm	5.1 mm

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications

Article number	6ES7194-2MH03-1AB0	6ES7194-2MH10-1AB0	6ES7194-2MH20-1AB0	6ES7194-2MH50-1AB0	6ES7194-2MN10-1AB0	6ES7194-2MN15-1AB0
	Power Cable M8, angled, 0,3m	Power Cable M8, angled, 1,0M	Power Cable M8, angled, 2,0M	Power Cable M8, angled, 5,0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
Number of bending cycles	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material						
Outgoing feeder type	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP	PP	PP
Material property						
• Halogen-free	Yes	Yes	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH20-1AC0	6ES7194-2LH50-1AC0	6ES7194-2LN10-1AC0	6ES7194-2LN15-1AC0
	Power Cable M8, 2,0M	Power Cable M8, 5,0M	Power Cable M8, 10m	Power Cable M8, 15m
General information				
Product type designation	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y	4 Li9Y 0.50 mm² Y
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications

Article number	6ES7194-2LH20-1AC0 Power Cable M8, 2,0M	6ES7194-2LH50-1AC0 Power Cable M8, 5,0M	6ES7194-2LN10-1AC0 Power Cable M8, 10m	6ES7194-2LN15-1AC0 Power Cable M8, 15m
Number of bending cycles	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²	2 500 000; cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes
Article number	6ES7194-2MH20-1AC0 Power Cable M8, 2,0M	6ES7194-2MH50-1AC0 Power Cable M8, 5,0M	6ES7194-2MN10-1AC0 Power Cable M8, 10m	6ES7194-2MN15-1AC0 Power Cable M8, 15m
General information				
Product type designation	Power cable	Power cable	Power cable	Power cable
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection				
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67
Ambient conditions				
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²	LIF9Y11YFHF 4x 0.50 mm ²
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²	2 000 000; cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s ²
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm

I/O systems

SIMATIC ET 200 systems without control cabinet

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Accessories > Cables and connectors

Technical specifications

Article number	6ES7194-2MH20-1AC0 Power Cable M8, 2,0M	6ES7194-2MH50-1AC0 Power Cable M8, 5,0M	6ES7194-2MN10-1AC0 Power Cable M8, 10m	6ES7194-2MN15-1AC0 Power Cable M8, 15m
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material				
Outgoing feeder type	180° cable outlet	180° cable outlet	180° cable outlet	180° cable outlet
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

Article number	6ES7194-2LH02-0AD0 Connecting Cable ET-Connection, 0,2m	6ES7194-2MH02-0AD0 Connecting cable ET-Connection 0,2m
General information		
Product type designation	Connecting cable for bus cable	Connecting cable for bus cable
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 sockets, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 sockets, 4-pin, shielded
Suitability for use	For connecting two ET CONNECTION bus cables	For connecting two ET CONNECTION bus cables
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during assembly, min.	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	80 °C	80 °C
Cables		
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.2 m	0.2 m
Number of electrical cores	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm
Permissible bending radius, single bend, min.	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm
Color of cable sheath	green	green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km
Mechanics/material		
Outgoing feeder type	180° cable outlet	180° cable outlet
Material of cable sheath	PVC	PUR
Material of core insulation	PE	PE
Material property		
• Halogen-free	No	Yes
• Silicone-free	Yes	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200AL

Accessories > Cables and connectors

Technical specifications

Article number	6ES7194-2AA00-0AA0 M8 Power Connector	6ES7194-2AC00-0AA0 M8 Power Connector, Socket
General information		
Product type designation	Power connector	Power connector
Product description	M8 plug connector with high degree of protection, 4-pin, plastic version	M8 plug connector with high degree of protection, socket insert, 4-pin, plastic version
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during assembly, min.	-30 °C	-30 °C
Ambient temperature during assembly, max.	85 °C	85 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	85 °C	85 °C
connection method		
Connector type	M8, 4-pole	M8, 4-pole
Type of electrical connection for mains supply line	Screw terminals	Screw terminals
• connectable cable cross-section for mains supply line, min.	0.14 mm ²	0.14 mm ²
• connectable cable cross-section for mains supply line, max.	0.5 mm ²	0.5 mm ²
• Connectable conductor cross-section for AWG cables, min.	26	26
• Connectable conductor cross-section for AWG cables, max.	20	20
Suitable for cable diameter, min.	4 mm	4 mm
usable for cable diameter, max.	5.5 mm	5.5 mm
Mechanics/material		
Outgoing feeder type	180° cable outlet	180° cable outlet
Material of housing	plastic	plastic
Dimensions		
Width	14 mm	14 mm
Depth	47 mm	47 mm

Article number	6ES7194-2AB00-0AA0 M8 Connector ET-Connection	Article number	6ES7194-2AB00-0AA0 M8 Connector ET-Connection
General information		Ambient conditions	
Product type designation	Connection plug	Ambient temperature during assembly, min.	-30 °C
Product description	M8 plug connector with high degree of protection, 4-pin, metal version	Ambient temperature during assembly, max.	80 °C
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	Ambient temperature during storage/transportation	
Degree and class of protection		• min.	-40 °C
IP degree of protection	IP65/67	• max.	80 °C
		Mechanics/material	
		Outgoing feeder type	180° cable outlet
		Material of housing	metal
		Dimensions	
		Width	14 mm
		Depth	47 mm

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200AL

Accessories > Labels

Overview

- Labels for the identification of channels, modules and slots of ET 200AL components
- Can be used for interface modules and I/O modules

Ordering data

Labels
10 x 5 mm, RAL 9016;
5 frames with 40 labels each

Article No.

6ES7194-2BA00-0AA0

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Overview



SIMATIC ET 200eco PN video

https://players.brightcove.net/1813624294001/70fecf0f-fbad-4fad-a077-d0e26af4d84c_default/index.html?videoId=6187715895001



- Compact block I/O for processing digital, fail-safe digital, analog and IO-Link signals for connecting to bus systems with Ethernet-based protocols PROFINET, EtherNet/IP and Modbus TCP
- Cabinet-free installation in degree of protection IP65/67/69K with M12 connection system
- Extremely rugged and resistant metal enclosure
- Housing type of the I/O devices with 2x M12 L-coded power connectors
 - 45 mm x 200 mm x 48 mm (W x H x D) with 8 x M12 for digital signals and IO-Link
- Housing type of the I/O devices with 2x M12 A-coded power connectors
 - 30 mm x 200 mm x 37 mm (W x H x D) with 4 x M12 for digital signals and IO-Link
 - 60 mm x 175 mm x 37 mm (W x H x D) with 8 x M12 for digital and fail-safe digital signals as well as IO-Link
 - 60 mm x 175 mm x 37 mm (W x H x D) with 4 x M12 or 8 x M12 for analog signals
- Fieldbus connection: 2 x M12 D-coded and automatic PROFINET addressing
- Data transfer rate 100 Mbps
- LLDP neighborhood discovery for topological configuration
- Fast startup (run-up within approx. 0.5 seconds)
- Channel-specific diagnostics, identification and maintenance data IM0 ... IM3
- Firmware update
- Ambient temperature range -40 °C to 60 °C
- Can be used in hazardous areas in zones 2 and 22
- Can be used outdoors
- Increase in communication availability due to Media Redundancy Protocol (MRP) on PROFINET as well as operation on S7-1500 R/H or S7-400H by means of S2 redundancy
- Variants of the I/O devices with M12 L-coded power connectors:
 - DI 8
 - DI 16
 - DQ 8 (0.5 A)
 - DQ 8 (2 A)
 - DIQ 16 (0.5A/2A)
 - 8 IO-Link + DI 4
 - 8 IO-Link + DIQ 8
 - 4 IO-Link + DIQ 12
 - AI 8 (TC, RTD)
 - AIQ 8 (U, I)
 - TM PosInput 2
- Variants of the I/O devices with M12 A-coded power connectors:
 - 8 DI
 - 16 DI
 - 8 DQ (2 A)
 - 8 DQ (1.3 A)
 - 8 DQ (0.5 A)
 - 16 DQ (1.3 A)
 - 8 DI/DQ (1.3 A)
 - 8 F-DI/3 F-DO (2 A)
 - 8 AI (U, I, TC, RTD)
 - 8 AI (TC, RTD)
 - 4 AO (U, I)
 - 4 IO-Link
 - 4 IO-Link + 8 DI + 4 DQ (1.3 A)

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > Digital I/O devices

Overview



- Digital I/O devices with 2x M12 L-coded power connectors and 45 mm width
 - 8 digital input signals with 8xM12 connection
 - 16 digital input signals with 8xM12 connection
 - 8 digital output signals 8-channel digital output module 0.5A with 8xM12 connection
 - 8 digital output signals 2A with 8xM12 connection
 - 16 digital input/output signals 0.5A/2A with 8xM12 connection



- Digital I/O devices with 2x M12 A-coded power connectors and 60 mm width
 - 8 digital input signals with 8xM12 connection
 - 16 digital input signals with 8xM12 connection
 - 8 digital output signals 1.3 A with 8xM12 connection
 - 8 digital output signals 2 A with 8xM12 connection
 - 16 digital output signals 1.3 A with 8xM12 connection
 - 8 digital input/output signals 1.3 A with 8xM12 connection



- Digital I/O devices with 2x M12 A-coded power connectors and 30 mm width
 - 8 digital input signals with 4xM12 connection
 - 8 digital output signals 0.5 A with 4xM12 connection
 - 8 digital output signals 1.3 A with 4xM12 connection

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > Digital I/O devices

Ordering data	Article No.		Article No.
ET 200eco PN digital input modules with M12 L-coded power connector • DI 8 x 24 V DC; 8 x M12, single and dual assignment, degree of protection IP67 • DI 16 x 24 V DC, 8 x M12, dual assignment, degree of protection IP67 with M12 A-coded power connector • 8 DI 24 V DC; 4 x M12, dual assignment, degree of protection IP67 • 8 DI 24 V DC; 8 x M12, degree of protection IP67 • 16 DI 24 V DC; 8 x M12, dual assignment, degree of protection IP67	6ES7141-6BG00-0BB0 6ES7141-6BH00-0BB0 6ES7141-6BF00-0AB0 6ES7141-6BG00-0AB0 6ES7141-6BH00-0AB0	PROFINET M12 connection plug, for user assembly Connector for PROFINET, 4-core, shielded IE M12 plug PRO connector • 1 unit • 8 units IE FC M12 plug PRO connector, for user assembly • 1 unit • 8 units	3RK1902-2DA00 6GK1901-0DB10-6AA0 6GK1901-0DB10-6AA8 6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8
ET 200eco PN digital output modules with M12 L-coded power connector • DQ 8 x 24 V DC/0.5 A; 8 x M12, single and dual assignment, degree of protection IP67 • DQ 8 x 24 V DC/2 A; 8 x M12, single and dual assignment, degree of protection IP67 with M12 A-coded power connector • 8 DQ 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DQ; degree of protection IP67 • 8 DQ 24 V DC/1.3 A; 4 x M12, dual assignment, degree of protection IP67 • 8 DQ 24 V DC/1.3 A; 8 x M12, degree of protection IP67 • 8 DQ 24 V DC/2 A; 8 x M12, degree of protection IP67 • 16 DQ 24 V DC/1.3 A; 8 x M12, dual assignment, degree of protection IP67	6ES7142-6BG00-0BB0 6ES7142-6BR00-0BB0 6ES7142-6BF50-0AB0 6ES7142-6BF00-0AB0 6ES7142-6BG00-0AB0 6ES7142-6BR00-0AB0 6ES7142-6BH00-0AB0	M12 connection plug for 24 V DC load power supply Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units Power M12 plug PRO Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit Power M12 cable connector PRO Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit M12 circular connector Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm ² , A-coded, max. 4 A • Straight • Angled	6GK1907-0DC10-6AA3 6GK1907-0DB10-6AA3 6GK1906-0EA00 6GK1906-0EB00
ET 200eco PN digital input/output modules with M12 L-coded power connector • DIQ 16 x 24 V DC/0.5 A/2 A; dual assignment, degree of protection IP67 with M12 A-coded power connector • 8 DI/DQ 24 V DC/1.3 A; 8 x M12, degree of protection IP67	6ES7143-6BH00-0BB0 6ES7147-6BG00-0AB0	PROFINET bus cable Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded • 3 m • 5 m • 10 m IE connecting cable M12-90/M12-90 Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1, 5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	3RK1902-4BA00-5AA0 3RK1902-4DA00-5AA0 3RK1902-4CA00-4AA0 3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10
Accessories • PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12 • Terminal block for ET 200eco PN, 10 A insulation displacement terminals • Spare fuses for terminal block, 10 units • Mounting rail 0.5 m • Profile screw for mounting rail, 50 units • Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units • Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units • Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each • Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each	6ES7148-6CB00-0AA0 6ES7194-6CA00-0AA0 6ES7194-6HB00-0AA0 6ES7194-6GA00-0AA0 6ES7194-6MA00-0AA0 3RX9802-0AA00 3RK1901-1KA00 6ES7194-2BA00-0AA0 3RT2900-1SB10		6XV1870-8GE30 6XV1870-8GE50 6XV1870-8GH10 6XV1870-8GH15 6XV1870-8GH20 6XV1870-8GH30 6XV1870-8GH50 6XV1870-8GN10 6XV1870-8GN15

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Ordering data	Article No.		Article No.
IE connecting cable M12-180/IE FC RJ45 plug-145 Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length: • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1871-5TH20 6XV1871-5TH30 6XV1871-5TH50 6XV1871-5TN10 6XV1871-5TN15		
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1881-5AH10 6XV1881-5AH20 6XV1881-5AH30 6XV1881-5AH50		
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	6ES7194-6KA00-0XA0		
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm ² , A-coded, max. 4 A, PUR casing, black • 1.5 m • 5 m • 10 m Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm ² , A-coded, max. 4 A, PUR casing, black	3RK1902-4HB15-5AA0 3RK1902-4HB50-5AA0 3RK1902-4HC01-5AA0 3RK1902-4PB15-3AA0		
IO-Link connecting cables Between IO-Link master and reader, on both sides with M12 plug, 4-pin • 5 m • 10 m	6GT2891-4MH50 6GT2891-4MN10		
Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm ²) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1801-2B		
		M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-5GE30 6XV1801-5GE50 6XV1801-5GH10 6XV1801-5GH15 6XV1801-5GH20 6XV1801-5GH30 6XV1801-5GH50 6XV1801-5GN10 6XV1801-5GN15
		M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6GE50 6XV1801-6GH10 6XV1801-6GH15 6XV1801-6GH20 6XV1801-6GH30 6XV1801-6GH50 6XV1801-6GN10 6XV1801-6GN15
		M12-180/M12-180 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6DE50 6XV1801-6DH10 6XV1801-6DH15 6XV1801-6DH20 6XV1801-6DH30 6XV1801-6DH50 6XV1801-6DN10 6XV1801-6DN15
		M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1801-5AH10 6XV1801-5AH20 6XV1801-5AH30 6XV1801-5AH50

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Technical specifications

Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L	6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L
General information		
Product function		
• Isochronous mode	Yes	Yes
• IRT	Yes	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher with HSP 0363	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/ GSD revision	GSDML V2.3.x	GSDML V2.3.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1	from V1.3 SP1
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current		
Current consumption (rated value)	85 mA; without load	90 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
Encoder supply		
Number of outputs	8	8
Hardware configuration		
Submodules		
• Number of configurable submodules, max.	2	2
Digital inputs		
Number of digital inputs	8	16
Digital inputs, parameterizable	Yes	Yes
Source/sink input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
all mounting positions		
- up to 60 °C, max.	8	16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.4 mA	2.4 mA
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interfaces		
Number of PROFINET interfaces	1	1

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Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L	6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L
1. Interface		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	No	No
EtherNet/IP	Yes	Yes
Modbus TCP	Yes	Yes
PROFINET IO Device		
Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	Yes	Yes
Media redundancy		
- MRP	Yes	Yes
EtherNet/IP		
Services		
- CIP Implicit Messaging	Yes	Yes
- CIP Explicit Messaging	Yes	Yes
- CIP Safety	No	No
- Shared device	Yes; 2x EtherNet/IP Scanner	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2	2
Updating times		
- Requested Packet Interval (RPI)	2 ms	2 ms
Redundancy mode		
- DLR (Device Level Ring)	No	No
Address area		
- Address space per module, max.	20 byte	20 byte
- LargeForwardOpen (Class3)	No	No
Modbus TCP		
Services		
- read coils (code=1)	Yes	Yes
- read discrete inputs (code=2)	Yes	Yes
- Read Holding Registers (Code=3)	Yes	Yes
- write single coil (code=5)	Yes	Yes
- write multiple coils (code=15)	Yes	Yes
- Write Multiple Registers (Code=16)	Yes	Yes
- Parameter change by master	No	No
- Modbus TCP Security Protocol	No	No
Address space per station		
- Address space per station, max.	20 byte	20 byte
- Access-consistent address space	2 byte	2 byte

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Updating time		
- I/O request interval	2 ms	2 ms
Connections		
- number of connections per device	12	12
Open IE communication		
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP	Yes	Yes
Isochronous mode		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes; DI, input current < 0.3 mA, per channel	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit encoder supply	Yes; Per channel group	Yes; Per channel group
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED	Yes; green/red LED	Yes; green/red LED
• MS LED	Yes; green/red LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP65/67/69K	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Use in hazardous areas		
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22	ATEX, UKEX, IECEx, CCCEx for Zone 22

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Article number	6ES7141-6BG00-0BB0 ET 200eco PN, DI 8x24VDC, M12-L		6ES7141-6BH00-0BB0 ET 200eco PN, DI 16x24VDC, M12-L	
Product functions / securitr				
signed firmware update	Yes			Yes
safely removing data	Yes			Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C			-40 °C
• max.	60 °C			60 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions		Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	
connection method				
Design of electrical connection	4/5-pin M12 circular connectors		4/5-pin M12 circular connectors	
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded		M12, 5-pin, A-coded	
Design of electrical connection for supply voltage	M12, 4-pin, L-coded		M12, 4-pin, L-coded	
Dimensions				
Width	45 mm		45 mm	
Height	200 mm		200 mm	
Depth	48 mm		48 mm	
Weights				
Weight, approx.	780 g		780 g	

Article number	6ES7141-6BF00-0AB0 ET200eco PN, 8DI, DC24V, 4xM12	6ES7141-6BG00-0AB0 ET200eco PN, 8DI, DC24V, 8xM12	6ES7141-6BH00-0AB0 ET200eco PN, 16DI, DC24V, 8xM12
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Input current			
Current consumption, typ.	100 mA	100 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A	4 A
Encoder supply			
Number of outputs	4	8	8
Digital inputs			
Number of digital inputs	8	8	16
• in groups of	2	1	2
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 60 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	7 mA
Cable length			
• unshielded, max.	30 m	30 m	30 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1

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1. Interface			
Interface types			
• M12 port	Yes	Yes	Yes
• integrated switch	Yes	Yes	Yes
Interface types			
M12 port			
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	No
PROFIsafe	No	No	No
PROFINET IO Device			
Services			
- IRT with the option "high flexibility"	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
Redundancy mode			
Media redundancy			
- MRP	Yes	Yes	Yes
Open IE communication			
• TCP/IP	No	No	No
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• ARP	Yes	Yes	Yes
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED
• Wire-break in signal transmitter cable	Yes	Yes	Yes
• Short-circuit encoder supply	Yes; Per channel group	Yes; Per channel group	Yes; Per channel group
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No
between Ethernet and electronics	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates			
Use in hazardous areas			
• Explosion protection category for gas	ATEX II 3G Ex nA II T4	ATEX II 3G Ex nA II T4	ATEX II 3G Ex nA II T4
• Explosion protection category for dust	ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3D Ex tc IIIC T90°C Dc
connection method			
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions			
Width	30 mm	60 mm	60 mm
Height	200 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm
Weights			
Weight, approx.	550 g	910 g	910 g

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Technical specifications

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
General information		
Product function		
• Isochronous mode	Yes	Yes
• IRT	Yes	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher with HSP 0363	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/ GSD revision	GSDML V2.3.x	GSDML V2.3.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1	from V1.3 SP1
Operating mode		
• DQ	Yes	Yes
• MSO	Yes	Yes
Supply voltage		
Load voltage 1L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction
Input current		
Current consumption (rated value)	65 mA; without load	65 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
Hardware configuration		
Submodules		
• Number of configurable submodules, max.	2	2
Digital outputs		
Number of digital outputs	8	8
Current-sourcing	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	
output type acc. to IEC 61131, type 2		Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Type: 2L+ (-52 V)	Type -14 V
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	2 A
• with inductive load, max.	0.5 A	2 A
• on lamp load, max.	5 W	10 W
Load resistance range		
• lower limit	48 Ω	12 Ω
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current		
• for signal "1" rated value	0.5 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.2 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Total current of the outputs		
• Current per module, max.	4 A	8 A
Cable length		
• unshielded, max.	30 m	30 m

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Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
Interfaces		
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	No	No
EtherNet/IP	Yes	Yes
Modbus TCP	Yes	Yes
PROFINET IO Device		
Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	Yes	Yes
Media redundancy		
- MRP	Yes	Yes
EtherNet/IP		
Services		
- CIP Implicit Messaging	Yes	Yes
- CIP Explicit Messaging	Yes	Yes
- CIP Safety	No	No
- Shared device	Yes; 2x EtherNet/IP Scanner	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2	2
Updating times		
- Requested Packet Interval (RPI)	2 ms	2 ms
Redundancy mode		
- DLR (Device Level Ring)	No	No
Address area		
- Address space per module, max.	20 byte	20 byte
- LargeForwardOpen (Class3)	No	No
Modbus TCP		
Services		
- read coils (code=1)	Yes	Yes
- read discrete inputs (code=2)	Yes	Yes
- Read Holding Registers (Code=3)	Yes	Yes
- write single coil (code=5)	Yes	Yes
- write multiple coils (code=15)	Yes	Yes
- Write Multiple Registers (Code=16)	Yes	Yes
- Parameter change by master	No	No
- Modbus TCP Security Protocol	No	No

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SIMATIC ET 200eco PN

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Technical specifications

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
Address space per station		
- Address space per station, max.	20 byte	20 byte
- Access-consistent address space	2 byte	2 byte
Updating time		
- I/O request interval	2 ms	2 ms
Connections		
- number of connections per device	12	12
Open IE communication		
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP	Yes	Yes
Isochronous mode		
Equidistance	Yes	Yes
shortest clock pulse	250 µs	250 µs
max. cycle	4 ms	4 ms
Interrupts/diagnostics/ status information		
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes; Outputs to M; channel by channel	Yes; Outputs to M; channel by channel
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• NS LED	Yes; green/red LED	Yes; green/red LED
• MS LED	Yes; green/red LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
• between the channels and the power supply of the electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67/69K	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02

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Technical specifications

Article number	6ES7142-6BG00-0BB0 ET 200eco PN, DQ 8x24VDC/0,5A, M12-L	6ES7142-6BR00-0BB0 ET 200eco PN, DQ 8x24VDC/2A, M12-L
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Use in hazardous areas		
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEX for Zone 2	ATEX, UKEX, IECEx, CCCEX for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEX for Zone 22	ATEX, UKEX, IECEx, CCCEX for Zone 22
Product functions / security		
signed firmware update	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded	M12, 4-pin, L-coded
Dimensions		
Width	45 mm	45 mm
Height	200 mm	200 mm
Depth	48 mm	48 mm
Weights		
Weight, approx.	780 g	780 g

Article number	6ES7142-6BF50-0AB0 ET200eco PN, 8DO, DC24V/0,5A, 4xM12	6ES7142-6BF00-0AB0 ET200eco PN, 8DO, DC24V/1,3A, 4xM12	6ES7142-6BG00-0AB0 ET200eco PN, 8DO, DC24V/1,3A, 8xM12	6ES7142-6BR00-0AB0 ET200eco PN, 8 DO, DC24V/2A, 8xM12	6ES7142-6BH00-0AB0 ET200eco PN, 16DO DC24V/1,3A, 8xM12
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Load voltage 1L+					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Load voltage 2L+					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Input current					
Current consumption, typ.	100 mA	100 mA	100 mA	100 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A	4 A	4 A	4 A
from load voltage 1L+ (unswitched voltage)	100 mA	4 A	4 A	4 A	4 A
from load voltage 2L+, max.	4 A	4 A	4 A	4 A	4 A
Digital outputs					
Number of digital outputs	8	8	8	8	16
• in groups of	8	4	4	4	8
Short-circuit protection	Yes	Yes	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs					
• on lamp load, max.	5 W	5 W	5 W	10 W	5 W

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Article number	6ES7142-6BF50-0AB0	6ES7142-6BF00-0AB0	6ES7142-6BG00-0AB0	6ES7142-6BR00-0AB0	6ES7142-6BH00-0AB0
	ET200eco PN, 8DO, DC24V/0,5A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 8xM12	ET200eco PN, 8 DO, DC24V/2A, 8xM12	ET200eco PN, 16DO DC24V/1,3A, 8xM12
Output current					
• for signal "1" rated value	0.5 A	1.3 A; Maximum	1.3 A; Maximum	2 A	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Parallel switching of two outputs					
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs (per group)					
all mounting positions					
- up to 55 °C, max.		3.9 A			
- up to 60 °C, max.	4 A	2.6 A	3.9 A	3.9 A	3.9 A
Cable length					
• unshielded, max.	30 m	30 m	30 m	30 m	30 m
Interfaces					
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1	1	1
1. Interface					
Interface types					
• M12 port		Yes			
• integrated switch	Yes	Yes	Yes	Yes	Yes
Interface types					
M12 port					
• Autonegotiation	Yes	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols					
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes	Yes
PROFINET CBA	No	No	No	No	No
PROFIsafe	No	No	No	No	No
PROFINET IO Device					
Services					
- IRT with the option "high flexibility"	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes
Redundancy mode					
Media redundancy					
- MRP	Yes	Yes	Yes	Yes	Yes
Open IE communication					
• TCP/IP	No	No	No	No	No
• SNMP	Yes	Yes	Yes	Yes	Yes
• DCP	Yes	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes	Yes
• ping	Yes	Yes	Yes	Yes	Yes
• ARP	Yes	Yes	Yes	Yes	Yes
Interrupts/diagnostics/status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes

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Article number	6ES7142-6BF50-0AB0	6ES7142-6BF00-0AB0	6ES7142-6BG00-0AB0	6ES7142-6BR00-0AB0	6ES7142-6BH00-0AB0
	ET200eco PN, 8DO, DC24V/0,5A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 4xM12	ET200eco PN, 8DO, DC24V/1,3A, 8xM12	ET200eco PN, 8 DO, DC24V/2A, 8xM12	ET200eco PN, 16DO DC24V/1,3A, 8xM12
Diagnoses					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED	Yes; green "ON" LED
• Wire-break in actuator cable	Yes	Yes	Yes	Yes	Yes
• Short-circuit	Yes	Yes	Yes	Yes	Yes
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation					
between the load voltages	Yes	Yes	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No	No	No
between Ethernet and electronics	Yes	Yes	Yes	Yes	Yes
Potential separation channels					
• between the channels	No	No	No	No	No
Degree and class of protection					
IP degree of protection	IP65/67	IP65/67	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates					
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules					
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2	SIL 2	SIL 2
Use in hazardous areas					
• Explosion protection category for gas	ATEX II 3G Ex nA II T4	ATEX II 3G Ex nA II T4	ATEX II 3G Ex nA II T4	ATEX II 3G Ex nA II T4	ATEX II 3G Ex nA II T4
• Explosion protection category for dust	ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3D Ex tc IIIC T90°C Dc
connection method					
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions					
Width	30 mm	30 mm	60 mm	60 mm	60 mm
Height	200 mm	200 mm	175 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm	49 mm	49 mm
Weights					
Weight, approx.	550 g	550 g	910 g	910 g	910 g

Article number	6ES7143-6BH00-0BB0
	ET 200eco PN, DIQ 16x24VDC/2A, M12-L
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/ GSD revision	GSDML V2.3.x
• Multi Fieldbus Configuration Tool (MFCT)	from V1.3 SP1
Operating mode	
• DI	Yes
• Counter	No
• DQ	Yes
• MSI	Yes
• MSO	Yes

Article number	6ES7143-6BH00-0BB0
	ET 200eco PN, DIQ 16x24VDC/2A, M12-L
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	90 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value

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Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
Encoder supply	
Number of outputs	8
Hardware configuration	
Submodules	
• Number of configurable submodules, max.	2
Digital inputs	
Number of digital inputs	16; Parameterizable as DIQ
• in groups of	8
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 60 °C, max.	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
• unshielded, max.	30 m
Digital outputs	
Number of digital outputs	16; Parameterizable as DIQ
• in groups of	8; 2 load groups for 8 outputs each
Current-sourcing	Yes
output type acc. to IEC 61131, type 0.5	Yes
output type acc. to IEC 61131, type 2	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	0.5 A: Type 1L+ (-70 V) / 2 A: Type (-18 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A / 2 A
• with inductive load, max.	0.5 A / 2 A
• on lamp load, max.	0.5 A: 5 W / 2 A 10 W
Load resistance range	
• lower limit	0.5 A: 48 ohms / 2 A: 12 ohms
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A / 2 A
• for signal "0" residual current, max.	0.1 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
Switching frequency	
• with resistive load, max.	0.5 A: 100 Hz / 2 A: 40 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	1L+: 2 A / 2L+: 6 A
• Current per module, max.	8 A
Cable length	
• unshielded, max.	30 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
PROFINET IO Device	
Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
Media redundancy	
- MRP	Yes

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Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
EtherNet/IP	
Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
Updating times	
- Requested Packet Interval (RPI)	2 ms
Redundancy mode	
- DLR (Device Level Ring)	No
Address area	
- Address space per module, max.	20 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
Address space per station	
- Address space per station, max.	20 byte
- Access-consistent address space	2 byte
Updating time	
- I/O request interval	2 ms
Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Wire-break	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit	Yes; Outputs to M and P; channel by channel
• Short-circuit encoder supply	Yes; Per channel group

Article number	6ES7143-6BH00-0BB0 ET 200eco PN, DIQ 16x24VDC/2A, M12-L
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	Yes
• between the channels, in groups of	8
• between the channels and the power supply of the electronics	8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEX for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEX for Zone 22
Product functions / security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	780 g

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Article number	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
Current consumption, typ.	100 mA
from supply voltage 1L+, max.	4 A
from load voltage 1L+ (unswitched voltage)	4 A
from load voltage 2L+, max.	4 A
Digital inputs	
Number of digital inputs	8
• in groups of	4
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions - up to 60 °C, max.	8
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	7 mA
Cable length	
• unshielded, max.	30 m
Digital outputs	
Number of digital outputs	8
• in groups of	4
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
Output current	
• for signal "1" rated value	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz

Article number	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
Total current of the outputs (per group)	
all mounting positions - up to 60 °C, max.	3.9 A
Cable length	
• unshielded, max.	30 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• M12 port	Yes
• integrated switch	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
PROFINET IO Device	
Services	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes
Redundancy mode	
Media redundancy	
- MRP	Yes
Open IE communication	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes

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I/O devices > Digital I/O devices

Technical specifications

Article number	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; green "ON" LED
• Wire-break in actuator cable	Yes
• Wire-break in signal transmitter cable	Yes
• Short-circuit	Yes
• Short-circuit encoder supply	Yes
• Group error	Yes; Red/yellow "SF/MT" LED
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No

Article number	6ES7147-6BG00-0AB0 ET200eco PN, 8 DIO, DC24V/1,3A, 8xM12
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Use in hazardous areas	
• Explosion protection category for gas	ATEX II 3G Ex nA II T4
• Explosion protection category for dust	ATEX II 3D Ex tc IIIC T90°C Dc
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight, approx.	910 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > Analog I/O devices

Overview



Analog distributed I/O devices with 2x M12 L-coded power connectors and 45 mm width

- 8 analog input signals RTD/TC with 8xM12 connection
- 6 analog input signals U/I and 2 analog input or output signals U/I with 8xM12 connection

Analog I/O devices with 2x M12 A-coded power connectors and 60 mm width

- 8 analog input signals U/I/RTD/TC with 8xM12 connection
- 8 analog input signals RTD/TC with 8xM12 connection
- 4 analog output signals U/I with 4xM12 connection

Ordering data

Article No.

Article No.

ET 200eco PN analog input modules

- 8 AI 4 U/I + 4 RTD/TC; 8 x M12, degree of protection IP67
- 8 AI RTD/TC; 8 x M12, degree of protection IP67
- 8 AI RTD/TC; 8 x M12-L, degree of protection IP67

6ES7144-6KD00-0AB0

6ES7144-6KD50-0AB0

6ES7144-6JF00-0BB0

ET 200eco PN analog output modules

- 4 AQ U/I; 4 x M12, degree of protection IP67

6ES7145-6HD00-0AB0

ET 200eco PN analog input/output modules

- 6 AI U/I, 2 AI/AQ U/I, 8 x M12, degree of protection IP67

6ES7146-6HF00-0BB0

Accessories

- PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN, 10 A insulation displacement terminals
- Spare fuses for terminal block, 10 units
- Mounting rail 0.5 m
- Profile screw for mounting rail, 50 units
- Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units
- Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units
- Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each

6ES7148-6CB00-0AA0

6ES7194-6CA00-0AA0

6ES7194-6HB00-0AA0

6ES7194-6GA00-0AA0

6ES7194-6MA00-0AA0

3RX9802-0AA00

3RK1901-1KA00

3RT2900-1SB10

PROFINET M12 connection plug, for user assembly

Connector for PROFINET, 4-core, shielded

IE M12 plug PRO connector

- 1 unit
- 8 units

IE FC M12 plug PRO connector, for user assembly

- 1 unit
- 8 units

3RK1902-2DA00

6GK1901-0DB10-6AA0

6GK1901-0DB10-6AA8

6GK1901-0DB20-6AA0

6GK1901-0DB20-6AA8

M12 connection plug for 24 V DC load power supply

Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units

Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units

6GK1907-0DC10-6AA3

6GK1907-0DB10-6AA3

M12 circular connector

Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A

- Straight
- Angled

3RK1902-4BA00-5AA0

3RK1902-4DA00-5AA0

M12 coupling socket

4-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A, angled

3RK1902-4CA00-4AA0

PROFINET bus cable

Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded

- 3 m
- 5 m
- 10 m

3RK1902-2HB30

3RK1902-2HB50

3RK1902-2HC10

IE connecting cable M12-90/M12-90

Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet
Length:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1870-8GE30

6XV1870-8GE50

6XV1870-8GH10

6XV1870-8GH15

6XV1870-8GH20

6XV1870-8GH30

6XV1870-8GH50

6XV1870-8GN10

6XV1870-8GN15

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Ordering data	Article No.		Article No.
IE connecting cable M12-180/IE FC RJ45 plug-145 Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length: • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1871-5TH20 6XV1871-5TH30 6XV1871-5TH50 6XV1871-5TN10 6XV1871-5TN15		
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1881-5AH10 6XV1881-5AH20 6XV1881-5AH30 6XV1881-5AH50		
		M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-5GE30 6XV1801-5GE50 6XV1801-5GH10 6XV1801-5GH15 6XV1801-5GH20 6XV1801-5GH30 6XV1801-5GH50 6XV1801-5GN10 6XV1801-5GN15
		M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1801-5AH10 6XV1801-5AH20 6XV1801-5AH30 6XV1801-5AH50

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Technical specifications

Article number	6ES7144-6KD00-0AB0	6ES7144-6KD50-0AB0	6ES7144-6JF00-0BB0
	ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	ET200eco PN, 8AI RTD/TC 8xM12	ET 200eco PN, AI 8xRTD/TC, M12-L
General information			
Product function			
• Isochronous mode			No
• IRT			Yes
• Prioritized startup			Yes
• Measuring range scalable			Yes
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version			STEP 7 V17 or higher with HSP 0369
• PROFINET from GSD version/ GSD revision			GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)			from V1.3 SP1
Operating mode			
• MSI			Yes
CiR - Configuration in RUN			
Calibration possible in RUN			Yes
Supply voltage			
Rated value (DC)	24 V	24 V	
Reverse polarity protection	Yes	Yes; against destruction	
Load voltage 1L+			
• Rated value (DC)			24 V
• Reverse polarity protection			Yes; against destruction
Input current			
Current consumption (rated value)			85 mA; without load
Current consumption, typ. from load voltage 1L+ (unswitched voltage)	110 mA	110 mA	12 A; Maximum value
from load voltage 2L+, max.			12 A; Maximum value

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Article number	6ES7144-6KD00-0AB0 ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	6ES7144-6KD50-0AB0 ET200eco PN, 8AI RTD/TC 8xM12	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
Encoder supply			
Number of outputs	4		
Hardware configuration			
Submodules			
• Number of configurable submodules, max.			2
Analog inputs			
Number of analog inputs	8	8	8
Constant measurement current for resistance-type transmitter, typ.			0.7 mA
Cycle time (all channels), min.			Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary
Technical unit for temperature measurement adjustable			Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages			
• 0 to +10 V	Yes		
• 1 V to 5 V	Yes		
• -10 V to +10 V	Yes		
• -80 mV to +80 mV	Yes	Yes	Yes; 16 bit incl. sign
Input ranges (rated values), currents			
• 0 to 20 mA	Yes		
• -20 mA to +20 mA	Yes		
• 4 mA to 20 mA	Yes		
Input ranges (rated values), thermocouples			
• Type B			Yes; 16 bit incl. sign
• Type C			Yes; 16 bit incl. sign
• Type E	Yes	Yes	Yes; 16 bit incl. sign
• Type J	Yes	Yes	Yes; 16 bit incl. sign
• Type K	Yes	Yes	Yes; 16 bit incl. sign
• Type L			Yes; 16 bit incl. sign
• Type N	Yes	Yes	Yes; 16 bit incl. sign
• Type R			Yes; 16 bit incl. sign
• Type S			Yes; 16 bit incl. sign
• Type T			Yes; 16 bit incl. sign
• Type U			Yes; 16 bit incl. sign
Input ranges (rated values), resistance thermometer			
• Ni 100	Yes	Yes	Yes; Standard/climate
• Ni 1000	Yes	Yes	Yes; Standard/climate
• Ni 120	Yes	Yes	Yes; Standard/climate
• Ni 200	Yes	Yes	Yes; Standard/climate
• Ni 500	Yes	Yes	Yes; Standard/climate
• Pt 100	Yes	Yes	Yes; Standard/climate
• Pt 1000	Yes	Yes	Yes; Standard/climate
• Pt 200	Yes	Yes	Yes; Standard/climate
• Pt 500	Yes	Yes	Yes; Standard/climate
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes	Yes	Yes
• 0 to 300 ohms	Yes	Yes	Yes
• 0 to 600 ohms	Yes	Yes	Yes
• 0 to 3000 ohms	Yes	Yes	Yes
• 0 to 6000 ohms			Yes

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Article number	6ES7144-6KD00-0AB0 ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	6ES7144-6KD50-0AB0 ET200eco PN, 8AI RTD/TC 8xM12	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
Thermocouple (TC)			
Temperature compensation			
- parameterizable	Yes	Yes	Yes
- internal temperature compensation	Yes	Yes	Yes
- external temperature compensation with Pt100		Yes	
- external temperature compensation with compensations socket	Yes	Yes	Yes
- dynamic reference temperature value		Yes	Yes
- for definable comparison point temperature		Yes	
- fixed reference temperature			Yes
Cable length			
• shielded, max.	30 m	30 m	30 m
Analog value generation for the inputs			
Analog value display	SIMATIC S7 format	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating	integrating
Integration and conversion time/resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes; channel by channel
• Integration time (ms)	2/16.67/20/100 ms	2/16.67/20/100 ms	0.84 / 16.7 (50) / 20 (60) / 60 (180)
• Basic conversion time, including integration time (ms)			4.50 / 21.5 (54) / 24 (64) / 64 (184)
• Interference voltage suppression for interference frequency f1 in Hz	500 / 60 / 50 / 10 Hz	500 / 60 / 50 / 10 Hz	none / 60 / 50 / 16.7
• Conversion time (per channel)	4 / 19 / 22 / 102 ms	4 / 19 / 22 / 102 ms	
Smoothering of measured values			
• parameterizable	Yes	Yes	Yes
Encoder			
Number of connectable encoders, max.	8	8	
Connection of signal encoders			
• for voltage measurement	Yes		
• for current measurement as 2-wire transducer	Yes		
• for current measurement as 4-wire transducer	Yes		
• for resistance measurement with two-wire connection	Yes	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes	Yes
• for resistance measurement with four-wire connection	Yes	Yes	Yes
Errors/accuracies			
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	U: 0.0035%/°C; I: 0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C	RTD: 0.0005%/°C; TC: 0.0035%/°C	0.0009 %/K; ±0.005 % / K at thermocouple
Crosstalk between the inputs, min.	85 dB	-85 dB	
Crosstalk between the inputs, max.			-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %	0.008 %	0.008 %
Temperature error of internal compensation			±1.5 °C

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Article number	6ES7144-6KD00-0AB0 ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	6ES7144-6KD50-0AB0 ET200eco PN, 8AI RTD/TC 8xM12	6ES7144-6JF00-0BB0 ET 200eco PN, AI 8xRTD/TC, M12-L
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Series mode interference (peak value of interference < rated value of input range), min.	46 dB	46 dB	
• Common mode interference, min.	70 dB	70 dB	
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency			
• Series mode interference (peak value of interference < rated value of input range), min.			40 dB
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	
Number of PROFINET interfaces	1	1	1
1. Interface			
Interface type			PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types			
• M12 port	Yes		Yes; 2x M12, 4-pin, D-coded
• Number of ports			2
• integrated switch	Yes	Yes	Yes
Protocols			
• PROFINET IO Device			Yes
• Open IE communication			Yes
Interface types			
M12 port			
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	
PROFIsafe	No	No	No
EtherNet/IP			Yes
Modbus TCP			Yes
PROFINET IO Device			
Services			
- IRT			Yes; 250 µs to 4 ms in 125 µs frame
- IRT with the option "high flexibility"	Yes		
- Prioritized startup	Yes	Yes	Yes
- Shared device			Yes
- Number of IO Controllers with shared device, max.			2
Redundancy mode			
• PROFINET system redundancy (S2)			Yes
• PROFINET system redundancy (R1)			No
• H-Sync forwarding			Yes
Media redundancy			
- MRP	Yes	Yes	Yes
EtherNet/IP			
Services			
- CIP Implicit Messaging			Yes
- CIP Explicit Messaging			Yes
- CIP Safety			No
- Shared device			Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.			2

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Updating times - Requested Packet Interval (RPI)			2 ms
Redundancy mode - DLR (Device Level Ring)			No
Address area - Address space per module, max. - LargeForwardOpen (Class3)			38 byte No
Modbus TCP Services - read coils (code=1) - read discrete inputs (code=2) - Read Holding Registers (Code=3) - write single coil (code=5) - write multiple coils (code=15) - Write Multiple Registers (Code=16) - Parameter change by master - Modbus TCP Security Protocol			Yes Yes Yes Yes Yes Yes No No
Address space per station - Address space per station, max. - Access-consistent address space			38 byte 2 byte
Updating time - I/O request interval			2 ms
Connections - number of connections per device			12
Open IE communication • TCP/IP • SNMP • DCP • LLDP • ping • ARP	No Yes Yes Yes Yes Yes	No Yes Yes Yes Yes Yes	Yes; (only EtherNet/IP or Modbus TCP) Yes Yes Yes
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	
Alarms • Diagnostic alarm • Maintenance interrupt • Limit value alarm	Yes	Yes	Yes; Parameterizable Yes; Parameterizable Yes; two upper and two lower limit values in each case
Diagnoses • Diagnostic information readable • Monitoring the supply voltage - parameterizable • Wire-break • Short-circuit encoder supply • Group error • Overflow/underflow	Yes Yes; green "ON" LED Yes; per module Yes; Red/yellow "SF/MT" LED Yes	Yes Yes; green "ON" LED Yes; Red/yellow "SF/MT" LED Yes	Yes Yes Yes Yes; Not for ±80 mV Yes
Diagnostics indication LED • RUN LED • ERROR LED • MAINT LED • NS LED • MS LED • IO LED • Channel status display • for channel diagnostics • Connection display LINK TX/RX			Yes; green LED Yes; red LED Yes; Yellow LED Yes; green/red LED Yes; green/red LED Yes; red/green/yellow LEDs Yes; green LED Yes; red LED Yes; green LED, only link

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Potential separation			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	
between Ethernet and electronics	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No
• between the channels and the power supply of the electronics			Yes
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67/69K
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules			Yes; from FS01
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262	Yes; Declaration of Conformity, see online support entry 109757262	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E	Yes; Based on AMS 2750 E	Yes; based on AMS 2750 F
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1			PL d
• Category according to ISO 13849-1			Cat. 3
• SIL acc. to IEC 62061			SIL 2
Use in hazardous areas			
• Explosion protection category for gas	ATEX gas explosion protection, Zone 2	ATEX gas explosion protection, Zone 2	ATEX, UKEX, IECEx, CCCEX for Zone 2
• Explosion protection category for dust	ATEX dust explosion protection, Zone 22	ATEX dust explosion protection, Zone 22	ATEX, UKEX, IECEx, CCCEX for Zone 22
Product functions / security			
signed firmware update			Yes
safely removing data			Yes
Ambient conditions			
Ambient temperature during operation			
• min.			-40 °C
• max.			60 °C
Altitude during operation relating to sea level			
• Ambient air temperature-barometric pressure-altitude			Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method			
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs			M12, 5-pin, A-coded
Design of electrical connection for supply voltage			M12, 4-pin, L-coded
Dimensions			
Width	60 mm	60 mm	45 mm
Height	175 mm	175 mm	200 mm
Depth	49 mm	49 mm	48 mm
Weights			
Weight, approx.	930 g	930 g	780 g
Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12	Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
Supply voltage		Analog outputs	
Rated value (DC)	24 V	Number of analog outputs	4
Reverse polarity protection	Yes	Voltage output, short-circuit protection	Yes
Input current		Voltage output, short-circuit current, max.	30 mA
Current consumption, typ.	280 mA	Current output, no-load voltage, max.	20 V
Actuator supply			
Number of outputs	4		

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Technical specifications

Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m
Analog value generation for the outputs	
Analog value display	SIMATIC S7 format
Conversion principle	Resistor network
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	1 ms
Settling time	
• for resistive load	2 ms
• for capacitive load	1.8 ms
• for inductive load	2 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.008 %
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• M12 port	Yes
• integrated switch	Yes

Article number	6ES7145-6HD00-0AB0 ET200eco PN, 4AO U/I 4xM12
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
PROFINET IO Device	
Services	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes
Redundancy mode	
Media redundancy	
- MRP	Yes
Open IE communication	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; green "ON" LED
• Wire-break	Yes; Channel-by-channel with current output
• Short-circuit	Yes; Channel-by-channel with voltage output
• Group error	Yes; Red/yellow "SF/MT" LED
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Use in hazardous areas	
• Explosion protection category for gas	ATEX gas explosion protection, Zone 2
• Explosion protection category for dust	ATEX dust explosion protection, Zone 22
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight, approx.	930 g

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Technical specifications

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I + AIQ 2xU/I, M12-L
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V18 or higher with HSP 0391
• PROFINET from GSD version/ GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5 or higher
Operating mode	
• MSI	Yes
• MSO	Yes
CiR - Configuration in RUN	
Calibration possible in RUN	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	110 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Actuator supply	
Number of outputs	2
Hardware configuration	
Submodules	
• Number of configurable submodules, max.	2
Analog inputs	
Number of analog inputs	8; 6 AI fixed, 2 AIQ can be parameterized
Cycle time (all channels), min.	sum of the basic conversion times
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 17 V for 2-wire transformers
• -20 mA to +20 mA	Yes; 17 V for 2-wire transformers
• 4 mA to 20 mA	Yes; 17 V for 2-wire transformers
Cable length	
• shielded, max.	30 m
Analog outputs	
Number of analog outputs	2; AIQ can be parameterized
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	40 mA
Current output, no-load voltage, max.	19 V
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I + AIQ 2xU/I, M12-L
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
• for current output four-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 μF
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m
Analog value generation for the inputs	
Analog value display	SIMATIC S7 format
Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0.84 / 16.7 (50) / 20 (60) / 60 (180)
• Basic conversion time, including integration time (ms)	4.50 / 21.5 (54) / 24 (64) / 64 (184)
• Interference voltage suppression for interference frequency f1 in Hz	none / 60 / 50 / 16.7
Smoothing of measured values	
• parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
Settling time	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > Analog I/O devices

Technical specifications

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	0.002 %/K
Crosstalk between the outputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.008 %
Interference voltage suppression for $f = n \times (f_1 \pm 0.5 \%)$, $f_1 =$ interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	46 dB
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• Integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
PROFINET IO Device	
Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
Media redundancy	
- MRP	Yes
EtherNet/IP	
Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
Updating times	
- Requested Packet Interval (RPI)	2 ms
Redundancy mode	
- DLR (Device Level Ring)	No
Address area	
- Address space per module, max.	48 byte; of which 44 bytes for inputs and 4 bytes for outputs
- LargeForwardOpen (Class3)	No
Modbus TCP	
Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
Address space per station	
- Address space per station, max.	48 byte; of which 44 bytes for inputs and 4 bytes for outputs
- Access-consistent address space	2 byte
Updating time	
- I/O request interval	2 ms
Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > Analog I/O devices

Technical specifications

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Wire-break	Yes; at 4 mA to 20 mA and 1 V to 5 V
• Short-circuit	Yes; encoder and actuator supply module to ground, for output type voltage; channel by channel
• Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No

Article number	6ES7146-6HF00-0BB0 ET 200eco PN, AI 6xU/I +AIQ 2xU/I, M12-L
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEX for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEX for Zone 22
Product functions / security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	795 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technology I/O modules > TM PosInput 2 counter and position detection module

Overview



Technical properties

- Counter and position detection module for ET 200eco PN
- Interfaces:
 - Encoder signals A, B and N for RS-422 differential signals or 24 V signals
 - SSI interface with clock and data for RS-422 differential signals
 - 24 V encoder supply, short-circuit-proof
 - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
 - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value

- Counting frequency 1 MHz (4 MHz with fourfold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable input filters for suppressing interferences at encoder and digital inputs

Supported types of encoders/signals

- Incremental encoders with and without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 32 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

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Ordering data	Article No.		Article No.
TM PosInput 2 counter and position detection module 2 channels, max. 1 MHz for RS-422 differential signals or SSI absolute encoders 200 kHz for 24 V count signals	6ES7147-6AB00-0BB0	Power M12 plug PRO Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit	6GK1906-0EA00
Accessories - Mounting rail 0.5 m - Profile screw for mounting rail, 50 units - Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units - Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units - Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each	6ES7194-6GA00-0AA0 6ES7194-6MA00-0AA0 3RX9802-0AA00 3RK1901-1KA00 6ES7194-2BA00-0AA0	Power M12 cable connector PRO Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	6GK1906-0EB00
PROFINET M12 connection plug, for user assembly Connector for PROFINET, 4-core, shielded IE M12 plug PRO connector 1 unit 8 units IE FC M12 plug PRO connector, for user assembly 1 unit 8 units	3RK1902-2DA00 6GK1901-0DB10-6AA0 6GK1901-0DB10-6AA8 6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8	M12 circular connector Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm ² , A-coded, max. 4 A - Straight - Angled	3RK1902-4BA00-5AA0 3RK1902-4DA00-5AA0
		M12 coupling socket 4-pin, screw terminal, max. 0.75 mm ² , A-coded, max. 4 A, angled	3RK1902-4CA00-4AA0
		PROFINET bus cable Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded 3 m 5 m 10 m	3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

Technology I/O modules > TM PosInput 2 counter and position detection module

Ordering data	Article No.		Article No.	
M12-90/M12-90 IE connecting cable Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1870-8GE30 6XV1870-8GE50 6XV1870-8GH10 6XV1870-8GH15 6XV1870-8GH20 6XV1870-8GH30 6XV1870-8GH50 6XV1870-8GN10 6XV1870-8GN15		M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-5GE30 6XV1801-5GE50 6XV1801-5GH10 6XV1801-5GH15 6XV1801-5GH20 6XV1801-5GH30 6XV1801-5GH50 6XV1801-5GN10 6XV1801-5GN15
M12-180/IE FC RJ45 plug-145 IE connecting cable Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length: • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1871-5TH20 6XV1871-5TH30 6XV1871-5TH50 6XV1871-5TN10 6XV1871-5TN15		M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6GE50 6XV1801-6GH10 6XV1801-6GH15 6XV1801-6GH20 6XV1801-6GH30 6XV1801-6GH50 6XV1801-6GN10 6XV1801-6GN15
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1881-5AH10 6XV1881-5AH20 6XV1881-5AH30 6XV1881-5AH50		M12-180/M12-180 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6DE50 6XV1801-6DH10 6XV1801-6DH15 6XV1801-6DH20 6XV1801-6DH30 6XV1801-6DH50 6XV1801-6DN10 6XV1801-6DN15
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	6ES7194-6KA00-0XA0			
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm ² , A-coded, max. 4 A, PUR casing, black • 1.5 m • 5 m • 10 m Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm ² , A-coded, max. 4 A, PUR casing, black	3RK1902-4HB15-5AA0 3RK1902-4HB50-5AA0 3RK1902-4HC01-5AA0 3RK1902-4PB15-3AA0			
Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm ²) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1801-2B		M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1801-5AH10 6XV1801-5AH20 6XV1801-5AH30 6XV1801-5AH50

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technology I/O modules > TM PosInput 2 counter and position detection module

Technical specifications

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
General information	
Number of channels	2
Product function	
• Isochronous mode	Yes
• IRT	Yes
• Fast startup	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V18 or higher with HSP
• PROFINET from GSD version/ GSD revision	GSDML V2.42
• Multi Fieldbus Configuration Tool (MFCT)	V1.5 or higher
Supply voltage	
Rated value (DC)	24 V
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; encoder power supply outputs applied with reversed polarity, loads conduct
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	100 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	4; 1 per encoder connection
Hardware configuration	
Submodules	
• Number of configurable submodules, max.	2
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
for technological functions	
- parameterizable	Yes
Cable length	
• shielded, max.	30 m
• unshielded, max.	30 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	2L+ (-39 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• with inductive load, max.	0.5 A
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; 2L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 μs
• "1" to "0", max.	50 μs
Parallel switching of two outputs	
• for uprating	No
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13
Total current of the outputs	
• Current per module, max.	2 A; Supply from 2L+
Cable length	
• shielded, max.	30 m
• unshielded, max.	30 m

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technology I/O modules > TM PosInput 2 counter and position detection module

Technical specifications

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Encoder	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	30 m
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• Pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	30 m
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• pulse encoder	Yes
• pulse encoder with direction	Yes
• pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	30 m; Up to 500 kHz
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
PROFINET IO Device	
Services	
- IRT	Yes; 500 µs to 4 ms at an interval of 125 µs
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
Media redundancy	
- MRP	Yes
EtherNet/IP	
Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
Updating times	
- Requested Packet Interval (RPI)	2 ms
Address area	
- Address space per module, max.	32 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
Address space per station	
- Address space per station, max.	32 byte
- Access-consistent address space	2 byte
Updating time	
- I/O request interval	2 ms
Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Isochronous mode	
Equidistance	Yes
shortest clock pulse	500 µs
max. cycle	4 ms

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

Technology I/O modules > TM PosInput 2 counter and position detection module

Technical specifications

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	No
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Short-circuit encoder supply	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Integrated Functions	
Counter	Yes
• Number of counters	2
• Counting frequency, max.	4 MHz; with quadruple evaluation
Fast mode	No
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2

Article number	6ES7147-6AB00-0BB0 ET 200eco PN, TM PosInput 2, M12-L
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	Yes; DI channels are isolated from the DQ channels
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Use in hazardous areas	
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEx for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEx for Zone 22
Product functions / security	
signed firmware update	Yes; V5.1.2 or higher
safely removing data	Yes; V5.1.2 or higher
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection	4/5/8-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	No
to standard PROFINET controller	Yes
Dimensions	
Width	45 mm
Height	200 mm
Depth	48 mm
Weights	
Weight, approx.	820 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > Fail-safe I/O device

Overview



The ET 200eco PN fail-safe I/O device expands the ET 200eco PN system family. It is incorporated seamlessly into the Safety Integrated concept like with ET 200MP / ET 200SP and ET200pro. It also supports safety-related communication via PROFINET. The functional safety is certified in accordance with IEC 61508. It is designed for safety-related use up to SIL 3 according to IEC 62061 and PL e according to ISO 13849.

The following fail-safe I/O device with 2x M12 A-coded power connectors and 60 mm width is available:

- F-DI 8x24V /F-DQ 3x24V 2A with 8xM12 connection

Ordering data

ET 200eco PN fail-safe digital input/output modules

- 8 F-DI 24 V DC/
3 F-DQ 24 V DC/2 A;
PROFINET, certified up to SIL 3
(IEC 61508), PL e (ISO 13849);
4 x M12/3 x M12, degree of
protection IP65/67

6ES7146-6FF00-0AB0

Accessories

- PD voltage distributor, 24 V DC;
1 X 7/8", 4 X M12
- Terminal block for ET 200eco PN,
10 A insulation displacement
terminals
- Spare fuses for terminal block,
10 units
- Mounting rail 0.5 m
- Profile screw for mounting rail,
50 units
- Sealing cap M12 for IP67
modules, 12 mm outer diameter,
without O-ring, 10 units
- Sealing cap M12 for IP67
modules, 15 mm outer diameter,
with O-ring, 10 units
- Labels 10 mm x 7 mm yellow, for
I/O devices with 2x M12 A-coded
power connectors; 17 frames with
48 labels each

6ES7148-6CB00-0AA0

6ES7194-6CA00-0AA0

6ES7194-6HB00-0AA0

6ES7194-6GA00-0AA0

6ES7194-6MA00-0AA0

3RX9802-0AA00

3RK1901-1KA00

6ES7194-6HA00-0AA0

PROFINET M12 connection plug, for user assembly

Connector for PROFINET, 4-core,
shielded

IE M12 plug PRO connector

- 1 unit
- 8 units

IE FC M12 plug PRO connector,
for user assembly

- 1 unit
- 8 units

3RK1902-2DA00

6GK1901-0DB10-6AA0

6GK1901-0DB10-6AA8

6GK1901-0DB20-6AA0

6GK1901-0DB20-6AA8

M12 connection plug for 24 V DC load power supply

Connection socket
for 24 V DC infeed;
4-pin, A-coded, 3 units

Connector for
loop-through of 24 V DC;
4-pin, A-coded, 3 units

6GK1907-0DC10-6AA3

6GK1907-0DB10-6AA3

M12 circular connector

Can be assembled, for connecting
actuators or sensors, 5-pin,
screw terminal, max. 0.75 mm²,
A-coded, max. 4 A

- Straight
- Angled

3RK1902-4BA00-5AA0

3RK1902-4DA00-5AA0

M12 coupling socket

4-pin, screw terminal,
max. 0.75 mm², A-coded,
max. 4 A, angled

3RK1902-4CA00-4AA0

PROFINET bus cable

Preassembled on one side with
1 x M12, D-coded, 4-wire, shielded

- 3 m
- 5 m
- 10 m

3RK1902-2HB30

3RK1902-2HB50

3RK1902-2HC10

M12-90/M12-90 IE connecting cable

Preassembled
IE FC TP trailing cable GP 2 x 2
(PROFINET type C) with two
4-pin M12 plugs
(D-coded) up to 85 m,
degree of protection IP65/IP67,
90° cable outlet
Length:

- 0.3 m
- 0.5 m
- 1.0 m
- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1870-8GE30

6XV1870-8GE50

6XV1870-8GH10

6XV1870-8GH15

6XV1870-8GH20

6XV1870-8GH30

6XV1870-8GH50

6XV1870-8GN10

6XV1870-8GN15

M12-180/IE FC RJ45 IE connecting cable plug-145

Preassembled
IE FC TP trailing cable GP 2 x 2
(PROFINET type C)
with M12 plug (D-coded)
and IE FC RJ45 plug,
degree of protection IP65/IP67
Length:

- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

6XV1871-5TH20

6XV1871-5TH30

6XV1871-5TH50

6XV1871-5TN10

6XV1871-5TN15

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > Fail-safe I/O device

Ordering data	Article No.		Article No.
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1881-5AH10 6XV1881-5AH20 6XV1881-5AH30 6XV1881-5AH50	IO-Link connecting cables Between IO-Link master and reader, on both sides with M12 plug, 4-pin • 5 m • 10 m	6GT2891-4MH50 6GT2891-4MN10
M12 Y-cable For connection of single-channel sensors (1001 evaluation), 5-pin For joint connection of an F-DQ and an F-DI channel by means of an 8-pin M12 socket	6ES7194-6KB00-0XA0 6ES7194-6KC00-0XA0	M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-5GE30 6XV1801-5GE50 6XV1801-5GH10 6XV1801-5GH15 6XV1801-5GH20 6XV1801-5GH30 6XV1801-5GH50 6XV1801-5GN10 6XV1801-5GN15
E-coding plug (metal) for fail-safe ET 200 distributed I/O, IP65/IP67	6ES7194-6KB01-0AA0		
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm², A-coded, max. 4 A, PUR casing, black • 1.5 m • 5 m • 10 m Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm², A-coded, max. 4 A, PUR casing, black	3RK1902-4HB15-5AA0 3RK1902-4HB50-5AA0 3RK1902-4HC01-5AA0 3RK1902-4PB15-3AA0	M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1801-5AH10 6XV1801-5AH20 6XV1801-5AH30 6XV1801-5AH50

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Technical specifications

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A	Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
General information		Encoder supply	
Engineering with		Number of outputs	2; Vs
• STEP 7 TIA Portal configurable/ integrated from version	V15 with HSP 204	Digital inputs	
Operating mode		Number of digital inputs	8; 8 (one-channel); 4 (two-channel)
• DI	Yes	Digital inputs, parameterizable	Yes
• DQ	Yes	Input characteristic curve in accordance with IEC 61131, type 1	Yes
Supply voltage		Number of simultaneously controllable inputs	
Rated value (DC)	24 V	all mounting positions	
Reverse polarity protection	Yes	- up to 60 °C, max.	8
Load voltage 1L+		Input voltage	
• Rated value (DC)	24 V	• Rated value (DC)	24 V
• Reverse polarity protection	Yes	• for signal "0"	-30 V DC to +5 V DC
Load voltage 2L+		• for signal "1"	15 V DC to 30 V DC
• Rated value (DC)	24 V	Input delay (for rated value of input voltage)	
• Reverse polarity protection	Yes	for standard inputs	
Input current		- parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Current consumption, typ.	200 mA	Cable length	
from supply voltage 1L+, max.	4 A	• unshielded, max.	30 m
from load voltage 2L+, max.	4 A		

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > Fail-safe I/O device

Technical specifications

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Digital outputs	
Number of digital outputs	3
• in groups of	3
Short-circuit protection	Yes; Electronic
Limitation of inductive shutdown voltage to	PM-switching: Typ. -26 V to (-48 V)
Controlling a digital input	No
Switching capacity of the outputs	
• on lamp load, max.	10 W
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs (per group)	
all mounting positions	
- up to 60 °C, max.	3.9 A
Cable length	
• unshielded, max.	30 m
Encoder	
Connectable encoders	
• 2-wire sensor	No
- permissible quiescent current (2-wire sensor), max.	0.5 mA
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• M12 port	Yes
• integrated switch	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	Yes
PROFINET IO Device	
Services	
- IRT with the option "high flexibility"	No; module will participate within an IRT topology
- Prioritized startup	No
Redundancy mode	
Media redundancy	
- MRP	Yes

Article number	6ES7146-6FF00-0AB0 ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Open IE communication	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; green "ON" LED
• Wire-break in actuator cable	Yes
• Wire-break in signal transmitter cable	Yes
• Short-circuit	Yes
• Short-circuit encoder supply	Yes
• Group error	Yes; Red/yellow "SF/MT" LED
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
• SILCL according to IEC 62061	SIL 3
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	60 °C
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight, approx.	940 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Overview



IO-Link master with 2x M12 L-coded power connectors and 45 mm width

- IO-Link communication modules for connecting up to 8 IO-Link devices
- Options: IO-Link master
 - with 4x Class A port and 4x Class B port as well as additional 4 digital inputs,
 - with 4x Port Class A and additional 12 digital inputs/outputs or
 - with 8x Port Class A and additional 8 digital inputs/outputs.
- The IO-Link specifications V1.0 and V1.1 are supported



IO-Link master with 2x M12 A-coded power connectors and 60 mm width

- IO-Link communication modules for connecting up to 4 IO-Link devices
- IO-Link master with 4x Class A port and additional 8 digital inputs and 4 digital outputs
- The IO-Link specification V1.0 is supported



IO-Link master with 2x M12 A-coded power connectors and 30 mm width

- IO-Link communication modules for connecting up to 4 IO-Link devices
- IO-Link master with 4x Class B port
- The IO-Link specifications V1.0 and V1.1 are supported

Ordering data	Article No.	Ordering data	Article No.
ET 200eco PN IO-Link master • 4 IO-L + 8 DI + 4 DQ, 24 V DC/1.3 A; 8 x M12, degree of protection IP67, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and Class A port as well as 8 digital inputs and 4 digital outputs • 4 IO-L; 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and Class B port • 8 IO-L + 4 DI 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 8 IO-Link devices according to IO-Link specification V1.0 and V1.1, 4x Class A port and 4 x Class B port, as well as 4 additional digital inputs • 8 IO-L + 8 DIQ 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 8 IO-Link devices according to IO-Link specification V1.0 and V1.1, 8x Class A ports, as well as 8 additional digital inputs/outputs • 4 IO-L + 12 DIQ 24 V DC; 8 x M12, degree of protection IP67, enclosure width 45 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1, 4x Class A ports, as well as 12 additional digital inputs/outputs	6ES7148-6JA00-0AB0 6ES7148-6JD00-0AB0 6ES7148-6JG00-0BB0 6ES7148-6JJ00-0BB0 6ES7148-6JE00-0BB0	PROFINET M12 connection plug, for user assembly Connector for PROFINET, 4-core, shielded IE M12 plug PRO connector • 1 unit • 8 units IE FC M12 plug PRO connector, for user assembly • 1 unit • 8 units M12 connection plug for 24 V DC load power supply Connection socket for 24 V DC infeed; 4-pin, A-coded, 3 units Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units M12 circular connector Can be assembled, for connecting actuators or sensors, 5-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A • Straight • Angled M12 coupling socket 4-pin, screw terminal, max. 0.75 mm², A-coded, max. 4 A, angled PROFINET bus cable Preassembled on one side with 1 x M12, D-coded, 4-wire, shielded • 3 m • 5 m • 10 m IE connecting cable M12-90/M12-90 Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded) up to 85 m, degree of protection IP65/IP67, 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m IE connecting cable M12-180/IE FC RJ45 plug-145 Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with M12 plug (D-coded) and IE FC RJ45 plug, degree of protection IP65/IP67 Length: • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	3RK1902-2DA00 6GK1901-0DB10-6AA0 6GK1901-0DB10-6AA8 6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 6GK1907-0DC10-6AA3 6GK1907-0DB10-6AA3 3RK1902-4BA00-5AA0 3RK1902-4DA00-5AA0 3RK1902-4CA00-4AA0 3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10 6XV1870-8GE30 6XV1870-8GE50 6XV1870-8GH10 6XV1870-8GH15 6XV1870-8GH20 6XV1870-8GH30 6XV1870-8GH50 6XV1870-8GN10 6XV1870-8GN15
Accessories • PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12 • Terminal block for ET 200eco PN, 10 A insulation displacement terminals • Spare fuses for terminal block, 10 units • Mounting rail 0.5 m • Profile screw for mounting rail, 50 units • Sealing cap M12 for IP67 modules, 12 mm outer diameter, without O-ring, 10 units • Sealing cap M12 for IP67 modules, 15 mm outer diameter, with O-ring, 10 units • Labels 10 mm x 5 mm RAL9016, for I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each • Labels 10 mm x 7 mm Ti-grey, for I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each	6ES7148-6CB00-0AA0 6ES7194-6CA00-0AA0 6ES7194-6HB00-0AA0 6ES7194-6GA00-0AA0 6ES7194-6MA00-0AA0 3RX9802-0AA00 3RK1901-1KA00 6ES7194-2BA00-0AA0 3RT2900-1SB10		

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > IO-Link master

Ordering data	Article No.	Article No.
M12-180/M12-180 IE robust connecting cable Preassembled IE FC TP robust food cable 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP69 Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1881-5AH10 6XV1881-5AH20 6XV1881-5AH30 6XV1881-5AH50	
M12 Y-cable For double connection of I/O by means of a single cable to ET 200, 5-pin	6ES7194-6KA00-0XA0	
Control line Preassembled on one side with 1 x M12 plug angled, 5-pin, 5 x 0.34 mm ² , A-coded, max. 4 A, PUR casing, black • 1.5 m • 5 m • 10 m Preassembled, 1 x M12 cable box straight, 1 x M12 plug, 3 x 0.34 mm ² , A-coded, max. 4 A, PUR casing, black	3RK1902-4HB15-5AA0 3RK1902-4HB50-5AA0 3RK1902-4HC01-5AA0 3RK1902-4PB15-3AA0	
IO-Link connecting cables Between IO-Link master and reader, on both sides with M12 plug, 4-pin • 5 m • 10 m	6GT2891-4MH50 6GT2891-4MN10	
Energy cable 4 x 1.5 Trailable power cable, with 4 copper cores (1.5 mm ²) for connecting to M12 plug-in connector; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1801-2B	
M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply the ET 200 with 24 V DC; 90° cable outlet Length: • 0.3 m • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-5GE30 6XV1801-5GE50 6XV1801-5GH10 6XV1801-5GH15 6XV1801-5GH20 6XV1801-5GH30 6XV1801-5GH50 6XV1801-5GN10 6XV1801-5GN15	
M12-180/M12-180 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6DE50 6XV1801-6DH10 6XV1801-6DH15 6XV1801-6DH20 6XV1801-6DH30 6XV1801-6DH50 6XV1801-6DN10 6XV1801-6DN15	
M12-90/M12-90 M12 power connecting cable Flexible 4-core power connecting cable, preassembled with L-coded, 4-pin M12 plug and L-coded, 4-pin M12 socket, both sides angled 90°, to supply terminal devices with 24 V DC Length: • 0.5 m • 1.0 m • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m	6XV1801-6GE50 6XV1801-6GH10 6XV1801-6GH15 6XV1801-6GH20 6XV1801-6GH30 6XV1801-6GH50 6XV1801-6GN10 6XV1801-6GN10	
M12-180/M12-180 M12 robust power connecting cable Flexible 4-core power connecting cable, preassembled with A-coded, 5-pin M12 plug and A-coded, 5-pin M12 socket to supply IP69 components with 24 V DC; Length: • 1.0 m • 2.0 m • 3.0 m • 5.0 m	6XV1801-5AH10 6XV1801-5AH20 6XV1801-5AH30 6XV1801-5AH50	
Power M12 plug PRO Connector for 24 V DC supply voltage, with installation instructions, 4-pin, L-coded, 1 unit	6GK1906-0EA00	
Power M12 cable connector PRO Connection socket for 24 V DC supply voltage, 4-pin, L-coded, with installation instructions, 1 unit	6GK1906-0EB00	

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JA00-0AB0 ET 200eco PN, 4xIO-Link + 8DI/4DO, 8xM12	6ES7148-6JD00-0AB0 ET 200eco PN, 4xIO-Link 4xM12	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
General information			
Product function			
• Isochronous mode			No
• Prioritized startup			Yes
Engineering with			
• STEP 7 TIA Portal configurable/ integrated from version			STEP 7 V17 or higher with HSP 0363
• PROFINET from GSD version/ GSD revision			GSDML V2.3.x
• Multi Fieldbus Configuration Tool (MFCT)			from V1.3 SP1
Operating mode			
• IO-Link	Yes	Yes	Yes
• DI	Yes	Yes	Yes
• Counter			No
• DQ	Yes	Yes; max. 100 mA	No
• MSI			No
• MSO			No
Supply voltage			
Rated value (DC)	24 V	24 V	
Reverse polarity protection	Yes	Yes	
Load voltage 1L+			
• Rated value (DC)			24 V
• Reverse polarity protection			Yes; against destruction
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
Current consumption (rated value)			70 mA; without load
Current consumption, typ. from supply voltage 1L+, max.	200 mA 4 A	100 mA 4 A	
from load voltage 1L+ (unswitched voltage)			12 A; Maximum value
from load voltage 2L+, max.	4 A	4 A	12 A; Maximum value
Encoder supply			
Number of outputs	6	4	8
Hardware configuration			
Submodules			
• Number of configurable submodules, max.			9
Digital inputs			
Number of digital inputs	8		4
Source/sink input			P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes
Number of simultaneously controllable inputs all mounting positions			
- up to 60 °C, max.	8		4
Input voltage			
• Rated value (DC)	24 V		24 V
• for signal "0"	-3 to +5V		-3 to +5V
• for signal "1"	+11 to +30V		+11 to +30V
Input current			
• for signal "0", max. (permissible quiescent current)	1.5 mA		
• for signal "1", typ.	7 mA		2.5 mA
Cable length			
• unshielded, max.	30 m		30 m

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JA00-0AB0 ET 200eco PN, 4xIO-Link + 8DI/4DO, 8xM12	6ES7148-6JD00-0AB0 ET 200eco PN, 4xIO-Link 4xM12	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
Digital outputs			
Number of digital outputs	4		
Short-circuit protection	Yes; Electronic		
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V		
Controlling a digital input	Yes		
Switching capacity of the outputs			
• on lamp load, max.	5 W		
Output current			
• for signal "1" rated value	1.3 A; Maximum		
• for signal "0" residual current, max.	1.5 mA		
Parallel switching of two outputs			
• for uprating	No		
• for redundant control of a load	Yes		
Switching frequency			
• with resistive load, max.	100 Hz		
• with inductive load, max.	0.5 Hz		
• on lamp load, max.	1 Hz		
Total current of the outputs (per group)			
all mounting positions			
- up to 60 °C, max.	3.9 A		
Cable length			
• unshielded, max.	30 m		
IO-Link			
Number of ports	4	4	8
• of which simultaneously controllable	4	4	8
IO-Link protocol 1.0	Yes	Yes	Yes
IO-Link protocol 1.1	No	Yes	Yes
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.			2 ms
Size of process data, input per port	32 byte	32 byte	33 byte
Size of process data, input per module	32 byte	128 bytes + 4 bytes PQI	264 byte
Size of process data, output per port	32 byte	32 byte	32 byte
Size of process data, output per module	32 byte	128 byte	256 byte
Memory size for device parameter		2 kbyte; for each port	2 kbyte; for each port
Master backup		Possible with function block IO_LINK_MASTER	possible with LIOLink_Master function block
Configuration without S7-PCT		Possible; autostart/manual function	Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m	20 m
Connection of IO-Link devices			
• Port type A	Yes	Yes; via 3-core cable	Yes; via 3-core cable
• Port type B		Yes; Additional device supply: max. 2 A per port, max. 4 A per module	Yes; additional device supply: max. 2 A per port, max. 6 A per module
• via three-wire connection	Yes		Yes
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	
Number of PROFINET interfaces	1	1	1
1. Interface			
Interface type			PROFINET with 100 Mbit/s full duplex (100BASE-TX)

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JA00-0AB0 ET 200eco PN, 4xIO-Link + 8DI/4DO, 8xM12	6ES7148-6JD00-0AB0 ET 200eco PN, 4xIO-Link 4xM12	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
Interface types			
• M12 port	Yes	Yes	Yes; 2x M12, 4-pin, D-coded
• Number of ports			2
• integrated switch	Yes	Yes	Yes
Protocols			
• PROFINET IO Device			Yes
• Open IE communication			Yes
Interface types			
M12 port			
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	
PROFIsafe	No	No	No
EtherNet/IP	No	No	Yes
Modbus TCP			Yes
PROFINET IO Device			
Services			
- IRT			Yes; 250 µs to 4 ms in 125 µs frame
- IRT with the option "high flexibility"	Yes	Yes	
- Prioritized startup			Yes
- Shared device			Yes
- Number of IO Controllers with shared device, max.			2
Redundancy mode			
• PROFINET system redundancy (S2)			Yes
• PROFINET system redundancy (R1)			No
• H-Sync forwarding			Yes
Media redundancy			
- MRP	Yes	Yes	Yes
EtherNet/IP			
Services			
- CIP Implicit Messaging			Yes
- CIP Explicit Messaging			Yes
- CIP Safety			No
- Shared device			Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.			2
Updating times			
- Requested Packet Interval (RPI)			2 ms
Redundancy mode			
- DLR (Device Level Ring)			No
Address area			
- Address space per module, max.			300 byte
- LargeForwardOpen (Class3)			No
Modbus TCP			
Services			
- read coils (code=1)			Yes
- read discrete inputs (code=2)			Yes
- Read Holding Registers (Code=3)			Yes
- write single coil (code=5)			Yes
- write multiple coils (code=15)			Yes
- Write Multiple Registers (Code=16)			Yes
- Parameter change by master			No
- Modbus TCP Security Protocol			No

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JA00-0AB0 ET 200eco PN, 4xIO-Link + 8DI/4DO, 8xM12	6ES7148-6JD00-0AB0 ET 200eco PN, 4xIO-Link 4xM12	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
Address space per station			
- Address space per station, max.			300 byte
- Access-consistent address space			2 byte
Updating time			
- I/O request interval			2 ms
Connections			
- number of connections per device			12
Open IE communication			
• TCP/IP	No	No	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	
• ARP	Yes	Yes	Yes
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	
Alarms			
• Diagnostic alarm	Yes	Yes	Yes; Parameterizable
• Maintenance interrupt			Yes; Parameterizable
Diagnoses			
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; green "ON" LED	Yes; green "ON" LED	Yes
- parameterizable			Yes
• Wire-break			Yes
• Wire-break in actuator cable	Yes		
• Wire-break in signal transmitter cable	Yes		
• Short-circuit	Yes	Yes; Device supply to M	
• Short-circuit encoder supply	Yes		Yes; Per channel
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	
Diagnostics indication LED			
• RUN LED			Yes; green LED
• ERROR LED			Yes; red LED
• MAINT LED			Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)			Yes; green LED
• NS LED			Yes; green/red LED
• MS LED			Yes; green/red LED
• IO LED			Yes; red/green/yellow LEDs
• Channel status display			Yes; green LED
• for channel diagnostics			Yes; red LED
• For load voltage monitoring			Yes; green LED
• Connection display LINK TX/RX			Yes; green LED, only link
Potential separation			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	
between Ethernet and electronics	Yes	Yes	Yes
Potential separation channels			
• between the channels	No		No
• between the channels and the power supply of the electronics			No
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67/69K
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules		No	Yes; from FS01

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JA00-0AB0 ET 200eco PN, 4xIO-Link + 8DI/4DO, 8xM12	6ES7148-6JD00-0AB0 ET 200eco PN, 4xIO-Link 4xM12	6ES7148-6JG00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L
Highest safety class achievable for safety-related tripping of standard modules • Performance level according to ISO 13849-1 • Category according to ISO 13849-1 • SIL acc. to IEC 62061			PL d Cat. 3 SIL 2
Use in hazardous areas • Explosion protection category for gas • Explosion protection category for dust	ATEX II 3G Ex nA II T4 ATEX II 3D Ex tc IIIC T90°C Dc	ATEX II 3G Ex nA II T4 ATEX II 3D Ex tc IIIC T90°C Dc	ATEX, UKEX, IECEx, CCCEX for Zone 2 ATEX, UKEX, IECEx, CCCEX for Zone 22
Product functions / security			
signed firmware update			Yes
safely removing data			Yes
Ambient conditions			
Ambient temperature during operation • min. • max.			-40 °C 60 °C
Altitude during operation relating to sea level • Ambient air temperature-barometric pressure-altitude			Up to max. 5 000 m, at installation height > 2 000 m additional restrictions, see manual for details
connection method			
Design of electrical connection		3/5-pin M12 round connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs			M12, 5-pin, A-coded
Design of electrical connection for supply voltage			M12, 4-pin, L-coded
Dimensions			
Width	60 mm	30 mm	45 mm
Height	175 mm	200 mm	200 mm
Depth	49 mm	49 mm	48 mm
Weights			
Weight, approx.	910 g	550 g	780 g

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
General information		
Product function • Isochronous mode • Prioritized startup	No Yes	No Yes
Engineering with • STEP 7 TIA Portal configurable/ integrated from version • PROFINET from GSD version/ GSD revision • Multi Fieldbus Configuration Tool (MFCT)	STEP 7 V17 or higher with HSP 0378 GSDML V2.3.x V1.4.1 or higher	STEP 7 V17 or higher with HSP 0378 GSDML V2.3.x V1.4.1 or higher
Operating mode • IO-Link • DI • Counter • DQ • MSI • MSO	Yes Yes No Yes Yes Yes	Yes Yes No Yes Yes Yes
Supply voltage		
Load voltage 1L+ • Rated value (DC) • Reverse polarity protection	24 V Yes; against destruction	24 V Yes; against destruction

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
Current consumption (rated value)	70 mA; without load	70 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value	12 A; Maximum value
Encoder supply		
Number of outputs	8	4
Hardware configuration		
Submodules		
• Number of configurable submodules, max.	10	6
Digital inputs		
Number of digital inputs	8; Parameterizable as DIQ	12; Parameterizable as DIQ
• in groups of	8	4
Digital inputs, parameterizable	Yes	Yes
Source/sink input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
all mounting positions		
- up to 60 °C, max.	8	12
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA	2.5 mA
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length		
• unshielded, max.	30 m	30 m
Digital outputs		
Number of digital outputs	8; Parameterizable as DIQ	12; Parameterizable as DIQ
• in groups of	8	2 load groups for 4 or 8 outputs each
Current-sourcing	Yes	Yes
output type acc. to IEC 61131, type 0.5	Yes	Yes
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	0.5 A: typ. 1L+ (-70 V)	0.5 A: Type 1L+ (-70 V) / 2 A: Type (-18 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A / 2 A
• with inductive load, max.	0.5 A	0.5 A / 2 A
• on lamp load, max.	5 W	0.5 A: 5 W / 2 A 10 W
Load resistance range		
• lower limit	48 Ω	0.5 A: 48 ohms / 2 A: 12 ohms
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.	1L+ (-0.8V)	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A / 2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
Switching frequency		
• with resistive load, max.	100 Hz	0.5 A: 100 Hz / 2 A: 40 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz
Total current of the outputs		
• Current per group, max.	1L+: 4 A	1L+: 2 A / 2L+: 5.5 A
• Current per module, max.	4 A	7.5 A
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
IO-Link		
Number of ports	8	4
• of which simultaneously controllable	8	4
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1	Yes	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms	2 ms
Size of process data, input per port	33 byte	33 byte
Size of process data, input per module	264 byte	132 byte
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	256 byte	128 byte
Memory size for device parameter	2 kbyte; for each port	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function	Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Connection of IO-Link devices		
• Port type A	Yes; via 3-core cable	Yes; via 3-core cable
• Port type B	No	No
• via three-wire connection	Yes	Yes
Interfaces		
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types		
• M12 port	Yes; 2x M12, 4-pin, D-coded	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2	2
• integrated switch	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• Open IE communication	Yes	Yes
Interface types		
M12 port		
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFIsafe	No	No
EtherNet/IP	Yes	Yes
Modbus TCP	Yes	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
PROFINET IO Device		
Services		
- IRT	Yes; 250 µs to 4 ms in 125 µs frame	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	2	2
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes
• PROFINET system redundancy (R1)	No	No
• H-Sync forwarding	Yes	Yes
Media redundancy		
- MRP	Yes	Yes
EtherNet/IP		
Services		
- CIP Implicit Messaging	Yes	Yes
- CIP Explicit Messaging	Yes	Yes
- CIP Safety	No	No
- Shared device	Yes; 2x EtherNet/IP Scanner	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2	2
Updating times		
- Requested Packet Interval (RPI)	2 ms	2 ms
Redundancy mode		
- DLR (Device Level Ring)	No	No
Address area		
- Address space per module, max.	300 byte	300 byte
- LargeForwardOpen (Class3)	No	No
Modbus TCP		
Services		
- read coils (code=1)	Yes	Yes
- read discrete inputs (code=2)	Yes	Yes
- Read Holding Registers (Code=3)	Yes	Yes
- write single coil (code=5)	Yes	Yes
- write multiple coils (code=15)	Yes	Yes
- Write Multiple Registers (Code=16)	Yes	Yes
- Parameter change by master	No	No
- Modbus TCP Security Protocol	No	No
Address space per station		
- Address space per station, max.	300 byte	300 byte
- Access-consistent address space	2 byte	2 byte
Updating time		
- I/O request interval	2 ms	2 ms
Connections		
- number of connections per device	12	12
Open IE communication		
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes	Yes
• LLDP	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/status information		
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
Diagnoses		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
- parameterizable	Yes	Yes
• Wire-break	Yes; DI, input current < 0.3 mA, per channel	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit encoder supply	Yes; Per channel	Yes; Per channel
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)		Yes; green LED
• NS LED	Yes; green/red LED	Yes; green/red LED
• MS LED	Yes; green/red LED	Yes; green/red LED
• IO LED	Yes; red-green-yellow LED	Yes; red-green-yellow LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• For load voltage monitoring	Yes; green LED	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link	Yes; green LED, only link
Potential separation		
between the load voltages	Yes	Yes
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	Yes
• between the channels and the power supply of the electronics		8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection		
IP degree of protection	IP65/67/69K	IP65/67/69K
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; from FS01	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Use in hazardous areas		
• Explosion protection category for gas	ATEX, UKEX, IECEx, CCCEX for Zone 2	ATEX, UKEX, IECEx, CCCEX for Zone 2
• Explosion protection category for dust	ATEX, UKEX, IECEx, CCCEX for Zone 22	ATEX, UKEX, IECEx, CCCEX for Zone 22
Product functions / security		
signed firmware update	Yes	Yes
safely removing data	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded	M12, 4-pin, L-coded

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

I/O devices > IO-Link master

Technical specifications

Article number	6ES7148-6JJ00-0BB0 ET 200eco PN, CM 8x IO-Link, M12-L	6ES7148-6JE00-0BB0 ET 200eco PN, CM 4x IO-Link, M12-L
Dimensions		
Width	45 mm	45 mm
Height	200 mm	200 mm
Depth	48 mm	48 mm
Weights		
Weight, approx.	780 g	780 g

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

Accessories > Mounting rail

Overview



- Aluminum mounting rail for installation of SIMATIC ET 200eco PN
- Securing the I/O devices via two profile screws
- Length of mounting rail 0.5 m

Ordering data

Article No.

Mounting rail for ET 200eco PN Length 0.5 m	6ES7194-6GA00-0AA0
Profile screw for mounting rail For fixing the I/O devices on the mounting rail; 50 units	6ES7194-6MA00-0AA0

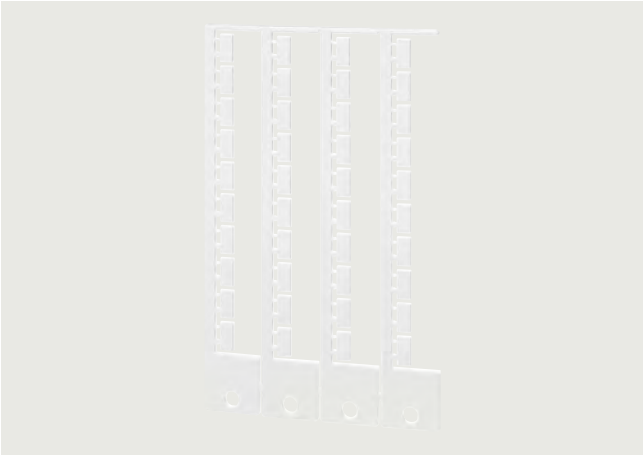
Technical specifications

Article number	6ES7194-6GA00-0AA0 Mounting BAR for ET200eco PN
Dimensions	
Width	500 mm
Height	203 mm
Depth	20 mm
Weights	
Weight, approx.	2.06 kg

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

Accessories > Labels

Overview



- Labels for channel and device labeling of the ET 200eco PN components

Ordering data

Article No.

Labels 10 mm x 5 mm RAL9016 For I/O devices with 2x M12 L-coded power connectors; 5 frames with 40 labels each	6ES7194-2BA00-0AA0
Labels 10 x 7 mm Ti-grey For I/O devices with 2x M12 A-coded power connectors; 5 frames with 40 labels each	3RT2900-1SB10
Labels 10 mm x 7 mm yellow For I/O devices with 2x M12 A-coded power connectors; 17 frames with 48 labels each	6ES7194-6HA00-0AA0

I/O systems
SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200eco PN

Accessories > Connector cover

Overview



- Stainless steel connector cover for ET 200ecoPN M12-L
- Optional use in hazardous area zone 2 / 22
- Can be used as protection against shocks and unintentional disconnection of cables

Ordering data

Stainless steel connector cover,
For using ET 200eco PN M12-L in
hazardous area zone 2 / 22

Article No.

6ES7194-6JA00-0BB0

Technical specifications

Article number	6ES7194-6JA00-0BB0 Connector cover for ET200ecoPN M12-L
General information	
Product description	connector cover for ET200ecoPN M12-L
Suitability for use	accessories for use of the ET200ecoPN M12-L in hazardous area Zone 2/22
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during assembly, min.	-40 °C
Ambient temperature during assembly, max.	80 °C
Ambient temperature during operation	
• min.	-40 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	80 °C
Mechanics/material	
Material of housing	stainless steel with plastic edge protection
Material property	
• Silicone-free	Yes
Dimensions	
Width	50 mm
Height	200 mm
Depth	110 mm
Weights	
Weight, approx.	710 g

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200clean

Overview



- Compact I/O devices in hygienic design for processing digital and IO-Link signals
- For connection to bus systems with Ethernet-based protocols PROFINET, EtherNet/IP, and Modbus TCP
- Very robust and chemically resistant plastic enclosure in hygienic design
- Cabinet-free installation in degree of protection IP65/67/69K with M12 connection system
- Trapezoidal enclosure shape of the I/O devices:
60/80 mm x 204 mm x 54 mm (W x H x D) with
8 x M12 for digital signals and IO-Link
- Ambient temperature range -30 °C to 55 °C
- Operation on high-availability S7-1500 R/H or S7-400H controllers possible
- Channel-specific diagnostics
- Identification and maintenance data
- Firmware update
- Security functions
- QR code identification link (ID-Link) for unambiguous identification of the product
- I/O device variants:
 - DI 16x 24 V DC, 8x M12
 - DIQ 16x 24 V DC/0.5 A, 8x M12
 - CM 8x IO-Link + DIQ 4x 24 V DC, 8x M12

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200clean

I/O devices > Digital I/O devices

Overview



Digital I/O devices in hygienic design for connecting sensors/actuators:

- 16 digital input signals with 8 x M12 connection
- 16 digital input/output signals 0.5 A with 8 x M12 connection

Ordering data

Article No.

Digital input modules

SIMATIC ET 200clean, DI 16x24 V DC

8x M12, dual assignment,
input type 3 (IEC 61131),
sinking input (PNP),
input delay 0.05..20 ms,
channel diagnostics for:
wire break at the input,
short-circuit encoder supply,
0.25 ms isochronous mode,
MSI, MRP, S2 redundancy,
I&M0...4, MultiFieldbus, PN IO,
Ethernet IP, Modbus TCP,
degree of protection IP69K

6ES7141-7BH00-0BB0

Digital input/output modules

SIMATIC ET 200clean, DIQ 16x 24 V DC/0.5 A

8x M12, dual assignment,
input type 3 (IEC 61131),
sinking input (PNP),
input delay 0.05..20 ms,
sourcing output (PNP),
substitute value output,
channel diagnostics for:
wire break at the input,
short-circuit encoder supply,
short-circuit at the output,
MSI, MSO, MRP, S2 redundancy,
I&M0...4, MultiFieldbus, PN IO,
Ethernet IP, Modbus TCP,
degree of protection IP69K

6ES7143-7BH00-0BB0

Technical specifications

Article number	6ES7141-7BH00-0BB0
	ET 200clean, DI 16x24VDC
General information	
Product function	
• Isochronous mode	Yes
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V19 or higher with HSP 0414
• PROFINET from GSD version/ GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5.x or higher
Operating mode	
• DI	Yes
• Counter	No
• MSI	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	85 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Hardware configuration	
Submodules	
• Number of configurable submodules, max.	2

Article number	6ES7141-7BH00-0BB0
	ET 200clean, DI 16x24VDC
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 55 °C, max.	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
• unshielded, max.	30 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Interfaces	
Number of PROFINET interfaces	1

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200clean

I/O devices > Digital I/O devices

Technical specifications

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes
PROFINET IO Device	
Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
Media redundancy	
- MRP	Yes
EtherNet/IP	
Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
Updating times	
- Requested Packet Interval (RPI)	2 ms
Redundancy mode	
- DLR (Device Level Ring)	No
Address area	
- Address space per module, max.	20 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
Address space per station	
- Address space per station, max.	20 byte
- Access-consistent address space	2 byte

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
Updating time	
- I/O request interval	2 ms
Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes
Isochronous mode	
Equidistance	Yes
shortest clock pulse	250 µs
max. cycle	4 ms
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Wire-break	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit encoder supply	Yes; Per channel group
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Product functions / security	
signed firmware update	Yes
safely removing data	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200clean

I/O devices > Digital I/O devices

Technical specifications

Article number	6ES7141-7BH00-0BB0 ET 200clean, DI 16x24VDC
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Mechanics/material	
Material	housing: PBT; seal: MVQ (silicone); bushing / metal parts: 1.4404 (stainless steel)
Dimensions	
Width	80 mm
Height	205 mm
Depth	54 mm
Weights	
Weight, approx.	260 g
Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
General information	
Product function	
• Isochronous mode	No
• IRT	Yes
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V19 or higher with HSP 0414
• PROFINET from GSD version/ GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5.x or higher
Operating mode	
• DI	Yes
• Counter	No
• DQ	Yes
• MSI	Yes
• MSO	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current	
Current consumption (rated value)	95 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
Hardware configuration	
Submodules	
• Number of configurable submodules, max.	2
Digital inputs	
Number of digital inputs	16; Parameterizable as DIQ
• in groups of	8
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 55 °C, max.	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage) for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
• unshielded, max.	30 m
Digital outputs	
Number of digital outputs	16; Parameterizable as DIQ
• in groups of	8; 2 load groups for 8 outputs each
Current-sourcing	Yes
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	typ. L+ (-70 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• with inductive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	1L+ (-0.8 V) / 2L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	4 A
• Current per module, max.	8 A

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200clean

I/O devices > Digital I/O devices

Technical specifications

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
Cable length • unshielded, max.	30 m
Encoder Connectable encoders • 2-wire sensor - permissible quiescent current (2-wire sensor), max.	Yes 1.5 mA
Interfaces Number of PROFINET interfaces	1
1. Interface Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types • M12 port • Number of ports • integrated switch	Yes; 2x M12, 4-pin, D-coded 2 Yes
Protocols • PROFINET IO Device • Open IE communication	Yes Yes
Interface types M12 port • Autonegotiation • Autocrossing • Transmission rate, max.	Yes Yes 100 Mbit/s
Protocols Supports protocol for PROFINET IO PROFIsafe EtherNet/IP Modbus TCP	Yes No Yes Yes
PROFINET IO Device Services - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.	Yes; 250 µs to 4 ms in 125 µs frame Yes Yes 2
Redundancy mode • PROFINET system redundancy (S2) • PROFINET system redundancy (R1) • H-Sync forwarding	Yes No Yes
Media redundancy - MRP	Yes
EtherNet/IP Services - CIP Implicit Messaging - CIP Explicit Messaging - CIP Safety - Shared device - Number of scanners with shared device, max.	Yes Yes No Yes; 2x EtherNet/IP Scanner 2
Updating times - Requested Packet Interval (RPI)	2 ms
Redundancy mode - DLR (Device Level Ring)	No
Address area - Address space per module, max. - LargeForwardOpen (Class3)	20 byte No

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
Modbus TCP Services - read coils (code=1) - read discrete inputs (code=2) - Read Holding Registers (Code=3) - write single coil (code=5) - write multiple coils (code=15) - Write Multiple Registers (Code=16) - Parameter change by master - Modbus TCP Security Protocol	Yes Yes Yes Yes Yes Yes No No
Address space per station - Address space per station, max. - Access-consistent address space	20 byte 2 byte
Updating time - I/O request interval	2 ms
Connections - number of connections per device	12
Open IE communication • TCP/IP • SNMP • LLDP • ARP	Yes; (only EtherNet/IP or Modbus TCP) Yes Yes Yes
Interrupts/diagnostics/ status information Substitute values connectable	Yes
Alarms • Diagnostic alarm • Maintenance interrupt • Hardware interrupt	Yes; Parameterizable Yes; Parameterizable Yes; Parameterizable
Diagnoses • Diagnostic information readable • Monitoring the supply voltage - parameterizable • Wire-break • Short-circuit • Short-circuit encoder supply	Yes Yes Yes Yes; DI, input current < 0.3 mA, per channel Yes; Outputs to M and P; channel by channel Yes; Per channel group
Diagnostics indication LED • RUN LED • ERROR LED • MAINT LED • NS LED • MS LED • IO LED • Channel status display • for channel diagnostics • For load voltage monitoring • Connection display LINK TX/RX	Yes; green LED Yes; red LED Yes; Yellow LED Yes; green/red LED Yes; green/red LED Yes; red/green/yellow LEDs Yes; green LED Yes; red LED Yes; green LED Yes; green LED, only link
Potential separation between the load voltages between Ethernet and electronics	Yes Yes
Potential separation channels • between the channels • between the channels, in groups of • between the channels and the power supply of the electronics	Yes 8 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200clean

I/O devices > Digital I/O devices

Technical specifications

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Product functions / security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions

Article number	6ES7143-7BH00-0BB0 ET 200clean, DIQ 16x24VDC/0,5A
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Mechanics/material	
Material	housing: PBT; seal: MVQ (silicone); bushing / metal parts: 1.4404 (stainless steel)
Dimensions	
Width	80 mm
Height	205 mm
Depth	54 mm
Weights	
Weight, approx.	260 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200clean

I/O devices > IO-Link master

Overview



IO-Link master in hygienic design for connecting sensors/actuators:

- 4x port Class A and 4x port Class B, as well as additionally 4 digital input/output signals 0.5 A with 8xM12 connection

Ordering data

Article No.

**SIMATIC ET 200clean,
CM 8x IO-Link + DIQ 4x 24 V DC**

8x M12, 4x port Class A +
4x port Class B,
channel diagnostics,
shared device with 2 controllers,
MRP, S2 redundancy, I&M0...4,
MultiFieldbus, PN IO,
Ethernet IP, Modbus TCP,
degree of protection IP69K

6ES7148-7JH00-0BB0

Technical specifications

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
General information	
Product function	
• Isochronous mode	No
• Prioritized startup	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V19 or higher with HSP 0414
• PROFINET from GSD version/ GSD revision	GSDML V2.4.x
• Multi Fieldbus Configuration Tool (MFCT)	V1.5.x
Operating mode	
• IO-Link	Yes
• DI	Yes
• DQ	Yes
• MSI	Yes
• MSO	Yes
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
Input current	
Current consumption (rated value)	100 mA; without load
from load voltage 1L+ (unswitched voltage)	12 A; Maximum value
from load voltage 2L+, max.	12 A; Maximum value
Encoder supply	
Number of outputs	8
Actuator supply	
Number of outputs	4
Hardware configuration	
Submodules	
• Number of configurable submodules, max.	10
Digital inputs	
Number of digital inputs	4; Parameterizable as DIQ
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Number of simultaneously controllable inputs	
all mounting positions	
- up to 55 °C, max.	4
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.4 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length	
• unshielded, max.	30 m
Digital outputs	
Number of digital outputs	4; Parameterizable as DIQ
output type acc. to IEC 61131, type 0.5	Yes
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	typ. 1L+ (-70 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• with inductive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	1L+ (-0.8V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	1 Hz

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200clean

I/O devices > IO-Link master

Overview

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
Total current of the outputs	
• Current per group, max.	1L+: 2 A
• Current per module, max.	2 A
Cable length	
• unshielded, max.	30 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
IO-Link	
Number of ports	8
• of which simultaneously controllable	8
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Cycle time, min.	2 ms
Size of process data, input per port	33 byte
Size of process data, input per module	264 byte
Size of process data, output per port	32 byte
Size of process data, output per module	256 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	possible with LIOLink_Master function block
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; additional device supply: max. 2 A per port, max. 6 A per module
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
Interface types	
• M12 port	Yes; 2x M12, 4-pin, D-coded
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
Interface types	
M12 port	
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	No
EtherNet/IP	Yes
Modbus TCP	Yes

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
PROFINET IO Device	
Services	
- IRT	Yes; 250 µs to 4 ms in 125 µs frame
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	2
Redundancy mode	
• PROFINET system redundancy (S2)	Yes
• PROFINET system redundancy (R1)	No
• H-Sync forwarding	Yes
Media redundancy	
- MRP	Yes
EtherNet/IP	
Services	
- CIP Implicit Messaging	Yes
- CIP Explicit Messaging	Yes
- CIP Safety	No
- Shared device	Yes; 2x EtherNet/IP Scanner
- Number of scanners with shared device, max.	2
Updating times	
- Requested Packet Interval (RPI)	2 ms
Redundancy mode	
- DLR (Device Level Ring)	No
Address area	
- Address space per module, max.	300 byte
- LargeForwardOpen (Class3)	No
Modbus TCP	
Services	
- read coils (code=1)	Yes
- read discrete inputs (code=2)	Yes
- Read Holding Registers (Code=3)	Yes
- write single coil (code=5)	Yes
- write multiple coils (code=15)	Yes
- Write Multiple Registers (Code=16)	Yes
- Parameter change by master	No
- Modbus TCP Security Protocol	No
Address space per station	
- Address space per station, max.	300 byte
- Access-consistent address space	2 byte
Updating time	
- I/O request interval	2 ms
Connections	
- number of connections per device	12
Open IE communication	
• TCP/IP	Yes; (only EtherNet/IP or Modbus TCP)
• SNMP	Yes
• LLDP	Yes
• ARP	Yes

I/O systems

SIMATIC ET 200 systems without control cabinet

SIMATIC ET 200clean

I/O devices > IO-Link master

Overview

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Maintenance interrupt	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes
- parameterizable	Yes
• Wire-break	Yes; DI, input current < 0.3 mA, per channel
• Short-circuit	Yes; Outputs to M and P; channel by channel
• Short-circuit encoder supply	Yes; Per channel
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• NS LED	Yes; green/red LED
• MS LED	Yes; green/red LED
• IO LED	Yes; red/green/yellow LEDs
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• For load voltage monitoring	Yes; green LED
• Connection display LINK TX/RX	Yes; green LED, only link
Potential separation	
between the load voltages	Yes
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
• between the channels and the power supply of the electronics	No

Article number	6ES7148-7JH00-0BB0 ET 200clean, CM 8x IO-Link
Degree and class of protection	
IP degree of protection	IP65/67/69K
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; from FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SIL acc. to IEC 62061	SIL 2
Product functions / security	
signed firmware update	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C
• max.	55 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Up to max. 5 000 m, at installation height > 2 000 m additional restrictions, see manual for details
connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Design of electrical connection for the inputs and outputs	M12, 5-pin, A-coded
Design of electrical connection for supply voltage	M12, 4-pin, L-coded
Mechanics/material	
Material	housing: PBT; seal: MVQ (silicone); bushing / metal parts: 1.4404 (stainless steel)
Dimensions	
Width	80 mm
Height	205 mm
Depth	54 mm
Weights	
Weight, approx.	280 g

I/O systems

SIMATIC ET 200 systems without control cabinet
SIMATIC ET 200clean

Accessories

Overview

For use in systems with increased hygienic requirements, specific mounting accessories are available.

Material transitions and contact surfaces of the accessories are provided with a hygienic seal that prevents the accumulation of dirt, bacteria and other microorganisms when installed.

Sealing cap

Sealing cap M12 in hygienic design and with degree of protection IP69K, for sealing open M12 sockets of the ET 200clean I/O devices.

Fixing screw

Fixing screw M5x50mm as stainless steel version, for mounting the ET 200clean I/O devices on conductive surfaces.

Ordering data

Article No.

Sealing cap M12 for ET 200clean Plastic version, hygienic seal, for degree of protection IP69K, 10 units per packing unit	6ES7194-7JA00-0AA0
Fixing screw M5x50mm for ET 200clean Stainless steel version, hygienic seal, 10 units per packing unit	6ES7194-7MA00-0AA0

I/O systems

PROFIBUS components

Diagnostics

Diagnostic repeater for PROFIBUS DP

Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slaves (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbps to 12 Mbps
- Connection via FastConnect using IDC

Ordering data

Article No.

Article No.

RS 485 diagnostic repeater

For connection of up to 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus cables

6ES7972-0AB01-0XA0

Accessories

RS 485 bus connector with 90° cable outlet

With screw-type connections, max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

6ES7972-0BA12-0XA0
6ES7972-0BB12-0XA0

PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet

With insulation displacement terminals, max. transfer rate 12 Mbps

Without PG interface

- 1 unit
- 100 units

6ES7972-0BA52-0XA0
6ES7972-0BA52-0XB0

With PG interface

- 1 unit
- 100 units

6ES7972-0BB52-0XA0
6ES7972-0BB52-0XB0

Without PG interface, grounding via control cabinet cover

- 1 unit

6ES7972-0BA70-0XA0

With PG interface, grounding via control cabinet cover

- 1 unit

6ES7972-0BB70-0XA0

RS 485 bus connector with angled cable outlet (35°)

With screw-type connections, max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

6ES7972-0BA42-0XA0
6ES7972-0BB42-0XA0

PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°)

With insulation displacement terminals, max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

6ES7972-0BA61-0XA0
6ES7972-0BB61-0XA0

PROFIBUS FastConnect stripping tool

Pre-adjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables

6GK1905-6AA00

PROFIBUS FC standard cable

Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m

6XV1830-0EH10

SIMATIC Manual Collection DL in 5 languages

All manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT

Consignee email address required for delivery.

6ES7998-8XE01-8YE0

SIMATIC Manual Collection DL in 5 languages

Software Update Service (SUS); within the framework of this contract, you will receive all current software versions as a download for one year. The contract is automatically extended by 1 year unless it is canceled 3 months before expiration. Delivery and service period: 1 year from date of invoice

Consignee email address required for delivery.

6ES7998-8XE01-8YE2

Connecting cable for PROFIBUS

12 Mbps, for PG connection to PROFIBUS DP, pre-assembled with 2 x 9-pin sub D plug, 3.0 m

6ES7901-4BD00-0XA0

Diagnostic repeater for PROFIBUS DP

Technical specifications

Article number	6ES7972-0AB01-0XA0 Diagnostic repeater f. PROFIBUS-DP,
Supply voltage	
Rated value (DC)	24 V
Power loss	
Power loss, typ.	4 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C

Article number	6ES7972-0AB01-0XA0 Diagnostic repeater f. PROFIBUS-DP,
connection method	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	FastConnect insulation displacement, 10 clamping cycles possible
Dimensions	
Width	80 mm
Height	125 mm
Depth	67.5 mm
Weights	
Weight, approx.	300 g

SIPLUS diagnostic repeater for PROFIBUS

Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbps to 12 Mbps
- Connection via FastConnect IDC

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data	Article No.
SIPLUS RS 485 diagnostic repeater For connection of up to 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus cables Exposure to environmental substances	6AG1972-0AB01-4XA0
Accessories	
RS 485 bus connector with 90° cable outlet Max. transfer rate 12 Mbps Extended temperature range and exposure to environmental substances • Without PG interface • With PG interface	6AG1972-0BA12-2XA0 6AG1972-0BB12-2XA0
RS 485 bus connector with angled cable outlet (Extended temperature range - 40 °C ... +70 °C and exposure to environmental substances) Max. transfer rate 12 Mbps • Without PG interface • With PG interface	6AG1972-0BA42-7XA0 6AG1972-0BB42-7XA0
Other accessories	See SIMATIC RS 485 diagnostic repeater, page 3/557

I/O systems**PROFIBUS components****Diagnostics****SIPLUS diagnostic repeater for PROFIBUS****Technical specifications**

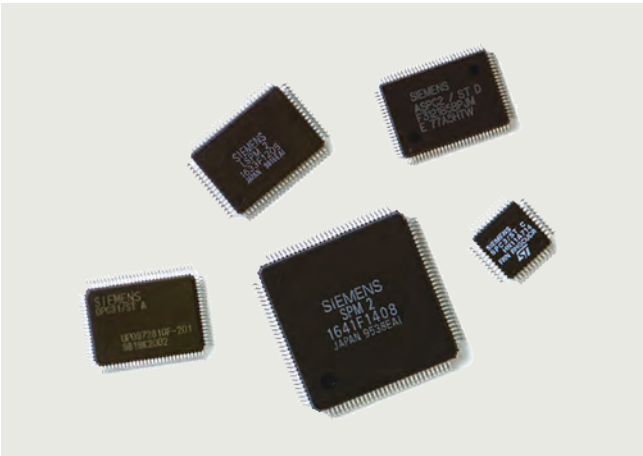
Article number	6AG1972-0AB01-4XA0
Based on	6ES7972-0AB01-0XA0 SIPLUS DP diagnostic repeater
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *

Article number	6AG1972-0AB01-4XA0
Based on	6ES7972-0AB01-0XA0 SIPLUS DP diagnostic repeater
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems
PROFIBUS components

PROFIBUS DP ASICs

Overview



- Easy connection of field devices to PROFIBUS
- Integrated low-power management
- Different ASICs for the different functional requirements and application areas

Ordering data

ASIC ASPC2

For constructing master interface modules (quantity discount)

- 6 units (lead-free)
- 66 units (lead-free)
- 660 units (lead-free)
- 4620 units (lead-free)

Article No.

6ES7195-0AA05-0XA0
6ES7195-0AA15-0XA0
6ES7195-0AA25-0XA0
6ES7195-0AA35-0XA0

ASIC SPC3

For constructing intelligent DP slave interface modules (quantity discount)

- 6 units (lead-free)
- 96 units (lead-free)
- 960 units (lead-free)
- 4800 units (lead-free)
- 750 units (lead-free) (tape & reel)

6ES7195-0BD04-0XA0
6ES7195-0BD14-0XA0
6ES7195-0BD24-0XA0
6ES7195-0BD34-0XA0
6ES7195-0BD44-0XA0

Article No.

ASIC DPC31 STEP C1

For constructing intelligent DP slave interface modules (quantity discount)

- 6 units (lead-free)
- 66 units (lead-free)
- 660 units (lead-free)
- 4620 units (lead-free)

6ES7195-0BF02-0XA0
6ES7195-0BF12-0XA0
6ES7195-0BF22-0XA0
6ES7195-0BF32-0XA0

ASIC SPC 4-2

For constructing intelligent DP slave interface modules (quantity discount)

- 5 units for laboratory development (lead-free)
- 160 units (lead-free, 1 tray)

6GK1588-3AA00
6GK1588-3AA15

I/O systems

PROFIBUS components

PROFIBUS DP ASICs

Technical specifications

	LSPM2	SPC3	DPC31
Protocol	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP, PROFIBUS PA
Application range	Simple slave application	Intelligent slave application	Intelligent slave application
Transmission rate, max.	12 Mbps	12 Mbps	12 Mbps
Bus access	in ASIC	in ASIC	in ASIC
Automatic determination of transmission rate	Yes	Yes	Yes
Microprocessor required	No	Yes	integrated
Scope of firmware	not required	6 to 24 KB	Approx. 38 KB
Message buffer	-	1.5 KB	6 KB
Power supply	5 V DC	5 V DC	3.3 V DC
Power loss, max.	0.35 W	0.5 W	0.2 W
Permissible ambient temperature	-40 °C to +75 °C	-40 °C to +85 °C	-40 °C to +85 °C
Enclosure	MQFP, 80-pin	PQFP, 44-pin	PQFP, 100-pin
Frame size	4 cm ²	2 cm ²	4 cm ²
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

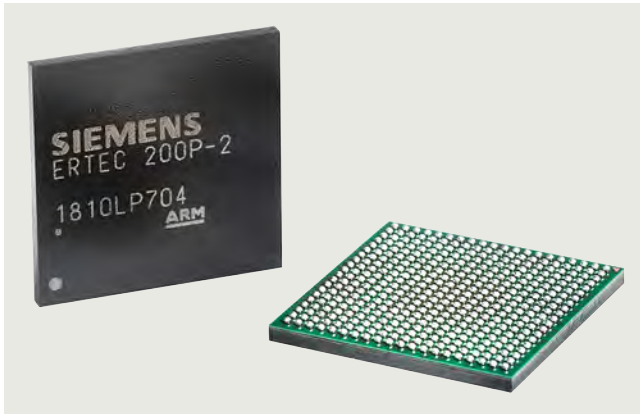
	SPC 4-2	ASPC2	SIM 1-2
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA
Application range	Intelligent slave application	Master application	Medium Attachment
Transfer rate, max.	12 Mbps	12 Mbps	31.25 Kbps
Bus access	in ASIC	in ASIC	-
Automatic determination of transfer rate	Yes	Yes	-
Microprocessor required	Yes	Yes	-
Scope of firmware	3 to 30 KB	80 KB	not required
Message buffer	3 KB	1 MB (external)	-
Power supply	5 V DC, 3.3 V	5 V DC	via bus
Power loss, max.	0.6 W at 5V 0.01 W at 3.3 V	0.9 W	0.05 W
Permissible ambient temperature	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Enclosure	TQFP, 44-pin	P-MQFP, 100-pin	MLPQ, 40-pin
Frame size	2 cm ²	4 cm ²	36 mm ²
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000

I/O systems

PROFINET components

ERTEC Enhanced Real-Time Ethernet Controller

Overview



Innovative and well-proven

As a dedicated PI member, Siemens has been actively advancing the development of PROFINET from the beginning. Siemens technology components benefit from the accumulated know-how. They have been field-proven in countless products, provide maximum performance capability and can be scaled to exact requirements.

And that is not all. Siemens Competence Centers offer advice for choosing the right technology component for the device, training opportunities and support throughout the development process, up to and including successful certification.

ERTEC 200P-2 – Your path to the fastest PROFINET

The ERTEC 200P-2 (Enhanced Real-Time Controller) sets new standards for communication. Designed for cycle times as low as 125 μ s, the performance upgrade for PROFINET has been integrated in the ERTEC 200P-2. With its 250 MHz ARM9 CPU and integrated IRT (isochronous real-time) switch, field devices with demanding performance requirements can be implemented. The reduced chip size simplifies integration into compact field devices. The CPU also allows integration of a user's own applications, which makes an external host CPU unnecessary depending on the application.

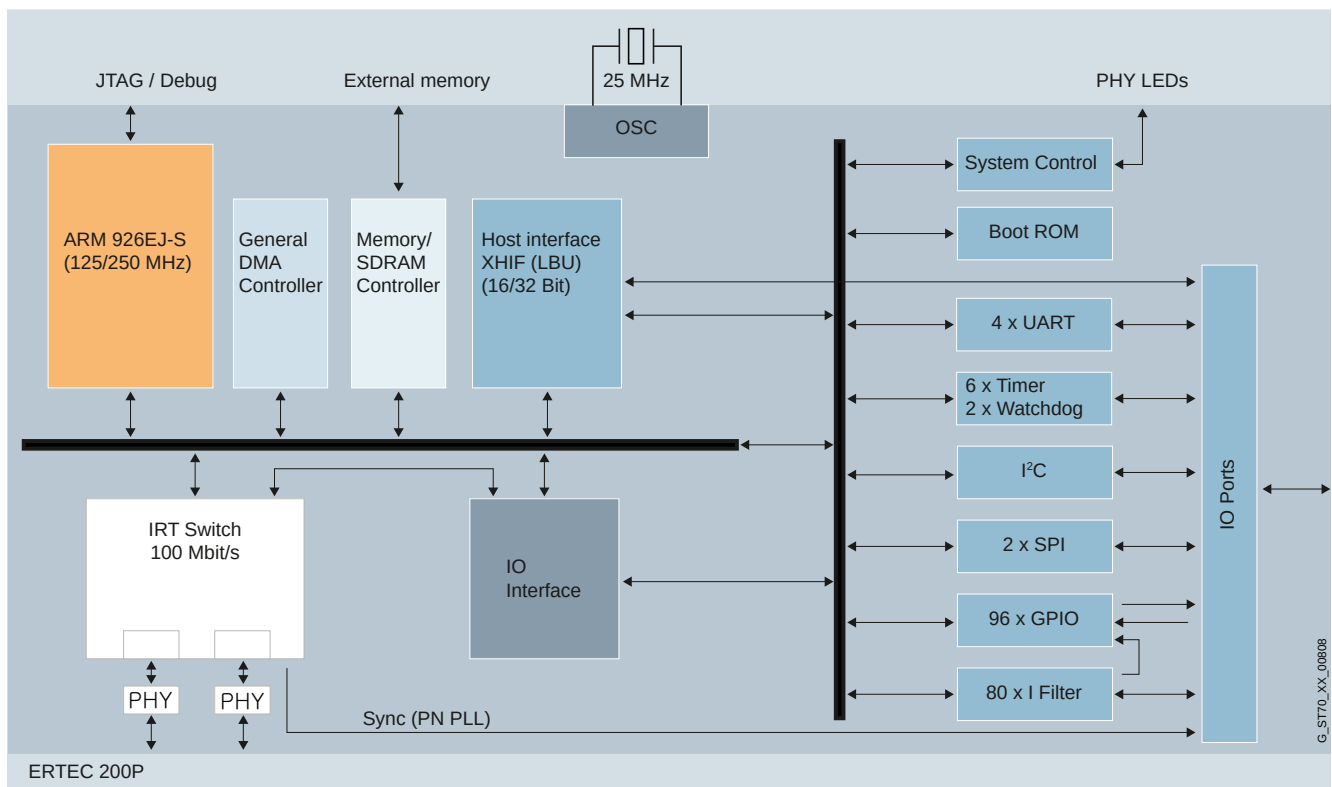
Development kit for ERTEC 200P-2

The development kit includes an evaluation board with sample applications so that commissioning can be completed in minimum time. The PROFINET stack is delivered as source code and includes the eCos open source real-time operating system and all development tools, analysis programs and documentation. Field devices with RT (real-time) and IRT (isochronous real-time) can be implemented with the ERTEC ASICs. The integrated switch allows the construction of field devices with two ports.

Functions:

- Isochronous mode
- Shared device for 4 controllers
- S2 system redundancy
- PROFINET performance upgrade with a minimum cycle time of 125 μ s.
- MRP/MRPD
- Regular, no-cost updates
- Current technology certificate

10



Internal structure of ERTEC 200P-2

I/O systems

PROFINET components

ERTEC Enhanced Real-Time Ethernet Controller

Ordering data

Article No.

ERTEC 200P-2

ASIC for connection to switched Ethernet 100 Mbps, Ethernet controller with integrated 2-port switch, ARM 926 processor and integrated PHYs; recommended for new developments

- 10 units (evaluation pack)
- 90 units (single tray)
- 450 units (drypack, 5 trays)
- 1 000 units (tape & reel)

6ES7195-0BH02-0XA0
6ES7195-0BH12-0XA0
6ES7195-0BH22-0XA0
6ES7195-0BH32-0XA0

PROFINET Device Development Kit for ERTEC 200P

6ES7195-3BE00-0YA1

ERTEC 200

ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs

- 70 units (single tray)
- 350 units (drypack, 5 trays)
- 3500 units (package, 10 drypacks)
- 1050 units (tape & reel)

6GK1182-0BB01-0AA1
6GK1182-0BB01-0AA2
6GK1182-0BB01-0AA3
6GK1182-0BB01-0AA4

ERTEC 400

ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integrated 4-port switch, ARM 946 processor and PCI interface (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO

- 70 units (single tray)
- 350 units (drypack, 5 trays)

6GK1184-0BB01-0AA1
6GK1184-0BB01-0AA2

Technical specifications

	ERTEC 200P-2
Integrated IRT switch	2-port
Integrated PHYs	Yes
Copper and fiber-optic cable supported	Yes
Minimum cycle time	125 µs
ARM CPU	ARM 926
Clock frequency	250 MHz
Configurable IOs, general purpose IOs	96
Enclosure size	17x17 mm
Ball pitch	0.8 mm

Development kits

Overview



With the development kits for PROFINET, compact or modular PROFINET field devices can be developed quickly and with little effort. Depending on the application, different development kits are available.

The development kits for the ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller) are suitable for the development of field devices with an integrated IRT switch (Isochronous Real-Time). The demand for real-time capability, linear topology capability, and for IT integration is therefore met perfectly.

With the help of the development kit for standard Ethernet controllers, PROFINET devices can be developed on the basis of a standard Ethernet controller. Devices with RT (Real-Time) can be implemented in the field device without special hardware.

The PROFIsafe starter kit permits the implementation of fail-safe devices. In so doing, the PROFIsafe stack applicatively builds on the PROFINET stack.

Ordering data

Article No.

ERTEC Development Kits / Evaluation Kits	
PROFINET Device Development Kit for ERTEC 200P	6ES7195-3BE00-0YA1
PROFIsafe starter kit V3.5 according to the PROFIsafe V2.6.1 profile	6ES7195-3BF03-0YA0
ERTEC ASICs	
ERTEC 200P-2	
ASIC for connection to Switched Ethernet 100 Mbps, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs	
• 10 units (evaluation pack) • 90 units (single tray) • 450 units (drypack, 5 trays) • 1 000 units (tape & reel)	6ES7195-0BH02-0XA0 6ES7195-0BH12-0XA0 6ES7195-0BH22-0XA0 6ES7195-0BH32-0XA0

I/O systems

PROFINET components

PROFINET driver

Overview

PROFINET driver for controllers

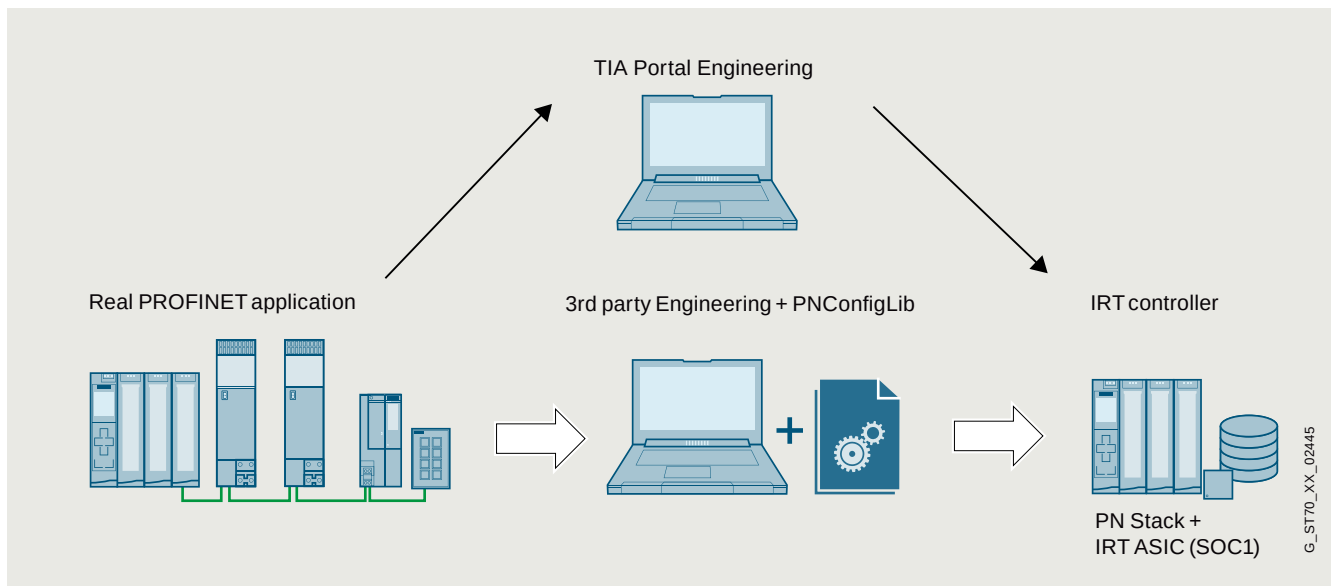
Reasonably priced components are a major competitive advantage, especially in series machine building. Here, users often develop in-house control software. For reasons of performance, flexibility and cost, the individual application is then implemented on standard PCs. The PROFINET driver supports this in-house development and requires no special hardware thanks to its conventional Ethernet interface.

Because the PROFINET driver is delivered as source code, proprietary solutions can be ported into various operating systems and hardware platforms. As a result, the PROFINET driver can also be optimally used in embedded systems for in-house controller solutions. Design and configuration is easy and takes place via an open XML interface without the need for engineering tools. The well-proven PROFINET stack from SIMATIC forms the centerpiece.

The PROFINET driver is suitable for both simple applications, such as individual PROFINET lines, as well as for complex machines. It supports PROFINET RT for cycle times starting from 1 ms via a standard Ethernet interface. Alternatively, PROFINET IRT can also be used for cycle times starting from 500 μ s, in connection with the CP1625 controller development kit.

PROFINET ConfigLib

PROFINET networks must be planned. This can be carried out for the PROFINET driver using the TIA Portal. A license is not required. ConfigLib is a standalone API for generating PROFINET hardware configurations. It can be used to create RT and IRT projects, whereby ConfigLib takes over the planning algorithm.



PNConfigLib – Efficient creation of hardware configurations without the TIA Portal

CP1625 Controller Development Kit

Siemens SOC1 gives you the hardware support required to build an IRT controller. The CP1625 Controller Development Kit is suitable for both standalone and host modes.

- Stand-alone mode: PN stack and application run on the CP1625
- Host mode: Application runs on the PC or, for example, ARM. The stack runs on the CP1625



SIMATIC CP1625

I/O systems
PROFINET components

PROFINET driver

Ordering data	Article No.
PROFINET driver For connecting distributed I/O and drives to user-specific control applications via PROFINET Development kit PROFINET controller and device for download; source code with example implementation, IRT controller in connection with CP1625 or CP1625 Dev (to be ordered separately); Consignee email address required for delivery SIMATIC CP1625 Development Board; PCIe card for PROFINET IRT Runtime licenses • 1 unit • 10 units • 50 units • 200 units • 500 units	6ES7195-3AA00-0YA1 6ES7648-2CF10-1BA0 6ES7195-3AA05-0XA0 6ES7195-3AA10-0XA0 6ES7195-3AA20-0XA0 6ES7195-3AA30-0XA0 6ES7195-3AA40-0XA0

I/O systems
Network components for PROFIBUS
Electrical networks (RS 485)

Active RS 485 terminating element

Overview



- Used to terminate bus segments at transfer rates of 9.6 Kbps to 12 Mbps
- Power supply independent of the bus nodes

Designed for Industry

- End-device independent bus termination thanks to own power supply

Ordering data	Article No.
Active RS 485 terminating element for PROFIBUS For terminating bus segments at transmission rates of 9.6 kbps to 12 Mbps	6ES7972-0DA00-0AA0

Technical specifications

Article number	6ES7972-0DA00-0AA0 RS485 Termin. resistor f. PROFIBUS/MPI,
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	30 mA
Power loss	
Power loss, max.	0.72 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at +25 °C
connection method	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	Screw terminal block
Dimensions	
Width	60 mm
Height	70 mm
Depth	43 mm
Weights	
Weight, approx.	95 g

I/O systems

Network components for PROFIBUS
Electrical networks (RS 485)

RS 485 repeater for PROFIBUS

Overview



- Automatic detection of transfer rates
- Transfer rates from 9.6 kbps to 12 Mbps are possible, incl. 45.45 kbps
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the expansion
- Galvanic isolation of segments
- Commissioning support
 - Switches for separation of segments
 - Bus activity display
 - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostic repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality.

Technical specifications

Article number	6ES7972-0AA02-0XA0 Repeater RS485 f. PROFIBUS/MPI
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
Power loss	
Power loss, typ.	0.7 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
IP degree of protection	IP20
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
connection method	
Design of electrical connection for supply voltage	Terminal module
Design of electrical connection for PROFIBUS cables	2 terminal blocks
Dimensions	
Width	45 mm
Height	128 mm
Depth	59.3 mm
Weights	
Weight, approx.	350 g

Ordering data

Article No.

RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbps,
24 V DC, IP20 enclosure

6ES7972-0AA02-0XA0

I/O systems

Network components for PROFIBUS

Electrical networks (RS 485)

SIPLUS DP active RS 485 terminating element

Overview



- Used to terminate bus segments at rates of 9.6 kbps to 12 Mbps
- Power supply independent of the bus participants

Designed for Industry

- End-device independent bus termination thanks to own power supply

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data

SIPLUS active RS 485 terminating element for PROFIBUS

To terminate bus segments at transfer rates of 9.6 kbps to 12 Mbps

Extended temperature range and exposure to environmental substances

Article No.

6AG1972-0DA00-2AA0

I/O systems

Network components for PROFIBUS
Electrical networks (RS 485)

SIPLUS DP active RS 485 terminating element

Technical specifications

Article number	6AG1972-0DA00-2AA0
Based on	6ES7972-0DA00-0AA0 SIPLUS DP RS485 terminator
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1972-0DA00-2AA0
Based on	6ES7972-0DA00-0AA0 SIPLUS DP RS485 terminator
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

Network components for PROFIBUS
Electrical networks (RS 485)

SIPLUS RS 485 repeater

Overview



- Automatic detection of transfer rates
- 45.45 kbps transfer rate is possible
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the number of participants and the expansion
- Galvanic isolation of segments
- Commissioning support
 - Switches for separation of segments
 - Bus activity display
 - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostic repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described in "Distributed I/O / Diagnostics / Diagnostic repeater for PROFIBUS DP".

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data

SIPLUS RS 485 repeater for PROFIBUS

Transfer rate up to max. 12 Mbps,
24 V DC, enclosure IP20

Extended temperature range and
exposure to environmental
substances

Article No.

6AG1972-0AA02-7XA0

I/O systems

Network components for PROFIBUS
Electrical networks (RS 485)

SIPLUS RS 485 repeater

Technical specifications

Article number	6AG1972-0AA02-7XA0
Based on	6ES7972-0AA02-0XA0 SIPLUS DP RS485 repeater
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1972-0AA02-7XA0
Based on	6ES7972-0AA02-0XA0 SIPLUS DP RS485 repeater
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

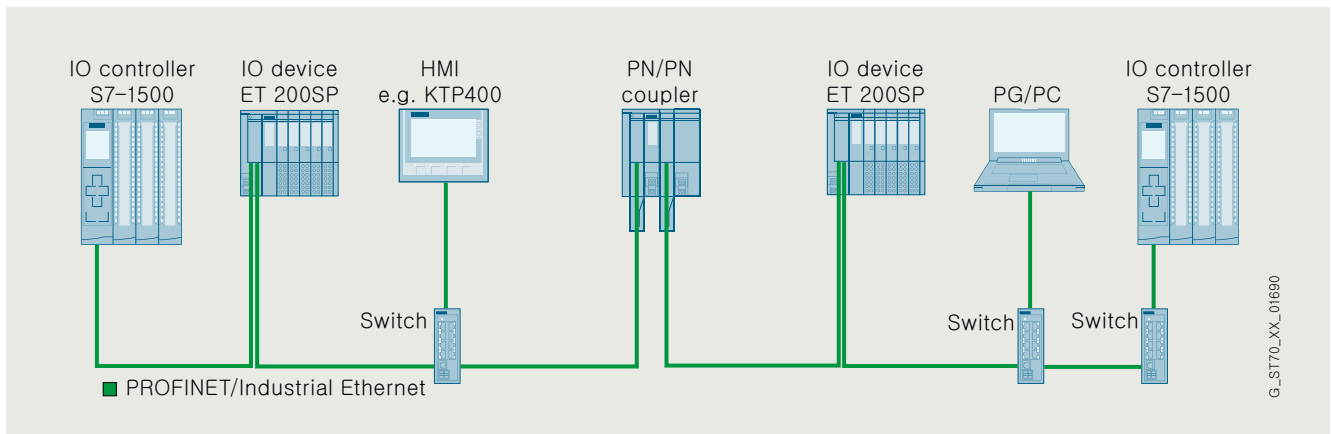
Gateways

PN/PN coupler

Overview



- Fast deterministic data exchange between CPUs with PROFINET controller, even beyond network boundaries
- Configuration with two PROFINET devices completely independent of the communication technology



Data transmission between two S7-1500 IO controllers beyond a PROFINET limit

- Very simple configuration of the data exchange via virtual IO modules or alternatively via data records for larger amounts of data
 - Simultaneous data transfer to up to 3 CPUs on own network side and/or up to 4 CPUs on opposite network side
 - Easy to integrate into any PROFINET network with 2 ports per network side
 - Fieldbus connection via a SIMATIC BusAdapter; this allows free selection of the connection system (RJ45, FC cable direct connection) and connection hardware (copper, POF, PCF, glass fiber). FO-to-copper media conversion can also be realized economically and without external converters.
- Additional functions
- Quantity structures
 - Cyclic transmission: Up to 1440 bytes each for input and output data
 - Data record transfer: Up to 4096 bytes per slot. Buffering of up to eight data records per slot
 - Maximum 16 input/output areas for data exchange
 - Max. 254 bytes of input and 253 bytes of output data per module
 - Exchange of fail-safe data between two F-CPU's via F-SendDP and F_ReceiveDP
 - Shared device with up to four IO controllers per network side
 - Module-internal shared input / shared output (MSI/MSO)
 - Device replacement without programming device
 - With topological configuration via proximity detection (LLDP)
 - Without topological configuration via redundant storage of the station name in the BusAdapter. A separate removable memory card is not required.
 - Reset button for restoring the factory settings
 - Redundant power supply
 - Galvanic isolation between the two PROFINET IO subnets
 - Media redundancy (MRP and MRPD)
 - I&M data
 - Firmware update
 - Support for Ethernet services (ping, arp, SNMP, MIP-2, LLDP)
 - Comprehensive diagnostics via LED displays and interrupts
 - Extensive compatibility with the PN/PN coupler up to firmware version V3.0

I/O systems

Gateways

PN/PN coupler

Ordering data	Article No.		Article No.
SIMATIC PN/PN coupler For deterministic data exchange between max. 4 PN controllers per side, also beyond network boundaries, transfer of PROFIsafe, I/O, MSI, MSO and data record communication, redundant power supply, PN connection via SIMATIC BusAdapter (BA), supplied without BusAdapter	6ES7158-3AD10-0XA0	SIMATIC BA 2XLC BusAdapter 2x LC glass fiber-optic cable connections	6ES7193-6AG00-0AA0
Accessories		SIMATIC BusAdapter: BA LC/RJ45 Media converter glass FOC/CU 1x LC FO connection and 1x RJ45 connection	6ES7193-6AG20-0AA0
DIN rail 35 mm		SIMATIC BusAdapter: BA LC/FC Media converter glass FOC/CU 1x LC FO connection and 1x FastConnect (FC) connection	6ES7193-6AG40-0AA0
SIMATIC, DIN rail 35 mm Length: 483 mm for 19" cabinets	6ES5710-8MA11	SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0
SIMATIC, DIN rail 35 mm Length: 530 mm for 600 mm cabinets	6ES5710-8MA21	Labeling strips	
SIMATIC, DIN rail 35 mm Length: 830 mm for 900 mm cabinets	6ES5710-8MA31	SIMATIC ET 200SP, 500 labeling strips light gray, roll with 500 strips	6ES7193-6LR10-0AA0
SIMATIC, DIN rail 35 mm, length 2 m	6ES5710-8MA41	SIMATIC ET 200SP, 500 labeling strips yellow, roll with 500 strips	6ES7193-6LR10-0AG0
SIMATIC ET 200SP, BA 2xRJ45 BusAdapter 2 RJ45 sockets	6ES7193-6AR00-0AA0	SIMATIC ET 200SP, 1000 labeling strips light gray, 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0
SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connection	6ES7193-6AF00-0AA0	SIMATIC ET 200SP, 1000 labeling strips yellow gray, 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	6ES7193-6AP00-0AA0	Spare parts	
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	Cover for BusAdapter interface 5 units	6ES7591-3AA00-0AA0
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	Power supply connector	
		Plug, socket, 2x2-pole, for ET 200SP, interface module, KP32F, PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded, 10 units per packing unit	6ES7193-4JB00-0AA0

Technical specifications

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler	Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
General information		Engineering with	
Product type designation	PN/PN coupler	• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15.1 or higher
Product function		• PROFINET from GSD version/ GSD revision	V2.3
• I&M data	Yes; I&M0 to I&M3	Installation type/mounting	
• Isochronous mode	No; For operation on isochronous bus	Mounting	Mounting rail 7.5 mm and 15 mm
• Tool changer	Yes; Docking station and docking unit	Supply voltage	
• Local coupling, IO data	Yes	Rated value (DC)	24 V
- Number of coupling modules	16	Reverse polarity protection	Yes
- Number of coupling submodules per module	4; 1x write, 3x read	Mains buffering	
• Local coupling, data records	Yes	• Mains/voltage failure stored energy time	10 ms
- Number of coupling modules	16	Input current	
- Number of coupling submodules per module	4; 1x write, 3x read	Current consumption, max.	360 mA; For 19.2 V input voltage at the right-hand supply terminal, including 2 plugged BA 2x LC
- Record length, max.	4 096 byte	from supply voltage 1L+, max.	320 mA; For 19.2 V input voltage at the left-hand supply terminal, including 2 plugged BA 2x LC
- FIFO depth in storage mode	8		

I/O systems

Gateways

PN/PN coupler

Technical specifications

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Power loss	
Power loss, typ.	4 W; For 24 V input voltage and 2 plugged BA 2x RJ45 If BusAdapters with an optical interface are plugged, there is an additional 750 mW per optical interface (3 W with 2 plugged BA 2x LC)
Address area	
Address space per module	
• Address space per module, max.	254 byte; max. 254 bytes of input data and 253 bytes of output data
Address space per station	
• Address space per station, max.	1 440 byte; per input / output
Hardware configuration	
Submodules	
• Number of submodules per station, max.	116
Interfaces	
Number of PROFINET interfaces	2; One PROFINET interface per line side
Optical interface	Yes; Via SIMATIC BusAdapter
Transmission rate, max.	100 Mbit/s
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
2. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
Protocols (Ethernet)	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
PROFINET IO Device	
Services	
- IRT	Yes
- PROFINET energy	No
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4; per line side
Redundancy mode	
• PROFINET system redundancy (S2)	Yes; NAP S2 acc. to IEC
• H-Sync forwarding	Yes
Media redundancy	
- MRP	Yes
- MRPD	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes; Parameterizable
Diagnostics indication LED	
• RUN LED	Yes; green LED
• ERROR LED	Yes; red LED
• MAINT LED	Yes; Yellow LED
• LINK LED	Yes; 2x green link LEDs on BusAdapter
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Potential separation	
between supply voltage and electronics	Yes; to power input 2
between Ethernet and electronics	Yes
Standards, approvals, certificates	
Network loading class	3
Ambient conditions	
Ambient temperature during operation	
• min.	-30 °C; From FS05
• max.	60 °C; = Tmax for horizontal installation; for vertical installation Tmax = 50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; restrictions for installation altitudes > 2 000 m, see section "Climatic and mechanical environmental conditions"
Mechanics/material	
Strain relief	Yes; Optional, for RJ45 and FC BusAdapter only
Dimensions	
Width	100 mm; Minimized with good handling
Height	117 mm
Depth	74 mm; with mounting rail
Weights	
Weight, approx.	200 g; without BusAdapter

I/O systems

Gateways

PN/CAN LINK

Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
 - Node / lifeguarding
 - Heartbeat
 - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Electrical isolation between the two networks
- Diagnostic interrupts
- Supported controllers: S7-1200, S7-1500, ET 200SP, Open Controller
- Optionally with function block SIMATIC ECC CHAdeMO: Realization of digital communication as basis for conductible DC charging of electric vehicles in line with the CHAdeMO standard

Ordering data

SIMATIC PN/CAN LINK

PROFINET gateway according to CAN or CANopen networks
CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20

Article No.

6BK1620-0AA00-0AA0

Article No.

Accessories

SIMATIC ECC CHAdeMO

Function block single license, electric vehicle communication according to CHAdeMO 1.x-2.0 specification.
In combination with SIMATIC PN/CA 6BK 1620-0AA00-0AA0 or ET 200SP CM CAN 6ES7137-6EA00-0BA0

6FE1263-8FB10-0AA0

Technical specifications

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
General information	
Product type designation	PN/CAN Link
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V14 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Power loss	
Power loss, typ.	2.2 W
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes

I/O systems

Gateways

PN/CAN LINK

Technical specifications

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
1. Interface	
Interface type	CAN according to CiA 303-1
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	9-pin sub D socket
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	50 kbit/s
• Transmission rate, max.	1 000 kbit/s
• max. number of devices	126
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	512; Send / receive
Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes
2. Interface	
Interface type	PROFINET
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes

Article number	6BK1620-0AA00-0AA0 SIMATIC PN/CAN LINK
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• American Bureau of Shipping (ABS)	Yes
• Bureau Veritas (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (Class NK)	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

I/O systems

Gateways

SIPLUS PN/CAN LINK

Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
 - Node / lifeguarding
 - Heartbeat
 - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- PLCs supported: S7-1200, S7-1500, ET 200SP, Open Controller

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme-specific information was added.

For technical documentation on SIPLUS, see:

<http://www.siemens.com/siplus-extreme>

Ordering data

SIPLUS PN/CAN Link

PROFINET gateway according to CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20
Ambient temperature -40 ... +70 °C (+85 °C for 10 min.)

Article No.

6AG1620-0AA00-7AA0

I/O systems

Gateways

SIPLUS PN/CAN LINK

Technical specifications

Article number	6AG1620-0AA00-7AA0
Based on	6BK1620-0AA00-0AA0 SIPLUS PN/CAN LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; in preparation
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1620-0AA00-7AA0
Based on	6BK1620-0AA00-0AA0 SIPLUS PN/CAN LINK
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology	
- Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
- Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O systems

Gateways

PN/J1939 LINK

Overview



- For data exchange between PROFINET and SAE J1939 networks
- J1939 functions:
 - Broadcast Announce Message (BAM)
 - Connection Mode Data Transfer (CMDT)
 - PDU 1 & 2
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 9-pin Sub-D socket for J1939
- Up to 253 logical nodes
- Up to 30 addressable ECUs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Ordering data

Article No.

SIMATIC PN/J1939 LINK

PROFINET gateway to J1939 networks; IP20

6BK1623-0AA00-0AA0

Technical specifications

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
General information	
Product type designation	PN/J1939 LINK
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V14 SP1 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Power loss	
Power loss, typ.	2.2 W
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes

I/O systems

Gateways

PN/J1939 LINK

Technical specifications

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
1. Interface	
Interface type	J1939 according to the standard "SAE J1939"
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
• Design of the connection	9-pin sub D socket
CAN	
• CAN operating modes	J1939 according to the standard "SAE J1939"
• Transmission rate, min.	100 kbit/s
• Transmission rate, max.	500 kbit/s
• max. number of devices	30
J1939	
• Addressable ECUs, max.	30
• Logical nodes, max.	253
• PDU 1	Yes
• PDU 2	Yes
• DM data	Yes
• BAM	Yes
• CMTD	Yes
2. Interface	
Interface type	PROFINET
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20

Article number	6BK1623-0AA00-0AA0 SIMATIC PN/J1939 LINK
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• Det Norske Veritas (DNV)	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (Class NK)	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

I/O systems

Gateways

PN/BACnet LINK

Overview



- Gateway between PROFINET and BACnet/IP networks according to EN ISO16484-5 and Addendum ANSI/ASHRAE Standard 135-2012.
- Integrated in Totally Integrated Automation via HSP, TIA Portal V14 or higher
- Integrated PROFINET switch and RJ45 socket for BACnet
- 1 000 BACnet objects/object references
- 1 000 subscribe services
- BACnet features:
 - Client & Server
 - Device profile: B-GW
 - Change of value / cyclic and acyclic data exchange
 - Scan of BACnet/IP network
- Supported BACnet object types:
 - Device
 - Binary input
 - Binary output
 - Analog input
 - Analog output
- Supported BACnet services:
 - DS-COV-A/B
 - DM-DDB-A/B
 - DM-DOB-B
 - DS-RP-A/B
 - DS-WP-A/P
 - GW-EO-B
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Ordering data

Article No.

SIMATIC PN/BACnet LINK

Gateway from PROFINET to BACnet/IP networks, device profile: B-GW, IP20

6BK1621-0AA00-0AA0

Technical specifications

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
General information	
Product type designation	PN/BACnet Link
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V14 SP1
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.11 A
Current consumption, max.	0.13 A
Power loss	
Power loss, typ.	2.7 W
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
1. Interface	
Interface type	BACnet/IP
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	1
• Design of the connection	RJ45
BACnet	
• BACnet device profile	B-GW
• Supported character sets	ISO 10646 (UTF-8)
• Network Security	No
• Number of BACnet objects/object references	1 000
• Number of subscription services	1 000

I/O systems

Gateways

PN/BACnet LINK

Technical specifications

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
2. Interface	
Interface type	PROFINET
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
PNO certificate	Yes
BTL certificate	Yes
RoHS conformity	Yes

Article number	6BK1621-0AA00-0AA0 SIMATIC PN/BACnet LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
connection method	
Design of electrical connection	Screw connection
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	210 g

I/O systems

Gateways

PN/M-Bus LINK

Overview



- For data exchange between PROFINET and M-Bus networks
- M-Bus functions:
 - M-Bus master
 - Primary address
 - Secondary address
 - Read-only access to M-Bus slaves
 - Short-circuit detection
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 3-pin screw terminal for M-Bus
- Up to 40 slaves (loads/units)
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Ordering data

Article No.

SIMATIC PN/M-Bus LINK

Gateway from PROFINET to M-Bus networks, M-Bus Master, IP20

6BK1622-0AA00-0AA0

Technical specifications

Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK
General information	
Product type designation	PN/M-Bus LINK
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	STEP 7 V15 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	any
Recommended mounting position	Horizontal
Rail mounting	Yes
Control cabinet installation	Yes
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.11 A; At 24 V and 5 loads
Current consumption, max.	0.4 A; At 20.4 V, 40 loads + 100 mA short-circuit current
Power loss	
Power loss, typ.	2.4 W
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2

I/O systems

Gateways

PN/M-Bus LINK

Technical specifications

Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
1. Interface	
Interface type	M-Bus master
Isolated	No
Interface types	
• Number of ports	1
• Design of the connection	3-wire screw-type terminal
M-Bus	
• Bus voltage, typ.	36 V
• Transmission rate, min.	300 bit/s
• Transmission rate, max.	9 600 bit/s
• max. number of devices	40
• Short-circuit detection	Yes
• short-circuit proof	Yes
• Connectable conductor cross-section	1.5 mm ²
• Cable length, max.	300 m
2. Interface	
Interface type	PROFINET
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Interrupts/diagnostics/status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes

Article number	6BK1622-0AA00-0AA0 SIMATIC PN/M-Bus LINK
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
RoHS conformity	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	215 g

Overview



- For interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler

Ordering data

Article No.

SIMATIC DP, DP/DP coupler

Coupling module for connecting two PROFIBUS DP networks, redundant power supply

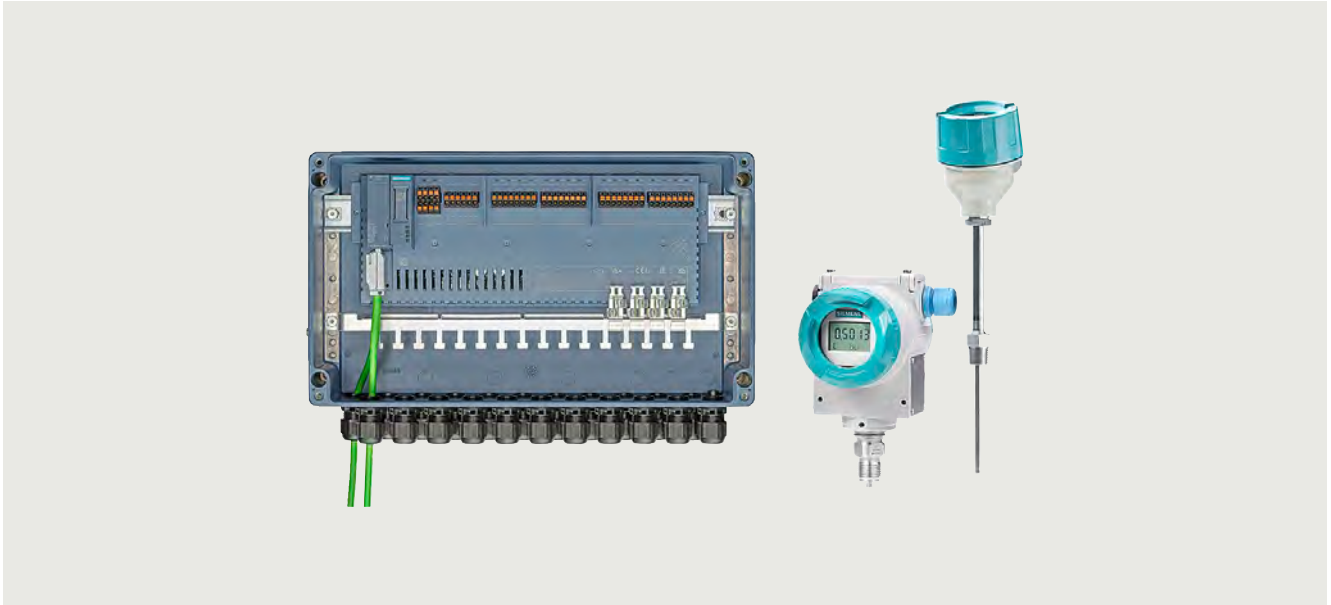
6ES7158-0AD01-0XA0

Note:
The manual is available free on the Internet.

Technical specifications

DP/DP transceiver	
PROFIBUS transmission rate	max. 12 Mbit/s
Interfaces	
• PROFIBUS DP	9-pin Sub-D connector
Supply voltage	24 V DC
Current consumption typ.	150 mA
Mounting	Upright (DIP switches above)
Perm. environmental conditions	
• Operating temperature	
- horizontal mounting	0°C ... +60°C
- all other mounting positions	0°C ... +40°C
• Transport/storage temperature	-40 °C ... +70 °C
• Relative humidity	10-95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	40 x 127 x 117
• Weight	approx. 250 g
Degree of protection	IP20

Overview

**Smart Field Distributor – SIMATIC Compact Field Unit**

With the new SIMATIC Compact Field Unit (CFU), we are re-interpreting the conventional approach to field device connection. The smart field distributor is installed at the process level and is connected via PROFINET, the world's leading Industrial Ethernet standard, directly to the automation system to form the foundation for digitalization in the field.

You benefit from greater flexibility and very simple handling coupled with maximum availability. This allows you to efficiently transfer your familiar system concept to the digital world.

Today's challenges for field device connection:

- High overhead for device integration and replacement
- Complicated, error-prone wiring and routing over multiple levels, making the hardware FAT very complex
- Extremely long copper cables and numerous terminal points in the field
- Multiple individual control cabinets
- Large numbers of different components and protocols necessitate costly spare parts inventories and training sessions
- High planning and documentation costs

I/O systems

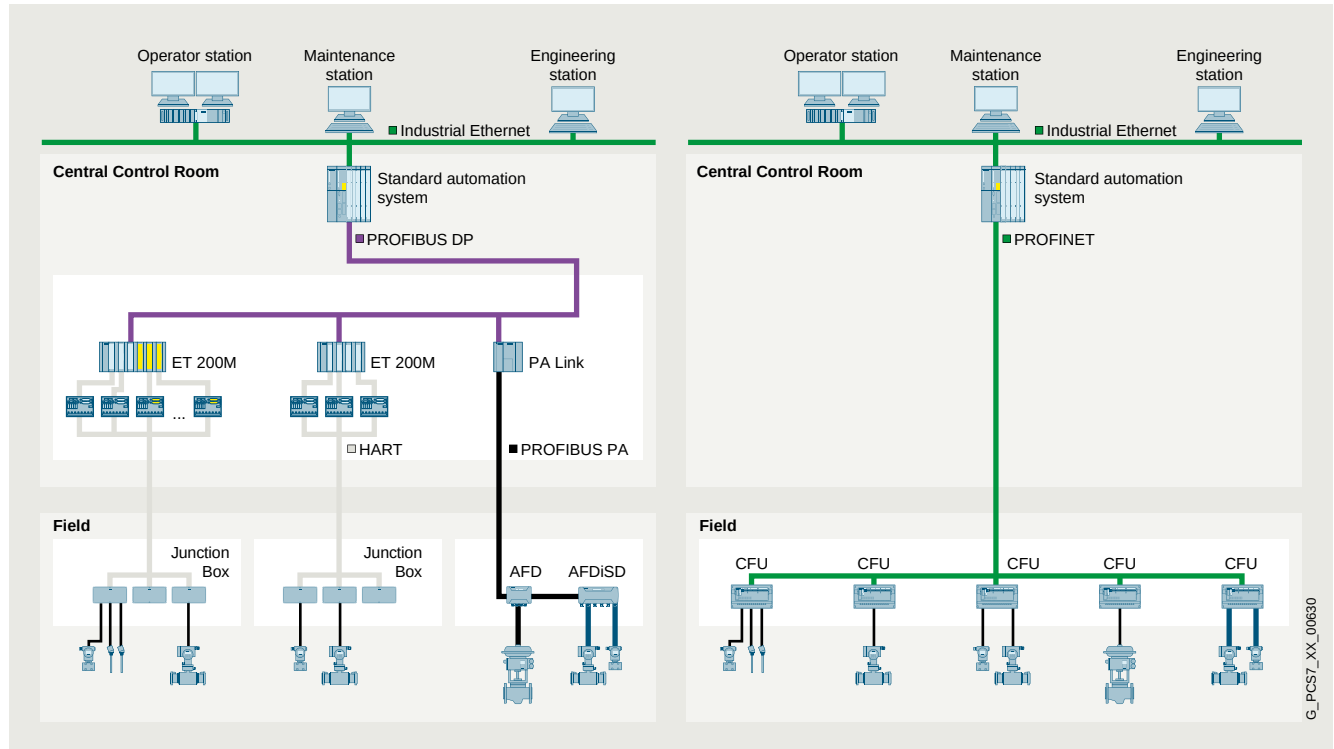
Gateways

SIMATIC CFU

Overview

SIMATIC CFU – The answer to these challenges

Mode of operation



Field device connection with previous technology (left) and with SIMATIC CFU (right)

The SIMATIC Compact Field Unit (CFU) is a real game-changer in field device connection and offers you entirely new prospects regarding simplicity, flexibility and standardization. The smart field distributor is installed at the process level and is connected via PROFINET directly to the automation system to form the foundation for digitalization in the field. Utilization of digital fieldbus communication considerably simplifies device interfacing compared to conventional 4 ... 20 mA engineering.

Greater flexibility thanks to consistent decentralization

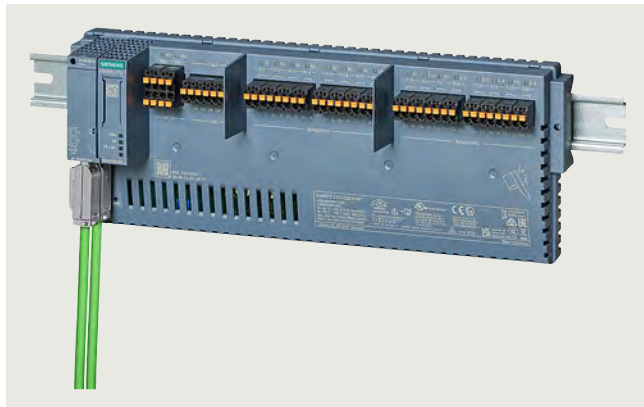
Distributed installation of the SIMATIC CFU means that classic control cabinets are no longer required and you can make considerable savings in cabling and the number of terminal points, as well as reducing planning and documentation overheads. The high granularity (16 I/O per SIMATIC CFU) enables flexible assignment to the higher-level controllers.

I/O systems

Gateways
SIMATIC CFU

SIMATIC CFU CIO HART edition

Overview



SIMATIC CFU CIO HART edition, in this case with BusAdapter, PROFINET bus cable and push-in terminals

SIMATIC CFU CIO HART edition

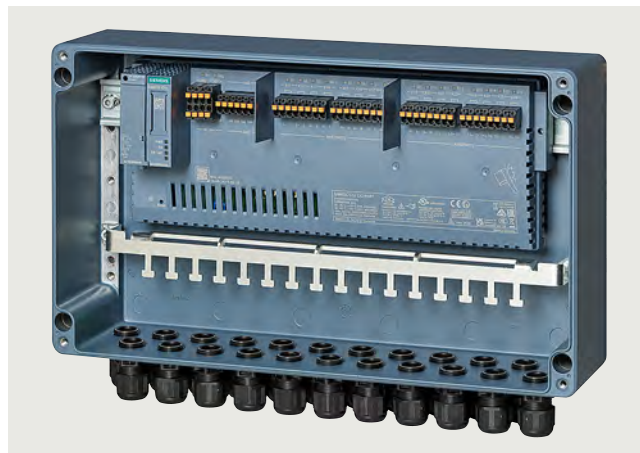
One device for all signal types

The SIMATIC CFU CIO HART is an innovative PROFINET device and offers the possibility of flexibly connecting all signal types to any channel. It is possible to process analog inputs (optionally with HART), analog outputs (optionally with HART), digital inputs and digital outputs. The corresponding signal types are configured conveniently using drag-and-drop in engineering. The SIMATIC CFU CIO HART thus offers a versatile solution for using the different signal types in your system with just one device.

16 freely configurable IO channels:

- Analog input/analog output:
 - 0-20 mA, 4-20 mA, 4-20 mA with HART
- Digital input/digital output:
 - Multiple modes available: Standard-DI, DI-Namur, DI Open-Collector
 - Counter up to 5 kHz
 - DI 24 V DC; DQ 24 V DC 0.5/2 A

Aluminum field enclosure



SIMATIC CFU CIO HART edition, aluminum field enclosure, open



SIMATIC CFU CIO HART edition, aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

Ordering data

Article No.

SIMATIC CFU CIO HART with aluminum enclosure

Comprising:

- 1 × SIMATIC CFU CIO HART (6ES7655-5PX41-1XX0)
- 1 × aluminum enclosure with cable glands, shield busbar, shield terminals

pre-assembled and tested

6ES7655-5PX41-1AX0

Article No.

SIMATIC CFU CIO HART

SIMATIC Compact Field Unit CIO HART edition with 16 × freely configurable channels (AI; AQ; HART; DI 24 V DC; DI NAMUR; DQ 24 V DC 0.5/2 A; Counter)

- Installation up to hazardous zone 2
- Channel diagnostics
- PROFINET interface
- Use of PROFINET BusAdapter
- Configuration in RUN (CiR)
- Media redundancy (MRP)
- PROFINET system redundancy (S2)
- Temperature range -40 ... +70 °C
- Installation on a 35 mm DIN rail

6ES7655-5PX41-1XX0

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU CIO HART edition

Technical specifications

Article number	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART
General information		
Product type designation	CFU CIO HART with aluminum enclosure	CFU CIO HART
Number of channels	16	16
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• The user can configure digital channels as input/output as required	Yes	Yes
• Digital channels can be parameterized	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V19 Update 2	V19 Update 2
• STEP 7 configurable/ integrated from version	STEP 7 V5.7.1.4	STEP 7 V5.7.1.4
• PROFIBUS from GSD version/ GSD revision	- / -	- / -
• PROFINET from GSD version/ GSD revision	GSDML V2.43 2024.03.04	GSDML V2.43 2024.03.04
Operating mode		
• DI	Yes	Yes
• Counter	Yes	Yes
• DQ	Yes	Yes
Installation type/mounting		
Mounting	For horizontal and vertical mounting	on 35 mm DIN rail, 2 spacing units wide
Mounting position	Horizontal, vertical	Horizontal, vertical
Recommended mounting position	horizontal set up	horizontal set up
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Short-circuit protection	Yes	Yes
Redundant power supply	Yes	Yes
Mains buffering		
• Mains/voltage failure stored energy time	1 ms; For communication	1 ms; For communication
Input current		
Current consumption (rated value)	4.1 A; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 2 A each	4.1 A; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 2 A each
Current consumption, max.	9 A	9 A
Inrush current, max.	7 A	7 A
I^2t	0.5 A ² ·s	0.5 A ² ·s
Encoder supply		
Number of outputs	16	16
Output voltage, min.	12 V	12 V
Short-circuit protection	Yes; Electronic	Yes; Electronic
Output current		
• up to 60 °C, max.	6 A; total current DQ + additional current for analog channels	8 A; total current DQ + additional current for analog channels
• up to 70 °C, max.		6 A; total current DQ + additional current for analog channels
Power loss		
Power loss, typ.	6.6 W; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 12 ohms load each	6.6 W; RJ45 BusAdapter, 8xDI, 4xAI, 2xAQ, 2xDQ with 12 ohms load each
Address area		
Address space per station		
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU CIO HART edition

Technical specifications

Article number	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART
Digital inputs		
Number of digital inputs	16	16
Digital inputs, parameterizable	Yes	Yes
Source/sink input	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	Yes; off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Digital input functions, parameterizable		
• Gate start/stop	Yes; hardware gate, usable by multiple DI counters	Yes; hardware gate, usable by multiple DI counters
• Freely usable digital input	Yes; Parameterizable input filter	Yes; Parameterizable input filter
• Counter	Yes	Yes
- Number, max.	16	16
- Counting frequency, max.	5 kHz; fast counter mode, sinking input; 1 kHz for sourcing input, NAMUR	5 kHz; high-speed counter mode, sinking input; 1 kHz for sourcing input, NAMUR
- Counting width	32 bit	32 bit
- Counting direction up/down	Yes; Up	Yes; Up
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-9 V to +5 V	-9 V to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA; max: 2.5 mA sourcing input; 2.3 mA sinking input; 10 mA fast counter; 6.5 mA NAMUR	2.5 mA; max: 2.5 mA sourcing input; 2.3 mA sinking input; 10 mA fast counter; 6.5 mA NAMUR
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable	Yes; none / 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; none / 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	16
Current-sinking	No	No
Current-sourcing	Yes	Yes
Short-circuit protection	Yes	Yes
• Response threshold, typ.	4.1 A	4.1 A
Open-circuit detection	Yes	Yes
Overload protection	Yes	Yes
Limitation of inductive shutdown voltage to	typ. L+ (-11 V)	typ. L+ (-11 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	2 A	2 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	12 Ω	12 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	Ue minus 1 V	Ue minus 1 V
Output current		
• for signal "1" rated value	2 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU CIO HART edition

Technical specifications

Article number	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART
Output delay with resistive load		
• "0" to "1", typ.	50 µs	50 µs
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", typ.	50 µs	50 µs
• "1" to "0", max.	100 µs	100 µs
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	No	No
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	1 Hz; at 2 A; 2 Hz at 0.5 A	1 Hz; at 2 A; 2 Hz at 0.5 A
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	2 A	2 A
horizontal installation		
- up to 60 °C, max.	6 A	8 A
- up to 70 °C, max.		6 A
vertical installation		
- up to 60 °C, max.	6 A	8 A
- up to 70 °C, max.		6 A
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Analog inputs		
Number of analog inputs	16	16
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
HART communication		
• Primary Master	Yes	Yes
• input resistance (with HART communication)	233 Ω	233 Ω
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Analog outputs		
Number of analog outputs	16; short-circuit proof with respect to ground	16; short-circuit proof with respect to ground
Output ranges, current		
• 0 to 20 mA	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	No	No
• 4 mA to 20 mA	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Connection of actuators		
• for current output two-wire connection	Yes	Yes
Load impedance (in rated range of output)		
• for current outputs, min.	50 Ω	50 Ω
• with current outputs, max.	750 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU CIO HART edition

Technical specifications

Article number	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART
Analog value generation for the inputs		
Integration and conversion time/resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes; channel by channel	Yes; channel by channel
Smoothing of measured values		
• parameterizable	Yes; none, weak, medium, strong, channel-by-channel	Yes; none, weak, medium, strong, channel-by-channel
Analog value generation for the outputs		
Settling time		
• for resistive load	2 ms; 750 ohm	2 ms; 750 ohm
• for inductive load	1.2 ms	1.2 ms
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	Yes
Connectable encoders		
• NAMUR encoder/changeover contact according to EN 60947	Yes; no CO contact	Yes; no CO contact
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Errors/accuracies		
Basic error limit (operational limit at 25 °C)		
• Current, relative to input range, (+/-)	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.1 %	0.1 %
Interfaces		
Number of PROFINET interfaces	1	1
1. Interface		
Interface type	PROFINET	PROFINET
Isolated	Yes	Yes
Interface types		
• Number of ports	2; via BusAdapter	2; via BusAdapter
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• Media redundancy	Yes; as MRP client	Yes; as MRP client
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	Yes
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
HART protocol	Yes	Yes
• Protocol version	up to Revision 7	up to Revision 7
PROFINET IO Device		
Services		
- Shared device	No	No
Redundancy mode		
• PROFINET system redundancy (S2)	Yes	Yes; Type S2
Media redundancy		
- MRP	Yes	Yes
Open IE communication		
• LLDP	Yes	Yes

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU CIO HART edition

Technical specifications

Article number	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
• Maintenance interrupt	Yes	Yes
• Limit value alarm	Yes	Yes
• Hardware interrupt	Yes	Yes
Diagnoses		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel
• Short-circuit	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green/red LED	Yes; green/red LED
• Channel status display	Yes; green/red LED	Yes; green/red LED
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
• Connection display LINK TX/RX	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Integrated Functions		
Frequency measurement	Yes	Yes
• Number of frequency meters	16	16
Counting functions		
• Continuous counting	Yes	Yes
• Counter response parameterizable	Yes	Yes
• Hardware gate via digital input	Yes	Yes
• Software gate	Yes	Yes
Measuring functions		
• Dynamic measurement period adjustment	Yes	Yes
Measuring range		
- Frequency measurement, min.	0.1 Hz	0.1 Hz
- Frequency measurement, max.	25 kHz; fast counter mode, sinking input; 1 kHz sourcing input, NAMUR	25 kHz; high-speed counter mode, sinking input; 1 kHz for sourcing input, NAMUR
Accuracy		
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation	100 ppm; depending on measuring interval and signal evaluation
Potential separation		
Potential separation digital inputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Potential separation digital outputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No

SIMATIC CFU CIO HART edition

Technical specifications

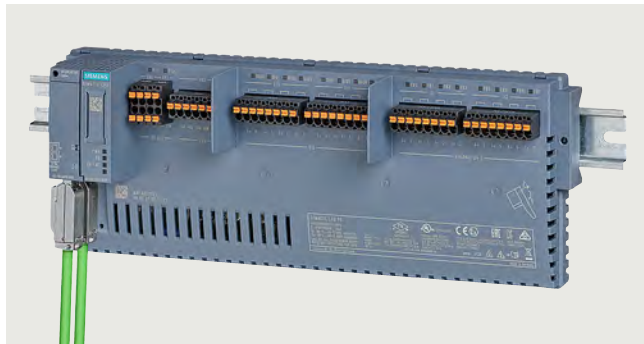
Article number	6ES7655-5PX41-1AX0 SIMATIC CFU CIO HART with Alu housing	6ES7655-5PX41-1XX0 SIMATIC CFU CIO HART
Degree and class of protection		
IP degree of protection	IP66	IP20
connection method		
Design of electrical connection	Connection plug	Connection plug
Dimensions		
Width	414 mm	329 mm
Height	266 mm	123 mm
Depth	111 mm	74 mm
Weights		
Weight, approx.	5.5 kg	0.7 kg

I/O systems

Gateways
SIMATIC CFU

SIMATIC CFU PA edition

Overview



SIMATIC CFU here with BusAdapter, PROFINET bus cable and push-in terminals

SIMATIC CFU PA edition

Plug-and-produce simplicity

Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. You can use the established and proven PROFIBUS PA standard to achieve this. It is integrated into the PA edition of the SIMATIC CFU, thus combining ruggedness and easy handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are automatically addressed. The device is integrated via standardized communication profiles.

This innovative new implementation of the PROFIBUS PA concept makes it possible to combine the simplicity of a point-to-point wiring system with the scalability of digital PROFIBUS PA fieldbus communication. As with digital field devices, it is not necessary to know prior to connection whether the discrete field device is a sensor or actuator – This can be easily configured afterwards via software.

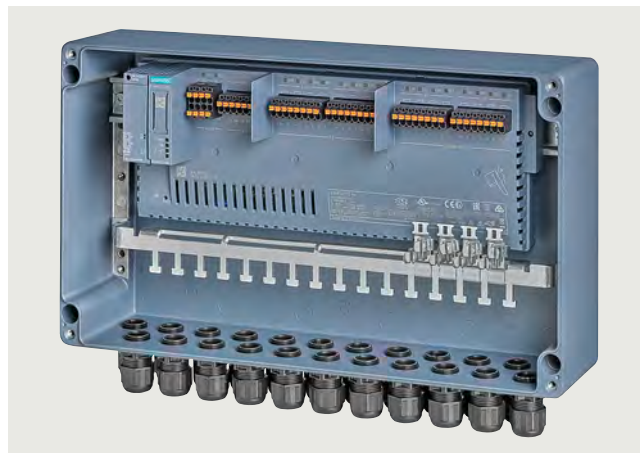
Combination of digital fieldbus and discrete I/Os

- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable (1 × counter functionality / frequency measurement)

Easy to use

- Automatic addressing of PROFIBUS PA field devices
- System-supported detection and integration of PROFIBUS PA field devices into the process control system
 - Utilization of standardized PA profiles
 - Commissioning, device replacement and maintenance wizards
- Implementation of diagnostic messages according to NAMUR NE107
- Installation on a 35 mm DIN rail

Aluminum field enclosure



CFU PA with RJ45 and push-in terminals, aluminum field enclosure, open



SIMATIC CFU aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

Ordering data

Article No.

SIMATIC CFU PA bundle with push-in terminals

Comprising:

- SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0

pre-assembled and tested

6ES7655-5PX11-1XX0

Article No.

SIMATIC CFU PA bundle with aluminum enclosure

Comprising:

- SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0
- Aluminum enclosure with cable glands, shield busbar, shield connection clamps

pre-assembled and tested

6ES7655-5PX11-1AX0

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU PA edition

Technical specifications

Article number	6ES7655-5PX11-1XX0 SIMATIC CFU PA	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing
General information		
Product type designation	PA Bundle	
Number of channels	16	
Product function		
• I&M data	Yes; I&M0 to I&M4	
• Isochronous mode	No	
• The user can configure digital channels as input/output as required	Yes	
• Digital channels can be parameterized	Yes	
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V17	
• STEP 7 configurable/ integrated from version	V5.6 HF2 and higher	
• PCS 7 configurable/ integrated from version	V9.0 SP2 and higher	
• PCS neo can be configured/ integrated from version	V3.0	
• PROFIBUS from GSD version/ GSD revision	- / -	
• PROFINET from GSD version/ GSD revision	GSDML V2.3	
Operating mode		
• Counter	Yes	
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	
Mounting position	Horizontal, vertical	Horizontal, vertical
Recommended mounting position		horizontal set up
Supply voltage		
Type of supply voltage	24 V DC	
Rated value (DC)	24 V	
Reverse polarity protection	Yes	
Short-circuit protection	Yes	
Redundant power supply	Yes	
Mains buffering		
• Mains/voltage failure stored energy time	5 ms; Bridging for field devices and communication	
Input current		
Current consumption (rated value)	2.5 A	
Current consumption, max.	2.55 A	
Inrush current, max.	8 A	
I ² t	0.3 A ² s	
Encoder supply		
Number of outputs	8	
Output voltage, min.	18.2 V	
Short-circuit protection	Yes; Electronic	
Output current		
• up to 60 °C, max.	2 A	
• up to 70 °C, max.	1 A	
Power loss		
Power loss, typ.	8.2 W; Depending on the type of BusAdapter used (typ. RJ45)	
Address area		
Address space per station		
• Address space per station, max.	1 440 byte; Dependent on configuration	
Digital inputs		
Number of digital inputs	8	
Source/sink input	Yes; P-reading	
Input characteristic curve in accordance with IEC 61131, type 1	Yes	
Input characteristic curve in accordance with IEC 61131, type 2	No	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Pulse extension	No	

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU PA edition

Technical specifications

Article number	6ES7655-5PX11-1XX0 SIMATIC CFU PA	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing
Number of simultaneously controllable inputs		
horizontal installation		
- up to 60 °C, max.	8; Total current must be observed, see DQ	
- up to 70 °C, max.	8; Total current must be observed, see DQ	
vertical installation		
- up to 60 °C, max.	8; Total current must be observed, see DQ	
Digital input functions, parameterizable		
• Counter	Yes	
- Number, max.	1	
- Counting frequency, max.	1 kHz	
- Counting width	32 bit	
- Counting direction up/down	Yes; Up	
Input voltage		
• Rated value (DC)	24 V	
• for signal "0"	-30 to +5 V	
• for signal "1"	+11 to +30V	
Input current		
• for signal "1", typ.	2.5 mA; Typical	
Input delay (for rated value of input voltage)		
for standard inputs		
- parameterizable	No	
- at "0" to "1", max.	3.2 ms; for counter function 0,1 ms	
- at "1" to "0", max.	3.2 ms; for counter function 0,1 ms	
Cable length		
• shielded, max.	1 000 m	
• unshielded, max.	600 m	
Digital outputs		
Type of digital output	Transistor	
Number of digital outputs	8	
Current-sinking	No	
Current-sourcing	Yes	
Short-circuit protection	Yes	
• Response threshold, typ.	0.7 to 1.3 A	
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	
Controlling a digital input	Yes	
Switching capacity of the outputs		
• on lamp load, max.	5 W	
Load resistance range		
• lower limit	48 Ω	
• upper limit	12 kΩ	
Output voltage		
• Type of output voltage	DC	
• for signal "1", min.	Ue minus 1 V	
Output current		
• for signal "1" rated value	0.5 A	
• for signal "0" residual current, max.	0.1 mA	
Output delay with resistive load		
• "0" to "1", max.	50 μs	
• "1" to "0", max.	100 μs	
Parallel switching of two outputs		
• for uprating	No	
• for redundant control of a load	No	
Switching frequency		
• with resistive load, max.	100 Hz	
• with inductive load, max.	2 Hz	
• on lamp load, max.	10 Hz	

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU PA edition

Technical specifications

Article number	6ES7655-5PX11-1XX0 SIMATIC CFU PA	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing
Total current of the outputs		
• Current per channel, max.	0.5 A	
horizontal installation		
- up to 60 °C, max.	2 A	
- up to 70 °C, max.	1 A	
vertical installation		
- up to 60 °C, max.	2 A	
Cable length		
• shielded, max.	1 000 m	
• unshielded, max.	600 m	
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	
- permissible quiescent current (2-wire sensor), max.	1.5 mA	
Interfaces		
Number of PROFINET interfaces	1	
Number of PROFIBUS interfaces	0	
PROFIBUS PA		
• Transmission rate, max.	31.25 kbit/s	
• Number of connectable PA field devices	8; electrically isolated from other interfaces, isolation tested at 2 500 V DC	
• Current output to PA field devices, max.	320 mA	
• permissible current per spur line	40 mA	
• Automatic addressing	Yes	
• System-supported integration of field devices via PA profiles	Yes	
• Extended fieldbus diagnostics	Yes	
1. Interface		
Interface type	PROFINET	
Isolated	Yes	
Interface types		
• Number of ports	2	
• integrated switch	Yes	
• BusAdapter (PROFINET)	Yes	
Protocols		
• PROFINET IO Device	Yes	
• PROFIBUS DP device	No	
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	
• Autonegotiation	Yes	
• Autocrossing	Yes	
Protocols		
Supports protocol for PROFINET IO	Yes	
Redundancy mode		
• PROFINET system redundancy (S2)	Yes; Type S2	
Media redundancy		
- MRP	Yes	
Open IE communication		
• LLDP	Yes	
Interrupts/diagnostics/status information		
Status indicator	Yes	
Alarms	Yes	
Diagnostics function	Yes	
Diagnoses		
• Monitoring of encoder power supply	Yes	
• Wire-break	Yes	
• Short-circuit	Yes	

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU PA edition

Technical specifications

Article number	6ES7655-5PX11-1XX0 SIMATIC CFU PA	6ES7655-5PX11-1AX0 SIMATIC CFU PA with Alu housing
Diagnostics indication LED		
• RUN LED	Yes; green LED	
• ERROR LED	Yes; red LED	
• MAINT LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes	
• Status indicator digital input (green)	Yes	
• Status indicator digital output (green)	Yes	
• Spur line status/fault	Yes	
Potential separation		
between the channels and PROFINET	Yes	
Potential separation digital inputs		
• between the channels	No	
• between the channels and the power supply of the electronics	No	
Potential separation digital outputs		
• between the channels	No	
• between the channels and the power supply of the electronics	No	
Degree and class of protection		
IP degree of protection	IP20	IP66
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	
• max.	70 °C	
Connection metho		
Design of electrical connection	Connection plug	
Connection method / spur line		
• Number of spur lines	8	
• Type of cable	Type A	
• Cable diameter, min.	6 mm	
• Cable diameter, max.	12 mm	
• Conductor cross-section, min.	0.2 mm ²	
• Conductor cross-section, max.	2.5 mm ²	
• Cable length, max.	120 m	
• total current output to field devices, max.	320 mA	
• Number of connectable field devices	8	
• Current limitation per field device, max.	40 mA	
• No-load voltage, max.	15.3 V	
• short-circuit proof	Yes	
• Short-circuit current (test current); max.	8 mA	
• intrinsically safe according to FISCO model	Yes	
• Debounce logic	Yes	
Dimensions		
Width	329 mm	414 mm
Height	123 mm	266 mm
Depth	74 mm	111 mm
Weights		
Weight, approx.	650 g	5.5 kg

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU DIQ edition

Overview



SIMATIC CFU DIQ edition

Individual, customer-specific solutions and flexible system/plant extensions are requirements that are becoming increasingly important in the process industry due to digitalization. SIMATIC CFU DIQ edition with 16 freely configurable digital IO channels offers a solution for the growing demands of distributed I/O.

SIMATIC CFU also has expansion functions for optional configuration. Two additional operating modes can be activated for selected digital inputs. "Counter" operating mode and "Frequency measurement" operating mode with a cut-off frequency of 1 kHz.

Actuator shutdown can be set for the digital outputs. The actuator shutdown of the SIMATIC CFU uses a monitoring channel (DI channel) to quickly set all digital outputs to a low digital level.

- 16 × digital inputs/outputs, freely configurable (2 × counter functionality / frequency measurement)

Aluminum field enclosure



SIMATIC CFU DIQ aluminum field enclosure, open



SIMATIC CFU aluminum field enclosure, closed

The die-cast aluminum enclosure is suitable for use in zone 2/22 hazardous areas. The following are included in the enclosure scope of supply:

- 22 × M20 plastic cable glands (incl. blanking plugs)
- 35 mm DIN rail
- Rail for strain relief and shield support

The enclosure has an inspection window for LED diagnostics.

Ordering data

Article No.

SIMATIC CFU DIQ with aluminum enclosure

Comprising:

- SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0
- SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0
- Aluminum enclosure with cable glands, shield busbar, shield connection clamp

pre-assembled and tested

6ES7655-5PX31-1AX0

Article No.

SIMATIC CFU DIQ

Comprising:

- SIMATIC CFU DIQ, Article No. 6ES7655-5PX31-0XX0
 - SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX31-1XX0
- pre-assembled and tested

6ES7655-5PX31-1XX0

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU DIQ edition

Technical specifications

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
General information		
Product type designation	DIQ with aluminum enclosure	DIQ Bundle
Number of channels	16	16
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
• The user can configure digital channels as input/output as required	Yes	Yes
• Digital channels can be parameterized	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V19 Update 2	V17
• STEP 7 configurable/ integrated from version	STEP 7 V5.7.1.4	V5.6 HF2 and higher
• PCS 7 configurable/ integrated from version	V9.1 SP2 UC7	V9.0 SP2 and higher
• PCS neo can be configured/ integrated from version		V3.1
• PROFIBUS from GSD version/ GSD revision	- / -	- / -
• PROFINET from GSD version/ GSD revision	GSDML V2.43 2024.02.08	GSDML V2.3
Operating mode		
• Counter	Yes	Yes
Installation type/mounting		
Mounting	For horizontal and vertical mounting	on 35 mm DIN rail, 2 spacing units wide
Mounting position	Horizontal, vertical	Horizontal, vertical
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Short-circuit protection	Yes	Yes
Redundant power supply	Yes	Yes
Mains buffering		
• Mains/voltage failure stored energy time	5 ms; For communication	5 ms; For communication
Input current		
Current consumption (rated value)	5.12 A	5.12 A
Current consumption, max.	5.13 A	5.13 A
Inrush current, max.	4.8 A	4.8 A
I _{2t}	0.073 A ² ·s	0.073 A ² ·s
Encoder supply		
Number of outputs	16	16
Output voltage, min.	18.2 V	
Short-circuit protection	Yes; Electronic	Yes; Electronic
Output current		
• up to 60 °C, max.	5 A	5 A
• up to 70 °C, max.	4 A	4 A
Power loss		
Power loss, typ.	2.88 W; Depending on the type of BusAdapter used (typ. RJ45)	2.88 W; Depending on the type of BusAdapter used (typ. RJ45)
Address area		
Address space per station		
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU DIQ edition

Technical specifications

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
Digital inputs		
Number of digital inputs	16	16
Source/sink input	Yes; P-reading	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	No
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Pulse extension	No	No
Number of simultaneously controllable inputs		
horizontal installation		
- up to 60 °C, max.	16; Total current must be observed, see DQ	16; Total current must be observed, see DQ
- up to 70 °C, max.	16; Total current must be observed, see DQ	16; Total current must be observed, see DQ
vertical installation		
- up to 60 °C, max.	16; Total current must be observed, see DQ	16; Total current must be observed, see DQ
Digital input functions, parameterizable		
• Counter	Yes	Yes
- Number, max.	2	2
- Counting frequency, max.	1 kHz	1 kHz
- Counting width	32 bit	32 bit
- Counting direction up/down	Yes; Up	Yes; Up
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.5 mA; Typical	2.5 mA; Typical
Input delay (for rated value of input voltage) for standard inputs		
- parameterizable	No	No
- at "0" to "1", max.	3.2 ms; for counter function 0,1 ms	for counter function 0,1 ms
- at "1" to "0", max.	3.2 ms; for counter function 0,1 ms	for counter function 0,1 ms
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	16
Current-sinking	No	No
Current-sourcing	Yes	Yes
Short-circuit protection	Yes	Yes
• Response threshold, typ.	0.7 to 1.3 A	0.7 to 1.3 A
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	Ue minus 1 V	Ue minus 1 V
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU DIQ edition

Technical specifications

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
Output delay with resistive load		
• "0" to "1", max.	50 µs	50 µs
• "1" to "0", max.	100 µs	100 µs
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	No	No
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A	0.5 A
horizontal installation		
- up to 60 °C, max.	5 A	5 A
- up to 70 °C, max.	4 A	4 A
vertical installation		
- up to 60 °C, max.	5 A	5 A
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interfaces		
Number of PROFINET interfaces	1	1
Number of PROFIBUS interfaces	0	0
1. Interface		
Interface type	PROFINET	PROFINET
Isolated	Yes	Yes
Interface types		
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes	Yes
Protocols		
• PROFINET IO Device	Yes	Yes
• PROFIBUS DP device	No	No
Interface types		
RJ 45 (Ethernet)		
• 100 Mbps	Yes	Yes
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
Redundancy mode		
• PROFINET system redundancy (S2)	Yes; Type S2	Yes; Type S2
Media redundancy		
- MRP	Yes	Yes
Open IE communication		
• LLDP	Yes	Yes

I/O systems

Gateways

SIMATIC CFU

SIMATIC CFU DIQ edition

Technical specifications

Article number	6ES7655-5PX31-1AX0 SIMATIC CFU DIQ with Alu housing	6ES7655-5PX31-1XX0 SIMATIC CFU DIQ
Interrupts/diagnostics/status information		
Status indicator	Yes	Yes
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Diagnoses		
• Monitoring of encoder power supply	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Potential separation		
between the channels and PROFINET	Yes	Yes
Potential separation digital inputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Potential separation digital outputs		
• between the channels	No	No
• between the channels and the power supply of the electronics	No	No
Degree and class of protection		
IP degree of protection	IP66	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	60 °C	70 °C
Connection method		
Design of electrical connection	Connection plug	Connection plug
Dimensions		
Width	414 mm	329 mm
Height	266 mm	123 mm
Depth	111 mm	74 mm
Weights		
Weight, approx.	5.5 kg	610 g

I/O systems

Gateways
SIMATIC CFU

BusAdapters

Overview



BA 2xRJ45, 2xFC and 2xLC BusAdapter

BusAdapters

A BusAdapter as a separate component allows a free choice of SIMATIC CFU connection to PROFINET:

- BA 2xRJ45:
2 electrical connections for bus cables with standard RJ45 connectors
- BA 2xFC:
2 electrical connections for direct connection of FastConnect bus cable
- BA 2xLC:
2 optical ports for fiber-optic cables
- BA 1xLC, 1xRJ45:
Mixed BusAdapter 1 optical connection and 1 electrical connection standard RJ45
- BA 1xLC, 1xFC:
Mixed BusAdapter 1 optical connection and 1 electrical connection for direct connection of FastConnect bus cable
- BA 2xRJ45 VD:
2 electrical connections for Ethernet communication via 2-, 4- or 8-wire copper cables and distances up to 500 m

Ordering data

Article No.

BusAdapters	Article No.
BA 2xRJ45 BusAdapter 2 × RJ45 connections for PROFINET (standard Ethernet socket)	6DL1193-6AR00-0AA0
BA 2xFC BusAdapter 2 × FastConnect (FC) connections for PROFINET	6DL1193-6AF00-0AA0
BA 2xLC BusAdapter 2 × glass fiber-optic connections	6DL1193-6AG00-0AA0
BA LC/RJ45 BusAdapter 2 × glass fiber-optic connections	6DL1193-6AG20-0AA0
BA LC/FC BusAdapter 2 × glass fiber-optic connections	6DL1193-6AG40-0AA0
BA 2xRJ45 (VD) BusAdapter 2 × electrical connections for Ethernet communication via 2, 4 or 8-wire copper cables and distances up to 500 m	6GK5991-2VA00-8AA2
BA 2xLC-LD BusAdapter 2 × LC-LD port, for single-mode glass fiber-optic, up to max. 20 km	6ES7193-6AG50-0AA0
BA LC-LD/RJ45 BusAdapter 1 × LC-LD port, for single-mode fiber-optic, up to max. 20km, 1 × RJ45 port	6ES7193-6AG60-0AA0

I/O systems

Gateways

SIMATIC CFU

BusAdapters

Technical specifications

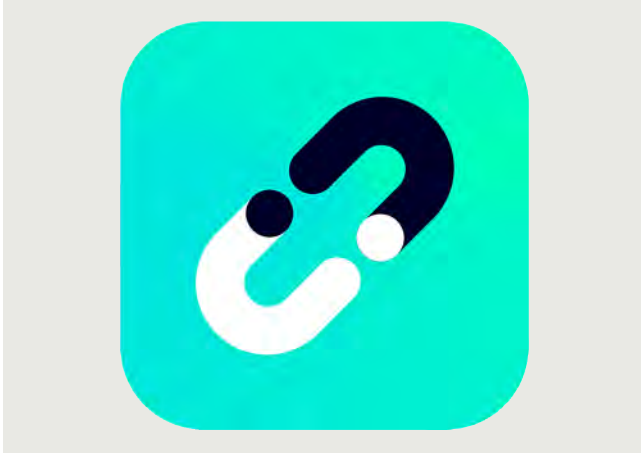
Article number	6DL1193-6AG20-0AA0 ET 200SP HA, BUSADAPTER BA LC/RJ45	6DL1193-6AG40-0AA0 ET 200SP HA, BUSADAPTER BA LC/FC
General information		
Product type designation	BA LC/RJ45	BA LC/FC
Interfaces		
Number of PROFINET interfaces	1; 2 ports (switch) LC / RJ45	1; 2 ports (switch) LC / FC
Supports protocol for PROFINET IO		
• Number of RJ45 ports	1	1
• Number of FC (FastConnect) connections		
• Number of LC ports	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
Cable length		
- Cu conductors	100 m	100 m
- Multimode graded-index fiber 50/125 µm	3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -23.5 dB, min. receiver sensitivity -31 dB
- Multimode graded-index fiber 62.5/125 µm	3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB	3 km; min. transmit power -20 dB, min. receiver sensitivity -31 dB
Standards, approvals, certificates		
RoHS conformity	Yes	Yes
China RoHS compliance	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C	-40 °C
• max.	70 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 65 °C horizontally, max. 60 °C vertically. When using different IO Devices, the derating specified there must be observed.	65 °C; = Tmax for horizontal installation; for vertical installation Tmax = 60 °C; redundant setup (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontally, max. 55 °C vertically. When using different IO Devices, the derating specified there must be observed.
Dimensions		
Width	20 mm	20 mm
Height	75 mm; Without protective caps (approx. 8 mm)	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm
Weights		
Weight, approx.	32 g	50 g

I/O systems

Data enablers

FDE Industrial Data Enabler

Overview



The SIMATIC Field Data Enabler (FDE) portfolio enables access to data from automation and process engineering plants. The acquired data can be transmitted to IT environments for further processing. This makes it possible to make data that was previously only available at the OT level accessible to the IT level as well.

Ordering data

SIMATIC Field Data Enabler PN for Linux

OPC UA server for mapping the diagnostic and asset information of a PROFINET network according to the OPC UA 30140 (PROFINET) and OPC UA 30120 (IO-Link) Companion Specifications.
Runs under Debian 11 (arm64, x86).
Recommended hardware:
SIMATIC IoT2050,
SIMATIC IPC127E;
single license,
software for download¹⁾;
email address required for delivery

Article No.

6ES7853-5BE00-0AA0

¹⁾ Up-to-date information and download availability can be found at <https://www.siemens.com/tia-online-software-delivery>.