

**7/2****based on ET 200SP**Standard CPUs

7/2 CPU 1510SP-1 PN

7/7 CPU 1512SP-1 PN

7/12 CPU 1514SP-2 PN

SIPLUS standard CPUs

7/18 SIPLUS CPU 1510SP-1 PN

7/21 SIPLUS CPU 1512SP-1 PN

Fail-safe CPUs

7/23 CPU 1510SP F-1 PN

7/28 CPU 1512SP F-1 PN

7/33 CPU 1514SP F-2 PN

SIPLUS fail-safe CPUs

7/39 SIPLUS CPU 1510SP F-1 PN

7/41 SIPLUS CPU 1512SP F-1 PN

Technology CPUs

7/44 CPU 1514SP T-2 PN

7/49 CPU 1514SP TF-2 PN

ET 200SP Open ControllersStandard CPUs

7/54 - CPU 1515SP PC2

Fail-safe CPUs

7/61 - CPU 1515SP PC2 F

Technology-CPUs

7/68 - CPU 1515SP PC2 T

7/73 - CPU 1515SP PC2 TF

SIPLUS ET 200SP Open ControllersSIPLUS standard CPUs

7/78 - SIPLUS CPU 1515SP PC2

SIPLUS fail-safe CPUs

7/81 - SIPLUS CPU 1515SP PC2 F

7/83**based on ET 200pro**Standard CPUs

7/83 IM 154-8 PN/DP CPU

7/87 CPU 1513pro-2 PN

7/93 CPU 1516pro-2 PN

Fail-safe CPUs

7/99 IM 154-8 F PN/DP CPU

7/104 CPU 1513pro F-2 PN

7/111 CPU 1516pro F-2 PN

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Overview



- CPU 1510SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU. The BusAdapter is not included in scope of supply and is to be ordered separately.

Ordering data

Article No.

SIMATIC DP, CPU 1510SP-1 PN for ET 200SP

6ES7510-1DK03-0AB0

Central processing unit with 200 KB work memory for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2
Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!

Accessories

SIMATIC DP, CM PROFIBUS DP

6ES7545-5DA00-0AB0

For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

SIMATIC Memory Card

SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS

6ES7954-8LC04-0AA0

3.3 V Flash, 4 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LE04-0AA0

3.3 V Flash, 12 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LF04-0AA0

3.3 V Flash, 24 MB

SIMATIC S7, memory card for S7-1x00 CPU

6ES7954-8LL04-0AA0

3.3 V Flash, 256 MB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LP04-0AA0

3.3 V Flash, 2 GB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LT04-0AA0

3.3 V Flash, 32 GB

DIN rail 35 mm

SIMATIC, DIN rail 35 mm

6ES5710-8MA11

Length: 483 mm for 19" cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA21

Length: 530 mm for 600 mm cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA31

Length: 830 mm for 900 mm cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA41

Length 2 m

SIMATIC S7-1500, grounding screw

6ES7590-5AA00-0AA0

For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail, 20 units per packing unit

SIMATIC ET 200SP, BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

2 RJ45 sockets

SIMATIC ET 200SP, BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

2x FastConnect connection

SIMATIC ET 200SP, BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

2 SCRJ FO connections

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Ordering data	Article No.	Ordering data	Article No.
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 10 units.	6GK1901-1BB10-2AB0
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 50 units.	6GK1901-1BB10-2AE0
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0	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
Labeling strips		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
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	6ES7193-6LR10-0AA0	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
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	6ES7193-6LR10-0AG0	Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	6GK1901-1GA00
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0	Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under https://www.siemens.com/simatic-docu .	
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0	SIMATIC Manual Collection DL in 5 languages¹⁾ 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
IE FC RJ45 plugs			
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 1 unit.	6GK1901-1BB20-2AA0		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 10 units.	6GK1901-1BB20-2AB0		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 50 units.	6GK1901-1BB20-2AE0		
IE FC RJ45 plug 180			
Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 1 unit.	6GK1901-1BB10-2AA0		

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Ordering data	Article No.	Article No.	
<p>SIMATIC Manual Collection DL in 5 languages¹⁾</p> <p>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</p> <p>Consignee email address required for delivery.</p> <p>Current Manual Collection DVD and the three subsequent updates</p>	6ES7998-8XE01-8YE2	<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> • Windows 10 Professional Version 22H2 • Windows 10 Enterprise Version 22H2 • Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> • Windows 11 Professional Version 22H2 & 23H2 • Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p>	6ES7822-1AE24-0YA5
		<p>Spare parts</p> <p>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</p> <p>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit</p>	6ES7193-4JB00-0AA0
		<p>SIMATIC ET 200SP, spare part 5 covers</p> <p>For BusAdapter interface of the ET 200SP CPU</p>	6ES7591-3AA00-0AA0
		<p>SIMATIC ET 200SP, spare part server module</p> <p>For ET 200SP</p>	6ES7193-6PA00-0AA0

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Technical specifications

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
General information	
Product type designation	CPU 1510SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7510-1DJ01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFlenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1510SP-1 PN

Technical specifications

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7510-1DK03-0AB0 CPU 1510SP-1 PN, 200KB Prog., 1MB Data
Product functions/security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Overview



- CPU 1512SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of delivery and is to be ordered separately.

Ordering data

Article No.

SIMATIC DP, CPU 1512SP-1 PN for ET 200SP

6ES7512-1DM03-0AB0

Central processing unit with 400 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2

Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!

Accessories

SIMATIC DP, CM PROFIBUS DP for ET 200SP

6ES7545-5DA00-0AB0

CPU module with PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

SIMATIC Memory Card

SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS

6ES7954-8LC04-0AA0

3.3 V Flash, 4 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LE04-0AA0

3.3 V Flash, 12 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LF04-0AA0

3.3 V Flash, 24 MB

SIMATIC S7, memory card for S7-1x00 CPU

6ES7954-8LL04-0AA0

3.3 V Flash, 256 MB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LP04-0AA0

3.3 V Flash, 2 GB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LT04-0AA0

3.3 V Flash, 32 GB

DIN rail 35 mm

SIMATIC, DIN rail 35 mm,

6ES710-8MA11

Length: 483 mm for 19" cabinets

SIMATIC, DIN rail 35 mm

6ES710-8MA21

Length: 530 mm for 600 mm cabinets

SIMATIC, DIN rail 35 mm

6ES710-8MA31

Length: 830 mm for 900 mm cabinets

SIMATIC, DIN rail 35 mm

6ES710-8MA41

Length 2 m

SIMATIC S7-1500, grounding screw

6ES7590-5AA00-0AA0

For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail 20 units per packing unit

SIMATIC ET 200SP, BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

2 RJ45 sockets

SIMATIC ET 200SP, BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

2x FastConnect connection

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Ordering data	Article No.	Ordering data	Article No.
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	6ES7193-6AP00-0AA0	Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 50 units.	6GK1901-1BB20-2AE0
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	IE FC RJ45 plug 180	
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	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
SIMATIC BA 2xLC BusAdapter 2x LC glass fiber-optic cable connections	6ES7193-6AG00-0AA0	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
SIMATIC BusAdapter: BA LC/RJ45 Media converter glass FOC/CU 1x LC FO connection and 1x RJ45 connection	6ES7193-6AG20-0AA0	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
SIMATIC BusAdapter: BA LC/FC Media converter glass FOC/CU 1x LC FO connection and 1x FastConnect (FC) connection	6ES7193-6AG40-0AA0	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
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0	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
Labeling strips		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
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	6ES7193-6LR10-0AA0	Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	6ES7193-6LR10-0AG0	Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0	Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	6GK1901-1GA00
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0		
IE FC RJ45 plugs			
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 1 unit.	6GK1901-1BB20-2AA0		
Industrial Ethernet FastConnect RJ45 plug 90 2x 2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x 2; 90° cable outlet 1 pack = 10 units.	6GK1901-1BB20-2AB0		

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Ordering data	Article No.	Article No.	
<p>Manuals for ET 200SP distributed I/O system</p> <p>ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals</p> <p>Manuals can be downloaded from the Internet as PDF files under https://www.siemens.com/simatic-docu.</p>		<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5
<p>SIMATIC Manual Collection DL in 5 languages¹⁾</p> <p>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</p> <p>Consignee email address required for delivery.</p>	6ES7998-8XE01-8YE0	<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p>	6ES7822-1AE24-0YA5
<p>SIMATIC Manual Collection DL in 5 languages¹⁾</p> <p>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</p> <p>Consignee email address required for delivery.</p>	6ES7998-8XE01-8YE2	<p>Spare parts</p> <p>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</p> <p>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit</p>	6ES7193-4JB00-0AA0
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> • Windows 10 Professional Version 22H2 • Windows 10 Enterprise Version 22H2 • Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> • Windows 11 Professional Version 22H2 & 23H2 • Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>SIMATIC ET 200SP, spare part 5 covers</p> <p>For BusAdapter interface of the ET 200SP CPU</p>	6ES7591-3AA00-0AA0
		<p>SIMATIC ET 200SP, spare part server module</p> <p>For ET 200SP</p>	6ES7193-6PA00-0AA0

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Technical specifications

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400 KB Prog., 2 MB Data
General information	
Product type designation	CPU 1512SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V19 (FW V3.1) / V18 (FW V3.0) or higher; with older TIA Portal versions configurable as 6ES7 512-1DK01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	400 kbyte
• integrated (for data)	2 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400 KB Prog., 2 MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFlenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1512SP-1 PN

Technical specifications

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400 KB Prog., 2 MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7512-1DM03-0AB0 CPU 1512SP-1 PN, 400 KB Prog., 2 MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Overview



- CPU 1514SP-2 PN for SIMATIC ET 200SP based on S7-1500 CPU 1515-2 PN
- For applications with medium/high requirements regarding program scope, networking and processing speed, for distributed configuration via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines. The additional integrated PROFINET interface with separate IP address can be used for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device, for example.
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Additional PROFINET interface with separate IP address
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of delivery and is to be ordered separately.

Ordering data

Article No.

SIMATIC DP, CPU 1514SP-2 PN for ET 200SP

6ES7514-2DN03-0AB0

Central processing unit with 600 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required, BusAdapter required for 1st interface
Observe the approvals and certificates according to entry 109818872 at support.industry.siemens.com!

Accessories

SIMATIC DP, CM PROFIBUS DP
For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

6ES7545-5DA00-0AB0

SIMATIC Memory Card

SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS

6ES7954-8LC04-0AA0

3.3 V Flash, 4 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LE04-0AA0

3.3 V Flash, 12 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LF04-0AA0

3.3 V Flash, 24 MB

SIMATIC S7, memory card for S7-1x00 CPU

6ES7954-8LL04-0AA0

3.3 V Flash, 256 MB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LP04-0AA0

3.3 V Flash, 2 GB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LT04-0AA0

3.3 V Flash, 32 GB

DIN rail 35 mm

SIMATIC, DIN rail 35 mm

6ES5710-8MA11

Length: 483 mm for 19" cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA21

Length: 530 mm for 600 mm cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA31

Length: 830 mm for 900 mm cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA41

Length 2 m

SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail

6ES7590-5AA00-0AA0

Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit

SIMATIC ET 200SP, BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

2 RJ45 sockets

SIMATIC ET 200SP, BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

2x FastConnect connection

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Ordering data	Article No.	Ordering data	Article No.
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	6ES7193-6AP00-0AA0	Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 50 units.	6GK1901-1BB20-2AE0
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	IE FC RJ45 plug 180	
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 1 unit.	6GK1901-1BB10-2AA0
SIMATIC BA 2xLC BusAdapter 2x LC glass fiber-optic cable connections	6ES7193-6AG00-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 10 units.	6GK1901-1BB10-2AB0
SIMATIC BusAdapter: BA LC/RJ45 Media converter glass FOC/CU 1x LC FO connection and 1x RJ45 connection	6ES7193-6AG20-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 10 units.	6GK1901-1BB10-2AE0
SIMATIC BusAdapter: BA LC/FC Media converter glass FOC/CU 1x LC FO connection and 1x FastConnect (FC) connection	6ES7193-6AG40-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 50 units.	6GK1901-1BB10-2AE0
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0	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
Labeling strips		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
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	6ES7193-6LR10-0AA0	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
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	6ES7193-6LR10-0AG0	Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 1 unit.	
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0	Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 10 units.	
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0	Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 10 units.	
IE FC RJ45 plugs		Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	6GK1901-1GA00

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Ordering data	Article No.	Article No.
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files under https://www.siemens.com/simatic-docu .		SIMATIC STEP 7 Professional V20; floating license Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at https://www.siemens.com/compatool
SIMATIC Manual Collection DL in 5 languages¹⁾ 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 STEP 7 Professional V20, floating license download¹⁾ Engineering software in the TIA Portal; software, documentation and license key for downloading ¹⁾ ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at https://www.siemens.com/compatool Consignee email address required for delivery
SIMATIC Manual Collection DL in 5 languages¹⁾ 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. Current Manual Collection DVD and the three subsequent updates	6ES7998-8XE01-8YE2	Spare parts Connector, socket, 2x2-pole, 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
STEP 7 Professional V20 Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> • Windows 10 Professional Version 22H2 • Windows 10 Enterprise Version 22H2 • Windows 10 Enterprise 2019 LTSC & 2021 LTSC Windows 11 (64-bit) <ul style="list-style-type: none"> • Windows 11 Professional Version 22H2 & 23H2 • Windows 11 Enterprise Version 22H2 & 23H2 Windows Server (64-bit) <ul style="list-style-type: none"> • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download		SIMATIC ET 200SP, spare part 5 covers For BusAdapter interface of the ET 200SP CPU SIMATIC ET 200SP, spare part server module For ET 200SP

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600 KB Prog., 3,5 MB Data
General information	
Product type designation	CPU 1514SP-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	600 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600 KB Prog., 3,5 MB Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP
Standard CPUs

CPU 1514SP-2 PN

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600 KB Prog., 3,5 MB Data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600 KB Prog., 3,5 MB Data
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Distributed Controllers

based on ET 200SP

Standard CPUs

CPU 1514SP-2 PN

Technical specifications

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600 KB Prog., 3,5 MB Data
Product functions/security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes

Article number	6ES7514-2DN03-0AB0 CPU 1514SP-2 PN, 600 KB Prog., 3,5 MB Data
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1510SP-1 PN

Overview



- SIPLUS CPU 1510SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller

- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP device (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU. The BusAdapter is not included in the scope of supply and is to be ordered separately. No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

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 CPU 1510SP-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 100 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC Memory Card required

200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required
Temperature range -40 ... +60 °C

6AG1510-1DK03-2AB0

200 KB work memory for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required
Temperature range -40 ... +70 °C; No BusAdapter can be inserted

6AG1510-1DK03-7AB0

Accessories

BA 2xRJ45 BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AR00-7AA0

BA 2xFC BusAdapter for increased vibration and EMC loads

(Extended temperature range and exposure to environmental substances)

6AG1193-6AF00-7AA0

IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

IE FC RJ45 plug 180

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

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 with 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 CPU 1510SP-1 PN, page 7/2

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1510SP-1 PN

Technical specifications

Article number	6AG1510-1DK03-2AB0	6AG1510-1DK03-7AB0
Based on	6ES7510-1DK03-0AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6ES7510-1DK03-0AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °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; 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, *
- 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)	
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		
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/ 6AG1193-6AB00-0AA0)	

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1510SP-1 PN

Technical specifications

Article number	6AG1510-1DK03-2AB0	6AG1510-1DK03-7AB0
Based on	6ES7510-1DK03-0AB0 SIPLUS ET 200SP CPU 1510SP-1 PN	6ES7510-1DK03-0AB0 SIPLUS ET 200SP CPU 1510SP-1 PN
Usage in industrial process technology		
<ul style="list-style-type: none"> - Against chemically active substances acc. to EN 60654-4 - Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 	<p>Yes; Class 3 (excluding trichlorethylene)</p> <p>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)</p>	<p>Yes; Class 3 (excluding trichlorethylene)</p> <p>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)</p>
Remark		
<ul style="list-style-type: none"> - 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		
<ul style="list-style-type: none"> • 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 	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1512SP-1 PN

Overview



- SIPLUS CPU 1512SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1513-1 PN
- For applications with average requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP device (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU. BusAdapter is not included in scope of supply and is to be ordered separately. No BusAdapter can be inserted with the variant for the temperature range -40...+70 °C.

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 CPU 1512SP-1 PN

(Extended temperature range and exposure to environmental substances)

400 KB work memory for program, 2 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required
Temperature range -40 ... +60 °C;

6AG1512-1DM03-2AB0

400 KB work memory for program, 2 MB for data, PROFINET IO IRT interface; SIMATIC Memory Card required
Temperature range -40 ... +70 °C; No BusAdapter can be inserted

6AG1512-1DM03-7AB0

Accessories

BA 2xRJ45 BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AR00-7AA0

BA 2xFC BusAdapter for increased vibration and EMC loads

(Extended temperature range and exposure to environmental substances)

6AG1193-6AF00-7AA0

IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

IE FC RJ45 plug 180

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

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, CPU 1512SP-1 PN, page 7/7

Distributed Controllers

based on ET 200SP
SIPLUS standard CPUs

SIPLUS CPU 1512SP-1 PN

Technical specifications

Article number	6AG1512-1DM03-2AB0	6AG1512-1DM03-7AB0
Based on	6ES7512-1DM03-0AB0	6ES7512-1DM03-0AB0
	SIPLUS ET 200SP CPU 1512SP-1 PN	SIPLUS ET 200SP CPU 1512SP-1 PN
Ambient conditions		
Ambient temperature during operation		
<ul style="list-style-type: none"> horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. 	-40 °C; = Tmin (incl. condensation/frost) 60 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax -40 °C; = Tmin 50 °C; = Tmax
Altitude during operation relating to sea level		
<ul style="list-style-type: none"> 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		
<ul style="list-style-type: none"> 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		
<ul style="list-style-type: none"> 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		
<ul style="list-style-type: none"> 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//6AG1193-6AB00-0AA0)	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, *
Use on ships/at sea		
<ul style="list-style-type: none"> 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 (6AG1193-6AA00-0AA0/6AG1193-6AB00-0AA0)	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; *
Usage in industrial process technology		
<ul style="list-style-type: none"> 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		
<ul style="list-style-type: none"> 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		
<ul style="list-style-type: none"> 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

Distributed Controllers

based on ET 200SP
Fail-safe CPUs

CPU 1510SP F-1 PN

Overview



- CPU 1510SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFINET in centralized and distributed configuration
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

SIMATIC DP, CPU 1510SP F-1 PN for ET 200SP

6ES7510-1SK03-0AB0

Central processing unit with 300 KB work memory for program and 1 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2
Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!

Accessories

SIMATIC DP, CM PROFIBUS DP

6ES7545-5DA00-0AB0

For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

SIMATIC Memory Card

SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS

6ES7954-8LC04-0AA0

3.3 V Flash, 4 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LE04-0AA0

3.3 V Flash, 12 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LF04-0AA0

3.3 V Flash, 24 MB

SIMATIC S7, memory card for S7-1x00 CPU

6ES7954-8LL04-0AA0

3.3 V Flash, 256 MB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LP04-0AA0

3.3 V Flash, 2 GB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LT04-0AA0

3.3 V Flash, 32 GB

DIN rail 35 mm

SIMATIC, DIN rail 35 mm

6ES7510-8MA11

Length: 483 mm for 19" cabinets

SIMATIC, DIN rail 35 mm

6ES7510-8MA21

Length: 530 mm for 600 mm cabinets

SIMATIC, DIN rail 35 mm

6ES7510-8MA31

Length: 830 mm for 900 mm cabinets

SIMATIC, DIN rail 35 mm

6ES7510-8MA41

Length 2 m

SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail

6ES7590-5AA00-0AA0

Absolutely necessary for the 2000 mm mounting rail
20 units per packing unit

SIMATIC ET 200SP, BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

2 RJ45 sockets

SIMATIC ET 200SP, BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

2x FastConnect connection

SIMATIC ET 200SP, BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

2 SCRJ FO connections

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1510SP F-1 PN

Ordering data	Article No.	Ordering data	Article No.
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 10 units.	6GK1901-1BB10-2AB0
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 50 units.	6GK1901-1BB10-2AE0
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0	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
Labeling strips		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
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	6ES7193-6LR10-0AA0	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
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	6ES7193-6LR10-0AG0	Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	6GK1901-1GA00
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0	Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under http://www.siemens.com/simatic-docu .	
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0	SIMATIC Manual Collection DL in 5 languages¹⁾ 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
IE FC RJ45 plugs			
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 1 unit.	6GK1901-1BB20-2AA0		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 10 units.	6GK1901-1BB20-2AB0		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 50 units.	6GK1901-1BB20-2AE0		
IE FC RJ45 plug 180			
Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 1 unit.	6GK1901-1BB10-2AA0		

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1510SP F-1 PN

Ordering data	Article No.	Article No.
<p>SIMATIC Manual Collection DL in 5 languages¹⁾</p> <p>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</p> <p>Consignee email address required for delivery.</p>	6ES7998-8XE01-8YE2	
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>STEP 7 Safety Advanced V20</p> <p>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</p> <p>Requirement: STEP 7 Professional V20</p> <p>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.</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software; floating license for 1 user; license key on USB flash drive</p> <p>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F</p> <p>Content: 1x USB</p>
<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p>	6ES7822-1AE24-0YA5	<p>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software, floating license for 1 user; license key for download¹⁾</p> <p>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery</p>
		<p>Spare parts</p>
		<p>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</p> <p>6ES7193-4JB00-0AA0</p> <p>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit</p>
		<p>SIMATIC ET 200SP, spare part 5 covers</p> <p>6ES7591-3AA00-0AA0</p> <p>For BusAdapter interface of the ET 200SP CPU</p>
		<p>SIMATIC ET 200SP, spare part server module</p> <p>6ES7193-6PA00-0AA0</p> <p>For ET 200SP</p>

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Fail-safe CPUs

CPU 1510SP F-1 PN

Technical specifications

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
General information	
Product type designation	CPU 1510SP F-1 PN
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V20 (FW V4.0) / V18 (FW V3.0) or higher; configurable with older TIA Portal versions as 6ES7510-1SJ01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
<ul style="list-style-type: none"> integrated (for program) integrated (for data) 	300 kbyte 1 Mbyte
Load memory	
<ul style="list-style-type: none"> Plug-in (SIMATIC Memory Card), max. 	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
<ul style="list-style-type: none"> Number 	2 048
IEC counter	
<ul style="list-style-type: none"> Number 	Any (only limited by the main memory)
S7 times	
<ul style="list-style-type: none"> Number 	2 048
IEC timer	
<ul style="list-style-type: none"> Number 	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
<ul style="list-style-type: none"> Size, max. 	16 kbyte
Address area	
I/O address area	
<ul style="list-style-type: none"> Inputs 	32 kbyte; All inputs are in the process image
<ul style="list-style-type: none"> Outputs 	32 kbyte; All outputs are in the process image
Address space per module	
<ul style="list-style-type: none"> Address space per module, max. 	288 byte; For input and output data respectively
Address space per station	
<ul style="list-style-type: none"> Address space per station, max. 	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
<ul style="list-style-type: none"> Type 	Hardware clock

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
1. Interface	
Interface types	
<ul style="list-style-type: none"> RJ 45 (Ethernet) Number of ports integrated switch BusAdapter (PROFINET) 	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45 3; 1. integr. + 2. via BusAdapter Yes Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
<ul style="list-style-type: none"> IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy 	Yes; IPv4 Yes Yes Yes Yes; Optionally also encrypted Yes Yes
PROFINET IO Controller	
Services	
<ul style="list-style-type: none"> Isochronous mode Direct data exchange IRT PROFenergy Prioritized startup Number of connectable IO Devices, max. Of which IO devices with IRT, max. Number of connectable IO Devices for RT, max. of which in line, max. Number of IO Devices that can be simultaneously activated/deactivated, max. Number of IO Devices per tool, max. Updating times PROFINET Security Class 	Yes Yes; Requirement: IRT and isochronous mode (MRPD optional) Yes Yes; per user program Yes; Max. 32 PROFINET devices 128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET 64 128 128 8; in total across all interfaces 8 The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data 1
PROFINET IO Device	
Services	
<ul style="list-style-type: none"> Isochronous mode IRT PROFenergy Shared device Number of IO Controllers with shared device, max. activation/deactivation of I-devices Asset management record PROFINET Security Class 	No Yes Yes; per user program Yes 4 Yes; per user program Yes; per user program SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP
Fail-safe CPUs

CPU 1510SP F-1 PN

Technical specifications

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7510-1SK03-0AB0 CPU1510SP F-1 PN, 300KB Prog., 1MB Data
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Product functions/security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1512SP F-1 PN

Overview



- CPU 1512SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFI-safe in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

SIMATIC DP, CPU 1512SP F-1 PN for ET 200SP

6ES7512-1SM03-0AB0

Central processing unit with 600 KB work memory for program and 2 MB for data, 1st interface: PROFINET IRT with 3-port switch, 25 ns bit performance, SIMATIC Memory Card required, BusAdapter required for ports 1 and 2 Observe the approvals and certificates according to entry 109817615 at support.industry.siemens.com!

Accessories

SIMATIC DP, CM PROFIBUS DP for ET 200SP CPU

6ES7545-5DA00-0AB0

Module with PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

SIMATIC Memory Card

SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS

6ES7954-8LC04-0AA0

3.3 V Flash, 4 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LE04-0AA0

3.3 V Flash, 12 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS

6ES7954-8LF04-0AA0

3.3 V Flash, 24 MB

SIMATIC S7, memory card for S7-1x00 CPU

6ES7954-8LL04-0AA0

3.3 V Flash, 256 MB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LP04-0AA0

3.3 V Flash, 2 GB

SIMATIC S7, memory card for S7-1x 00 CPU

6ES7954-8LT04-0AA0

3.3 V Flash, 32 GB

DIN rail 35 mm

SIMATIC, DIN rail 35 mm

6ES5710-8MA11

Length: 483 mm for 19" cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA21

Length: 530 mm for 600 mm cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA31

Length: 830 mm for 900 mm cabinets

SIMATIC, DIN rail 35 mm

6ES5710-8MA41

Length 2 m

SIMATIC S7-1500, grounding screw for connecting PE to the S7-1500 mounting rail

6ES7590-5AA00-0AA0

Absolutely necessary for the 2000 mm mounting rail 20 units per packing unit

SIMATIC ET 200SP, BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

2 RJ45 sockets

SIMATIC ET 200SP, BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

2x FastConnect connection

SIMATIC ET 200SP, BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

2 SCRJ FO connections

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1512SP F-1 PN

Ordering data	Article No.	Article No.
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 10 units.
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 50 units.
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0	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.
Labeling strips		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.
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	6ES7193-6LR10-0AA0	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.
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	6ES7193-6LR10-0AG0	Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0	Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under http://www.siemens.com/simatic-docu .
SIMATIC ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0	SIMATIC Manual Collection DL in 5 languages¹⁾ 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.
IE FC RJ45 plugs		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 1 unit.	6GK1901-1BB20-2AA0	
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 10 units.	6GK1901-1BB20-2AB0	
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 50 units.	6GK1901-1BB20-2AE0	
IE FC RJ45 plug 180		
Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 1 unit.	6GK1901-1BB10-2AA0	

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1512SP F-1 PN

Ordering data	Article No.	Article No.
<p>SIMATIC Manual Collection DL in 5 languages¹⁾</p> <p>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</p> <p>Consignee email address required for delivery.</p> <p>Current Manual Collection DVD and the three subsequent updates</p>	6ES7998-8XE01-8YE2	
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>STEP 7 Safety Advanced V20</p> <p>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</p> <p>Requirement: STEP 7 Professional V20</p> <p>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.</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software; floating license for 1 user; license key on USB flash drive</p> <p>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F</p> <p>Content: 1x USB</p>
<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p>	6ES7822-1AE24-0YA5	<p>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software, floating license for 1 user; license key for download¹⁾</p> <p>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery</p>
		<p>Spare parts</p>
		<p>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</p> <p>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit</p>
		<p>SIMATIC ET 200SP, spare part 5 covers</p> <p>For BusAdapter interface of the ET 200SP CPU</p>
		<p>SIMATIC ET 200SP, spare part server module</p> <p>For ET 200SP</p>

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Fail-safe CPUs

CPU 1512SP F-1 PN

Technical specifications

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600 KB Prog./2 MB Data
General information	
Product type designation	CPU 1512SP F-1 PN
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V19 (FW V3.1) / V18 (FW V3.0) or higher; with older TIA Portal versions configurable as 6ES7512-1SK01-0AB0
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
<ul style="list-style-type: none"> integrated (for program) integrated (for data) 	600 kbyte 2 Mbyte
Load memory	
<ul style="list-style-type: none"> Plug-in (SIMATIC Memory Card), max. 	32 Gbyte
CPU processing times	
for bit operations, typ.	25 ns
for word operations, typ.	32 ns
for fixed point arithmetic, typ.	42 ns
for floating point arithmetic, typ.	170 ns
Counters, timers and their retentivity	
S7 counter	
<ul style="list-style-type: none"> Number 	2 048
IEC counter	
<ul style="list-style-type: none"> Number 	Any (only limited by the main memory)
S7 times	
<ul style="list-style-type: none"> Number 	2 048
IEC timer	
<ul style="list-style-type: none"> Number 	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
<ul style="list-style-type: none"> Size, max. 	16 kbyte
Address area	
I/O address area	
<ul style="list-style-type: none"> Inputs 	32 kbyte; All inputs are in the process image
<ul style="list-style-type: none"> Outputs 	32 kbyte; All outputs are in the process image
Address space per module	
<ul style="list-style-type: none"> Address space per module, max. 	288 byte; For input and output data respectively
Address space per station	
<ul style="list-style-type: none"> Address space per station, max. 	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
<ul style="list-style-type: none"> Type 	Hardware clock

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600 KB Prog./2 MB Data
1. Interface	
Interface types	
<ul style="list-style-type: none"> RJ 45 (Ethernet) Number of ports integrated switch BusAdapter (PROFINET) 	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45 3; 1. integr. + 2. via BusAdapter Yes Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
<ul style="list-style-type: none"> IP protocol PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy 	Yes; IPv4 Yes Yes Yes Yes; Optionally also encrypted Yes Yes
PROFINET IO Controller	
Services	
<ul style="list-style-type: none"> Isochronous mode Direct data exchange IRT PROFenergy Prioritized startup Number of connectable IO Devices, max. Of which IO devices with IRT, max. Number of connectable IO Devices for RT, max. of which in line, max. Number of IO Devices that can be simultaneously activated/deactivated, max. Number of IO Devices per tool, max. Updating times PROFINET Security Class 	Yes Yes; Requirement: IRT and isochronous mode (MRPD optional) Yes Yes; per user program Yes; Max. 32 PROFINET devices 128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET 64 128 128 8; in total across all interfaces 8 The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data 1
PROFINET IO Device	
Services	
<ul style="list-style-type: none"> Isochronous mode IRT PROFenergy Shared device Number of IO Controllers with shared device, max. activation/deactivation of I-devices Asset management record PROFINET Security Class 	No Yes Yes; per user program Yes 4 Yes; per user program Yes; per user program SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1512SP F-1 PN

Technical specifications

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600 KB Prog./2 MB Data
2. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	1 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7512-1SM03-0AB0 CPU 1512SP F-1 PN, 600 KB Prog./2 MB Data
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	Yes; either CFC or failsafe functionality
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
Fail-safe CPUs

CPU 1514SP F-2 PN

Overview



- CPU 1514SP F21 PN for SIMATIC ET 200SP based on S7-1500 CPU 1515F-2 PN
- For applications with medium/high requirements regarding program scope, networking and processing speed, for distributed configuration via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines. The additional integrated PROFINET interface with separate IP address can be used for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device, for example.
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Additional PROFINET interface with separate IP address
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

SIMATIC DP, CPU 1514SP F-2 PN for ET 200SP **6ES7514-2SN03-0AB0**

Central processing unit with 900 KB work memory for program and 3.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required, BusAdapter required for 1st interface Observe the approvals and certificates according to entry 109818872 at support.industry.siemens.com!

Accessories

SIMATIC DP, CM PROFIBUS DP **6ES7545-5DA00-0AB0**

For ET 200SP CPU module w. PROFIBUS DP interface (9-pin D-sub socket) DP master for 125 DP devices, DP device

SIMATIC Memory Card

SIMATIC S7, memory card for S7-1x 00 CPU/SINAMICS **6ES7954-8LC04-0AA0**

3.3 V Flash, 4 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS **6ES7954-8LE04-0AA0**

3.3 V Flash, 12 MB

SIMATIC S7, memory card for S7-1x00 CPU/SINAMICS **6ES7954-8LF04-0AA0**

3.3 V Flash, 24 MB

SIMATIC S7, memory card for S7-1x00 CPU **6ES7954-8LL04-0AA0**

3.3 V Flash, 256 MB

SIMATIC S7, memory card for S7-1x 00 CPU **6ES7954-8LP04-0AA0**

3.3 V Flash, 2 GB

SIMATIC S7, memory card for S7-1x 00 CPU **6ES7954-8LT04-0AA0**

3.3 V Flash, 32 GB

DIN rail 35 mm

SIMATIC, DIN rail 35 mm **6ES7110-8MA11**

Length: 483 mm for 19" cabinets

SIMATIC, DIN rail 35 mm **6ES7110-8MA21**

Length: 530 mm for 600 mm cabinets

SIMATIC, DIN rail 35 mm **6ES7110-8MA31**

Length: 830 mm for 900 mm cabinets

SIMATIC, DIN rail 35 mm **6ES7110-8MA41**

Length 2 m

SIMATIC S7-1500, grounding screw **6ES7590-5AA00-0AA0**

For connecting PE to the S7-1500 mounting rail; essential for 2000 mm mounting rail 20 units per packing unit

SIMATIC ET 200SP, BA 2XRJ45 BusAdapter 2x RJ45 sockets **6ES7193-6AR00-0AA0**

SIMATIC ET 200SP, BA 2xFC BusAdapter 2x FastConnect connections **6ES7193-6AF00-0AA0**

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Ordering data	Article No.	Article No.	
SIMATIC ET 200SP, BA 2xSCRJ BusAdapter 2 SCRJ FO connections	6ES7193-6AP00-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 10 units.	6GK1901-1BB10-2AB0
SIMATIC ET 200SP, BA SCRJ/RJ45 BusAdapter Media converter FOC-CU 1x SCRJ FO connection and 1x RJ45 connection	6ES7193-6AP20-0AA0	Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 50 units.	6GK1901-1BB10-2AE0
SIMATIC ET 200SP, BusAdapter: BA SCRJ/FC Media converter FOC-CU 1x SCRJ FO connection and 1x FastConnect (FC) connection	6ES7193-6AP40-0AA0	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
SIMATIC ET 200SP, 160 reference designation labels 10 sheets (160 labels), for BA, BU, IM and I/O modules	6ES7193-6LF30-0AW0	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
Labeling strips		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
SIMATIC ET 200SP, 500 labeling strips, light gray Roll of 500 strips	6ES7193-6LR10-0AA0	Industrial Ethernet FastConnect stripping tool Stripping tool for fast stripping of insulation from the IE FastConnect cables.	6GK1901-1GA00
SIMATIC ET 200SP, 500 labeling strips, yellow Roll of 500 strips	6ES7193-6LR10-0AG0	Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals are available as PDF files on the Internet under https://www.siemens.com/simatic-docu .	
SIMATIC ET 200SP, 1000 labeling strips, light gray 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AA0	SIMATIC Manual Collection DL in 5 languages¹⁾ 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 ET 200SP, 1000 labeling strips, yellow 10 sheets DIN A4, perforated, paper, 180 g/sqm	6ES7193-6LA10-0AG0		
IE FC RJ45 plugs			
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 1 unit.	6GK1901-1BB20-2AA0		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 10 units.	6GK1901-1BB20-2AB0		
Industrial Ethernet FastConnect RJ45 plug 90 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 90° cable outlet 1 pack = 50 units.	6GK1901-1BB20-2AE0		
IE FC RJ45 plug 180			
Industrial Ethernet FastConnect RJ45 plug 180 2x2 RJ45 plug-in connector (10/100 Mbps), with rugged metal enclosure and FC connection technology, for IE FC cable 2x2; 180° cable outlet 1 pack = 1 unit.	6GK1901-1BB10-2AA0		

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Ordering data	Article No.	Article No.
<p>SIMATIC Manual Collection DL in 5 languages¹⁾</p> <p>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</p> <p>Consignee email address required for delivery.</p>	6ES7998-8XE01-8YE2	
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>STEP 7 Safety Advanced V20</p> <p>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</p> <p>Requirement: STEP 7 Professional V20</p> <p>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.</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software; floating license for 1 user; license key on USB flash drive</p> <p>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F</p> <p>Content: 1x USB</p>
<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p>	6ES7822-1AE24-0YA5	<p>SIMATIC S7, F-programming tool; STEP 7 Safety Advanced V20; engineering software, floating license for 1 user; license key for download¹⁾</p> <p>Class A, 2 languages (en, de); runs with TIA Portal V20 STEP 7 Professional V20; for configuring SIMATIC S7-1200F/1500F, SIMATIC S7-1500F SW Controller, SIMATIC S7-300F/400F/WinAC F; Consignee email address required for delivery</p>
		<p>Spare parts</p>
		<p>Connector, socket, 2x2-pole, ET 200SP, interface module, KP32F</p> <p>6ES7193-4JB00-0AA0</p> <p>PN-PN coupler, grid size 5.08 mm spring-loaded terminals, internally bridged, color-coded 10 units per packing unit</p>
		<p>SIMATIC ET 200SP, spare part 5 covers</p> <p>6ES7591-3AA00-0AA0</p> <p>For BusAdapter interface of the ET 200SP CPU</p>
		<p>SIMATIC ET 200SP, spare part server module</p> <p>6ES7193-6PA00-0AA0</p> <p>For ET 200SP</p>

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900 Kb Prog. 3,5 Mb Data
General information	
Product type designation	CPU 1514SP F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900 Kb Prog. 3,5 Mb Data
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFlenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900 Kb Prog. 3,5 Mb Data
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Contoller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Contoller	
Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900 Kb Prog. 3,5 Mb Data
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Distributed Controllers

based on ET 200SP

Fail-safe CPUs

CPU 1514SP F-2 PN

Technical specifications

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900 Kb Prog. 3,5 Mb Data
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Product functions/security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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

Article number	6ES7514-2SN03-0AB0 CPU 1514SP F-2 PN, 900 Kb Prog. 3,5 Mb Data
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1510SP F-1 PN

Overview



- SIPLUS CPU 1510SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

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 CPU 1510SP F-1 PN

6AG1510-1SK03-2AB0

(Extended temperature range and exposure to environmental substances)

Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

Temperature range -40 ... +60 °C

Accessories

SIPLUS BA 2xRJ45 BusAdapter

6AG1193-6AR00-7AA0

SIPLUS BA 2xFC BusAdapter

6AG1193-6AF00-7AA0

IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

IE FC RJ45 plug 180

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

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, CPU 1510 F-1 PN, page 7/23

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1510SP F-1 PN

Technical specifications

Article number	6AG1510-1SK03-2AB0
Based on	6ES7510-1SK03-0AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °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; 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	6AG1510-1SK03-2AB0
Based on	6ES7510-1SK03-0AB0 SIPLUS ET 200SP CPU 1510SP F-1 PN
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

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1512SP F-1 PN

Overview



- SIPLUS CPU 1512SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with average requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP
- Increase in availability of systems and machines
- Supports PROFI-safe in centralized and distributed configurations
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO controller
- PROFINET Shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS device for 125 PROFIBUS DP devices (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing), support for external encoders, output cams/cam tracks and probes

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

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 CPU 1512SP F-1 PN

(Extended temperature range and exposure to environmental substances)

Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

Temperature range -25...+60 °C

6AG1512-1SK01-2AB0

Temperature range -40...+70 °C; No BusAdapter can be inserted

6AG1512-1SK01-7AB0

600 KB work memory for program, 2 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required

6AG1512-1SM03-2AB0

Temperature range -40...+0 °C;

6AG1512-1SM03-7AB0

600 KB work memory for program, 2 MB for data, PROFINET IO IRT interface, SIMATIC Memory Card required
Temperature range -40...+70 °C; No BusAdapter can be inserted

Accessories

SIPLUS BA 2xRJ45 BusAdapter

6AG1193-6AR00-7AA0

SIPLUS BA 2xFC BusAdapter

6AG1193-6AF00-7AA0

IE FC RJ45 plugs

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

IE FC RJ45 plug 180

(Extended temperature range and exposure to environmental substances)

180° cable outlet

1 unit

6AG1901-1BB10-7AA0

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, CPU 1512 F-1 PN, page 7/28

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1512SP F-1 PN

Technical specifications

Article number	6AG1512-1SK01-2AB0	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
Based on	6ES7512-1SK01-0AB0	6ES7512-1SK01-0AB0	6ES7512-1SM03-0AB0	6ES7512-1SM03-0AB0
	SIPLUS ET 200SP CPU 1512SP F-1PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN	SIPLUS ET 200SP CPU 1512SP F-1 PN
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-25 °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; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-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; 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
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	No	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, *			
- 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//6AG1193-6AB00-0AA0)	
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)	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 (with the exception of oil droplets in the air); *	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//6AG1193-6AB00-0AA0)	

Distributed Controllers

based on ET 200SP
SIPLUS fail-safe CPUs

SIPLUS CPU 1512SP F-1 PN

Technical specifications

Article number	6AG1512-1SK01-2AB0	6AG1512-1SK01-7AB0	6AG1512-1SM03-2AB0	6AG1512-1SM03-7AB0
Based on	6ES7512-1SK01-0AB0 SIPLUS ET 200SP CPU 1512SP F-1PN	6ES7512-1SK01-0AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN	6ES7512-1SM03-0AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN	6ES7512-1SM03-0AB0 SIPLUS ET 200SP CPU 1512SP F-1 PN
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)	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			
• 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	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			

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Overview



- The CPU for applications with medium to high requirements regarding program/data storage in the SIMATIC ET 200SP T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
 - OPC UA Data Access
 - OPC UA Security
 - OPC UA Methods Call
 - Support of OPC UA Companion specifications
 - OPC UA Alarms & Conditions
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1514SP T-2 PN **6ES7514-2VN03-0AB0**

900 KB work memory for program, 3.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required

Accessories

CM DP for ET 200SP CPU **6ES7545-5DA00-0AB0**

PROFIBUS DP master/device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

SIMATIC Memory Card

4 MB **6ES7954-8LC04-0AA0**

12 MB **6ES7954-8LE04-0AA0**

24 MB **6ES7954-8LF04-0AA0**

256 MB **6ES7954-8LL04-0AA0**

2 GB **6ES7954-8LP04-0AA0**

32 GB **6ES7954-8LT04-0AA0**

DIN rail 35 mm

• Length: 483 mm for 19" cabinets **6ES5710-8MA11**

• Length: 483 mm for 600 mm cabinets **6ES5710-8MA21**

• Length: 830 mm for 900 mm cabinets **6ES5710-8MA31**

• Length 2 m **6ES5710-8MA41**

PE connection element for 2000 mm mounting rail **6ES7590-5AA00-0AA0**

20 units

BA 2xRJ45 BusAdapter **6ES7193-6AR00-0AA0**

BA 2xFC BusAdapter for increased vibration and EMC loads **6ES7193-6AF00-0AA0**

Equipment labeling plate **6ES7193-6LF30-0AW0**

10 sheets of 16 labels, for printing with thermal transfer card printer or plotter

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**

IE FC RJ45 plugs

RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

IE FC RJ45 plug 90

90° cable outlet

1 unit **6GK1901-1BB20-2AA0**

10 units **6GK1901-1BB20-2AB0**

50 units **6GK1901-1BB20-2AE0**

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Ordering data	Article No.	Article No.
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	SIMATIC STEP 7 Professional V20; floating license Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at https://www.siemens.com/compatool
IE FC TP standard cable GP 2x2 4-wire, 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	SIMATIC STEP 7 Professional V20; floating license download¹⁾ Engineering software in the TIA Portal; software, documentation and license key for downloading ¹⁾ ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at https://www.siemens.com/compatool Consignee email address required for delivery
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10	SIMATIC Manual Collection DL in 5 languages¹⁾ 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.
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10	SIMATIC Manual Collection DL in 5 languages¹⁾ 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.
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	Spare parts Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units
STEP 7 Professional V20 Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> • Windows 10 Professional Version 22H2 • Windows 10 Enterprise Version 22H2 • Windows 10 Enterprise 2019 LTSC & 2021 LTSC Windows 11 (64-bit) <ul style="list-style-type: none"> • Windows 11 Professional Version 22H2 & 23H2 • Windows 11 Enterprise Version 22H2 & 23H2 Windows Server (64-bit) <ul style="list-style-type: none"> • Windows Server 2019 Standard (full installation) • Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download		6ES7822-1AA24-0YA5 6ES7822-1AE24-0YA5 6ES7998-8XE01-8YE0 6ES7998-8XE01-8YE2 6ES7193-4JB00-0AA0 6ES7591-3AA00-0AA0 6ES7193-6PA00-0AA0

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
General information	
Product type designation	CPU 1514SP T-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFlenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- PROFIenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP T-2 PN

Technical specifications

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7514-2VN03-0AB0 CPU 1514SP T-2 PN, 900KB Prg., 3,5MB Dat
Product functions/security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	No
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Overview



- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the SIMATIC ET 200SP T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- PROFINET IO IRT interface with 2-port switch, corresponding BusAdapter required
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or third-party PROFINET IO Controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA Server and Client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems with the functions:
 - OPC UA Data Access
 - OPC UA Security
 - OPC UA Methods Call
 - Support of OPC UA Companion specifications
 - OPC UA Alarms & Conditions
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- SIMATIC Motion Interpreter – Technology objects for programming and controlling axes and kinematics
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Ordering data

Article No.

CPU 1514SP TF-2 PN 900 KB work memory for program, 3.5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC Memory Card required	6ES7514-2WN03-0AB0
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/device with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	6ES7545-5DA00-0AB0
SIMATIC Memory Card	
4 MB	6ES7954-8LC04-0AA0
12 MB	6ES7954-8LE04-0AA0
24 MB	6ES7954-8LF04-0AA0
256 MB	6ES7954-8LL04-0AA0
2 GB	6ES7954-8LP04-0AA0
32 GB	6ES7954-8LT04-0AA0
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	6ES5710-8MA11
• Length: 483 mm for 600 mm cabinets	6ES5710-8MA21
• Length: 830 mm for 900 mm cabinets	6ES5710-8MA31
• Length 2 m	6ES5710-8MA41
PE connection element for 2000 mm mounting rail 20 units	6ES7590-5AA00-0AA0
BA 2xRJ45 BusAdapter	6ES7193-6AR00-0AA0
BA 2xFC BusAdapter for increased vibration and EMC loads	6ES7193-6AF00-0AA0
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
IE FC RJ45 plugs RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	6GK1901-1BB20-2AA0
10 units	6GK1901-1BB20-2AB0
50 units	6GK1901-1BB20-2AE0

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Ordering data	Article No.	Article No.
IE FC RJ45 plug 180 180° cable outlet 1 unit 10 units 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	SIMATIC STEP 7 Professional V20; floating license Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at https://www.siemens.com/compatool
IE FC TP standard cable GP 2x2 4-wire, 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	
IE FC TP trailing cable 2 x 2 (type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use in cable carriers; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-3AH10	SIMATIC STEP 7 Professional V20, floating license download¹⁾ Engineering software in the TIA Portal; software, documentation and license key for downloading ¹⁾ ; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels. The system requirements specification can be found at https://www.siemens.com/compatool Consignee email address required for delivery
IE FC TP marine cable 2 x 2 (type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	6XV1840-4AH10	
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00	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. 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
STEP 7 Professional V20 Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 10 (64-bit) <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC Windows 11 (64-bit) <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 Windows Server (64-bit) <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download		
		6ES7822-1AA24-0YA5 6ES7822-1AE24-0YA5 6ES7833-1FA24-0YA5 6ES7833-1FA24-0YH5 6ES7998-8XE01-8YE0
		SIMATIC Manual Collection DL in 5 languages¹⁾ 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.

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Ordering data

SIMATIC Manual Collection DL in 5 languages¹⁾
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.

Article No.

6ES7998-8XE01-8YE2

Article No.

Spare parts

Power supply connector

Spare part; for connecting the 24 V DC supply voltage

- With push-in terminals; 10 units

6ES7193-4JB00-0AA0

Cover for BusAdapter interface

5 units

6ES7591-3AA00-0AA0

Server module

6ES7193-6PA00-0AA0

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900 KB Prg, 3,5 MB Dat
General information	
Product type designation	CPU 1514SP TF-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V20 (FW V4.0) / V18 (FW V3.0) or higher
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated (for program)	900 kbyte
• integrated (for data)	3.5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900 KB Prg, 3,5 MB Dat
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900 KB Prg, 3,5 MB Dat
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes
- PROFlenergy	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFlenergy	Yes; per user program
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X2
• Number of ports	1
• integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	No

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900 KB Prg, 3,5 MB Dat
PROFINET IO Controller	
Services	
- Isochronous mode	No
- Direct data exchange	No
- IRT	No
- PROFlenergy	Yes; per user program
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- PROFlenergy	Yes; per user program
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
• RS 485	Yes; Via CM DP module
• Number of ports	1
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• max. number of DP devices	125; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Protocols	
Number of connections	
• Number of connections, max.	192; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50

Distributed Controllers

based on ET 200SP
Technology CPUs

CPU 1514SP TF-2 PN

Technical specifications

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900 KB Prg, 3,5 MB Dat
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- per cam (50 points and 600 segments)	2
- per cam (50 points and 6 000 segments)	20
- for each set of kinematics	30
- per Interpreter	60
- Per leading axis proxy	3
• kinematics functions	
- kinematics with up to 4 interpolating axes	Yes; max. 3D + orientation
- kinematics with 5 or more interpolating axes	No
- user-defined kinematics	No
- SIMATIC Safe Kinematics	No
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7514-2WN03-0AB0 CPU 1514SP TF-2 PN, 900 KB Prg, 3,5 MB Dat
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Product functions/security	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
safely removing data	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °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
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	Yes; either CFC or failsafe functionality
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	265 g

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Overview



- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller Standard and optional preinstalled WinCC Runtime Advanced
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
For separating the Windows or Linux operating system from control functions
- Quad-core processor for optimal use of the Hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DisplayPort; 2x USB 3.0; 2 x USB 2.0 port
- 2 PROFINET interfaces: X1 via PN-IO BusAdapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP Module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2

Type of delivery:
en, de, fr, es, it, zh

Industrial OS and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card

- CPU 1515SP PC2 (8 GB RAM)

6ES7677-2DB43-0GB1

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card

- CPU 1515SP PC2 (48 GB RAM)

6ES7677-2DB42-0GB1

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP preinstalled, 128 GB CFast card

- CPU 1515SP PC2 + HMI 128PT
- CPU 1515SP PC2 + HMI 512PT
- CPU 1515SP PC2 + HMI 2048PT

6ES7677-2DB42-0GK0

6ES7677-2DB42-0GL0

6ES7677-2DB42-0GM0

Accessories

BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

BA SCRJ/RJ45 BusAdapter

6ES7193-6AP20-0AA0

BA SCRJ/FC BusAdapter

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BA 2XLC BusAdapter

6ES7193-6AG00-0AA0

BA LC/RJ45 BusAdapter

6ES7193-6AG20-0AA0

BA LC/FC BusAdapter

6ES7193-6AG40-0AA0

CM DP for ET 200SP CPU

6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Server module

6ES7193-6PA00-0AA0

Spare part

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

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

6ES7193-6LR10-0AA0

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

6ES7193-6LA10-0AA0

SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 operating system upgrade package

6ES7678-2AD01-0AA0

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade image

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Ordering data	Article No.	Article No.
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p> <p>6ES7822-1AE24-0YA5</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC ODK 1500S</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive</p> <p>6ES7806-2CD03-0YA0</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license)¹⁾</p> <p>Email address required for delivery</p> <p>6ES7806-2CD03-0YG0</p>
		<p>WinCC Advanced V19</p> <p>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime</p> <ul style="list-style-type: none"> Floating license; software and documentation on DVD; license key on USB flash drive Floating license; software, documentation and license key for download¹⁾; Email address required for delivery <p>6AV2102-0AA02-3AA5</p> <p>6AV2102-0AA02-3AH5</p>

¹⁾ Up-to-date information and download availability can be found at <https://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
General information		
Product type designation	CPU 1515SP PC2	CPU1515SP PC2 - IndOS
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V19	V19
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP	S7-1500 Software Controller CPU 1505SP
Supply voltage		
Rated value (DC)	24 V	24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Memory		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFast memory card	Yes; 128 GB flash memory	Yes; 128 GB flash memory
Work memory		
• integrated (for program)	2 Mbyte	2 Mbyte
• integrated (for data)	7.5 Mbyte	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte	20 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Hardware configuration		
Integrated power supply	Yes	Yes
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
Interfaces		
Number of industrial Ethernet interfaces	2	2
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1	1
Video interfaces		
• Graphics interface	1x DisplayPort	1x DisplayPort

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
1. Interface		
Interface type	PROFINET	PROFINET
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Number of connections	88	88
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
PROFINET IO Device		
Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFINergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Number of connections	44	44
Interface types		
• RS 485	Yes	Yes
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125	125
Services		
- Equidistance	No	No
- Isochronous mode	No	No
Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
Protocols		
Number of connections		
• Number of connections, max.	88	88
Redundancy mode		
Media redundancy		
- Media redundancy	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2

Technical specifications

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• horizontal installation, min.	-20 °C	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems		
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC	SIMATIC Industrial OS
Configuration		
Configuration/programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	No	No
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	100	100
Open Development interfaces		
• Size of ODK SO file, max.	5.8 Mbyte	5.8 Mbyte

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Standard CPUs > CPU 1515SP PC2**Technical specifications**

Article number	6ES7677-2DB42-0GB1 CPU1515SP PC2	6ES7677-2DB43-0GB1 CPU1515SP PC2 - IndOS
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Overview



- Turnkey all-in-one solution with preinstalled fail-safe SIMATIC S7-1500 Software Controller and optional preinstalled WinCC Runtime Advanced
- Fail-safe versions make it possible to control machines or plants in a fail-safe environment. This makes it possible to address applications which require an SIL3 (Safety Integrity Level) safety class according to IEC 61508 2nd Edition or a PL e (Performance Level) according to ISO 13849.
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
For separating the Windows or Linux operating system from control functions
- Quad-core processor for optimal use of the Hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DisplayPort; 2x USB 3.0; 2x USB 2.0 port
- 2 PROFINET interfaces: X1 via PN-IO BusAdapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP Module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 F (+ HMI)

Type of delivery:
en, de, fr, es, it, zh

Industrial OS and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card
• CPU 1515SP PC2 F (8 GB RAM)

6ES7677-2SB43-0GB1

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card
• CPU 1515SP PC2 F (8 GB RAM)

6ES7677-2SB42-0GB1

Windows 10 IoT Enterprise 64-bit and S7-1500 Software Controller CPU 1505SP F preinstalled, 128 GB CFast card
• CPU 1515SP PC2 F + HMI 128PT (8 GB RAM)

6ES7677-2SB42-0GK0

• CPU 1515SP PC2 F + HMI 512PT (8 GB RAM)

6ES7677-2SB42-0GL0

• CPU 1515SP PC2 F + HMI 2048PT (8 GB RAM)

6ES7677-2SB42-0GM0

Accessories

BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

BA SCRJ/RJ45 BusAdapter

6ES7193-6AP20-0AA0

BA SCRJ/FC BusAdapter

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BA 2XLC BusAdapter

6ES7193-6AG00-0AA0

BA LC/RJ45 BusAdapter

6ES7193-6AG20-0AA0

BA LC/FC BusAdapter

6ES7193-6AG40-0AA0

CM DP for ET 200SP CPU

6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Server module

6ES7193-6PA00-0AA0

Spare part

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

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

6ES7193-6LR10-0AA0

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

6ES7193-6LA10-0AA0

SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 F Operating system upgrade package

6ES7678-2AS01-0AA0

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and SB flash drive with upgrade image

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Ordering data	Article No.	Article No.
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p> <p>6ES7822-1AE24-0YA5</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC ODK 1500S</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license)¹⁾</p> <p>Email address required for delivery</p> <p>6ES7806-2CD03-0YA0</p> <p>6ES7806-2CD03-0YG0</p>
		<p>WinCC Advanced V19</p> <p>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime</p> <ul style="list-style-type: none"> Floating license; software and documentation on DVD; license key on USB flash drive Floating license; software, documentation and license key for download¹⁾; Email address required for delivery <p>6AV2102-0AA02-3AA5</p> <p>6AV2102-0AA02-3AH5</p>

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
General information		
Product type designation	CPU 1515SP PC2 F	CPU1515SP PC2 F - IndOS
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V19	V19
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP F	S7-1500 Software Controller CPU 1505SP F
Supply voltage		
Rated value (DC)	24 V	24 V
Processor		
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores	Intel Atom E3940, 1.6 GHz, 4 cores
Memory		
Type of memory	DDR3L	DDR3L
Main memory	8 GB RAM	8 GB RAM
CFast memory card	Yes; 128 GB flash memory	Yes; 128 GB flash memory
Work memory		
• integrated (for program)	3 Mbyte	3 Mbyte
• integrated (for data)	7.5 Mbyte	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte	20 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Hardware configuration		
Integrated power supply	Yes	Yes
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
Interfaces		
Number of industrial Ethernet interfaces	2	2
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1	1
Video interfaces		
• Graphics interface	1x DisplayPort	1x DisplayPort
1. Interface		
Interface type	PROFINET	PROFINET
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Number of connections	88	88

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
Interface types		
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• Number of ports	2	2
• integrated switch	Yes	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes	Yes
PROFINET IO Controller		
Services		
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- PROFlenergy	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1	1
Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
PROFINET IO Device		
Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFlenergy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only	SNMP Configuration and DCP Read Only

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No
• Number of ports	1	1
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Number of connections	44	44
Interface types		
• RS 485	Yes	Yes
Protocols		
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP device	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• max. number of DP devices	125	125
Services		
- Equidistance	No	No
- Isochronous mode	No	No
Address area		
- Inputs, max.	8 kbyte	8 kbyte
- Outputs, max.	8 kbyte	8 kbyte
Protocols		
Number of connections		
• Number of connections, max.	88	88
Redundancy mode		
Media redundancy		
- Media redundancy	Yes; only via BusAdapter	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes	Yes

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	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	Up to 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	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h	< 1.00E-09
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• horizontal installation, min.	-20 °C	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems		
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC	SIMATIC Industrial OS
Configuration		
Configuration/programming		
Programming language		
- LAD	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	No	No
- GRAPH	Yes	Yes

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Fail-safe CPUs > CPU 1515SP PC2 F

Technical specifications

Article number	6ES7677-2SB42-0GB1 CPU1515SP PC2 F	6ES7677-2SB43-0GB1 CPU1515SP PC2 F - IndOS
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes
• Protection level: Complete protection	Yes	Yes
• User administration	Yes; device-wide	Yes; device-wide
• Number of users	100	100
Open Development interfaces		
• Size of ODK SO file, max.	5.8 Mbyte	5.8 Mbyte
Peripherals/Options		
SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Overview



ET 200SP Open Controller CPU, 1515SP PC2 T combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one solution with preinstalled SIMATIC S7-1500 Software Controller T and optional preinstalled WinCC Runtime Advanced
- High performance automation tasks with the use of Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S
- PROFINET IO IRT interface with 2-port switch (corresponding BusAdapter required)
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Increased number of Motion Control resources (5,120 credits) from version 30.1 of the Software Controller and TIA Portal V19 Update 1

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 T

ET 200SP central module with Windows 10 IoT Enterprise 64-bit and preinstalled SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality

Type of delivery:

- en, de, fr, es, it, zh
- CPU 1515SP PC2 T

6ES7677-2VB42-0GB1

With preinstalled WinCC RT Advanced

- CPU 1515SP PC2 T + HMI 128PT
- CPU 1515SP PC2 T + HMI 512PT
- CPU 1515SP PC2 T + HMI 2048PT

6ES7677-2VB42-0GK0

6ES7677-2VB42-0GL0

6ES7677-2VB42-0GM0

Accessories

BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

BA SCRJ/RJ45 BusAdapter

6ES7193-6AP20-0AA0

BA SCRJ/FC BusAdapter

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BA 2XLC BusAdapter

6ES7193-6AG00-0AA0

BA LC/RJ45 BusAdapter

6ES7193-6AG20-0AA0

BA LC/FC BusAdapter

6ES7193-6AG40-0AA0

CM DP for ET 200SP CPU

6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Server module

6ES7193-6PA00-0AA0

Spare part

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

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

6ES7193-6LR10-0AA0

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

6ES7193-6LA10-0AA0

SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 T Operating system upgrade package

6ES7678-2AV01-0AA0

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade Image, license stick: CPU 1505SP T V3

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Ordering data	Article No.	Article No.
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p> <p>6ES7822-1AE24-0YA5</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC ODK 1500S</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license)¹⁾</p> <p>Email address required for delivery</p> <p>6ES7806-2CD03-0YA0</p> <p>6ES7806-2CD03-0YG0</p>
		<p>WinCC Advanced V19</p> <p>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime</p> <ul style="list-style-type: none"> Floating license; software and documentation on DVD; license key on USB flash drive Floating license; software, documentation and license key for download¹⁾; Email address required for delivery <p>6AV2102-0AA02-3AA5</p> <p>6AV2102-0AA02-3AH5</p>

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Technical specifications

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
General information	
Product type designation	CPU 1515SP PC2 T
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V19
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP T
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DisplayPort

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Technical specifications

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
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	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	5 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2021 LTSC

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 T

Technical specifications

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte

Article number	6ES7677-2VB42-0GB1 CPU1515SP PC2 T
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Overview



ET 200SP Open Controller, CPU 1515SP PC2 TF, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one solution with preinstalled fail-safe SIMATIC S7-1500 Software Controller TF and optional preinstalled WinCC Runtime Advanced
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S
- PROFINET IO IRT interface with 2-port switch (corresponding BusAdapter required)
- Isochronous mode with PROFINET IO IRT
- Integrated Motion Control functionalities for controlling speed-controlled, positioning and synchronous axes (gearing and camming), support for external encoders, output cams/cam tracks and probes. Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roller picker, articulated arm, cylindrical robot, tripod picker and SCARA.
- Cross-PLC synchronous operation for synchronization of multiple SIMATIC S7-1500T Controllers
- Increased number of Motion Control resources (5,120 credits) from version 30.1 of the Software Controller and TIA Portal V19 Update 1

Ordering data

Article No.

SIMATIC ET 200SP Open Controller CPU 1515SP PC2 TF

Fail-safe ET 200SP central module with Windows 10 IoT Enterprise 64-bit and preinstalled fail-safe SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 128 GB CFast card; with extended Motion Control functionality

Type of delivery:

en, de, fr, es, it, zh

- CPU 1515SP PC2 TF

6ES7677-2WB42-0GB1

With preinstalled WinCC RT Advanced

- CPU 1515SP PC2 TF + HMI 128PT
- CPU 1515SP PC2 TF + HMI 512PT
- CPU 1515SP PC2 TF + HMI 2048PT

6ES7677-2WB42-0GK0

6ES7677-2WB42-0GL0

6ES7677-2WB42-0GM0

Accessories

BA 2xRJ45 BusAdapter

6ES7193-6AR00-0AA0

BA 2xFC BusAdapter

6ES7193-6AF00-0AA0

BA 2xSCRJ BusAdapter

6ES7193-6AP00-0AA0

BA SCRJ/RJ45 BusAdapter

6ES7193-6AP20-0AA0

BA SCRJ/FC BusAdapter

6ES7193-6AP40-0AA0

For increased vibration and EMC loads

BA 2XLC BusAdapter

6ES7193-6AG00-0AA0

BA LC/RJ45 BusAdapter

6ES7193-6AG20-0AA0

BA LC/FC BusAdapter

6ES7193-6AG40-0AA0

CM DP for ET 200SP CPU

6ES7545-5DA00-0AB0

PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps

Server module

6ES7193-6PA00-0AA0

Spare part

Power supply connector

6ES7193-4JB00-0AA0

Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)

Equipment labeling plate

6ES7193-6LF30-0AW0

10 sheets of 16 labels

Labeling strips

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

6ES7193-6LR10-0AA0

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

6ES7193-6LA10-0AA0

SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 TF Operating system upgrade package,

6ES7678-2AW01-0AA0

Microsoft Windows 10 IoT Enterprise 2021 LTSC 64-bit upgrade, scope of supply: COA, COL and USB flash drive with upgrade Image, license stick: CPU 1505SP TF V3

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Ordering data	Article No.	Article No.
<p>STEP 7 Professional V20</p> <p>Target system: SIMATIC S7-1200, S7-1200 G2, S7-1500, S7-300, S7-400, WinAC</p> <p>Requirement:</p> <p>Windows 10 (64-bit)</p> <ul style="list-style-type: none"> Windows 10 Professional Version 22H2 Windows 10 Enterprise Version 22H2 Windows 10 Enterprise 2019 LTSC & 2021 LTSC <p>Windows 11 (64-bit)</p> <ul style="list-style-type: none"> Windows 11 Professional Version 22H2 & 23H2 Windows 11 Enterprise Version 22H2 & 23H2 <p>Windows Server (64-bit)</p> <ul style="list-style-type: none"> Windows Server 2019 Standard (full installation) Windows Server 2022 Standard (full installation) <p>Type of delivery: 9 languages: en, de, zh included, fr, sp, it, ru, ja, ko as download</p>		<p>SIMATIC STEP 7 Professional V20, floating license download¹⁾</p> <p>Engineering software in the TIA Portal; software, documentation and license key for downloading¹⁾; Class A; for configuring SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p> <p>Consignee email address required for delivery</p> <p>6ES7822-1AE24-0YA5</p>
<p>SIMATIC STEP 7 Professional V20; floating license</p> <p>Engineering software in the TIA Portal; software and documentation on DVD; license key on USB flash drive; Class A; for configuration of SIMATIC S7-1200/1500, S7-300/400/WinAC, SIMATIC Basic Panels, SIMATIC Unified Basic Panels.</p> <p>The system requirements specification can be found at https://www.siemens.com/compatool</p>	6ES7822-1AA24-0YA5	<p>SIMATIC ODK 1500S</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive</p> <p>Open Development Kit V2.5 for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license)¹⁾</p> <p>Email address required for delivery</p> <p>6ES7806-2CD03-0YA0</p> <p>6ES7806-2CD03-0YG0</p>
		<p>WinCC Advanced V19</p> <p>Engineering software in the TIA Portal; in 6 languages: en, de, fr, es, it, zh; for configuring SIMATIC Panels, WinCC Runtime Advanced, WinCC Unified PC Runtime</p> <ul style="list-style-type: none"> Floating license; software and documentation on DVD; license key on USB flash drive Floating license; software, documentation and license key for download¹⁾; Email address required for delivery <p>6AV2102-0AA02-3AA5</p> <p>6AV2102-0AA02-3AH5</p>

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Technical specifications

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
General information	
Product type designation	CPU 1515SP PC2 TF
Engineering with	
• STEP 7 TIA Portal configurable/ integrated from version	V19
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP TF
Supply voltage	
Rated value (DC)	24 V
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
Work memory	
• integrated (for program)	3 Mbyte
• integrated (for data)	7.5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Size, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DisplayPort

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
Interface types	
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• Number of ports	2
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; compatible BusAdapters: BA 2x RJ45, BA 2x M12, BA 2x FC, BA 2x LC, BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted
• Web server	Yes
• Media redundancy	Yes
PROFINET IO Controller Services	
- Isochronous mode	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- shortest clock pulse	500 µs
- IRT	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class	1
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Technical specifications

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- PROFINergy	Yes; per user program
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- activation/deactivation of I-devices	Yes; per user program
- Asset management record	Yes; per user program
- PROFINET Security Class	SNMP Configuration and DCP Read Only
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
• Number of ports	1
3. Interface	
Interface type	PROFIBUS with CM DP
Number of connections	44
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	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	88
Redundancy mode	
Media redundancy	
- Media redundancy	Yes; only via BusAdapter
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
SIMATIC communication	
• S7 routing	Yes
OPC UA	
• OPC UA Client	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
• Alarms and Conditions	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	5 120
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- per cam (1 000 points and 50 segments)	2
- per cam (10 000 points and 50 segments)	20
- for each set of kinematics	30
- Per leading axis proxy	3
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
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 SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h

Distributed Controllers

based on ET 200SP

ET 200SP Open Controllers

Technology-CPU > CPU 1515SP PC2 TF

Technical specifications

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card max. 10% load; SD card not used
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Operating systems	
pre-installed operating system	Windows 10 Enterprise 2021 LTSC
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes

Article number	6ES7677-2WB42-0GB1 CPU1515SP PC2 TF
Access protection	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide
• Number of users	100
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

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 ET 200SP Open Controller CPU 1515SP PC2

SIPLUS ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and preinstalled SIMATIC S7-1500 Software Controller; 8 GB RAM, 30 GB CFast card

Type of delivery:

en, de, fr, es, it, zh

• SIPLUS ET 200SP CPU 1515SP PC2

6AG1677-2DB42-2GB1

For areas with exceptional exposure to environmental substances (conformal coating); ambient temperature -40 ... +60 °C

• SIPLUS ET 200SP CPU 1515SP PC2 Spare

6AG1677-2DB40-2AA0

Spare part, without CFast card

Accessories

BA 2xRJ45 BusAdapter

6AG1193-6AR00-7AA0

(Extended temperature range and exposure to environmental substances)

SIPLUS BA 2xFC BusAdapter

6AG1193-6AF00-7AA0

(Extended temperature range and exposure to environmental substances)

BA 2xSCRJ BusAdapter

6AG1193-6AP00-2AA0

(Extended temperature range and exposure to environmental substances)

BA 2xLC BusAdapter

6AG1193-6AG00-2AA0

(Extended temperature range and exposure to environmental substances)

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 CPU 1515SP PC2, page 7/54

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

Technical specifications

Article number	6AG1677-2DB42-2GB1	6AG1677-2DB40-2AA0
Based on	6ES7677-2DB42-0GB1	6ES7677-2DB40-0AA0
	SIPLUS ET 200SP CPU1515SP PC2	SIPLUS ET 200SP CPU1515SP PC2
Ambient conditions		
Ambient temperature during operation		
<ul style="list-style-type: none"> min. max. 	-40 °C; = Tmin up to 55 °C with max. 64 ET 200SP modules, max. 2x 900 mA USB load and max. 2x 500 mA USB load; up to 60 °C with max. 32 ET 200SP modules and 4x 500 mA USB load; FS06 or higher; up to 70 °C with max. 16 ET 200SP modules, 4x 100 mA USB load and no visualization	-40 °C; = Tmin
<ul style="list-style-type: none"> horizontal installation, min. horizontal installation, max. 	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax	-40 °C; = Tmin (incl. condensation/frost) 70 °C; = Tmax; from 55 °C: with max. 32 ET 200SP modules and 4x 500 mA USB load; from 60 °C with max. 16 ET 200SP modules, max. 4x 100 mA USB load, no visualization and projected empty space between CPU and ET 200SP module
<ul style="list-style-type: none"> vertical installation, min. vertical installation, max. 	-40 °C; = Tmin 50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load	-40 °C; = Tmin 50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load
Ambient temperature during storage/transportation		
<ul style="list-style-type: none"> min. max. 	-40 °C 70 °C	-40 °C 70 °C
Altitude during operation relating to sea level		
<ul style="list-style-type: none"> Installation altitude above sea level, max. Ambient air temperature-barometric pressure-altitude 	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	2 000 m Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity		
<ul style="list-style-type: none"> 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
Vibrations		
<ul style="list-style-type: none"> Operation, tested according to IEC 60068-2-6 Transport, tested acc. to IEC 60068-2-6 	Yes Yes	Yes Yes
Shock testing		
<ul style="list-style-type: none"> tested according to IEC 60068-2-6 tested according to IEC 60068-2-27 tested according to IEC 60068-2-29 Storage/transport, tested acc. to IEC 60068-2-27 	Yes Yes Yes Yes	Yes Yes Yes Yes
Resistance		
Coolants and lubricants		
<ul style="list-style-type: none"> 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		
<ul style="list-style-type: none"> 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, *

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS standard CPUs > SIPLUS CPU 1515SP PC2

Technical specifications

Article number	6AG1677-2DB42-2GB1	6AG1677-2DB40-2AA0
Based on	6ES7677-2DB42-0GB1 SIPLUS ET 200SP CPU1515SP PC2	6ES7677-2DB40-0AA0 SIPLUS ET 200SP CPU1515SP PC2
Conformal coating		
<ul style="list-style-type: none"> • 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 	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>	<p>Yes; Class 2 for high reliability</p> <p>Yes; Type 1 protection</p> <p>Yes; Discoloration of coating possible during service life</p> <p>Yes; Conformal coating, Class A</p>

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS fail-safe CPUs > SIPLUS CPU 1515SP PC2 F

Overview



SIPLUS ET 200SP Open Controller, SIPLUS CPU 1515SP PC2 F, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the SIPLUS ET 200SP system, the SIPLUS S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a SIPLUS ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

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 Open Controller CPU 1515SP PC2 F

(Extended temperature range and exposure to environmental substances)

8 GB RAM, 128 GB CFast with Windows 10 IoT Enterprise 64-bit and S7-1500 Failsafe Software Controller CPU 1505SP F preinstalled, interfaces: 1x slot CFast, 1x slot SD/MMC, 1x connector for ET 200SP BusAdapter PROFINET, 1x 10/100/1000 Mbps Ethernet, 2x USB 3.0; 2x USB 2.0, 1x DisplayPort, documentation on CFast, restore image on CFast

• SIPLUS CPU 1515SP PC2 F

6AG1677-2SB42-2GB1

Accessories

BA 2xRJ45 BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AR00-7AA0

SIPLUS BA 2xFC BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AF00-7AA0

BA 2xSCRJ BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AP00-2AA0

BA 2xLC BusAdapter

(Extended temperature range and exposure to environmental substances)

6AG1193-6AG00-2AA0

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 CPU 1515SP PC2 F, page 7/61

Distributed Controllers

based on ET 200SP

SIPLUS ET 200SP Open Controllers

SIPLUS fail-safe CPUs > SIPLUS CPU 1515SP PC2 F

Technical specifications

Article number	6AG1677-2SB42-2GB1
Based on	6ES7677-2SB42-0GB1 SIPLUS ET 200SP CPU1515SP PC2 F
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; from 55 °C: with max. 32 ET 200SP modules and 4x 500 mA USB load; from 60 °C with max. 16 ET 200SP modules, max. 4x 100 mA USB load, no visualization and projected empty space between CPU and ET 200SP module
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; with max. 32 ET 200SP modules and max. 4x 500 mA USB load
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
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
Vibrations	
• Operation, tested according to IEC 60068-2-6	Yes
• Transport, tested acc. to IEC 60068-2-6	Yes
Shock testing	
• tested according to IEC 60068-2-6	Yes
• tested according to IEC 60068-2-27	Yes

Article number	6AG1677-2SB42-2GB1
Based on	6ES7677-2SB42-0GB1 SIPLUS ET 200SP CPU1515SP PC2 F
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

Distributed Controllers

based on ET 200pro
Standard CPUs

IM 154-8 PN/DP CPU

Overview



- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master/IO controller via PROFIBUS DP/PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- Component-based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component-based Automation (CBA)
- PROFINET interface with 3-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Fail-safe IM 154-8F PN/DP CPU PROFIsafe available

Note

SIMATIC Micro Memory Card required for operation of CPU.

Ordering data

Article No.

IM 154-8 PN/DP CPU interface module, V3.2

6ES7154-8AB01-0AB0

PROFINET IO controller for operating distributed I/Os on PROFINET, with integrated PLC functionality.

Accessories

MMC 64 KB ¹⁾

6ES7953-8LF31-0AA0

For program backup.

MMC 128 KB ¹⁾

6ES7953-8LG31-0AA0

For program backup.

MMC 512 KB ¹⁾

6ES7953-8LJ31-0AA0

For program backup.

MMC 2 MB ¹⁾

6ES7953-8LL31-0AA0

For program backup and/or firmware updates.

MMC 4 MB ¹⁾

6ES7953-8LM32-0AA0

For program backup.

MMC 8 MB ¹⁾

6ES7953-8LP31-0AA0

For program backup.

Connection module

6ES7194-4AN00-0AA0

For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.

Industrial Ethernet RJ45 plug 180

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10
6XV1840-3AH10
6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- 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.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro
Standard CPUs

IM 154-8 PN/DP CPU

Ordering data

IE connecting cable M12-180/M12-180

- Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:

- 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
- 20 m
- 30 m
- 40 m
- 50 m

- PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 plugs (male contact insert), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

- PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 plug (male contact insert at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

IE FC M12 plug PRO

PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.

- 1 unit
- 8 units
- PROFINET M12 plug connector, D-coded, angled.

IE panel feedthrough

Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.

Article No.

6XV1870-8AE30
6XV1870-8AE50
6XV1870-8AH10
6XV1870-8AH15
6XV1870-8AH20
6XV1870-8AH30
6XV1870-8AH50
6XV1870-8AN10
6XV1870-8AN15
6XV1870-8AN20
6XV1870-8AN30
6XV1870-8AN40
6XV1870-8AN50

3RK1902-2NB30
3RK1902-2NB50
3RK1902-2NC10

3RK1902-2HB30
3RK1902-2HB50
3RK1902-2HC10

6GK1901-0DB20-6AA0
6GK1901-0DB20-6AA8
3RK1902-2DA00

6GK1901-0DM20-2AA5

Article No.

7/8" connecting cable to power supply

5-wire, 5x1.5 mm², trailable, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:

- 1.5 m
- 2.0 m
- 3.0 m
- 5.0 m
- 10 m
- 15 m

- Trailing power cable, 5x1.5 mm², pre-assembled at both ends with 7/8" angled plugs (female contact insert at one end, male contact insert at the other end), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

- Trailing power cable, 5x1.5 mm², pre-assembled at one end with 7/8" angled plug with female contact insert (socket at one end, other end open), in various lengths:

- 3.0 m
- 5.0 m
- 10 m

Power line

5-wire, 5x1.5 mm², trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.

7/8" connection plug

For ET 200eco, with axial cable outlet

- With male contact insert, 5-pack
- With female contact insert, 5-pack
- Angled, with female contact insert, 1 unit
- Angled, with male contact insert, 1 unit

7/8" cover cap, 10 per pack

Twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

Crossed twisted pair cables 4x2 with RJ45 plugs

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

6XV1822-5BH15
6XV1822-5BH20
6XV1822-5BH30
6XV1822-5BH50
6XV1822-5BN10
6XV1822-5BN15

3RK1902-3NB30
3RK1902-3NB50
3RK1902-3NC10

3RK1902-3GB30
3RK1902-3GB50
3RK1902-3GC10

6XV1830-8AH10

6GK1905-0FA00
6GK1905-0FB00
3RK1902-3DA00
3RK1902-3BA00

6ES7194-3JA00-0AA0

6XV1870-3QE50
6XV1870-3QH10
6XV1870-3QH20
6XV1870-3QH60
6XV1870-3QN10

6XV1870-3RE50
6XV1870-3RH10
6XV1870-3RH20
6XV1870-3RH60
6XV1870-3RN10

Distributed Controllers

based on ET 200pro
Standard CPUs

IM 154-8 PN/DP CPU

Ordering data	Article No.	Ordering data	Article No.
M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00	PROFIBUS FC standard cable GP 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 sealing caps with female thread 5 units	6ES7194-4JD60-0AA0	PROFIBUS FC trailing cable 2-wire, shielded.	6XV1830-3EH10
PROFIBUS M12 connecting cable Pre-assembled, with two 5-pin M12 plugs/sockets, up to 100 m, in various lengths:		PROFIBUS FC food cable 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	6XV1830-0GH10
1.5 m	6XV1830-3DH15	PROFIBUS FC robust cable 2-wire, shielded Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	6XV1830-0JH10
2.0 m	6XV1830-3DH20	PROFIBUS M12 connection plug 5-pin, B-coded, metal housing, 1 pack = 5 units. • Female contact insert	6GK1905-0EB00
3.0 m	6XV1830-3DH30		
5.0 m	6XV1830-3DH50		
10 m	6XV1830-3DN10		
15 m	6XV1830-3DN15		
M12 bus termination connector for PROFIBUS, female contact insert	6GK1905-0ED00		
M12 bus termination connector for PROFIBUS, male contact insert	6GK1905-0EC00		
M12 plug connector, axial outlet, with male contact insert	6GK1905-0EA00		

Technical specifications

Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384 KB	Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384 KB
General information		Data areas and their retentivity	
Engineering with		Flag	• Size, max. 2 048 byte
• Programming package	STEP 7 V5.5 or higher	Address area	
Supply voltage		I/O address area	• Inputs 2 048 byte • Outputs 2 048 byte
Rated value (DC)	24 V	Process image	• Inputs, adjustable 2 048 byte • Outputs, adjustable 2 048 byte
Memory		Time of day	
Work memory		Clock	• Hardware clock (real-time) Yes
• integrated 384 kbyte		Operating hours counter	• Number 1
• expandable No		Interfaces	Interfaces/bus type 1x MPI/PROFIBUS DP, 1x PROFINET (3 ports)
Load memory		1. Interface	Interface type Integrated RS 485 interface
• Plug-in (MMC), max. 8 Mbyte		Interface types	• RS 485 Yes
CPU processing times		Protocols	• MPI Yes • PROFIBUS DP master Yes • PROFIBUS DP device Yes • Point-to-point connection No
for bit operations, typ. 0.05 µs		PROFIBUS DP master	• max. number of DP devices 124
for word operations, typ. 0.09 µs			
for fixed point arithmetic, typ. 0.12 µs			
for floating point arithmetic, typ. 0.45 µs			
Counters, timers and their retentivity			
S7 counter			
• Number 256			
IEC counter			
• present Yes			
S7 times			
• Number 256			
IEC timer			
• present Yes			

Distributed Controllers

based on ET 200pro
Standard CPUs

IM 154-8 PN/DP CPU

Technical specifications

Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384 KB
2. Interface	
Interface type	PROFINET
Interface types	
• Number of ports	3
Protocols	
• MPI	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
PROFINET IO Controller	
Services	
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- Number of IO Devices with IRT and the option "high flexibility"	128
- Number of connectable IO Devices for RT, max.	128
Protocols	
SIMATIC communication	
• S7 routing	Yes
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	8
• UDP	Yes
- Number of connections, max.	8
Web server	
• supported	Yes

Article number	6ES7154-8AB01-0AB0 ET 200pro: IM 154-8 PN/DP CPU, 384 KB
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
S7 basic communication	
• supported	Yes
S7 communication	
• supported	Yes
Number of connections	
• overall	16
Degree and class of protection	
IP degree of protection	IP65/67
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights	
Weight, approx.	720 g

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Overview



- CPU 1513pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA server and client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Ordering data

Article No.

CPU 1513pro-2 PN

300 KB work memory for program, 1.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

6ES7513-2PL00-0AB0

600 KB work memory for program, 2.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

6ES7513-2PM03-0AB0

Accessories

SIMATIC Memory Card

4 MB¹⁾

6ES7954-8LC04-0AA0

12 MB¹⁾

6ES7954-8LE04-0AA0

24 MB¹⁾

6ES7954-8LF04-0AA0

256 MB¹⁾

6ES7954-8LL04-0AA0

2 GB¹⁾

6ES7954-8LP04-0AA0

32 GB¹⁾

6ES7954-8LT04-0AA0

Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";
With 3 x M12 and 2 x 7/8",
for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0
6GK1901-1BB10-2AB0
6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10
6XV1840-3AH10
6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- 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.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Ordering data	Article No.	Article No.
IE connecting cable M12-180/M12-180 <ul style="list-style-type: none"> • Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP65/IP67, in various lengths: <ul style="list-style-type: none"> • 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 • 20 m • 30 m • 40 m • 50 m • PROFINET M12 trailing connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m • PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plug (contact pin insert at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m 	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50	<ul style="list-style-type: none"> • Trailing power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m • Trailing power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> • 1 unit • 8 units • PROFINET M12 plug connector, D-coded, angled. 	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00	3RK1902-3NB30 3RK1902-3NB50 3RK1902-3NC10
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5	3RK1902-3GB30 3RK1902-3GB50 3RK1902-3GC10
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: <ul style="list-style-type: none"> • 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	6XV1830-8AH10
7/8" connection plug For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> • With contact pin insert, 5-pack • With socket insert, 5-pack • Angled, with socket insert, 1 unit • Angled, with contact pin insert, 1 unit 	6GK1905-0FA00 6GK1905-0FB00 3RK1902-3DA00 3RK1902-3BA00	5-wire, 5 x 1.5 mm², trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.
7/8" cover cap, 10 per pack	6ES7194-3JA00-0AA0	Power cable
Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3QE50 6XV1870-3QH10 6XV1870-3QH20 6XV1870-3QH60 6XV1870-3QN10	7/8" connection plug
Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3RE50 6XV1870-3RH10 6XV1870-3RH20 6XV1870-3RH60 6XV1870-3RN10	Twisted pair cables 4x2 with RJ45 plugs
M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00	M12 sealing caps with internal thread 5 units

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Technical specifications

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
General information		
Product type designation	CPU 1513pro-2 PN	CPU 1513pro-2 PN
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7513-2PL00-0AB0
Supply voltage		
Rated value (DC)		24 V
Memory		
Work memory		
• integrated (for program)	300 kbyte	600 kbyte
• integrated (for data)	1.5 Mbyte	2.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	40 ns	6 ns
for word operations, typ.	48 ns	7 ns
for fixed point arithmetic, typ.	64 ns	9 ns
for floating point arithmetic, typ.	256 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1 P3	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45	3; 2x M12 + 1x RJ45
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Technical specifications

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- PROFINergy	Yes	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFINergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface types		
• RJ 45 (Ethernet)	No	No
• Number of ports	1; 1x M12	1; 1x M12
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Technical specifications

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- PROFlenergy	Yes	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32	32
- of which in line, max.	32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- IRT	No	No
- PROFlenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
Protocols		
Number of connections		
• Number of connections, max.	128; Via integrated interfaces of the CPU	128; Via integrated interfaces of the CPU
Redundancy mode		
Media redundancy		
- Media redundancy		Yes; only via 1st interface (X1)
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported		Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes; Data access (read, write), method call, custom address space	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space; embedded 2017 UA server profile V1.02	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions		Yes

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1513pro-2 PN

Technical specifications

Article number	6ES7513-2PL00-0AB0 ET 200pro: CPU 1513pro-2 PN	6ES7513-2PM03-0AB0 ET 200pro: CPU 1513pro-2 PN
Supported technology objects		
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	1 120
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Product functions/security		
PROFINET Security Class		1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C	-25 °C
• horizontal installation, max.	55 °C	55 °C
• vertical installation, min.	-25 °C	-25 °C
• vertical installation, max.	55 °C	55 °C
Configuration		
Configuration/programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe		No
• Protection level: Complete protection	Yes	Yes
• User administration		Yes; device-wide and centralized
• Number of users		100
Dimensions		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm; without connection module M12 7/8 inch
Weights		
Weight, approx.	614 g	474 g; device only

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Overview



- CPU 1516pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA Server and Client (Data Access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU

Ordering data

Article No.

CPU 1516pro-2 PN

1 MB work memory for program, 5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required

6ES7516-2PN00-0AB0

2 MB work memory for program, 7.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required

6ES7516-2PP03-0AB0

Accessories

SIMATIC Memory Card

- 4 MB¹⁾
- 12 MB¹⁾
- 24 MB¹⁾
- 256 MB¹⁾
- 2 GB¹⁾
- 32 GB¹⁾

6ES7954-8LC04-0AA0

6ES7954-8LE04-0AA0

6ES7954-8LF04-0AA0

6ES7954-8LL04-0AA0

6ES7954-8LP04-0AA0

6ES7954-8LT04-0AA0

Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";
With 3 x M12 and 2 x 7/8",
for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10

6XV1840-3AH10

6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- IE FC TP trailing cable GP 2x2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.
- IE TP torsion cable GP 2x2; sold by the meter, max. delivery unit 1000 m; minimum order quantity 20 m.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Ordering data	Article No.	Article No.
IE connecting cable M12-180/M12-180 <ul style="list-style-type: none"> • Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths: <ul style="list-style-type: none"> • 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 • 20 m • 30 m • 40 m • 50 m • PROFINET M12 trailing connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m • PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plug (contact pin insert at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m 	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50	<ul style="list-style-type: none"> • Trailing power cable, 5 x 1.5 mm², preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m • Trailing power cable, 5 x 1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> • 1 unit • 8 units • PROFINET M12 plug connector, D-coded, angled. 	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00	Power cable 5-wire, 5 x 1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5	7/8" connection plug For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> • With contact pin insert, 5-pack • With socket insert, 5-pack • Angled, with socket insert, 1 unit • Angled, with contact pin insert, 1 unit
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm ² , trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: <ul style="list-style-type: none"> • 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	7/8" cover cap, 10 per pack 6ES7194-3JA00-0AA0
		Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m
		Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m
		M12 sealing cap For protection of unused M12 connections with ET 200pro
		M12 sealing caps with internal thread 5 units

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Technical specifications

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
General information		
Product type designation	CPU 1516pro-2 PN	CPU 1516pro-2 PN
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7516-2PN00-0AB0
Supply voltage		
Rated value (DC)	24 V	24 V
Memory		
Work memory		
• integrated (for program)	1 Mbyte	2 Mbyte
• integrated (for data)	5 Mbyte	7.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	10 ns	6 ns
for word operations, typ.	12 ns	7 ns
for fixed point arithmetic, typ.	16 ns	9 ns
for floating point arithmetic, typ.	64 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1 P3	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45	3; 2x M12 + 1x RJ45
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Technical specifications

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- PROFINET energy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFINET energy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface types		
• RJ 45 (Ethernet)	No	No
• Number of ports	1; 1x M12	1; 1x M12
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Technical specifications

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32	32
- of which in line, max.	32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
Protocols		
Number of connections		
• Number of connections, max.	128; Via integrated interfaces of the CPU	128; Via integrated interfaces of the CPU
Redundancy mode		
Media redundancy		
- Media redundancy	Yes; only via 1st interface (X1)	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes	Yes

Distributed Controllers

based on ET 200pro
Standard CPUs

CPU 1516pro-2 PN

Technical specifications

Article number	6ES7516-2PN00-0AB0 ET 200pro: CPU 1516PRO-2 PN	6ES7516-2PP03-0AB0 ET 200pro: CPU 1516pro-2 PN
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Product functions/security		
PROFINET Security Class		1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C	-25 °C
• horizontal installation, max.	55 °C	55 °C
• vertical installation, min.	-25 °C	-25 °C
• vertical installation, max.	55 °C	55 °C
Configuration		
Configuration/programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe		No
• Protection level: Complete protection	Yes	Yes
• User administration		Yes; device-wide and centralized
• Number of users		100
Dimensions		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm; without connection module M12 7/8 inch
Weights		
Weight, approx.	614 g	474 g; device only

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

IM 154-8 F PN/DP CPU

Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PL e according to ISO 13849.1:2006
- For high-performance control solutions in ET 200pro
- Increase in availability of systems and machines
- Integral web server with the option of creating user-defined web pages
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 IO devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

Note:

SIMATIC Micro Memory Card required for operation of CPU.

Ordering data

Article No.

IM 154-8 F PN/DP CPU interface module, V3.2

Fail-safe PROFINET IO controller for operating distributed I/O on PROFINET, with integrated PLC functionality.

- 512 KB work memory

6ES7154-8FB01-0AB0

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

6ES7833-1FC02-0YA5

Floating license for 1 user, software, documentation and license key for download¹⁾;
Email address required for delivery

6ES7833-1FC02-0YH5

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

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.

Floating license for 1 user;
license key on USB flash drive

6ES7833-1FA24-0YA5

Floating license for 1 user,
license key for download¹⁾;
Email address required for delivery

6ES7833-1FA24-0YH5

¹⁾ Up-to-date information and download availability can be found at <http://www.siemens.com/tia-online-software-delivery>.

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

IM 154-8 F PN/DP CPU

Ordering data	Article No.	Article No.
Accessories		
SIMATIC Micro Memory Cards		
MMC 64 KB ²⁾ For program backup.	6ES7953-8LF31-0AA0	
MMC 128 KB ²⁾ For program backup.	6ES7953-8LG31-0AA0	
MMC 512 KB ²⁾ For program backup.	6ES7953-8LJ31-0AA0	
MMC 2 MB ²⁾ For program backup and/or firmware updates.	6ES7953-8LL31-0AA0	
MMC 4 MB ²⁾ For program backup.	6ES7953-8LM32-0AA0	
MMC 8 MB ²⁾ For program backup.	6ES7953-8LP31-0AA0	
Connection module For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.	6ES7194-4AN00-0AA0	
Industrial Ethernet FC RJ45 plug 90 RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet. • 1 unit • 10 units	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0	
Industrial Ethernet FC RJ45 plug 180 RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet • 1 unit • 10 units • 50 units	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0	
Industrial Ethernet FastConnect installation cables • FastConnect standard cable • FastConnect trailing cable • FastConnect marine cable	6XV1840-2AH10 6XV1840-3AH10 6XV1840-4AH10	
		Industrial Ethernet FastConnect installation cables • 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.
		Industrial Ethernet FastConnect Stripping tool
		6GK1901-1GA00
		IE connecting cable M12-180/M12-180 • Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET type C) with two 4-pin M12 plugs (D-coded), degree of protection IP65/IP67, in various lengths: - 0.3 m - 0.5 m - 1.0 m - 15 m - 2.0 m - 3.0 m - 5.0 m - 10 m - 15 m - 20 m - 30 m - 40 m - 50 m • PROFINET M12 trailing connecting cable, preassembled at both ends with angled M12 plugs (contact pin), in various lengths: - 3.0 m - 5.0 m - 10 m • PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plug (contact pin at one end, other end open), in various lengths: - 3.0 m - 5.0 m - 10 m
		6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50 3RK1902-2NB30 3RK1902-2NB50 3RK1902-2NC10 3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10
		IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. • 1 unit • 8 units • PROFINET M12 plug connector, D-coded, angled
		6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00
		IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units
		6GK1901-0DM20-2AA5

²⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

IM 154-8 F PN/DP CPU

Ordering data	Article No.	Ordering data	Article No.
7/8" connecting cable to power supply <ul style="list-style-type: none"> 5-wire, 5x1.5 mm², trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: <ul style="list-style-type: none"> - 1.5 m - 2.0 m - 3.0 m - 5.0 m - 10 m - 15 m Trailing power cable, 5x1.5 mm², preassembled at both ends with 7/8" angled plugs (socket at one end, contact pin at the other end), in various lengths: <ul style="list-style-type: none"> - 3.0 m - 5.0 m - 10 m Trailing power cable, 5x1.5 mm², preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths: <ul style="list-style-type: none"> - 3.0 m - 5.0 m - 10 m 	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 3RK1902-3NB30 3RK1902-3NB50 3RK1902-3NC10 3RK1902-3GB30 3RK1902-3GB50 3RK1902-3GC10	M12 sealing cap For protection of unused M12 connections with ET 200pro	3RX9802-0AA00
Power line 5-wire, 5x1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.	6XV1830-8AH10	M12 sealing caps with internal thread 5 units	6ES7194-4JD60-0AA0
7/8" connection plug For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> • With pin insert, 5-pack • With socket insert, 5-pack • Angled, with socket insert, 1 unit • Angled, with pin insert, 1 unit 7/8" cover cap, 10 per pack	6GK1905-0FA00 6GK1905-0FB00 3RK1902-3DA00 3RK1902-3BA00 6ES7194-3JA00-0AA0	PROFIBUS M12 connecting cable Preassembled, with two 5-pin M12 plugs/sockets, up to 100 m, in various lengths: <ul style="list-style-type: none"> 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
Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3QE50 6XV1870-3QH10 6XV1870-3QH20 6XV1870-3QH60 6XV1870-3QN10	M12 bus termination connector for PROFIBUS, socket insert M12 bus termination connector for PROFIBUS, pin insert M12 plug connector, axial outlet, with pin insert	6GK1905-0ED00 6GK1905-0EC00 6GK1905-0EA00
Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m	6XV1870-3RE50 6XV1870-3RH10 6XV1870-3RH20 6XV1870-3RH60 6XV1870-3RN10	PROFIBUS FC standard cable GP 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
		PROFIBUS FC trailing cable 2-wire, shielded.	6XV1830-3EH10
		PROFIBUS FC food cable 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	6XV1830-0GH10
		PROFIBUS FC robust cable 2-wire, shielded. Sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m.	6XV1830-0JH10
		PROFIBUS M12 connection plug 5-pin, B-coded, metal enclosure, 1 pack = 5 units. <ul style="list-style-type: none"> • Socket insert 	6GK1905-0EB00

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

IM 154-8 F PN/DP CPU

Technical specifications

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
General information	
Engineering with	
• Programming package	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
Supply voltage	
Rated value (DC)	24 V
Memory	
Work memory	
• integrated	512 kbyte
• expandable	No
Load memory	
• Plug-in (MMC), max.	8 Mbyte
CPU processing times	
for bit operations, typ.	0.05 µs
for word operations, typ.	0.09 µs
for fixed point arithmetic, typ.	0.12 µs
for floating point arithmetic, typ.	0.45 µs
Counters, timers and their retentivity	
S7 counter	
• Number	256
IEC counter	
• present	Yes
S7 times	
• Number	256
IEC timer	
• present	Yes
Data areas and their retentivity	
Flag	
• Size, max.	2 048 byte
Address area	
I/O address area	
• Inputs	2 048 byte
• Outputs	2 048 byte
Process image	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
Time of day	
Clock	
• Hardware clock (real-time)	Yes
Operating hours counter	
• Number	1
1. Interface	
Interface type	Integrated RS 485 interface
Interface types	
• RS 485	Yes
Protocols	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP device	Yes
• Point-to-point connection	No
PROFIBUS DP master	
• max. number of DP devices	124

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
2. Interface	
Interface type	PROFINET
Interface types	
• Number of ports	3
Protocols	
• MPI	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP device	No
PROFINET IO Controller	
Services	
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- Number of IO Devices with IRT and the option "high flexibility"	128
- Number of connectable IO Devices for RT, max.	128
Protocols	
SIMATIC communication	
• S7 routing	Yes
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	8
• UDP	Yes
- Number of connections, max.	8
Web server	
• supported	Yes
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
S7 basic communication	
• supported	Yes
S7 communication	
• supported	Yes
Number of connections	
• overall	16
Degree and class of protection	
IP degree of protection	IP65/67

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

IM 154-8 F PN/DP CPU

Technical specifications

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
Configuration	
Configuration/programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Block encryption	Yes; With S7 block Privacy

Article number	6ES7154-8FB01-0AB0 ET 200pro: IM 154-8F PN/DP CPU, 512KB
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights	
Weight, approx.	720 g

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

CPU 1513pro F-2 PN

Overview



- Fail-safe CPU 1513pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements on the program scope and processing speed, for distributed setup via PROFINET IO.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA server and client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Ordering data

Article No.

CPU 1513pro F-2 PN

450 KB work memory for program, 1.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

6ES7513-2GL00-0AB0

900 KB work memory for program, 2.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface, SIMATIC Memory Card required

6ES7513-2GM03-0AB0

Accessories

SIMATIC Memory Card

- 4 MB¹⁾
- 12 MB¹⁾
- 24 MB¹⁾
- 256 MB¹⁾
- 2 GB¹⁾
- 32 GB¹⁾

6ES7954-8LC04-0AA0

6ES7954-8LE04-0AA0

6ES7954-8LF04-0AA0

6ES7954-8LL04-0AA0

6ES7954-8LP04-0AA0

6ES7954-8LT04-0AA0

Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";
With 3 x M12 and 2 x 7/8",
for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10

6XV1840-3AH10

6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- 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.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Ordering data	Article No.	Article No.
IE connecting cable M12-180/M12-180 Preassembled IE FC TP trailing cable GP 2x2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths: <ul style="list-style-type: none"> • 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 • 20 m • 30 m • 40 m • 50 m 	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50	Trailing power cable, 5x1.5 mm ² , preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m
PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plugs (contact pin insert), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m 	3RK1902-2NB30 3RK1902-2NB50 3RK1902-2NC10	Trailing power cable, 5x1.5 mm ² , preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m
PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plug (contact pin insert at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m 	3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10	Power cable 5-wire, 5x1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> • 1 unit • 8 units • PROFINET M12 plug connector, D-coded, angled. 	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00	7/8" connection plug For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> • With contact pin insert, 5-pack • With socket insert, 5-pack • Angled, with socket insert, 1 unit • Angled, with contact pin insert, 1 unit
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5	7/8" cover cap, 10 per pack 6ES7194-3JA00-0AA0
7/8" connecting cable to power supply 5-wire, 5x1.5 mm ² , trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: <ul style="list-style-type: none"> • 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	Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m
		Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m
		M12 sealing cap For protection of unused M12 connections with ET 200pro 3RX9802-0AA00
		M12 sealing caps with internal thread 5 units 6ES7194-4JD60-0AA0

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
General information		
Product type designation	CPU 1513pro F-2 PN	CPU 1513pro F-2 PN
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V16	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7513-2GL00-0AB0
Supply voltage		
Rated value (DC)		24 V
Memory		
Work memory		
• integrated (for program)	450 kbyte	900 kbyte
• integrated (for data)	1.5 Mbyte	2.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	40 ns	6 ns
for word operations, typ.	48 ns	7 ns
for fixed point arithmetic, typ.	64 ns	9 ns
for floating point arithmetic, typ.	256 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type		Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1 P3	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45	3; 2x M12 + 1x RJ45
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- PROFINergy	Yes	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFINergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface types		
• RJ 45 (Ethernet)	No	No
• Number of ports	1; 1x M12	1; 1x M12
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- PROFlenergy	Yes	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32	32
- of which in line, max.	32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	
- Isochronous mode	No	No
- IRT	No	No
- PROFlenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices		Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
Protocols		
Number of connections		
• Number of connections, max.	128; Via integrated interfaces of the CPU	128; Via integrated interfaces of the CPU
Redundancy mode		
Media redundancy		
- Media redundancy		Yes; only via 1st interface (X1)
- MRP	Yes; as MRP redundancy manager and/or MRP client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported		Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes	Yes; Data access (read, write), method call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions		Yes

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
Supported technology objects		
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool
• Number of available Motion Control resources for technology objects	800	1 120
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
Probability of failure (for service life of 20 years and repair time of 100 hours)		
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09
Product functions/security		
PROFINET Security Class		1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C	-25 °C
• horizontal installation, max.	55 °C	55 °C
• vertical installation, min.	-25 °C	-25 °C
• vertical installation, max.	55 °C	55 °C
Configuration		
Configuration/programming		
Programming language		
- LAD	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC		Yes; either CFC or failsafe functionality
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1513pro F-2 PN

Technical specifications

Article number	6ES7513-2GL00-0AB0 ET 200pro: CPU 1513pro F-2 PN	6ES7513-2GM03-0AB0 ET 200pro: CPU 1513pro F-2 PN
Access protection		
• protection of confidential configuration data		Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe		Yes
• Protection level: Complete protection	Yes	Yes
• User administration		Yes; device-wide and centralized
• Number of users		100
Dimensions		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm; without connection module M12 7/8 inch
Weights		
Weight, approx.	614 g	474 g; device only

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

CPU 1516pro F-2 PN

Overview



- Fail-safe CPU 1516pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516F-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated Motion Control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA Server and Client (Data Access) as runtime option for the easy connection of SIMATIC ET 200pro to non-Siemens devices/systems
- Integrated web server with the option of creating user-defined web pages

Note

SIMATIC Memory Card required for operation of the CPU.

Ordering data

Article No.

CPU 1516pro F-2 PN

1.5 MB work memory for program, 5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required

6ES7516-2GN00-0AB0

3 MB work memory for program, 7.5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC Memory Card required

6ES7516-2GP03-0AB0

Accessories

SIMATIC Memory Card

- 4 MB¹⁾
- 12 MB¹⁾
- 24 MB¹⁾
- 256 MB¹⁾
- 2 GB¹⁾
- 32 GB¹⁾

6ES7954-8LC04-0AA0

6ES7954-8LE04-0AA0

6ES7954-8LF04-0AA0

6ES7954-8LL04-0AA0

6ES7954-8LP04-0AA0

6ES7954-8LT04-0AA0

Connection module

6ES7194-4AP00-0AA0

CM CPU 2PN M12 / 7/8";
With 3 x M12 and 2 x 7/8",
for connecting 2 x PROFINET

Industrial Ethernet FC RJ45 plug 180

RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet

- 1 unit
- 10 units
- 50 units

6GK1901-1BB10-2AA0

6GK1901-1BB10-2AB0

6GK1901-1BB10-2AE0

Industrial Ethernet FastConnect installation cables

- FastConnect standard cable
- FastConnect trailing cable
- FastConnect marine cable

6XV1840-2AH10

6XV1840-3AH10

6XV1840-4AH10

Industrial Ethernet FastConnect installation cables

- 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.

6XV1870-2D

6XV1870-2F

Industrial Ethernet FastConnect

Stripping tool

6GK1901-1GA00

¹⁾ An MMC is essential for operating the CPU

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1516pro F-2 PN

Ordering data	Article No.	Article No.
IE connecting cable M12-180/M12-180 Preassembled IE FC TP trailing cable GP 2x2 (PROFINET type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths: <ul style="list-style-type: none"> • 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 • 20 m • 30 m • 40 m • 50 m 	6XV1870-8AE30 6XV1870-8AE50 6XV1870-8AH10 6XV1870-8AH15 6XV1870-8AH20 6XV1870-8AH30 6XV1870-8AH50 6XV1870-8AN10 6XV1870-8AN15 6XV1870-8AN20 6XV1870-8AN30 6XV1870-8AN40 6XV1870-8AN50	Trailing power cable, 5x1.5 mm ² , preassembled at both ends with 7/8" angled plugs (socket insert at one end, contact pin insert at the other end), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m
PROFINET M12 trailing connecting cable, preassembled at both ends with angled M12 plugs (contact pin insert), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m 	3RK1902-2NB30 3RK1902-2NB50 3RK1902-2NC10	Trailing power cable, 5x1.5 mm ² , preassembled at one end with 7/8" angled plug with socket insert (socket at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m
PROFINET M12 trailing connecting cable, preassembled at one end with angled M12 plug (contact pin insert at one end, other end open), in various lengths: <ul style="list-style-type: none"> • 3.0 m • 5.0 m • 10 m 	3RK1902-2HB30 3RK1902-2HB50 3RK1902-2HC10	Power cable 5-wire, 5x1.5 mm ² , trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1000 m.
IE FC M12 plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet. <ul style="list-style-type: none"> • 1 unit • 8 units • PROFINET M12 plug connector, D-coded, angled. 	6GK1901-0DB20-6AA0 6GK1901-0DB20-6AA8 3RK1902-2DA00	7/8" connection plug For ET 200eco, with axial cable outlet <ul style="list-style-type: none"> • With contact pin insert, 5-pack • With socket insert, 5-pack • Angled, with socket insert, 1 unit • Angled, with contact pin insert, 1 unit
IE panel feedthrough Cabinet bushing for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	6GK1901-0DM20-2AA5	7/8" cover cap, 10 per pack 6ES7194-3JA00-0AA0
7/8" connecting cable to power supply 5-wire, 5x1.5 mm ² , trailable, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths: <ul style="list-style-type: none"> • 1.5 m • 2.0 m • 3.0 m • 5.0 m • 10 m • 15 m • Other special lengths with 90° or 180° cable outlet. 	6XV1822-5BH15 6XV1822-5BH20 6XV1822-5BH30 6XV1822-5BH50 6XV1822-5BN10 6XV1822-5BN15 See under http://support.automation.siemens.com/WW/view/en/26999294 .	Twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m
		Crossed twisted pair cables 4x2 with RJ45 plugs 0.5 m 1 m 2 m 6 m 10 m
		M12 sealing cap For protection of unused M12 connections with ET 200pro
		M12 sealing caps with internal thread 5 units

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1516pro F-2 PN

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
General information		
Product type designation	CPU 1516pro F-2 PN	CPU 1516pro F-2 PN
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V17 (FW V2.9) / V14 (FW V2.0) or higher	V20 (FW V4.0) / V19 (FW V3.1) or higher; configurable with older TIA Portal versions as 6ES7516-2GN00-0AB0
Supply voltage		
Rated value (DC)	24 V	24 V
Memory		
Work memory		
• integrated (for program)	1.5 Mbyte	3 Mbyte
• integrated (for data)	5 Mbyte	7.5 Mbyte
Load memory		
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	10 ns	6 ns
for word operations, typ.	12 ns	7 ns
for fixed point arithmetic, typ.	16 ns	9 ns
for floating point arithmetic, typ.	64 ns	37 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Size, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
1. Interface		
Interface types		
• RJ 45 (Ethernet)	Yes; X1 P3	Yes; X1 P3
• Number of ports	3; 2x M12 + 1x RJ45	3; 2x M12 + 1x RJ45
• integrated switch	Yes	Yes
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes

Distributed Controllers

based on ET 200pro
Fail-safe CPUs

CPU 1516pro F-2 PN

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	Yes
- Isochronous mode	Yes	Yes
- Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)	Yes; Requirement: IRT and isochronous mode (MRPD optional)
- IRT	Yes	Yes
- PROFINET energy	Yes; per user program	Yes; per user program
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	256	256
- of which in line, max.	256	256
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	No
- Isochronous mode	No	No
- IRT	Yes	Yes
- PROFINET energy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
2. Interface		
Interface types		
• RJ 45 (Ethernet)	No	No
• Number of ports	1; 1x M12	1; 1x M12
• integrated switch	No	No
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes
• Media redundancy	No	No

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1516pro F-2 PN

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	
- Isochronous mode	No	No
- Direct data exchange	No	No
- IRT	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; in total, up to 1024 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32	32
- of which in line, max.	32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
- PROFINET Security Class		1
PROFINET IO Device		
Services		
- PG/OP communication	Yes	
- Isochronous mode	No	No
- IRT	No	No
- PROFIenergy	Yes; per user program	Yes; per user program
- Prioritized startup	No	No
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- activation/deactivation of I-devices	Yes; per user program	Yes; per user program
- Asset management record	Yes; per user program	Yes; per user program
- PROFINET Security Class		SNMP Configuration and DCP Read Only
Protocols		
Number of connections		
• Number of connections, max.	128; Via integrated interfaces of the CPU	128; Via integrated interfaces of the CPU
Redundancy mode		
Media redundancy		
- Media redundancy	Yes; only via 1st interface (X1)	Yes; only via 1st interface (X1)
- MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD	200 ms; For MRP, bumpless for MRPD
- Number of stations in the ring, max.	50	50
SIMATIC communication		
• S7 routing	Yes	Yes
OPC UA		
• OPC UA Client	Yes	Yes; Data Access (registered Read/Write), Method Call
• OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; data access (read, write, subscribe), method call, alarms & condition (A&C), custom address space, role-based access control
• Alarms and Conditions	Yes	Yes

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1516pro F-2 PN

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
Supported technology objects		
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects	800	2 400
• Required Motion Control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
Probability of failure (for service life of 20 years and repair time of 100 hours)		
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09
Product functions/security		
PROFINET Security Class		1
signed firmware update		Yes
Secure Boot		Yes
safely removing data		Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C	-25 °C
• horizontal installation, max.	55 °C	55 °C
• vertical installation, min.	-25 °C	-25 °C
• vertical installation, max.	55 °C	55 °C
Configuration		
Configuration/programming		
Programming language		
- LAD	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC		Yes; either CFC or failsafe functionality
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/ password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes

Distributed Controllers

based on ET 200pro

Fail-safe CPUs

CPU 1516pro F-2 PN

Technical specifications

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516PRO F-2 PN	6ES7516-2GP03-0AB0 ET 200pro: CPU 1516pro F-2 PN
Access protection		
• protection of confidential configuration data	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Write protection for Failsafe		Yes
• Protection level: Complete protection	Yes	Yes
• User administration		Yes; device-wide and centralized
• Number of users		100
Dimensions		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm; without connection module M12 7/8 inch
Weights		
Weight, approx.	614 g	474 g; device only