

CT-5341 Profibus DP Master module

1 Module Description

The Profibus-DP master module supports 1 DP interface, supports the standard PROFIBUS-DP V0/V1 protocol, and supports the Profibus-DP master working mode. In combination with the adapter module, the Profibus-DP protocol can be converted to other protocols, such as ModbusTCP, Profinet, EtherCAT, Ethernet/IP, etc. When using the module, it is necessary to configure the process data reading and writing instructions, diagnostic instructions, configuration information, and configuration parameters of the Profibus-DP bus in the IO Config software.

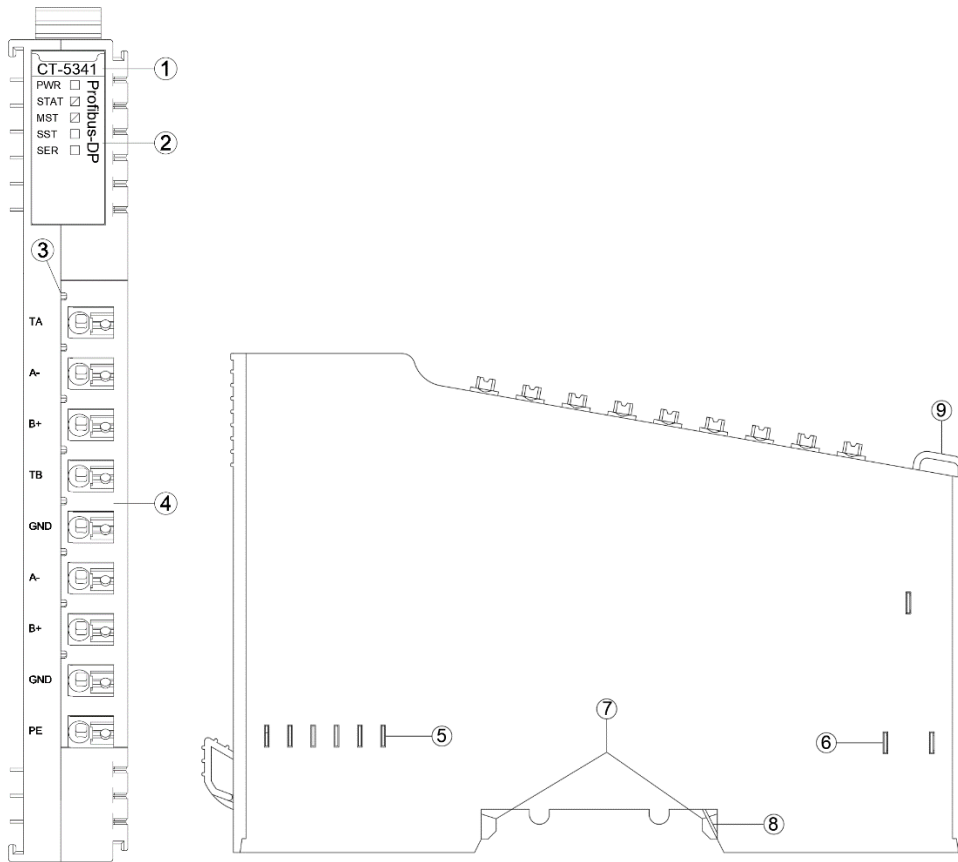
All slave devices that support the Profibus-DP protocol can use this module to realize the interconnection with the upper PLC or the upper computer. Such as: PLC, DCS, remote IO, inverter, motor start protection device, intelligent high and low voltage electrical appliances, power measurement device, intelligent field measurement equipment and instruments, etc.

Note: When the DP master module is configured with DP Config software, it needs to be connected to a separate serial port cable, and the interface is on the side of the module.

2 Technical Parameters

General Parameters	
Power	Max.200mA@5.0VDC
Isolation	DP communication twisted pair and system power supply isolation voltage: AC 500V DP communication twisted pair with PE isolation voltage: AC 500V
Wiring Wire Diameter	Max.1.0mm ² (AWG 17) Min.0.2mm ² (AWG 24)
Installation:	35mm DIN-Rail
Size	115*14*75mm
Weight	62g
Vibration Resistance	Comply with IEC 61131-2 and EC 60068-2-6
Impact Resistance	Comply with IEC 61131-2 and IEC 60068-2-27
EMC Performance	Comply with IEC 61131-2 and IEC 61000-4
Environmental Parameters	
Horizontal Installation Operating Temperature	-35°C~70°C
Vertically Installation Operating Temperature	-35°C~60°C
Relative Humidity	< 95% RH non-condensing
Storage Temperature	-40°C~85°C
Storage Humidity	< 95% RH non-condensing
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
PROFIBUS-DP Parameters	
Channel	1 way
Interface	Terminal wiring
Protocol	Profibus-DP V0/V1
Station	Profibus-DP master
Station Address	Configured by IO configure software
Topology	Linear topology with termination resistors
Number of Slaves Supported	The extension module can carry with 32 slaves, and with repeaters it can be expanded to 125 slaves
Baud Rate	9.6k/19.2k/45.45k/93.75k/187.5k/500k/1.5M/3M/6M/12M (bps)
Max. Communication Distance	1000m
The Max. Length of the I/O Process Data	Max. Input: 1400 bytes, Max. Output: 1400 bytes The max. sum of input and output is 2800 bytes.

3 Hardware interface



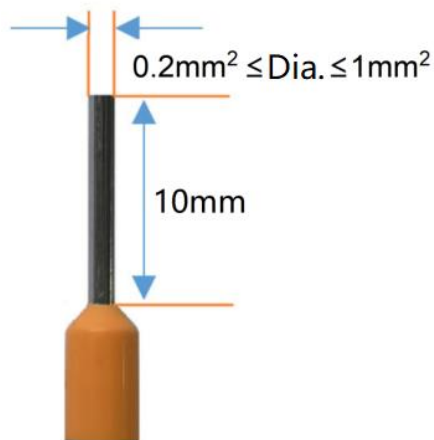
- ① Module Type
- ② State Indicator
- ③ N/A
- ④ Wiring Terminal and Identification
- ⑤ Internal Bus
- ⑥ Field Power
- ⑦ Buckle
- ⑧ Grounding Spring Sheet
- ⑨ Fixed Wiring Harness

3.1 Wiring Terminal

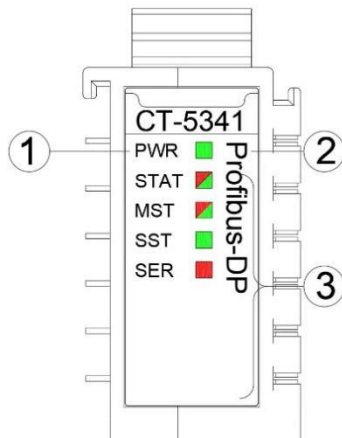
Terminal	At the head and tail of the DP bus	In the middle of the DP bus
TA	Built-in terminal resistance	N/A
A-		DP_A signal wire
B+		DP_B signal wire
TB		N/A
GND	Signal grounding	Signal grounding
A-	DP_A signal wire	DP_A signal wire
B+	DP_B signal wire	DP_B signal wire
GND	Signal grounding	Signal grounding
PE	Grounding terminal	Grounding terminal

When connecting cables (terminals)with cores, need to check and connect them according to the corresponding node serial number.

It is recommended to use cables with cores greater than 0.2mm^2 and smaller than 1mm^2 .The cold-pressed terminal parameters are as follows:

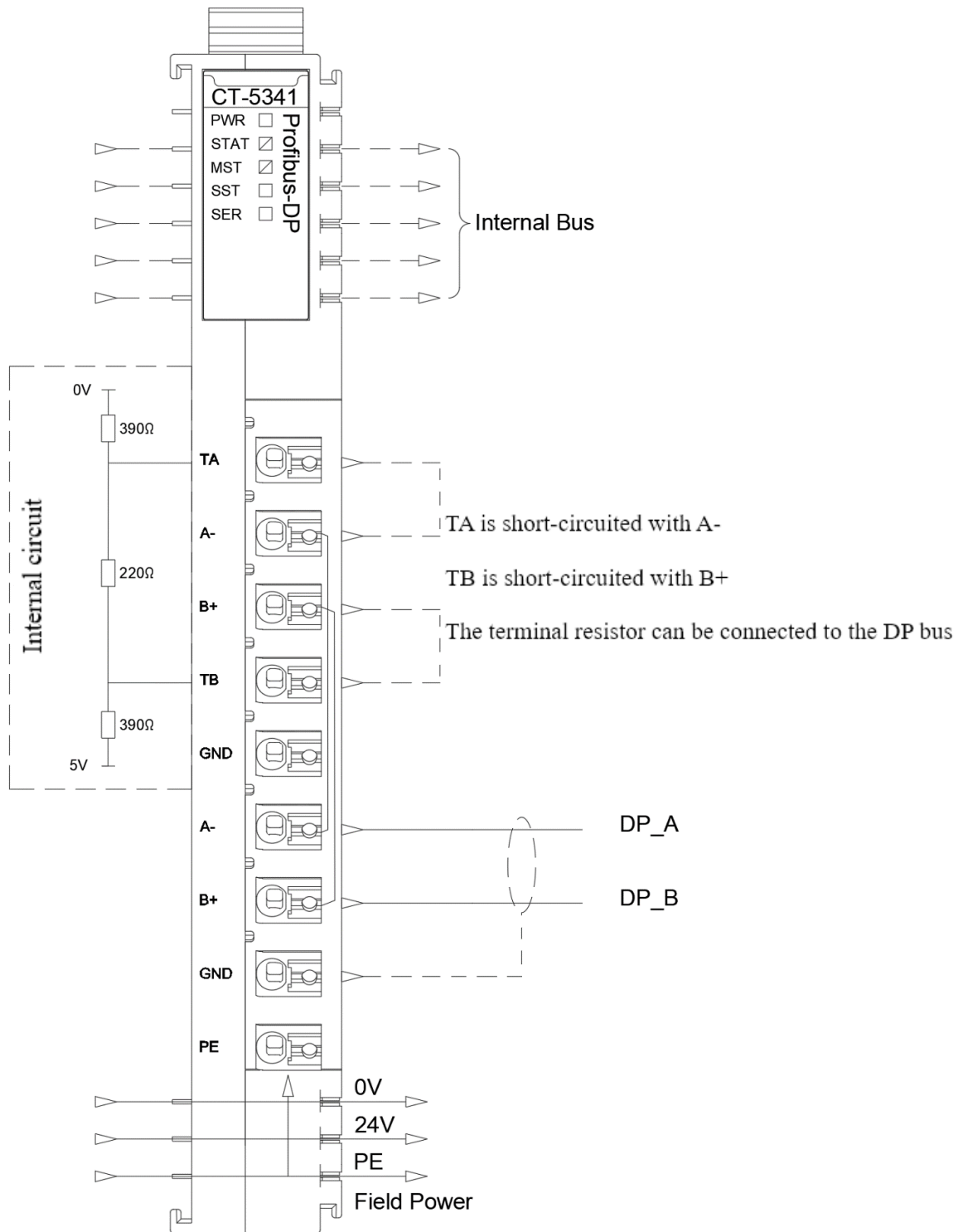


3.2 LED indicator definition

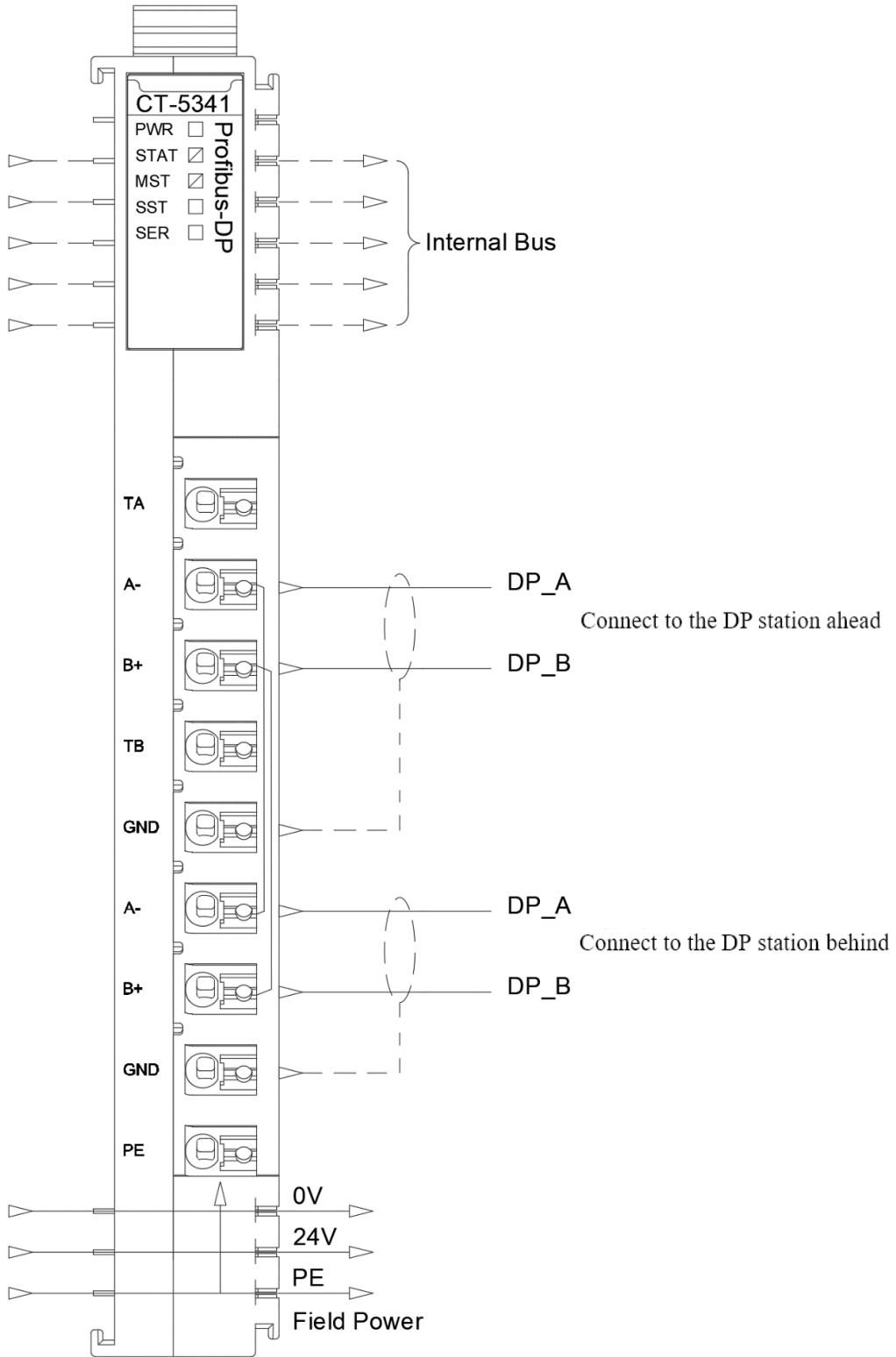


PWR Power Indicator(Green)	Definition
ON	The system power supply is normal
OFF	The system power supply is failure
STAT-Module State Indicator (Red/Green)	Definition
Double Flash (RED)	The module exception has been soft-restarted
ON (Green)	Operational Mode
Green Single Flash	Stop mode
Flash(2.5Hz) (RED/Green)	Upgrading mode
Flash(10Hz) (RED/Green)	Firmware Upgrading
Flash(2.5Hz) (RED)	Offline mode
MST DP Master Status indicator (Green/Red)	Definition
Flash(2.5Hz) (Green)	The DP master is starting up
ON(Green)	The DP master is operating normally
ON(RED)	The DP master is offline or faulty
Flash(10Hz) (RED)	The number of submodules or the length of the process data configuration is exceeded
SST DP Slave Status indicator (Green)	Definition
SER DP Slave Error indicator (RED)	Definition
SST Flash, SER Flash	Upgrading mode
SST ON, SER OFF	No configuration parameters for the DP master
SST ON, SER OFF	All DP slaves are operating normally
SST OFF, SER ON	All DP slaves are offline or faulty
SST Flash, SER ON	Some DP slaves are offline or faulty

4 Wiring



The module CT-5341 is at the head and tail of the DP bus



The module CT-5341 is in the middle of the DP bus

5 Process Data Definition

5.1 Module Process Data Definition

Sub-slot 0 of the CT-5341 has no process data. The IO data of the DP bus, the diagnostic data of the DP master, and the diagnostic data of the DP slave are stored on sub-slots 1-63 (submodules) of the CT-5341.

5.2 Submodule Process Data Mapping

The CT-5341 contains a total of 6 module types, which are defined as follows:

5.2.1 Diag. Master

This type of submodule reads the diagnostic data of the DP master status, and the number of configurable submodules is 0-1, and the process data accounts for 1 Double Word (Unsigned 32), which is defined as follows:

Input data								
Byte No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Slave Diag. Len. Err.	Master Diag. Module Num. Err.	Len. Err.	Master Err.	Master State Machine			
Byte 1	Reserved				IO Module Num. Err.	IO Output Len. Err.	IO Input Len. Err.	Slave Diag. Module Num. Err.
Byte 2	Reserved							
Byte 3	Reserved							

Data Description:

Master State Machine: The master state machine of the DP station

- 0x00: DP master offline mode
- 0x01: DP master online mode
- 0x02: The initial mode of the DP master
- 0x03: DP master test mode

Master Err.: indicates an error condition for the DP master

0: Normal

1: Faulty

Len. Err.: Error condition for the number of submodules or the length of the process data

0: Correct

1: Overrun (determined by submodule type)

Master Diag. Module Num. Err.: The DP master diagnoses the errors in the number of submodules

0: Correct

1: Overrun (maximum 1)

Slave Diag. Len. Err.: DP Slave Diagnostics Process Data Total Length Error Condition

0: Correct

1: Overrun (maximum 125 Word)

Slave Diag. Module Num. Err.: DP Slave diagnoses the number errors of sub-modules

0: Correct

1: Overrun (maximum 5 pcs)

IO Input Len. Err.: The error status of the DP bus IO input data total length

0: Correct

1: Overrun (maximum 1400 bytes)

IO Output Len. Err.: The error status of the IO output data on the DP bus total length

0: Correct

1: Overrun (maximum 1400 bytes)

IO Module Num. Err. Error status of DP bus IO data reading and writing sub-module number

0: Correct

1: Overrun (maximum 50)

5.2.2 Diag. xxx Slave(s)

This type of submodule can read the diagnostic data of DP slaves that have participated in bus configuration, and supports 1-125 DP slaves for optional. The process data of each submodule occupies n (n = xxx) Word (Unsigned 16), and each Word corresponds to 1 DP slave, which is defined as follows.

Note:

1. The number of configurable sub-modules is 0-5, and the total length of process data supports up to 125 Word after all sub-modules are added;
2. CN-8033 only supports 1-32 DP slaves for optional.

Input data										
Word No.	Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Word 0	Byte 0	Reserved				IO Data Exchange	Config Err.	Prm. Err.	Slave Mode	
	Byte 0	Slave ID								
...	...									
Word n	Byte 2n	Slave Status	Reserved			IO Data Exchange	Config Err.	Prm. Err.	Slave Mode	
	Byte 2n+1	Slave ID								

Data Description:

Slave Mode: DP slave online/offline

0: Offline

1: Online

PRM. Err.: DP slave parameter settings

0: The parameter is correct

1: The parameter is incorrect

Config Err.: the configuration status of the DP slave

- 0: The configuration is correct
- 1: The configuration is incorrect

IO Data Exchange: the I/O data exchange of the DP slaves

- 0: I/O data is not exchanged
- 1: I/O data is being exchanged

Slave ID: the ID number of the DP slave participating in the bus configuration

5.2.3 Input xxx Byte(s)

This type of submodule can read the I/O data of the DP bus, and supports 1-8 bytes for optional. The process data of each submodule occupies n (n = xxx) bytes (Unsigned 8), which is defined as follows:

Note:

The number of configurable IO data submodules (Input xxx Byte(s)/Input xxx Word(s)/Output xxx Byte(s)/Output xxx Word(s)) is 0-50, and the total length of process data is up to 1400 bytes after all IO input data submodules (Input xxx Byte(s)/Input xxx Word(s)) are added.

Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	IO Data							
...	...							
Byte n	IO Data							

Data Description:

N/A

5.2.4 Input xxx Word(s)

This type of submodule can read the IO data of the DP bus, and supports 1-256 Word for optional. The process data of each submodule occupies n (n = xxx) Word

(Unsigned 16), which is defined as follows:

Note:

1. The number of configurable IO data submodules (Input xxx Byte(s)/Input xxx Word(s)/Output xxx Byte(s)/Output xxx Word(s)) is 0-50, and the total length of process data supports up to 1400 bytes after all IO input data submodules (Input xxx Byte(s)/Input xxx Word(s)) are added.
2. CN-8033 only supports 1-32 Word for optional.

Input data									
Word No.	Byte No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Word 0	Byte 0	IO Data							
	Byte 1								
...							
Word n	Byte 2n	IO Data							
	Byte 2n+1								

Data Description:

N/A

5.2.5 Output xxx Byte(s)

This type of submodule can write I/O data to the DP bus, and supports 1-8 bytes for optional. The process data of each submodule occupies n (n = xxx) bytes (Unsigned 8), which is defined as follows:

Note:

The number of configurable IO data submodules (Input xxx Byte(s)/Input xxx Word(s)/Output xxx Byte(s)/Output xxx Word(s)) is 0-50, and the total length of process data supports up to 1400 bytes after all IO output data submodules (Output xxx Byte(s)/Output xxx Word(s)) are added.

Output data								
Byte No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	IO Data							
...	...							
Byte n	IO Data							

Data Description:

N/A

5.2.6 Output xxx Word(s)

This type of submodule can write I/O data to the DP bus, and supports 1-256 Word for optional. The process data of each submodule occupies n (n = xxx) bytes (Unsigned 16), which is defined as follows:

Note:

1. The number of configurable IO data submodules (Input xxx Byte(s)/Input xxx Word(s)/Output xxx Byte(s)/Output xxx Word(s)) is 0-50, and the total length of process data supports up to 1400 bytes after all IO output data submodules (Output xxx Byte(s)/Output xxx Word(s)) are added.
2. CN-8033 only supports 1-32 Word for optional.

Input data									
Word No.	Byte No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Word 0	Byte 0	IO Data							
	Byte 1								
...							
Word n	Byte 2n	IO Data							
	Byte 2n+1								

Data Description:

N/A

6 Configuration Parameters Definition

CT-5341 sub-slot 0 has configuration parameters.

CT-5341 sub-slots 1-63 (sub-module) have no configuration parameters (each sub-module reserves 1 byte of configuration parameters for future expansion).

The configuration parameters of CT-5341 sub-slot 0 include input and output fault handling configuration parameters, which account for 5 bytes in length and are defined as follows:

Configure parameters									
Byte No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	Reserved					Byte Swap	Fault Action Out	Fault Action In	
Byte 1	Reserved								
Byte 2									
Byte 3									
Byte 4									

Data Description:

Fault Action In: Enter the fault handling method. In the event of a disconnection from communication with the lower layer (DP slave) or failure of the DP master, the CT-5341 processes the IO input data of the DP bus in this mode. (Default: 1)

0: Keeps the last input value

1: Zeroing the input value

Fault Action Out: Outputs the fault handling method. When disconnected from the upper layer communication (C-series coupler, such as CN-8031, etc.), the CT-5341 processes the IO output data of the DP bus in this mode. (Default: 1).

0: Keeps the last output value

1: Zeroing the output value

Byte Swap: Input xxx Word(s)/Output xxx Word(s) submodule process data endian swap. (Default: 0)

0: Forbidden

1: Enable

A Dimensional drawing

