Remote IO

C Series

User Manual

V1.11

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Remote IO-C Series

Odot Automation System Co., Ltd.

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1 Product Overview

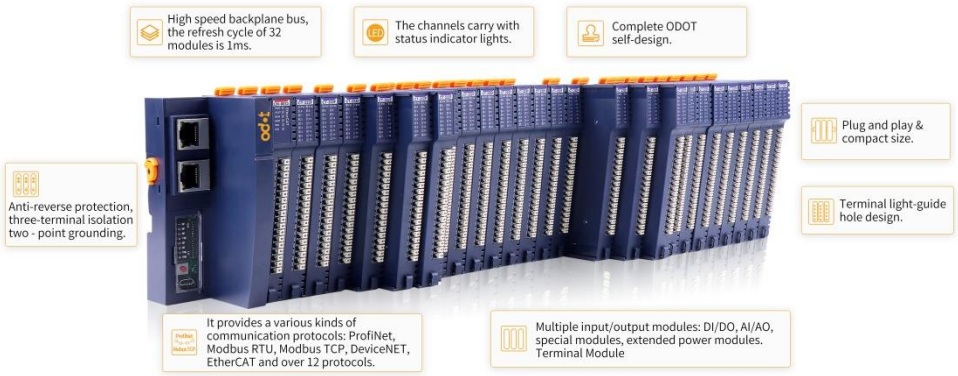
Remote IO system consists of network adapter module and extended IO module. The network adapter module controls fieldbus communication and it realizes communication link with host station controller or host computer software.

The extended IO module controls the connection with the input and output sensors in the field. At first the Input IO module collects the field signals and sends it to the network adapter through the internal bus. Secondly the controller reads and processing data from the adapter through the field bus, and it writes the output data into the network adapter, then the network adapter could write the output data into the output IO module via the internal bus, so the the field equipment control could be realized.

According to the communication interface of the controller system, the network adapter could select the corresponding bus module and mainstream industrial communication protocols including Modbus, Profibus-DP, Profinet, EtherCAT, EtherNet/IP, CANsopen, CC-Link, PowerLink, etc. And there are 6 categories of extended IO modules such as: digital input module, digital output module, analog input module, analog output module, special module, hybrid IO module, etc.

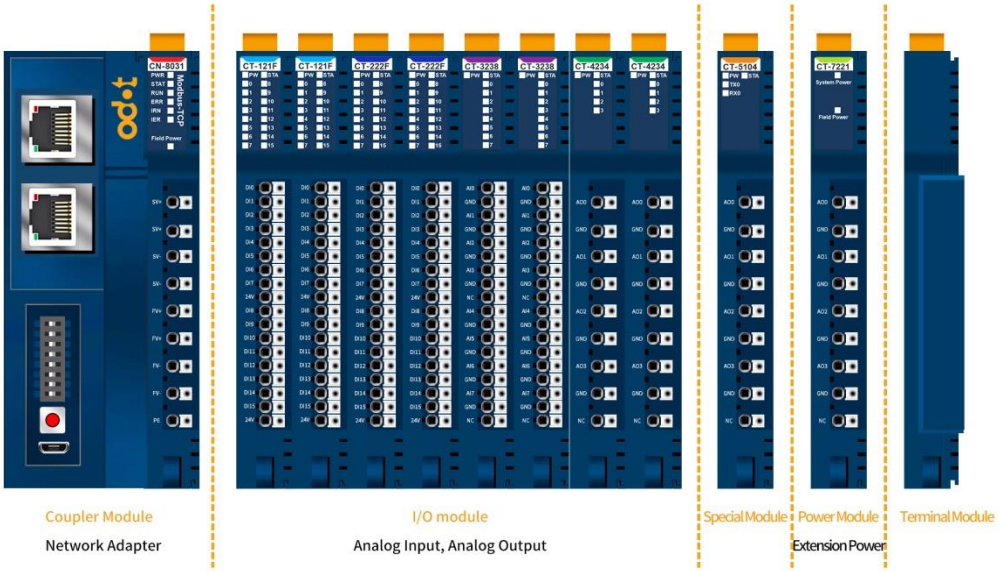
The network adapter and the extended IO module could be freely combined according to the field requirements, and it could achieve lower cost with the Remote IO module when the project rquires more data points.

1.1 Module Feature



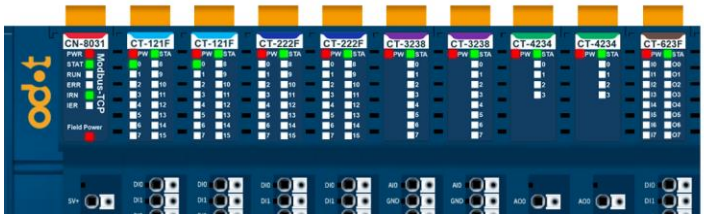
1.2 Module Layout

The ODOT-C series is a remote I/O module. The adapter module lies on the far left, and on the right are extended I/O modules.



1.3 LED Indicators

The user can easily check the power state of adapter and I/O module, I/O module operating state, and the number of I/O channels though LED state. And the detailed indicator state should refer to the related adapter or IO modules.



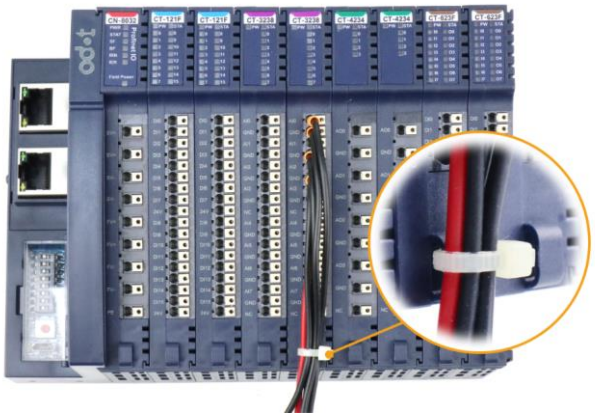
1.4 Ground Protection

There is one metal resilient sheet on the back of the module, which is used for effective grounding with the guide rail. The metal resilient sheet and the adapter PE (protective earthing) are connected internally.

1.5 Wiring

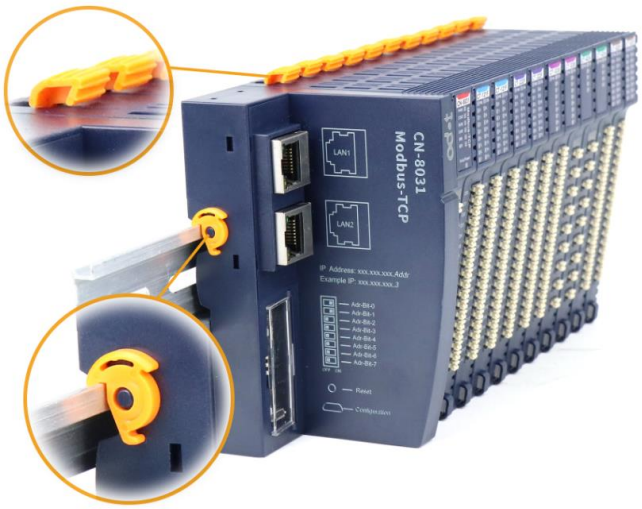
Use push-in method to connect single-wire or crimp terminal wires without any other tools. Users can save wiring time and ensure a safe operation regardless of wiring experience.

The module equips with a wiring fixed end for cable harness, which is used to fix the cable when the IO module is wired with multiple cables.



1.6 Installation and Removal

DIN-Rail Lock could be safely and reliably installed on 35 mm DIN-Rail. There is a manual closure buckle on the upper side of all modules for locking, and a manual buckle is on the left side of the adapter for locking the guide rail.



When the module is removed, it needs to manually unlock the guide rail on the upper side of the module. For the adapter module, you also need to unlock the left rail buckle counterclockwise.

1.7 Installation Size

Adapter size: 115*51.5*75mm I/O module size: 115*14*75mm

2 Network Adapter

CN-8011 Modbus-RTU Network Adapter

1 Module Overview

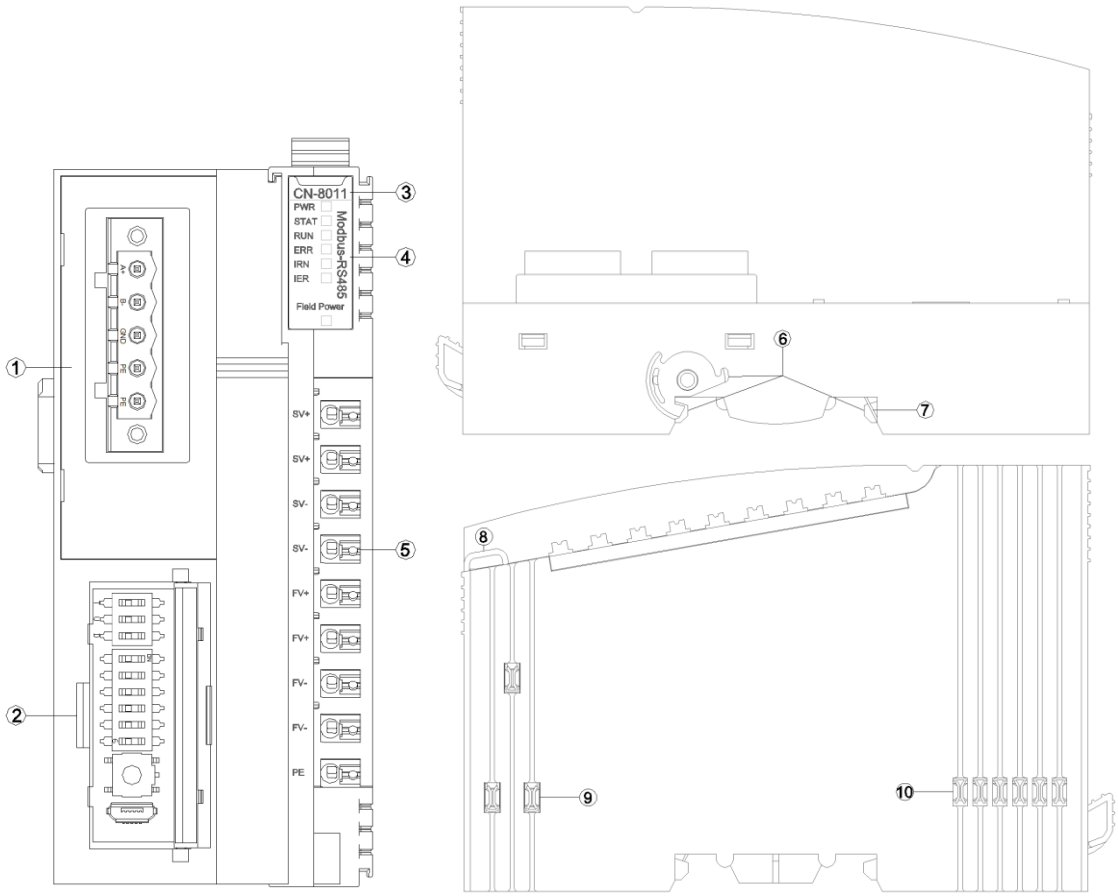
CN-8011 Modbus-RTU network adapter supports standard Modbus-RTU communication, it supports function code of 01/02/03/04/05/06/15/16/23, and this device could monitor the IO module communication state in real time.

2 Technical Parameter

Adapter Hardware Parameter	
System Power	Nominal:24Vdc, Range: 9-36Vdc Reverse Protection: YES
Power Consumption	30mA@24Vdc
Internal Bus Supply Current	Max：2.5A@5VDC
Isolation	System Power to Field Power Isolation
Power Supply	Nominal:24Vdc, Range:22-28Vdc
Field Power Current	Max. DC 8A

IO Modules Supported	32 pcs
Wiring	Max.1.5mm²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operation Temperature	-40~85℃
Operation Humidity	5%-95% (No Condensation)
Weight	IP20
Modbus-RTU Parameter	
Protocol	Modbus-RTU/ASCII
Function Code	01 / 02 / 03 / 04 / 05 / 06 / 15 / 16
Baud Rate	2400~115200bps
Station No.	1~63(Dial-code switch configuration),64~247(Software configuration)
Interface	5 Pin screw terminal
Data Bits	7, 8
Parity Checking	None, Even, ODD
Stop Bit	1，2
Max. bus length	1200m（RS485，2400 baud rate）
Terminal resistance and offset resistance	DIP switch configuration

3 Hardware Interface



① RS485 port

② Config Interface

③ Module type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

⑧ Fixed Wiring Harness

⑨ Field Power

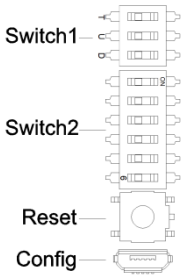
⑩ Internal Bus

3.1 RS485 Interface

Modbus RS485 port is 5 Pin screw terminals and its Pin definition is as below:

Pin	Definition	Description
1	A+	RS485 A+
2	B-	RS485 B-
3	SGND	Signal Grounded
4	Shield	Earthing of Shield
5	PE	Protect Earthing

3.2 Configuration Interface



Switch1: DIP switch used to set the terminal resistance, pull up and down resistance.T: terminal resistance, U: pull up resistance, D: pull down resistance.

The Switch2: DIP switch used to set the adapter module address.It is set by an 8-bit binary hardware dial - code switch, and each Modbus adapter has a unique station address (1~63).

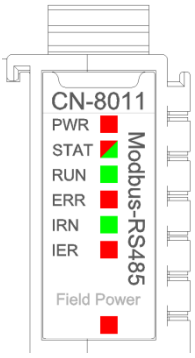
(Special note: When the address needs to be set beyond 63, the address should be dialed to set it to 0, and the station address should be set in IO Config software)

Reset: Module reset button, long pressing the button for more than 5 seconds and all parameters of the module will be restored to the default value. When the Reset

button is activated, a green indicator will light up in the upper left corner of the button.

Config: configured ports, it is standard MicroUSB interface for configuring device parameters and firmware upgrades.

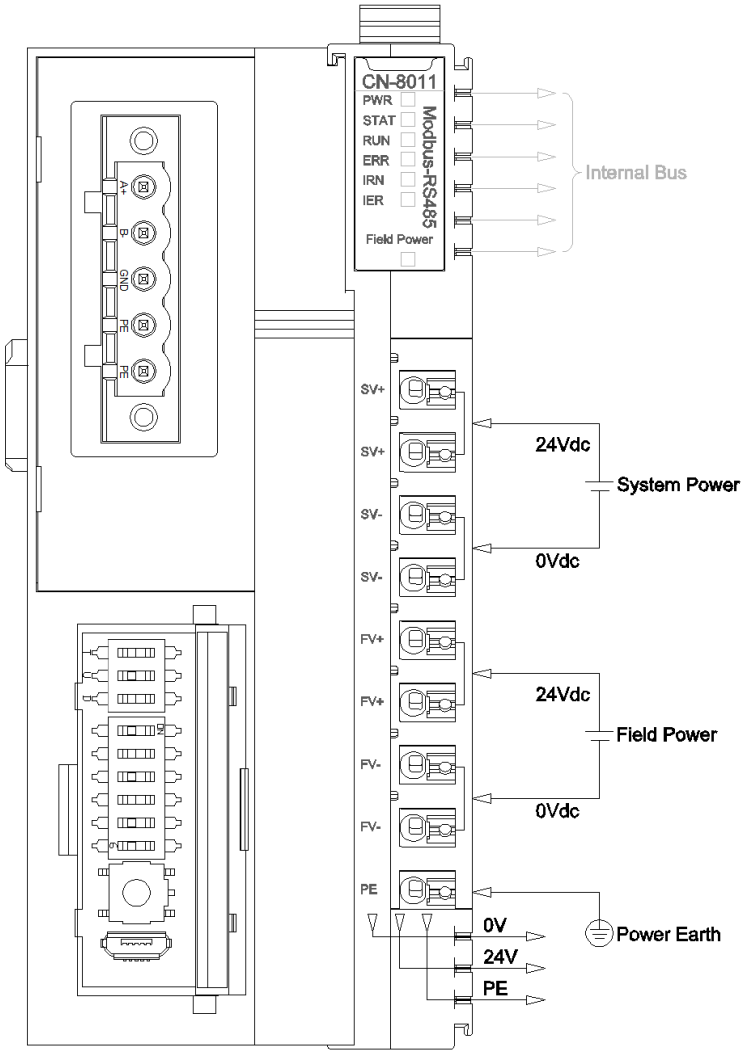
3.3 LED Indicator



PWR Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Module State (RED/GREEN)	Definition
Double Flash (RED)	Module Soft Restarted by Hard-Fault
ON(GREEN)	Running
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Boot Mode
Flash(10Hz) (RED/GREEN)	Firmware Updating
RUN Network State (GREEN)	Definition
OFF	No data exchanging.
Flash	Modbus data exchanging
ERR Network Error (RED)	Definition
OFF	Modbus data exchanging normal
ON	Modbus data exchanging failure
IRN IO Run (GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure
IER IO Error (RED)	Definition
OFF	IO communication normal
Double Flash	IO communication failure
Field Power State (RED)	Definition
ON	Field Power Normal
OFF	Field Power Failure

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.



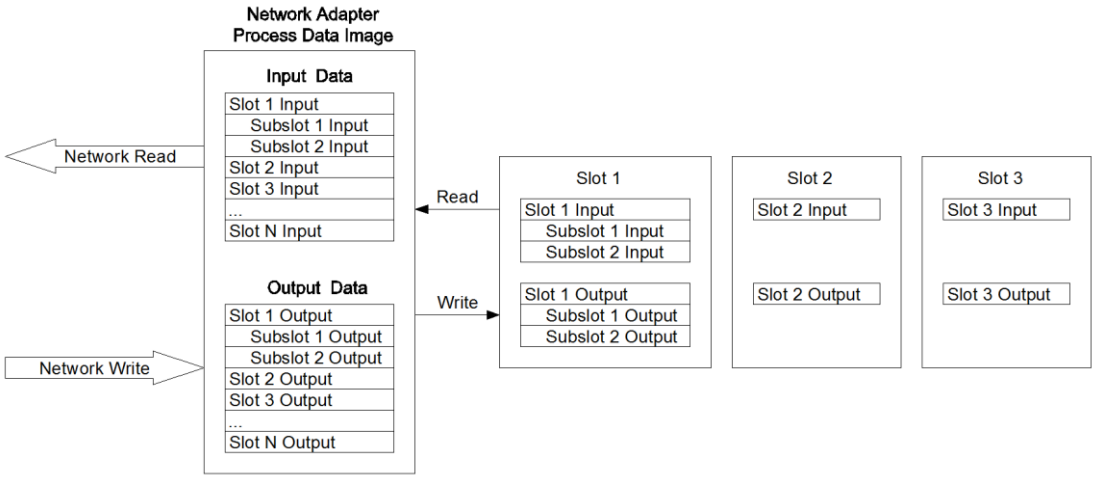
5 Process data definition

5.1 Adapter process data definition

Modbus-RTU Adapter itself has no input-output process data.

5.2 IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



Modbus address mapping table varies according to module combination, and detailed address mapping table could be viewed through IO Config – the configuration software.

6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0						Fault Action for Output	Fault Action for Input	Source of Configuration Data
Byte 1	Slave ID							
Byte 2	BaudRate							
Byte 3								
Byte 4								
Byte 5								
Byte 6			Serial Mode	Stop Bits		Parity Bits		Data Bits
Byte 7	Char Pitch							
Byte 8	Response Delay(ms)							
Byte 9								

Data declaration:

Source of Config Data： Parameter configuration mode (Default: 0)

0：Configuration Software

Fault Action for Input： Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode. (Default: 0, Hold Last Input Value)

0：Hold Last Input Value

1：Clear Input Value

Fault Action for Output： Output fault handling mode, when the IO module is offline, the adapter will process the IO module output data according to this mode. (Default: 1, Clearing Output Value)

0：Hold Last Output Value

1：Clearing Output Value

Slave ID：Modbus slave ID，hardware dial code or software configuration，1-247

Baud Rate：Serial port baud rate，(Default：2，9600bps)

0：2400bps

1：4800bps

2：9600bps

3：14400bps

4：19200bps

5：38400bps

6：57600bps

7：115200bps

Data Bits: data bits，(default：Bit 1, 8)

0：Bit 7

1：Bit 8

Parity Bits：Parity Checking，(default：0，no parity)

0：None

1：ODD

2：EVEN

Stop Bits：stop bits，(default：Bit 0，1)

0：Bit 1

1：Bit 2

Serial Mode：Serial port mode (default：0，RTU)

0：RTU

1：ASCII

Char Pitch: Character Pitch is the detection time of frame interval when receiving a message (T is the time of single character transmission, related to baud rate) (default: 2, 5 characters)

0：1.5 characters

1：3.5 characters

2：5 characters

3：10 characters

4：20 characters

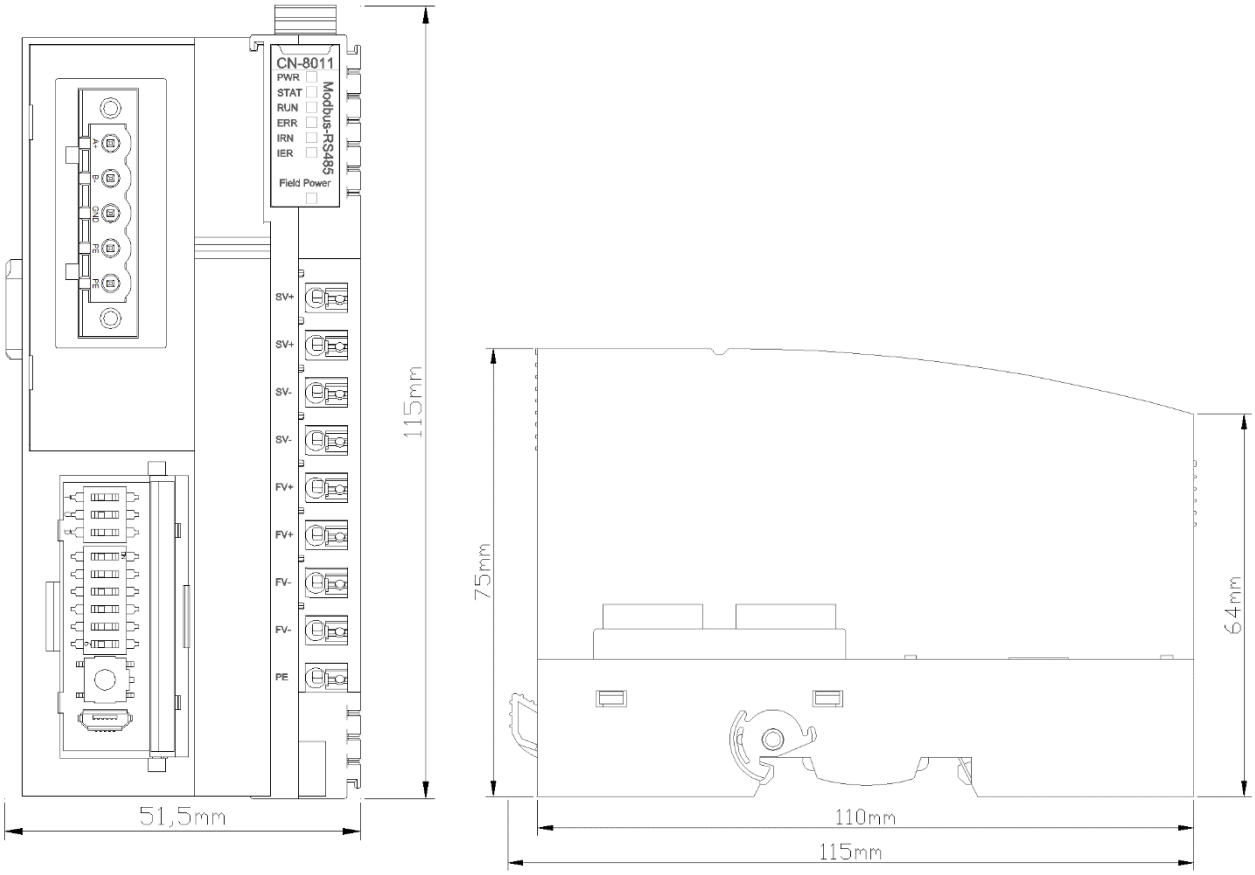
5：50 characters

6：100 characters

7：200 characters

Response Delay(ms)： Reply delay time from Slave, self-defined, default 10ms, effective range: 0-65535.

A Dimension drawing



CN-8012 Profibus-DP Network Adapter

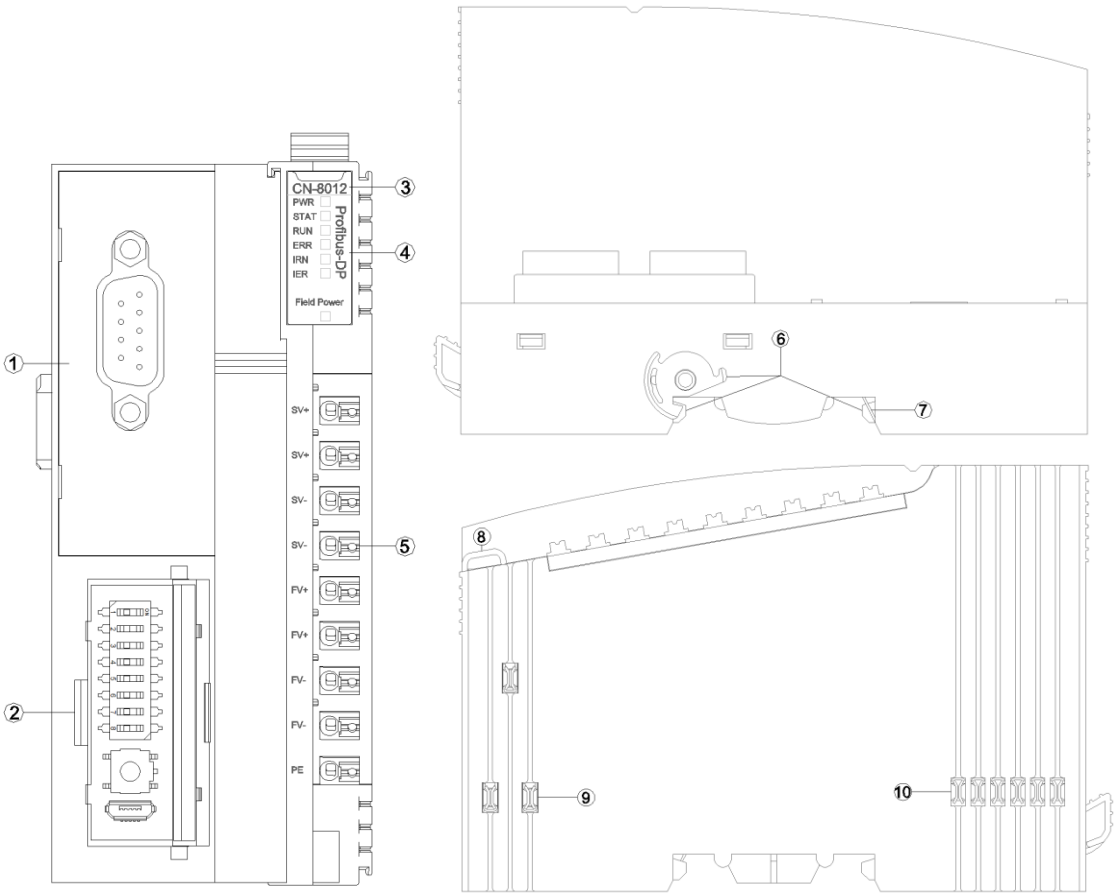
1 Module Overview

CN-8012 PROFIBUS-DP network adapter supports access of standard PROFIBUS-DP, and the protocol version it supports is DPV0.

2 Technical Parameter

Adapter Hardware Parameter	
System Power	Nominal:24Vdc, Range: 9-36Vdc Reverse Protection: YES
Power Consumption	30mA@24Vdc
Internal Bus Supply Current	Max：2.5A@5VDC
Isolation	System Power to Field Power Isolation
Power Supply	Nominal:24Vdc, Range:22-28Vdc
Field Power Current	Max. DC 8A
IO Modules Supported	32 pcs
Wiring	Max.1.5mm²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operation Temperature	-40~85℃
Operation Humidity	5%-95%(No Condensation)
Protection Class	IP20
Profibus-DP Parameter	
Protocol	PROFIBUS DPV0
Interface Type	DB9 female head
Station Type	PROFIBUS Slave
Station Address	Dial code switch configuration
Topology	Bus topology
Configuration Max. Length	232 bytes
IO data Max. Length	Input: Max. 244 bytes, Output: Max. 244 bytes, Sum of input and out put: Max. 288 bytes

3 Hardware Interface



① Profibus-DP port

② Config Interface

③ Module type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

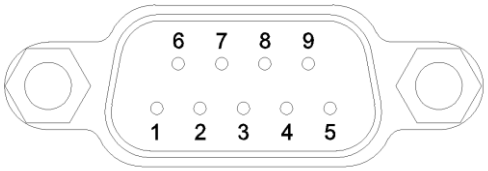
⑧ Fixed Wiring Harness

⑨ Field Power

⑩ Internal Bus

3.1 Profibus-DP Interface

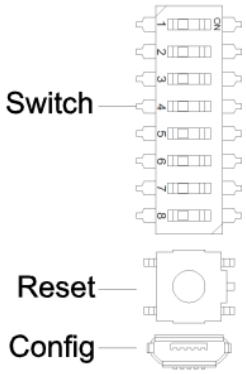
Profibus-DP port is 9 Pin terminals and its Pin definition is as below:



Interface Pin Definition

Pin	Definition	Description
1	Shield	Earthing of Shield
2	--	--
3	B	Data line B
4	CNTR-P	Direction control-P
5	DGND	Signal Grounded
6	VP(+)	+5v
7	--	--
8	A	Data lineA
9	CNTR-N	Direction control-N

3.2 Configuration Interface

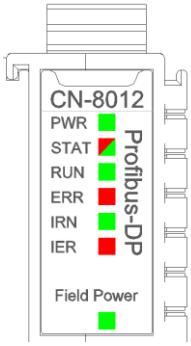


Switch: The station address of the Profibus DP adapter.It is set by an 8-bit binary hardware dial code switch, and each PROFIBUS adapter has a unique station address (1~127).

Reset: Module reset button, long pressing the button for more than 5 seconds and all parameters of the module will be restored to the default value. When the Reset button is activated, a green indicator will light up in the upper left corner of the button.

Config: configured ports, it is standard MicroUSB interface for configuring device parameters and firmware upgrades.

3.3 LED Indicator

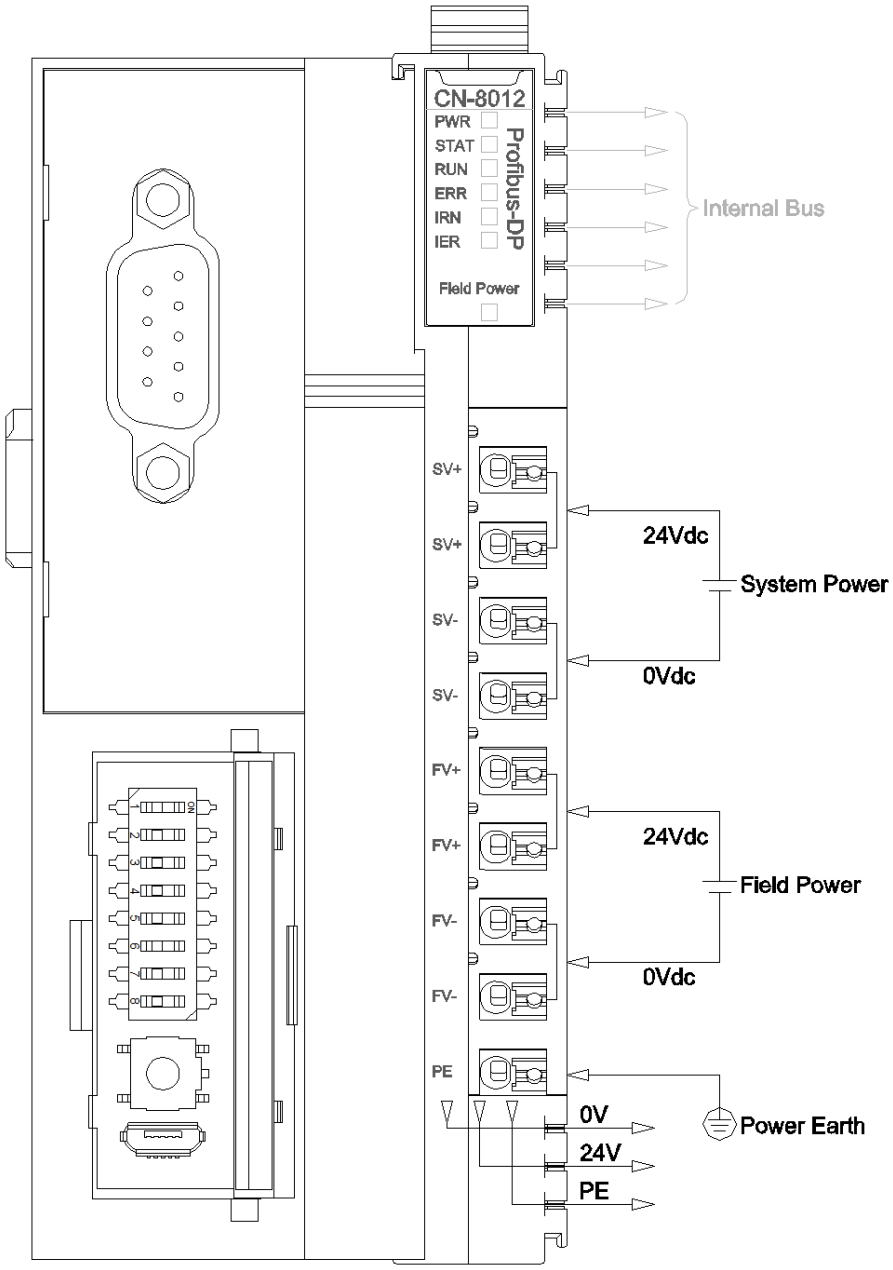


PWR Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Module State (RED/GREEN)	Definition
Double Flash (RED)	Module Soft Restarted by Hard-Fault
ON(GREEN)	Running
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Boot Mode
Flash(10Hz) (RED/GREEN)	Firmware Updating
RUN Network State (GREEN)	Definition
OFF	DP off-line mode
ON	DP data exchanging mode
ERR Network Error (RED)	Definition
Off	DP data exchanging mode
Flash	DP off-line mode
IRN IO Run (GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure

IER IO Error (RED)	Definition
OFF	IO communication normal
Double Flash	IO communication failure
Field Power State (RED)	Definition
ON	Field Power Normal
OFF	Field Power Failure

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.


CN-8012
PWR
STAT
RUN
ERR
IRN
IER
Profibus-DP
Field Power
Internal Bus
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
24Vdc
System Power
0Vdc
24Vdc
Field Power
0Vdc
Power Earth
0V
24V
PE

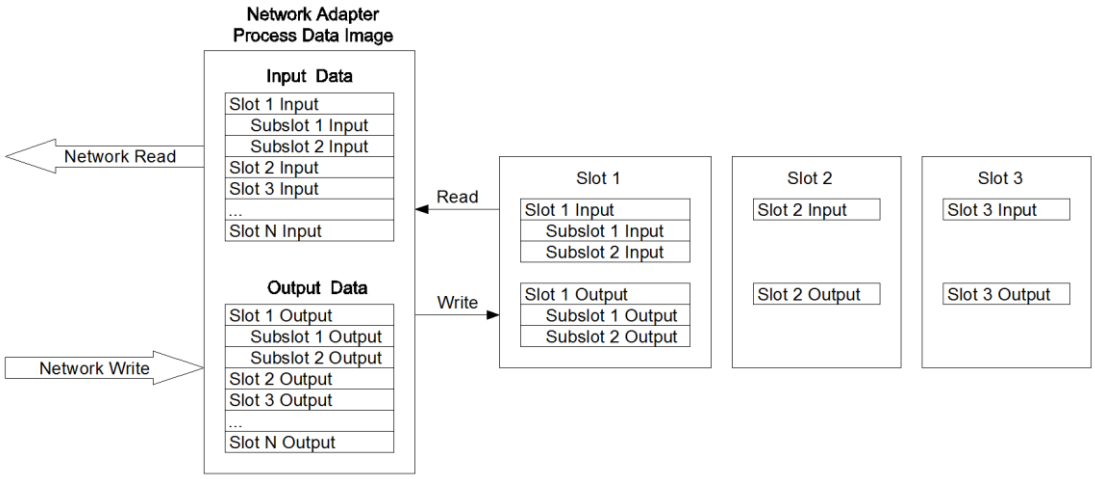
5 Process data definition

5.1 Adapter process data definition

Profibus-DP Adapter itself has no input-output process data.

5.2 IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



Real-time data exchange is conducted between the network adapter and the extended IO module, and the data address table could be dynamically allocated according to the different modules inserted in the IO slot.

The actual mapping address should be added IO module manually in STEP 7, TIA or other configured software, and the address would be automatically mapped, so the actual mapping address could be checked.

6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0						Fault Action for Output	Fault Action for Input	Source of Configuration Data
Byte 1	DP Address							

Data declaration:

Source of Config Data： Parameter configuration mode (Default: 1, Field BUS configuration)

0：Configured software configuration

1：Field BUS configuration

Fault Action for Input： Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode. (Default: 0, Hold Last Input Value)

0：Hold Last Input Value

1：Clear Input Value

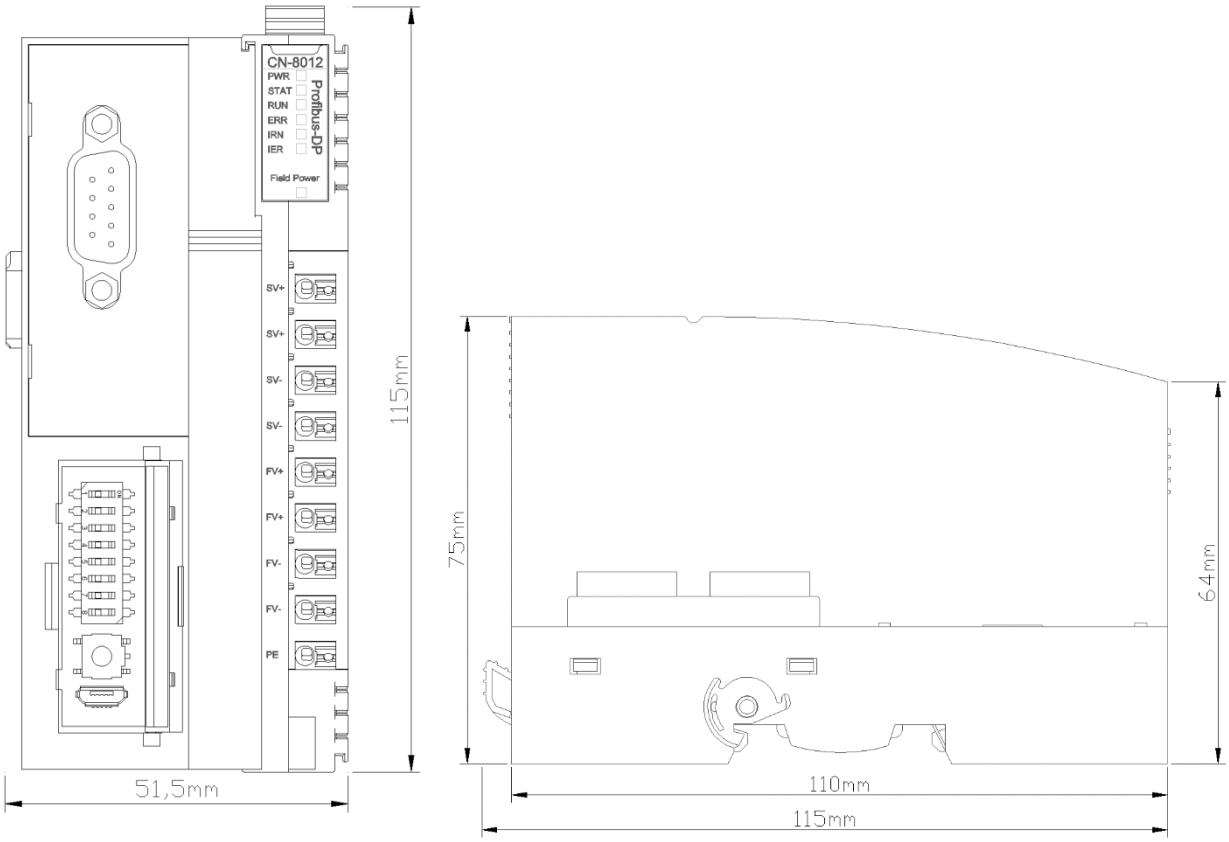
Fault Action for Output： Output fault handling mode, when the IO module is offline, the adapter will process the IO module output data according to this mode. (Default: 1, Clearing Output Value)

0：Hold Last Output Value

1：Clearing Output Value

DP Address： DP slave device no. (Read-only, displayed as the value of the dial code switch)

A Dimension drawing



CN-8013 CC-Link Network Adapter

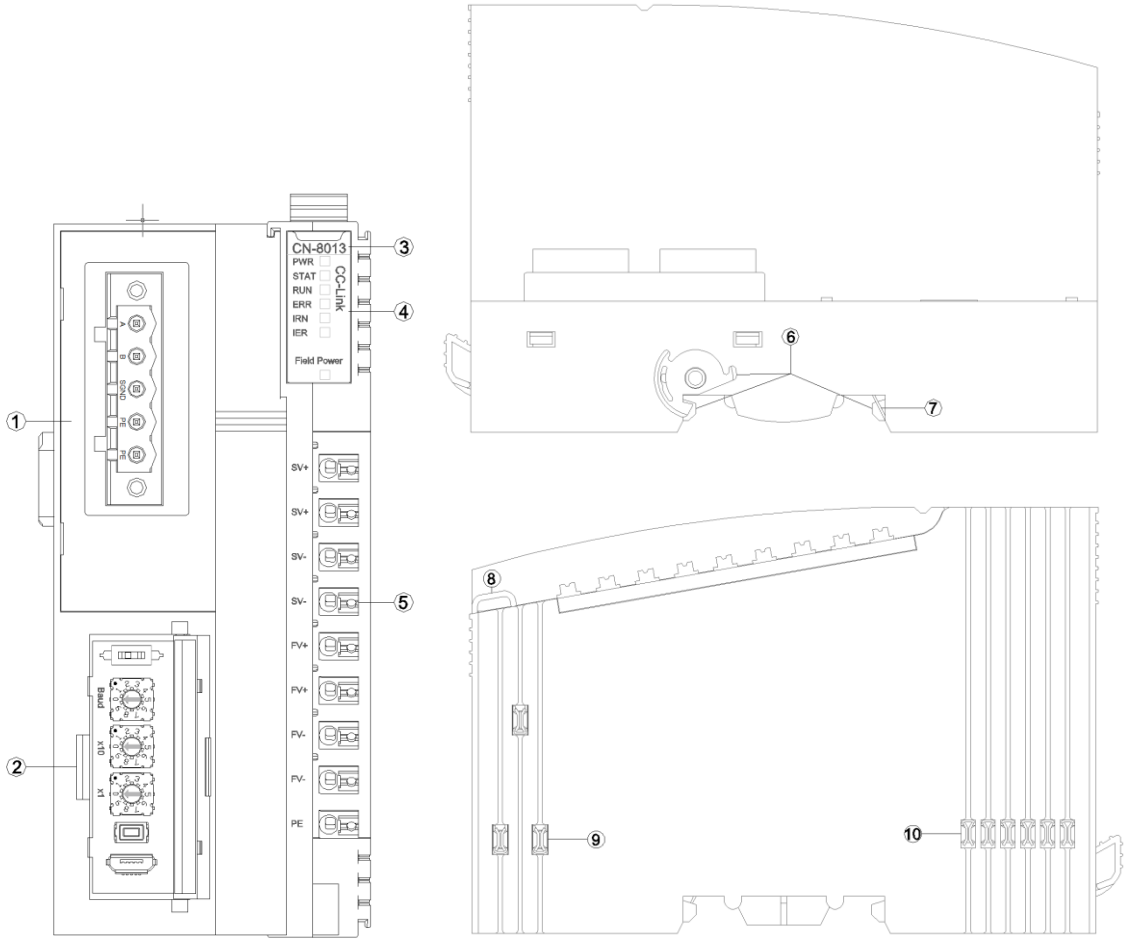
1 Module Overview

CN-8013 CC-Link network adapter supports standard CC-Link Ver.2 communication and it could monitor the communication status of IO modules in real time.

2 Technical Parameter

Adapter Hardware Parameter	
System Power	Nominal:24Vdc, Range: 9-36Vdc Reverse Protection: YES
Power Consumption	110mA@24Vdc
Internal Bus Supply Current	Max：2.5A@5Vdc
Isolation	System Power to Field Power Isolation
Power Supply	Nominal:24Vdc, Range:22-28Vdc
Field Power Current	Max. DC 8A
IO Modules Supported	32pcs
Wiring	Max.1.5mm²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operation Temperature	-40~85℃
Operation Humidity	5%-95% (No Condensation)
Protection Class	IP20
CC-Link Parameter	
Protocol	CC-Link Ver.2
Station Type	Remote device station
Number of Logical Stations Occupied	1, 2, 3, 4
Extended Loop Setup	1 time, 2 times, 4 times, 8 times
I/O Data Capacity	RX/RY capacity（bit）max. 896 RWr/RWw capacity（word）max. 128
Baud Rate	156K/625K/2.5M/5M/10Mbps
Node Station (Station No.)	1~64(DIP switch configuration)，when DIP switch value is not 1~64, and the mandatory station number is 1.
Interface	5 Pin screw terminal
Max. bus length	1200m（156kbps）
Terminal resistance	120ohm

3 Hardware Interface



① CC-Link port

② Config Interface

③ Module type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

⑧ Fixed Wiring Harness

⑨ Field Power

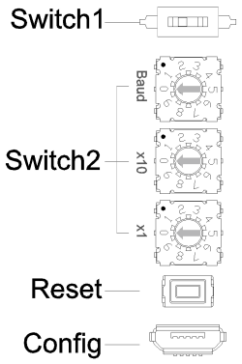
⑩ Internal Bus

3.1 CC-Link Interface

Modbus RS485 port is 5 Pin screw terminals and its Pin definition is as below:

Pin	Definition	Description
1	DA	Signal DA
2	DB	Signal DB
3	DG	Signal Grounded
4	SLD	Earthing of Shield
5	FG	Protect Earthing

3.2 Configuration Interface



Switch1: DIP switch is used to set the terminal resistance.

The Switch2: DIP switch is used to set the adapter module node address (station number) and baud rate.

The node address is set by two hardware DIP switches of decimal number, and each CC-Link adapter has a unique node address (1~64).

(Please note: when the DIP switch value is not 1~64, the node address ie the station number is compelled to be 1.)

The corresponding relation between baud rate and dial code is:

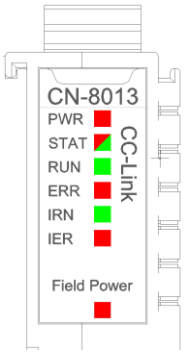
Code configuration	Communication Rate (bps)

0	156k
1	625k
2	2.5M
3	5M
4	10M

Reset: Module reset button, long pressing the button for more than 5 seconds and all parameters of the module will be restored to the default value. When the Reset button is activated, a green indicator will light up in the upper left corner of the button.

Config: configured ports, it is standard MicroUSB interface for configuring device parameters and firmware upgrades.

3.3 LED Indicator

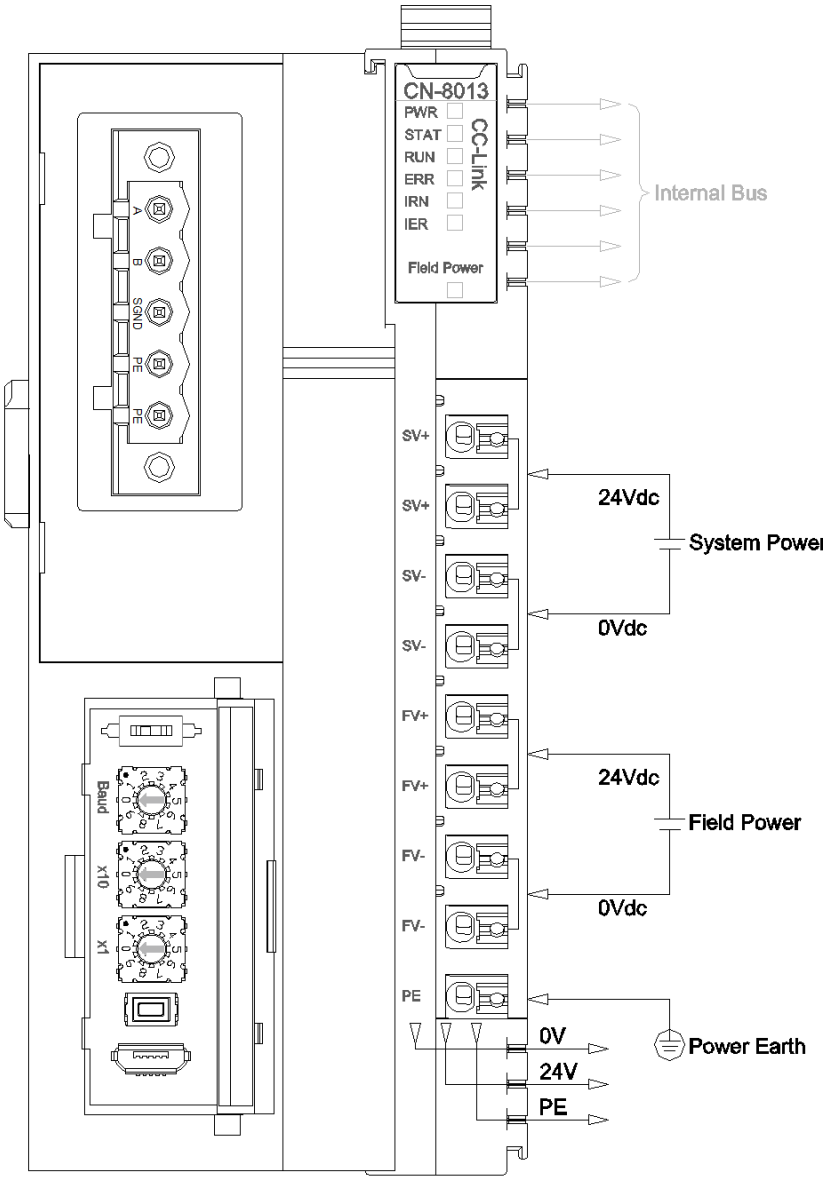


PWR Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Module State (RED/GREEN)	Definition
Double Flash (RED)	Module Soft Restarted by Hard-Fault
ON(GREEN)	Running
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Boot Mode
Flash(10Hz) (RED/GREEN)	Firmware Updating
RUN Network State (GREEN)	Definition
OFF	No data exchanging.
ON	CC-Link data exchanging

ERR Network Error (RED)	Definition
OFF	CC-Link data exchanging normal
ON	CC-Link data exchanging failure
Flash	When CC-Link communication normally functiones, the station number or baud rate will get changed
IRN IO Run (GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure
IER IO Error (RED)	Definition
OFF	IO communication normal
Double Flash	IO communication failure
Field Power State (RED)	Definition
ON	Field Power Normal
OFF	Field Power Failure

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.


CN-8013
PWR
STAT
RUN
ERR
IRN
IER
CC-Link
Field Power
Internal Bus
A
B
SGND
PE
PE
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
24Vdc
System Power
0Vdc
24Vdc
Field Power
0Vdc
0V
24V
PE
Power Earth
Baud
x10
x1

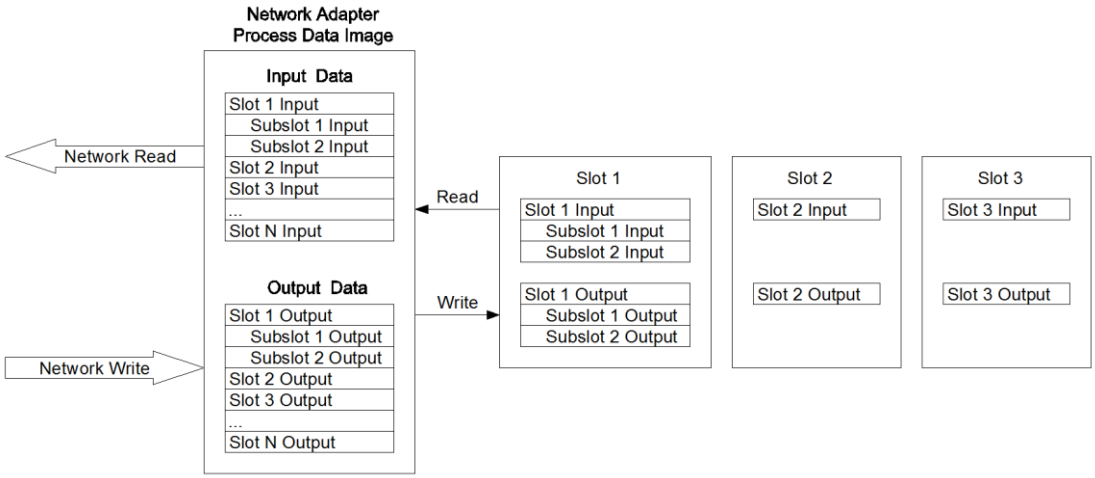
5 Process data definition

5.1 Adapter process data definition

CC-Link Adapter itself has no input-output process data.

5.2 IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0						Fault Action for Output	Fault Action for Input	Source of Configuration Data
Byte 1	Slave ID							
Byte 2	BaudRate							
Byte 3	Occupied Stations							
Byte 4	Extesion Cycles							
Byte 5	Auto Stations/Cycles							
Byte 6	RX/RY Size(Bits)							
Byte 7								
Byte 8	RWr/RWw Size(words)							
Byte 9								

Data declaration:

Source of Configuration Data： Parameter configuration mode (Default: 0)

0：Configuration Software

Fault Action for Input： Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode. (Default: 0, Hold Last Input Value)

0：Hold Last Input Value

1：Clear Input Value

Fault Action for Output： Output fault handling mode, when the IO module is offline, the adapter will process the IO module output data according to this mode. (Default: 1, Clearing Output Value)

0：Hold Last Output Value

1：Clearing Output Value

Slave ID：CC-Link slave ID number, hardware DIP switch setting, 1-64

Baud Rate：Serial port baud rate, (Default：0，156bps))

0：156Kbps

1：625Kbps

2：2.5Mbps

3：5Mbps

4：10Mbps

Occupied Stations：The number of logical stations occupied (Default：3，4 stations)

0：1 station

1：2 stations

2：3 stations

3：4 stations

Extesion Cycles：Extended loop setup (Default：3，8 Times)

0：1 Time

1：2 Times

2：4 Times

3：8 Times

Auto Stations/Cycles：Automatic counting station number and extension cycle, disable, cycle optional. (Default: 0, disabled)

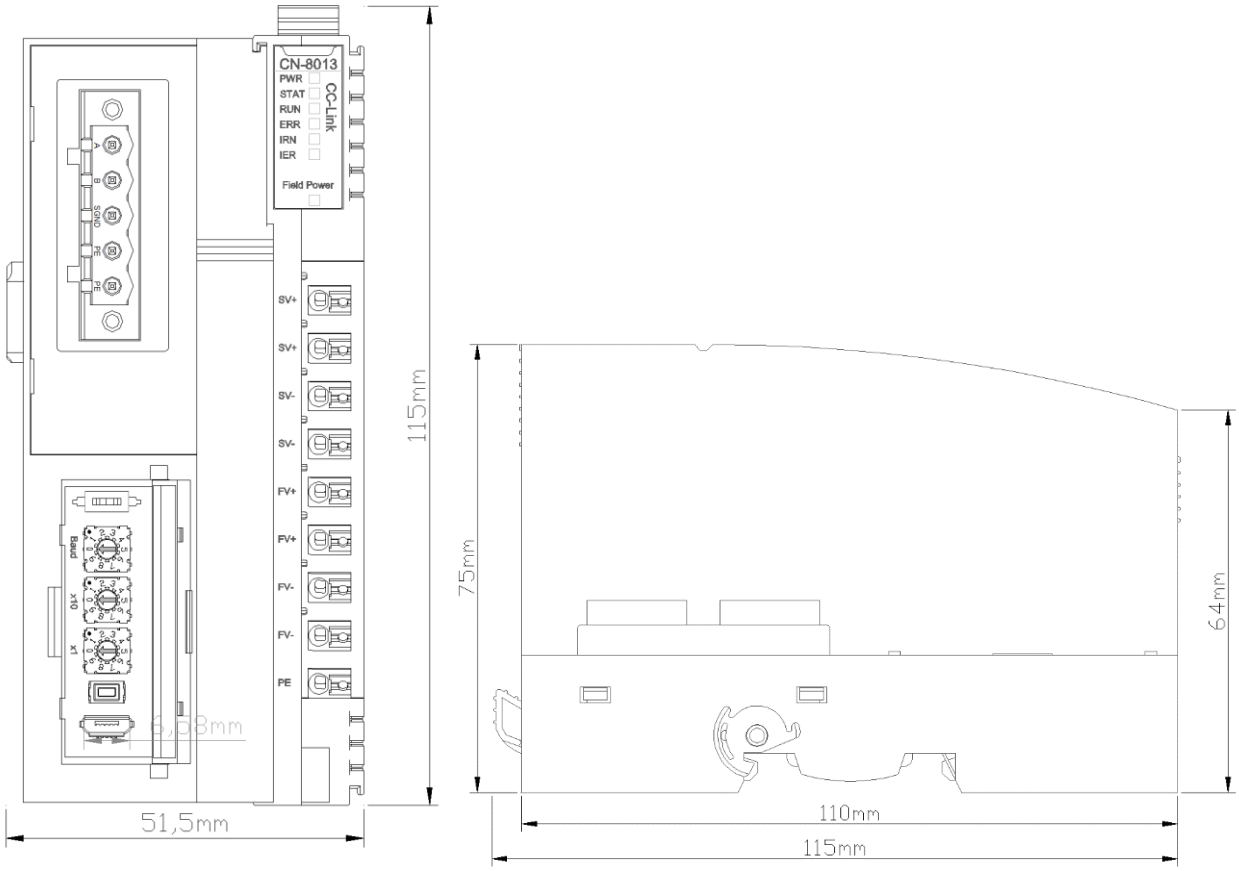
0：disabled

1：enabled

RX/RY Size(Bits)：RX/RY Capacity (Bits)

RWr/RWw Size(words)：RWr/RWw Capacity (Word)

A Dimension drawing



CN-8031 Modbus TCP Network Adapter

1 Module Overview

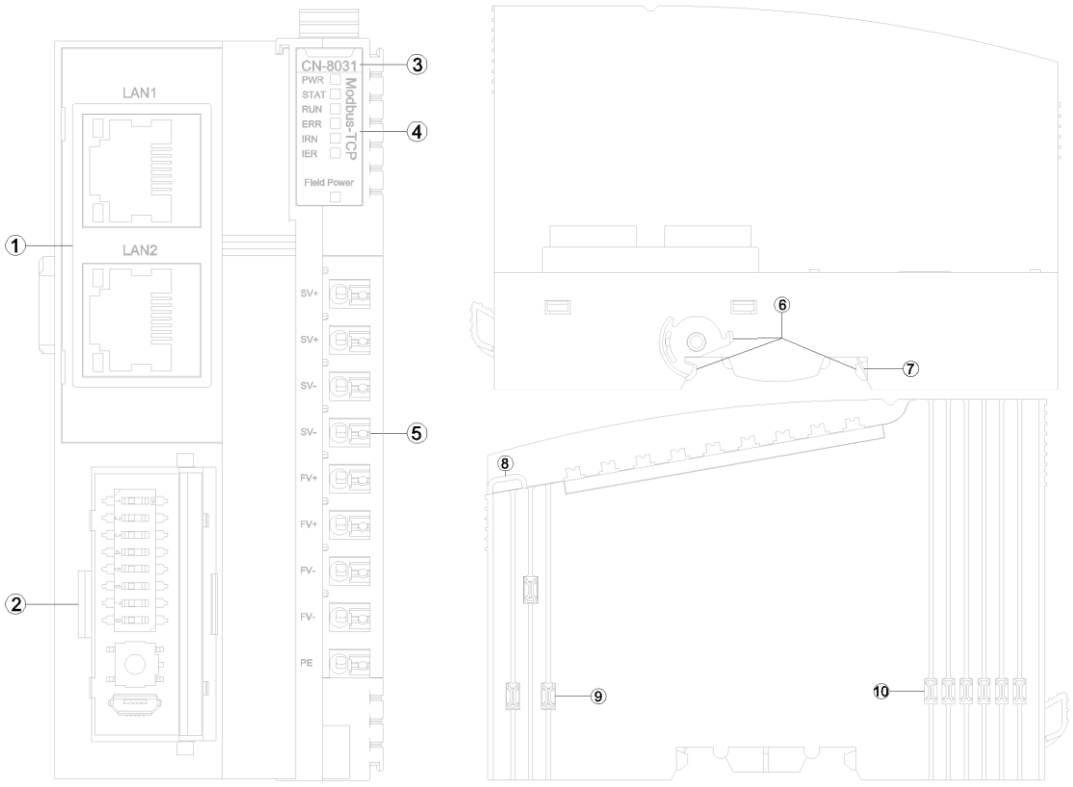
CN-8031 Modbus TCP Network Adapter supports the standard Modbus TCP Server Communication, and Ethernet supports the cascade function of dual-port switches. This adapter supports access to 5 Modbus TCP clients simultaneously, supports Modbus function code 01/02/03/04/05/06/15/16 /23, supports the Modbus application of watchdog, supports the process data maximum sum of input and output of 8192 bytes, and supports number of the extension IO module of 32. Module carries with the diagnostic function and it can monitor the communication state of IO module in real time.

2 Technical Parameters

Hardware Specification	
System Power	Nominal:24Vdc, Range: 9-36Vdc Reverse Protection: YES
Power Consumption	50mA@24Vdc
Current Output	Max.2.5A@5VDC
Isolation	System Power to Field Power Isolation
Field Power	Nominal:24Vdc, Range:22-28Vdc
Field Power Current	Max. 8A
IO Modules Supported	32 pcs
Wiring	Max.1.5mm²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operation Temperature	-40~85℃
Operation Humidity	5%-95% (No Condensation)
Protection Class	IP20
Communication Interface Specification	
Protocol	Modbus-TCP
Process Data Area	Sum of input and output:8192 Byte
Diagnostic Function	Supported
Modbus Data Storage Area	0xxxx area (Coil): 8192 Bit 1xxxx area (Discrete input): 8192 Bit 3xxxx area (Input register): 2048 Word

	4xxxx area (Holding register): 2048 Word 3xxxx area (System diagnostics - state input): 105 Word 4xxxx area (System diagnostics - control output): 1 Word
Number of TCP	5 Clients
TCP Keepalive	YES
Modbus Watchdog	YES (Default: Enable, 30 Seconds)
Function Code	01/02/03/04/05/06/15/16/23
Network Interface	2*RJ45
Speed	10/100Mbps, MDI/MIDX, Full-Duplex
Distance	100m
IP Address	DIP switch set or IO-Config software set

3 Hardware Interface



① Network Interface

② Config Interface

③ Module Type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

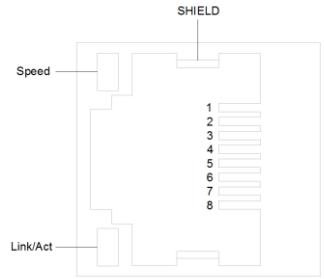
⑧ Fixed Wiring Harness

⑨ Field Power

⑩ Internal Bus

Network Interface

LAN1/LAN2 support switch function, 10Mbps and 100Mbps data rates, MDI/MID-X auto crossover.



Speed: Network Speed (Green)

ON:100Mbps

OFF:10Mbps

Link/Act: Link State、Active State(Orange)

ON: Link UP

OFF: Link DOWN

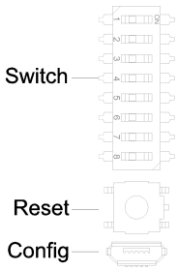
Flash: Active

SHIELD: RJ45 Shield Interface

RJ45 Pin definition

Pin	Definition	Description
1	TD+	Transmitter Signal Positive
2	TD-	Transmitter Signal Negative
3	RD+	Receiver Signal Positive
4	--	--
5	--	--
6	RD-	Receiver Signal Negative
7	--	--
8	--	--

Configuration Interface



Switch: the DIP switch is used for setting the IP address (the default IP address is 192.168.1.100).

When the dial value is 0, all 4 bytes of the IP address are configured by the software or use the default IP address (192.168.1.100).

When the dial code value is not 0, the last byte of the IP address is determined by the dial code value, and the first three bytes could be configured by the software or use the default address(192.168.1).

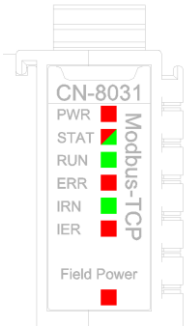
The relationship between IP address and dial code value is shown in the following table:

Switch Bit Number (ON: 1, OFF: 0)								Switch Value	IP Address
1	2	3	4	5	6	7	8		
0	0	0	0	0	0	0	0	0	Configured by software
1	0	0	0	0	0	0	0	1	x.x.x.1
0	1	0	0	0	0	0	0	2	x.x.x.2
1	1	0	0	0	0	0	0	3	x.x.x.3
.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.
0	1	1	1	1	1	1	1	254	x.x.x.254
1	1	1	1	1	1	1	1	255	x.x.x.255
Notice: The default IP address after device reset is 192.168.1.100									

Reset: Module reset button, long pressing the button for more than 5 seconds and all parameters of the module will be restored to the default value. When the Reset button is activated, a green indicator will light up in the upper left corner of the button.

Config: Configure port, a standard Micro USB interface for configuring device parameters and firmware upgrades.

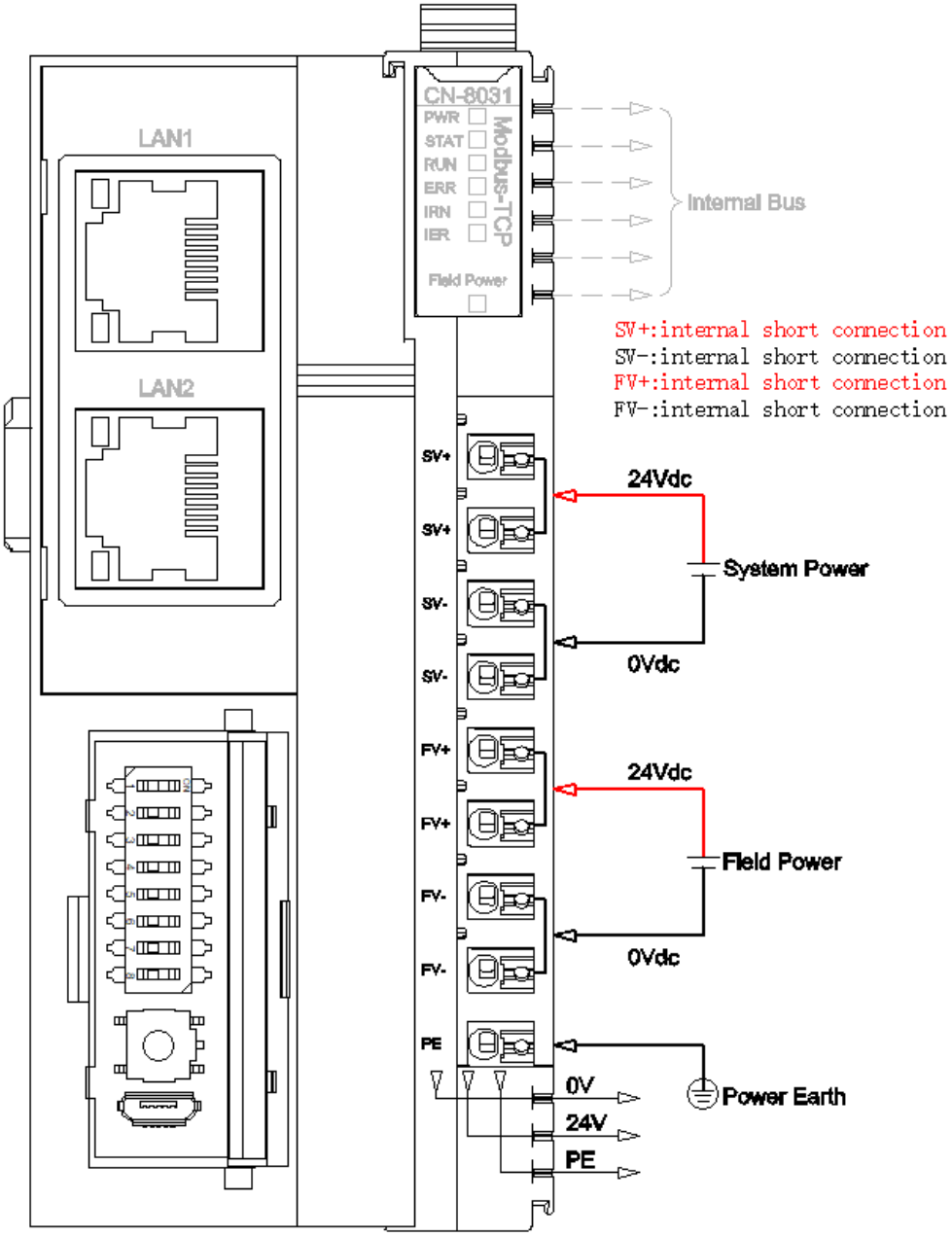
LED indicator



PWR Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Module State (RED/GREEN)	Definition
Double Flash (RED)	Module Soft Restarted by Hard-Fault
ON(GREEN)	Running
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Boot Mode
Flash(10Hz) (RED/GREEN)	Firmware Updating
RUN Network State (GREEN)	Definition
ON	Modbus connected
OFF	Modbus disconnected
Flash	Modbus read-write
Quadruple Flash	Led test
Flash(10Hz)	MAC address error
ERR Network Error (RED)	Definition
Flash(2.5Hz)	LAN1 and LAN2 Link-Down
OFF	LAN1 or LAN2 Link-Up
Flash(10Hz)	MAC Address Error
IRN IO Run (GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure
IER IO Error (RED)	Definition
OFF	IO communication normal
Double Flash	IO communication failure
Field Power State (RED)	Definition
ON	Field Power Normal
OFF	Field Power Failure

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.



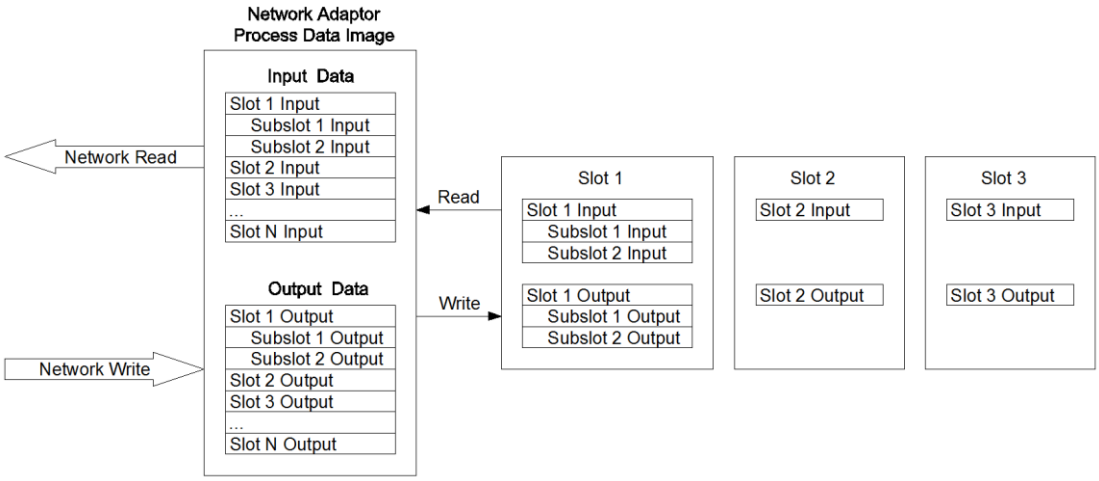
5 Process data definition

Adapter process data definition

Modbus-TCP adapter itself has no input-output process data.

IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



Modbus address mapping table varies according to module combination, and detailed address mapping table could be viewed through IO Config – the configuration software.

6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved			Sniffer Port	Port Mirroring	Reserved	Fault Action for Input	Source of Config Data
Byte 1	MAC Address [0]							
Byte 2	MAC Address [1]							
Byte 3	MAC Address [2]							
Byte 4	MAC Address [3]							
Byte 5	MAC Address [4]							
Byte 6	MAC Address [5]							
Byte 7	IP Address [0]							
Byte 8	IP Address [1]							
Byte 9	IP Address [2]							
Byte 10	IP Address [3]							
Byte 11	Net Mask [0]							
Byte 12	Net Mask [1]							
Byte 13	Net Mask [2]							
Byte 14	Net Mask [3]							
Byte 15	Net Gateway [0]							
Byte 16	Net Gateway [1]							
Byte 17	Net Gateway [2]							
Byte 18	Net Gateway [3]							
Byte 19	Modbus Port							
Byte 20								
Byte 21	Reserved							Watchdog
Byte 22	Watchdog Time(s)							
Byte 23								

Data declaration:

Source of Config Data：Parameter configuration mode (Default: 0)

0：Configuration Software

Fault Action for Input：Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode.

0：Hold Last Input Value

1：Clear Input Value

Port Mirroring：The port mirroring function could mirror the message of adapter

network data to LAN1 or LAN2 for output. (Default: 0)

0：Disable

1：Enable

Sniffer Port： Mirror port, which is used to monitor adapter network message data when port mirror function is enabled. (Default: 0)

0：LAN1

1：LAN2

MAC Address: MAC address, read-only property.

IP Address: Adapter IP address, when the value of the dial-code switch is not 0, the last byte of the IP address is replaced by the dial-code value.

Net Mask: Subnet mask.

Net Gateway: Gateway address.

Modbus Port: Modbus-TCP server port number. (Default: 502)

Watchdog: Modbus watchdog. (Default: 1)

0：Disable

1：Enable

Watchdog Time(s): Modbus application watchdog period, when the watchdog is enabled, if there is no Modbus data exchange on the TCP connection in this period, the TCP connection will be disconnected (other TCP connections with data exchange will be remained normally). (Default: 30)

7. System diagnostic area

The data storage area is divided into five areas as below:

The first area is "coil" (DO) storage area, with a total of 8192 bytes;

The second area is the "discrete quantity input " (DI) storage area, with a total of 8192 bytes;

The third area is the "input register" (AI) storage area, with a total of 2048 words;

The fourth area is the "holding register" (AO) storage area, with a total of 2048 words;

The fifth area is the "system diagnosis" storage area, which stores the working state of IO

module, with a total of 105/1 words. And it could access to the "system diagnosis area" to view the module information, and it can be used to set the module disconnection alarm and other functions. The data storage area allocation and address coding ranges are shown in table 3.1.

Table 3.1.Data Storage Area Address Table

No.	Storage Area	Description	Store Capacity	Address range
1	0 Area	Coil	8192 Bit	0x0000~0x1FFF
2	1 Area	Discrete quantity input	8192 Bit	0x0000~0x1FFF
3	3 Area	Input register	2048 Word	0x0000~0x07FF
4	4 Area	Holding register	2048 Word	0x0000~0x07FF
5	3 Area 4 Area	System diagnosis	105 Word 1 word	0x2000~0x2068 0x2000

The system diagnosis area is divided into two areas, the first area: Address 0x2000-0x2068 with a total of 105 words, which is the "Module state input" area. The Modbus client could monitor this address area 38193 ~ 38297 via calling Modbus 04 function code and it could acquire the module current working state and error code, and the data format is shown in below table:

No.	Modbus Address (Decimalism)	Address (Hexadecimal)	Data Name	Description
1	8192	0x2000	Reset Mode	Reset State*
2	8193	0x2001	Reserve	
3	8194	0x2002	DIP switch value	
4	8195	0x2003	Running time - Second	
5	8196	0x2004	Running time - Minute	
6	8197	0x2005	Running time - Hour	
7	8198	0x2006	Running time - Day	
8	8199	0x2007	MAC	Current Device MAC
9	8200	0x2008		
10	8201	0x2009		
11	8202	0x200A	IP	Current Device IP
12	8203	0x200B		

13	8204	0x200C	MASK	Current Device MASK
14	8205	0x200D		
15	8206	0x200E	GATEWAY	Current Device GATEWAY
16	8207	0x200F		
17	8208	0x2010	DI-size	Discrete quantity input area data size
18	8209	0x2011	DO-size	Coil output area data size
19	8210	0x2012	AI-size	Input register area data size
20	8211	0x2013	AO-size	Holding register area data size
21	8212	0x2014	Config-Client-IP	Configured client IP
22	8213	0x2015		
23	8214	0x2016	Config-Client-Port	Configured client port
24	8215	0x2017	Modbus-Client-Number	Connected Modbus client number
25	8216	0x2018	Modbus-Client-1-IP	Client 1-IP
26	8217	0x2019		
27	8218	0x201A	Modbus-Client-1-Port	Client 1-Port
28	8219	0x201B	Modbus-Client-2-IP	Client 2-IP
29	8220	0x201C		
30	8221	0x201D	Modbus-Client-2-Port	Client 2-Port
31	8222	0x201E	Modbus-Client-3-IP	Client 3-IP
32	8223	0x201F		
33	8224	0x2020	Modbus-Client-3-Port	Client 3-Port
34	8225	0x2021	Modbus-Client-4-IP	Client 4-IP
35	8226	0x2022		
36	8227	0x2023	Modbus-Client-4-Port	Client 4-Port
37	8228	0x2024	Modbus-Client-5-IP	Client 5-IP
38	8229	0x2025		
39	8230	0x2026	Modbus-Client-5-Port	Client 5-Port
40	8231	0x2027	Module_Error[0]	Module 0 error code
41	8232	0x2028		
42	8233	0x2029	Module_Error[1]	Module 1 error code
43	8234	0x202A		
44	8235	0x202B	Module_Error[2]	Module 2 error code
45	8236	0x202C		
46	8237	0x202D	Module_Error[3]	Module 3 error code
47	8238	0x202E		
48	8239	0x202F	Module_Error[4]	Module 4 error code
49	8240	0x2030		

50	8241	0x2031	Module_Error[5]	Module 5 error code
51	8242	0x2032		
52	8243	0x2033	Module_Error[6]	Module 6 error code
53	8244	0x2034		
54	8245	0x2035	Module_Error[7]	Module 7 error code
55	8246	0x2036		
56	8247	0x2037	Module_Error[8]	Module 8 error code
57	8248	0x2038		
58	8249	0x2039	Module_Error[9]	Module 9 error code
59	8250	0x203A		
60	8251	0x203B	Module_Error[10]	Module 10 error code
61	8252	0x203C		
62	8253	0x203D	Module_Error[11]	Module 11 error code
63	8254	0x203E		
64	8255	0x203F	Module_Error[12]	Module 12 error code
65	8256	0x2040		
66	8257	0x2041	Module_Error[13]	Module 13 error code
67	8258	0x2042		
68	8259	0x2043	Module_Error[14]	Module 14 error code
69	8260	0x2044		
70	8261	0x2045	Module_Error[15]	Module 15 error code
71	8262	0x2046		
72	8263	0x2047	Module_Error[16]	Module 16 error code
73	8264	0x2048		
74	8265	0x2049	Module_Error[17]	Module 17 error code
75	8266	0x204A		
76	8267	0x204B	Module_Error[18]	Module 18 error code
77	8268	0x204C		
78	8269	0x204D	Module_Error[19]	Module 19 error code
79	8270	0x204E		
80	8271	0x204F	Module_Error[20]	Module 20 error code
81	8272	0x2050		
82	8273	0x2051	Module_Error[21]	Module 21 error code
83	8274	0x2052		
84	8275	0x2053	Module_Error[22]	Module 22 error code
85	8276	0x2054		
86	8277	0x2055	Module_Error[23]	Module 23 error code
87	8278	0x2056		
88	8279	0x2057	Module_Error[24]	Module 24 error code
89	8280	0x2058		

90	8281	0x2059	Module_Error[25]	Module 25 error code
91	8282	0x205A		
92	8283	0x205B	Module_Error[26]	Module 26 error code
93	8284	0x205C		
94	8285	0x205D	Module_Error[27]	Module 27 error code
95	8286	0x205E		
96	8287	0x205F	Module_Error[28]	Module 28 error code
97	8288	0x2060		
98	8289	0x2061	Module_Error[29]	Module 29 error code
99	8290	0x2062		
100	8291	0x2063	Module_Error[30]	Module 30 error code
101	8292	0x2064		
102	8293	0x2065	Module_Error[31]	Module 31 error code
103	8294	0x2066		
104	8295	0x2067	Module_Error[32]	Module 32 error code
105	8296	0x2068		

*Reset state Register 38193 address data format is as below:

Addres offset	Aaddress name	Description	Power on default value
bit0	Power_On_Reset	Power on reset	0/1
bit1-3	Reserved	Reserved	0
bit4	External_Reset	External Reset	0/1
bit5	Reserved	Reserved	0
bit6	Soft_Reset_Request	Soft Reset	0
bit7	Reserved	Reserved	0
bit8	HardFault	Hard Fault Reset	0
bit9	StackOver	Stack Over Reset	0
bit10	MemoryOver	Memory Over Reset	0
bit11-15	Reserved	Reserved	0

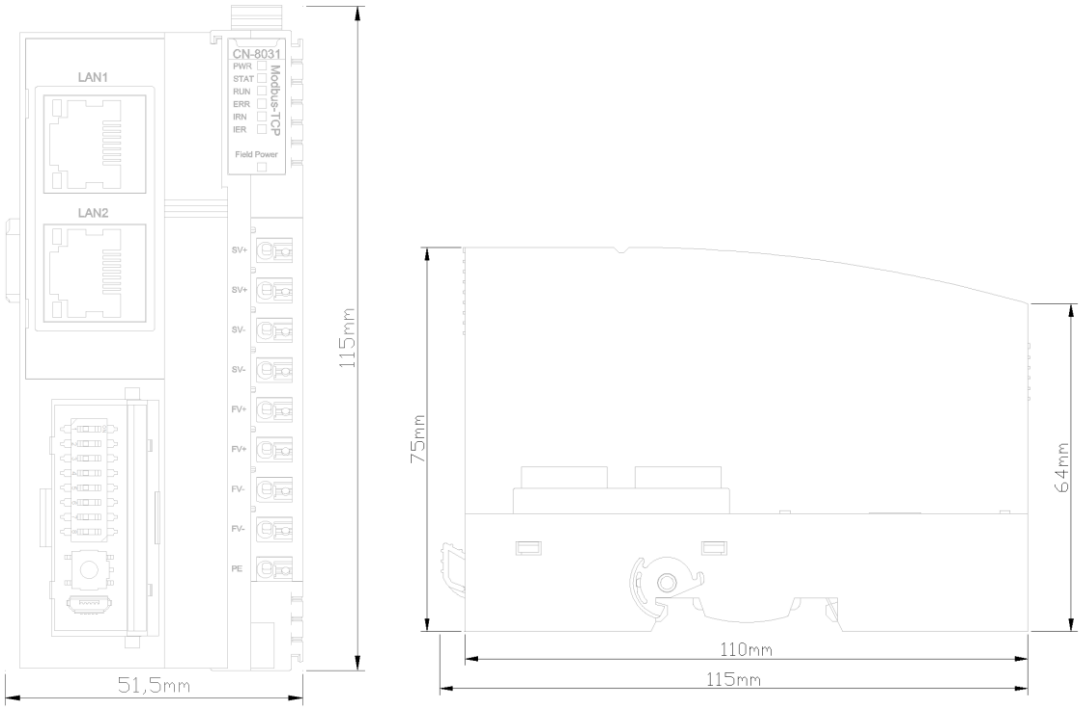
Second area：Address 0x2000 tota1one word，this is the "Module control output" area （48193），Modbus client could control this address 48193 via asking Modbus 03 function code, and it could realize module reset or port mirroring function. The data format definition is as below:

No.	Modbus Address (Decimalism)	Address (Hexadecimal)	Data Name	Description
1	8192	0x2000	Reset State	

Register 408193 address data format is as below:

Addres offset	Address Name	Description	Value range	Default value
bit0	Restart	0->1 Rising edge triggering system reset	0-1	0
bit1	port_mirror	Port mirroring function enable 0: disabled 1: enable	0-1	0: disabled
bit2	sniffer_port	Mirror port selection 0:LAN1 1:LAN2	0-1	0:LAN1
bit3-15	reseived	Reserved	0	0

A Dimension drawing



CN-8032 Profinet Network Adapter

1 The module overview

The CN-8032 Profinet network adapter supports standard Profinet IO Device Communication. The adapter supports MRP media redundancy, and it could realize ring network redundancy. And it supports RT/IRT real-time and synchronous communication mode, with its RT real-time communication minimum period of 1ms and IRT synchronous communication minimum period of 250us.The adapter supports a maximum input of 1440 bytes, a maximum output of 1440 bytes, and the number of the extended IO modules it supports is 32.

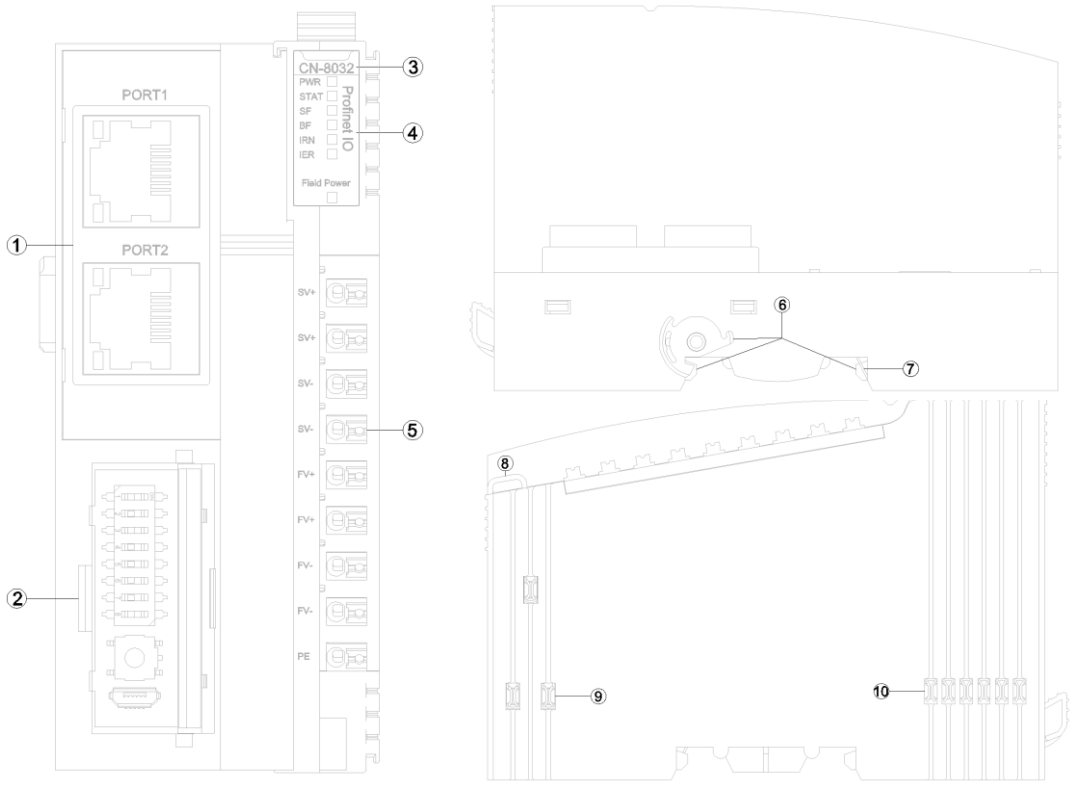
2 Technical Parameters

Hardware Specification	
System Power	Nominal: 24Vdc, Range: 9-36Vdc Reverse Protection: YES
Power Consumption	110mA@24Vdc
Current Output	Max:2A@5Vdc
Isolation	System Power to Field Power Isolation
Field Power	Nominal: 24Vdc, Range: 22-28Vdc Reverse Protection: YES
Field Power Current	Max. DC 8A
IO Modules Supported	32 pcs
Wiring	Max.1.5mm ²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%-95% (No Condensation)
Protection Level	IP20
Profinet Parameter	
Protocol	Profinet IO Device
I/O Data Size	Input Max.1440 Bytes, Output Max.1440 Bytes
RT	YES，Min.1ms
IRT	YES，Min.250us
MRP	YES
MRPD	NO

Network Interface	2*RJ45
Speed	10/100Mbps, MDI/MIDX, Full-Duplex
Distance	100m
Profinet Device Name	DIP switch setting or Profinet monitor modifying

Notice: The adapter does not support the MRPD (Media Redundancy for Planned Duplication) function, so the MRP and IRT functions cannot be used simultaneously.

3 Hardware Interface



① Network Interface

② Config Interface

③ Module Type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

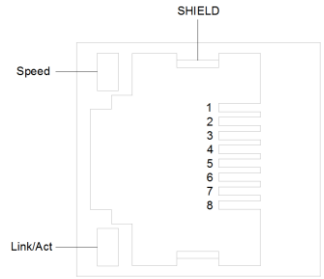
⑧ Fixed Wiring Harness

⑨ Field Power

⑩ Internal Bus

3.1 Network Interface

PORT1 and PORT2 are both Profinet communication port, and support switch function with 10Mbps and 100Mbps data rates, MDI/MID-X auto crossover.



Speed: Network Speed LED (Green)

ON: 100Mbps

OFF: 10Mbps

Link/Act: Link State、Active State(Orange)

ON: Link UP

OFF: Link DOWN

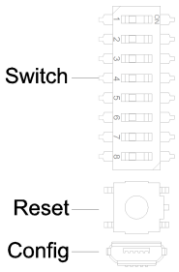
Flash: Active

SHIELD: RJ45 Shield Interface

RJ45 Pin definition

Pin	Definition	Description
1	TD+	Transmitter Signal Positive
2	TD-	Transmitter Signal Negative
3	RD+	Receiver Signal Positive
4	--	--
5	--	--
6	RD-	Receiver Signal Negative
7	--	--
8	--	--

3.2 Configuration Interface



Switch: The DIP switch is used to set the name of Profinet device.

When the DIP switch value is 0, the device default name is cn8032-addr, and it could use Profinet monitor to set the device name online.

When the dial-code switch value is not 0, the device name is determined by the value of the DIP switch. The relationship between the device name and the dial value is shown in the following table:

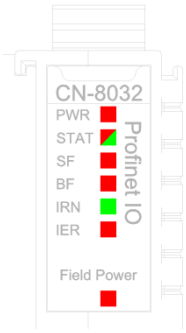
Switch Bit Number(ON:1,OFF:0)								Switch Value	Profinet Deice Name
1	2	3	4	5	6	7	8		
0	0	0	0	0	0	0	0	0	Configured By Software (Default:cn8032-addr)
1	0	0	0	0	0	0	0	1	cn8032-1
0	1	0	0	0	0	0	0	2	cn8032-2
.	.	.	.	.	.	.	.	.	.
0	1	0	1	0	0	0	0	10	cn8032-10
.	.	.	.	.	.	.	.	.	.
0	1	1	1	1	1	1	1	254	cn8032-254
1	1	1	1	1	1	1	1	255	cn8032-255
Description: Factory default dial code value is 0, the device name is cn8032-addr.									

Reset: Module reset button. All parameters of the module will be restored to the default value after pressing the button for more than 5 seconds. When the Reset button is pressed, a green LED will light up in the upper left corner of the button.

Config: Configure port, a standard Micro USB interface for configuring device parameters and firmware upgrades.

Description: device parameters can be set in Profinet IO controller configuration software.

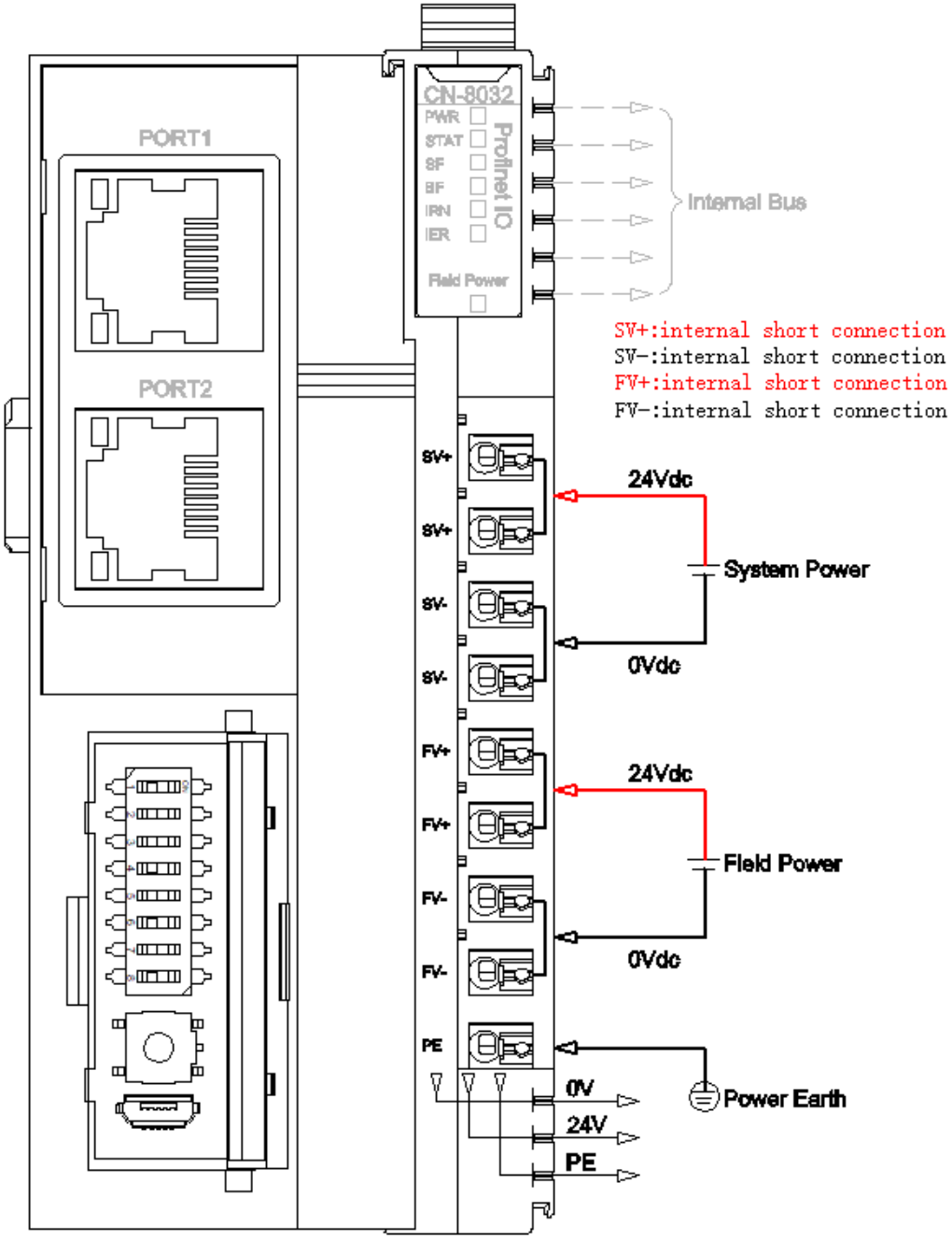
3.3 LED Indicators



PWR Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Module State (RED/GREEN)	Definition
Double Flash (RED)	Module Soft Restart by Hard-Fault
ON(GREEN)	Operating
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Boot Mode
Flash(10Hz) (RED/GREEN)	Firmware Update
SF System Failure (RED)	Definition
OFF	Normal
ON	System Failure, Topology Error
Flash	Led light test
Flash(10Hz)	MAC address error
BF Bus Failure (RED)	Definition
ON	Port1 and Port2 Link-Down
Flash(2.5Hz)	Offline mode
OFF	Online mode
Flash(10Hz)	MAC address error
IRN IO RUN(GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure
IER IO Error (RED)	Definition
OFF	IO communication normal
Double Flash	IO communication failure
Field Power State (RED)	Definition
ON	Field Power Normal
OFF	Field Power Failure

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.



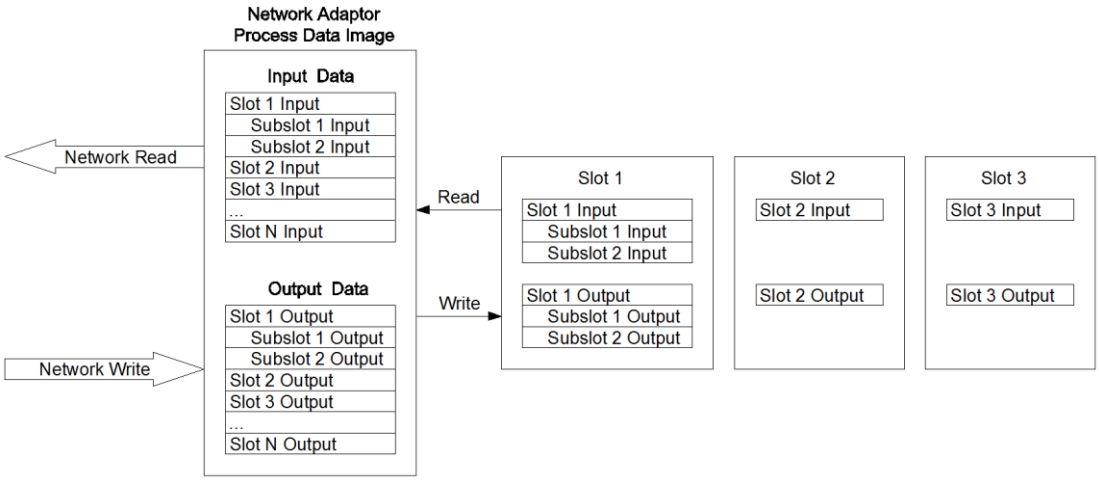
5 Process data definition

Adapter process data definition

Profinet adapter itself has no input-output process data.

IO module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



The maximum number of input bytes of the Profinet network adapter is 1440 bytes, and the maximum number of output bytes is 1440 bytes.

6 Configuration parameters definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved					Fault Action for Output	Fault Action for Input	Source of Config Data
Byte 1	MAC Address [0]							
Byte 2	MAC Address [1]							
Byte 3	MAC Address [2]							
Byte 4	MAC Address [3]							
Byte 5	MAC Address [4]							
Byte 6	MAC Address [5]							
Byte 7	IP Address [0]							
Byte 8	IP Address [1]							
Byte 9	IP Address [2]							
Byte 10	IP Address [3]							
Byte 11	Net Mask [0]							
Byte 12	Net Mask [1]							
Byte 13	Net Mask [2]							
Byte 14	Net Mask [3]							
Byte 15	Net Gateway [0]							
Byte 16	Net Gateway [1]							
Byte 17	Net Gateway [2]							
Byte 18	Net Gateway [3]							
Byte 19 ... Byte 82	Profinet Device Name							

Data description:

Source of Config Data：Parameter configuration mode (Default: 1)

0：Configure software

1：Field Bus

Fault Action for Input：Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode. (Default: 0)

0：Hold Last Input Value

1：Clearing Input Value

Fault Action for Output：Output fault handling mode，when the fieldbus is

offline the adapter will process the IO module output data according to this mode. (Default: 1)

0：Hold Last Output Value

1：Clearing Output Value

MAC Address： MAC address, read-only attribute.

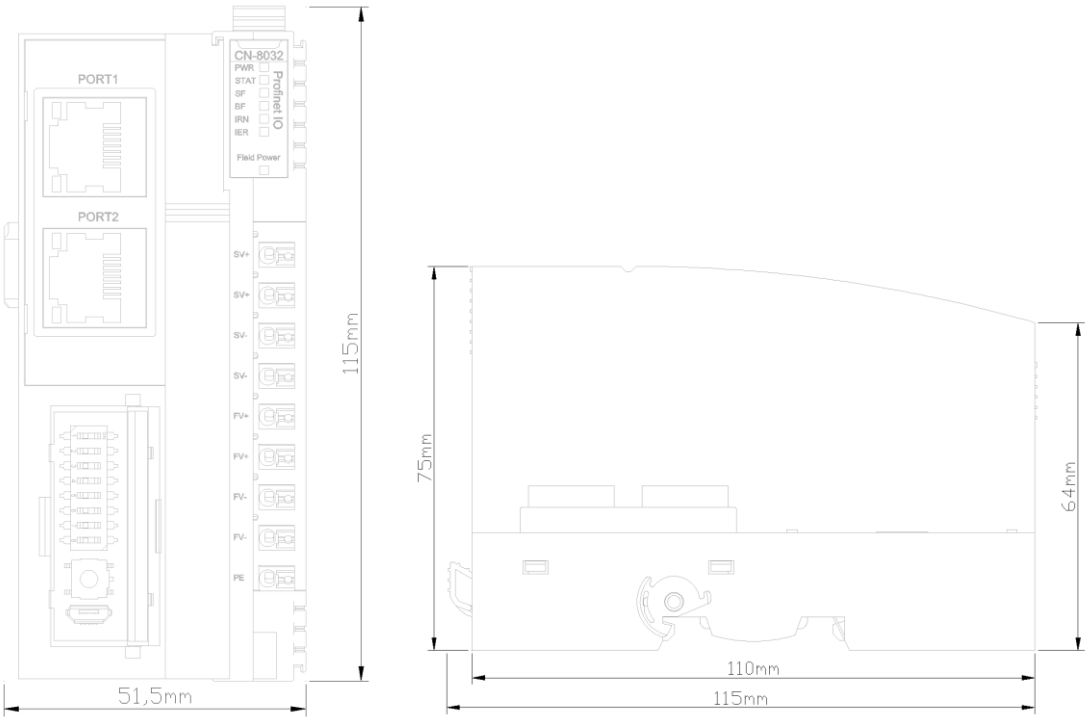
IP Address： IP address, read-only attribute.

Net Mask： Subnet mask, read-only attribute.

Net Gateway: Gateway address, read-only attribute.

Profinet Device Name: Profinet device name, read-only attribute. (Device name is determined by the DIP switch)

A Dimension drawing



CN-8033 EtherCAT Network Adapter

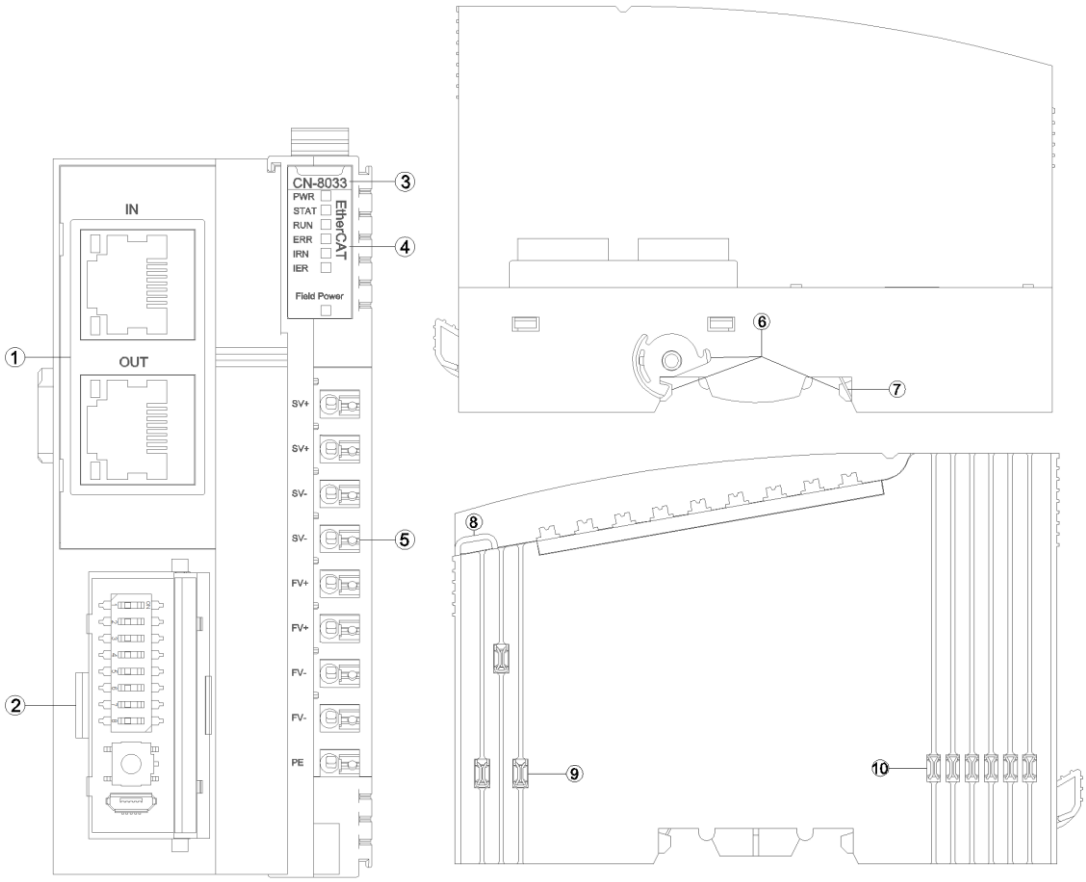
1 The module overview

The CN-8033 EtherCAT I/O module supports standard EtherCAT protocol access. The adapter supports a Max. input of 1024 bytes and a Max. output of 1024 bytes. It supports 32 pcs of extended IO modules.

2 Technical Parameters

Hardware Specification	
System Power	Nominal: 24Vdc, Range: 9-36Vdc Protection: Overcurrent Protection, Reverse Protection: YES
Power Consumption	110mA@24Vdc
Internal BUS Supply Current	Max：2A@5VDC
Isolation	System Power to Field Power Isolation
Field Power Supply	Power Supply：22~28V（Nominal 24VDC）
Field Power Supply Current	Max. DC 8A
I/O Modules supported	32 pcs
Wiring	Max.1.5mm²(AWG 16)
Mounting Type	35mm Size DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Level	IP20
EtherCAT Parameter	
Protocol	EtherCAT
Process data area	Input Max.1024 Bytes, Output Max.1024 Bytes
Network Interface	2 *RJ45
Speed	10/100Mbps, MDI/MIDX, Full-Duplex
Max.Bus Legenth	100m

3 Hardware Interface



① Network Interface

② Config Interface

③ Module Type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

⑧ Fixed Wiring Harness

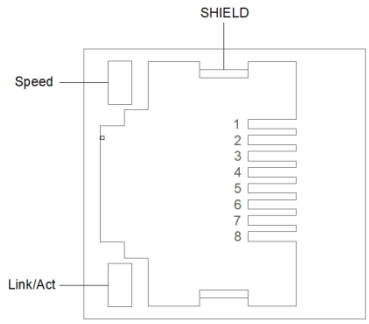
⑨ Field Power

⑩ Internal Bus

3.1 Network Interface

IN is the input interface of EtherCAT, OUT is the output interface of EtherCAT,

and it support switch function with 10Mbps and 100Mbps data rates, MDI/MID-X auto crossover.



Speed: Network Speed LED Indicator (Green)

ON:100M

OFF:10M

Link/Act: Link State, Active State (Orange)

ON: Link UP

OFF:Link DOWN

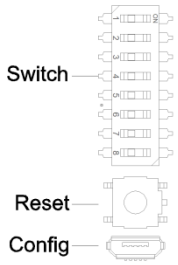
Flash:Active

SHIELD: RJ45 Shield Interface

RJ45 Pin definition

Pin	Definition	Description
1	TD+	Transmitter Signal Positive
2	TD-	Transmitter Signal Negative
3	RD+	Receiver Signal Positive
4	--	--
5	--	--
6	RD-	Receiver Signal Positive
7	--	--
8	--	--

3.2 Configuration Interface



Switch: station alias configuration

When the dial - code switch value is not 0, the dial - code value is station alias, after dialing the code, the site alias will not take effect until the power is turned off and restarted.When the dial - code switch value is 0, using the site alias set by the PLC Master or the site alias in EEPROM memory.

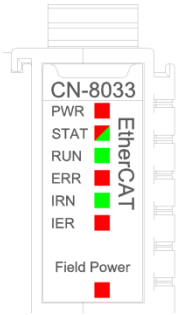
The relationship between the site alias and the dial - code switch value is shown in the following table:

Dial - code switch pin number (ON:1, OFF:0)								Dial - code switch value	Site Alias
								0	0
								1	1
								2	2
								.	.
								10	10
								.	.
								254	254
								255	255

Reset: Module reset button. All parameters of the module will be restored to the default value after pressing the button for more than 5 seconds. When the Reset button is pressed, a green LED will light up in the upper left corner of the button.

Config: Configure port, a standard Micro USB interface for configuring device parameters and firmware upgrades.

3.3 LED Indicator

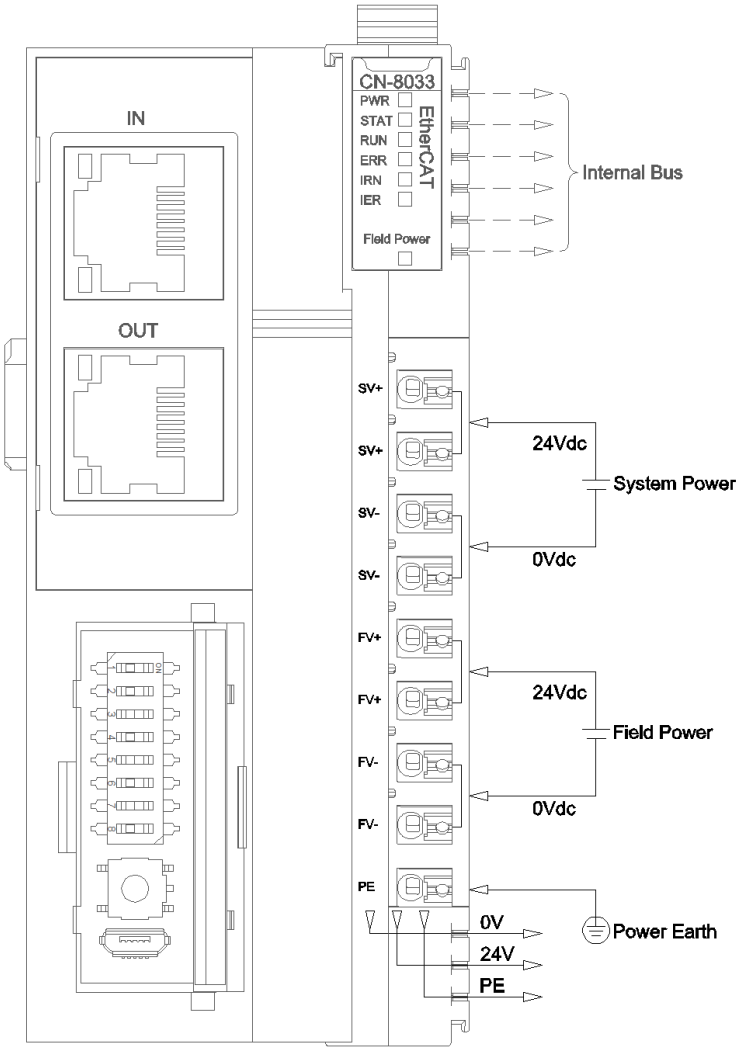


PWR - Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT - Module State LED (RED/GREEN)	Definition
Double Flash (RED)	Module abnormal, has been softly restarted
ON(GREEN)	Operating
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Upgrading Mode
Flash(10Hz) (RED/GREEN)	Firmware Updating
RUN - Bus running Indicator	Definition
ON	Operating
OFF	Initialization state
Flash(10Hz)	During boot or in the state of BootStrap
Flash(2.5Hz)	Pre-Operational State
Single Flash	Safe Operating State
ERR - Bus Error LED	Definition
OFF	No failure
ON	Application control failure
Flash(10Hz)	Startup Errors
Flash(2.5Hz)	Invalid Configuration
Single Flash	Local error, unsolicited state switch
Double Flash	Watchdog Error
IRN - IO RUN(GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure
IER - IO Error (RED)	Definition
OFF	IO communication normal
Double flash	IO communication failure
Field Power - Indicator	Definition

On	On-site power supply normal
Off	On-site power supply abnormal

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.



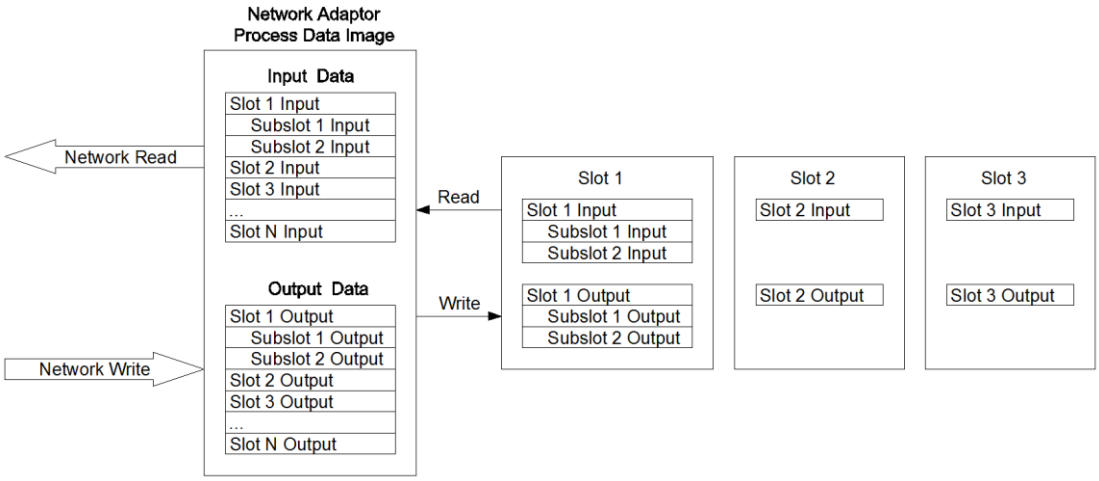
5 Process data definition

5.1 Adapter process data definition

EtherCAT adapter itself has no input/output process data.

5.2 IO module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



The maximum number of input bytes of the EtherCAT network adapter is 1024 bytes, and the maximum number of output bytes is 1024 bytes.

6 Configuration parameters definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved					Fault Action for Output	Fault Action for Input	Source of Config Data

Data description:

Source of Config Data：Parameter configuration mode (Default: 0)

0：Configured software configuration

1：Field Bus configuration

Fault Action for Input：Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode. (Default: 0)

0：Hold Last Input Value

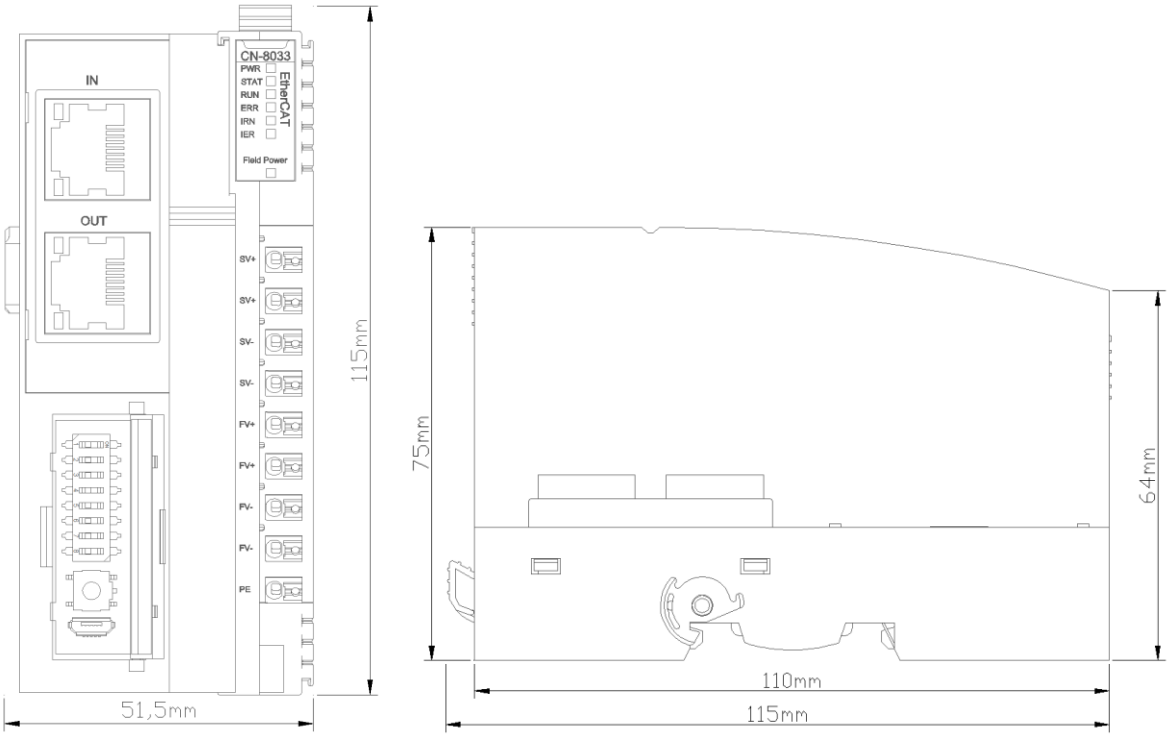
1：Clearing Input Value

Fault Action for Output：Output fault handling mode，when the fieldbus is offline the adapter will process the IO module output data according to this mode. (Default: 0)

0：Hold Last Output Value

1：Clearing Output Value

A DIMENSION


CN-8033
PWR
STAT
RUN
ERR
IRN
IER
EtherCAT
Field Power
IN
OUT
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
115mm
51,5mm
75mm
64mm
110mm
115mm

CN-8034 Ethernet/IP Network Adapter

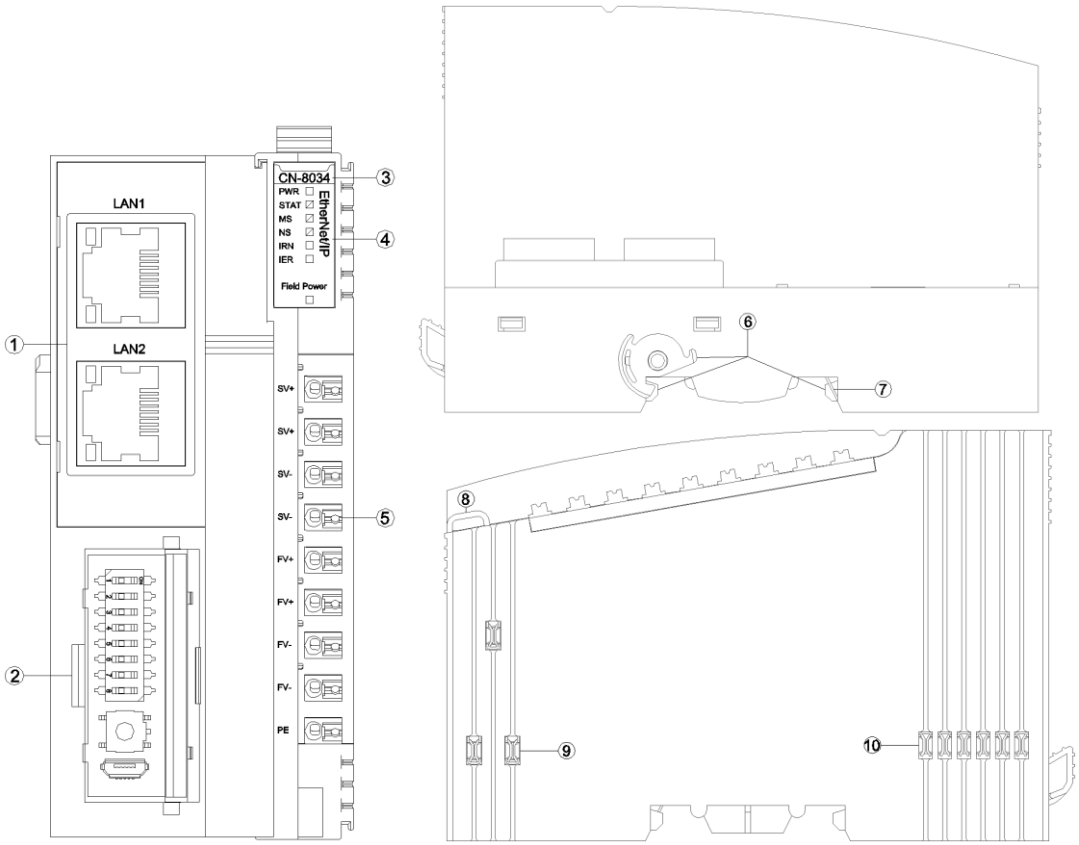
1 The module overview

The CN-8034 Ethernet/IP I/O module supports standard Ethernet/IP protocol access. The adapter supports a Max. input of 504 bytes and a Max. output of 504 bytes. It supports 32 pcs of extended IO modules.

2 Technical Parameters

Hardware Specification	
System Power	Nominal: 24Vdc, Range: 9-36Vdc Protection: Overcurrent Protection, Reverse Protection: YES
Power Consumption	110mA@24Vdc
Internal BUS Supply Current	Max.2A@5VDC
Isolation	System Power to Field Power Isolation
Field Power Supply	Power Supply：22~28V（Nominal 24VDC）
Field Power Supply Current	Max. DC 8A
I/O Modules supported	32 pcs
Wiring	Max.1.5mm²(AWG 16)
Mounting Type	35mm Size DIN-Rail
Size	115*51.5*75mm
Weight	130g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Level	IP20
Ethernet/IP Parameter	
Protocol	Ethernet/IP
Max. input length	504 Bytes per assembly instance
Max. output length	504 Bytes per assembly instance
Max. no. of explicit message connections	10
Max. no. of implicit message connections	5
Max. no. of CIP connections	10
Network Interface	2*RJ45
Speed	10/100Mbps, MDI/MIDX, Full-Duplex
Max.Bus Legenth	100m

3 Hardware Interface



① Network Interface

② Config Interface

③ Module Type

④ LED Indicator

⑤ Wiring Terminal

⑥ Buckle

⑦ Grounding Resilient Sheet

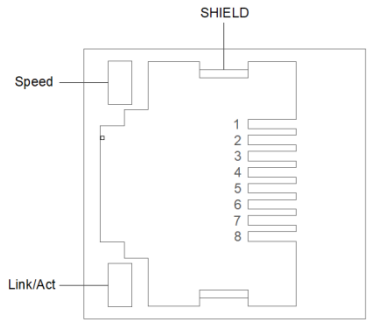
⑧ Fixed Wiring Harness

⑨ Field Power

⑩ Internal Bus

3.1 Network Interface

LAN1/LAN2 are the Ethernet/IP Ethernet port which support switch functions, 10Mbps and 100Mbps data rates, MDI/MID-X auto crossover.



Speed: Network Speed LED Indicator (Green)

ON:100M

OFF:10M

Link/Act: Link State, Active State (Orange)

ON:Link UP

OFF:Link DOWN

Flash:Active

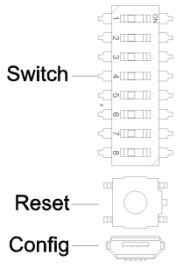
SHIELD: RJ45 Shield Interface

RJ45 Pin definition

Pin	Definition	Description
1	TD+	Transmitter Signal Positive
2	TD-	Transmitter Signal Negative
3	RD+	Receiver Signal Positive
4	--	--
5	--	--
6	RD-	Receiver Signal Positive

7	--	--
8	--	--

3.2 Configuration Interface



Switch: the DIP switch is used for setting the IP address (the default IP address is 192.168.1.200).

When the dial value is 0, all 4 bytes of the IP address are configured by the software or use the default IP address (192.168.1.200).

When the dial code value is not 0, the last byte of the IP address is determined by the dial code value, and the first three bytes could be configured by the software or use the default address(192.168.1).

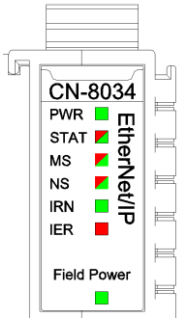
The relationship between IP address and dial code value is shown in the following table:

Switch Bit Number (ON: 1, OFF: 0)								Switch Value	IP Address
								0	Configured by software（or default）
								1	x.x.x.1
								2	x.x.x.2
								3	x.x.x.3
								.	.
								.	.
								254	x.x.x.254
								255	x.x.x.255
Notice: The default IP address after device reset is 192.168.1.200									

Reset: Module reset button, long pressing the button for more than 5 seconds and all parameters of the module will be restored to the default value. When the Reset button is activated, a green indicator will light up in the upper left corner of the button.

Config: Configure port, a standard Micro USB interface for configuring device parameters and firmware upgrades.

3.3 LED indicator

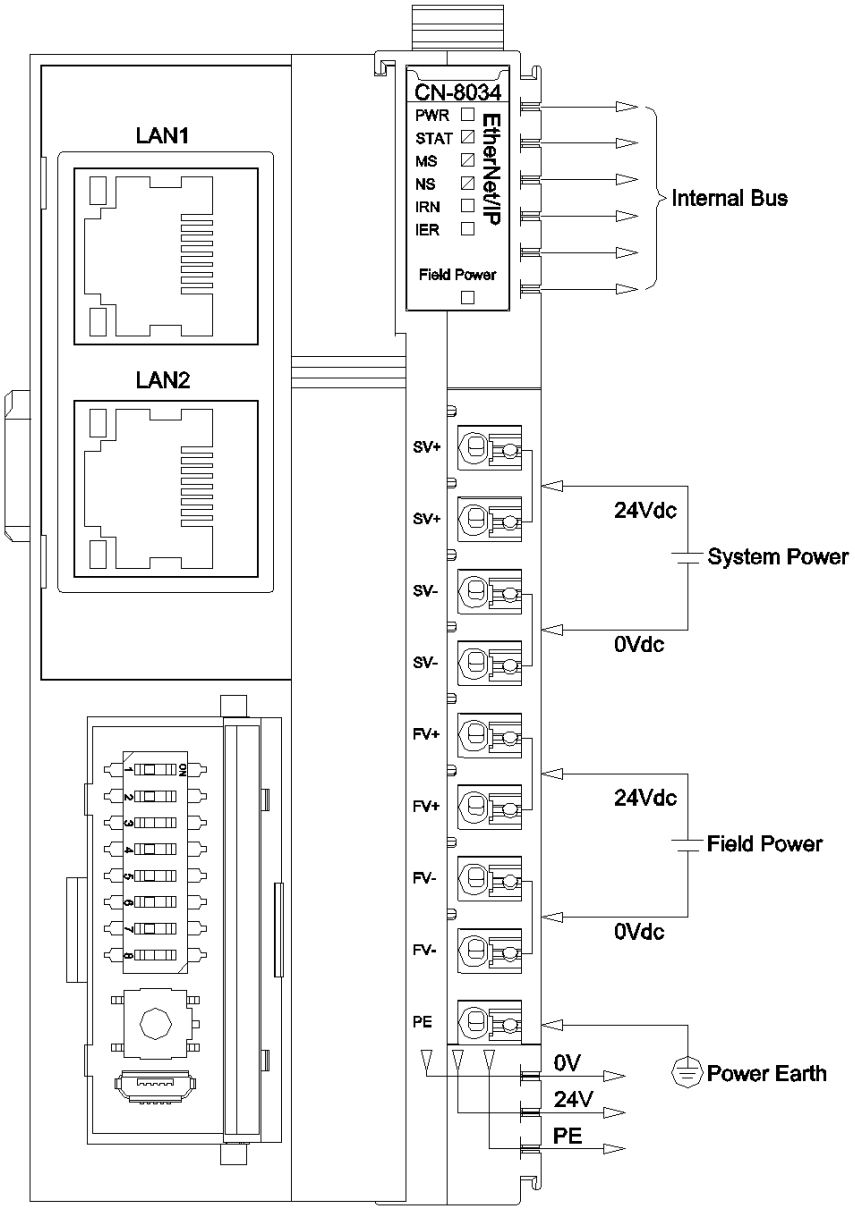


PWR Power State (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Module State (RED/GREEN)	Definition
Double Flash (RED)	Module Soft Restarted by Hard-Fault
ON(GREEN)	Running
Single Flash (GREEN)	Stopping
Flash(2.5Hz) (RED/GREEN)	Boot Mode
Flash(10Hz) (RED/GREEN)	Firmware Updating
MS module state indicator	Definition
ON(GREEN)	Module running state correct
Flash(1Hz) (GREEN)	Module not configured
Flash(GREEN/RED/GREEN)	Module power on self-test state
Flash(1Hz) (RED)	The module detects a recoverable failure state
Red(GREEN)	The module detects an unrecoverable failure status
OFF	Module power off
NS network state indicator	Definition
ON(GREEN)	The connection has been established.IP address configuration completed, at least one CIP connection established, the master connection does not time out.

Flash(1Hz) (GREEN)	The connection not established.IP address configuration completed, CIP connection not established, the master connection does not time out.
Flash(GREEN/RED/ OFF)	Module power on self-test state.
Flash(1Hz) (RED)	The connection times out, IP address configuration completed, the master connection times out.
ON(RED)	Duplicate IP, the IP addressis is already in use.
OFF	Not powered, no IP address.
IRN - IO RUN(GREEN)	Definition
ON	IO initialization normal
OFF	IO initialization failure
IER - IO Error (RED)	Definition
OFF	IO communication normal
Double flash	IO communication failure
Field Power - Indicator	Definition
ON	On-site power supply normal
OFF	On-site power supply abnormal

4 Wiring

Please note when wiring: for the internal construction, two terminals of SV+ have been short-connected, two terminals of SV- have been short-connected, two terminals of FV+ have been short-connected, and two terminals of FV- have been short-connected. For external it only needs to access one system power supply and one field power supply.



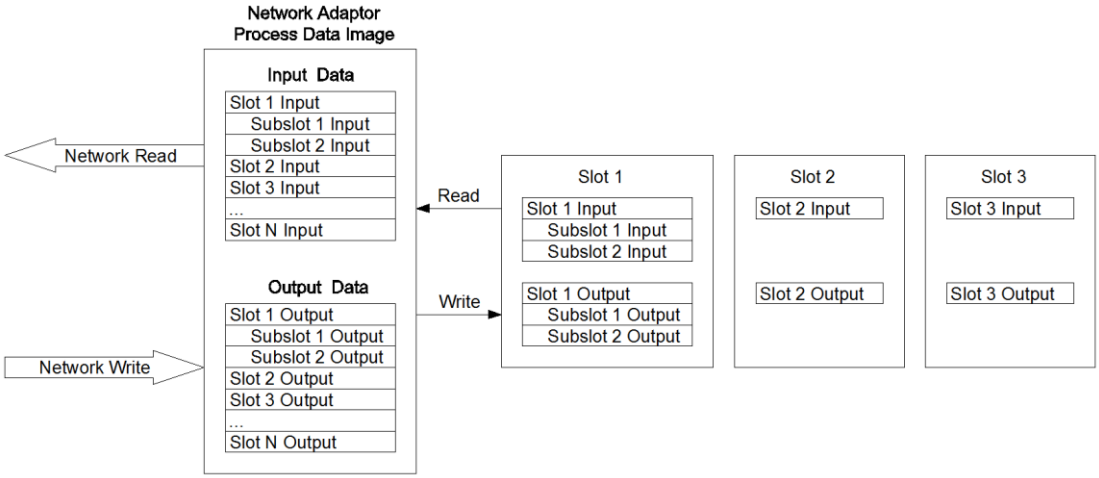
5 Process data definition

5.1 Adapter process data definition

Ethernet/IP adapter itself has no input/output process data.

5.2 IO module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



The maximum number of input bytes of the Ethernet/IP network adapter is 504 bytes, and the maximum number of output bytes is 504 bytes.

6 Configuration parameters definition

Configuration parameters									
Bit No		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0		Reserved			O-->T Transfer Format	T-->O Transfer Format	Fault Action for Output	Fault Action for Input	Source of Config Data
Byte 1		MAC Address[0]							
Byte 2		MAC Address[1]							
Byte 3		MAC Address[2]							
Byte 4		MAC Address[3]							
Byte 5		MAC Address[4]							
Byte 6		MAC Address[5]							
Byte 7		IP Address[0]							
Byte 8		IP Address[1]							
Byte 9		IP Address[2]							
Byte 10		IP Address[3]							
Byte 11		Net Mask[0]							
Byte 12		Net Mask[1]							
Byte 13		Net Mask[2]							
Byte 14		Net Mask[3]							
Byte 15		Net Gateway[0]							
Byte 16		Net Gateway[1]							
Byte 17		Net Gateway[2]							
Byte 18		Net Gateway[3]							
Byte 19		T-->O Size (Bytes)							
Byte 20									
Byte 21		O-->T Size (Bytes)							
Byte 22									

Data description:

Source of Config Data：Parameter configuration mode (Default: 0)

0：Configured software configuration

1：Field Bus configuration

Fault Action for Input： Input fault handling mode, when IO module is offline, the adapter will process IO module input data according to this mode. (Default: 0)

0：Hold Last Input Value

1：Clearing Input Value

Fault Action for Output： Output fault handling mode， when the fieldbus is offline the adapter will process the IO module output data according to this mode. (Default: 0)

0：Hold Last Output Value

1：Clearing Output Value

T-->O Transfer Format： T-->O Input conversion format, read only.

O-->T Transfer Format： O-->T Output conversion format, read only.

MAC Address： MAC address, read only.

IP Address： IP Addess

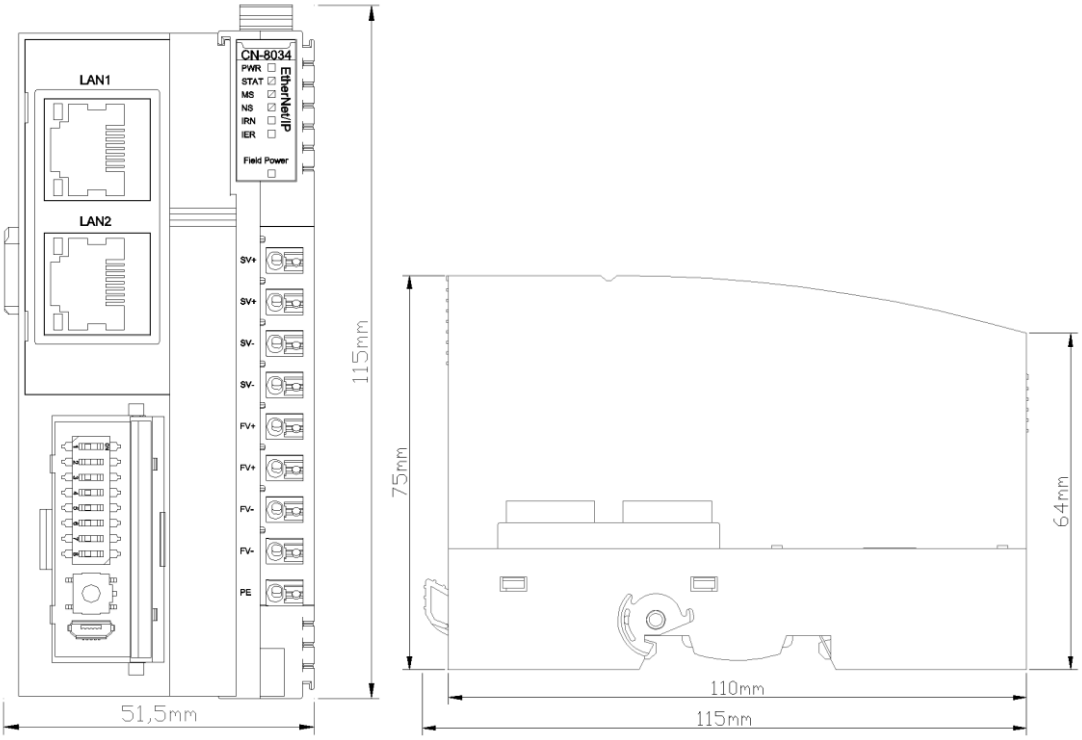
Subnet Mask

Gateway Address

T-->O Size (Bytes)： O-->T length (Bytes) , read only.

O-->T Size (Bytes)： O-->T length (Bytes) , read only.

A DIMENSION


LAN1
LAN2
CN-8034
PWR
STAT
MS
NS
IRN
IER
EtherNet/IP
Field Power
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
115mm
51,5mm
75mm
64mm
110mm
115mm

3 Extended IO module

CT-121F 16 channel digital input/24VDC/ Sink type

1 Module features

◆ the module supports 16 channels digital input, supports sink input, and input voltage is 24VDC.

◆ the module can collect digital output signal of field equipment (dry contact or active output).

◆ the module can be accessed to 2-wire or 3-wire digital sensor.

◆ the internal bus and field input of the module use opto-isolator.

◆ the module supports the input signal holding function, and the holding time can be set.

◆the module carries 16 digigtal input channels with LED indicator on each channel.

◆ supports counting function, by adding counting sub-module.

◆ each input channel of the module supports a 32-bit counter with the counting frequency <200Hz.

◆ the module can set the digital signal input filtering time and the byte transmission order of the counter.

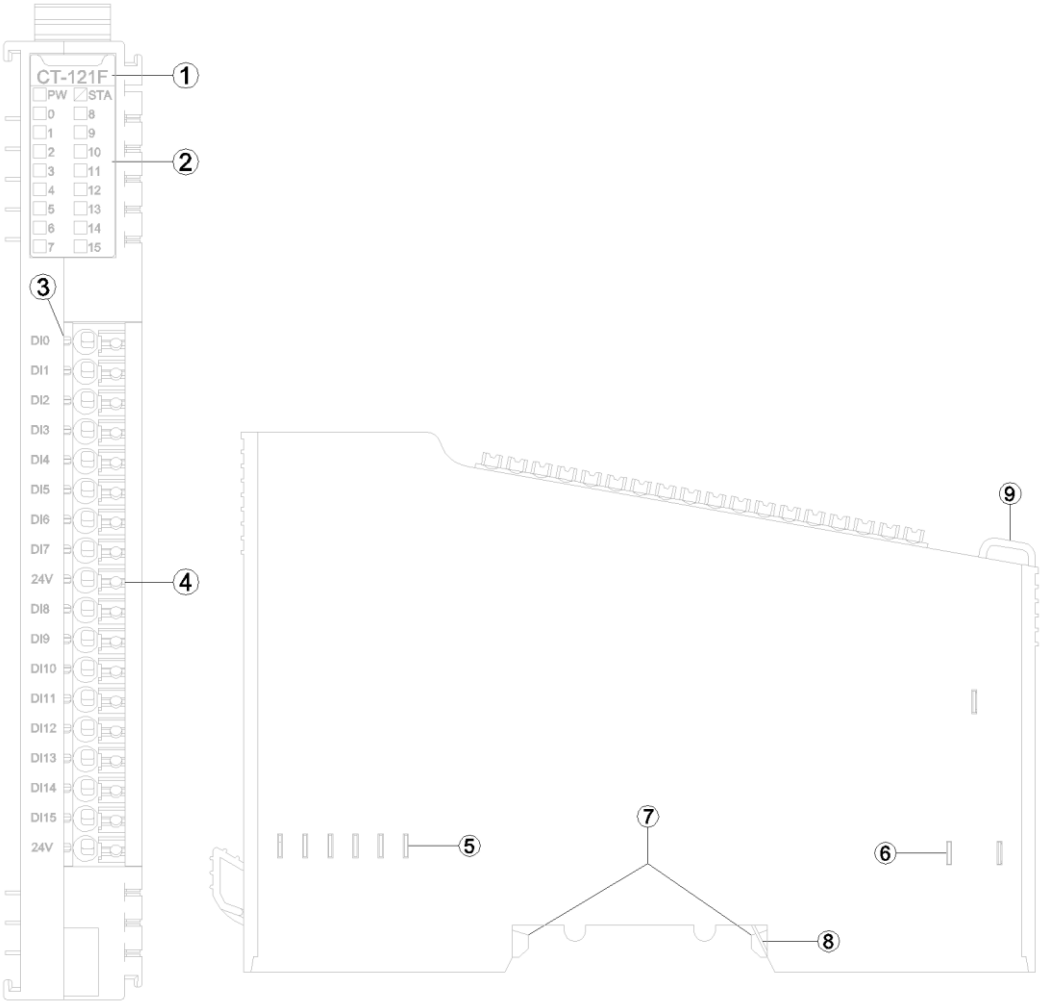
◆ each channel of the module can set the counting mode and counting direction independently.

2 Technical parameters

General parameters	
Power Consumption	Max.60mA@5.0Vdc
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24Vdc, Range:22-28Vdc

Wiring	Max.1.5mm ²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%-95% (No Condensation)
Protection Class	IP20
Input parameters	
Channel Number	16 channel sink input
LED Indicator	16 channel input LED indicator
Turn-on voltage	Min.10Vdc to Max.28Vdc
Turn-off Voltage	Max.5Vdc
Turn-on current	Max.5mA/channel@28V
input impedance	>7.5kΩ
Input delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
filter time	Default 10ms
Sample frequency	500Hz
Counter frequency	<200Hz

3 Hardware interfaces



① Module Type

② State indicator

③ Channel indicator

④ Wiring Terminal and identification

⑤ Internal Bus

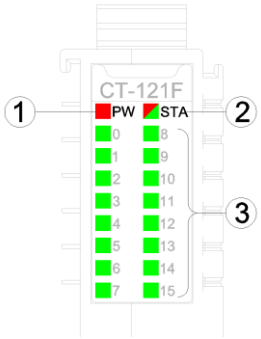
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



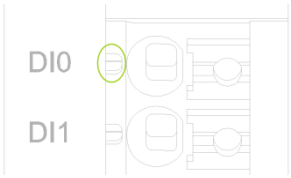
① Power LED indicator (red)

② Module State LED indicator (red/green)

③ Input channel LED indicator (green)

PW Power State (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-15 channel indicator light	Definition
ON	Input signal valid
OFF	Input signal invalid

3.2 Field channel LED indicator (Green)

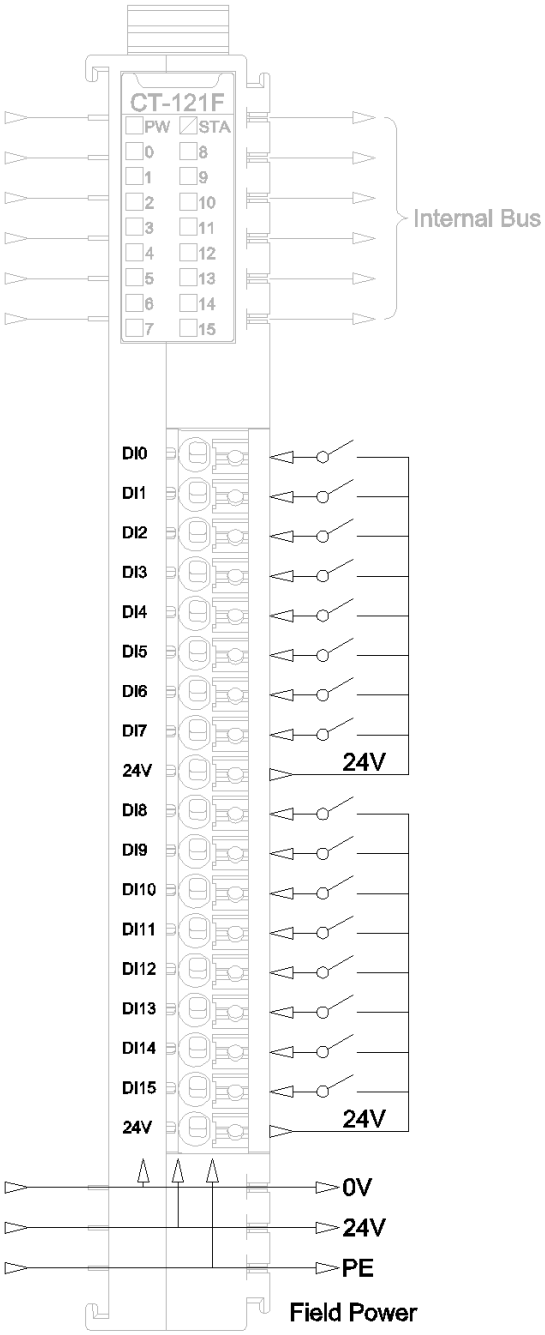


When input signal of input channel is valid, the corresponding field channel LED indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	24V	Power output
10	DI8	Signal input
11	DI9	
12	DI10	
13	DI11	
14	DI12	
15	DI13	
16	DI14	
17	DI15	
18	24V	Power output

4 Wiring


CT-121F
PW
STA
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Internal Bus
DI0
DI1
DI2
DI3
DI4
DI5
DI6
DI7
24V
DI8
DI9
DI10
DI11
DI12
DI13
DI14
DI15
24V
24V
0V
24V
PE
Field Power

5 Process data definition

<16DI Input State> Submodule process data definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0
Byte 1	DI Ch#15	DI Ch#14	DI Ch#13	DI Ch#12	DI Ch#11	DI Ch#10	DI Ch#9	DI Ch#8

Data description:

DI Ch#(0-15)：When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0：Input signal invalid

1：Input signal valid

<16DI Counter Submodule> Submodule process data definition:

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								
Byte 23								
Byte 24	Counter Value Ch#6							

Byte 25	
Byte 26	
Byte 27	
Byte 28	Counter Value Ch#7
Byte 29	
Byte 30	
Byte 31	
Byte 32	Counter Value Ch#8
Byte 33	
Byte 34	
Byte 35	
Byte 36	Counter Value Ch#9
Byte 37	
Byte 38	
Byte 39	
Byte 40	Counter Value Ch#10
Byte 41	
Byte 42	
Byte 43	
Byte 44	Counter Value Ch#11
Byte 45	
Byte 46	
Byte 47	
Byte 48	Counter Value Ch#12
Byte 49	
Byte 50	
Byte 51	
Byte 52	Counter Value Ch#13
Byte 53	
Byte 54	
Byte 55	
Byte 56	Counter Value Ch#14
Byte 57	
Byte 58	
Byte 59	
Byte 60	Counter Value Ch#15
Byte 61	
Byte 62	
Byte 63	

Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0
Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8

Data description:

Counter Value Ch#(0-15)：Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-15)：When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

<16DI Input State> Submodule configuration parameter definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

0：Disable

1：200ms

2：500ms

3：1000ms

4：1500ms

5：2000ms

6：3000ms

7：5000ms

<16DI Counter Submodule> Submodule configuration parameter definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	
Byte 5	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0
Byte 6	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0：AB-CD

1：BA-DC

2：CD-AB

3：DC-BA

Storage Function: Storage Function is supported or not, read only attribute, and this value is the actual value of the module when uploading device parameters.

0：storage is not supported

1：storage is supported

Storage Enable：Storage enable，when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the

last saved count value on the next power on. (Default: 1)

0：Disabled

1：Enable

Count Mode Ch# (0-15)：Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

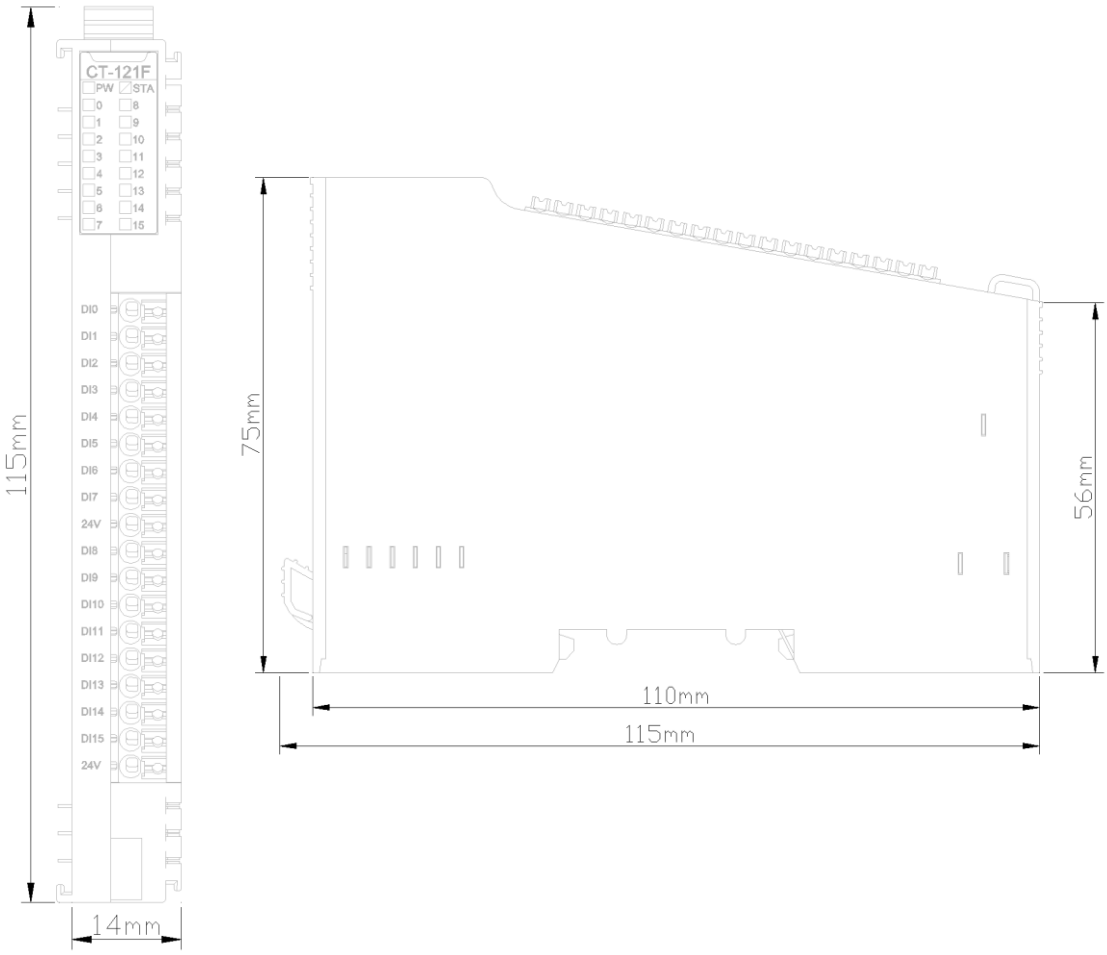
2: double edge count

Count Direction Ch# (0-15): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing



CT-122F 16 channels digital input/0VDC/Source type

1 Module features

◆ the Module supports 16 channels digital input, supports source input, and input voltage 0V.

◆ the module could collect the digital output signal of field equipment (dry contact or active output).

◆ the module can be connected to a 2-wire or 3-wire digital sensor.

◆ the internal bus of the module and field input are isolated by optocoupler.

◆ the module supports input signal holding function, holding time can be set.

◆ the module carries with 16 digital input channel LED indicator.

◆ after adding counting submodule, the counting function is effective.

◆ each input channel of the module supports 32-bit counter with counting frequency <200Hz.

◆ the module could set the digital signal input filter time and counter byte transmission sequence.

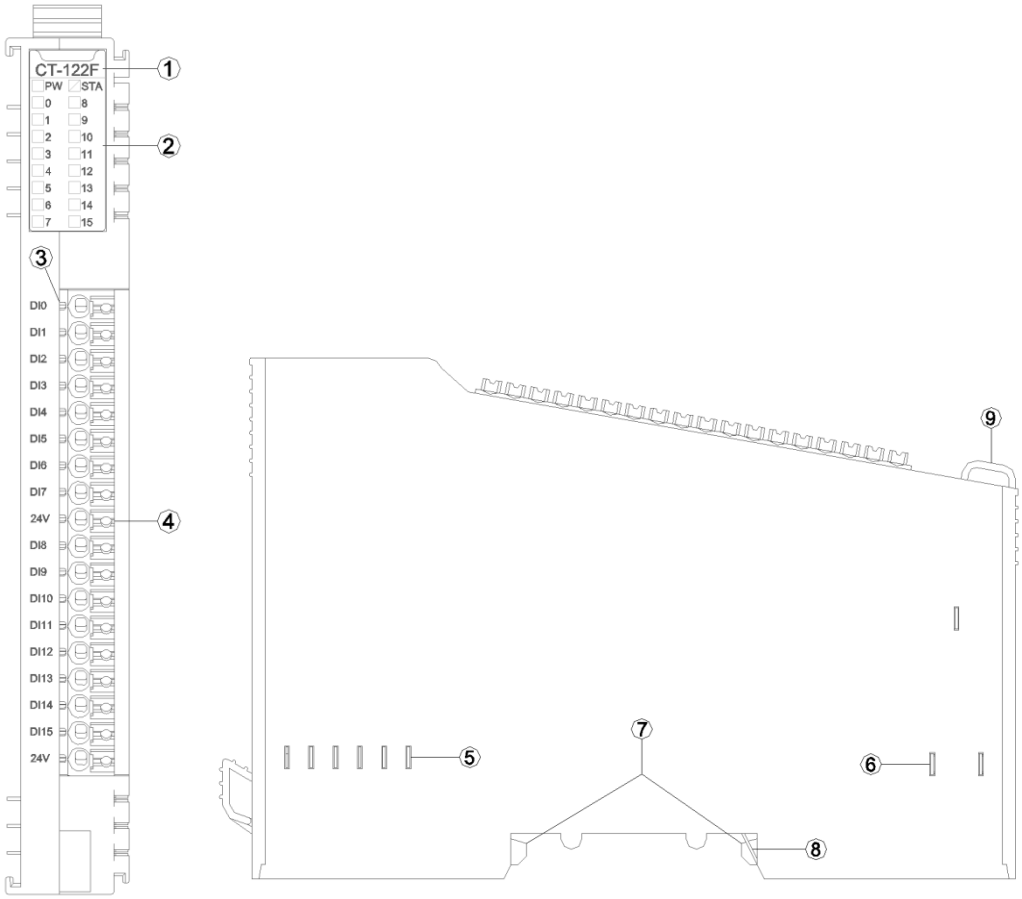
◆ each channel of the module could set the counting mode and counting direction independently.

2 Technical parameters

General parameters	
Power Consumption	Max.60mA@5.0Vdc
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24Vdc, Range:22-28Vdc
Wiring	I/O Wiring：Max.1.5mm²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%-95% (No Condensation)
Protection Class	IP20

Input parameters	
Channel Number	16 channels source input
LED Indicator	16 channels input LED indicator
Turn-on voltage	Min.10Vdc to Max.28Vdc
Turn-off Voltage	Max.5Vdc
Turn-on current	Max.5mA/channel@28V
input impedance	>7.5kΩ
Input delay	OFF to ON :Max.3ms ON to OFF :Max.2ms
filter time	Default 10ms
Sample frequency	500Hz
Counter frequency	<200Hz

3 Hardware interfaces



① Module Type

② State indicator

③ Channel indicator

④ Wiring Terminal and identification

⑤ Internal Bus

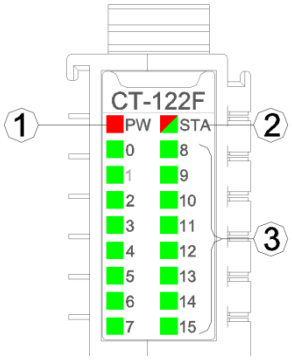
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



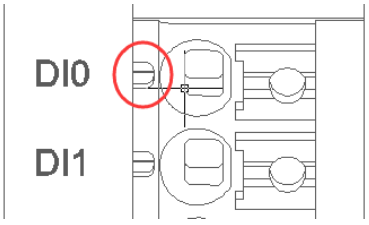
① Power LED indicator (red)

② Module State LED indicator (red/green)

③ Input channel LED indicator (green)

PW Power State (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-15 channel indicator light	Definition
ON	Input signal valid
OFF	Input signal invalid

3.2 Field channel LED indicator (Green)



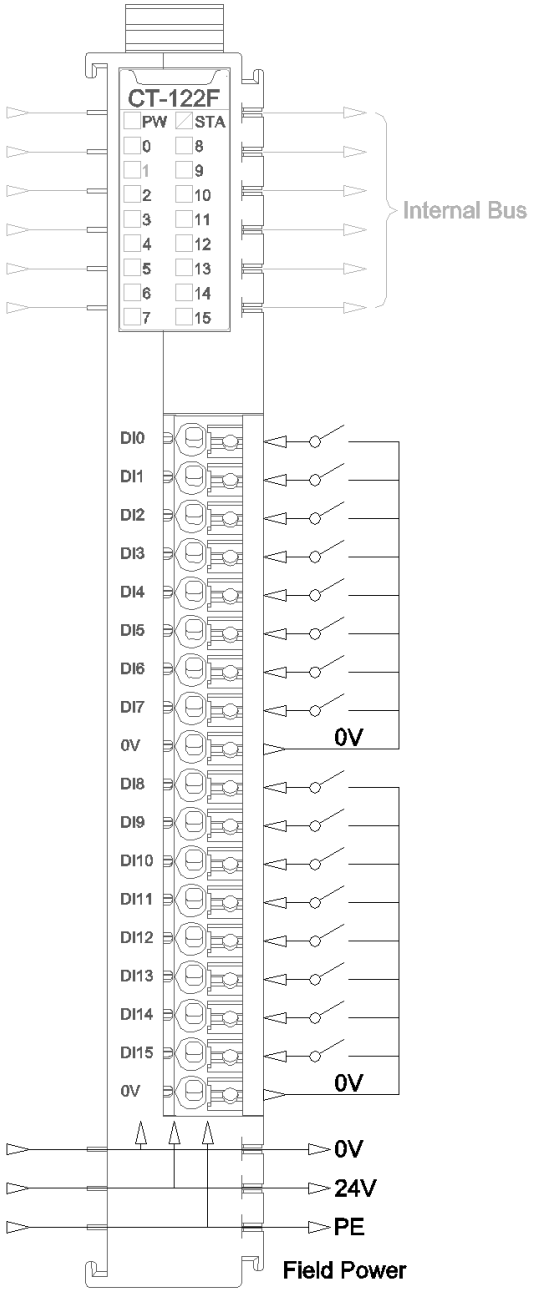
When input signal of input channel is valid, the corresponding field channel LED

indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	24V	Power output
10	DI8	Signal input
11	DI9	
12	DI10	
13	DI11	
14	DI12	
15	DI13	
16	DI14	
17	DI15	
18	24V	Power output

4 Wiring


CT-122F
PW
STA
0
8
1
9
2
10
3
11
4
12
5
13
6
14
7
15
Internal Bus
DI0
DI1
DI2
DI3
DI4
DI5
DI6
DI7
0V
DI8
DI9
DI10
DI11
DI12
DI13
DI14
DI15
0V
0V
24V
PE
Field Power

5 Process data definition

<16DI Input State> Submodule process data definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0
Byte 1	DI Ch#15	DI Ch#14	DI Ch#13	DI Ch#12	DI Ch#11	DI Ch#10	DI Ch#9	DI Ch#8

Data description:

DI Ch#(0-15)：When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0：Input signal invalid

1：Input signal valid

<16DI Counter Submodule> Submodule process data definition:

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							

Byte 21	
Byte 22	
Byte 23	
Byte 24	Counter Value Ch#6
Byte 25	
Byte 26	
Byte 27	
Byte 28	Counter Value Ch#7
Byte 29	
Byte 30	
Byte 31	
Byte 32	Counter Value Ch#8
Byte 33	
Byte 34	
Byte 35	
Byte 36	Counter Value Ch#9
Byte 37	
Byte 38	
Byte 39	
Byte 40	Counter Value Ch#10
Byte 41	
Byte 42	
Byte 43	
Byte 44	Counter Value Ch#11
Byte 45	
Byte 46	
Byte 47	
Byte 48	Counter Value Ch#12
Byte 49	
Byte 50	
Byte 51	
Byte 52	Counter Value Ch#13
Byte 53	
Byte 54	
Byte 55	
Byte 56	Counter Value Ch#14
Byte 57	
Byte 58	
Byte 59	
Byte 60	Counter Value Ch#15
Byte 61	
Byte 62	
Byte 63	

Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0
Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8

Data description:

Counter Value Ch#(0-15)：Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-15)：When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

<16DI Input State> Submodule configuration parameter definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

0：Disable

1：200ms

2：500ms

3：1000ms

4：1500ms

5：2000ms

6：3000ms

7：5000ms

<16DI Counter Submodule> Submodule configuration parameter definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	

Byte 5	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0
Byte 6	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0：AB-CD

1：BA-DC

2：CD-AB

3：DC-BA

Storage Function: Storage Function is supported or not, read only attribute, and this value is the actual value of the module when uploading device parameters.

0：storage is not supported

1：storage is supported

Storage Enable：Storage enable，when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0：Disabled

1：Enable

Count Mode Ch# (0-15)：Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

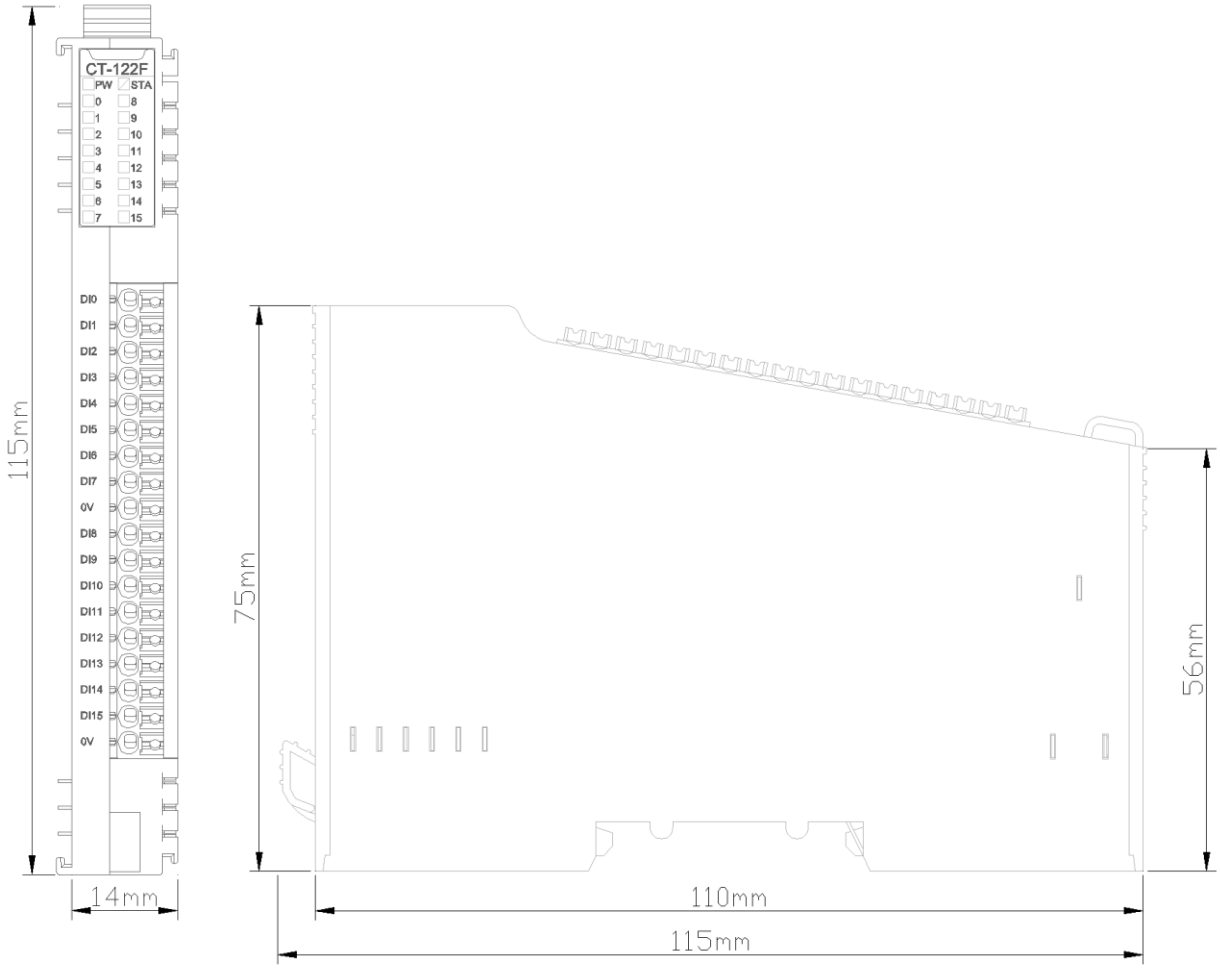
2: double edge count

Count Direction Ch# (0-15): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing


CT-122F
PW
STA
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
DI0
DI1
DI2
DI3
DI4
DI5
DI6
DI7
0V
DI8
DI9
DI10
DI11
DI12
DI13
DI14
DI15
0V
115mm
14mm
75mm
56mm
110mm
115mm

CT-2228: 8 channel digital output/24VDC/ Source type

1 Module features

◆the module supports 8-channel digital output, output high level effective, and output voltage 24V

◆the module could drive field equipment (relay, solenoid valve, etc.)

◆the module internal bus and field output are isolated by optocoupler

◆the module carries with 8 digital output channel LED indicator

◆the module has the functions of thermal shutdown and overcurrent protection

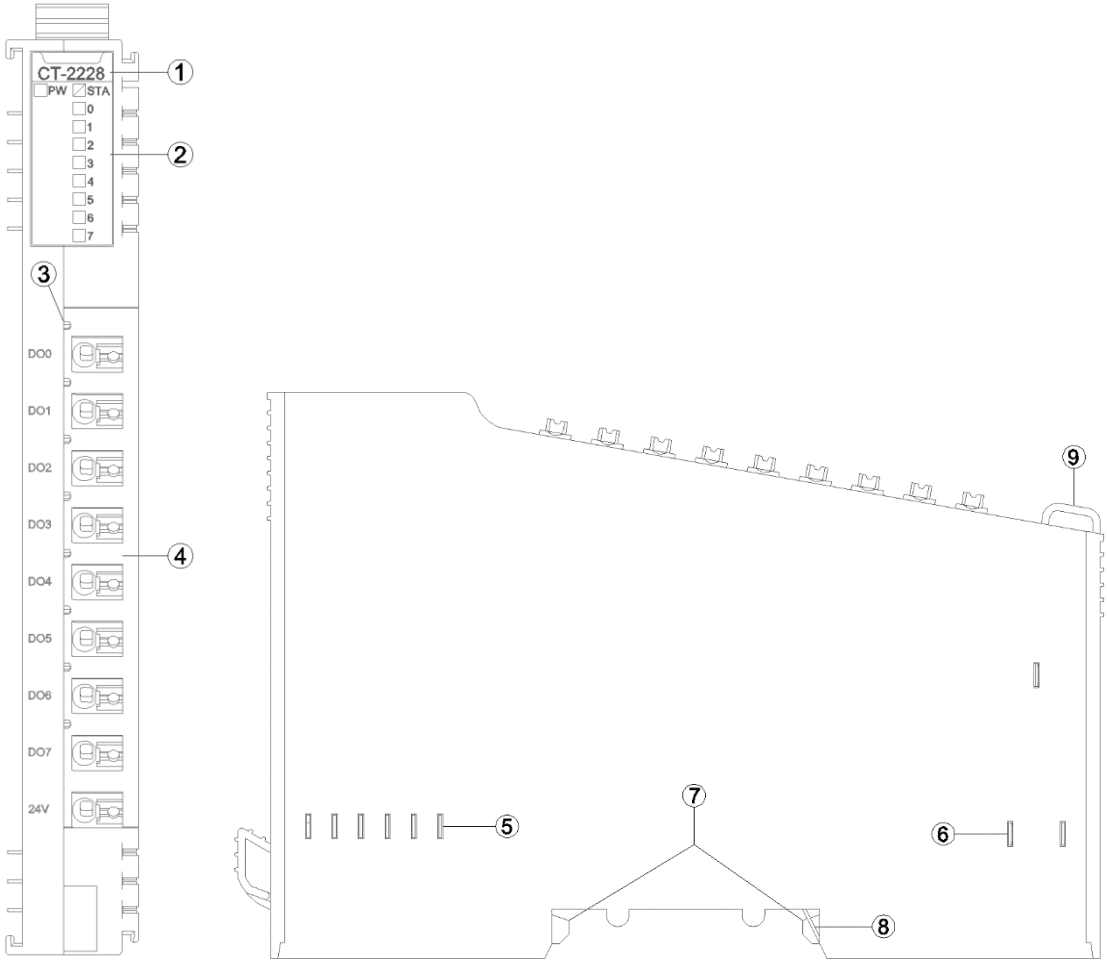
◆the module supports short circuit protection and overload protection

2 Technical Parameters

General parameters	
Power Consumption	Max.80mA@5.0Vdc
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24Vdc, Range:22-28Vd
Wiring	I/O wiring:Max.1.5mm^2(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Output parameters	
Channel Number	8 Channels
LED Indicator	8 Channels output LED Indicator
Rated Current	Typical value：500mA
Leak Current	Max. value：100uA
Output	<280mΩ

Impedance	
Output Delay	OFF to ON:Max.100us ON to OFF:Max.150us
Protection Function	Over temperature turn-off: typical 135℃ Overcurrent protection: typical value 1.1A

3 Hardware Interface



① Module Type

② State indicator

③ Channel indicator

④ Wiring Terminal and identification

⑤ Internal Bus

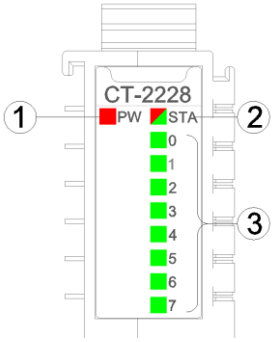
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



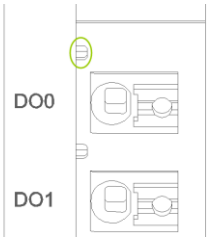
① Power LED indicator (red)

② Module State LED indicator (red/green)

③ Output channel LED indicator (green)

PW Power State (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-7 channel LED indicator (GREEN)	Definition
ON	Output signal valid
OFF	Output signal invalid

3.2 Field channel LED indicator (Green)



When the output signal of the output channel is valid, the corresponding field channel LED indicator is lit.

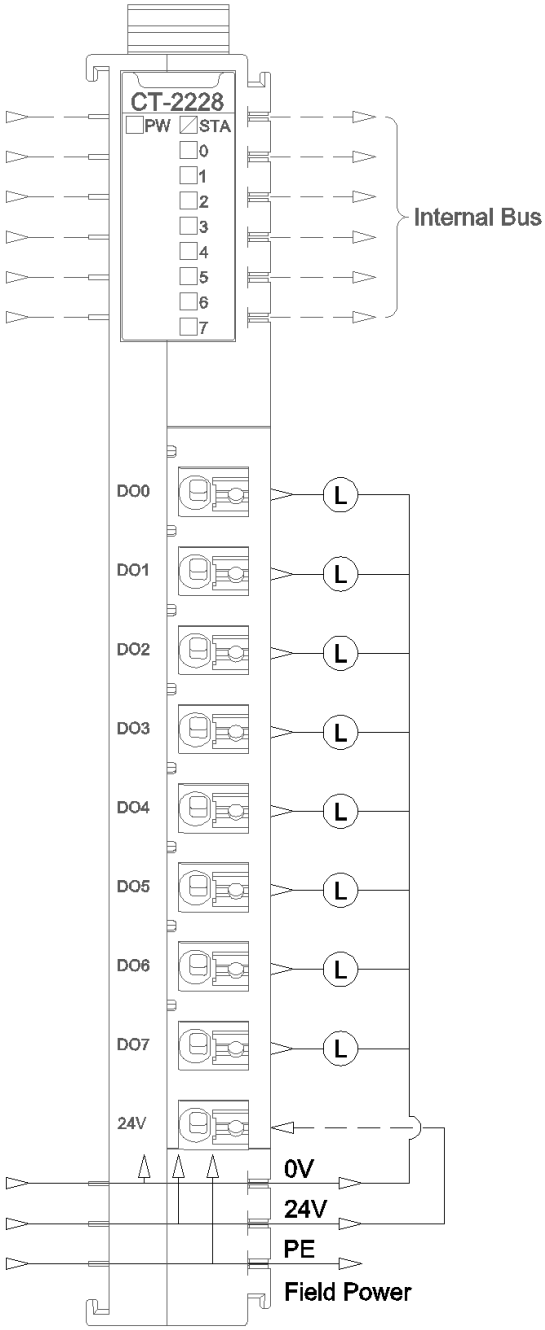
3.3 Terminal definition

Terminal Number	Symbol	Description
1	DO0	Signal output
2	DO1	
3	DO2	
4	DO3	
5	DO4	
6	DO5	
7	DO6	
8	DO7	
9	24V	Power intput *(Note1)*

Note 1: When the red LED indicator beside the 24V terminals lights up, this is indicating that the module output has passed the field bus, so the 24V terminals could be disconnected. The max.output current of each channel is 500mA, and the max. sum of the current of all the output channels is 4A.When the total current exceeds 2A, and it is suggested to connect the power in the 24V terminal at the same time to avoid the on-site power current exceeding its limit.

When the red LED indicator beside the 24V terminal goes off, it means that the module output is not powered. In this case, the power supply needs to be connected in the 24V terminal. At this point, the max. output current of each channel is 500mA, and the sum of all output channel currents is 4A.

4 Wiring


CT-2228
PW
STA
0
1
2
3
4
5
6
7
Internal Bus
DO0
DO1
DO2
DO3
DO4
DO5
DO6
DO7
24V
L
0V
24V
PE
Field Power

5 Process data definition

Output Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DO Ch#7	DO Ch#6	DO Ch#5	DO Ch#4	DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0

Data declaration：

DO Ch#(0-7)： When the bit is 1, the output signal of the corresponding channel is effective, the output is high level, and the output is invalid when it is 0.

0: The output signal is invalid

1: The output signal is valid

6 Configuration parameters definition

Configured Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault Action for Output Ch#7	Fault Action for Output Ch#6	Fault Action for Output Ch#5	Fault Action for Output Ch#4	Fault Action for Output Ch#3	Fault Action for Output Ch#2	Fault Action for Output Ch#1	Fault Action for Output Ch#0
Byte 1	Fault Value for Output Ch#7	Fault Value for Output Ch#6	Fault Value for Output Ch#5	Fault Value for Output Ch#4	Fault Value for Output Ch#3	Fault Value for Output Ch#2	Fault Value for Output Ch#1	Fault Value for Output Ch#0

Data description:

Fault Action for Output Ch#(0-7)： When IO module detects the internal bus communication is abnormal and enters offline mode, and output data will be processed in this mode. (Default: 0)

0：Hold Last Output State

1：Output Fault Value

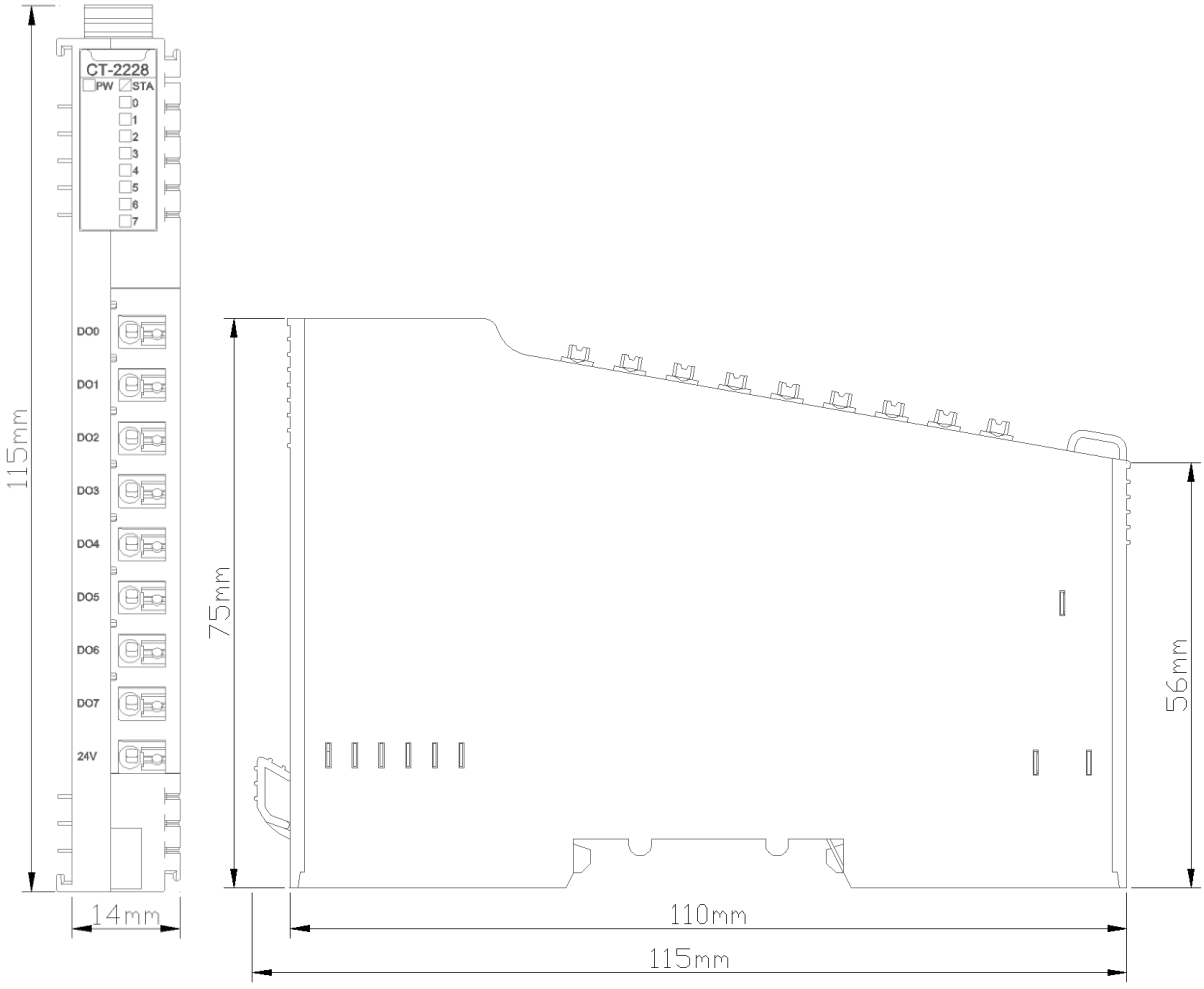
Fault Value for Output Ch#(0-7)： When the fault output mode is 1, this bit sets the fault output value, and when the internal bus of IO module is offline, this setting

value will be output.(Default: 0)

0: Output low level.

1: Output high level.

A DIMENSION



CT-222F 16 channel digital output/24VDC/source type

1 Module features

◆ the module supports 16 channels digital output, the output high level is valid, the output voltage is 24VDC.

◆ module can drive field equipment. (relay, solenoid valve, etc.)

◆ the internal bus of the module and field output are using opto-coupler.

◆ the module has 16 digital output channel LED indicator light.

◆ the module has the functions of thermal shutdown and overcurrent protection.

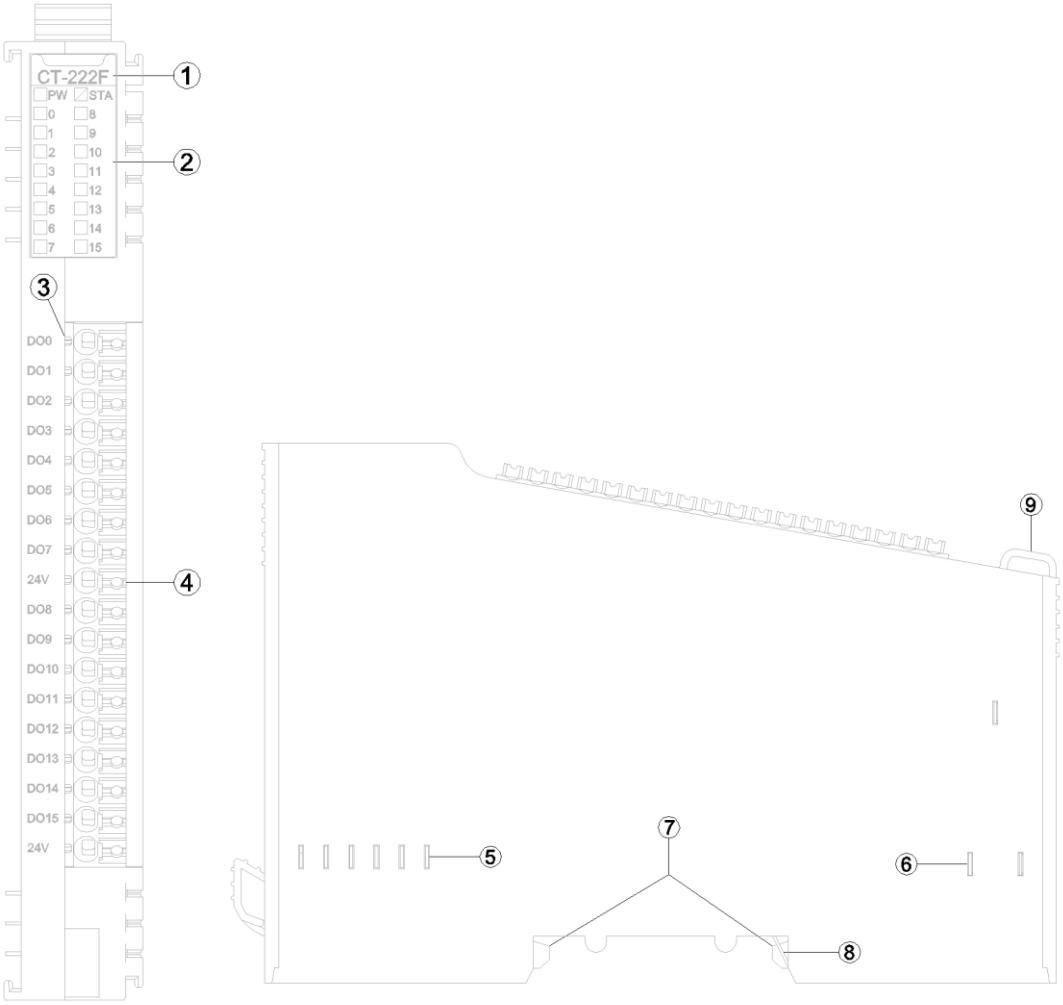
◆ the module supports short circuit protection and overload protection.

2 Technical parameters

General Parameters	
Power	Max.175mA@5.0Vdc
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24Vdc, Range:22-28Vdc
Wiring	Max.1.5mm ²(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%-95% (No Condensation)
Protection Class	IP20
Output Parameters	
Channel Number	16 channel source type output
LED Indicator	16 channel output LED indicator
Rated Current	Typical value: 500mA
Leakage Current	Max：10uA
Output Impedance	<200mΩ
Output Delay	OFF to ON: Max.100us ON to OFF: Max.150us

Protection	Overtemperature shutdown: typical value is 135℃ Overcurrent protection: typical value 1.1A Short circuit protection support

3 Hardware interfaces



① Module Type

② State indicator

③ Channel indicator

④ Wiring Terminal and identification

⑤ Internal Bus

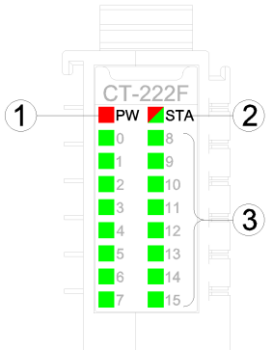
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

LED indicator definition



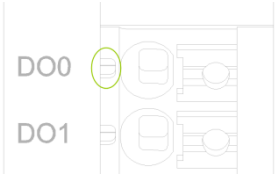
① Power indicator light (red)

② Module State indicator light (red/green)

③ Output channel indicator light (green)

PW Power State	Definition
ON	Internal bus power supply normal
OFF	Internal bus power supply failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5 Hz)	Module internal bus is not started
Red slow flash (2.5 Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash (2.5 Hz) (RED/GREEN)	updating mode
Flash (10 Hz) (RED/GREEN)	firmware update
Double Flash (RED)	Module exception has been soft-restarted
0-15 channel indicator light	Definition
ON	Output signal valid
OFF	Output signal invalid

Field channel LED indicator (Green)



When output signal of output channel is valid, the corresponding field channel

LED indicator is on.

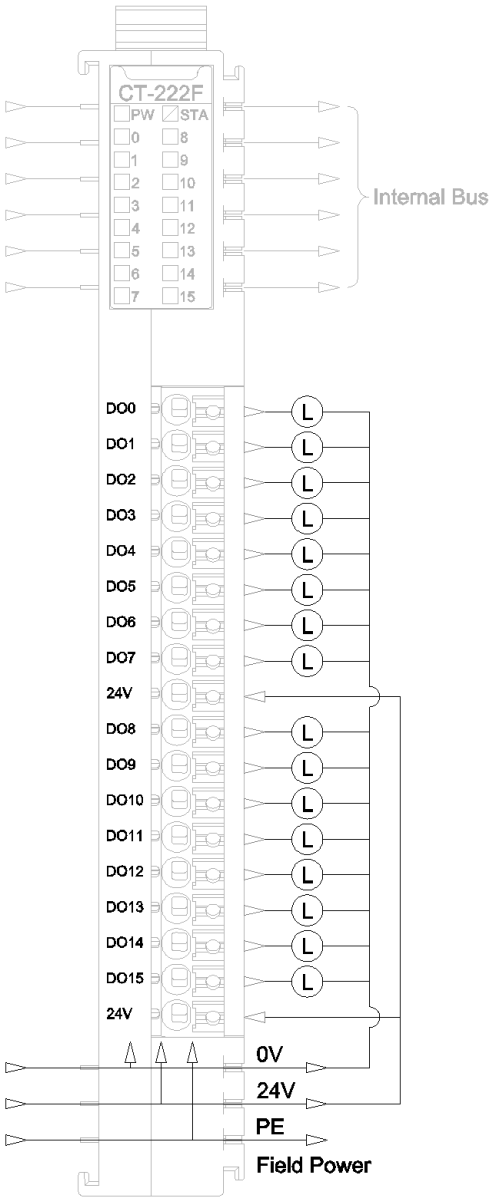
Terminal definition

Terminal Number	Symbol	The Description
1	DO0	Signal output
2	DO1	
3	DO2	
4	DO3	
5	DO4	
6	DO5	
7	DO6	
8	DO7	
9	24V	Power input *(note1)*
10	DO8	Signal output
11	DO9	
12	DO10	
13	DO11	
14	DO12	
15	DO13	
16	DO14	
17	DO15	
18	24V	Power input*(note1)*

Note 1: when the red LED indicator beside the 24V wiring terminal is on, it indicates that the fieldbus is powered on, then the maximum output current of each channel is 500mA, and the maximum sum of all output channel currents is 4A.

When the 24VDC power is supplied to the 24V wiring terminal separately, the maximum sum of all the output channel currents is 8A (Regardless of whether the fieldbus is powered or not, 24V wiring terminals can be connected to 24VDC power supply).

4 Wiring


CT-222F
PW
STA
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Internal Bus
DO0
DO1
DO2
DO3
DO4
DO5
DO6
DO7
24V
DO8
DO9
DO10
DO11
DO12
DO13
DO14
DO15
24V
L
0V
24V
PE
Field Power

5 Process data definition

Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DO Ch#7	DO Ch#6	DO Ch#5	DO Ch#4	DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0
Byte 1	DO Ch#15	DO Ch#14	DO Ch#13	DO Ch#12	DO Ch#11	DO Ch#10	DO Ch#9	DO Ch#8

Data declaration:

DO Ch#(0-15)：when this bit is 1, the corresponding channel output signal is valid, the output is high level, and the output is invalid when it is 0.

0：Output signal is invalid

1：Output signal is valid

6 Configuration parameter definitions

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault Action for Output Ch#7	Fault Action for Output Ch#6	Fault Action for Output Ch#5	Fault Action for Output Ch#4	Fault Action for Output Ch#3	Fault Action for Output Ch#2	Fault Action for Output Ch#1	Fault Action for Output Ch#0
Byte 1	Fault Action for Output Ch#15	Fault Action for Output Ch#14	Fault Action for Output Ch#13	Fault Action for Output Ch#12	Fault Action for Output Ch#11	Fault Action for Output Ch#10	Fault Action for Output Ch#9	Fault Action for Output Ch#8
Byte 2	Fault Value for Output Ch#7	Fault Value for Output Ch#6	Fault Value for Output Ch#5	Fault Value for Output Ch#4	Fault Value for Output Ch#3	Fault Value for Output Ch#2	Fault Value for Output Ch#1	Fault Value for Output Ch#0
Byte 3	Fault Value for Output Ch#15	Fault Value for Output Ch#14	Fault Value for Output Ch#13	Fault Value for Output Ch#12	Fault Value for Output Ch#11	Fault Value for Output Ch#10	Fault Value for Output Ch#9	Fault Value for Output Ch#8

Data description:

Fault Action for Output Ch#(0-15)：Fault Output mode. When the IO module detects an internal bus exception and fails to communicate with the adapter. And the module will turn to offline mode, so the output data is processed in this way. (default: 0)

0: keep the last time output State.

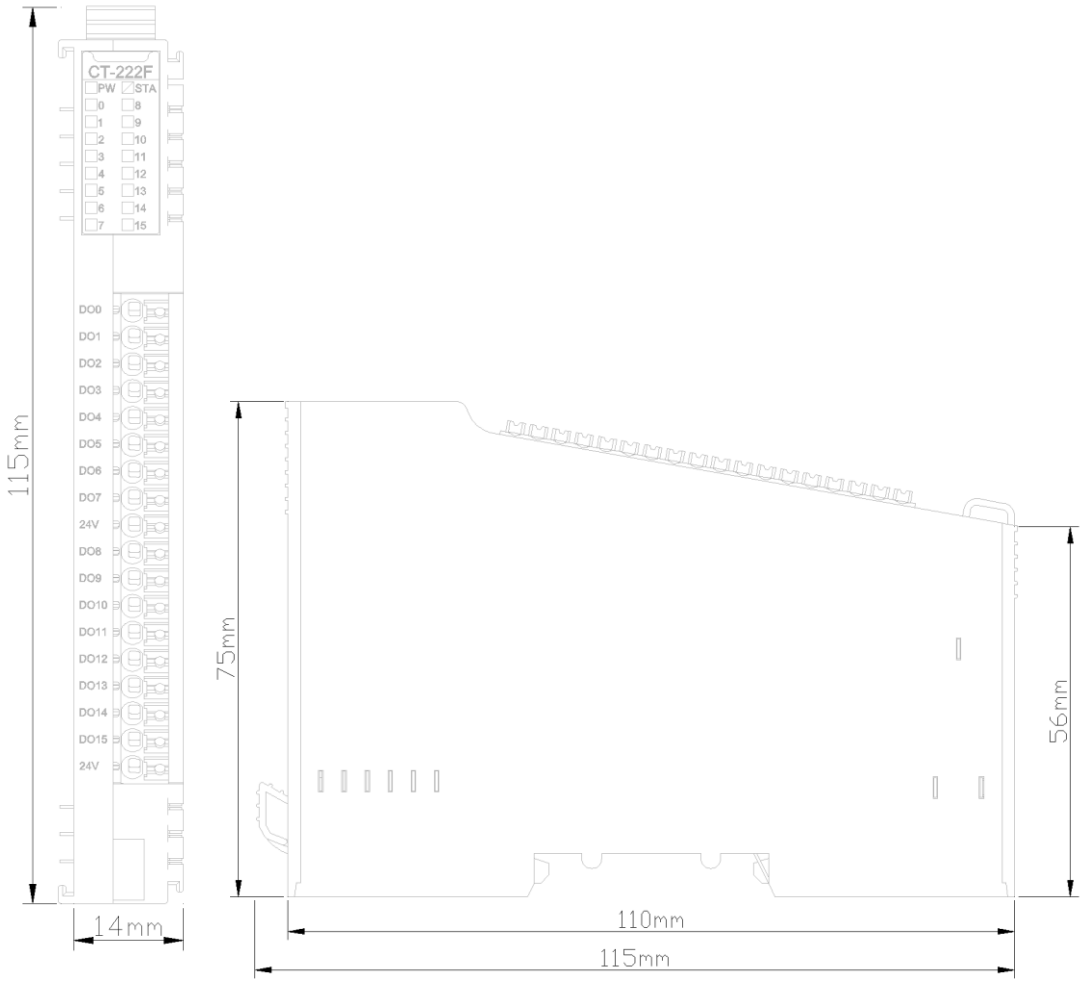
1: output fault value.

Fault Value for Output Ch#(0-15): when the Fault Output mode is 1, this bit sets the Fault Output Value, and this setting value will be outputted when the interal bus of IO module is offline. (default: 0)

0: Output low level.

1: Output high level.

A Dimension drawing



CT-2718: 8 channel relay output 2A/30VDC/60W

1 Module features

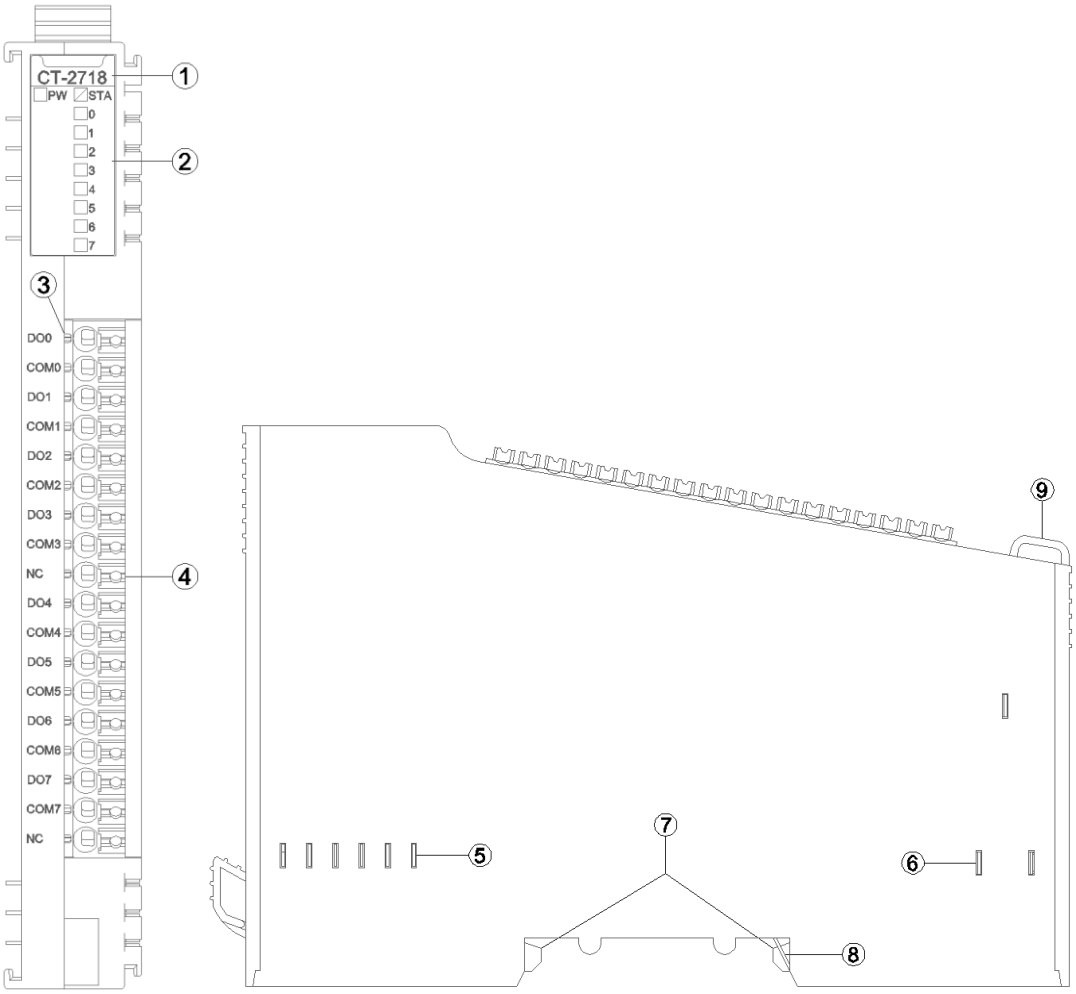
- ◆ 8-channel relay normally on output
- ◆ 8 LED channel indicators
- ◆ Low on resistance (≤100mΩ)
- ◆ 250VAC/220VDC the max. switch voltage is 250VAC/220VDC

2 Technical Parameters

General parameters	
Power Consumption	Max.280mA@5.0Vdc
Isolation	I/O to internal bus：coil isolation(1600VAC)
Field Power	Not used
Wiring	I/O wiring：Max.1.5mm^2(AWG 16)
Mounting Type	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95%(No Condensation)
Protection Class	IP20
Output Parameter	
Channel Number	8 channel relay normally on output
LED Indicator	8 channel output LED Indicator
Max. Switching Current	2A
Max. Switching Voltage	250VAC/220VDC
Max. Switching Power	62.5VA/60W
Contact Resistance	≤100mΩ
Output Delay	ON to OFF:Max.3ms OFF to ON:Max.3ms
Mechanical Endurance	1x10^8
Electricity	1x10^5

Endurance	
Vibration	10Hz~55Hz 3.3mm Double vibration amplitude
Impact	Stability：735m/s^2 Strength：980m/s^2

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

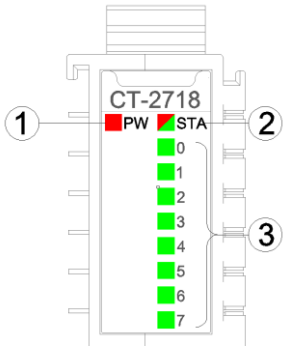
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

③ Output channel LED indicator (green)

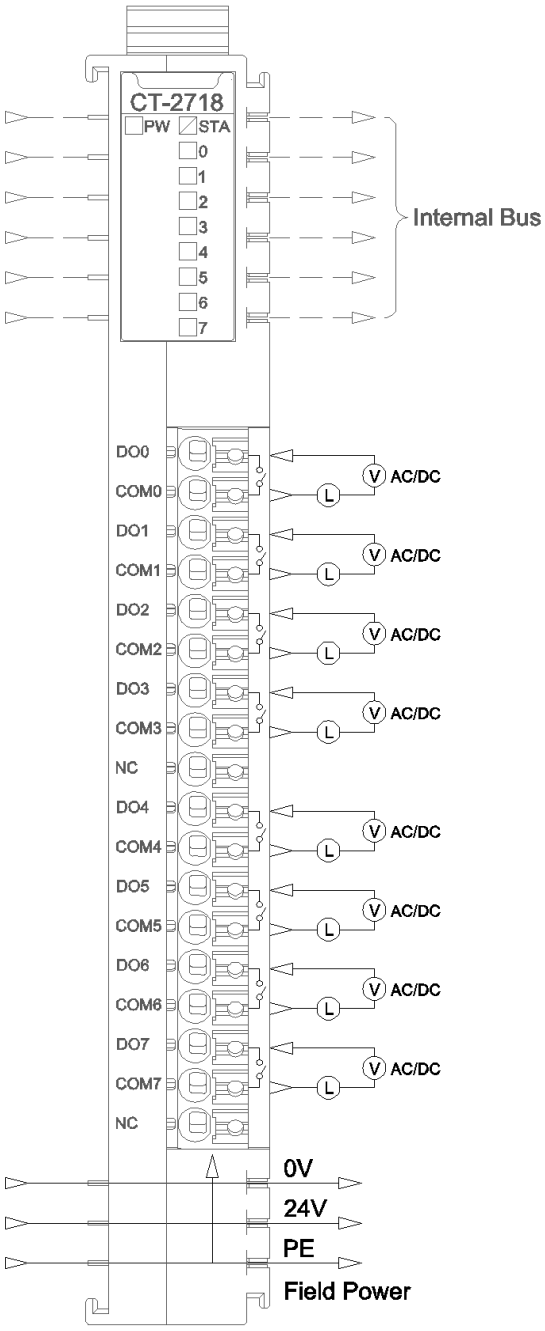
PW Power State (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-7 channel LED indicator (GREEN)	Definition
ON	Output signal valid
OFF	Output signal invalid

3.2 Terminal definition

Terminal Number	Definition	Description
1	DO0	Channel 0 output
2	COM0	Channel 0 Common Port
3	DO1	Channel 1 output
4	COM1	Channel 1 Common Port

5	DO2	Channel 2 output
6	COM2	Channel 2 Common Port
7	DO3	Channel 3 output
8	COM3	Channel 3 Common Port
9	NC	Not Connected
10	DO4	Channel 4 output
11	COM4	Channel 4 Common Port
12	DO5	Channel 5 output
13	COM5	Channel 5 Common Port
14	DO6	Channel 6 output
15	COM6	Channel 6 Common Port
16	DO7	Channel 7 output
17	COM7	Channel 7 Common Port
18	NC	Not Connected

4 Wiring


CT-2718
PW
STA
0
1
2
3
4
5
6
7
Internal Bus
DO0
COM0
DO1
COM1
DO2
COM2
DO3
COM3
NC
DO4
COM4
DO5
COM5
DO6
COM6
DO7
COM7
NC
V
L
AC/DC
0V
24V
PE
Field Power

5 Process data definition

Output Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DO Ch#7	DO Ch#6	DO Ch#5	DO Ch#4	DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0

Data description：

DO Ch#(0-7)： When the bit is 1, the output signal of corresponding channel is effective and the output contact of relay is closed.When the bit is 0, the output is invalid and the relay contact is disconnected.

0: The output signal is invalid

1: The output signal is valid

6 Configuration parameters definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault Action for Output Ch#7	Fault Action for Output Ch#6	Fault Action for Output Ch#5	Fault Action for Output Ch#4	Fault Action for Output Ch#3	Fault Action for Output Ch#2	Fault Action for Output Ch#1	Fault Action for Output Ch#0
Byte 1	Fault Value for Output Ch#7	Fault Value for Output Ch#6	Fault Value for Output Ch#5	Fault Value for Output Ch#4	Fault Value for Output Ch#3	Fault Value for Output Ch#2	Fault Value for Output Ch#1	Fault Value for Output Ch#0

Data description：

Fault Action for Output Ch#(0-7)： Fault output mode. When IO module detects that internal bus communication is failed and enters offline mode, the output data will be processed in this mode. (Default: 0)

0: Hold the last output state.

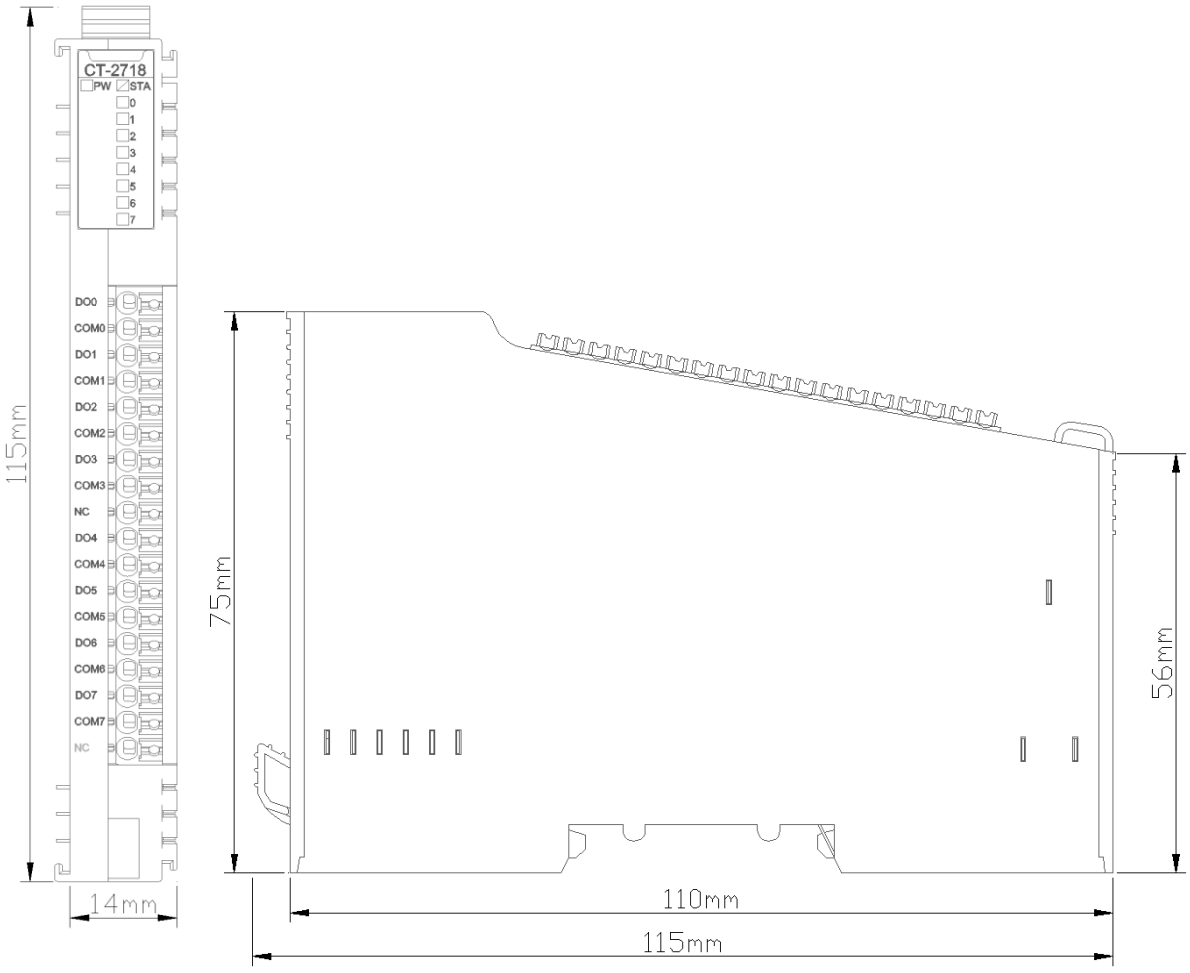
1: Output fault value

Fault Value for Output Ch#(0-7)： When the fault output mode is 1, this bit would set the fault output value, and when the internal bus of IO module is offline, this setting value will be output.(Default: 0)

0: Output low level.

1: Output high level.

A DIMENSION



CT-3158: 8 Channel Voltage Input

0~5VDC/0~10VDC/±5VDC/±10VDC, 12Bit

1 Module features

◆ The module supports 8 channels of voltage signal input

◆ The module could collect 0~5VDC, 0~10VDC, ±5VDC, ±10VDC, with a 12-bit resolution

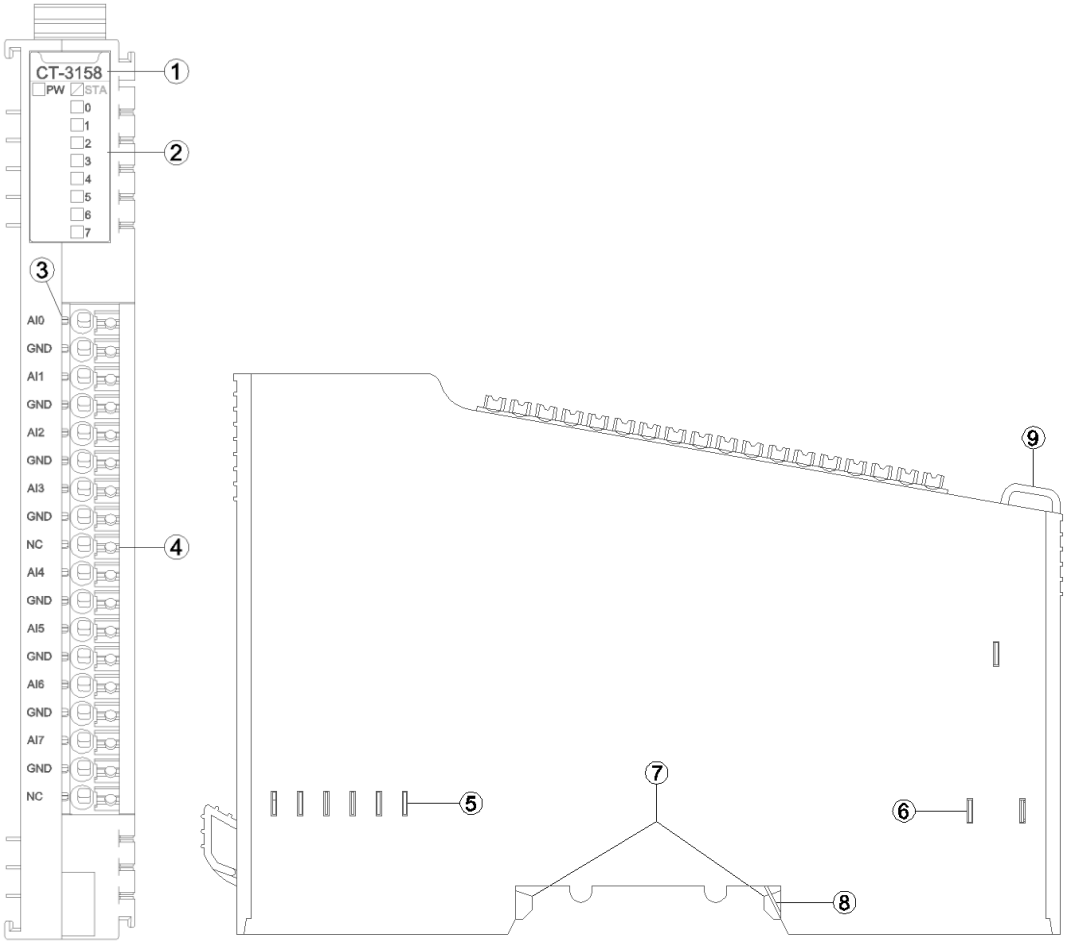
◆ The module carries with 8 analog input channel LED indicator

◆ The module input signal is a single ended common grounding input

2 Technical Parameters

General parameters	
Power	Max.90mA@5.0Vdc
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Not used
Wiring	I/O wiring：Max.1.5mm^2(AWG 16)
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Input Parameter	
Channel Number	8 channel voltage input
LED Indicator	8 channel input indicators
Input Voltage Range	0~5VDC、0~10VDC、±5VDC、±10VDC
Resolution	12Bit
Accuracy	±0.3%@25℃ ±0.5@-40~85℃
Output Impedance	1MΩ
Common Terminal	Common Grounding Input

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

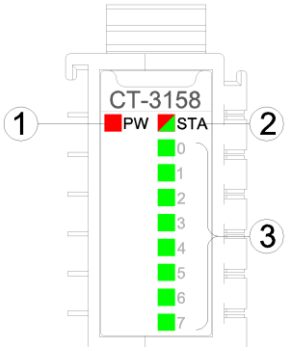
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LEDLED indicator definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

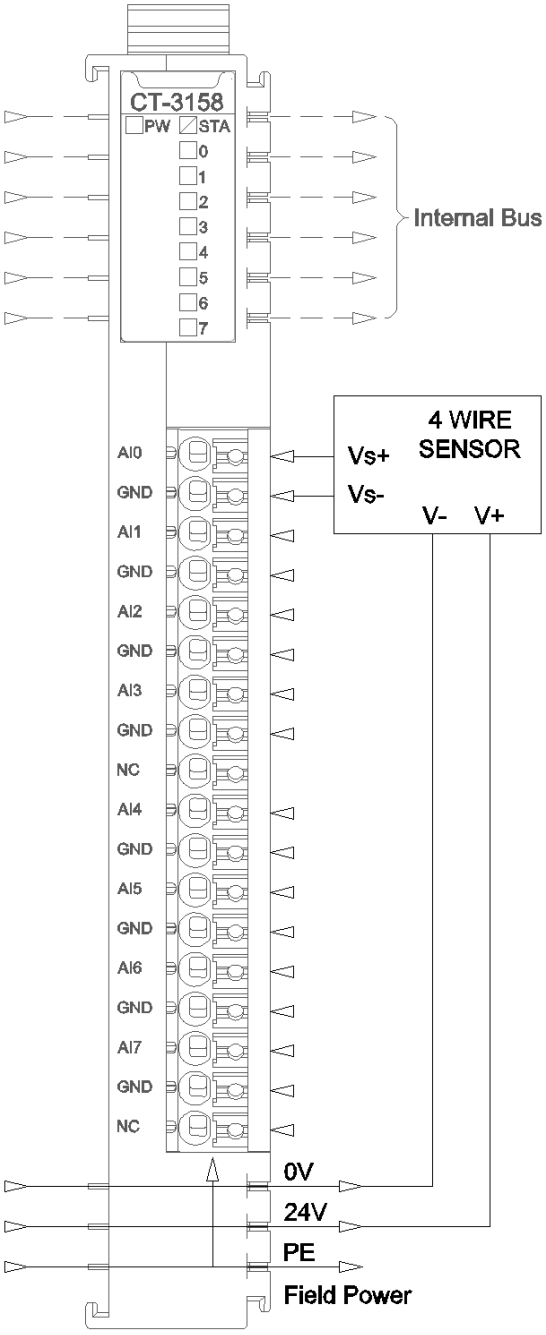
③ Intput channel LED indicator (green)

PW POWER STATE (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA MODULE STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-7 channel LED indicator (GREEN)	Definition
ON	The input signal exceeds 1% of the range
OFF	Invalid input signal

3.2 Terminal definition

Terminal Number	Definition	Description
1	AI0	Signal Input CH0
2	GND	
3	AI1	Signal Input CH1
4	GND	
5	AI2	Signal Input CH2
6	GND	
7	AI3	Signal Input CH3
8	GND	
9	NC	Not Connected
10	AI4	Signal Input CH4
11	GND	
12	AI5	Signal Input CH5
13	GND	
14	AI6	Signal Input CH6
15	GND	
16	AI7	Signal Input CH7
17	GND	
18	NC	Not Connected

4 Wiring


CT-3158
PW
STA
0
1
2
3
4
5
6
7
Internal Bus
4 WIRE
SENSOR
Vs+
Vs-
V-
V+
AI0
GND
AI1
GND
AI2
GND
AI3
GND
NC
AI4
GND
AI5
GND
AI6
GND
AI7
GND
NC
0V
24V
PE
Field Power

5 Process data definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data(CH 0)							
Byte 1								
Byte 2	Analog Input Data(CH 1)							
Byte 3								
Byte 4	Analog Input Data(CH 2)							
Byte 5								
Byte 6	Analog Input Data(CH 3)							
Byte 7								
Byte 8	Analog Input Data(CH 4)							
Byte 9								
Byte 10	Analog Input Data(CH 5)							
Byte 11								
Byte 12	Analog Input Data(CH 6)							
Byte 13								
Byte 14	Analog Input Data(CH 7)							
Byte 15								

Data Declaration：

Analog Input Data (CH0-7)：Voltage input data value

Process Data Definition (8AI)					
Voltage(0-5 V)	Voltage (0-10V)	Voltage (±5V)	Voltage (±10V)	Decimal	Hex
5	10	5	10	4095	0x0FFF
.	.	.	.	.	.
.	.	.	.	.	.
2.5	5	2.5	5	2047	0x07FF
.	.	.	.	.	.
.	.	.	.	.	.
0	0	0	0	0	0x0000
/	/	.	.	.	.
/	/	.	.	.	.
/	/	-2.5	-5	-2047	0xF801
/	/	.	.	.	.
/	/	.	.	.	.
/	/	-5	-10	-4095	0xF001

6 Configuration parameters definition

Configuration Parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							16Bit Data Format
Byte 1	Voltage Type (CH 0)	Voltage Type (CH 1)	Voltage Type (CH 2)	Voltage Type (CH 3)	Voltage Type (CH 4)	Voltage Type (CH 5)	Voltage Type (CH 6)	Voltage Type (CH 7)

Data Declaration：

16Bit Data Format： Sequence of 16-bit data byte transmission (Default:0)

0：A_B。

1：B_A。

Voltage Type(CH 0-7)： Input voltage type (Default:2)

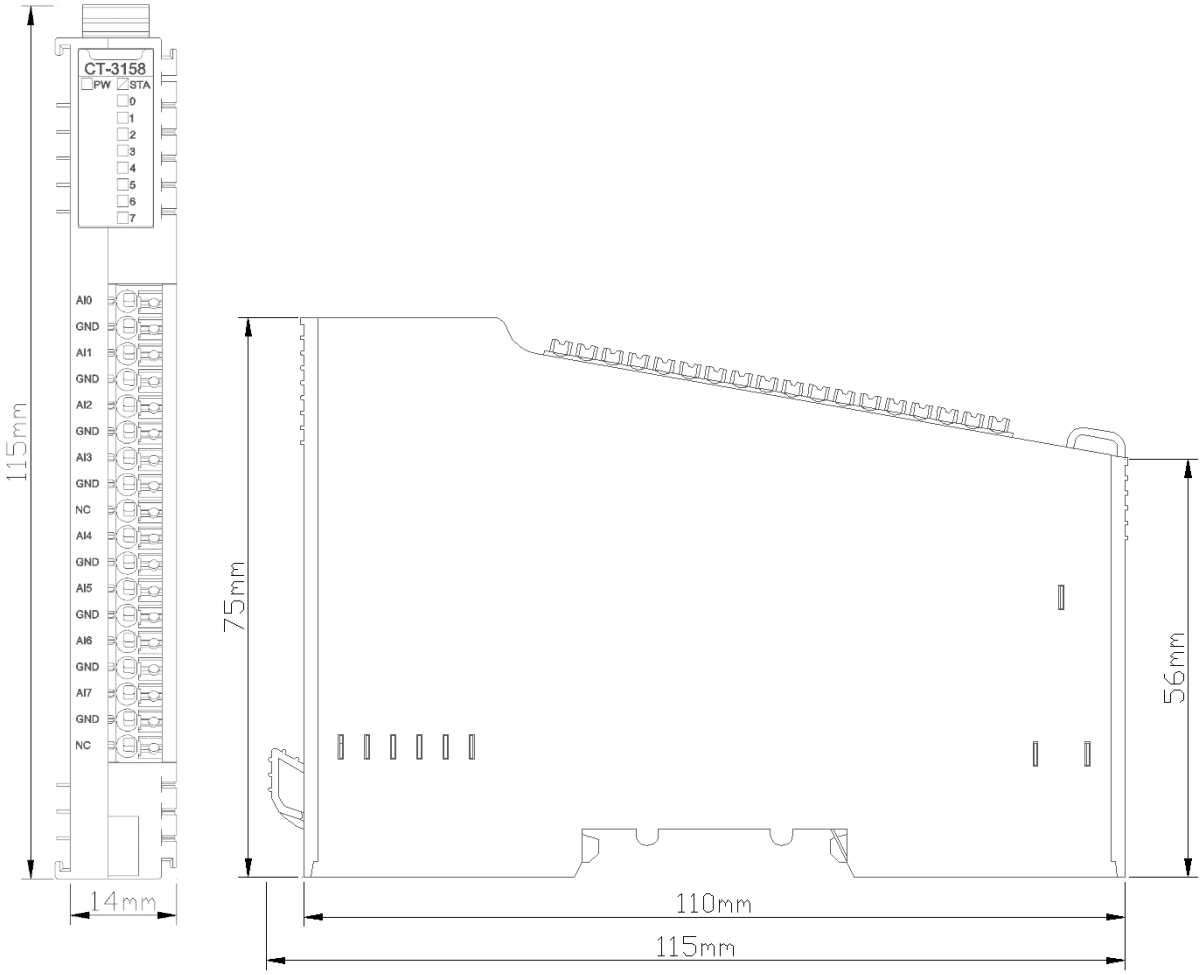
0：0~5Vdc。

1：-5~5Vdc。

2：0~10Vdc。

3：-10~10Vdc。

A DIMENSION


CT-3158
PW
STA
0
1
2
3
4
5
6
7
AI0
GND
AI1
GND
AI2
GND
AI3
GND
NC
AI4
GND
AI5
GND
AI6
GND
AI7
GND
NC
115mm
14mm
75mm
56mm
110mm
115mm

cCT-3238: 8-channel analog input /0&4-20mA/15-bit single-terminal

1 Module features

◆ The module supports 8-channel current signal acquisition.

◆ The module can be configured for 0-20mA or 4-20mA current signal acquisition.

◆ The module supports 2-wire (non-loop output, external power supply required) or 4-wire current sensor input.

◆ The internal bus of the module and field input adopts magnetic insulation.

◆ The module input channel is connected to the field active analog signal current output sensor.

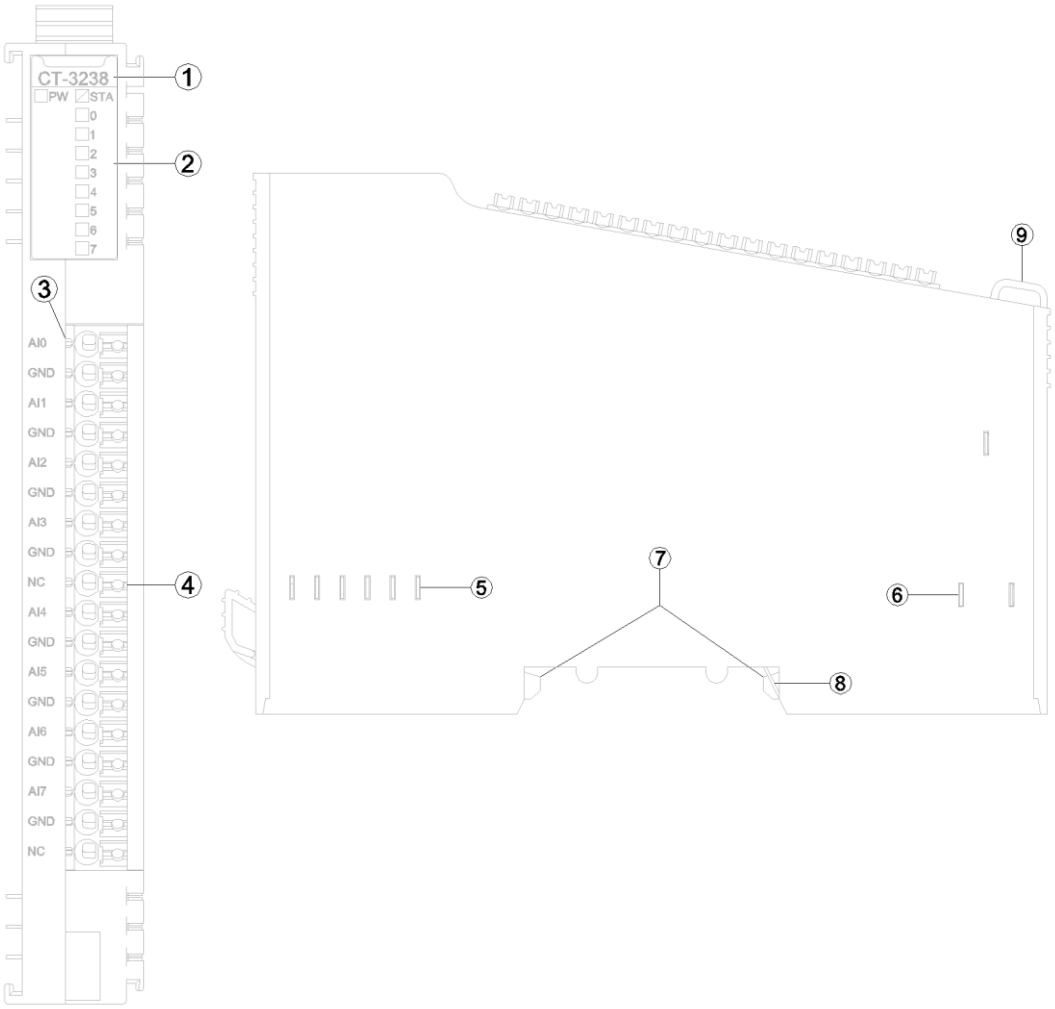
◆ The module channel equips with TVS overvoltage protection.

2 Technical parameters

General parameters	
Power	Max.65mA@5.0Vdc
Isolation	I/O to internal bus: magnetic isolation (2.5KVrms) Power isolation: DC-DC
Wiring	I/O wiring: Max.1.5mm ²(AWG 16)
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environmental parameters	
Working temperature	-40~85℃
Environmental humidity	5%-95% (No Condensation)
Protection grade	IP20
Input parameters	
Channel Number	8 channels
LED Indicator	8 LED channel State indicators
Input range	Maximum: 0 ~ 23.5 mA
Resolution ratio	15 Bit
Acquisition precision	±0.3% full range, @25℃
	±0.5% full range, @-20~70℃

Sampling rate	20 ms / 1 channel
Data format	16-bit signed integer

3 Hardware interfaces



① Module Type

② State indicator

③ (no field channel indicator)

④ Wiring Terminal and marking

⑤ Internal Bus

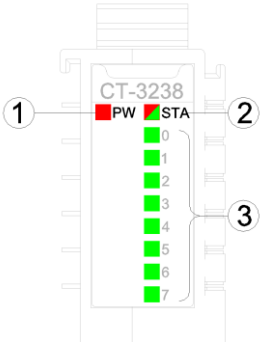
⑥ Field Power

⑦ Buckle

⑧ Grounding Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator lights



① Power indicator light (red)

② Module State indicator (red/green)

③ Input channel indicator light (green)

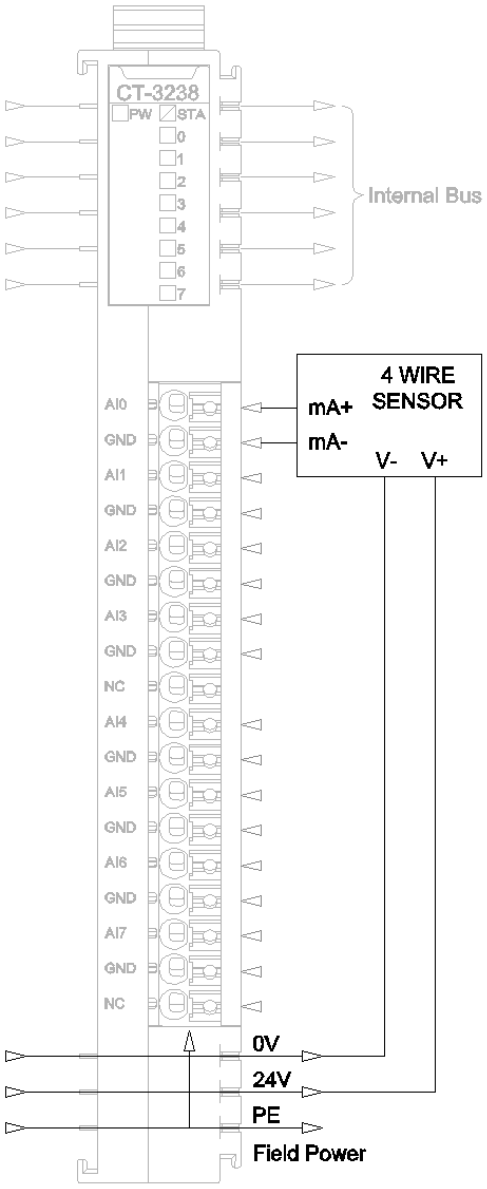
PW power indicator	Definition
ON	Internal bus power supply is normal
OFF	Internal bus power supply is failure
STA module State indicator	Definition
Green slow flash (2.5hz)	The internal bus of the module is not started
Red slow flash (2.5hz)	Module internal bus offline
Green on	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware upgrading
Red flashes twice	Module exception has been soft-restarted
0-7 channel indicator light	Definition
ON	Input signal >=1% range
OFF	Input signal <1% range

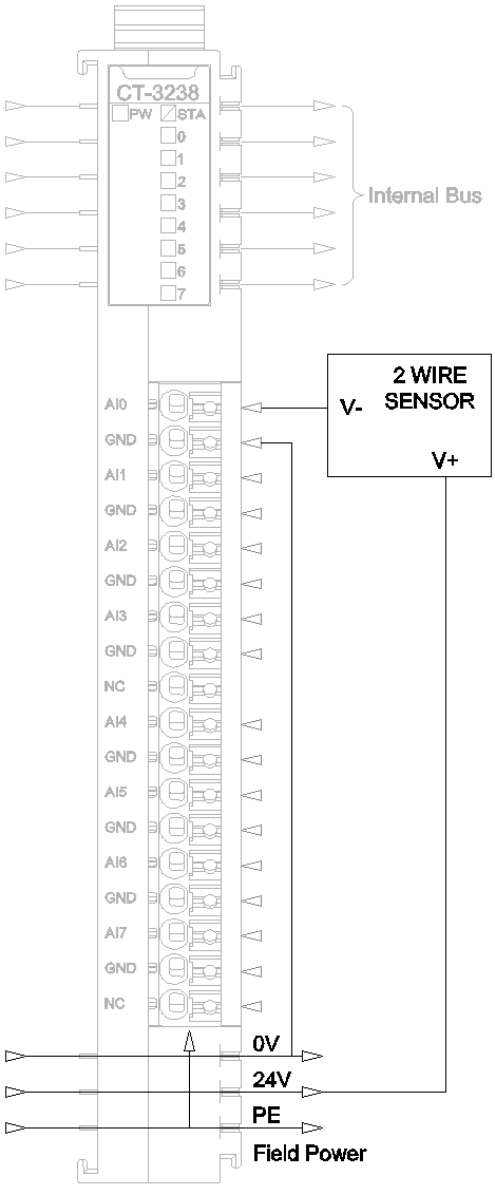
3.2 Terminal definition

Terminal number	Definition	Instruction
1	AI0	Current input CH0
2	GND	
3	AI1	Current input CH1
4	GND	
5	AI2	Current input CH2
6	GND	
7	AI3	Current input CH3
8	GND	

9	NC	Not connected
10	AI4	Current input CH4
11	GND	
12	AI5	Current input CH5
13	GND	
14	AI6	Current input CH6
15	GND	
16	AI7	Current input CH7
17	GND	
18	NC	Not connected

4 Wiring


CT-3238
PW
STA
0
1
2
3
4
5
6
7
Internal Bus
AI0
GND
AI1
GND
AI2
GND
AI3
GND
NC
AI4
GND
AI5
GND
AI6
GND
AI7
GND
NC
4 WIRE
SENSOR
mA+
mA-
V-
V+
0V
24V
PE
Field Power


CT-3238
PW
STA
0
1
2
3
4
5
6
7
Internal Bus
AI0
GND
AI1
GND
AI2
GND
AI3
GND
NC
AI4
GND
AI5
GND
AI6
GND
AI7
GND
NC
2 WIRE
SENSOR
V-
V+
0V
24V
PE
Field Power

5 Process data definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								
Byte 8	Analog Input Data (CH 4)							
Byte 9								
Byte 10	Analog Input Data (CH 5)							
Byte 11								
Byte 12	Analog Input Data (CH 6)							
Byte 13								
Byte 14	Analog Input Data (CH 7)							
Byte 15								

Data description:

Analog Input Data (CH0-7)： Analog signal Input value of corresponding channel.

Analog Input Data (CT-3238)				
Current (0-20mA)	Current (4-20mA)	Decimal	Hexadecimal	Location
>23.515	>22.810	32767	7FFF	Overflow
23.515	22.81	32511	7EFF	Exceed the upper limit
.	.	.	.	
.	.	.	.	
20.0007	20.0005	27649	6C01	
20	20	27648	6C00	Rated range
.	.	.	.	
.	.	.	.	
0	4	0	0000	
<0.0	3.9995	-1	FFFF	Exceed the lower limit
	.	.	.	
	.	.	.	

	1.1852	-4864	ED00	
	<1.1852	-32768	8000	Underflow

For example: AI0 input monitoring value of the CT-3238 is 16#3126=12582, if it chooses the range of 4-20mA, then the theoretical input value of AI0 is: 12582/27648*16+4=11.28125mA.

For example: AI0 input monitoring value of the CT-3238 is 16#3126=12582, if it chooses the range of 0-20mA, then the theoretical input value of AI0 is: 12582/27648*16=7.28125mA

6 Configuration parameter definition

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	16Bit Data Format							
Byte 1	Current Type Ch#7	Current Type Ch#6	Current Type Ch#5	Current Type Ch#4	Current Type Ch#3	Current Type Ch#2	Current Type Ch#1	Current Type Ch#0

Data description:

16Bit Data Format：Analog data storage format. (default: 0)

0：A-B

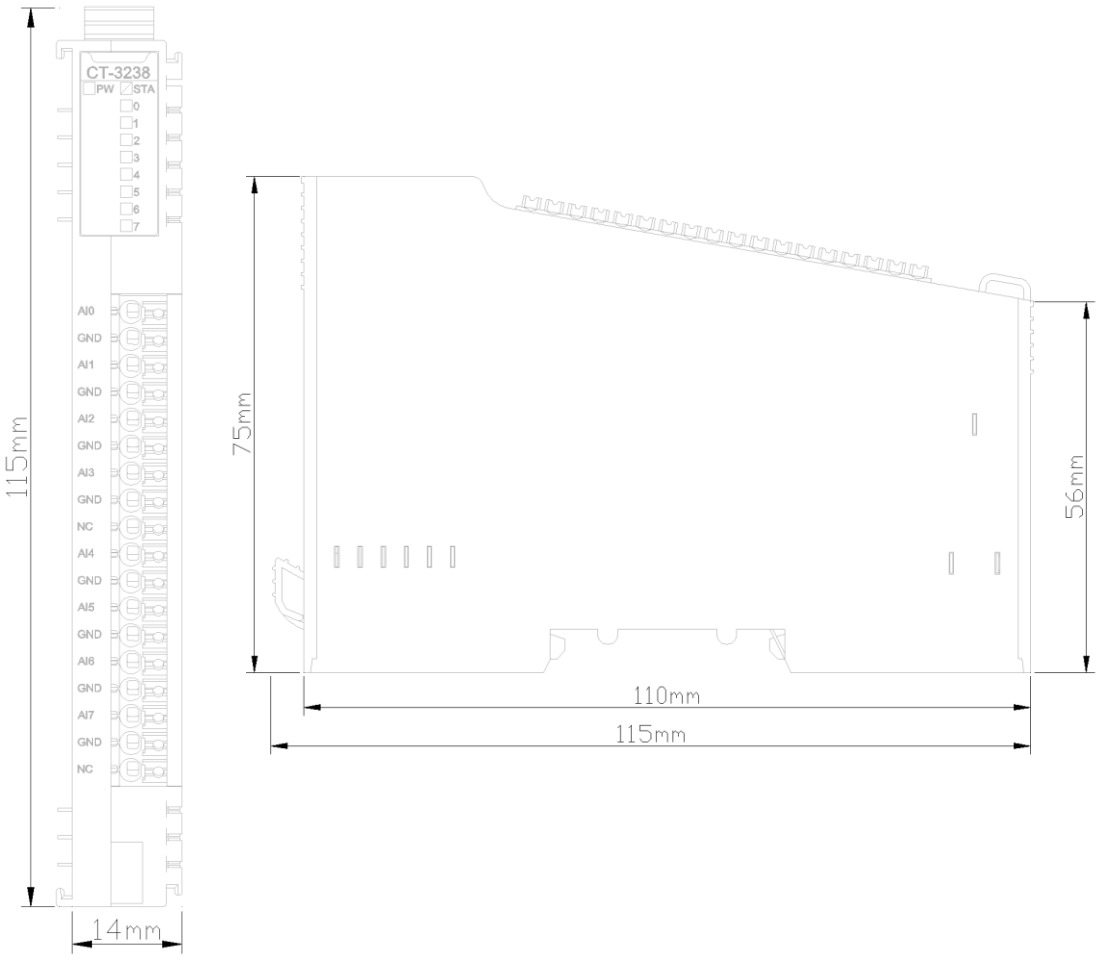
1：B-A

Current Type Ch#(0-7)：Type of input signal. (default: 1)

0：0-20mA

1：4-20mA

A Dimension drawing



CT-3713: 3-channel RTD-PT100 temperature acquisition module

1 Module features

◆ The module supports 3-channel RTD thermal resistance (PT100) temperature acquisition

◆ The module could be connected to a 2-wire or 3-wire PT100 temperature sensor

◆ The internal bus of the module and field input adopts magnetic isolation

◆ The module carries with 3 analog input channel LED indicator

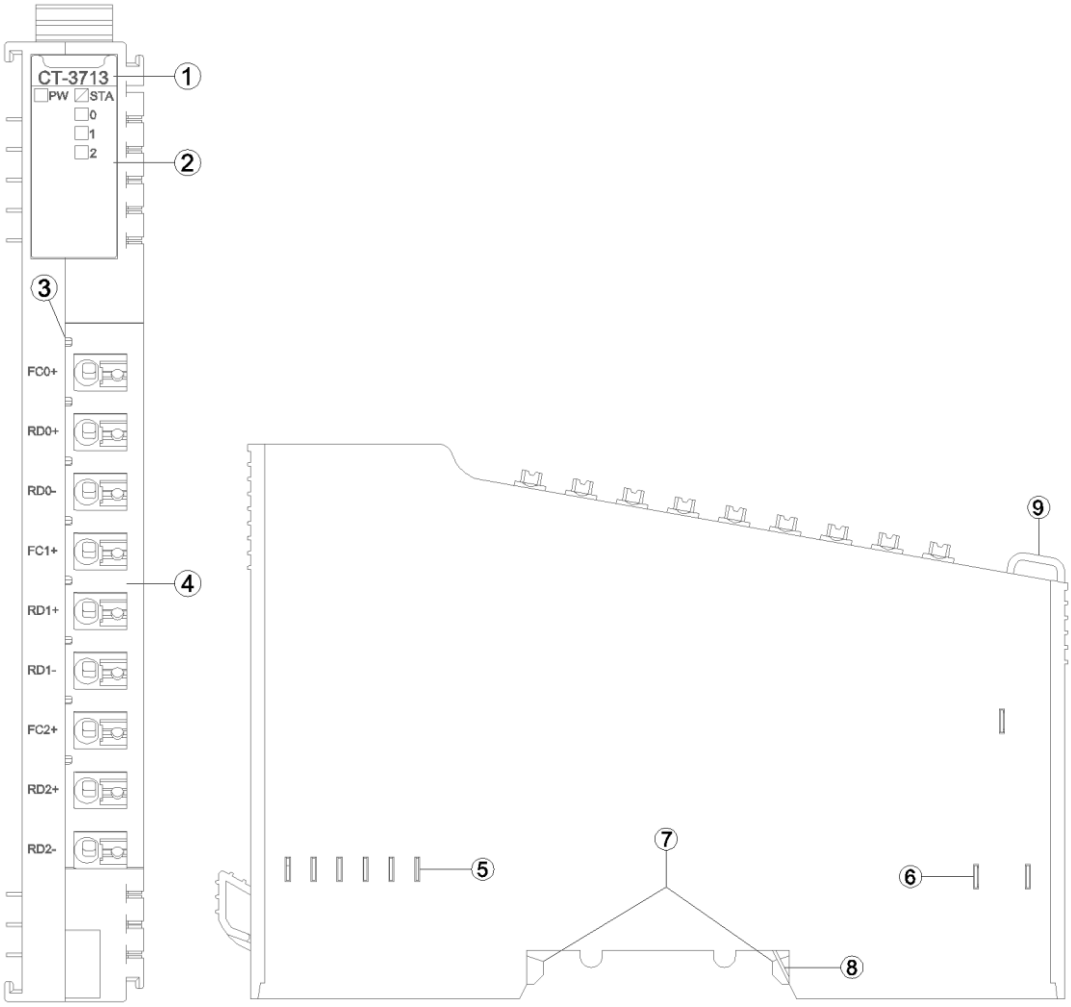
◆ 15-bit ADC resolution

2 Technical Parameters

General parameters	
Power	Max.35mA@5.0Vdc
Isolation	I/O to internal bus: magnetic isolation (2.5KVrms)
Field Power	Not used
Wiring	I/O Wiring：Max.1.5mm^2(AWG 16)
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Input Parameter	
Channel Number	3 Channels
LED Indicator	3 Green LED
Resolution	15 bit
Sensor Type	PT100
Measurement Range	-240~880℃

Measurement Accuracy	0.5℃
Single Channel Conversion Time	MAX.21ms

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

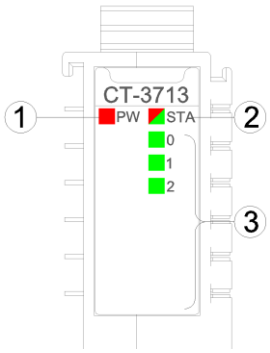
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LEDLED indicator definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

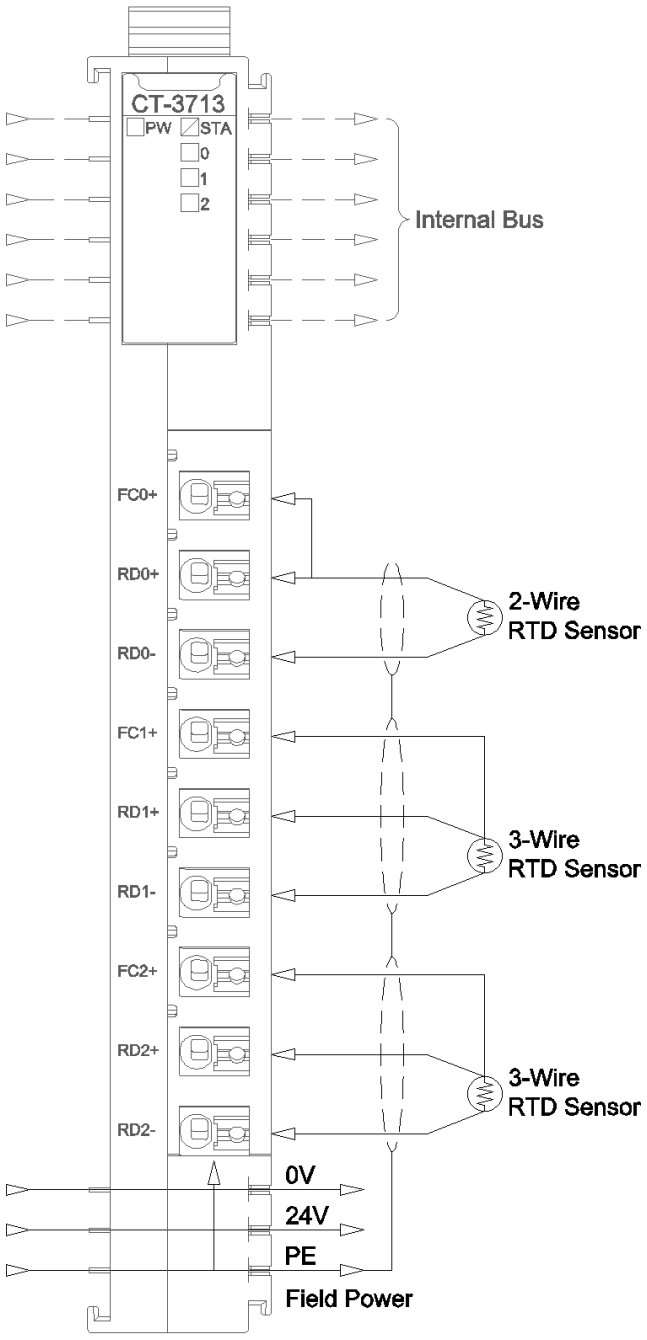
③ Output channel LED indicator (green)

PW POWER STATE (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA MODULE STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-2 Channel Indicator	Definition
ON	The input signal exceeds 1% of the range
OFF	Invalid input signal

3.2 Terminal definition

Terminal Number	Definition	Description
1	FC0+	Signal Input CH0
2	RD0+	
3	RD0-	
4	FC1+	Signal Input CH1
5	RD1+	
6	RD1-	
7	FC2+	Signal Input CH2
8	RD2+	
9	RD2-	

4 Wiring


CT-3713
PW
STA
0
1
2
Internal Bus
FC0+
RD0+
RD0-
FC1+
RD1+
RD1-
FC2+
RD2+
RD2-
2-Wire
RTD Sensor
3-Wire
RTD Sensor
3-Wire
RTD Sensor
0V
24V
PE
Field Power

5 Process data definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data(CH 0)							
Byte 1								
Byte 2	Analog Input Data(CH 1)							
Byte 3								
Byte 4	Analog Input Data(CH 2)							
Byte 5								

Data Declaration：

Analog Input Data (CH0-2)：Analog channel input data values

Process Data Definition			
Temperature	Decimal	Hex	Location
>880.0	32767	7FFF	Overflow
880.0	8800	2260	Exceeds the upper limit
.	.	.	
.	.	.	
850.1	8501	2135	
850.0	8500	2134	Rated range
.	.	.	
.	.	.	
-200.0	-2000	F830	
-200.1	-2001	F82F	Exceeds the lower limit
.	.	.	
.	.	.	
-240.0	-2400	F6A0	
<-240.0	-32768	8000	Underflow

6 Configuration parameters definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							16Bit Data Format

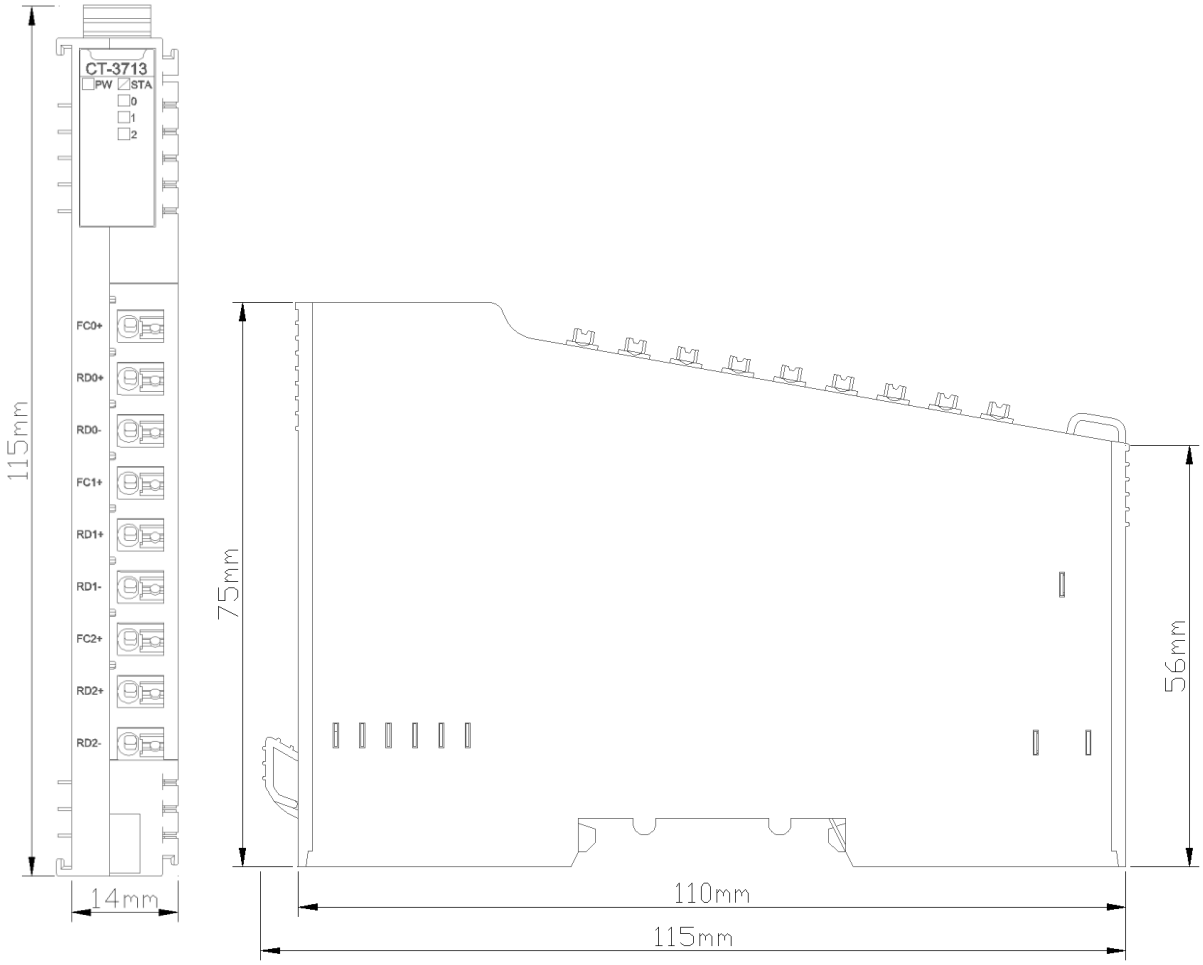
Data Declaration：

16Bit Data Format：Sequence of 16-bit data byte transmission (Default: 0)

0：A_B

1：B_A

A DIMENSION


CT-3713
PW
STA
0
1
2
FC0+
RD0+
RD0-
FC1+
RD1+
RD1-
FC2+
RD2+
RD2-
115mm
14mm
75mm
56mm
110mm
115mm

CT-3804: 4 channels Analog Input,Thermocouple（ J type, K type, E type, T type, Stype, R type, B type, N type, C type）

1 Module features

◆ The module supports 4-channel thermocouple signal acquisition

◆ The module carries with 4 analog LED indicators

◆ The module supports 9 kinds of conventional thermocouple temperature measurement type

◆ The internal bus of the module and field input adopts magnetic isolation

◆ The module input channel supports TVS overvoltage protection

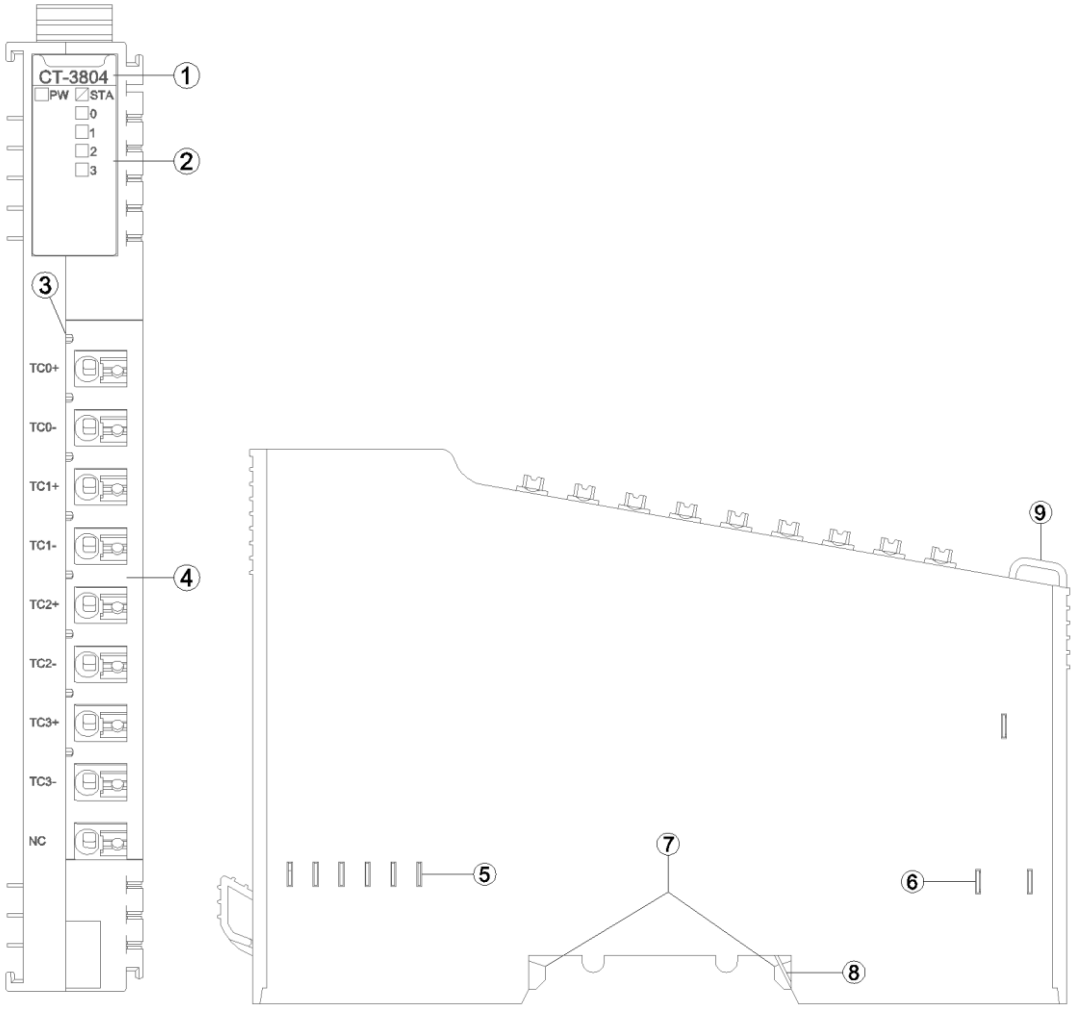
◆ 24-bit ADC resolution (Σ-δ type)

2 Technical Parameters

General parameters	
Power	Max.50mA@5.0Vdc
Isolation	I/O to internal bus: magnetic isolation (2.5KVrms)
Field Power	Not used
Wiring	I/O Wiring：Max.1.5mm ²(AWG 16)
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Input Parameter	
Channel Number	4 Channels
LED Indicator	4 Input LED Indicators
Sensor Type	J / K/ E / T / S / R / B / N / C type thermocouples

Acquisition Accuracy		±0.3% Full Scale，@25℃ ±0.5% Full Scale，@-40~85℃
Single Channel Sampling Rate		50Hz (Max.)
Measuring Range ℃	J Type	-210~1200℃
	K Type	-270~1370℃
	E Type	-270~1000℃
	T Type	-270~400℃
	S Type	-50~1760℃
	R Type	-50~1760℃
	B Type	0~1820℃
	N Type	-270~1300℃
	C Type	0~2320℃
Data Format		16-Bit Signed Integer (Integer)

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

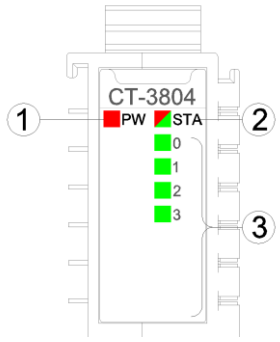
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LEDLED indicator definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

③ Output channel LED indicator (green)

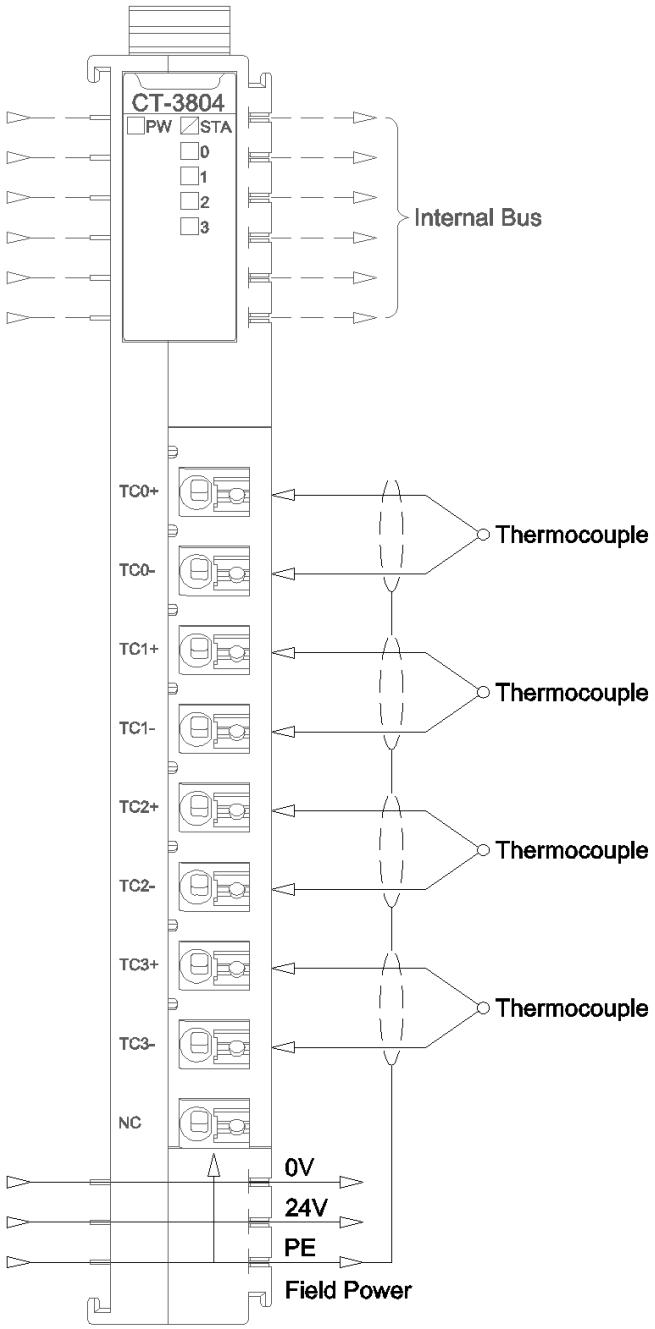
PW POWER STATE (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA MODULE STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-3 Channel Indicator	Definition
ON	The input signal exceeds 1% of the range
OFF	Invalid output signal

3.2 Terminal definition

Terminal Number	Definition	Description
1	TC0+	Signal Input CH0
2	TC0-	
3	TC1+	Signal Input CH1

4	TC1-	
5	TC2+	Signal Input CH2
6	TC2-	
7	TC3+	Signal Input CH3
8	TC3-	
9	NC	Not Connected

4 Wiring



5 Process data definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data(CH 0)							
Byte 1								
Byte 2	Analog Input Data(CH 1)							
Byte 3								
Byte 4	Analog Input Data(CH 2)							
Byte 5								
Byte 6	Analog Input Data(CH 3)							
Byte 7								

Data Declaration：

Analog Input Data (CH0-3)：The current temperature acquisition value of the corresponding channel

Process Data Definition - J Type			
Temperature	Decimal	Hex	Location
>1360.0	32767	7FFF	Overflow
1360.0	13600	3520	Exceeds the upper limit
.	.	.	
.	.	.	
1200.1	12001	2EE1	
1200.0	12000	2EE0	Rated range
.	.	.	
.	.	.	
-210.0	-2100	F7CC	
<-210.0	-32768	8000	Underflow

Process Data Definition - K Type			
Temperature	Decimal	Hex	Location
>1622.0	32767	7FFF	Overflow
1622.0	16220	3F5C	Exceeds the upper limit
.	.	.	
.	.	.	
1372.1	13721	3599	
1372.0	13720	3598	Rated range
.	.	.	

.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

Process Data Definition – E Type			
Temperature	Decimal	Hex	Location
>1200.0	32767	7FFF	Overflow
1200.0	12000	2EE0	Exceeds the upper limit
.	.	.	
.	.	.	
1000.1	10001	2711	
1000.0	10000	2710	Rated range
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

Process Data Definition –T Type			
Temperature	Decimal	Hex	Location
>540.0	32767	7FFF	Overflow
540.0	5400	1518	Exceeds the upper limit
.	.	.	
.	.	.	
400.1	4001	FA1	
400.0	4000	FA0	Rated range
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

Process Data Definition –S Type			
Temperature	Decimal	Hex	Location
>1850.0	32767	7FFF	Overflow
1850.0	18500	4844	Exceeds the upper limit
.	.	.	
.	.	.	
1769.1	17691	451B	
1769.0	17690	451A	Rated range
.	.	.	
.	.	.	

-50.0	-500	FE0C	
-50.1	-501	FE0B	Exceeds the lower limit
.	.	.	
.	.	.	
-170.0	-1700	F95C	
<-170.0	-32768	8000	Underflow

Process Data Definition – R Type			
Temperature	Decimal	Hex	Location
>2019.0	32767	7FFF	Overflow
2019.0	20190	4EDE	Exceeds the upper limit
.	.	.	
.	.	.	
1769.1	17691	451B	
1769.0	17690	451A	Rated range
.	.	.	
.	.	.	
-50.0	-500	FE0C	
-50.1	-501	FE0B	Exceeds the lower limit
.	.	.	
.	.	.	
-170.0	-1700	F95C	
<-170.0	-32768	8000	Underflow

Process Data Definition - B Type			
Temperature	Decimal	Hex	Location
>2070.0	32767	7FFF	Overflow
2070.0	20700	50DC	Exceeds the upper limit
.	.	.	
.	.	.	
1820.1	18201	4719	
1820.0	18200	4718	Rated range
.	.	.	
.	.	.	
0.0	0		
<0.0	-32768	8000	Underflow

Process Data Definition – N Type			
Temperature	Decimal	Hex	Location
>1550.0	32767	7FFF	Overflow

1550.0	15500	3C8C	Exceeds the upper limit
.	.	.	
.	.	.	
1300.1	13001	32C9	
1300.0	13000	32C8	Rated range
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32768	8000	Underflow

Process Data Definition – C Type			
Temperature	Decimal	Hex	Location
>2320.0	32767	7FFF	Overflow
2320.0	23200	5AA0	Rated range
.	.	.	
.	.	.	
0.0	0		
<0.0	-32768	8000	Underflow

6 Configuration parameters definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							16Bit Data Format
Byte 1	TC Input Type (CH 1)				TC Input Type (CH 0)			
Byte 1	TC Input Type (CH 3)				TC Input Type (CH 2)			

Data Declaration:

16Bit Data Format：Big-endian and little-endian format of data upload:

0：A_B

1：B_A

TC Input Type(CH 0-3)：Sensor type of the channel：

0：Channel is disabled

1：J Type

2：K Type

3：E Type

4：T Type

5：S Type

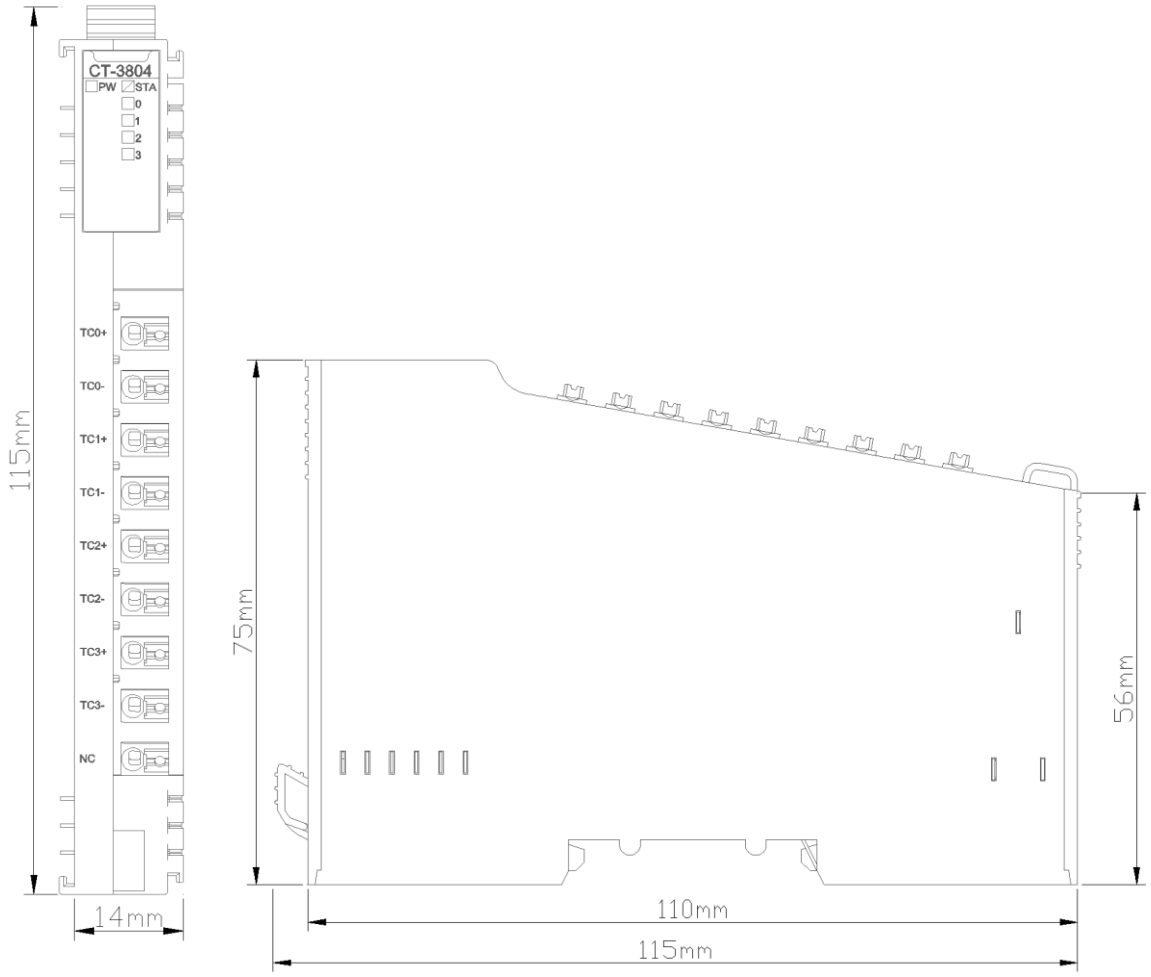
6：R Type

7：B Type

8：N Type

9：C Type

A DIMENSION


CT-3804
PW
STA
0
1
2
3
TC0+
TC0-
TC1+
TC1-
TC2+
TC2-
TC3+
TC3-
NC
115mm
14mm
75mm
56mm
110mm
115mm

CT-4154 4 channels Voltage Output 0~5VDC/0~10VDC/±5VDC/±10VDC,16 bits

1 Module features

◆The module supports 4 channels voltage signal output

◆ Output range：0~5VDC, 0~10VDC, ±5VDC, ±10VDC, 16 bits

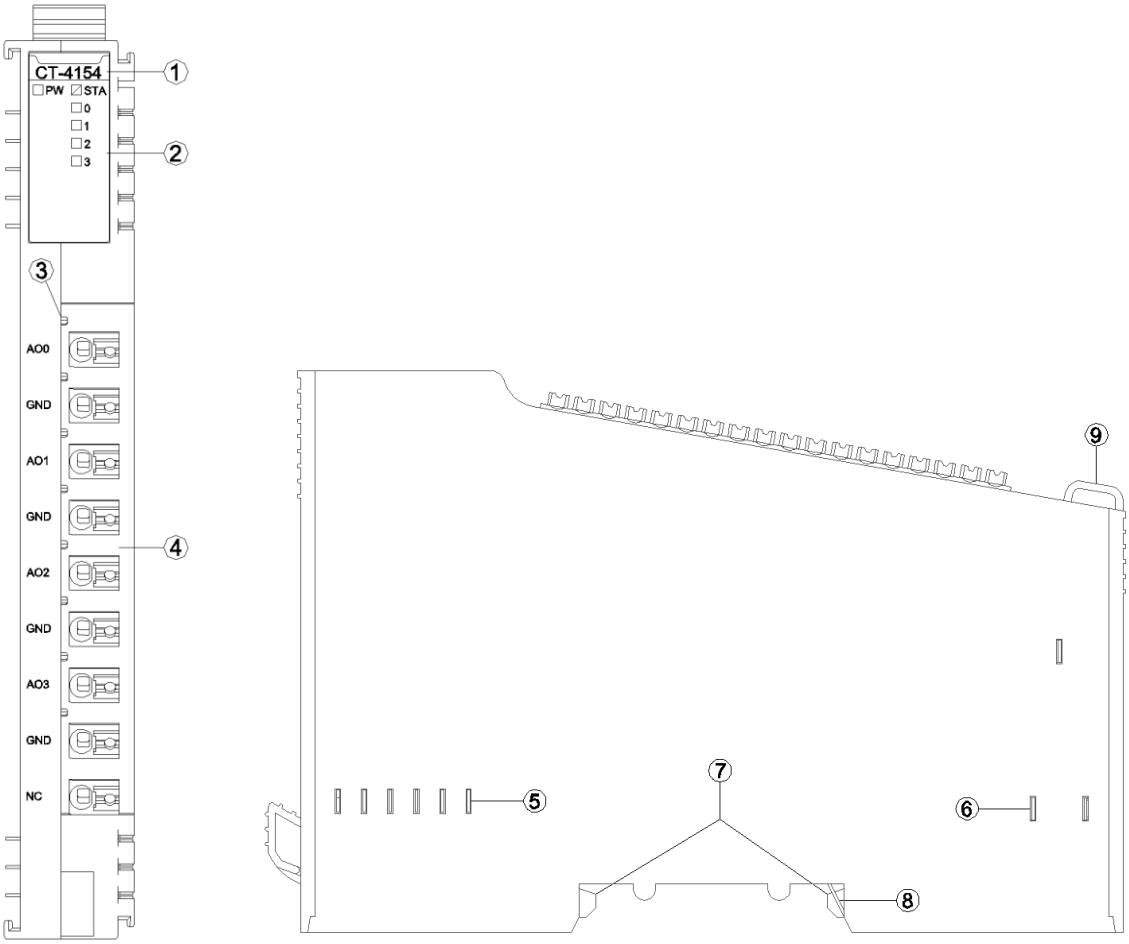
◆ The module carries with 4 analog output LED indicators

◆ Module output signal is single - ended common - grounded output

2 Technical Parameters

General parameters	
Power	Max.250mA@5.0Vdc
Isolation	I/O to internal bus: magnetic isolation (3KVrms)
Field Power	Not used
Wiring	I/O Wiring I/O：Max.1.5mm^2(AWG 16)
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Output Parameter	
Channel Number	4 Channels voltage output
LED Indicator	4 Channels voltage output indicator
Output Voltage Range	0~5VDC、0~10VDC、±5VDC、±10VDC
Load Resistance	Max.5kΩ
Resolution	16 bits
Acquisition Accuracy	±0.1%(Full Scale)@25℃ ±0.3(Full Scale)@-40~85℃
Sampling Rate	1 ms / all channels
Diagnose	Overtemperature/overcurrent status monitoring
Protection Current	20mA.
Common Port	Common grounded output

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

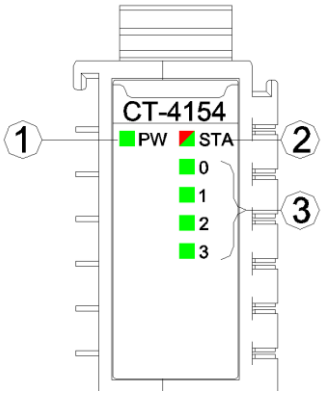
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

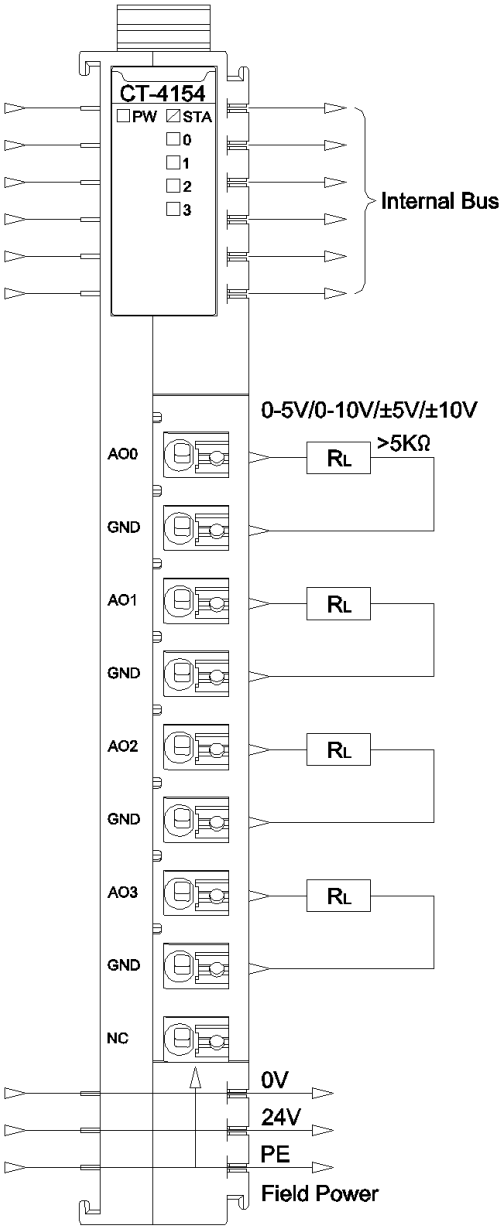
③ Output channel LED indicator (green)

PW POWER STATE (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA MODULE STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-3 Channel Indicator	Definition
ON	The output value is not 0
OFF	The output value is 0

3.2 Terminal definition

Terminal Number	Definition	Description
1	AO0	Signal Output CH0
2	GND	
3	AO1	Signal Output CH1
4	GND	
5	AO2	Signal Output CH2
6	GND	
7	AO3	Signal Output CH3
8	GND	
NC	NC	Not Connected

4 Wiring


CT-4154
PW
STA
0
1
2
3
Internal Bus
0-5V/0-10V/±5V/±10V
>5KΩ
AO0
GND
AO1
GND
AO2
GND
AO3
GND
NC
RL
0V
24V
PE
Field Power

5 Process data definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved			Over temperature	Overcurrent (CH3)	Overcurrent (CH2)	Overcurrent (CH1)	Overcurrent (CH0)
Output Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Output Data(CH 0)							
Byte 1								
Byte 2	Analog Output Data(CH 1)							
Byte 3								
Byte 4	Analog Output Data(CH 2)							
Byte 5								
Byte 6	Analog Output Data(CH 3)							
Byte 7								

Data Declaration：

Analog Output Data (CH0-4)：voltage output value

Unipolarity 0-5V/0-10V output value

Voltage (0-5V)	Voltage (0-10V)	Decimal	Hex
5	10	65535	0xFFFF
.	.	.	.
.	.	.	.
2.5	5	32767	0x7FFF
.	.	.	.
.	.	.	.
0	0	0	0x0000

Bipolar ±5V/±10V Output value

Voltage (±5V)	Voltage (±10V)	Decimal	Hex
5	10	32767	0x7FFF
.	.	.	.
.	.	.	.
2.5	5	16383	0x3FFF

.	.	.	.
.	.	.	.
0	0	0	0x0000
.	.	.	.
.	.	.	.
-2.5	-5	-16384	0XC000
.	.	.	.
.	.	.	.
-5	-10	-32768	0x8000

6 Configuration parameters definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							16Bit Data Format
Byte 1	Voltage Type(CH 1)				Voltage Type(CH 0)			
Byte 2	Voltage Type(CH 3)				Voltage Type(CH 2)			

Data Declaration:

16Bit Data Format：16 bits data byte transmission sequence (default value: A_B)

A_B：Big-endian format transmission

B_A：Little-endian format transmission

Voltage Type(CH 0-3)：Output voltage type (default value: 0~10Vdc)

Disable：Output disable

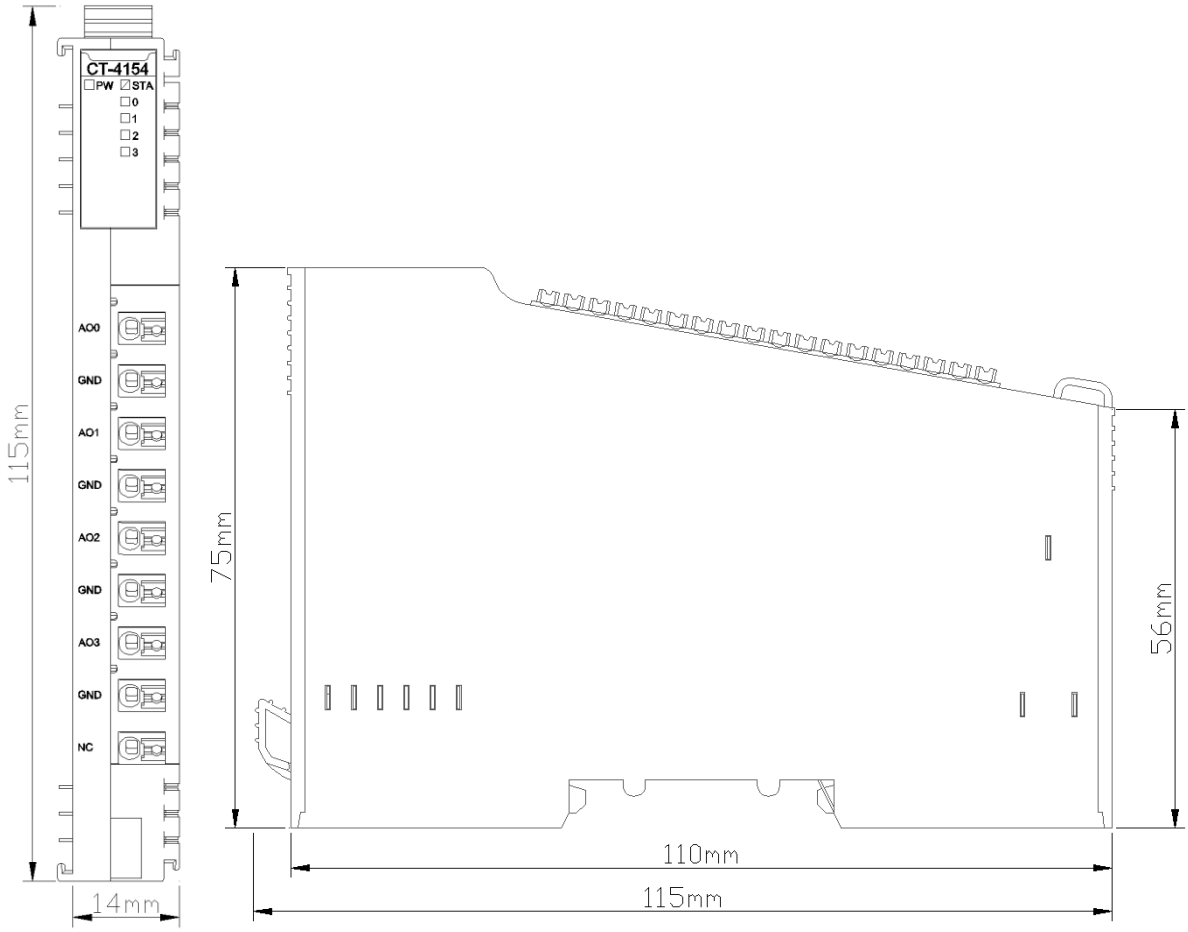
0~5Vdc：0~5V Direct-current output

0~10Vdc：0~10V Direct-current output

-5~5Vdc：-5~5V Direct-current output

-10~10Vdc：-10~10V Direct-current output

A DIMENSION


CT-4154
PW
STA
0
1
2
3
AO0
GND
AO1
GND
AO2
GND
AO3
GND
NC
115mm
14mm
75mm
56mm
110mm
115mm

CT-4158 8 channels Voltage Output

0~5VDC/0~10VDC/±5VDC/±10VDC,16bits

1 Module features

◆The module supports 8 channels voltage signal output

◆ Output range：0~5VDC, 0~10VDC, ±5VDC, ±10VDC，16 bits

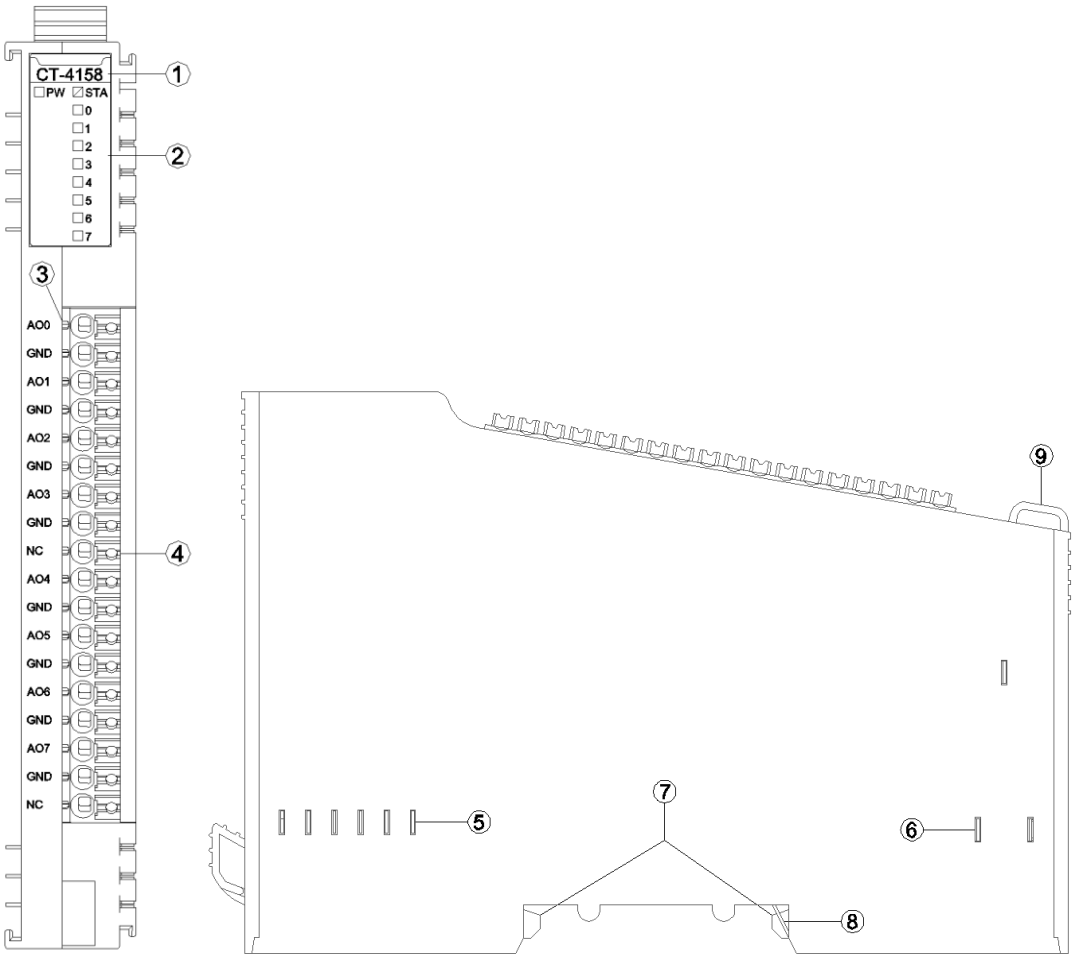
◆ The module carries with 8 analog output LED indicators

◆ Module output signal is single - ended common - grounded output

2 Technical Parameters

General parameters	
Power	Max.300mA@5.0Vdc
Isolation	I/O to internal bus: magnetic isolation (3KVrms)
Field Power	Not used
Wiring	I/O Wiring I/O：Max.1.5mm^2(AWG 16)
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Output Parameter	
Channel Number	8Channels voltage output
LED Indicator	8 Channels voltage output indicator
Output Voltage Range	0~5VDC、0~10VDC、±5VDC、±10VDC
Load Resistance	Max.5kΩ
Resolution	16 bits
Acquisition Accuracy	±0.1%(Full Scale)@25℃ ±0.3(Full Scale)@-40~85℃
Sampling Rate	1 ms / all channels
Diagnose	Overtemperature/overcurrent status monitoring
Protection Current	20mA.
Common Port	Common grounded output

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

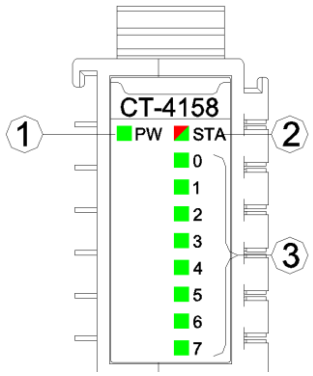
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

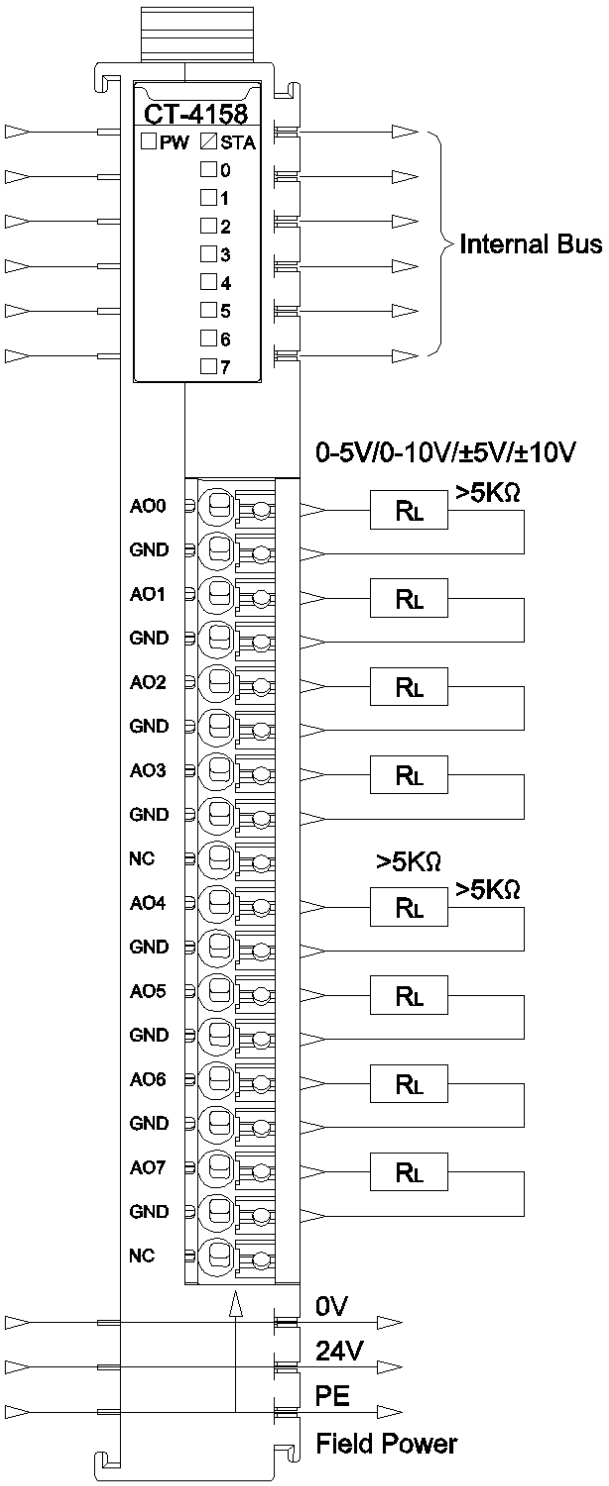
③ Output channel LED indicator (green)

PW POWER STATE (RED)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA MODULE STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-3 Channel Indicator	Definition
ON	The output value is not 0
OFF	The output value is 0

3.2 Terminal definition

Terminal Number	Definition	Description
1	AO0	Signal Output CH0
2	GND	
3	AO1	Signal Output CH1
4	GND	
5	AO2	Signal Output CH2
6	GND	
7	AO3	Signal Output CH3
8	GND	
9	NC	Not Connected
10	AO4	Signal Output CH4
11	GND	
12	AO5	Signal Output CH5
13	GND	
14	AO6	Signal Output CH6
15	GND	
16	AO7	Signal Output CH7
17	GND	
18	NC	Not Connected

4 Wiring


CT-4158
PW
STA
0
1
2
3
4
5
6
7
Internal Bus
0-5V/0-10V/±5V/±10V
AO0
GND
AO1
GND
AO2
GND
AO3
GND
NC
AO4
GND
AO5
GND
AO6
GND
AO7
GND
NC
RL
>5KΩ
>5KΩ
>5KΩ
0V
24V
PE
Field Power

5 Process data definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							Overtemperature
Output Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Output Data(CH 0)							
Byte 1								
Byte 2	Analog Output Data(CH 1)							
Byte 3								
Byte 4	Analog Output Data(CH 2)							
Byte 5								
Byte 6	Analog Output Data(CH 3)							
Byte 7								
Byte 8	Analog Output Data(CH 4)							
Byte 9								
Byte 10	Analog Output Data(CH 5)							
Byte 11								
Byte 12	Analog Output Data(CH 6)							
Byte 13								
Byte 14	Analog Output Data(CH 7)							
Byte 15								

Data Declaration：

Analog Output Data (CH0-7)：voltage output value

Unipolarity 0-5V/0-10V output value

Voltage (0-5V)	Voltage (0-10V)	Decimal	Hex
5	10	65535	0xFFFF
.	.	.	.
.	.	.	.
2.5	5	32767	0x7FFF
.	.	.	.
.	.	.	.
0	0	0	0x0000

Bipolar ±5V/±10V Output value

Voltage (±5V)	Voltage (±10V)	Decimal	Hex
5	10	32767	0x7FFF
.	.	.	.
.	.	.	.
2.5	5	16383	0x3FFF
.	.	.	.
.	.	.	.
0	0	0	0x0000
.	.	.	.
.	.	.	.
-2.5	-5	-16384	0XC000
.	.	.	.
.	.	.	.
-5	-10	-32768	0x8000

6 Configuration parameters definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							16Bit Data Format
Byte 1	Voltage Type(CH 1)				Voltage Type(CH 0)			
Byte 2	Voltage Type(CH 3)				Voltage Type(CH 2)			
Byte 3	Voltage Type(CH 5)				Voltage Type(CH 4)			
Byte 4	Voltage Type(CH 7)				Voltage Type(CH 6)			

Data Declaration:

16Bit Data Format：16 bits data byte transmission sequence (default value: A_B)

A_B：Big-endian format transmission

B_A：Little-endian format transmission

Voltage Type(CH 0-7)：Output voltage type (default value: 0~10Vdc)

Disable：Output disable

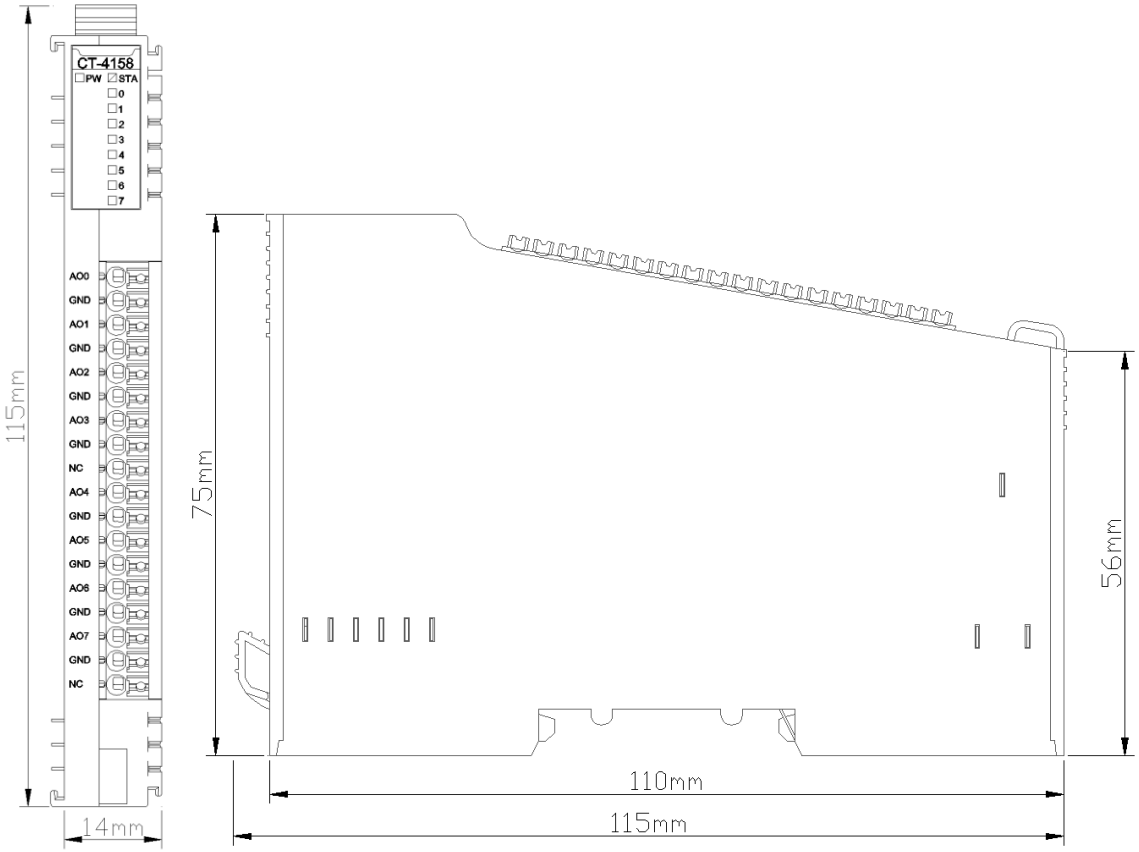
0~5Vdc：0~5V Direct-current output

0~10Vdc：0~10V Direct-current output

-5~5Vdc：-5~5V Direct-current output

-10~10Vdc：-10~10V Direct-current output

A DIMENSION



CT-4234: 4-channel analog output /0&4-20mA/16-bit single-terminal

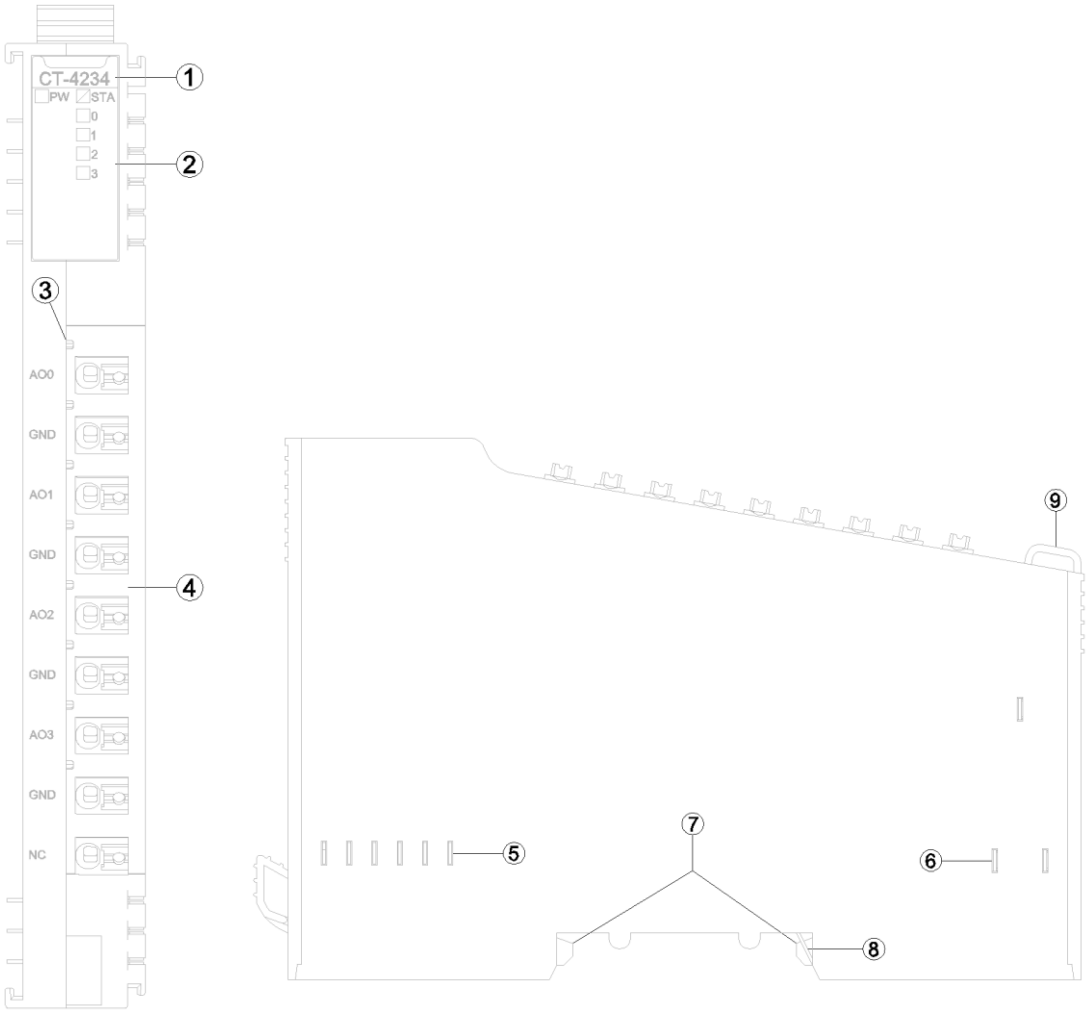
1 Module features

- ◆ 2 output ranges can be set(0-20mA、4-20mA)
- ◆ The module internal bus and field output adopts magnetic insulation
- ◆ Single-terminal grounded together output mode

2 Technical parameters

General parameters	
Power	Max.25mA@5.0Vdc
IO bus isolation	I/O to internal bus: magnetic isolation (2.5KVrms)
Wiring	I/O wiring: Max.1.5mm ²(AWG 16)
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environmental parameters	
Working temperature	-40~85℃
Environmental humidity	5%-95% (No Condensation)
Protection grade	IP20
Output parameters	
Channel Number	4 channels
resolution ratio	16Bit
Output range	0-20mA/4-20mA
The output precision	>0.3%
Diagnostic function	Disconnection or overload, field power supply error
The common terminal	0V grounded together, channels are not isolated
Conversion time	2ms/ all channels
load	Max.1KΩ

3 Hardware interfaces



① Module Type

② State Indicator

③ (non field channel indicator)

④ Wiring Terminal and Marking

⑤ Internal Bus

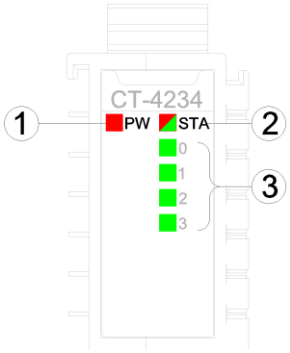
⑥ Field Power

⑦ Buckle

⑧ Grounding Sheet

⑨ Fixed Wiring Harness

3.1 LED indicators definition



① Power LED indicator (red)

② Module State LED indicator (red/green)

③ Output channel LED indicator (green)

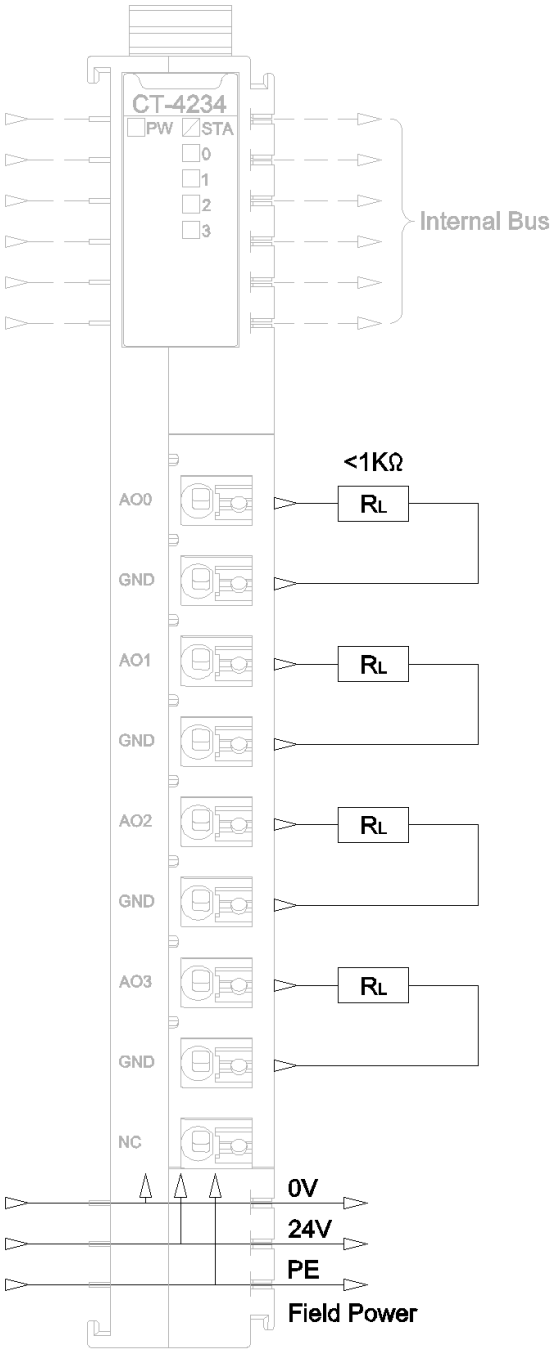
PW Power Indicator(Red)	Definition
ON	Internal bus power supply is normal
OFF	Internal bus power supply is failure
STA Module State Indicator(Red/Green)	Definition
Green Slow Flash (2.5hz)	The internal bus of the module is not started
Red Slow Flash (2.5hz)	Module internal bus offline
Green Normally On	Operation is normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware upgrading
Red Flashes Twice	Module exception has been soft-restarted
0-3 Channel Indicator Light	Definition
ON	Output signal >=1% range
OFF	Output signal <1% range

3.2 Terminal definition

Terminal number	Definition	Instructions
1	AO0	Current output CH0
2	GND	
3	AO1	Current output CH1
4	GND	
5	AO2	Current output CH2
6	GND	

7	AO3	Current output CH3
8	GND	
9	NC	Disconnected

4 Wiring



5 Progress data definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved		Field Power Error (CH0-3)	DAC Communication Error (CH0-3)	Output Opening or Overload (CH3)	Output Opening or Overload (CH2)	Output Opening or Overload (CH1)	Output Opening or Overload (CH0)
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Output Data (CH 0)							
Byte 1								
Byte 2	Analog Output Data (CH 1)							
Byte 3								
Byte 4	Analog Output Data (CH 2)							
Byte 5								
Byte 6	Analog Output Data (CH 3)							
Byte 7								

Data description:

Output Opening or Overload (CH0-3)： Current output diagnostic State, when the corresponding Output channel is open or overloaded, this bit is set to 1, and it will be automatically cleared when the load returns to normal.

0: normal is load

1: openload or overload

DAC Communication Error(CH0-3)： DAC converter Communication is Error. This Error will occur when the field power supply is disconnected or the DAC and isolator are damaged.

0: DAC communication is normal

1: DAC conversion failed

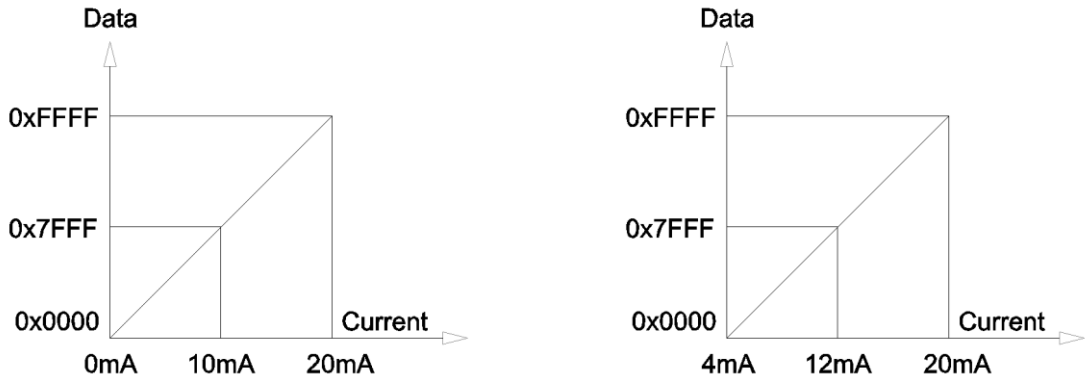
Field Power Error (CH0-3)： This Error will occur when the Field Power is not powered on.

0: field power access is normal

1: field power access is failure

Analog Output Data(CH0-3)： Analog Output value, 16-bit unsigned integer.

Analog Output Data (CT-4234)			
Current (0 to 20 mA)	Current (4-20 mA)	Decimal 16 bits	Hexadecimal 16 bits
20	20	65535	0xFFFF
.	.	.	.
.	.	.	.
.	.	.	.
10	12	32767	0x7FFF
.	.	.	.
.	.	.	.
.	.	.	.
0	4	0	0x0000



16Bit Data/Current

6 Configuration parameter definition

Configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							16Bit Data Format
Byte 1	Reserved				Current Type CH3	Current Type CH2	Current Type CH1	Current Type CH0

Data description:

16Bit Data Format：Analog data storage format. (Default: 0)

0：A-B

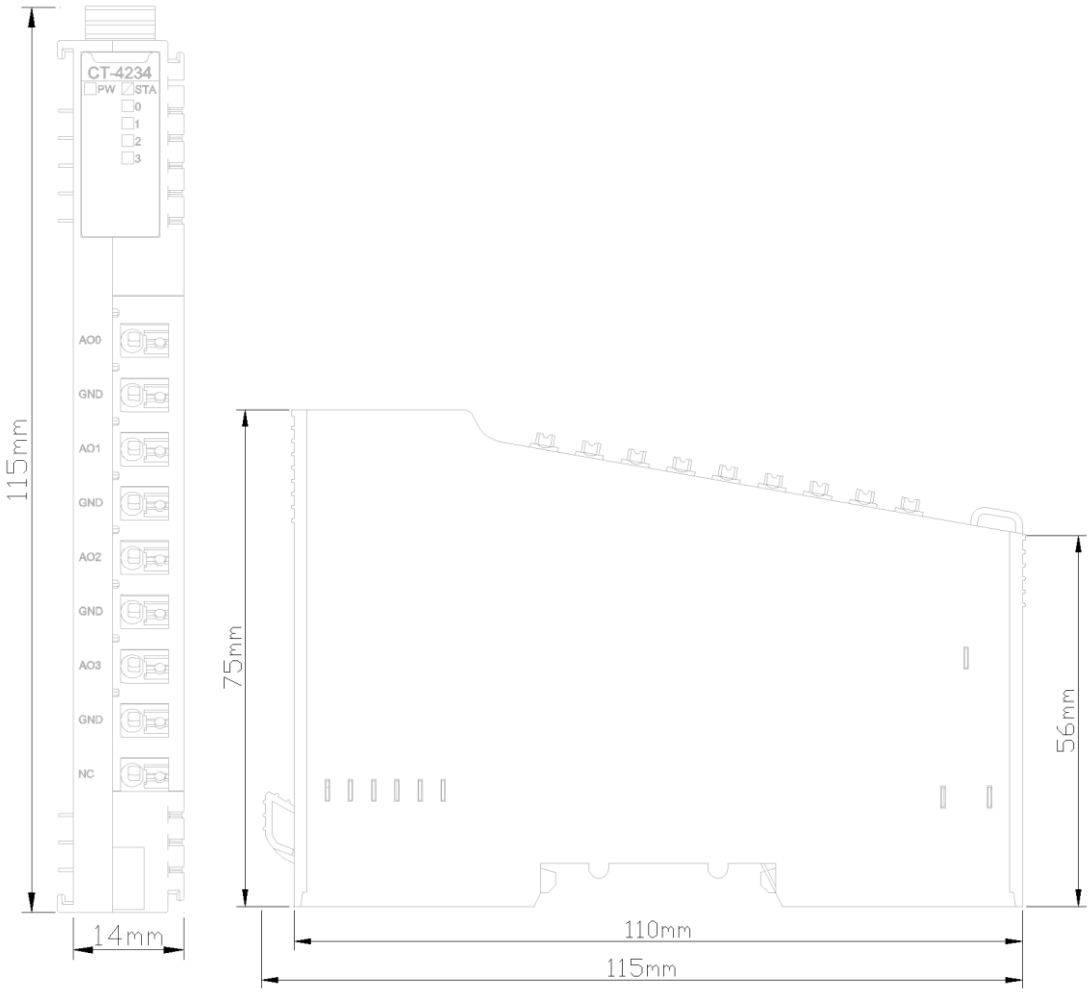
1：B-A

Current Type(CH0-3)：Type of output current. (Default: 1)

0：0-20mA

1：4-20mA

A Dimension drawing



CT-5321 Modbus Serial Port Module

1 Module Description

The Modbus serial port module supports 1 channel RS485/RS232 /RS422 (optional), supports Modbus RTU/ASCII protocol, and supports master, slave and free transparent transmission mode.

The serial Module **CT-5321** could be applied with the adapter modules, so it could convert Modbus into other protocols such as Modbus TCP, Profinet, EtherCAT, EtherNet/IP, etc. When the module is used, serial port parameters and Modbus instructions should be configured in IO Config software.

Devices with RS485/RS232/RS422 interface, which support modbus-RTU /ASCII, could be applied with **CT-5321** to realize interconnection with upper PLC or upper computers. **CT-5321** could be applied with devices such as: PLC, DCS, remote IO, VFD, motor start protection device, intelligent high and low voltage electrical apparatus, power measurement device, intelligent field measurement equipment and instruments, etc.

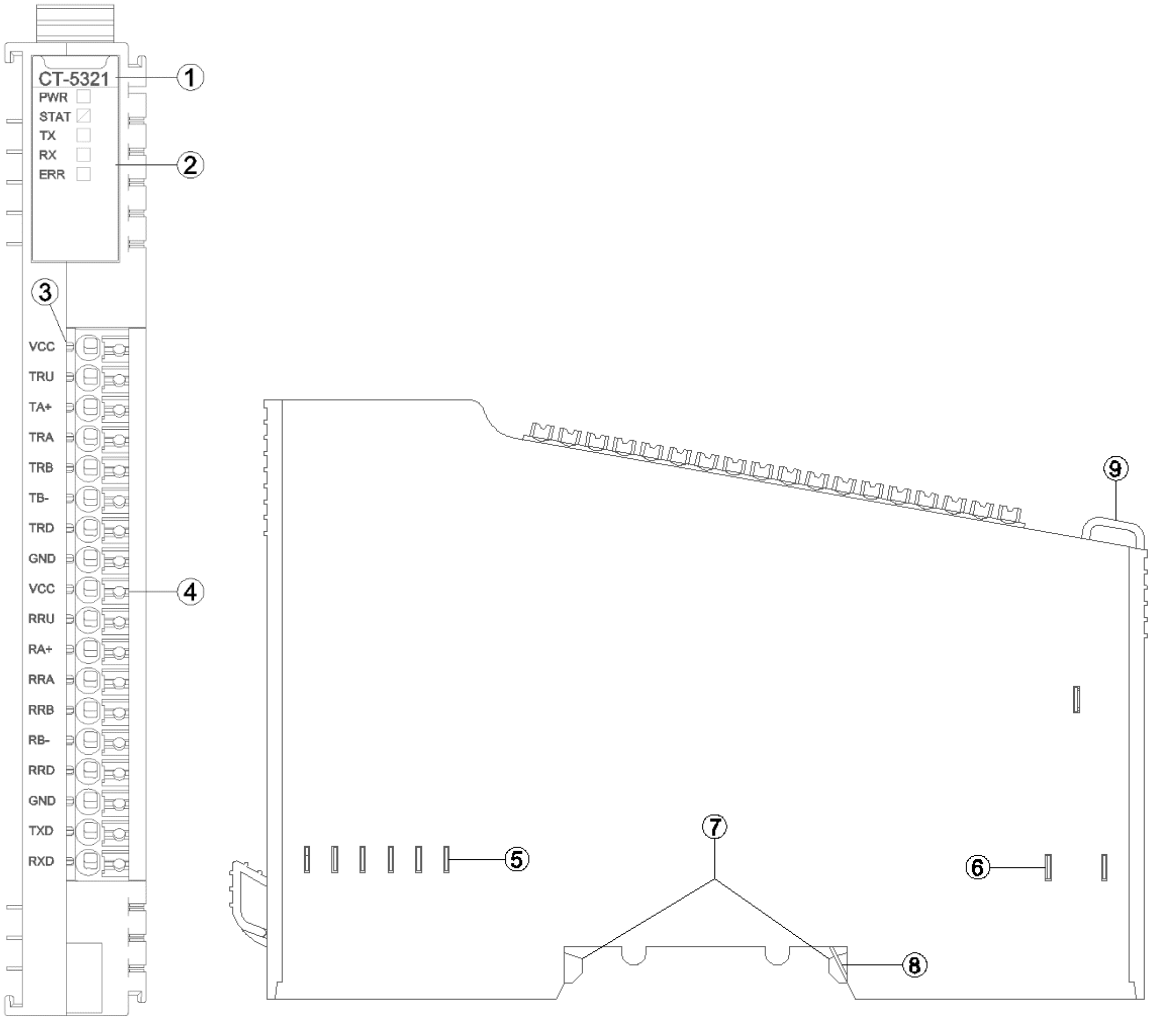
2 Technical Parameters

General parameters	
Power	Max.500mA@5.0Vdc
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24Vdc, Range:22-28Vdc
Wiring	I/O Wiring：Max.1.5mm²(AWG 16)
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20
Serial Port Parameters	

M/S/F:Channel Number	1Channel
M/S/F:Interface	RS485/RS232/RS422
M/S:Protocol	Modbus RTU/ASCII
M/S/F:Working Mode	Modbus Master, Slave, Transparent Transmission
M/S/F:Baud Rate	300bps-500Kbps
M/S/F:Data Bit	Bit 7, Bit 8
M/S/F:Parity Checking	None, Odd, Even
M/S/F:Stop Bit	Bit1, Bit2
M/S/F: Character Interval	1.5t-200t
F: Byte Order Conversion	Prohibit, Enable
M/F:Response Timeout	Customized，default：1000
M/F: Polling Timeout	Customized，default：100
M: Read Data Processing Mode	Hold the last input value, clear the input value
M: Data Output Mode	Polling, event triggering (data changes)
M: Module Control Enable	Prohibit, Enable
M: Module Control Mode	Level trigger (continuously valid), rising edge trigger (single valid)
M: Power on Event Output	Prohibit, Enable
S:Slave ID	Customized，default：1
S:Response Time	Customized，default：50

Note: M represents the valid parameters of master mode, S represents the valid parameters of slave mode, and F represents the valid parameters of free transparent transmission mode

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

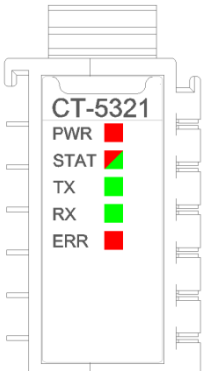
⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 Wiring Terminal

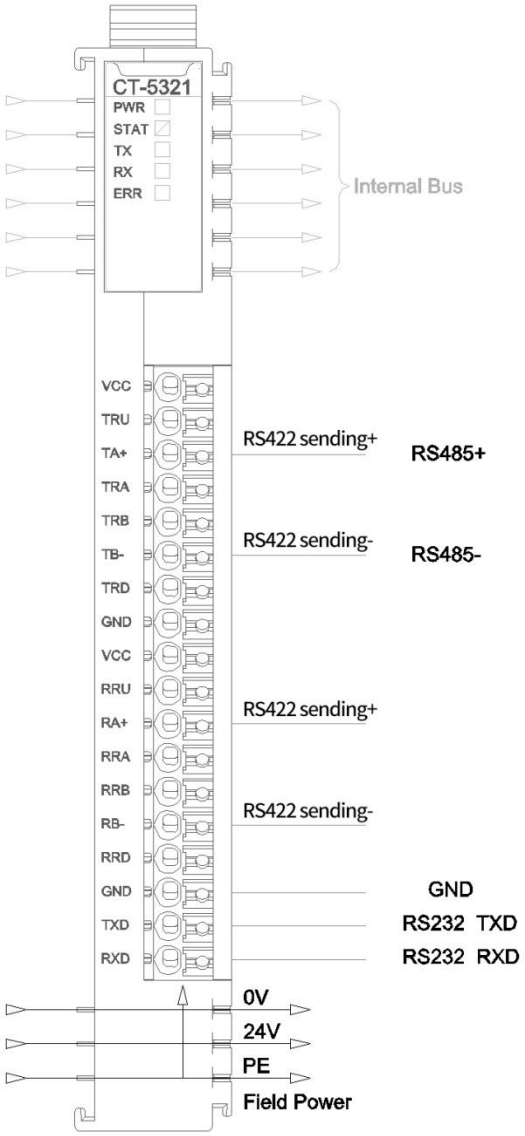
Terminal	RS485	RS422	RS232
VCC	4.7K Pull up resistance short connection	4.7K Pull up resistance short connection (TX)	
TRU			
TA+	A+	TX+	
TRA	120R Terminal resistance short connection	120R Terminal resistance short connection (TX)	
TRB			
TB-	B-	TX-	
TRD	4.7KPull down resistance short connection	4.7K Pull down resistance short connection (TX)	
GND			
VCC		4.7K Pull up resistance short connection (RX)	
RRU			
RA+		RX+	
RRA		120R Terminal resistance short connection (RX)	
RRB			
RB-		RX-	
RRD		4.7K Pull down resistance short connection (RX)	
GND	GND		GND
TXD			TXD
RXD			RXD

3.2 LED Indicator State



PW power indicator(Red)	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)	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 Update
TX Serial Port Sending Indicator	Definition
OFF	No data sending
Flash	Serial port data sending
RX Serial Port receiving Indicator	Definition
OFF	No data receiving
Flash	Serial port data receiving
ERR Running Indicator	Definition
OFF	Configuration normal, communication normal
Single Flash	Communication abnormal
Cycle Flash	Configuration error

4 Wiring


CT-5321
PWR
STAT
TX
RX
ERR
Internal Bus
VCC
TRU
TA+
TRA
TRB
TB-
TRD
GND
VCC
RRU
RA+
RRA
RRB
RB-
RRD
GND
TXD
RXD
RS422 sending+
RS485+
RS422 sending-
RS485-
RS422 sending+
RS422 sending-
GND
RS232 TXD
RS232 RXD
0V
24V
PE
Field Power

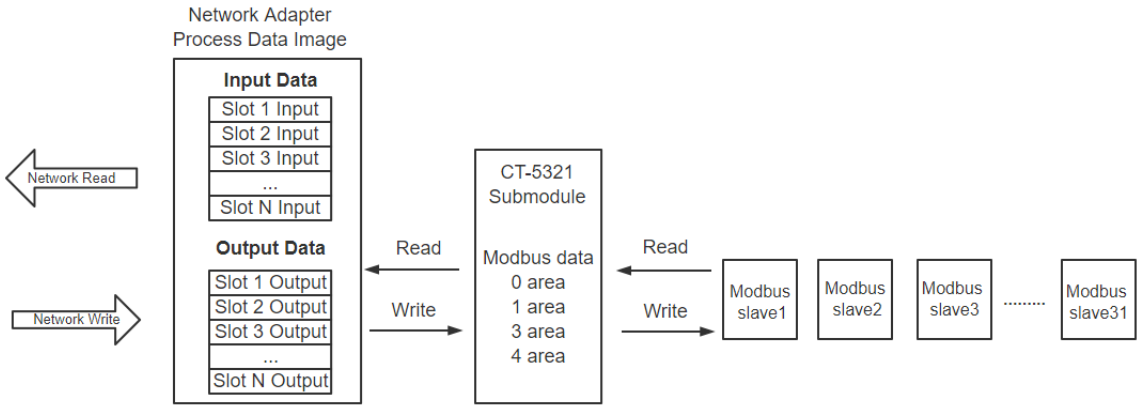
5 Process data definition

5.1 Module process data definition

CT-5321, the module itself has no input or output process data.

5.2 Submodule process data mapping

The network adapter reads and writes the input and output process data of the sub-module of CT-5321 in real time through the internal bus.Its data mapping model is shown as the figure below:



6 Configuration parameters definition

6.1 CT-5321 Configuration parameter definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0						BaudRate Select	Gateway Mode	
Byte 1	Standard BaudRate							
Byte 2								
Byte 3								
Byte 4								
Byte 5	Custom BaudRate							
Byte 6								
Byte 7								
Byte 8								
Byte 9		Byte Swap	Serial Mode	Stop Bits		Parity Bits		Data Bits
Byte 10	Char Pitch							
Byte 11	Response Timeout(ms)							
Byte 12								
Byte 13	Delay Between Polls(ms)							
Byte 14								
Byte 15				First Output on Power-Up	Module Control Mode	Module Control Enable	Output Mode	Fault Action for Read Command
Byte 16	Slave ID							
Byte 17	Response Delay(ms)							
Byte 18								

M/S/F：Gateway Mode : Module working mode（default：Modbus Master）

0：Modbus Master

1：Modbus Slave

2：Free port communication mode

M/S/F：Baudrate Selection（default：standard baud rate）

0：Standard baud rate

1：Customized baud rate

M/S/F：Standard BaudRate（default：9600bps）

0：300bps

1：600bps

2：1200bps

3：2400bps

4：4800bps

5：9600bps

6：14400bps

7：19200bps

8：38400bps

9：57600bps

10：115200bps

11：128000bps

12：230400bps

13：256000bps

14：384000bps

15：500000bps

M/S/F：Custom BaudRate: 300-500000bps could be set，default: 9600 Note: The devices of a few customers are with non-standard Baud rate, and it could be customized.

M/S/F：Data Bits(default：Bit 8)

0：Bit 7

1：Bit 8

M/S/F：Parity Bits(default：None)

0：None

1：Odd

2：Even

M/S/F：Stop Bits(default：Bit 1)

0：Bit 1

1：Bit 2

M/S:Serial Mode (default：RTU)

0：RTU

1：ASCll

F:Btye Swap (default：disabled)

0：Disabled

1：Enable

M/S/F:Char Pitch： Frame interval detection time when receiving a message.（T is the transmission time of a single character and is related to the baud rate） (default：5 CH)

0：1.5 CH

1：3.5 CH

2：5 CH

3：10 CH

4：20 CH

5：50 CH

6：100 CH

7：200 CH

M/F: Response Timeout (ms): The time that the master sends a command and waits for a response from the slave.1~65535 could be set, the default is 1000.

M/F: Delay Between Polls (ms): The interval time between Modbus commands (the delay between receiving the slave response message and sending the next command), 0~65535 could be set, default 100.

M: Fault Action for Read Command: The way the data is processed after the timeout of the slave read data. (Default: Hold last input value)

0: Hold the last input value

1: Clearing input value optional

M:Output Mode: The Modbus periodically sending write messages under "polling mode".In "event triggered" mode, write commands are sent only when

the Modbus output data changes.(Default: polling)

0: polling

1: Event triggers (data changes)

M: Module Control Enable: When it is necessary to control the read and write commands of Modbus, it could select enabling mode and control the read and write commands of Modbus by controlling the value of "module control output". (Default: disabled)

0: disabled

1: enable

M: Module Control Mode. This value is valid only in module control enabled mode. (Default: Level triggered)

0: Level trigger (effective continuously)

1: Rising edge trigger (single trigger)

M: First Output on Power-on. (Default: enabled)

0: disabled

1: enable

S: Slave ID: 1-247 could be set.This parameter is only valid in slave mode.

S: Respond Delay (MS): 0~65535 is optional, default 50.

6.2 CT-5321 Parameter definitions for submodules

6.2.1 Submodules in master mode

M: Diagnostic module

M: Reading coil (0xxxx), it supports 8~128bits optionally

M: Reading discrete input (1xxxx), it supports 8~128bits optionally

M: Reading input register (3xxxx), it supports 1~16words optionally

M: Reading hold register (4xxxx), it supports 1~16words optionally

M: Writing coil (0 xxxx), it supports single coil and 8~128bits optionally

M: Writing hold register (4xxxx), it supports single register and 1~16words optionally

M: Diagnostic module, it includes module status input, module error code input, module control output, and polling time input.The drop-down menu commands need to be added to the first 8 lines of the slot.

1. Module state input: there are 8~48 channels available. The module state could monitor the working state of each data slot. When a data slot fails, the corresponding state bit will be set to 1, and it would be reset automatically after failure recovery.

2. Module error code input: there are 8~48 channels available. When the data slot fails, the error code module could display the function code of the error channel and the detailed error code. According to the error code, the user can judge the cause of the fault, and then take the corresponding adjustment method.See "Modbus Error Code Table" for a detailed description.

3. Module control output: there are 8~48 channels available. The read/write channel for output control of the command is valid when the parameter (**M: module** control) under the serial port is in enabled mode.

4. Polling time input: Polling time is used for monitoring serial ports.

6.2.2 Submodules in slave mode

S: Diagnostic module

S: Reading coil (0xxxx)， it supports 1~1024Bytes optionally

S: Reading hold register (4xxxx), it supports 1~512words optionally

S: Writing coil (0xxxx), it supports 1~1024Bytes optionally

S: Writing discrete input (1xxxx), it supports 8~1024Bytes optionally

S: Writing input register (3xxxx), it supports 1~512words optionally

S: Writing hold register (4xxxx), it supports 1~512words optionally

S :Diagnostic module

The module could monitor the communication failure by entering the state in slave. Please see the following table to check the failure.

Modbus Error code table

Error Code	Fault description	Troubleshooting method
0x00	Working properly	N/A
0x01	Illegal function code	The device does not support the current function code, please refer to the slave manual to select the corresponding function code module
0x02	Illegal data address	If the device data exceeds its address range, refer to the slave manual to modify the data starting address or data length
0x03	Illegal data value	Data length error, data length beyond the Max. allowed value 125(Word) or 2000(Bit), modify the length
0x04	Data processing error	Check that if the range of data values meets the slave requirements
0x05	Application layer length mismatch	Increase the receive character pitch and check the communication parameter Settings
0x06	Protocol ID error	Check the sending end message
0x07	Cache address error	Device internal error

0x08	Bit offset error	Device internal error
0x09	The slave ID number does not match	Increase timeout time, check hardware connection state, and check communication parameter Settings
0x0A	CRC Error	CRC error, check communication line
0x0B	LRC Error	LRC error, check communication line
0x0C	Answer function codes do not match	Check the hardware connection state
0x0D	Answer addresses do not match	Check the hardware connection state
0x0E	The length of the reply data does not match	Check the hardware connection state
0x0F	Communication timeout	Increase timeout time, check hardware connection state, and check communication parameter Settings
0x10	ASCII mode starting character Error	':' Colon starting character Error
0x11	ASCII mode terminator character Error	CR/LF Carriage return terminator character Error
0x12	ASCII mode non-character data	The data contains non-hexadecimal ASCII codes
0x13	ASCII mode character error	Slave answering length error

6.2.3 Submodule in free transparent transmission mode

F : Control and state modules

F : Input and output data modules all support 1~512words optionally

Definition of process data for control and state modules

IO module data direction	Data Name	Variable Name	Data Type	Byte Offset
Input Data	Output control word - feedback	Control_Word_Feedback	uint16_t	0
	Send frame byte length-	Send_Data_Len_Feedback	uint16_t	2

	feedback			
	Serial State	COM_Status	uint16_t	4
	Received Error frame count	Error_Counter	uint16_t	6
	Total received data frame count	Received_Counter	uint16_t	8
	The current received frame byte length	Received_Data_Len	uint16_t	10
Output Data	Output control word	Control_Word	uint16_t	0
	Send frame byte length	Send_Data_Len	uint16_t	2

Variable Definition：

Variable Name	Bit15-6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Control_Word	Reserved	Received Counter Reset	Error Counter Reset	Timeout Error Reset	Parity Error Reset	Done Reset	Trigger
Send_Data_Len	Send_Data_Len						
COM_Status	Reserved			Timeout Error	Parity Error	Done	Busy
Error_Counter	Error_Counter						
Received_Counter	Received_Counter						
Received_Data_Len	Received_Data_Len						

Input data description：

1. Control_Word_Feedback is the feedback value of Control_Word, which will be updated to the control word feedback after the output control word is refresh to the module
2. Send_Data_Len_Feedback is the feedback value of Send_Data_Len. After the length of sending frame bytes is refreshed to the module, it will be updated to the length feedback of sending frame bytes.
3. In the answering mode, when the serial ports are sending data, the Busy bit is set to 1.

3.1 When the serial port receives the reply within the timeout period, the Busy

bit will be reset, and Done will be completed at position 1 and Received_Counter will calculate the value plus 1. If there is a parity error in the received frame, and Parity_Error will be set to 1, while Error_Counter will count plus 1.Received_Data_Len holds the number of bytes of the currently received frame.

3.2 When the serial port does not receive a reply within the timeout period, the Busy bit will be reset, and the Done will be completed at position 1. At the same time, Timeout_Error will be set as 1, and the Error_Counter will be added as 1, so the Received_Data_Len value will be reset.

4. In the active report mode, when slave received the data packet, and the Received_Counter will count as a value plus 1. If there is a parity error in the received frame, the Parity_Error bit will be set to 1, while the Error_Counter will count plus 1.

Description of output data :

1. When Received_Counter_Reset is in rise edge, the Received_Counter value will be reset.

When Error_Counter_Reset is in rise edge, Error_Counter value will be reset.

When Timeout_Error_Reset s in rise edge, Timeout_Error will be reset.

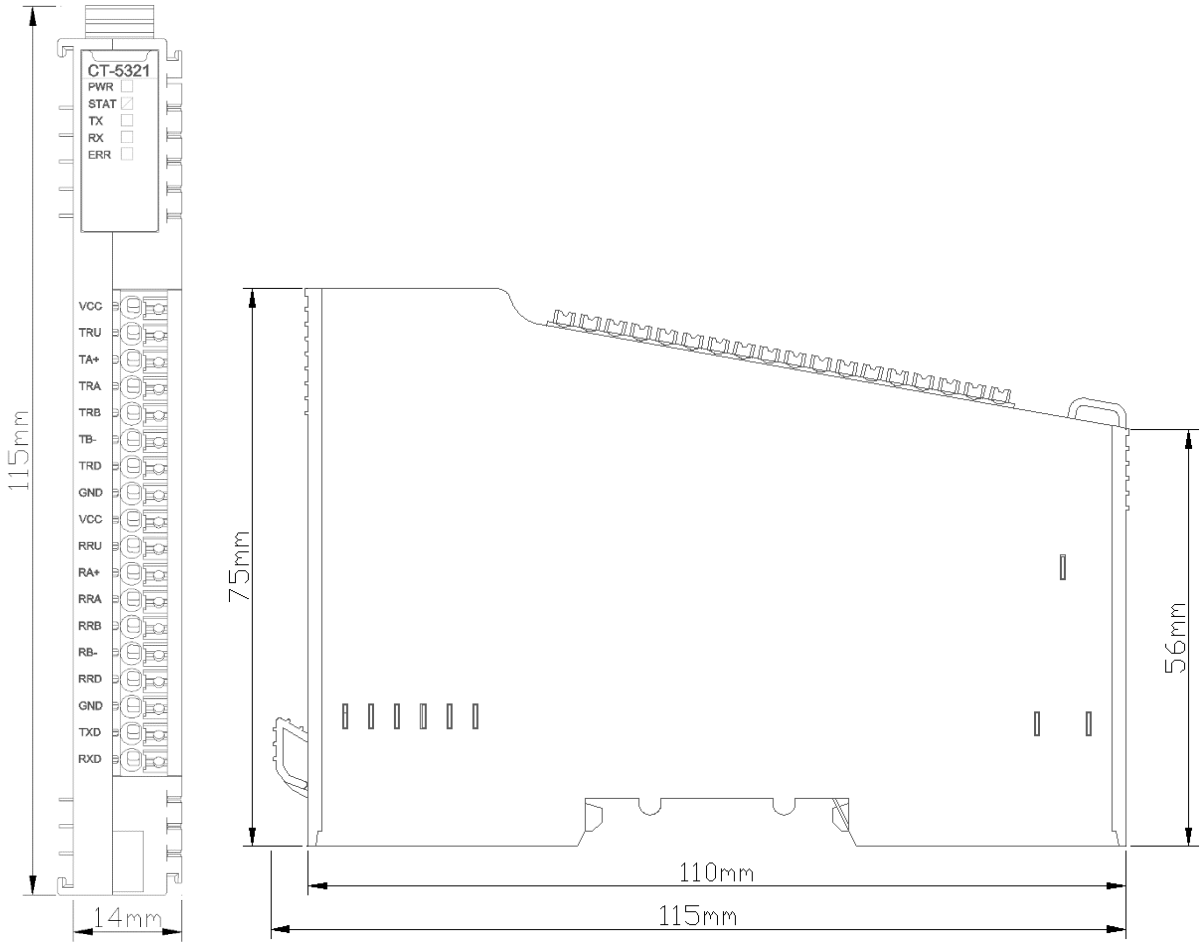
When Parity_Error_Reset is in rise edge, Parity_Error will be reset.

When Done_Reset is in rise edge, Done will be reset.

2. In the active report mode, the Trigger bit is invalid and the Send_Data_Len is invalid.

3. In master-slave response mode, when Trigger is in rise edge, and it will Trigger serial port to send data for one time, and the serial port will send data packets according to the data length of Send_Data_Len and wait for the replying processing.

A DIMENSION


CT-5321
PWR
STAT
TX
RX
ERR
VCC
TRU
TA+
TRA
TRB
TB-
TRD
GND
VCC
RRU
RA+
RRA
RRB
RB-
RRD
GND
TXD
RXD
115mm
14mm
75mm
56mm
110mm
115mm

CT-5710 Bus extended master module

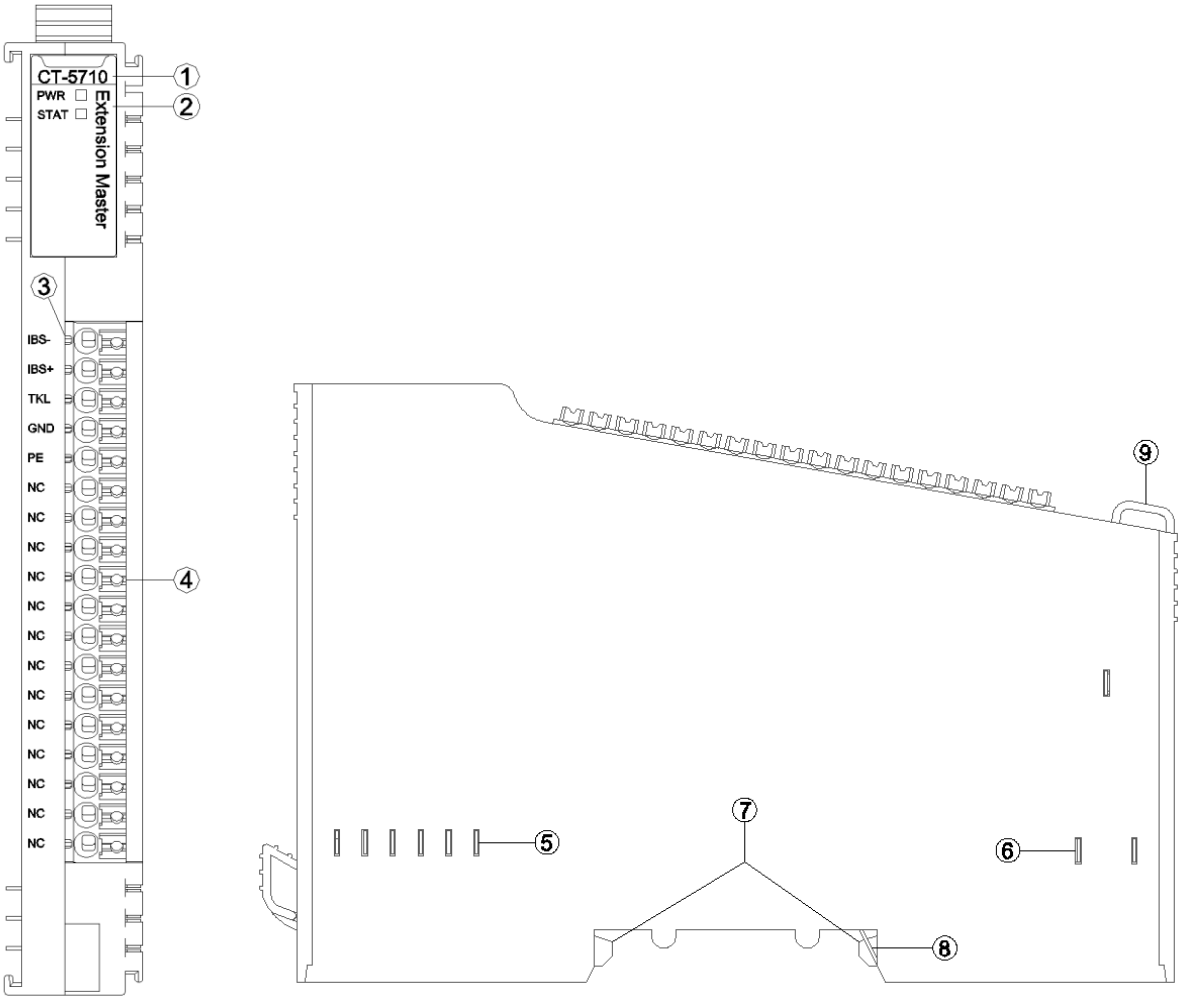
1 Module Description

The bus extened master module is used to extend the bus.The bus extended master module has no process data and configuration parameters.

2 Technical Parameters

General parameters	
Power	Max.20mA@5.0Vdc
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20

3 Hardware Interface



① Module Type

② State indicator

③ Channel indicator (N/A)

④ Wiring Terminal and identification

⑤ Internal Bus

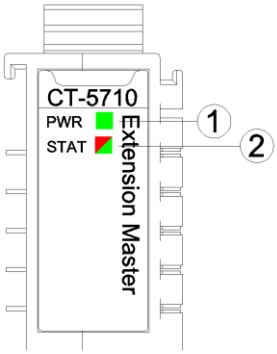
⑥ Field Power (N/A)

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



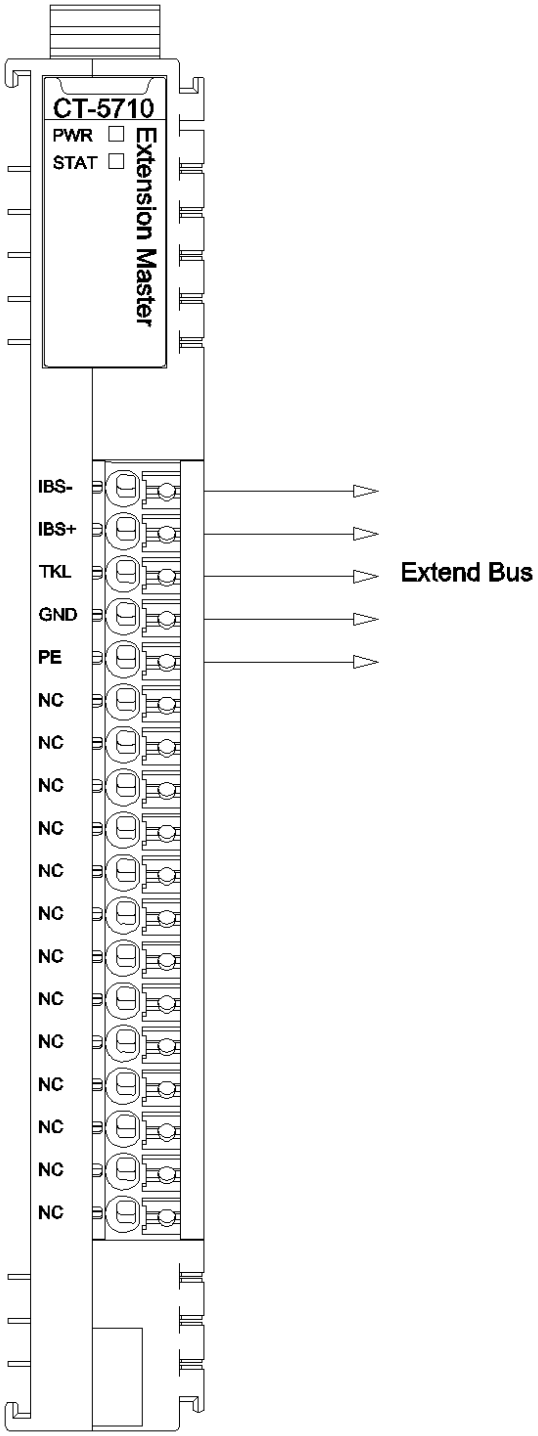
① System Power LED indicator (red)

② Bus State LED indicator (red/green)

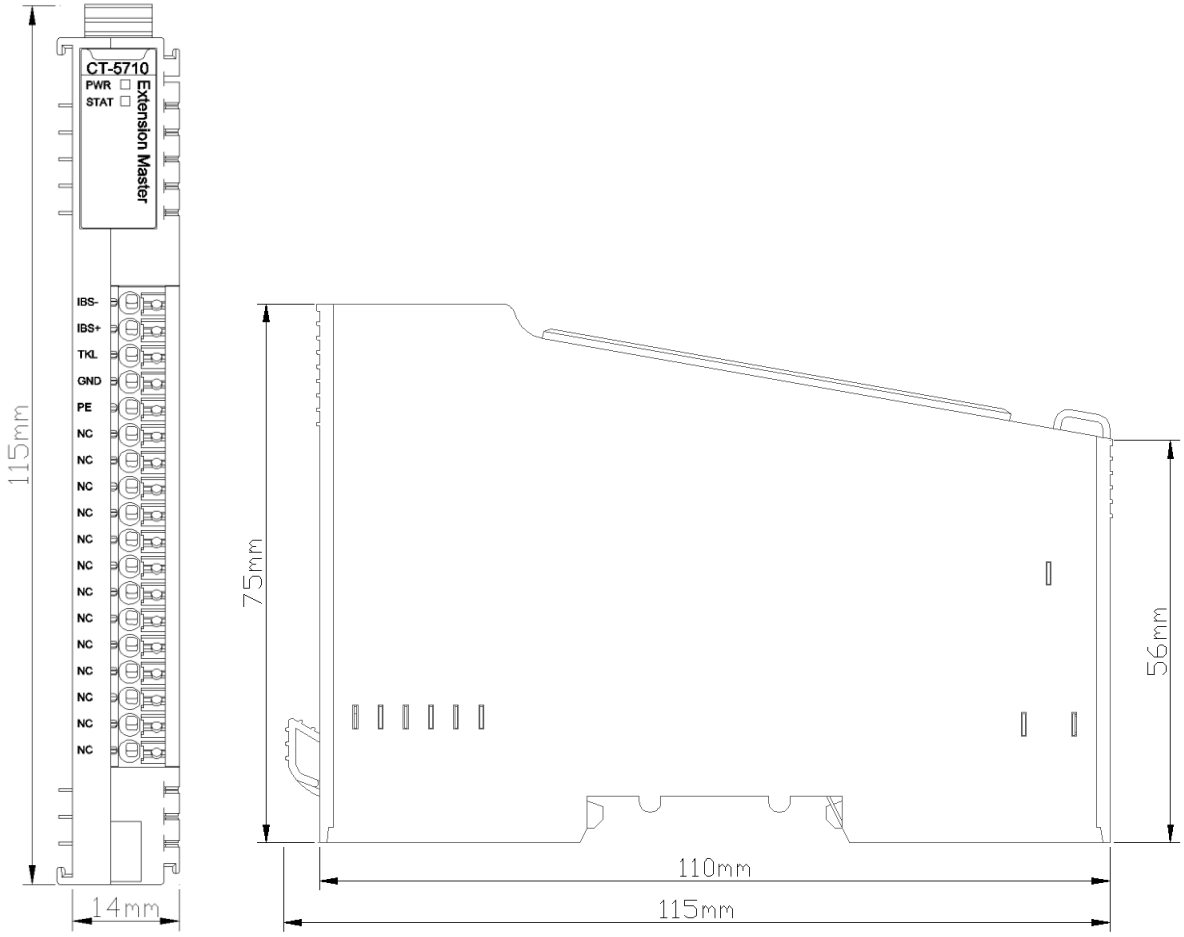
PWR POWER STATE (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Bus STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted

4 Wiring

Bus extended cable requires 5 core shielded cable, IBS+ and IBS- must use twisted pair. PE guarantees a reliable grounding and the total length of the bus extended cable should not exceed 10 meters.



A DIMENSION


CT-5710
PWR
STAT
Extension Master
IBS-
IBS+
TKL
GND
PE
NC
NC
NC
NC
NC
NC
NC
NC
NC
NC
NC
NC
NC
115mm
14mm
75mm
56mm
110mm
115mm

CT-5720 Bus extended slave module

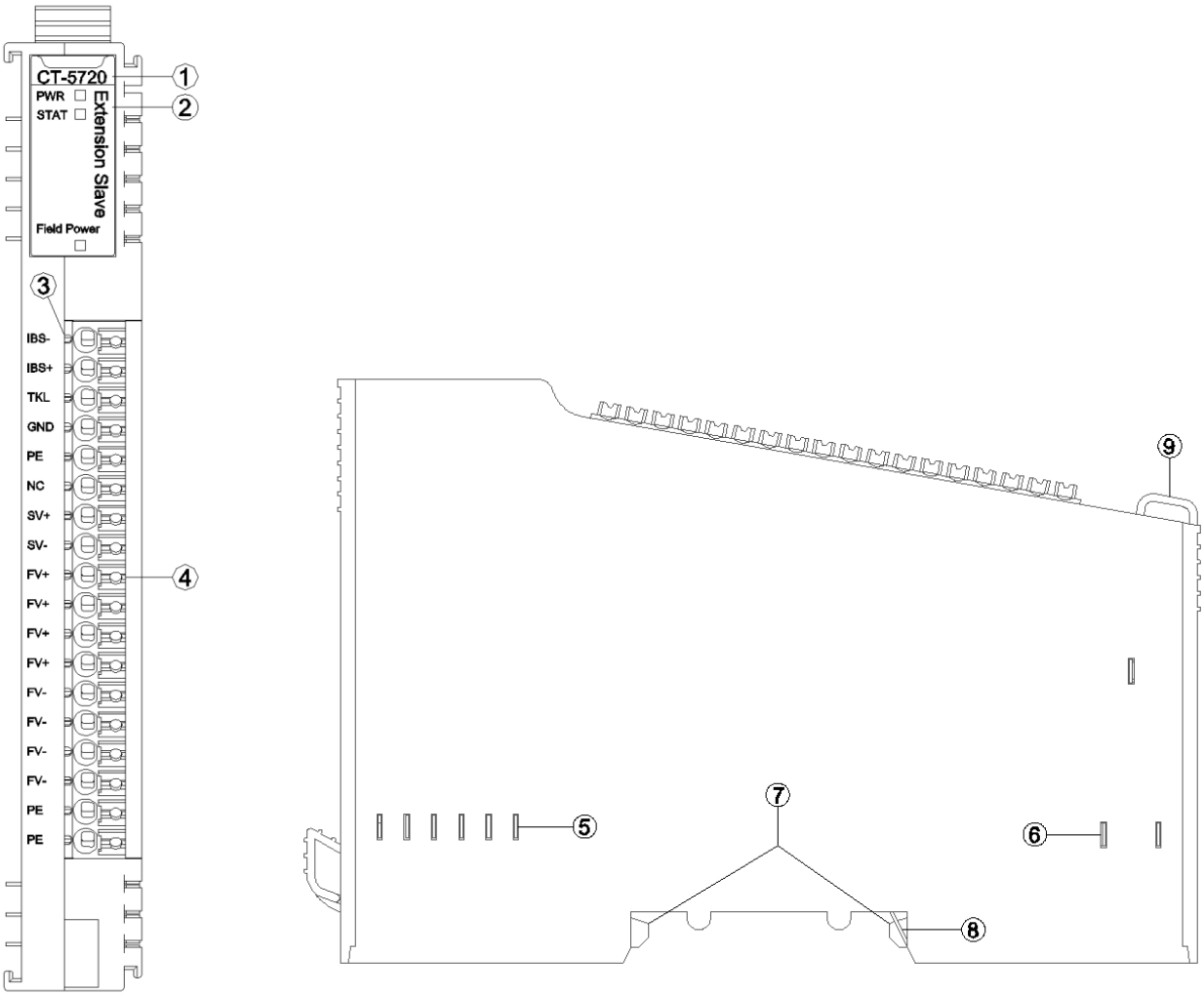
1 Module Description

The bus extened slave module is used to extend the bus.The bus extended slave module has no process data and configuration parameters.

2 Technical Parameters

General parameters	
Power	Max.20mA@5.0Vdc
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
System Power	Nominal: 24Vdc, Range: 9-36Vdc Protection: Overcurrent Protection, Reverse Protection: YES
Internal BUS Supply Current	Max. 2.5A@5VDC
Isolation	System Power to Field Power Isolation
Field Power Supply	Power Supply：22~28V（Nominal 24VDC） Protection: Reverse Protection: YES
Field Power Supply Current	Max. DC 8A
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20

3 Hardware Interface



① Module Type

② State indicator

③ Channel indicator (N/A)

④ Wiring Terminal and identification

⑤ Internal Bus

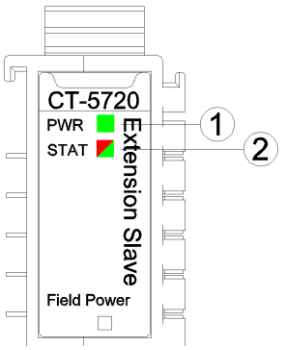
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



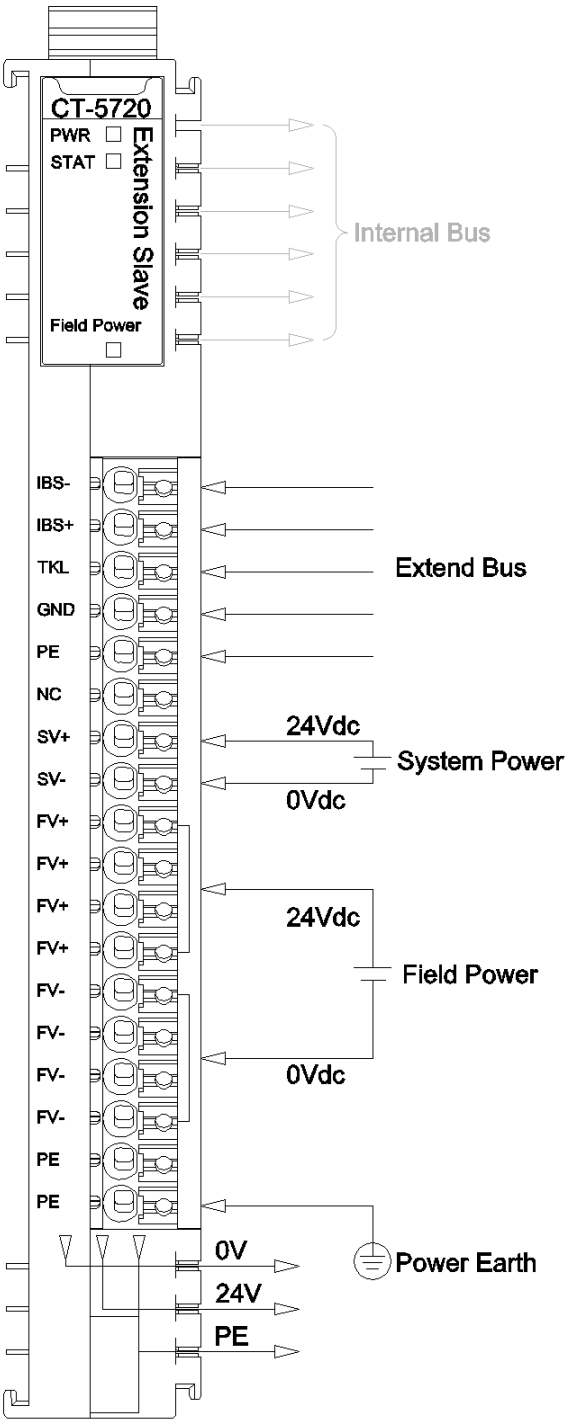
① System Power LED indicator (red)

② Bus State LED indicator (red/green)

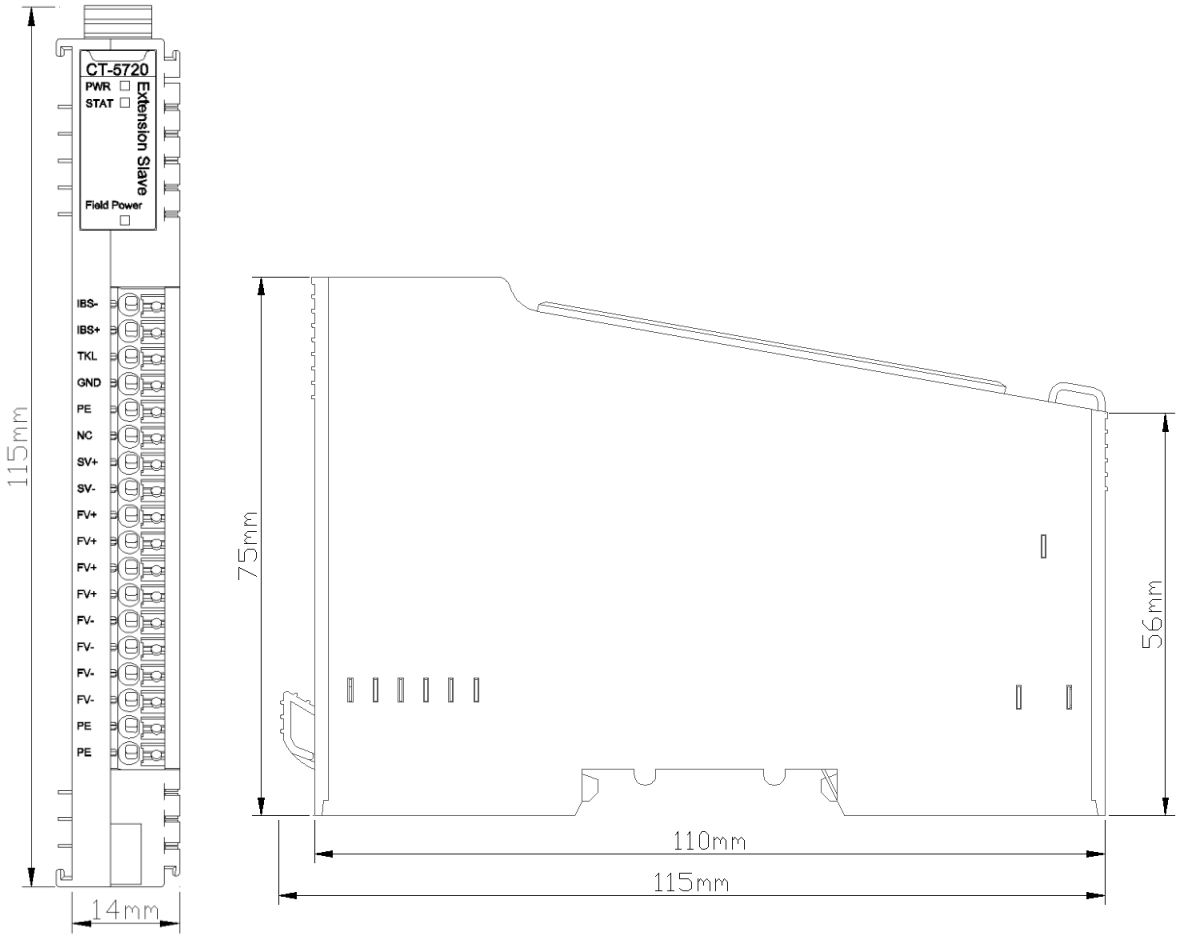
PWR POWER STATE (RED)	Definition
ON	System Power Normal
OFF	System Power Failure
STAT Bus STATE (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted

4 Wiring

Bus extended cable requires 5 core shielded cable, IBS+ and IBS- must use twisted pair. PE guarantees a reliable grounding and the total length of the bus extended cable should not exceed 10 meters.



A DIMENSION


CT-5720
PWR
STAT
Extension Slave
Field Power
IBS-
IBS+
TKL
GND
PE
NC
SV+
SV-
FV+
FV+
FV+
FV+
FV-
FV-
FV-
FV-
PE
PE
115mm
14mm
75mm
56mm
110mm
115mm

CT-5800 Terminal module

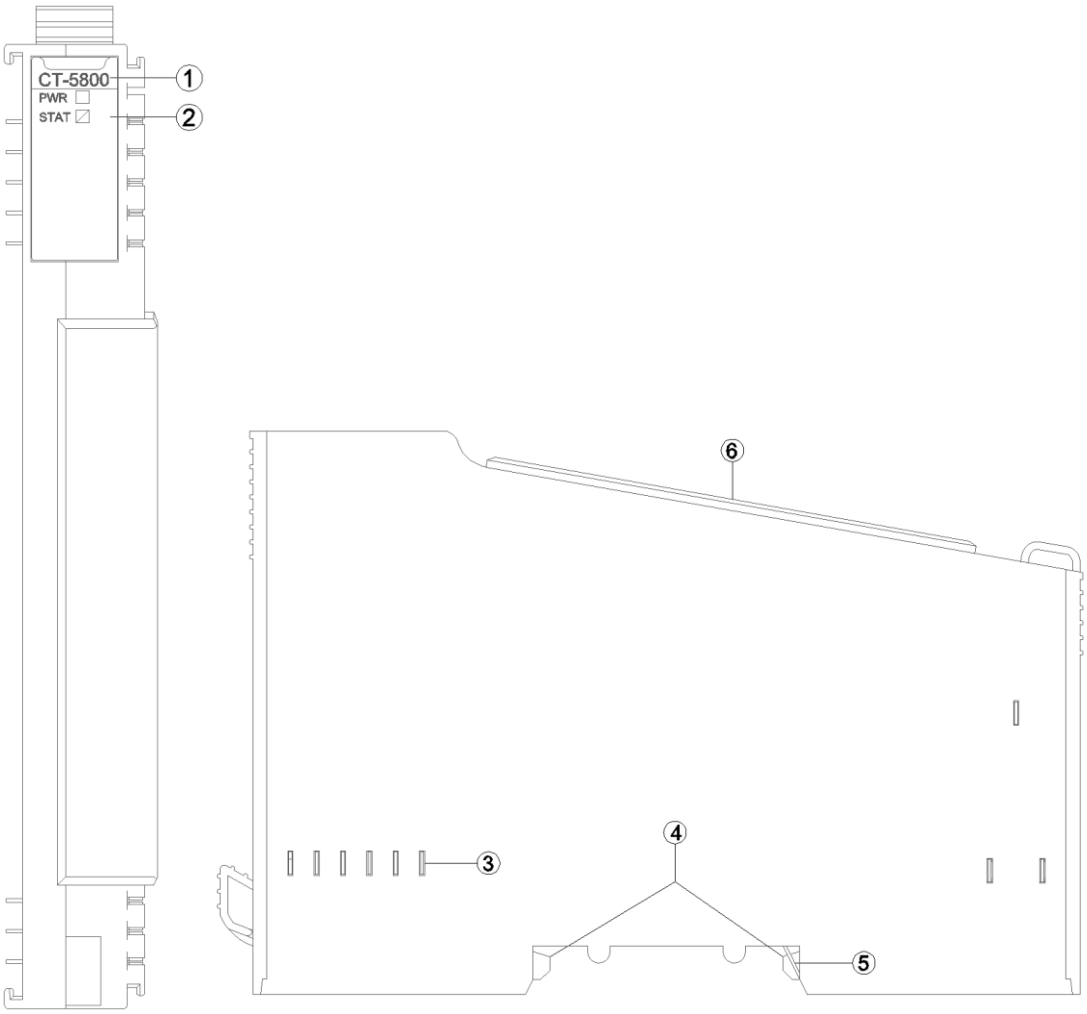
1 Module Description

Terminal modules are used to stabilize the internal bus communication. When the number of adapter extension IO modules reaches 16 or more and terminal modules should be required.When the number of adapter extending IO modules is less than 16, and the terminal module **CT-5810** only for dustproof could be selected. The dustproof terminal could cover the internal bus and field power supply hardware of the last IO module. And terminal modules have no process data and configuration parameters.

2 Technical Parameters

General parameters	
Power	Max.20mA@5.0Vdc
Mounting Type	35mmDIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20

3 Hardware Interface



① Module Type

② State indicator

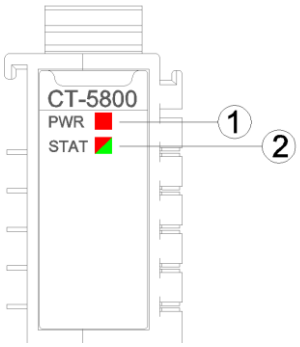
③ Internal Bus

④ Buckle

⑤ Grounding Resilient Sheet

⑥ Terminal Cover

3.1 LEDLED indicator definition

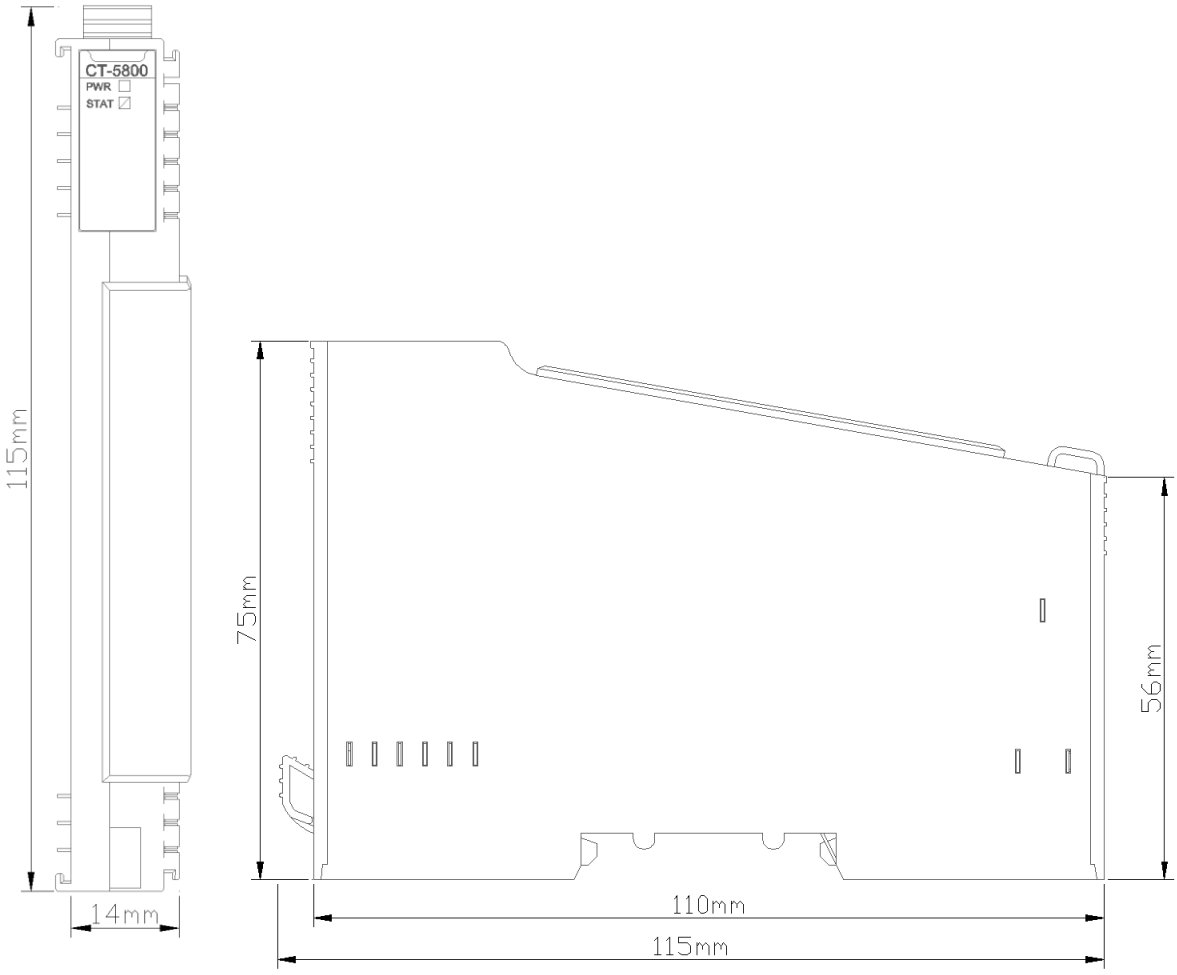


① System Power LED indicator(red)

② Module State LED indicator (red/green)

PWR Power LED Indicator (Red)	Definition
ON	The system power supply is normal.
OFF	The system power supply is failure
STAT Module State LED Indicator (Red/Green)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted

A DIMENSION



CT-623F 8-channel digital input /24VDC/ source or sink type & 8-channel digital output /24VDC/ source type

1 Module features

◆ The module supports 8-channel digital input, and supports source type and sink type two-way input. The input voltage is 0V/24VDC.

◆ The module supports 8-channel digital output, Output high level valid, and the output voltage is 24VDC.

◆ Module input channel can collect digital output signal of field equipment. (dry contact or active output)

◆ The module input channel can be connected to the 2-wire or 3-wire digital sensor.

◆ Module input channel supports 32-bit counter for each channel, the counting frequency < 200Hz.

◆ The input channel of the module supports the signal maintenance function, and the maintenance time can be set.

◆ The input channel of the module can set the digital signal input filtering time and the byte transfer order of the counter.

◆ The input channel of the module can set the counting mode and counting direction independently.

◆ Module output channel can drive field equipment .(relay, solenoid valve, etc.)

◆ The output channel of the module is equipped with short circuit, thermal shutdown and overvoltage protection functions.

◆ Module internal bus and field input and output , using Optocoupler isolation.

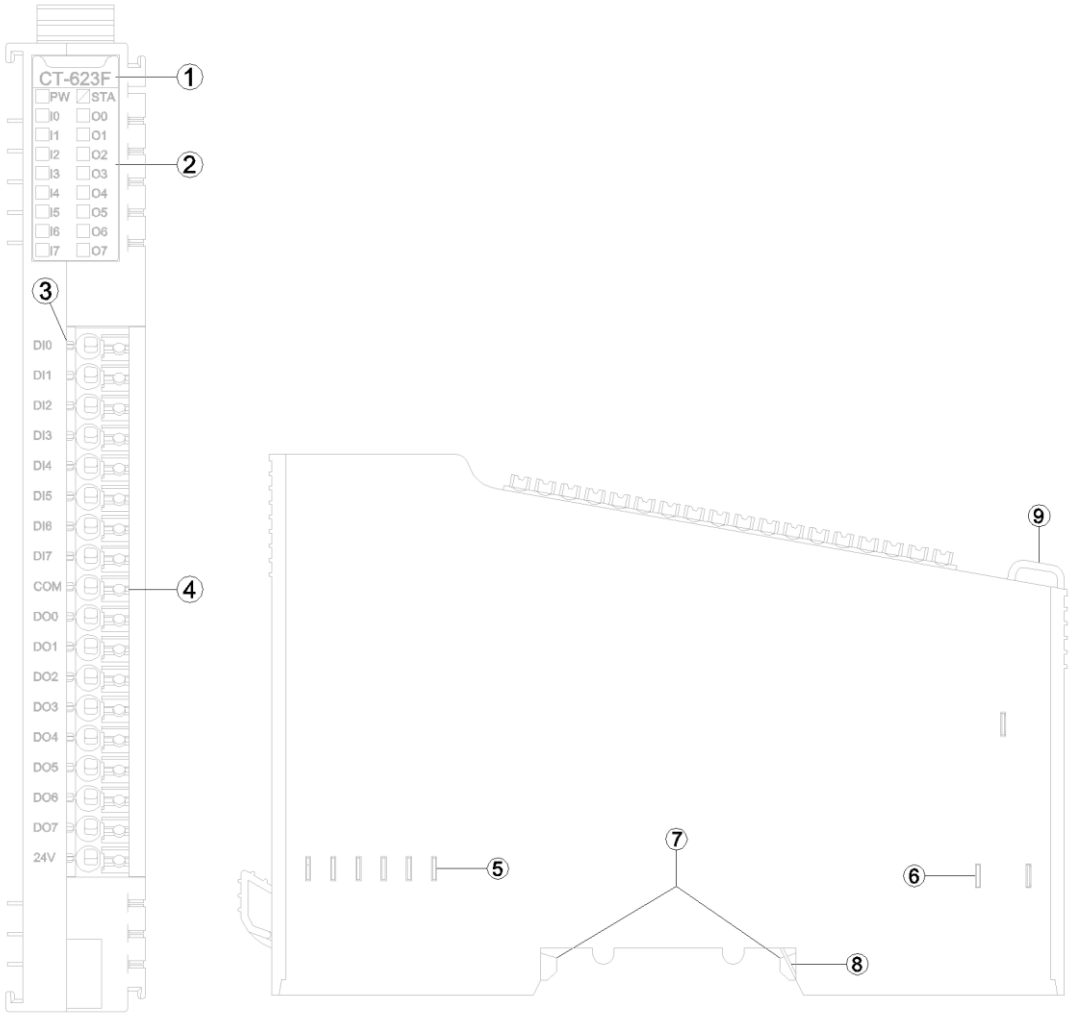
◆ Module has 16 digital input and output channel LED indicator light.

2 Technical parameters

General Parameters	
Power	Max.85mA@5.0Vdc
Isolation	I/O to internal bus: opto-coupler isolation (3KVrms)
Field Power	Nominal voltage: 24Vdc Input range: 22~28Vdc
Wiring	I/O wiring: Max.1.5mm ²(AWG 16)
Installation	35mm DIN-Rail
size	115*14*75mm
Weight	65g
Environment Specification	
Working temperature	-40~85℃
Environmental humidity	5%-95% (No Condensation)
Protection grade	IP20
Environmental Parameters	
Channel Number	8-channel source/sink type input
Indicator	8 channel input indicators
Open voltage	High input: Min.10Vdc to Max.28Vdc (Common: 0Vdc) Low input: Min.0Vdc to Max.14Vdc (Common: 24Vdc)
Close voltage	High input: Max.5Vdc (Common: 0Vdc) Low input: Min.19Vdc (Common: 24Vdc)
Open current	Max.5mA/ channel @28V
Input impedance	>7.5kΩ
Input delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
Prop filter	Default: 10ms
Sampling frequency	500Hz
Count frequency	<200Hz
Output parameter	
Channel Number	8 channel source type output
LED Indicator	8 channel output indicators
Rated current	Typical value:0.5A
Leakage current	Maximum value: 10uA
Output impedance	<200mΩ
Output delay	OFF to ON: Max.100us ON to OFF: Max.150us

Protection function	Temperature protection: typical value 135℃ Protection current: typical value 1.1A Short circuit protection support

3 Hardware interfaces



① Module Type

② State indicators

③ Channel indicators

④ Wiring Terminal and Marking

⑤ Internal Bus

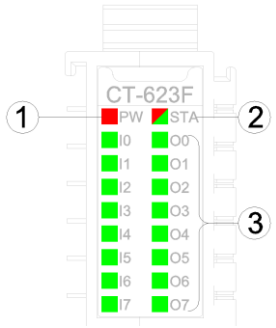
⑥ Field Power

⑦ Buckle

⑧ Grounding Sheet

⑨ Fixed Wiring Harness

3.1 LED indicators Definition



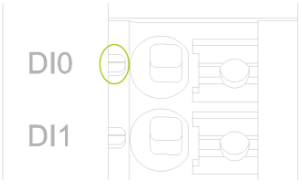
① Power indicator (red)

② Module state indicator (red/green)

③ Input/output channel indicators (green)

PW power indicator	Definition
ON	Internal bus power supply normal
OFF	Internal bus power supply failure
STA module state indicator	Definition
Green slow flash (2.5hz)	The internal bus of the module is not started
Red slow flash (2.5hz)	Module internal bus offline
Green normally on	Module works normally
Flash(2.5Hz) (RED/GREEN)	Operating mode
Flash(10Hz) (RED/GREEN)	Firmware upgrading
Red flashes twice	Module exception has been soft-restarted
I0-I7 input channel indicators	Definition
ON	input signal valid
OFF	input signal invalid
O0-O7 output channel indicators	Definition
ON	Output signal valid
OFF	Output signal invalid

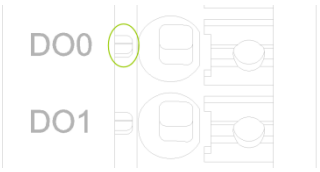
3.2 Field input channel LED indicator (red/green)



When the COM terminal is connected to a low level and the input channel signal is at a high level, the corresponding channel green indicator is on.

When the COM terminal is connected to a high level and the input channel signal is at a low level, the corresponding channel red indicator is on.

3.3 Field output channel LED indicator (green)



When the output signal of the output channel is valid, the corresponding channel indicator is on.

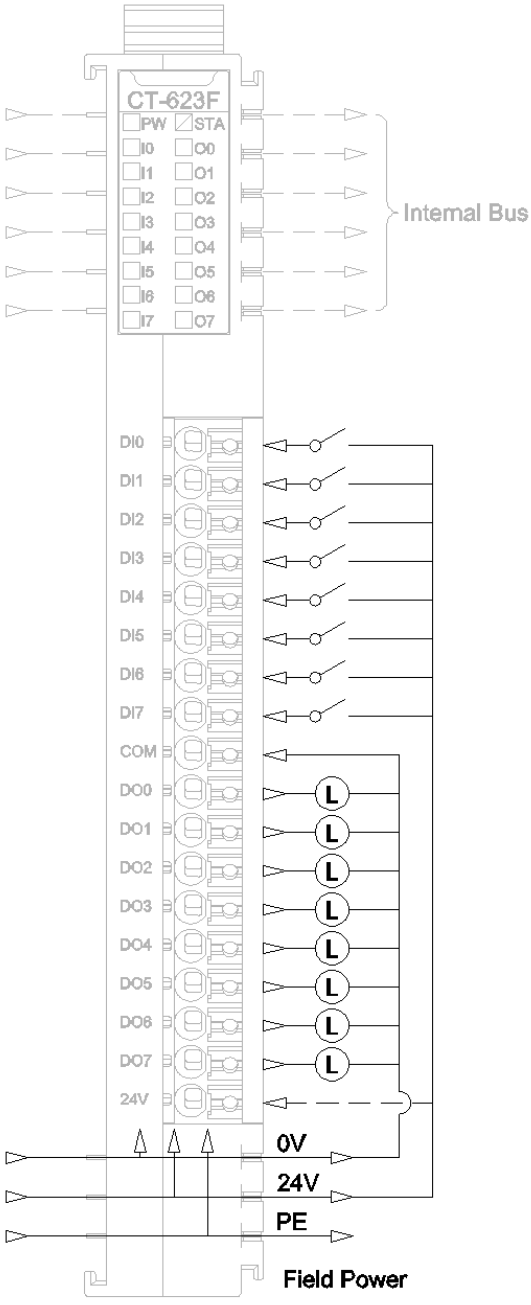
3.4 Terminal definition

Terminal Number	Symbol	Instruction
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	COM	Input common terminal
10	DO0	Signal output
11	DO1	
12	DO2	
13	DO3	
14	DO4	
15	DO5	
16	DO6	
17	DO7	
18	24V	Power input (*Note1*)

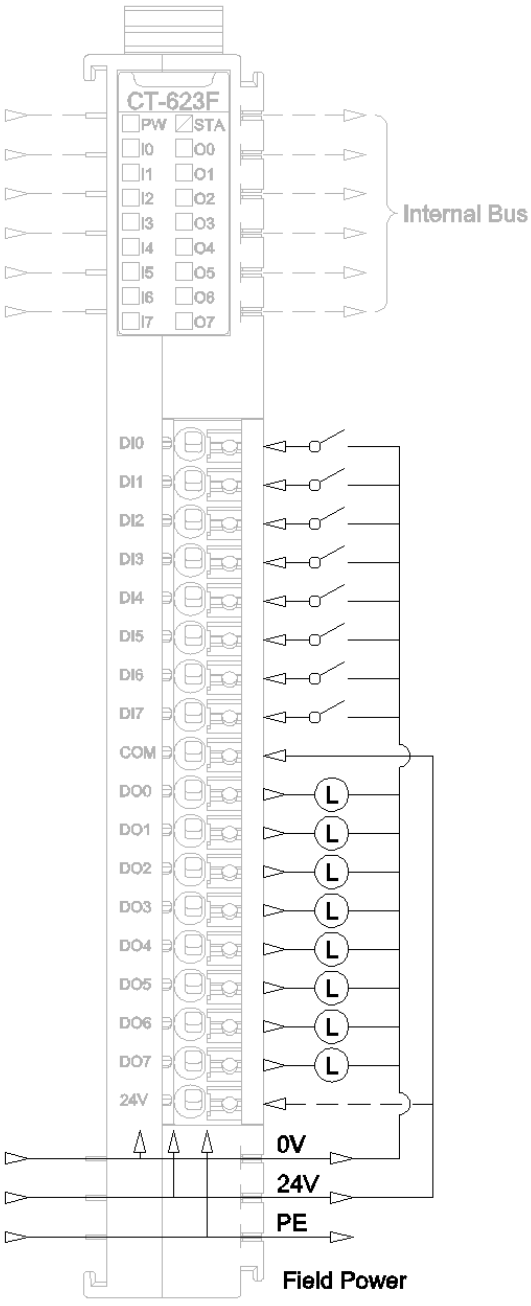
Note 1: when the red LED indicator beside the 24V wiring terminal lights up, it indicates that the fieldbus is powered on, then the maximum output current of each channel is 500mA, and the maximum sum of all output channel currents is 2A.

When the 24VDC power is supplied to the 24V wiring terminal separately, the sum of all the output channel currents is at the maximum of 4A (Whether the fieldbus is powered on or not, 24V wiring terminals can both be connected to 24VDC power supply).

4 Wiring



High level/Sink input



Low level/Source Input

5 Process data definition

<8DI&8DO IO State> Submodule procedure data definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DO Ch#7	DO Ch#6	DO Ch#5	DO Ch#4	DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0

Data description:

DI Ch#(0-7): When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

DO Ch#(0-7): when this bit is 1, the corresponding channel output signal is valid, the output is high level, and the output is invalid when it is 0.

0: Output signal invalid

1: Output signal valid

<8DI Counter Submodule> Submodule process data definition.

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								

Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								
Byte 23								
Byte 24	Counter Value Ch#6							
Byte 25								
Byte 26								
Byte 27								
Byte 28	Counter Value Ch#7							
Byte 29								
Byte 30								
Byte 31								
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0

Data description:

Counter Value Ch#(0-7)：count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-7)：when the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel will be cleared.

Note: The maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definition

<8DI&8DO IO State> Submodule configuration parameter definition

Configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		
Byte 3	Fault Action for Output Ch#7	Fault Action for Output Ch#6	Fault Action for Output Ch#5	Fault Action for Output Ch#4	Fault Action for Output Ch#3	Fault Action for Output Ch#2	Fault Action for Output Ch#1	Fault Action for Output Ch#0
Byte 4	Fault Value for Output Ch#7	Fault Value for Output Ch#6	Fault Value for Output Ch#5	Fault Value for Output Ch#4	Fault Value for Output Ch#3	Fault Value for Output Ch#2	Fault Value for Output Ch#1	Fault Value for Output Ch#0

Data description:

Input Filtering Time(ms)：Channel input filtering time，unit: ms. (Default: 10)

Input Holding Time(ms)：Channel input signal holding time, unit: ms. (Default: 0)

0：Disable

1：200ms

2：500ms

3：1000ms

4：1500ms

5：2000ms

6：3000ms

7：5000ms

Fault Action for Output Ch#(0-7)：Fault Output mode. When the IO module detects an internal bus exception and fails to communicate with the adapter, the module enters offline mode, the output data will be processed in this way. (Default: 0)

0: keep the last time output state.

1: output fault value.

Fault Value for Output Ch#(0-7)：When the fault output mode is 1, the bit sets

the fault output value, which is output when the IO module internal bus is offline. (Default: 0)

0: output low level.

1: output high level.

<8DI Counter Submodule> Submodule configuration parameter definition

Configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0

Data description:

32Bit Data Format：Byte transmission order of channel count values (Default: 0).

0：AB-CD

1：BA-DC

2：CD-AB

3：DC-BA

Storage Function：storage Function is support or not, read only attribute, and this value is the actual value of the module when uploading device parameters.

0: storage is not support

1: storage is support

Storage Enable：Storage enable，when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value when it is powered on next time. (Default: 1)

0：Disabled

1：Enable

Count Mode Ch#(0-7)： Input channel count mode. (Default: 0)

0: Rising edge count

1: Falling edge count

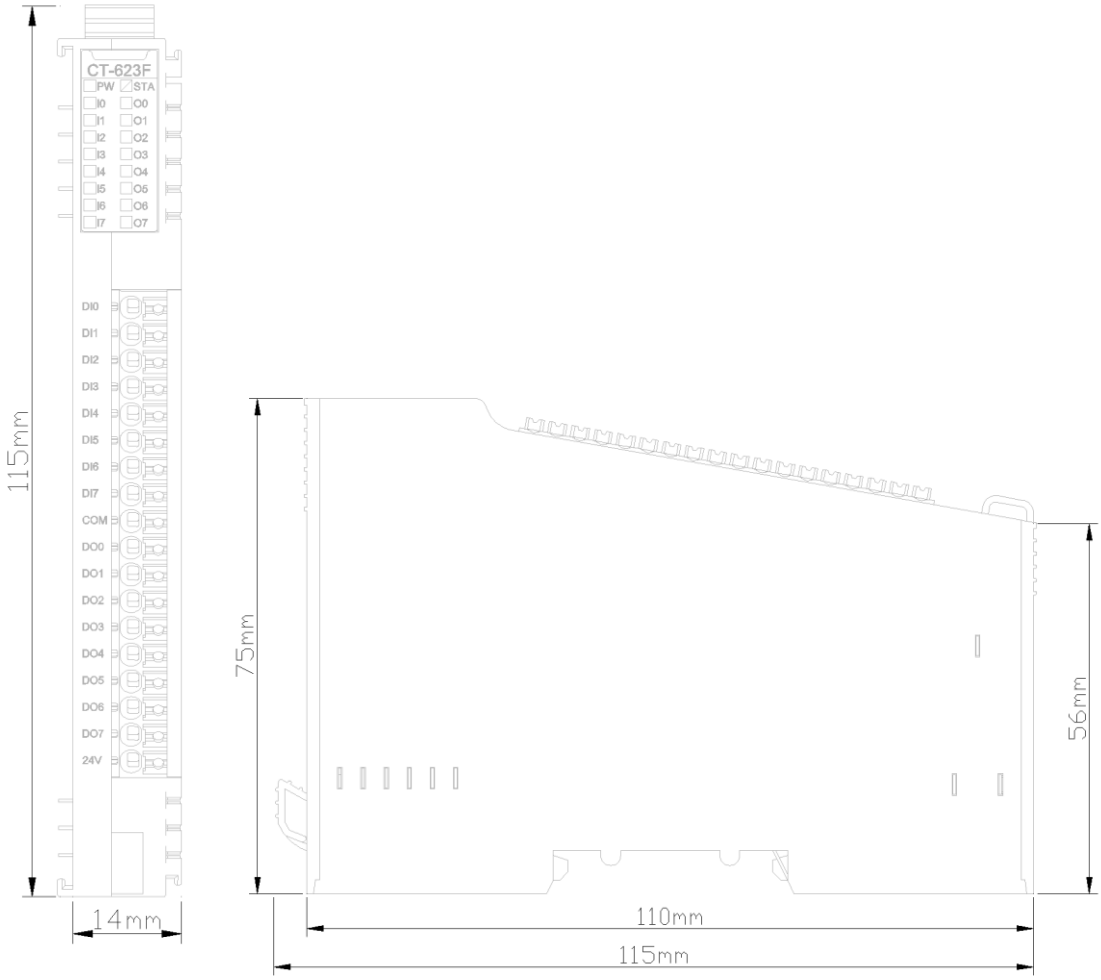
2: Double edge count

Count Direction Ch#(0-7)：The counting direction of the input channel. (Default: 0)

0: Count up

1: Count down

A Dimension drawing



CT-7221 Power Supply Extension Module 5V/2A

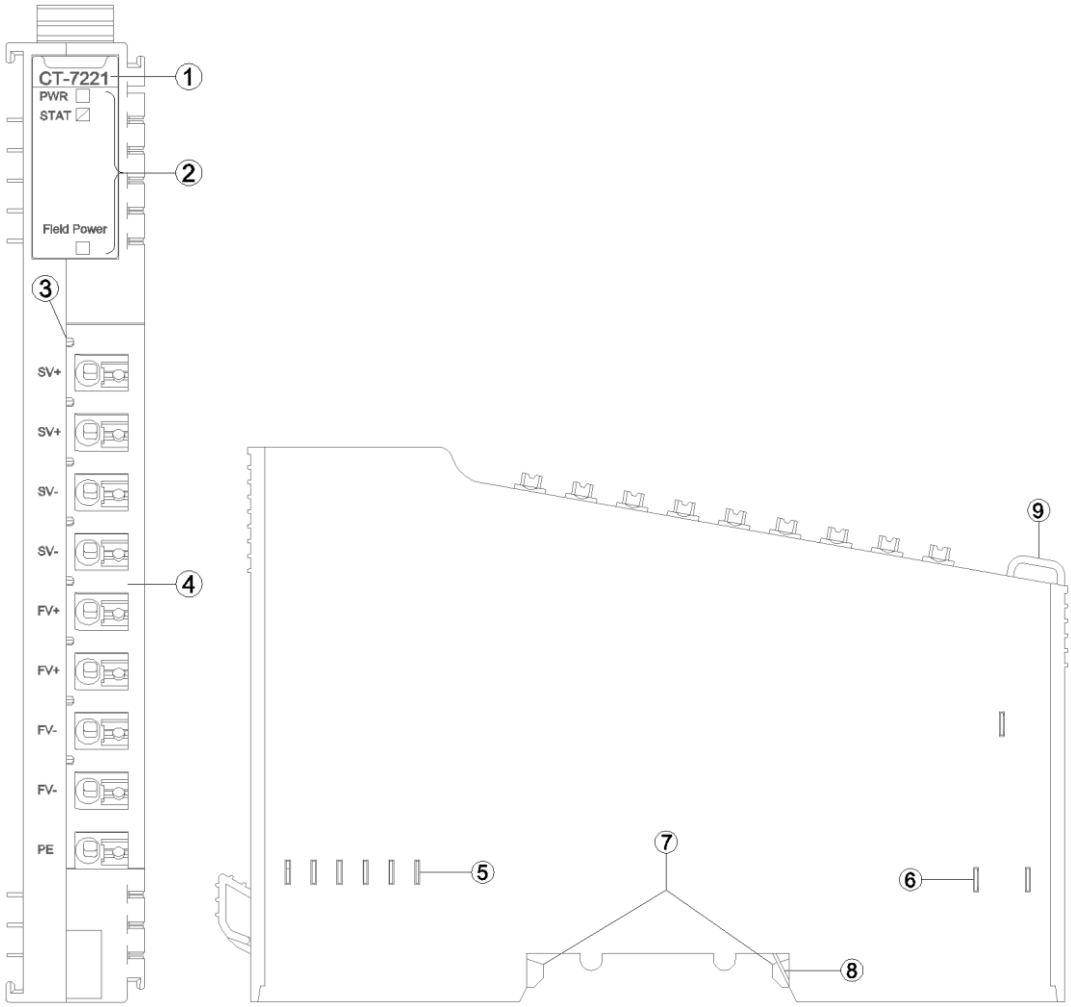
1 Module features

- ◆ System Power and Field Power Extension
- ◆ System Power Output 2A@5VDC
- ◆ Field Power Extension 8A Current

2 Technical Parameters

General parameters	
System Power	Nominal: 24Vdc, Range: 9-36Vdc Protection: overcurrent protection, anti-reverse connection protection
Module Internal Power Consumption	20mA@5VDC
Internal Bus Supply Current	Max：2.0A@5VDC
Isolation	System Power to Field Power Isolation
Field Power	Power Supply：22~28V（Nominal: 24Vdc） Protection： anti-reverse connection protection
Field Power Supply Current	Max. DC 8A
Environment Specification	
Operational Temperature	-40~85℃
Operational Humidity	5%~95% RH(No Condensation)
Protection Class	IP20

3 Hardware Interface



① Module Type

② State indicator

③ N/A

④ Wiring Terminal and identification

⑤ Internal Bus

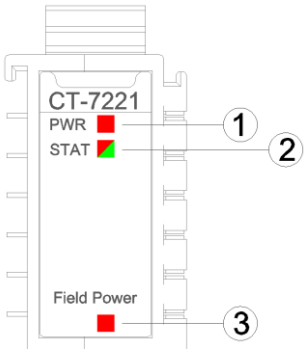
⑥ Field Power

⑦ Buckle

⑧ Grounding Resilient Sheet

⑨ Fixed Wiring Harness

3.1 LED indicator definition



① System Power LED Indicator (red)

② Module State LED indicator (red/green)

③ Field Power LED Indicator (red)

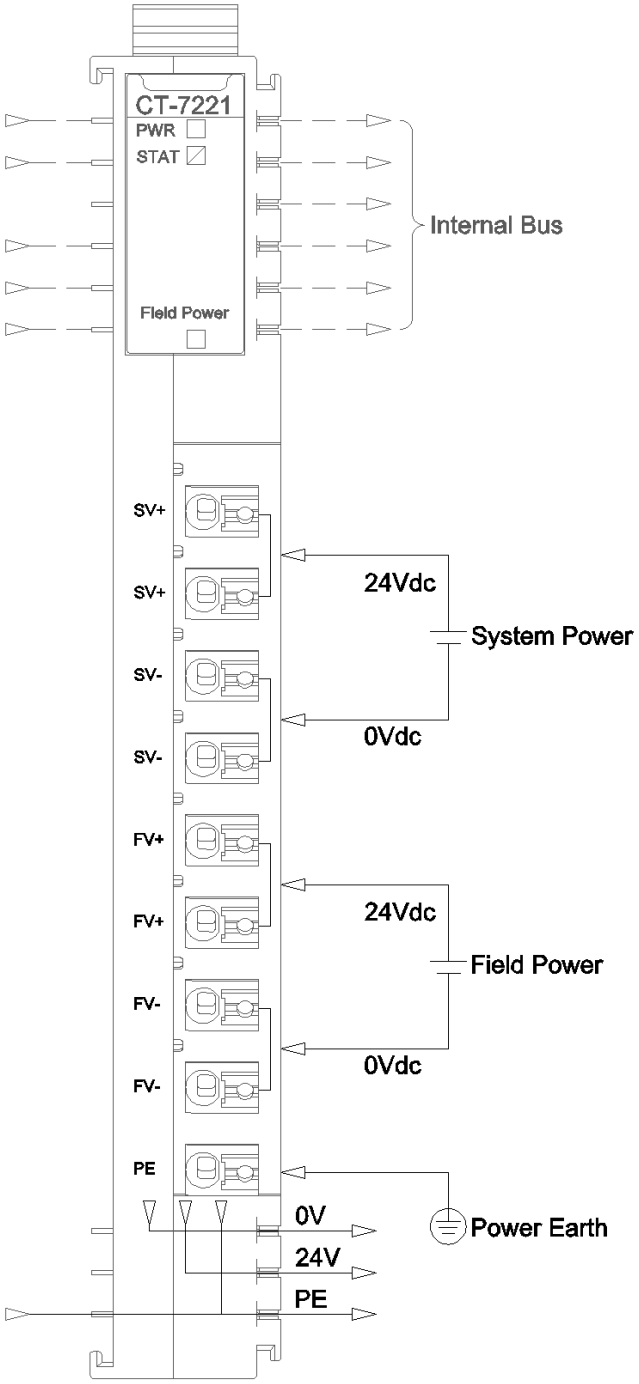
PWR Power LED Indicator (Red)	Definition
ON	The system power supply is normal.
OFF	The system power supply is failure.
STAT Module State LED Indicator (Red/Green)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
Field Power LED Indicator (Red)	Definition
ON	The field power supply is normal.
OFF	The field power supply is failure.

3.2 Terminal definition

Terminal Number	Definition	Description
1	SV+	System Power Positive Pole
2	SV+	
3	SV-	System Power Negative Pole
4	SV-	
5	FV+	Field Power Positive

6	FV+	Pole
7	FV-	Field Power Negative Pole
8	FV-	
9	PE	System Grounded

4 Wiring


CT-7221
PWR
STAT
Field Power
Internal Bus
SV+
SV+
SV-
SV-
FV+
FV+
FV-
FV-
PE
24Vdc
System Power
0Vdc
24Vdc
Field Power
0Vdc
0V
24V
PE
Power Earth

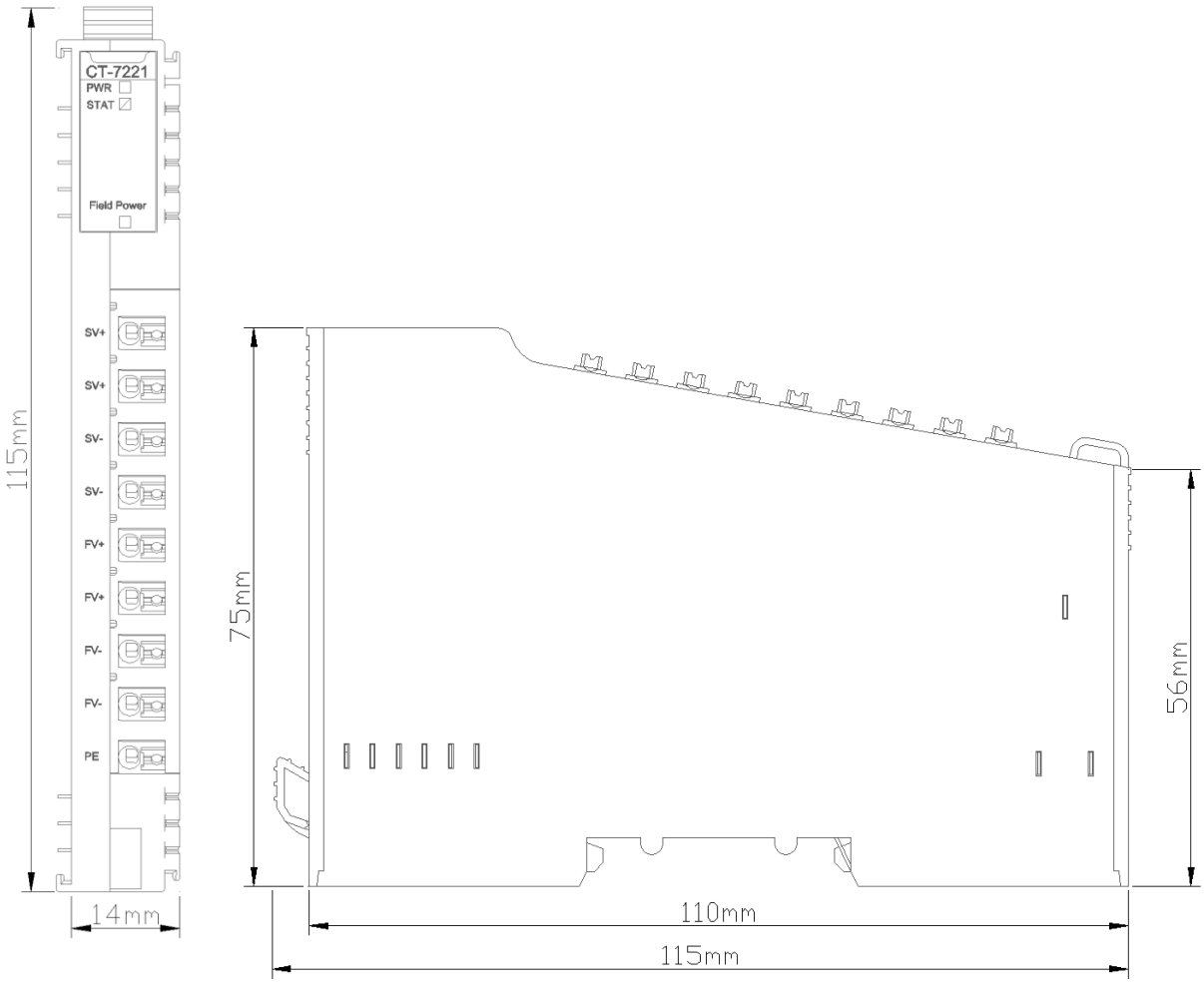
5 Process data definition

No process data.

6 Configuration parameters definition

No configuration parameter.

A DIMENSION



4 IO-Config configuration software

1 Software introduction

IO Config configuration software is use to config Remote IO products, which could realize the module functions of parameter uploading and downloading, process data monitoring, data address table view, device search, firmware upgrade, etc.

Note: when using IO-Config to configure the software, the serial port supports all the protocol adapters for parameter uploading, configuration parameter modification, online monitoring, etc. The Ethernet port only supports the Modbus TCP adapter (CN-8031) for parameter uploading, configuration parameter modification, online monitoring, etc.

The serial MicroUSB cable is required the function of data transmission and power supply. Some mobile USB cable is only with the power supply function, and no data transmission function, so it could not be used for adapter parameters uploading and downloading.

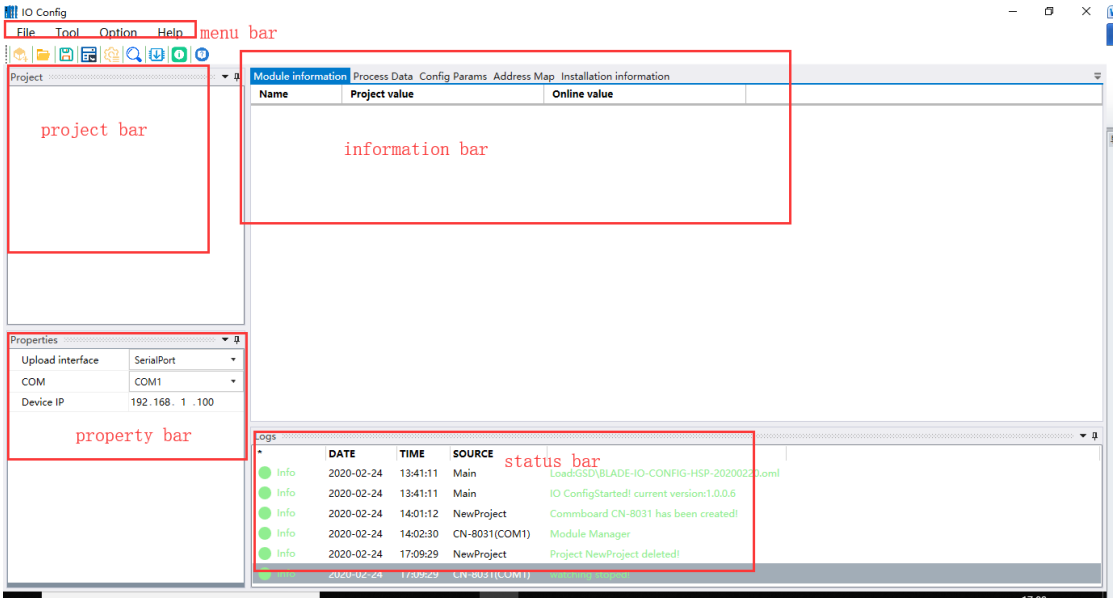
2 Offline configurations

When the device is disconnected to the software, the network adapter and IO module could be preselected according to the user actual module needs, and the software will automatically generate the data address mapping table.

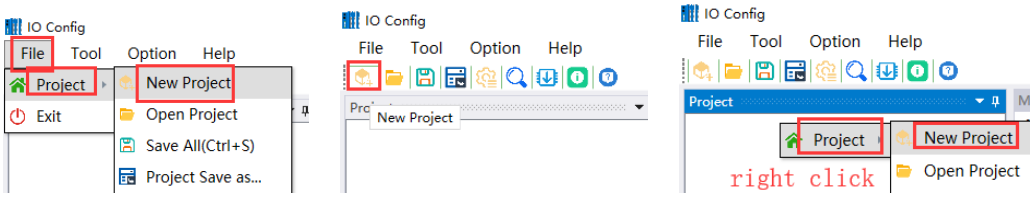
The offline mode is mainly designed **for Modbus adapter,** and the address in the address mapping table is the access address of IO module data. For other protocol adapter, the IO address of the device could be automatically generated after configured in the configuration software of the host station system.

In offline mode, adding module manually to view the address table is as the below steps:

1. Find the installation package, click install IO Config software, and open IO Config configuration software after installation.

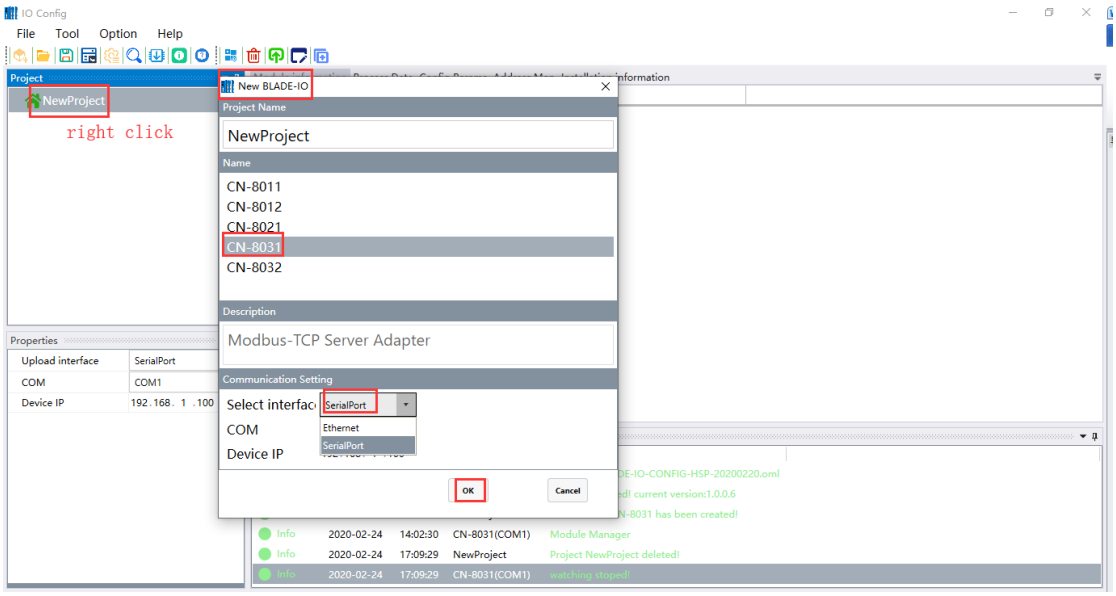


2. Click File→Project→New Project in the menu bar, or click the shortcut key or right-click Project→New Project in the project bar, and fill in the project name.

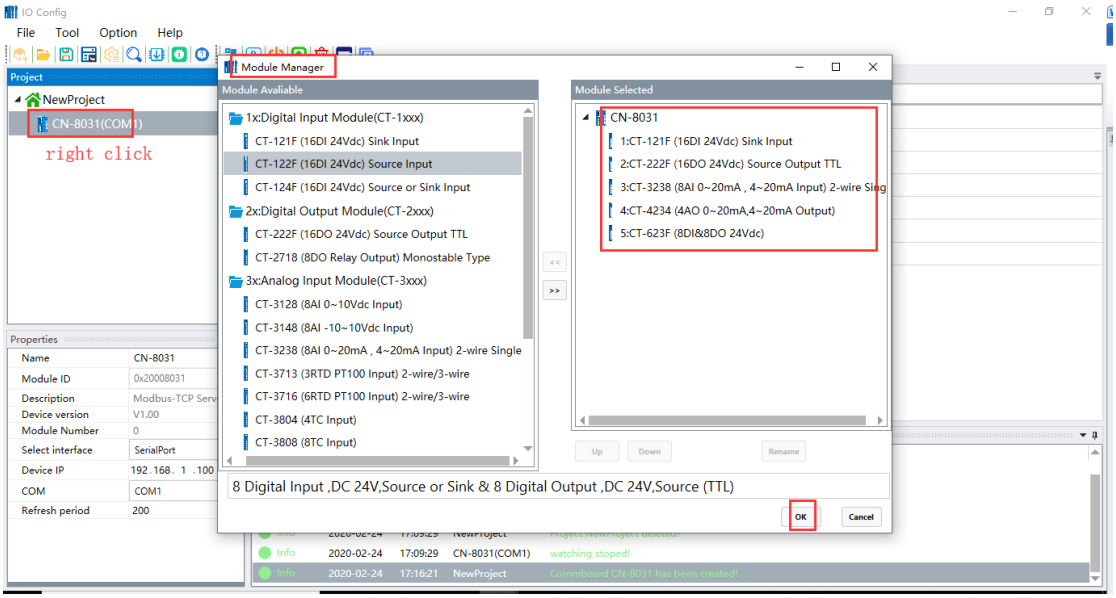


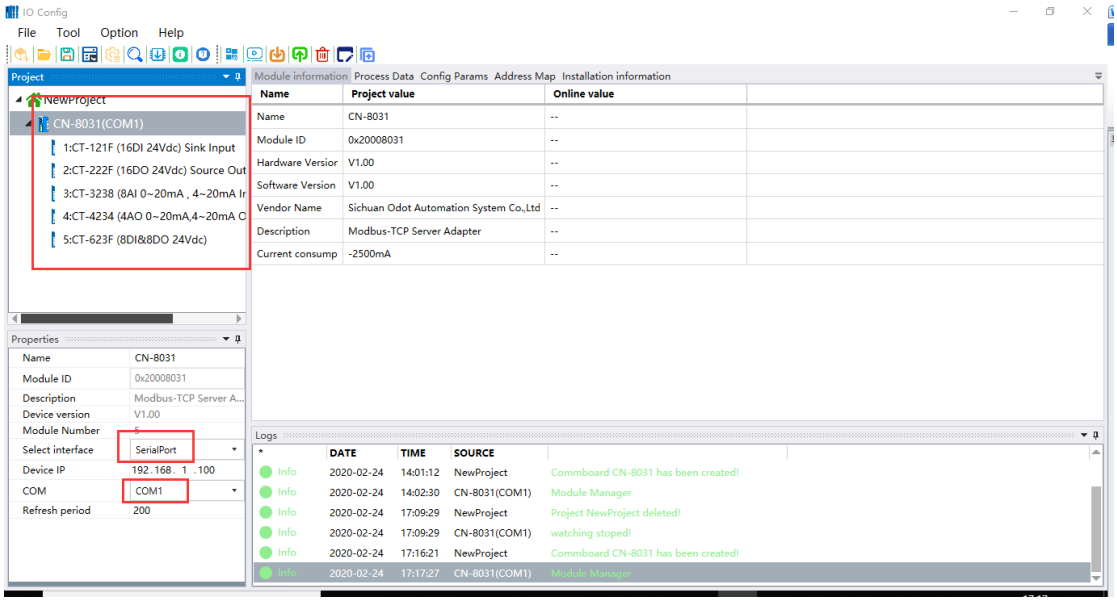
3. Right-click the NewProject Module in the project bar, and select CN-8031 In the pop-up window, then select one network port or serial port (if selecting serial port and it needs to select serial port number) and click OK.

Note: All network adapter modules could connect to the configuration software for debugging through the serial port. Only MODBUS TCP adapter can connect to the configuration software for debugging both through the Ethernet port and serial port.



4. Right-click CN-8031→click Module Manager, Double-click to select the detailed IO module that will hang with CN8031 in the pop-up window, and click OK.

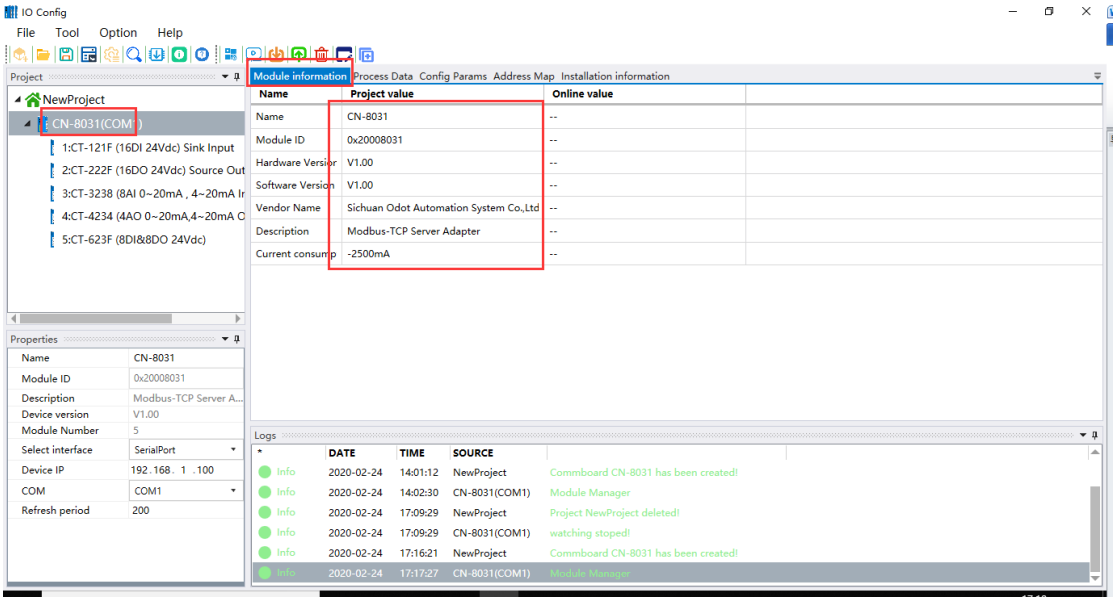




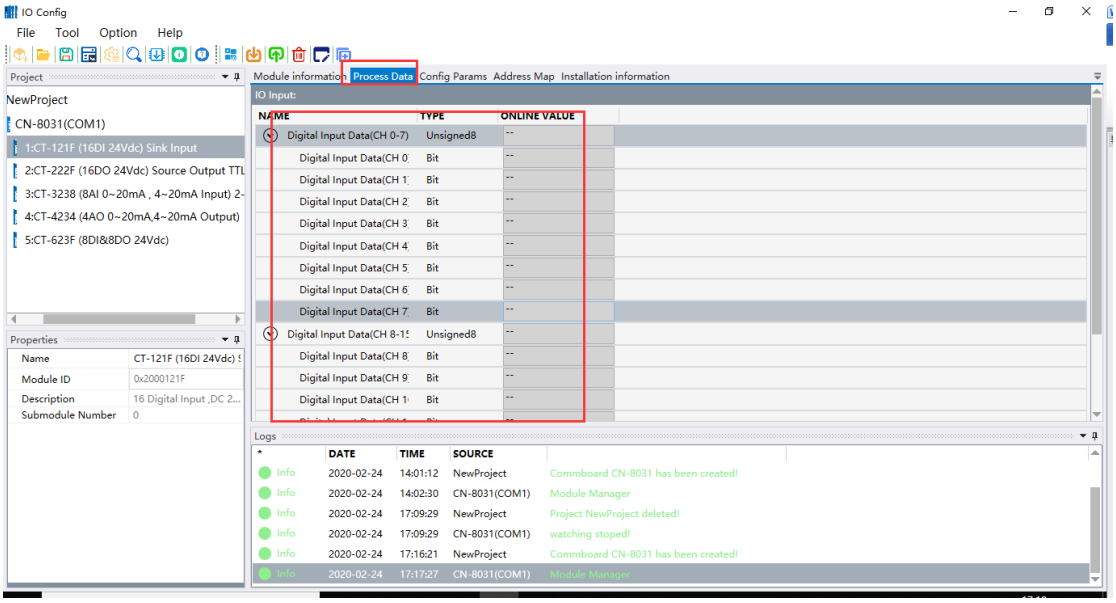
Module manually adding supports shortcut keys "Ctrl C", "Ctrl V" and "Delete" for copy, paste and delete IO module. Select CN-8031 and click the shortcut "Ctrl S" to save the configuration project.

5. Click Basic Information, Process Data, Configuration Parameters, Address Table and Installation Information in the information bar to view IO module information.

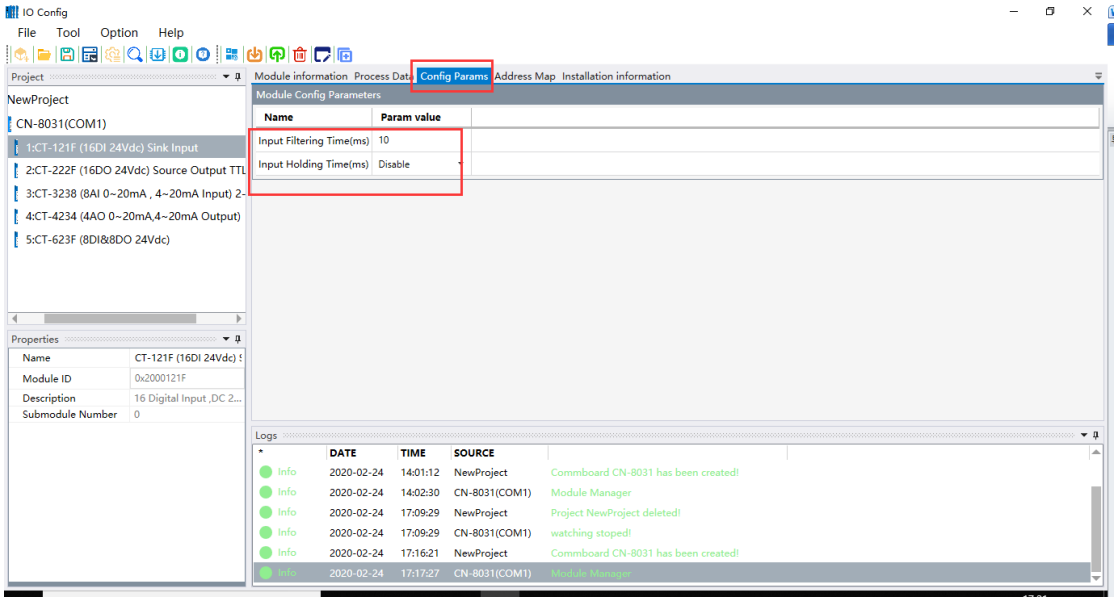
In Basic Information interface, you can view the communication protocol and version information of the current adapter module, and the module description and version information of the IO module.



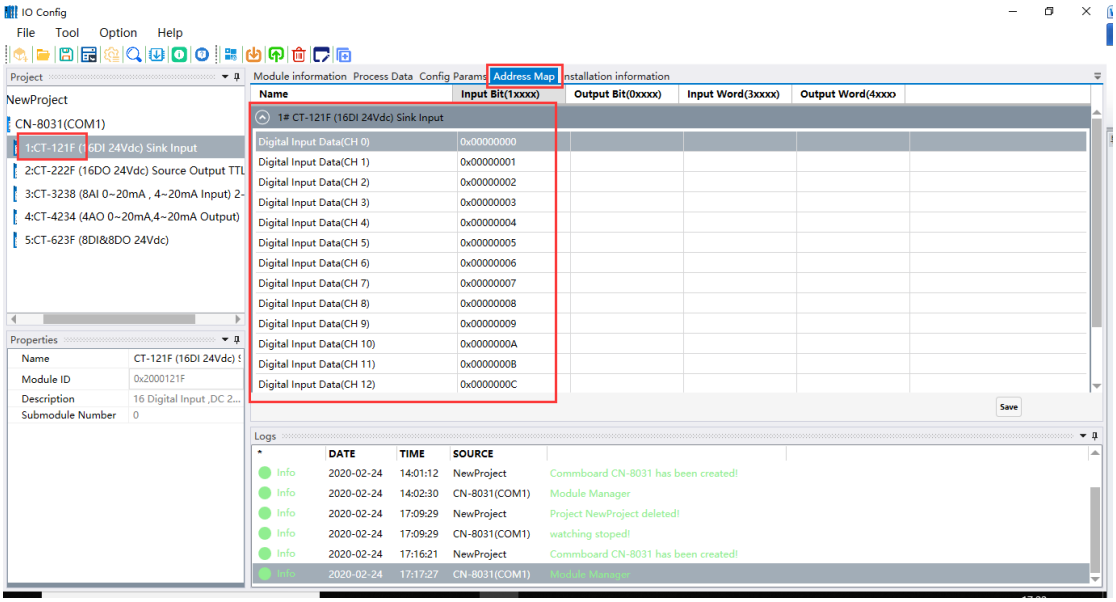
In Process Data interface, you can view the data type of the IO module, as well as the online monitoring value of the input data, and the online monitoring value and current value of the output data.

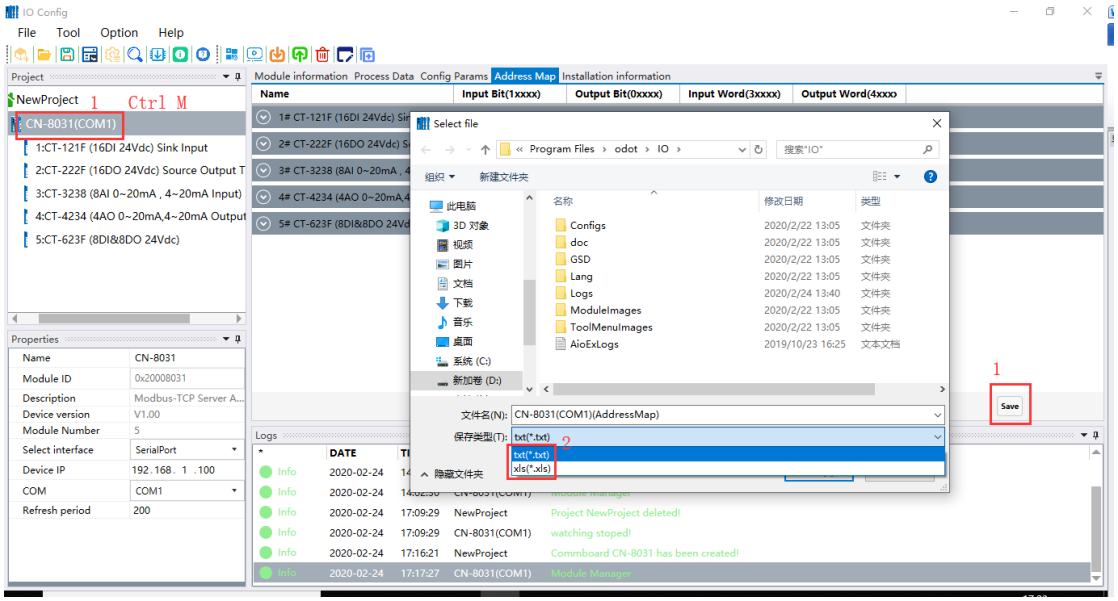


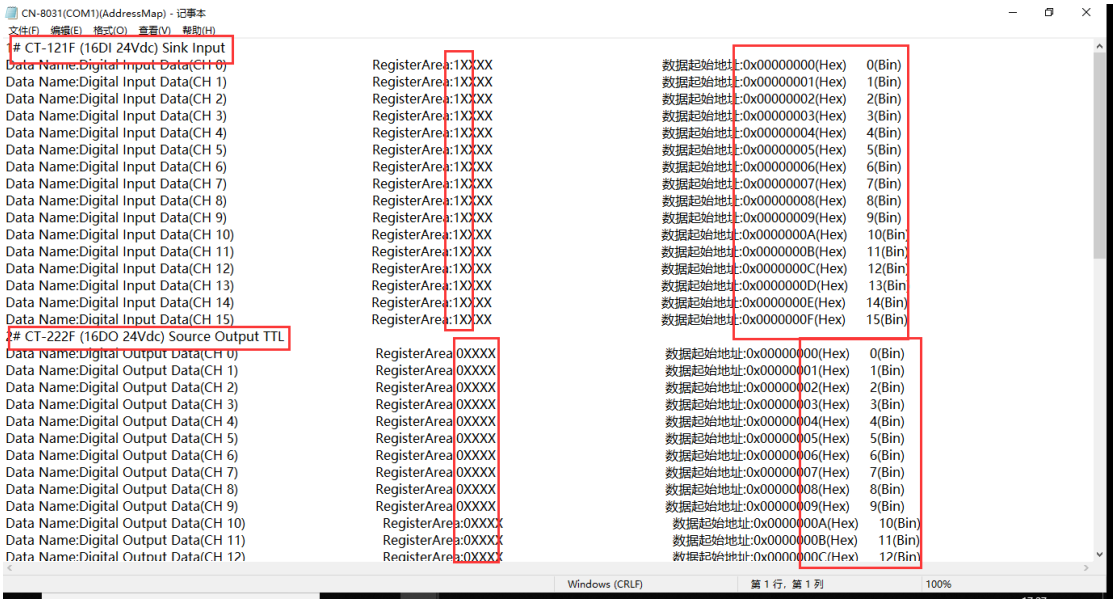
In Configuration Parameters interface, the configuration parameters and communication parameters of the adapter module cdoul be set. Configuration parameters of IO module could be set.

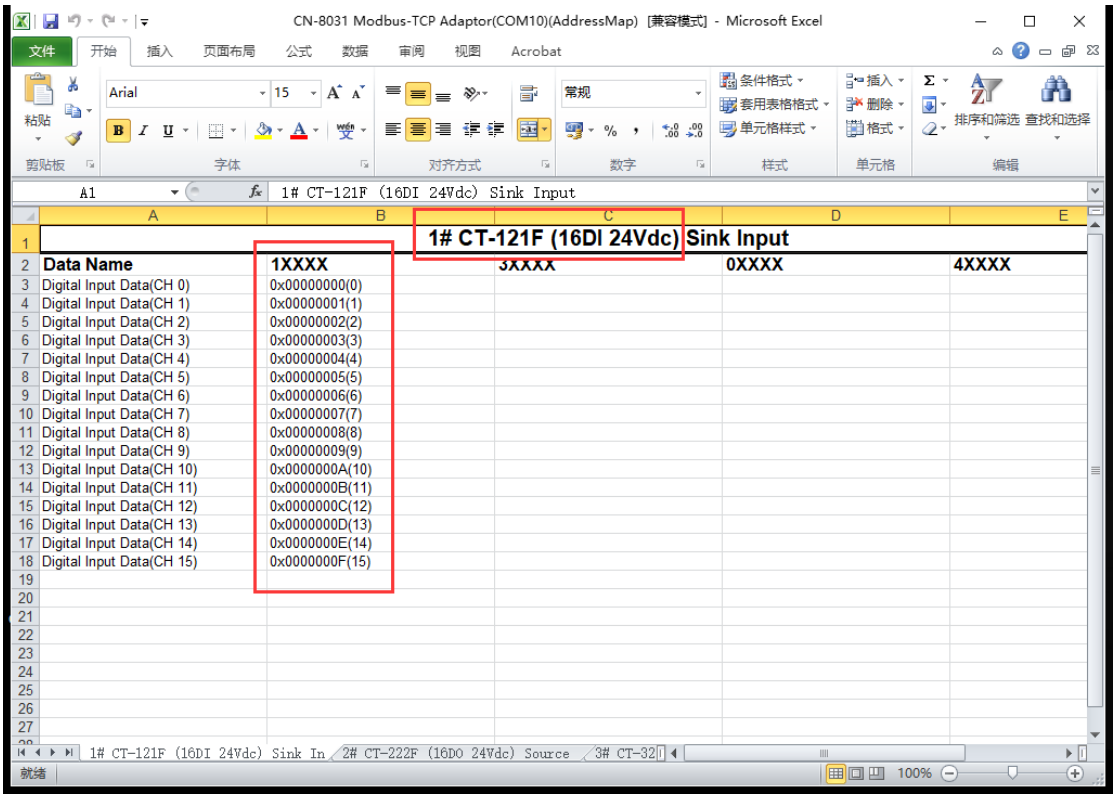


In the Address Map interface, you can view the channel address of the IO module. Click the address table save button or the shortcut "Ctrl M" to export the address table. And address table format is TXT or XLS.

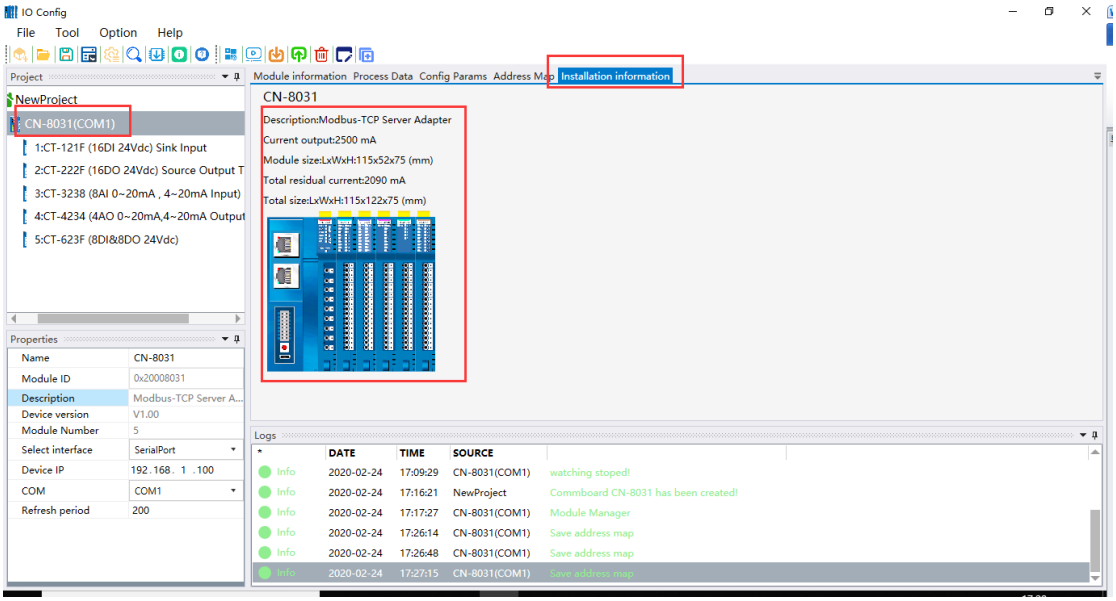



IO Config
File Tool Option Help
Project
NewProject
1 Ctrl M
CN-8031(COM1)
1:CT-121F (16DI 24Vdc) Sink Input
2:CT-222F (16DO 24Vdc) Source Output T
3:CT-3238 (8AI 0~20mA , 4~20mA Input)
4:CT-4234 (4AO 0~20mA,4~20mA Output
5:CT-623F (8DI&8DO 24Vdc)
Properties
Name CN-8031
Module ID 0x20008031
Description Modbus-TCP Server A...
Device version V1.00
Module Number 5
Select interface SerialPort
Device IP 192.168. 1 .100
COM COM1
Refresh period 200
Module information Process Data Config Params Address Map Installation information
Name
Input Bit(1xxxx)
Output Bit(0xxxx)
Input Word(3xxxx)
Output Word(4xxxx
Select file
Program Files › odot › IO ›
搜索"IO"
组织
新建文件夹
此电脑
3D 对象
视频
图片
文档
下载
音乐
桌面
系统 (C:)
新加卷 (D:)
名称
修改日期
类型
Configs 2020/2/22 13:05 文件夹
doc 2020/2/22 13:05 文件夹
GSD 2020/2/22 13:05 文件夹
Lang 2020/2/22 13:05 文件夹
Logs 2020/2/24 13:40 文件夹
ModuleImages 2020/2/22 13:05 文件夹
ToolMenuImages 2020/2/22 13:05 文件夹
AioExLogs 2019/10/23 16:25 文本文档
文件名(N): CN-8031(COM1)(AddressMap)
保存类型(T): txt(*.txt)
txt(*.txt)
xls(*.xls)
2
隐藏文件夹
1
Save
Logs
DATE
Info 2020-02-24
Info 2020-02-24 17:09:29 NewProject Project NewProject deleted!
Info 2020-02-24 17:09:29 CN-8031(COM1) watching stoped!
Info 2020-02-24 17:16:21 NewProject Commboard CN-8031 has been created!
Info 2020-02-24 17:17:27 CN-8031(COM1) Module Manager


CN-8031(COM1)(AddressMap) - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
1# CT-121F (16DI 24Vdc) Sink Input
Data Name:Digital Input Data(CH 0) RegisterArea:1XXXX 数据起始地址:0x00000000(Hex) 0(Bin)
Data Name:Digital Input Data(CH 1) RegisterArea:1XXXX 数据起始地址:0x00000001(Hex) 1(Bin)
Data Name:Digital Input Data(CH 2) RegisterArea:1XXXX 数据起始地址:0x00000002(Hex) 2(Bin)
Data Name:Digital Input Data(CH 3) RegisterArea:1XXXX 数据起始地址:0x00000003(Hex) 3(Bin)
Data Name:Digital Input Data(CH 4) RegisterArea:1XXXX 数据起始地址:0x00000004(Hex) 4(Bin)
Data Name:Digital Input Data(CH 5) RegisterArea:1XXXX 数据起始地址:0x00000005(Hex) 5(Bin)
Data Name:Digital Input Data(CH 6) RegisterArea:1XXXX 数据起始地址:0x00000006(Hex) 6(Bin)
Data Name:Digital Input Data(CH 7) RegisterArea:1XXXX 数据起始地址:0x00000007(Hex) 7(Bin)
Data Name:Digital Input Data(CH 8) RegisterArea:1XXXX 数据起始地址:0x00000008(Hex) 8(Bin)
Data Name:Digital Input Data(CH 9) RegisterArea:1XXXX 数据起始地址:0x00000009(Hex) 9(Bin)
Data Name:Digital Input Data(CH 10) RegisterArea:1XXXX 数据起始地址:0x0000000A(Hex) 10(Bin)
Data Name:Digital Input Data(CH 11) RegisterArea:1XXXX 数据起始地址:0x0000000B(Hex) 11(Bin)
Data Name:Digital Input Data(CH 12) RegisterArea:1XXXX 数据起始地址:0x0000000C(Hex) 12(Bin)
Data Name:Digital Input Data(CH 13) RegisterArea:1XXXX 数据起始地址:0x0000000D(Hex) 13(Bin)
Data Name:Digital Input Data(CH 14) RegisterArea:1XXXX 数据起始地址:0x0000000E(Hex) 14(Bin)
Data Name:Digital Input Data(CH 15) RegisterArea:1XXXX 数据起始地址:0x0000000F(Hex) 15(Bin)
2# CT-222F (16DO 24Vdc) Source Output TTL
Data Name:Digital Output Data(CH 0) RegisterArea:0XXXX 数据起始地址:0x00000000(Hex) 0(Bin)
Data Name:Digital Output Data(CH 1) RegisterArea:0XXXX 数据起始地址:0x00000001(Hex) 1(Bin)
Data Name:Digital Output Data(CH 2) RegisterArea:0XXXX 数据起始地址:0x00000002(Hex) 2(Bin)
Data Name:Digital Output Data(CH 3) RegisterArea:0XXXX 数据起始地址:0x00000003(Hex) 3(Bin)
Data Name:Digital Output Data(CH 4) RegisterArea:0XXXX 数据起始地址:0x00000004(Hex) 4(Bin)
Data Name:Digital Output Data(CH 5) RegisterArea:0XXXX 数据起始地址:0x00000005(Hex) 5(Bin)
Data Name:Digital Output Data(CH 6) RegisterArea:0XXXX 数据起始地址:0x00000006(Hex) 6(Bin)
Data Name:Digital Output Data(CH 7) RegisterArea:0XXXX 数据起始地址:0x00000007(Hex) 7(Bin)
Data Name:Digital Output Data(CH 8) RegisterArea:0XXXX 数据起始地址:0x00000008(Hex) 8(Bin)
Data Name:Digital Output Data(CH 9) RegisterArea:0XXXX 数据起始地址:0x00000009(Hex) 9(Bin)
Data Name:Digital Output Data(CH 10) RegisterArea:0XXXX 数据起始地址:0x0000000A(Hex) 10(Bin)
Data Name:Digital Output Data(CH 11) RegisterArea:0XXXX 数据起始地址:0x0000000B(Hex) 11(Bin)
Data Name:Digital Output Data(CH 12) RegisterArea:0XXXX 数据起始地址:0x0000000C(Hex) 12(Bin)
Windows (CRLF) 第 1 行，第 1 列 100%



In the Installation Information interface, you can check the current, size and other parameters of the module.

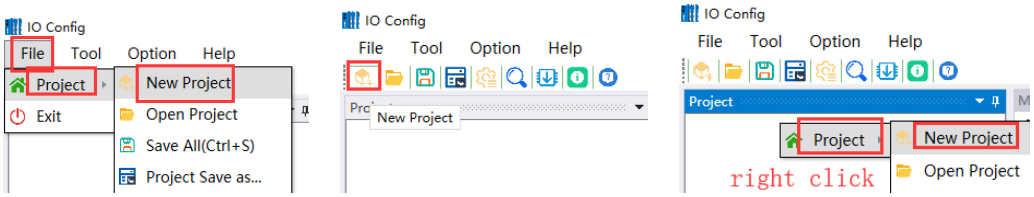


3 Online configurations

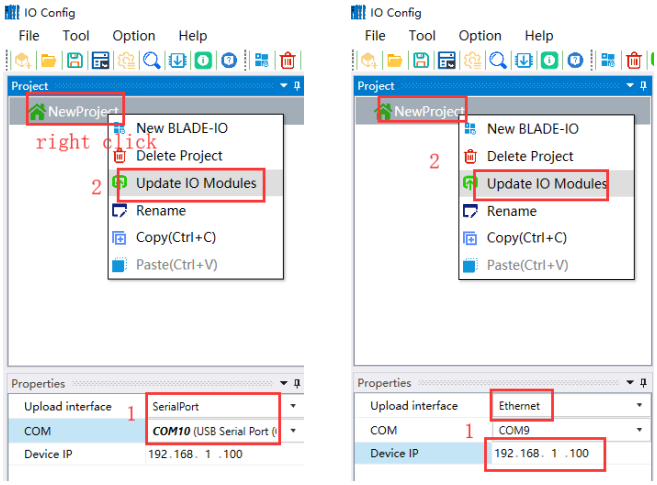
Supplying 24V power to the module, and connect the module to the computer

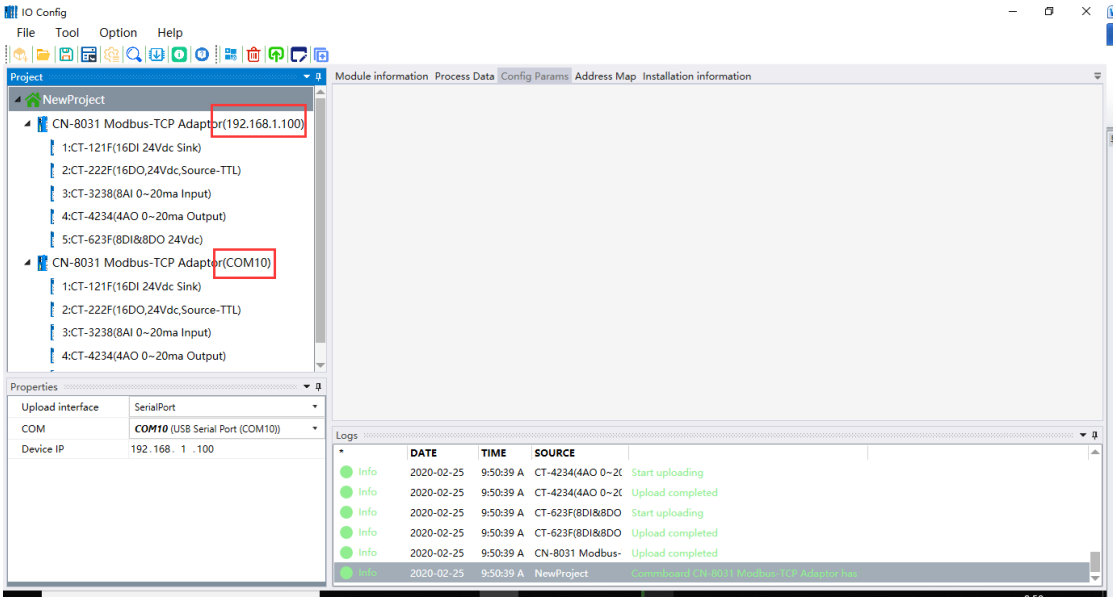
with Micro USB or network cable (Micro USB cable needs to install a driver and the COM port will be automatically assigned after the driver installation, such as COM3).

1. After installing IO Config software, open the configuration software, and click File→Project→New Project in the menu bar , or click shortcut of New Project, or right-click Project→New Project in the project menu bar, and manually fill in the project name.



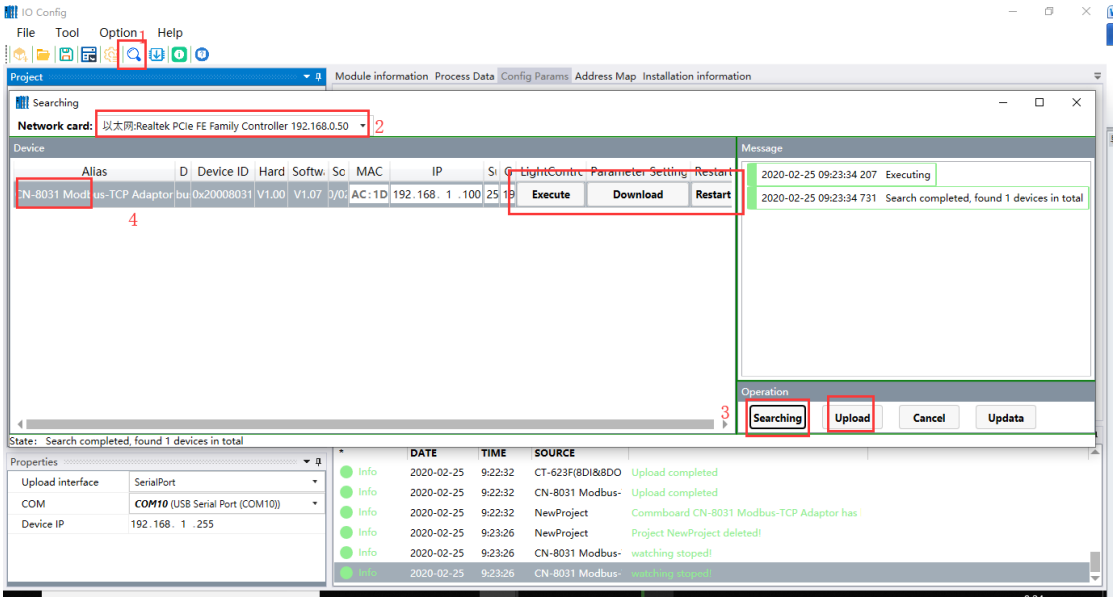
2. In the Property bar, modify the upload interface by selecting serial port and the serial port number is COM10, or modify the upload interface to select Ethernet. The device IP address: 192.168.1.100 (MODBUS TCP communication only). Right-click Project Name→Upload IO Modules, and the IO module will be automatically scanned in the project menu.

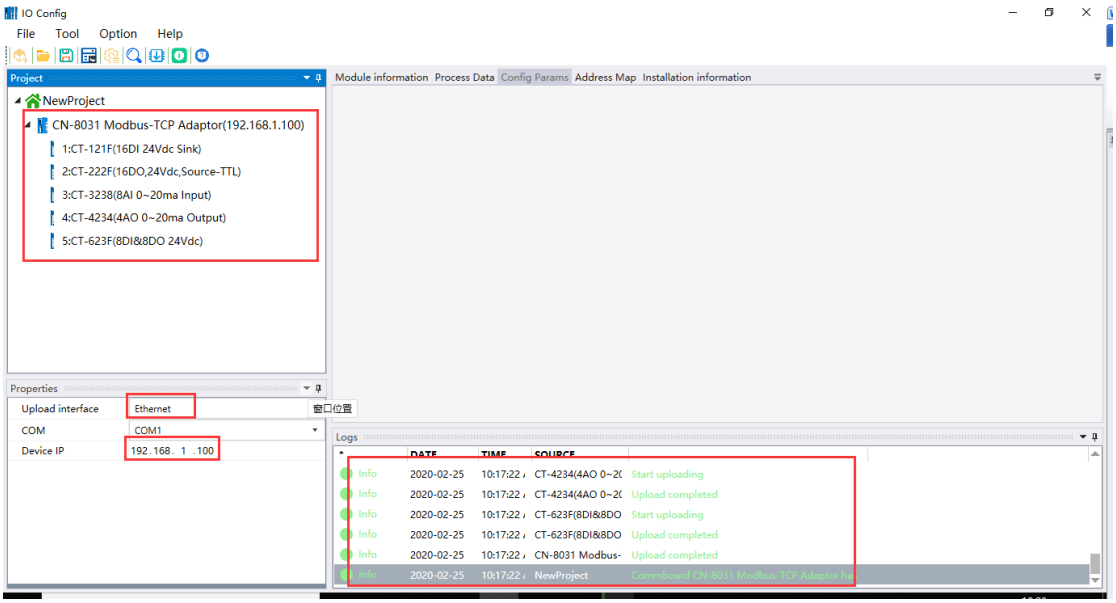




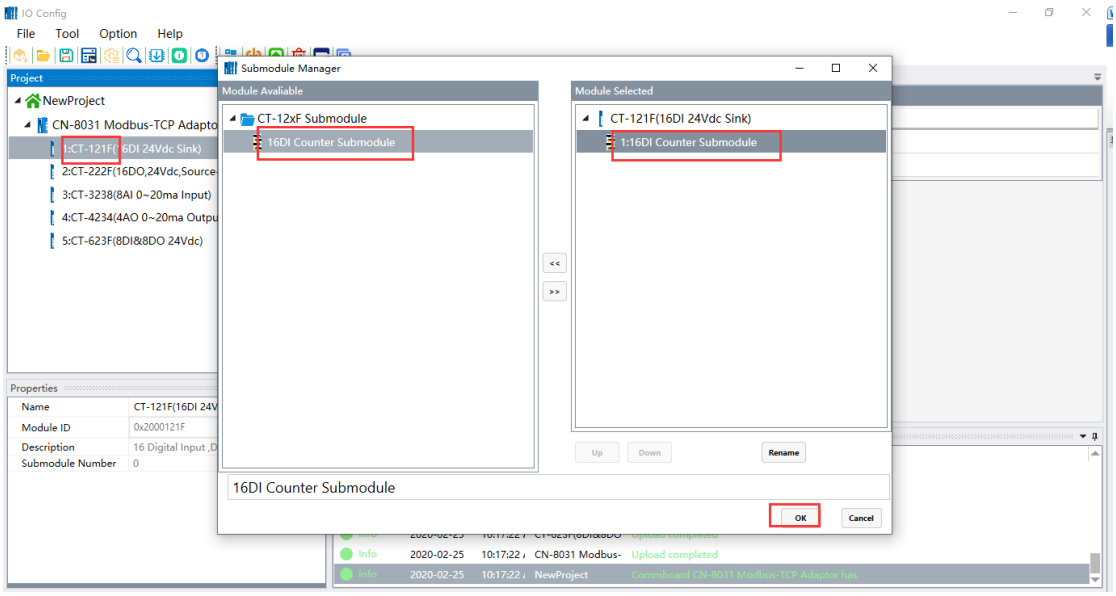
When the adapter module is CN-8031 (MODBUS TCP communication), clicking Tool to search device or click shortcut to search device, and selecting the Local Network Card in the pop-up interface, then clicking Search Device, and all adapter modules in the network structure will be scanned in the device list. In this interface it could view paramters such as version of adapter hardware and software, IP address and so on. When there are multiple adapters in the network, it supports the function of "Light Up" to find the device, "Download" to modify the adapter IP address and "Restart". When firmwares need to be upgraded, click "Upgrade" to enter the upgrade interface.

Clicking "Upload" and all IO modules will be uploaded automatically in the project menu.

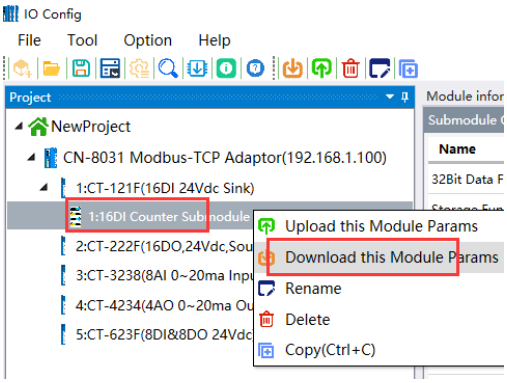


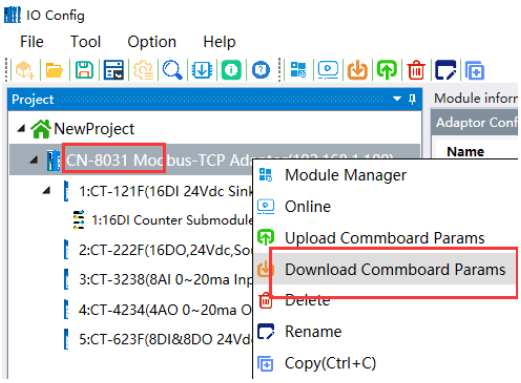


For the digital input module, you can manually add the counting sub-module.

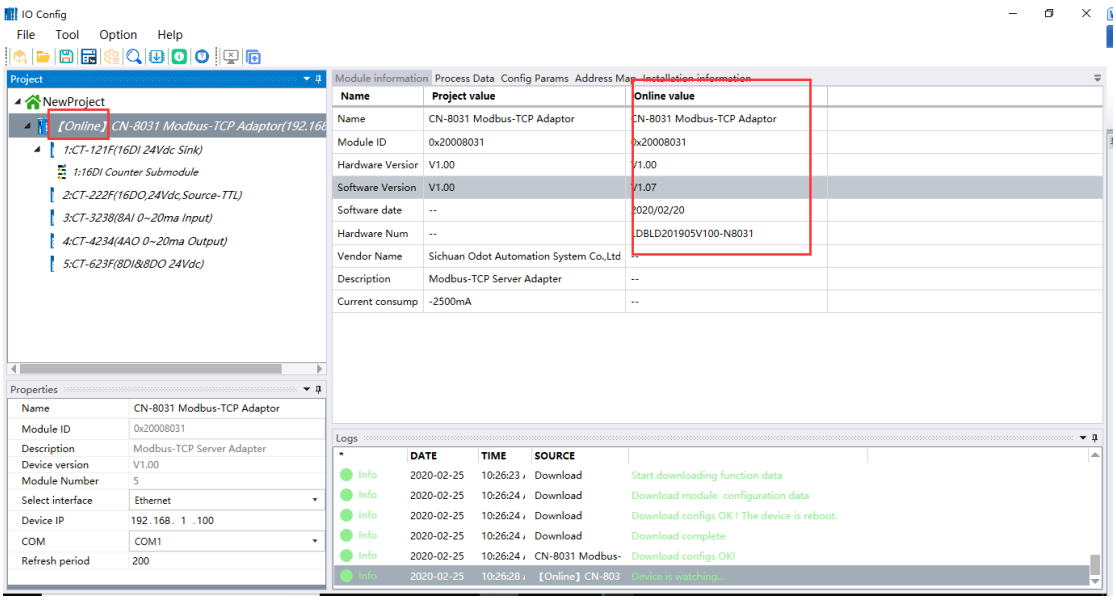


After adding a sub-module, you must right-click to download the module configuration or right-click CN-8031 to download IO parameters. Otherwise, if clicking directly online and it will result in an error in the state menu of "the number of sub-module does not match the total number of configuration sub-module".

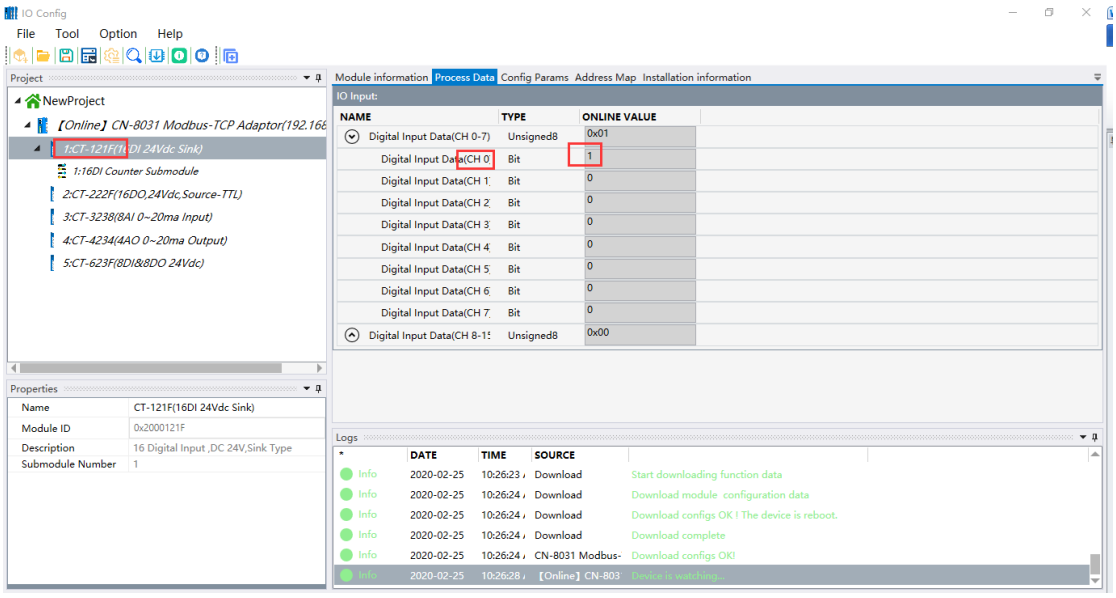




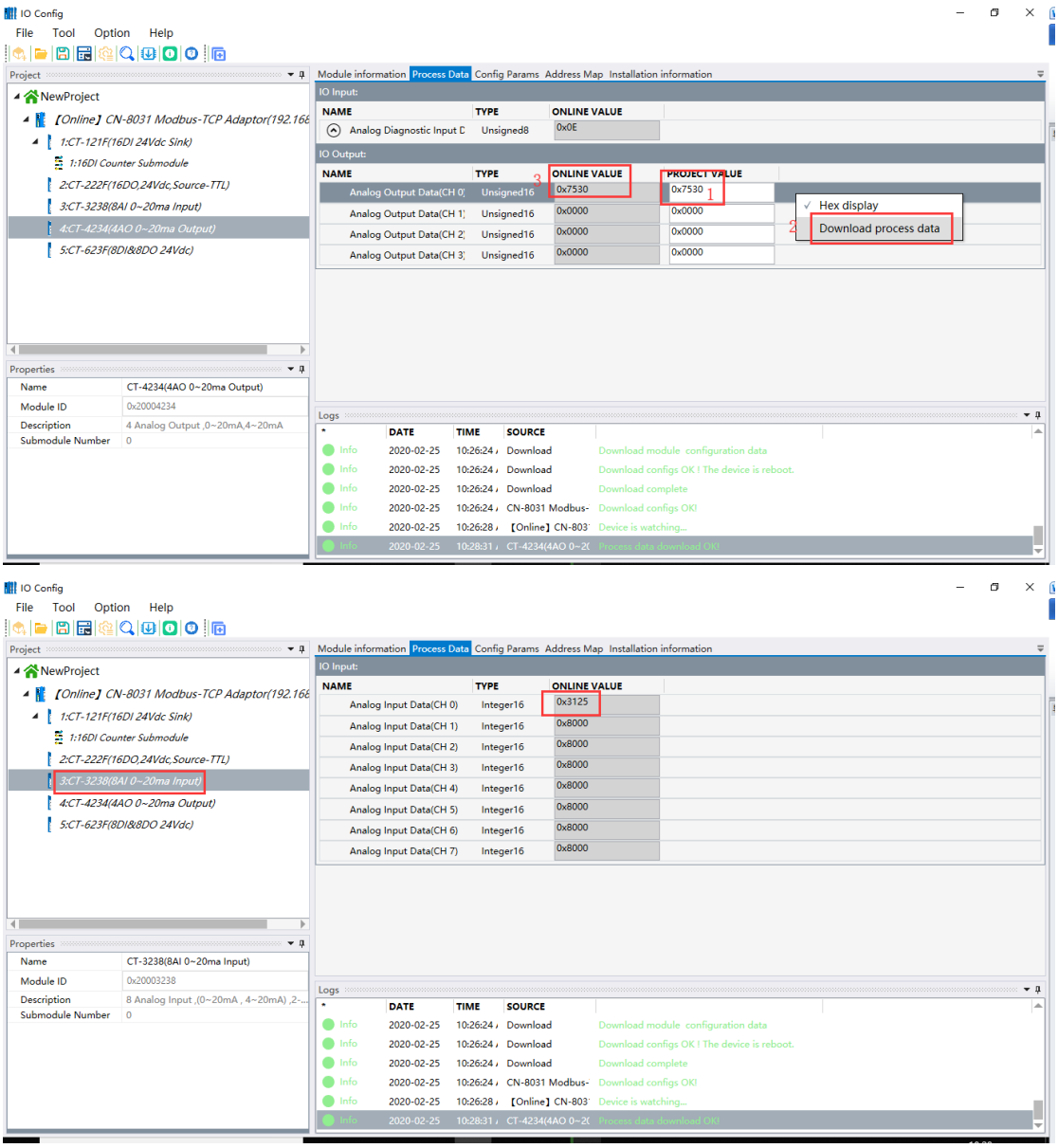
3. Right-click the adapter module CN-8031 and clicking online. It could monitor the IO module data online.



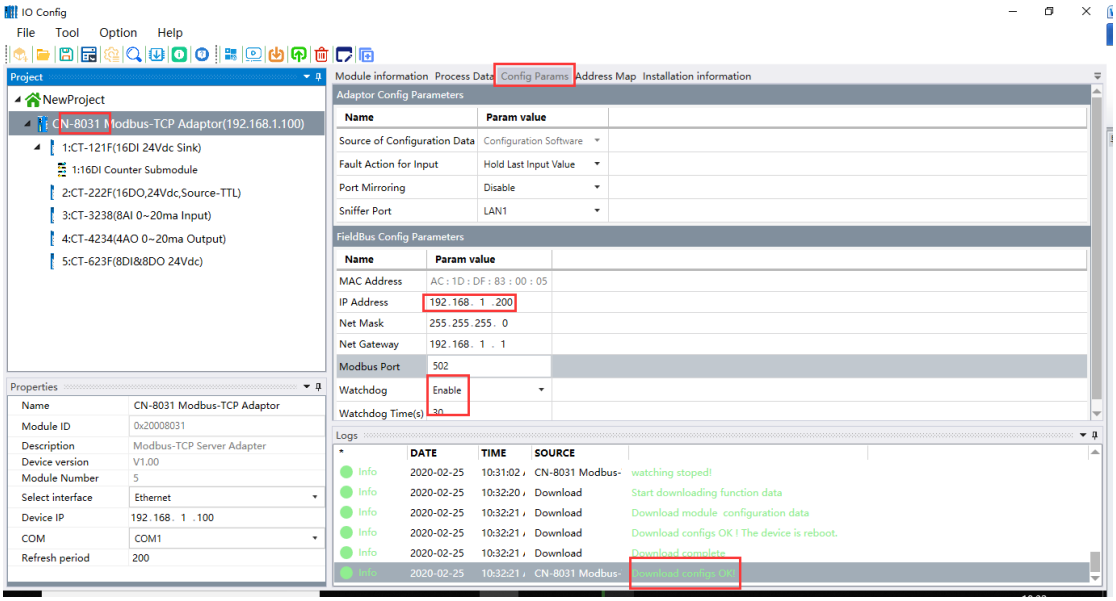
Example: CT-121F in slot 1, the external power 24VDC is supplied to the DI0 of CT-121F. And in the process data interface, the CH0 monitoring value is 1.

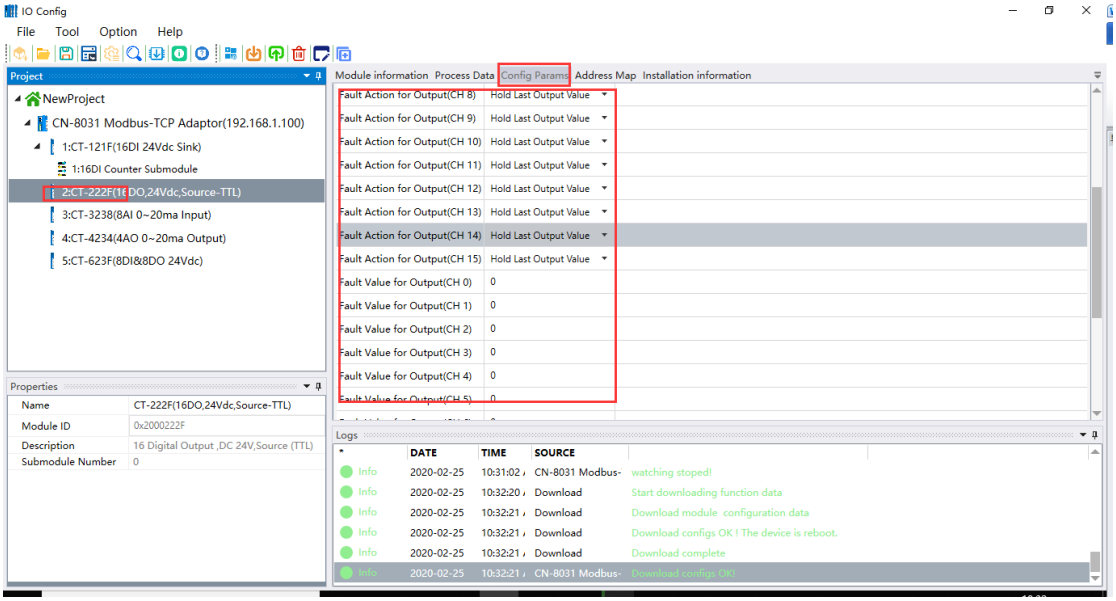


Example: Assigning the CH0 channel of CT-4234 in slot 4 to 16#7530= 30000, and connect it to the CH0 channel of CT-3238 in slot 3 at the same time.The CH0 of CT-3238 monitoring value is 16#3125.

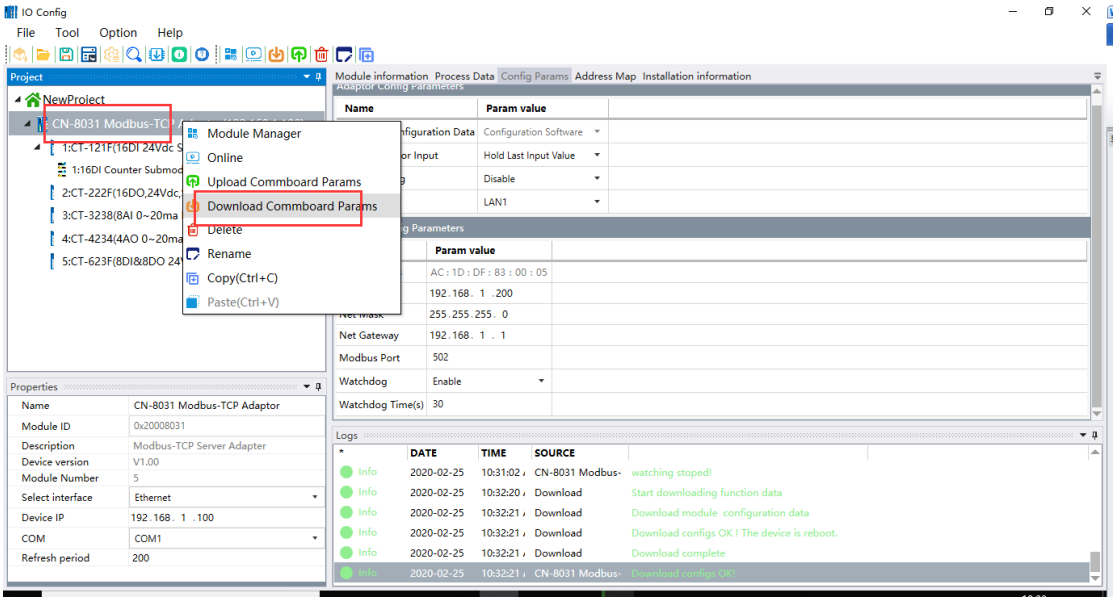


4. Configuration parameters can be modified in the configuration interface.

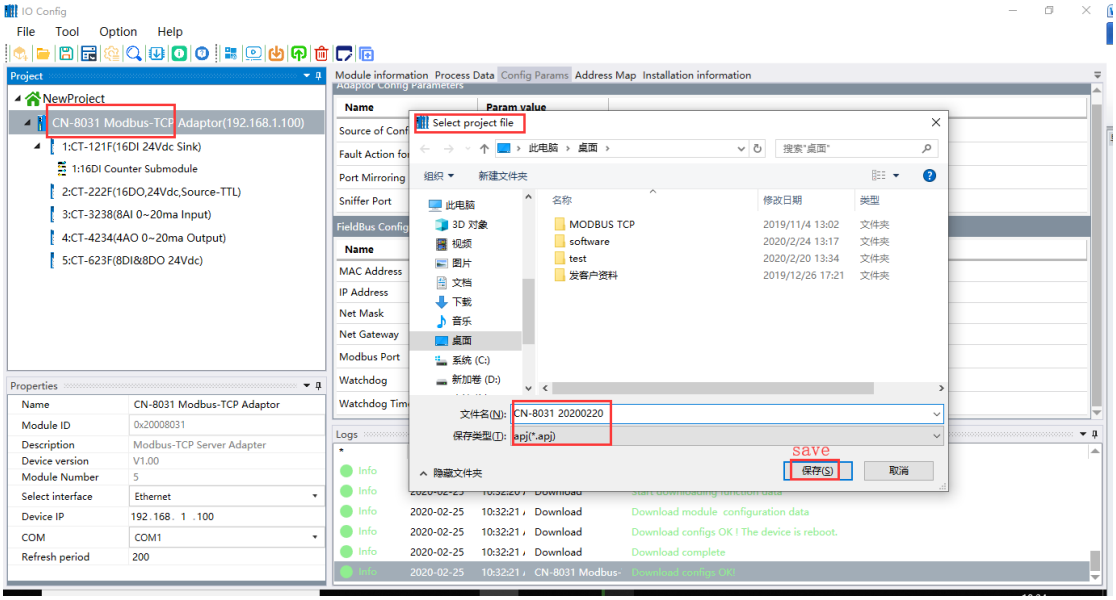




After the parameters are changed, you can right-click on CN-8031-Download IO Parameters in the project bar. So the configuration parameters of the adapter and IO module could be modified.



After all parameters are modified, select CN-8031 and click the shortcut key "Ctrl S" to save the configuration project.

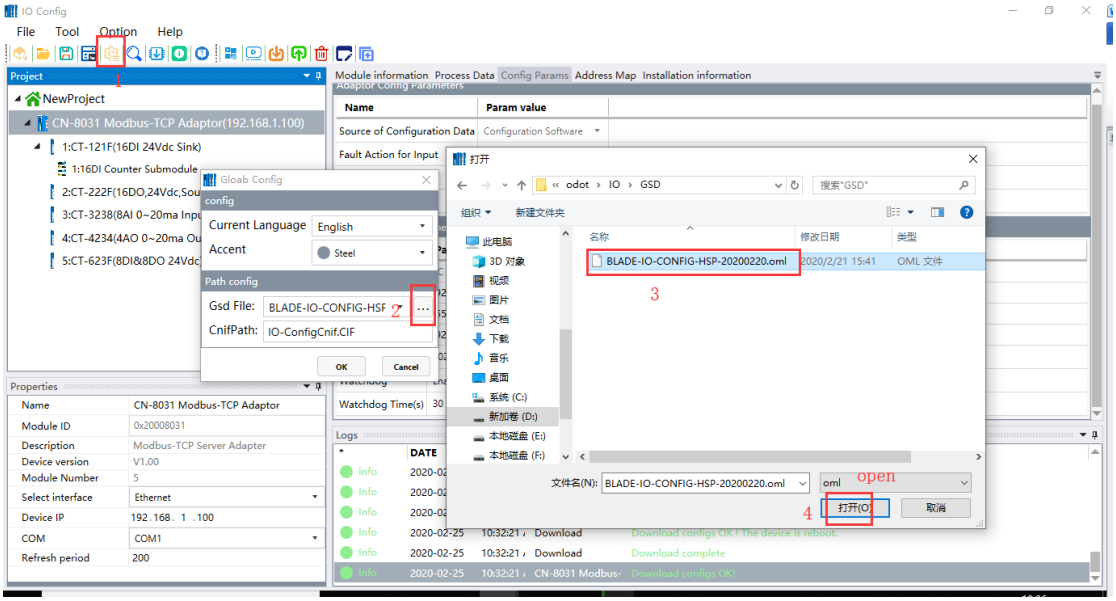


4 Update device library files

Update device library file is used to update the newly added IO module of software. When a new IO module is released, the customer can import the IO module into the configuration software by only updating the device library file, so there is no need to reinstall the configuration software.

First, copy and paste the latest version of the device library file of BLADE-IO-CONFIG-HSP-20200213 into the GSD folder of the software installation directory.

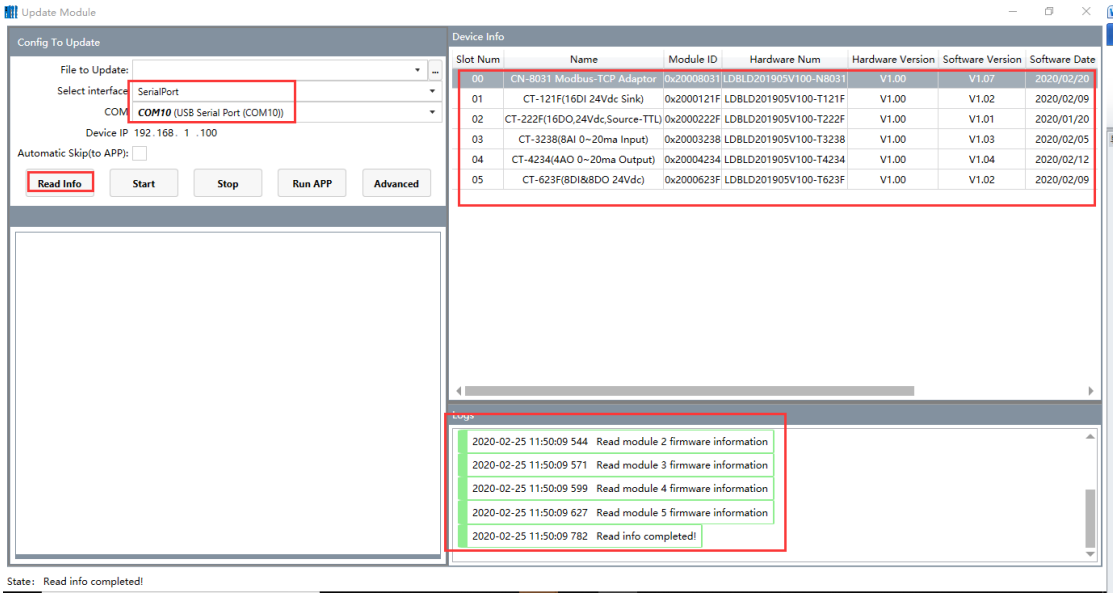
Second, click Option-Configuration or shortcut key in the menu bar. And in the pop-up window, please find the new library file (.oml) under the 'Path config', and click open to complete the update of the device library File.



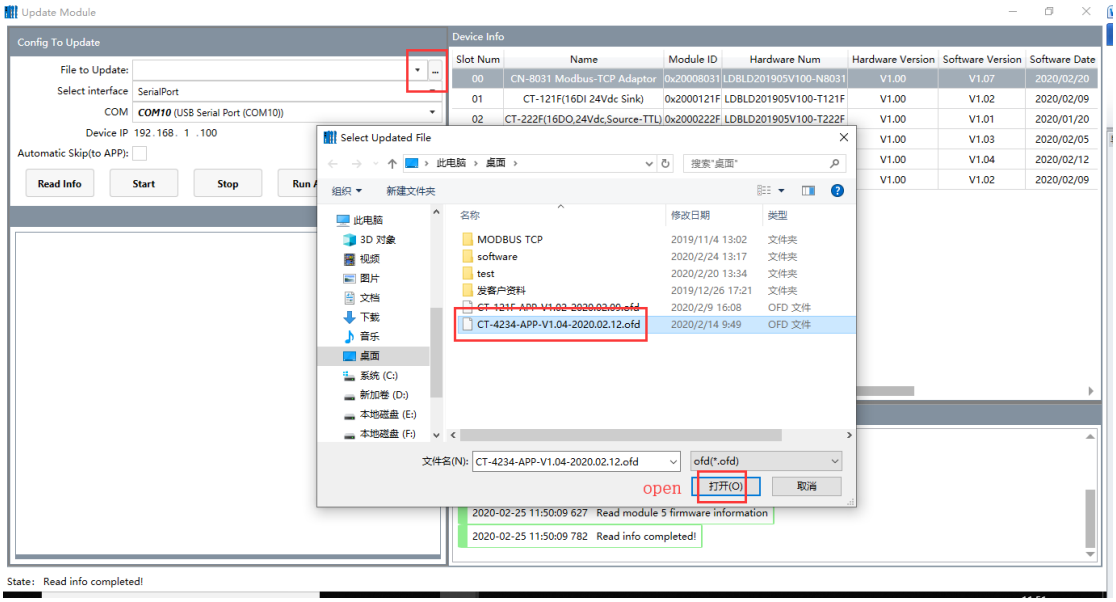
5 Device firmware upgrades

In IO Config software, clicking Tool→Online upgrade or shortcut and in the pop-up window, selecting "Serial Port" (Ethernet could be selected for MODBUS TCP communication) and the serial port number is "COM10". Click "read Info" to

view the version information of the current adapter or IO module.



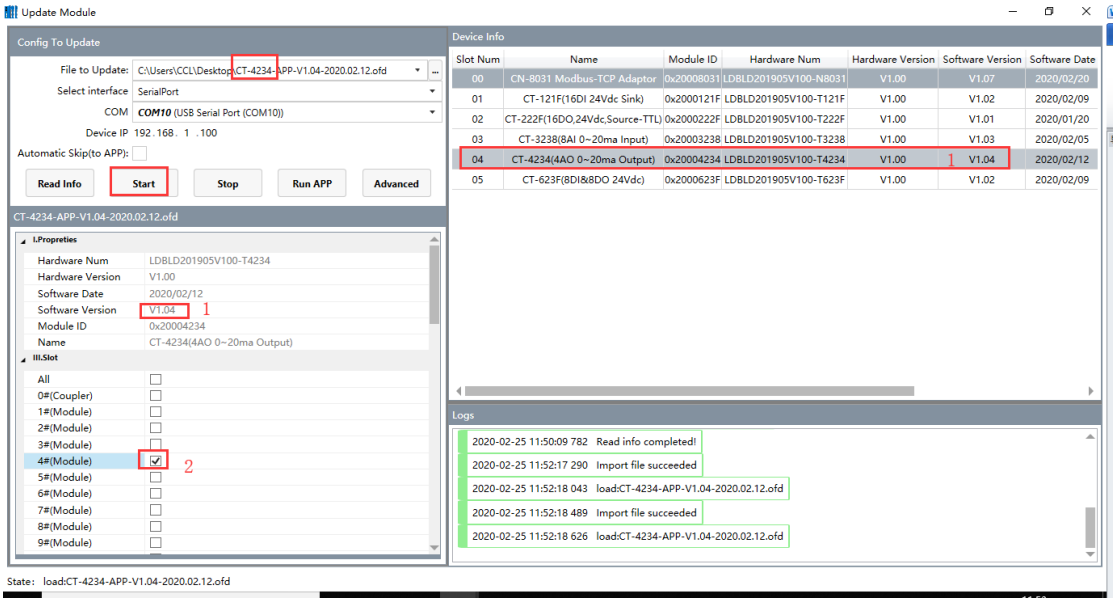
Click the right side of the upgrade file, and select the upgrade file (.ofd) of the analog output module CT-4234 in the pop-up window, and open it.



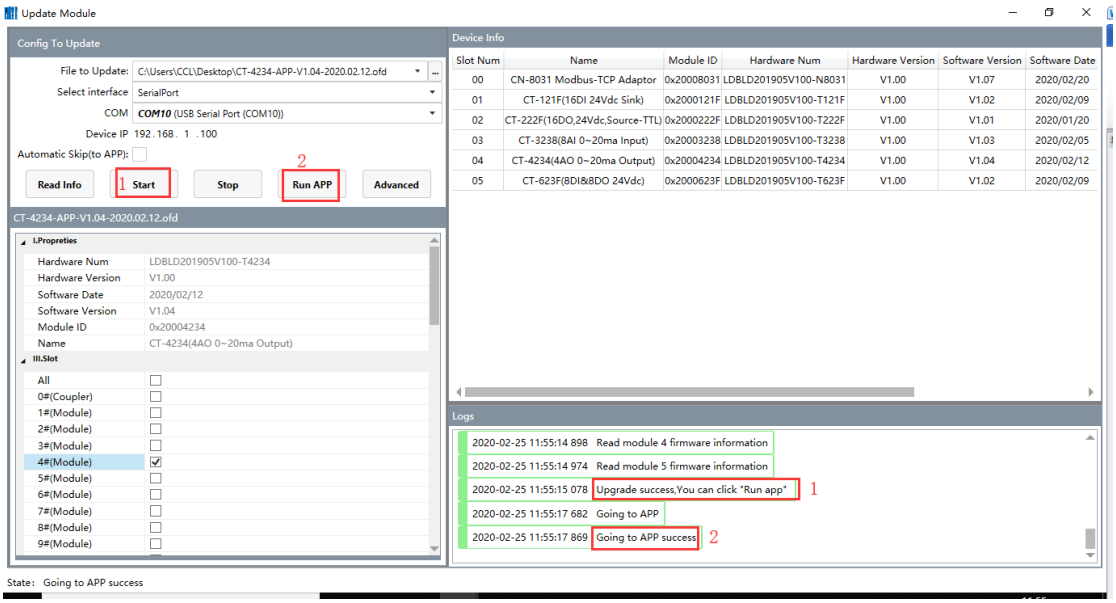
The upgrade version and other information could be viewed in the lower left side of the upgrade menu. And there is no upgrade for the currently firmware version so no need for upgrading. If the version information is inconsistent, please select the slot where the module is located(marking√) and click to start the upgrade.

Note: if the hardware version displayed on the lower left side of the menu is IO

module, and it needs to select the slot where the module is located(marking√) and click to start the upgrade.

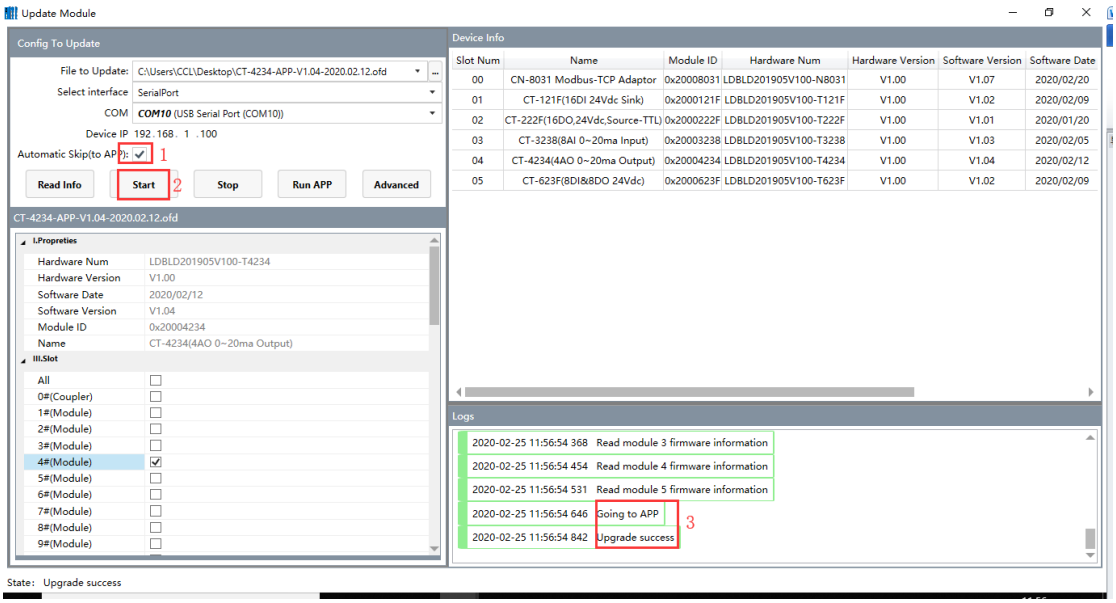


Please note when upgrading: just click to Start for the upgrade, after the upgrade is completed, and it requires to enter APP mode, so it needs to manually click "run APP" or power up the device again.



If it only needs to upgrade firmware of one module, you can select Automatic Skip (to APP), and click Start for upgrade, then the APP will run automatically when the

upgrade is completed. If it needs to upgrade the firmware of multiple modules, please do not select Automatic Skip (to APP). Clicking Run APP after all the modules upgrade is finished.



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