EtherNet/IP
XB6 Series Slice I/O
User Manual

Nanjing Solidot Electronic Technology Co., Ltd.

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Nanjing Solidot Electronic Technology Co., Ltd.

Address: Angying Building , No. 91 Shengli Road, Jiangning Zone, Nanjing, Jiangsu

Postal code: 211106

Telephone: 4007788929

Website: https://www.solidotech.com/en

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1 Product Features

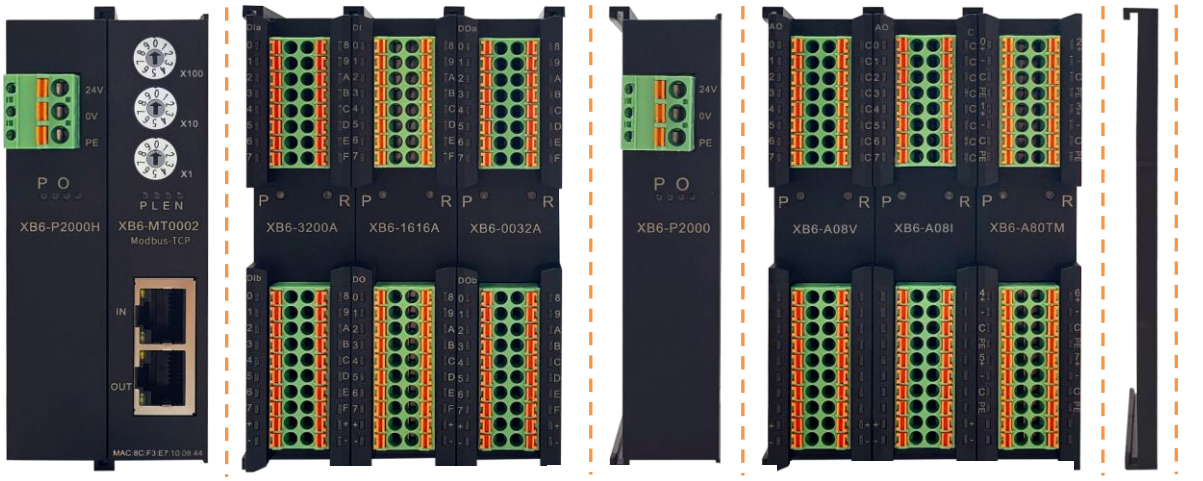
1.1 Product Overview

XB6 series Slice I/O modules adopt the structure of coupler and I/O module combination. The coupler connects the expandable I/O modules to the real-time industrial Ethernet system, and the I/O module communication backplane adopts X-bus, which provides high real-time performance and a wide range of modules, providing users with high-speed data acquisition, optimized system configuration, simplified on-site wiring, and improved system reliability.

1.2 Product Features

- **Less nodes occupied**
  A node consists of a bus coupler, 1 to 32 I/O modules of the X-bus series and an end cap.
- **Flexible configuration**
  Various types of slice I/O modules are available in any combination.
- **Extensive functionality**
  Support flexible expansion, I/O all kinds of complete; can be integrated with digital, analog, temperature and other modules, a rich variety, can be applied to different applications needs.
- **High compatibility**
  The coupler communication interface conforms to industrial Ethernet communication standards and supports mainstream EtherNet/IP masters.
- **Support for parameter configuration**
  Supports parameter configuration with automatic saving.
- **High Speed**
  The backplane utilizes the X-bus: scanning period max. 1 ms.
- **Easy diagnosis**
  Innovative channel indicator design, close to the channel, channel status at a glance, easy to detect and maintain.

1.3 Application Configuration



Application method:

Different modules can be combined, including power supply, coupler, digital, analog, relay, temperature, and other modules.

Application configuration:

Different I/O module combinations can be adopted depending on master station access capacity, number of stations, I/O points, function type, and other requirements.

Configuration rules:

From left to right, the modules should be arranged in the order of power supply, coupler module, I/O modules, and cover plate (must be configured).

2 Naming Rules

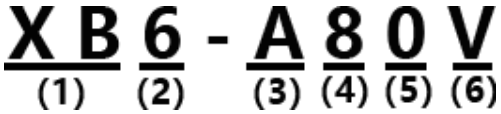
2.1 Naming Rules

2.1.1 Coupler Naming Rules

XB6-EI2002ST
(1) (2) (3) (4) (5) (6)

Item	Value	Description Of The Values
(1)	Bus Type	XB: X-bus
(2)	Product Series	6: Slice I/O
(3)	Bus Protocol	EI: EtherNet/IP EC: EtherCAT PN: PROFINET CB: CC-Link IE Field Basic CT: CC Link IE TSN
(4)	Power Supply	20:2A
(5)	Number of Bus Interfaces	02：2*RJ45
(6)	Module Type	ST：Kit of power supply, coupler, and cover plate

2.1.2 I/O Module Naming Rules



Item	Value	Description Of The Values				
(1)	Bus Type	XB: X-Bus				
(2)	Product Series	6: Slice				
(3)	I/O Module Type	A：Analog Blank：Digital				
(4)	Number Of Inputs	Analog: 0, 4, 8 Digital: 0, 16, 32				
(5)	Number Of Outputs	Analog: 0, 4, 8 Digital: 0, 16, 32				
(6)	I/O Characteristics	**Digital**			**Analog**	
		Code	Input	Output	Code	Description
		A	NPN	NPN, 0.5A	V	-10~+10 V, 0~+10 V
		B	PNP	PNP, 0.5A	I	4~20 mA, 0~20 mA
		BW	PNP	PNP, 0.25A	TM	Resistance Temperature Detector (RTD), thermocouple (TC)
		N	NPN/PNP	-		
		AN	-	NPN, 0.1A		
		BN	-	PNP, 0.1A		

2.2 List of Common Modules

Model	Product Description	
XB6-EI2002ST	EtherNet/IP coupler kit (power supply + coupler + cover plate)	
XB6-P2000	Extension power module	
XB6-3200A	32-channel digital input module, NPN type	
XB6-3200B	32-channel digital input module, PNP type	
XB6-0032A	32-channel digital output module, NPN type	
XB6-0032B	32-channel digital output module, PNP type	
XB6-0032BW		
XB6-1600A	16-channel digital input module, NPN type	
XB6-1600B	16-channel digital input module, PNP type	
XB6-0016A	16-channel digital output module, NPN type	
XB6-0016B	16-channel digital output module, PNP type	
XB6-0016BW		
XB6-0800A	8-channel digital input module, NPN type	
XB6-0800B	8-channel digital input module, PNP type	
XB6-0008A	8-channel digital output module, NPN type	
XB6-0008B	8-channel digital output module, PNP type	
XB6-0008BW		
XB6-1616A	16-channel digital input/output module, NPN type	
XB6-1616B	16-channel digital input/output module, PNP type	
XB6-1616BW		
XB6-3200N	32-channel digital input, NPN/PNP compatible	
XB6-0032AN	32-channel digital output, NPN type	
XB6-0032BN	32-channel digital output, PNP type	
XB6-A80V	8-channel analog input module	Optional ranges: 0~+10 V, -10~+10 V
XB6-A40V	4-channel analog input module	
XB6-A08V	8-channel analog output module	
XB6-A04V	4-channel analog output module	
XB6-A80I	8-channel analog input module	Optional ranges: 0~20 mA, 4~20 mA
XB6-A40I	4-channel analog input module	
XB6-A08I	8-channel analog output module	

XB6-A04I	4-channel analog output module	
XB6-0012J	12-channel relay output module	
XB6-A40TM	4-channel RTD and thermocouple temperature acquisition module	
XB6-A80TM	8-channel RTD and thermocouple temperature acquisition module	
XB6-P04A	Pulse output module	
XB6-P20D	Encoder counting module	
XB6-P20DS	Encoder counting module	
XB6-C01SP	Serial communication module	
XB6-VT16	Silce valve terminal	
XX6-C18_2	Common terminal extended module	

3 Product Parameters

3.1 General Parameters

General Technical Parameters		
Size	Power Module	106X61X22.5 Mm
	Coupler Module	106X61X22.5 Mm
	I/O Modules	106X73X25.7 Mm
Weight	Power Module	110g
	Coupler Module	80 g
	I/O Modules	90 g
Operating Temperature	-10℃~+60℃	
Storage Temperature	-20℃~+75℃	
Relative Humidity	95%, Non-Condensing	
Protection Class	IP20	

3.2 Power Supply Parameters

Power Supply Parameters		
Power Module	Operating Power	24 VDC（18V~30V）
	Output Voltage	5 VDC
	Output Current	2A, 4A
Coupler Module	Operating Power	5 VDC
	Operating Current	400 mA
I/O Modules	Operating Power	5 VDC

3.3 Interface Parameter

Ethernet/Ip Interface Parameters	
Bus Protocol	EtherNet/IP
Number of I/O Stations	Depends on the controller
Data Transmission Medium	Ethernet CAT5 cable
Transmission Distance	≤100 m (station to station)
Transmission Rate	100 Mbps
Bus Interface	2XRJ45

3.4 Digital Parameter

Signal Type		
Input	Rated Voltage	24 VDC（18V~30V）
	Number of Inputs	8, 16, 32
	Signal Type	NPN/ PNP
	"0" Signal Voltage (PNP)	-3~+3 V
	"1" Signal Voltage (PNP)	15~30 V
	"0" Signal Voltage (NPN)	15~30 V
	"1" Signal Voltage (NPN)	-3~+3 V
	Input Filter	3 ms
	Input Current	4 mA
	Isolation Method	Optocoupler Isolation
	Electrical Isolation	500 VAC
	Channel Indicator Lights	Green LED
Output	Rated Voltage	24 VDC (±25%)
	Number of Outputs	8, 16, 32
	Signal Type	NPN/ PNP
	Load Type	Resistive loads, inductive loads
	Single Channel Rated Current	NPN type Max: 500 mA PNP type Max: 500 mA BW type Max: 250 mA
	Port Protection	Over-voltage and over-current protection
	Isolation Method	Optocoupler Isolation
	Electrical Isolation	500 VAC

	Channel Indicator Lights	Green LED
relay output	Rated Voltage	24 VDC（18V~30V）
	Number of Outputs	12
	Isolation Method	Optocouplers, Relays
	Rated Load	2 A
	Channel Indicator Lights	Green LED light

3.5 Analog Parameter

3.5.1 Technical Parameters

Model Type				
Analog Input	Number of Inputs	4, 8		
	Input Signal (Voltage Type)	0~+10 V, -10 V~+10 V (range adjustable)		
	Input Signal (Current Type)	0~20 mA, 4~20 mA (range adjustable)		
	Resolution	16 bit		
	Sampling Rate	XB6-A40V、XB6-A80V、XB6-A40I、XB6-A80I	≤1 ksps	
	Accurate	XB6-A40V、XB6-A80V、XB6-A40I、XB6-A80I	±0.1%	
	Input Impedance (Voltage Type)	≥2 kΩ		
	Input Impedance (Current Type)	100 Ω		
	Electrical Isolation	500 VAC		
	Channel Indicator	Green LED		
Temperature Input	Number of Inputs	4, 8		
	Sensor Type	Thermocouple	Thermal Resistor	Resistor
	Connection Method	2-wire	2-wire, 3-wire	2-wire
		K: -200~1370℃ J: -200~1200℃ E: -200~1000℃ S: -50~1690℃ B： 50~1800℃	Pt100: -200~850°C Pt200: -200~600℃ Pt500: -200~600℃ Pt1000: -200~600°C	15Ω~3kΩ
	Accurate	± 0.3%	±1°C	±0.1%
	Sensitivity	0.1°C		±0.1 Ω
	Resolution	16 bit		
	Channel Indicator	Green LED		

Analog Output	Number of Outputs	4, 8	
	Output Signal (Voltage Type)	0~+10 V, -10~+10 V (range adjustable)	
	Output Signal (Current Type)	0~20 mA, 4~20 mA (range adjustable)	
	Resolution	16 bit	
	Accurate	XB6-A04V、XB6-A08V、XB6-A04I、XB6-A08I	±0.1%
	Load Impedance (Voltage Type)	≥2 kΩ	
	Load Impedance (Current Type)	≤200 Ω	
	Electrical Isolation	500 VAC	
	Channel Indicator	Green LED	

Note: The analog voltage module does not support overflow and overshoot, and the analog current module supports overflow and overshoot.

3.5.2 Voltage I/O Range Selection and Code Value Table

Voltage I/O Range Selection and Code Value Table				
Range Selection	0	1	2	3
Range	-10 V~+10 V	0~+10 V	-10 V~+10 V	0~+10 V
Code Value Range	-32768~32767	0~32767	-27648~27648	0~27648
Voltage Input Formula	D=(65535/20)*U	D=(32767/10)*U	D=(55296/20)*U	D=(27648/10)*U
Voltage Output Formula	U=(D*20)/65535	U=(D*10)/32767	U=(D*20)/55296	U=(D*10)/27648
Code Value Table	See also Tables3-1 Voltage Code Values .			

Note: D: Code value; I: current

Tables3-1 Voltage Code Values

Range / Voltage	**0 (default)**	**1**	**2**	**3**
	code value	**code value**	**code value**	**code value**
-10	-32768		-27648	
-9	-29491		-24883	
-8	-26214		-22118	
-7	-22937		-19354	
-6	-19661		-16589	
-5	-16384		-13824	
-4	-13107		-11059	
-3	-9830		-8294	
-2	-6554		-5530	
-1	-3277		-2765	
0	0	0	0	0

1	3277	3277	2765	2765
2	6554	6553	5530	5530
3	9830	9830	8294	8294
4	13107	13107	11059	11059
5	16384	16384	13824	13824
6	19661	19660	16589	16589
7	22937	22937	19354	19354
8	26214	26214	22118	22118
9	29491	29490	24883	24883
10	32767	32767	27648	27648
	D= (65535/20) *U	D= (32767/10) *U	D= (55296/20) *U	D= (27648/10) *U
	U=(D*20)/65535	U= (D*10)/32767	U=(D*20)/55296	U= (D*10)/27648

Note: In the analog voltage input module, when the channel input voltage exceeds 10V, the maximum code value is displayed. Analog voltage output module, when the code value setting exceeds the maximum code value corresponding to the range in the table, all channels output 10V.

3.5.3 Current I/O Range Selection and Code Value Table

Analog Current Input/Output Range Selection and Code Value Range				
Range Selection	0	1	2	3
Range	4~20 mA	0~20 mA	4~20 mA	0~20 mA
Code Value Range	0~65535		0~27648	
Current Input Formula	D=65535/16*I-16384	D=(65535/20)*I	D=(27648/16)*I-6912	D=(27648/20)*I
Current Output Formula	I=(D+16384)*16/65535	I=(D*20)/65535	I=((D+6912)*16)/27648	I=(D*20)/27648
Code Value Table	See alsoTables3-2 Current Code Values			

Note: D: Code value; I: current

Tables3-2 Current Code Values

Range / Current	0 (default)	1	2	3
	4-20mA	0-20mA	4-20mA	0-20mA
	code value	code value	code value	code value
0		0		0
1		3277		1382
2		6554		2765
3		9830		4147
4	0	13107	0	5530
5	4096	16384	1728	6912
6	8192	19661	3456	8294
7	12288	22937	5184	9677
8	16384	26214	6912	11059
9	20479	29491	8640	12442
10	24575	32768	10368	13824
11	28671	36044	12096	15206
12	32767	39321	13824	16589
13	36863	42598	15552	17971
14	40959	45875	17280	19354
15	45055	49151	19008	20736
16	49151	52428	20736	22118
17	53247	55705	22464	23501
18	57343	58982	24192	24883
19	61439	62258	25920	26266
20	65535	65535	27648	27648
21			29376	29030
22			31104	30413
22.814			32511	31538
22.962				31743
23	65535	65535		31795
23.518			32767	32511
23.703				
24				32767
25				
	D=65535/16*I-16384	D = (65535/20)*I	D=(27648/16)*I-6912	D=(27648/20)*I

Note: When the input current of range 2 is > 22.81 mA, the code values all show 32767; when the specified code value is > 32511, the output current is 22.81 mA.

For range 3 input current > 23.52 mA, the code values all show 32767; for specified code values > 32511, the output current is 23.52 mA.

3.6 Common Terminal Expansion Module Parameters

Common Terminal	
Rated Voltage	125 VDC/AC 250V
Rated Current	8 A
Number of Common Terminals	2 sets

4 Panel

4.1 Coupler Panel

4.1.1 Coupler Structure

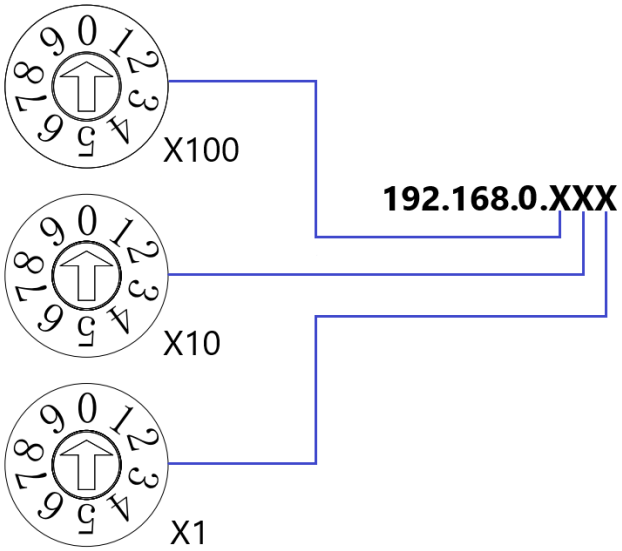
Name and function description of each part of the product

Number	Name	Description
①	Power interface	Push-in terminal blocks
②	Guide rail slot	Suitable for DIN 35 mm rail fixing
③	Power ID, indicator	Indicates power status
④	Rotary switches and ID	IP address and reset settings
⑤	System ID, indicator	Indicates power supply, module operation status
⑥	Bus interface	2×RJ45

4.1.2 Rotary Switch

IP address setting

A rotary switch can be used to specify the setting method of the module IP address.



Set value (decimal)	IP address setting method
000	BOOTP-based settings The factory rotary switch is set to "000", the default state is based on the BOOTP setting, if it has been modified using the host computer, continue the last setting value to start.
001 to 254	Sets the IP address lower 1Byte in the range of 1 to 254 by "×100" for the hundredth digit, "×10" for the tenth digit, and "×1" for the first digit. Setting in the range of 1 to 254 by "×100" for the hundreds digit, "×10" for the tens digit, and "×1" for the bits. IP Address High 3Byte Continuation of the value last set via the host computer. When the IP address is set to a value other than 000 by the rotary switch in the factory factory state, the high 3Byte is 192.168.0.
255~	When the rotary switch is set to 255 or above, the module starts with the previous startup method and parameters after powering up.

Precautions

1、 Tool selection

Screwdriver size: 3 mm opening

2、 Be sure to set the rotary switch IP with the power off.

3、 If the IP address needs to be changed during communication, the new settings must be re-powered to take effect after the new settings are completed.

Reset Function

Restoration of factory settings can be executed by special operation of the rotary switch.

For more information on how to do this, see**7.3Restore Factory Settings**

4.1.3 ID and Indicators

Description of IDs and indicators of the power module			
ID	**Color**	**Status**	**Status description**
P	Green	ON	Normal status of working power supply
		Flashing	80% overload. The power supply to real stage load is cut off
		OFF	Unpowered or abnormal power supply
O	Red	OFF	No overload
		ON	90% overload
		Flashing	80% overload. The power supply to real stage load is cut off

Description of IDs and indicators of the coupler module			
ID	**Color**	**Status**	**Status description**
P (PWR)	GREEN	ON	Normal status of power supply
		OFF	Unpowered or abnormal power supply
L (LINK)	GREEN	ON	The I/O module is connected, X-bus system is interacted
		Flashing 1Hz	The I/O module is connected, X-bus system is ready to interact
		Flashing 5Hz	The I/O module is not connected, X-bus system configuration abnormal
		OFF	The I/O module is not connected or abnormal connection
E (ERR)	RED	ON	An unrecoverable major error has occurred on the device (constant illumination is not supported for devices with S/N numbers beginning with 1294)
		Flashing 1Hz	Equipment being tested for power-up A recoverable secondary exception occurred on the device (devices with S/N numbers beginning with 1294 blink to represent an IP conflict)
		OFF	Equipment in working order
N (NS)	GREEN	ON	The device has established a connection
		Flashing 1Hz	Device has not established a connection, but IP address is acquired; device is undergoing a power-up test
		OFF	Device did not obtain an IP address; duplicate IP address or power cutoff

Network port status indicator			
ID	**Color**	**Status**	**Status description**
IN	Green	ON	establish a network connection
		OFF	No network connection established or abnormal
	Yellow	Flashing	Connection established with data interaction
		OFF	No data interaction or exception

OUT	Green	ON	establish a network connection
		OFF	No network connection established or abnormal
	Yellow	Flashing	Connection established with data interaction
		OFF	No data interaction or exception

4.2 I/O Module Panel

Names and functional descriptions of each part of the module

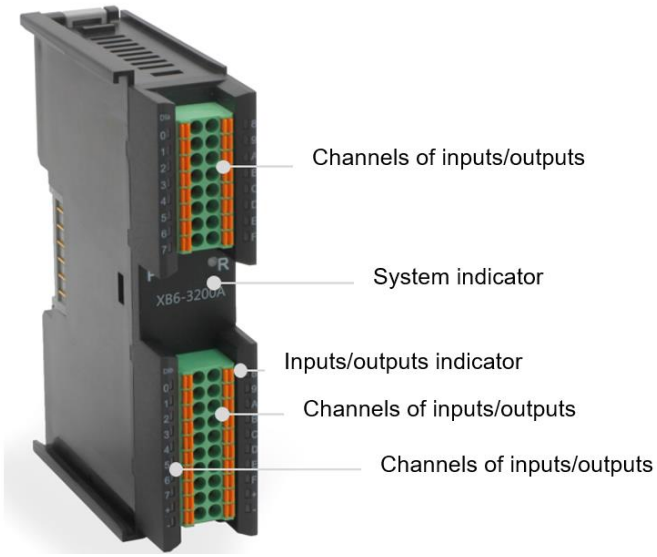


Table 4-1 Indicator Description

Port Status Indicator			
ID	**Color**	**Status**	**Status description**
P	Green	ON	Power supply normal
		OFF	The product is not powered up or the power supply is abnormal
R	Green	ON	The system is functioning normally
		Flashing 1 Hz	I/O modules connected, X-bus system ready for interaction
		OFF	Device is not powered up, X-bus is not interacting with data or is abnormal
Input Channel Indication	Green	ON	Module detects channels with signal inputs
		OFF	No signal input or abnormal signal input on module channel
Output Channel Indication	Green	ON	Module channels have signal outputs
		OFF	No signal output or abnormal signal output from module channel

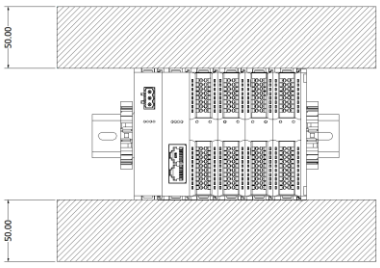
5 Installation and Disassembly

5.1 Installation Guide

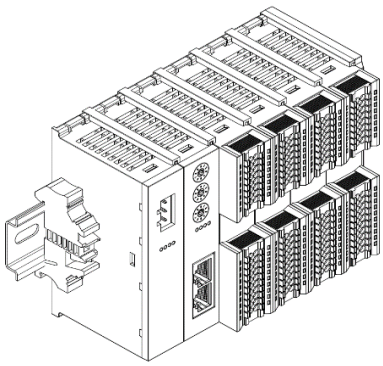
Module Installation Precautions

- Ensure that the cabinet is well ventilated.
- Do not install this unit next to or above equipment that may generate excessive heat.
- Be sure to install the module in a vertical position and maintain air circulation around the module (at least 50 mm air space above and below the module).
- After the module is installed, be sure to secure the module by installing rail mounts on both ends of the module.
- Be sure to disconnect the power supply when installing/disassembling.

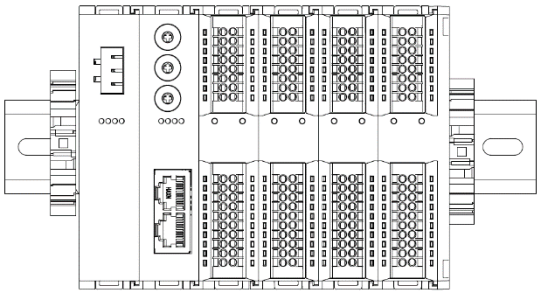
Minimum clearance for module mounting (≥50 mm)



Ensure that the module is mounted vertically



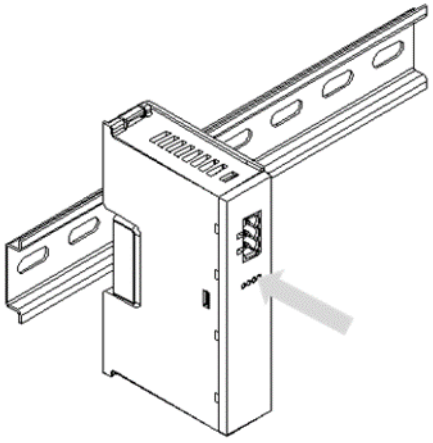
Be sure to install the rail mounts

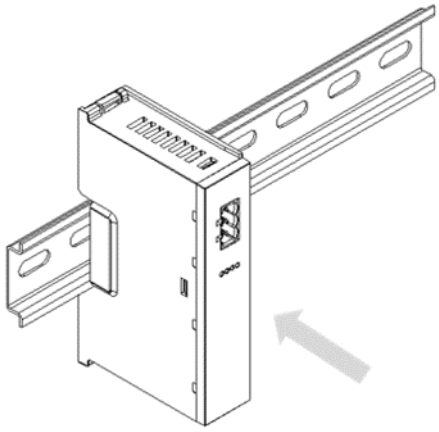


5.2 Installation And Disassembly Steps

Module Installation and Removal	
Module Installation Steps	1. Install the power supply module first on the rail that has been fixed. 2. Install the coupler and the required I/O modules in turn to the right of the power supply module. 3. After installing all required I/O modules, install the end caps to complete the module assembly. 4. Install the rail fixings on both ends of the power module and end cap to fix the module.
Module disassembly procedure	1. Loosen the rail fixings at both ends of the module. 2. Use a one screwdriver to pry off the module snap. 3. Pull out the disassembled module.

5.3 Installation Diagram

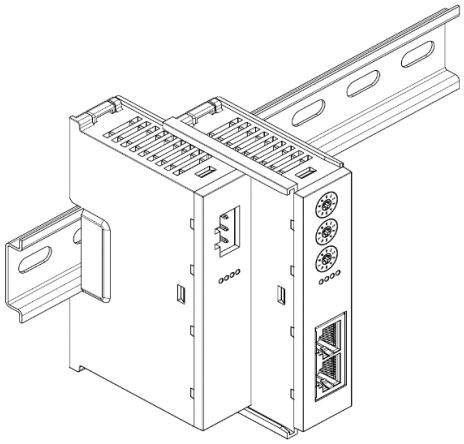
Power module installation	**Steps**
 ①	Align the power module guide rail slot vertically with the guide rail, as shown in the figure①



②

Press the power module with force until a "click" sound is heard. The module is now installed in place, as shown in the figure②.

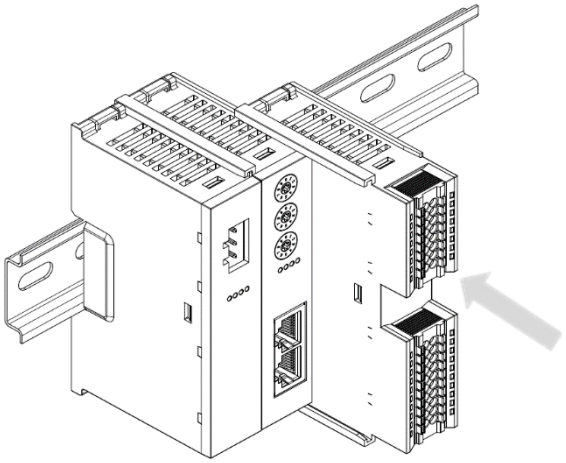
Coupler module installation	Steps



③

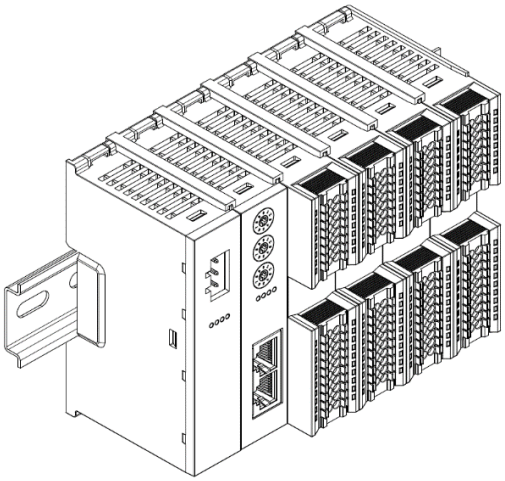
Align the left slot of the coupler module with the right side of the power module, and push it in as shown in the figure ③. Press the module with force into the guide rail until a "click" sound is heard. The module is now installed in placed.

I/O module installation	Steps

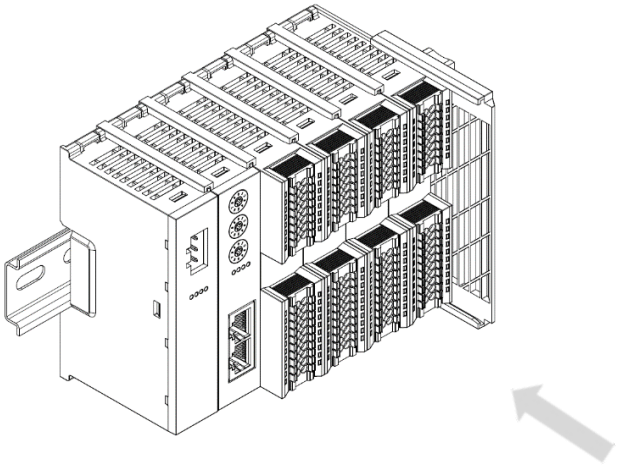


④

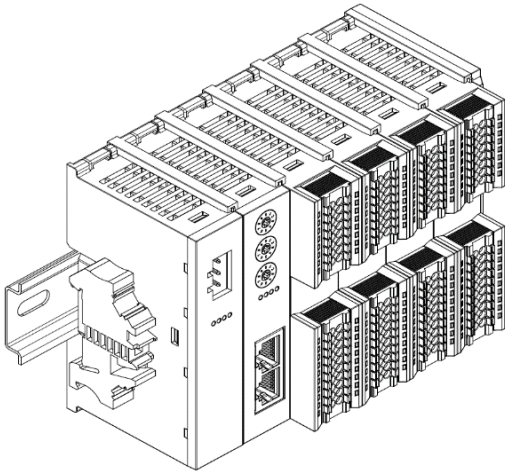
Install the required IO modules one by one using the same the steps as coupler module installation, as shown in the figure④⑤



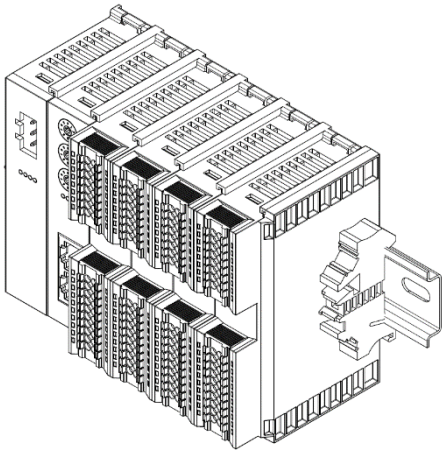
⑤

End cover installation	Steps
	Install the end cover on the right side of the last module, as shown in the figure⑥, using the same installation method as the coupler module.

⑥

Installation of guide rail fasteners	Steps
	Install a guide rail fastener next to the left side of the coupler, and lock it tightly, as shown in the figure⑦

⑦

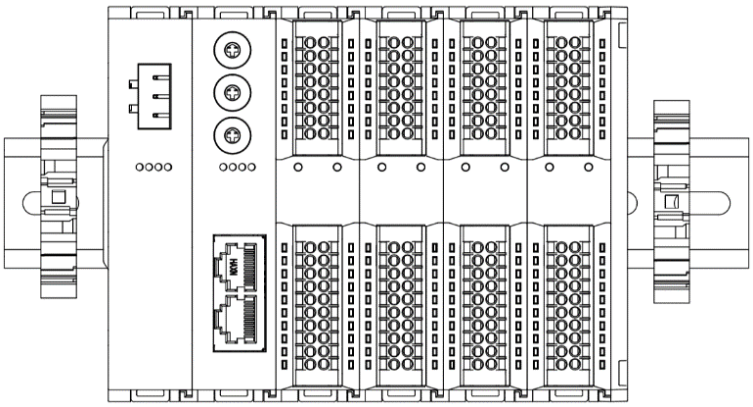


⑧

Install a guide rail fastener on the right side of the end cover. In this process, first push the guide rail fastener towards the coupler to ensure that the module is installed firmly, and then lock the fastener with a screwdriver, as shown in the figure⑧

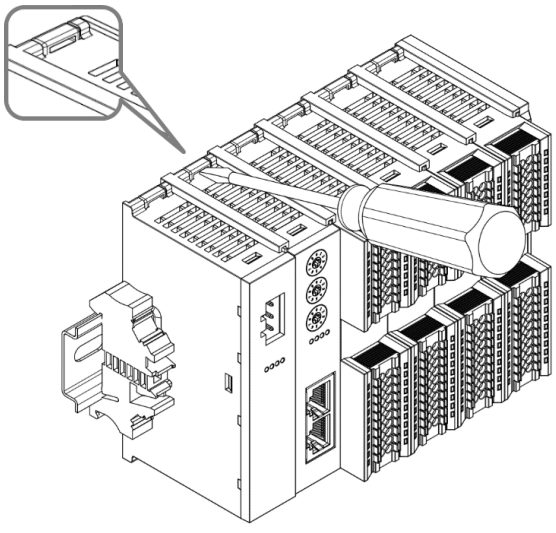
Disassembly

Steps



⑨

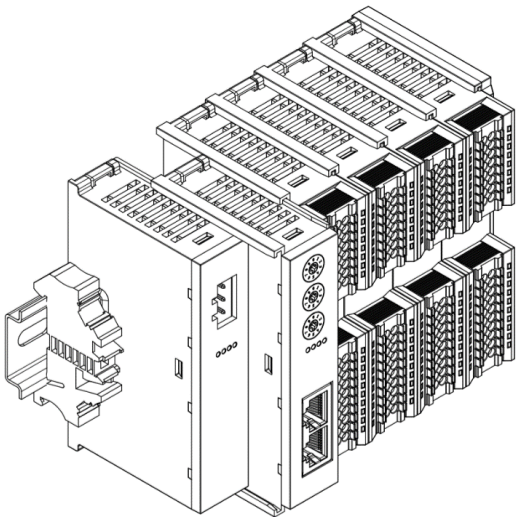
Using a screwdriver, loosen the guide rail fastener at one end of the module, and move it to one side to create a gap between the module and the fastener, as shown in the figure⑨



Insert the slotted screwdriver into the snap fitting of the module to be removed, and exert force along lateral direction of the module (until a click sound is heard), as shown in the figure⑩.
Note: Each module has two snap fittings, one on the top and the other at the bottom. Both should

be operated in this way.

⑩

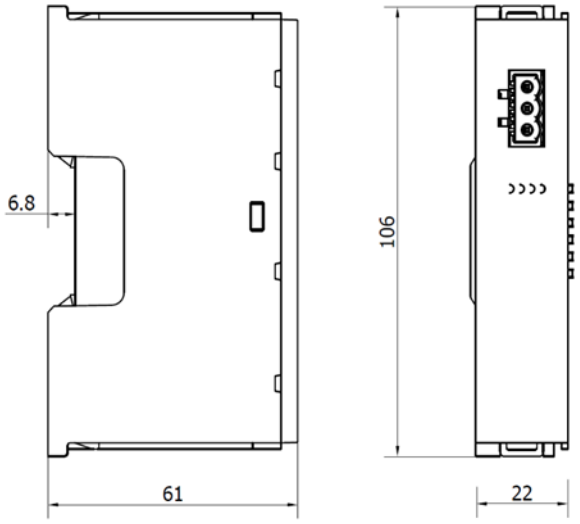


⑪

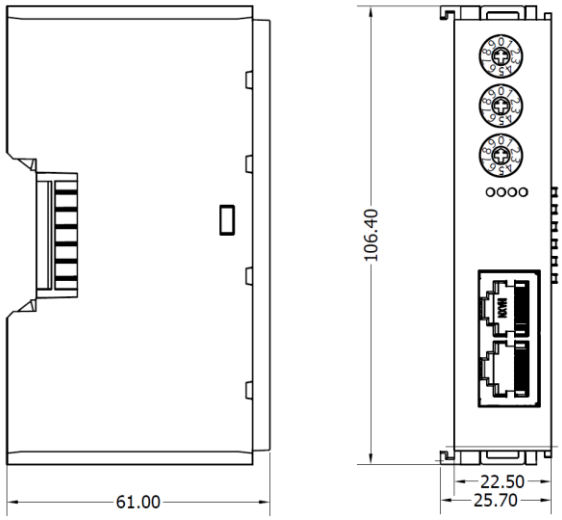
Remove the module in the reverse order of installation, as shown in the figure⑪.

5.4 Dimensions

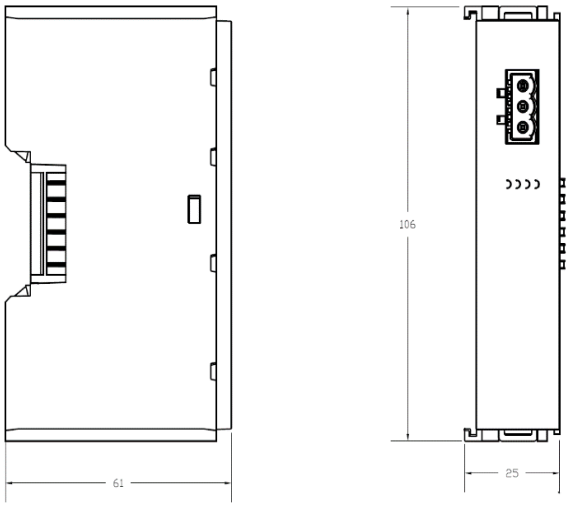
Power module dimensions (Unit: mm)



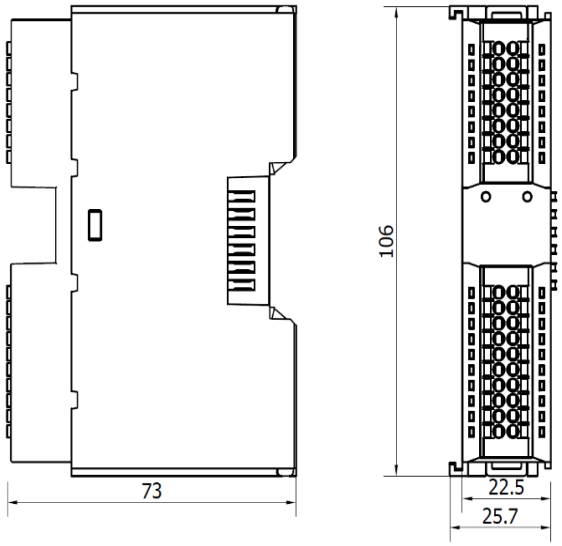
Coupler module dimensions (Unit: mm)



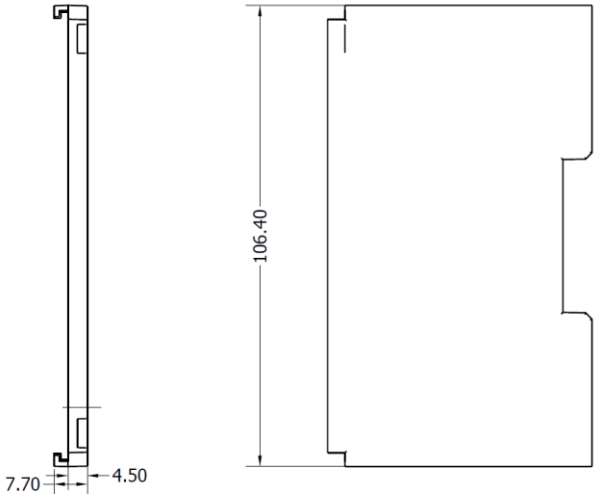
Extension power module dimensions (Unit: mm)



I/O module dimensions (Unit: mm)



End cover module dimensions (Unit: mm)



Note: All installed with DIN 35 mm standard guide rail, specification 35*7.5*1.0 (unit mm)

6 Wiring

6.1 Wiring Terminal

Wiring Terminal		
Signal Wire Terminal	Number of Poles	16 P
	Number of Poles	20 P
	Wire Gauge	26 -16 AWG 0.3-1.0 mm²
Power Terminal	Number of Poles	3P
	Wire Gauge	26 -12 AWG 0.3-1.5mm²
Bus Interface	2*RJ45	Category 5+ UTP or STP (STP recommended)

6.2 Wiring Instructions and Requirements

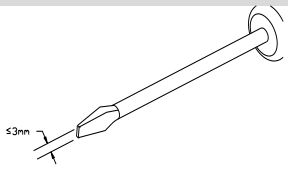
Power supply wiring precautions

- **The module system-side power supply and field-side power supply need to be configured separately, do not mix them.**
- **PE needs to be reliably grounded.**

Tables 6-1 Tooling and Wiring Requirements

Wiring Tool Requirements

The terminal adopts screwless design, and the installation and removal of cables can be operated by using a screwdriver (specification: ≤3 mm).



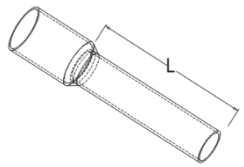
Stripped Wire Length Requirements

Recommended stripping length 10 mm

Wiring Method

For single stranded hard wires, after stripping the corresponding length of wire, press down the button while inserting the single stranded wire.

Multi-stranded flexible wires, after stripping the corresponding length of wire, can be directly connected or supporting the use of the corresponding standard specifications of the cold compression end (tube-type insulated terminals, as follows), press down the button at the same time the line will be inserted.

Tube Insulation End Specification Sheet		
specification	**model number**	**Cross-sectional area of conductor mm²**
 Tube insulated terminal L ≥ 10 mm in length	E0510	0.5
	E0310	0.3
	E7510	0.75
	E7512	
	E1010	1.0
	E1012	
	E1510	1.5
Tube insulated terminal L ≥ 10 mm in length	E1518	

Power supply wiring: power module 3P terminal

Using the DC24V power module, refer to the wiring method and connect the power supply according to the circuit shown in the following figure, and at the same time ground PE reliably (twisted-pair wire is recommended for the power supply cable).

Figure 6-1 Coupler, I/O Module, and Power Supply Wiring Diagrams

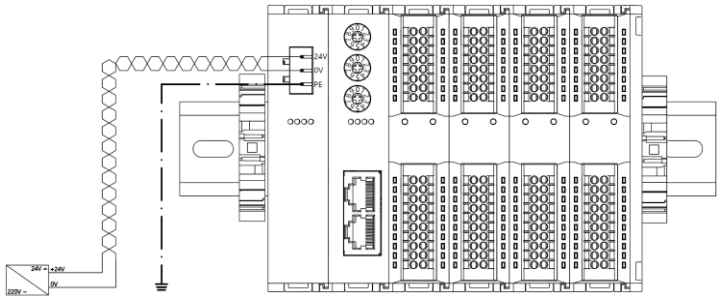
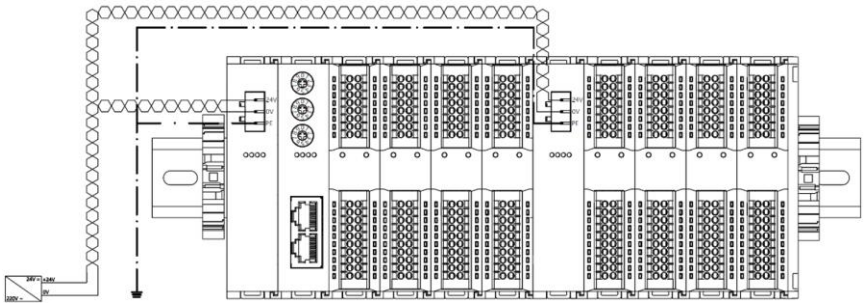


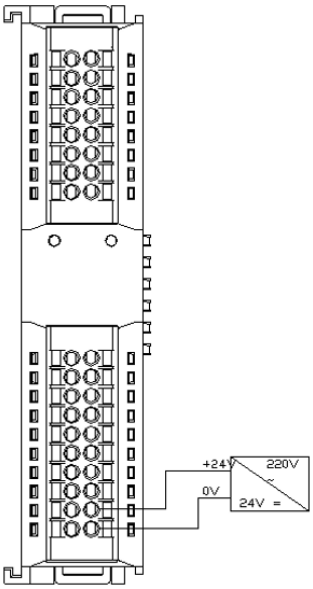
Figure 6-2 Coupler, I/O Module, Power Module, I/O Module, Power Supply Wiring Diagrams



Load power wiring: 20P terminal on field side

Refer to the corresponding I/O module wiring diagram and wiring method to press the signal wire cable into the terminal block.

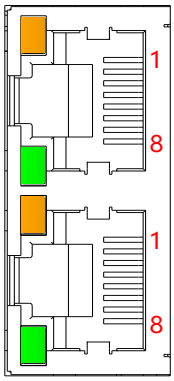
The load power supply uses 24 VDC power supply, refer to the wiring method and connect the power supply according to the circuit shown in the left figure (refer to the corresponding).1.1 **错误!表格结果无效。**).



Signal terminal wiring: 16P\20P terminal

Refer to the corresponding I/O module wiring diagram and wiring method to press the signal wire cable into the terminal block.

Bus wiring: Industrial Ethernet bus communication interface



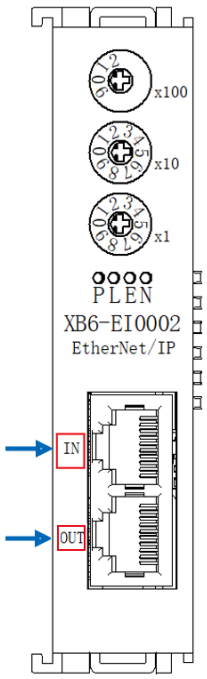
Pin	signal
1	TD+
2	TD-
3	RD+
4	—
5	—
6	RD-
7	—
8	—

It is recommended to use category 5 or higher double-shielded (braided mesh + aluminum foil) STP cables as communication cables, and the wiring method refers to6.3 XB6-EI0002 Communication Interface Wiring .

6.3 XB6-EI0002 Communication Interface Wiring

Some of the XB6-EI0002 coupler screen prints are identified as IN/OUT as shown below.

When wiring, it is necessary to connect the network topology according to the corresponding scenario examples, otherwise communication failures may occur.

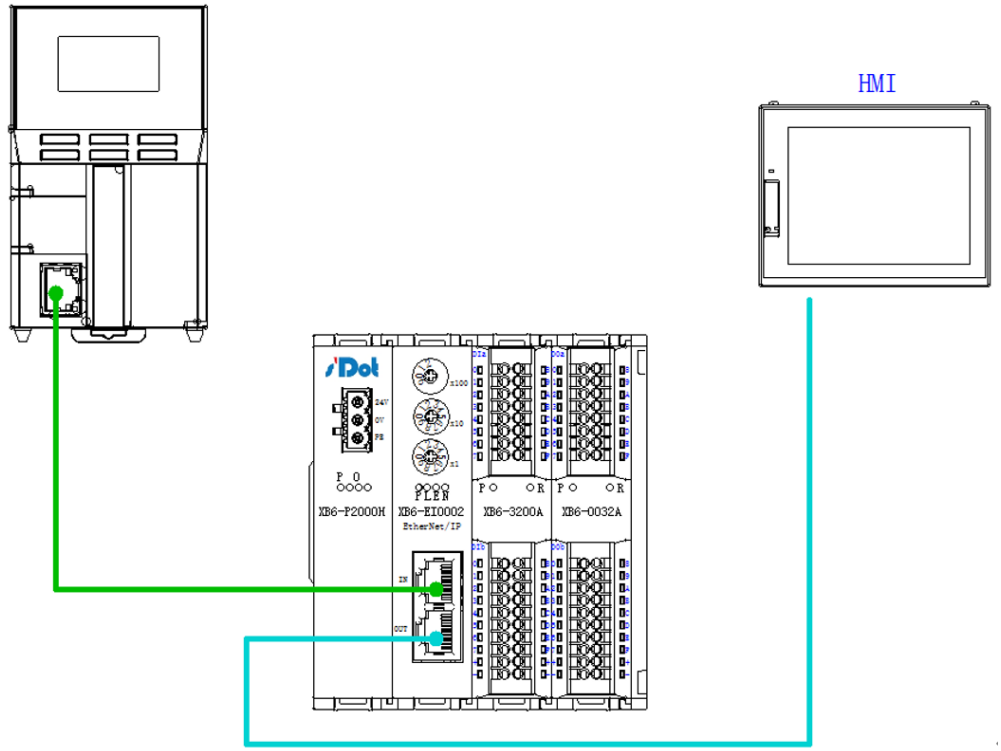


6.3.1 Scenario 1: There Is Only One Set of XB6-EI0002 Modules in the Network

When there is only 1 set of XB6-EI0002 modules in the network:

- The "IN" port of the module is connected to any network port of the previous node device;
- The "OUT" port of the module is connected to any of the network ports of the device of the following node, for example, as shown in the figure below.

When connecting to devices from other manufacturers, follow the network topology specification of the corresponding manufacturer.

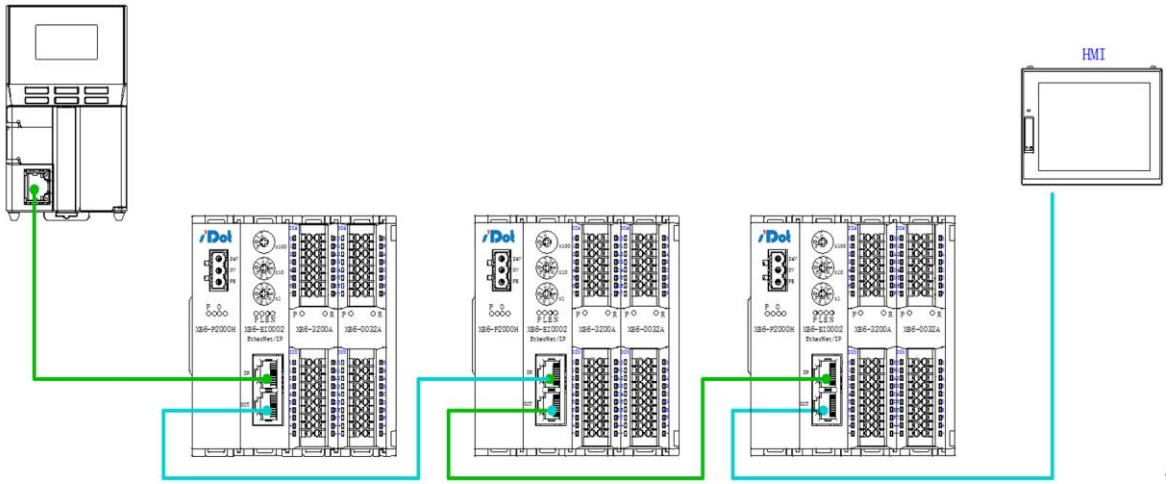


6.3.2 Scenario 2: There Are Multiple XB6-EI0002 Modules in the Network

When there are multiple XB6-EI0002 modules in the network:

- The "IN" port of the first module is connected to any network port of the previous node device;
- The last module "OUT" port is connected to any network port of the device in the next node;
- Module to module connection must follow the principle of "IN" to "OUT", such as shown in the following figure.

When connecting to devices from other manufacturers, follow the network topology specification of the corresponding manufacturer.

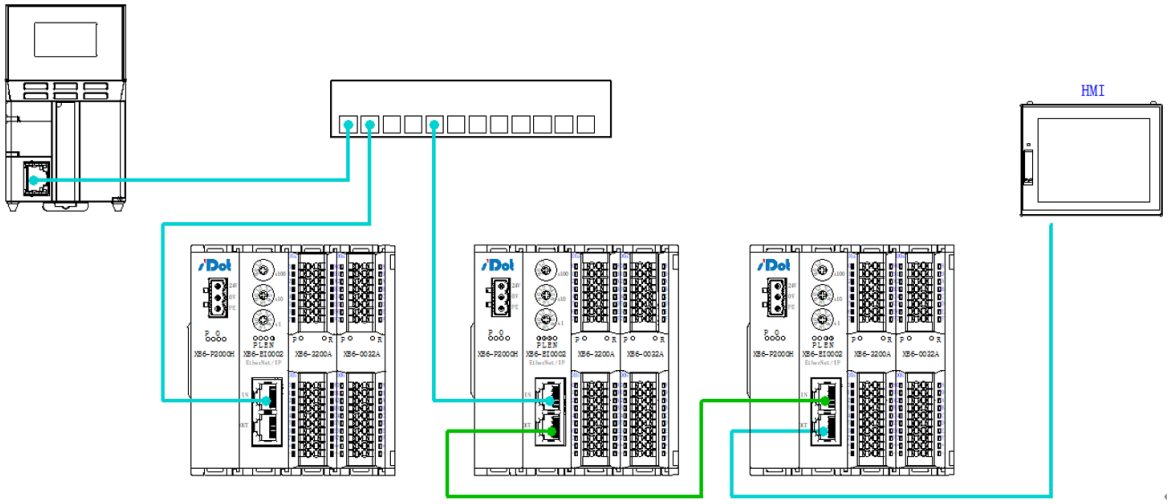


6.3.3 Scenario 3: Using Switches In A Network

When a switch is used in the network:

- The "IN" port of the module is connected to any network port of the switch;
- Module to module connection must follow the principle of "IN" to "OUT", such as shown in the following figure.

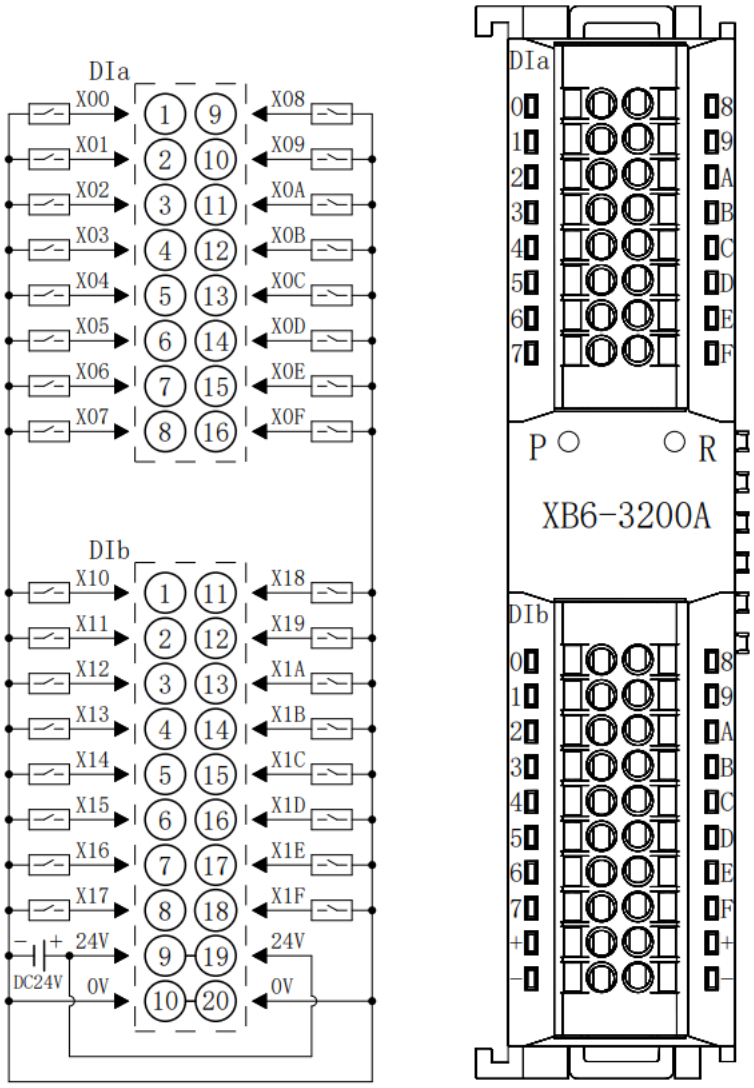
When connecting to devices from other manufacturers, follow the network topology specification of the corresponding manufacturer.



6.4 I/O Module Wiring Diagram

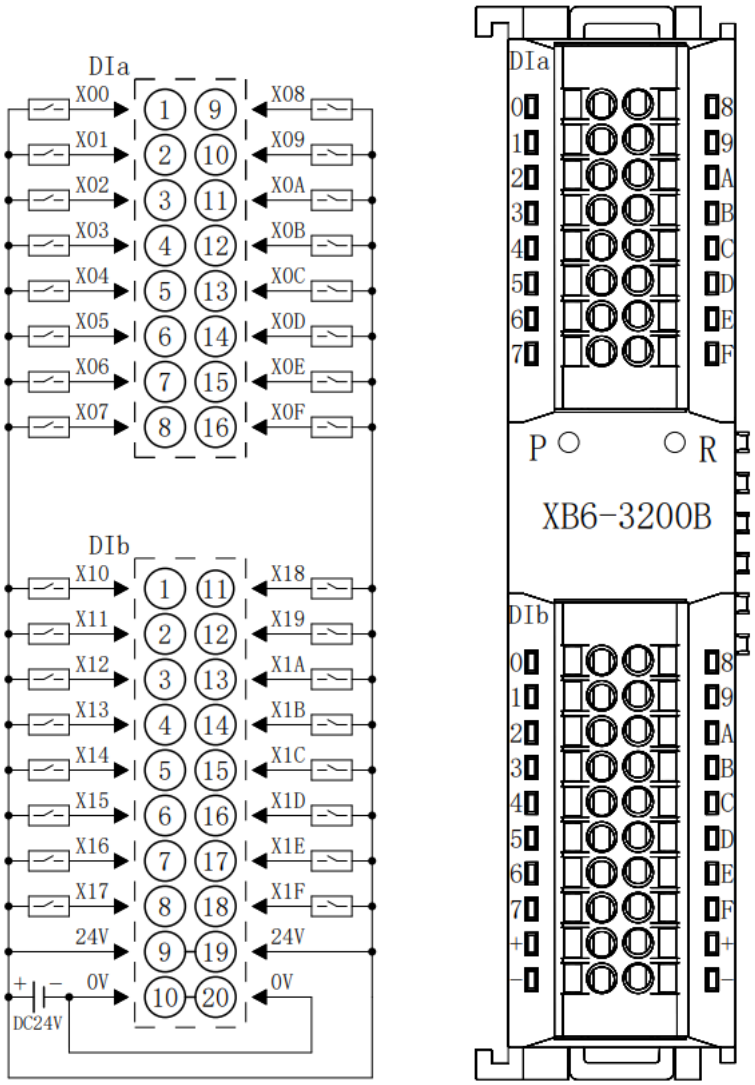
XB6-3200N, XB6-0032AN, XB60032BN wiring diagrams refer to the XB6 Series_MIL Connector Type IO User's Manual.

6.4.1 XB6-3200A



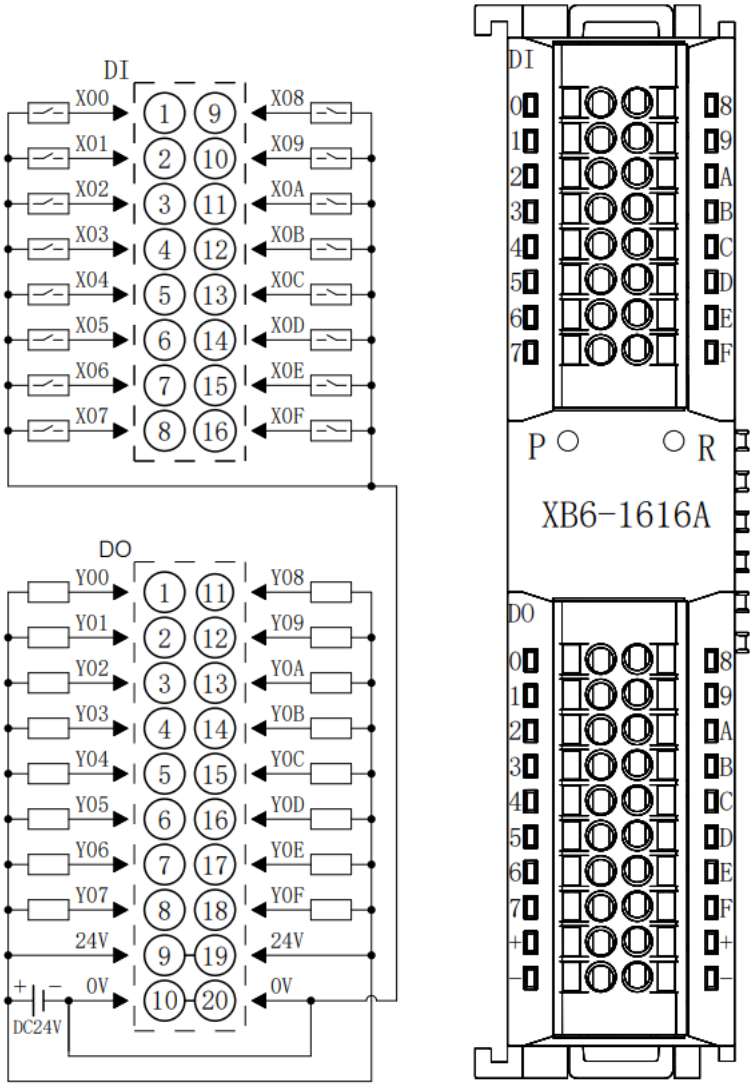
*24V internal conduction; 0V internal conduction

6.4.2 XB6-3200B



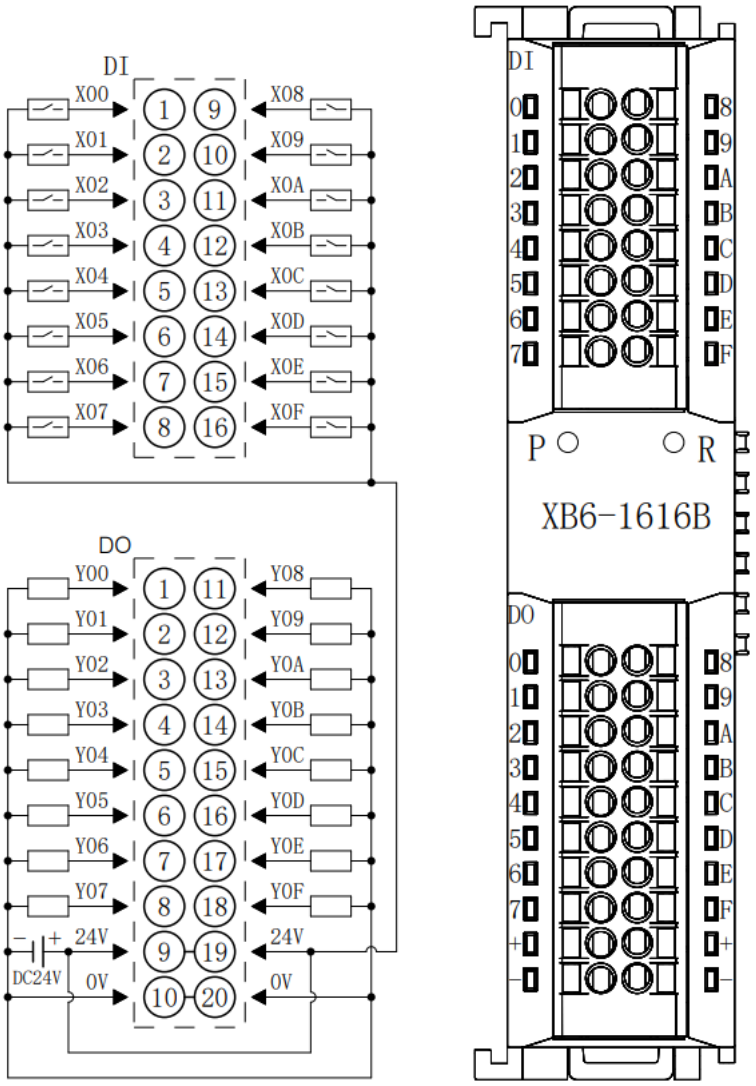
*24V internal conduction; 0V internal conduction

6.4.3 XB6-1616A



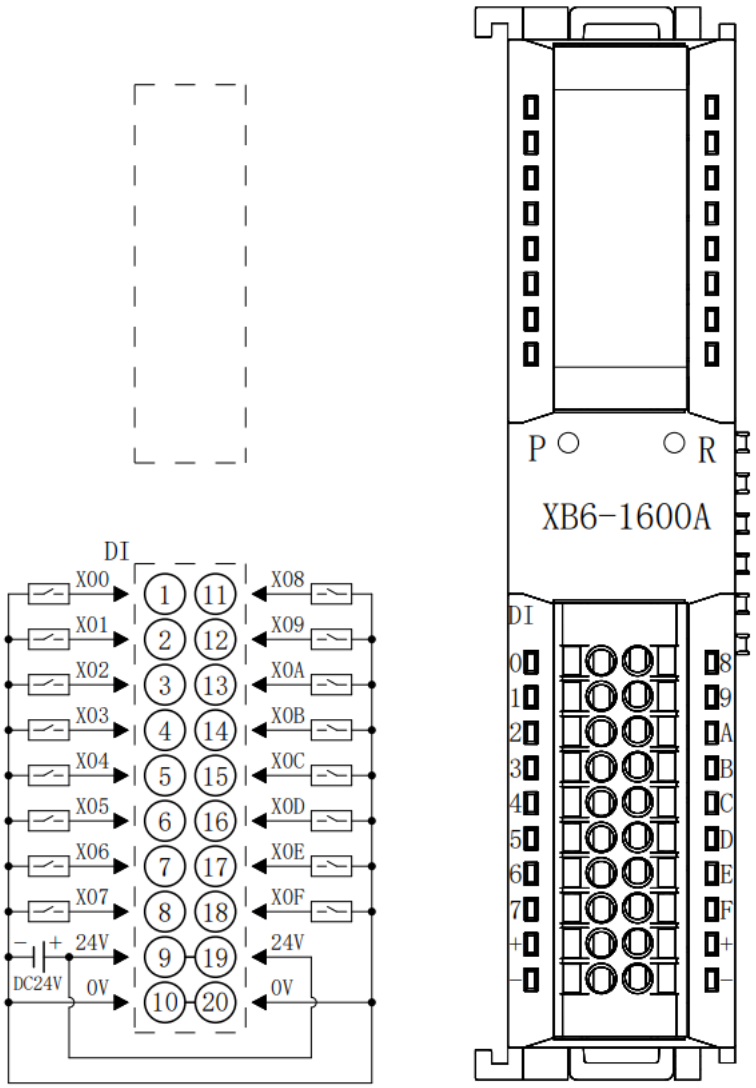
*24V internal conduction; 0V internal conduction

6.4.4 XB6-1616B



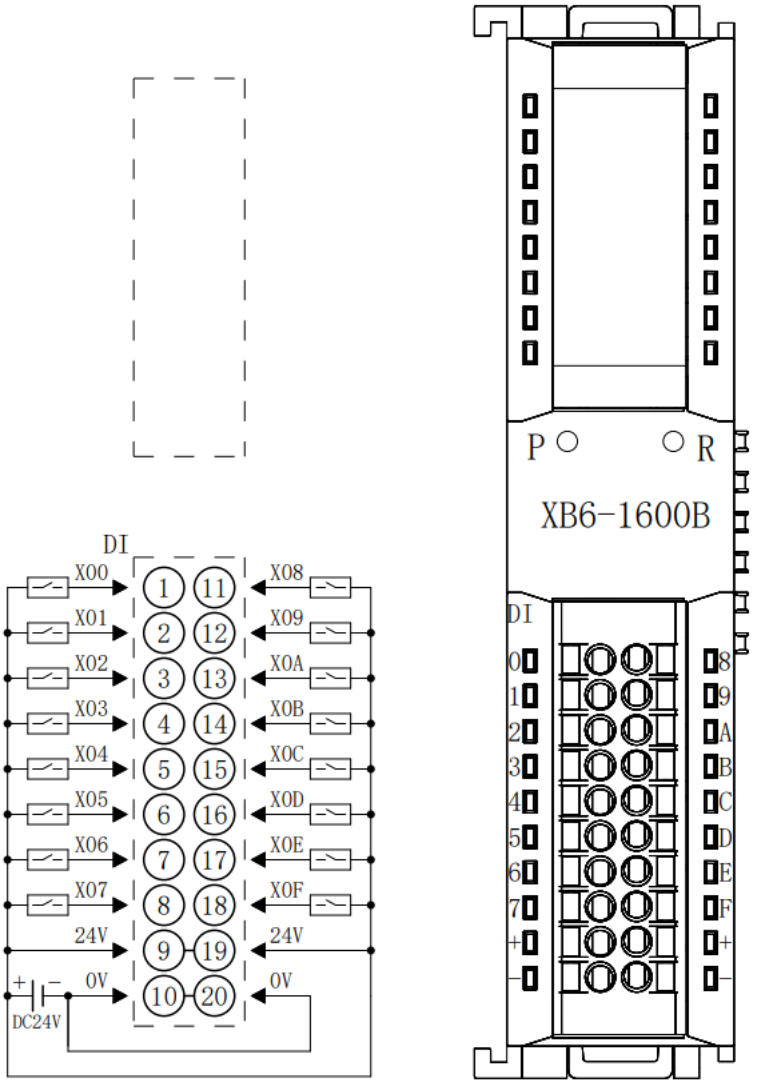
*24V internal conduction; 0V internal conduction

6.4.5 XB6-1600A



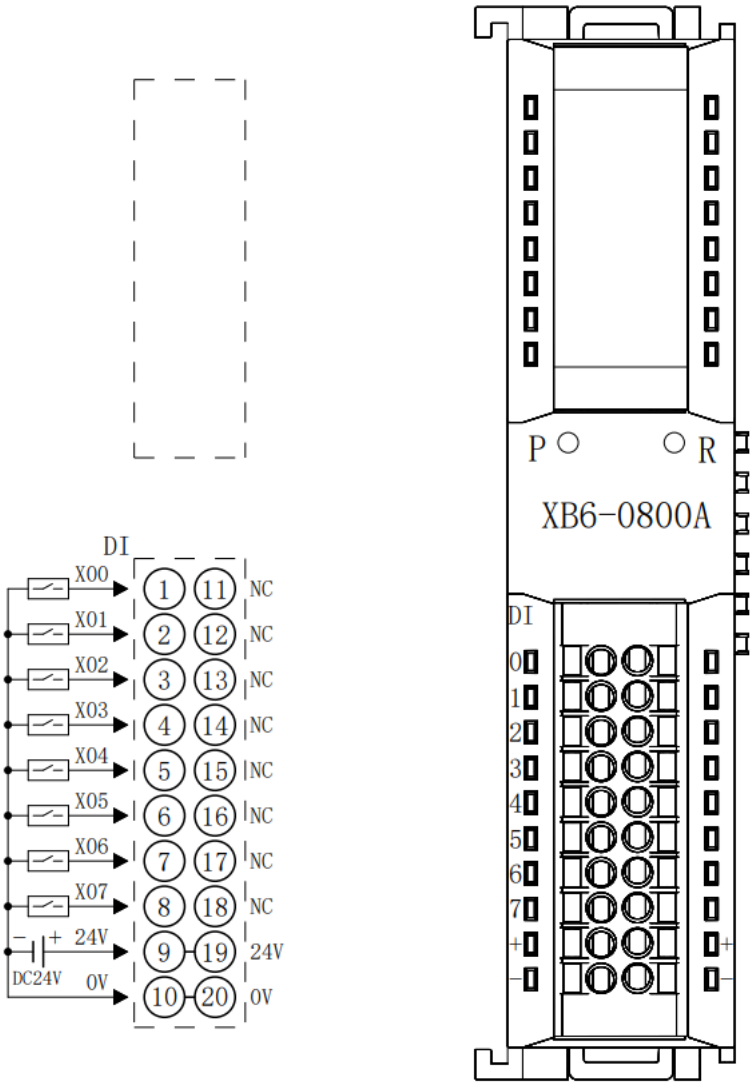
*24V internal conduction; 0V internal conduction

6.4.6 XB6-1600B



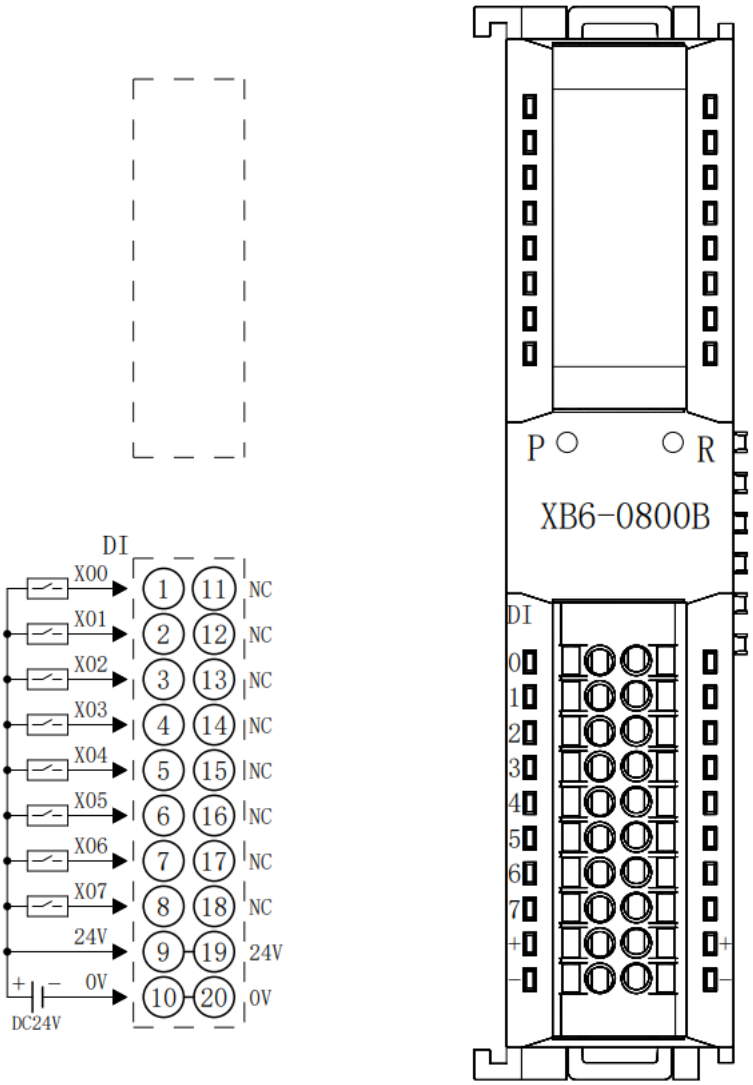
*24V internal conduction; 0V internal conduction

6.4.7 XB6-0800A



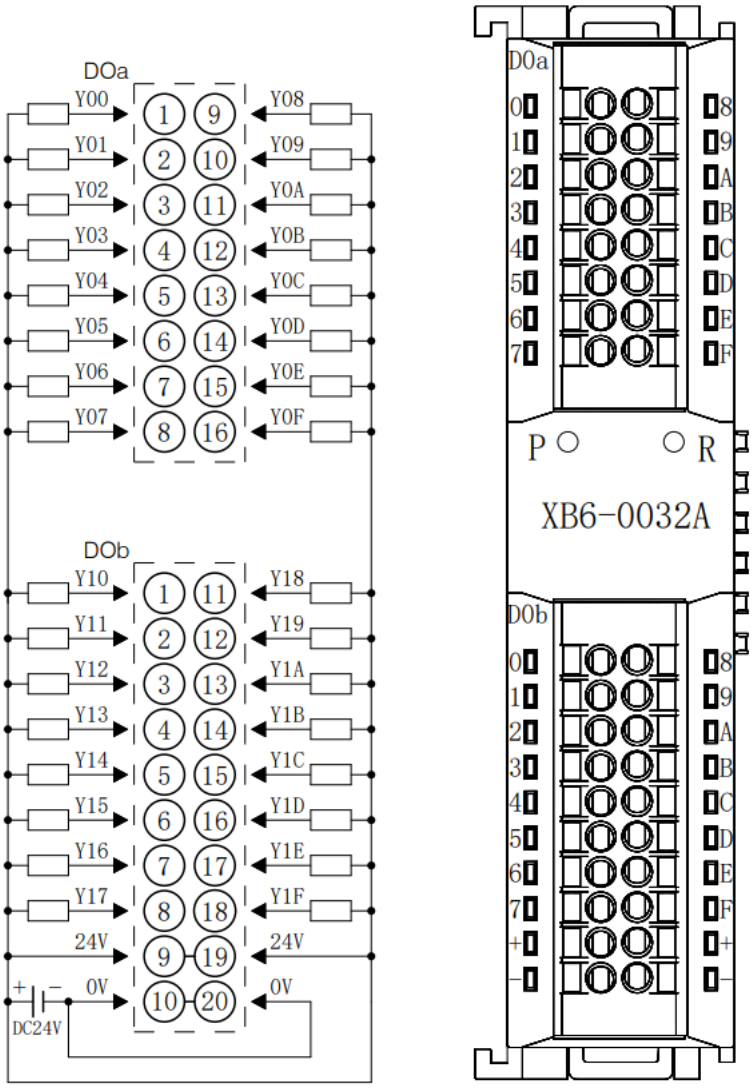
*24V internal conduction; 0V internal conduction

6.4.8 XB6-0800B



*24V internal conduction; 0V internal conduction

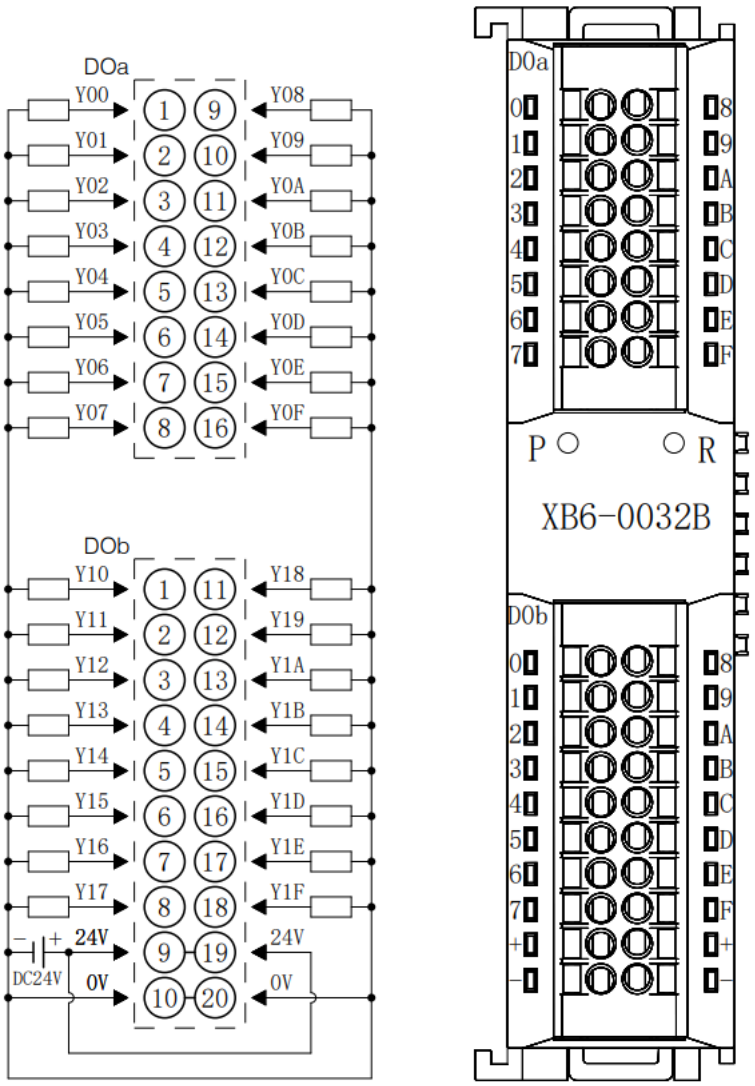
6.4.9 XB6-0032A



*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

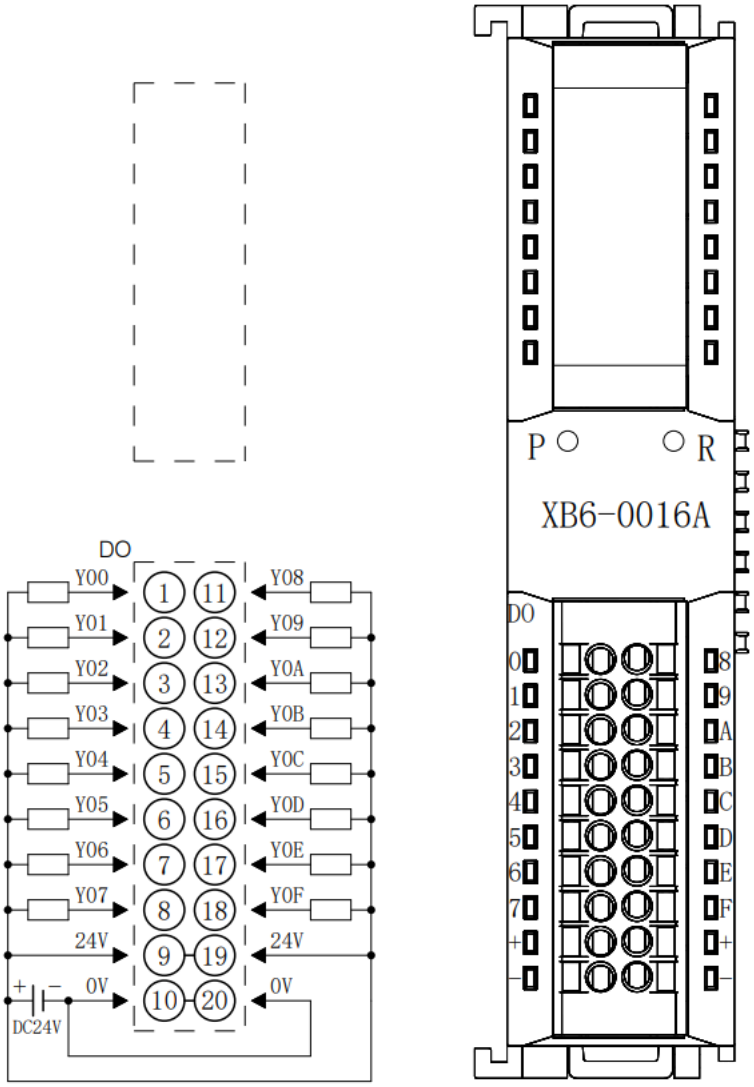
6.4.10 XB6-0032B



*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

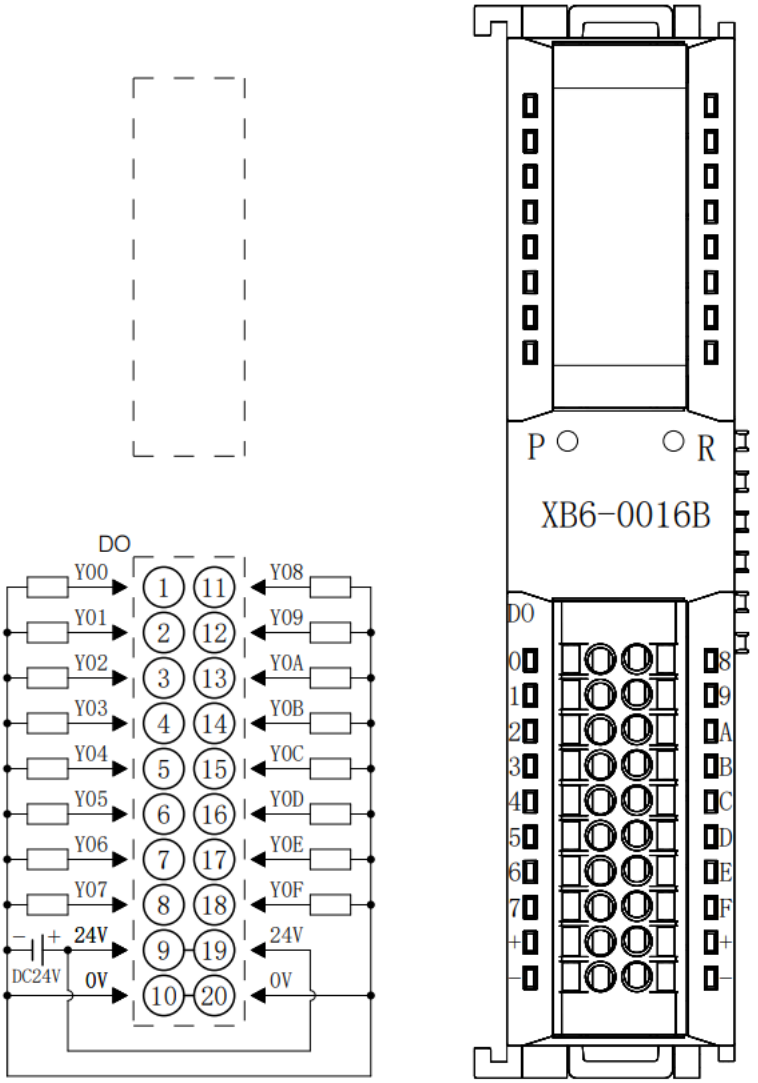
6.4.11 XB6-0016A



*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

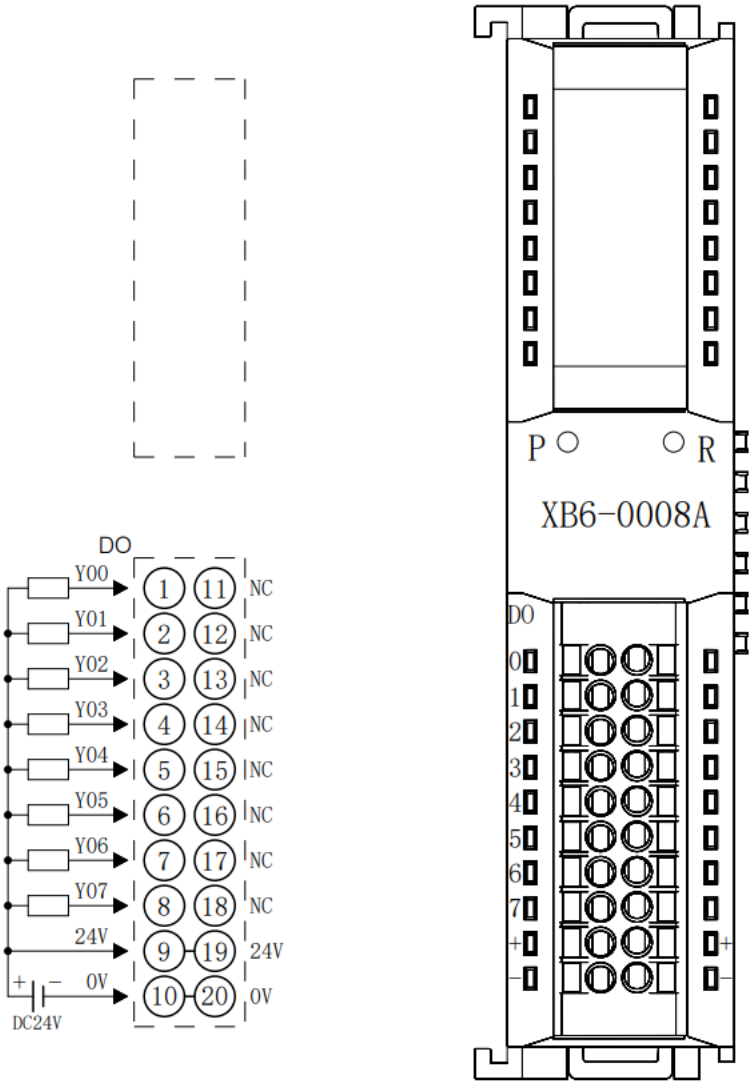
6.4.12 XB6-0016B



*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

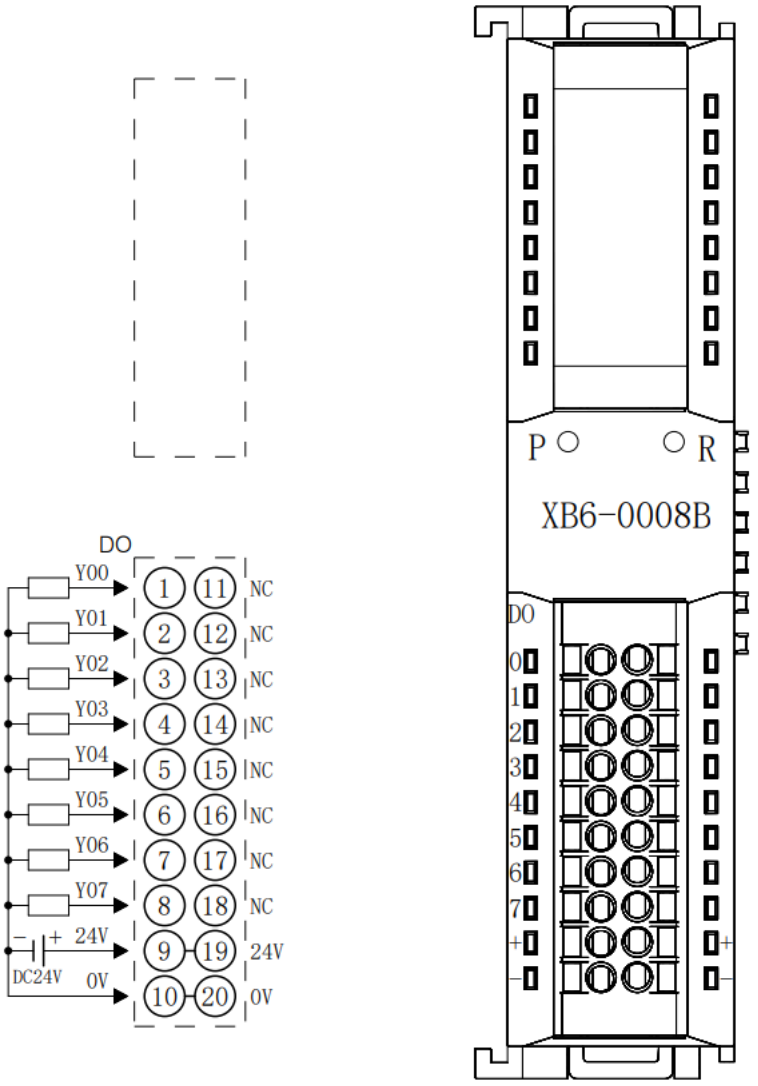
6.4.13 XB6-0008A



*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

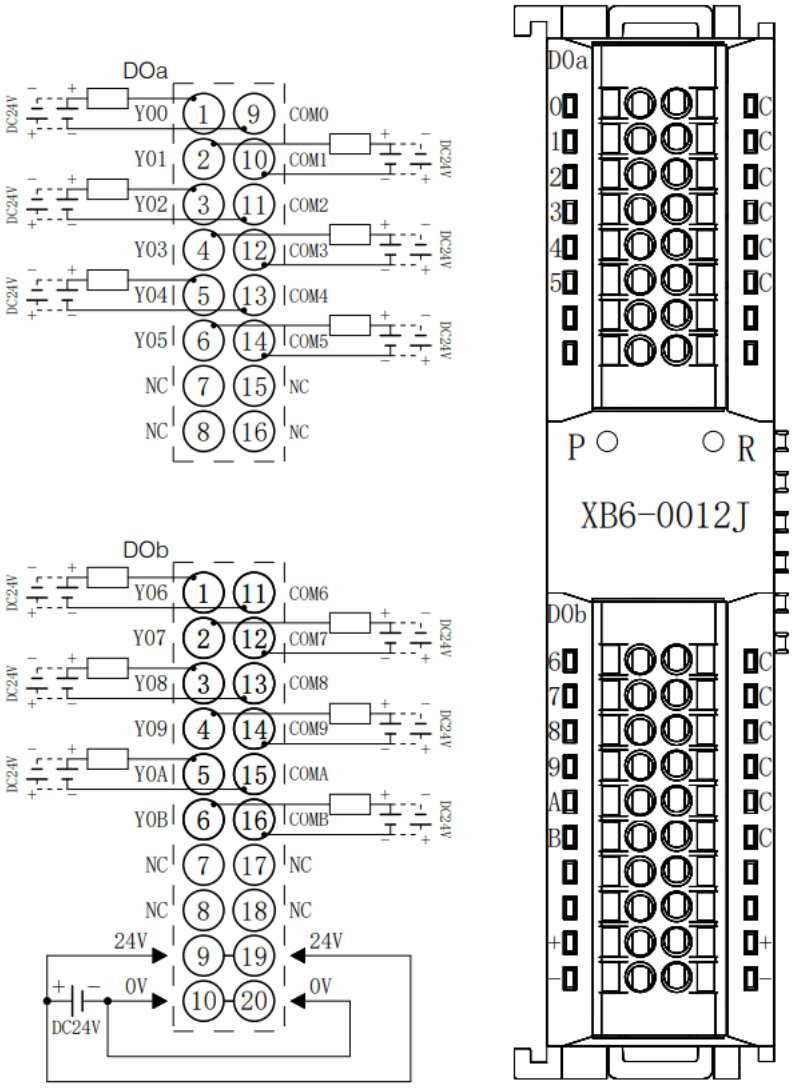
6.4.14 XB6-0008B



*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

6.4.15 XB6-0012J

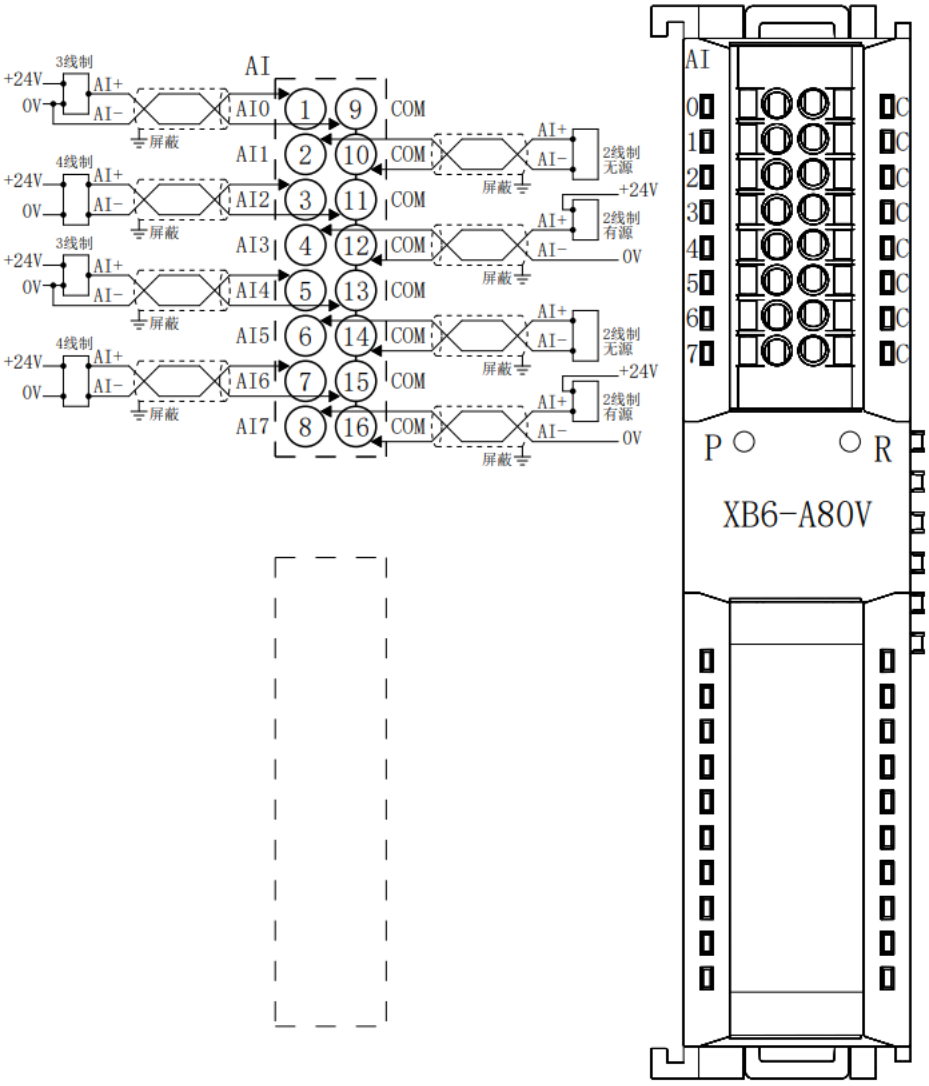


*24V internal conduction; 0V internal conduction

*Load common terminal power supply need to be the same as modules

*COM can be connected to positive or negative electrodes, it’ s not connected inside and support DC0-48V

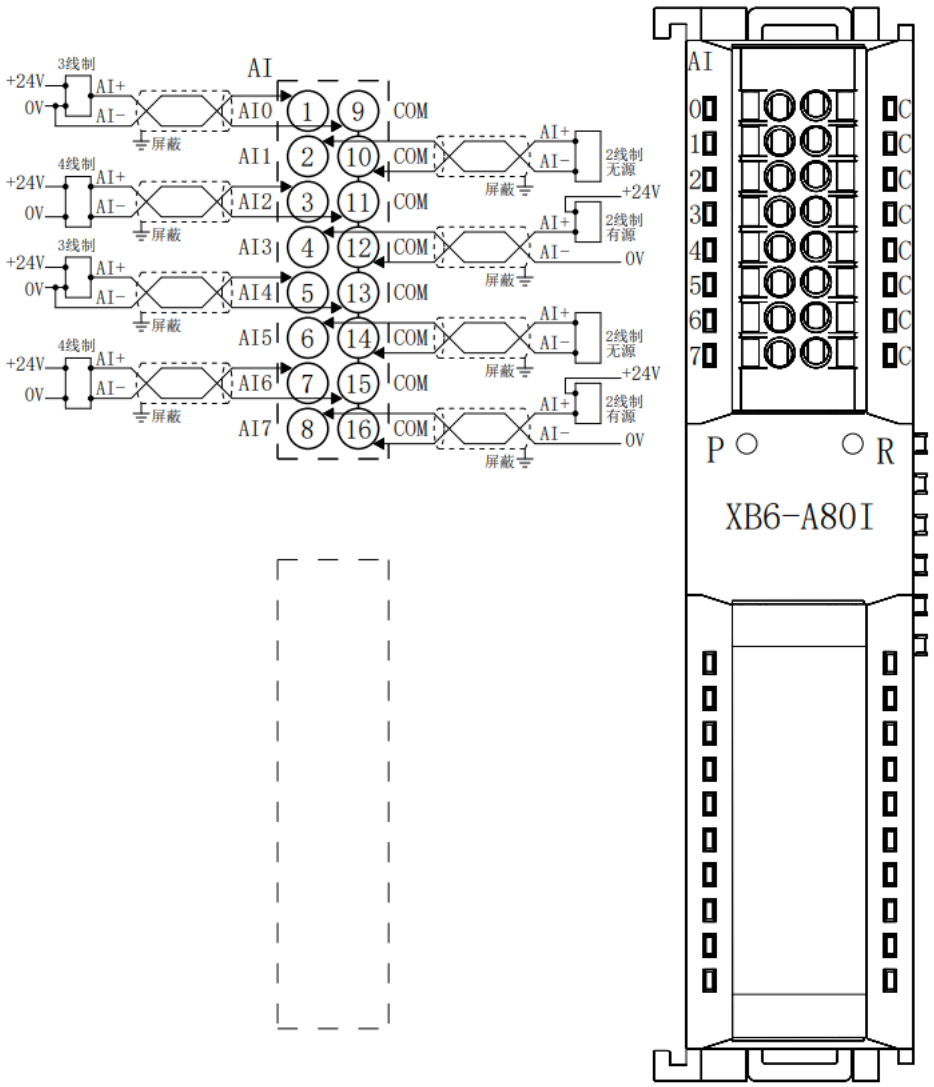
6.4.16 XB6-A80V



*COM internal conduction

*All channel loads need to use the same power supply

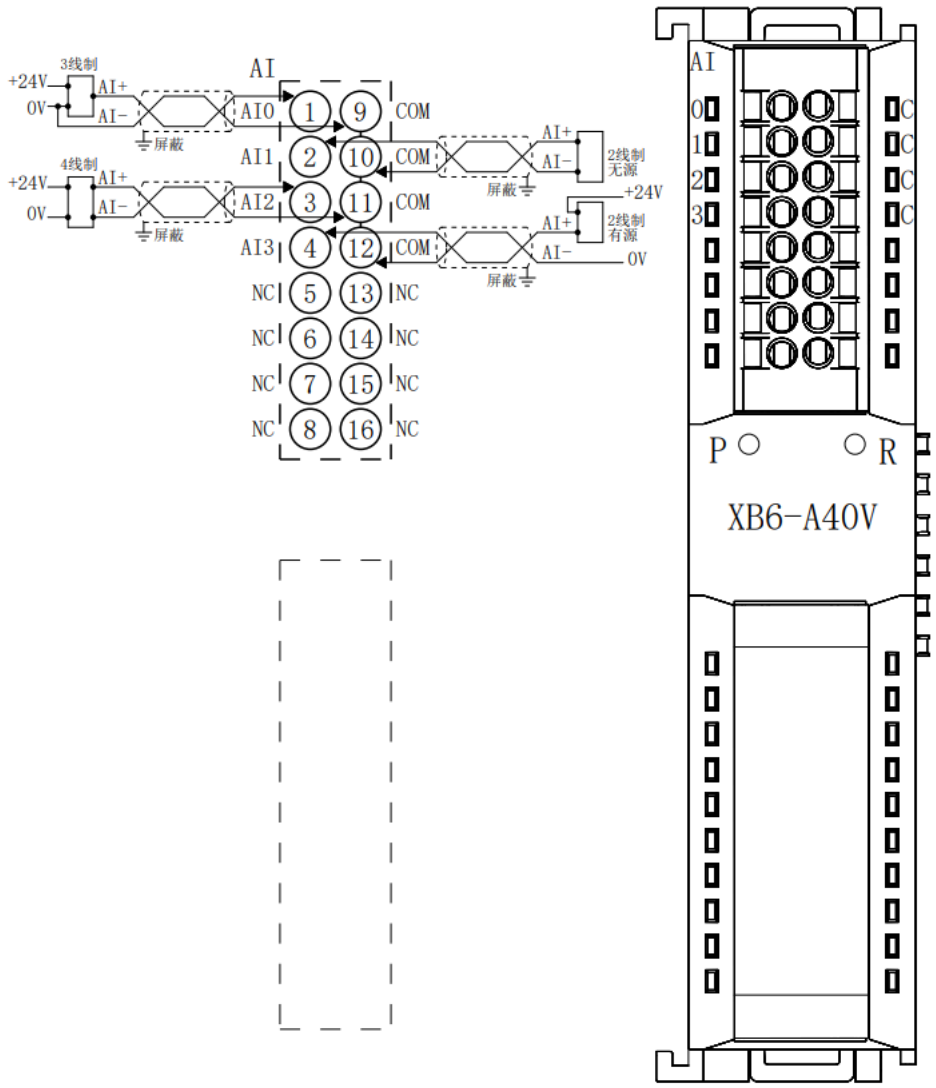
6.4.17 XB6-A80I



*COM internal conduction

*All channel loads need to use the same power supply

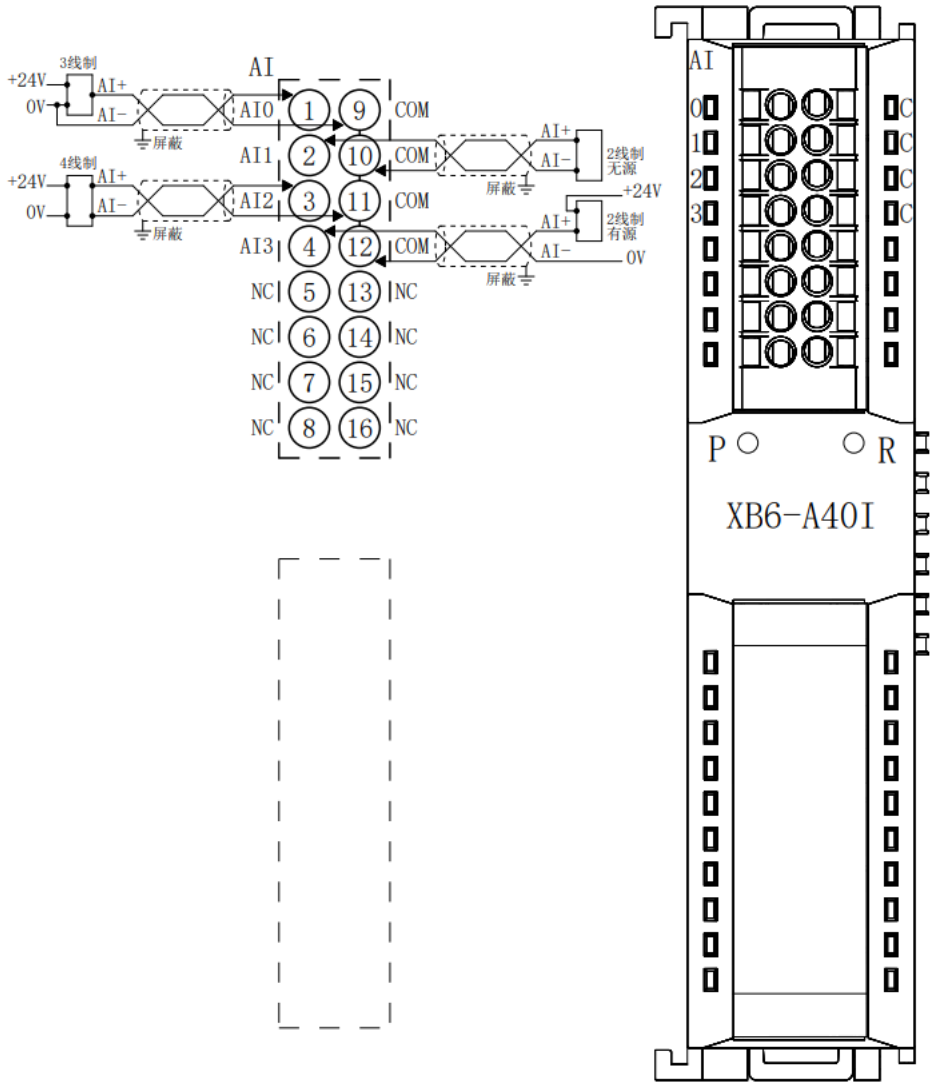
6.4.18 XB6-A40V



*COM internal conduction

*All channel loads need to use the same power supply

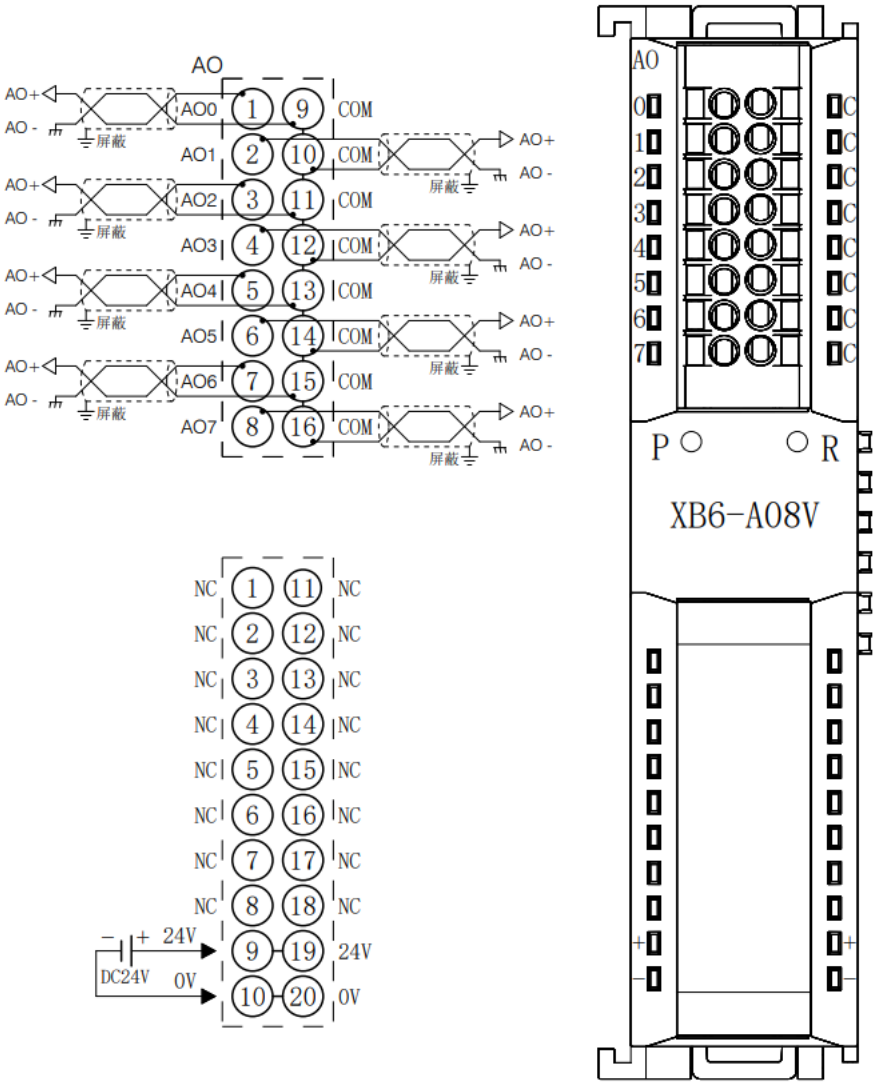
6.4.19 XB6-A40I



*COM internal conduction

*All channel loads need to use the same power supply

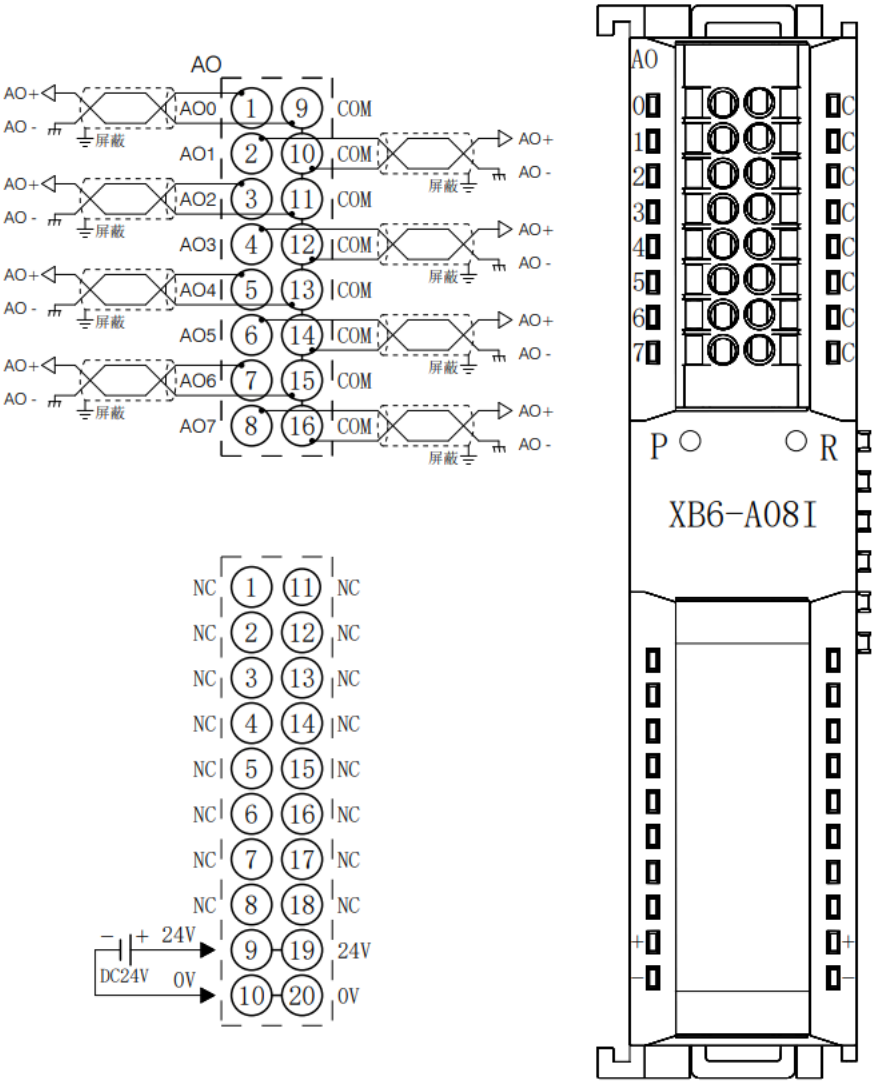
6.4.20 XB6-A08V



*COM internal conduction

*24V internal conduction; 0V internal conduction

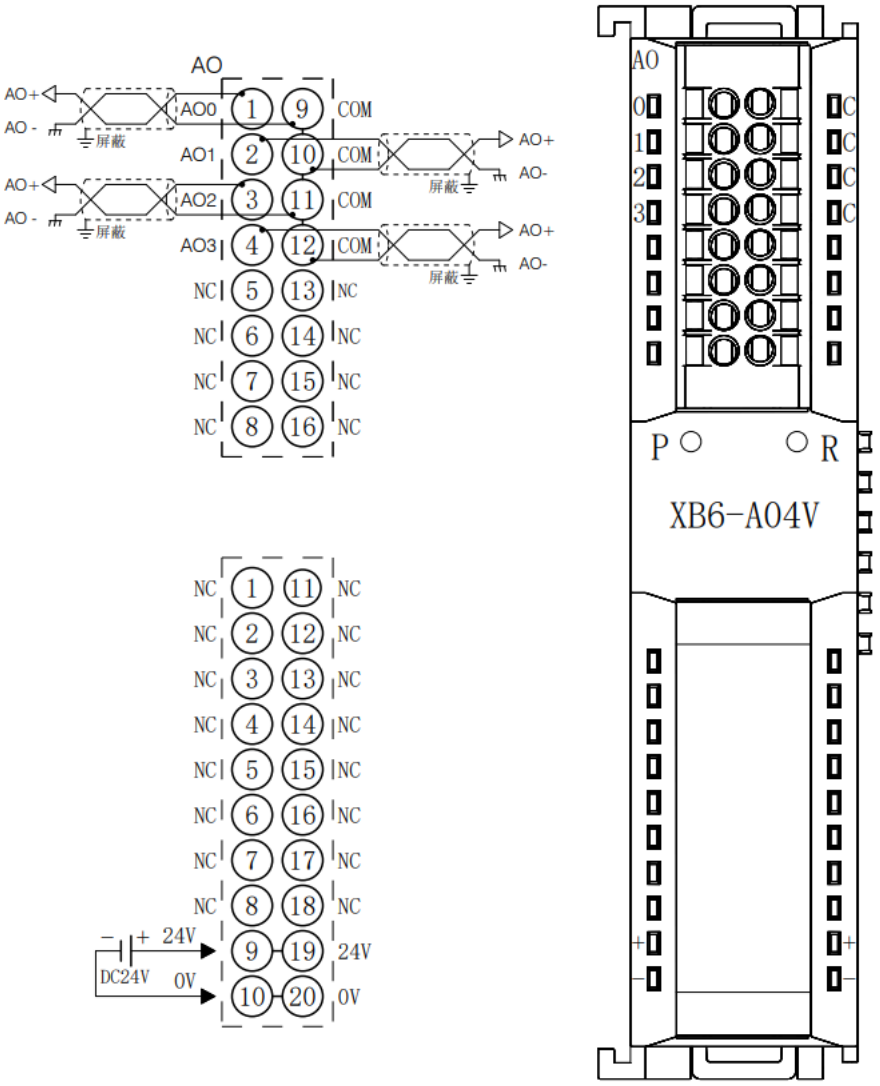
6.4.21 XB6-A08I



*COM internal conduction

*24V internal conduction; 0V internal conduction

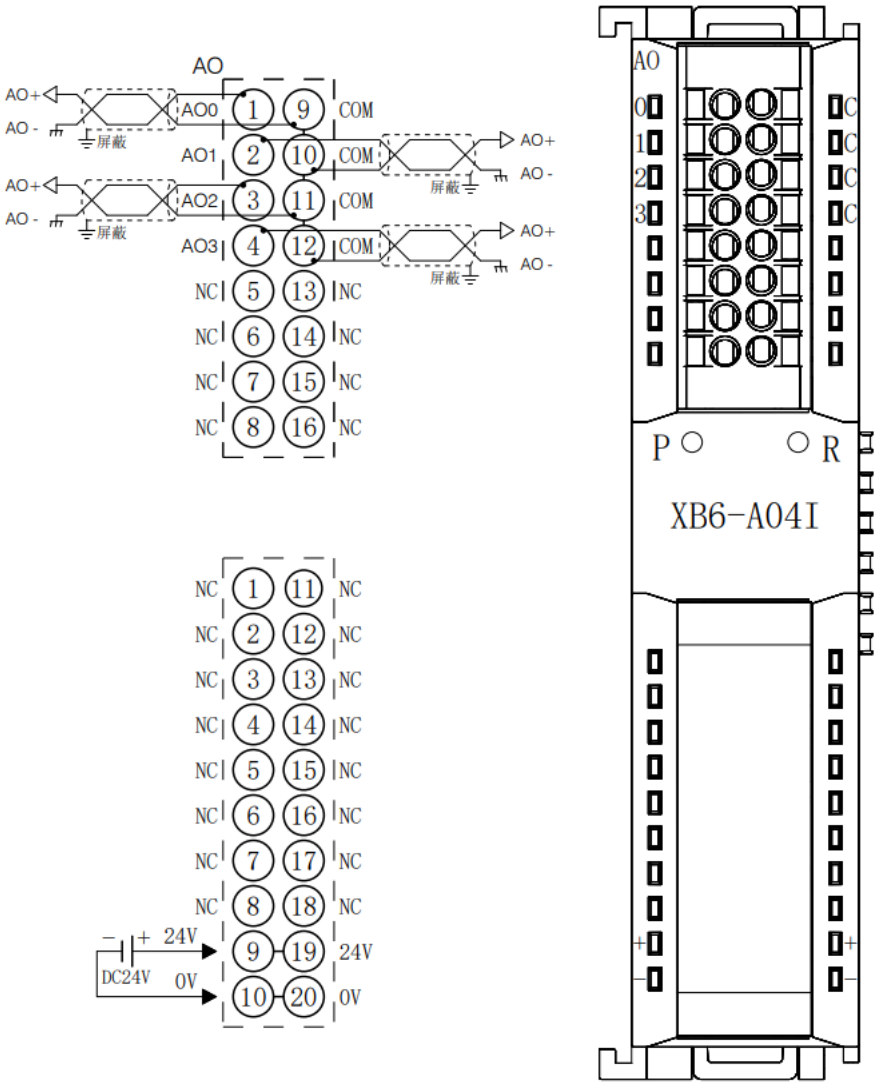
6.4.22 XB6-A04V



*COM internal conduction

*24V internal conduction; 0V internal conduction

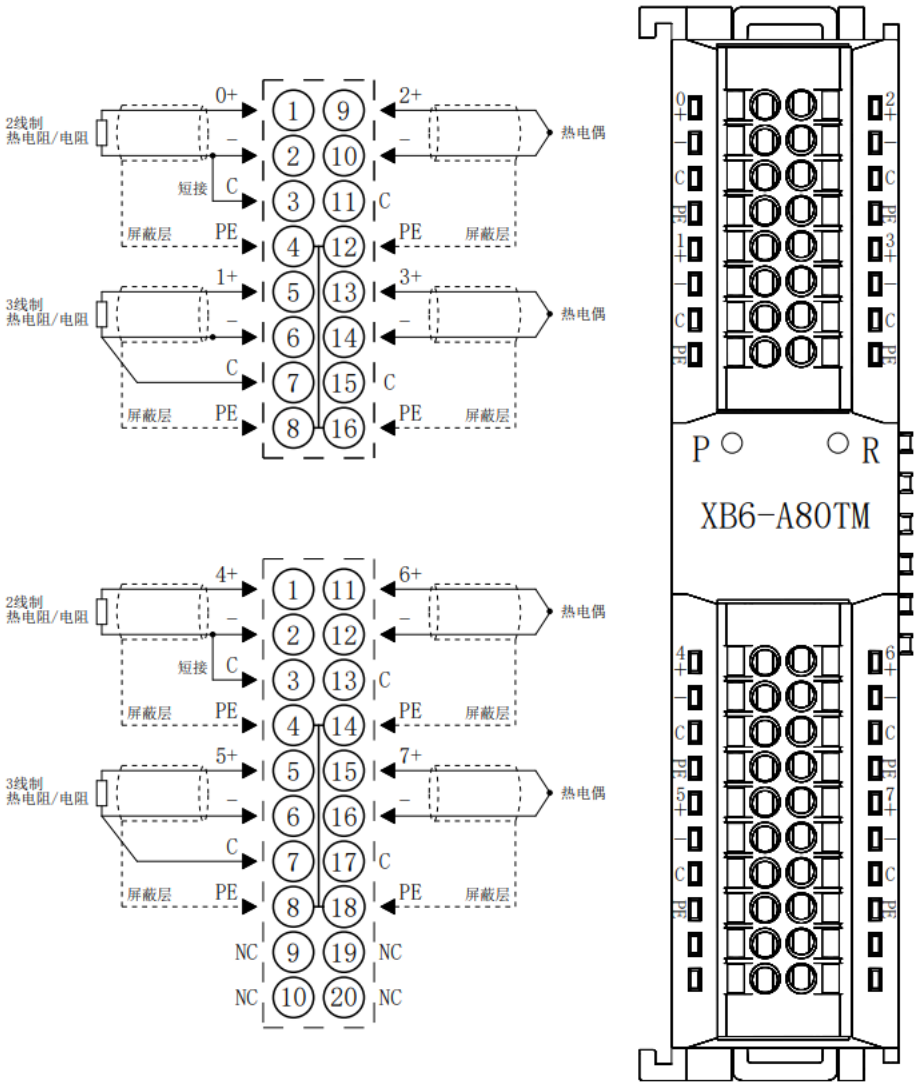
6.4.23 XB6-A04I



*COM internal conduction

*24V internal conduction; 0V internal conduction

6.4.24 XB6-A80TM

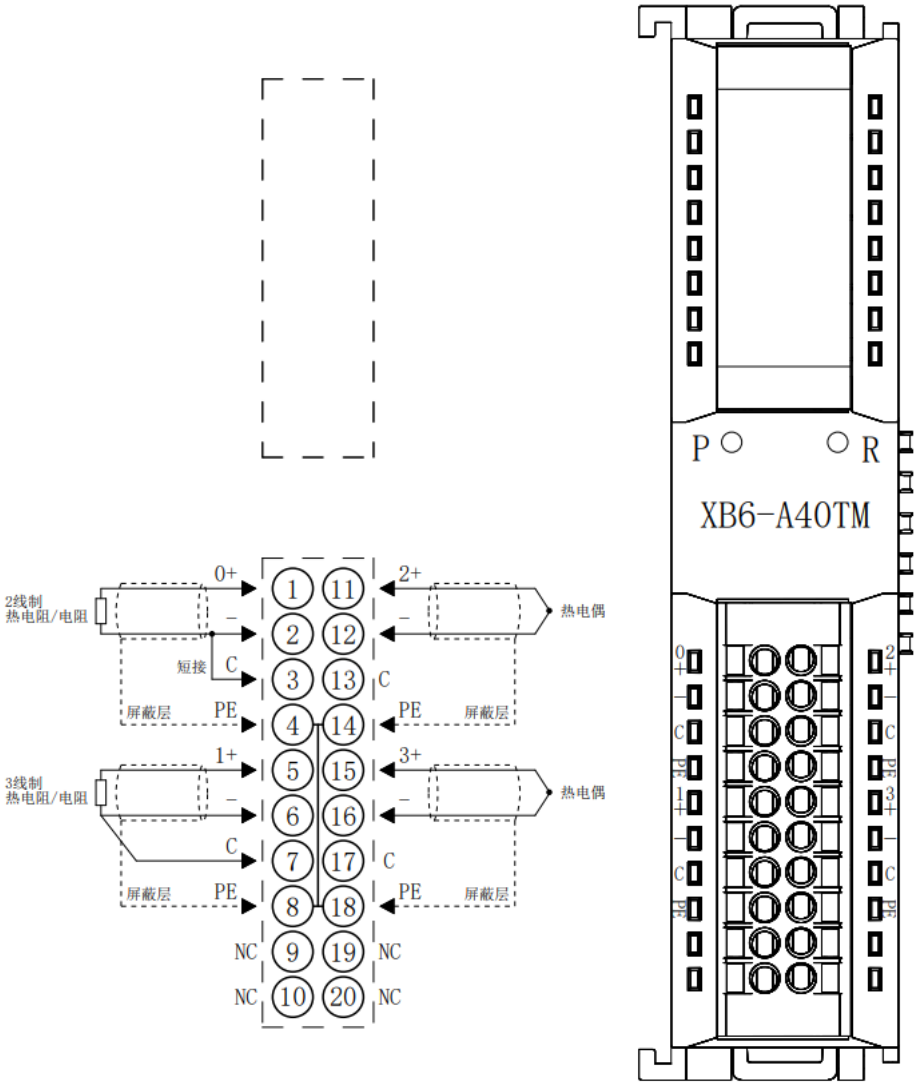


*PE internal conduction

*2-wire thermal resistor needs to short-circuit "-" and "C" externally

*4-wire sensors need to be changed to 2-wire or 3-wire access

6.4.25 XB6-A40TM

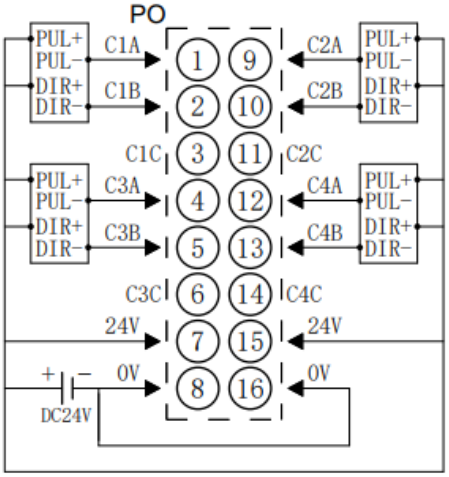


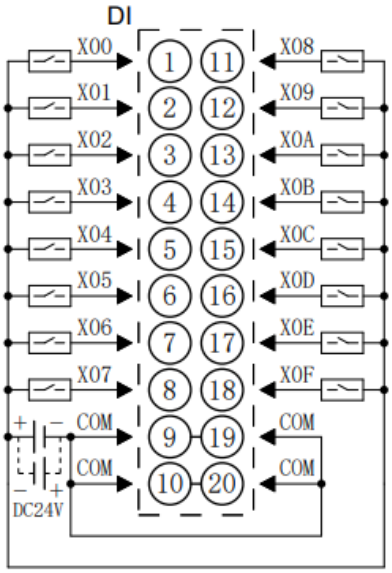
*PE internal conduction

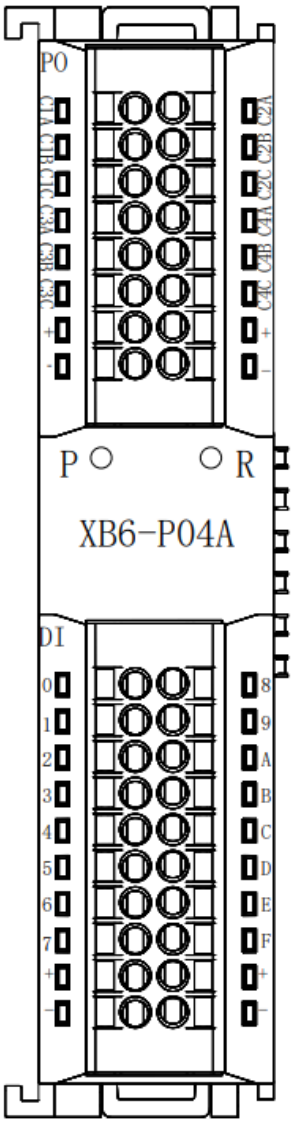
*2-wire thermal resistor needs to short-circuit "-" and "C" externally

*4-wire sensors need to be changed to 2-wire or 3-wire access

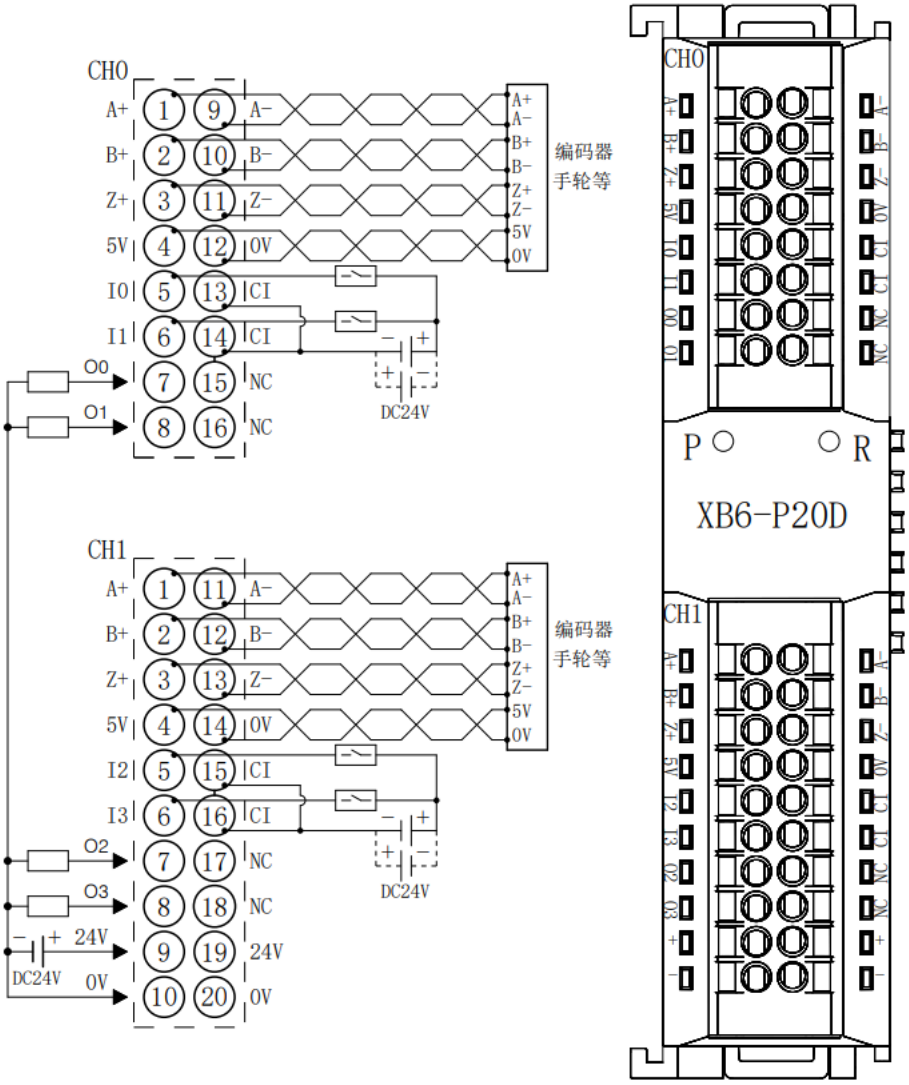
6.4.26 XB6-P04A







6.4.27 XB6-P20D

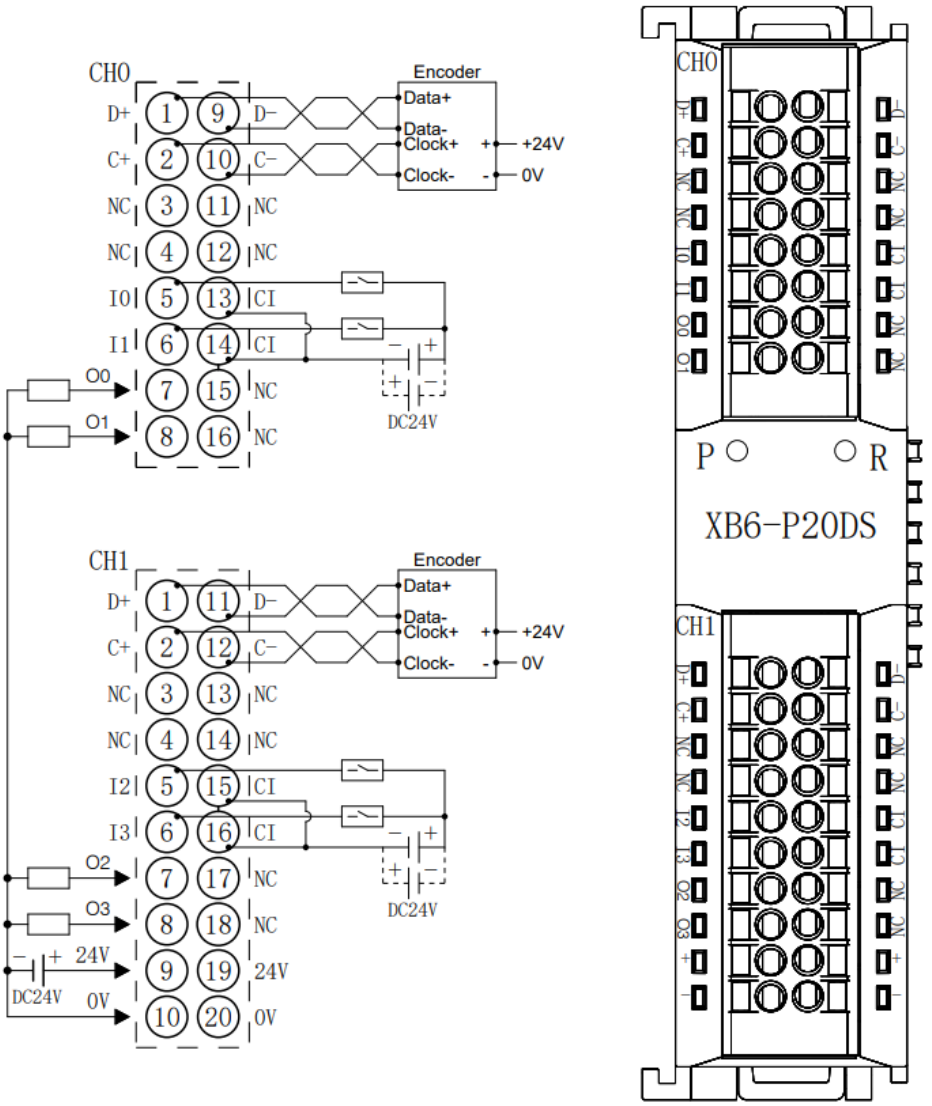


*24V internal conduction; 0V internal conduction

*CI is the common terminal of input channels I0~I3, internally conductive, NPN/PNP compatible

*The load common terminal power supply should use the same power supply as the module

6.4.28 XB6-P20DS

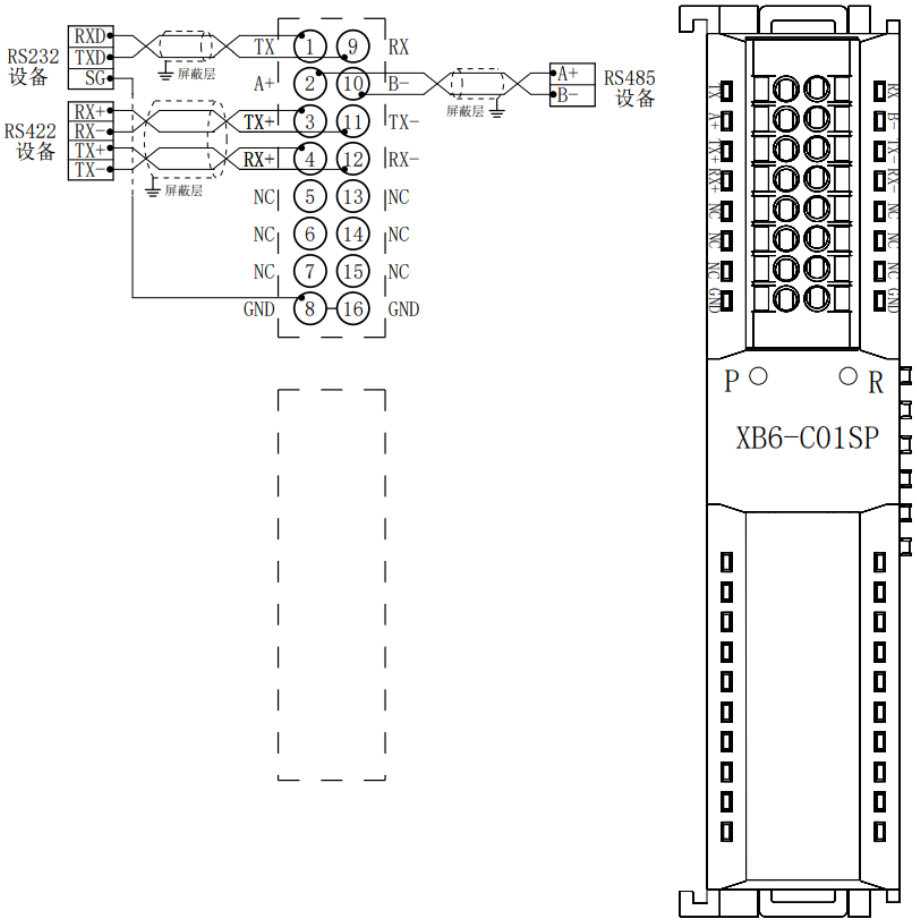


*24V internal conduction; 0V internal conduction

*CI is the common terminal of input channels I0~I3, internally conductive, NPN/PNP compatible

*The load common terminal power supply should use the same power supply as the module

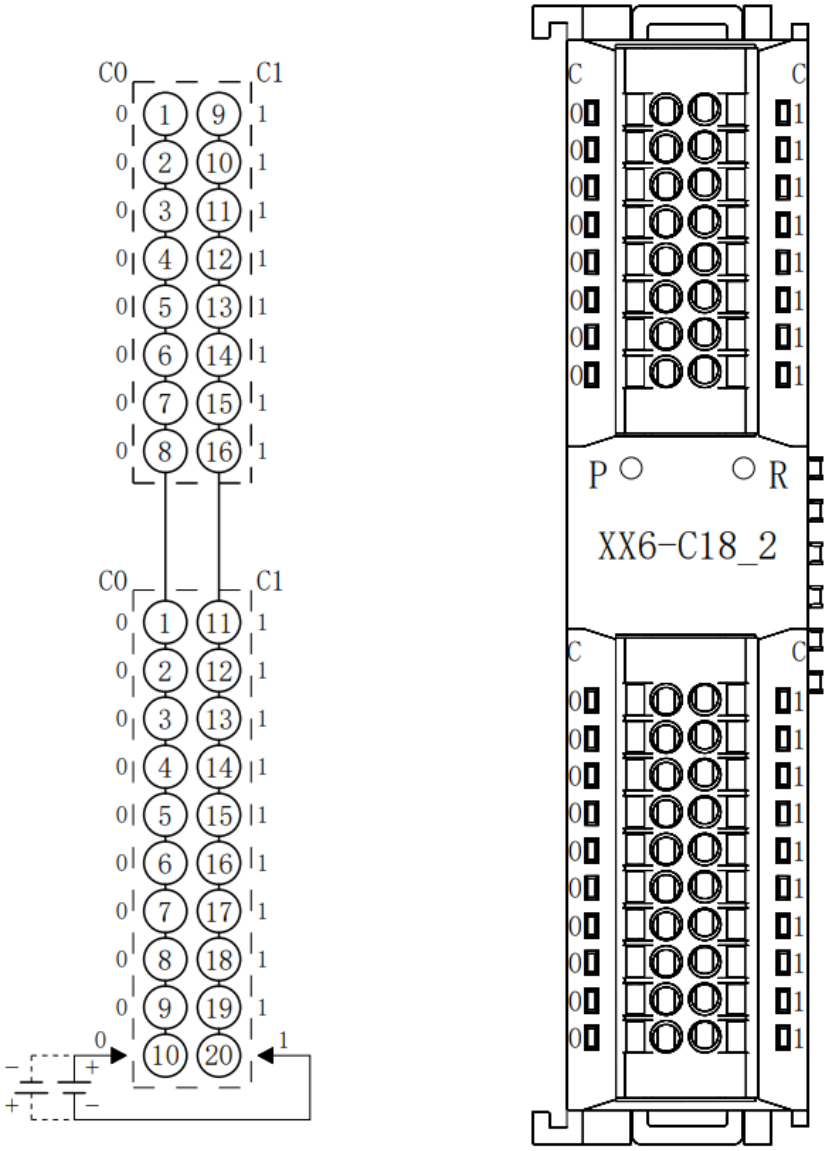
6.4.29 XB6-C01SP



*GND is the RS232 signal ground, internally conductive

*Cables should use shielded twisted pairs and be reliably grounded

6.5 Common Terminal Expansion Module Wiring Diagram



*C0 Line 1 internal conduction; C1 Line 1 internal conduction;

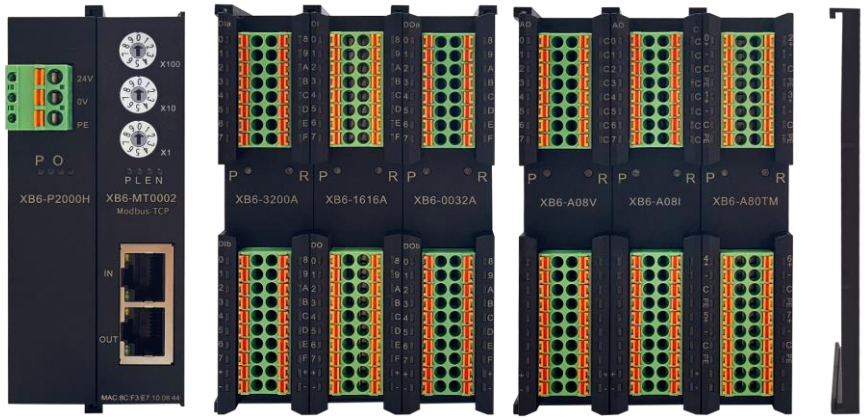
7 Operation

7.1 Modular Application

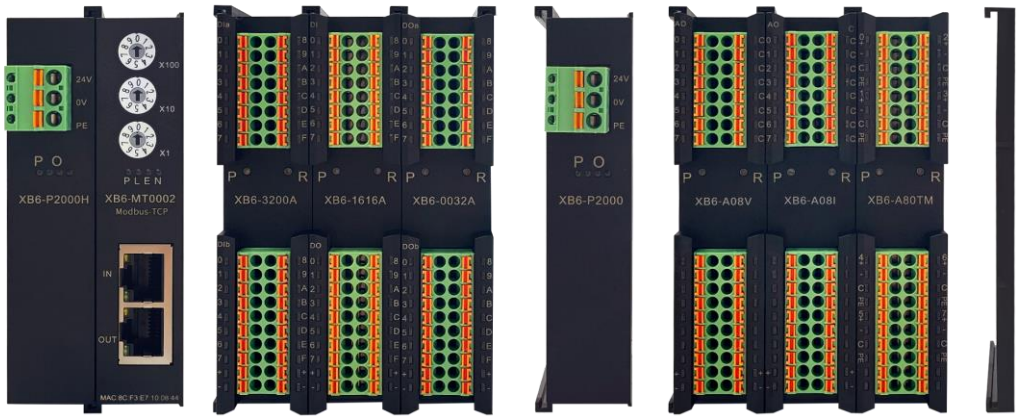
Two combinations are available for the product as shown below, each containing a coupler, I/O modules and an end cover.

First product combination (coupler, I/O modules, cover plate)

Coupler I/O modules Cover plate



Second product combination (coupler, I/O modules, extension power module, I/O modules, cover plate)				
Coupler	I/O modules	extension power module	I/O modules	cover plate



Limitations on the number of module configurations:

1. The number of IO modules that can be supported by a coupler is not higher than 32.
2. The number of analog modules should not exceed 12, and the number of 8-channel analog inputs should not exceed 8.
3. If the number of I/O modules configured in the system exceeds 10, additional expansion power modules are required, and the number of I/O modules configured after the expansion power modules ≤ 12.

7.2 IP Settings And Modifications

- Device IPs with S/N numbers beginning with 1259 support Class B addresses, others do not.
- When modifying the IP, the IP Setting Tool tool is recommended for devices with S/N number 1294.
- Devices with S/N numbers starting with 1294 support IP modification in communication. Modifying IP while other devices are connected keeps the connection uninterrupted, and the IP will not take effect until it is re-powered.
- Devices cannot be scanned when there is an IP conflict for a device whose S/N number begins with 1294.
  1 device can be scanned in case of IP conflict of other S/N number devices.

7.2.1 Setting The IP Address With A Rotary Switch

The description and operation of the rotary switch is detailed in "4.1.2Rotary Switch "

- **When the IP address is set by rotary switch from the factory status**
  IP address is 192.168.0.XXX (XXX is the setting value of the rotary switch, range 1~254).
- **When setting the IP address with the rotary switch from a state where the IP address has already been set with the host computer**
  The IP address follows the high 3byte of the IP address set via the host computer and the low 1byte is the setting value of the rotary switch.
  For example, if you change the setting of the rotary switch after setting it to 172.10.0.12 from the host computer, the rotary switch setting will be changed to 172.10.0.12.
  The IP address is 172.10.0.XXX (XXX) for the rotary switch setting (1 to 254).

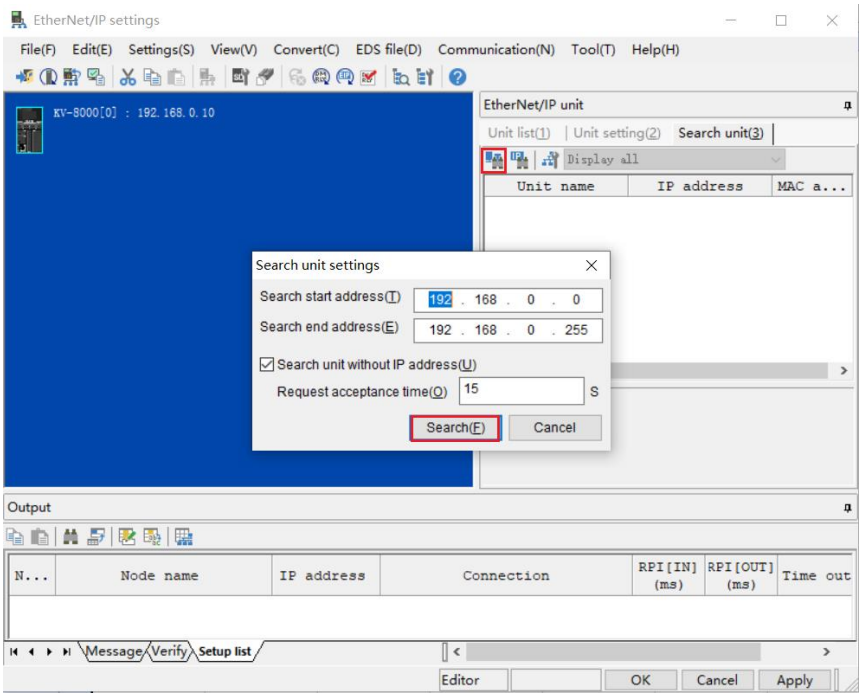
- When the module is shipped from the factory, the rotary switch is set to "000", the IP address is not assigned, and the IP address defaults to 192.168.0.120 for devices with S/N number beginning with 1294.
- After the modification by the host computer is completed, the module modifies the startup method to fixed IP startup and reboots automatically. The module starts with the rotary switch setting value and the IP address composed of the assigned network segment.
- Abnormal rotary switch setting: When the rotary switch is set to 255 or 255 or more, the module starts in the same way as the previous startup with parameters after powering up.

7.2.2 Setting The IP Address Via The Host Computer Software

Toggle the rotary switch to 0, power up the module, scan the module using the host computer, and click on the IP address field of the module to modify the IP address after scanning the module.

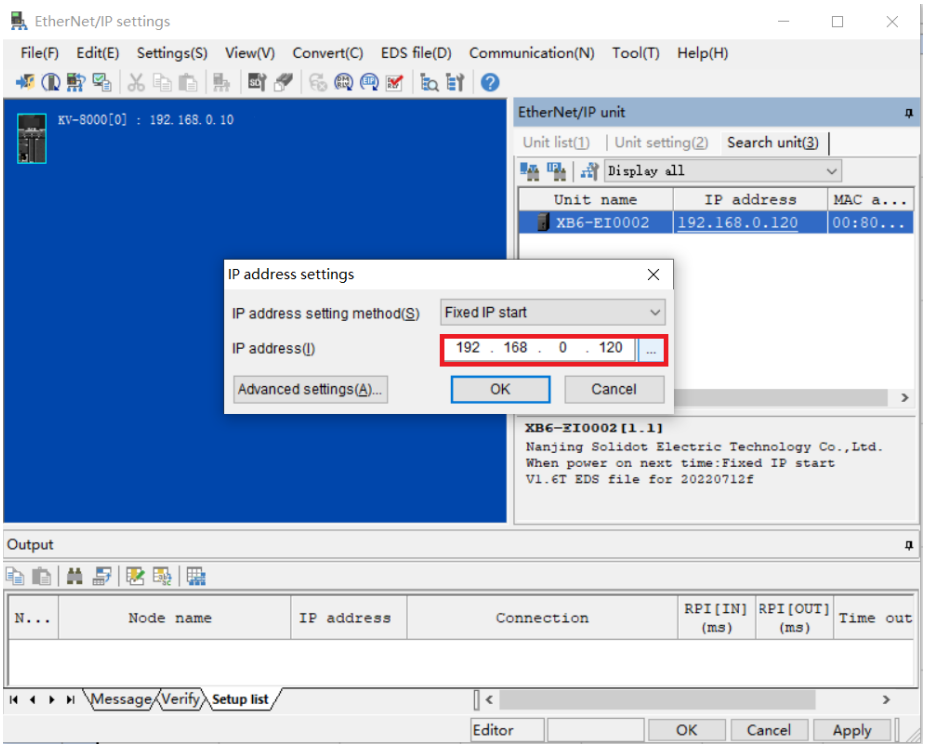
This section describes how to change the IP address, using the Keens KV-8000 and the upper computer KV STUDIO Ver.10G as examples:

1、 scanning device



2、 IP modification

Click "IP Address" displayed in the "Device Search Results" to bring up the "IP Address Settings" dialog box. Set the IP address.



Precautions

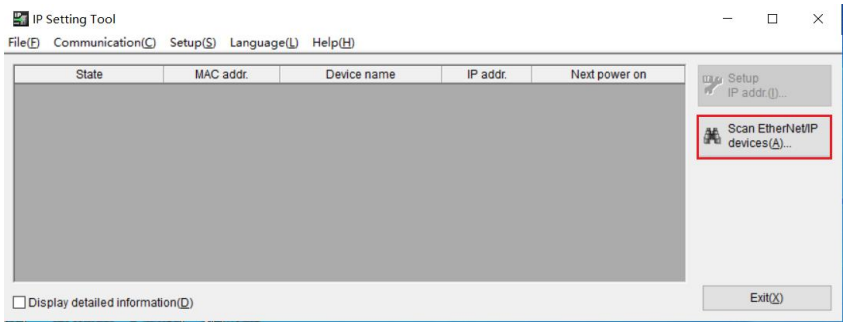
- If you use BOOTP to modify the IP address, you need to set the request acceptance time when scanning and the timeout time when setting the IP address to 60s. After the upper computer modification is completed, the module modifies the startup method to fixed IP startup and restarts automatically. The module starts with the IP address composed of the rotary switch setting value and the assigned network segment.
- If the IP is modified across network segments, after the modification is completed, the host computer may not be in the same network segment as the module, resulting in the host computer prompting a timeout or not being able to scan to the module after the allocation, which can be solved by modifying the IP address of the host computer so that it is in the same network segment as the module.

7.2.3 Setting An IP Address With The IP Setting Tool

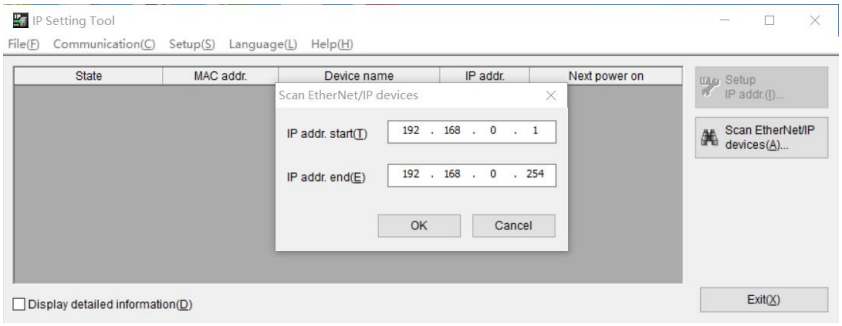
After the device is powered on, you can set the coupler IP address using the IP Setting Tool.

⚠ Check the coupler S/N number (appearance available).
Devices with S/N number starting with 1294 support modifying device IP in communication, while devices of other versions do not support modifying device IP in communication for the time being.

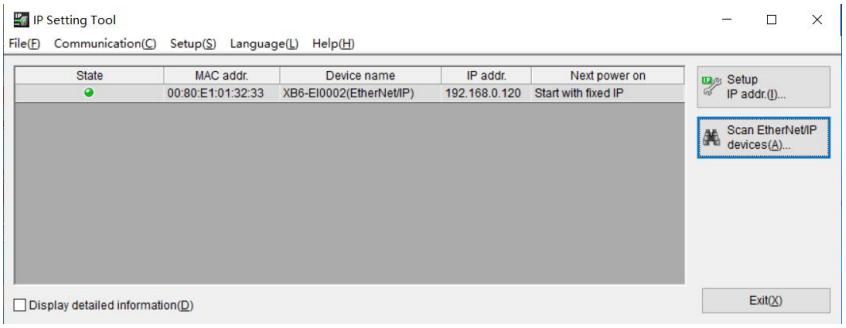
1. Open the IP Setting Tool and click the Scan for EtherNet/IP Devices button.



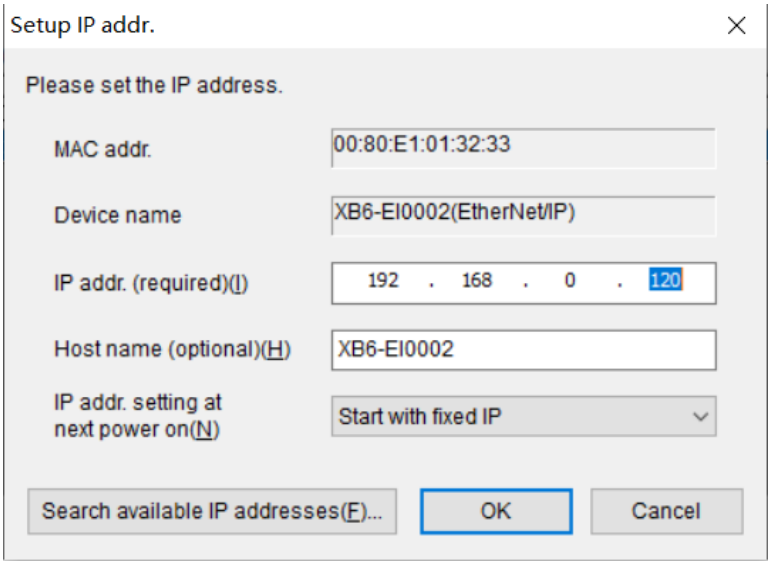
2. Set the IP segment and click OK.



Examples of scanned devices are shown in the following figure.



3. Double-click the device and set the IP address in the pop-up "IP Settings" window, as shown below.

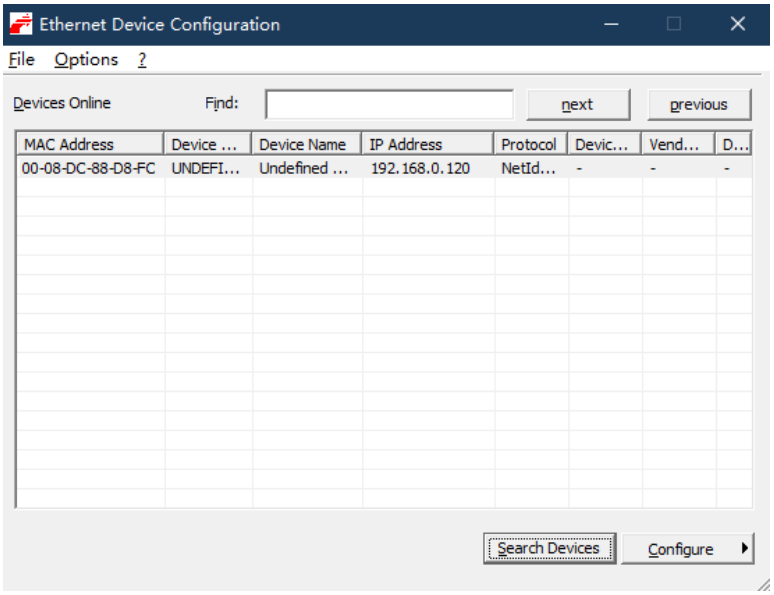


7.2.4 Setting the IP Address Via Ethernet Device Configuration

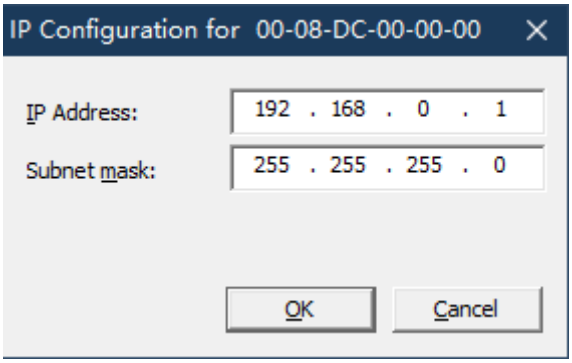
After the device is powered on, you can set the coupler IP address through the Ethernet Device Configuration tool.

⚠ Devices with S/N numbers starting with 1294 do not support IP modification by this tool.

1. Open the Ethernet Device Configuration tool and click the "Scan for Search Devices" button to search for devices as shown below.



2. Click "Configure -> Set IP Adress", the window shown below will pop up, set the IP address and subnet mask according to the actual situation.



7.3 Restore Factory Settings

If the IP address is forgotten, lost or other abnormalities occur during use, the module can be reset through the IP address reset function.

Restore factory settings operation by rotary switch as follows:

1. Power up the module by flipping the rotary switch to 999.
2. After the module is powered up, flip the rotary switch back to 000 without disconnecting power.
3. After the rotary switch is flipped back to 000, the module automatically performs a restoration of the factory settings.
4. After the module is restored to factory settings, the IP address parameter is cleared and the startup mode is BOOTP.

- Devices with S/N numbers beginning with 1294 have a reset IP address of 192.168.0.120.
- Other versions of the device reset with the IP address parameter cleared and the boot method BOOTP.

7.4 Module Parameter Setting Function

7.4.1 Digital Output Clear/Hold Function

The Clear/Hold function is for modules with outputs. This function configures the output action of the module when communication is disconnected.

Clear Output: When communication is disconnected, the module output channel automatically clears the output.

Hold Outputs: The module output channels keep outputs when communication is disconnected.

Configuration method

See "7.6Bus Module Configuration Description ".

***Repowering is recommended after modifications are completed.**

7.4.2 Module Output Action Configuration Function in Bus RUN/IDLE State

The RUN/IDLE state output action configuration function is for modules with outputs, and you can select the action of the module outputs to be held or cleared when the bus state is switched to the idle state.

Configuration method

See "7.6Bus Module Configuration Description ".

***Repowering is recommended after modifications are completed.**

7.4.3 Digital Input Filter Time

Digital input filtering prevents the program from responding to unexpected rapid changes in the input signal, which may be generated by switch contact jumps or electrical noise. Digital Input Filtering is currently configured in a fixed 3ms configuration to filter out noise within 3ms, channels are not individually configurable.

An input filter time of 3 ms means that a single signal change from "0" to "1" or from "1" to "0 "A single high or low pulse shorter than 3 ms will not be detected.

Configuration method

See "7.6Bus Module Configuration Description ".

***Repowering is recommended after modifications are completed.**

7.4.4 Analog Filter Settings Function

Analog input filter function

The analog input filter function averages the A/D converted data internally to reduce the effects of fluctuations in the input signal due to noise.

Analog inputs are processed as moving averages with a specified number of A/D conversions.

Filter Function Configuration

Each channel can be configured individually, configuration range: 1~200 times, default 10 times;

8-channel module sampling rate is: 1.25KHZ/8 channels (800us/8 channels);

4-channel module sampling rate is: 2.5KHZ/4 channels (400us/4 channels).

Configuration method

See "7.6Bus Module Configuration Description ".

***Repowering is recommended after modifications are completed.**

7.4.5 Analog Range Configuration Function

The analog range setting function is used to set the analog range (see "3.5Analog Parameter ").

Configuration method

See "7.6Bus Module Configuration Description ".

***Repowering is recommended after modifications are completed.**

7.5 Process Data

7.5.1 I/O Module Process Data

Digital I/O modules.

Each module is assigned a length of 4Byte data unit, each channel occupies 1Bit, the actual length of data used varies depending on the number of module channels.

Analog I/O modules:

Each module is assigned a length of 16 Byte data unit, each channel occupies 2 Byte, the actual length of data used varies depending on the number of module channels.

The data lengths are allocated in the table below.

Module Model	Uplink process data length (Byte)		Downstream process data length (Byte)	
	assigned value	Actual value used	assigned value	Actual value used
XB6-EI0002	4	4	-	-
XB6-3200A/B	4	4	-	-
XB6-1600A/B	4	2	-	-
XB6-0800A/B	4	1	-	-
XB6-0032A/B	-	-	4	4
XB6-0016A/B	-	-	4	2
XB6-0008A/B	-	-	4	1
XB6-1616A/B	4	2	4	2
XB6-0012J	-	-	4	2
XB6-VT16	-	-	4	2
XB6-A80V	16	16	-	-
XB6-A40V	16	8	-	-
XB6-A80I	16	16	-	-
XB6-A40I	16	8	-	-
XB6-A08V	-	-	16	16
XB6-A04V	-	-	16	8
XB6-A08I	-	-	16	16
XB6-A04I	-	-	16	8
XB6-A80TM	16	16	16	16
XB6-A40TM	16	8	16	8
XB6-P20D	20	20	16	12
XB6-P20DS	20	20	2	2
XB6-P40A	24	24	36	36
XB6-C01SP	40	40	40	40

7.5.2 Coupler Process Data

The coupler is allocated 4Byte of data for coupler status indication and alarms, definition of bottom bus status indication and topology comparison hints.

Bottom bus status indication:

status value	State Definition	account for
1	Bottom Bus Initialization	Bottom bus initialization phase
2	Bottom Bus Ready	The bottom bus is pre-connected and only performs parameter downstreaming
4	Bottom bus open status	Bottom bus opens connection to perform process data interaction

Topology State Comparison Status Tip:

status value	account for
0	Topology comparison normal
1	There is a mismatch of I/O module types in the topology
2	Unconfigured topology
3	There are I/O modules missing from the topology
4	Excess I/O modules in the topology
5	There are I/O module types in the topology that are not supported by the coupler

7.6 Bus Module Configuration Description

7.6.1 Application in CODESYS V3.5 Software Environment

1. Preparations

Hardware Environment

A computer with CODESYS V3.5 software pre-installed.

Network cables.

One switching power supply.

Module mounting rails and rail fixings.

Please configure the module model and type according to the actual configuration, such as the following table:

Devices	Model Number	Quantities
PLC	CODESYS Control Win V3 - x64 SysTray Software	-
Coupler	XB6-EI0002	1
I/O Modules	XB6-3200A	1
	XB6-0032A	4
	XB6-0032B	1
	XB6-A40V	1
End Cover	XB6-CVR00	1

Device Configuration Files

Configuration file access: https:**//www.solidotech.com/documents/configfile**

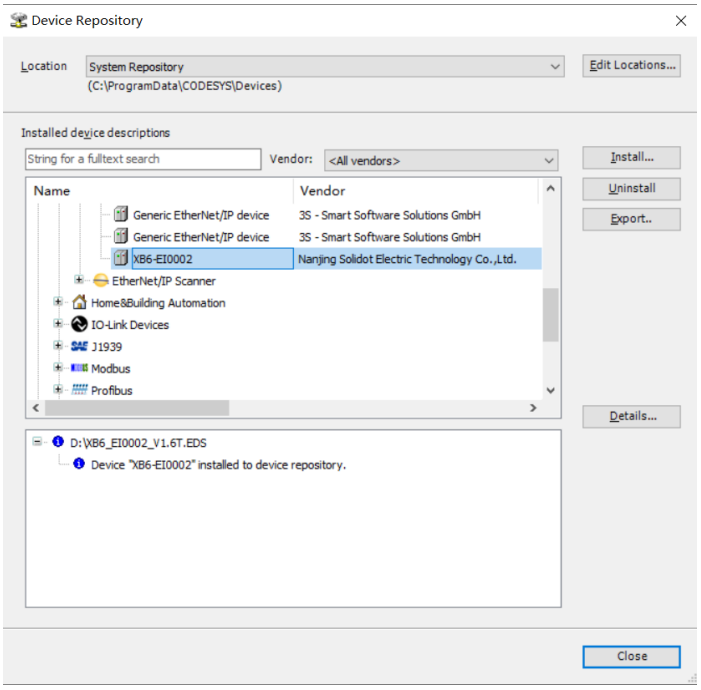
Hardware configuration and wiring

Please follow the "5Installation and Disassembly " and "6Wir " require operation.

2. Installing the device configuration file

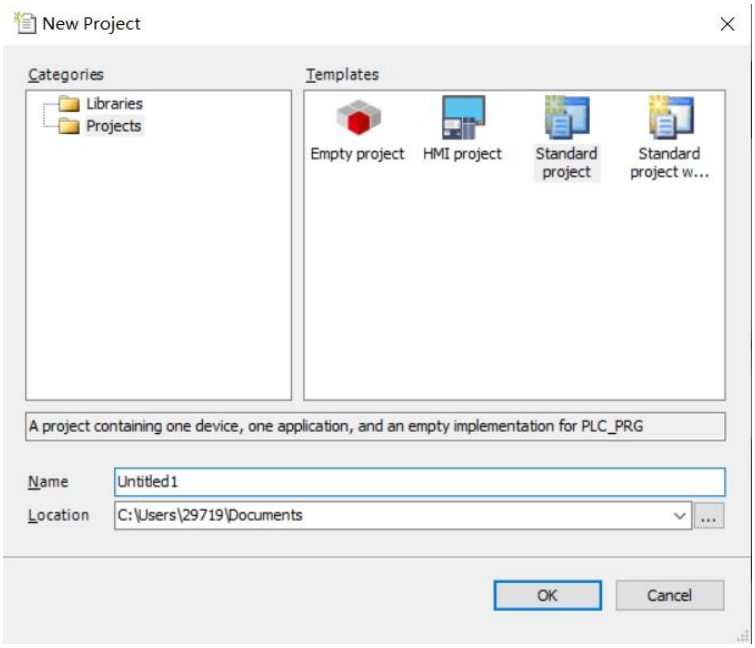
1. Install the EhterNet/IP EDS device description file ("XB6_EI0002_VX.X.EDS").
   a) Open CODESYS software **and** select "Tools -> Device Repository".
   b) Click "Install" and select the relevant EDS file to install.

Successful installation shows that the device "xxxx" has been installed to the device repository, as shown in the following figure.



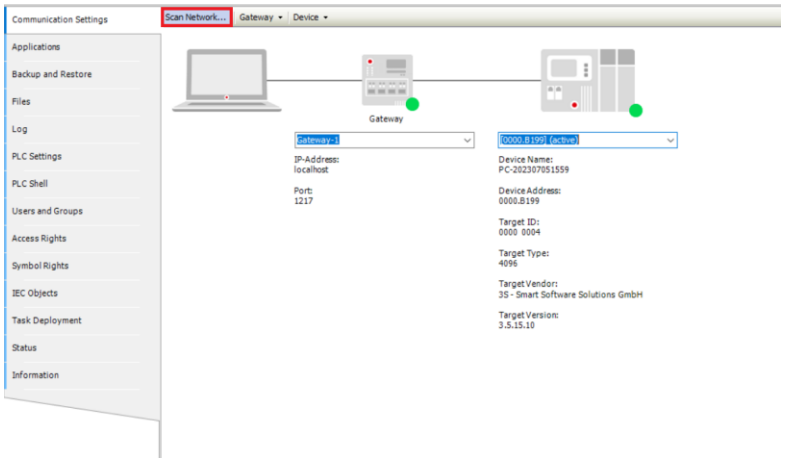
3. New construction

Click "File" and select "New Project".

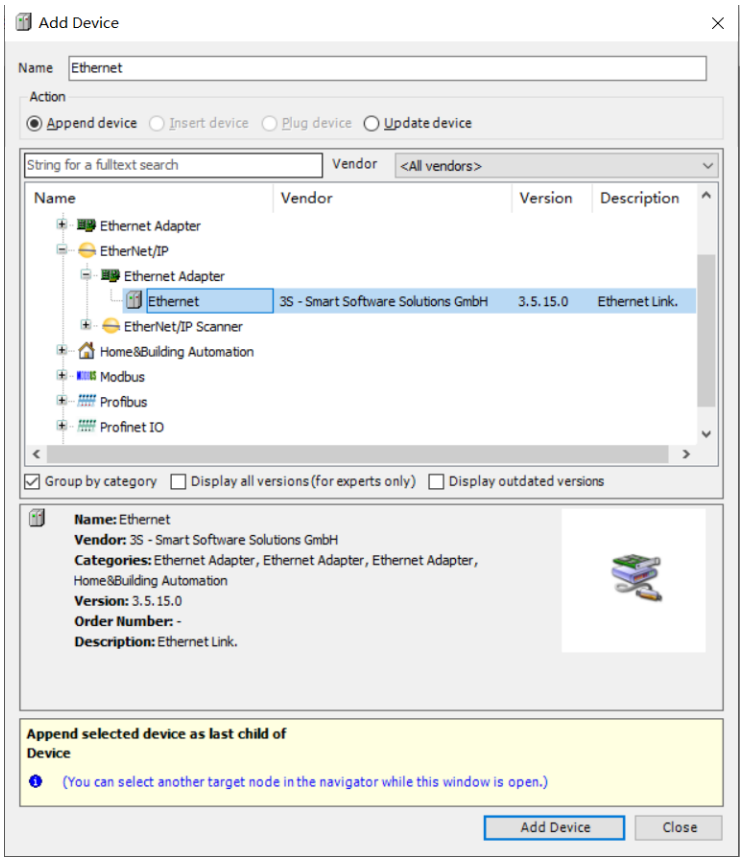


4. Add "Ethernet"

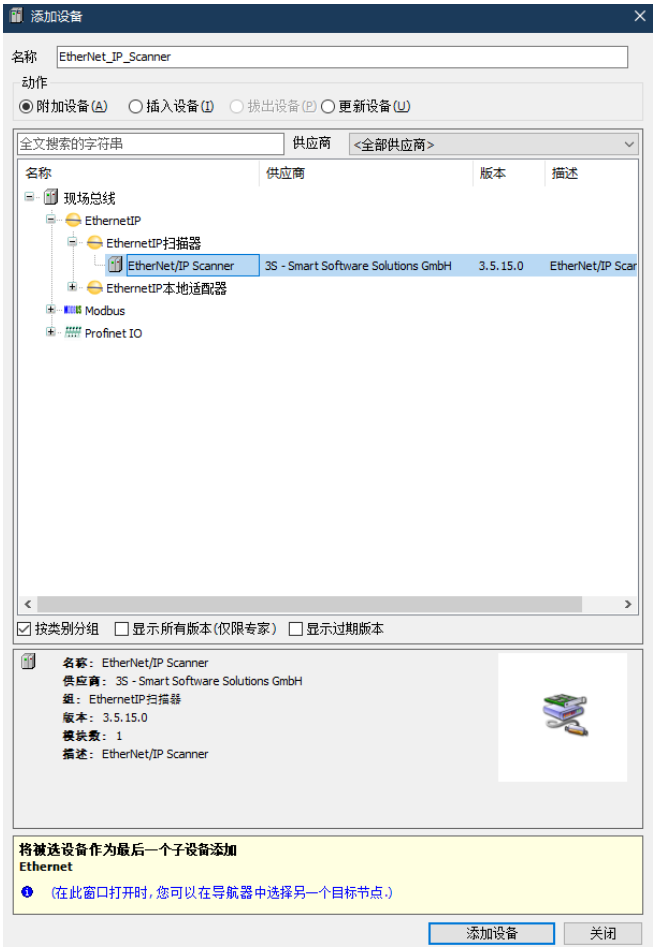
1. Start the PLC with "CODESYS Control Win V3 - x64 SysTray".
2. Double-click "Device (CODESYS Control Win V3 X84**)"** in the left navigation tree**, and then** click "Scan Network"**.**
3. Select the device, scan the network, and the network is active, as shown in the figure below:



4. Select "Device(CODESYS Control Win V3 X84) " " in the left navigation tree, right click and select "Add Device".
5. Select "EthernetIP -> Ethernet Adapter -> Ethernet" as shown below.

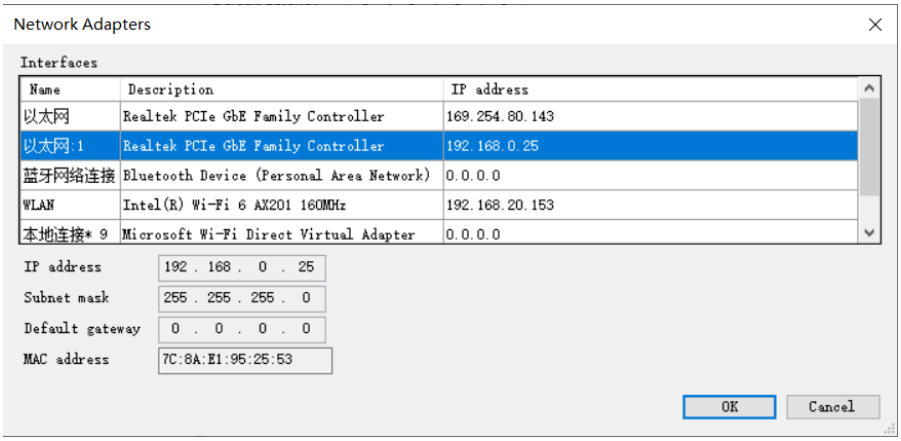


6. Select "Ethernet" in the left navigation tree, right click and select "Add Device".
7. Select "EthernetIP -> EthernetIP Scanner -> Ethernet/IP Scanner" as shown below.



5. Configure "EthernetIP".

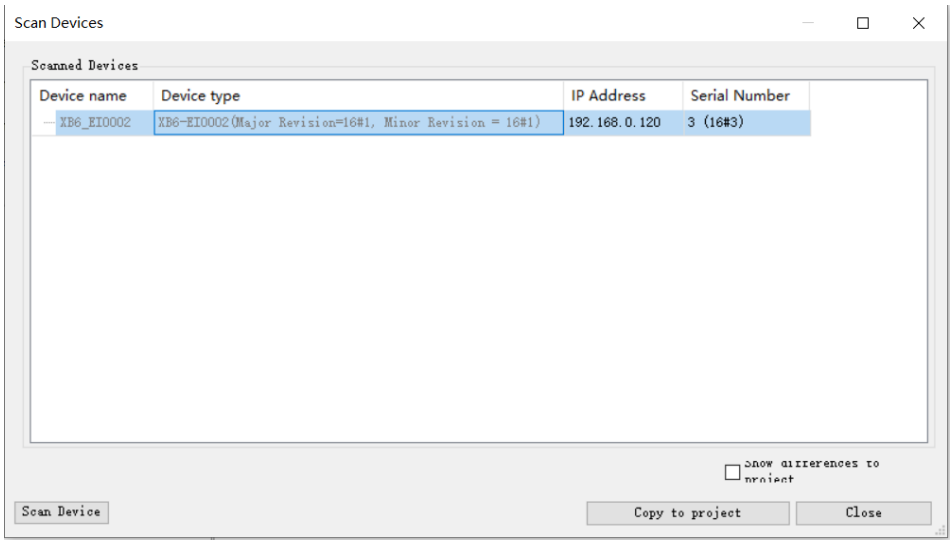
1. Double-click on "Ethernet" in the left navigation tree to open the configuration window.
2. On the General tab, click ... to the right of Interfaces and select Network Adapters, as shown in the following figure.



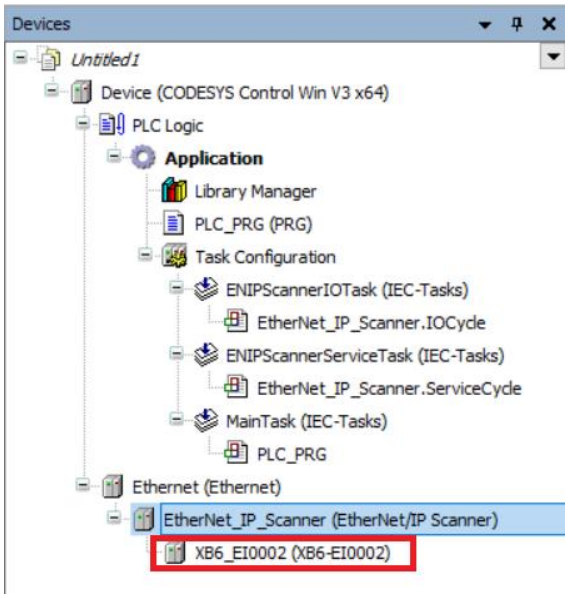
Click "Confirm".

6. Add Device

1. Log in to the device.
2. Check "EtherNet_IP_Scanner (EtherNet/IP Scanner)**"** in the left navigation tree **and** click Scan Devices.
3. Select "XB6_EI0002" and click "Copy to Project" as shown below.



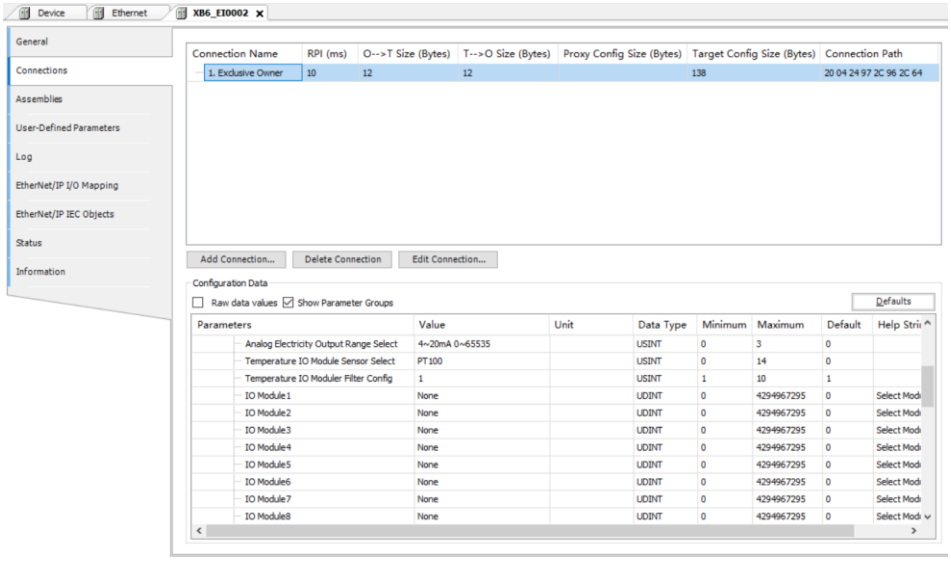
The device has been added, as shown below.



7. Parameter setting and I/O module addition

The parameter setting function is used to configure the configuration of uplink data, downlink data, digital clear hold, input filtering, analog range, configuration, and temperature module parameters.Table 7-1 Parameter Description Parameter Description

1. Double-click the device to open the "Device Configuration" window, switch to the "Connections" page, as shown below.



2. To modify the parameter values, see parameter descriptions inTable 7-1 Parameter Description Parameter Description

Connection Name	RPI (ms)	O-->T Size (Bytes)	T-->O Size (Bytes)	Proxy Config Size (Bytes)	Target Config Size (Bytes)	Connection Path
1. Exclusive Owner	10	12	12		138	20 04 24 97 2C 96 2C 64

Add the I/O modules in sequence according to the system configuration, such as shown in the following figure.

Parameters	Value	Unit	Data Type	Minimum	Maximum	Default
Analog Voltage Ouput Range Select	-10V~10V -32768~32767		USINT	0	3	0
Analog Electricity Output Range Select	4~20mA 0~65535		USINT	0	3	0
Temperature IO Module Sensor Select	PT100		USINT	0	14	0
Temperature IO Moduler Filter Config	1		USINT	1	10	1
IO Module1	XB6-0032B(W)		UDINT	0	4294967295	0
IO Module2	XB6-3200B		UDINT	0	4294967295	0
IO Module3	XB6-1616B(W)		UDINT	0	4294967295	0
IO Module4	None		UDINT	0	4294967295	0
IO Module5	None		UDINT	0	4294967295	0
IO Module6	None		UDINT	0	4294967295	0
IO Module7	None		UDINT	0	4294967295	0

Table 7-1 Parameter Description

Parameters	Parameter Description
T-->O Size (byte)	Uplink data, equal to 4+n*4+m*16 n: number of digital input I/O modules (including hybrid I/O modules) m: number of analog input I/O modules
O-->T size (byte)	Downstream data, equal to j*4 + k*16 j: number of digital output I/O modules (including mixed I/O modules) k: number of analog output I/O modules
Hold or Clear Parameter	The output is cleared or held: 0: Clear, default is "0". 1: Hold.
IDLE Status Output Mode	Module output action in bus RUN/IDLE state, configured as "0", clear, configured as "1", hold, default is "0".
Digtal Input Filter Config	Digital input filtering, default setting is "3 ms".
Analog Input Filter Config	Analog input filter, default setting is "10".
Analog Voltage Input Range Select	Analog input voltage module range, default setting is "0".
Analog Electricity Input Range Select	Analog input current module range, default setting is "0".
Analog Voltage Output Range Select	Analog output voltage module range, default setting is "0".
Analog Electricity Output Range Select	Analog output current module range, default setting is "0".
Temperature IO Module Sensor Select	Temperature module parameter that allows you to configure the type of sensor.
Temperature IO Moduler Filter Config	Temperature module filter configuration.
IO Module n	Configured as I/O in the actual configuration. Modify IO Module 1~ IO Module n to the corresponding configuration.

3. Click "Online -> Multiple Downloads" and select "Always perform full downloads".
4. Click  and the system is online.

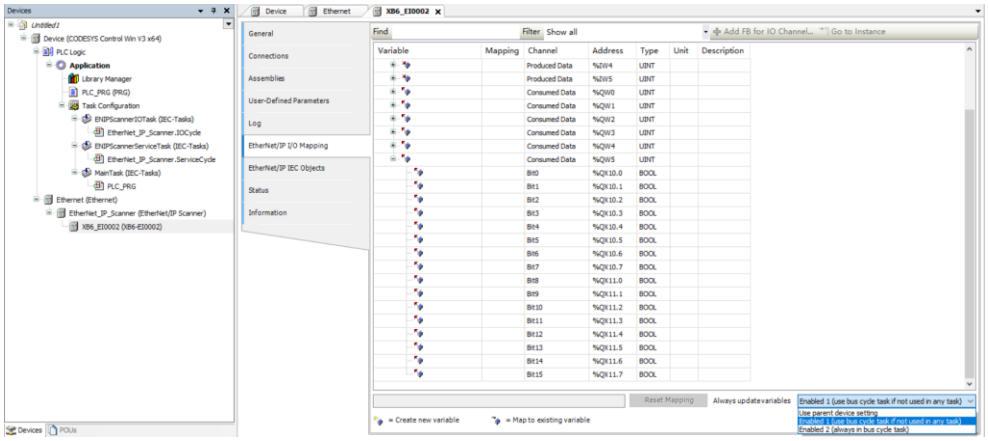
8. Check the device indicator

XB6-P2000H: P light is always on in green color.

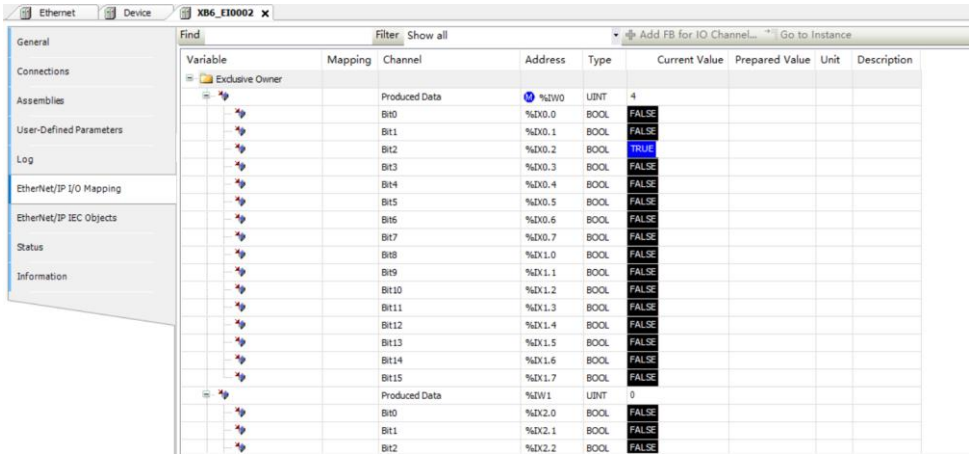
XB6-EI0002: P light is always on in green color, L light is always on, E light is not on, N light is always on.I/O module: P light is always on, R light is always on.

9. Test I/O Modules

1. Click the  button to log out.
2. Double-click the coupler to switch to the "EtherNet/IP I/O Mapping" tab.
3. Select "Enable 1" mode from the drop-down list in the lower right corner, as shown below.



4. Click  to monitor the data in the following screen.



7.6.2 Application In KV STUDIO Ver.10G Software Environment

1. Preparations

Hardware Environment

A computer with pre-installed KV STUDIO Ver.10G software.

Network cables.

One switching power supply.

Module mounting rails and rail fixings.

Please configure the module model and type according to the actual configuration, such as the following table:

Devices	Model Number	Quantities
PLC	KV-NC32	1
Coupler	XB6-EI2002ST	1
I/O Module (in software)	XB6-1600B	1
	XB6-3200A	1
	XB6-A80I	1
	XB6-0032B	1
	XB6-A80V	1
	XB6-A04I	1
End Cover	XB6-CVR00	1

Device Configuration Files

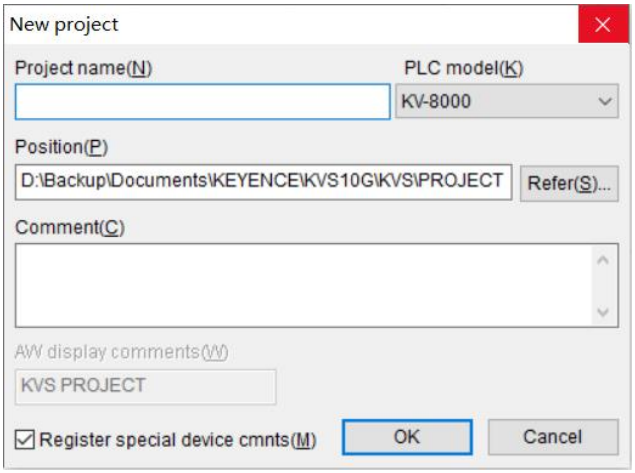
Configuration file access: https://www.solidotech.com/documents/configfile

Hardware configuration and wiring

Please follow the "5Installation and Disassembly " and "6Wir " require operation.

2. Create Project

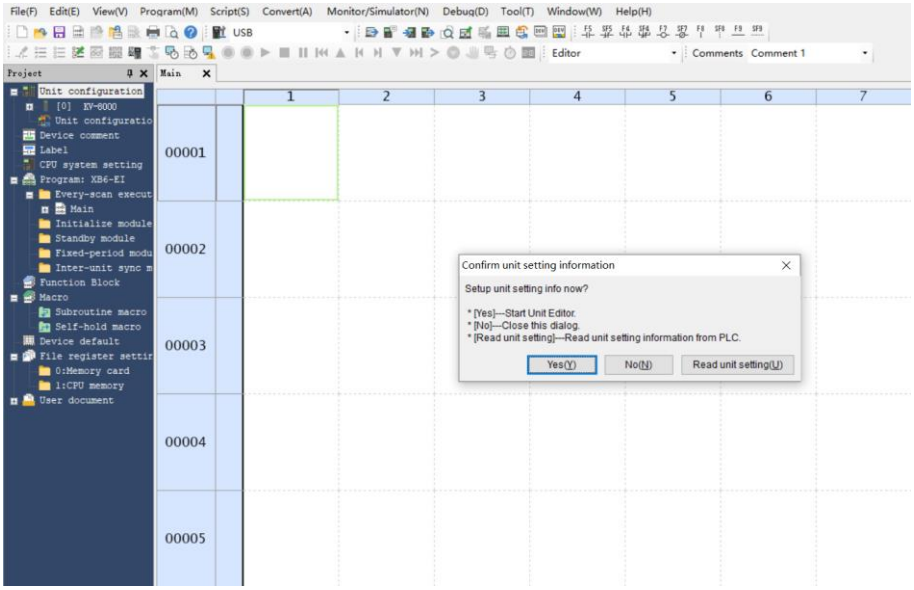
1. Open KV STUDIO software, select "File -> New Project".
2. In the popup box, fill in "Project Name", select "Supported Models", "Location".



Item name: Customization

Supported models: View PLC appearance and select the corresponding model, e.g. KV-8000

3. The Confirm Unit Configuration Settings dialog box pops up, click Yes.

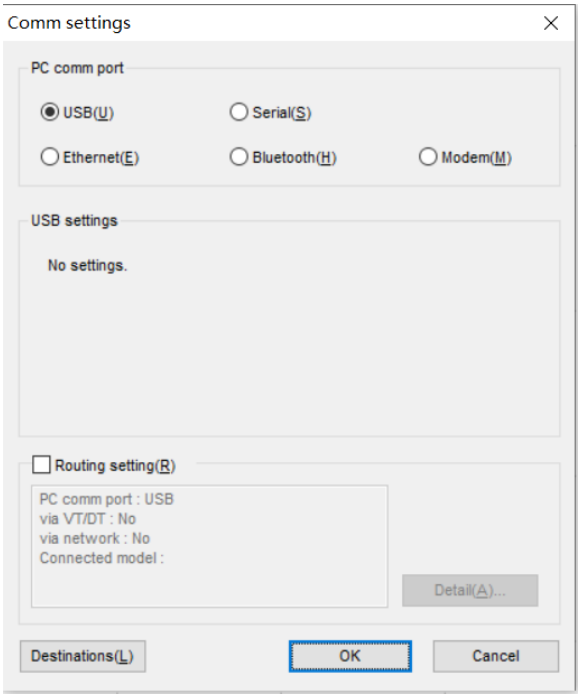


3. Communication settings

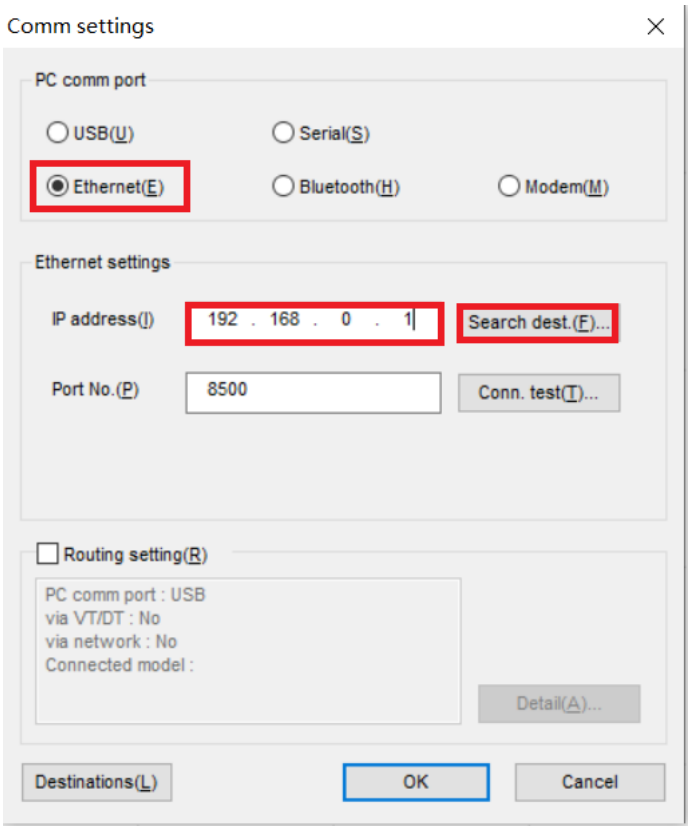
Select the communication method, if the PLC and the host computer software are connected through a network cable, select "Ethernet", if connected through USB, select "USB".

Procedure for "Ethernet" operation

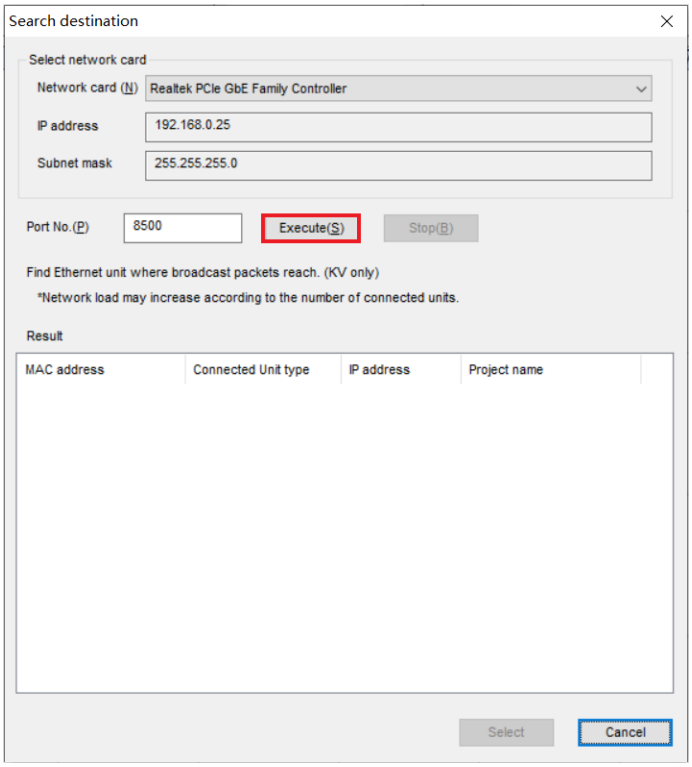
1.  Click thebutton on the menu bar to display "Communication Settings".



2. Select Ethernet, configure the IP address, and click Find Connection Destination.
   The IP address is configured in the "192.168.0" network segment.



3. Select the NIC in the Find Connection Target pop-up box and click Perform Find.



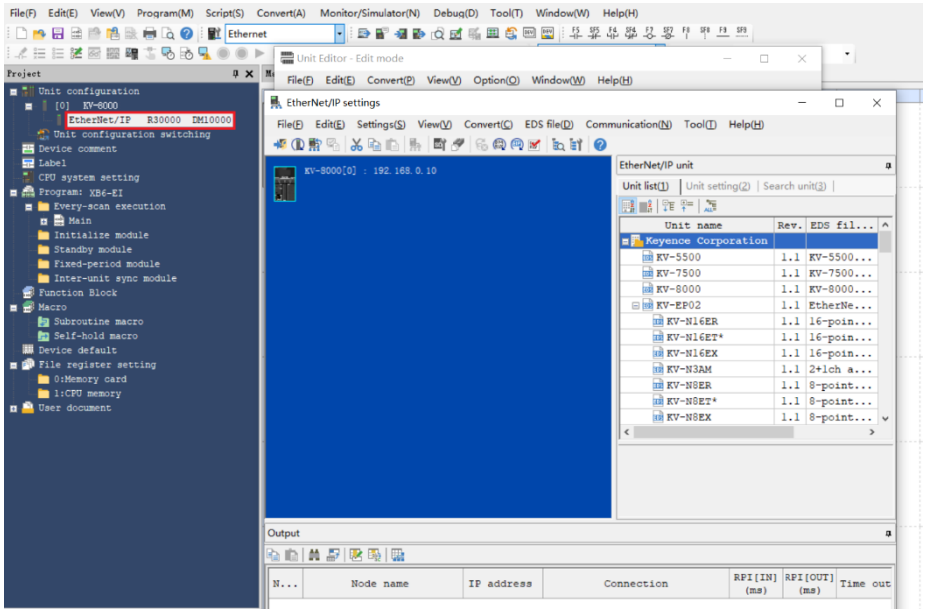
4. Check the found PLCs and click Select.
5. Click OK.

"USB connection" operation method

Select USB on the "Communication Settings" screen.

4. Installation of EDS files

1. Double click "EtherNet/IP" in the left navigation tree to enter the "EtherNet/IP Settings" interface, such as the following figure.

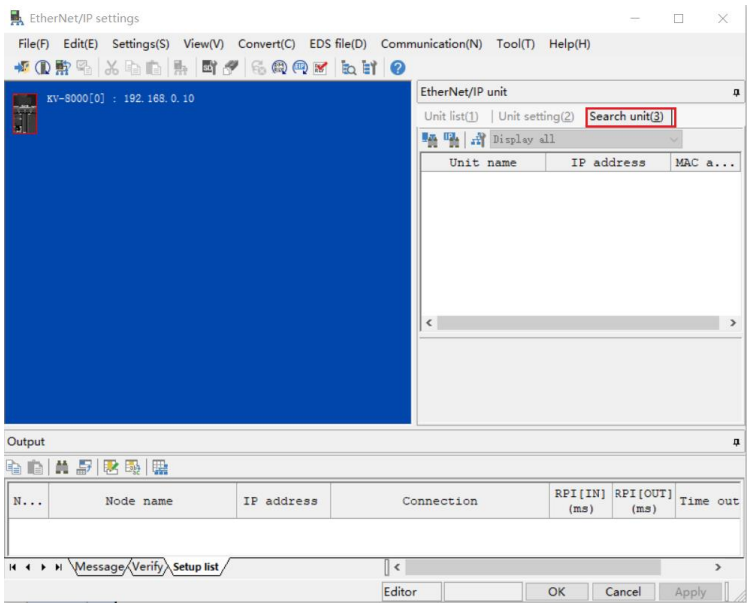


2. Click "EDS File" in the menu bar of the "EtherNet/IP Settings" screen, and then click "Login".
3. In the folder where the EDS file is located, select the EDS file of the corresponding model and click "OK".

5. Topological configuration

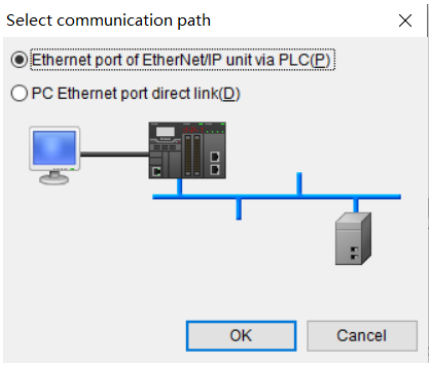
Topology configuration can be "manually added" and "automatic configuration" two ways, this configuration using manual configuration.

1. Enter the "EtherNet/IP Settings" interface and switch to the "Device Search" tab as shown below.

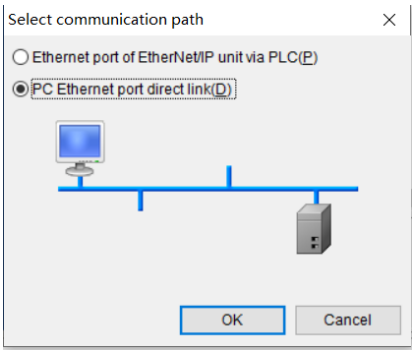


2. Click  to select the communication path.

The USB connection is as follows:

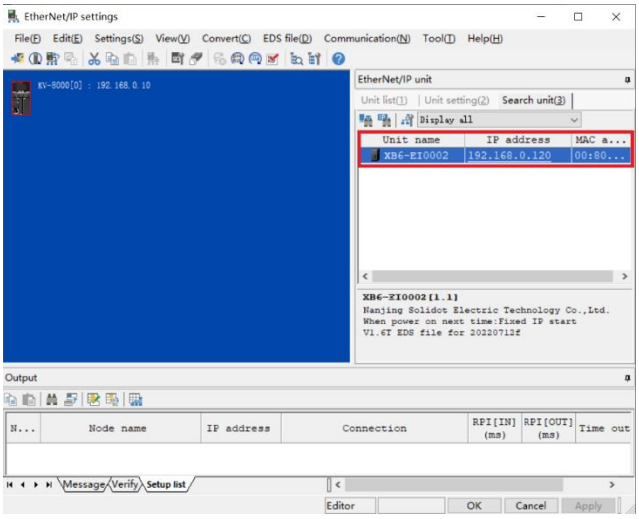


The network cable is connected as follows:

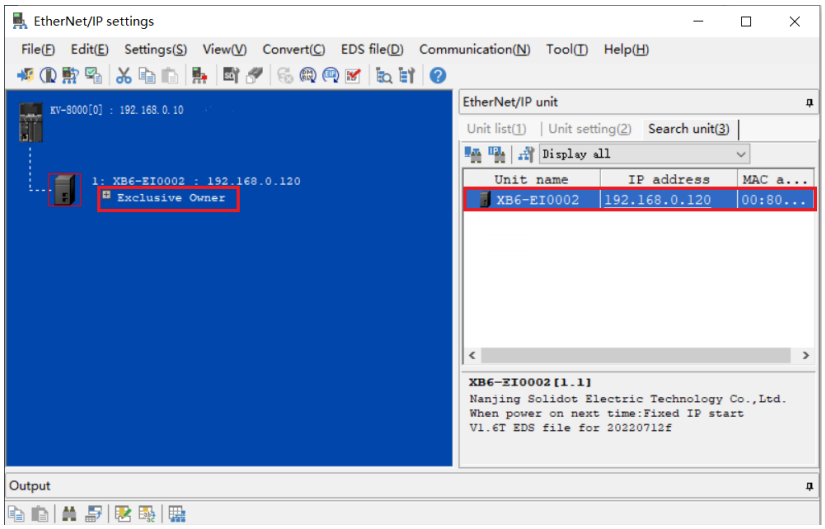


Select "Directly connect to PC's Ethernet port" and set the local NIC and IP address.

3. Click  to find devices connected within the network.
4. Set the IP address network segment for lookup.
5. Click "Find" and the following example will be displayed when the search is completed.



6. Double-click on a found device to add it to the configuration.



6. Setting the IP address

In the interface of the found device, double-click the IP address column and configure the IP address in the pop-up box. The default address network segment is 192.168.0.

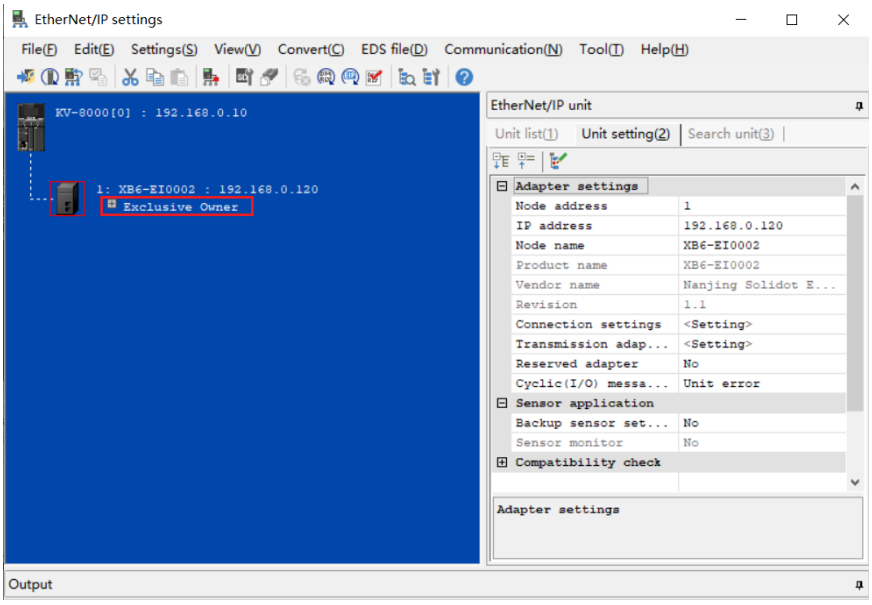
Description:

- The timeout for setting the IP address needs to be configured to 60s.
- If the dipswitch has been configured with an IP address, the IP of the dipswitch takes precedence.

7. parameterization

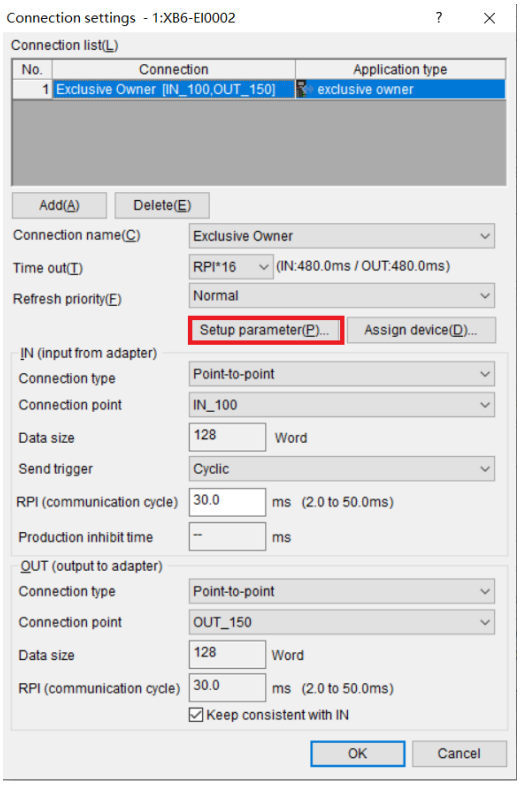
The parameter setting function is used to configure the configuration of uplink data, downlink data, clear hold, configuration of module output action in bus RUN/IDLE state, input filtering, analog range, configuration, and temperature module parameter configuration.Table 7-2 Parameter Description See Table 72 for parameter descriptions.

1. After adding a module, click Exclusive Owner to enter the Module Settings window.



2. On the Connection Settings screen, click Parameter Settings to configure the module parameters in the

pop-up box.



The "Parameter Settings" screen is shown below.

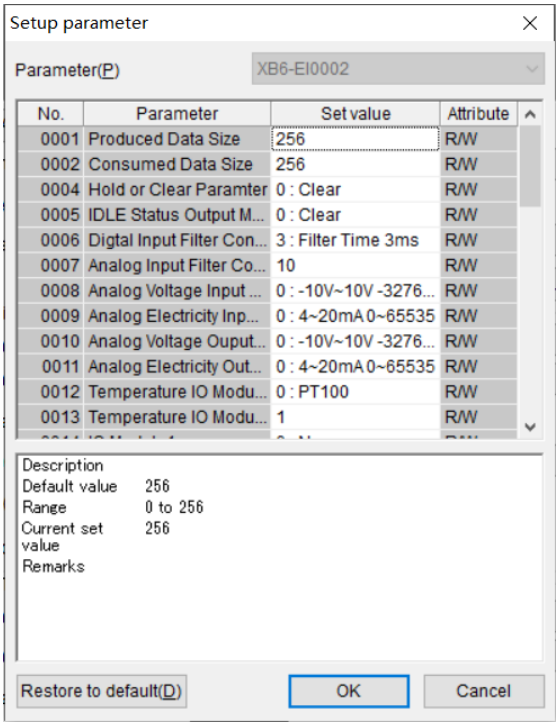


Table 7-2 Parameter Description

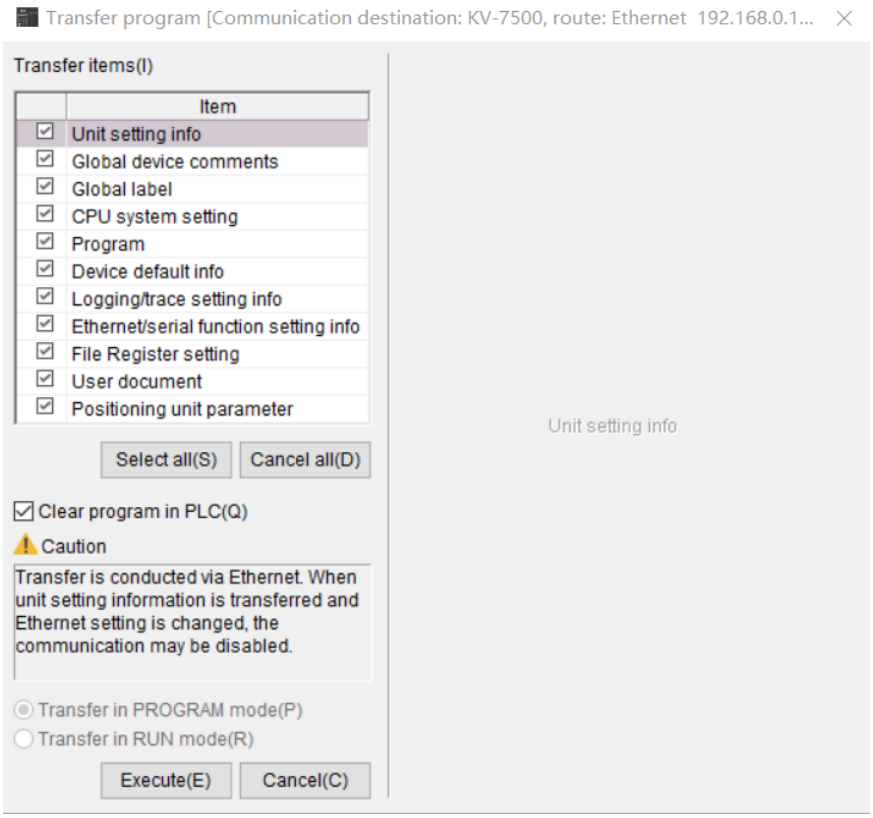
Parameters	Parameter Description
Produce Data Size	Uplink data, equal to 4+n*4+m*16 n: number of digital input I/O modules (including hybrid I/O modules) m: Number of analog input I/O modules
Consume Data Size	Downstream data, equal to j*4 + k*16 j: Number of digital output I/O modules (including hybrid I/O modules) k: Number of analog output I/O modules
Hold or Clear Parameter	The output is cleared or held: "0": clear, default is "0". "1": Maintain.
IDLE Status Output Mode	Module output action in bus RUN/IDLE state, configured as "0", clear, configured as "1", hold, default is "0".
Digtal Input Filter Config	Digital input filtering, default setting is "3 ms".
Analog Input Filter Config	Analog input filter, default setting is "10".
Analog Voltage Input Range Select	Analog input voltage module range, default setting is "0".
Analog Electricity Input Range Select	Analog input current module range, default setting is "0".
Analog Voltage Output Range Select	Analog output voltage module range, default setting is "0".
Analog Electricity Output Range Select	Analog output current module range, default setting is "0".
Temperature IO Module Sensor Select	Temperature module parameter that allows you to configure the type of sensor.
Temperature IO Moduler Filter Config	Temperature module filter configuration.
IO Module	Configured as the I/O in the actual configuration. Modify IO Module 1~ IO Module n to the corresponding configuration.

3. Click Apply.
4. Click OK.

8. Configuration Download

After the module configuration and parameter setting are completed, it is downloaded to the PLC.

1. Select "Monitor/Simulator (N) -> PLC Transfer -> Monitor Mode (C)".



2. Click "Execute" to download to the PLC.

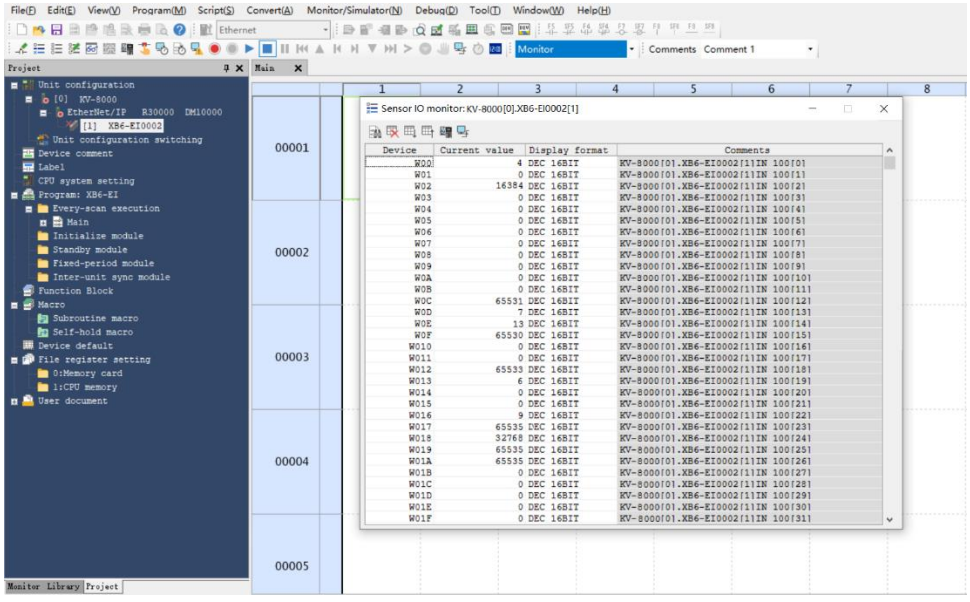
9. Check the device indicator

XB6-P2000H: P light is always on in green color.

XB6-EI0002: P light is always on in green color, L light is always on, E light is not on, N light is always on.I/O module: P light is always on, R light is always on.

10. data monitoring

In monitoring mode, double click "XB6-EI0002" icon to open the monitoring table, you can monitor the corresponding module. The following figure is shown:



Correspondence table of soft components and modules:

Soft Component	Corresponding Modules
W00~ W01	XB6-EI0002
W02~W03	XB6-1600B
W04~W0B	XB6-A80I
W0C~W013	XB6-A80V
W014~W015	XB6-3200A
W016~W017	XB6-0032B
W018~W01F	XB6-A04I

7.6.3 Application In CX-One Software Environment

1. Preparations

Hardware Environment

- **Module preparation**

  This description uses the XB6-EI2002ST module kit, XB6-1600B, XB6-3200A, XB6-A80I, XB6-0032B, XB6-A80V, and XB6-A04I six modules as an example.

- **One computer with CX-One software pre-installed**
- **EtherNet/IP special shielded cable**
- **One Omron PLC, this description takes KV-NC32 as an example**
- **One switching power supply**
- **Module installation guide rails and guide rail fixings**
- **Device Configuration Files**

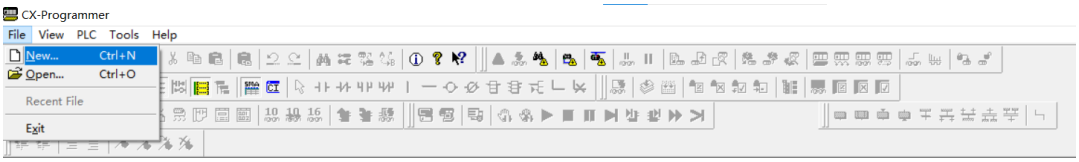
Configuration file access: https://www.solidotech.com/documents/configfile

- **Hardware configuration and wiring**

Please follow the "5Installation and Disassembly " and "6Wir " require operation.

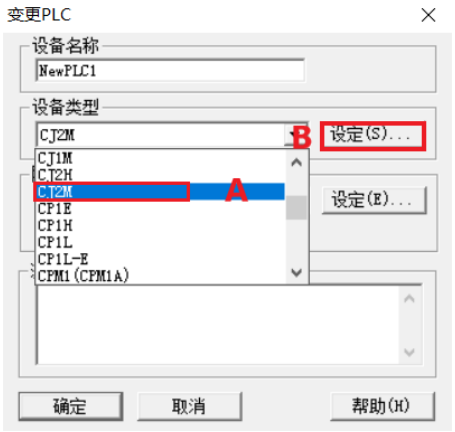
2. New construction

1. Open CX-Programmer software and select "File -> New".

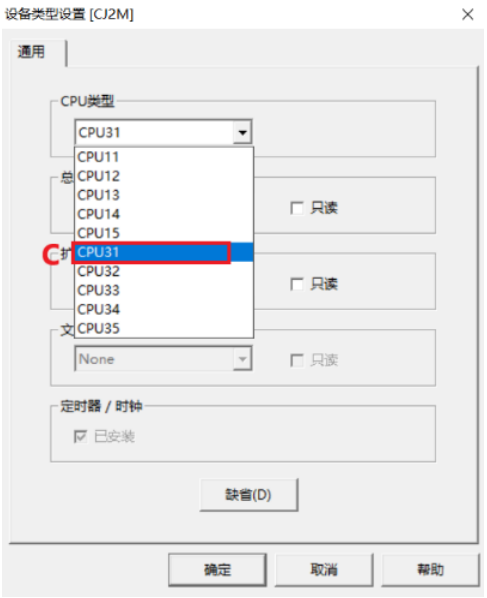


2. The "Change PLC" window pops up, select "Device Type" and click "Set" to view the appearance of the PLC and select the actual device type.

   Example:

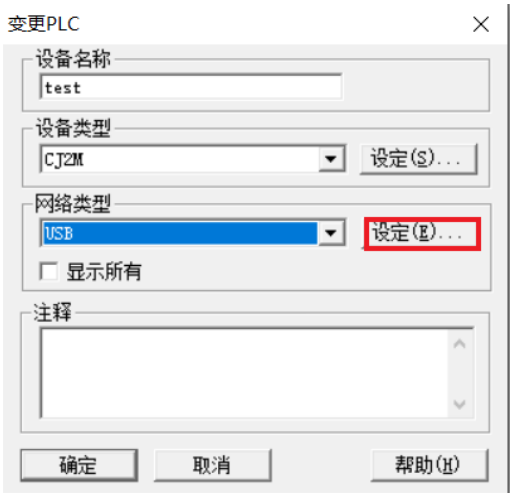


3. The "Device Type Setting" window pops up to view the appearance of the PLC and select the actual device type, for example:

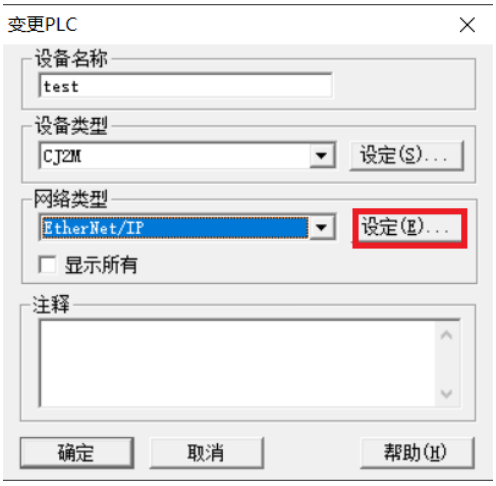


4. Click OK.
5. In the "Change PLC" window, select "Network Type", i.e., the way the PLC connects to the computer, which is categorized into USB connection and network cable connection, and the corresponding network types are "USB" and "EtherNet/IP" respectively. The corresponding network types are "USB" and "EtherNet/IP".

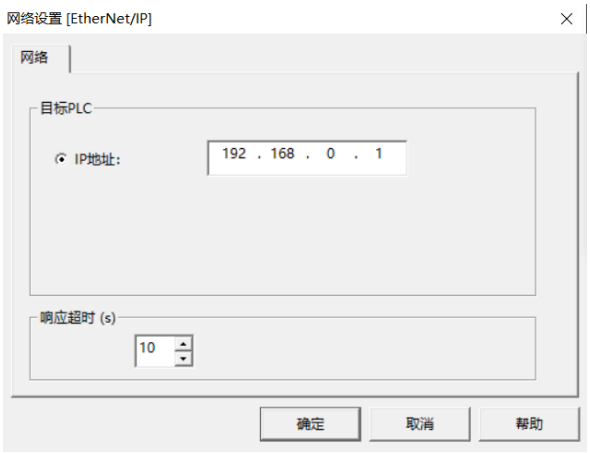
- The "USB" type is as follows:
  a) Select the network type as "USB" and click "Settings".



  b) In the "Network Settings" pop-up window, select "Direct Connection".
  c) Click OK.
- The "EtherNet/IP" type is as follows:
  a) Select the network type as "EtherNet/IP" and click "Settings".



b) Enter the PLC address in the "Network Settings" pop-up window.

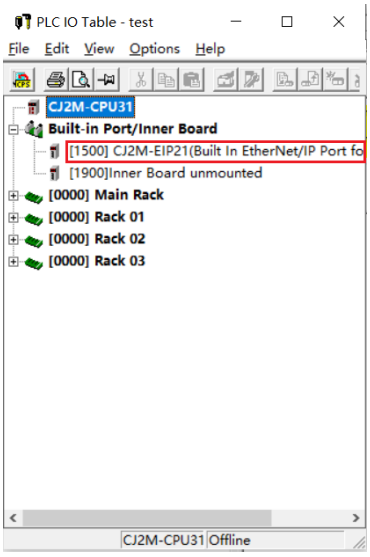


Note: In "EtherNet/IP" mode, the IP of the computer needs to be set to the same network segment as the PLC.

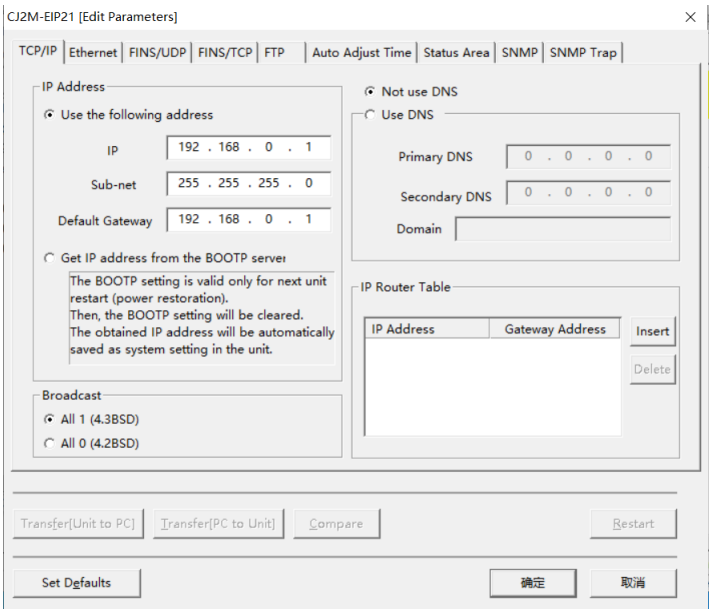
c) Click OK to complete the creation of the new project.

3. Setting the PLC IP address

1. Double-click "IO Table and Unit Settings" to open the "PLC IO Table" screen.
2. Double-click to select the PLC module under "Built-in port/slice version", for example:



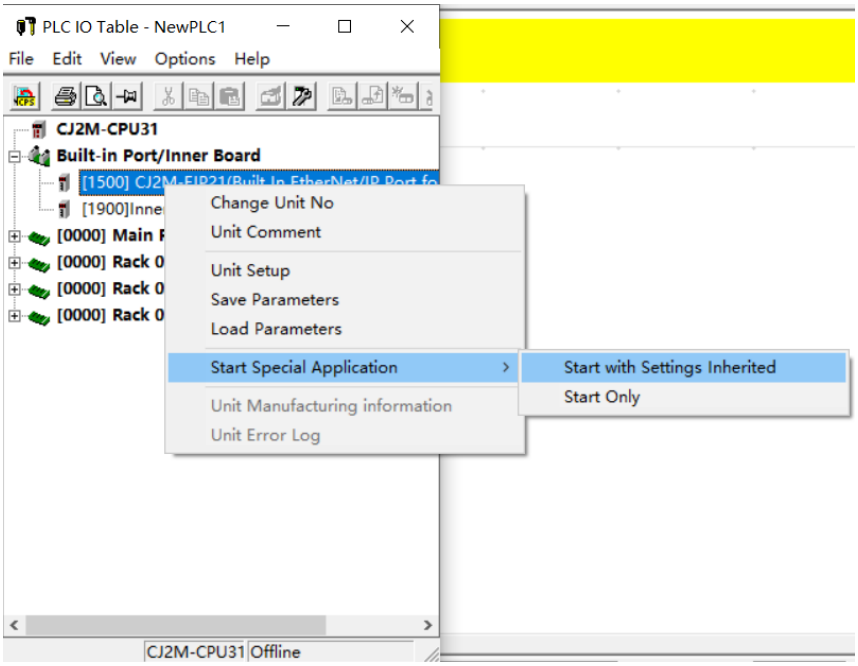
3. The IP address of the PLC can be reset (not configurable when using a USB connection).



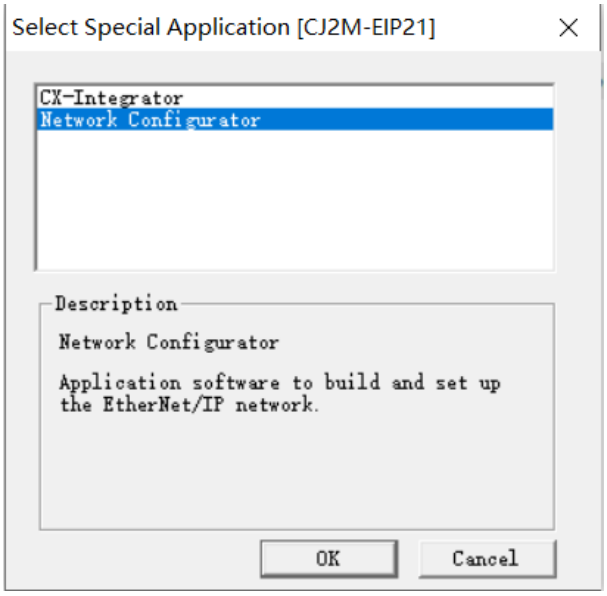
4. Click OK to complete the PLC IP address setting.

4. Installation of EDS files

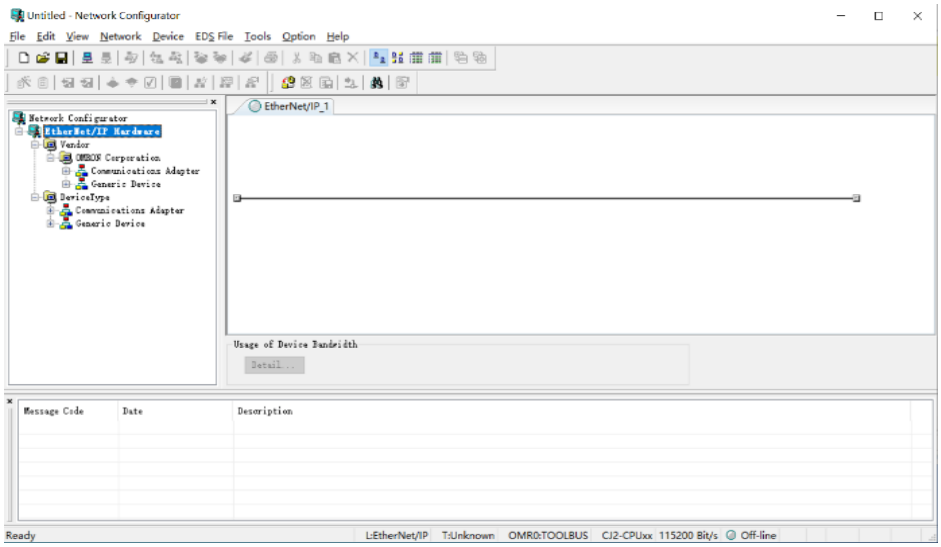
1. Double-click "IO Table and Unit Settings" to open the "PLC IO Table" window.
2. Right click on the built-in EIP module and select "Launch Dedicated Application -> Inherit Settings Launch" as shown below.



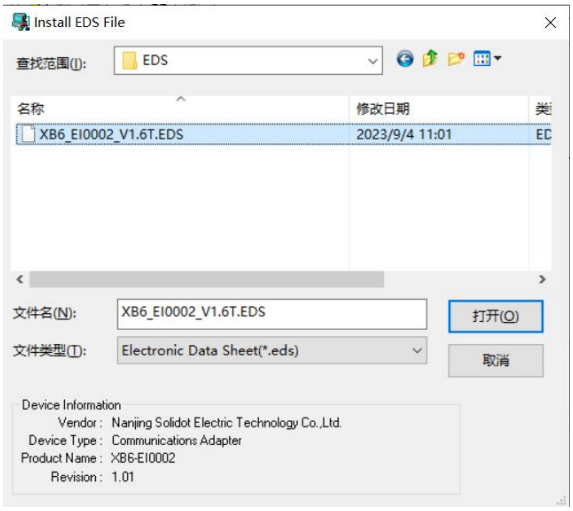
3. The "Select Special Program" screen will pop up, select "Network Configurator" as shown below.



4. Click OK to enter the Network Configurator Settings screen as shown below.



5. Click "EDS File -> Install" in the menu bar, select the "EDS file" to be installed, and complete the file installation.

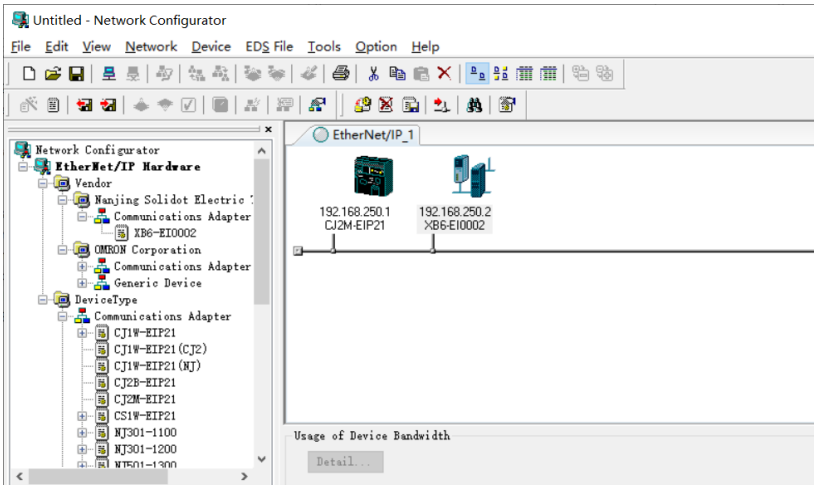


5. Hardware Configuration

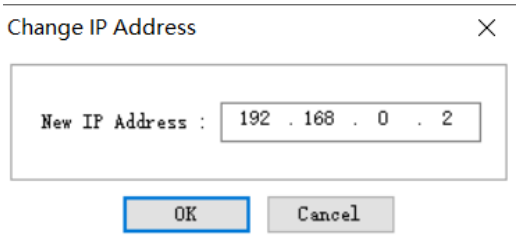
Adding PLCs and couplers can be done manually or by automatic scanning.

Manual addition method:

1. In the left navigation bar of "Network Configurator", expand the "DeviceType" directory, and double-click the PLC and coupler to add them to the network, as shown in the following figure.

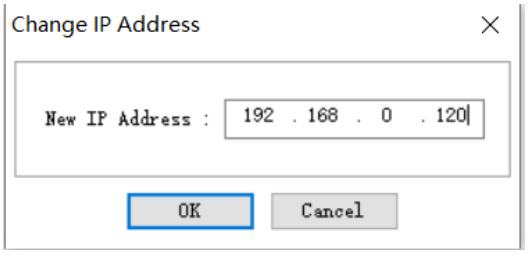


2. Select the PLC icon and right click.
3. Click "Change Node Address" and enter the destination IP address, for example:



Click OK.

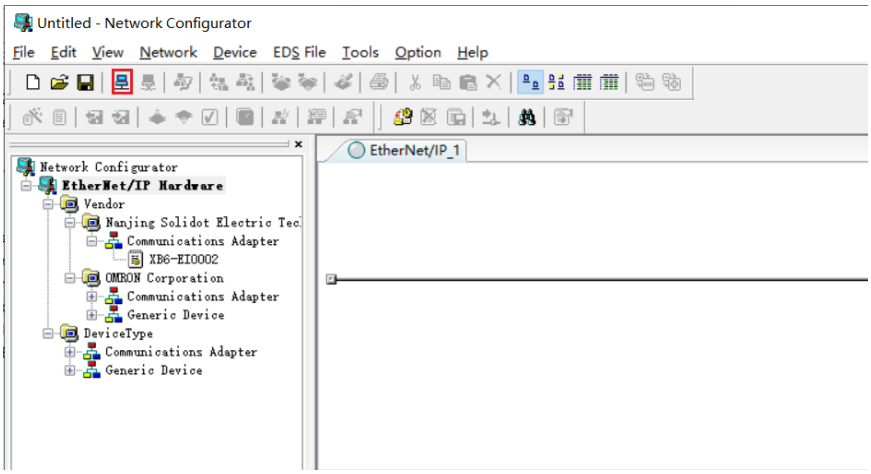
4. Select the coupler icon and right click.
5. Click "Change Node Address" to enter the destination IP address, please enter the actual address of the coupler, for example:



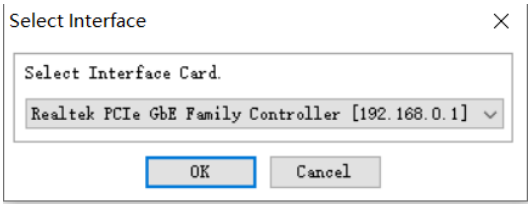
Click OK.

Automatic scanning method:

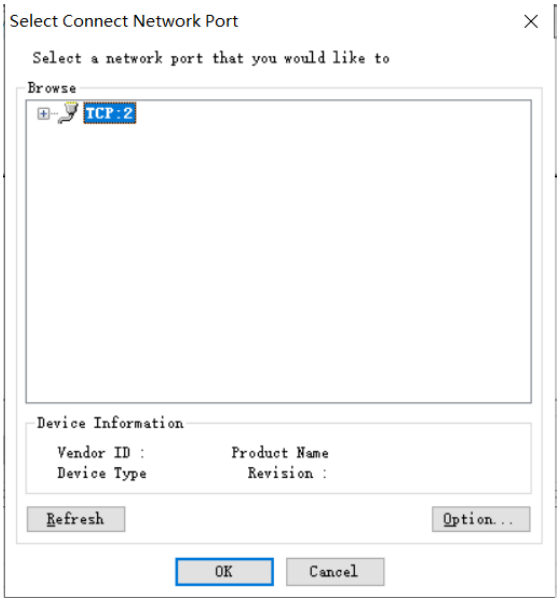
1. Click the Connect icon as shown below.



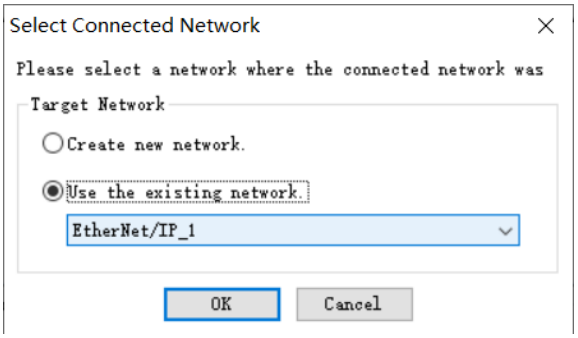
2. The "Setup Interface" window pops up as shown below.



3. Check "TCP:2".

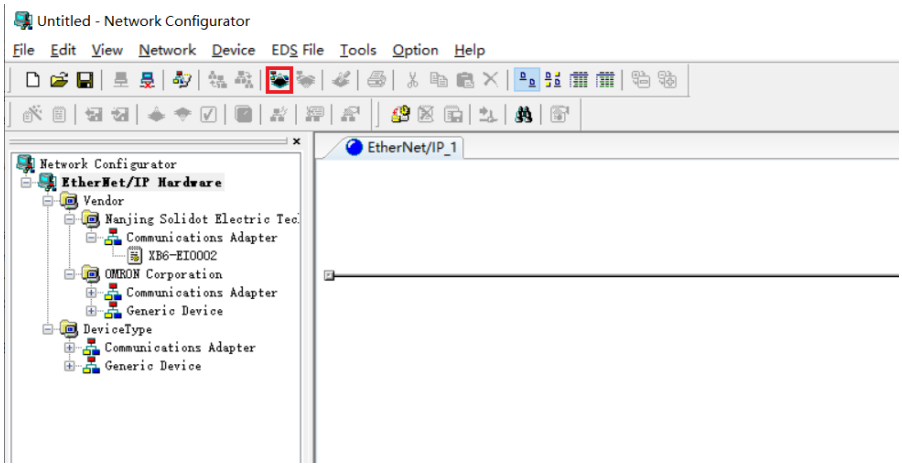


The following dialog box pops up.

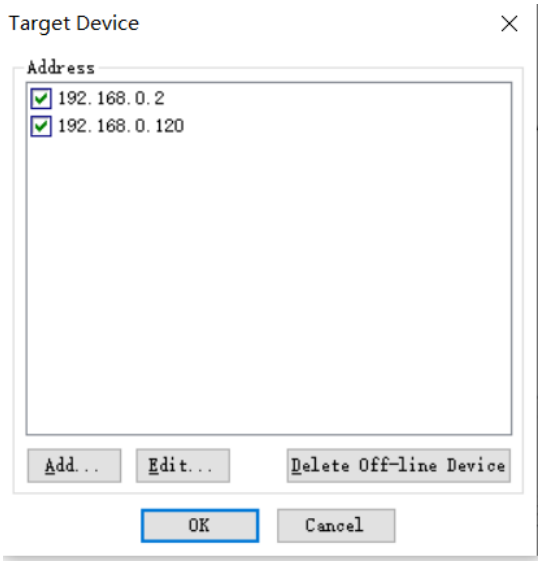


4. Click OK.

5. Click the following icon.



6. The "Setup Interface" window pops up as shown below.



If the coupler cannot be swept out, use the "Ethernet Device Configuration" tool to modify the IP address of the coupler, and then reopen the operation.

6. Parameter setting and I/O module addition

The parameter setting function is used to configure the configuration of uplink data, downlink data, clear hold, input filter, analog range, configuration, and temperature module parameters.Table 7-3 Parameter Description Parameter Description

1. Double-click the coupler icon to enter the "Edit Device Parameters" window to set the parameters.
2. Set the "Produce Data Size" (upstream data) and "Consume Data Size" (downstream data) according to the actual settings , such as the following figure:

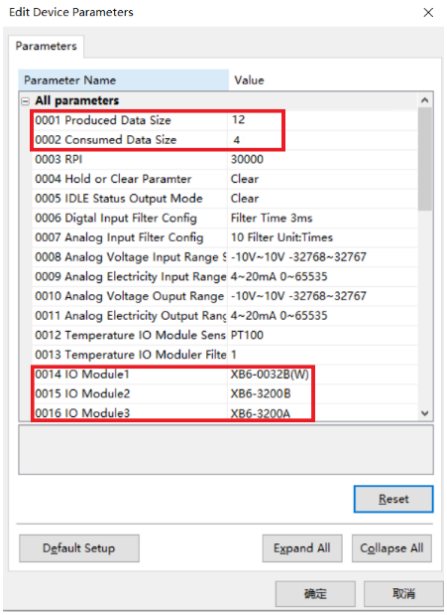
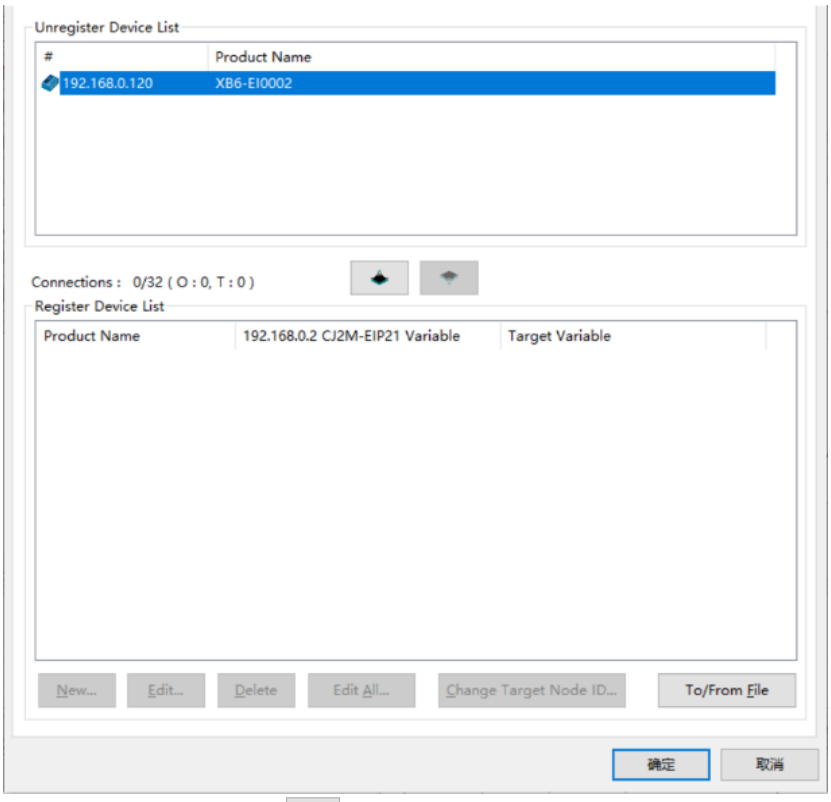


Table 7-3 Parameter Description

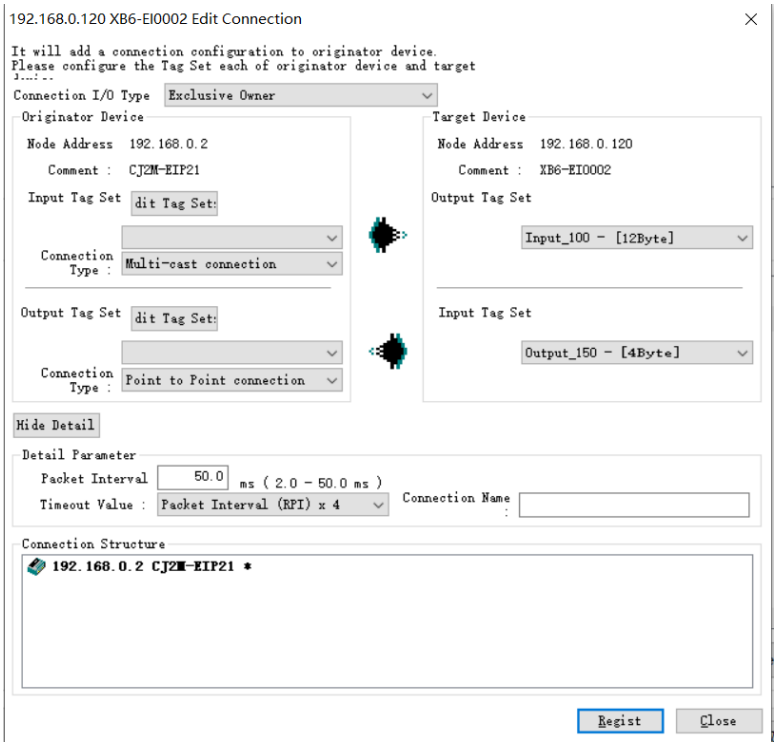
parameters	Parameter description
Produce Data Size	Uplink data, equal to 4+n*4+m*16 n: number of digital input I/O modules (including hybrid I/O modules) m: Number of analog input I/O modules
Consume Data Size	Downstream data, equal to j*4 + k*16 j: number of digital output I/O modules (including hybrid I/O modules) k: Number of analog output I/O modules
Hold or Clear Parameter	The output is cleared or held: 0: Clear, default is "0". 1: Hold.
IDLE Status Output Mode	Module output action in bus RUN/IDLE state, configured as "0", clear, configured as "1", hold, default is "0".
Digtal Input Filter Config	Digital input filtering, default setting is "3 ms".
Analog Input Filter Config	Analog input filter, default setting is "10".
Analog Voltage Input Range Select	Analog input voltage module range, default setting is "0".
Analog Electricity Input Range Select	Analog input current module range, default setting is "0".
Analog Voltage Output Range Select	Analog output voltage module range, default setting is "0".
Analog Electricity Output Range Select	Analog output current module range, default setting is "0".
Temperature IO Module Sensor Select	Temperature module parameter that allows you to configure the type of sensor.
Temperature IO Moduler Filter Config	Temperature module filter configuration.
IO Module n	Configured as the I/O in the actual configuration. Modify IO Module 1~ IO Module 3 to the corresponding configuration.

7. Setting label variables

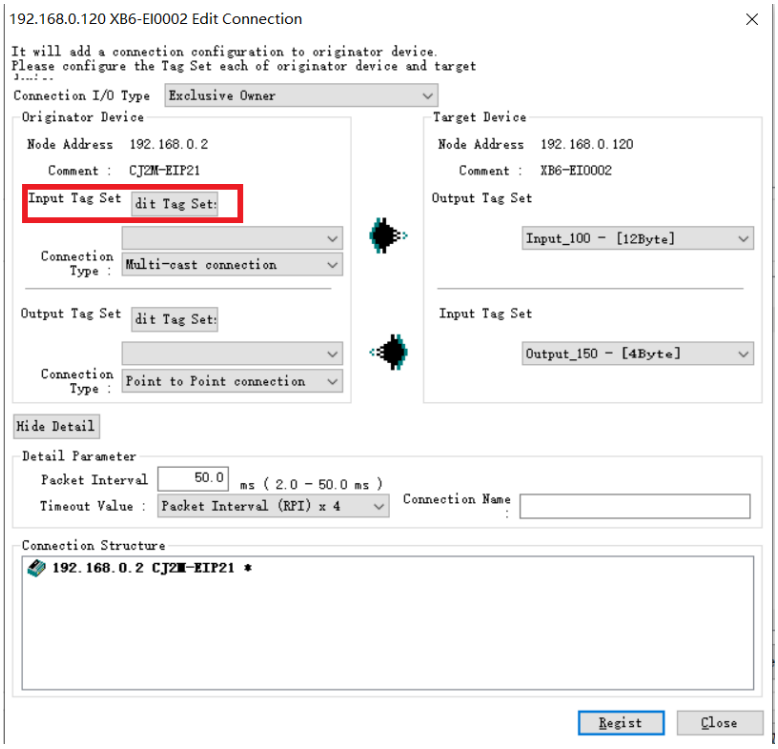
1. Double-click the PLC icon to open the "Edit Device Parameters" window, such as the one shown below.



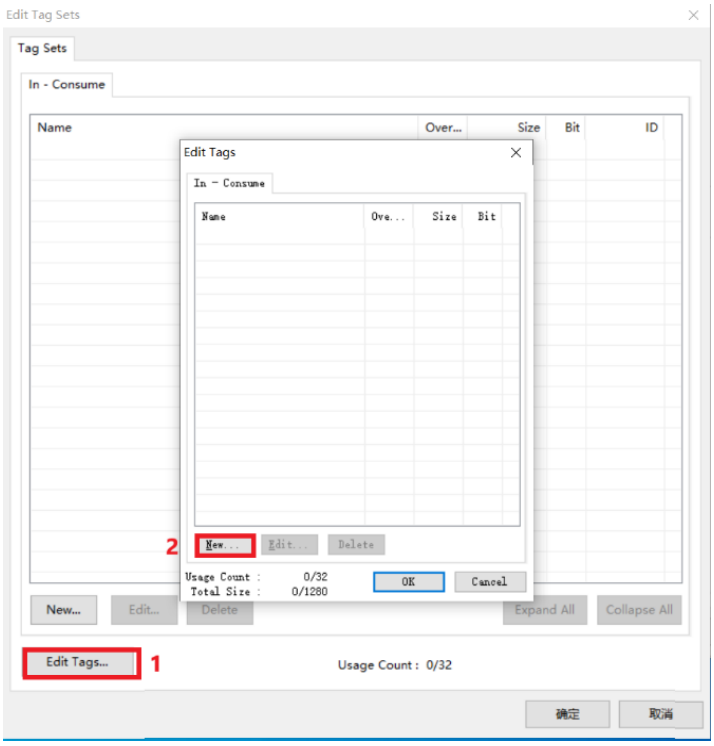
2. Select the device, click the button, and double-click the device to display the following interface.



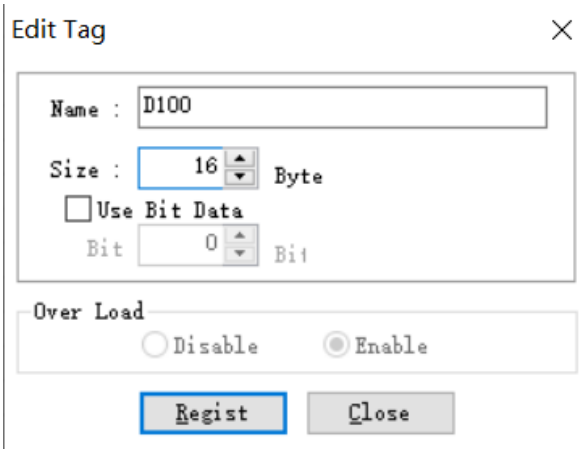
3. Click the following button.



4. The "Edit Tag Set" window pops up.
5. First click the "Edit Tags" button, then click the "New" button, as shown below.



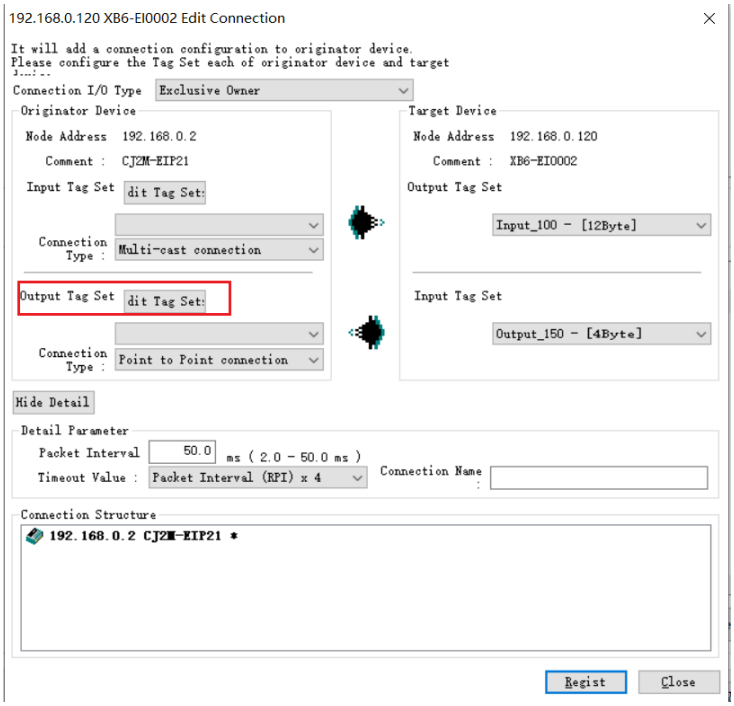
6. The "Edit Tag" window pops up, and you can set the upper row data.



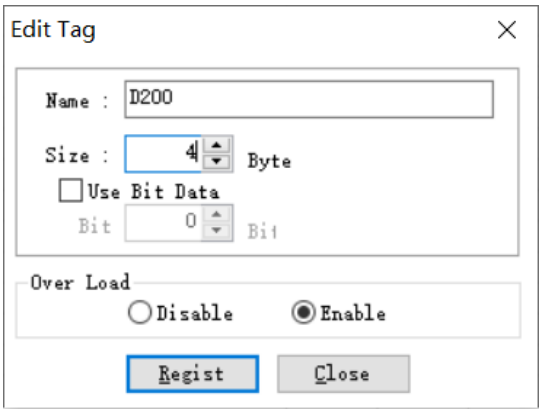
Name: the starting ID of the uplink data, representing the starting ID of the input module in the configuration.

Size: upstream data, see value6Parameter setting and I/O module addition See 6 Parameter Settings and I/O Module Additions for values.

7. Click "Regist".
8. Click "Close".
9. Click OK.
10. Click OK to save the configuration.
11. Click the following button.



12. The same method is used to set up the downstream data, for example in the following figure.

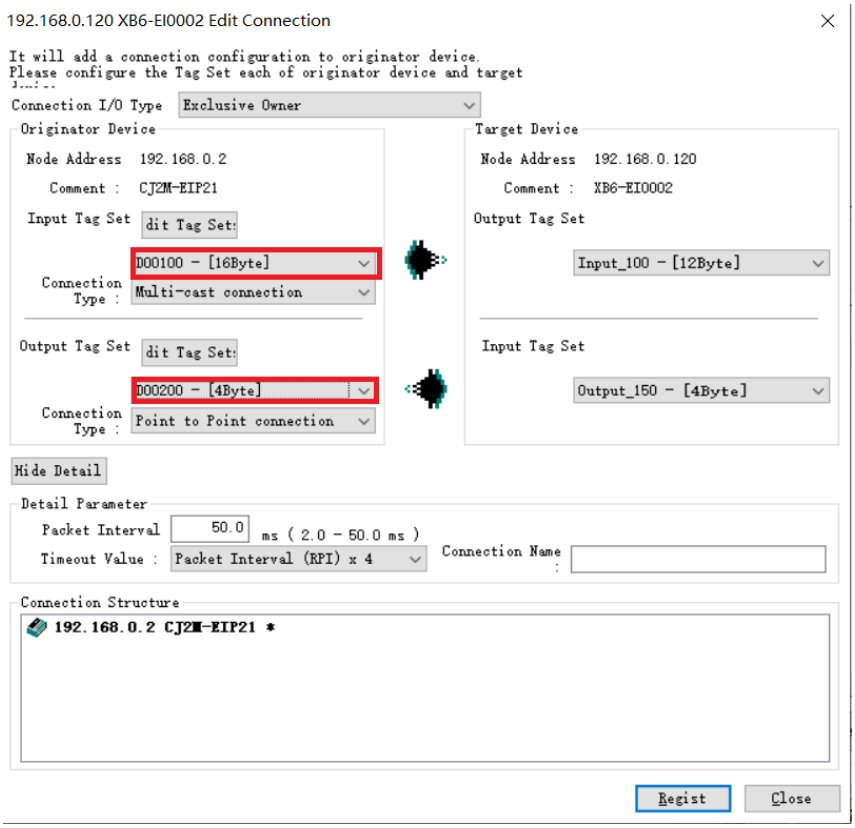


Name: Starting ID of the downstream data, starting ID of the output module in the configuration.

Size: downstream data.

The starting ID value of the downlink data needs to be greater than the starting ID of the uplink data + the uplink data.

13. Select upstream data and downstream data in "Connection Type", such as the following figure.



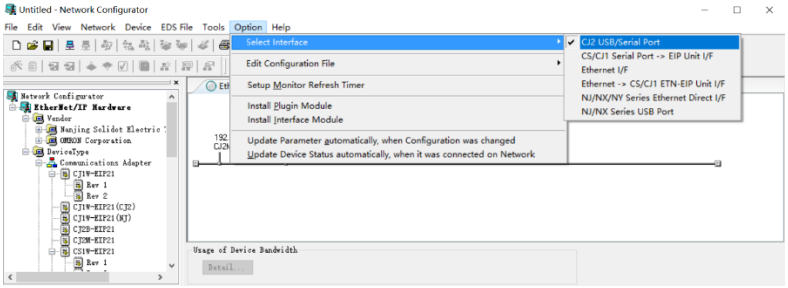
14. Click "Regist".
15. Click "Close".
16. Click OK.

8. PLC Download

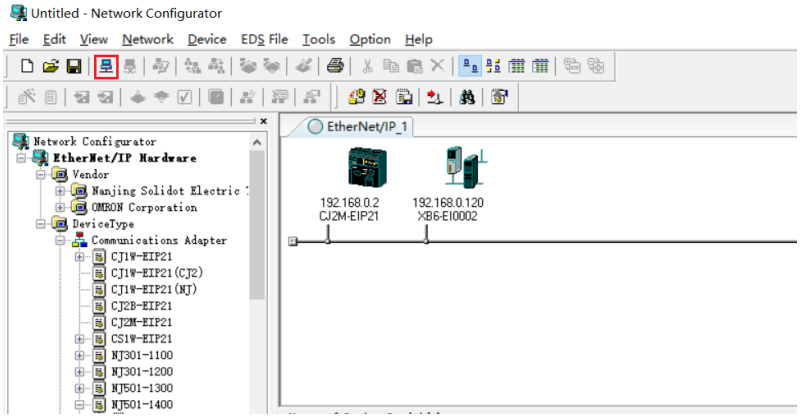
1. (When "Auto Scan" is selected for the configuration, this step is omitted and executed directly.3 Connect to the network.

"USB" type

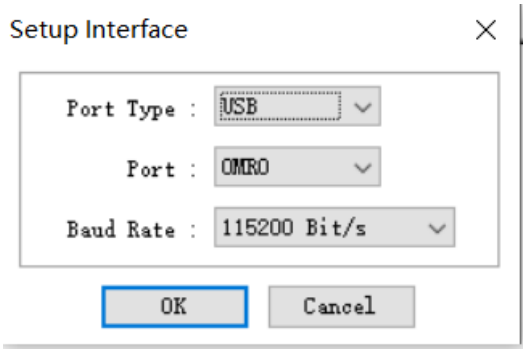
a) Click the menu "Option" button and select the network type "SJ2 USB/serial port".



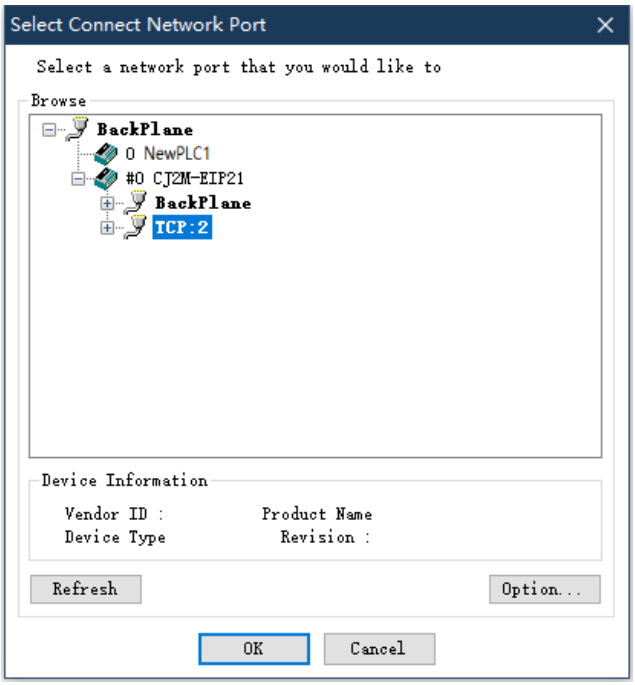
b) Click the Connect icon as shown below.



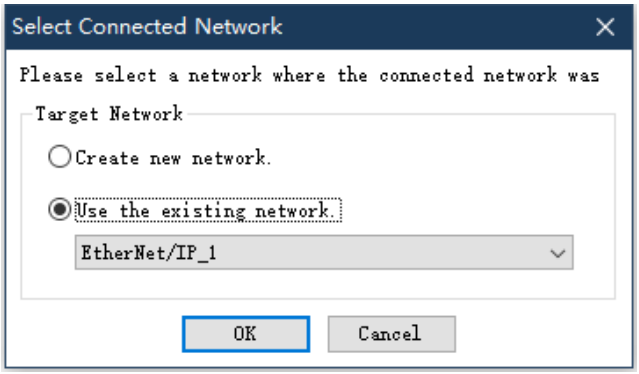
c) The "Setup Interface" window pops up as shown below.



d) Expand the collapsed buttons in turn and select "TCP:2".



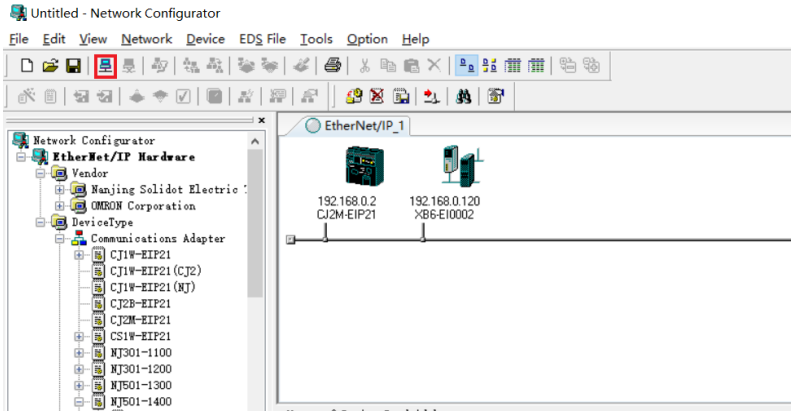
e) Click "OK" and the following window will pop up.



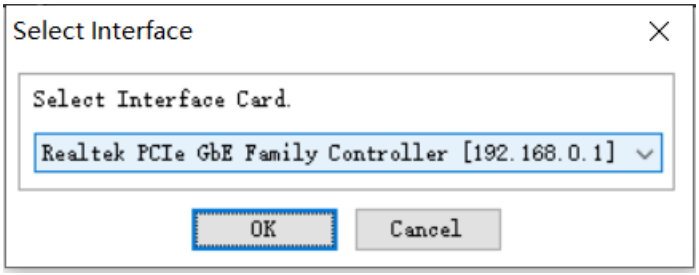
"EtherNet/IP" type

a) Click on the menu "Option" button and select the network type "Ethernet I/F".

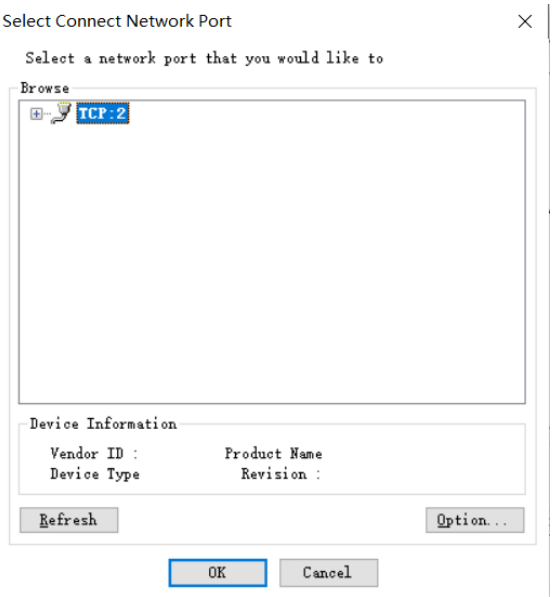
b) Click the Connect icon as shown below.



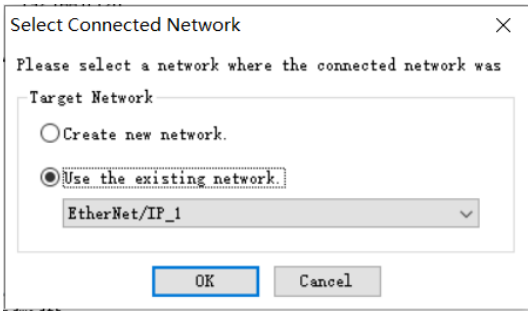
c) The "Setup Interface" window pops up as shown below.



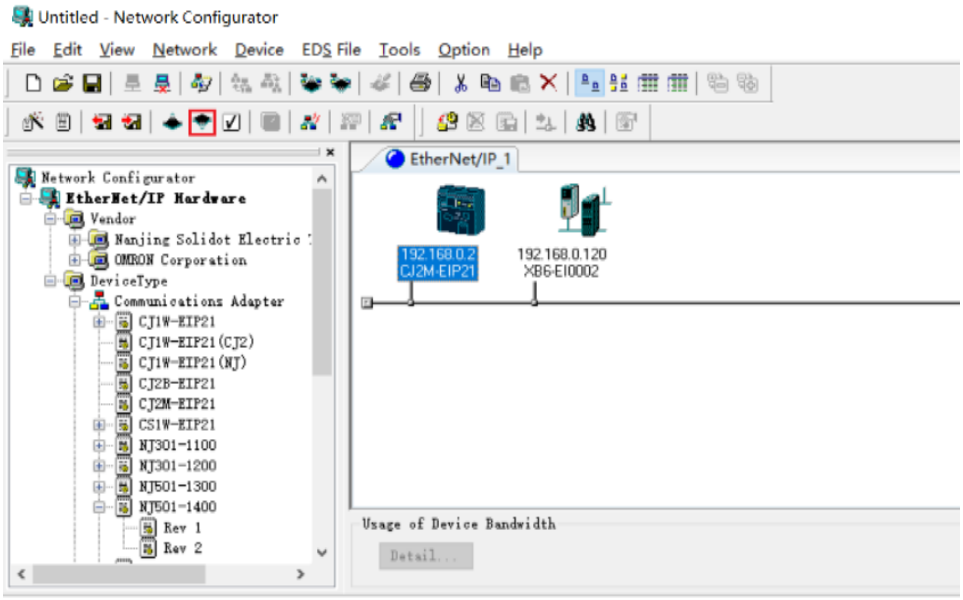
d) Check "TCP:2".



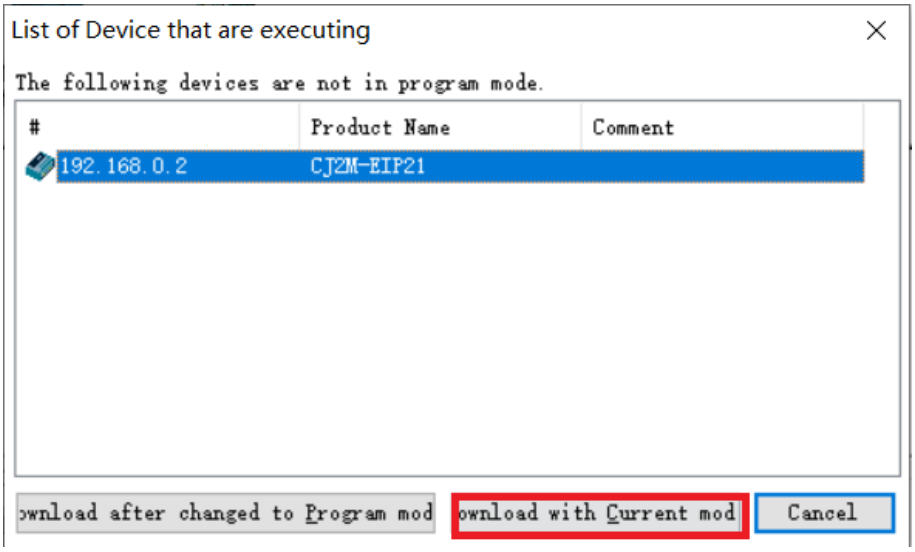
The following dialog box pops up.



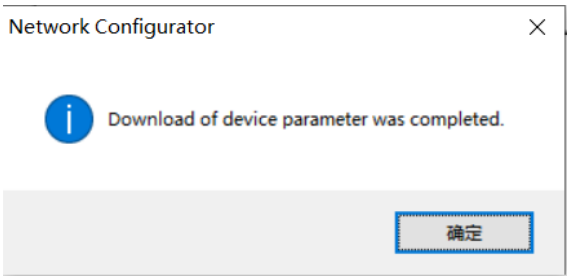
2. (This step is omitted when the configuration selects the automatic scanning method.) Click OK.
3. Select the PLC icon and click the "Download to Device" icon as shown below.



4. Click Yes in the Network Configurator pop-up window.
5. Select the module and click the following button.



6. The following window will pop up, indicating that the download is complete, click "OK".



Note: If the PLC reports a connection error after the download is complete, please check the parameter configuration and re-download after power failure and reboot (download NetWork Configurator first, then CX-Programmer).

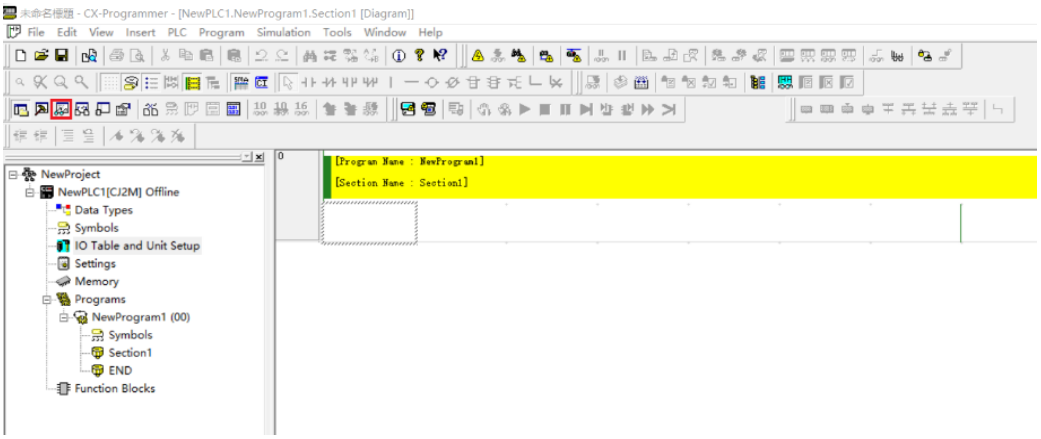
9. Check the device indicator

XB6-P2000H: P light is always on in green color.

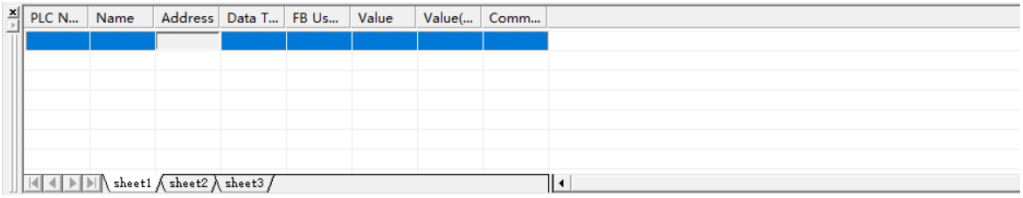
XB6-EI0002: P light is always on in green color, L light is always on, E light is not on, N light is always on.I/O module: P light is always on, R light is always on.

10. IO table and unit setup verification

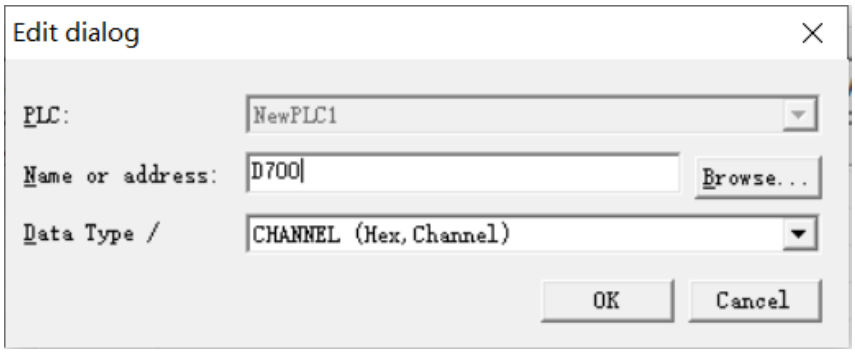
1. Switch to the CX-Programmer programming software as shown below.



2. Click the  icon and the following screen appears below.



3. Double-click the address area to bring up the Edit Dialog.
4. In the "Address and Name" field, write the channel address. For example, if the downstream data name is set to "D700", the starting address of the output module in the configuration is "D700".



Click OK to monitor the corresponding values.