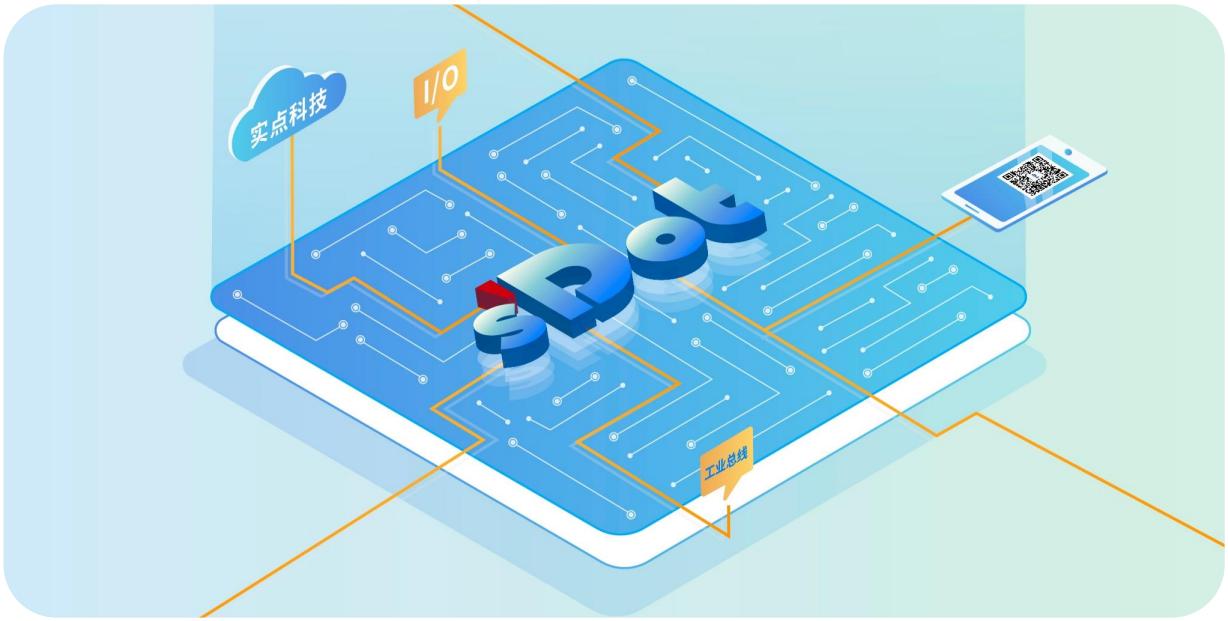

CC-Link IE Field Basic

XB6S Series Slice I/O

User Manual

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1 Product Overview

1.1 Product Introduction

XB6S series slice I/O modules adopt the structure of a combination of couplers and I/O modules. The coupler connects the expandable I/O modules to the real-time industrial Ethernet system. The backplane uses the X-bus, and the coupler module is responsible for fieldbus communication, thus realizing the function of real-time data exchange between various I/O modules and couplers/controllers.

The XB6S series slice I/O modules are rich in variety and have high real-time performance, providing users with guarantees for high-speed data acquisition, optimized system configuration, simplified on-site wiring, and improved system reliability.

1.2 Product Features

- **Occupies fewer nodes**
  A node consists of a bus coupler, 1 to 32 XB6S series I/O modules, 1 to 32 XBF series expansion I/O modules, and a terminal cover.
- **Rich functional expansion**
  It supports flexible expansion and has a full range of I/O types. It can integrate a variety of digital modules, analog modules, and temperature modules to meet the needs of different application scenarios.
- **Flexible configuration**
  Various types of slice I/O modules can be combined arbitrarily.
- **Strong compatibility**
  The coupler communication interface complies with communication standards and supports mainstream CC-Link IE Field Basic master stations.
- **Small size**
  Compact structure and small space occupation.
- **Easy diagnosis**
  The indicator lights are fully designed, the module status is clear at a glance, and detection and maintenance are convenient.

- **Fast speed**
  The backplane uses X-bus bus: the minimum scanning cycle is 200us and the typical value is 1ms.
- **Easy to install**
  DIN 35 mm standard rail installation.
  It adopts spring-type terminal blocks, making wiring convenient and quick.

1.3 Application

The coupler module is connected to the controller at the application site, and the I/O module is responsible for connecting to the input and output sensors at the application site. The general process of data collection and processing control is as follows:

a. The input I/O module collects various signals on site and sends them to the coupler via the internal bus;
b. The controller reads and processes the data from the coupler via the fieldbus or industrial Ethernet, and then writes the output data into the coupler;
c. The coupler then writes the output data to the output I/O module through the internal bus, thereby realizing the control of the device.

The expandable I/O modules include digital input module, digital output module, digital input and output module, analog input module, analog output module, temperature module, etc.

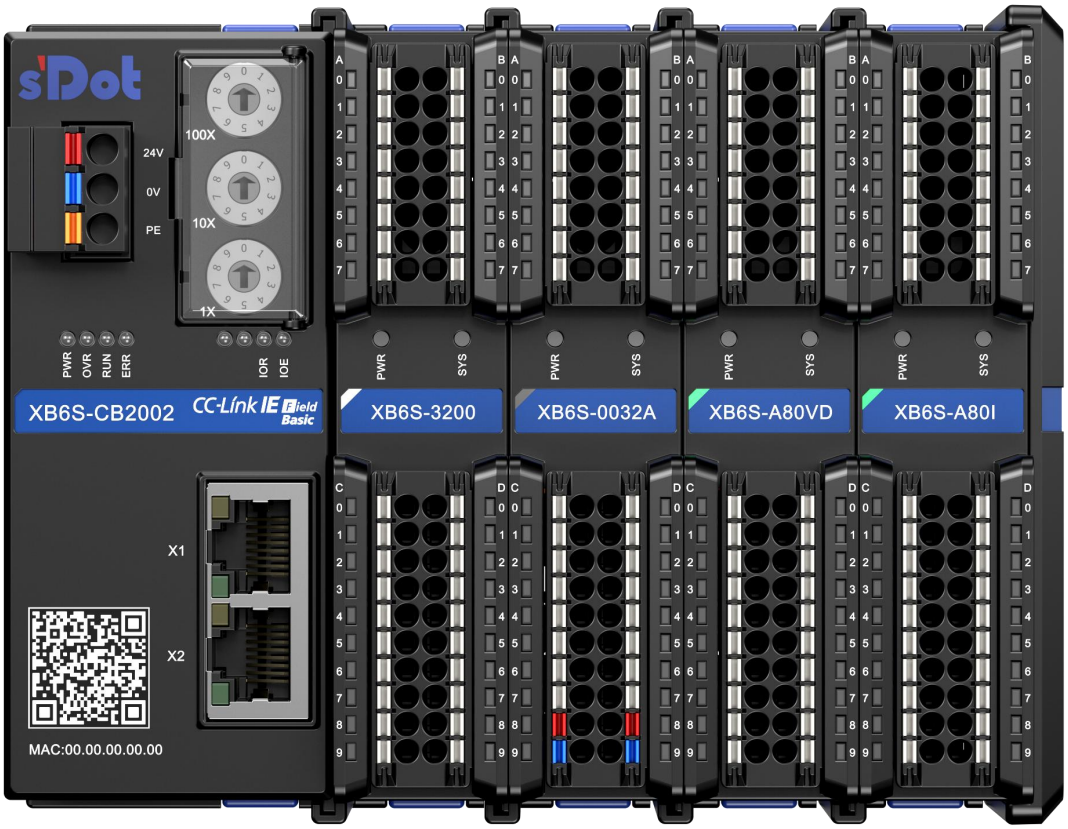
Application: The application method adopts the combination of modules such as coupler, digital quantity, analog quantity, temperature, and extended power supply.

Application configuration: According to the requirements of master station access capability, number of sites, I/O points, function type, etc., it can adapt to different types of I/O module combination configurations.

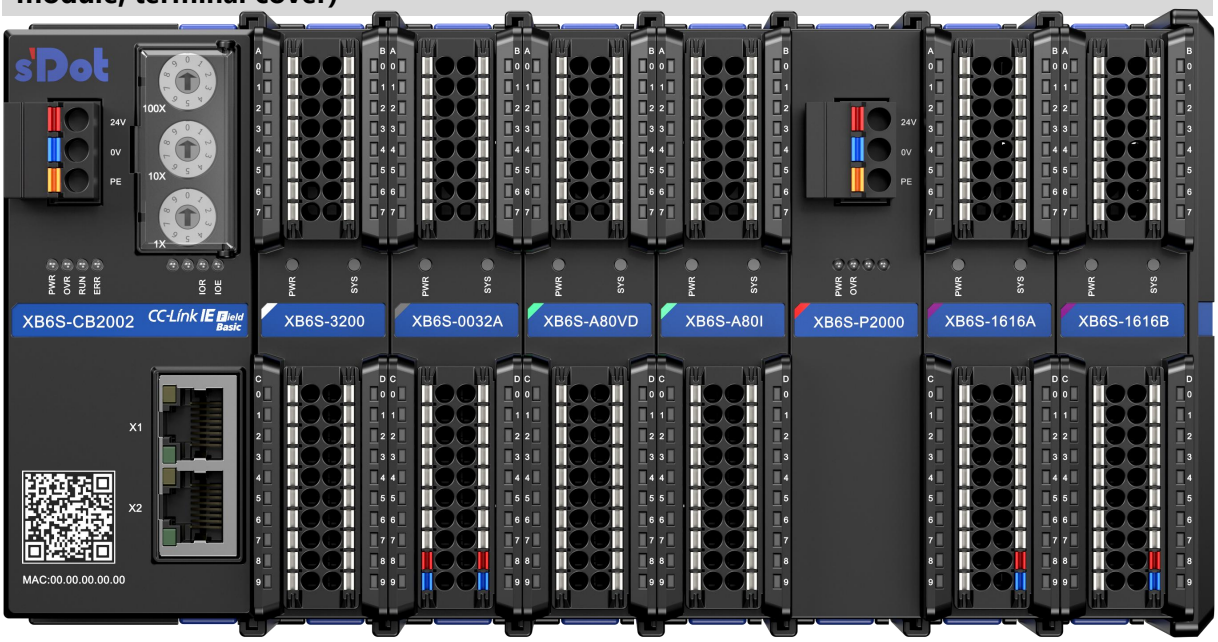
Configuration rules: The modules from left to right are coupler module, power module, I/O module, terminal cover (mandatory), etc.

The product adopts the application mode of the combination of coupler, I/O module and terminal cover, and there are two combinations as follows.

Product combination 1 (coupler module, I/O module, terminal cover)



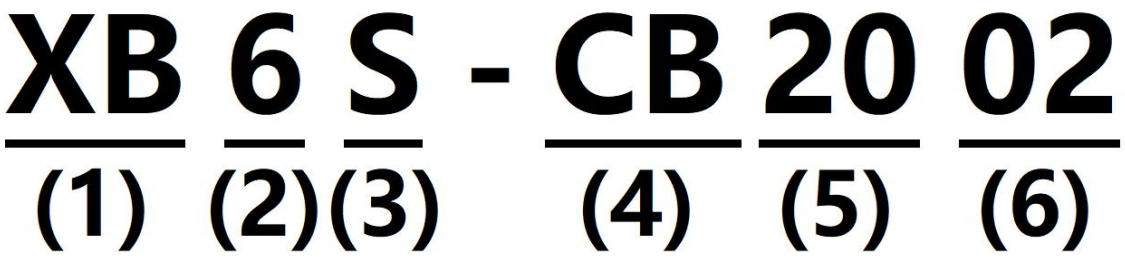
Product combination 2 (coupler module, I/O module, expansion power module, I/O module, terminal cover)



2 Naming convention

2.1 Naming convention

2.1.1 Coupler naming convention



Serial Number	Meaning	Value Description
(1)	Bus Type	XB: X-bus
(2)	Product range	6: Slice type
(3)	Product Version	S is for Strengthen, an upgraded version
(4)	Bus protocol	CB: CC-Link IE Field Basic EC: EtherCAT PN: PROFINET EI: EtherNet/IP MT: Modbus TCP
(5)	Power	20: 2A
(6)	Number of network ports	02: Dual network ports

2.1.2 I/O module naming convention

XB 6 S - A 8 0 V

(1) (2)(3) (4) (5)(6)(7)

<table>
<tr><th>Serial Number</th><th>Meaning</th><th colspan="6">Value Description</th></tr>
<tr><td>(1)</td><td>Bus Type</td><td colspan="6">XB: X-bus</td></tr>
<tr><td>(2)</td><td>Product range</td><td colspan="6">6: Insert type</td></tr>
<tr><td>(3)</td><td>Product Version</td><td colspan="6">S is for Strengthen, an upgraded version</td></tr>
<tr><td>(4)</td><td>I/O module types</td><td colspan="6">A: Analog
Default: Digital</td></tr>
<tr><td>(5)</td><td>Input signal points</td><td colspan="6">Analog: 0, 4, 8
Digital: 00, 08, 16, 32</td></tr>
<tr><td>(6)</td><td>Output signal points</td><td colspan="6">Analog: 0, 4, 8
Digital: 00, 08, 16, 32</td></tr>
<tr><td rowspan="11">(7)</td><td rowspan="11">Input and output characteristics</td><td colspan="4">Digital</td><td colspan="2">Analog</td></tr>
<tr><td>Coding</td><td>Input</td><td>Output</td><td>Connector Type</td><td>Coding</td><td>illustrate</td></tr>
<tr><td>A</td><td rowspan="4">NPN/PNP compatible</td><td>NPN</td><td>/</td><td rowspan="2">V</td><td rowspan="2">Single-ended signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V</td></tr>
<tr><td>B</td><td>PNP</td><td>/</td></tr>
<tr><td>N</td><td>/</td><td rowspan="3">MIL Connector</td><td rowspan="3">VD</td><td rowspan="3">Differential signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V</td></tr>
<tr><td>AN</td><td>NPN</td></tr>
<tr><td>BN</td><td>PNP</td></tr>
<tr><td>default</td><td>NPN/PNP compatible</td><td colspan="2">/</td><td>I</td><td>Single-ended signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA</td></tr>
<tr><td rowspan="2">J</td><td rowspan="2">/</td><td rowspan="2">Relay</td><td rowspan="2">ID</td><td rowspan="2">Differential signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA, -20mA~+20mA</td></tr>
<tr><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>TM</td><td>Temperature collection of thermal resistors, thermocouples, etc.</td></tr>
</table>

2.2 Module List

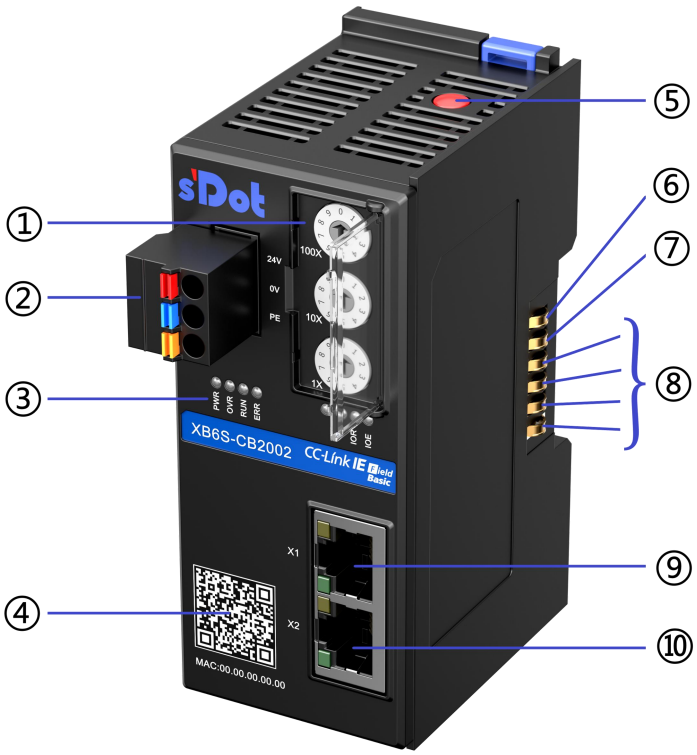
Model	Product Description	
XB6S-CB2002	CC-Link IE Field Basic bus Coupler module	
XB6S-3200	32-channel digital input module, input NPN/PNP compatible, input filter default 3ms	
XB6S-1600	16-channel digital input module, input NPN/PNP compatible, input filter default 3ms	
XB6S-0800	8-channel digital input module, input NPN/PNP compatible, input filter default 3ms	
XB6S-1616A	16-channel digital input and 16-channel digital output module Input NPN/PNP compatible, input filter default 3ms, output NPN type	
XB6S-1616B	16-channel digital input and 16-channel digital output module Input NPN/PNP compatible, input filter default 3ms, output PNP type	
XB6S-0032A	32-channel digital output module, output NPN type	
XB6S-0032B	32-channel digital output module, output PNP type	
XB6S-0016A	16-channel digital output module, output NPN type	
XB6S-0016B	16-channel digital output module, output PNP type	
XB6S-0008A	8-channel digital output module, output NPN type	
XB6S-0008B	8-channel digital output module, output PNP type	
XB6S-3200N	32-channel digital input module, input NPN/PNP compatible, input filter default 3ms, MIL connector type	
XB6S-0032AN	32-channel digital output module, output NPN type, MIL connector type	
XB6S-0032BN	32-channel digital output module, output PNP type, MIL connector type	
XB6S-0012J/6	12-channel relay output module (Note: the "/" in the model number can be omitted, that is, XB6S-0012J/6 and XB6S-0012J6 are the same module)	
XB6S-A80VD	8-channel analog voltage input module	Differential signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V
XB6S-A80V	8-channel analog voltage input module	Single-ended signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V
XB6S-A40VD	4-channel analog voltage input module	Differential signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V
XB6S-A40V	4-channel analog voltage input module	Single-ended signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V
XB6S-A80ID	8-channel analog current input module	Differential signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA, -20mA~+20mA
XB6S-A80I	8-channel analog current input module	Single-ended signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA
XB6S-A40ID	4-channel analog current input module	Differential signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA, -20mA~+20mA
XB6S-A40I	4-channel analog current input module	Single-ended signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA
XB6S-A08V	8-channel analog voltage output module	Single-ended signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V

XB6S-A04V	4-channel analog voltage output module	Single-ended signal, adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V
XB6S-A08I	8-channel analog current output module	Single-ended signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA
XB6S-A04I	4-channel analog current output module	Single-ended signal, adjustable range: Disable, 4mA~20mA, 0mA~20mA
XB6S-A80TM	8-channel thermal resistor and thermocouple temperature acquisition module (for module introduction, please refer to the official website module user manual)	
XB6S-A40TM	4-channel thermal resistor and thermocouple temperature acquisition module (for module introduction, please refer to the official website module user manual)	
XB6S-PL20	2-channel single-ended incremental encoder counting module (for module introduction, please refer to the official website module user manual)	
XB6S-PS20D	2-channel SSI absolute encoder counting module (for module introduction, please refer to the official website module user manual)	
XB6S-PL20D	2-channel differential incremental encoder counting module (for module introduction, please refer to the official website module user manual)	
XB6S-PC80	8-channel pulse counting module (For module introduction, please refer to the official website module user manual)	
XB6S-PT04A	4-channel PTO pulse output module (for module introduction, please refer to the official website module user manual)	
XB6S-C01SP	1-channel serial communication module (For module introduction, please refer to the official website module user manual)	
XB6S-P2000	Extension power module	
XB6S-C18_2	Common terminal expansion module	
XB6S-CVR00	Terminal cover	

3 Module Introduction

3.1 CC-Link IE Field Basic Coupler

3.1.1 Panel structure



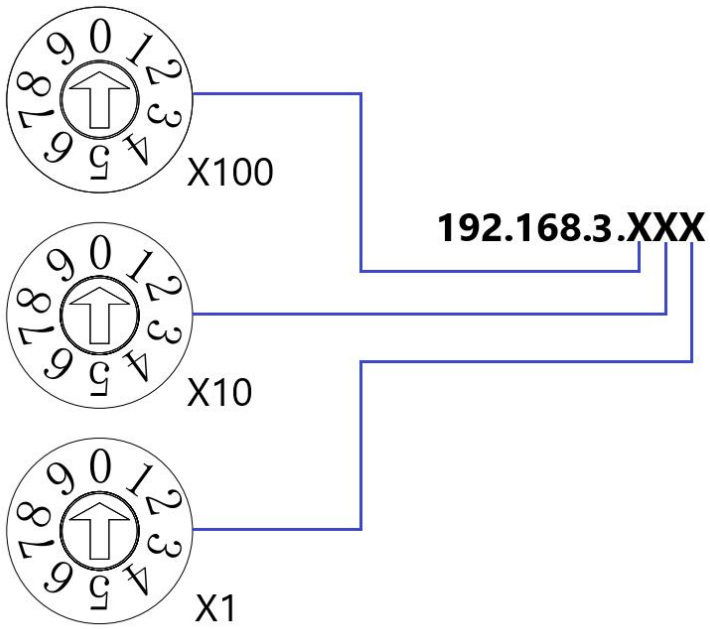
Serial Number	Name	Illustrate
①	Rotary Switch	Set IP address
②	Power Terminal Blocks	3P spring-loaded terminal blocks
③	Module indicators and indicator markings	Indicates coupler power status and system operation status

④	Module QR code	Scan the code to get module related information
⑤	Reset button	Reset IP information and configuration parameters
⑥	Power supply+	5V
⑦	Power supply-	0V
⑧	X-bus communication signal	Communication signal
⑨	Bus interface X1	RJ45 interface
⑩	Bus interface X2	RJ45 interface

3.1.2 Rotary Switch

IP address setting

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



Setting value (decimal)	IP address setting method
001 ~ 254	Set up the lower 1 Byte of the IP address. "×100" For hundreds, pass "×10" For ten, through "×1"For the individual positions, Set it within the range of 1 to 254.
000, 255 ~	When the rotary switch is set to 0, 255 or above, the IP address currently used by the module is the IP address last changed by the host computer or the factory IP address.

The rotary switch is set to "000" at the factory, and the IP address is set to the factory IP: 192.168.3.100.

Precautions

1、 Tool selection

Screwdriver specifications: opening ≤3mm.

2、 The rotary switch IP must be set when the power is off. If the IP address needs to be modified during the communication process, the new IP setting must be completed and the power must be turned on again for it to take effect.

3.1.3 Indicator light function

Definition of indicator lights for CC-Link IE Field Basic coupler				
Logo	**Name**	**Color**	**State**	**Status description**
PWR	Power indicator	Green	Always on	The module power supply is working properly
			Off	The module is not powered or the power supply is abnormal.
OVR	Overload indicator light	Red	Off	Not overloaded
			Always on	The load reaches more than 90% (±5%)
RUN	Operation status indicator	Green	Always on	The equipment is operating normally and the cyclic transmission is in progress
			Flashing 2.5Hz	The device is operating normally, and the cyclic transmission is stopped
			Flashing 10Hz	Module not configured
			Off	Module disconnected
ERR	Bus error indicator	Red	Always on	An unrecoverable critical error occurred on the device
			Flash	Data interaction is incorrect
			Off	The equipment is operating normally
IOR	IO communication indicator	Green	Always on	I/O Process data has been established
			Flashing 1Hz	No business data interaction
			Flashing 10Hz	Coupler firmware upgrade
IOE	IO abnormal indicator	Red	Always on	Communication abnormality
			Flashing 1Hz	There is an alarm I/O module abnormality
			Off	No abnormality in communication

Network Status Indicator Definition				
Logo	**Name**	**Color**	**State**	**Status description**
X1	Network status indicator	Orange	Flash	The connection is established and data is exchanged
			Off	No data interaction or exception
		Green	Always on	Establishing a network connection
			Off	No network connection established or abnormal
X2	Network status indicator	Orange	Flash	The connection is established and data is exchanged
			Off	No data interaction or exception
		Green	Always on	Establishing a network connection
			Off	No network connection established or abnormal

3.1.4 Product Parameters

3.1.4.1 Interface parameters

CC-Link IE Field Basic interface parameters		
Bus protocol	CC-Link IE Field Basic	
Port Number	61450 (periodic data), 61451 (search node)	
Logical station number	[1,4]	
Maximum data volume	RX,RY	64×4 bits
	RWr，RWw	32×4 words
Number of slaves	Depends on the number of slaves supported by the master	
Data transmission medium	Ethernet CAT5 Cable	
Transfer rate	100Mbps	
Minimum cycle time[1]	1ms	
Transmission distance	≤100m (station to station distance)	
Bus interface	2 × RJ45	
Maximum number of modules connected in series	32	
Input and output process data volume	1024Bytes[2]	

Note [1]: Cycle time (scan cycle) between PLC and coupler.

Note [2]: The total length of uplink and downlink data shall not exceed 1024 bytes.

3.1.4.2 Power parameters

Power parameters	
Input voltage	SELV Input 24VDC (18V~36V)
Input Current	Max: 600mA (24VDC)
Backplane supply current	Max: 2A
Backplane supply voltage	5VDC

3.1.4.3 General parameters

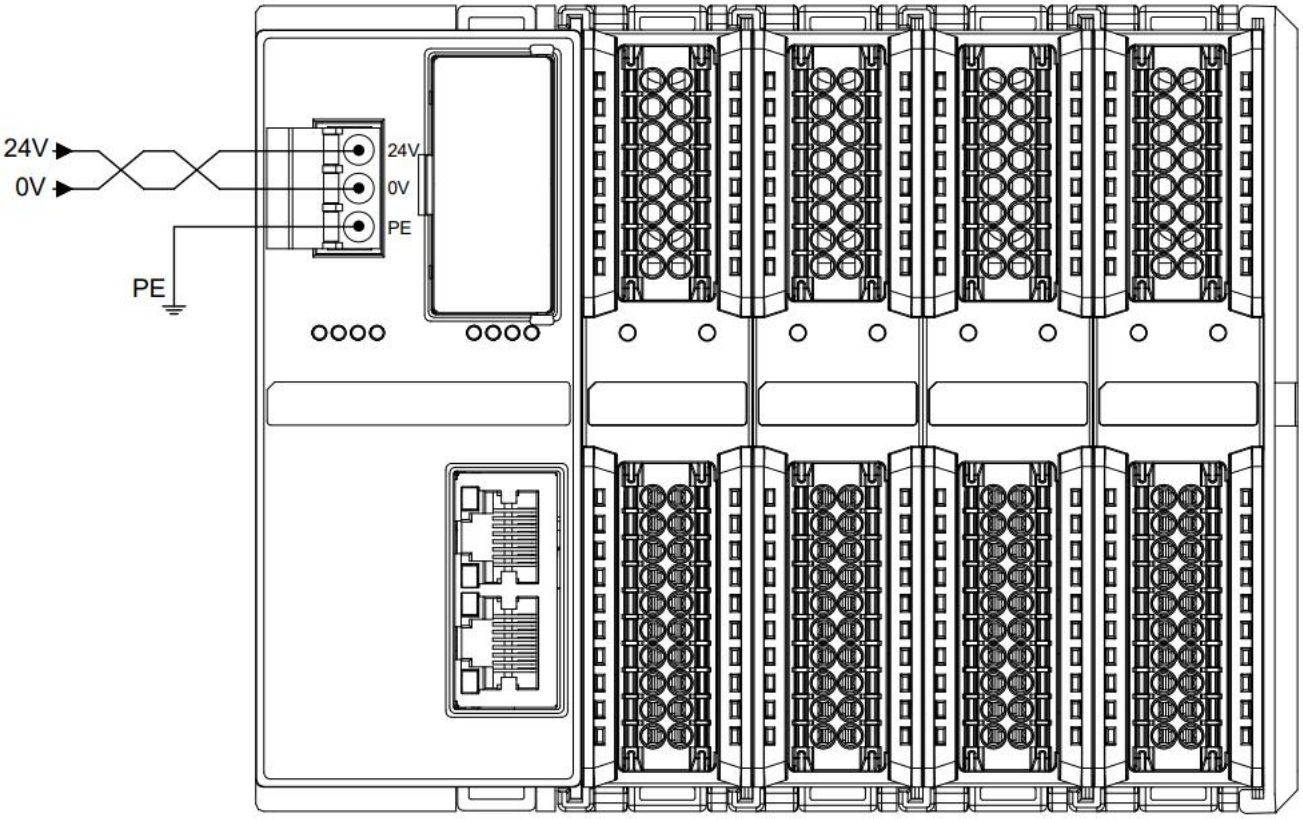
General technical parameters		
Specifications and dimensions		106.4 × 43 × 61mm
Weight		160g
Usage Environment	Operating temperature	-20℃~+60℃
	Storage temperature	-40℃~+80℃
	Relative humidity	95%, non-condensing
	Altitude	≤2000m
	Protection	IP20

	level	
	Overvoltage category	I
	Pollution degree	Level 2

Module abnormality self-recovery	Support
Short circuit protection	Support (automatic recovery mechanism)
Reverse polarity protection	Support (automatic recovery mechanism)
Surge protection	Support

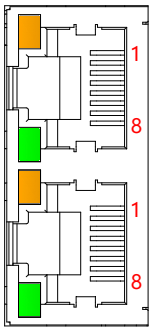
3.1.5 Power wiring diagram

Use a 24VDC power module and refer to the wiring method. Connect the power supply according to the circuit shown in the figure below, and ground PE reliably (twisted pair cable is recommended for the power cable).



3.1.6 Bus wiring

It uses a standard RJ45 network interface and a standard crystal connector, and the pin assignments are shown in the following table.



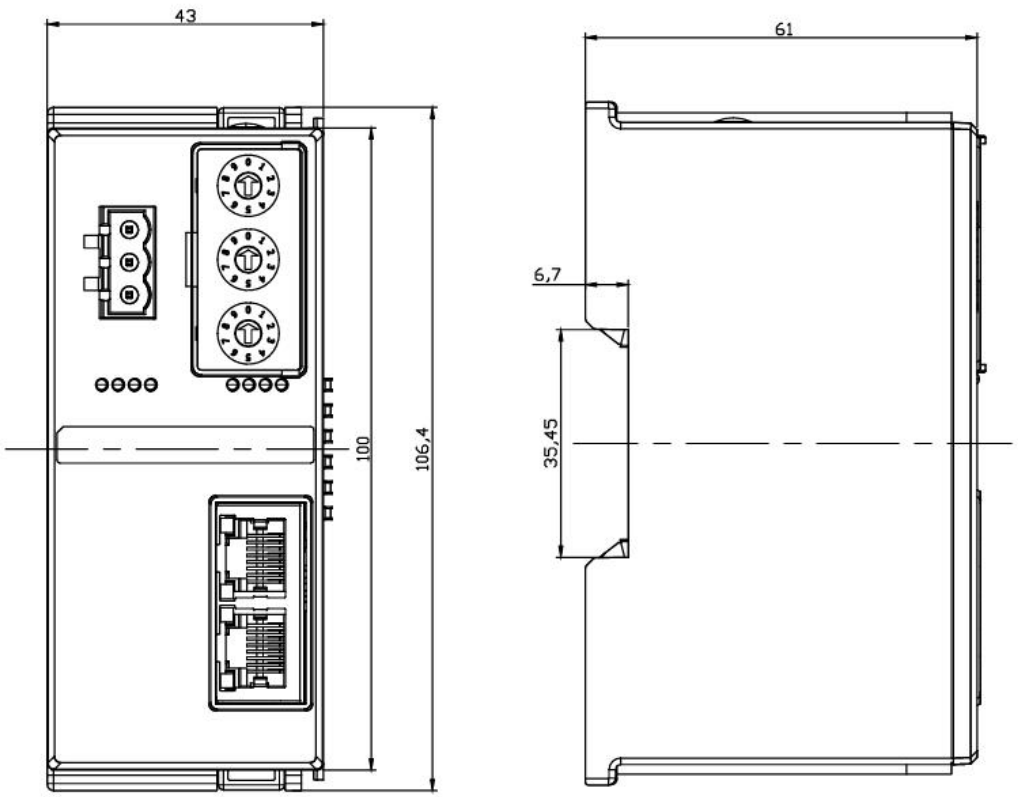
Pin Number	Signal
1	TD+
2	TD-
3	RD+
4	—
5	—
6	RD-
7	—
8	—

☛ Precautions

- It is recommended to use double-shielded (braided mesh + aluminum foil) STP cable of category 5 or higher as communication cable.
- The length of the cable between devices cannot exceed 100m.

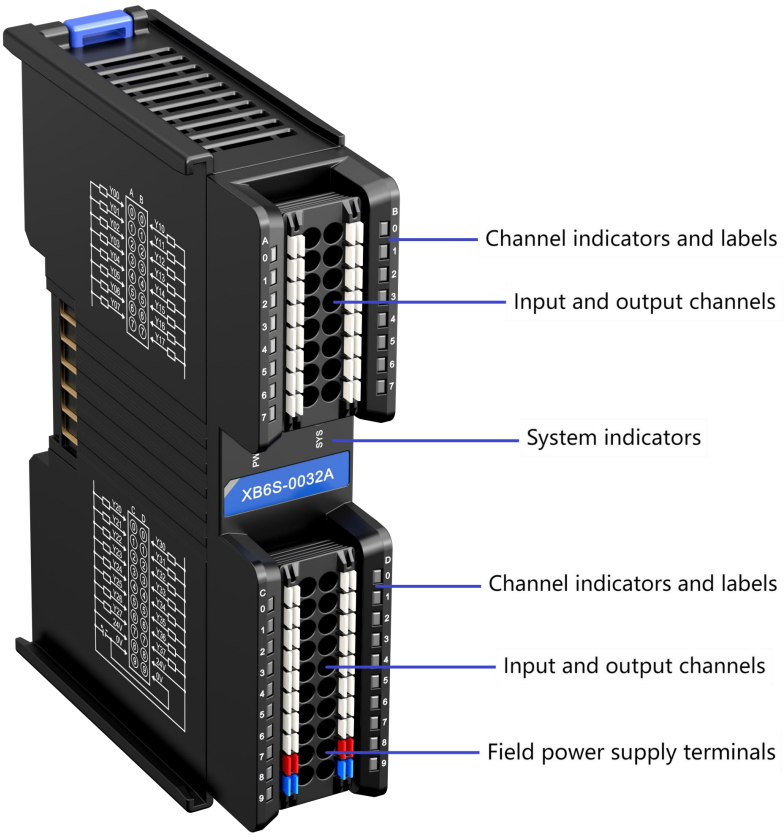
3.1.7 Dimensions

Coupler dimensions (mm)



3.2 Digital I/O Modules

3.2.1 Panel structure



3.2.2 Indicator light function

Digital I/O module indicator light definition				
Logo	**Name**	**Color**	**State**	**Status description**
PWR	Power indicator	Green	Always on	Power supply is normal
			Off	The product is not powered on or the power supply is abnormal
SYS	Operation status indicator	Green	Always on	The system is running normally
			Flashing 1Hz	No business data interaction, waiting to establish business data interaction
			Flashing 10Hz	Firmware Upgrade
			Off	System not working
0~7	Input channel indicator	Green	Always on	The module channel has signal input
			Off	The module channel has no signal input or the signal input is abnormal
0~7	Output channel indicator	Green	Always on	The module channel has signal output
			Off	The module channel has no signal output or the signal output is abnormal

3.2.3 Technical Parameters

3.2.3.1 Digital Input Module Parameters

Digital input				
Product Model	XB6S-3200	XB6S-3200N	XB6S-1600	XB6S-0800
Bus input power rated voltage	5VDC (4.5V~5.5V)			
Bus input power rated current	≤100mA	≤70mA	≤80mA	≤60mA
Input rated voltage	24VDC (20.4V~28.8V)			
Typical input current	5mA/ch (24VDC)			
Input signal points	32	32	16	8
Input signal type	NPN/PNP compatible			
Input signal form	Voltage direct input form Sink input: NPN open collector input Source input: PNP open collector input			
OFF voltage/OFF current	-3V~+5V/0.9mA or less			
ON voltage/ON current	11V~30V/2.1mA or above			
Reaction time	<50us			
Input filtering	No filter, 0.1ms, 0.2ms, 0.5ms, 1ms, 2ms, 3ms (factory setting), 4ms...18ms, 19ms, 20ms			
Maximum input frequency	150Hz (filter time: 3ms)			
Input Impedance	5.4KΩ			
Isolation method	Optocoupler Isolation			
Isolation withstand voltage	500VAC			
Rated current consumption	100mA	70mA	80mA	60mA
Power consumption	0.5W	0.35W	0.4W	0.3W
Digital input type	Type1/Type3			
Channel indicator light	Green LED light			

3.2.3.2 Digital input and output module parameters

Digital input		
Product Model	XB6S-1616A	XB6S-1616B
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤130mA	≤100mA
Input rated voltage	24VDC (20.4V~28.8V)	
Typical input current	5mA/ch (24VDC)	
Input signal points	16	16
Input signal type	NPN/PNP compatible	
Input signal form	Voltage direct input form Sink input: NPN open collector input Source input: PNP open collector input	
OFF voltage/OFF current	-3V~+5V/0.9mA or less	
ON voltage/ON current	11V~30V/2.1mA or above	
Reaction time	<50us	
Input filtering	No filter, 0.1ms, 0.2ms, 0.5ms, 1ms, 2ms, 3ms (factory setting), 4ms...18ms, 19ms, 20ms	
Maximum input frequency	150Hz (filter time: 3ms)	
Input Impedance	5.4KΩ	
Isolation method	Optocoupler Isolation	
Isolation withstand voltage	500VAC	
Rated current consumption	130mA	100mA
Power consumption	0.65W	0.5W
Digital input type	Type1/Type3	
Channel indicator light	Green LED light	
Digital output		
Output signal points	16	16
Output signal type	NPN	PNP
Field side input voltage range	24VDC (20.4V~28.8V)	
Output voltage drop	< 1V	
Output load type	Resistive load, inductive load, lamp load	
Single channel rated current	Max: 0.5A (seeFigure 1)	
Leakage Current	<10uA	

Reaction time	<150us
Output channel protection	Short circuit protection (automatic recovery mechanism)
Module protection	Reverse connection protection (automatic recovery mechanism), field-side surge protection
Isolation method	Optocoupler Isolation
Isolation withstand voltage	500VAC
Channel indicator light	Green LED light

3.2.3.3 Digital output module parameters

Digital output				
Product Model	XB6S-0032A	XB6S-0032B	XB6S-0032AN	XB6S-0032BN
Bus input power rated voltage	5VDC (4.5V~5.5V)			
Bus input power rated current	≤150mA	≤110mA	≤130mA	≤80mA
Field side input voltage range	24VDC (20.4V~28.8V)			
Output signal points	32	32	32	32
Output signal type	NPN	PNP	NPN	PNP
Output voltage drop	< 1V			
Output load type	Resistive load, inductive load, lamp load			
Single channel rated current	Max: 0.5A (seeFigure 1)		Max: 0.1A	
Leakage Current	<10uA			
Reaction time	<150us			
Output channel protection	Short circuit protection (automatic recovery mechanism)			
Module protection	Reverse connection protection (automatic recovery mechanism), field-side surge protection			
Isolation method	Optocoupler Isolation			
Isolation withstand voltage	500VAC			
Rated current consumption	150mA	110mA	130mA	80mA
Power consumption	0.75W	0.55W	0.65W	0.4W
Channel indicator light	Green LED light			

Digital output				
Product Model	XB6S-0008A	XB6S-0008B	XB6S-0016A	XB6S-0016B
Bus input power rated voltage	5VDC (4.5V~5.5V)			
Bus input power rated current	≤70mA	≤60mA	≤110mA	≤90mA
Field side input voltage range	24VDC (20.4V~28.8V)			
Output signal points	8	8	16	16
Output signal type	NPN	PNP	NPN	PNP
Output voltage drop	< 1V			
Output load type	Resistive load, inductive load, lamp load			
Single channel rated	Max: 0.5A (seeFigure 1)			

current				
Leakage Current	<10uA			
Reaction time	<150us			
Output channel protection	Short circuit protection (automatic recovery mechanism)			
Module protection	Reverse connection protection (automatic recovery mechanism), field-side surge protection			
Isolation method	Optocoupler Isolation			
Isolation withstand voltage	500VAC			
Rated current consumption	70mA	60mA	110mA	90mA
Power consumption	0.35W	0.3W	0.55W	0.45W
Channel indicator light	Green LED light			

3.2.3.4 Relay output module parameters

Relay output	
Product Model	XB6S-0012J/6
Bus input power rated voltage	5VDC (4.5V~5.5V)
Bus input power rated current	≤100mA
Field side input voltage range	24VDC (20.4V~28.8V)
Output signal points	12
Output format	Relay
Output load type	Resistive load, inductive load, lamp load
Single channel rated voltage	24VDC
Single channel rated current	Max: 2A (seeFigure 2)
Hardware output response time	10ms/10ms
Module protection	Field side reverse connection protection (automatic recovery mechanism), field side surge protection
Isolation method	Optocoupler isolation + relay isolation
Isolation withstand voltage	1500VAC
Rated current consumption	100mA
Power consumption	0.5W
Mechanical life	Minimum 20 million operations (18,000 operations/hour)
Electrical life	Minimum 100,000 operations (2A, 24VDC, inductive load)
Channel indicator light	Green LED light

3.2.3.5 General technical parameters

General technical parameters	
Specifications and dimensions	106.4 × 25.7 × 72.3mm
weight	32-channel DIO: 110g
	16-channel DIO: 90g
	8-channel DIO: 90g
	XB6S-0012J/6: 135g
Operating temperature	-20℃~+60℃
Storage temperature	-40℃~+80℃
Relative humidity	95%, non-condensing

Altitude	≤2000m
Pollution degree	Level 2
Protection level	IP20
Safety Certification	UL certification, CE certification
Green Environmental Certification	RoHS certification, REACH certification

Figure 1:

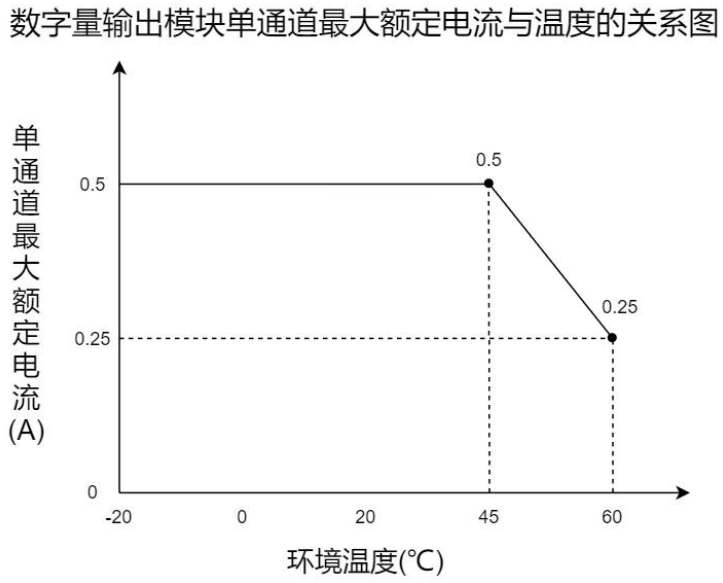
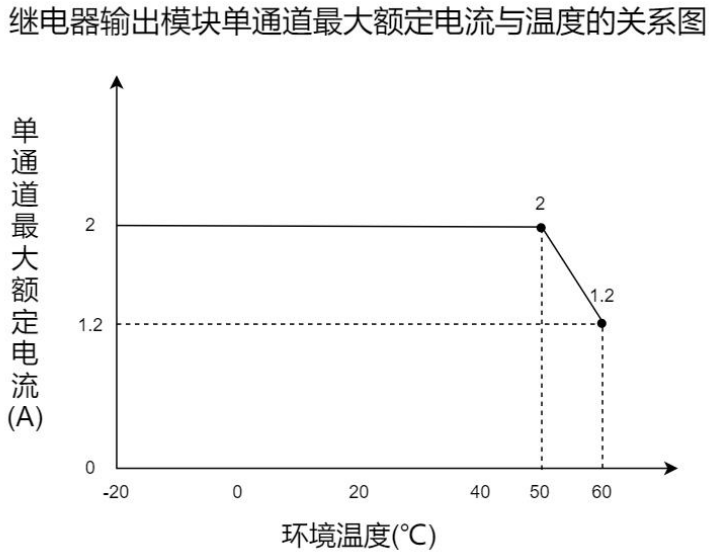
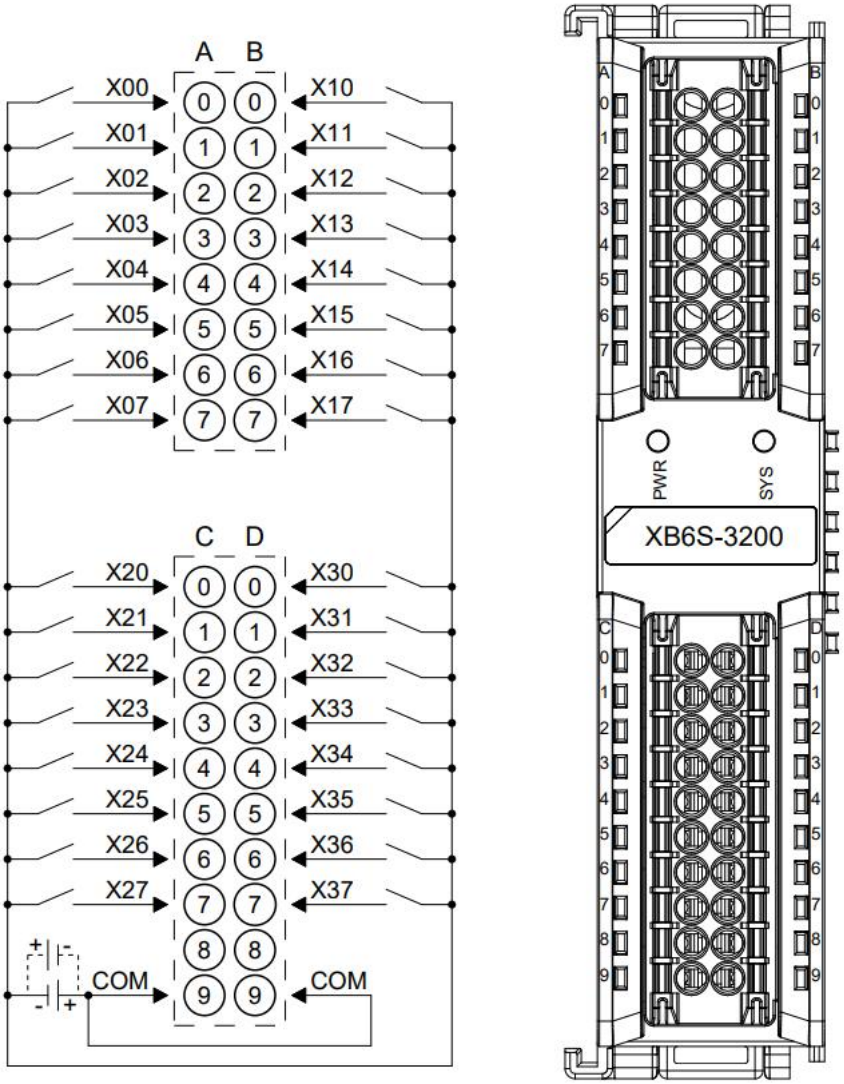


Figure 2:



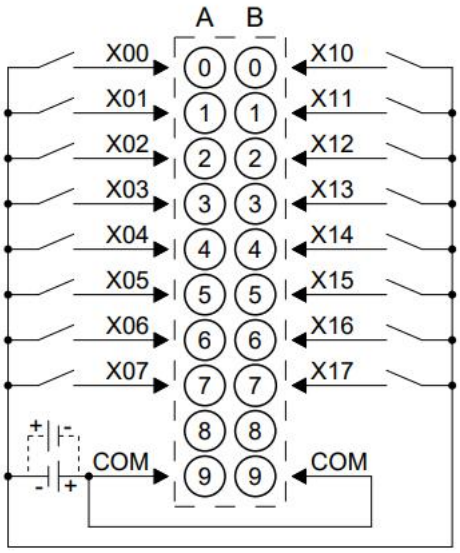
3.2.4 Wiring Diagram

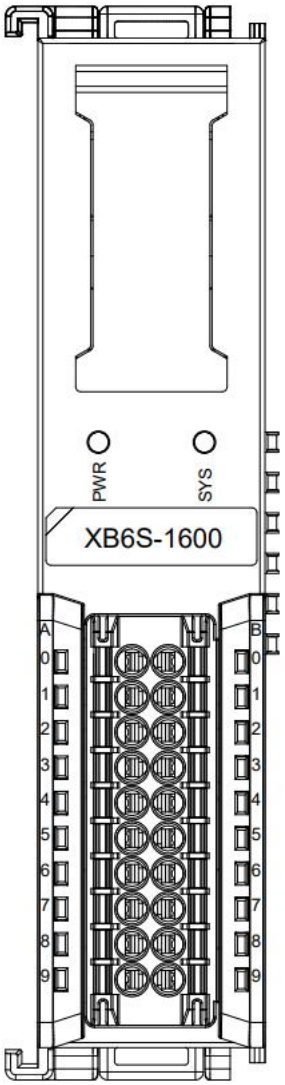
3.2.4.1 XB6S-3200



*COM internal conduction; NPN/PNP compatible

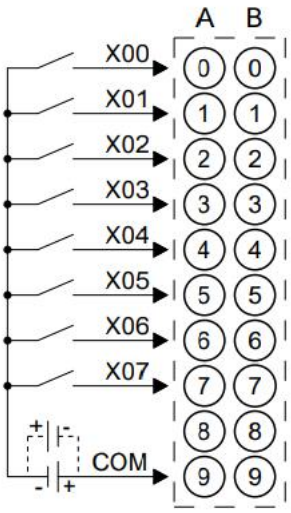
3.2.4.2 XB6S-1600

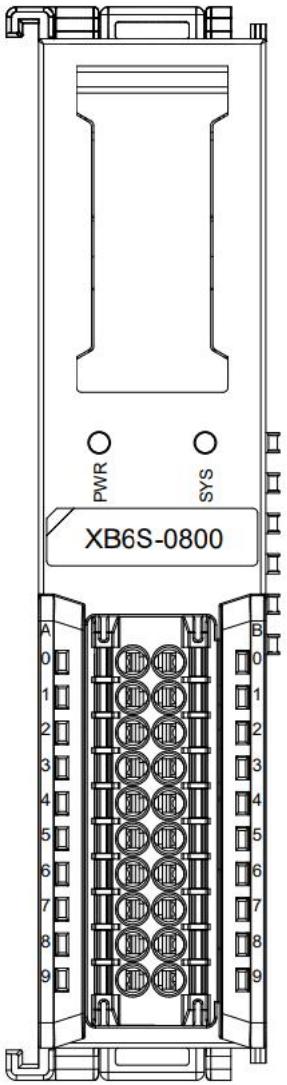




*COM internal conduction; NPN/PNP compatible

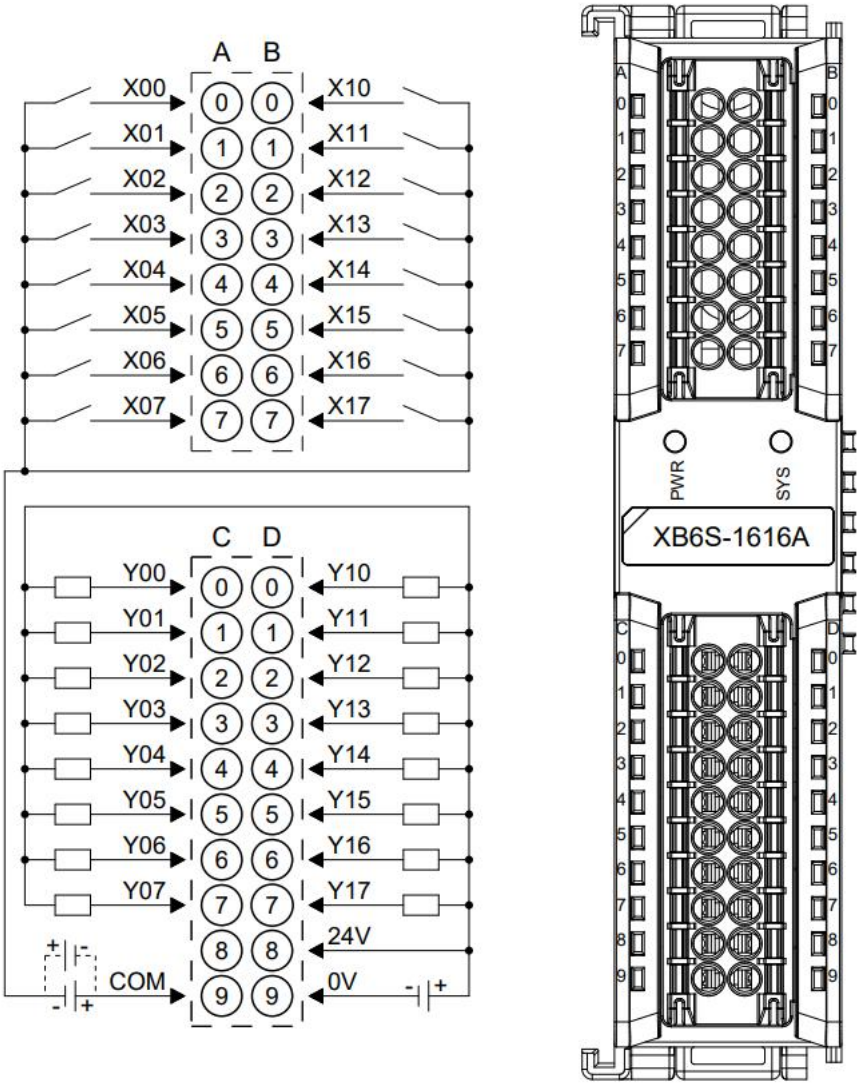
3.2.4.3 XB6S-0800





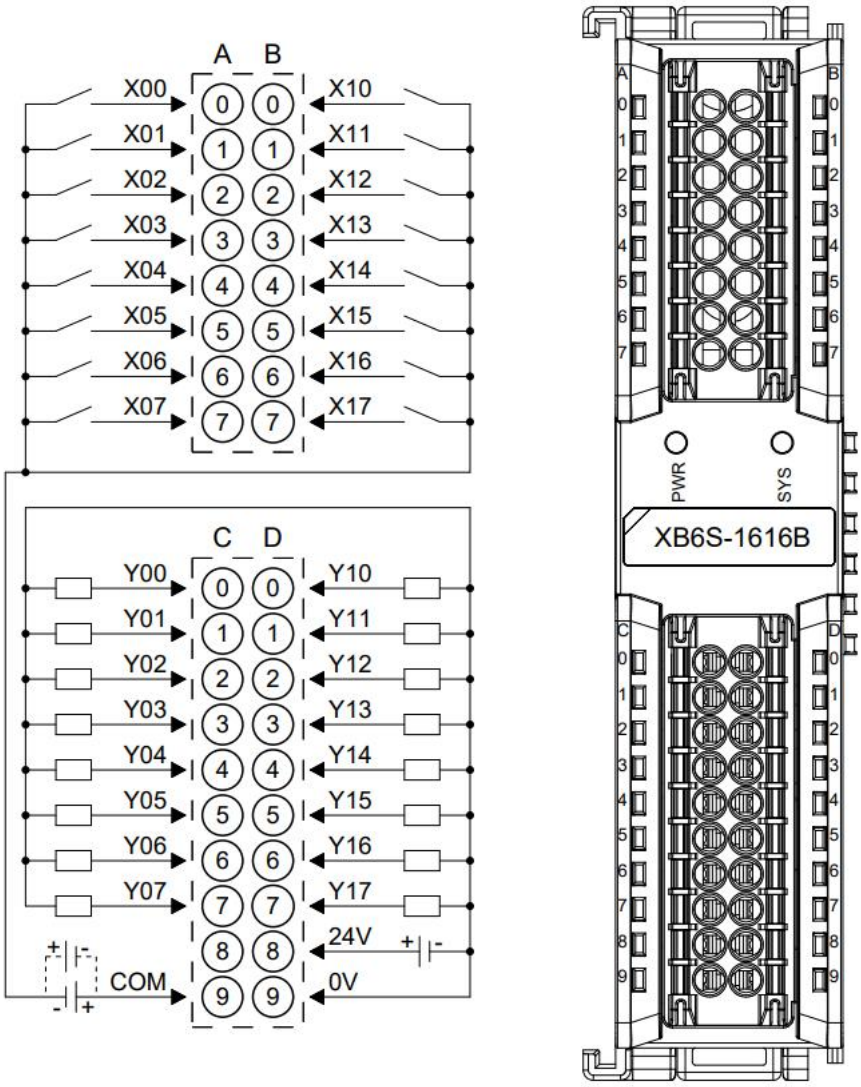
*NPN/PNP compatible

3.2.4.4 XB6S-1616A



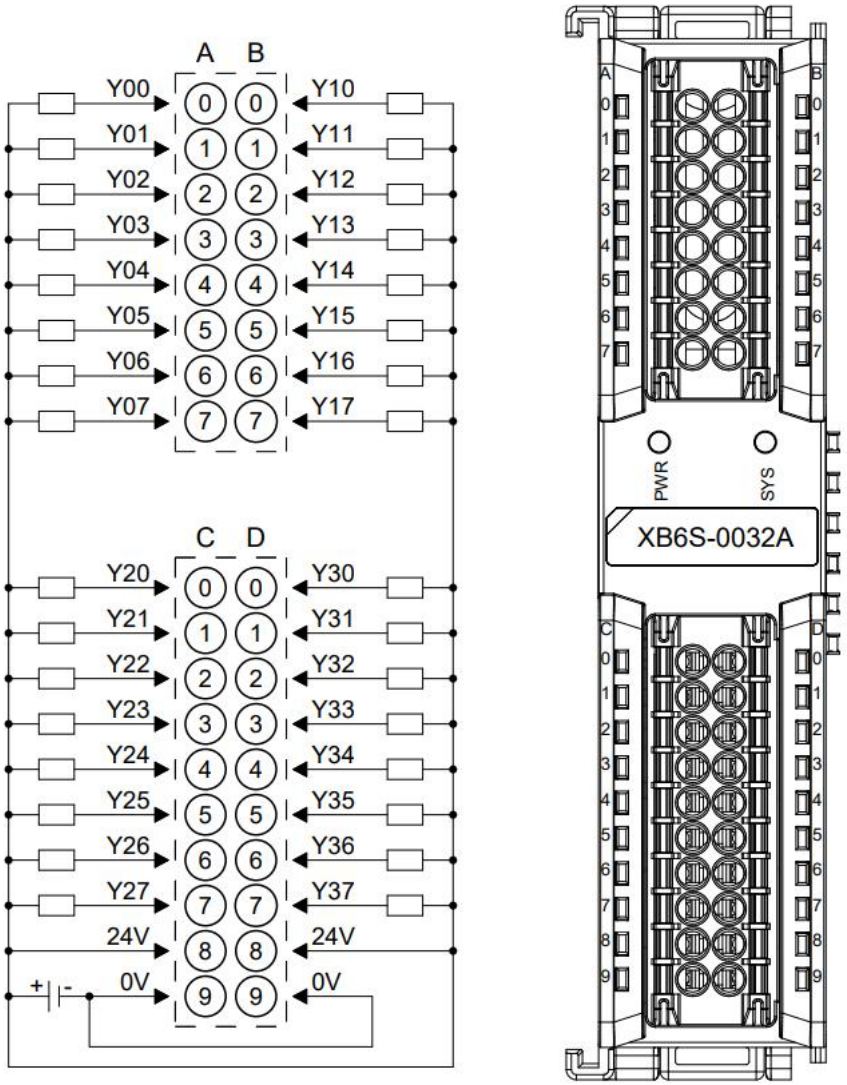
*COM is the common terminal of DI, DI is NPN/PNP compatible, DO is NPN

3.2.4.5 XB6S-1616B



*COM is the common terminal of DI, DI is NPN/PNP compatible, DO is PNP

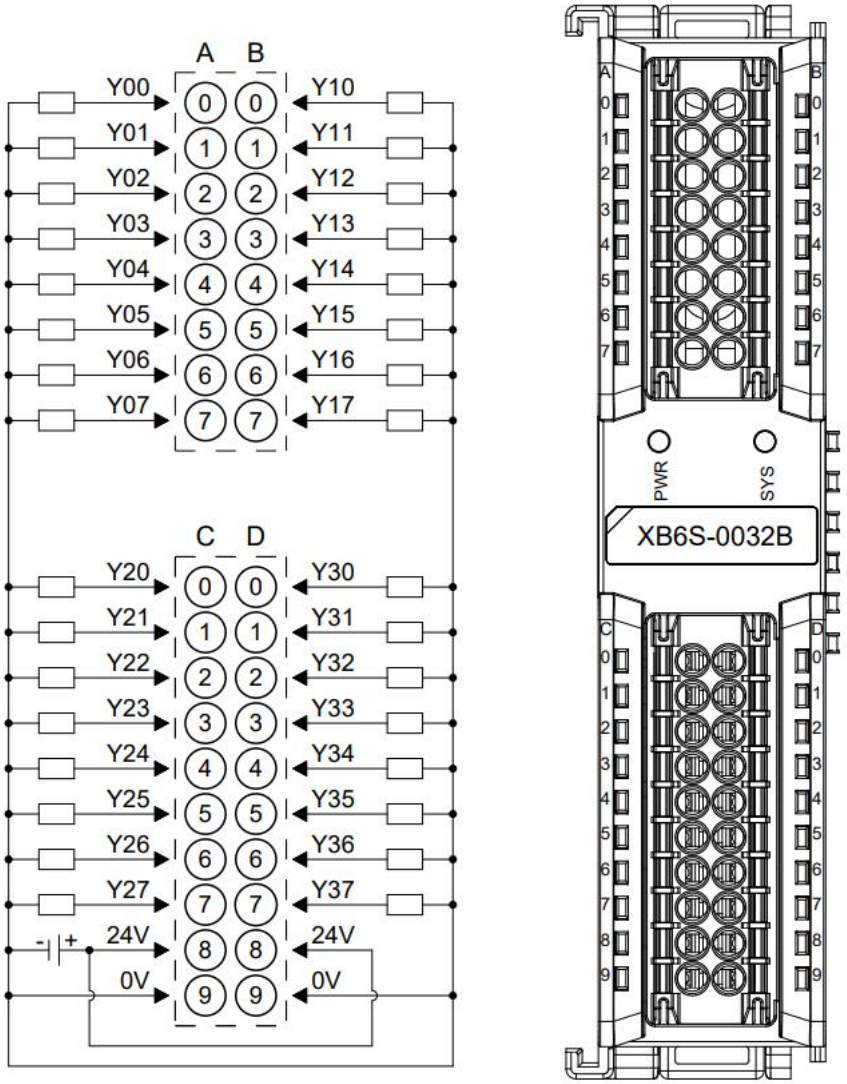
3.2.4.6 XB6S-0032A



*24V internal conduction; 0V internal conduction

*The load common power supply must use the same power supply as the module

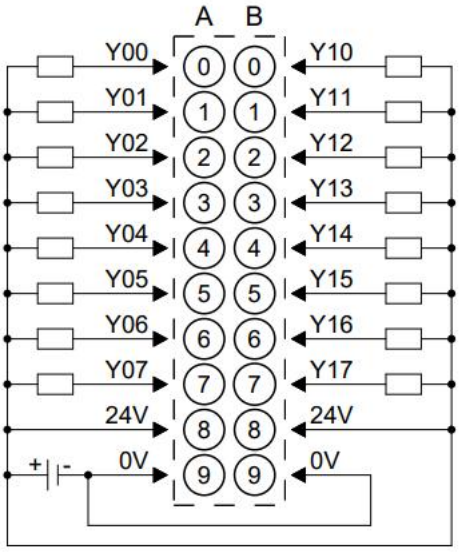
3.2.4.7 XB6S-0032B

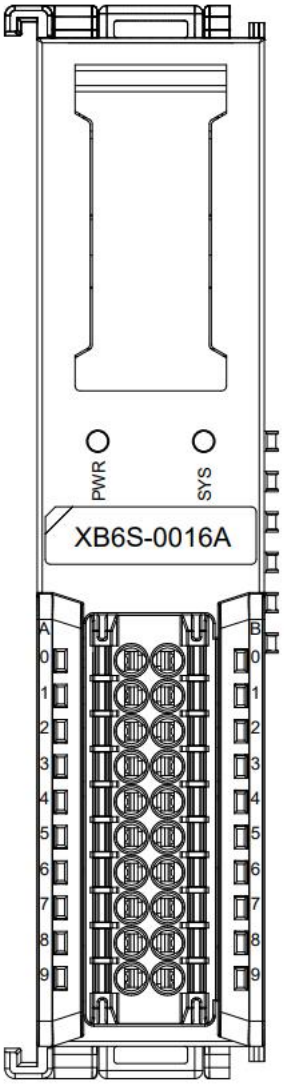


*24V internal conduction; 0V internal conduction

*The load common power supply must use the same power supply as the module

3.2.4.8 XB6S-0016A

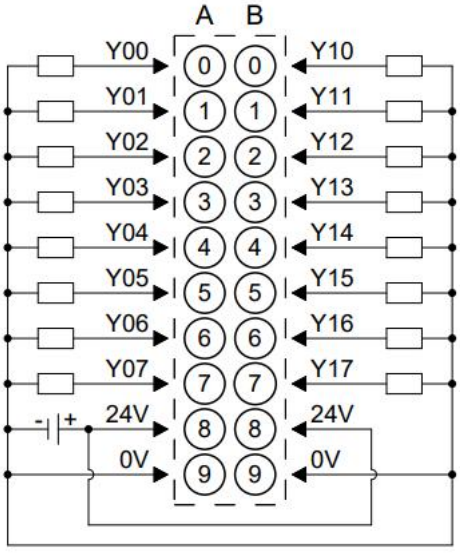


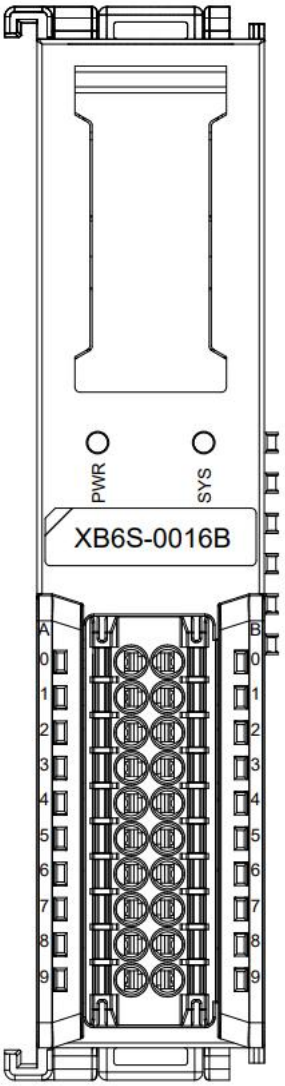


*24V internal conduction; 0V internal conduction

*The load common power supply must use the same power supply as the module

3.2.4.9 XB6S-0016B

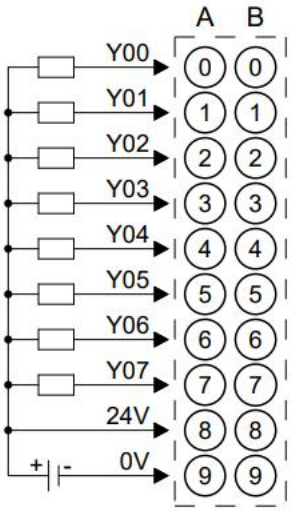


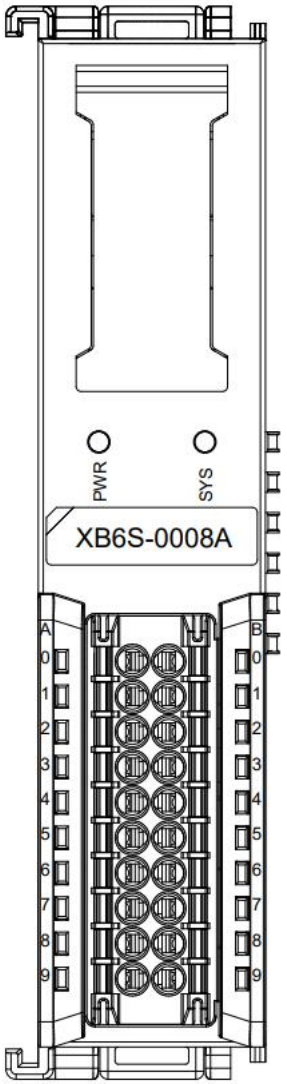


*24V internal conduction; 0V internal conduction

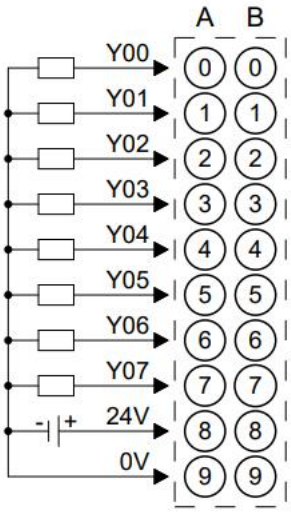
*The load common power supply must use the same power supply as the module

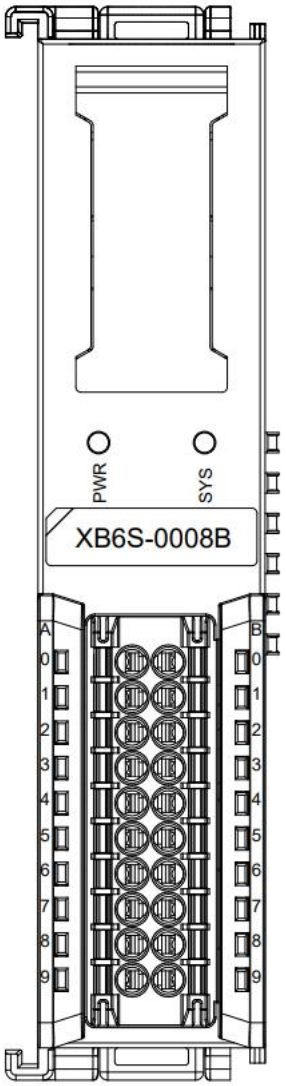
3.2.4.10 XB6S-0008A



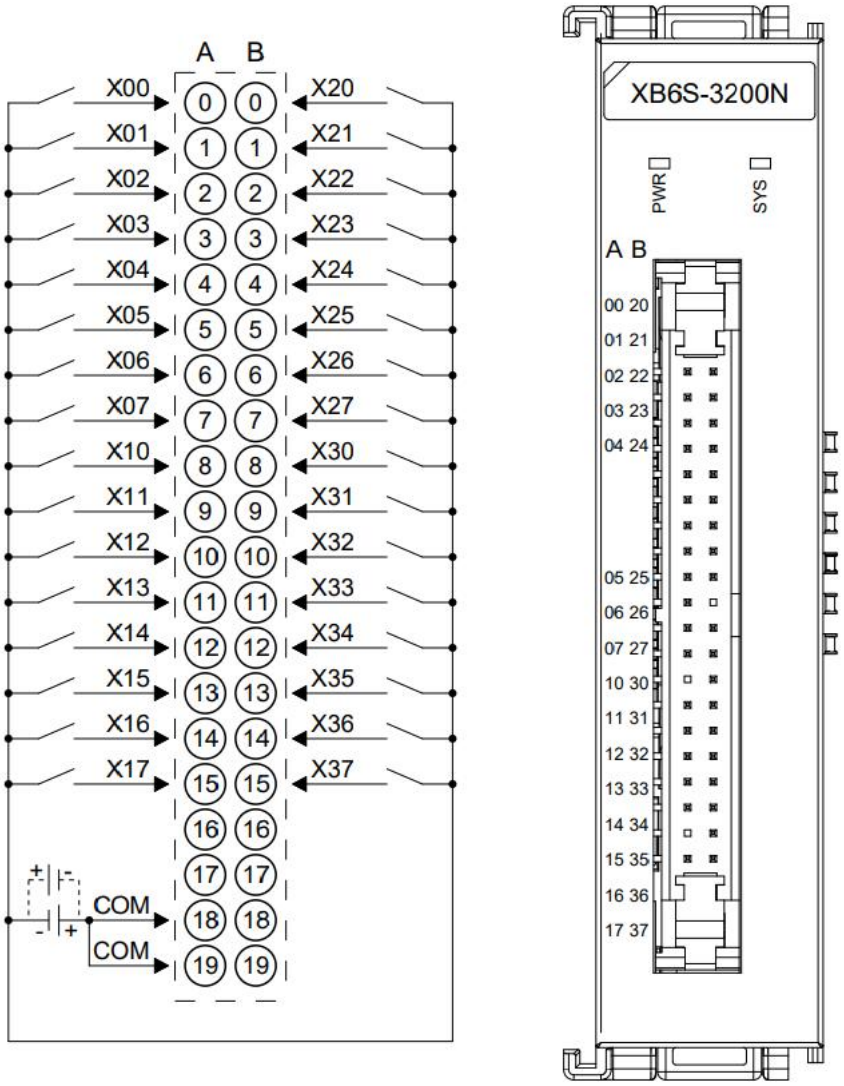


3.2.4.11 XB6S-0008B



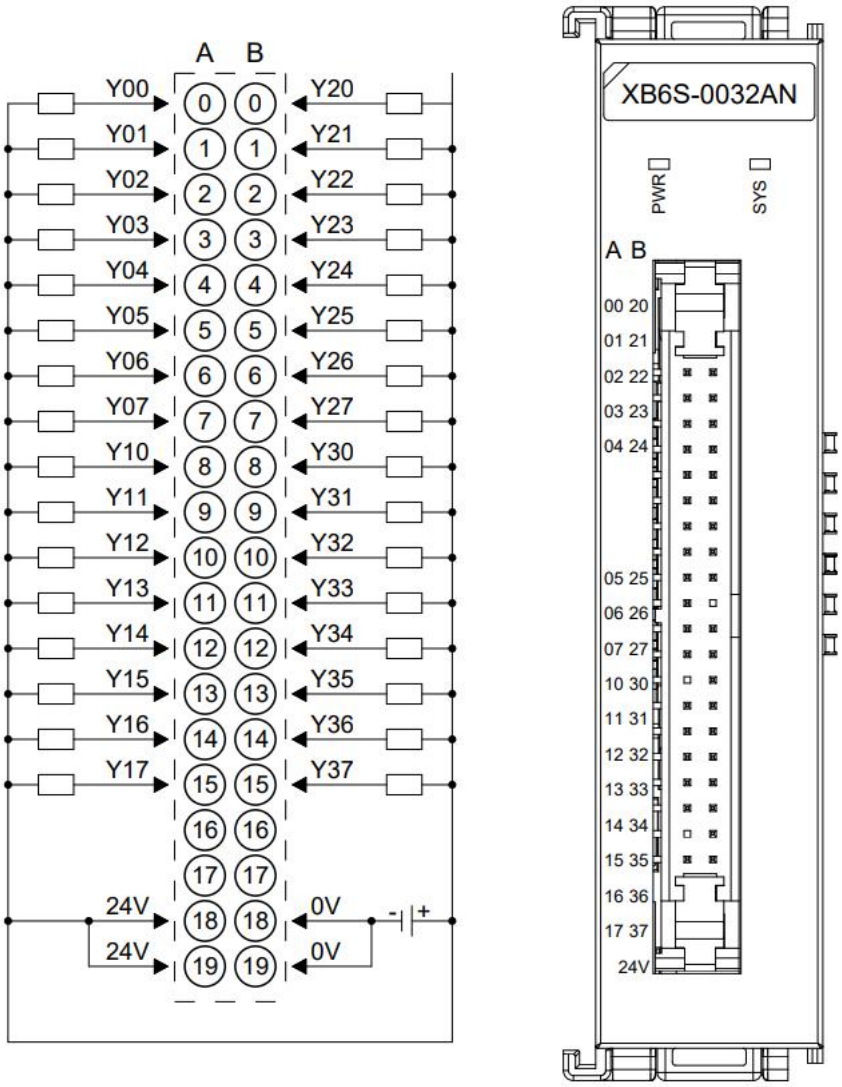


3.2.4.12 XB6S-3200N



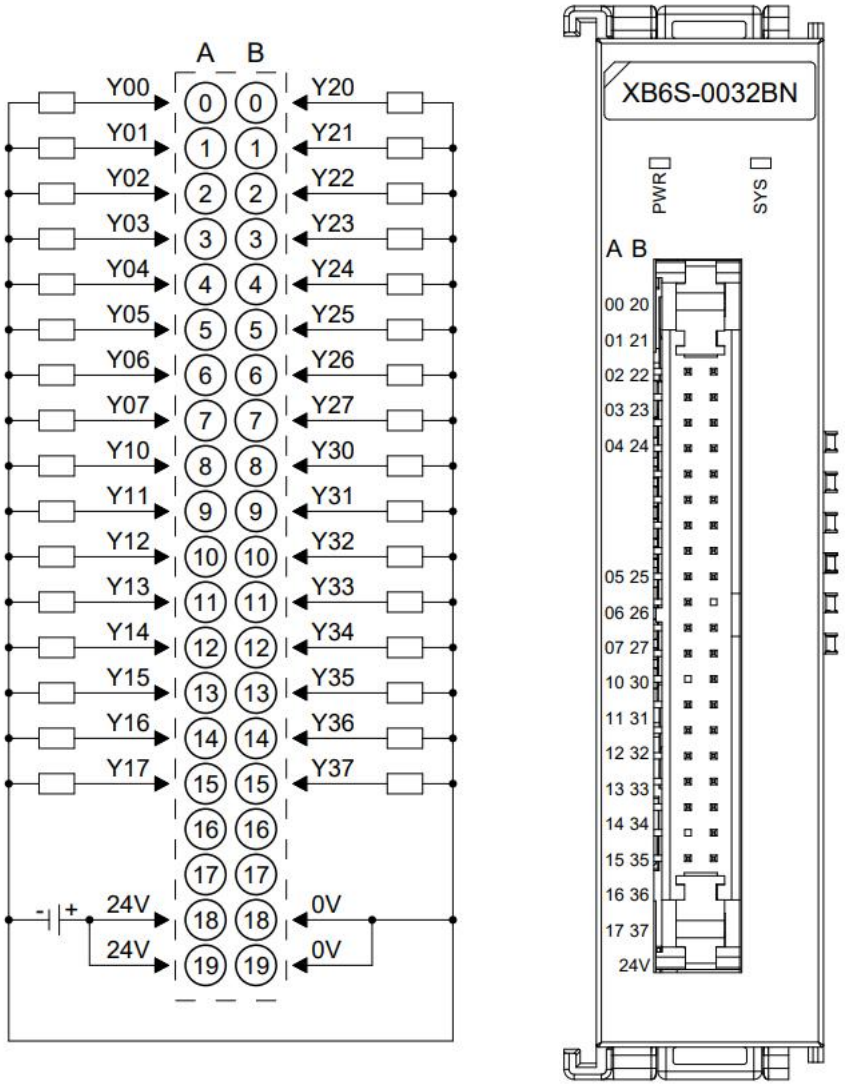
*COM internal conduction; NPN/PNP compatible

3.2.4.13 XB6S-0032AN



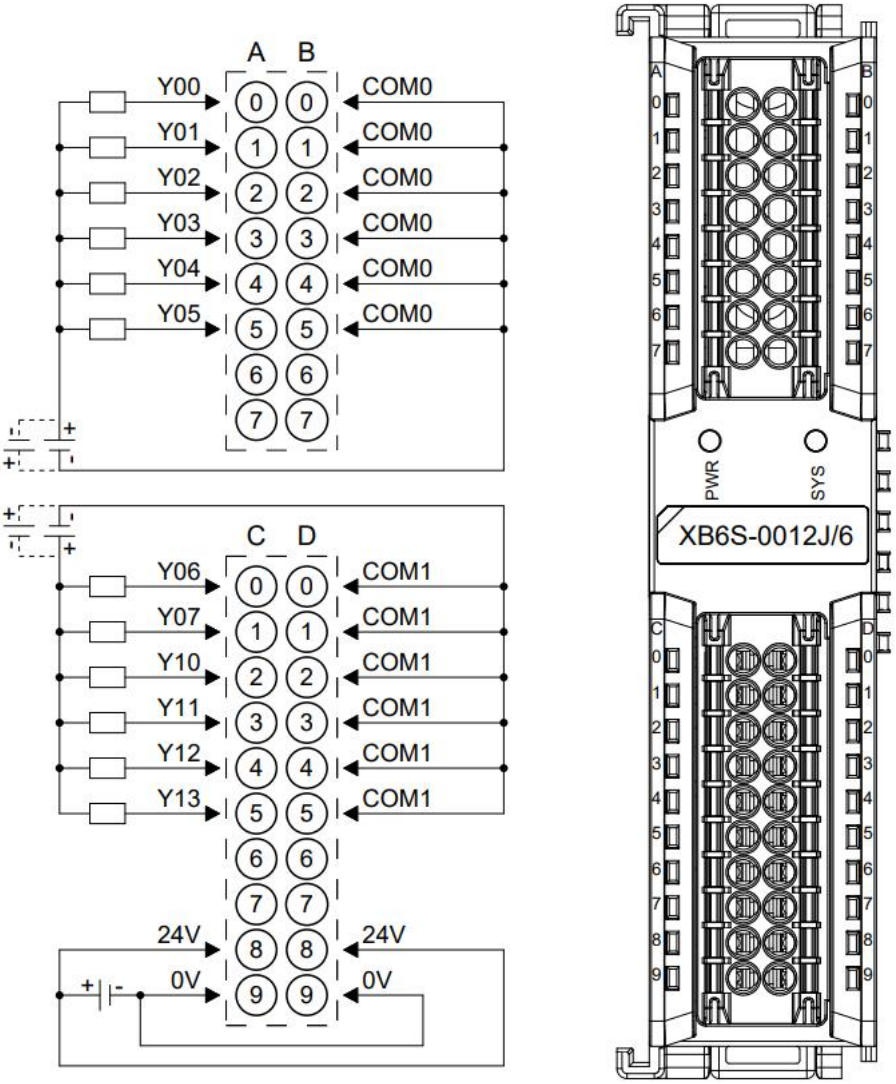
*24V internal conduction; 0V internal conduction

3.2.4.14 XB6S-0032BN



*24V internal conduction; 0V internal conduction

3.2.4.15 XB6S-0012J/6

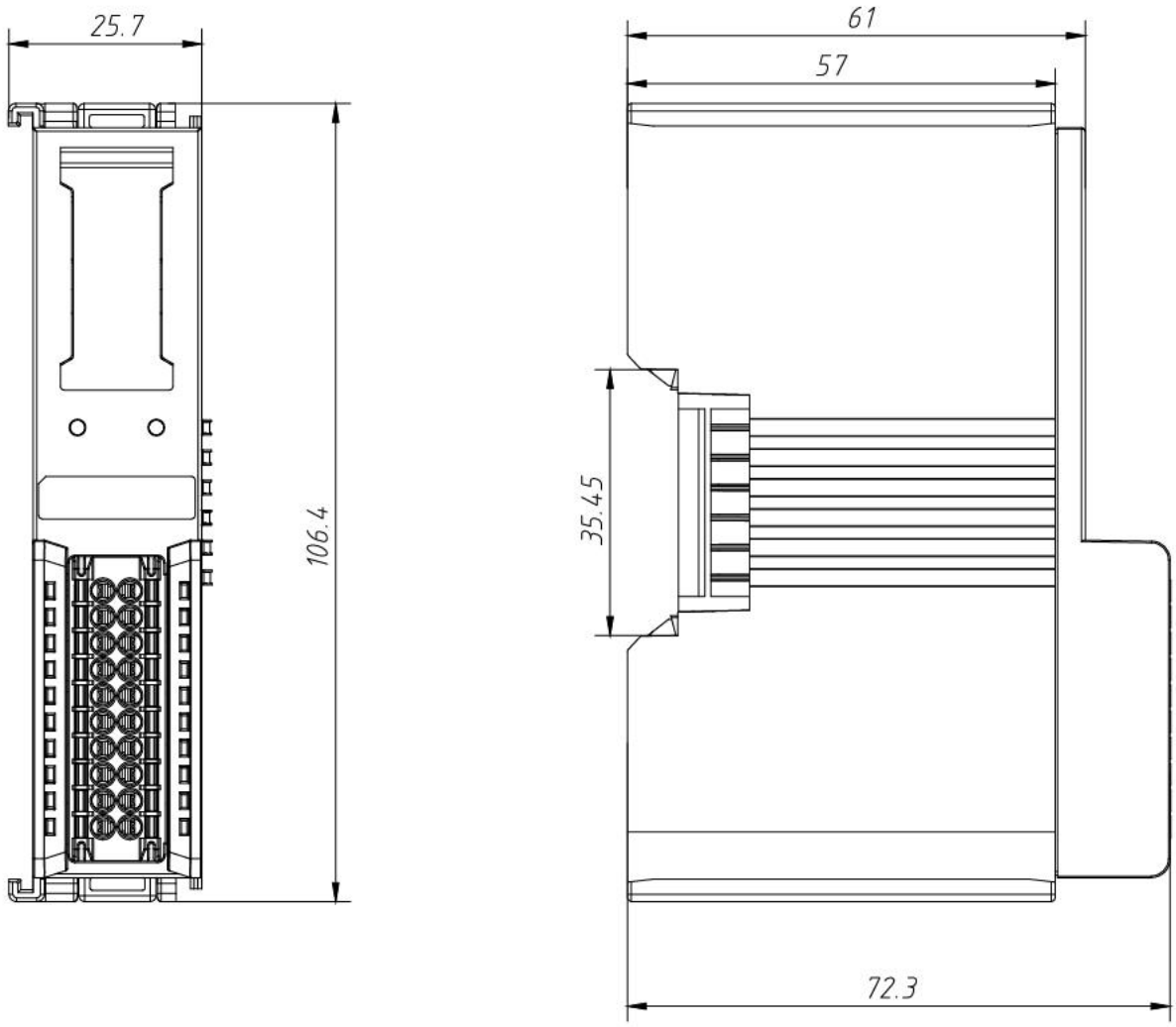


*24V internal conduction; 0V internal conduction

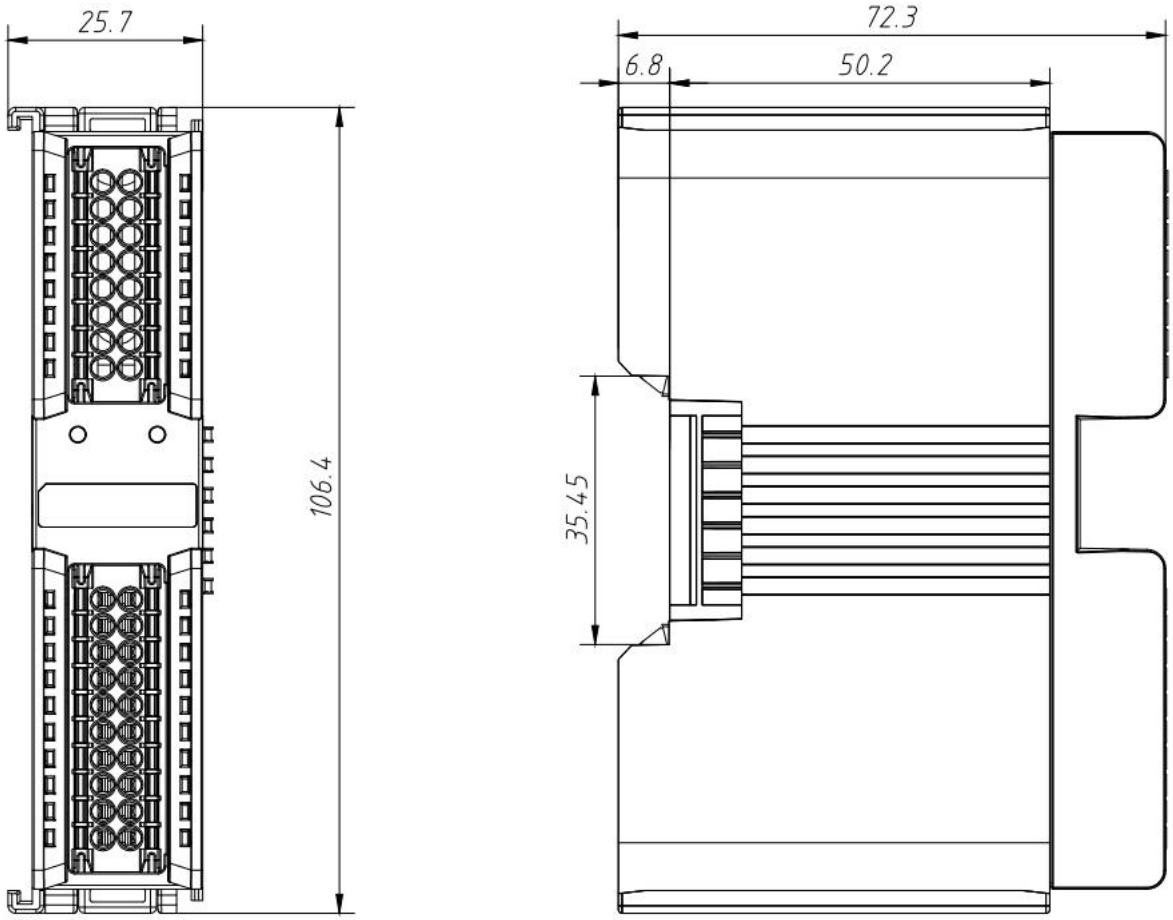
*COM0 is internally conductive; COM1 is internally conductive

3.2.5 Dimensions

8/16 channel digital I/O module dimensions (in mm)

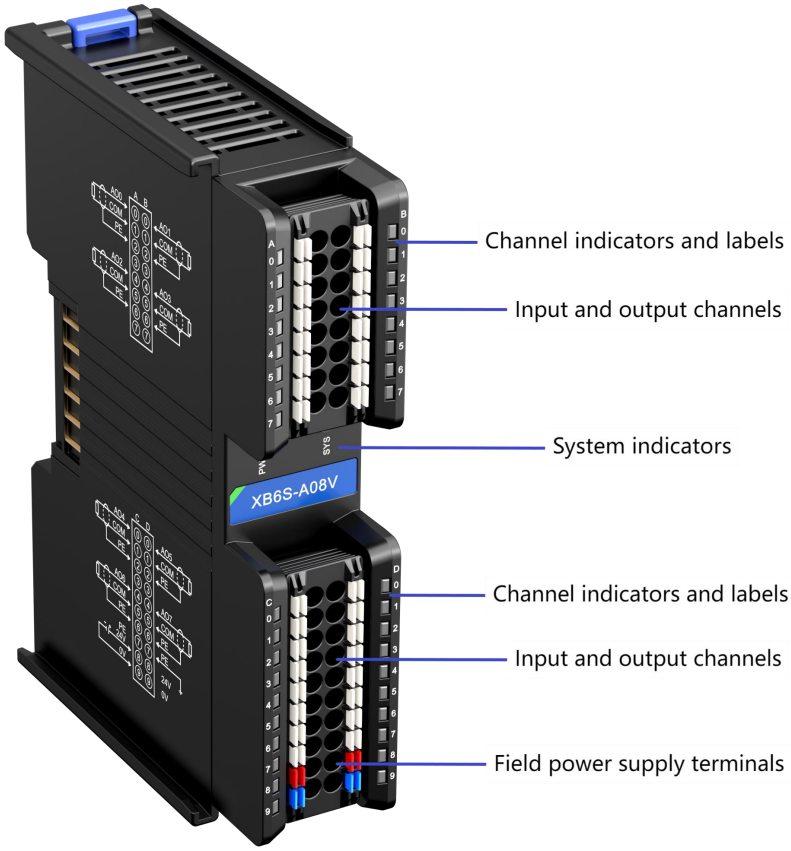


32-channel digital I/O module dimensions (in mm)



3.3 Analog I/O Modules

3.3.1 Panel structure



3.3.2 Indicator light function

Analog I/O module indicator light definition				
Logo	**Name**	**Color**	**State**	**Status description**
PWR	Power indicator	Green	Always on	Power supply is normal
			Off	The product is not powered on or the power supply is abnormal
SYS	Operation status indicator	Green	Always on	The system is running normally
			Flashing 1Hz	No business data interaction, waiting to establish business data interaction
			Flashing 10Hz	Firmware Upgrade
			Off	System not working
0~7	Input channel indicator	Green	Always on	The module channel has signal input
			Off	The module channel has no signal input or the signal input is abnormal
0~7	Output channel	Green	Always on	The module channel has signal output
			Off	The module channel has no signal output or the

	indicator			signal output is abnormal

3.3.3 Technical Parameters

3.3.3.1 Analog input module parameters

Analog input		
Product Model	XB6S-A80VD	XB6S-A80ID
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤210mA	
Enter points	8	8
Input Type	Voltage Type	Current Type
Input signal	Disable、-10V~+10V、0V~10V、-5V~+5V, 0V~5V, 1V~5V (range adjustable, default is -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA, -20mA~+20mA (The range is adjustable, the default is 0mA~20mA)
Input signal type	Differential signal	
Channel response time	550us/ch 850us/8ch	
Resolution	16 bits	
Sampling rate (all channels)	≤1ksps	
Accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range	
Input filtering	Support	
Smoothing series	1~200	
Input impedance (voltage type)	⩾1MΩ	-
Input impedance (current type)	-	≤250Ω
Common mode voltage range	12VAC	-
Maximum voltage allowed by the channel (voltage type)	30V	-
Maximum current allowed by the channel (current type)	-	30mA
The system cannot be affected	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected	
Potential isolation	No isolation between channels, isolation between channels and backplane bus, isolation between channels and supply voltage	
Input overload protection	Support clamp protection	Support current limiting protection

Input protection	±30V	±30mA
Isolation withstand voltage	500VDC	
Rated current consumption	210mA	
Power consumption	1.05W	
Channel indicator light	Green LED light	

Analog input		
Product Model	XB6S-A80V	XB6S-A80I
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤260mA	≤110mA
Enter points	8	8
Input Type	Voltage Type	Current Type
Input signal	Disable、-10V~+10V、0V~10V、-5V~+5V, 0V~5V, 1V~5V (range adjustable, default is -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA (The range is adjustable, the default is 0mA~20mA)
Input signal type	Single-ended signal	
Channel response time	560us/ch 770us/8ch	
Resolution	16 bits	
Sampling rate (all channels)	≤1ksps	
Accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range	
Input filtering	support	
Smoothing series	1~200	
Input impedance (voltage type)	⩾400kΩ	-
Input impedance (current type)	-	≤100Ω
Maximum voltage allowed by the channel (voltage type)	30V	-
Maximum current allowed by the channel (current type)	-	30mA
The system cannot be affected	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected	
Potential isolation	No isolation between channels, isolation between channels and backplane bus, isolation between channels and supply voltage	
Input overload protection	Support clamp protection	Support current limiting protection
Input protection	±30V	±30mA

Isolation withstand voltage	500VDC	
Rated current consumption	260mA	110mA
Power consumption	1.35W	0.55W
Channel indicator light	Green LED light	

Analog input		
Product Model	XB6S-A40VD	XB6S-A40ID
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤150mA	
Enter points	4	4
Input Type	Voltage Type	Current Type
Input signal	Disable、-10V~+10V、0V~10V、-5V~+5V, 0V~5V, 1V~5V (range adjustable, default is -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA, -20mA~+20mA (The range is adjustable, the default is 0mA~20mA)
Input signal type	Differential signal	
Channel response time	300us/ch 600us/4ch	
Resolution	16 bits	
Sampling rate (all channels)	≤1ksps	
Accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range	
Input filtering	Support	
Smoothing series	1~200	
Input impedance (voltage type)	⩾1MΩ	-
Input impedance (current type)	-	≤250Ω
Common mode voltage range	12VAC	-
Maximum voltage allowed by the channel (voltage type)	30V	-
Maximum current allowed by the channel (current type)	-	30mA
The system cannot be affected	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected	
Potential isolation	No isolation between channels, isolation between channels and backplane bus, isolation between channels and supply voltage	

Input overload protection	Support clamp protection	Support current limiting protection
Input protection	±30V	±30mA
Isolation withstand voltage	500VDC	
Rated current consumption	150mA	
Power consumption	0.75W	
Channel indicator light	Green LED light	

Analog input		
Product Model	XB6S-A40V	XB6S-A40I
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤180mA	≤100mA
Enter points	4	4
Input Type	Voltage Type	Current Type
Input signal	Disable、-10V~+10V、0V~10V、-5V~+5V, 0V~5V, 1V~5V (range adjustable, default is -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA (The range is adjustable, the default is 0mA~20mA)
Input signal type	Single-ended signal	
Channel response time	400us/ch 700us/4ch	300us/ch 600us/4ch
Resolution	16 bits	
Sampling rate (all channels)	≤1ksps	
Accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range	
Input filtering	support	
Smoothing series	1~200	
Input impedance (voltage type)	⩾400kΩ	-
Input impedance (current type)	-	≤100Ω
Maximum voltage allowed by the channel (voltage type)	30V	-
Maximum current allowed by the channel (current type)	-	30mA
The system cannot be affected	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected	
Potential isolation	No isolation between channels, isolation between channels and backplane bus, isolation between channels and supply voltage	

Input overload protection	Support clamp protection	Support current limiting protection
Input protection	±30V	±30mA
Isolation withstand voltage	500VDC	
Rated current consumption	180mA	100mA
Power consumption	0.95W	0.5W
Channel indicator light	Green LED light	

3.3.3.2 Analog output module parameters

Analog output		
Product Model	XB6S-A08V	XB6S-A08I
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤100mA	
Field side input voltage range	24VDC (20.4V~28.8V)	
Output points	8	8
Output Type	Voltage Type	Current Type
Output signal	Disable、-10V~+10V、0V~10V、-5V~+5V, 0V~5V, 1V~5V (range adjustable, default is -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA (The range is adjustable, the default is 0mA~20mA)
Channel response time	400us/ch 400us/8ch	
Resolution	16 bits	
Accuracy	±0.1% at 25℃, ±0.3% over the entire temperature range	
Load impedance (voltage type)	≥2kΩ (1kΩ accuracy: ±3‰ at 25℃, ±5‰ at full temperature)	-
Load impedance (current type)	-	≤500Ω
The system cannot be affected	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected	
Output protection	Overload protection, open circuit protection, short circuit protection (all with automatic recovery mechanism)	
Potential isolation	No isolation between channels, isolation between channels and backplane bus, isolation between channels and supply voltage	
Isolation withstand voltage	500VDC	
Rated current consumption	100mA	
Power consumption	0.5W	
Clear and keep optional functions in non-OP state	Support	
Channel indicator light	Green LED light	

Analog output		
Product Model	XB6S-A04V	XB6S-A04I
Bus input power rated voltage	5VDC (4.5V~5.5V)	
Bus input power rated current	≤80mA	
Field side input voltage range	24VDC (20.4V~28.8V)	
Output points	4	4
Output Type	Voltage Type	Current Type
Output signal	Disable、-10V~+10V、0V~10V、-5V~+5V, 0V~5V, 1V~5V (range adjustable, default is -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA (The range is adjustable, the default is 0mA~20mA)
Channel response time	200us/ch 200us / 4ch	
Resolution	16 bits	
Accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range	
Load impedance (voltage type)	⩾2kΩ (1kΩ accuracy: ±3‰ at 25℃, ±5‰ at full temperature)	-
Load impedance (current type)	-	⩽500Ω
The system cannot be affected	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected	
Output protection	Overload protection, open circuit protection, short circuit protection (all with automatic recovery mechanism)	
Potential isolation	No isolation between channels, isolation between channels and backplane bus, isolation between channels and supply voltage	
Isolation withstand voltage	500VDC	
Rated current consumption	80mA	
Power consumption	0.4W	
Clear and keep optional functions in non-OP state	Support	
Channel indicator light	Green LED light	

3.3.3.3 General technical parameters

General technical parameters	
Specifications and dimensions	106.4 × 25.7 × 72.3mm
Weight	8-channel AIO: 125g
	4-channel AIO: 105g
Operating temperature	-20℃~+60℃

Storage temperature	-40℃~+80℃
Relative humidity	95%, non-condensing
Altitude	≤2000m
Pollution degree	Level 2
Protection level	IP20
Safety Certification	UL certification, CE certification
Green Environmental Certification	RoHS certification, REACH certification

3.3.4 Analog voltage parameters

3.3.4.1 Voltage input range selection table

Voltage input range selection and code value range					
Range selection	Range	Code value range	Voltage input calculation formula	Voltage output calculation formula	Code value correspondence table
0	Disable: indicates that the channel is disabled.				
1 (default)	-10V~+10V	-32768~32767	D=(65535/20)*U	U=(D*20)/65535	See also3.3.4.3 Voltage Input Code Value Table
2	0V~10V	0~32767	D=(32767/10)*U	U=(D*10)/32767	
3	-10V~+10V	-27648~27648	D=(55296/20)*U	U=(D*20)/55296	
4	0V~10V	0~27648	D=(27648/10)*U	U=(D*10)/27648	
5	-5V~+5V	-27648~27648	D=(55296/10)*U	U=(D*10)/55296	
6	0V~5V	0~27648	D=(27648/5)*U	U=(D*5)/27648	
7	1V~5V	0~27648	D=(27648/4)*U-6912	U=(D+6912)*4/27648	

Note: D represents the code value, U represents the voltage, and the analog voltage input module range defaults to 1: -10V~+10V (-32768~32767).

3.3.4.2 Voltage output range selection table

Voltage output range selection and code value range					
Range selection	Range	Code value range	Voltage input calculation formula	Voltage output calculation formula	Code value correspondence table
0	Disable: indicates that the channel is disabled.				
1 (default)	-10V~+10V	-32768~32767	D=(65535/20)*U	U=(D*20)/65535	See also3.3.4.4 Voltage output code value table
2	0V~10V	0~32767	D=(32767/10)*U	U=(D*10)/32767	
3	-10V~+10V	-27648~27648	D=(55296/20)*U	U=(D*20)/55296	
4	0V~10V	0~27648	D=(27648/10)*U	U=(D*10)/27648	
5	-5V~+5V	-27648~27648	D=(55296/10)*U	U=(D*10)/55296	
6	0V~5V	0~27648	D=(27648/5)*U	U=(D*5)/27648	
7	1V~5V	0~27648	D=(27648/4)*U-6912	U=(D+6912)*4/27648	

Note: D represents the code value, U represents the voltage, and the analog voltage output module range defaults to 1: -10V~+10V (-32768~32767).

3.3.4.3 Voltage Input Code Value Table

Range / Voltage	-10V~+10V	0V~10V	-10V~+10V	0V~10V
	-32768~32767	0~32767	-27648~27648	0~27648
	Code value	Code value	Code value	Code value
-10.13	-	-	-27980	-
-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	-
-0.13	-426	-384	-359	-332
-0.06	-197	-197	-166	-156
0	0	0	0	0
1	3277	3277	2765	2765
2	6554	6554	5530	5530
3	9830	9830	8294	8294
4	13107	13107	11059	11059
5	16384	16384	13824	13824
6	19661	19661	16589	16589
7	22937	22937	19354	19354
8	26214	26214	22118	22118
9	29491	29491	24883	24883
10	32767	32767	27648	27648
10.12	-	-	27980	27980
Code value formula	Code value =(65535/20)*Voltage	Code value =(32767/10)*Voltage	Code value =(55296/20)*Voltage	Code value =(27648/10)*Voltage
Voltage formula	Voltage =(Code value*20) /65535	Voltage =(Code value*10) /32767	Voltage =(Code value*20) /55296	Voltage =(Code value*10) /27648

Note: ① When the voltage input module range is selected as -10V~+10V (-32768~32767), it supports the overflow function, that is, when the channel input voltage is greater than 10V, the maximum code value 32767 is displayed; when the input channel input voltage is less than -10V, the minimum code value is displayed.-32768.

②When the voltage input module range is selected as 0V~10V (0~32767), it supports underflow, overshoot, overflow and underflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within

-0.13V~+10V. When the channel input voltage is greater than 10V, the maximum code value 32767 is displayed; when the input channel input voltage is less than -0.13V, the minimum overshoot code value is displayed.-384,Simultaneous alarm.

③Voltage input module range selection -10V~+10V(-27648~27648) supports overshoot, overflow, underflow and underflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within -10.13V~+10.12V. Underflow means that when the channel input voltage is greater than 10.12V, the maximum overshoot code value 27980 is displayed, and an alarm is issued at the same time; when the input channel input voltage is less than -10.13V, the minimum overshoot code value is displayed-27980, alarm at the same time.

④Voltage input module range selection 0V~10V (0~27648) supports overshoot, overflow, and overflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within -0.13V~+10.12V. Overflow means that when the channel input voltage is greater than 10.12V, the maximum overshoot code value 27980 is displayed, and an alarm is issued at the same time; when the input channel input voltage is less than -0.13V, the minimum overshoot code value is displayed-332, alarm at the same time.

Range / Voltage	-5V~+5V	0V~5V	1V~5V
	-27648~27648	0~27648	0~27648
	Code value	Code value	Code value
-5.07	-27980	-	-
-5	-27648	-	-
-4	-22118	-	-
-3	-16588	-	-
-2	-11060	-	-
-1	-5530	-	-
-0.07	-332	-332	-
0	0	0	-
0.94	5198	5198	-345
1	5530	5530	0
2	11060	11060	6912
3	16588	16588	13824
4	22118	22118	20736
5	27648	27648	27648
5.06	27980	27980	27933
Code value formula	Code value=(55296/10)*Voltage	Code value=(27648/5)*Voltage	Code value=(27648/4)*Voltage-6912
Voltage formula	Voltage=(Code value*10)/55296	Voltage=(Code value*5)/27648	Voltage=(Code value+6912)*4/27648

Note:①When the voltage input module range is -5V~+5V (-27648~27648), it supports overshoot, overflow, and overflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within -5.07V~+5.06V. When the channel input voltage is greater than 5.06V, the maximum overshoot code value 27980 is

displayed, and an alarm is issued at the same time; when the input channel input voltage is less than -5.07V, the minimum overshoot code value -27980 is displayed, and an alarm is issued at the same time.

② The voltage input module range is 0V~5V (0~27648) supports overshoot, overflow, and overflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within -0.07V~+5.06V. Overflow means that when the channel input voltage is greater than 5.06V, the maximum overshoot code value 27980 is displayed, and an alarm is issued at the same time; when the input channel input voltage is less than -0.07V, the minimum overshoot code value is displayed-332, alarm at the same time.

③The voltage input module range is 1V~5V (0~27648) supports overshoot, overflow, underflow and underflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within 0.94V~5.06V. Underflow means that when the channel input voltage is greater than 5.06V, the maximum overshoot code value 27933 is displayed, and an alarm is issued at the same time; when the input channel input voltage is less than 0.94V, the minimum overshoot code value is displayed-345, alarm at the same time.

3.3.4.4 Voltage output code value table

Range / Voltage	-10V~+10V	0V~10V	-10V~+10V	0V~10V
	-32768~32767	0~32767	-27648~27648	0~27648
	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	6554	5530	5530
3	9830	9830	8294	8294
4	13107	13107	11059	11059
5	16384	16384	13824	13824
6	19661	19661	16589	16589
7	22937	22937	19354	19354
8	26214	26214	22118	22118
9	29491	29491	24883	24883
10	32767	32767	27648	27648
Code value formula	Code value =(65535/20)*Voltage	Code value =(32767/10)*Voltage	Code value =(55296/20)*Voltage	Code value =(27648/10)*Voltage
Voltage formula	Voltage =(Code value*20) /65535	Voltage =(Code value*10) /32767	Voltage =(Code value*20) /55296	Voltage =(Code value*10) /27648

Note: ①The voltage output module supports overflow and underflow functions.When the voltage output module range is selected as -10V~+10V or 0V~10V and the code value is set greater than the maximum code value corresponding to the range, all channels output 10V voltage;

When the voltage output module range is -10V~+10V and the code value is set to be less than the minimum code value corresponding to the range, all channels output -10V voltage;

When the voltage output module range is selected as 0V~10V and the code value is set to be less than the minimum code value corresponding to the range, all channels output 0V voltage.

Range / Voltage	-5V~+5V	0V~5V	1V~5V
	-27648~27648	0~27648	0~27648
	Code value	Code value	Code value
-5	-27648	-	-
-4	-22118	-	-
-3	-16588	-	-
-2	-11060	-	-
-1	-5530	-	-
0	0	0	-
1	5530	5530	0
2	11060	11060	6912
3	16588	16588	13824
4	22118	22118	20736
5	27648	27648	27648
Code value formula	Code value=(55296/10)*Voltage	Code value=(27648/5)*Voltage	Code value=(27648/4)*Voltage-6912
Voltage formula	Voltage=(Code value*10)/55296	Voltage=(Code value*5)/27648	Voltage=(Code value+6912)*4/27648

Note:①The voltage output module supports overflow and underflow functions.When the voltage output module range is -5V~+5V/0V~5V/1V~5V and the code value is set greater than the maximum code value corresponding to the range, all channels output 5V voltage;

When the voltage output module range is -5V~+5V and the code value is set to be less than the minimum code value corresponding to the range, all channels output -5V voltage;

When the voltage output module range is selected as 0V~5V and the code value is set to be less than the minimum code value corresponding to the range, all channels output 0V voltage;

When the voltage output module range is selected as 1V~5V and the code value is set to be less than the minimum code value corresponding to the range, all channels output 1V voltage.

3.3.5 Analog current parameters

3.3.5.1 Current input range selection table

Current input range selection and code value range					
Range selection	Range	Code value range	Current input calculation formula	Current output calculation formula	Code value correspondence table
0	Disable: indicates that the channel is disabled.				
1	4mA~20mA	0~65535	D=(65535/16)*I-16384	I=(D+16384)*16/65535	See also3.3.5.3 Current input code value table
2 (default)	0mA~20mA	0~65535	D=(65535/20)*I	I=(D*20)/65535	
3	4mA~20mA	0~27648	D=(27648/16)*I-6912	I=((D+6912)*16)/27648	
4	0mA~20mA	0~27648	D=(27648/20)*I	I=(D*20)/27648	
5	-20mA~+20mA	0~65535	D=(65535/40)*(I+20)	I=(D*40)/65535-20	

Note: D represents the code value, I represents the current, and the default range of the analog current input module is 2: 0mA~20mA (0~65535).

Range 5: -20mA~+20mA (0~65535) is unique to the current input differential signal module.

3.3.5.2 Current output range selection table

Current output range selection and code value range					
Range selection	Range	Code value range	Current input calculation formula	Current output calculation formula	Code value correspondence table
0	Disable: indicates that the channel is disabled.				
1	4mA~20mA	0~65535	D=(65535/16*I)-16384	I=(D+16384)*16/65535	See also3.3.5.4 Current output code value table
2 (default)	0mA~20mA	0~65535	D=(65535/20)*I	I=(D*20)/65535	
3	4mA~20mA	0~27648	D=(27648/16)*I-6912	I=((D+6912)*16)/27648	
4	0mA~20mA	0~27648	D=(27648/20)*I	I=(D*20)/27648	

Note: D represents the code value, I represents the current, and the analog current output module range defaults to 2: 0mA~20mA (0~65535).

3.3.5.3 Current input code value table

Range / Current	4mA~20mA	0mA~20mA	4mA~20mA	0mA~20mA	-20mA~+20mA
	0~65535	0~65535	0~27648	0~27648	0~65535
	Code value	Code value	Code value	Code value	Code value
-20	-	-	-	-	0
-15	-	-	-	-	8192
-10	-	-	-	-	16384
-9	-	-	-	-	18022

-8	-	-	-	-	19661
-7	-	-	-	-	21299
-6	-	-	-	-	22937
-5	-	-	-	-	24576
-4	-	-	-	-	26214
-3	-	-	-	-	27852
-2	-	-	-	-	29491
-1	-	-	-	-	31129
0	-	0	-	0	32768
1	-	3277	-	1382	34406
2	-	6554	-	2765	36044
3	-	9830	-	4147	37683
4	0	13107	0	5530	39321
5	4096	16384	1728	6912	40959
6	8192	19661	3456	8294	42598
7	12288	22937	5184	9677	44236
8	16384	26214	6912	11059	45875
9	20479	29491	8640	12442	47513
10	24575	32768	10368	13824	49151
11	28671	36044	12096	15206	50790
12	32767	39321	13824	16589	52428
13	36863	42598	15552	17971	54066
14	40959	45875	17280	19354	55705
15	45055	49151	19008	20736	57343
16	49151	52428	20736	22118	58982
17	53247	55705	22464	23501	60620
18	57343	58982	24192	24883	62258
19	61439	62258	25920	26266	63897
20	65535	65535	27648	27648	65535
20.19	-	-	28034	27917	-
20.24	-	-	28085	27986	-
Code value formula	Code value = 65535/16*current-16384	Code value = (65535/20) * current	Code value = (27648/16)*current-6912	Code value = (27648/20) * current	Code value =(65535/40)*(current+20)

Note: Range 5: -20mA~+20mA (0~65535) is unique to the current input differential signal module.

① When the current input module range is selected as 4mA~20mA (0~65535), it supports overflow and overflow alarm functions, that is, when the channel input current is greater than 20.03mA, the maximum code value 65535 is displayed and an alarm is issued; when the input channel input current is less than 4mA, the minimum code value is displayed0.

②When the current input module range is selected from 0mA to 20mA (0 to 65535), it supports overflow, underflow and overflow alarm functions. That is, when the channel input current is greater than 20.03mA, the maximum code value 65535 is displayed and an alarm is issued at the same time.; When the input channel input current is less than 0mA, the minimum code value 0 is displayed.

③When the current input module range is 4mA~20mA (0~27648), it supports overflow, overshoot, overflow, and overflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within 4mA~20.24mA. Overflow means that when the channel input current is greater than 20.24mA, the maximum overshoot code value is displayed.28085When the input current of the input channel is less than 4mA, the minimum overshoot code value 0 is displayed.

④When the current input module range is 0mA~20mA (0~27648), it supports overflow, overshoot, overflow, and overflow alarm functions. Overshoot means that the channel input range exceeds the range and enters overshoot, and the normal calculation code value is displayed within 0mA~20.24mA. Overflow means that when the channel input current is greater than 20.24mA, the maximum overshoot code value is displayed.27986When the input current of the input channel is less than 0mA, the minimum overshoot code value 0 is displayed.

⑤When the current input module range is -20mA~+20mA (0~65535), it supports overflow, underflow and overflow alarm functions. That is, when the channel input current is greater than 20mA, the maximum code value 65535 is displayed and an alarm is issued at the same time.; Input channel input is less than-20mAWhen the current is on, the minimum code value 0 is displayed.

3.3.5.4 Current output code value table

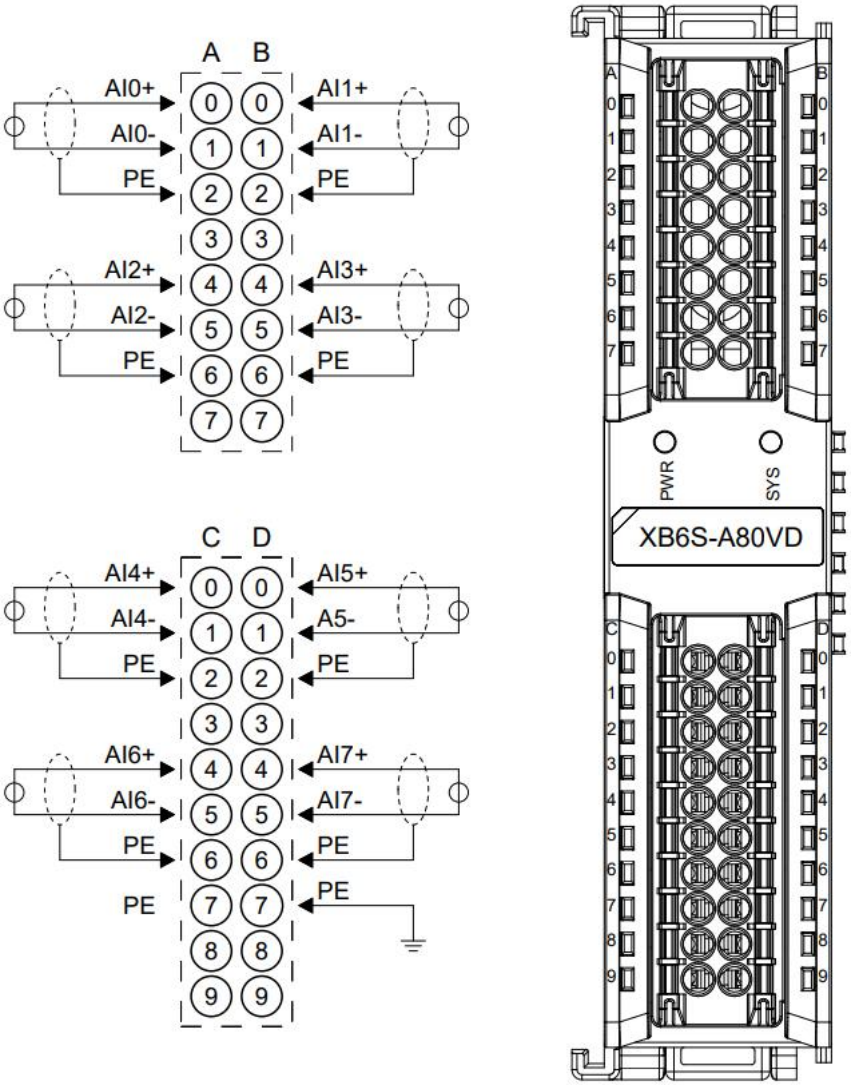
Range / Current	4mA~20mA	0mA~20mA	4mA~20mA	0mA~20mA
	0~65535	0~65535	0~27648	0~27648
	Code value	Code value	Code value	Code value
0	-	0	-	0
1	-	3277	-	1382
2	-	6554	-	2765
3	-	9830	-	4147
4	0	13107	0	5530
5	4096	16384	1728	6912
6	8192	19661	3456	8294
7	12288	22937	5184	9677
8	16384	26214	6912	11059
9	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

22.81	-	-	32511	31538
23.52	-	-	-	32511
Code value formula	Code value = 65535/16*current-16384	Code value = (65535/20) * current	Code value = (27648/16)*current-6912	Code value = (27648/20) * current

Note: ① When the current output module range is 4mA~20mA (0~27648) and 0mA~20mA (0~27648), it supports overflow overshoot, overflow and overflow alarm functions. That is, when the current output module range is 4mA~20mA (0~27648) and the code value is set greater than32511When the current output module is set to 0mA~20mA (0~27648), the code value is set to be greater than32511When , all channels output 23.52mA current and alarm at the same time.

3.3.6 Wiring Diagram

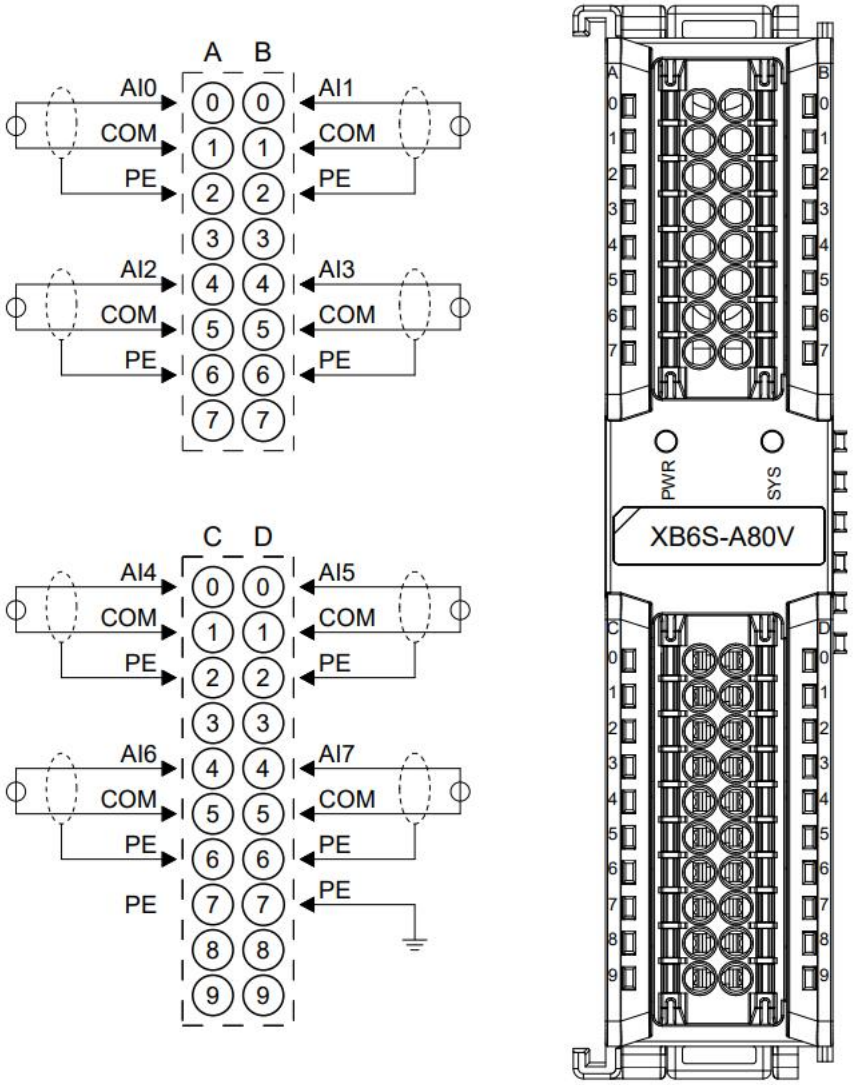
3.3.6.1 XB6S-A80VD



*All PEs are internally conductive

*It is recommended to use shielded twisted pair cables, connect the shield layer to the PE port, and ground it reliably

3.3.6.2 XB6S-A80V

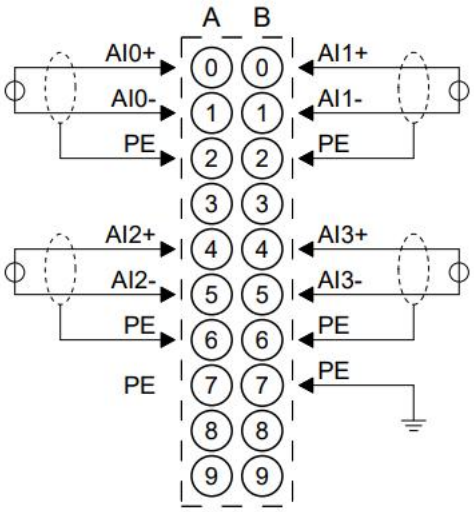


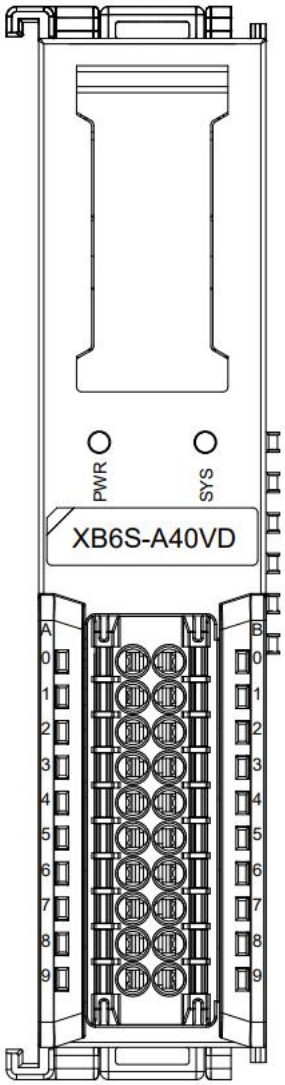
*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

3.3.6.3 XB6S-A40VD

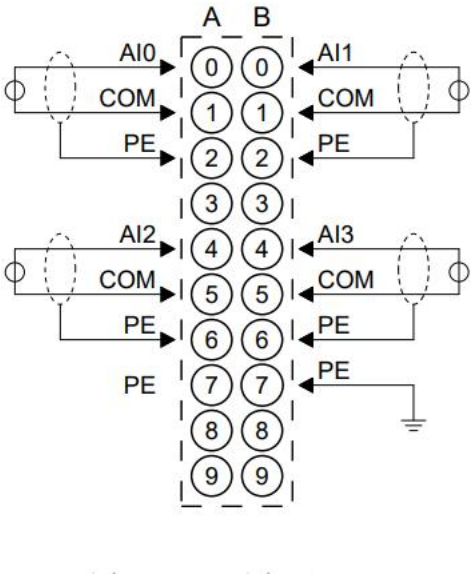


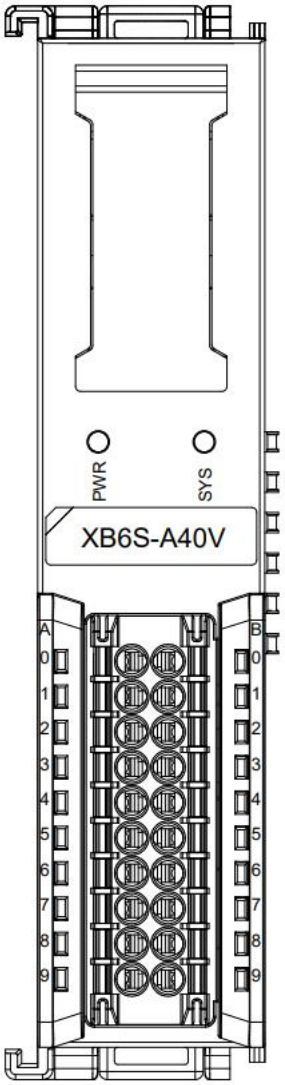


*All PEs are internally conductive

*It is recommended to use shielded twisted pair cables, connect the shield layer to the PE port, and ground it reliably

3.3.6.4 XB6S-A40V



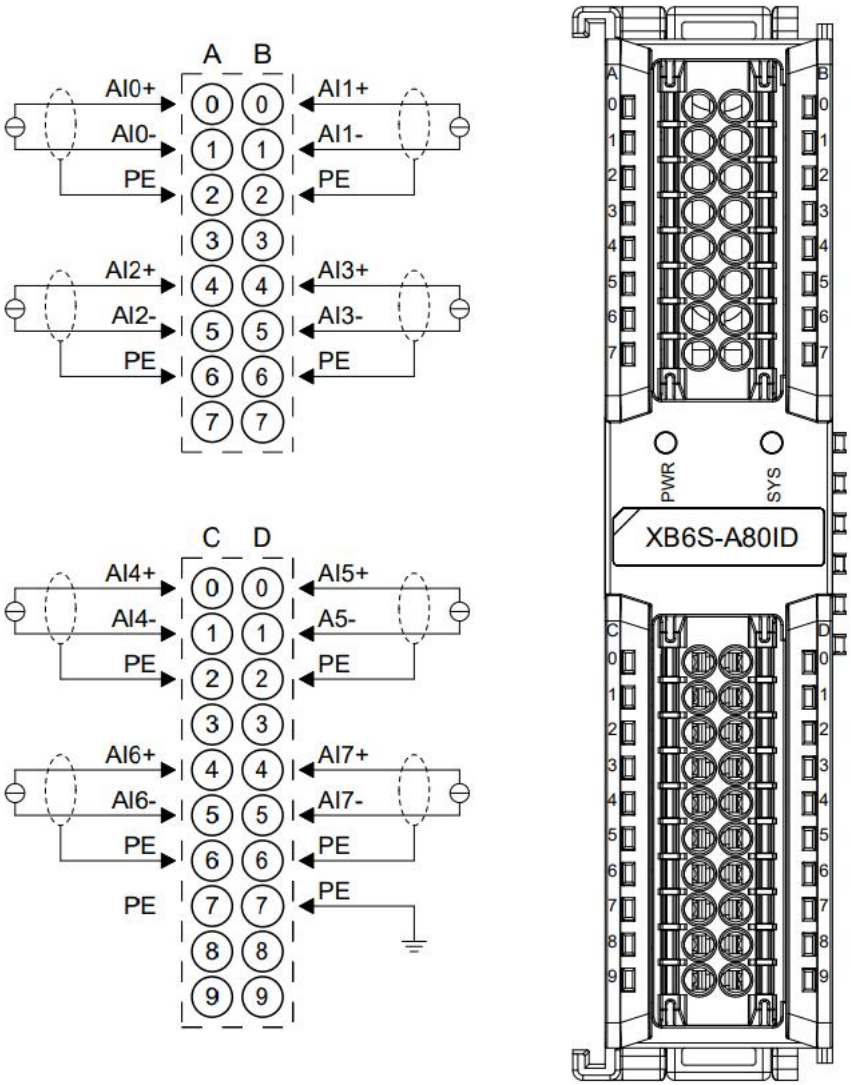


*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

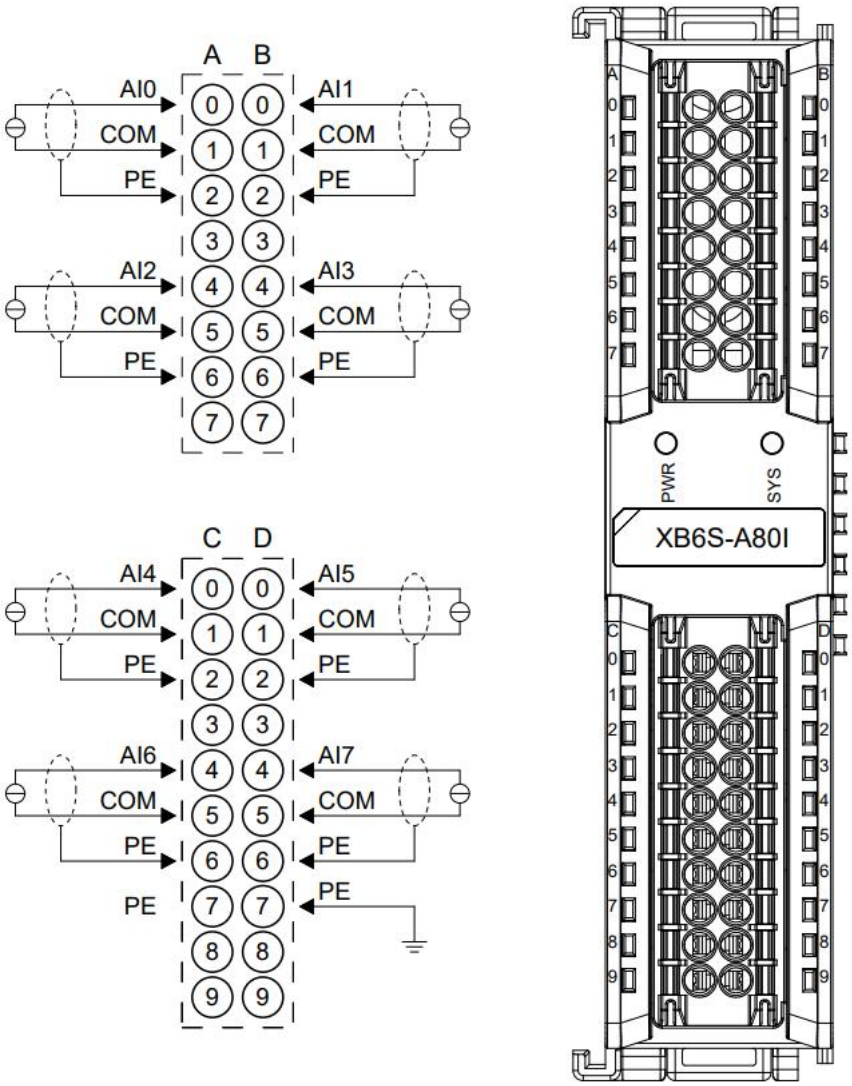
3.3.6.5 XB6S-A80ID



*All PEs are internally conductive

*It is recommended to use shielded twisted pair cables, connect the shield layer to the PE port, and ground it reliably

3.3.6.6 XB6S-A80I

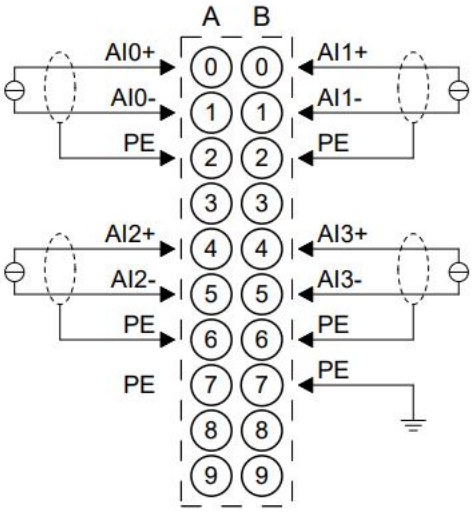


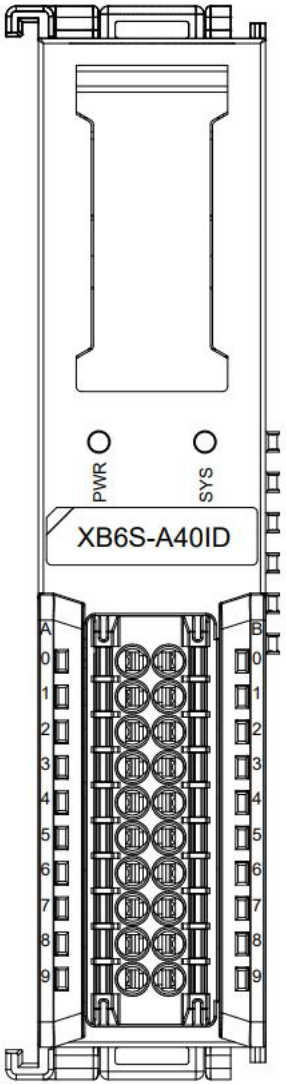
*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

3.3.6.7 XB6S-A40ID

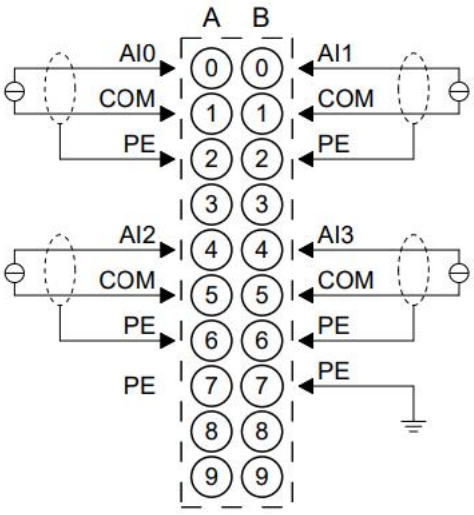


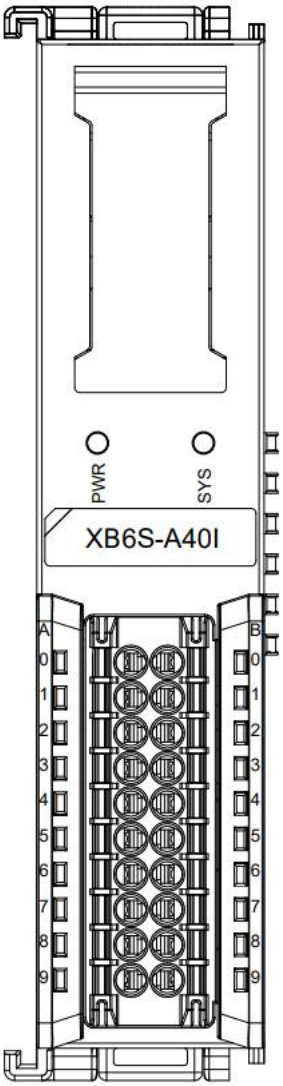


*All PEs are internally conductive

*It is recommended to use shielded twisted pair cables, connect the shield layer to the PE port, and ground it reliably

3.3.6.8 XB6S-A40I



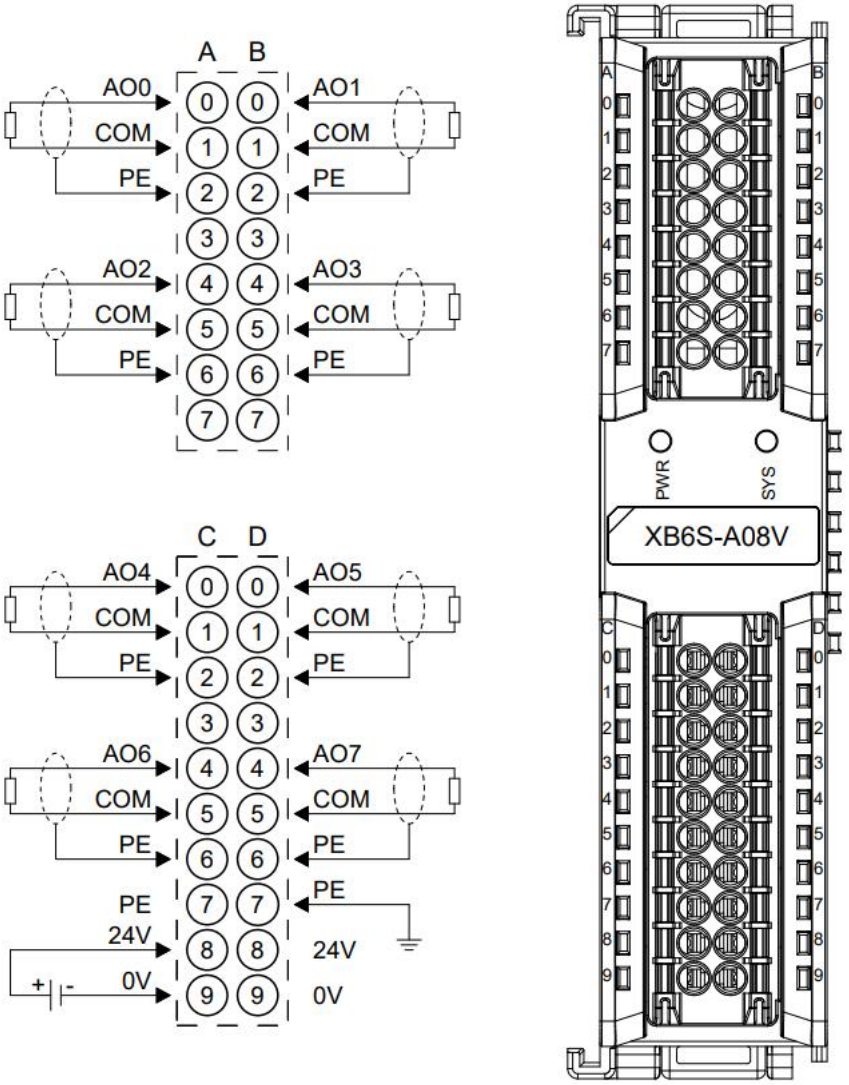


*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

3.3.6.9 XB6S-A08V

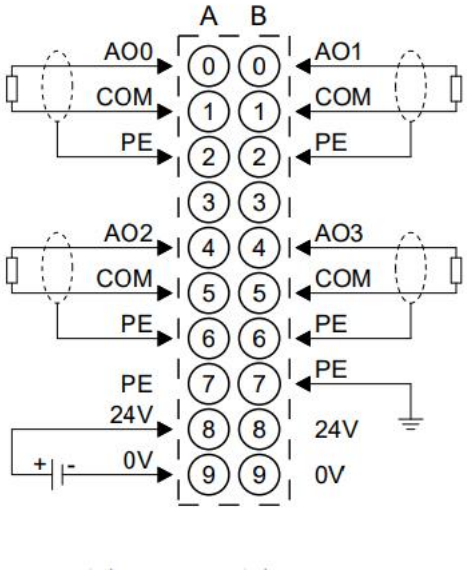


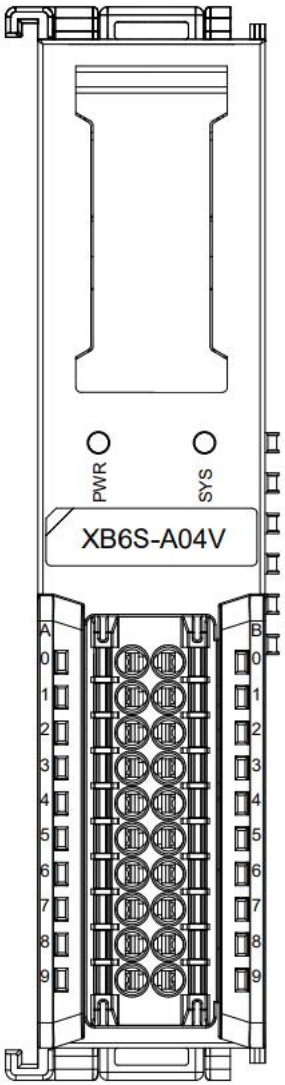
*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

3.3.6.10 XB6S-A04V



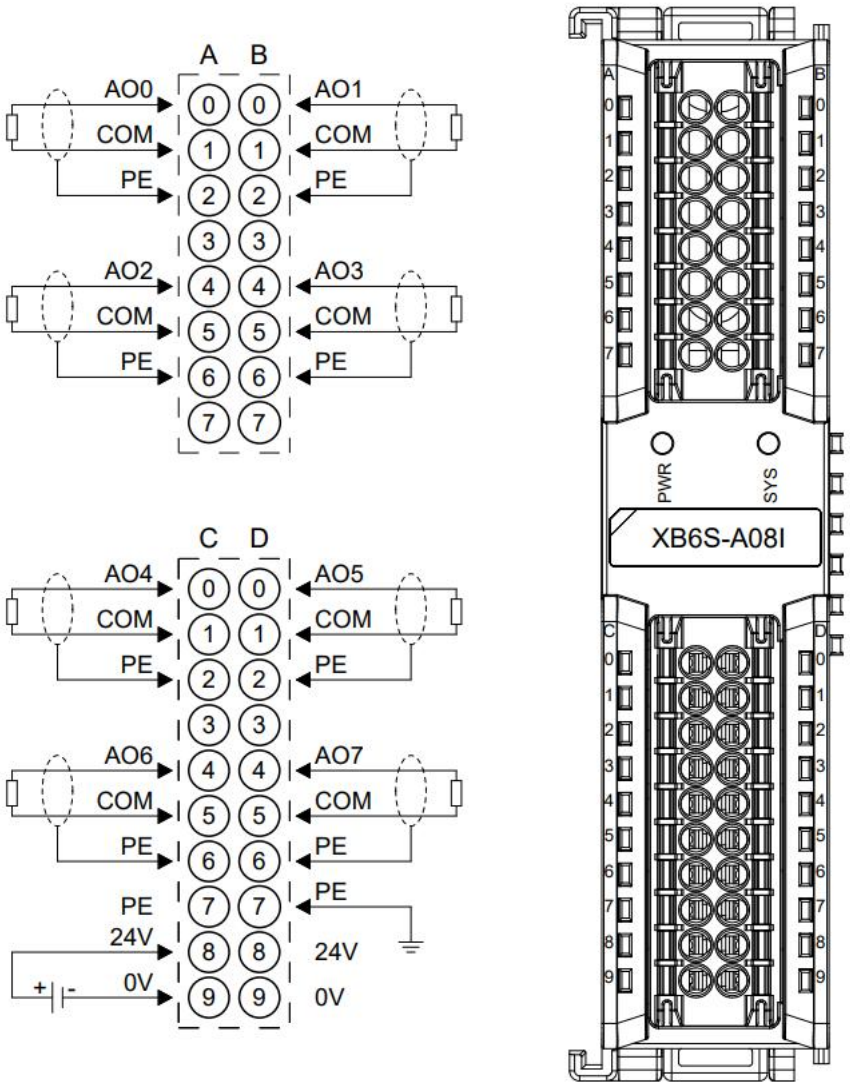


*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

3.3.6.11 XB6S-A08I

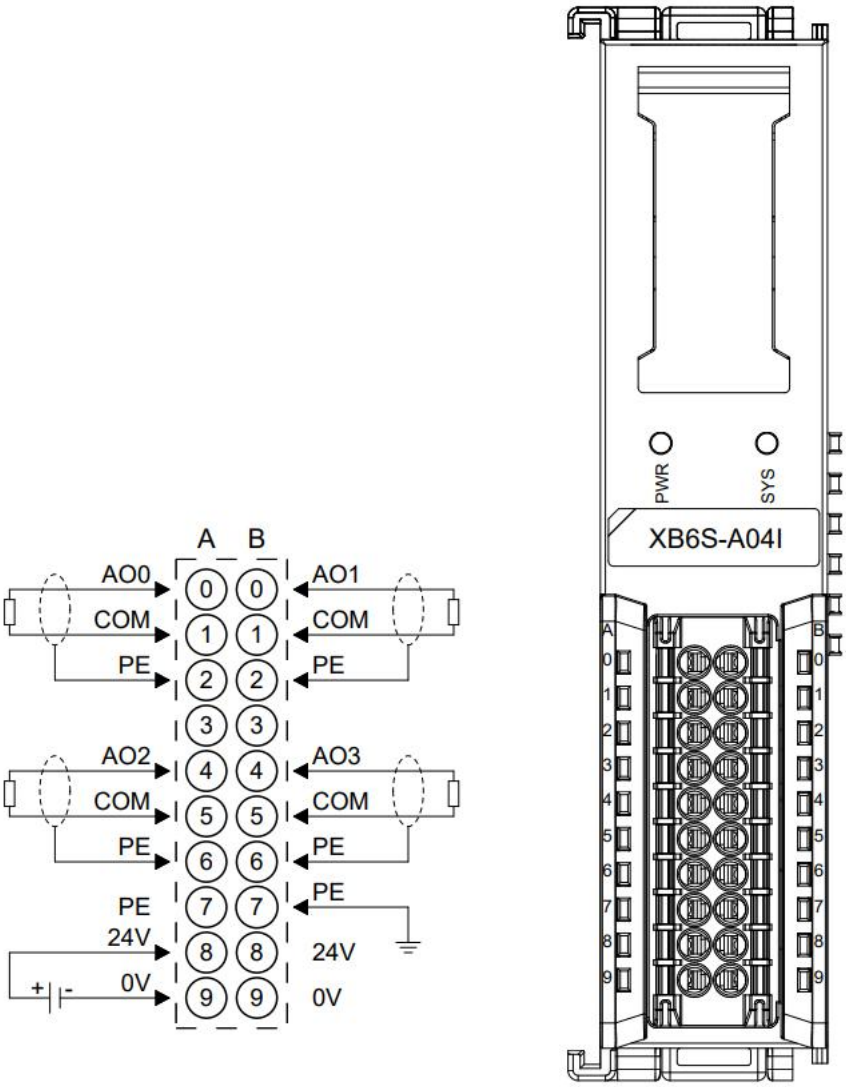


*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

*Shielded twisted pair cables are recommended for signal cables

3.3.6.12 XB6S-A04I



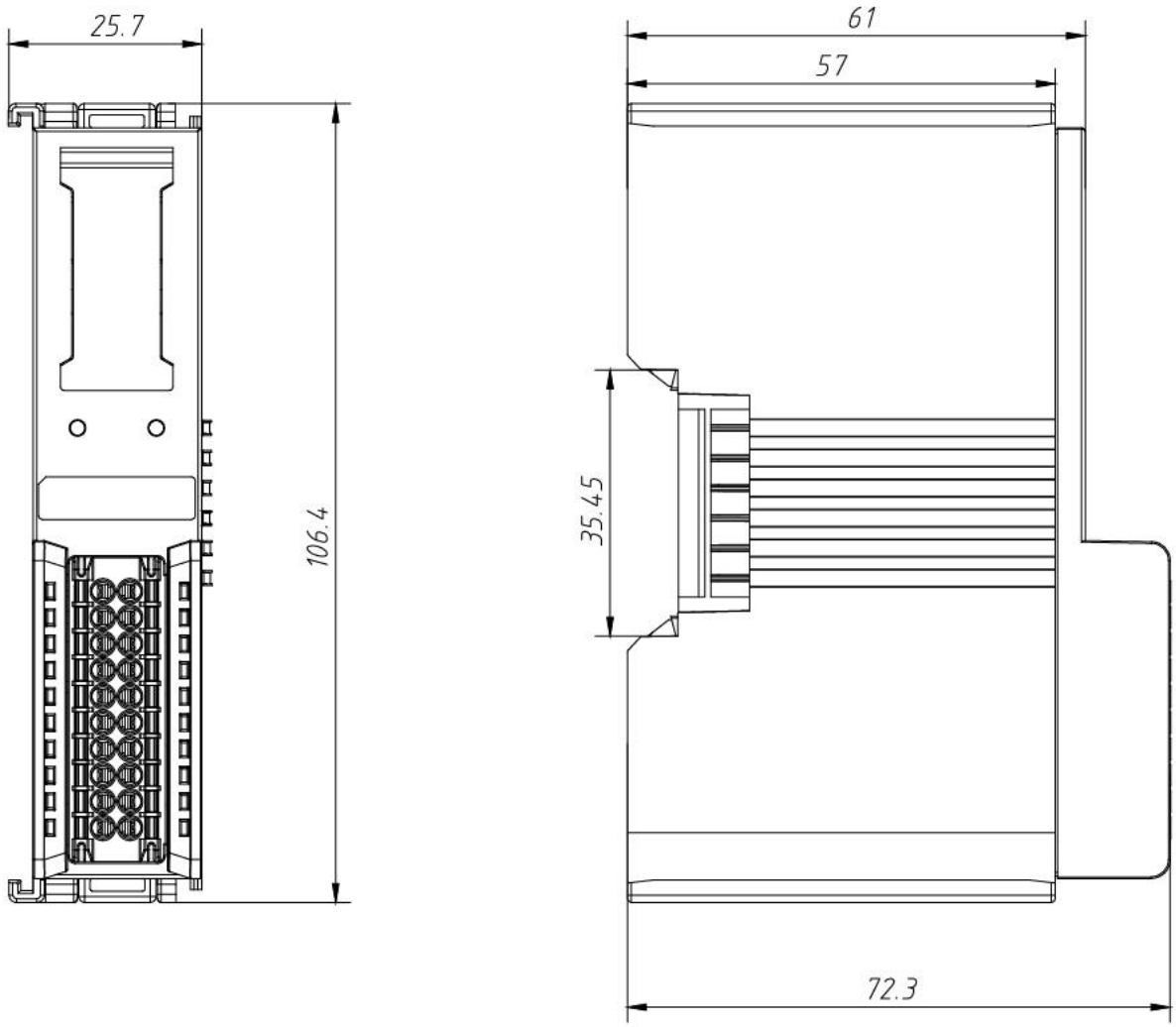
*COM is internally conductive, PE is internally conductive

*All channel loads must be from the same source

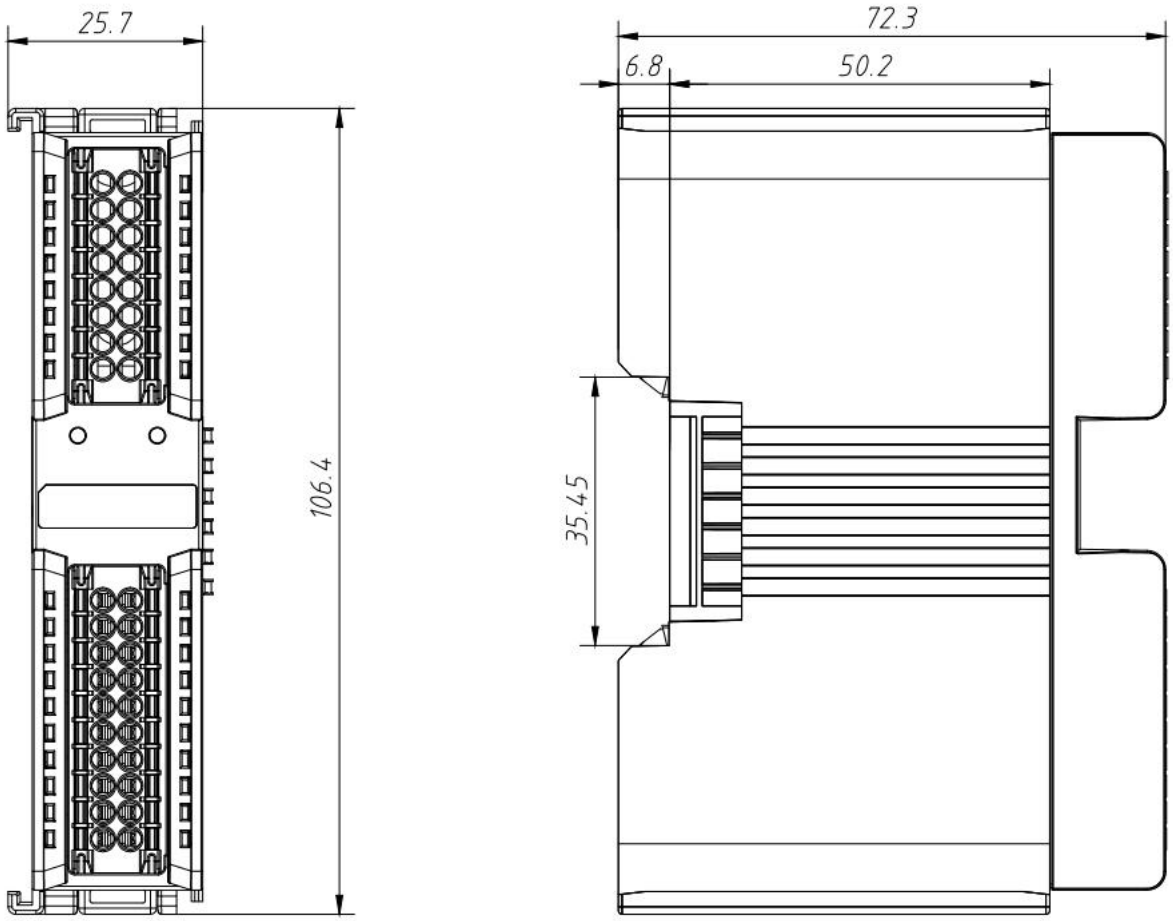
*Shielded twisted pair cables are recommended for signal cables

3.3.7 Dimensions

4-channel analog I/O module dimensions (in mm)

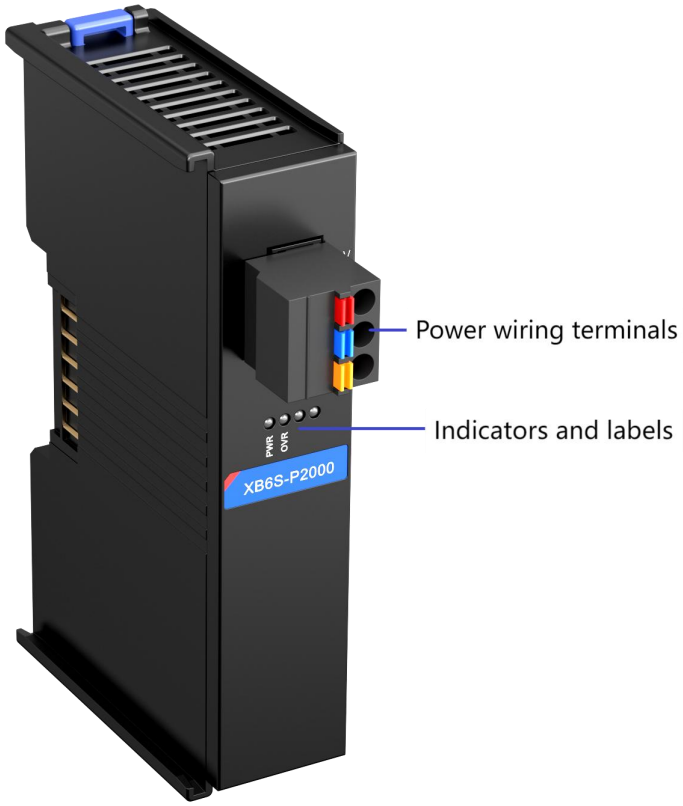


8-channel analog I/O module dimensions (in mm)



3.4 Extension power module

3.4.1 Panel structure



3.4.2 Indicator light function

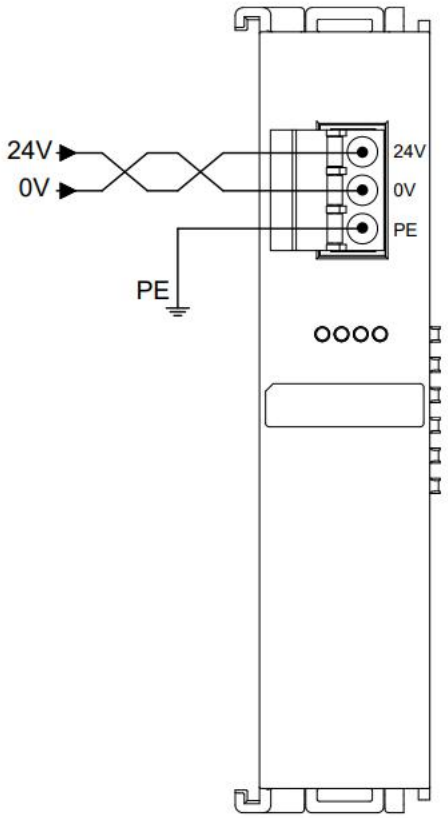
Definition of indicator lights on the extended power module				
Logo	**Name**	**Color**	**State**	**Status description**
PWR	Power indicator	Green	Always on	The module power supply is working properly
			Off	The module is not powered or the power supply is abnormal.
OVR	Overload indicator light	Red	Off	Not overloaded
			Always on	The load reaches more than 90% (±5%)

3.4.3 Technical Parameters

Power parameters	
Input voltage	SELV Input 24VDC (18V~36V)
Input Current	600mA (24VDC)
Output voltage	5VDC
Output Current	2A

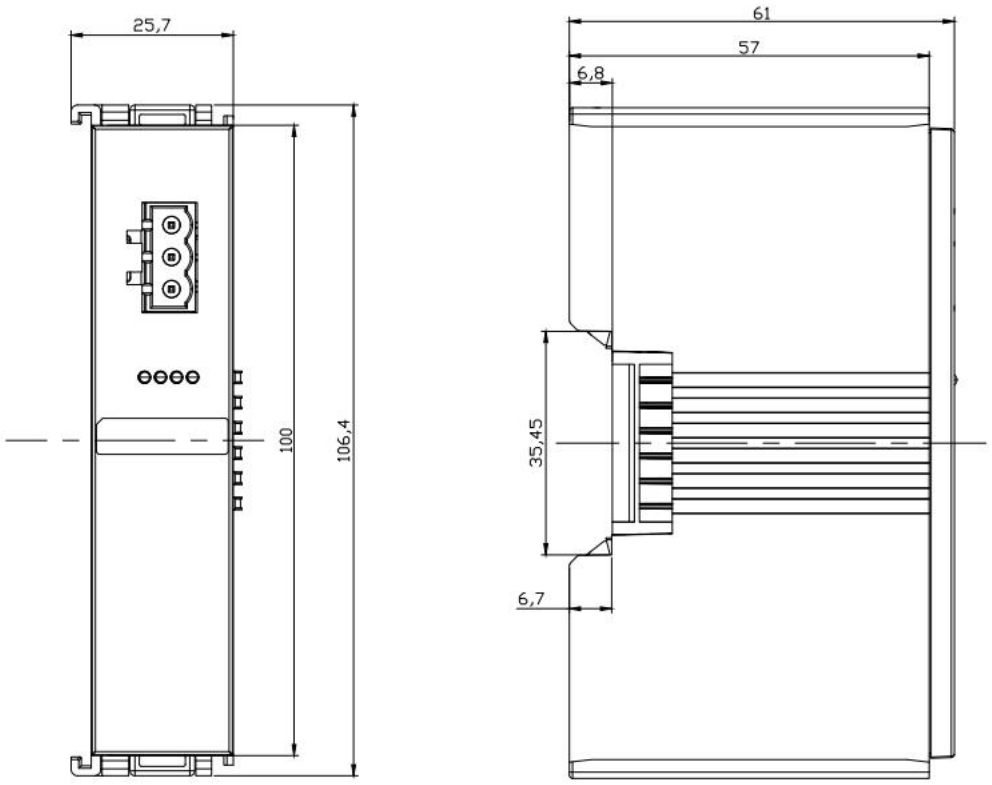
General technical parameters	
Specifications and dimensions	106.4 × 25.7 × 61mm
Weight	110g
Operating temperature	-20℃~+60℃
Storage temperature	-40℃~+80℃
Relative humidity	95%, non-condensing
Altitude	≤2000m
Pollution degree	Level 2
Short circuit protection	Support (automatic recovery mechanism)
Reverse polarity protection	Support (automatic recovery mechanism)
Surge protection	Support
Protection level	IP20
Safety Certification	UL certification, CE certification
Green Environmental Certification	RoHS certification, REACH certification

3.4.4 Wiring Diagram



3.4.5 Dimensions

Extended power supply dimensions (in mm)

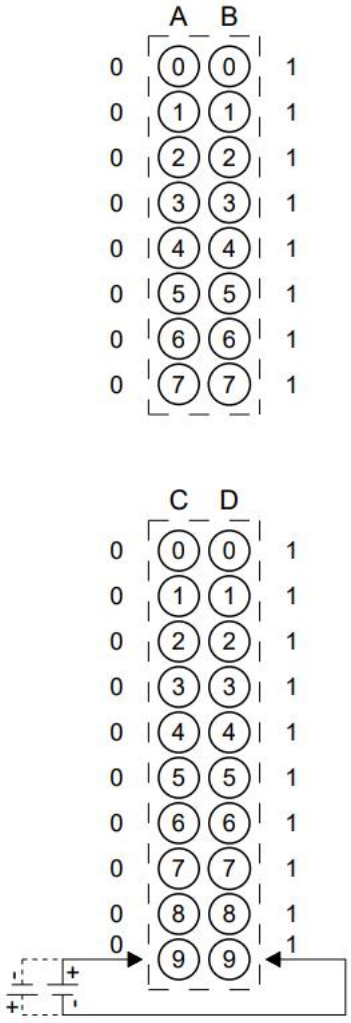


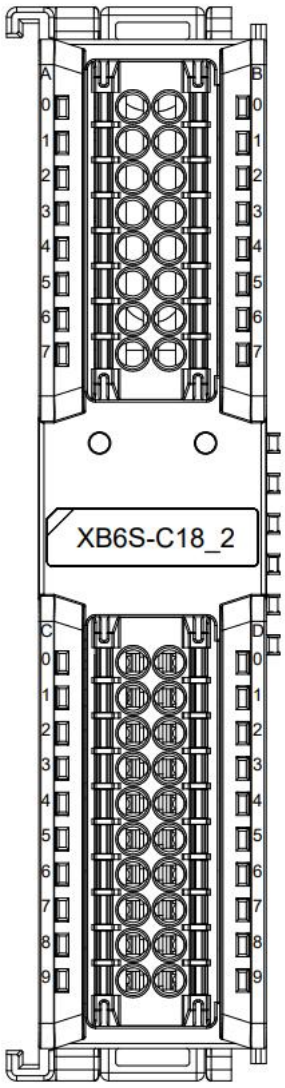
3.5 Common terminal expansion module

3.5.1 Technical Parameters

Common terminal parameters	
Rated voltage	24VDC (18V~36V)
Rated current	8A
Number of public terminals	2 groups
General technical parameters	
Specifications and dimensions	106.4 × 25.7 × 72.3mm
Weight	95g
Operating temperature	-20℃~+60℃
Storage temperature	-40℃~+80℃
Relative humidity	95%, non-condensing
Altitude	≤2000m
Pollution degree	Level 2
Protection level	IP20
Safety Certification	UL certification, CE certification
Green Environmental Certification	RoHS certification, REACH certification

3.5.2 Wiring Diagram

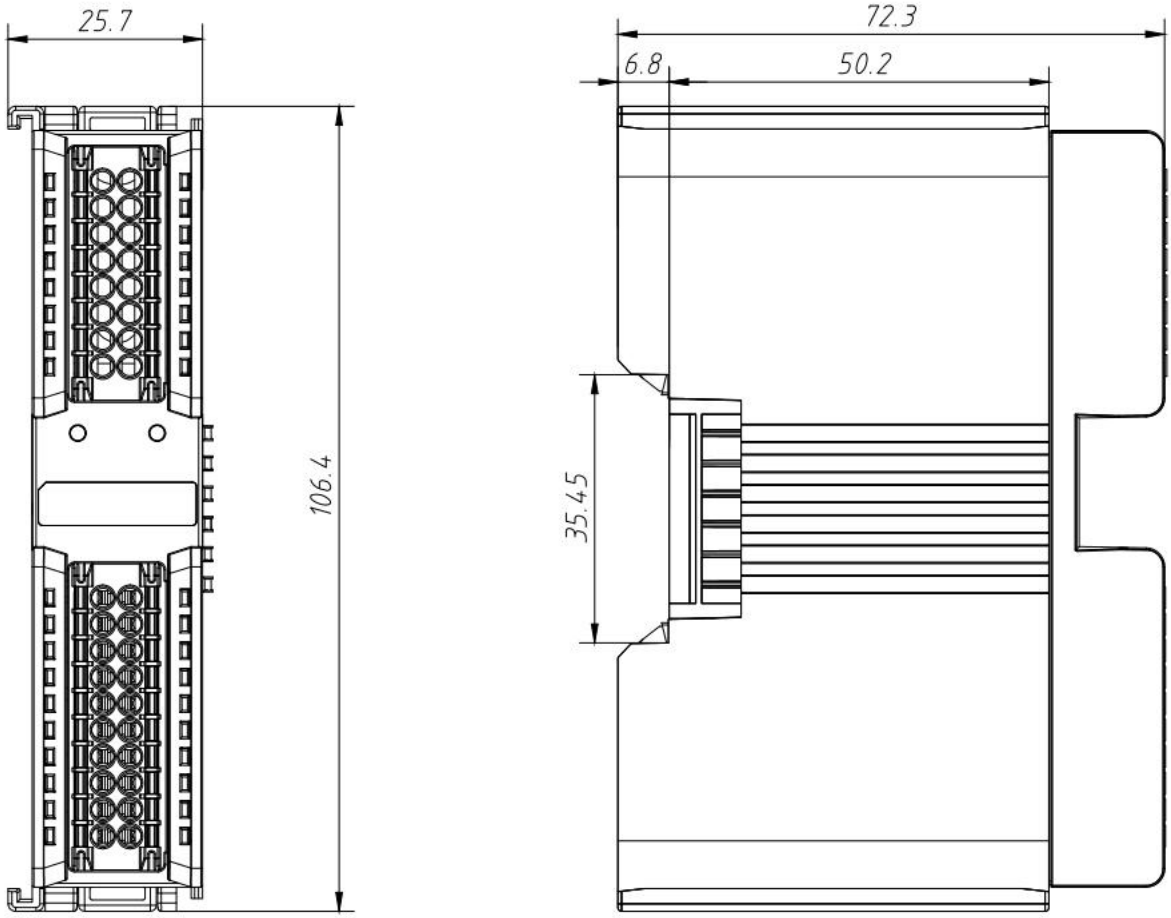




* Channel ID 0 is internally conductive
* Channel ID 1, internal conduction

3.5.3 Dimensions

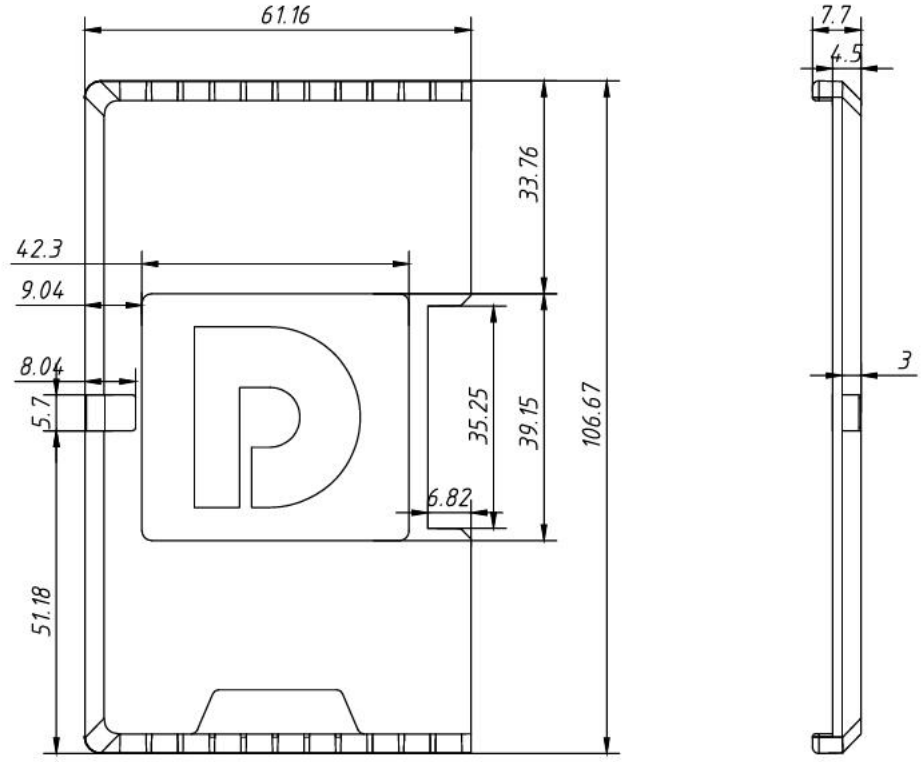
Dimensions (unit: mm)



3.6 Terminal cover

3.6.1 Dimensions

Terminal cover dimensions (unit: mm)



Note: All are installed using DIN 35 mm standard rails, with DIN rail specifications of 35*7.5*1.0 and 35*15*1.0 (unit: mm).

4 Installation and removal

4.1 Installation Guide

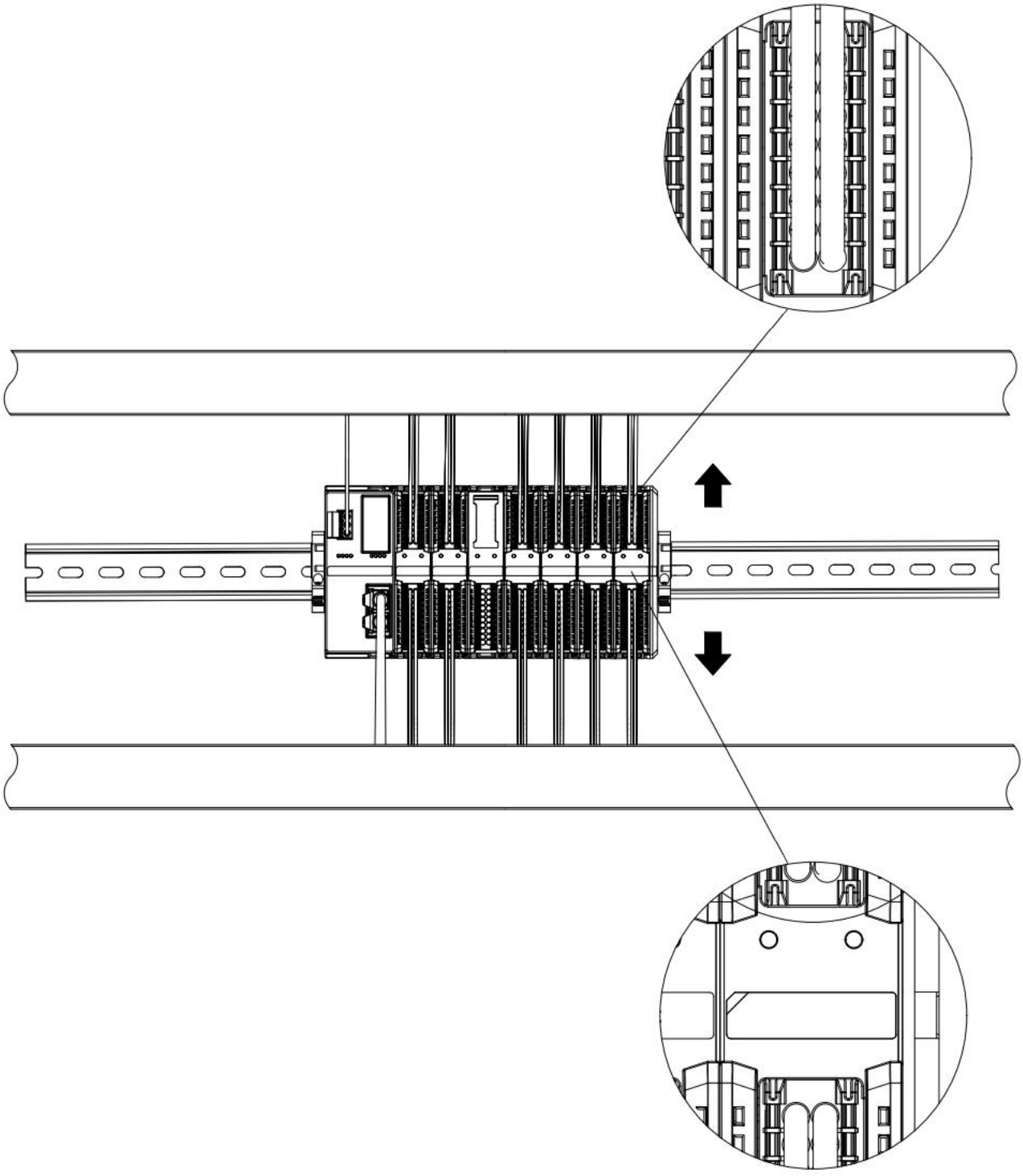
Installation\removal precautions

- **The module protection level is IP20. The module needs to be installed in a cabinet and used indoors.**
- **Ensure that the cabinet has good ventilation measures (such as installing an exhaust fan in the cabinet).**
- **Do not install this device near or over any equipment that may cause overheating.**
- **Be sure to install the module vertically on the fixed rail and maintain air circulation around it (there should be at least 50 mm of air circulation space above and below the module).**
- **After the module is installed, be sure to install the guide rail fixings at both ends to secure the module.**
- **Installation and removal must be performed with the power turned off.**
- **After the module is installed, it is recommended to connect and route the cables in an up-and-down manner.**

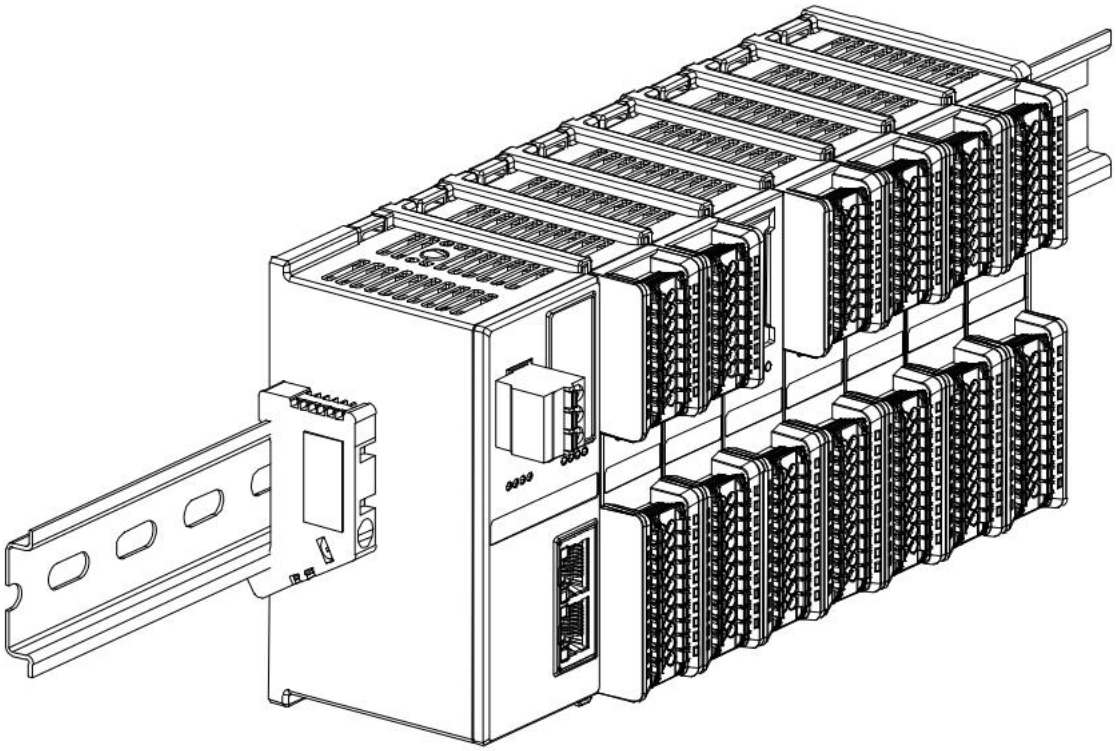
⚠ Warning

- If used in a manner not specified in the product user manual, the protection provided by the equipment may be impaired.

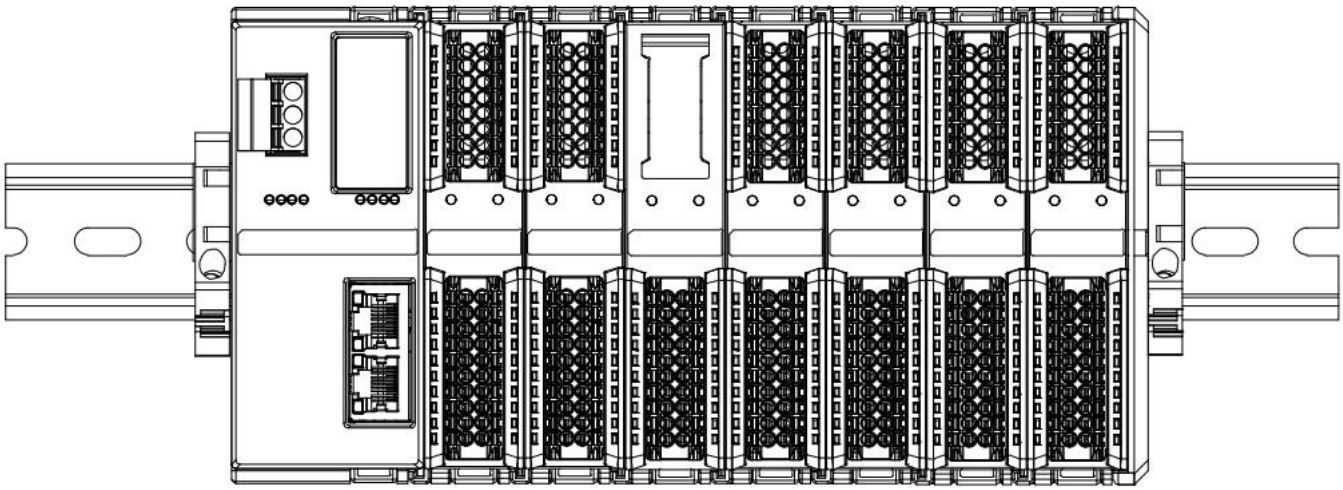
Module installation diagram, minimum clearance between top and bottom (≥ 50mm)



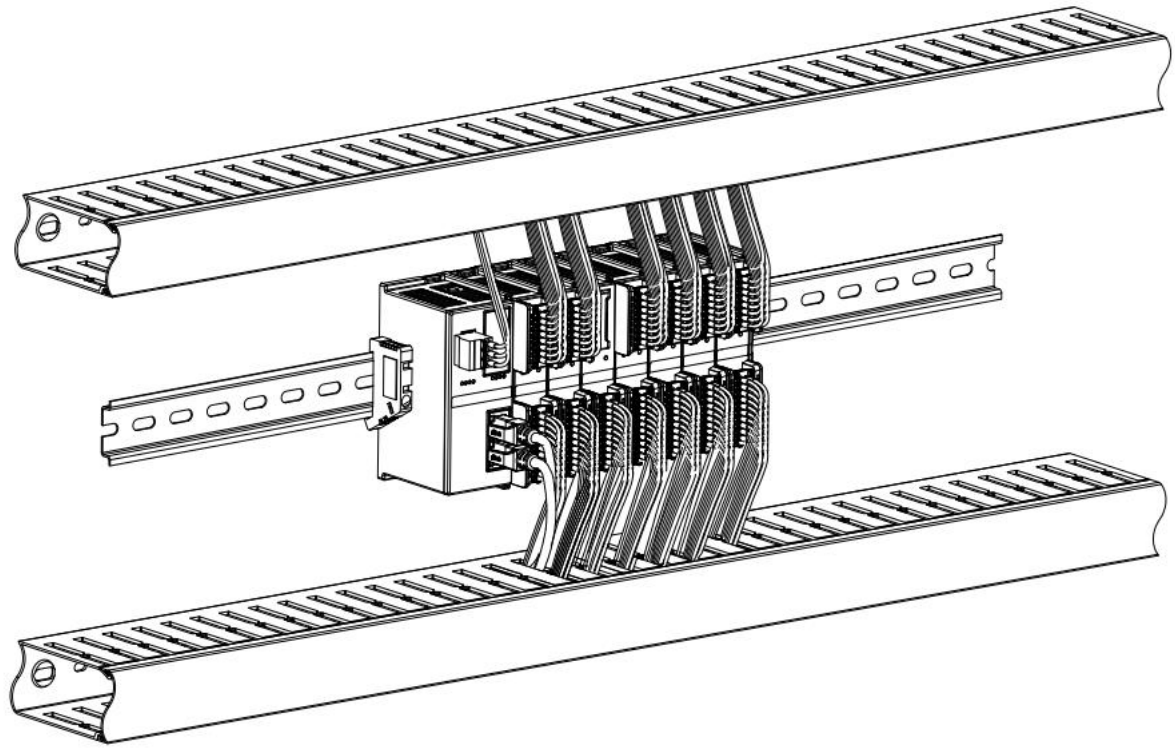
Ensure the module is installed vertically on the fixed rail



Be sure to install the rail fixings



Module upper and lower wiring diagram



4.2 Installation and removal steps

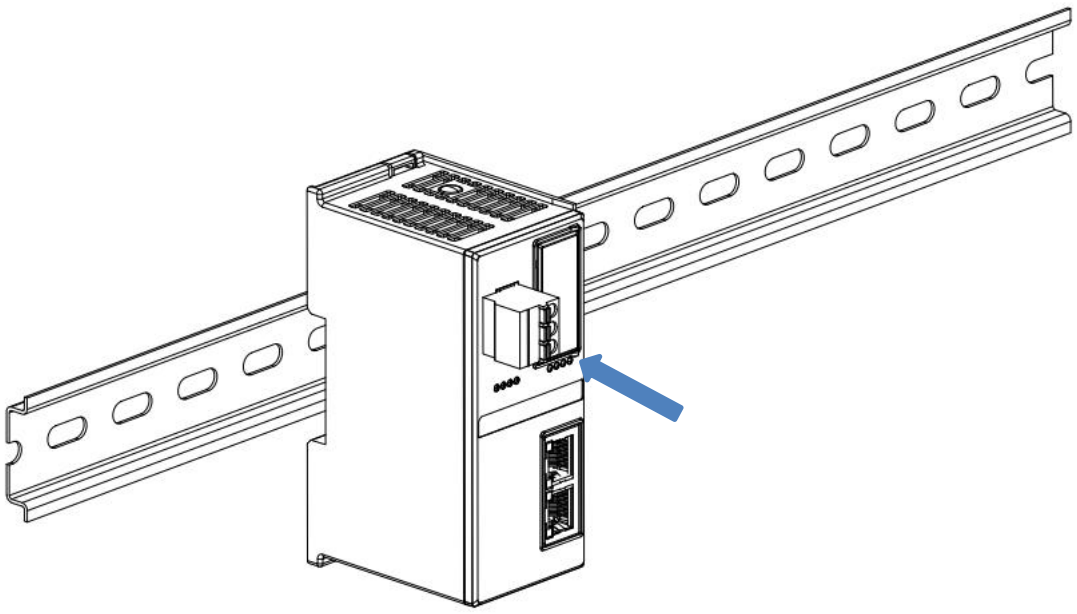
Module installation and removal	
Module installation steps	1. Install the coupler module on the fixed guide rail first.
	2. Install the required I/O modules or functional modules in sequence on the right side of the coupler module.
	3. After installing all required modules, install the terminal cover to complete the module assembly.
	4. Install the guide rail fixings at both ends of the coupler module and the terminal cover to fix the module.
Module disassembly steps	1. Loosen the guide rail fixings at both ends of the module.
	2. Use a flat-blade screwdriver to pry open the module buckle.
	3. Pull out the disassembled module.

4.3 Installation and disassembly diagram

Coupler module installation

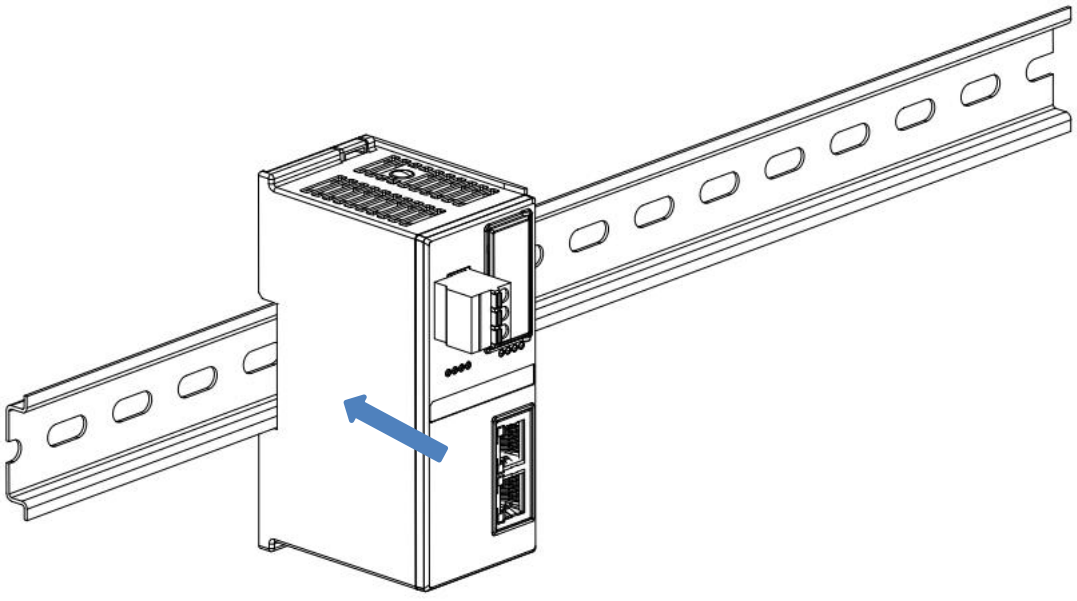
- Align the coupler module vertically with the guide rail slot, as shown in Figure ① below.

①



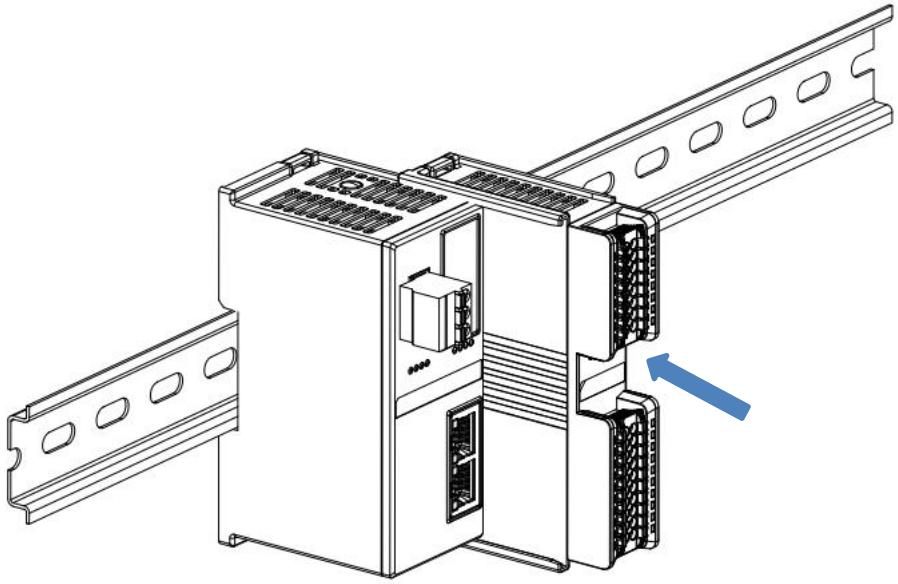
- Press the coupler module in the direction of the guide rail with force until you hear a "click" sound, and the module is installed in place, as shown in Figure ② below.

②

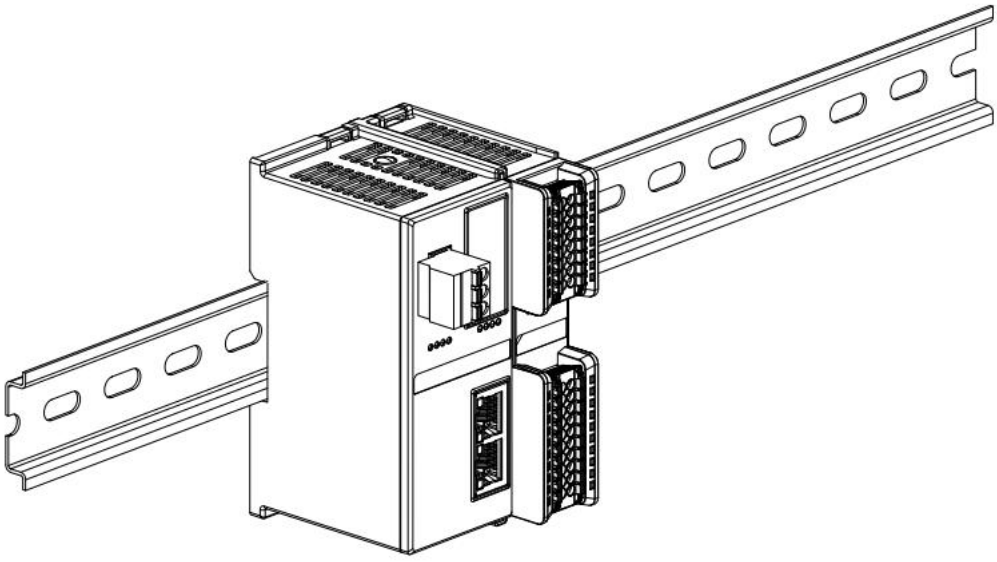


I/O Module Installation

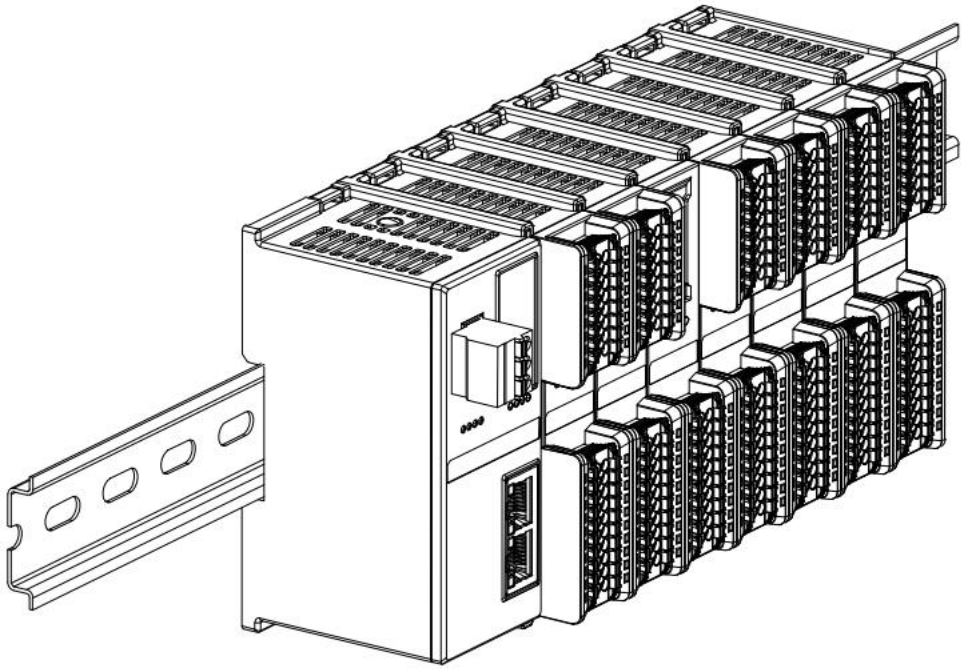
- Follow the steps above to install the coupler module and install the required I/O modules or functional modules one by one. Push them in as shown in Figures ③, ④, and ⑤ below. When you hear a "click", the module is installed in place.



③



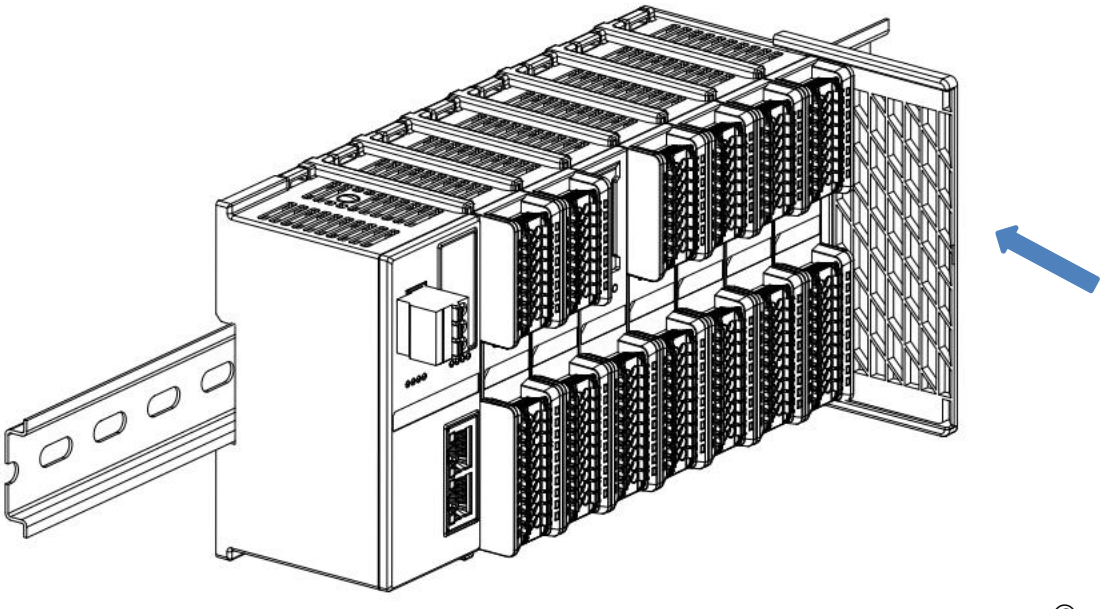
④



⑤

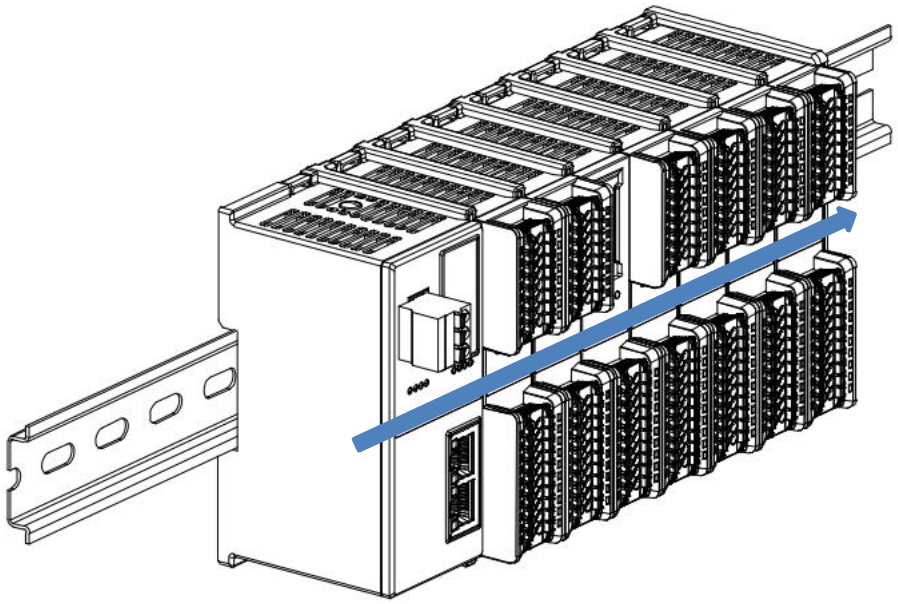
Terminal cover installation

- Install the terminal cover on the right side of the last module, aligning one side of the terminal cover groove with the guide rail. For installation, refer to the installation method of the I/O module and push the terminal cover inwards into place, as shown in Figure ⑥ below.



⑥

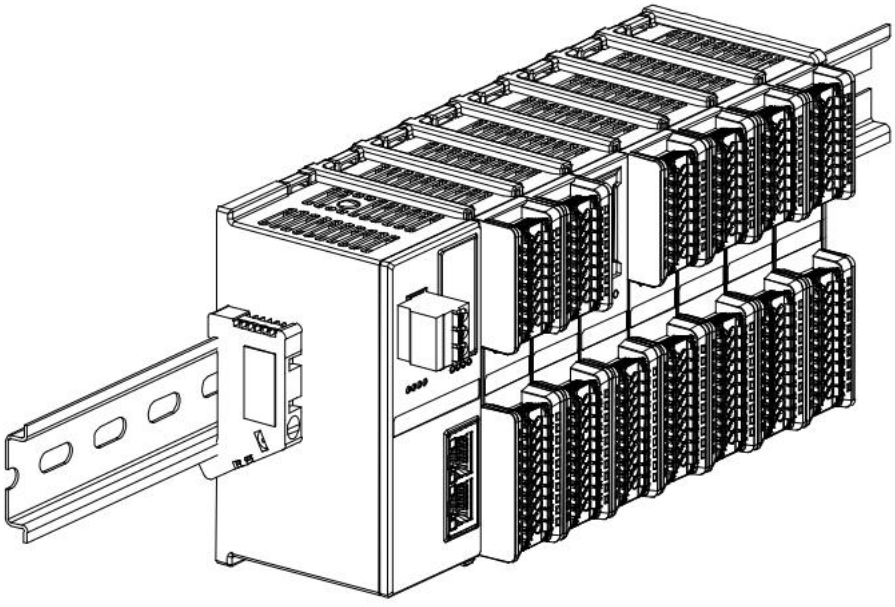
- After the terminal cover is installed, check whether the front of the entire module is flat, and ensure that all modules and end covers are installed in place and the front is flush, as shown in Figure ⑦ below.



⑦

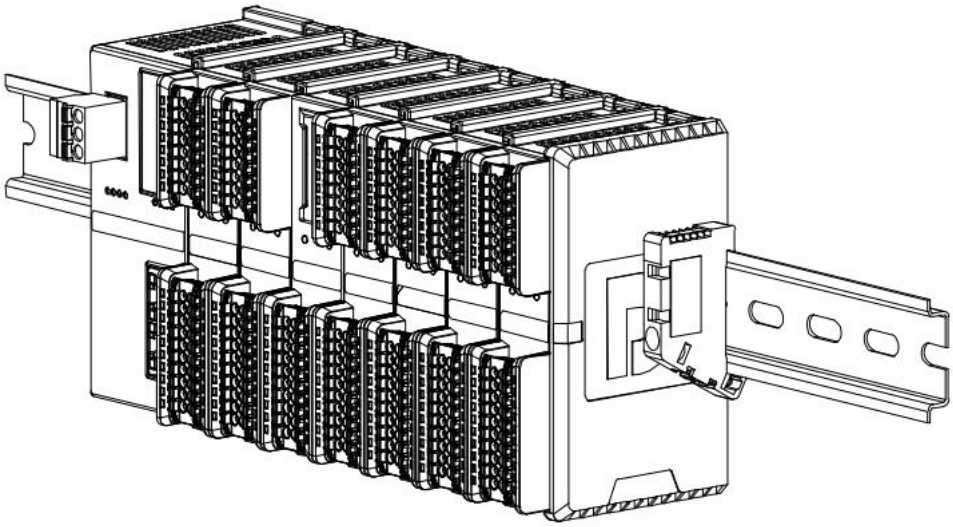
Guide rail fixing installation

- Install and tighten the guide rail fixings close to the left side of the coupler, as shown in Figure ⑧ below.



⑧

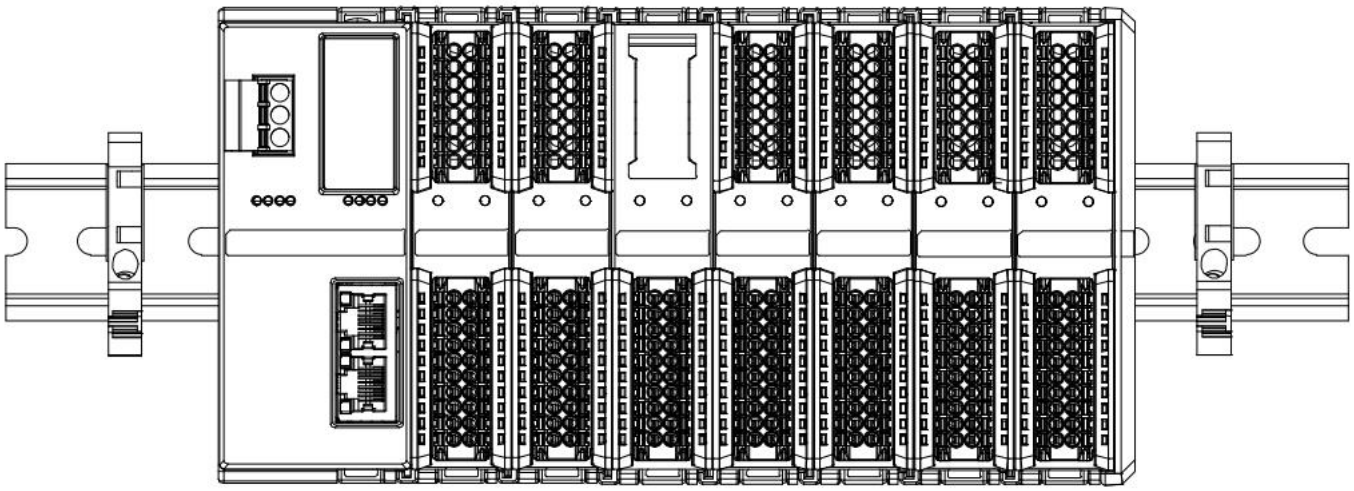
- Install the rail fixing on the right side of the terminal cover. First push the rail fixing toward the coupler to ensure that the module is installed firmly, and then tighten the rail fixing with a screwdriver, as shown in Figure ⑨ below.



⑨

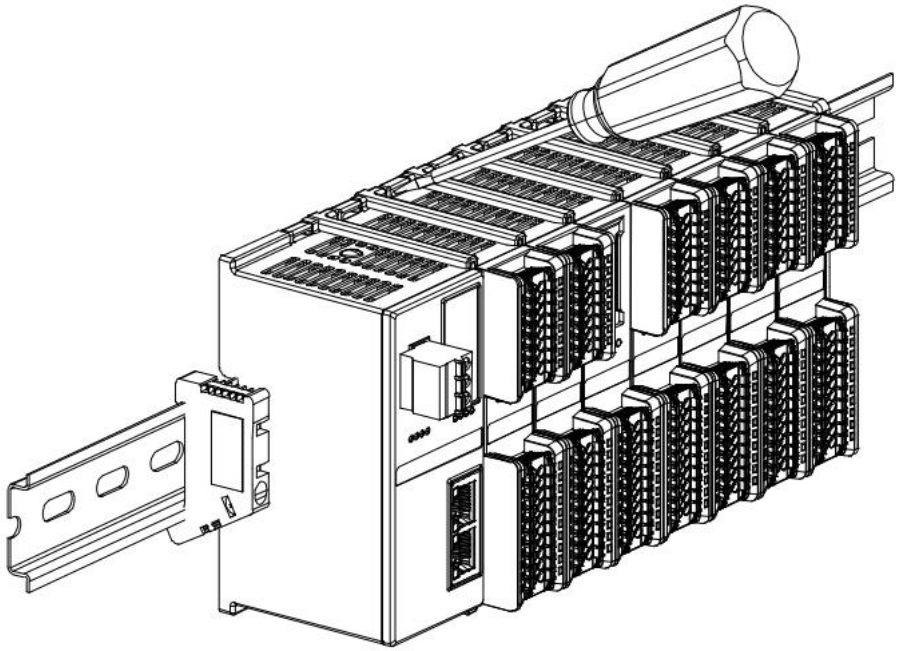
Disassembly

- Use a screwdriver to loosen the guide rail fixing at one end of the module and move it to one side to ensure that there is a gap between the module and the guide rail fixing, as shown in Figure ⑩ below.

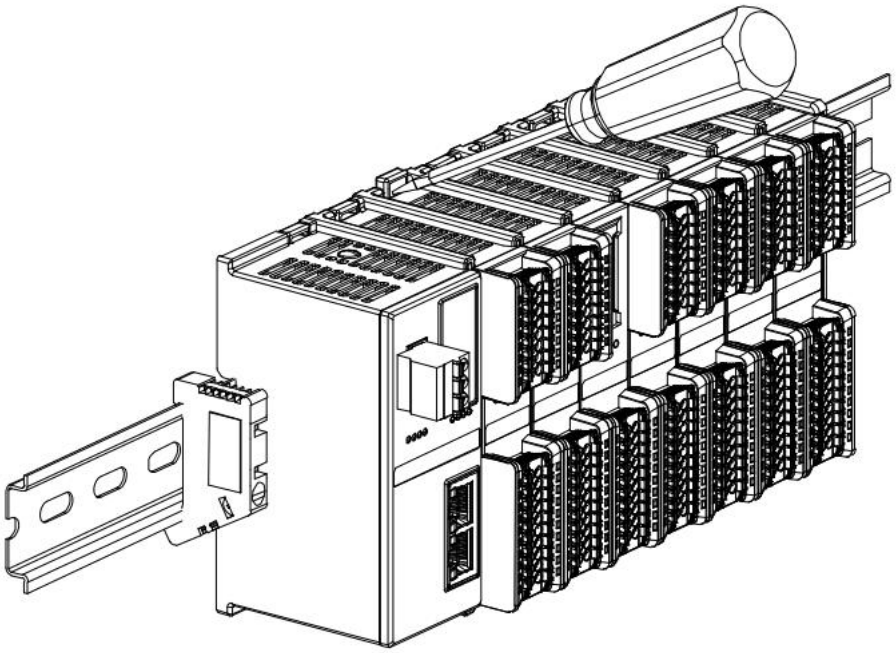


⑩

- Insert a flat-head screwdriver into the buckle of the module to be removed, and apply force sideways in the direction of the module (until you hear a sound), as shown in the following figure⑪and⑫Note: Each module has a buckle on the top and bottom, and the same method is used for both.

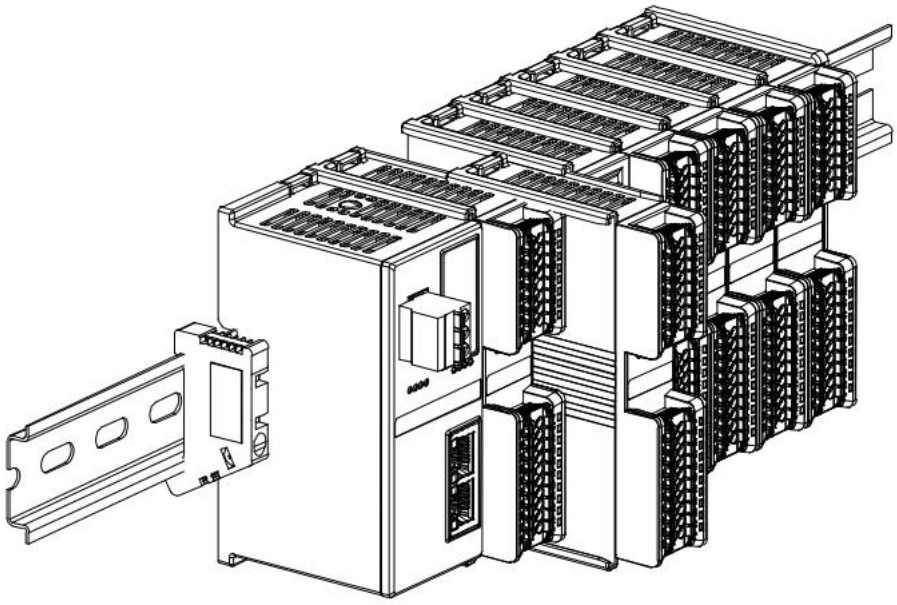


⑪



⑫

- Follow the opposite operation of installing the module to disassemble the module, as shown below⑬.



⑬

5 Wiring

5.1 Terminal Blocks

⚠ Warning

Terminal Blocks		
Power Terminals	Rated voltage	320V
	Rated current	20A
	Number of poles	3P
	Wire diameter	22~16 AWG 0.3~1.5 mm²
Signal line terminals (i.e. input and output terminals)	Rated voltage	200V
	Rated current	9.5A
	Number of poles	16P+20P
	Wire diameter	22~17 AWG 0.3~1.0 mm²
Bus interface	2 × RJ45	Category 5 or higher UTP or STP (STP is recommended)

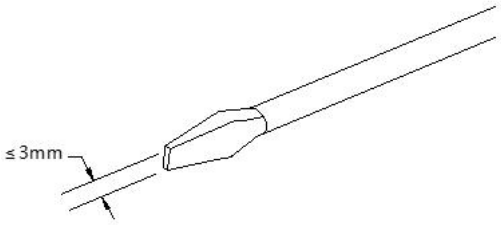
5.2 Wiring Instructions and Requirements

Power Wiring Precautions

- The module system side power supply and field side power supply are configured and used separately. Do not mix them.
- PE must be grounded reliably.

Wiring tool requirements

The power terminals and signal line terminals adopt a screw-free design, and the cables can be installed and removed using a flat-blade screwdriver (specification: ≤3mm).



Stripping length requirements

The recommended cable stripping length for power and signal line terminals is 10 mm.

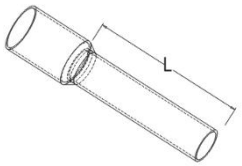
Wiring method

For single-strand rigid wire, after stripping the wire to the corresponding length, press the button and insert the single-strand wire directly into the corresponding end hole.

For multi-strand flexible wires, after stripping the wires to the corresponding length, you can directly connect or use the corresponding standard specifications of cold-pressed terminals (tubular insulated terminals, reference specifications are shown in the following table) in combination. Press the button and insert the insulated terminal directly into the corresponding end hole.

The specifications of power terminals and signal line terminals are shown in the following table:

Specifications of tubular insulation terminals		
Specifications	model	Conductor cross-sectional area mm²

 Tube type insulated terminal L The length is10mm	E0310	0.3
	E0510	0.5
	E7510	0.75
	E1010	1.0
	E1510	1.5

Warning

- Only copper wires may be used for wiring.

Warning

- Cable temperature: 80℃.

5.3 Wiring Instructions for MIL Connector Type Modules

5.3.1 Compatible product list

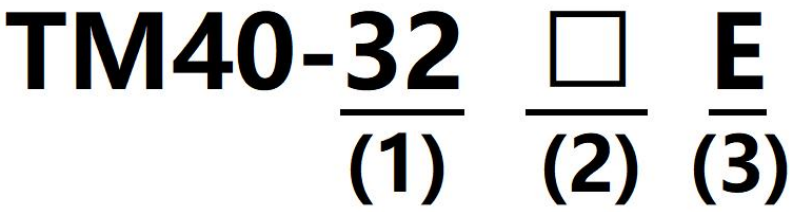
MIL connector type I/O modules need to be connected to the terminal block through a cable with a connector for use.

Model	Describe	Adapter Terminal Block	Adapter Cable
XB6S-3200N	32-channel digital input, NPN/PNP compatible	TM40-32AE	TM40-XXXX-1 TM40-XXXX-1S
		TM40-32BE	TM40-XXXX-2 TM40-XXXX-2S
XB6S-0032AN	32-channel digital output, NPN type	TM40-32AE	TM40-XXXX-1 TM40-XXXX-1S
XB6S-0032BN	32-channel digital output, PNP type	TM40-32BE	

Note: TM40-XXXX-2/TM40-XXXX-2S cables are dedicated to PNP input and cannot be used with other types of input/output.

5.3.2 Terminal Block Naming Rules

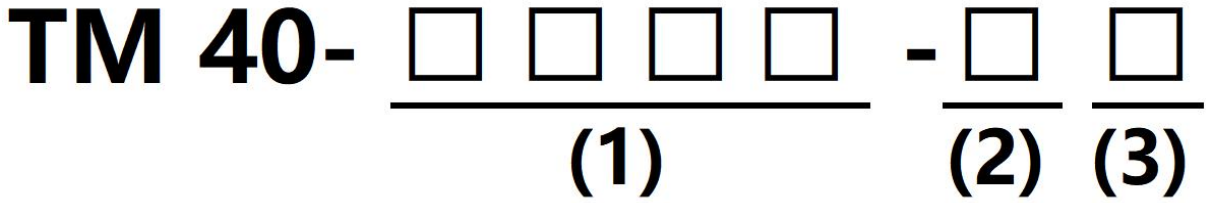
The terminal blocks of this product include TM40-32AE and TM40-32BE. The naming rules are as follows.



Serial number	Meaning	Options	Illustrate
(1)	Terminal block points	32	32 points
(2)	Input/Output Type	A	NPN type input/output
		B	PNP type input/output
(3)	Terminal block type	E	European terminal block

5.3.3 Cable Naming Rules

The terminal blocks and I/O connection cables of this product include TM40-XXXX-1, TM40-XXXX-1S, TM40-XXXX-2, and TM40-XXXX-2S. The naming rules are as follows.



serial number	meaning	Options	illustrate
(1)	Cable length	0500~1500	Cable custom length range, unit: mm
(2)	Cable function	1	adaptation: NPN type input PNP type output NPN type output
		2	PNP type input only
(3)	Cable shielding	S	Shielded Cable
		default	Unshielded Cable

Note: TM40-XXXX-2/TM40-XXXX-2S cables are dedicated to PNP input and cannot be used with other types of input/output.

5.3.4 Terminal block parameters

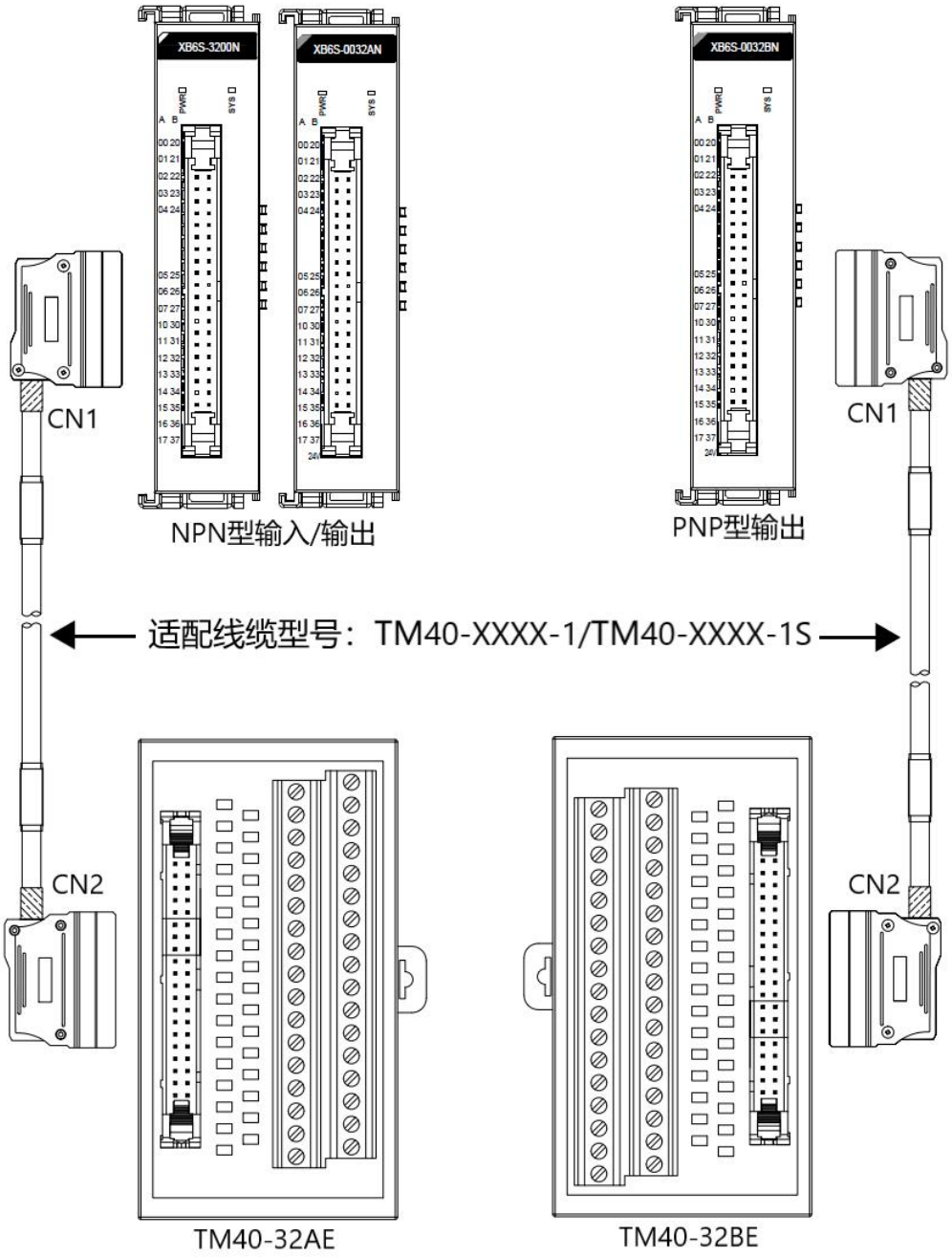
Technical specifications	
Rated current	1A
Rated voltage	DC24V
Suitable for wires	1.5mm2/AWG16 or below

5.3.5 Cable parameters

Technical specifications	
Wire Gauge	AWG28
Conductor composition	7/0.127
Conductor material	Soft copper wire
Insulation Materials	PE
Core twisting	Filling, cotton string, strapping, paper bag
Surface Covering	PVC
Conductor impedance (20℃)	239Ω/Kn or less
Withstand voltage (in air)	AC500V/min
Insulation resistance (20℃)	50MΩ/Kn or more

5.3.6 Configuring rules

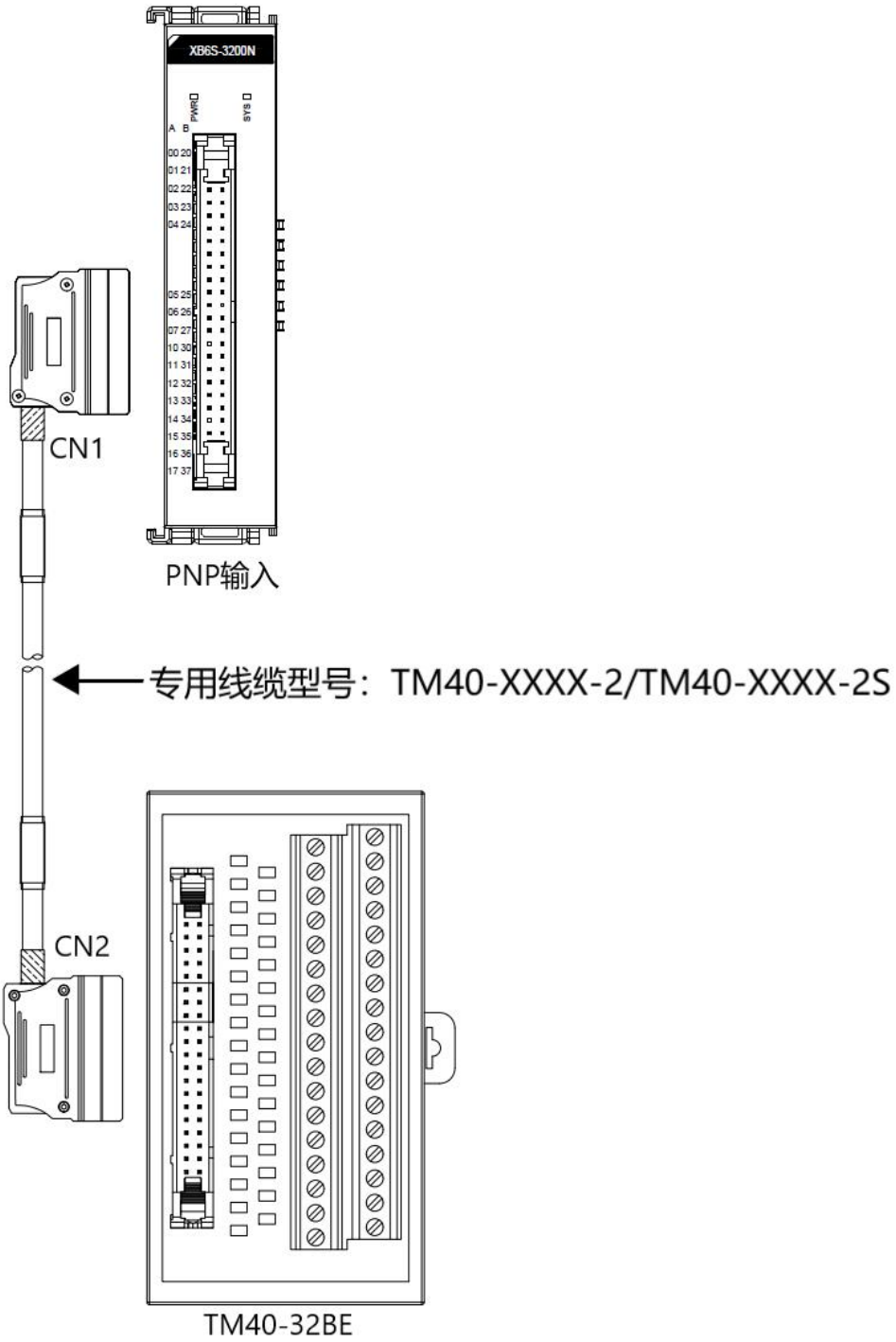
- Configuration examples for NPN type input, NPN type output, and PNP type output



Both ends of the cable are marked with CN1 and CN2. The I/O side is connected to the CN1 end, and the terminal block side is connected to the CN2 end.

- Configuration example for PNP type input

  When using the XB6S-3200N PNP input, it must be used with the TM40-XXXX-2/TM40-XXXX-2S cable.



Both ends of the cable are marked with CN1 and CN2. The I/O side is connected to the CN1 end, and the terminal block side is connected to the CN2 end.

6 Use

6.1 IP settings and modifications

6.1.1 Setting the IP address via the rotary switches

- **When the IP address is set by the rotary switch from the factory**
  The IP address is 192.168.3.XXX (XXX is the setting value of the rotary switch, ranging from 1 to 254).
- **When setting the IP address by the rotary switch after the IP address has been set by the host computer**
  The IP address uses the high 3 bytes of the IP address set by the host computer, and the low 1 byte is the setting value of the rotary switch.
  For example, if you change the rotary switch setting after setting it to 172.10.0.12 on the host computer, the IP address will be 172.10.0.XXX (XXX is the setting value of the rotary switch, ranging from 1 to 254).

Precautions

●For a description and operation of the rotary switch, see3.1.2 Rotary switch.

●When the module leaves the factory, the rotary switch is set to "000" and the IP address is 192.168.3.100.

●Only the host bit of the IP address can be modified, and the network segment cannot be modified. If the network segment has been assigned, the module will use the assigned network segment to form the IP address. If it has not been assigned, the module will use the 192.168.3 network segment to form the IP address.

●abnormal Rotation Switch setting: When Rotation When the switch is set to a value other than 1 to 254, the module will start with the IP last modified by the host computer after it is powered on.

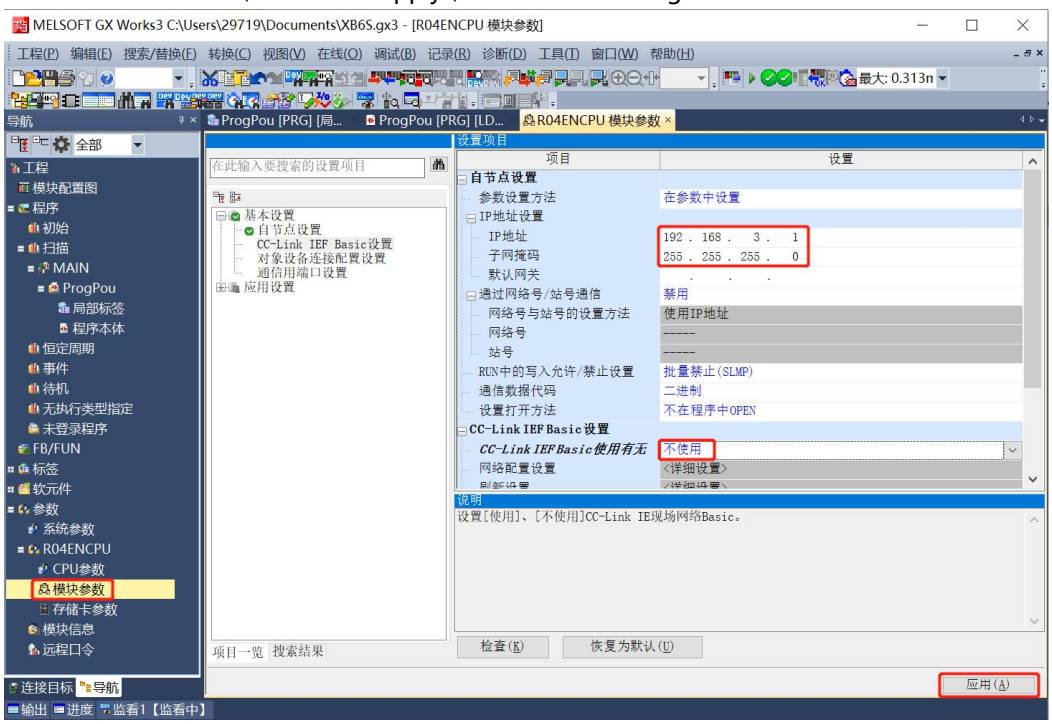
6.1.2 Modify the IP address through the Conf_TestTool_ToMaster.exe tool

1. After the hardware connection is completed, power on, turn the rotary switch to the IP host position to be assigned, and set the computer IP address of the installation tool to the same network segment as the module IP. (For example, the module's default factory IP address is 192.168.3.100, and the computer IP can be changed to 192.168.3.88)
2. Open Conf_TestTool_ToMaster.exe, select "Step2.Test executed", select the network device used in "IP address (master station ID)", click "Detect Connected Device", and record the MAC address in "serverMACAddr".
3. Click "IP address setting of connected devices", fill in the recorded MAC address in "Slave station MAC address", fill in the IP address to be changed in "IP address to be set for the slave station", and click "Execute" to complete the IP address modification.

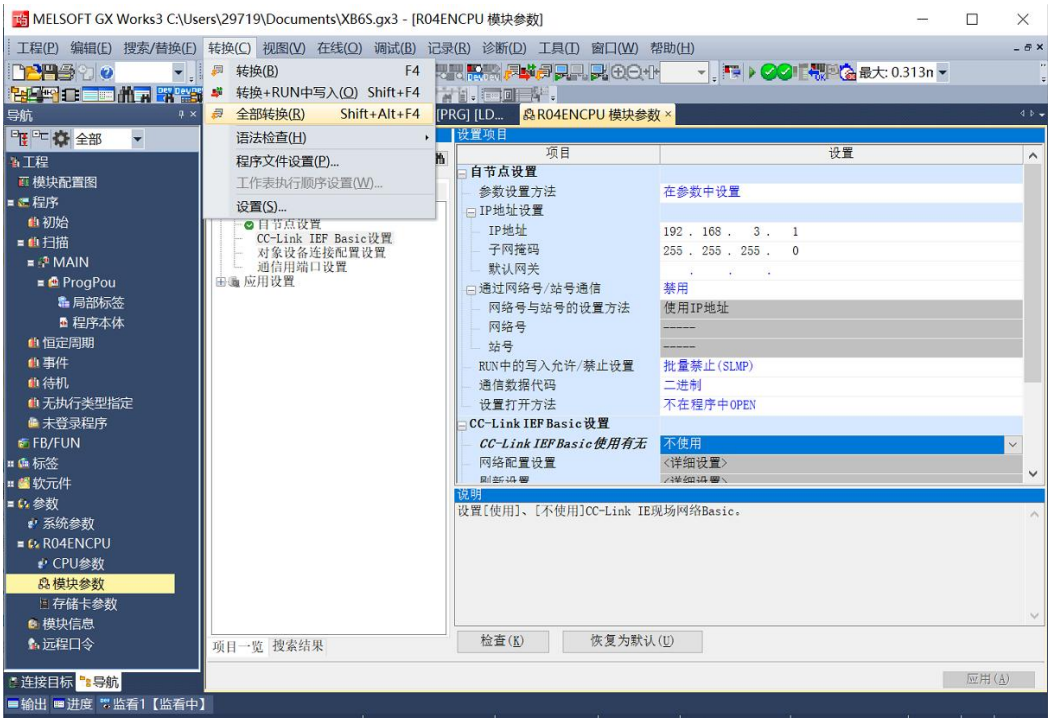
6.1.3 Set the IP address through the host computer software

- **Taking Mitsubishi R04ENCPU and host computer GX Works3 as examples, this article introduces how to modify the IP address.**

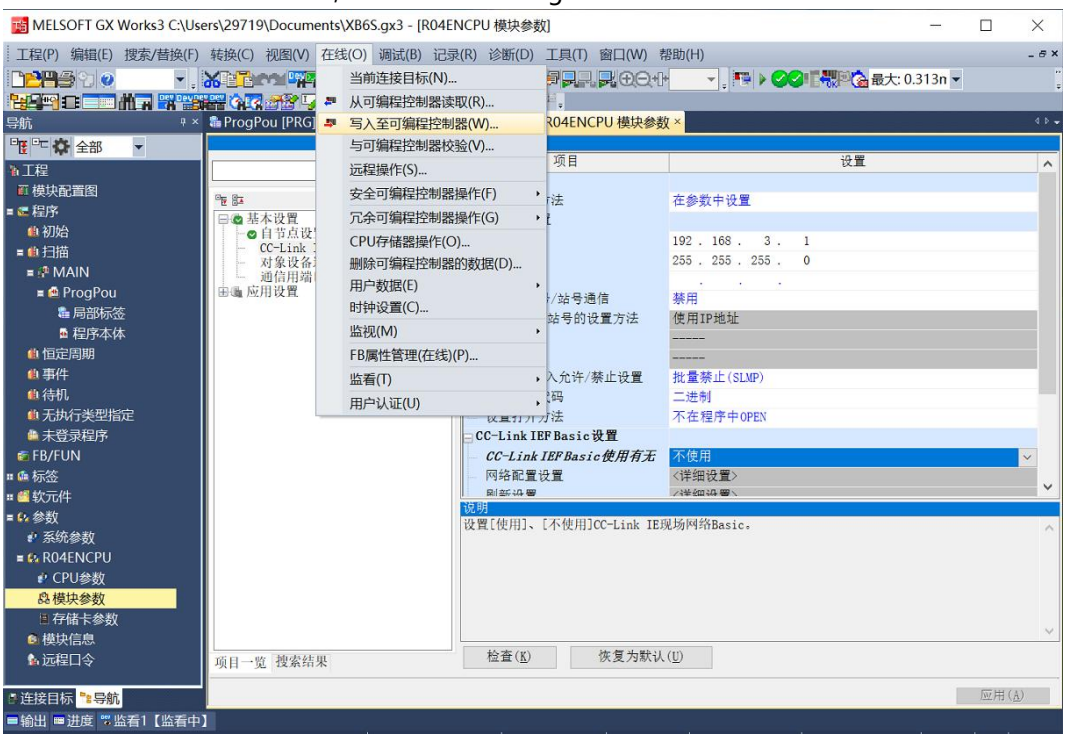
a. Since the module's default IP address is 192.168.3.100 when it leaves the factory, the IP addresses of the PLC and the module must be in the same network segment when the module is connected for the first time, otherwise the direct scan will fail.
If the PLC is not in the 3rd network segment, double-click "Parameters -> CPU Module Model -> Module Parameters" in the left navigation interface, set the PLC to the 3rd network segment under the IP address setting, select "Not Used" in the drop-down box of "CC-Link IEF Basic Use or Not", and click "Apply", as shown in the figure below.



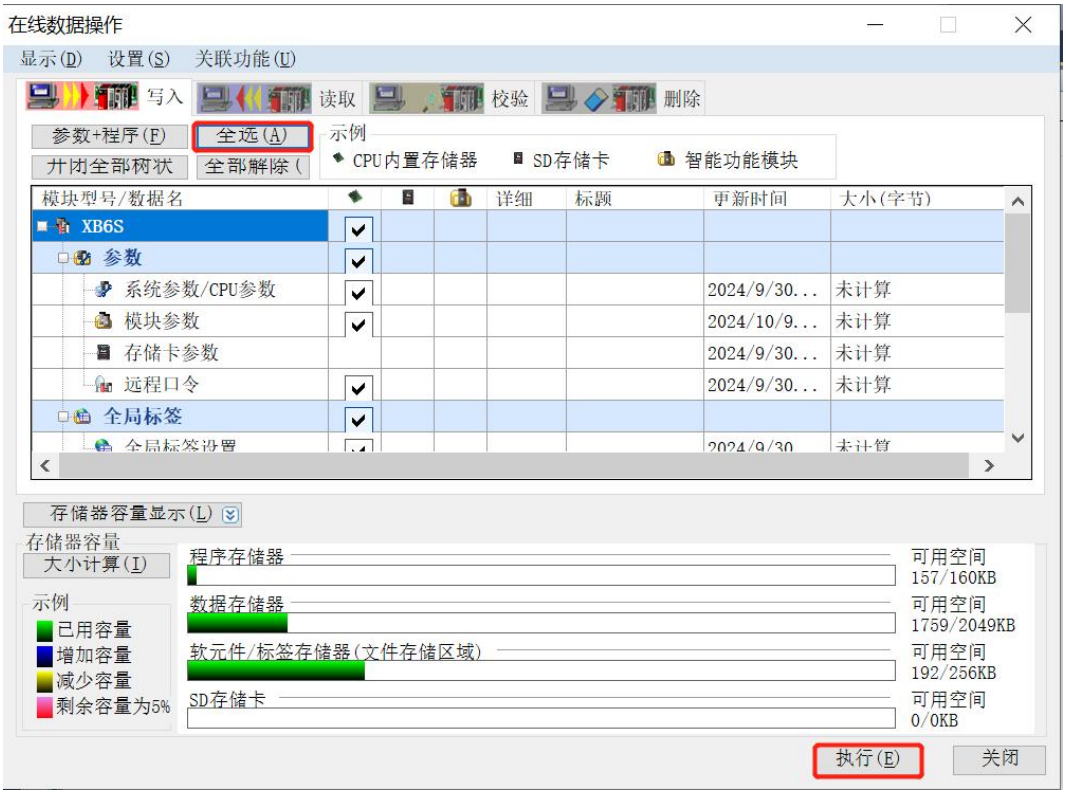
b. Click "Convert" in the menu bar and click "Convert All", as shown in the figure below.



c. Click "Online" in the menu bar, click "Write to PLC", and write the set parameters to the CPU module of the master station, as shown in the figure below.



d. The "Online Data Operation" dialog box pops up. Select "Select All" and click "Execute", as shown in the figure below.

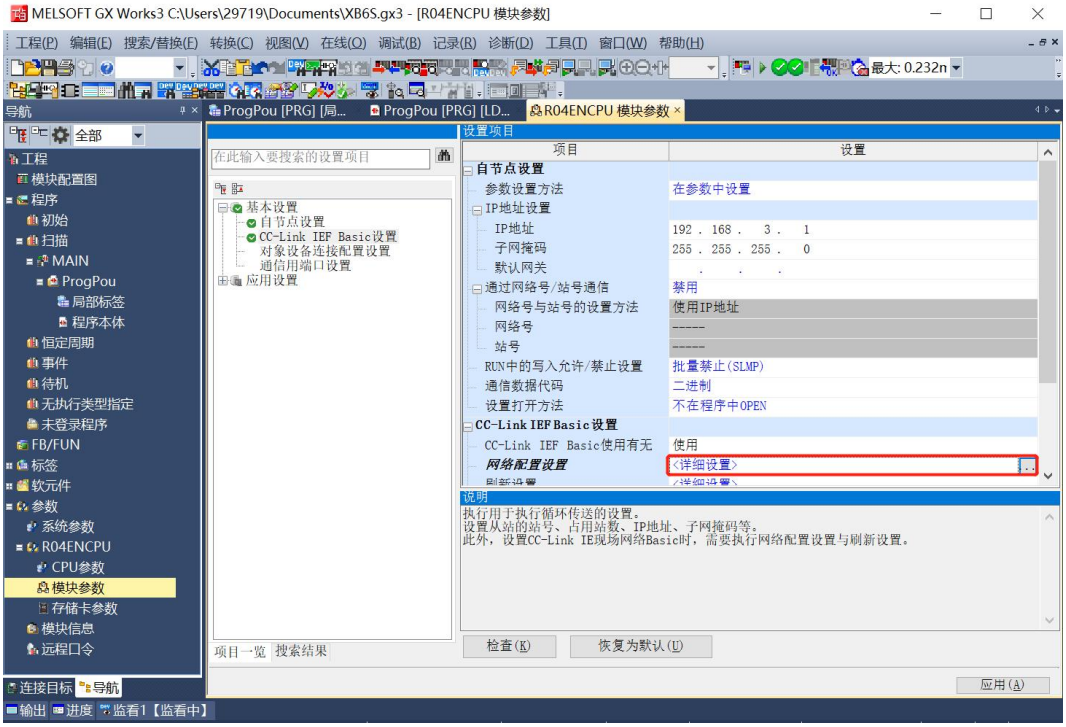


e. A prompt box pops up saying "Parameters already exist, do you want to overwrite?" Select "Yes to All", as shown in the figure below.

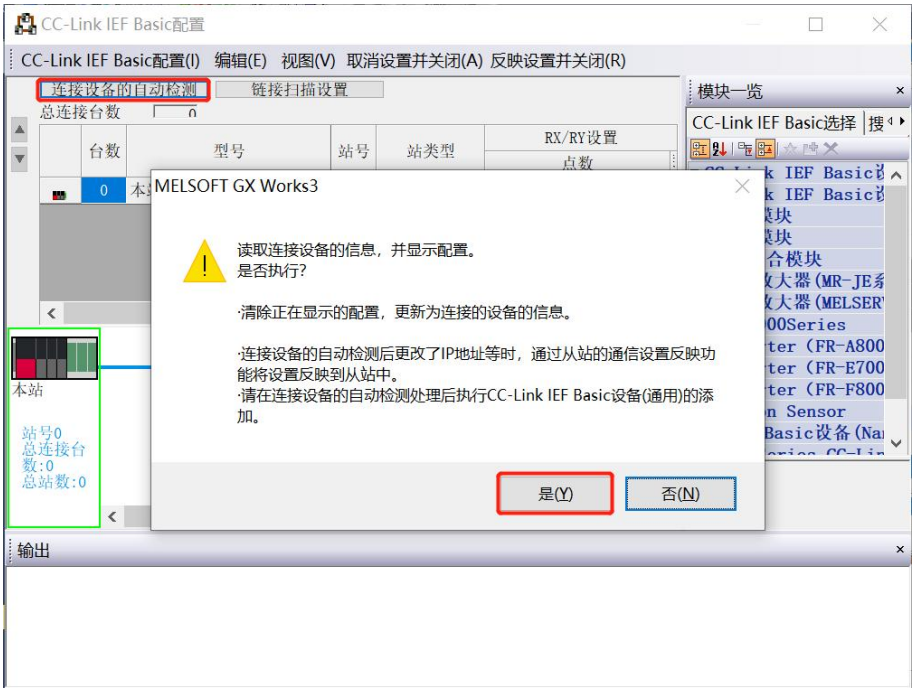
f. The download and parameter setting operation is now complete. Click Close.

g. Disconnect power from the module and PLC and then power them back on.

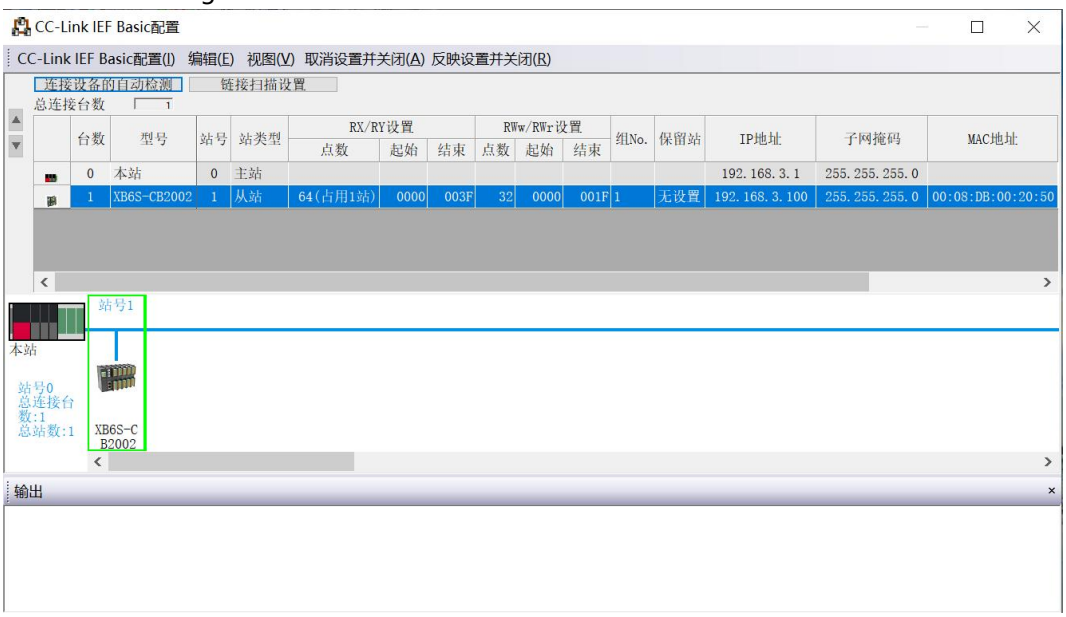
h. After the PLC is powered on again, it is now set to network segment 3. In the project setting interface, select "Use" in the drop-down box of "CC-Link IEF Basic Use or Not", and double-click "Network Configuration Settings -> Detailed Settings", as shown in the figure below.



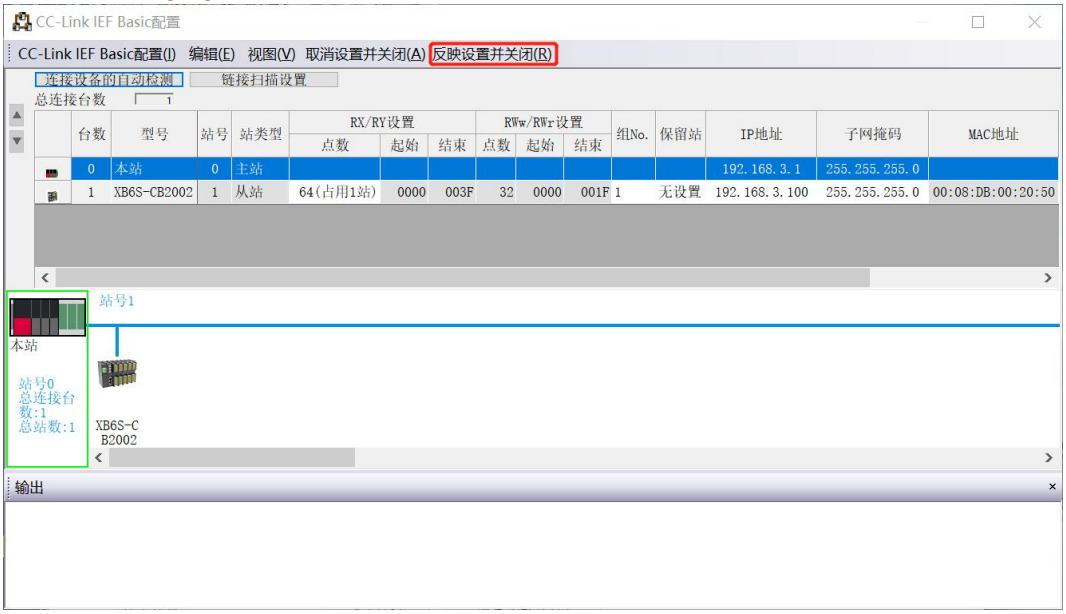
i. In the pop-up window of CC-Link IEF Basic configuration, click "Automatically detect connected devices" and a prompt box "Execute" will pop up. Select "Yes", as shown in the following figure.



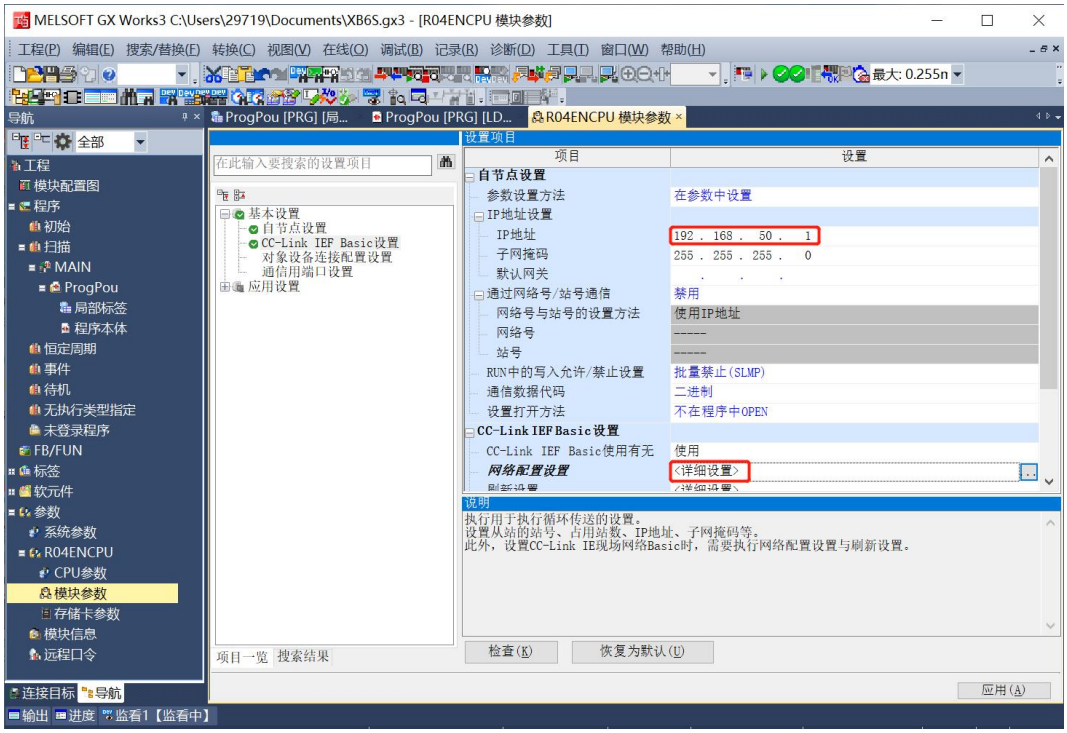
j. After the scan is completed, the information of the connected coupler modules is displayed as shown in the figure below.



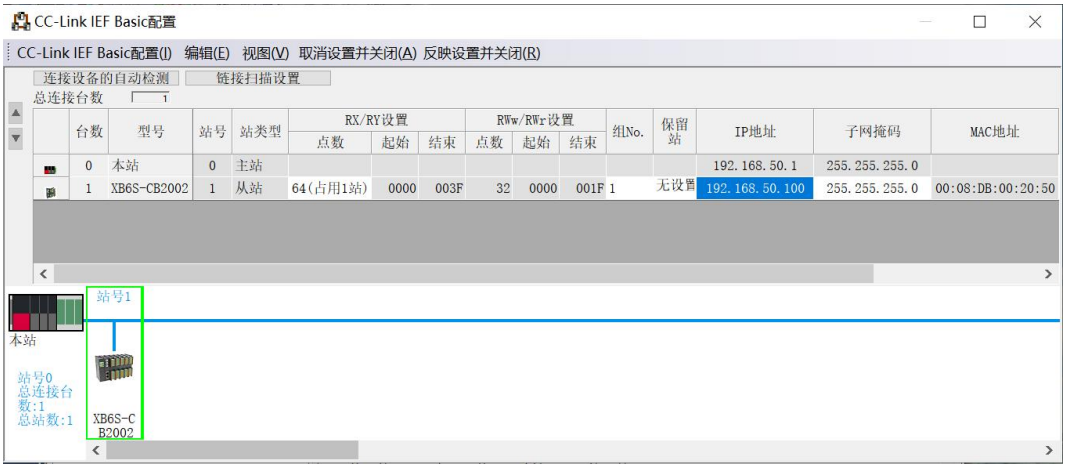
k. If you modify the PLC to use network segment 50, click Reflect Settings and Close, as shown in the following figure.



l. In the project settings interface, set the PLC to segment 50 under the IP address settings, and double-click "Network Configuration Settings -> Detailed Settings", as shown in the figure below.



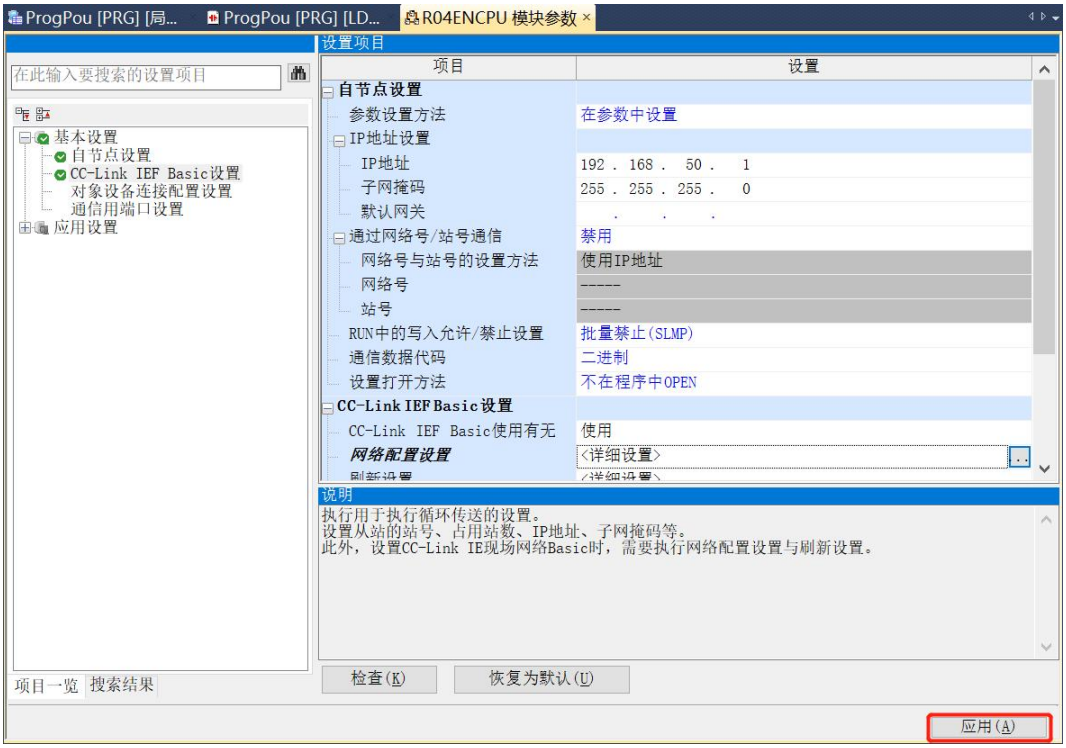
m. In the CC-Link IEF Basic configuration window, change the module's IP address to segment 50, as shown in the figure below.



n. Right-click the slave device and select "Online->Reflect remote station communication settings". A prompt box will pop up asking "Execute". Click "OK", as shown in the figure below.

o. Click Reflect Settings and Close as shown in the following figure.

p. After clicking "Apply", repeat the above steps b~g, as shown in the figure below.



q. After the PLC is powered on again, the network segments of the PLC and the coupler are in the same network segment, and the IP change setting is successful. If the on-site PLC and the coupler have successfully communicated, you only need to perform steps k~q to modify the IP.

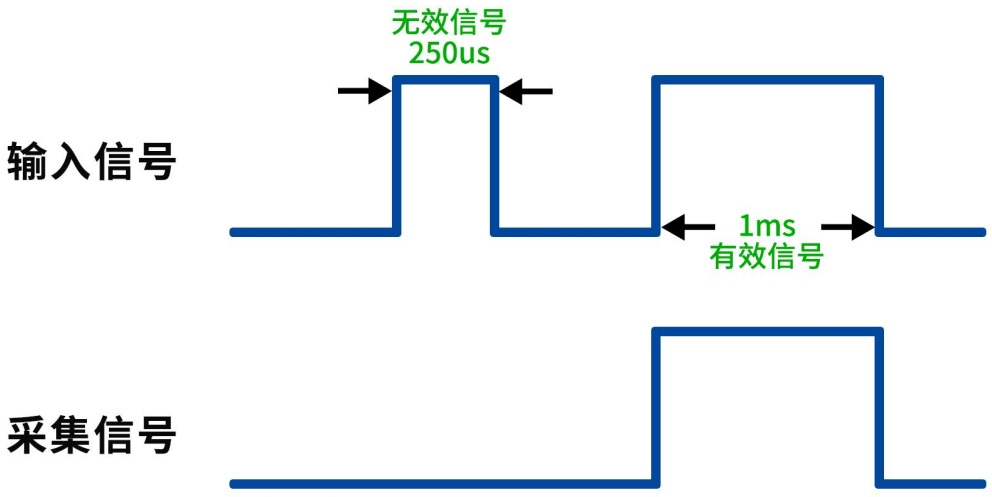
6.2 Parameter Description

6.2.1 Digital input filtering

Digital input filtering prevents the program from responding to unexpected rapid changes in input signals that may be caused by switch contact bounce or electrical noise. Digital input filtering supports single module settings, and each module can be configured separately, not channels.

The digital input filter FilterTime is currently configured by default to 3ms, and the supported setting range is no filtering, 0.1ms, 0.2ms, 0.5ms, 1ms, 2ms, 3ms (factory setting), 4ms...18ms, 19ms, 20ms. When configured to 3ms, clutter within 3ms can be filtered out. The 3ms input filter time means that a single signal can only be detected if it changes from "0" to "1", or from "1" to "0" for 3ms, and a single high pulse or low pulse shorter than 3ms will not be detected.

Function description: When the input filter is configured to 1ms, the clutter within 1ms can be filtered out. As shown in the figure below, when there is a 250us signal input, it will be regarded as an invalid signal, and a single high pulse or low pulse shorter than 1ms will not be detected; signals of 1ms and above can be collected.



6.2.2 Digital output signal clear/hold

The clear/hold function is for modules with output channels. This function can configure the output mode of the output channel when the module is in a non-OP state (stop running or the coupler network cable is disconnected). This parameter supports the following output states:

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

Output enable: When communication is disconnected, the module output channel always outputs valid values.

Output hold: When communication is disconnected, the module output channel maintains the last output value.

6.2.3 Analog range setting

Analog range setting Range Select is used to set the analog range. Each channel can be configured separately (see3.3.4 and 3.3.5 Analog Parameters).

6.2.4 Analog input filtering

- **Analog input filter function**

The analog input filter function can average the data after A/D conversion internally to reduce the impact of fluctuations due to noise on the input signal.

The analog input is processed by moving average with the specified number of A/D conversions.

- **Filter function configuration**

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

6.2.5 Analog output signal clear/hold

The clear/hold function is for modules with output channels. This function can configure the output mode of the output channel when the module is in a non-OP state (stop running or the coupler network cable is disconnected). This parameter supports the following output states:

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

Keep output: When the communication is disconnected, the module output channel keeps outputting.

Output preset value: When communication is disconnected, the module output channel outputs the preset value.

The analog clear and hold function supports module overall settings (template mode) and single channel settings (single channel mode). Any channel can be set in single channel mode or template mode. The single channel mode has a higher priority than the template mode. The specific configuration method is shown in the following table. The default is to clear the module output as a whole.

Analog output module clears and holds parameters				
Parameter name	Parameter meaning	Parameter Value	Parameter value meaning	default value
TemplateMode	Template Mode	0	Clear all channels to clear output	0
		1	Hold all channels to hold output	
		2	Preset all channel output preset value	
TemplateValue Chx	Single channel clear/hold configuration	0	Template Value template mode value, that is, single-channel mode is not enabled	0
		1	Clear single channel clear output	
		2	Hold single channel hold output	
		3	Preset single channel output preset value	
Preset Value Chx	Single channel presets	Code value range	Current/voltage value corresponding to the output code value (Corresponding range code value table)	0

Note: When the overall setting (template mode) of the module is configured as 2, that is, the preset value of all-channel output takes effect, the preset value is based on the preset code value of channel 0 in the single-channel preset value, and all-channel output is performed.

6.2.6 Analog value power-off preservation

Analog parameters support abnormal power failure and communication disconnection. All module configuration parameters can be saved. Analog modules support power failure saving by default.

This manual uses GX Works3 as an example to introduce the parameter configuration method of the XB6S-CB2002 coupler + I/O module combination. For detailed steps, seeParameter settings in section 6.4.1After the modification is completed, it is recommended to power on again.

6.3 Soft component description

6.3.1 Coupler software

The coupler soft element allocation is as follows:

Station Type	Number of occupied stations	Software	illustrate
Slave	[1,4]	RX	64◊X bits For digital input process data
		RY	64◊X bits For digital output of process data
		R	32◊X words For analog input process data
		R	32◊X words For analog output of process data

Note: X is the number of occupied stations.

6.3.2 IO module channels and soft components

IO module data allocation instructions

Digital IO module:

Each channel of the module occupies 1 bit, and the actual data length used varies depending on the number of module channels.

Analog IO module:

Each channel of the module occupies 2 bytes. The actual data length used varies depending on the number of module channels.

The data length is allocated as follows:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
XB6S-3200(N)	4	4	-	-
XB6S-1600	2	2	-	-
XB6S-0800	1	1	-	-
XB6S-1616A/B	2	2	2	2
XB6S-0032A/B(N)	-	-	4	4
XB6S-0016A/B	-	-	2	2
XB6S-0008A/B	-	-	1	1
XB6S-0012J/6	-	-	2	2
XB6S-A80VD	16	16	-	-
XB6S-A80V	16	16	-	-
XB6S-A40VD	8	8	-	-
XB6S-A40V	8	8	-	-
XB6S-A80ID	16	16	-	-
XB6S-A80I	16	16	-	-
XB6S-A40ID	8	8	-	-
XB6S-A40I	8	8	-	-
XB6S-A08V	-	-	16	16
XB6S-A04V	-	-	8	8
XB6S-A08I	-	-	16	16
XB6S-A04I	-	-	8	8
XB6S-A80TM	16	16	-	-
XB6S-A40TM	8	8	-	-
XB6S-PL20	34	34	20	20
XB6S-PS20D	26	26	2	2
XB6S-PL20D	34	34	20	20
XB6S-PC80	64	64	2	2
XB6S-PT04A	48	48	56	56
XB6S-C01SP-32Bytes	32	32	32	32

XB6S-C01SP-64Bytes	64	64	64	64
XB6S-C01SP-128Bytes	128	128	128	128
XB6S-C01SP-255Bytes	255	255	255	255

IO module channel and soft element correspondence table

XB6S-3200(N)		
Signal transmission direction: input module -> master station		
Software No.	Corresponding input channel	Input signal
DIa Digital input		
RX0~RXF	Channel 0~F	Input signal X0~XF
DIb Digital input		
RX10~RX1F	Channel 0~F	Input signal X10~X1F
XB6S-1600		
Signal transmission direction: input module -> master station		
Software No.	Corresponding input channel	Input signal
DI Digital input		
RX0~RXF	Channel 0~F	Input signal X0~XF
XB6S-0800		
Signal transmission direction: input module -> master station		
Software No.	Corresponding input channel	Input signal
DI Digital input		
RX0~RX7	Channel 0~7	Input signal X0~X7
XB6S-1616A/B		
Signal transmission direction: Master station->Input and output module->Master station		
Software No.	Corresponding output channel	Input and output signals
DI Digital input		
RX0~RXF	Channel 0~F	Input signal X0~XF
RX10~RX1F	none	Prohibited Use
DO digital output		
RY0~RYF	Channel 0~F	Output signal Y0~YF
RY10~RY1F	none	Prohibited Use
XB6S-0032A/B(N)		
Signal transmission direction: Master station -> output module		
Software No.	Corresponding output channel	Input signal
DOa Digital output		
RY0~RYF	Channel 0~F	Output signal Y0~YF
DOb Digital output		
RY10~RY1F	Channel 0~F	Output signal Y10~Y1F
XB6S-0016A/B		
Signal transmission direction: Master station -> output module		
Software No.	Corresponding output channel	Input signal
DO digital output		

RY0~RYF	Channel 0~F	Output signal Y0~YF

XB6S-0008A/B		
Signal transmission direction: Master station -> output module		
Software No.	Corresponding output channel	Input signal
DO digital output		
RY0~RY7	Channel 0~7	Output signal Y0~Y7
XB6S-0012J		
Signal transmission direction: Master station -> output module		
Software No.	Software No.	Software No.
RY0~RYB	RY0~RYB	RY0~RYB
XB6S-A80VD/XB6S-A80V/XB6S-A80ID/XB6S-A80I/XB6S-A80TM		
Signal transmission direction: Input module -> Master station		
Software No.	Corresponding input channel	Input signal
AI analog input		
Wr0~7	Channel 0~7	Input signal D0~D7
XB6S-A40VD/XB6S-A40V/XB6S-A40ID/XB6S-A40I/XB6S-A40TM		
Signal transmission direction: Input module -> Master station		
Software No.	Corresponding input channel	Input signal
AI analog input		
Wr0~3	Channel 0~3	Input signal D0~D3
XB6S-A08V/XB6S-A08I		
Signal transmission direction: master station -> output module		
Software No.	Corresponding output channel	Output signal
AO analog output		
Ww0~7	Channel 0~7	Output signal D0~D7
XB6S-A04V/XB6S-A04I		
Signal transmission direction: master station -> output module		
Software No.	Corresponding output channel	Output signal
AO analog output		
Ww0~3	Channel 0~3	Output signal D0~D3

6.4 CC-Link IE Field Basic Coupler Configuration Application

6.4.1 Application in GX Works3 software environment

1、Preparation

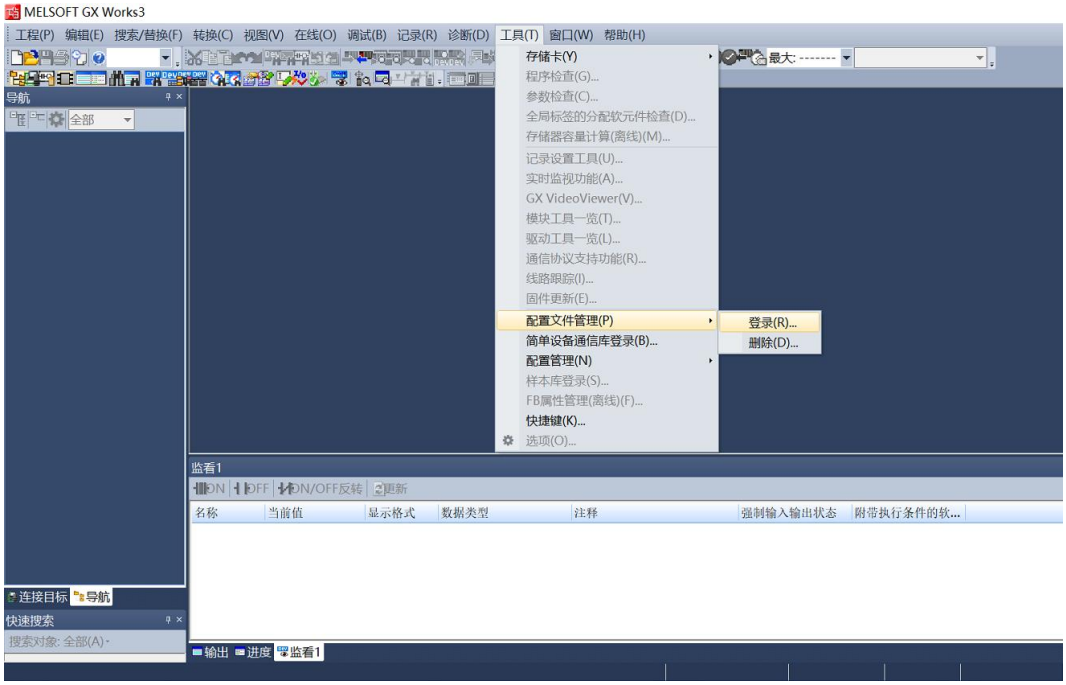
- **Hardware Environment**
  - **Module preparation. This description takes the XB6S-CB2002+XB6S-1616B+XB6S-A80VD+XB6S-A08I topology as an example.**
  - **A computer with GX Works3 pre-installed**
  - **A Mitsubishi PLC**
    This description takes model R04ENCPU as an example
  - **Shielded cable for CC-Link IE Field Basic**
  - **Switching power supply**
  - **Device Profile**
    Configuration file acquisition address:https://www.solidotech.com/documents/configfile
- **Hardware configuration and wiring**
  Please follow the4 Installation and removal"and"5 WiringRequest action

- **Computer IP requirements**

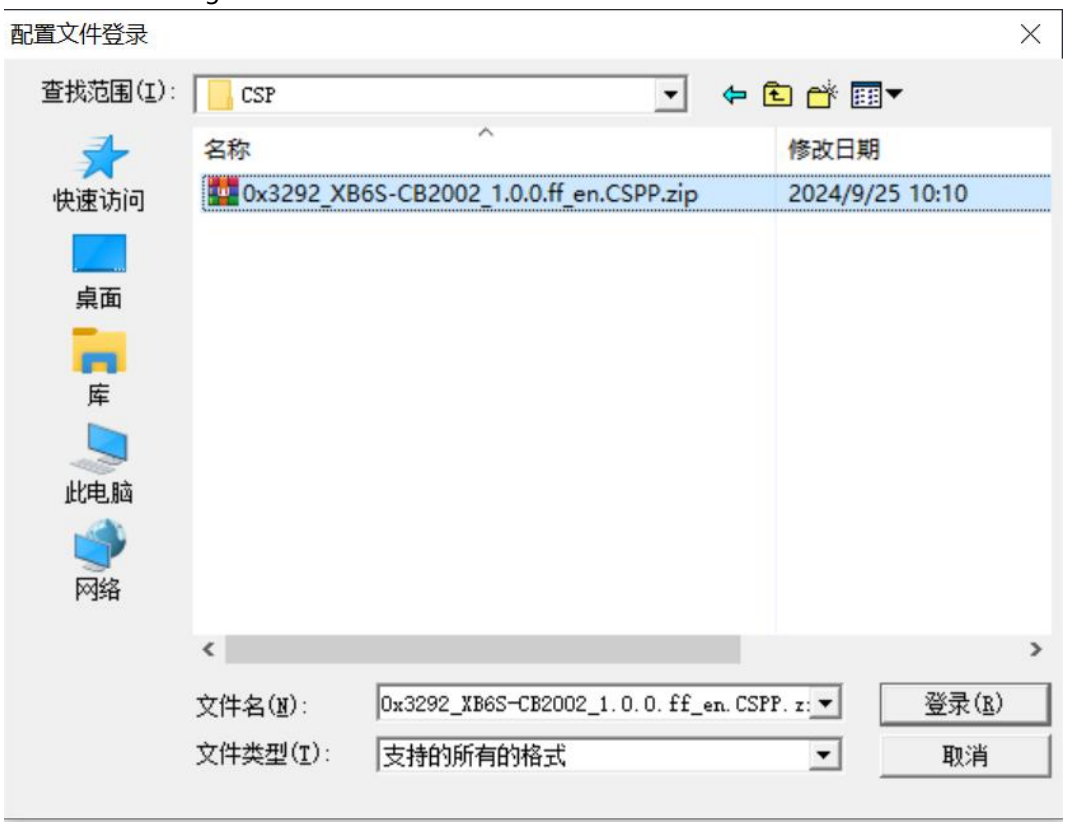
Set the IP address of the computer and the IP address of the PLC, and ensure that they are in the same network segment.

2、Install CSP File

a. Open GX Work3 software, click "Tools" in the menu bar, and click "Configuration File Management -> Login", as shown in the figure below.



b. In the pop-up box, select the CSP file to be added and click "Login" to complete the installation, as shown in the figure below.



Note: The configuration file does not need to be decompressed, and the project needs to be closed during installation; if the configuration file needs to be replaced, be sure to uninstall it before adding it.

3、 Create a project

a. Click "Project" in the menu bar, and then click "New Project".

b. The New Project dialog box pops up. Select "RCPU" for PLC series, "R04EN" for PLC type, and ladder diagram as the default programming language.

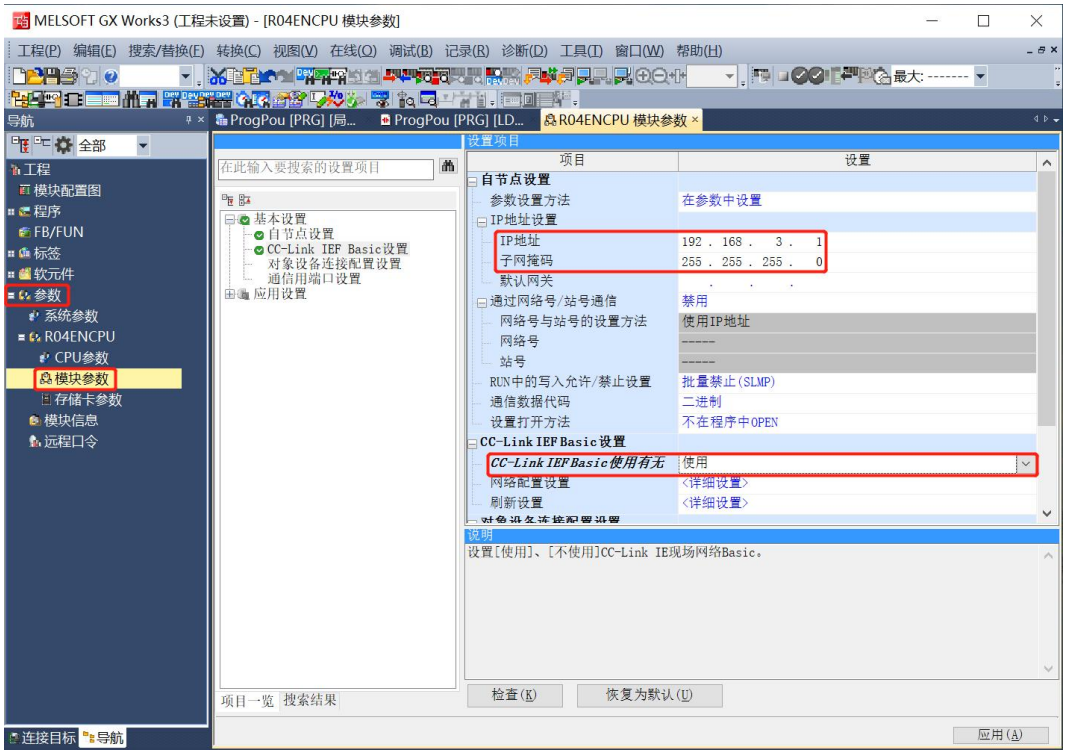
c. Click OK, as shown in the following figure.

XB6S-CB2002 coupler supports the following master station list:

MELSEC iQ-R	
name	model
Programmable controller	CPUR00CPU, R01CPU, R02CPU, R04CPU, R04ENCPU, R08CPU, R08ENCPU, R16CPU, R16ENCPU, R32CPU, R32ENCPU, R120CPU, R120ENCPU
C language controller module	R12CCPU-V
MELSEC iQ-L	
CPU Module	L04HCPU, L08HCPU, L16HCPU
MELSEC iQ-F	
FX5UJ CPU Module	FX5UJ-24MR/ES, FX5UJ-24MT/ES, FX5UJ-24MT/ESS, FX5UJ-40MR/ES, FX5UJ-40MT/ES, FX5UJ-40MT/ESS, FX5UJ-60MR/ES, FX5UJ-60MT/ES, FX5UJ- 60MT/ESS
FX5U CPU Module	FX5U-32MR/ES, FX5U-32MT/ES, FX5U-32MT/ESS, FX5U-64MR/ES, FX5U-64MT/ES, FX5U-64MT/ESS, FX5U-80MR/ES, FX5U-80MT/ES, FX5U-80MT/ESS , FX5U-32MR/DS, FX5U-32MT/DS, FX5U-32MT/DSS, FX5U-64MR/DS, FX5U-64MT/DS, FX5U-64MT/DSS, FX5U-80MR/DS, FX5U-80MT/DS, FX5U -80MT/DSS
FX5UC CPU Module	FX5UC-32MT/D, FX5UC-32MT/DSS, FX5UC-64MT/D, FX5UC-64MT/DSS, FX5UC-96MT/D, FX5UC-96MT/DSS, FX5UC-32MT/DS-TS, FX5UC-32MT/DSS- TS, FX5UC-32MR/DS-TS
FX5 Intelligent Function Module	FX5-ENET
MELSEC-Q	
General purpose high speed QCPU	Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU
MELSEC-L	
Ethernet port built-in LCPU	L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT
MELIPC	
MELIPC MI5000 Series	MI5122-VW

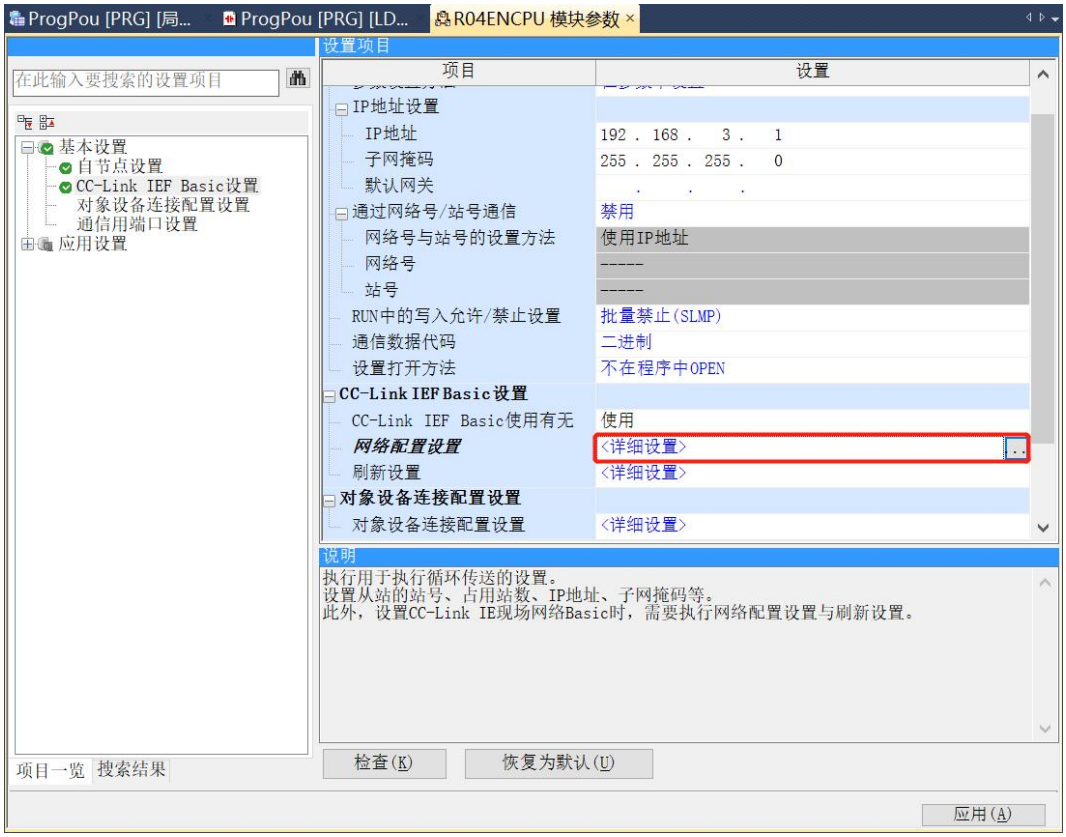
4、Setting up using CC-Link IE Field Network Basic

a. In the left navigation interface, select "Parameters -> CPU Module Model", double-click "Module Parameters", set the IP address of the CPU under IP Address Settings, and select "Use" in the drop-down box of "CC-Link IEF Basic Use or Not", as shown in the figure below.

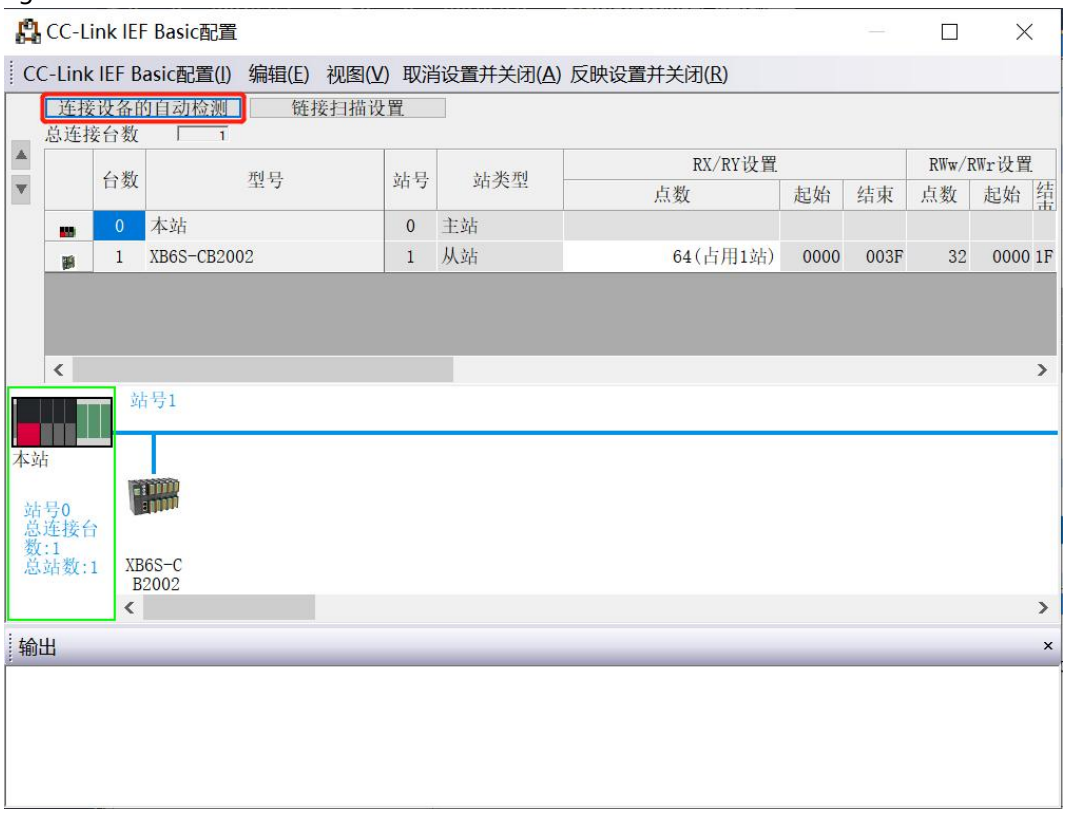


Note:The IP addresses of the CPU and XB6S-CB2002 need to be set to the same network segment.

b. In the project settings interface, select "Network Configuration Settings" and double-click "Detailed Settings", as shown in the figure below.

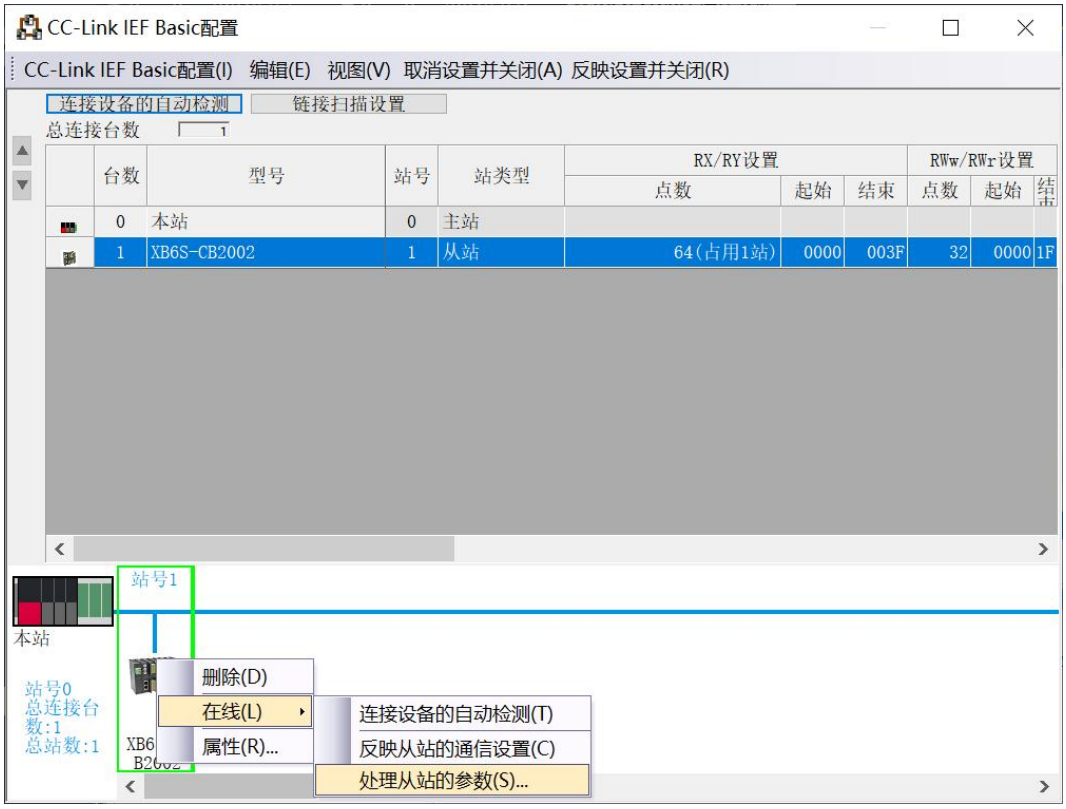


c. In the CC-Link IEF Basic configuration pop-up window, click "Automatic detection of connected devices" to automatically add the connected modules to the network, as shown in the following figure.

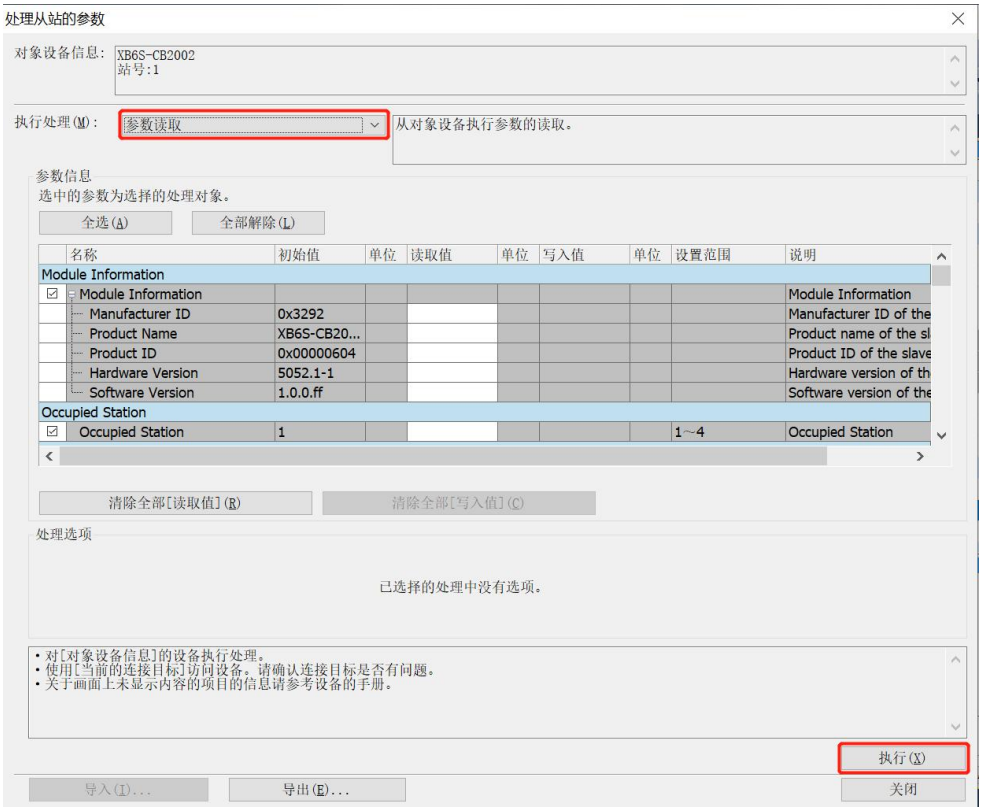


5、Reading parameters

a. In the CC-Link IEF Basic configuration window, right-click the slave device and select "Online -> Process slave parameters", as shown in the figure below.

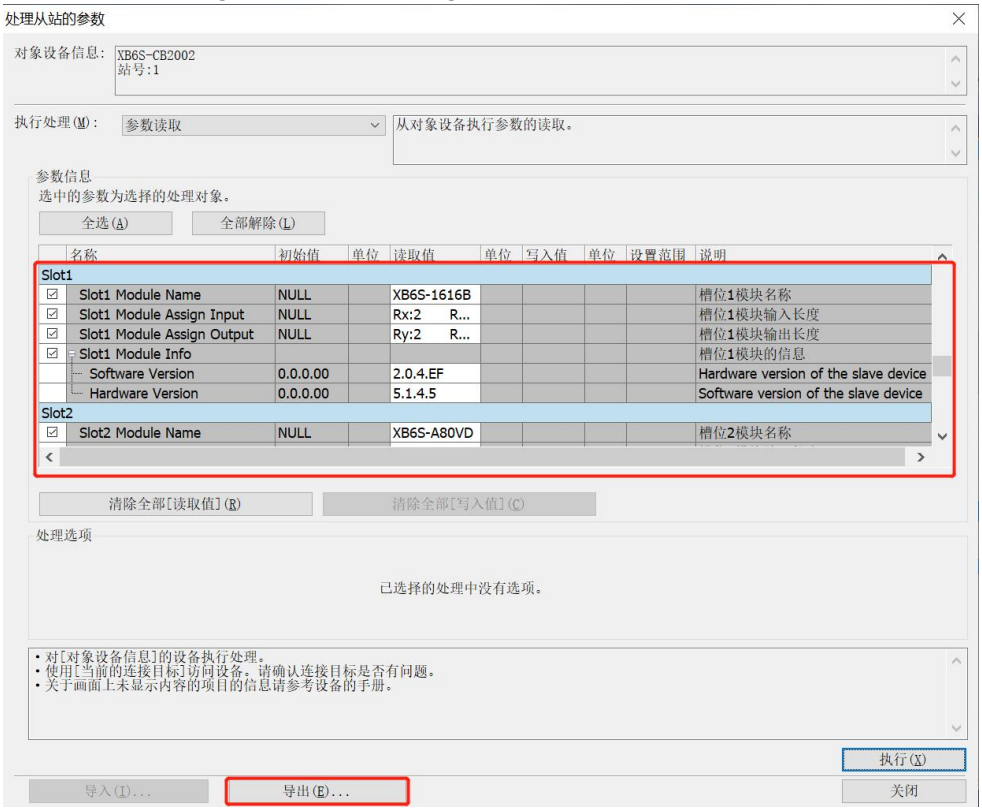


b. In the pop-up window for processing the parameters of the slave station, set the execution process to "Parameter Read" and click "Execute" to complete the reading of related parameters, as shown in the following figure.



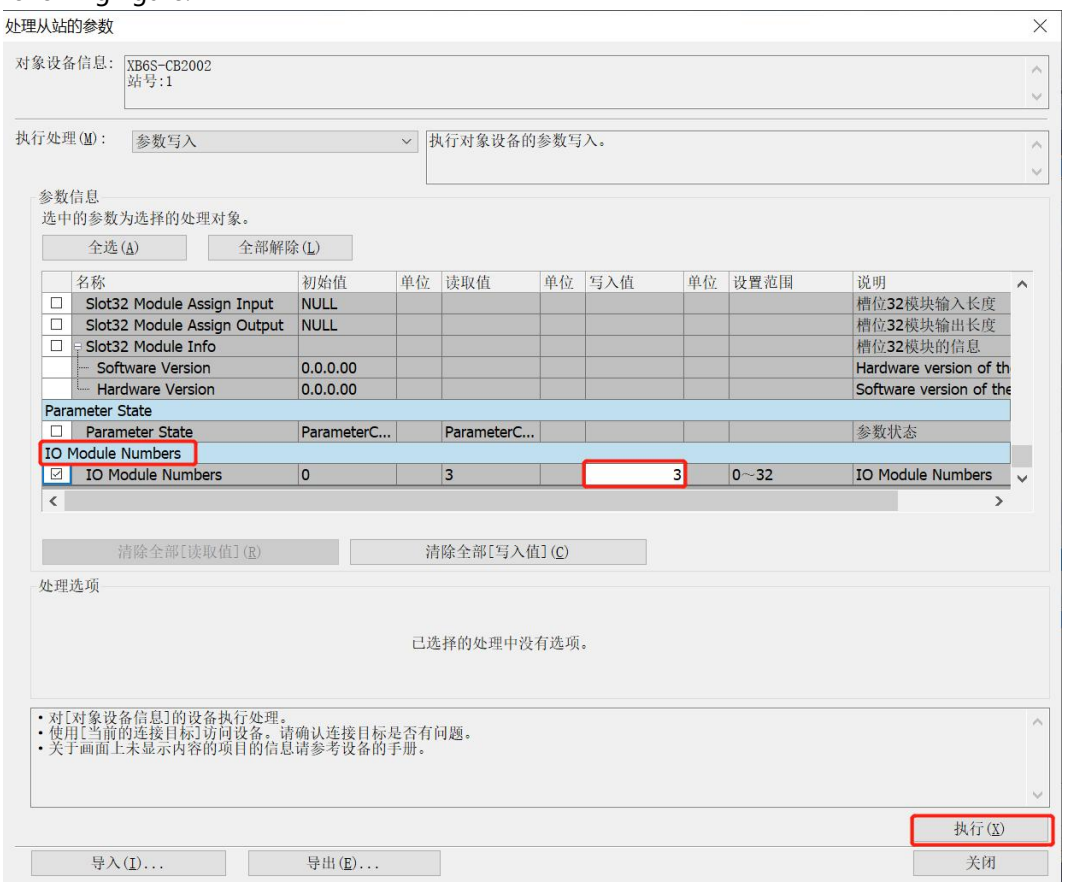
6、 IO information query

a. In the pop-up window for processing slave station parameters, you can check the corresponding IO information in [Slot1~32]. You can check the module name, input and output length, hardware version number and software version number. Click [Export (E)] to generate an Excel file for later viewing, as shown in the figure below.



7、Number of write modules

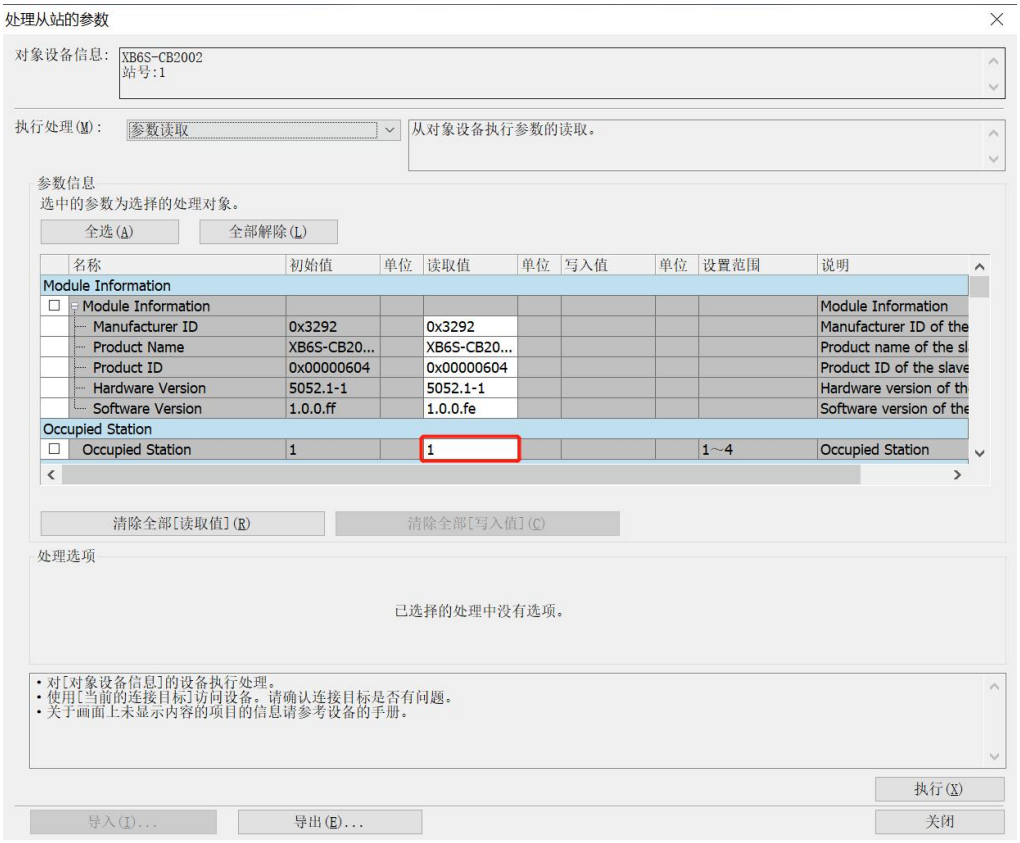
a. In the pop-up window for processing the slave station parameters, set the execution process to "Parameter Write", click "Release All", check the "IO Module Numbers" function option, and write the total number of IOs connected in the actual topology in "Write Value". After the settings are completed, click "Execute" to complete the configuration delivery, as shown in the following figure.



Note: Writing the module number is a necessary step for communication and must be performed.

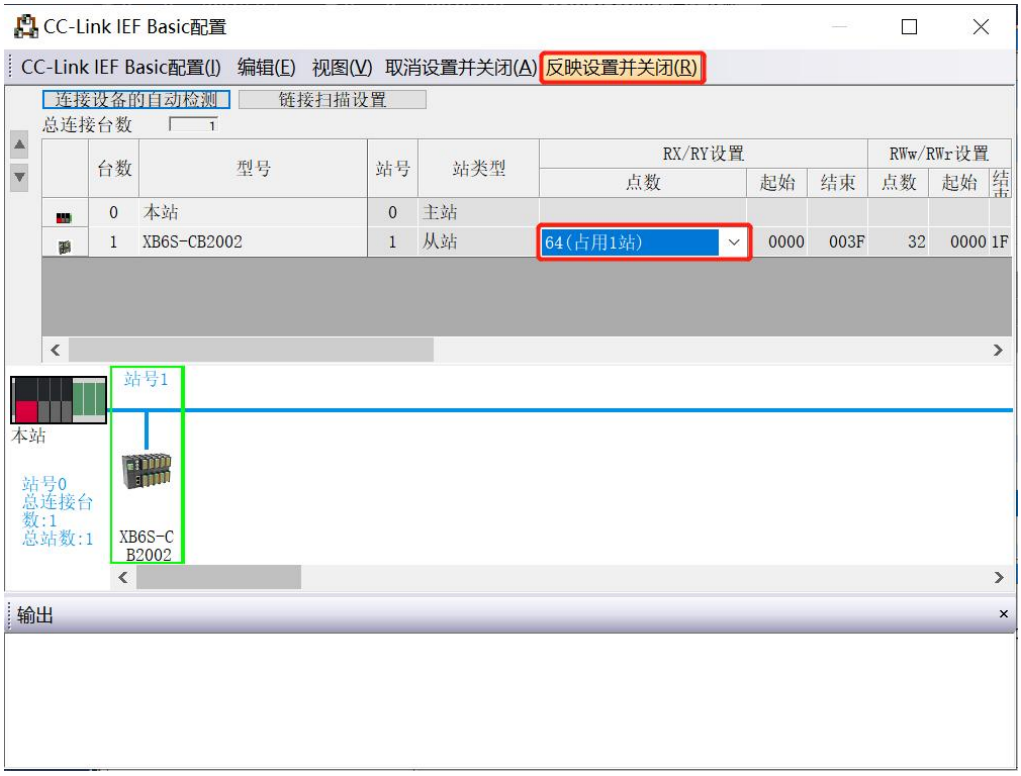
8、Occupied station number selection

a. In the parameter pop-up window for processing the slave station, record the "Read value" as "1", as shown in the figure below.



Note: Occupied Station is the number of stations occupied by the coupler. You need to read the current position and return to the configuration page to select manually.

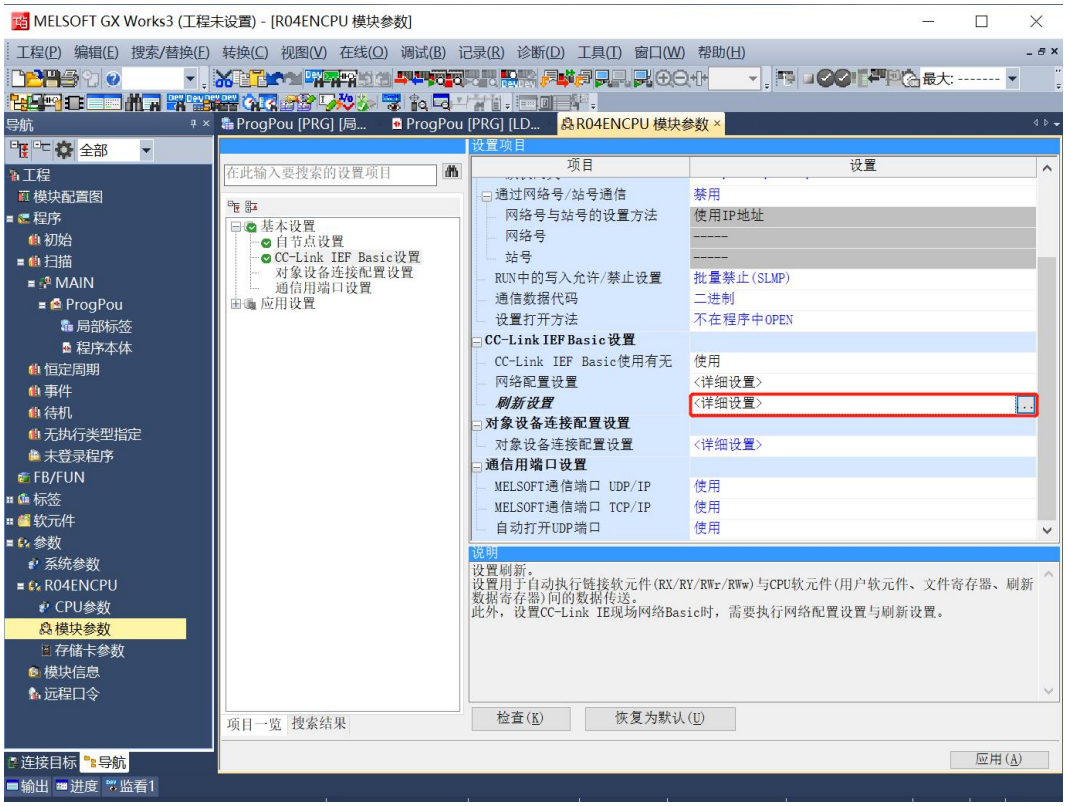
b. The number of occupied stations is selected according to the read value. Here, select 1 station to occupy. Click "Reflect Settings and Close" to complete the configuration, as shown in the following figure.



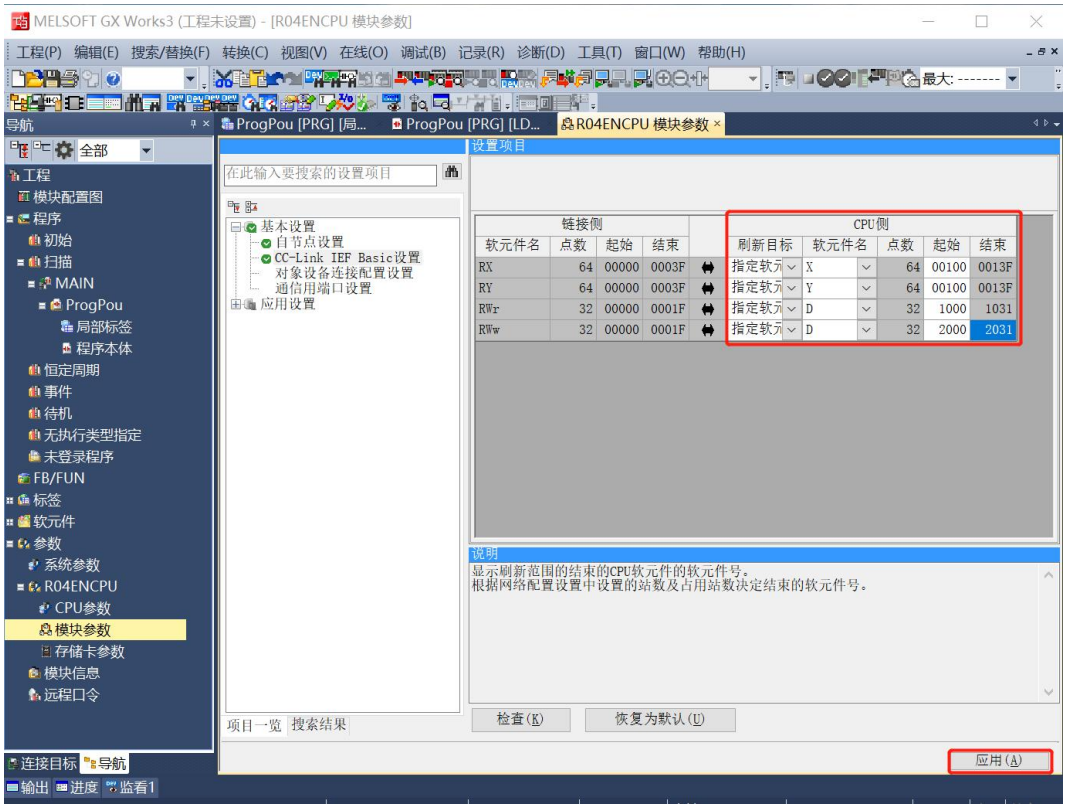
9、 Refresh side settings

a. In the left navigation interface, select "Parameters -> CPU Module Model" and double-click "Module Parameters".

b. In the project setting interface, select "CC-Link IEF Basic Settings -> Refresh Settings", double-click "Detailed Settings", as shown in the figure below.



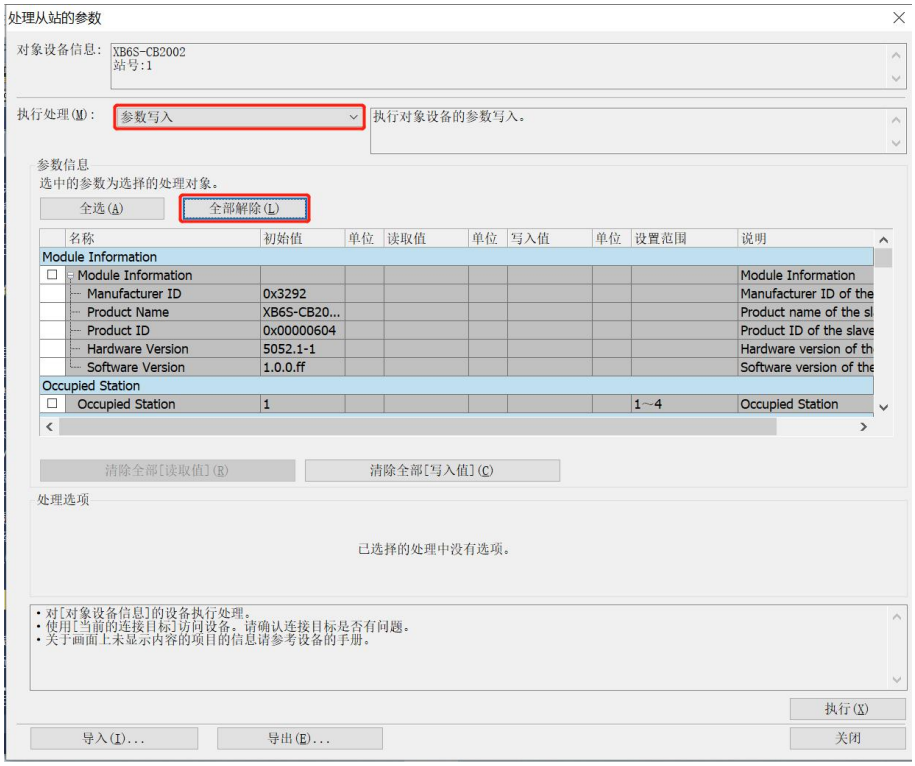
c. Configure related parameters. After completing the configuration, click Apply, as shown in the following figure.



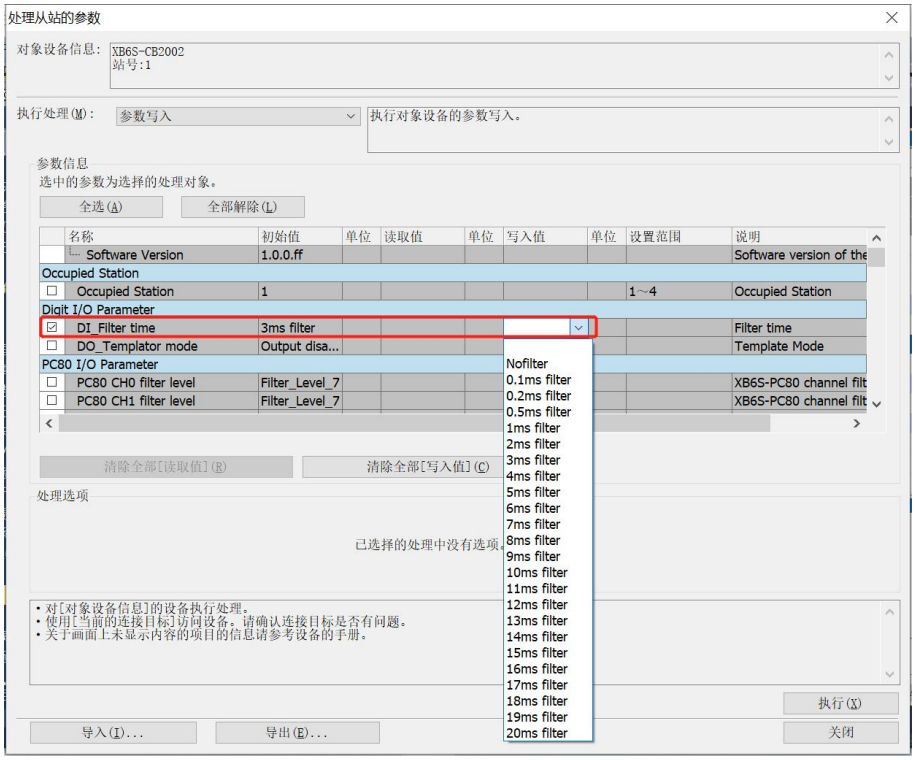
10、 Parameter settings

a. In the CC-Link IEF Basic configuration window, right-click the slave device and select "Online -> Process slave parameters".

b. In the parameter pop-up window for processing slave stations, set the execution processing to "Parameter Write" and click "Release All" to facilitate individual configuration of parameters, as shown in the figure below.

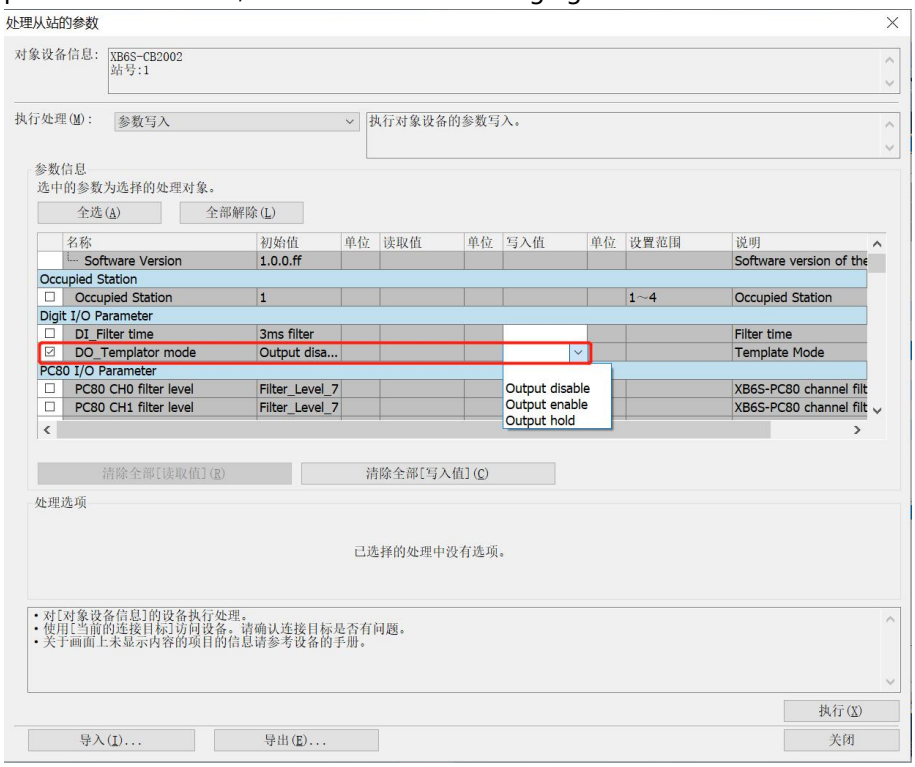


c. For example, to modify the digital filter time parameters, you can check the "DI_Filter time" function option, select the filter time as needed in "Write value", and after the settings are completed, click "Execute" to save the parameters to the coupler and download the parameters to the controller to make the parameters effective, as shown in the figure below.

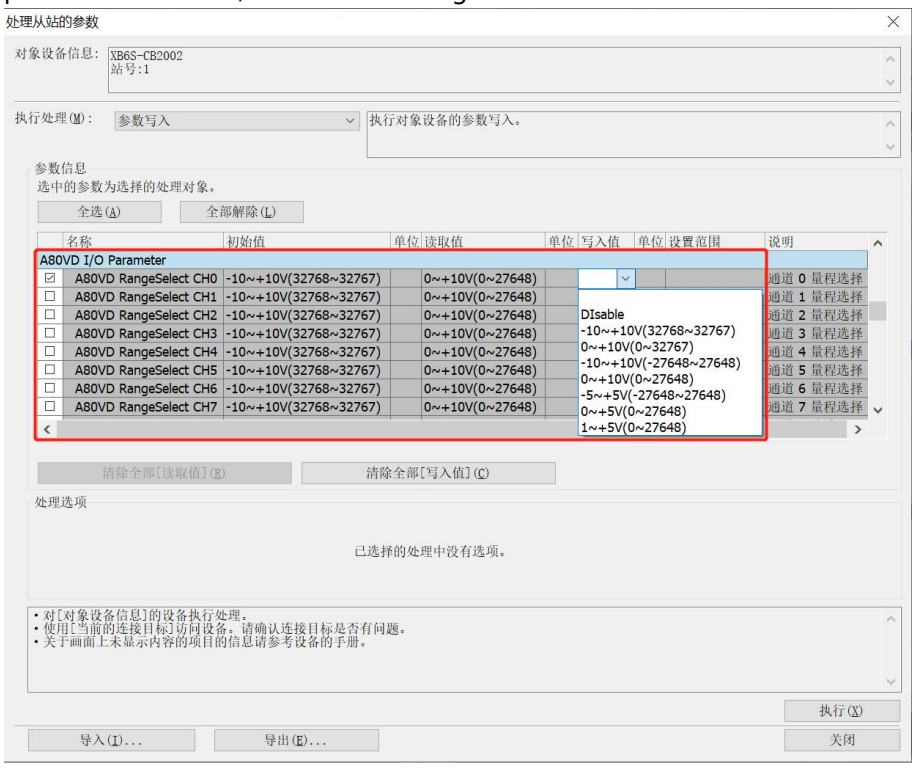


d. For example, to clear/hold the function parameters of the digital output signal, you can check the "DO_Templator mode" function option, and select "Output disable", "Output enable" or "Output hold" as needed in "Write value". After the settings are completed, click "Execute" to

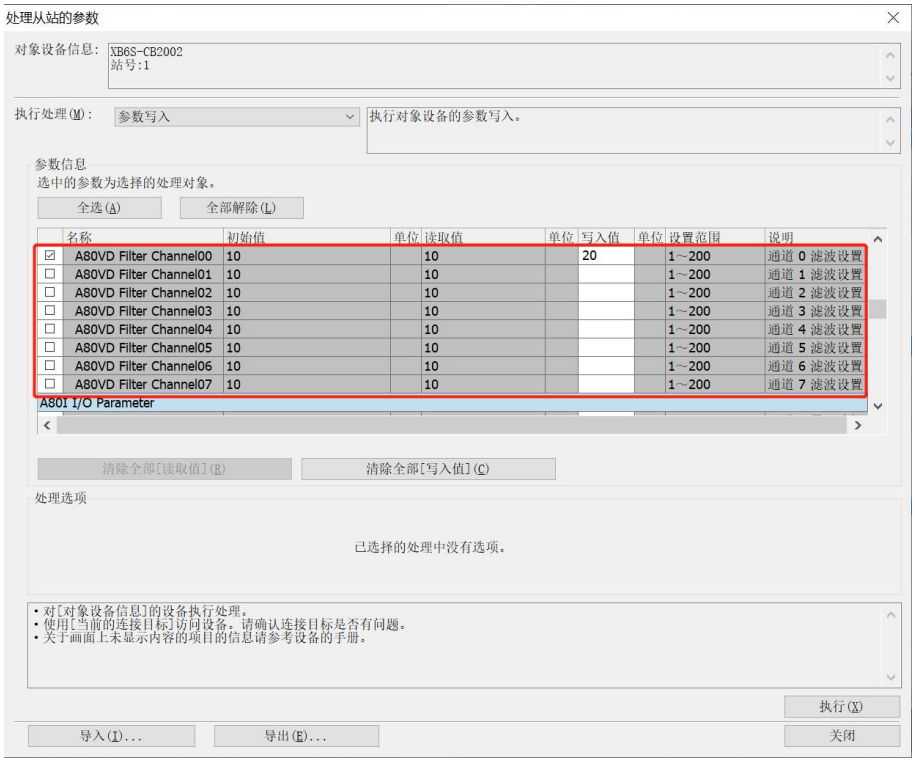
save the parameters to the coupler and download the parameters to the controller to make the parameters effective, as shown in the following figure.



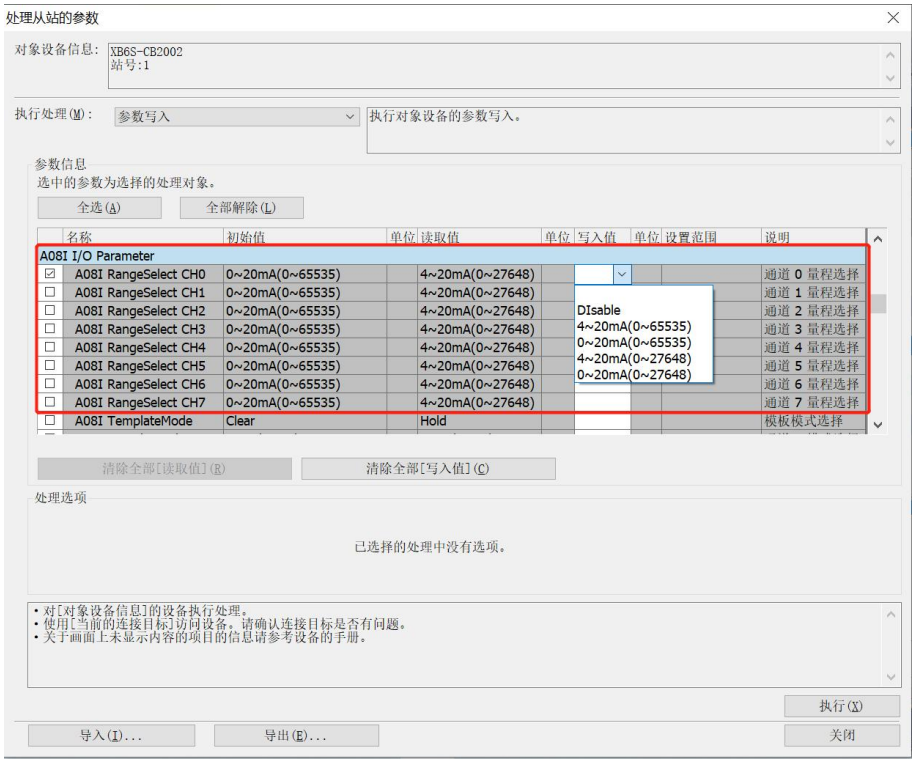
e. For example, to modify the analog voltage range of XB6S-A80VD, you can check the "RangeSelect" function option, select the channel range as needed in "Write Value", and configure each channel independently. After the settings are completed, click "Execute" to save the parameters to the coupler and download the parameters to the controller to make the parameters effective, as shown in the figure below.



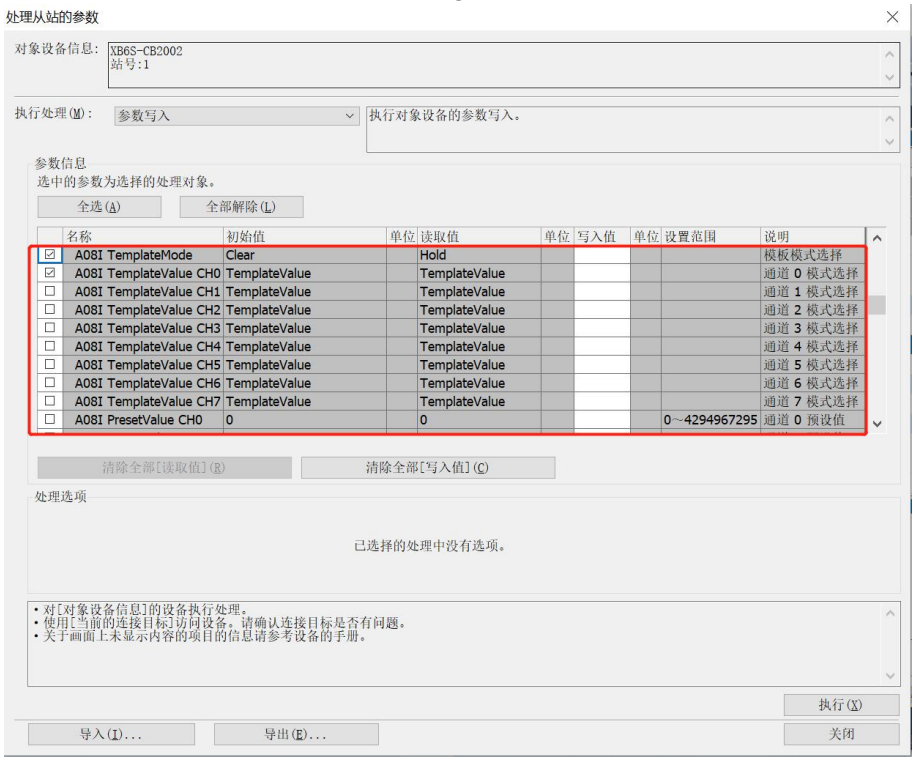
f. For example, to modify the XB6S-A80VD analog input filter parameters, you can check the "Filter Channel" function option, enter the number of filters as needed in the "Write Value" field, and configure each channel independently. After the settings are completed, click "Execute" to save the parameters to the coupler and download the parameters to the controller to make the parameters effective, as shown in the figure below.



g. For example, to modify the analog output current range of XB6S-A08I, you can check the "RangeSelect" function option, select the channel range as needed in "Write Value", and configure each channel independently. After the settings are completed, click "Execute" to save the parameters to the coupler and download the parameters to the controller to make the parameters effective, as shown in the figure below.

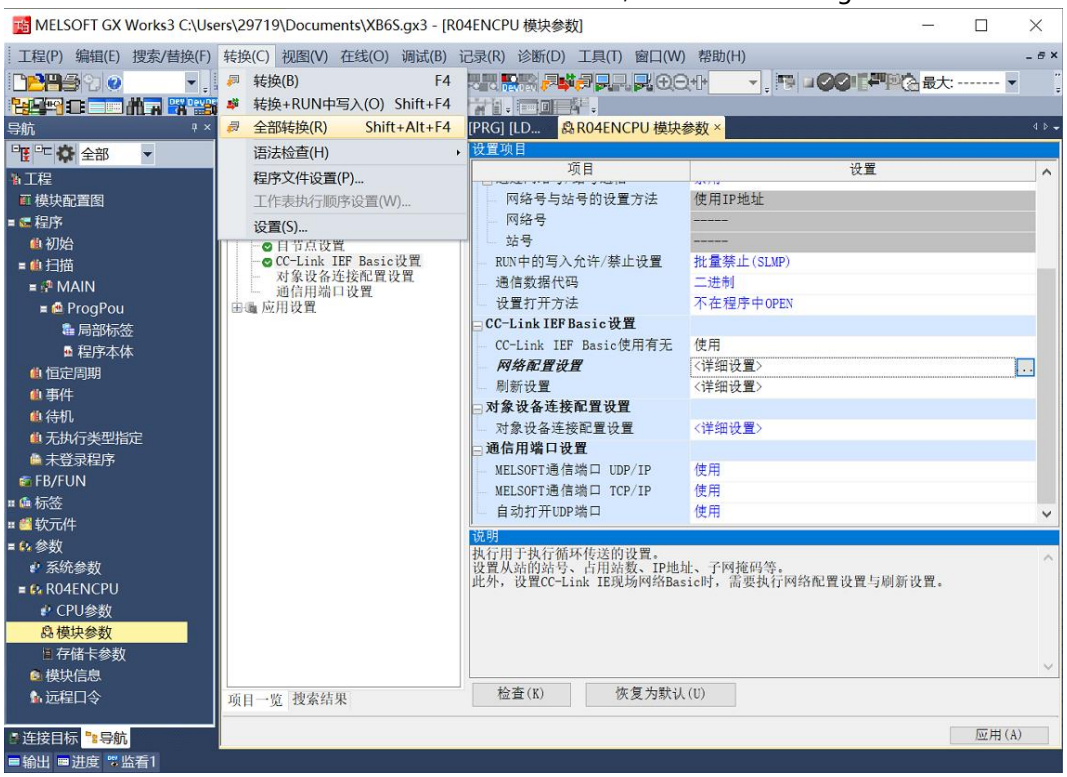


h. For example, to modify the XB6S-A08I analog output clear/hold function, all channels are in output clear mode by default. Module channels can be configured separately. Check the function options that need to be set and set them in "Write Value". For the corresponding relationship, see6.2.5 Clear/hold analog output signalAfter the settings are completed, click "Execute" to save the parameters to the coupler and download the parameters to the controller to make the parameters effective, as shown in the figure below.

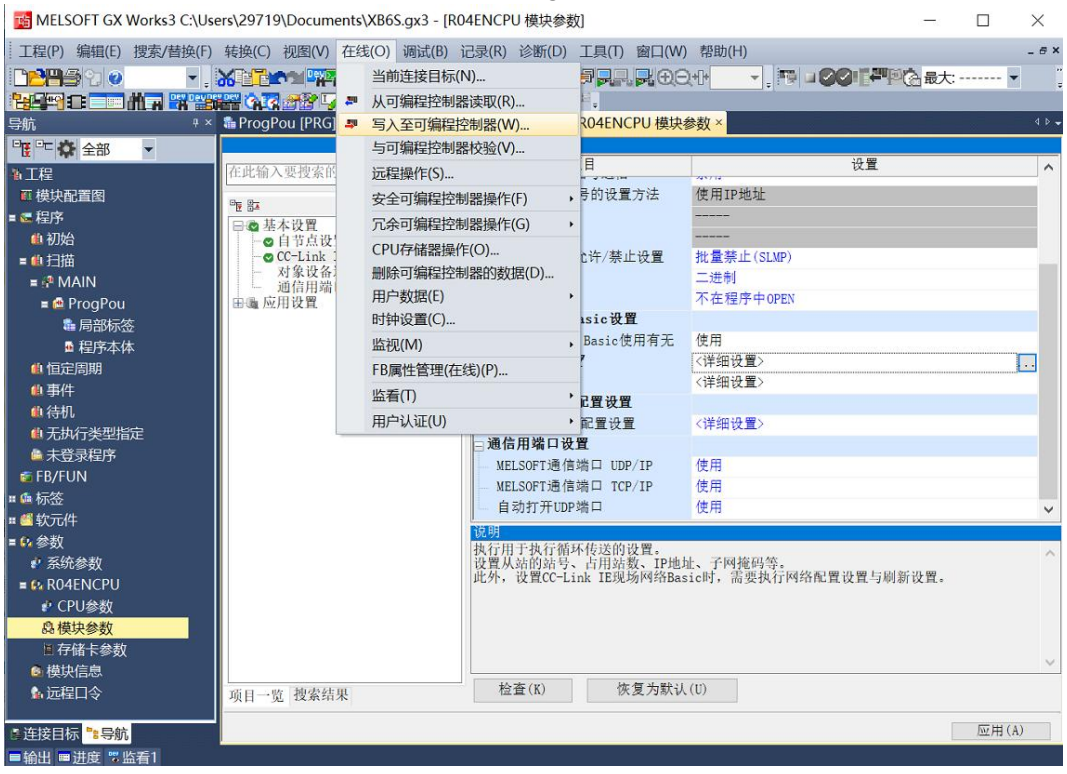


11、 Download setting parameters

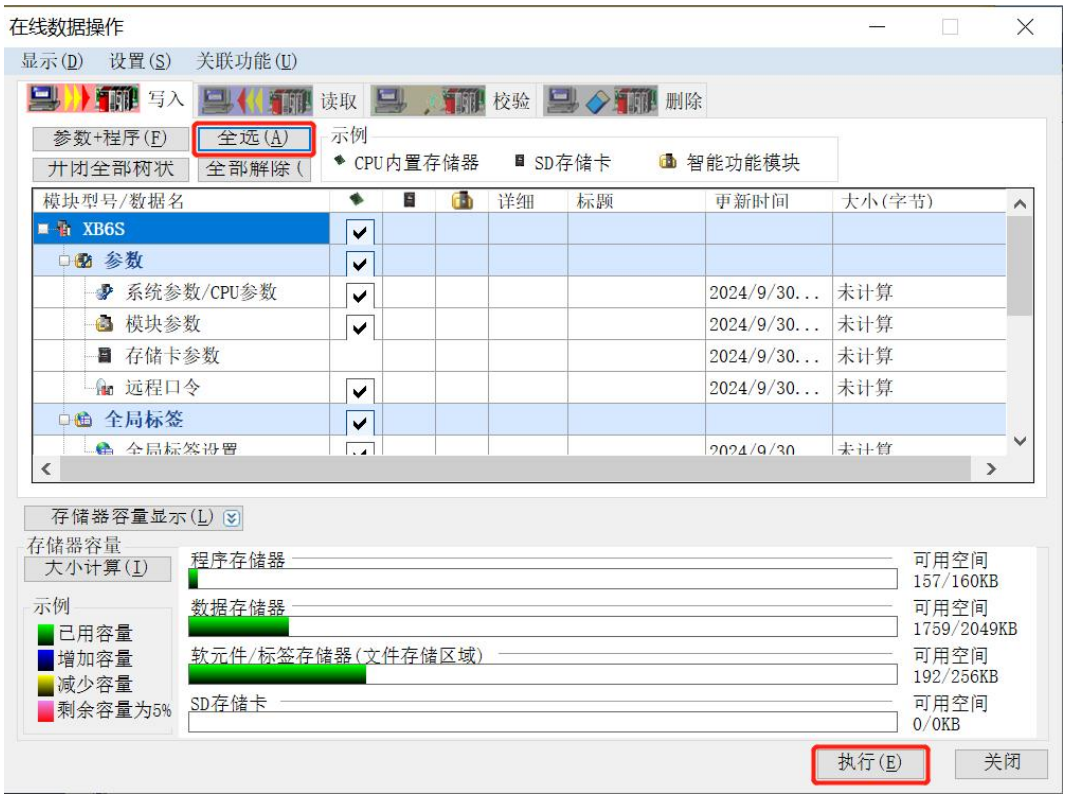
a. Click "Convert" in the menu bar and click "Convert All", as shown in the figure below.



b. Click "Online" in the menu bar, click "Write to PLC", and write the set parameters to the CPU module of the master station, as shown in the figure below.



c. The "Online Data Operation" dialog box pops up, select "Select All", as shown in the figure below.



d. Click Execute.

e. A prompt box pops up asking "Do you want to write to PLC after executing remote STOP?" Select "Yes".

f. A lower-level prompt box pops up: "Parameters already exist, do you want to overwrite?" Select "Yes to All".

g. A lower-level prompt box pops up: "There is no data in the soft component comment (COMMENT). No data is written." Click "OK".

h. A prompt box pops up saying "CPU is in STOP state. Do you want to execute remote RUN?" Select "Yes".

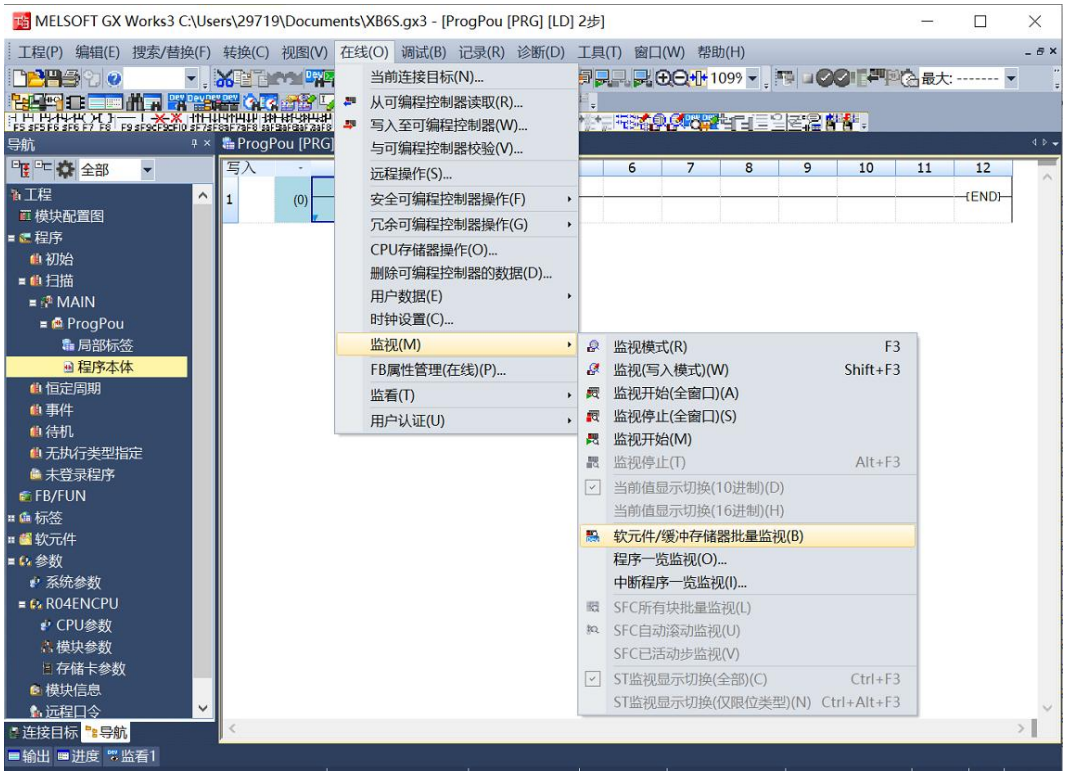
i. A dialog box pops up saying "Completed". Click OK.

j. The download and parameter setting operation is now complete. Click Close.

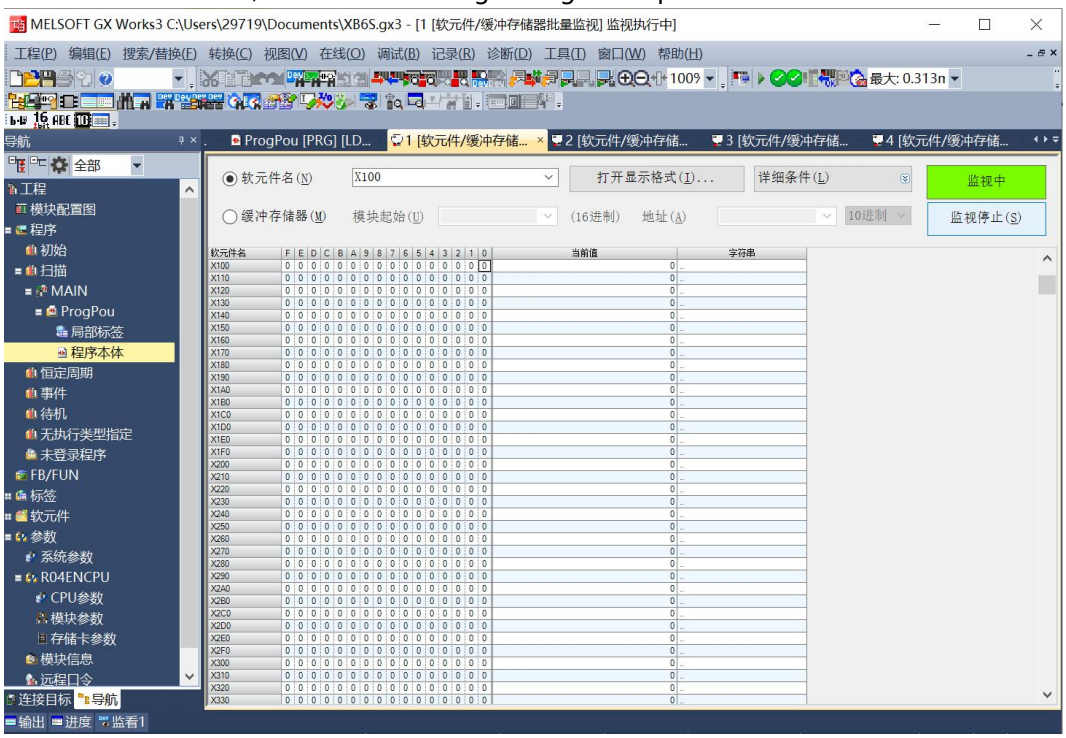
k. Disconnect power from the module and PLC and then power them back on.

12、 Monitoring Settings

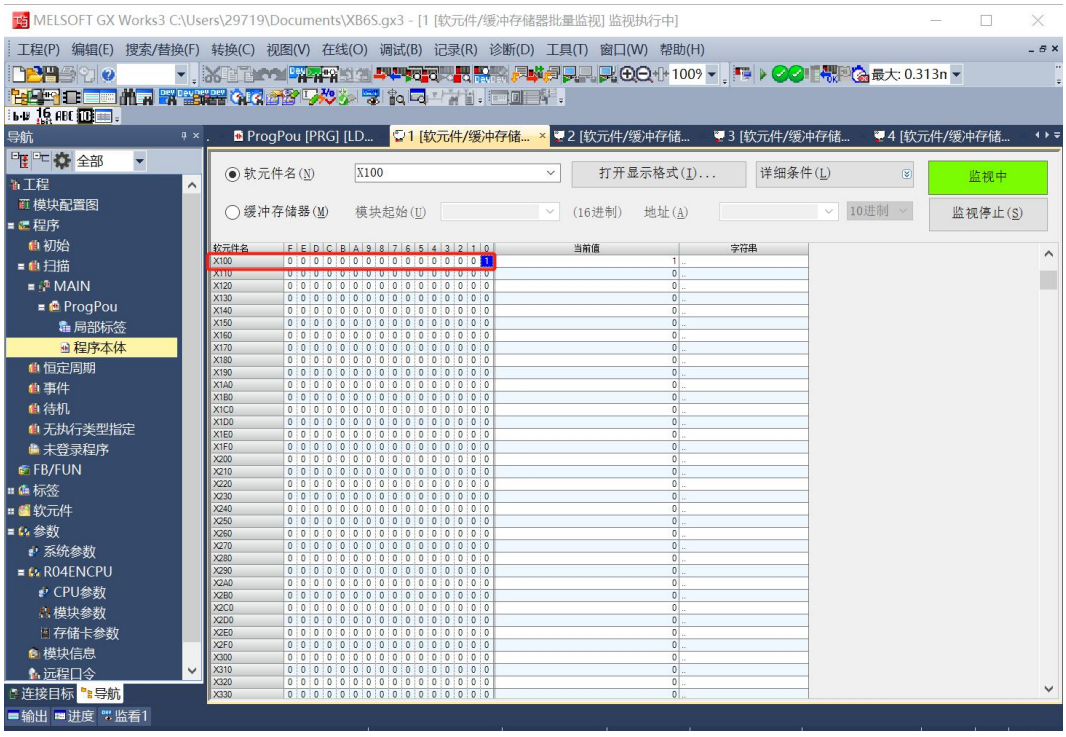
a. Select "Online -> Monitor -> Device/Buffer Memory Batch Monitor".



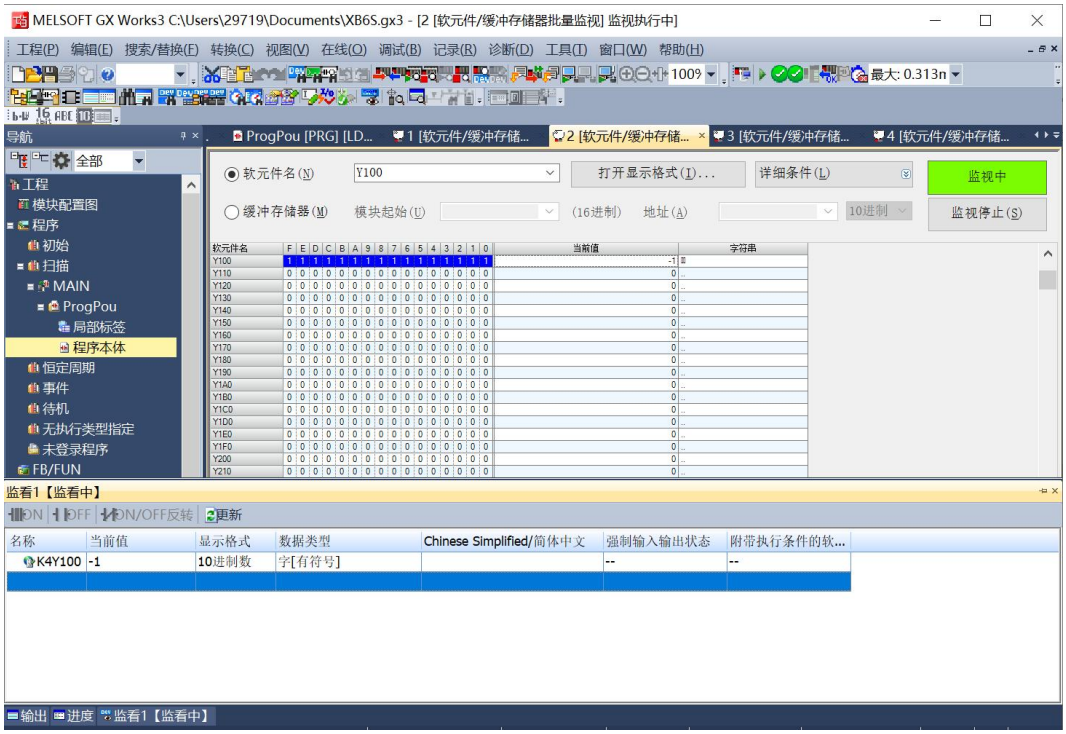
b. Repeat the above operation to establish four monitoring interfaces. Enter the parameters of "Remote Input (RX) Refresh Soft Component", "Remote Output (RY) Refresh Soft Component", "Remote Register (RWr)" and "Remote Register (RWw)" set in the network parameter setting interface in the "Soft Component Name" of the four monitoring interfaces, that is, "X100", "Y100", "D1000" and "D2000", and the monitoring setting is completed.



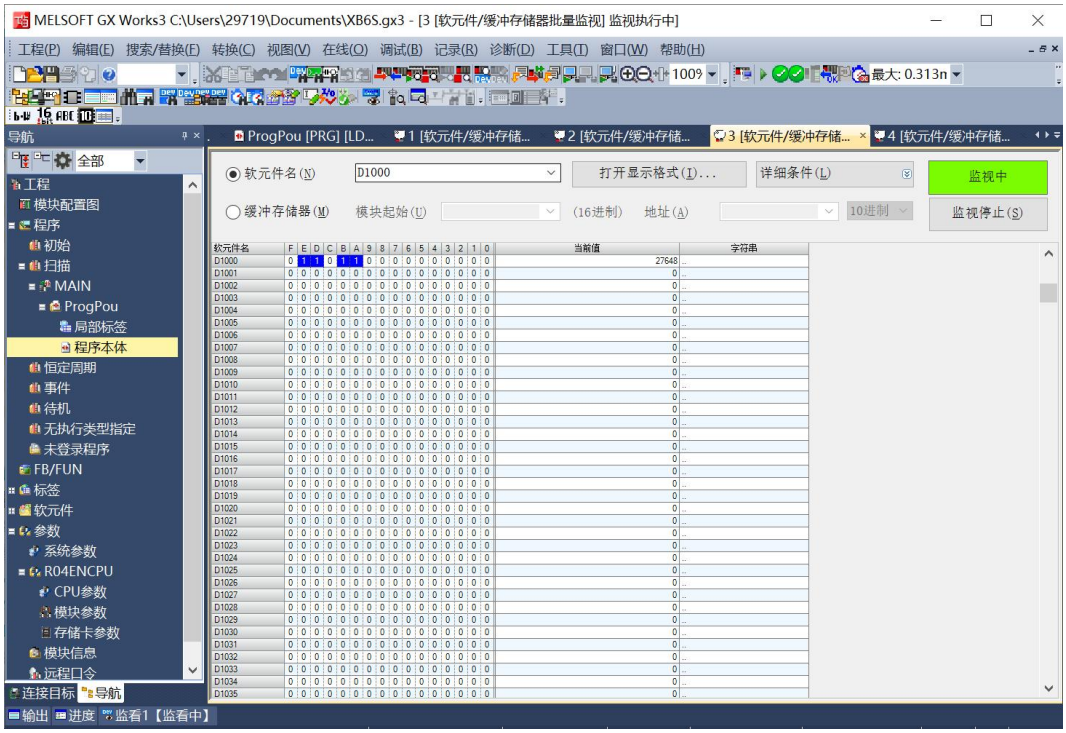
c. The XB6S-1616B module has 16 input channels, each channel occupies 1 bit, corresponding to X100 (0~F). When input channel 0 inputs a valid voltage, the module channel 0 indicator light is always on, and the monitoring interface X100 value is 1, as shown in the figure below.



d. The XB6S-1616B module has 16 output channels, each channel occupies 1 bit, corresponding to Y100 (0~F). Double-click the value to modify the channel value. When the value of any channel from 0 to F is 1, the indicator light of the corresponding channel is always on. When the channel value is 0, the indicator light of the corresponding channel is off. The monitoring interface is shown in the figure below.



e. The XB6S-A80VD module has 8 analog input channels, each channel occupies 2 bytes, the starting address is D1000, corresponding to D1000 (0~F)~D1007 (0~F), and the input voltage code value of each channel can be viewed in the monitoring interface. The monitoring interface is shown in the figure below.



f. The XB6S-A08I module has 8 analog output channels, each channel occupies 2 bytes, the starting address is D2000, corresponding to D2000 (0~F)~D2007 (0~F), the values of D2000~D2007 can be modified to voltage code values, and the monitoring interface is shown in the figure below.