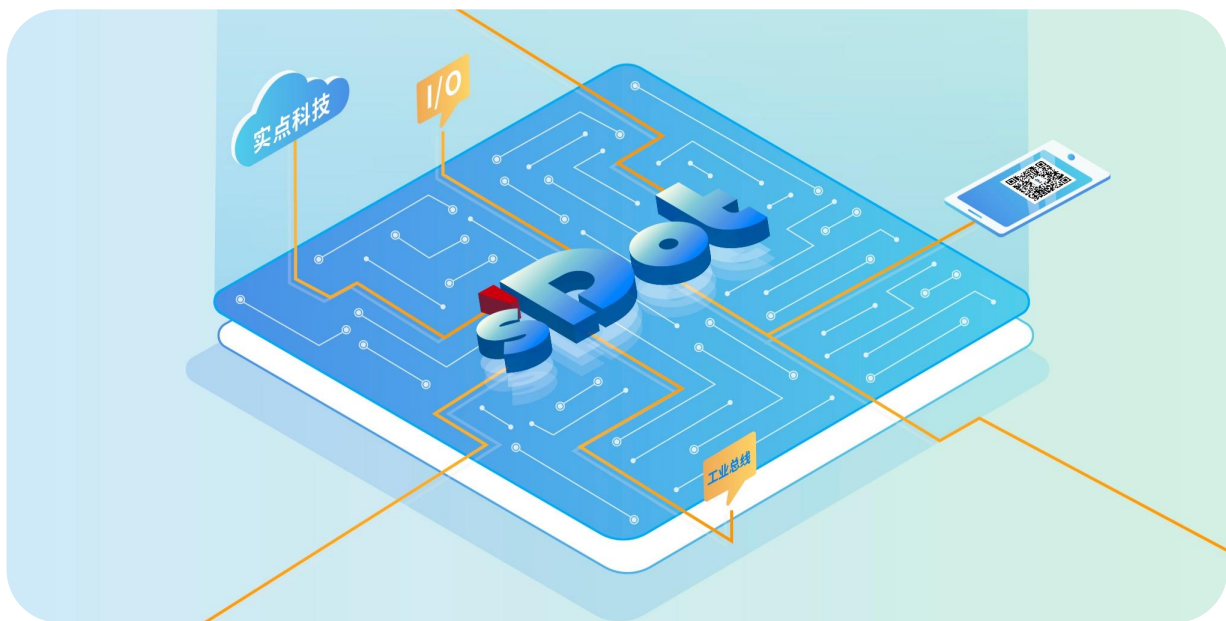




EtherNet/IP

XB6S Series Slice I/O

User Manual



Nanjing Solidot Electronic Technology Co., Ltd.

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1 Product Overview

1.1 Product Introduction

The XB6S series slice I/O modules employ a combination of couplers and I/O modules. The coupler connects the expandable I/O modules to a real-time industrial Ethernet system. The backplane uses an X-bus bus, and the coupler module handles fieldbus communication, thus enabling various I/O modules to exchange data with the coupler/controller in real time.

The XB6S series of slice I/O modules offers a wide variety and high real-time performance, providing users with support for high-speed data acquisition, optimized system configuration, simplified field wiring, and improved system reliability.

1.2 Product Features

- **Small number of nodes required**
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 functionality**
It supports flexible expansion and has a complete range of I/O types; it can integrate various digital modules, analog modules, analog current & voltage compatible modules, and temperature modules to meet the needs of different applications.
- **Flexible configuration**
Various types of slice I/O modules can be combined arbitrarily.
- **High compatibility**
The coupler's communication interface conforms to communication standards and supports mainstream EtherNet/IP master stations.
- **Small size**
It has a compact structure and occupies little space.
- **Easy to diagnose**
The indicator lights are complete, making the module status clear at a glance and facilitating testing and maintenance.
- **Fast**

The backplane uses the X-bus bus: the minimum scan cycle is 200us, and the typical value is 1ms.

- **Easy to install**

Mounted on DIN 35 mm standard rails.

It adopts spring-loaded terminal blocks, making wiring convenient and quick.

1.3 Application methods

The coupler module connects to the controller at the application site, while the I/O module connects to the input and output sensors at the application site. The typical data acquisition, processing, and control flow is as follows:

- a. The input I/O module collects various field signals and sends them to the coupler via the internal bus;
- b. The controller reads and processes data from the coupler via fieldbus or industrial Ethernet, and then writes the output data back to the coupler.
- c. The coupler then writes the output data to the output I/O module via the internal bus, thereby enabling device control.

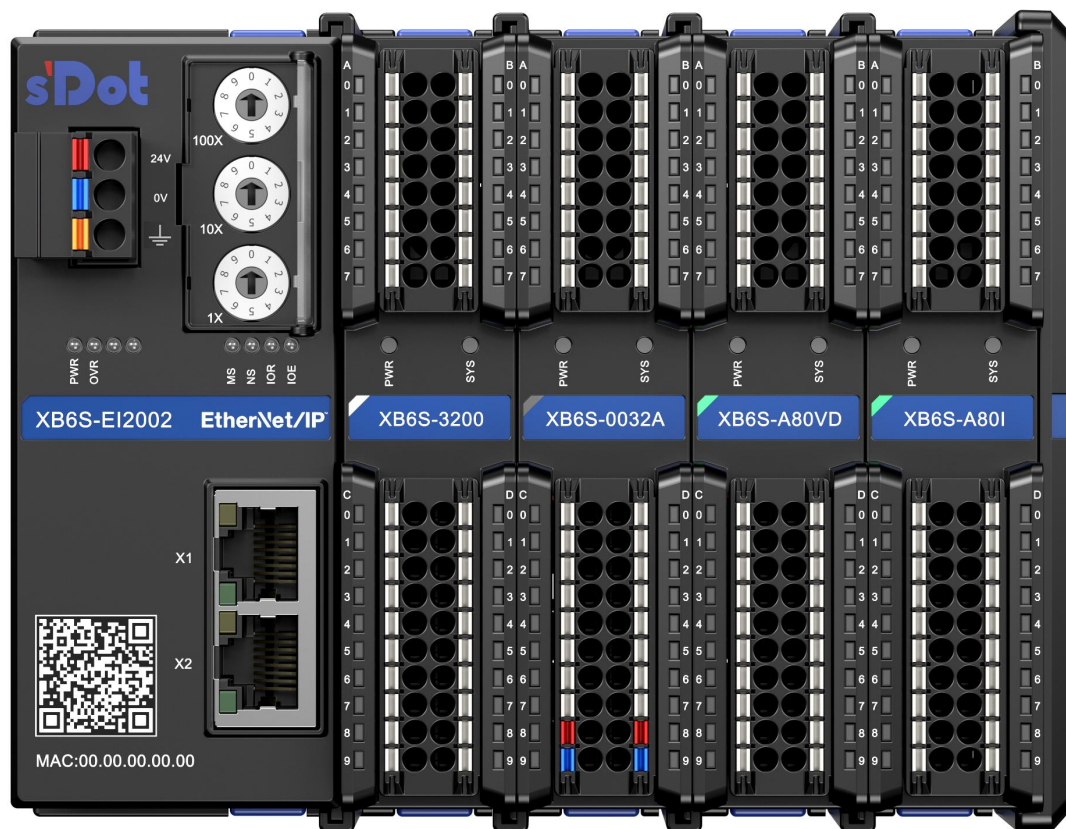
Expandable I/O modules include digital input modules, digital output modules, digital input/output modules, analog input modules, analog output modules, temperature modules, etc.

Application method: Applications employ a combination of modules such as couplers, digital signals, analog signals, temperature sensors, and extended power supplies.

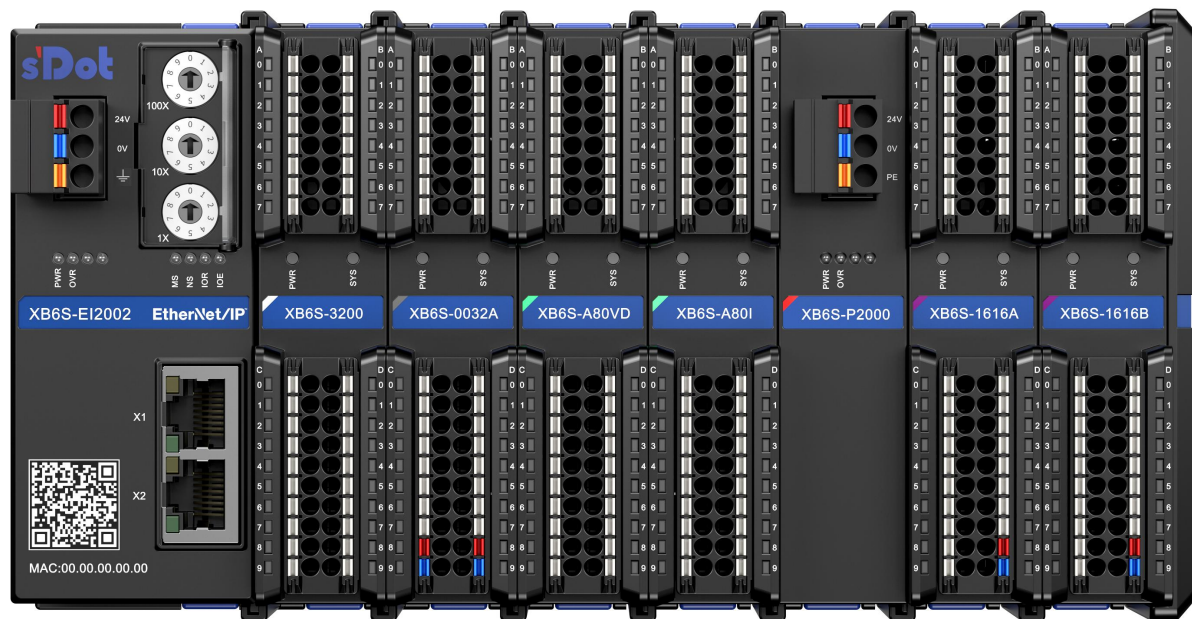
Application configuration: Depending on the requirements of the main station's access capabilities, number of stations, number of I/O points, and function types, it can adapt to different models of I/O module combinations and configurations.

Configuration rules: The modules, from left to right, consist of a coupler module, a power module, an I/O module, and a terminal cover (which must be configured).

The product uses a combination of coupler, I/O module, and terminal cover, and there are two possible combinations.

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

Product combination option two (coupler module, I/O module, extended power supply module, I/O module, terminal cover)



2 Naming Rules

2.1 Naming Rules

2.1.1 Coupler naming rules

XB 6 S - EI 20 02
(1) (2)(3) (4) (5) (6)

Serial number	Meaning	Value description
(1)	Bus type	XB: X-bus
(2)	Product Series	6: Insert type
(3)	Product Version	S: Strengthen, upgraded version
(4)	Bus Protocol	EC: EtherCAT PN: PROFINET EI: EtherNet/IP
(5)	Power supply	20:2A
(6)	Number of network ports	02: Dual network ports
(7)	Product Configuration	C: Standard Edition Default: Flagship Edition

2.1.2 I/O module naming rules

XB **6** **S** - **A** **8** **0** **V**
(1) **(2)****(3)** **(4)** **(5)****(6)****(7)**

Serial number	Meaning	Value description					
(1)	Bus type	XB: X-bus					
(2)	Product Series	6: Insert type					
(3)	Product Version	S: Strengthen, upgraded version					
(4)	Types of I/O modules	A: Analog Default: Digital					
(5)	Number of input signal points	Analog: 0, 4, 8 Digital: 00, 08, 16, 32					
(6)	Number of output signal points	Analog: 0, 4, 8 Digital: 00, 08, 16, 32					
(7)	Input/output characteristics	Digital				Analog	
		Coding	Input	Output	Connector type	Coding	Illustrate
		A	NPN/PNP compatible	NPN	/	V	Single-ended signal, adjustable range: Disable -10V~+10V, 0V~10V -5V~+5V, 0V~5V, 1V~5V
		B		PNP	/		
		N		/	MIL connectors	VD	Differential signal, adjustable range: Disable -10V~+10V, 0V~10V -5V~+5V, 0V~5V, 1V~5V
		AN		NPN			
		BN		PNP			
		default	NPN/PNP compatible	/		I	Single-ended signal, adjustable range: Disable 4mA~20mA, 0mA~20mA
		J	/	relay		ID	Differential signal, adjustable range: Disable 4mA~20mA, 0mA~20mA -20mA~+20mA
						default	Single-ended signal,

						compatible with analog current and voltage.
					TM	Temperature acquisition using RTDs, thermocouples, etc.

2.2 Module list

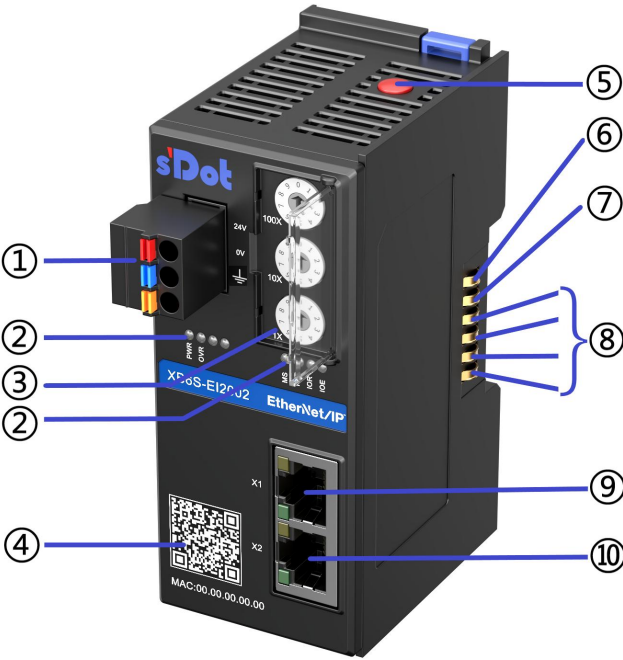
Model	Product Description	
XB6S-EI2002	EtherNet/IP Bus Coupler Module (Flagship Edition)	
XB6S-EI2002-C	EtherNet/IP Bus Coupler Module (Standard Edition)	
XB6S-3200	32-channel digital input module, NPN/PNP compatible input, input filter default 3ms	
XB6S-1600	16-channel digital input module, NPN/PNP compatible input, input filter default 3ms	
XB6S-0800	8-channel digital input module, NPN/PNP compatible input, input filter default 3ms	
XB6S-1616A	16-channel digital input/16-channel digital output module Input is NPN/PNP compatible, input filter default is 3ms, output is NPN type.	
XB6S-1616B	16-channel digital input/16-channel digital output module Input is NPN/PNP compatible, input filter default is 3ms, output is PNP type.	
XB6S-0032A	32-channel digital output module, outputting NPN type	
XB6S-0032B	32-channel digital output module, PNP type output	
XB6S-0016A	16-channel digital output module, outputting NPN type	
XB6S-0016B	16-channel digital output module, outputting PNP type	
XB6S-0008A	8-channel digital output module, outputting NPN type	
XB6S-0008B	8-channel digital output module, PNP type output	
XB6S-3200N	32-channel digital input module, NPN/PNP compatible input, input filter default 3ms, MIL connector type.	
XB6S-0032AN	32-channel digital output module, NPN type output, MIL connector type	
XB6S-0032BN	32-channel digital output module, PNP type, MIL connector type	
XB6S-0012J/6	12-channel relay output module (Note: The "/" in the model number can be omitted, meaning 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-A80	8-channel analog current & voltage compatible input module	Single-ended signal, adjustable range: Disable, 0mA~20mA, 4mA~20mA, -20mA~+20mA. -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V
XB6S-A40	4-channel analog current & voltage compatible input module	
XB6S-A08	8-channel analog current & voltage compatible output module	Single-ended signal, adjustable range: Disable, 0mA~20mA, 4mA~20mA, -10V~+10V, 0V~10V. -5V~+5V, 0V~5V, 1V~5V
XB6S-A04	4-channel analog current & voltage compatible output module	
XB6S-A80TM	8-channel RTD/thermocouple temperature acquisition module (for module details, please refer to the module user manual on the official website).	
XB6S-A40TM	4-channel RTD/thermocouple temperature acquisition module (for module details, please refer to the module user manual on the official website).	
XB6S-PL20	2-channel single-ended incremental encoder counting module (for module details, please refer to the module user manual on the official website).	
XB6S-PS20D	2-channel SSI absolute encoder counting module (for module details, please refer to the module user manual on the official website).	
XB6S-PL20D	2-channel differential incremental encoder counting module (for module details, please refer to the module user manual on the official website).	
XB6S-PC80	8-channel pulse counting module (for module details, please refer to the module user manual on the official website).	
XB6S-PT04A	4-channel PTO pulse output module (for module details, please refer to the module user manual on the official website).	
XB6S-C01SP	1-channel serial communication module (see the module user manual on the official website for module details).	
XB6S-XBF02	Gateway Module, supporting connection to XBF series I/O modules (For detailed module specifications, refer to the module user manual on the official website)	
XB6S-P2000	Expansion power module	
XB6S-C18_2	Common End Expansion Module	
XB6S-CVR00	Terminal cover	

3 Module Introduction

3.1 EtherNet/IP Coupler

3.1.1 Panel structure



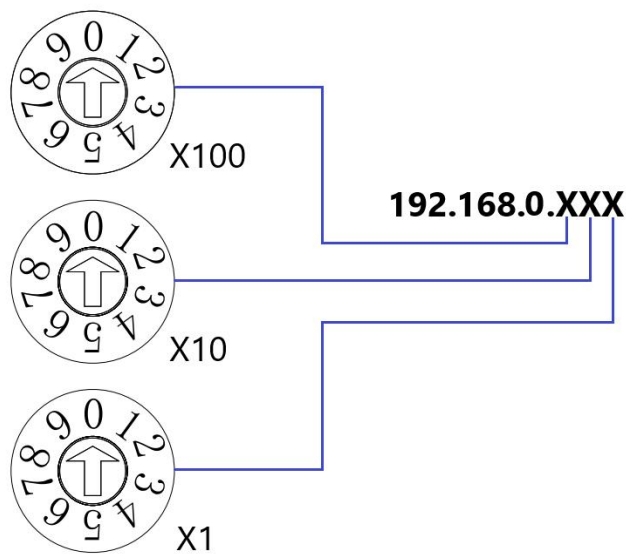
Serial Number	Name	Illustrate
①	Power terminal	3P spring-loaded terminal block
②	Module indicator lights and indicator light labels	Indicates coupler power status and system operating status
③	Rotary switch	Set IP address
④	Module QR code	Scan the QR code to access module-related information.
⑤	Reset button	Reset IP information and configuration parameters

⑥	Power+	5V
⑦	power supply-	0V
⑧	X-bus communication signals	Communication signals
9	Bus Interface X1	RJ45 interface
⑩	Bus Interface X2	RJ45 interface

3.1.2 Rotary switch

IP address settings

A rotary switch can be used to specify the method for setting the module's IP address.



Setting value (decimal)	IP address setting method
000	Based on BOOT settings The rotary switch is set to "000" at the factory. The default state is based on the BOOT setting. If it has been modified using the host computer, it will continue to start with the previous setting value.
001 ~ 254	set upThe least significant byte of an IP address is used. The hundreds digit is represented by "×100", the tens digit by "×10", and the tens digit by "×1".For the units digit, inSet within the range of 1 to 254. The most significant 3 bytes of the IP address continue from the previous one.host computerSet value. workfactoryFactory conditionDownBy rotatingThe toggle switch willWhen the IP address is set to a value other than 000, the high 3 bytes are 192.168.0.
255~	When the rotary switch is set to 255 or higher...After the module is powered on, it starts using the same startup method and parameters as the previous startup.

Precautions

- 1、 Tool Selection
Screwdriver specifications: 3 mm opening.
- 2、 The rotary switch IP address must be set with the power off. If the IP address needs to be changed during communication, a power cycle must be performed after the new settings are completed for them to take effect.

3.1.3 Indicator light function

EtherNet/IP Coupler Indicator Definitions				
Logo	Name	Color	State	Status Description
PWR	Power indicator light	green	ON	The module power supply is working normally.
			OFF	Module not powered or power supply abnormal
OVR	Overload indicator light	red	OFF	Not overloaded
			ON	The load reaches 90% ($\pm 5\%$) or more.
MS	Module status indicator	green	ON	Equipment is operating normally
			OFF	The device has no power input.
NS	Network status indicator	green	ON	Establish at least one CIP connection (any transport class).
			Flashing 1Hz	An IP address was configured but no CIP connection was established, and the Exclusive Owner connection did not time out.
			OFF	The device is not powered on or is powered on but no IP address is configured.
IOR	IO communication indicator	green	ON	I/O Process data has been established
			Flashing 1Hz	No business data interaction
			Flashing 10Hz	Coupler firmware upgrade
IOE	IO error indicator	red	ON	Communication error
			OFF	No communication issues

Network status indicator definition				
Logo	Name	Color	State	Status Description
X1	Network status indicator	orange color	Flashing	Connection established and data exchanged
			OFF	No data interaction or anomaly
		green	ON	Establish network connection
			OFF	No network connection established or abnormal
X2	Network status indicator	orange color	Flashing	Connection established and data exchanged
			OFF	No data interaction or anomaly
		green	ON	Establish network connection
			OFF	No network connection established or abnormal

3.1.4 Product Parameters

3.1.4.1 Interface parameters

EtherNet/IP interface parameters	
Bus Protocol	EtherNet/IP
Number of stations	It depends on the number of slave stations supported by the main station.
Data transmission medium	Ethernet CAT5 cable
Transmission rate	100Mbps
Minimum loop time [1]	2ms
Transmission distance	≤100m (distance between stations)
Bus interface	2×RJ45
Maximum number of modules connected in series	32
Input maximum process data volume	504 Bytes
Output maximum process data volume	504 Bytes

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

3.1.4.2 Power parameters

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

3.1.4.3 General parameters

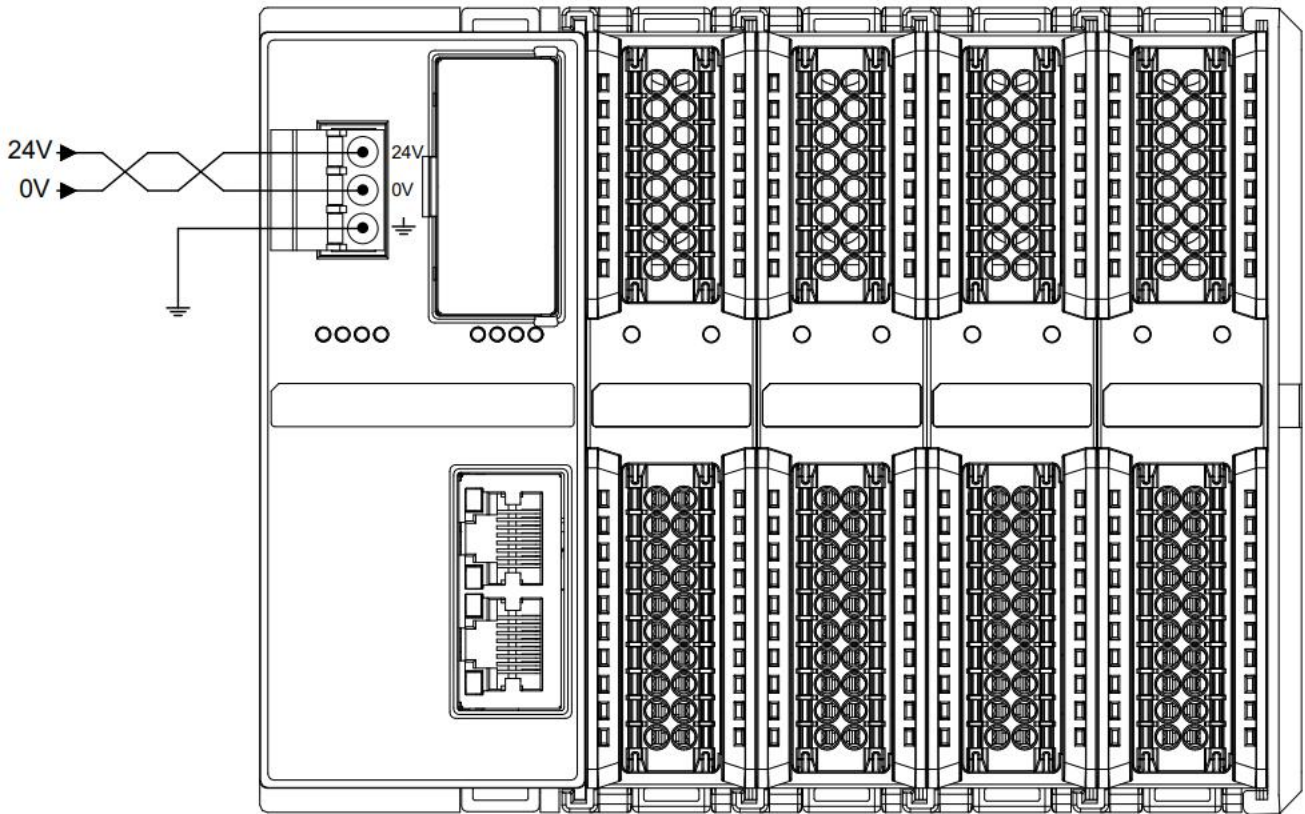
General technical parameters		
Specifications and dimensions		106.4 × 43 × 61mm
Weight		160g
Usage Environment	Operating temperature	-20°C~+60°C
	Storage temperature	-40°C~+80°C
	relative humidity	95%, no condensation
	Altitude	≤2000m
	Vibration resistance	IEC 60068-2-6sinusoidal vibration 5Hz~8.4Hz,3.5mm,8.4Hz~150Hz,1g

		X/Y/Z Triaxial 10 One cycle/Axial (1) 00min
	Impact resistance	IEC 60068-2-27 Mechanical shock 150m/s ² , 11ms, ±X/Y/Z Six directions 3 Second-rate/Direction, Together 18 Second-rate
	Protection level	IP20
	Overvoltage category	I
	Pollution level	Level 2

Electromagnetic compatibility requirements	electrostatic discharge	Level 3	Contact ±8kV, Air ±8kV, IEC61000-4-2
	surge	Level 3	1KV DM 2KV CM, IEC61000-4-5
	Electrical Fast Burst	Level 4	Power cord ±4KV, IEC61000-4-4
Module error self-recovery		support	
Alarm		support	
Firmware upgrade		support	
Short circuit protection		Supports (automatic recovery mechanism)	
Reverse connection protection		Supports (automatic recovery mechanism)	
Surge protection		support	
CE certification		EMC EN 61131-2 EN IEC 61000-6-4 EN IEC 61000-6-2	
		LVD EN 61010-1:2010/A1 EN IEC 61010-2-201	
RoHS certification		EU Directive 2011/65/EU Annex II	

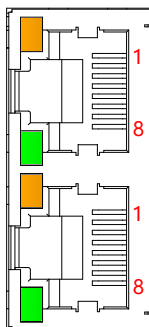
3.1.5 Power wiring diagram

Using a 24VDC power module, refer to the wiring method and connect the power supply according to the circuit shown in the diagram below, while ensuring reliable grounding (twisted pair cable is recommended for the power supply).



3.1.6 Bus wiring

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



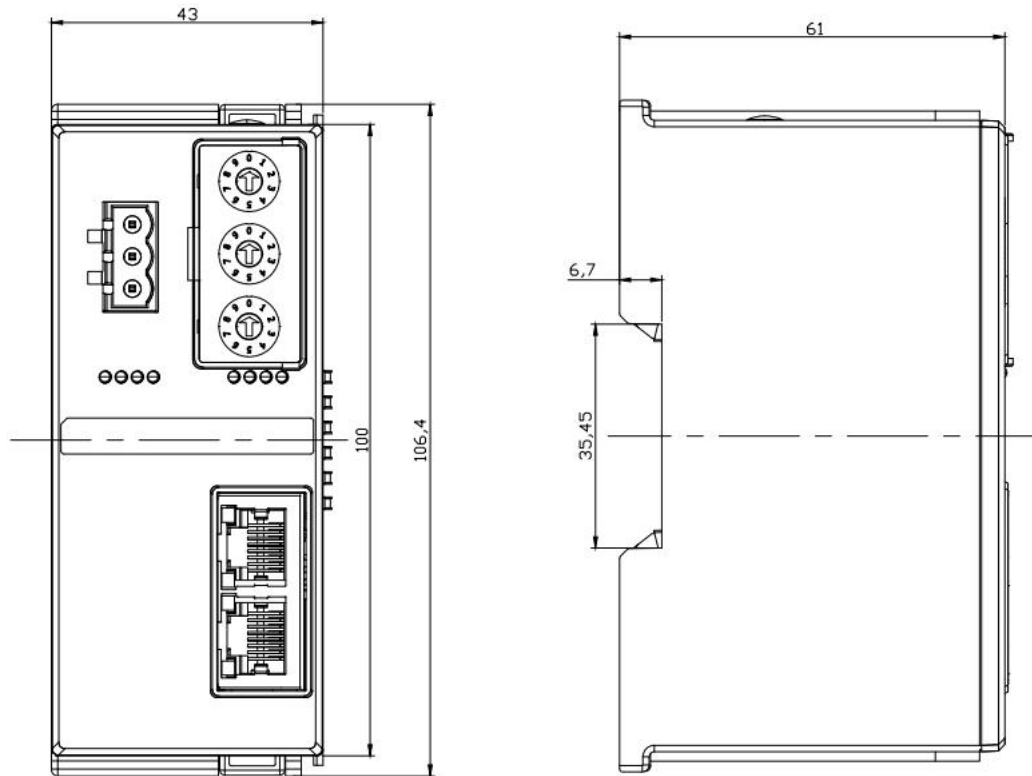
pin number	Signal
1	TD+
2	TD-
3	RD+
4	—
5	—
6	RD-
7	—
8	—

Precautions

- Category 5 or higher double-shielded (braided mesh + aluminum foil) STP cables are recommended for use as communication cables.
- The length of the cable between devices must not exceed 100m.

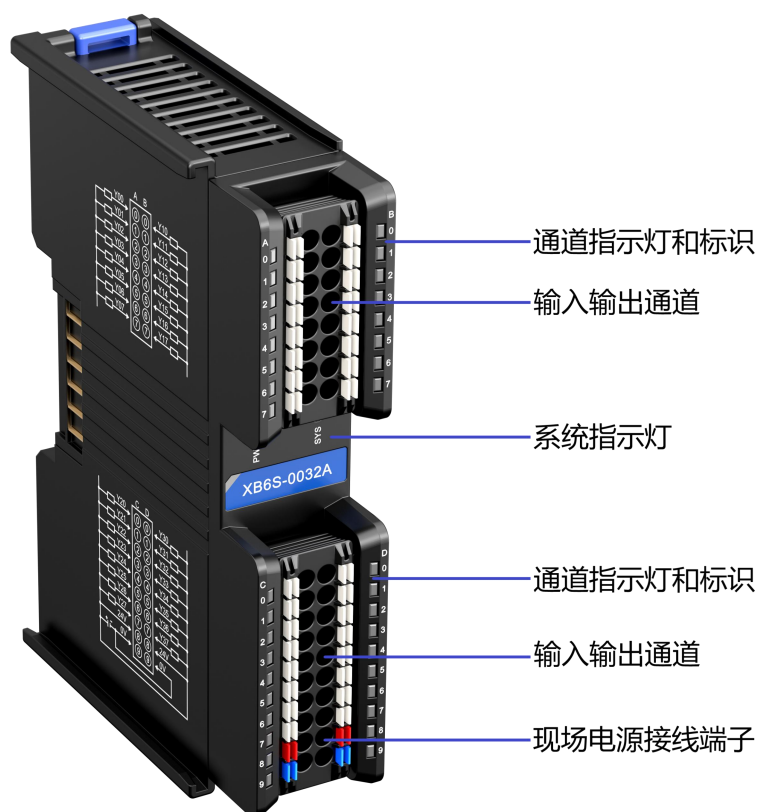
3.1.7 Outline Dimensions

Coupler dimensions (unit: mm)



3.2 Digital I/O modules

3.2.1 Panel structure



3.2.2 Indicator light function

Digital I/O module indicator light definitions				
Logo	Name	Color	State	Status Description
PWR	Power indicator	green	ON	Power supply is normal
			OFF	The product is not powered on or the power supply is abnormal.
SYS	Operating status indicator	green	ON	The system is running normally.
			Flashing 1Hz	No business data interaction, waiting to establish business data interaction.
			Flashing 10Hz	Firmware upgrade
			OFF	The system is not working.
0~7	Input channel indicator	green	ON	The module channel has a signal input.
			OFF	The module channel has no signal input or the signal input is abnormal.
0~7	Output channel indicator	green	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 supply rated voltage	5VDC (4.5V~5.5V)			
Bus input power supply rated current	≤100mA	≤70mA	≤80mA	≤60mA
Input rated voltage	24VDC (20.4V~28.8V)			
Typical input current	5mA/ch (24VDC)			
Number of input signal points	32	32	16	8
Input signal type	NPN/PNP compatible			
Input signal form	direct voltage input form Sink input: NPN open-collector input form Source type input: PNP open collector input form			
OFF voltage/OFF current	-3V to +5V / less than 0.9mA			
ON voltage/ON current	11V~30V/2.1mA or above			
reaction time	<50us			
Input filter	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 methods	Optical isolation			
Isolation and withstand voltage	500VAC			
Rated current consumption	100mA	70mA	80mA	60mA
Power consumption	0.5W	0.35W	0.4W	0.3W
Numeric input type	Type1/Type3			
Channel indicator lights	Green LED lights			

3.2.3.2 Digital Input/Output Module Parameters

Digital input		
Product Model	XB6S-1616A	XB6S-1616B
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	≤130mA	≤100mA
Input rated voltage	24VDC (20.4V~28.8V)	
Typical input current	5mA/ch (24VDC)	
Number of input signal points	16	16
Input signal type	NPN/PNP compatible	
Input signal form	direct voltage input form Sink input: NPN open-collector input form Source type input: PNP open collector input form	
OFF voltage/OFF current	-3V to +5V / below 0.9mA	
ON voltage/ON current	11V~30V/2.1mA or above	
reaction time	<50us	
Input filter	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 methods	Optical isolation	
Isolation and withstand voltage	500VAC	
Rated current consumption	130mA	100mA
Power consumption	0.65W	0.5W
Numeric input type	Type1/Type3	
Channel indicator lights	Green LED lights	
Digital output		
Number of 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	Max: 0.5A (see details)Figure 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 methods	Optical isolation
Isolation and withstand voltage	500VAC
Channel indicator lights	Green LED lights

3.2.3.3 Digital output module parameters

Digital output				
Product Model	XB6S-0032A	XB6S-0032B	XB6S-0032AN	XB6S-0032BN
Bus input power supply rated voltage	5VDC (4.5V~5.5V)			
Bus input power supply rated current	≤150mA	≤110mA	≤130mA	≤80mA
Field-side input voltage range	24VDC (20.4V~28.8V)			
Number of 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 (see details) Figure 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 methods	Optical isolation			
Isolation and withstand voltage	500VAC			
Rated current consumption	150mA	110mA	130mA	80mA
Power consumption	0.75W	0.55W	0.65W	0.4W
Channel indicator lights	Green LED lights			

Digital output				
Product Model	XB6S-0008A	XB6S-0008B	XB6S-0016A	XB6S-0016B
Bus input power supply rated voltage	5VDC (4.5V~5.5V)			
Bus input power supply rated current	≤70mA	≤60mA	≤110mA	≤90mA
Field-side input voltage range	24VDC (20.4V~28.8V)			
Number of 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 current	Max: 0.5A (see details) Figure 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 methods	Optical isolation			
Isolation and withstand voltage	500VAC			
Rated current consumption	70mA	60mA	110mA	90mA
Power consumption	0.35W	0.3W	0.55W	0.45W
Channel indicator lights	Green LED lights			

3.2.3.4 Relay output module parameters

Relay output	
Product Model	XB6S-0012J/6
Bus input power supply rated voltage	5VDC (4.5V~5.5V)
Bus input power supply rated current	≤100mA
Field-side input voltage range	24VDC (20.4V~28.8V)
Number of output signal points	12
Output format	Relay
Output load type	Resistive load, inductive load, lamp load
minimum load current	10mA
minimum load voltage	5V
Single channel rated voltage	24VDC
Single-channel rated current	Max: 2A (see details) Figure 2
Hardware output response time	10ms/10ms
Module protection	Field-side reverse connection protection (automatic recovery mechanism), field-side surge protection
Isolation methods	Optical isolation + relay isolation
Isolation and 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 lights	Green LED lights

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°C~+60°C
Storage temperature	-40°C~+80°C
relative humidity	95%, no condensation
Altitude	≤2000m
Pollution level	Level 2
Protection level	IP20
Safety certification	UL certification, CE certification
Green certification	RoHS certification, REACH certification

Figure 1:

数字量输出模块单通道最大额定电流与温度的关系图

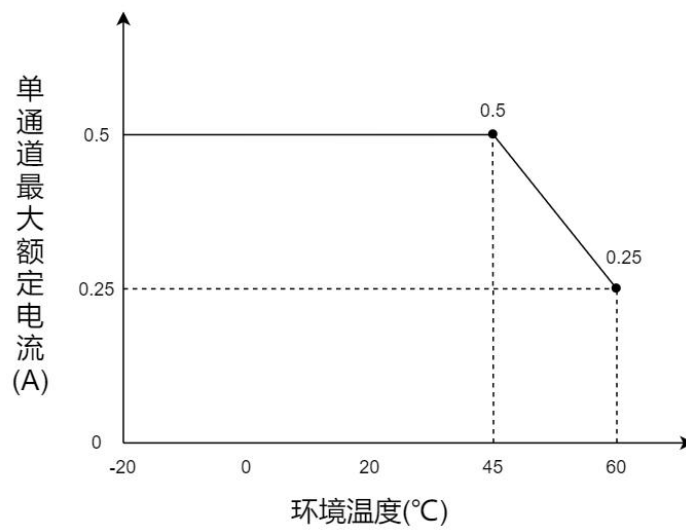
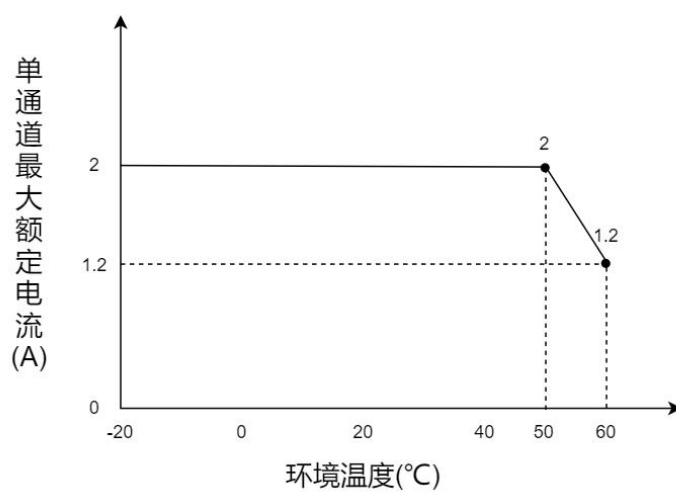


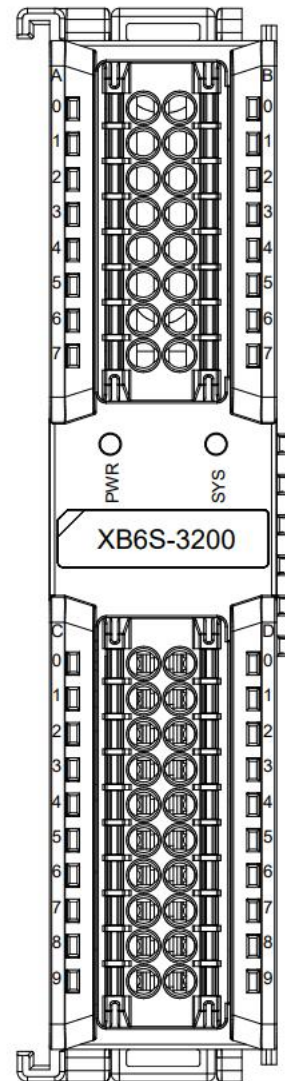
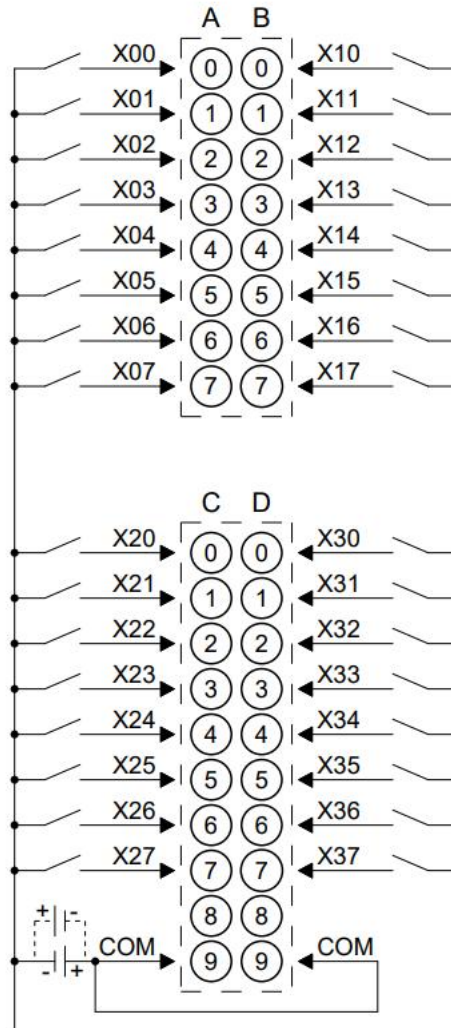
Figure 2:

继电器输出模块单通道最大额定电流与温度的关系图



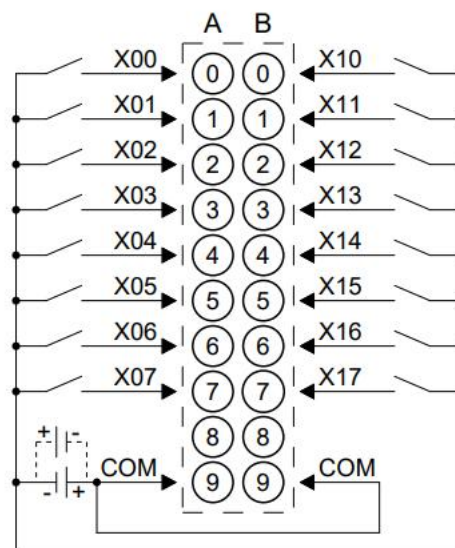
3.2.4 Wiring diagram

3.2.4.1 XB6S-3200

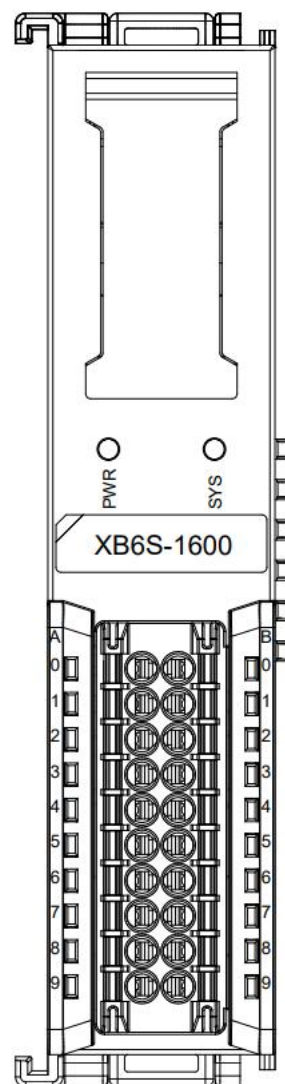


*COM internal conduction; NPN/PNP compatible

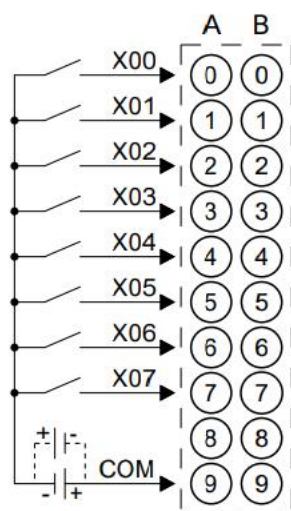
3.2.4.2 XB6S-1600



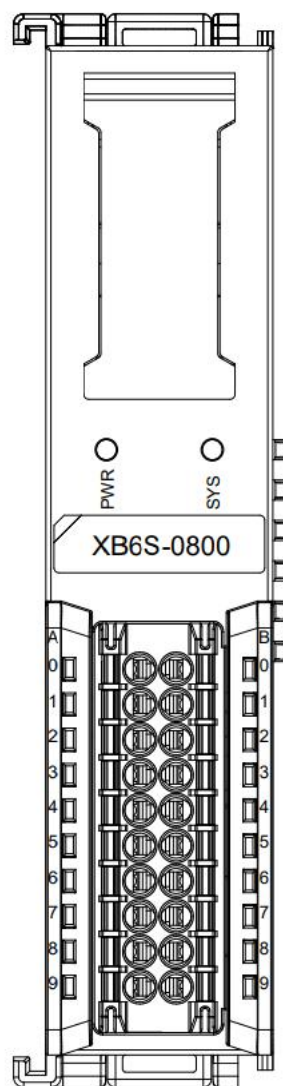
*COM internal conduction; NPN/PNP compatible



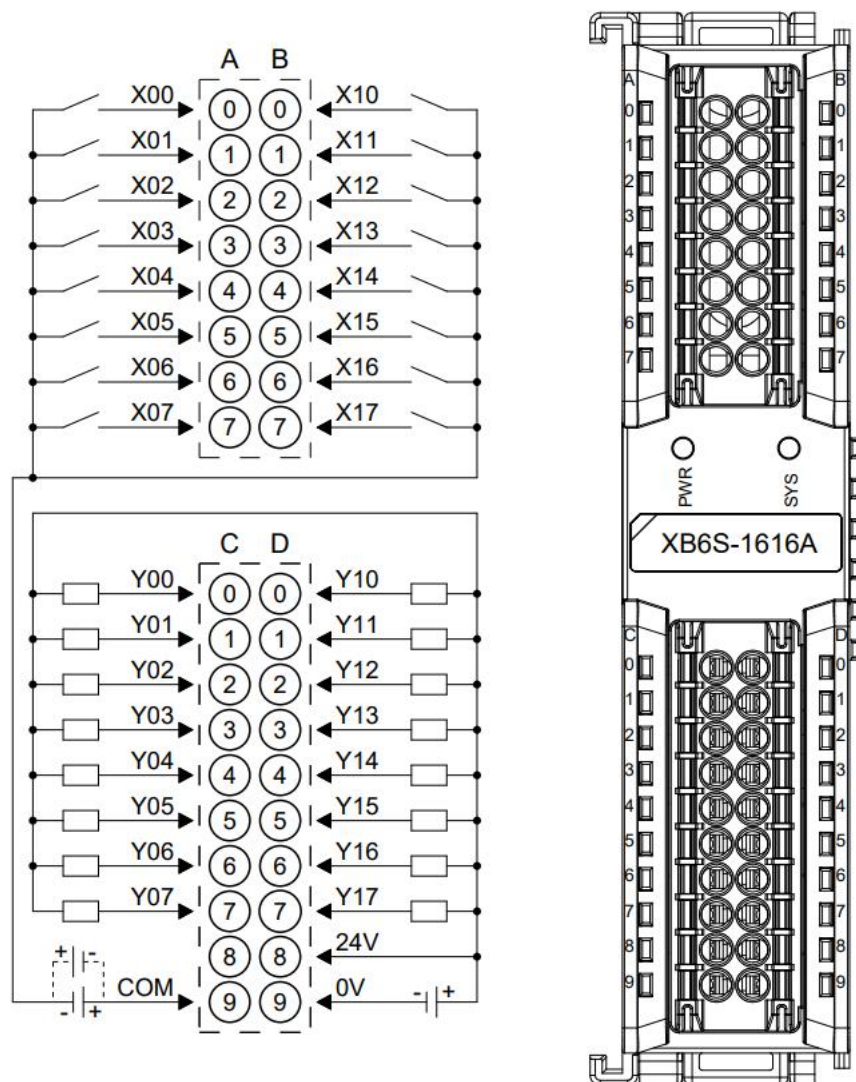
3.2.4.3 XB6S-0800



*NPN/PNP compatible

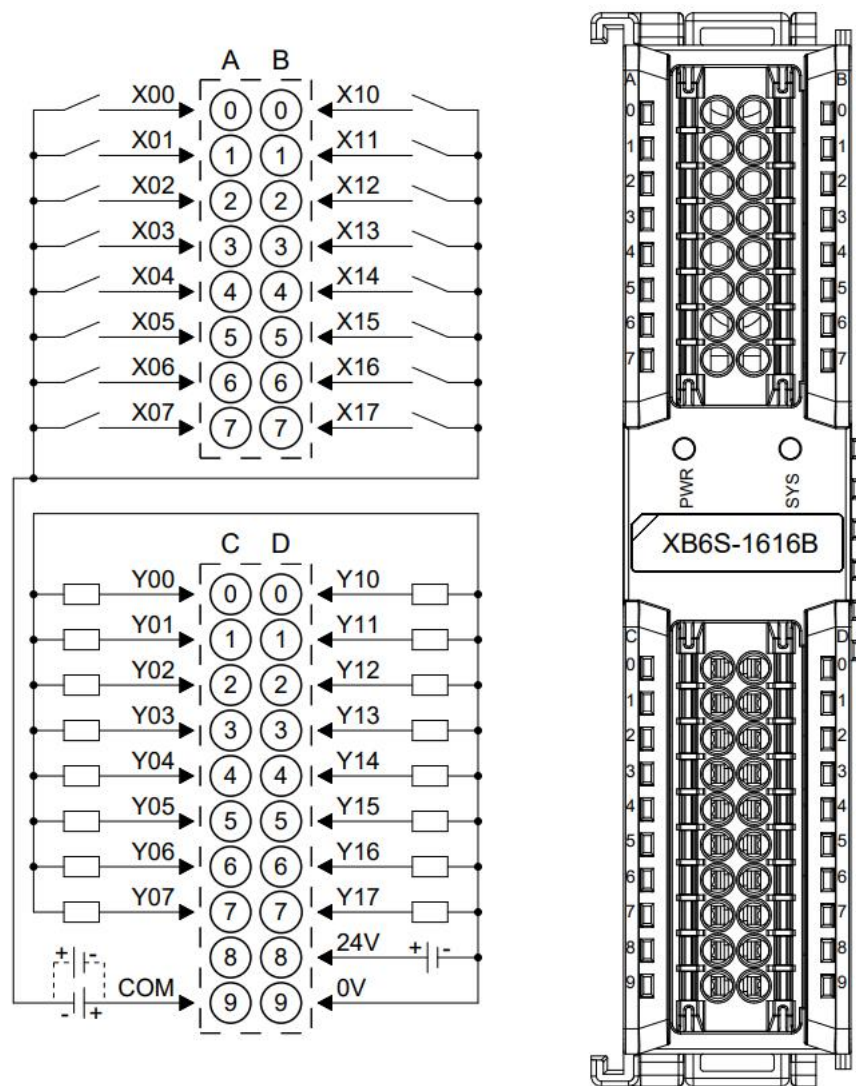


3.2.4.4 XB6S-1616A



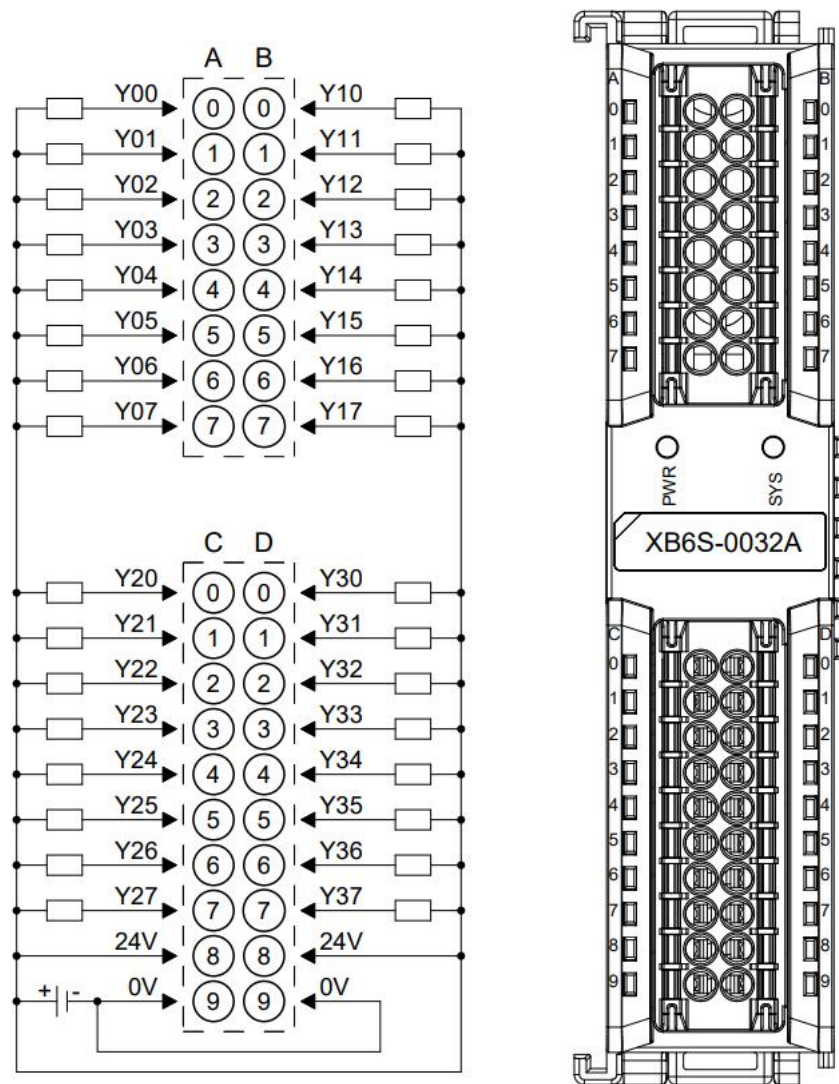
*COM is the common terminal for DI, DI is NPN/PNP compatible, and DO is NPN.

3.2.4.5 XB6S-1616B



*COM is the common terminal for DI, DI is NPN/PNP compatible, and DO is PNP.

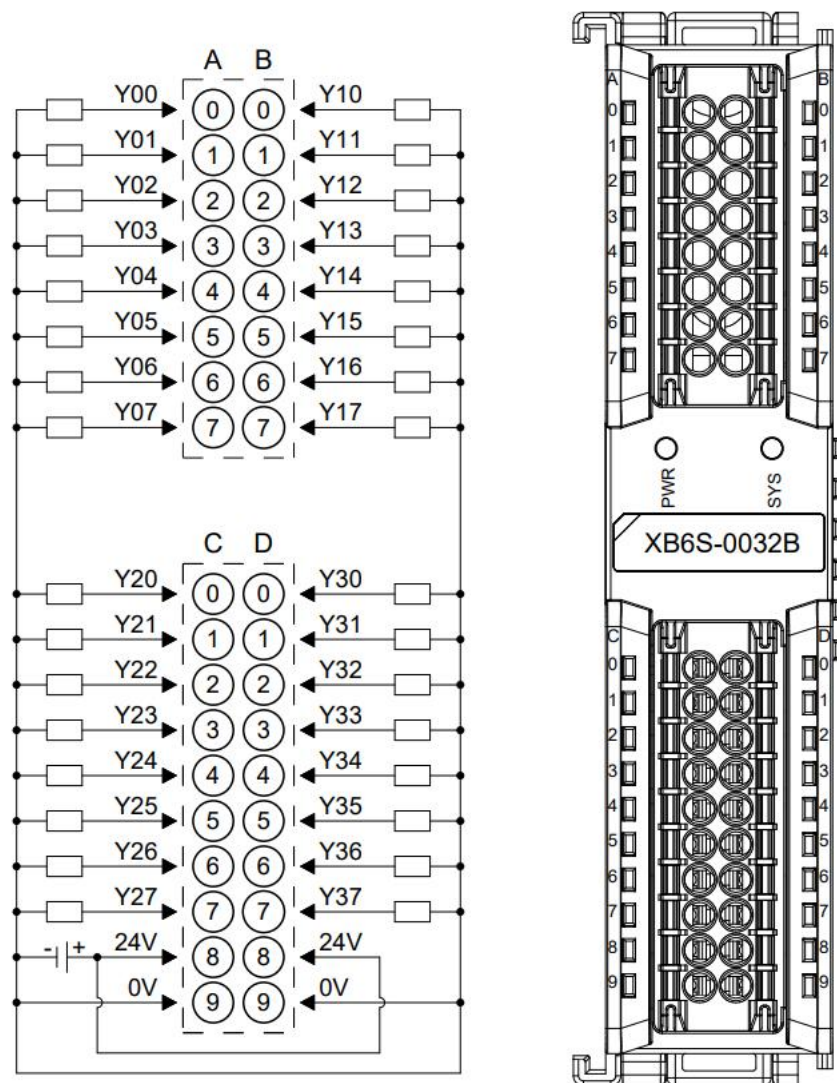
3.2.4.6 XB6S-0032A



*24V internal conduction; 0V internal conduction

*The load's common power supply must share the same power supply as the module.

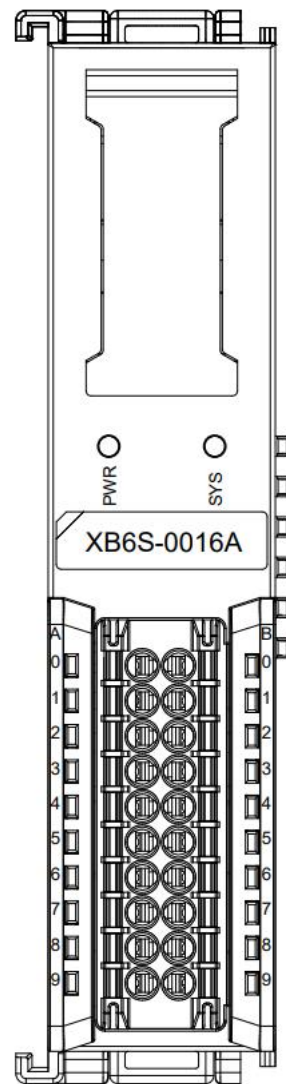
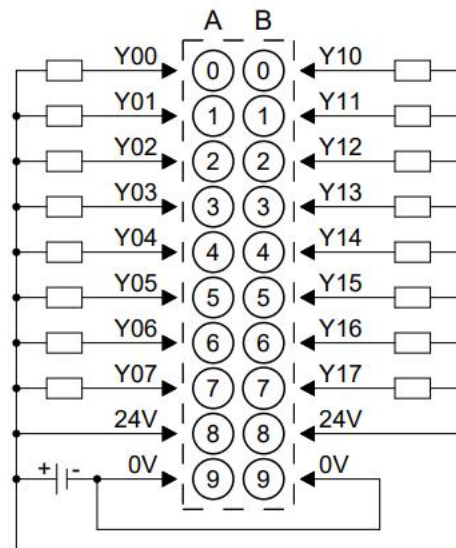
3.2.4.7 XB6S-0032B



*24V internal conduction; 0V internal conduction

*The load's common power supply must share the same power supply as the module.

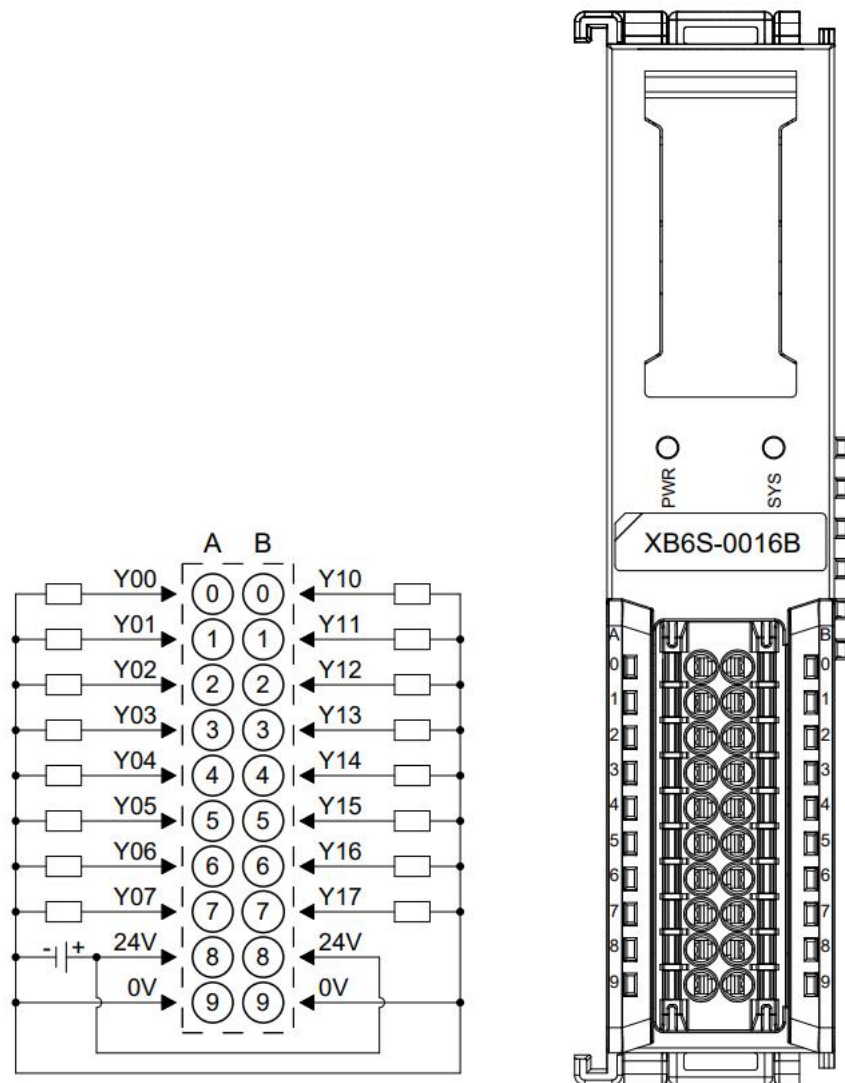
3.2.4.8 XB6S-0016A



*24V internal conduction; 0V internal conduction

*The load's common power supply must share the same power supply as the module.

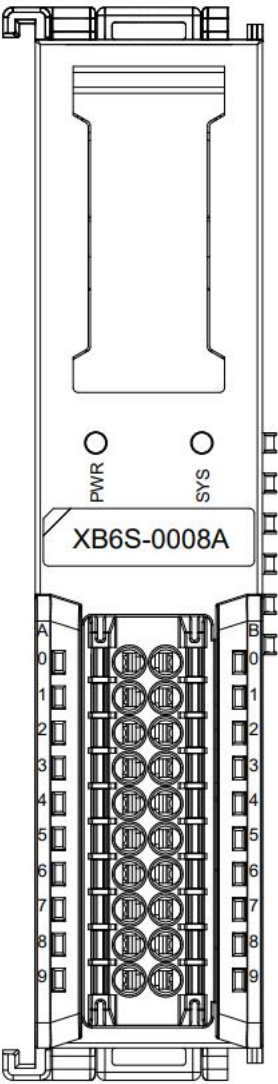
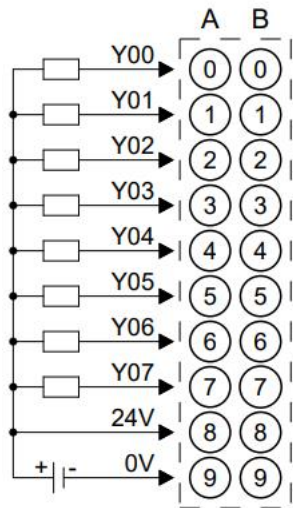
3.2.4.9 XB6S-0016B



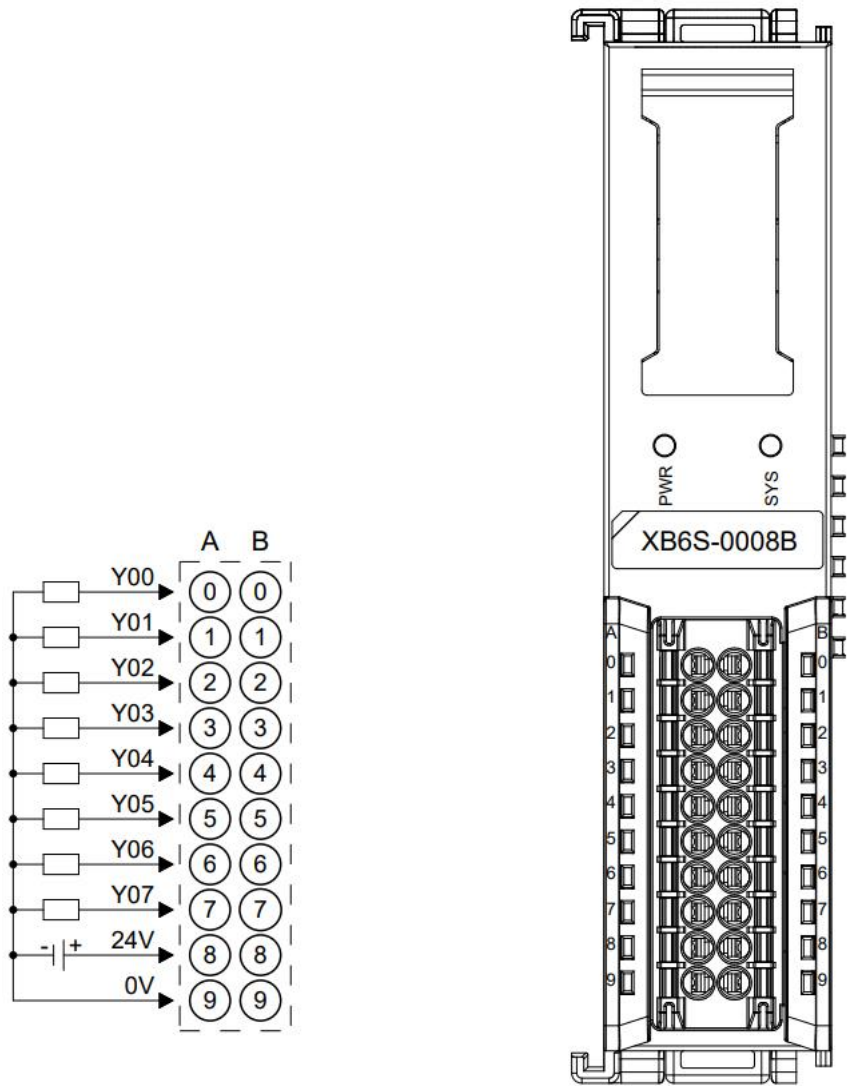
*24V internal conduction; 0V internal conduction

*The load's common power supply must share the same power supply as the module.

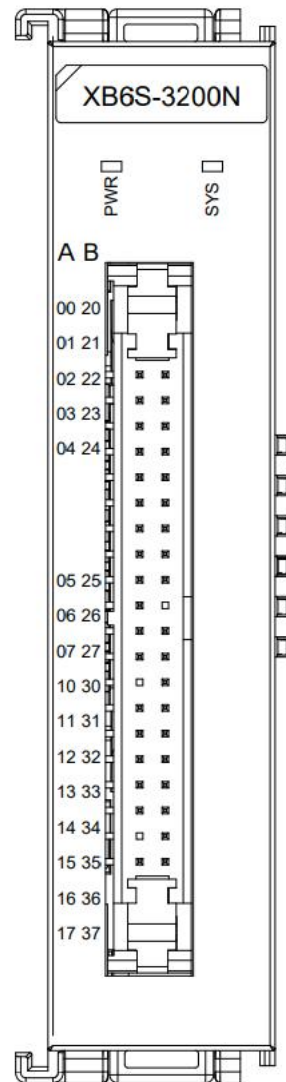
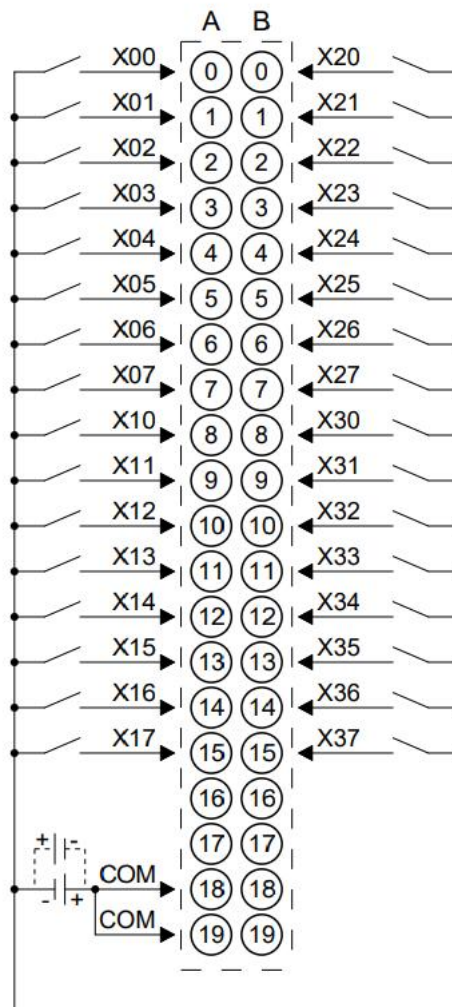
3.2.4.10 XB6S-0008A



3.2.4.11 XB6S-0008B

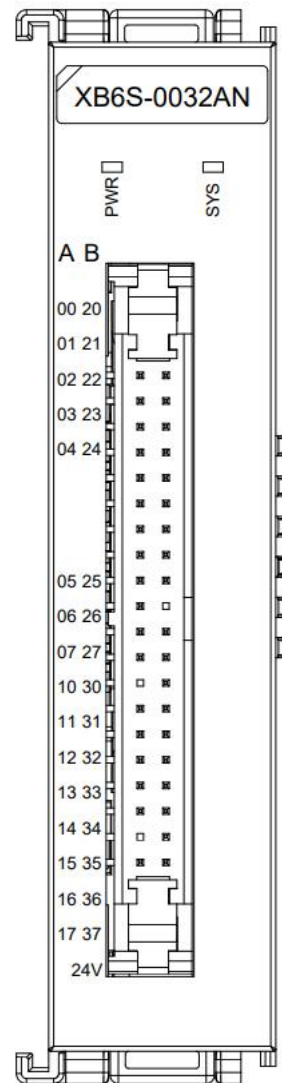
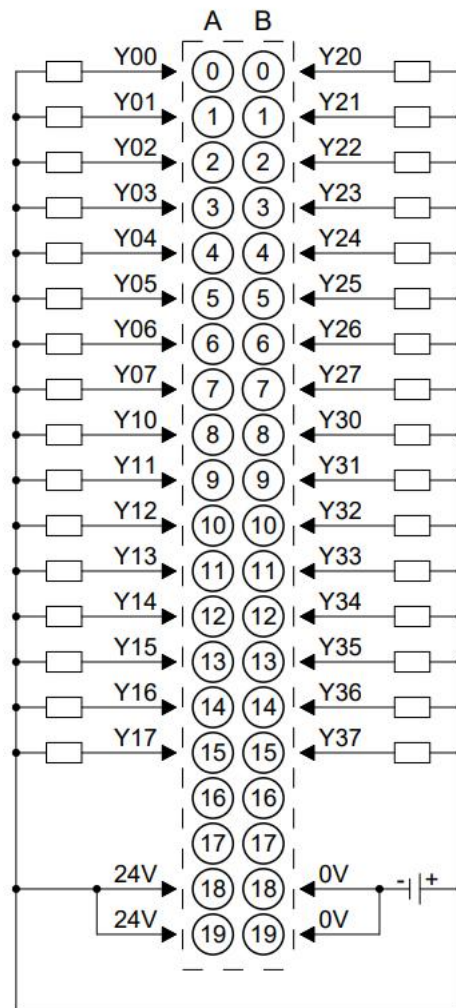


3.2.4.12 XB6S-3200N



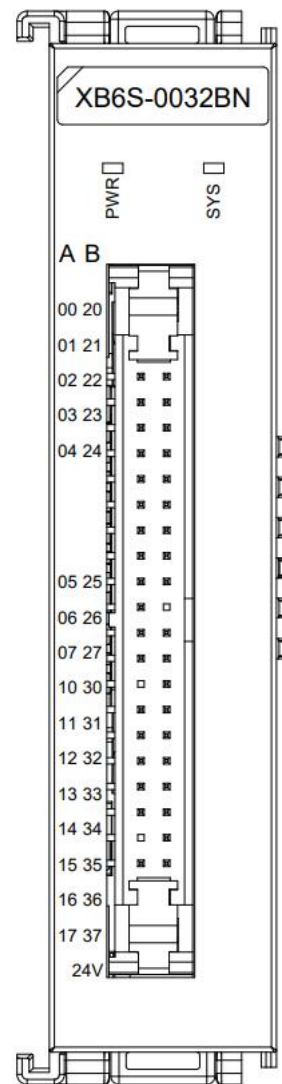
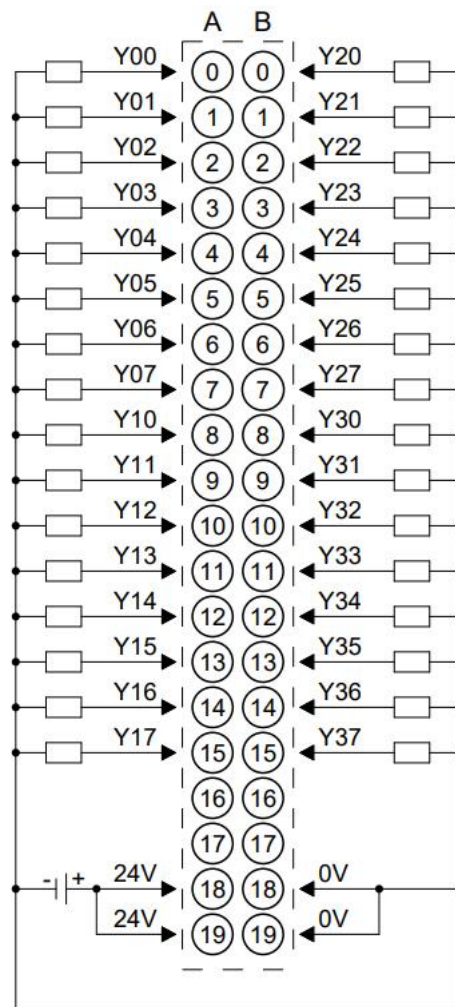
*COM internal conduction; NPN/PNP compatible

3.2.4.13 XB6S-0032AN



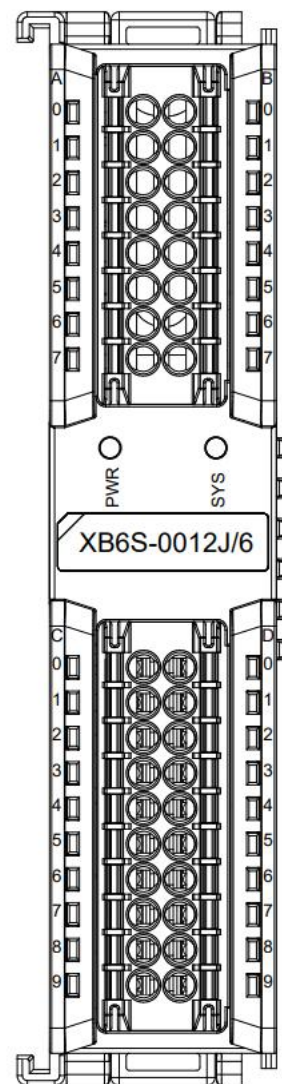
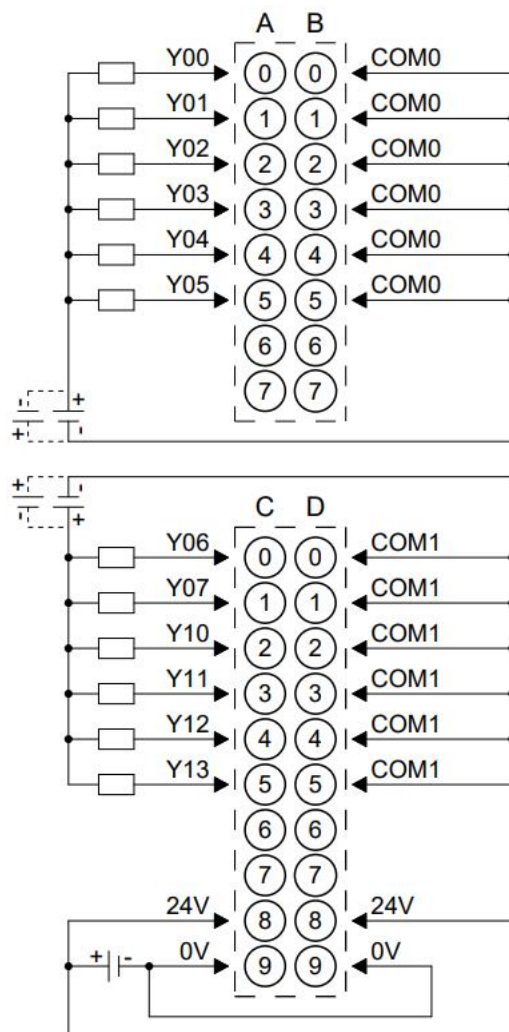
*24V internal conduction; 0V internal conduction

3.2.4.14 XB6S-0032BN



*24V internal conduction; 0V internal conduction

3.2.4.15 XB6S-0012J/6

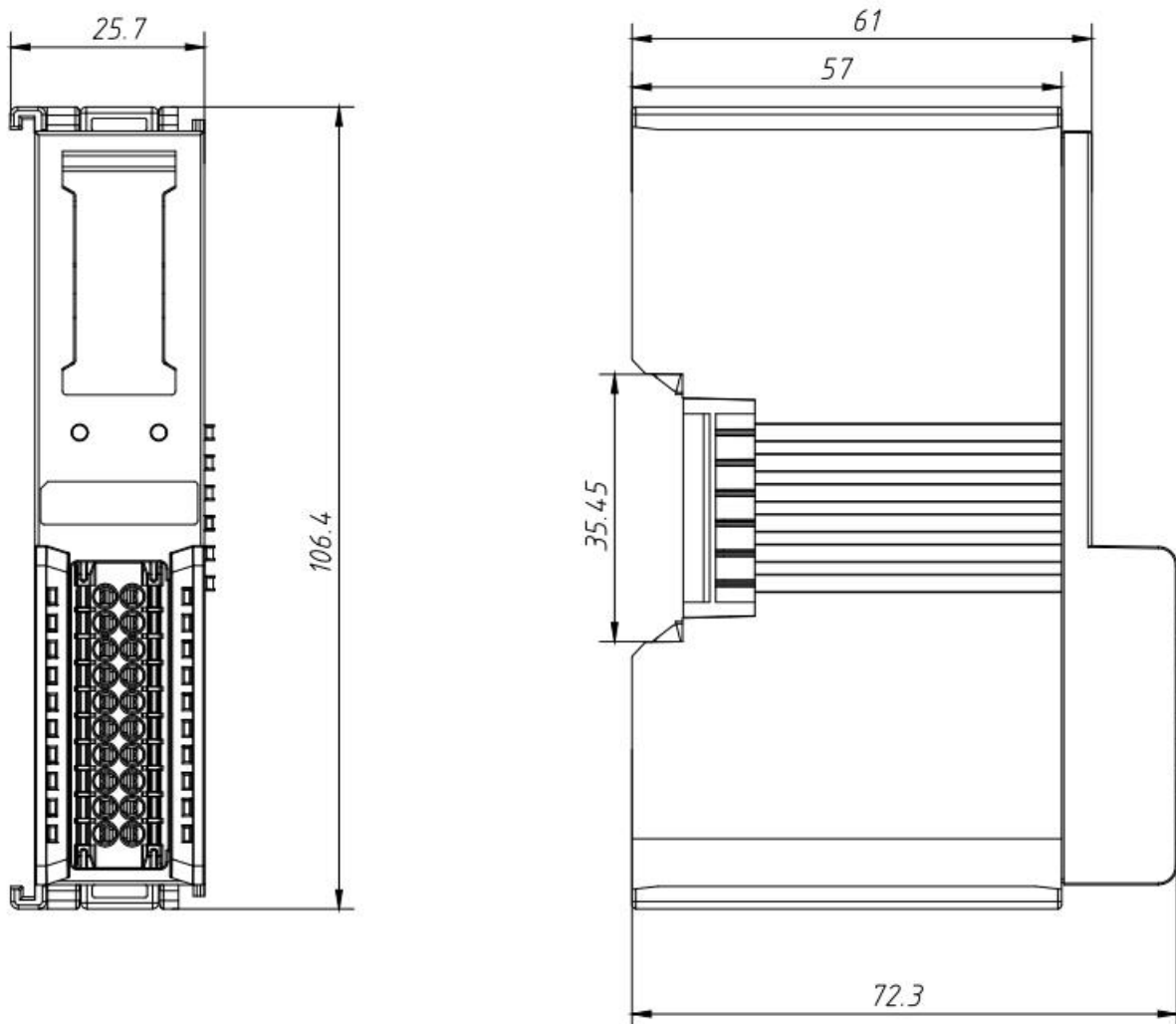


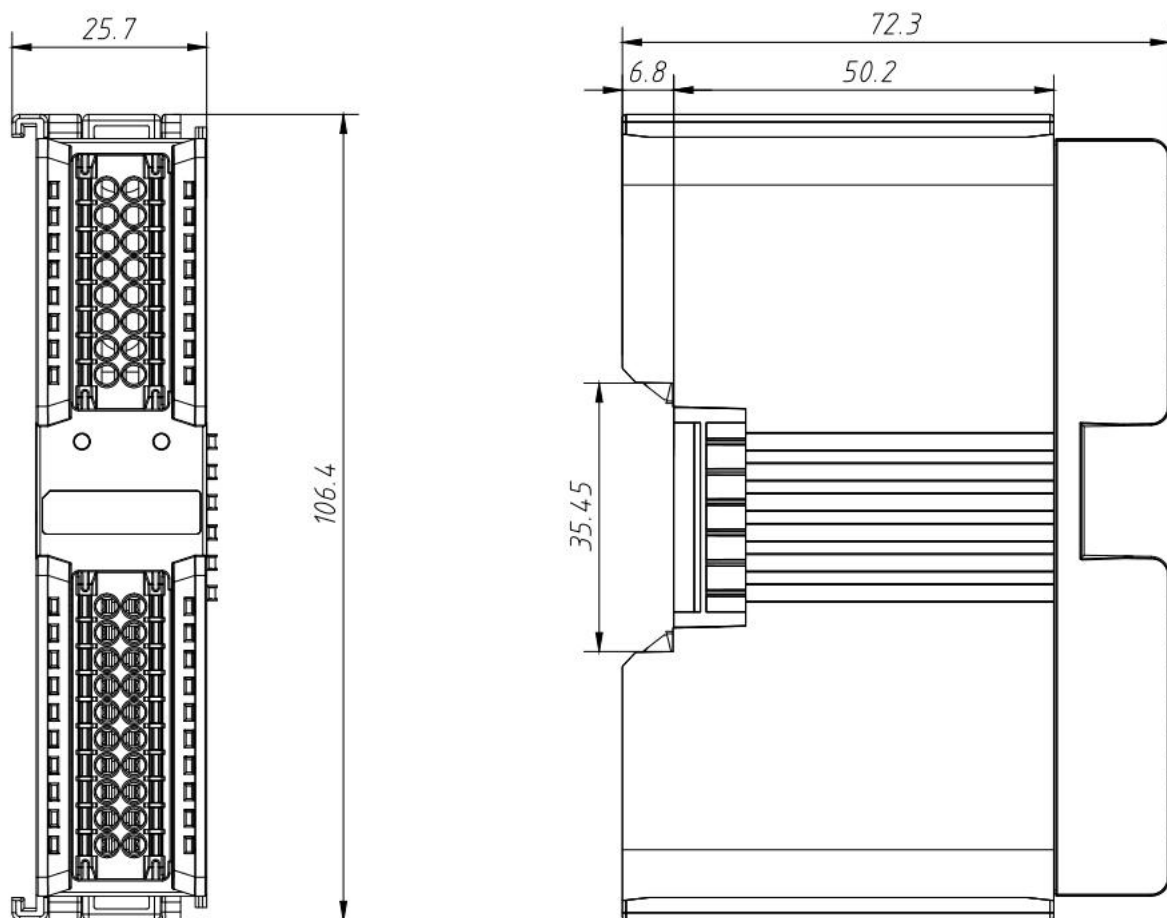
*24V internal conduction; 0V internal conduction

*COM0 is internally powered; COM1 is internally powered.

3.2.5 Outline Dimensions

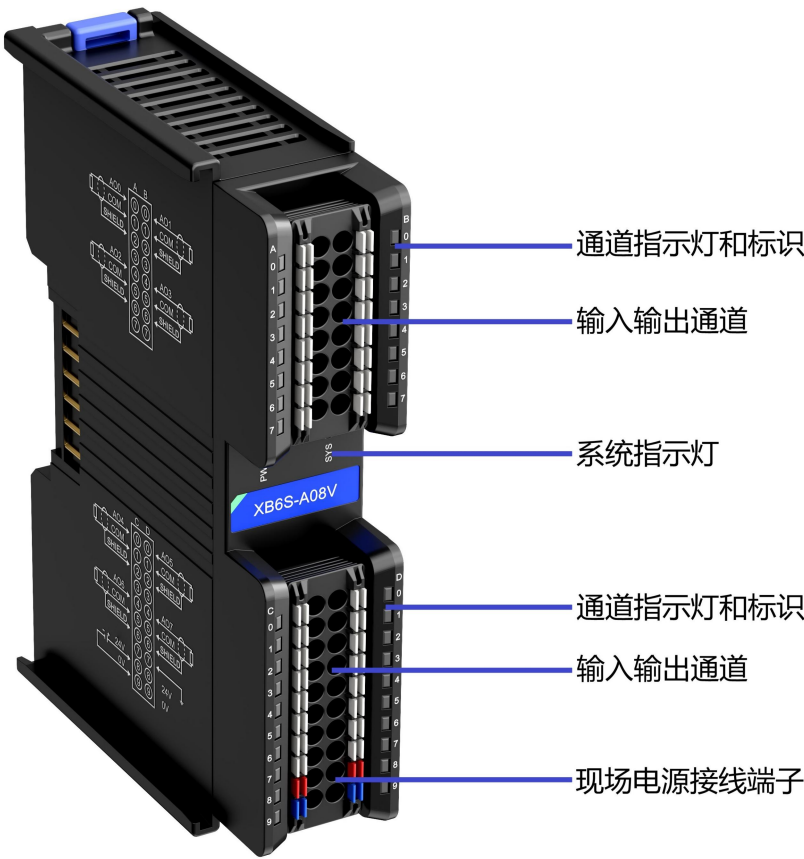
8/16 channel digital I/O module dimensions (unit: mm)



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

3.3 Analog I/O module

3.3.1 Panel structure



3.3.2 Indicator light function

Analog I/O module indicator light definitions				
Logo	Name	Color	State	Status Description
PWR	Power indicator light	green	ON	Power supply is normal
			OFF	The product is not powered on or the power supply is abnormal.
SYS	Operating status indicator	green	ON	The system is running normally.
			Flashing 1Hz	No business data interaction, waiting to establish business data interaction.
			Flashing 10Hz	Firmware upgrade
			OFF	The system is not working.
0~7	Input channel indicator	green	ON	The module channel has a signal input.
			OFF	The module channel has no signal input or the signal input is abnormal.
0~7	Output channel	green	ON	The module channel has signal output.

	indicator		OFF	The module channel has no signal output or the signal output is abnormal.
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3.3.3 Technical parameters

3.3.3.1 Analog input module parameters

Analog input module		
Product Model	XB6S-A80VD	XB6S-A80ID
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	$\leq 210\text{mA}$	
input 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 measurement range is adjustable, with the default value being 0mA~20mA)
Input signal type	Differential signaling	
Channel reaction time	550us / ch 850us / 8ch	
resolution	16 bits	
Sampling rate (full channel)	$\leq 1\text{ksps}$	
accuracy	$\pm 0.1\%$ at 25°C, $\pm 0.3\%$ over the entire temperature range.	
Input filter	support	
Smooth series	1~200	
Input impedance (voltage type)	$\geq 1\text{M}\Omega$	-
Input impedance (current type)	-	$\leq 250\Omega$
Common mode voltage range	12VAC	-
Maximum allowable voltage for the channel (voltage type)	30V	-
Maximum allowable current for the channel (current type)	-	30mA
The system must not be affected	In the event of a short circuit due to a fault in the $\pm 15\text{V}$ power supply, the system's +5V power supply must not be affected.	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Input overload protection	Support clamp protection	Supports rate limiting protection

Input protection	$\pm 30V$	$\pm 30mA$
Isolation and withstand voltage	500VDC	
Rated current consumption	210mA	
Power consumption	1.05W	
Channel indicator lights	Green LED lights	

Analog input module		
Product Model	XB6S-A80V	XB6S-A80I
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	$\leq 260\text{mA}$	$\leq 140\text{mA}$
input 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 measurement range is adjustable, with the default value being 0mA~20mA)
Input signal type	single-ended signal	
Channel reaction time	560us / ch 770us / 8ch	
resolution	16 bits	
Sampling rate (full channel)	$\leq 1\text{ksps}$	
accuracy	$\pm 0.1\%$ at 25°C, $\pm 0.3\%$ over the entire temperature range.	
Input filter	support	
Smooth series	1~200	
Input impedance (voltage type)	$\geq 400\text{k}\Omega$	-
Input impedance (current type)	-	$\leq 100\Omega$
Maximum allowable voltage for the channel (voltage type)	30V	-
Maximum allowable current for the channel (current type)	-	30mA
The system must not be affected	In the event of a short circuit due to a fault in the $\pm 15\text{V}$ power supply, the system's +5V power supply must not be affected.	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Input overload protection	Support clamp protection	Supports rate limiting protection
Input protection	$\pm 30\text{V}$	$\pm 30\text{mA}$
Isolation and withstand voltage	500VDC	
Rated current consumption	260mA	140mA
Power consumption	1.35W	0.7W
Channel indicator lights	Green LED lights	

Analog input module		
Product Model	XB6S-A40VD	XB6S-A40ID
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	$\leq 150\text{mA}$	
input 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 measurement range is adjustable, with the default value being 0mA~20mA)
Input signal type	Differential signaling	
Channel reaction time	300us / ch 600us / 4ch	
resolution	16 bits	
Sampling rate (full channel)	$\leq 1\text{ksps}$	
accuracy	$\pm 0.1\%$ at 25°C, $\pm 0.3\%$ over the entire temperature range.	
Input filter	Support	
Smooth series	1~200	
Input impedance (voltage type)	$\geq 1\text{M}\Omega$	-
Input impedance (current type)	-	$\leq 250\Omega$
Common mode voltage range	12VAC	-
Maximum allowable voltage for the channel (voltage type)	30V	-
Maximum allowable current for the channel (current type)	-	30mA
The system must not be affected	In the event of a short circuit due to a fault in the $\pm 15\text{V}$ power supply, the system's +5V power supply must not be affected.	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Input overload protection	Support clamp protection	Supports rate limiting protection
Input protection	$\pm 30\text{V}$	$\pm 30\text{mA}$
Isolation and withstand voltage	500VDC	
Rated current consumption	150mA	
Power consumption	0.75W	
Channel indicator lights	Green LED lights	

Analog input module		
Product Model	XB6S-A40V	XB6S-A40I
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	$\leq 180\text{mA}$	$\leq 100\text{mA}$
input 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 measurement range is adjustable, with the default value being 0mA~20mA)
Input signal type	single-ended signal	
Channel reaction time	400us / ch 700us / 4ch	300us / ch 600us / 4ch
resolution	16 bits	
Sampling rate (full channel)	$\leq 1\text{kps}$	
accuracy	$\pm 0.1\%$ at 25°C, $\pm 0.3\%$ over the entire temperature range.	
Input filter	support	
Smooth series	1~200	
Input impedance (voltage type)	$\geq 400\text{k}\Omega$	-
Input impedance (current type)	-	$\leq 100\Omega$
Maximum allowable voltage for the channel (voltage type)	30V	-
Maximum allowable current for the channel (current type)	-	30mA
The system must not be affected	In the event of a short circuit due to a fault in the $\pm 15\text{V}$ power supply, the system's +5V power supply must not be affected.	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Input overload protection	Support clamp protection	Supports rate limiting protection
Input protection	$\pm 30\text{V}$	$\pm 30\text{mA}$
Isolation and withstand voltage	500VDC	
Rated current consumption	180mA	100mA
Power consumption	0.95W	0.5W
Channel indicator lights	Green LED lights	

3.3.3.2 Analog output module parameters

Analog output module		
Product Model	XB6S-A08V	XB6S-A08I
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	$\leq 100\text{mA}$	
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 measurement range is adjustable, with the default value being 0mA~20mA)
Channel reaction time	400us / ch 400us / 8ch	
resolution	16 bits	
accuracy	$\pm 0.1\%$ at 25°C, $\pm 0.3\%$ over the entire temperature range.	
Load impedance (voltage type)	$\geq 2\text{k}\Omega$ (1k Ω accuracy: $\pm 3\%$ at 25°C, $\pm 5\%$ at full temperature)	-
Load impedance (current type)	-	$\leq 500\Omega$
The system must not be affected	In the event of a short circuit due to a fault in the $\pm 15\text{V}$ power supply, the system's +5V power supply must not be affected.	
Output protection	Overload protection, open circuit protection, and short circuit protection (all with automatic recovery mechanisms).	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Isolation and withstand voltage	500VDC	
Rated current consumption	100mA	
Power consumption	0.5W	
Clearing and retaining optional functions in non-OP state	support	
Channel indicator lights	Green LED lights	

Analog output module		
Product Model	XB6S-A04V	XB6S-A04I
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply 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 measurement range is adjustable, with the default value being 0mA~20mA)
Channel reaction 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°C, ±5‰ at full temperature)	-
Load impedance (current type)	-	≤500Ω
The system must not be affected	In the event of a short circuit due to a fault in the ±15V power supply, the system's +5V power supply must not be affected.	
Output protection	Overload protection, open circuit protection, and short circuit protection (all with automatic recovery mechanisms).	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Isolation and withstand voltage	500VDC	
Rated current consumption	80mA	
Power consumption	0.4W	
Clearing and retaining optional functions in non-OP state	support	
Channel indicator lights	Green LED lights	

3.3.3.3 Analog current & voltage compatible input module parameters

Analog current & voltage compatible input module		
Product Model	XB6S-A80	XB6S-A40
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	≤100mA	≤80mA
input points	8	4
Input type	Current & Voltage Compatible	
Input signal	Disable, 0mA~20mA, 4mA~20mA, -20mA~+20mA, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V (range adjustable, default is 4mA~20mA)	
Input signal type	single-ended signal	
Channel reaction time	1ms / ch	
resolution	16 bits	
Sampling rate (full channel)	≤1ksps	
accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range.	
Input filter	support	
Smooth series	1~200	
Input impedance (voltage)	≥100kΩ	
Input impedance (current)	≤105Ω	
Maximum allowable voltage (voltage) for the channel	30V	
Maximum allowable current (current) for the channel	30mA	
The system must not be affected	In the event of a short circuit due to a fault in the ±15V power supply, the system's +5V power supply must not be affected.	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Input overload protection	Supports clamping protection (voltage) / Supports current limiting protection (current).	
Input protection	±30V (voltage) / ±30mA (current)	
Isolation and withstand voltage	500VDC	
Rated current consumption	100mA	80mA
Power consumption	0.5W	0.4W
Channel indicator lights	Green LED lights	
Current/voltage input disconnection detection	support	

3.3.3.4 Analog current & voltage compatible output module parameters

Analog current & voltage compatible output module		
Product Model	XB6S-A08	XB6S-A04
Bus input power supply rated voltage	5VDC (4.5V~5.5V)	
Bus input power supply rated current	≤100mA	≤80mA
Field-side input voltage range	24VDC (20.4V~28.8V)	
Output points	8	4
Output type	Current & Voltage Compatible	
Output signal	Disable, 0mA~20mA, 4mA~20mA, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V (range adjustable, default is 4mA~20mA)	
Channel reaction time	400us / ch	
resolution	16 bits	
accuracy	±0.1% at 25°C, ±0.3% over the entire temperature range.	
Load impedance (voltage)	≥2kΩ (Accuracy: ±1‰ at 25°C, ±3‰ at full temperature)	
Load impedance (current)	≤600Ω	
The system must not be affected	In the event of a short circuit due to a fault in the ±15V power supply, the system's +5V power supply must not be affected.	
Output protection	Overload protection, open circuit protection, and short circuit protection (all with automatic recovery mechanisms).	
Potential isolation	There is no isolation between channels, isolation between channels and the backplane bus, and isolation between channels and the power supply voltage.	
Isolation and withstand voltage	500VDC	
Rated current consumption	100mA	80mA
Power consumption	0.5W	0.4W
Clearing and retaining optional functions in non-OP state	support	
Channel indicator lights	Green LED lights	
On-site power supply testing	support	

3.3.3.5 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°C~+60°C
Storage temperature	-40°C~+80°C
relative humidity	95%, no condensation
Altitude	≤2000m
Pollution level	Level 2
Protection level	IP20
Safety certification	UL certification, CE certification
Green certification	RoHS certification, REACH certification

3.3.4 Analog voltage module parameters

3.3.4.1 Voltage Input Module Range Selection Table

Voltage input module range selection and code value range					
Range selection	Measuring range	Code value range	Voltage input calculation formula	Voltage output calculation formula	Code value mapping table
0	Disable indicates that the channel is not enabled.				
1 (default)	-10V~+10V	-32768~32767	$D=(65535/20)*U$	$U=(D*20)/65535$	See 3.3.4.3 Voltage Input Module 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 code value, U represents voltage, and the default range of the analog voltage input module is 1: -10V~+10V (-32768~32767).

3.3.4.2 Voltage Output Module Range Selection Table

Voltage output module range selection and code value range					
Range selection	Measuring range	Code value range	Voltage input calculation formula	Voltage output calculation formula	Code value mapping table
0	Disable indicates that the channel is not enabled.				
1 (default)	-10V~+10V	-32768~32767	$D=(65535/20)*U$	$U=(D*20)/65535$	See 3.3.4.4 Voltage Output Module 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 default range of the analog voltage output module is 1: -10V~+10V (-32768~32767).

3.3.4.3 Voltage Input Module 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 = $(65535/20) \times \text{Voltage}$	Code value = $(32767/10) \times \text{Voltage}$	Code value = $(55296/20) \times \text{Voltage}$	Code value = $(27648/10) \times \text{Voltage}$
Voltage formula	Voltage = $(\text{Code value} \times 20) / 65535$	Voltage = $(\text{Code value} \times 10) / 32767$	Voltage = $(\text{Code value} \times 20) / 55296$	Voltage = $(\text{Code value} \times 10) / 27648$

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

②When the voltage input module's range is selected from 0V to 10V (0~32767), it supports underflow, overflow, and underflow alarm functions. Overflow occurs when the channel input range exceeds the range; within -0.13V to +10V, the calculated code value is displayed. Overflow occurs when

the channel input voltage is greater than 10V; the maximum code value of 32767 is displayed. When the input voltage is less than -0.13V, the minimum overflow code value is displayed.-384,Simultaneously issue an alarm..

③ Voltage input module range selection: -10V to +10V (-27648~27648It supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range, and the calculated code value is displayed within the range of -10.13V to +10.12V. Overflow occurs when the channel input voltage is greater than 10.12V, and the maximum overshoot code value of 27980 is displayed, along with an alarm; when the input voltage is less than -10.13V, the minimum overshoot code value is displayed.-27980, alarm triggered simultaneously..

④Voltage input module range selection 0V~10V (0~27648It supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the measurement range, and the calculated code value is displayed within the range of -0.13V to +10.12V. Overflow occurs when the channel input voltage is greater than 10.12V, and the maximum overshoot code value of 27980 is displayed, along with an alarm; when the input voltage is less than -0.13V, the minimum overshoot code value is displayed.-332, alarm triggered simultaneously.

rang e Voltage e	-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's range is selected as -5V to +5V (-27648 to 27648), it supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range; within -5.07V to +5.06V, a normal calculated code value is displayed. Overflow occurs when the channel input voltage is greater than 5.06V; the maximum overshoot code value of

27980 is displayed, and an alarm is triggered. When the input voltage is less than -5.07V, the minimum overshoot code value of -27980 is displayed, and an alarm is triggered.

② Voltage input module range selection: 0V~5V (0~27648It supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the measurement range, and the calculated code value is displayed within the range of -0.07V to +5.06V. Overflow occurs when the channel input voltage is greater than 5.06V, and the maximum overshoot code value of 27980 is displayed, along with an alarm; when the input voltage is less than -0.07V, the minimum overshoot code value is displayed.-332, alarm triggered simultaneously.

③ Voltage input module range selection: 1V~5V (0~27648It supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the measurement range; within the range of 0.94V to 5.06V, the normal calculated code value is displayed. Overflow occurs when the channel input voltage is greater than 5.06V; the maximum overshoot code value of 27933 is displayed, and an alarm is triggered. When the input voltage is less than 0.94V, the minimum overshoot code value is displayed.-345, alarm triggered simultaneously.

3.3.4.4 Voltage output module 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 = $(65535/20) \times \text{Voltage}$	Code value = $(32767/10) \times \text{Voltage}$	Code value = $(55296/20) \times \text{Voltage}$	Code value = $(27648/10) \times \text{Voltage}$
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 overflow functions. When the voltage output module range is selected as -10V~+10V or 0V~10V, and the code value is set to be greater than the maximum code value corresponding to the range, the channel outputs 10V voltage.

When the voltage output module range is selected as -10V to +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, the channel outputs 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 e	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:① The voltage output module supports overflow and overflow functions. When the voltage output module range is selected as -5V~+5V/0V~5V/1V~5V and the code value is set to be greater than the maximum code value corresponding to the range, the channel outputs 5V voltage.

When the voltage output module range is selected as -5V to +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, the channel outputs 1V voltage.

3.3.5 Analog current module parameters

3.3.5.1 Current input module range selection table

Current input module range selection and code value range					
Range selection	Measuring range	Code value range	Current input calculation formula	Current output calculation formula	Code value mapping table
0	Disable indicates that the channel is not enabled.				
1	4mA~20mA	0~65535	$D = (65535/16) * I - 16384$	$I = (D + 16384) * 16 / 65535$	See 3.3.5.3 Current Input Module 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 code value, I represents 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 module range selection table

Current output module range selection and code value range					
Range selection	Measuring range	Code value range	Current input calculation formula	Current output calculation formula	Code value mapping table
0	Disable indicates that the channel is not enabled.				
1	4mA~20mA	0~65535	$D = (65535/16 * I) - 16384$	$I = (D + 16384) * 16 / 65535$	See 3.3.5.4 Current Output Module 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 code value, I represents current, and the default range of the analog current output module is 2: 0mA~20mA (0~65535).

3.3.5.3 Current Input Module 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 = $65535/16 * \text{current} - 16384$	Code value = $(65535/20) * \text{current}$	Code value = $(27648/16) * \text{current} - 6912$	Code value = $(27648/20) * \text{current}$	Code value = $(65535/40) * (\text{current} + 20)$

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 from 4mA to 20mA (0 to 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 will be displayed and an alarm will be triggered. When the input channel input current is less than 4mA, the minimum code value will be displayed.0.

②When the current input module's range is selected from 0mA to 20mA (0 to 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 will be displayed, and an alarm will be triggered simultaneously.When the input current is less than 0mA, the minimum code value 0 is displayed.

③When the current input module's range is selected from 4mA to 20mA (0 to 27648), it supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range; within the range of 4mA to 20.24mA, the normal calculated code value is displayed. Overflow occurs when the channel input current exceeds 20.24mA, and the maximum overshoot code value is displayed.28085Simultaneously, an alarm is triggered. Underflow occurs when the input current to the input channel is less than 4mA, and the minimum overshoot code value of 0 is displayed.

④When the current input module's range is selected from 0mA to 20mA (0~27648), it supports overshoot, overflow, and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range; within the range of 0mA to 20.24mA, the normal calculated code value is displayed. Overflow occurs when the channel input current exceeds 20.24mA, and the maximum overshoot code value is displayed.27986Simultaneously, an alarm is triggered. Underflow occurs when the input current to the input channel is less than 0mA, and the minimum overshoot code value of 0 is displayed.

⑤When the current input module's range is selected from -20mA to +20mA (0 to 65535), it supports overflow and overflow alarm functions. That is, when the channel input current is greater than 20mA, the maximum code value 65535 will be displayed, and an alarm will be triggered simultaneously.Input channel input less than -20mAWhen the current is applied, the minimum code value of 0 is always displayed.

3.3.5.4 Current output module 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 = $65535/16 * \text{current} - 16384$	Code value = $(65535/20) * \text{current}$	Code value = $(27648/16) * \text{current} - 6912$	Code value = $(27648/20) * \text{current}$

Note: ① When the current output module range is selected as 4mA~20mA (0~27648) or 0mA~20mA (0~27648), it supports overflow, overshoot, and overflow alarm functions. That is, when the current output module range is selected as 4mA~20mA (0~27648) and the code value is set to greater than...32511At the same time, all channels output 22.81mA current and trigger an alarm. The current output module range is 0mA~20mA (0~27648), and the code value is set to be greater than...32511At that time, all channels output 23.52mA current and simultaneously trigger an alarm.

3.3.6 Analog Current & Voltage Compatible Module Parameters

3.3.6.1 Current & Voltage Compatible Input Module Range Selection Table

Current & Voltage Compatible Input Module Range Selection and Code Value Range					
Range selection	Measuring range	Code value range	Current/Voltage Input Calculation Formula	Current/Voltage Output Calculation Formula	Code value mapping table
0	Disable indicates that the channel is not enabled.				
1	0mA~20mA	0~27648	$D=(27648/20)*I$	$I=(D*20)/27648$	See 3.3.6.3 Current & Voltage Compatible Input Module Code Value Table
2 (default)	4mA~20mA	0~27648	$D=(27648/16)*I-6912$	$I=((D+6912)*16)/27648$	
3	-20mA~+20mA	-27648~27648	$D=(55296/40)*I$	$I=(D*40)/55296$	
4	-10V~+10V	-27648~27648	$D=(55296/20)*U$	$U=(D*20)/55296$	
5	-10V~+10V	-32768~32767	$D=(65535/20)*U$	$U=(D*20)/65535$	
6	0V~10V	0~27648	$D=(27648/10)*U$	$U=(D*10)/27648$	
7	0V~10V	0~32767	$D=(32767/10)*U$	$U=(D*10)/32767$	
8	-5V~+5V	-27648~27648	$D=(55296/10)*U$	$U=(D*10)/55296$	
9	-5V~+5V	-32768~32767	$D=(65535/10)*U$	$U=(D*10)/65535$	
10	0V~5V	0~27648	$D=(27648/5)*U$	$U=(D*5)/27648$	
11	0V~5V	0~32767	$D=(32767/5)*U$	$U=(D*5)/32767$	
12	1V~5V	0~27648	$D=(27648/4)*U-6912$	$U=(D+6912)*4/27648$	

3.3.6.2 Current & Voltage Compatible Output Module Range Selection Table

Current & Voltage Compatible Output Module Range Selection and Code Value Range					
Range selection	Measuring range	Code value range	Current/Voltage Input Calculation Formula	Current/Voltage Output Calculation Formula	Code value mapping table
0	Disable indicates that the channel is not enabled.				
1	0mA~20mA	0~27648	$D=(27648/20)*I$	$I=(D*20)/27648$	See 3.3.6.4 Current & Voltage Compatible Output Module Code Value Table
2 (default)	4mA~20mA	0~27648	$D=(27648/16)*I-6912$	$I=((D+6912)*16)/27648$	
3	-10V~+10V	-27648~27648	$D=(55296/20)*U$	$U=(D*20)/55296$	
4	-10V~+10V	-32768~32767	$D=(65535/20)*U$	$U=(D*20)/65535$	
5	0V~10V	0~27648	$D=(27648/10)*U$	$U=(D*10)/27648$	
6	0V~10V	0~32767	$D=(32767/10)*U$	$U=(D*10)/32767$	
7	-5V~+5V	-27648~27648	$D=(55296/10)*U$	$U=(D*10)/55296$	
8	-5V~+5V	-32768~32767	$D=(65535/10)*U$	$U=(D*10)/65535$	
9	0V~5V	0~27648	$D=(27648/5)*U$	$U=(D*5)/27648$	
10	0V~5V	0~32767	$D=(32767/5)*U$	$U=(D*5)/32767$	
11	1V~5V	0~27648	$D=(27648/4)*U-6912$	$U=(D+6912)*4/27648$	

3.3.6.3 Current & Voltage Compatible Input Module Code Value Table

range Current	0mA~20mA	4mA~20mA	-20mA~+20mA
	0~27648	0~27648	-27648~27648
	code value	code value	code value
-23.52	-	-	-32512
-20	-	-	-27648
-15	-	-	-20736
-10	-	-	-13824
-5	-	-	-6912
-3.52	-4864	-	-4864
-1	-1382	-	-1382
0	0	-	0
1	1382	-	1382
1.185	1638	-4864	1638
2	2765	-3456	2765
3	4147	-1728	4147
4	5530	0	5530
5	6912	1728	6912
6	8294	3456	8294
7	9677	5184	9677
8	11059	6912	11059
9	12442	8640	12442
10	13824	10368	13824
11	15206	12096	15206
12	16589	13824	16589
13	17971	15552	17971
14	19354	17280	19354
15	20736	19008	20736
16	22118	20736	22118
17	23501	22464	23501
18	24883	24192	24883
19	26266	25920	26266
20	27648	27648	27648
22.81	31538	32511	31533
23.52	32511	-	32511
Code value formula	Code value = (27648/20) * current	Code value = (27648/16) * current - 6912	Code value = (55296/40) * current

Note: ① When the current & voltage compatible input module range is selected from 0mA to 20mA (0~27648), it supports overshoot $\pm 3.52\text{mA}$ and supports overflow and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range. -3.52mA~23.52mA. The value displayed within mA is the normal calculated code value. Overflow or overflow is displayed as -32768/32767.

② The current & voltage compatible input module supports overshoot $\pm 2.81\text{mA}$ when the range selection is 4mA~20mA (0~27648), and supports overflow and overflow alarm functions. Overshoot

occurs when the channel input range exceeds the range. 1.185mA~2The normal calculation code value is displayed within 2.81mA. Overflow and overflow are displayed as -32768/32767.

③ The current & voltage compatible input module supports overshoot $\pm 3.52\text{mA}$ when the range selection is -20mA to 20mA (-27648 to 27648), and supports overflow and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range. -23.52mA~23.52The value displayed within mA is the normal calculated code value. Overflow or overflow is displayed as -32768/32767.

range Voltage	-10V~+10V	-10V~+10V	0V~10V	0V~10V
	-27648~27648	-32768~32767	0~27648	0~32767
	code value	code value	code value	code value
-11.759	-31512	-	-	-
-10	-27648	-32768	-	-
-9	-24883	-29491	-	-
-8	-22118	-26214	-	-
-7	-19354	-22937	-	-
-6	-16589	-19661	-	-
-5	-13824	-16384	-	-
-4	-11059	-13107	-	-
-3	-8294	-9830	-	-
-2	-5530	-6554	-	-
-1.759	-4864	-5764	-4864	-
-1	-2765	-3277	-2765	-
0	0	0	0	0
1	2765	3277	2765	3277
2	5530	6554	5530	6554
3	8294	9830	8294	9830
4	11059	13107	11059	13107
5	13824	16384	13824	16384
6	16589	19661	16589	19661
7	19354	22937	19354	22937
8	22118	26214	22118	26214
9	24883	29491	24883	29491
10	27648	32767	27648	32767
11.759	31511	-	31511	-
Code value formula	Code value = $(55296/20) \times \text{Voltage}$	Code value = $(65535/20) \times \text{Voltage}$	Code value = $(27648/10) \times \text{Voltage}$	Code value = $(32767/10) \times \text{Voltage}$
Voltage formula	Voltage = $(\text{Code value} \times 20) / 55296$	Voltage = $(\text{Code value} \times 20) / 65535$	Voltage = $(\text{Code value} \times 10) / 27648$	Voltage = $(\text{Code value} \times 10) / 32767$

Note: ① The current & voltage compatible input module supports overshoot $\pm 1.759\text{V}$ when the range is selected as -10V~+10V (-27648~27648), and supports overflow and overflow alarm functions.

Overshoot occurs when the channel input range exceeds the range. -11.759V~1The calculated code value is displayed within 1.759V. Overflow or overflow is displayed as -32768/32767.

② The current & voltage compatible input module does not support overshoot when the range selection is -10V~+10V (-32768~32767), but supports overflow and overflow alarm functions. Overflow is displayed as -32768/32767.

③ The current & voltage compatible input module supports overshoot $\pm 1.759V$ when the range selection is 0V~10V (0~27648), and supports overflow and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range. -1.759V~1The calculated code value is displayed within 1.759V. Overflow or overflow is displayed as -32768/32767.

④ The current & voltage compatible input module does not support overshoot when the range is selected from 0V to 10V (0~32767), but supports overflow and overflow alarm functions. Overflow is displayed as 0/32767.

range Voltage	-5V~+5V	-5V~+5V	0V~5V	0V~5V	1V~5V
	-27648~27648	-32768~32767	0~27648	0~32767	0~27648
	code value	code value	code value	code value	code value
-5.879	-32512	-	-	-	-
-5	-27648	-32768	-	-	-
-4	-22118	-26214	-	-	-
-3	-16588	-19661	-	-	-
-2	-11060	-13107	-	-	-
-1	-5530	-6554	-	-	-
-0.879	-4864	-5761	-4864	-	-
0	0	0	0	0	-
0.296	1637	1940	1637	1940	-4864
1	5530	6554	5530	6554	0
2	11060	13107	11060	13107	6912
3	16588	19661	16588	19661	13824
4	22118	26214	22118	26214	20736
5	27648	32767	27648	32767	27648
5.704	31541	-	31541	-	32511
5.879	32511	-	32511	-	-
Code value formula	code value=(55296/10)*Voltage	code value=(65535/10)*Voltage	code value=(27648/5)*Voltage	code value=(32767/5)*Voltage	code value=(27648/4)*Voltage-6912
Voltage formula	Voltage=(code value*10)/55296	Voltage=(code value*10)/ 65535	Voltage=(code value*5)/27648	Voltage=(code value*5)/ 32767	Voltage=(code value+6912)*4/27648

Note: ① When the current & voltage compatible input module range is selected as -5V~+5V (-27648~27648), it supports overshoot $\pm 0.879V$ and supports overflow and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range. -5.879V~5The calculated code value is displayed within 0.879V. Overflow or overflow is displayed as -32768/32767.

② The current & voltage compatible input module does not support overshoot when the range is selected as $-5V \sim +5V$ ($-32768 \sim 32767$), but supports overflow and overflow alarm functions. Overflow is displayed as $-32768/32767$.

③ The current & voltage compatible input module supports overshoot $\pm 0.879V$ when the range is selected from $0V$ to $5V$ ($0 \sim 27648$), and supports overflow and overflow alarm functions. Overshoot occurs when the channel input range exceeds the range. $-0.879V$ The calculated code value is displayed within the range of V to $5.879V$. Overflow or overflow is displayed as $-32768/32767$.

④ The current & voltage compatible input module does not support overshoot when the range is selected from $0V$ to $5V$ (0 to 32767), but supports overflow and overflow alarm functions. Overflow is displayed as $0/32767$.

⑤ The current & voltage compatible input module supports overshoot $\pm 0.704V$ when the range is selected from $1V$ to $5V$ (0 to 27648), and supports overflow and overshoot alarm functions. Overshoot occurs when the channel input range exceeds the range. $0.296V$ The calculated code value is displayed within the range of V to $5.704V$. Overflow or overflow is displayed as $-32768/32767$.

3.3.6.4 Current & Voltage Compatible Output Module Code Value Table

range Current	0mA~20mA	4mA~20mA
	0~27648	0~27648
	code value	code value
0	0	-
1	1382	-
2	2765	-
3	4147	-
4	5530	0
5	6912	1728
6	8294	3456
7	9677	5184
8	11059	6912
9	12442	8640
10	13824	10368
11	15206	12096
12	16589	13824
13	17971	15552
14	19354	17280
15	20736	19008
16	22118	20736
17	23501	22464
18	24883	24192
19	26266	25920
20	27648	27648
Code value formula	Code value = (27648/20) * current	Code value = (27648/16) * current - 6912
Current formula	Current = ((code value * 20) / 27648	Current = ((Code value + 6912) * 16) / 27648

Note: Code values set outside the range for current & voltage compatible output modules will not take effect. For analog output modules, if the preset value of the cleared and retained parameters exceeds the code value range, the preset value will not take effect, and the previous valid value will be maintained.

range Voltage	-10V~+10V	-10V~+10V	0V~10V	0V~10V
	-27648~27648	-32768~32767	0~27648	0~32767
	code value	code value	code value	code value
-10	-27648	-32768	-	-
-9	-24883	-29491	-	-
-8	-22118	-26214	-	-
-7	-19354	-22937	-	-
-6	-16589	-19661	-	-
-5	-13824	-16384	-	-
-4	-11059	-13107	-	-
-3	-8294	-9830	-	-
-2	-5530	-6554	-	-
-1	-2765	-3277	-	-
0	0	0	0	0
1	2765	3277	2765	3277
2	5530	6554	5530	6554
3	8294	9830	8294	9830
4	11059	13107	11059	13107
5	13824	16384	13824	16384
6	16589	19661	16589	19661
7	19354	22937	19354	22937
8	22118	26214	22118	26214
9	24883	29491	24883	29491
10	27648	32767	27648	32767
Code value formula	Code value = $(55296/20) \times \text{Voltage}$	Code value = $(65535/20) \times \text{Voltage}$	Code value = $(27648/10) \times \text{Voltage}$	Code value = $(32767/10) \times \text{Voltage}$
Voltage formula	Voltage = $(\text{Code value} \times 20) / 55296$	Voltage = $(\text{Code value} \times 20) / 65535$	Voltage = $(\text{Code value} \times 10) / 27648$	Voltage = $(\text{Code value} \times 10) / 32767$

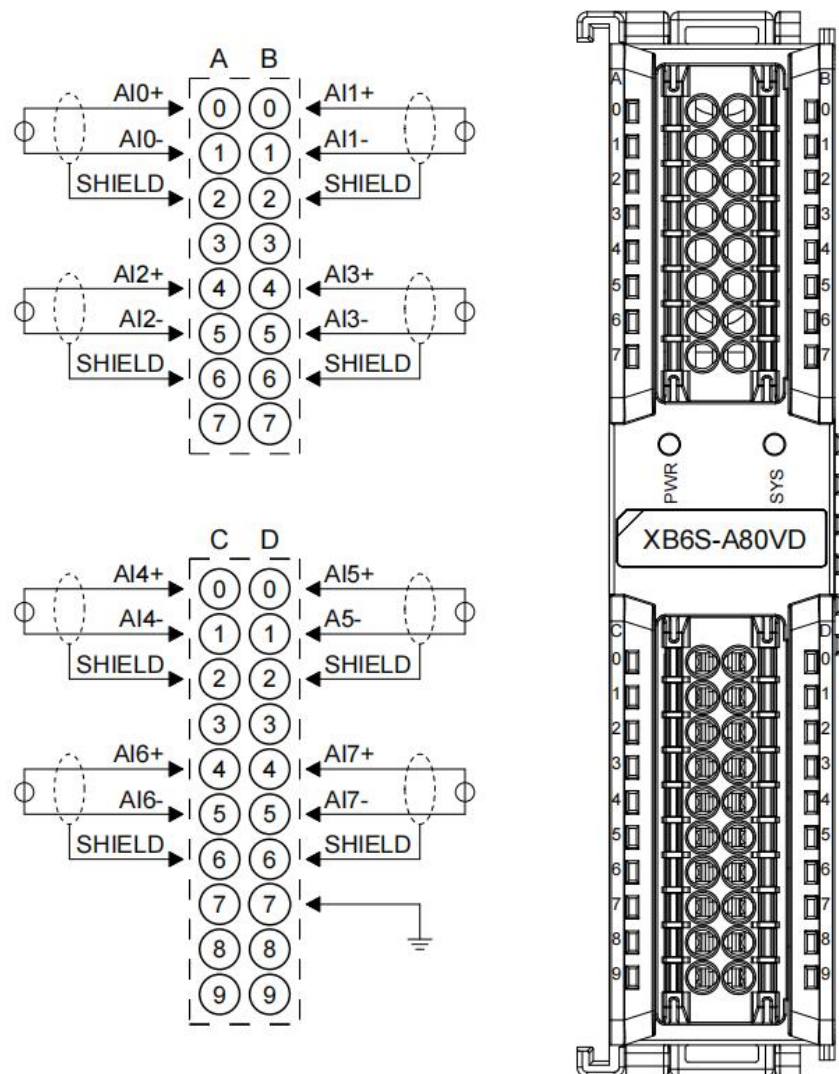
Note: Code values set outside the range for current & voltage compatible output modules will not take effect. For analog output modules, if the preset value of the cleared and retained parameters exceeds the code value range, the preset value will not take effect, and the previous valid value will be maintained.

range Voltage	-5V~+5V	-5V~+5V	0V~5V	0V~5V	1V~5V
	-27648~27648	-32768~32767	0~27648	0~32767	0~27648
	code value	code value	code value	code value	code value
-5	-27648	-32768	-	-	-
-4	-22118	-26214	-	-	-
-3	-16588	-19661	-	-	-
-2	-11060	-13107	-	-	-
-1	-5530	-6554	-	-	-
0	0	0	0	0	-
1	5530	6554	5530	6554	0
2	11060	13107	11060	13107	6912
3	16588	19661	16588	19661	13824
4	22118	26214	22118	26214	20736
5	27648	32767	27648	32767	27648
Code value formula	code value=(55296/10)*Voltage	code value=(65535/10)*Voltage	code value=(27648/5)*Voltage	code value=(32767/5)*Voltage	code value=(27648/4)*Voltage-6912
Voltage formula	Voltage=(code value*10)/55296	Voltage=(code value*10)/ 65535	Voltage=(code value*5)/27648	Voltage=(code value*5)/ 32767	Voltage=(code value+6912)*4/27648

Note: Code values set outside the range for current & voltage compatible output modules will not take effect. For analog output modules, if the preset value of the cleared and retained parameters exceeds the code value range, the preset value will not take effect, and the previous valid value will be maintained.

3.3.7 Wiring diagram

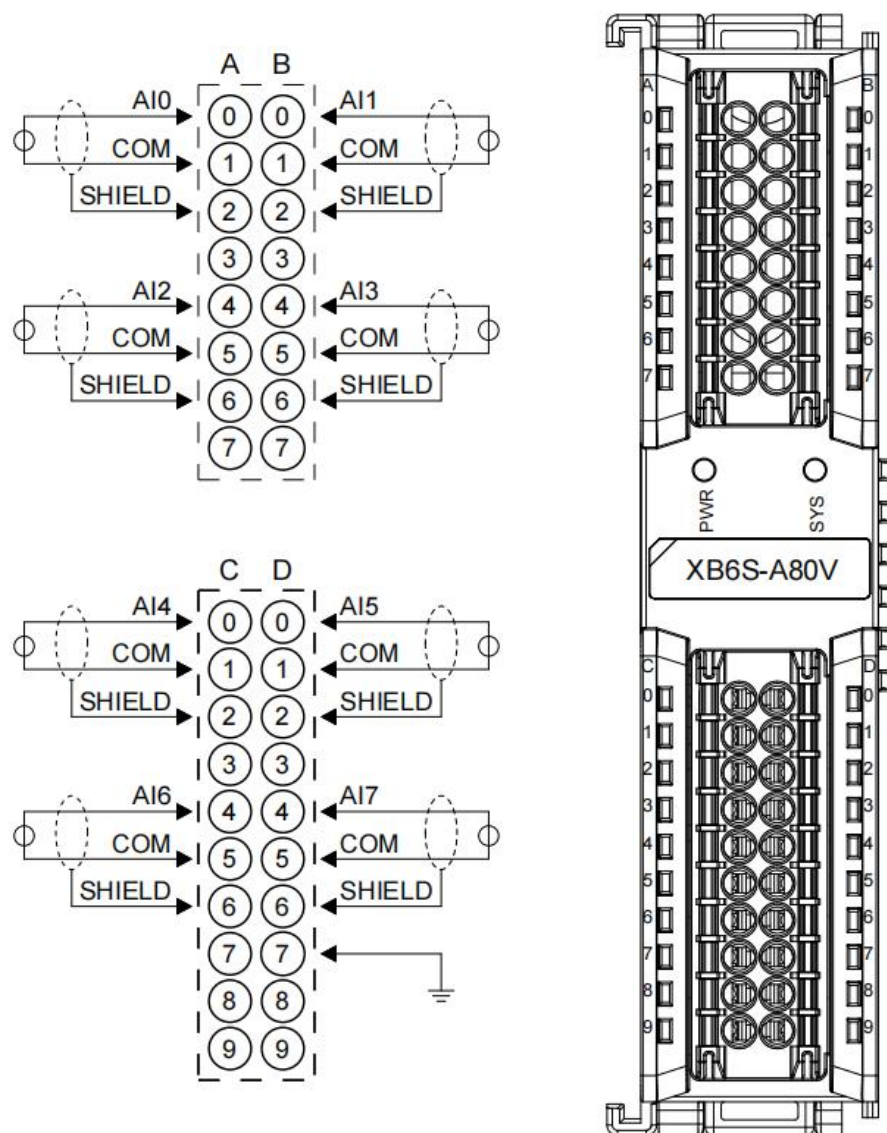
3.3.7.1 XB6S-A80VD



*All SHIELD internal conduction

*It is recommended to use shielded twisted-pair cable, connect the shield to the SHIELD port, and ground it reliably.

3.3.7.2 XB6S-A80V

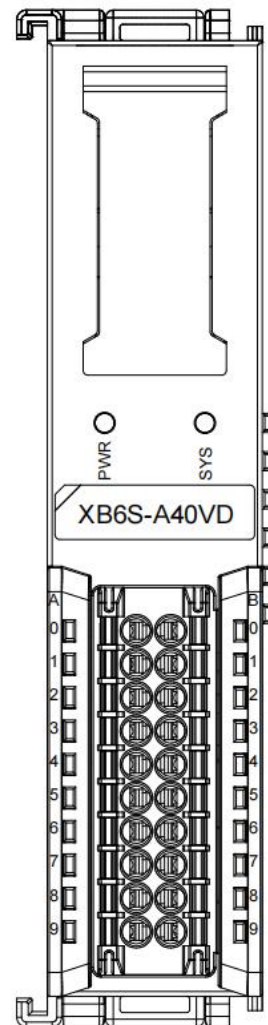
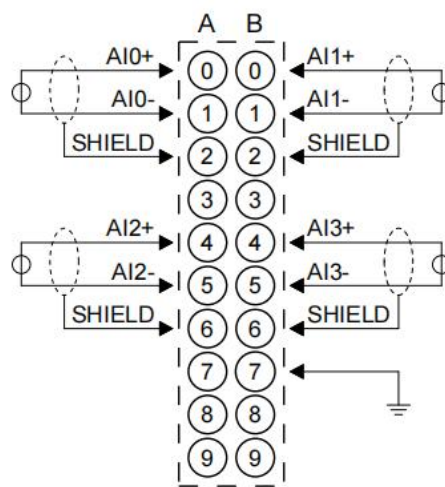


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

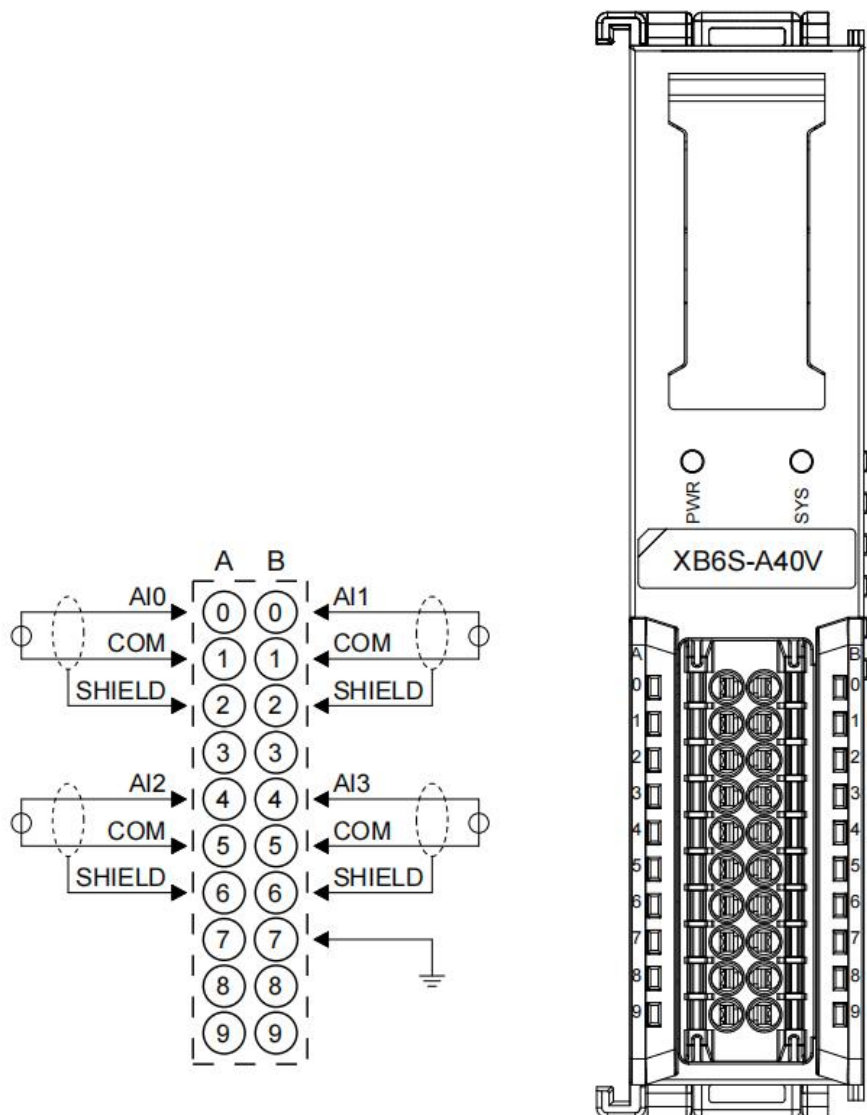
3.3.7.3 XB6S-A40VD



*All SHIELD internal conduction

*It is recommended to use shielded twisted-pair cable, connect the shield to the SHIELD port, and ground it reliably.

3.3.7.4 XB6S-A40V

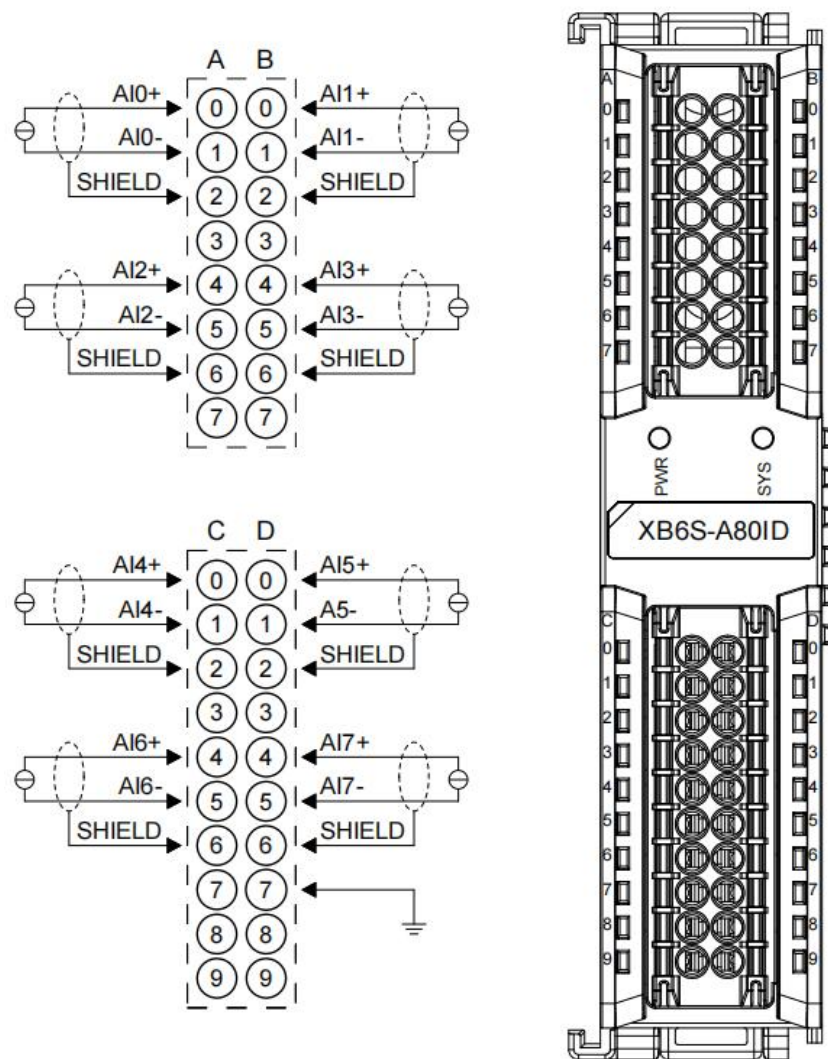


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

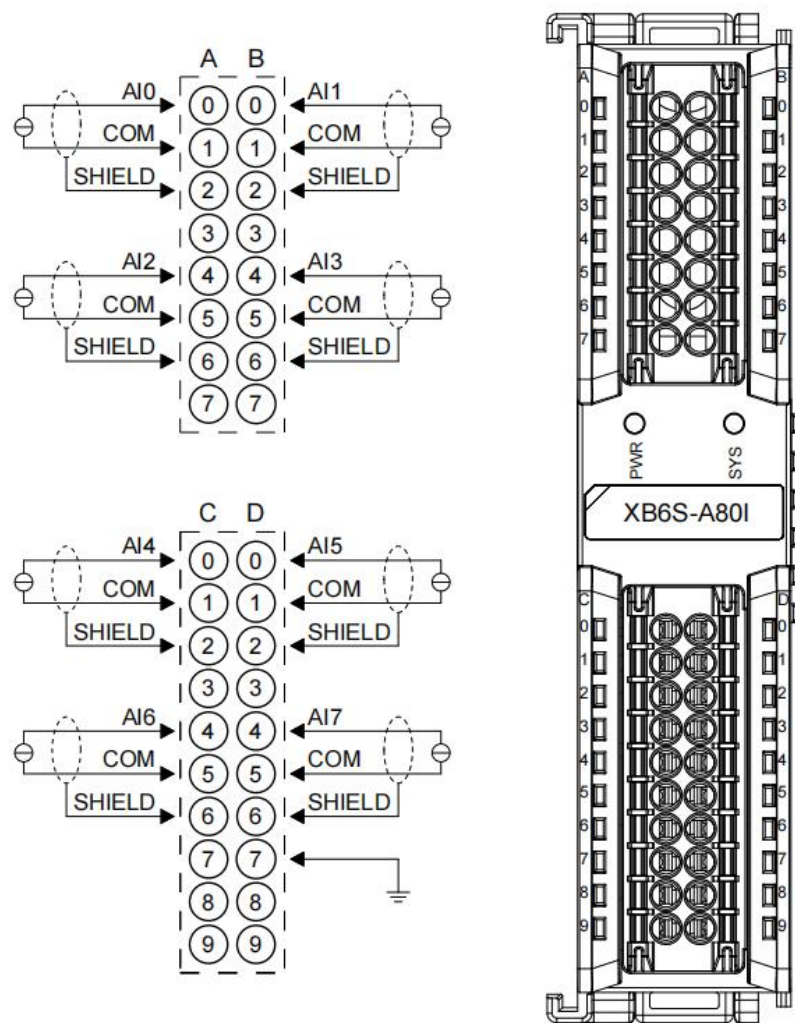
3.3.7.5 XB6S-A80ID



*All SHIELD internal conduction

*It is recommended to use shielded twisted-pair cable, connect the shield to the SHIELD port, and ground it reliably.

3.3.7.6 XB6S-A80I

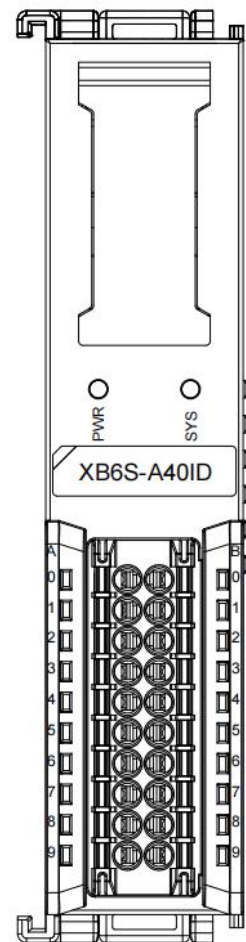
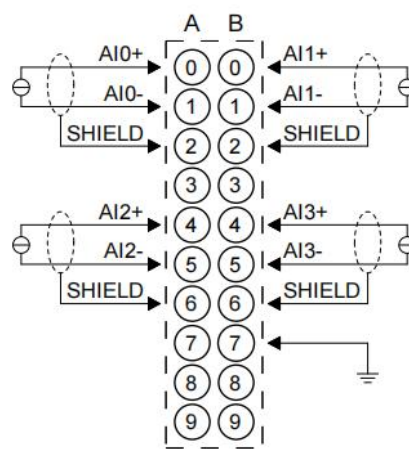


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

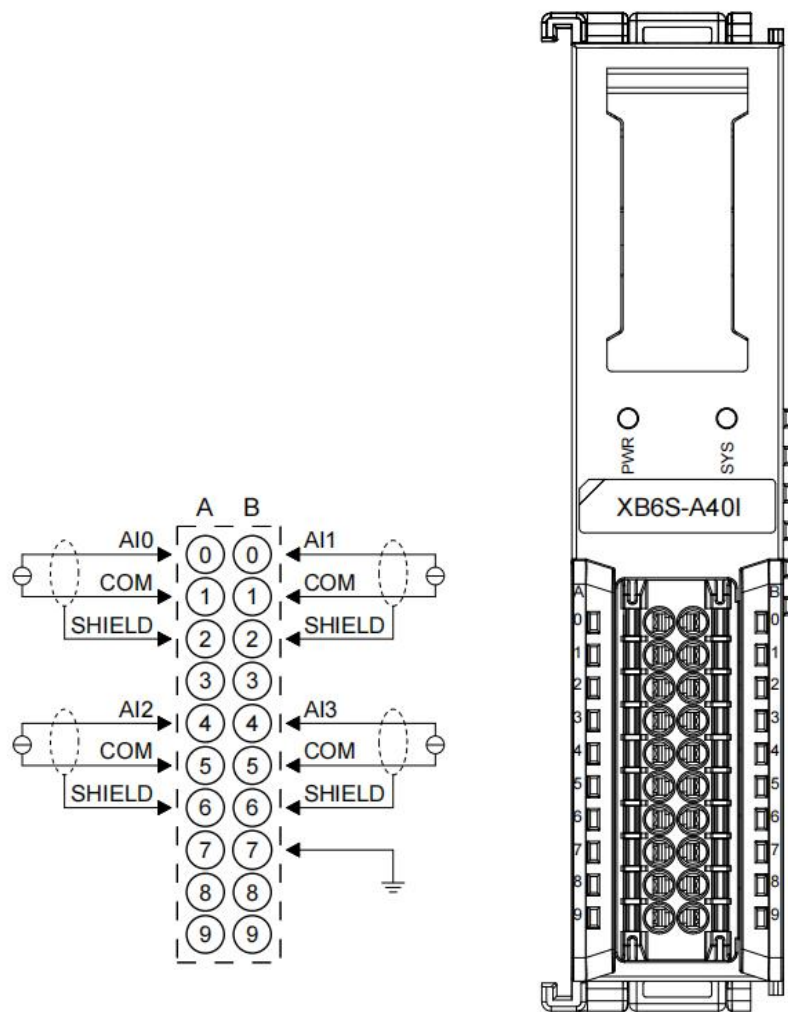
3.3.7.7 XB6S-A40ID



*All SHIELD internal conduction

*It is recommended to use shielded twisted-pair cable, connect the shield to the SHIELD port, and ground it reliably.

3.3.7.8 XB6S-A40I

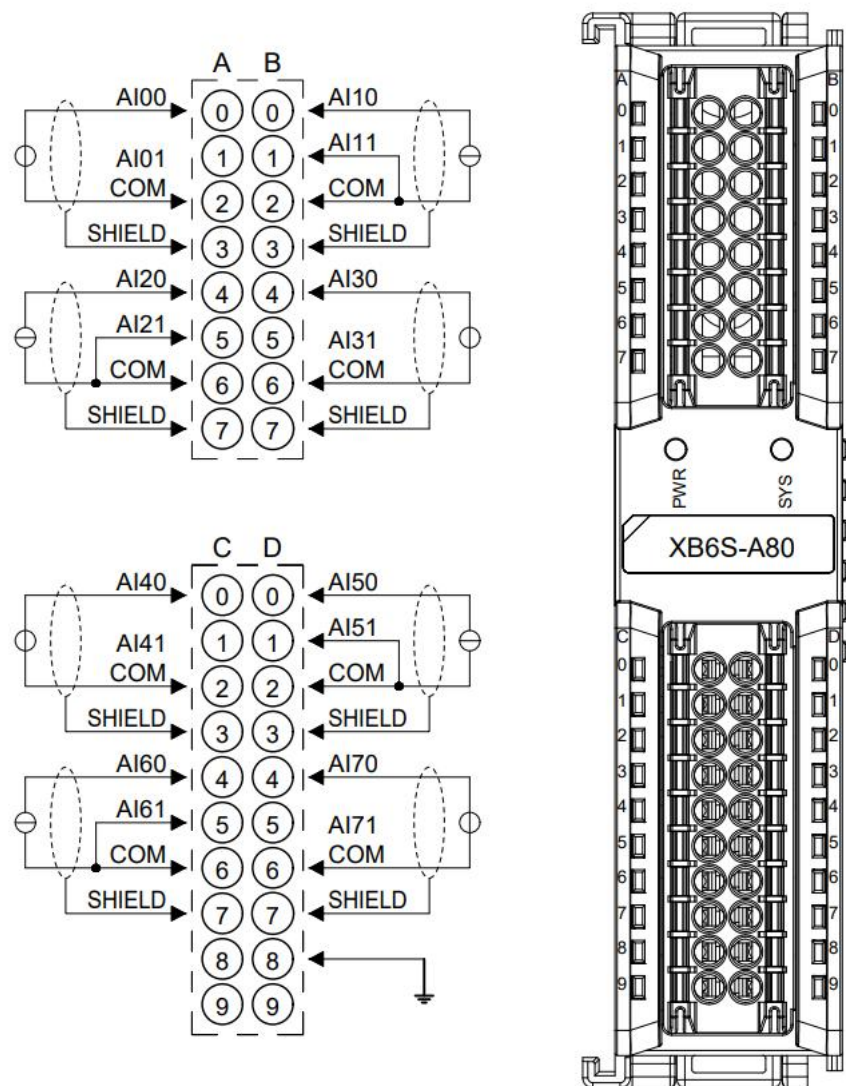


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.9 XB6S-A80



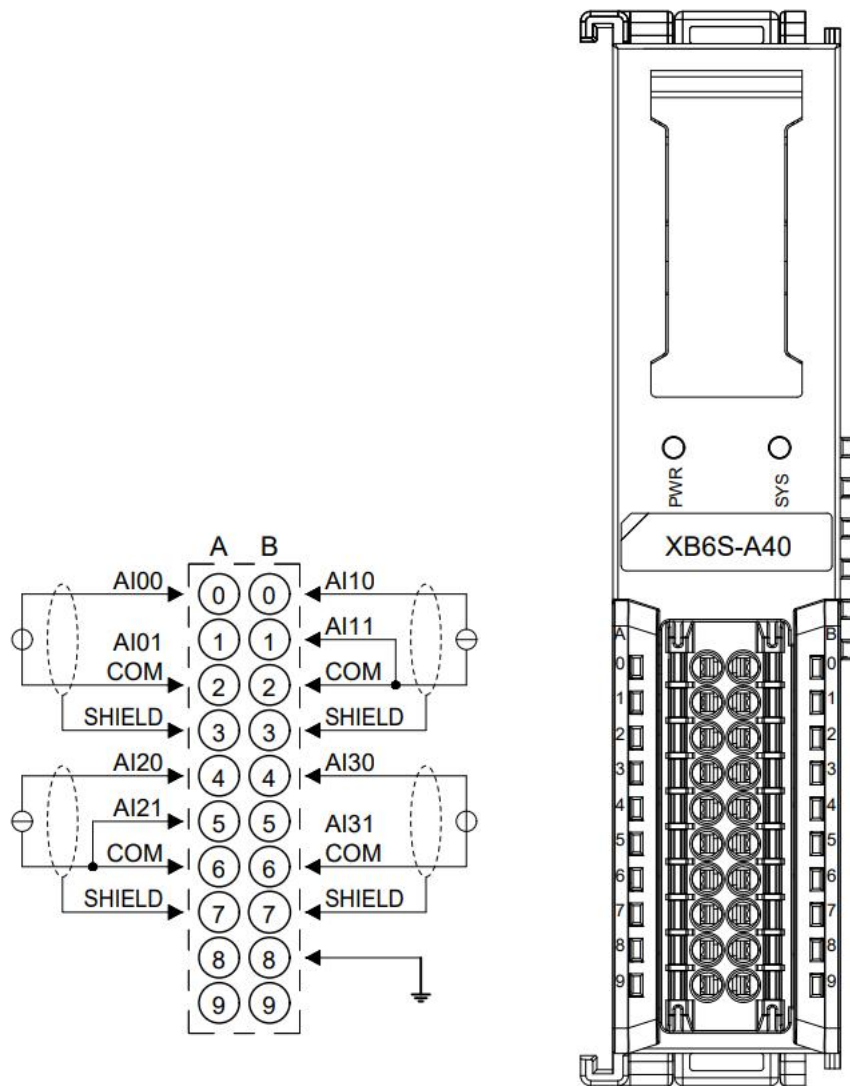
*COM internal conduction, SHIELD internal conduction

*For current-mode applications, AIx1 and COM need to be shorted externally.

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.10 XB6S-A40



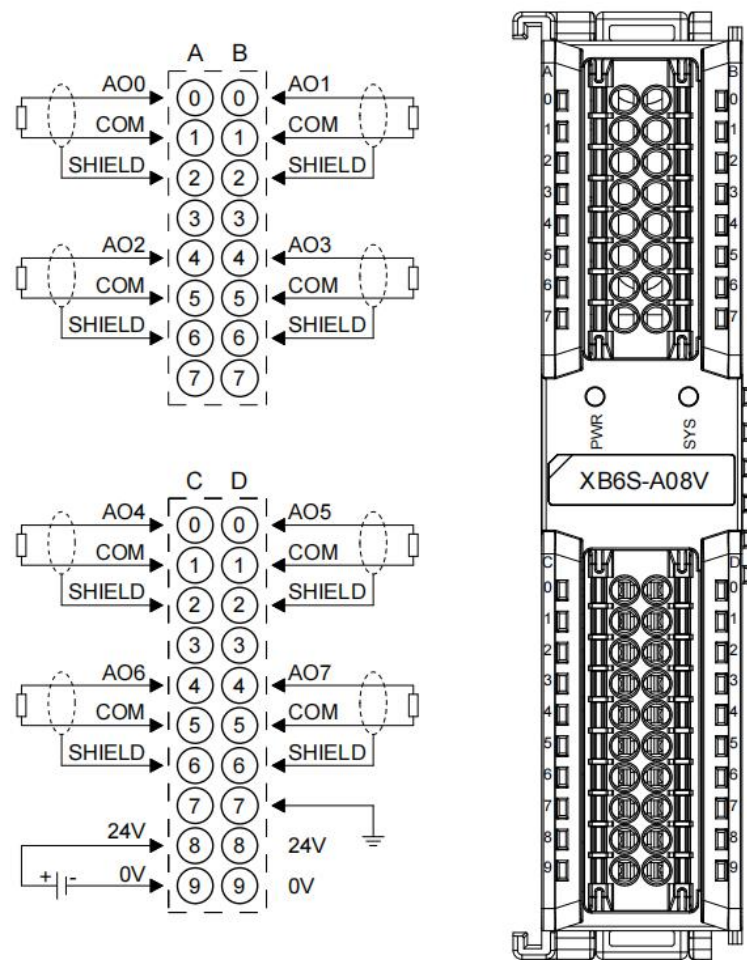
*COM internal conduction, SHIELD internal conduction

*For current-mode applications, AIx1 and COM need to be shorted externally.

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.11 XB6S-A08V

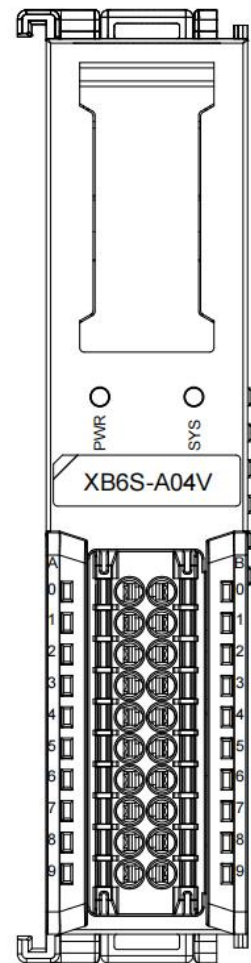
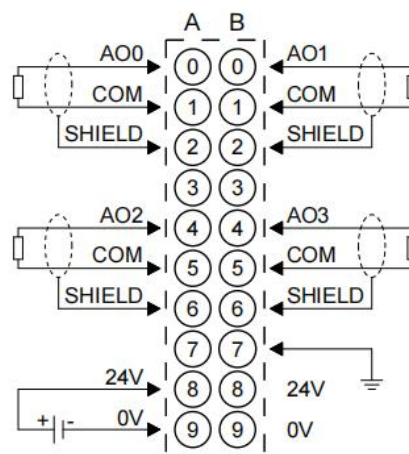


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

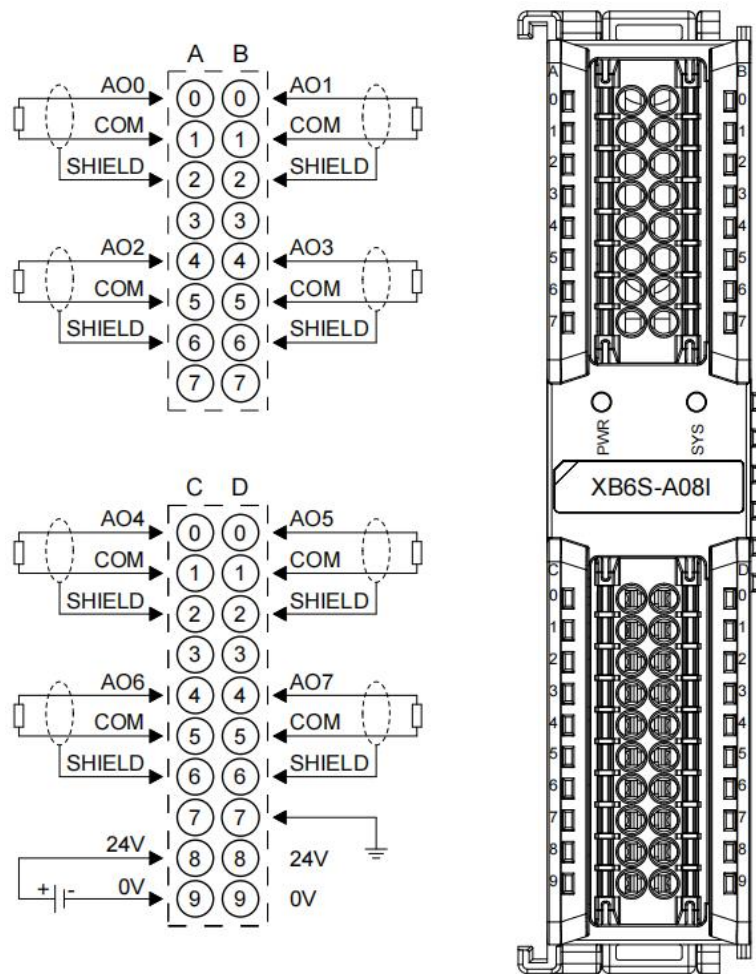
*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.12 XB6S-A04V



- *COM internal conduction, SHIELD internal conduction
- *All channel loads must originate from the same source.
- *Shielded twisted-pair cables are recommended for signal cables.

3.3.7.13 XB6S-A08I

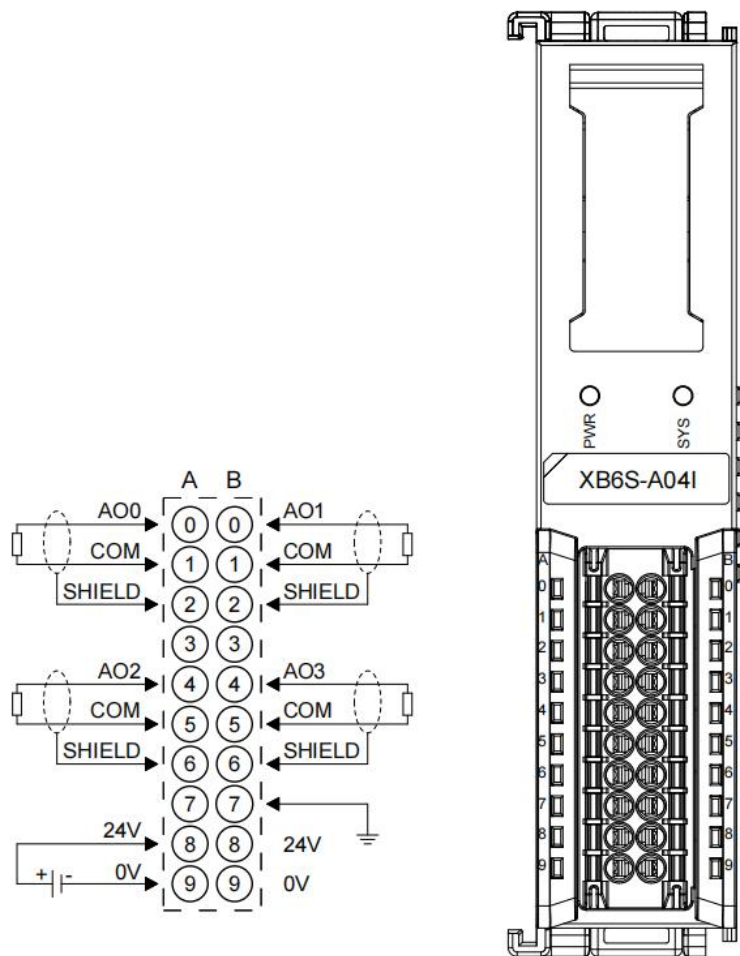


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.14 XB6S-A04I

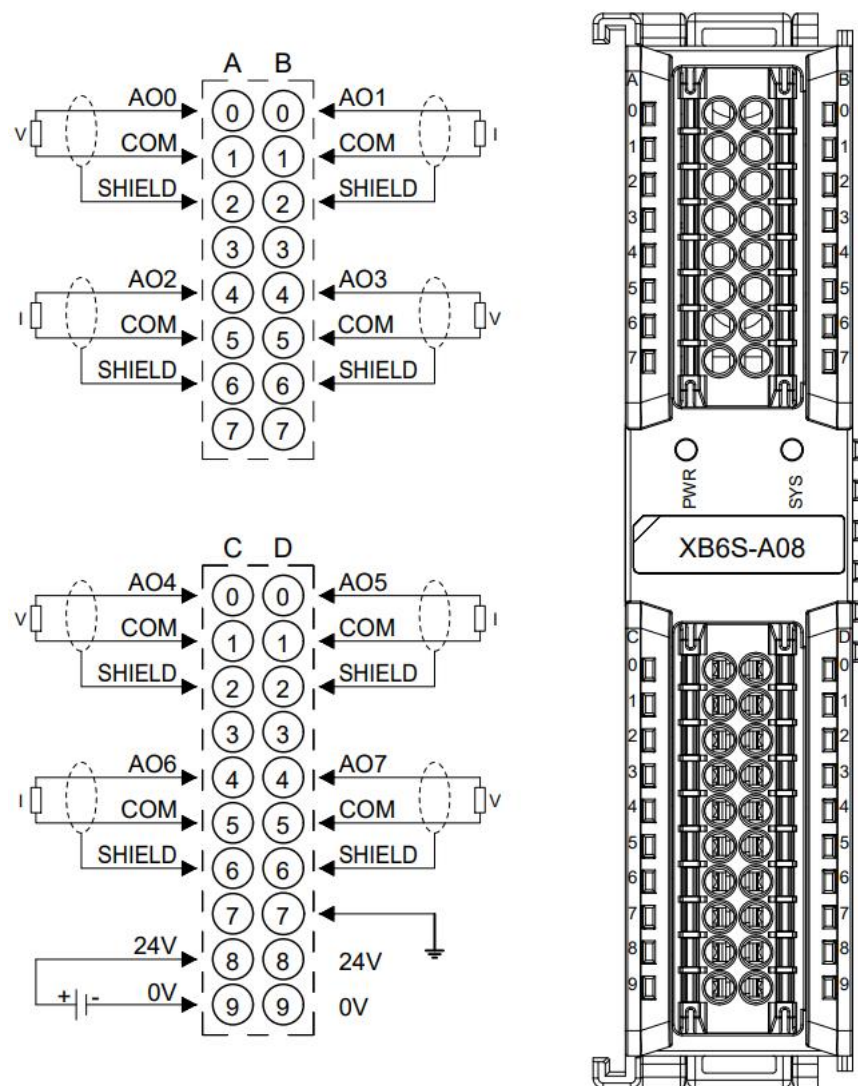


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.15 XB6S-A08

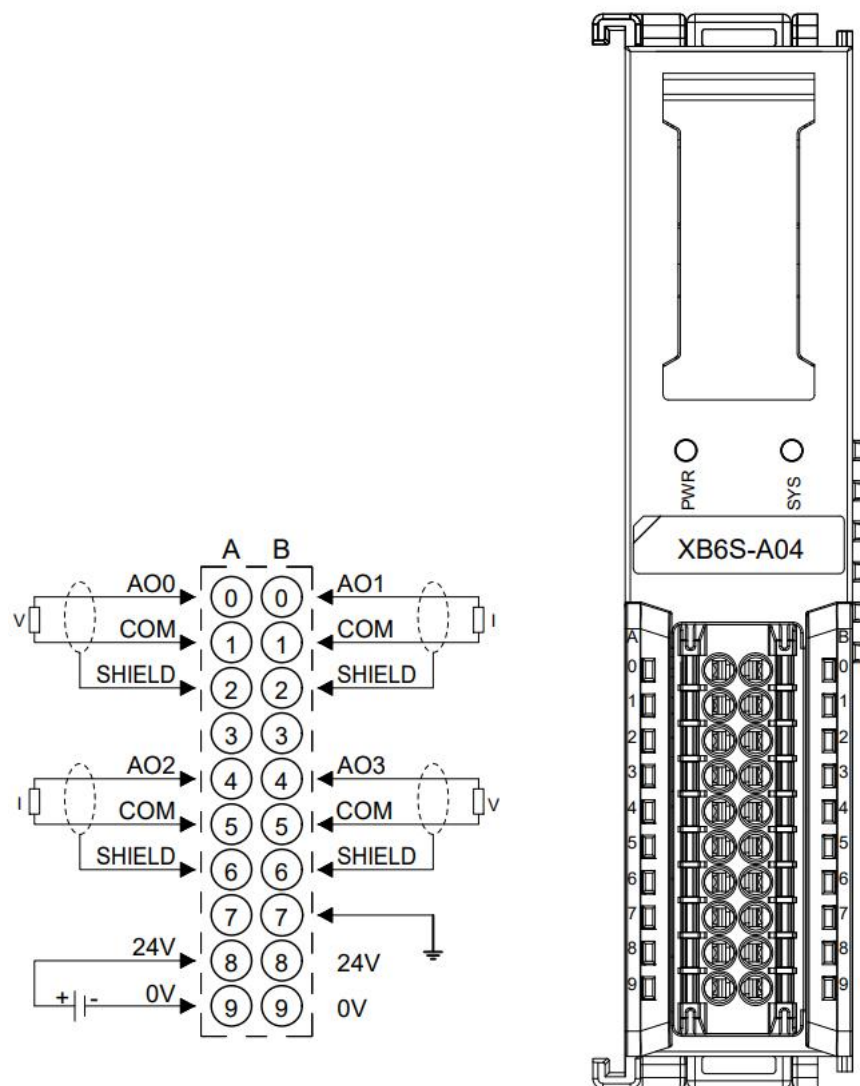


*COM internal conduction, SHIELD internal conduction

*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.7.16 XB6S-A04



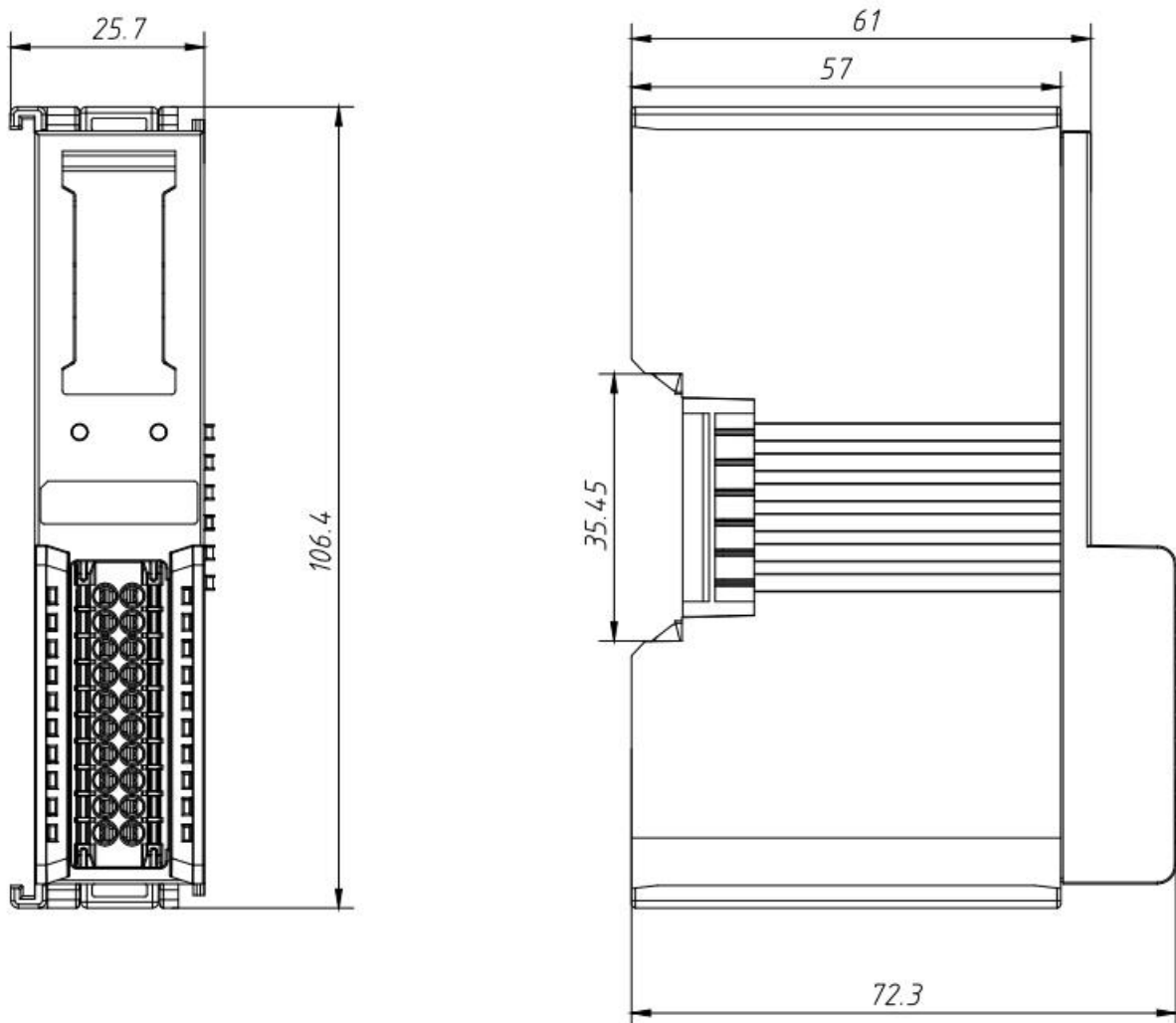
*COM internal conduction, SHIELD internal conduction

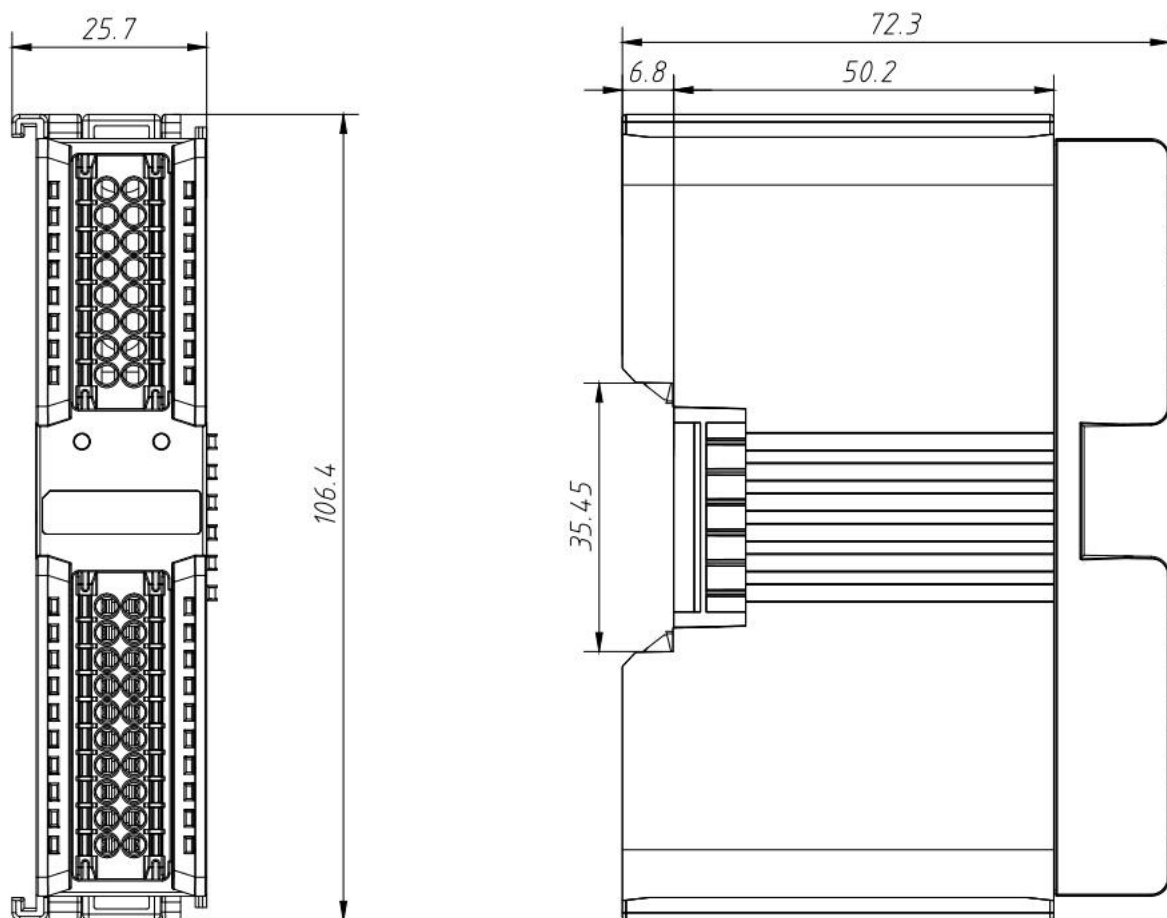
*All channel loads must originate from the same source.

*Shielded twisted-pair cables are recommended for signal cables.

3.3.8 Outline Dimensions

Dimensions of a 4-channel analog I/O module (in mm)



Dimensions of an 8-channel analog I/O module (in mm)

3.4 Extended power module

3.4.1 Panel structure



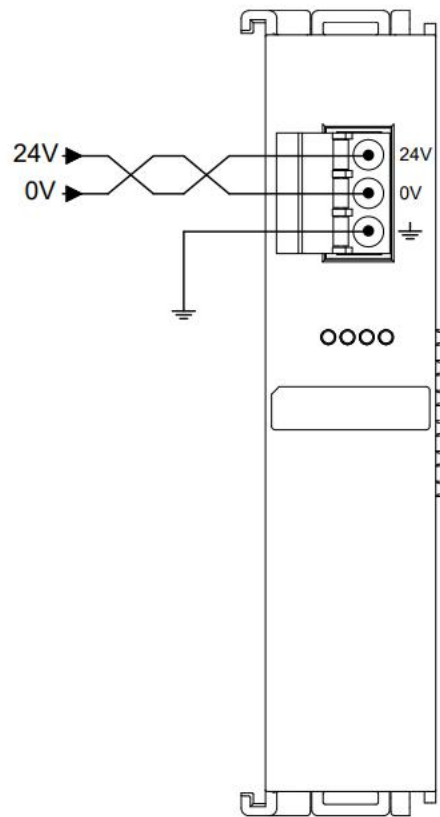
3.4.2 Indicator light function

Extended power module indicator light definition				
Logo	Name	Color	State	Status Description
PWR	Power indicator light	green	ON	The module power supply is working normally.
			OFF	Module not powered or power supply abnormal
OVR	Overload indicator light	red	OFF	Not overloaded
			ON	The load reaches 90% ($\pm 5\%$) or more.

3.4.3 Technical parameters

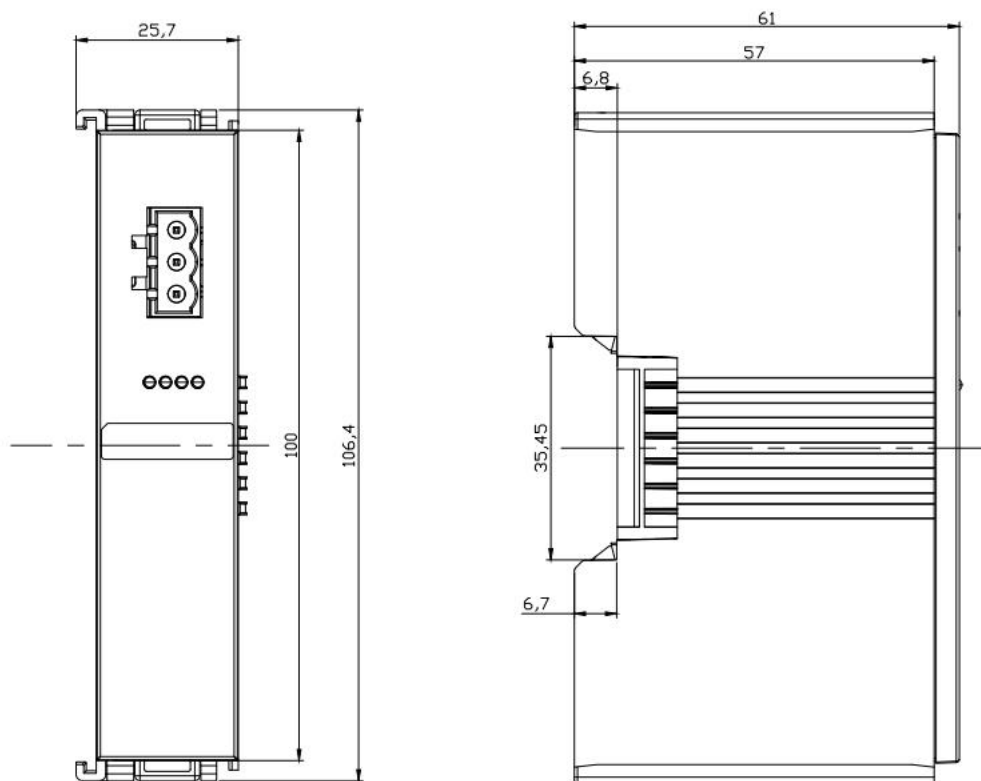
Power parameters	
Input voltage	SELV Input 24VDC (18V~36V)
Input current	600mA (24VDC)
Output voltage	5VDC
Output current	2A
General technical parameters	
Specifications and dimensions	106.4 × 25.7 × 61mm
weight	110g
Operating temperature	-20°C ~ +60°C
Storage temperature	-40°C ~ +80°C
relative humidity	95%, no condensation
Altitude	≤2000m
Pollution level	Level 2
Short circuit protection	Supports (automatic recovery mechanism)
Reverse connection protection	Supports (automatic recovery mechanism)
Surge protection	support
Protection level	IP20
Safety certification	UL certification, CE certification
Green certification	RoHS certification, REACH certification

3.4.4 Wiring diagram



3.4.5 Outline Dimensions

Extended power supply dimensions (unit: mm)

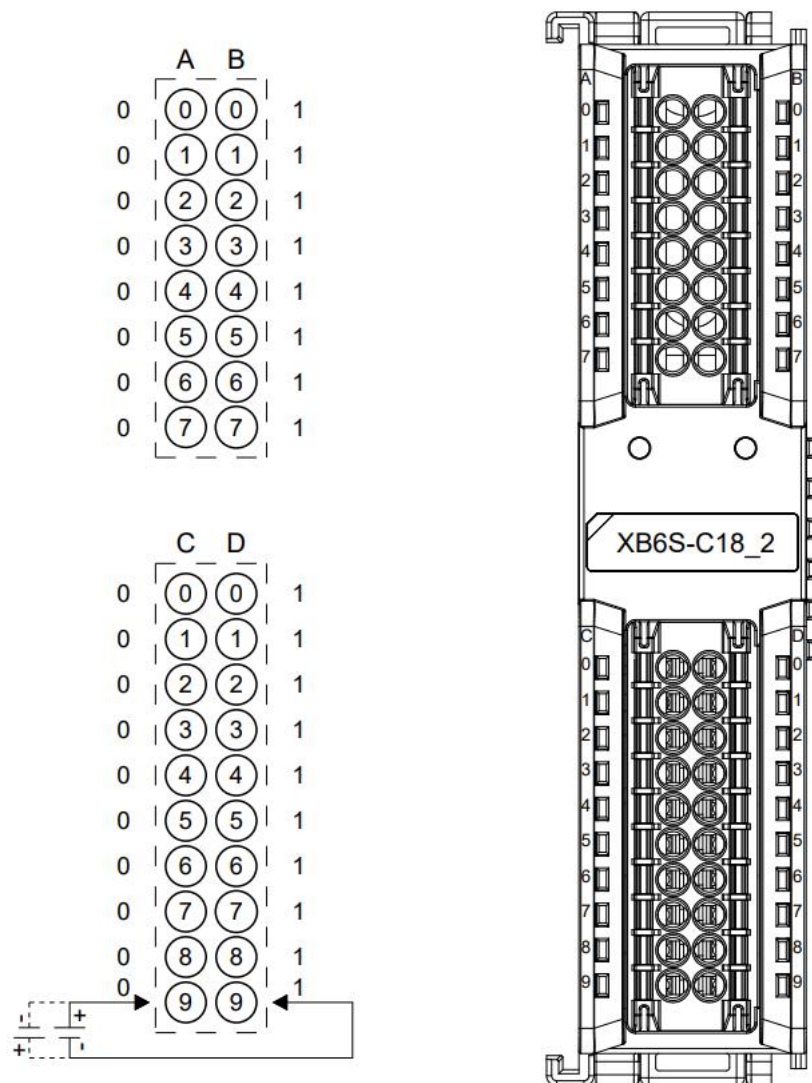


3.5 Public End Extension Module

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°C~+60°C
Storage temperature	-40°C~+80°C
Relative humidity	95%, no condensation
Altitude	≤2000m
Pollution level	Level 2
Protection level	IP20
Safety certification	UL certification, CE certification
Green certification	RoHS certification, REACH certification

3.5.2 Wiring diagram

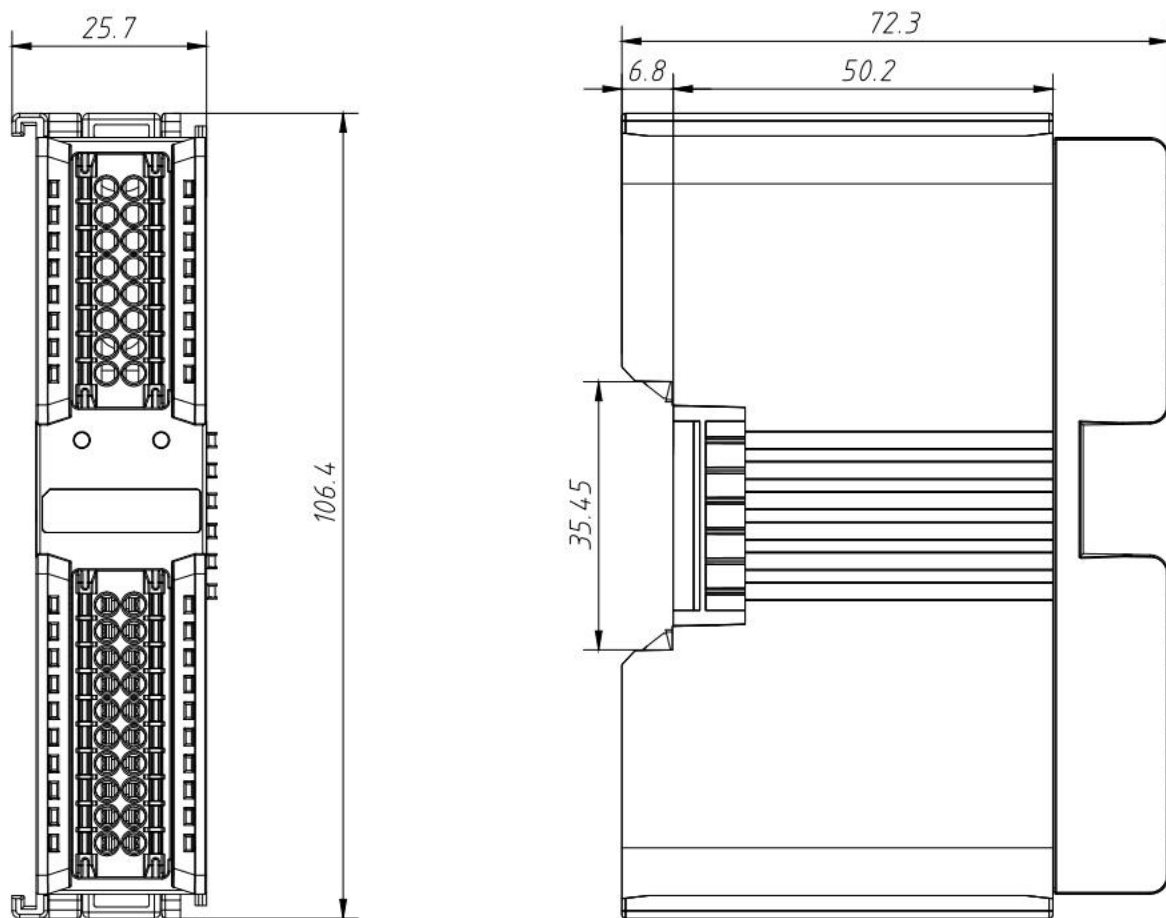


*Channel identifier 0 indicates internal conduction.

*Channel Identifier 1: Internal Conductor

3.5.3 Outline Dimensions

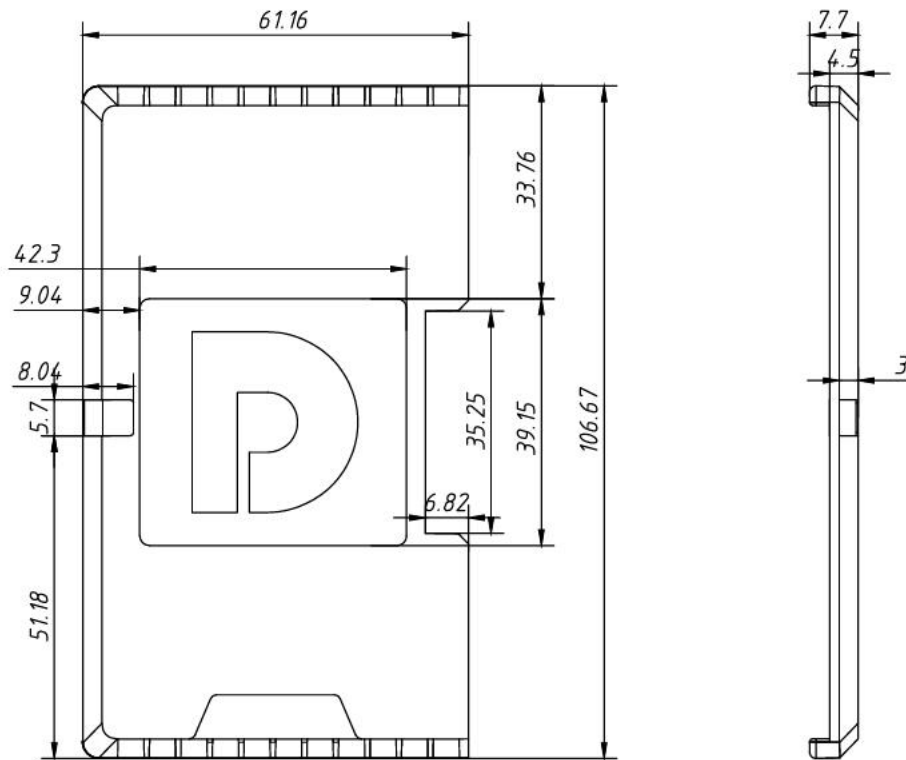
External dimensions (unit: mm)



3.6 Terminal cover

3.6.1 Outline Dimensions

Terminal cover dimensions (unit: mm)



Note: All installations use DIN 35 mm standard rails. DIN rail specifications are 35*7.5*1.0 and 35*15*1.0 (unit: mm).

4 Installation and removal

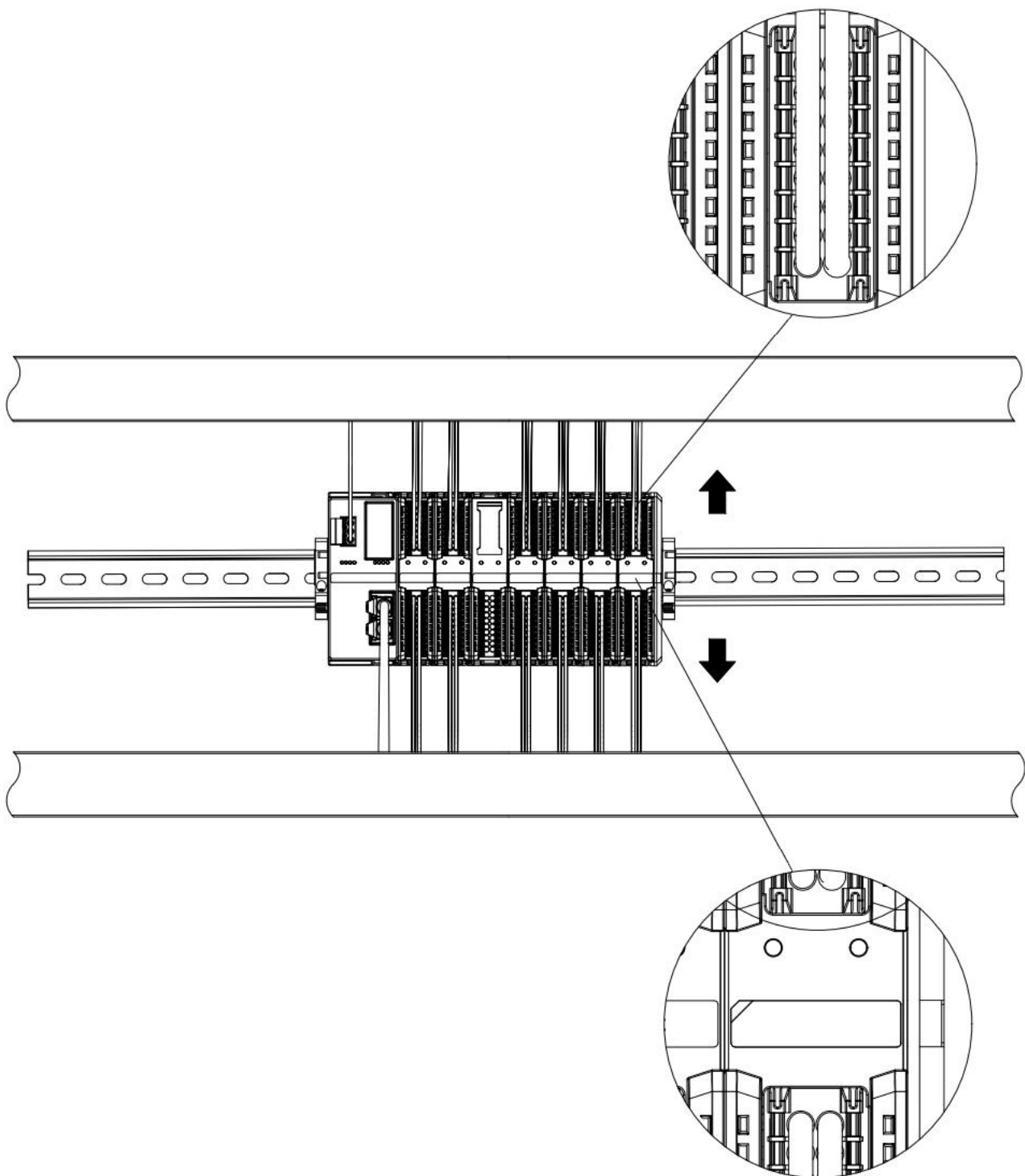
4.1 Installation Guide

Installation/Removal Precautions

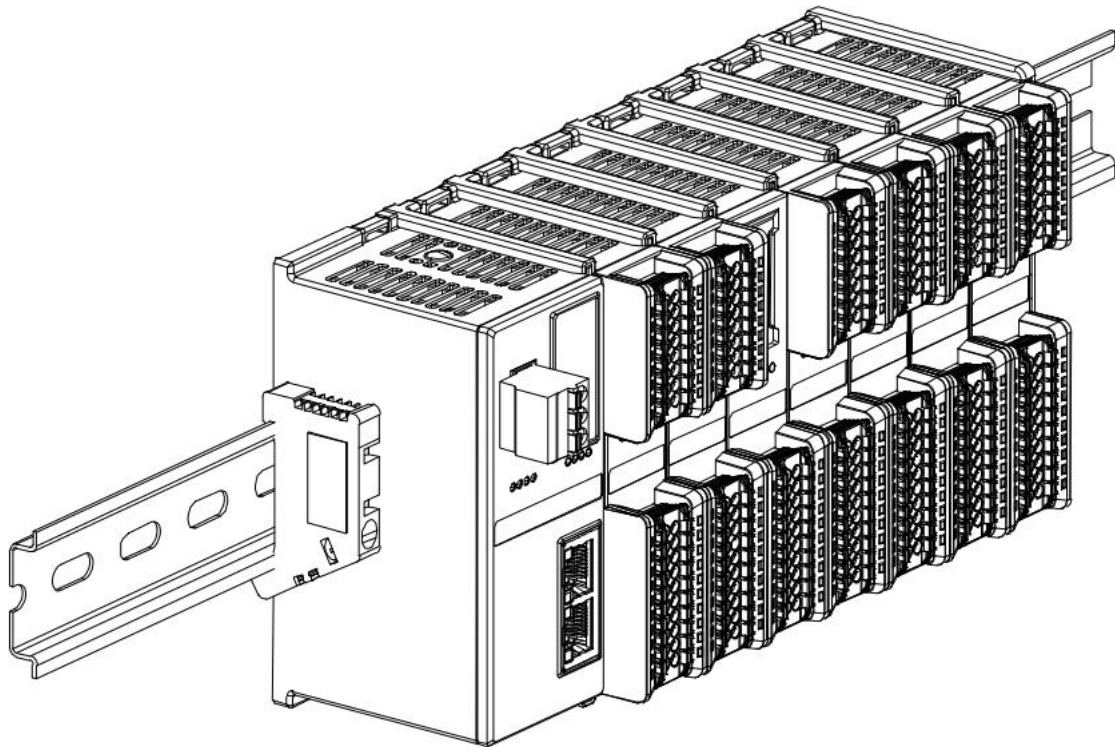
- The module has an IP20 protection rating and must be installed in a cabinet for indoor use.
- Ensure that the server rack has good ventilation (such as installing exhaust fans in the server rack).
- Do not install this device next to or above equipment that may cause overheating.
- Make sure to install the module vertically on the fixed guide rail and ensure that there is air circulation around it (there should be at least 50mm of air circulation space above and below the module).
- After the module is installed, be sure to install guide rail fasteners at both ends to secure the module.
- Installation/removal must be performed with the power off.
- After the module is installed, it is recommended to connect and wire the cables using a top-to-bottom wiring method.



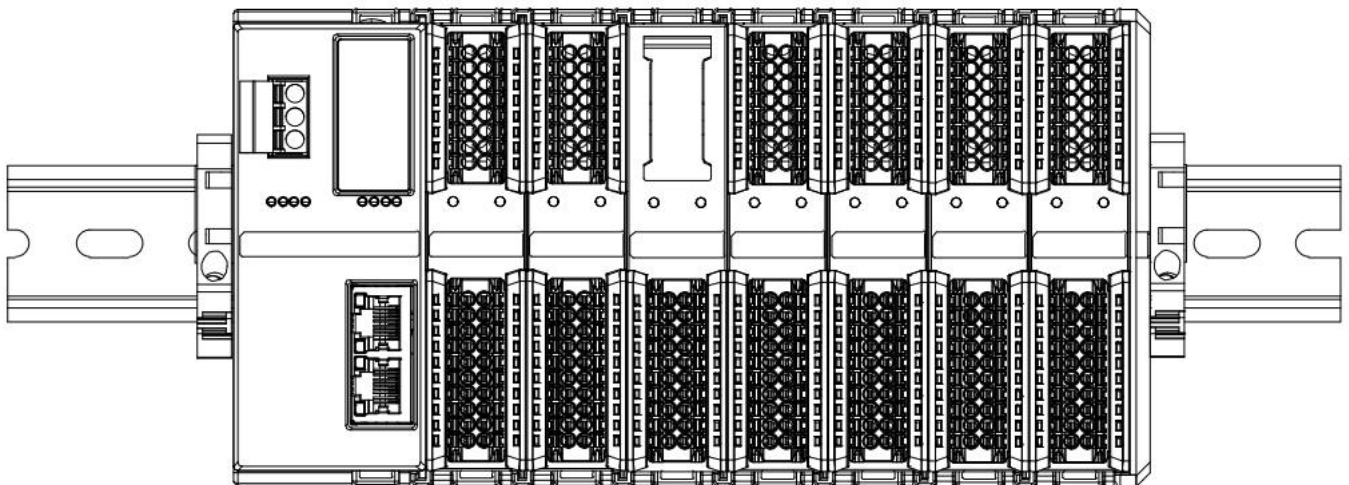
- If the device is not used in accordance with the product user manual, the protection it provides may be compromised.
-

Module installation diagram, minimum vertical clearance ($\geq 50\text{mm}$)

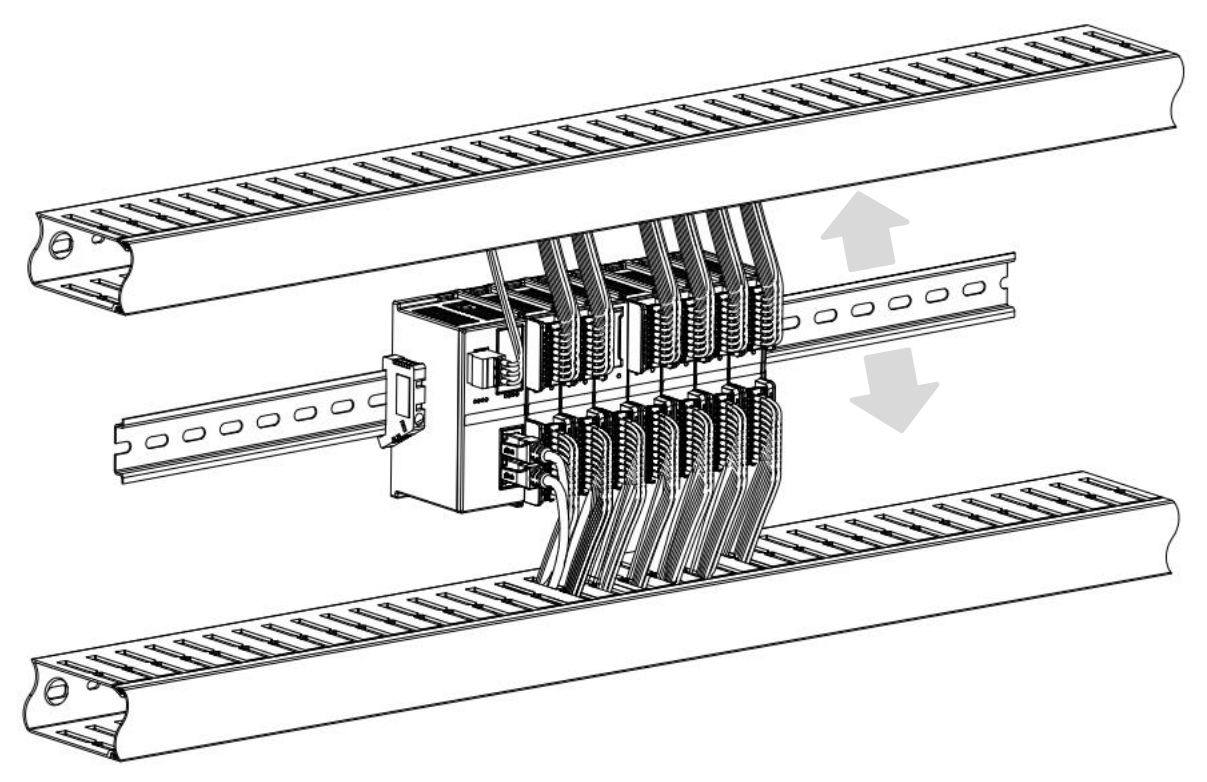
Ensure the module is installed vertically on the fixed guide rail.



Be sure to install the guide rail fasteners.



Module top and bottom wiring diagram



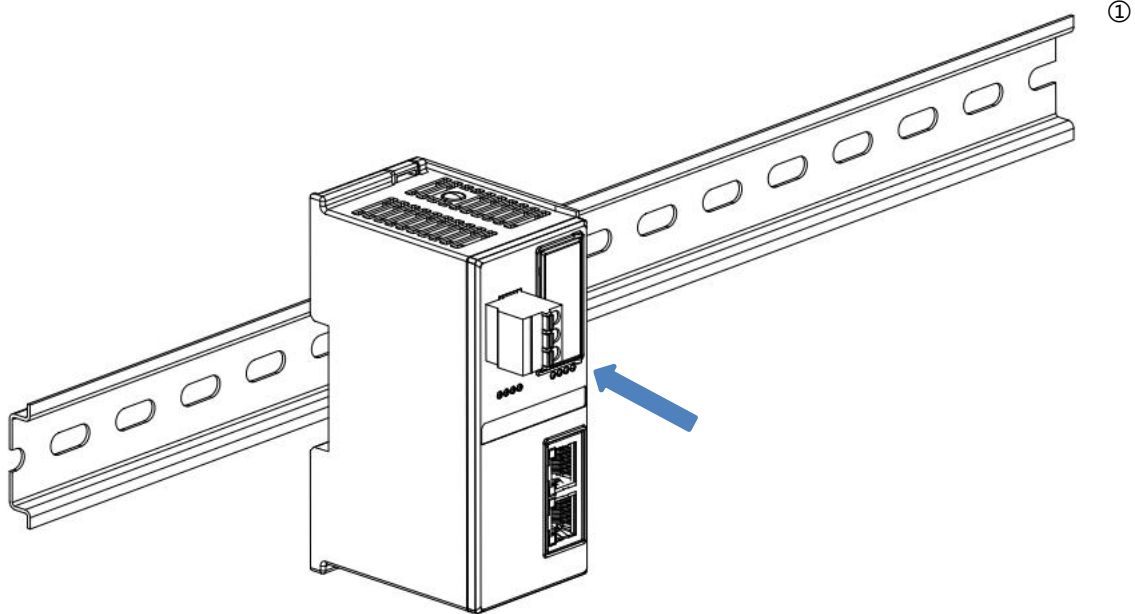
4.2 Installation and disassembly steps

Module installation and removal	
Module installation steps	1. First, install the coupler module on the fixed guide rail.
	2. Install the required I/O modules or functional modules in sequence on the right side of the coupler module.
	3. After installing all the necessary modules, install the terminal cover to complete the module assembly.
	4. Install guide rail fasteners at both ends of the coupler module and the terminal cover to fix the module.
Module disassembly steps	1. Loosen the guide rail fasteners at both ends of the module.
	2. Use a flathead screwdriver to pry open the module clips.
	3. Remove the disassembled module.

4.3 Installation and disassembly diagram

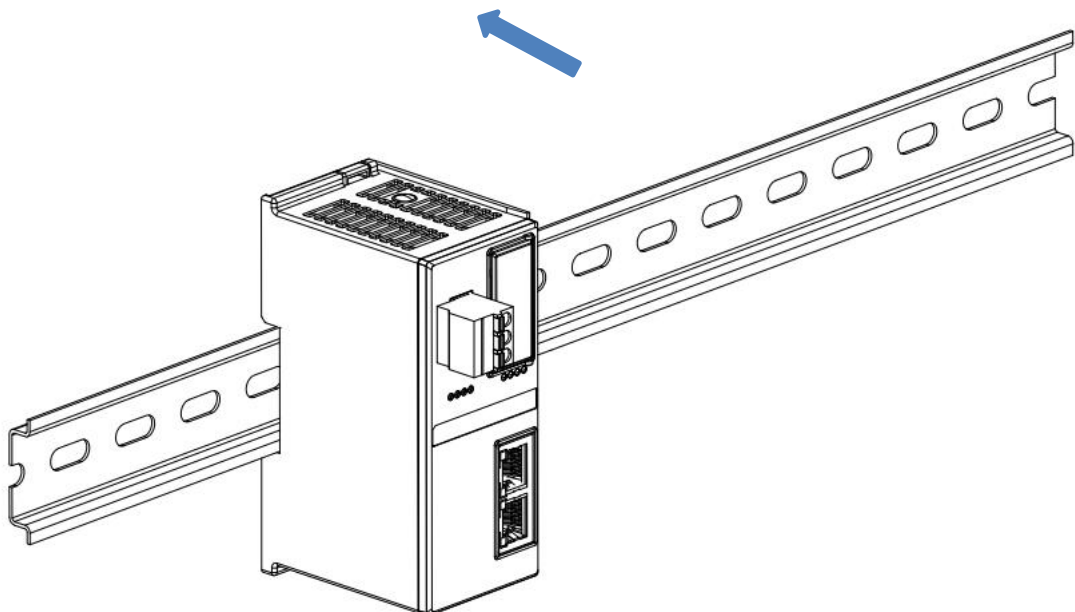
Coupler module installation

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



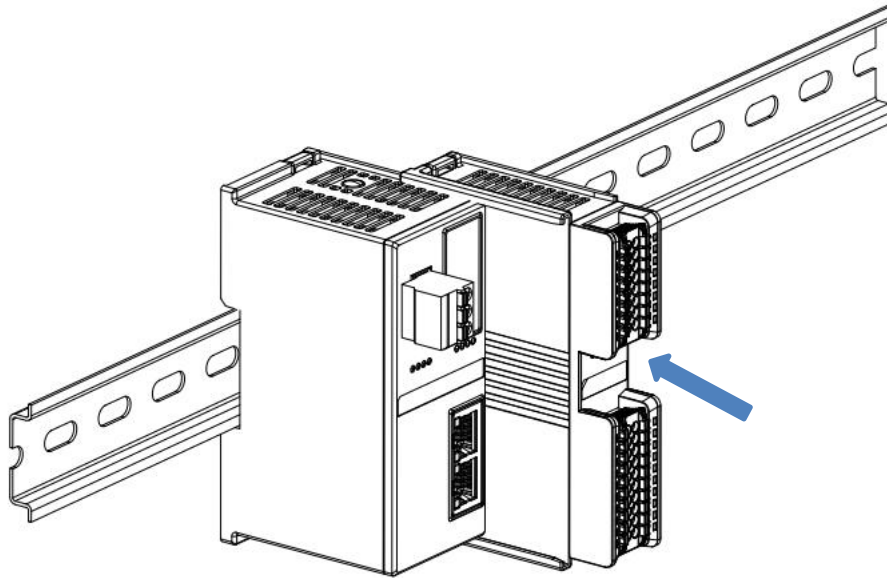
- Press the coupler module firmly into the guide rail direction until you hear a "click" sound, indicating that the module is installed in place, as shown in Figure ② below.

②

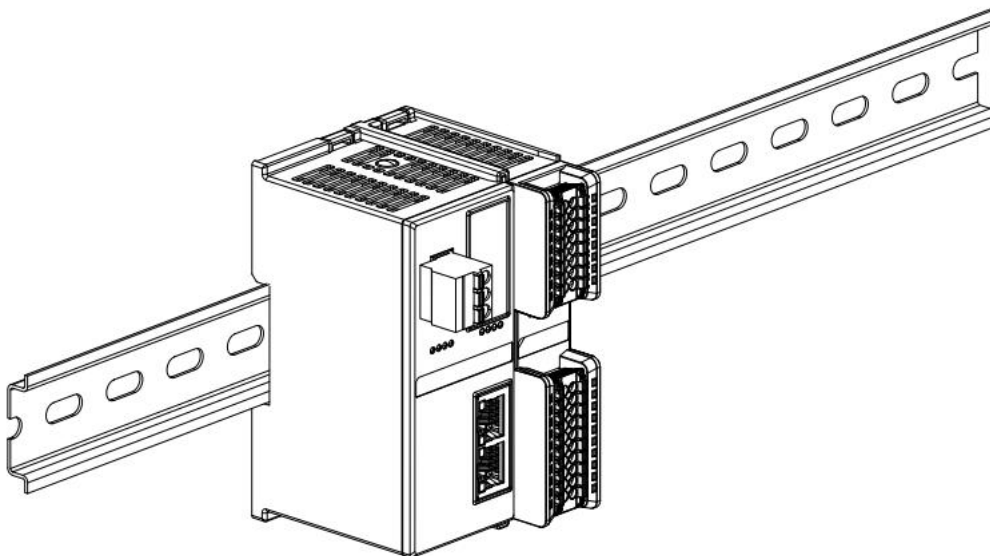


I/O module installation

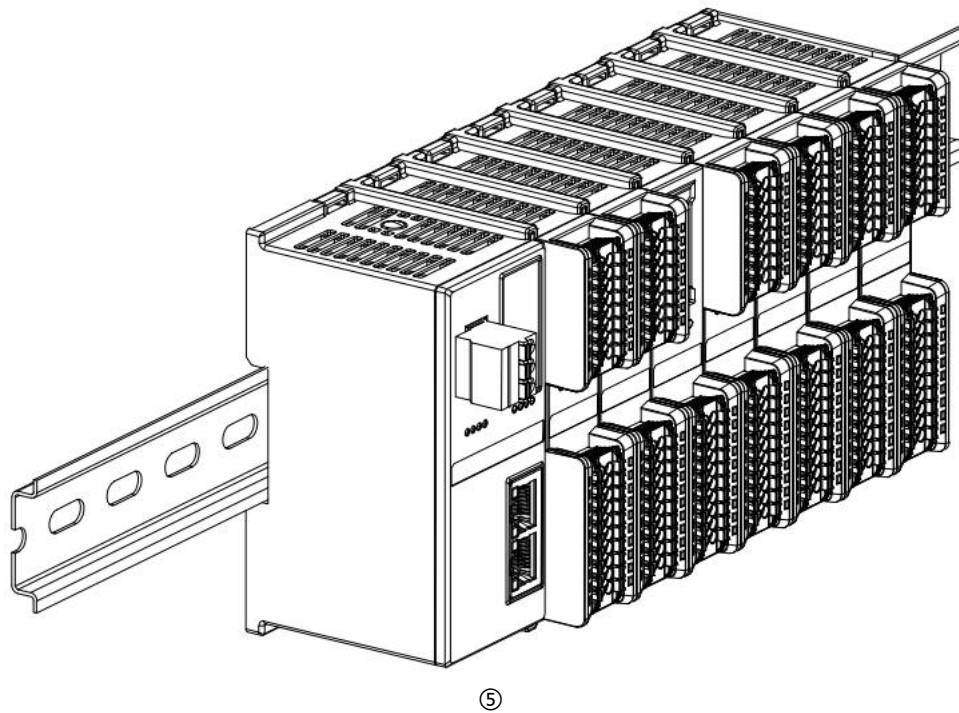
- Following the steps described above for installing the coupler module, install the required I/O modules or functional modules one by one, as shown in Figures ③, ④, and ⑤. Push them in until you hear a "click" sound, indicating that the module is installed in place.



③

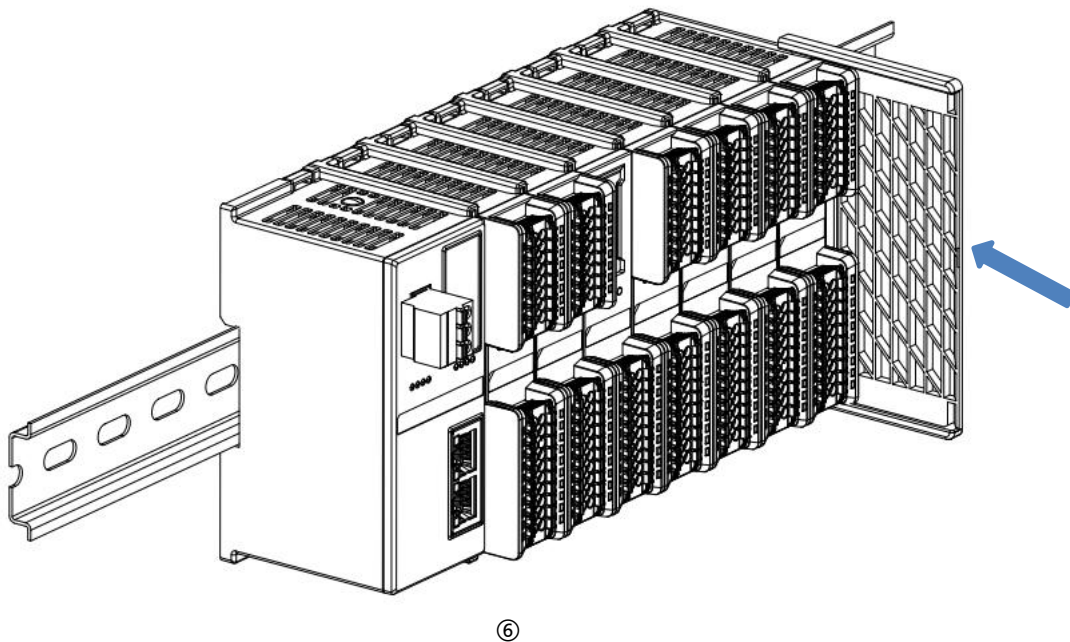


④

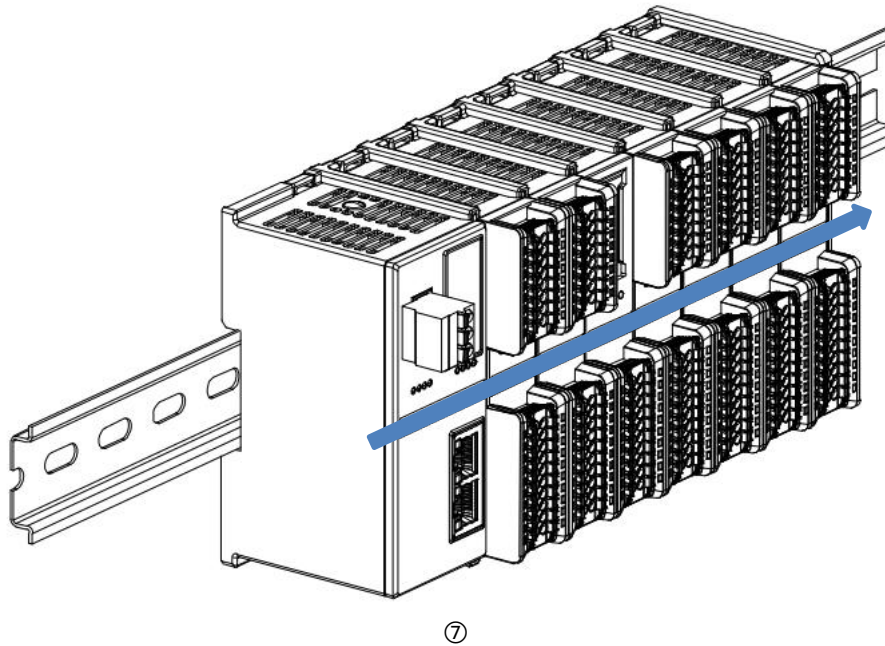


Terminal cover installation

- Install the terminal cover on the right side of the last module. Align the groove side of the terminal cover with the guide rail. For the installation method, please refer to the installation method of the I/O module. Push the terminal cover inward into place, as shown in Figure 6 below.

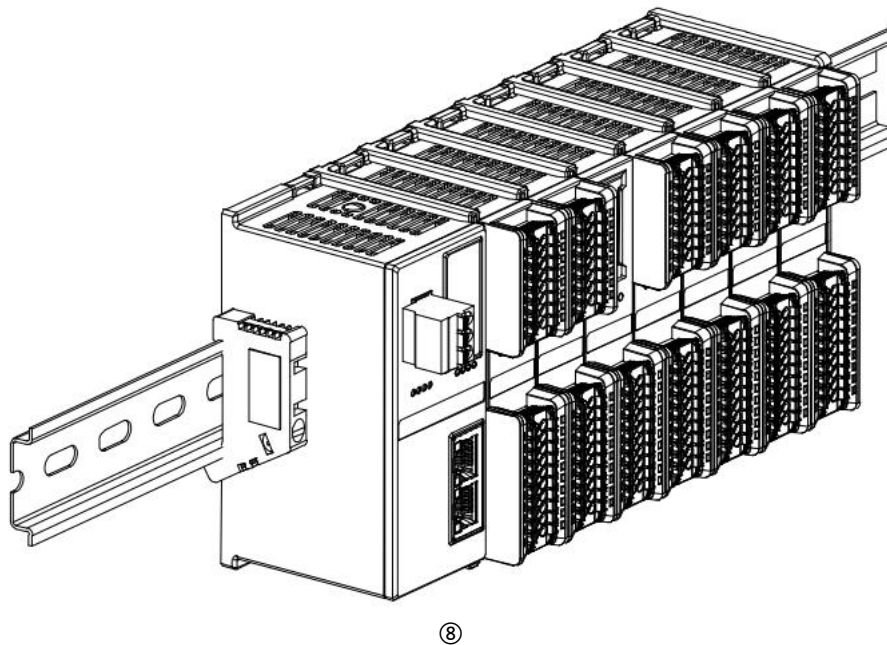


- After the terminal cover is installed, check whether the front of the entire module is flat, and ensure that all modules and end covers are installed in place and the front is flush, as shown in Figure 7 below.

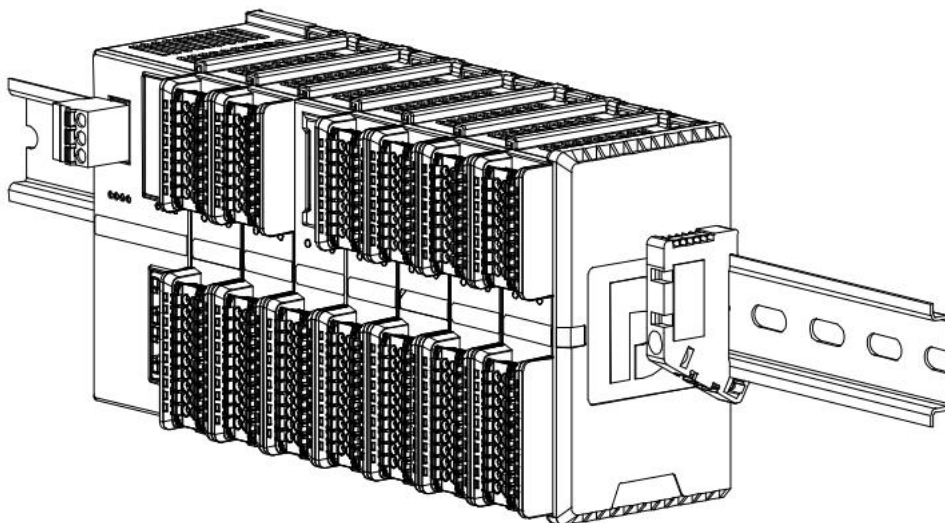


Guide rail fastener installation

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



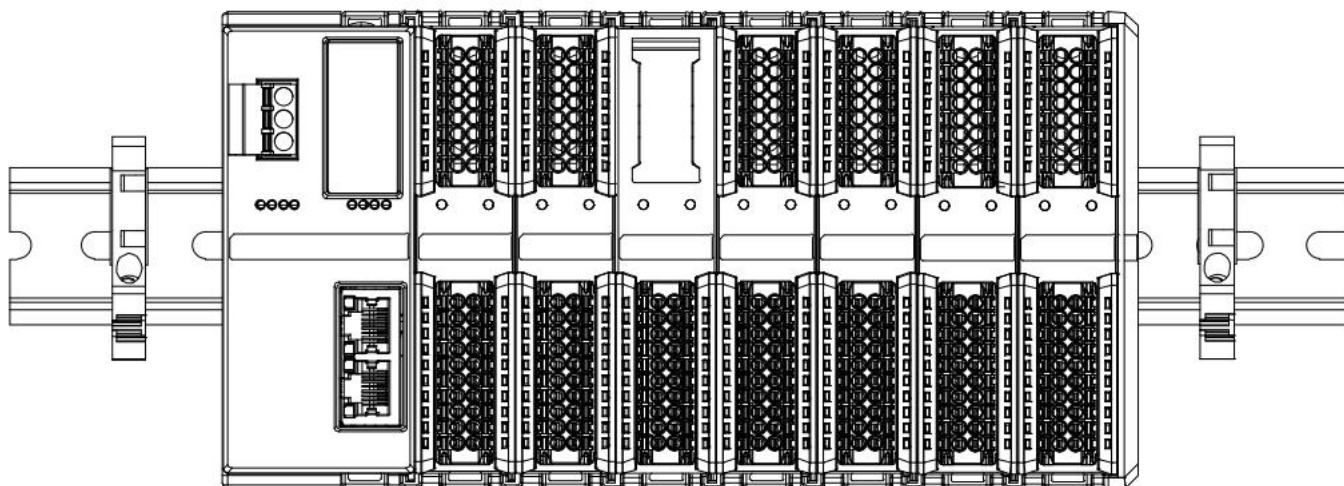
- Install the guide rail fastener on the right side of the terminal cover. First, push the guide rail fastener towards the coupler to ensure that the module is installed securely, and then tighten the guide rail fastener with a screwdriver, as shown in Figure 9 below.



9

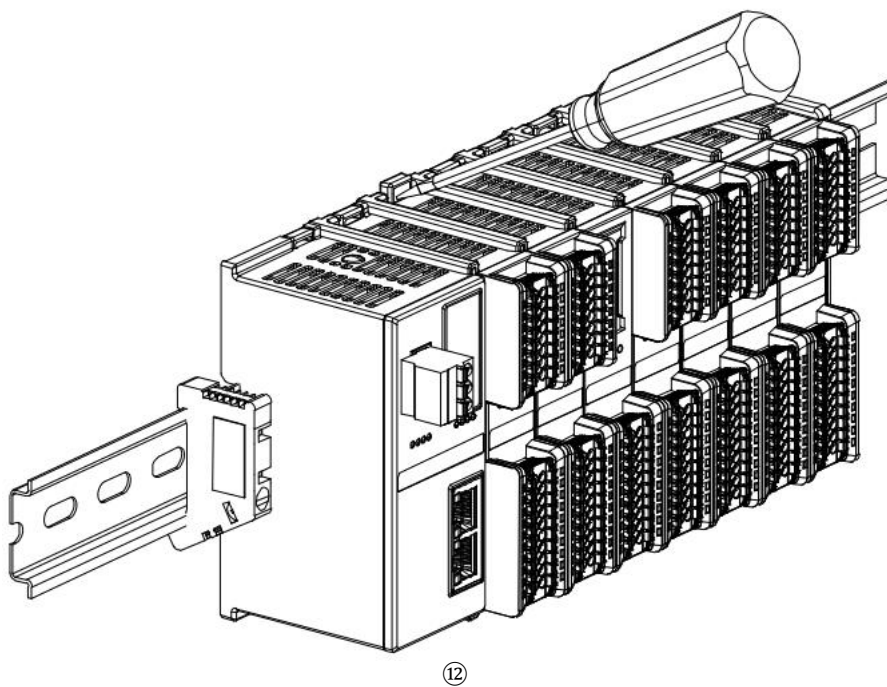
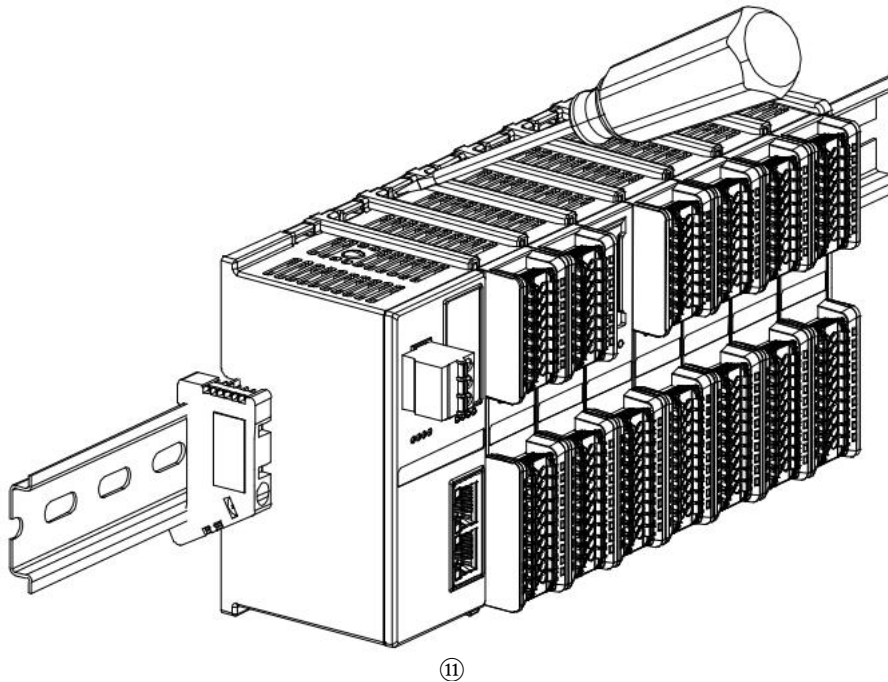
Disassembly

- Loosen the guide rail fastener at one end of the module with a screwdriver and move it to one side, ensuring there is a gap between the module and the guide rail fastener, as shown in Figure 10 below.

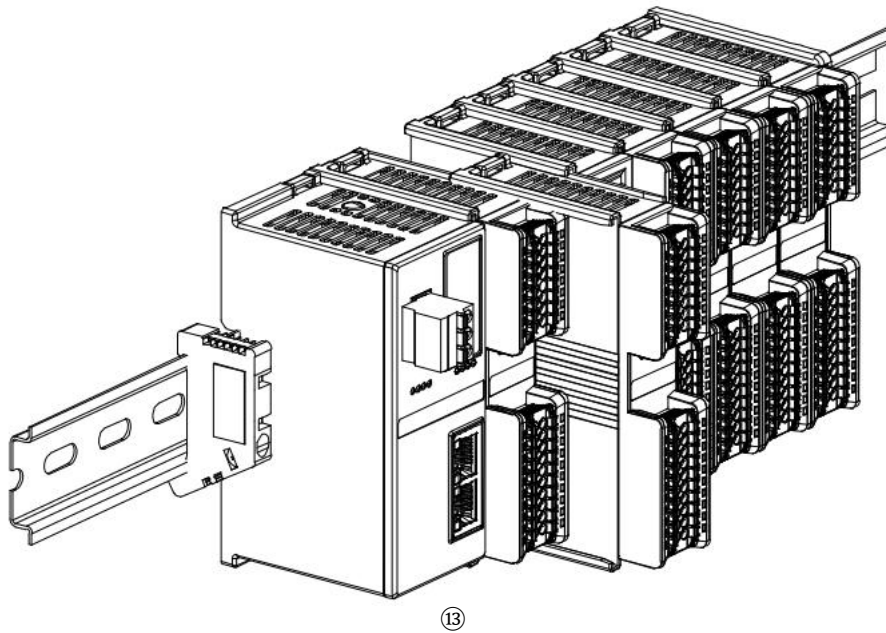


10

- Insert the flathead screwdriver into the clips of the module to be removed, and apply force from the side towards the module (you will hear a click), as shown in the picture below.⑪and⑫As shown.
Note: Each module has a latch at the top and bottom; operate in the same way for all of them.



- Disassemble the module following the reverse procedure of installing the module, as shown in the following figure.⑬As shown.



5 wiring

5.1 Terminal blocks



Terminal blocks		
Power terminals	Rated voltage	320V
	Rated current	20A
	Extreme number	3P
	wire diameter	twenty two~16 AWG 0.3~1.5 mm ²
Signal line terminals (i.e., input/output terminals)	Rated voltage	200V
	Rated current	9.5A
	Extreme number	16P+20P
	wire diameter	twenty two~17 AWG 0.3~1.0 mm ²
Bus interface	2×RJ45	UTP or STP of Category 5 or higher (STP recommended)

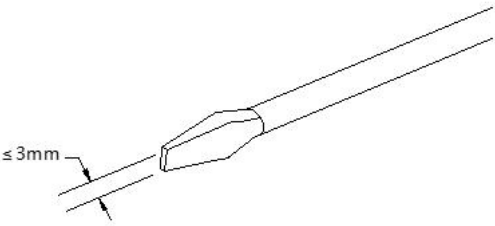
5.2 Wiring instructions and requirements

Power connection precautions

- The power supply for the module system side and the power supply for the field side should be configured and used separately. Do not mix them.
- Reliable grounding is required.

Wiring tool requirements

The power terminals and signal terminals feature a screwless design, allowing for cable installation and removal using a flathead screwdriver (size: $\leq 3\text{mm}$).



Stripping length requirements

For power and signal line terminals, a cable stripping length of 10 mm is recommended.



Wiring method

For a 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.

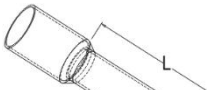


After stripping the wire to the corresponding length, the multi-strand flexible wire can be directly connected or used with the



corresponding standard cold-pressed terminals (tubular insulated terminals, see the table below for reference specifications). Pressing down the button will insert the insulated terminal directly into the corresponding end hole.

The specifications for power supply terminals and signal line terminals are shown in the table below:

Specifications of tubular insulated ends		
Specifications	model	conductor cross-sectional area (mm ²)
	E0310	0.3
	E0510	0.5

Tubular insulated terminalsLThe length is10mm	E7510	0.75
	E1010	1.0
	E1510	1.5



- Only copper wires can be used for wiring.



- Cable temperature: 80°C

5.3 MIL Connector Type Module Wiring Instructions

5.3.1 Compatible Product List

MIL connector type I/O modules require connection to a terminal block via 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: The TM40-XXXX-2/TM40-XXXX-2S model cable is a PNP type input cable and cannot be used with other types of input/output.

5.3.2 Terminal block naming rules

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

TM40-32

(1)

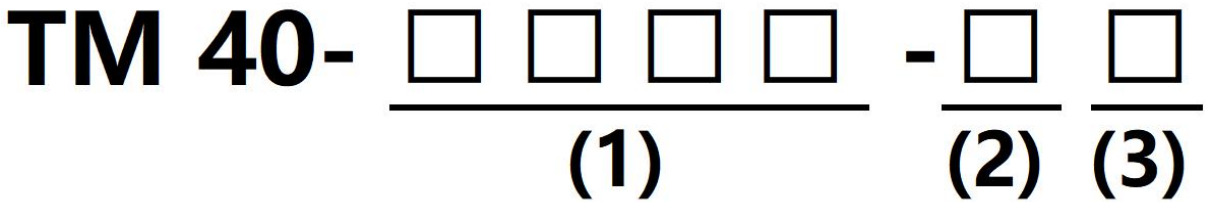
(2)

(3)

serial number	meaning	Options	illustrate
(1)	Number of terminal blocks	32	32 points
(2)	Input/Output Types	A	NPN type input/output
		B	PNP type input/output
(3)	Terminal block type	E	European-style terminal block

5.3.3 Cable naming rules

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



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

Note: The TM40-XXXX-2/TM40-XXXX-2S model cable is a PNP type input cable and cannot be used with other types of input/output.

5.3.4 Terminal block parameters

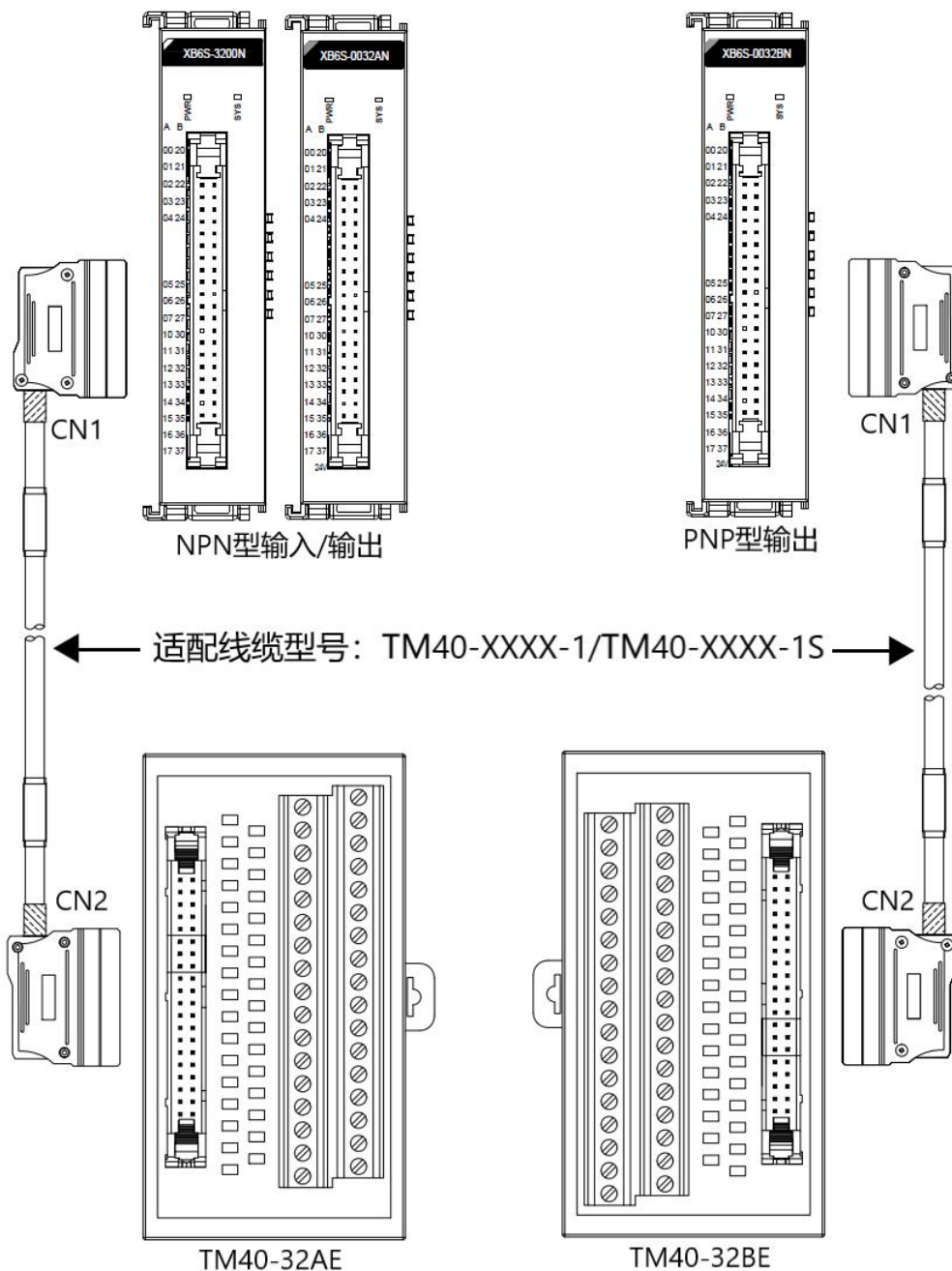
Technical Specifications	
Rated current	1A
Rated voltage	DC24V
Suitable for wires	1.5mm²/AWG16 and below

5.3.5 Cable parameters

Technical Specifications	
Line gauge	AWG28
Conductor composition	7/0.127
Conductor materials	soft copper wire
Insulating materials	PE
Core wire twisting	Stuffing, cotton thread, straps, paper bags
Exterior covered	PVC
Conductor impedance (20°C)	Below 239Ω/Kn
Withstand voltage (in the air)	AC500V/min
Insulation resistance (20°C)	50MΩ/Kn or higher

5.3.6 Configuration rules

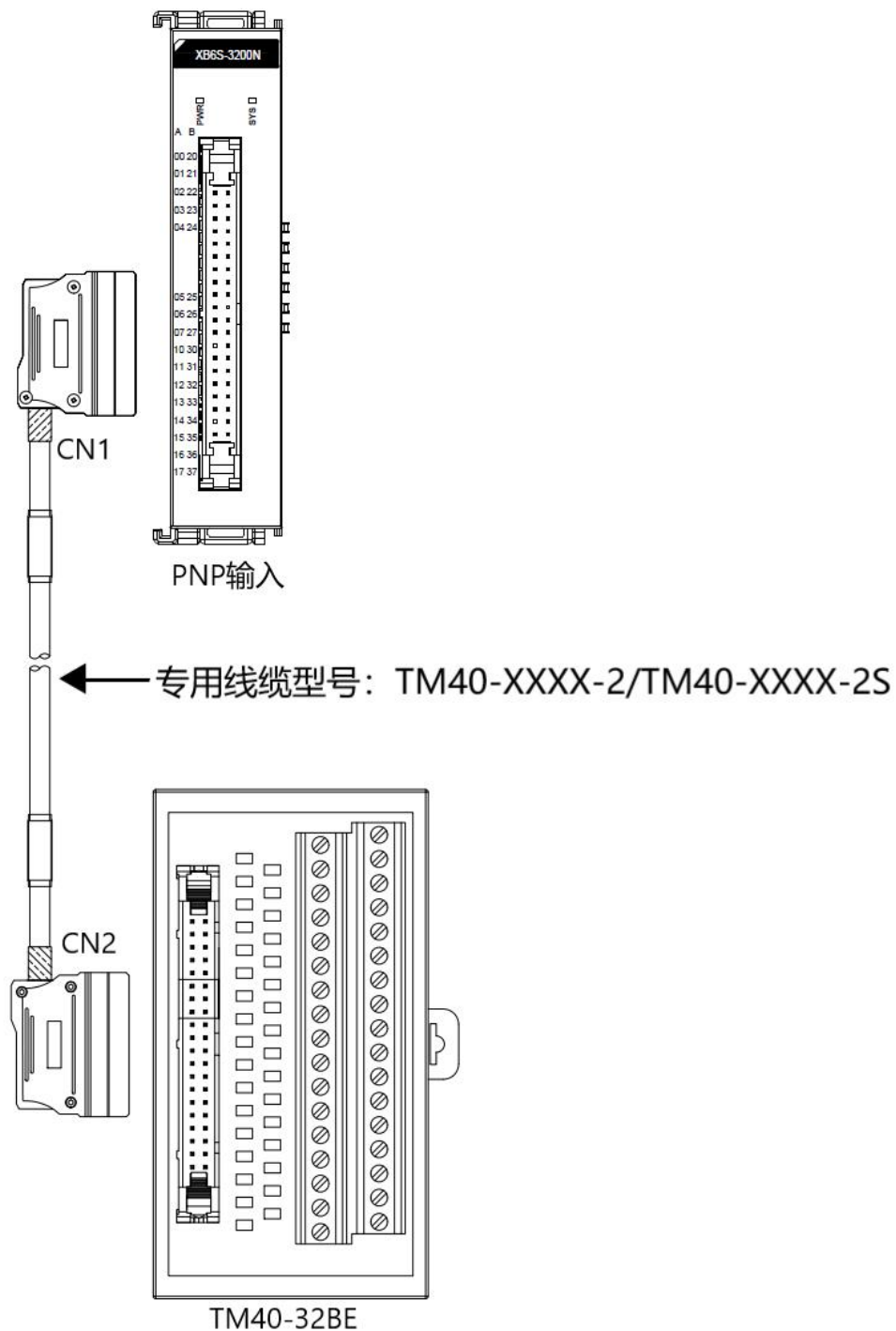
- Configuration examples for NPN type input, NPN type output, and PNP type output



The cable is marked CN1 and CN2 at both ends. 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 type input, it must be used with a cable of type TM40-XXXX-2/TM40-XXXX-2S.



The cable is marked CN1 and CN2 at both ends. 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 Set the IP address using the rotary switch.

For a detailed description and operating instructions of the rotary switch, please refer to "[3.1.2 Rotary Switch](#)".

- **When setting the IP address from the factory default state via the rotary switch**

The IP address is 192.168.0.XXX (XXX is the setting value of the rotary switch, ranging from 1 to 254).

- **When setting the IP address via a rotary switch from a state where the IP address has already been configured via the host computer.**

The IP address is derived from 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, when changing the settings of the rotary switch after setting the IP address to 172.10.0.12 via the host computer, the IP address becomes 172.10.0.XXX (XXX is the setting value of the rotary switch (1 to 254)).

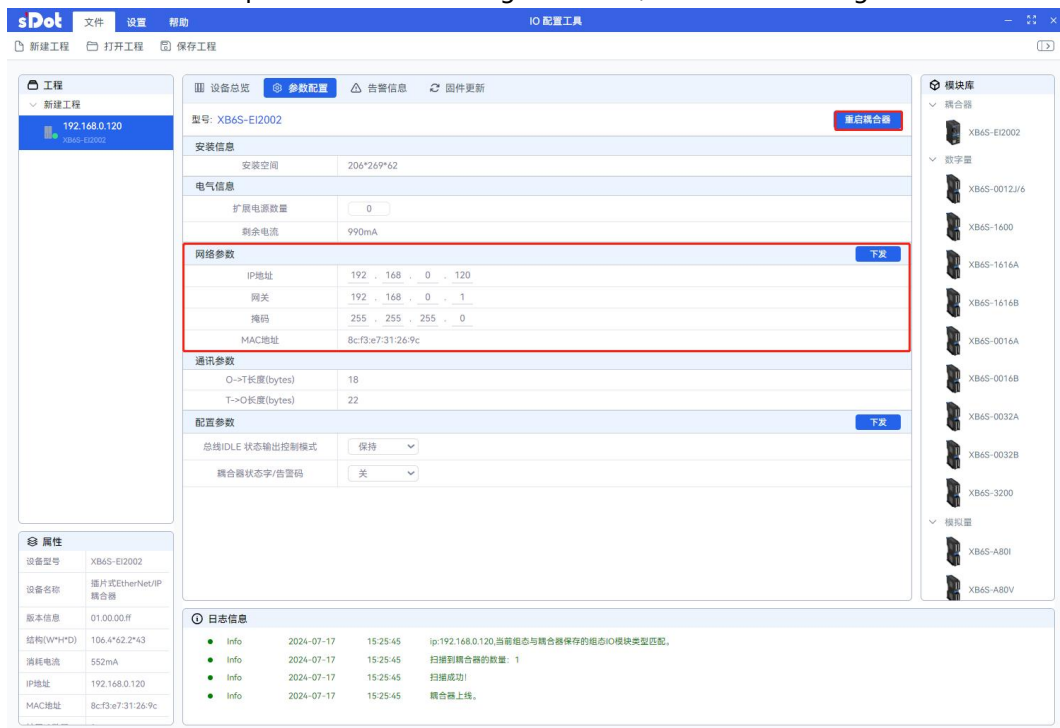
Precautions

- When the module leaves the factory, the rotary switch is set to "000", and no IP address is assigned. The default IP address is 192.168.0.120.
 - After the host computer modifications are completed, the module will change its startup method to fixed IP startup and automatic restart. The module will start with an IP address composed of the rotary switch setting and the assigned network segment.
 - Abnormal rotary switch setting: When the rotary switch is set to 255 or higher, the module will start with the previous startup method and parameters after power-on.
-

6.1.2 Configure the IP address via host computer software.

➤ Taking the host computer IO Config Tool as an example, this article introduces how to modify the IP address.

- a. After scanning the device, input the parameter configuration page of XB6S-EI2002, modify the IP address under network parameters, click "Send", click "Restart Coupler" and then rescan the device or power on the device again to scan, as shown in the figure below.



Precautions

- If you change the IP address across network segments, the host computer may time out or fail to scan the module after the change because the host computer and the module are not on the same network segment. This can be resolved by changing the host computer's IP address to make it on the same network segment as the module.

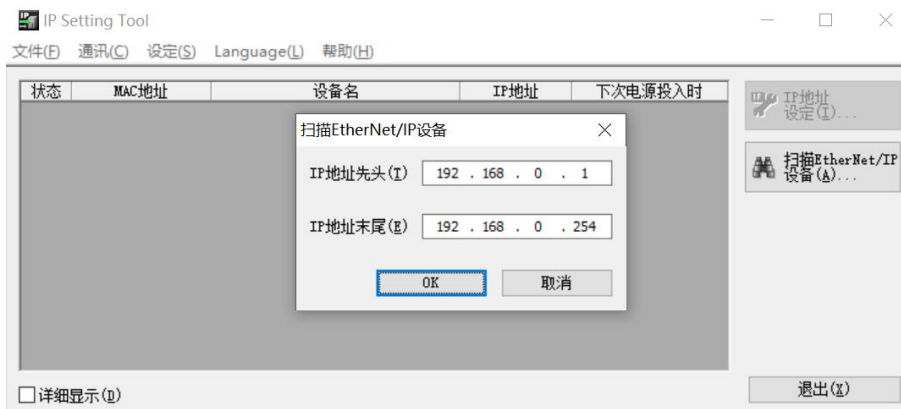
6.1.3 Set the IP address using the IP Setting Tool

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

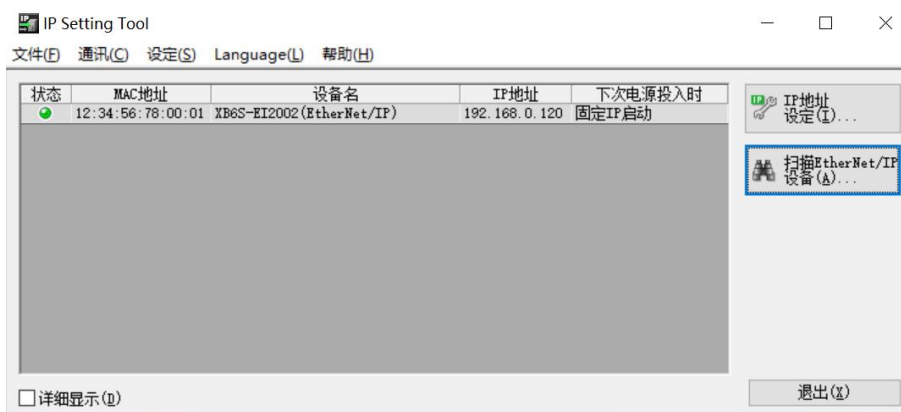
- a. Open the IP Setting Tool and click the "Scan EtherNet/IP Devices" button.



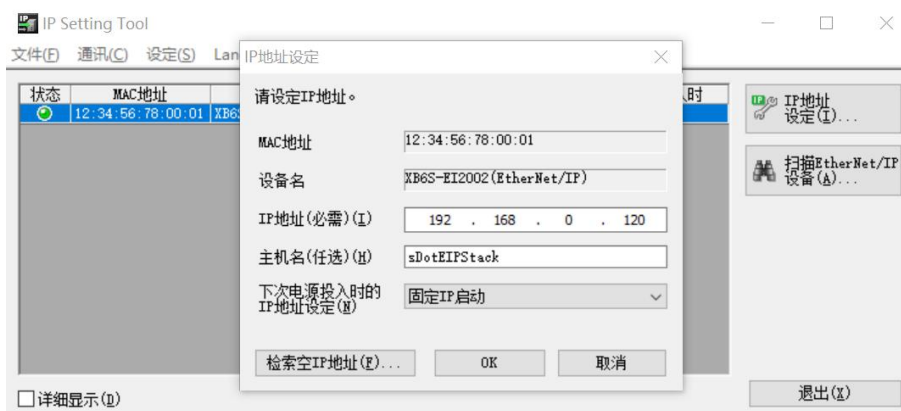
- b. Configure the IP address range and click "OK".



- c. The scanned devices are shown in the image below.



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



6.2 Factory reset

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

After powering on the module, press and hold the reset button for 3 seconds until both the IOR and IOE lights on the coupler illuminate simultaneously and then turn off. If you see the IOR light flashing, the reset was successful. See [link to reset button location] for details. ["3.1.1 Panel Structure"](#).

The parameters for button reset are shown in the table below:

Button reset parameters	
IP	192.168.0.120
Default gateway	192.168.0.1
Subnet mask	255.255.255.0
Idle	1 (0: clear; 1: keep)
HostName	sDotEIPStack
Number of I/O modules in the topology	Clear

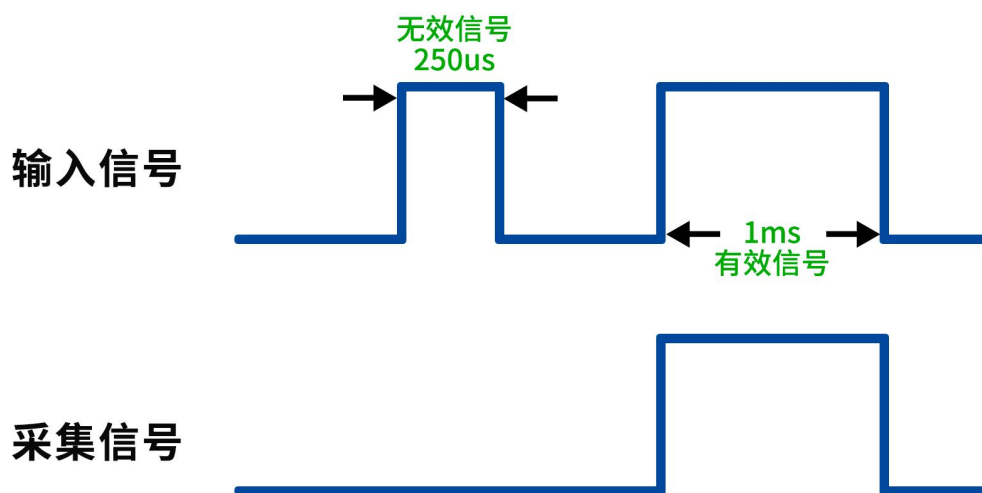
6.3 Parameter Description

6.3.1 Digital input filter

Digital input filter prevents unexpected rapid changes in input signals from causing switch contact skipping or electrical noise. Digital input filter supports single-module settings; each module can be configured independently, but individual channels cannot.

The default setting for the digital input filter FilterTime is 3ms, with supported settings of no filter, 0.1ms, 0.2ms, 0.5ms, 1ms, 2ms, 3ms (factory setting), 4ms...18ms, 19ms, and 20ms. When configured to 3ms, noise within 3ms can be filtered out. A 3ms input filter time means that a single signal transitioning from "0" to "1" or from "1" to "0" must take 3ms to be detected; single high or low pulses shorter than 3ms will not be detected.

Function Description: When the input filter is configured to 1ms, noise within 1ms can be filtered out. As shown in the figure below, a signal input of 250us will be considered an invalid signal; single high or low pulses shorter than 1ms will not be detected; signals of 1ms and longer can be acquired.



6.3.2 Clear/hold digital output signal

The clear/hold function is for modules with output channels. This function configures the output mode of the output channels when the module is not in an OP state (stopped running or with the coupler network cable disconnected). This parameter supports the following output states:

Clear output: When communication is disconnected, the module output channel will automatically clear the output, i.e., output 0.

Output valid value: When communication is disconnected, the module output channel continues to output a valid value, i.e., output 1.

Retain the previous output value: When communication is disconnected, the module output channel retains the previous output value.

The digital clear and retain function supports both module-wide settings (template mode) and single-channel settings (single-channel mode). Any channel can be configured using either single-channel mode or template mode, with single-channel mode having higher priority than template mode. Specific configuration methods are shown in the table below; the default is module-wide clear output.

Clear and hold parameters of digital output module			
Parameter name	Parameter meaning	Parameter value meaning	default value
Set template	Full channel mode settings	Clear the output, i.e., output 0.	Clear output
		Output a valid value, i.e., output 1.	
		Keep the previous output value	
Exception settings	Single-channel mode settings	Follow the template value, i.e., do not enable single-channel mode.	Follow template value
		Clear the output, i.e., output 0.	
		Output a valid value, i.e., output 1.	
		Keep the previous output value	

6.3.3 Analog range settings

The Range Select setting is used to set the range of analog signals. Each channel can be configured individually (see details for range settings).[3.3.4](#) and [3.3.5 Analog Parameters](#)).

6.3.4 Analog input filter

● Analog input filter function

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

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

● Filter function configuration

Each channel can be configured individually, with a configuration range of 1 to 200, and a default of 10 times.

6.3.5 Analog output signal clear/hold

The clear/hold function is for modules with output channels. This function configures the output mode of the output channels when the module is not in an OP state (stopped running or with the coupler network cable disconnected). This parameter supports the following output states:

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

Maintain output: The module's output channel continues to output even when communication is interrupted.

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

The analog output clear and hold function supports both module-wide settings (template mode) and single-channel settings (single-channel mode). Any channel can be configured using either single-channel mode or template mode, with single-channel mode having higher priority than template mode. Specific configuration methods are shown in the table below; the default is module-wide output clear.

Analog output module clear hold parameters			
Parameter name	Parameter meaning	Parameter value meaning	default value
Set template	Full channel mode settings	Clear, meaning clear all output channels.	Keep
		Maintain output across all channels.	
		Preset, i.e., preset values for all channels output.	
Exception settings	Single-channel mode settings	Follow the template value, i.e., do not enable single-channel mode.	Single channel preset value
		Channel clear, i.e., clearing the output of a single channel.	
		Channel hold, i.e., single-channel hold output.	
		Single-channel preset value, current/voltage value corresponding to the output code value (Corresponding range code value table)	

Note: When the overall module settings (template mode) are configured as preset, i.e., the preset values for all channels are in effect, the preset values are based on the preset code value of channel 0 in the single channel preset values, and all channels are output.

6.3.6 Analog signal power-off retention

The analog parameters support the function of saving all configuration parameters of the module when communication is interrupted due to abnormal power failure. Analog modules all support power failure saving by default.

This manual uses the IO Config Tool as an example to introduce the parameter configuration method of the XB6S-EI2002 coupler + I/O module combination. For detailed steps, please refer to

[link/reference].[Parameter settings in section 6.6.1](#) After making the modifications, it is recommended to power on again.

6.4 Fault code information

6.4.1 Coupler general fault codes

category	serial number	Error Type	Error code	Event Name	Event Code (2#)	Event code (10#)	Event code (16#)	processing method
General Error	2	Online upgrade error	1	Firmware upgrade error	000000010000001	129	0x0081	Try upgrading again, check for environmental interference, and check if the firmware is too large, etc.
			2	Firmware is incompatible with the current module model.	0000000010000010	130	0x0082	Check if the files are correct, and if there are any abnormalities or interferences in the modules.
	3	Voltage error	5	Load-side voltage not connected	0000000011000101	197	0x00C5	Check if the on-site power supply is connected.
	6	Channel error	4	overflowing from the channel	0000000110000100	388	0x0184	Check whether the input signal of the corresponding channel exceeds the measurement range and whether the output signal exceeds the configurable range.
	7	Parameter error	0	Parameter setting error	0000000111000000	448	0x01C0	Check module parameter settings
	63	X-bus communication error	1	X-bus initialization failed.	0000111111000001	4033	0x0FC1	Check if the module connection is normal.
			2	X-bus token timed out	0000111111000010	4034	0x0FC2	Check if the module has any abnormalities or interference.
			3	X-bus module disconnected	0000111111000011	4035	0x0FC3	Check if the module is online or experiencing

								interference, etc.
			4	CRC error in parsing data	0000111111000100	4036	0x0FC4	Check if the module has any abnormalities or interference.
Analog quantity	1	XB6S-A 80TM	0	Disconnection	0010000001000000	8256	0x2040	Check if the wiring of the corresponding channel is normal.

6.4.2 Fault Code Viewing

For example, using IO Config Tool and KV STUDIO Ver.10G software, see [link to documentation] for detailed instructions.[6.6.1 Fault Code Viewing](#)and[6.6.2 Fault Code Viewing](#).

6.5 Process data

6.5.1 I/O module process data

Digital I/O modules:

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

Analog I/O module:

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

Data length allocation is as follows:

Module model	Uplink data length (Bytes)		Downlink data length (Bytes)	
	Assignment value	Actual usage value	Assignment value	Actual usage value
XB6S-3200(N)	4	4	-	-
XB6S-1600	2	2	-	-
XB6S-0800	1	1	-	-
XB6S-0032A/B(N)	-	-	4	4
XB6S-1616A/B	2	2	2	2
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-A80	18	18	-	-
XB6S-A40	10	10	-	-
XB6S-A08V	-	-	16	16
XB6S-A04V	-	-	8	8
XB6S-A08I	-	-	16	16
XB6S-A04I	-	-	8	8
XB6S-A08	-	-	16	16
XB6S-A04	-	-	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

6.5.2 Coupler process data

Without an alarm status word, the coupler does not occupy any uplink data length;

With an alarm status word present, the coupler occupies 4 bytes: the first two bytes represent the current module's alarm code, and the last two bytes represent the module's station number. Refer to Section [6.6.2 Fault Code Viewing](#).

Note: The lower the station number, the higher the alarm priority. For example, if stations 0 and 1 trigger alarms simultaneously, the alarm for station 0 will be displayed. Only after the alarm for station 0 is cleared will the alarm for station 1 be updated and displayed.

6.6 EtherNet/IP coupler configuration application

6.6.1 Application in the IO Config Tool software environment

1、Preparation

- **Hardware environment**

- **Module preparation:** This guide uses the **XB6S-EI2002+XB6S-1616B+XB6S-A80VD+XB6S-A08I** topology as an example.
- **One computer, pre-installed with IO Config Tool software, is configured to have its IP address and the module on the same network segment.**

Each coupler module is assigned a default IP address at the factory. The default IP addresses are typically as follows:

IP address: 192.168.0.120

Gateway: 192.168.0.1

Mask: 255.255.255.0

- **EtherNet/IP dedicated shielded cable**
- **One switching power supply**

- **Hardware configuration and wiring**

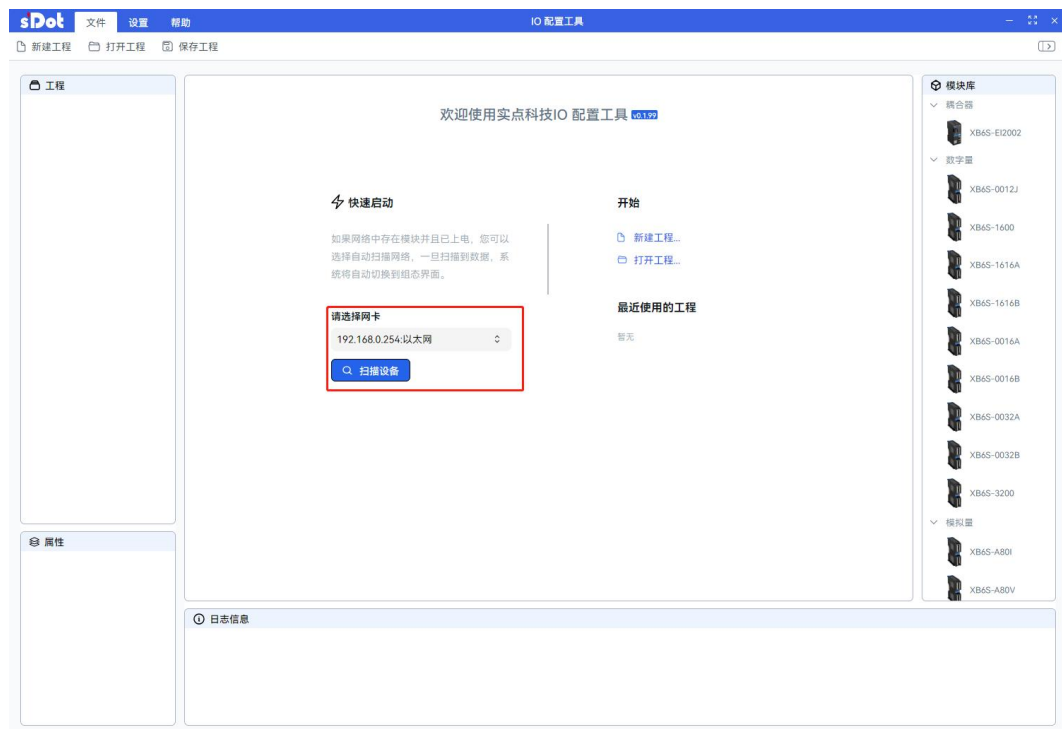
Please follow the instructions [4. Installation and Removal](#) and [5-wire connection](#) "Required Operation"

- **Module power-on**

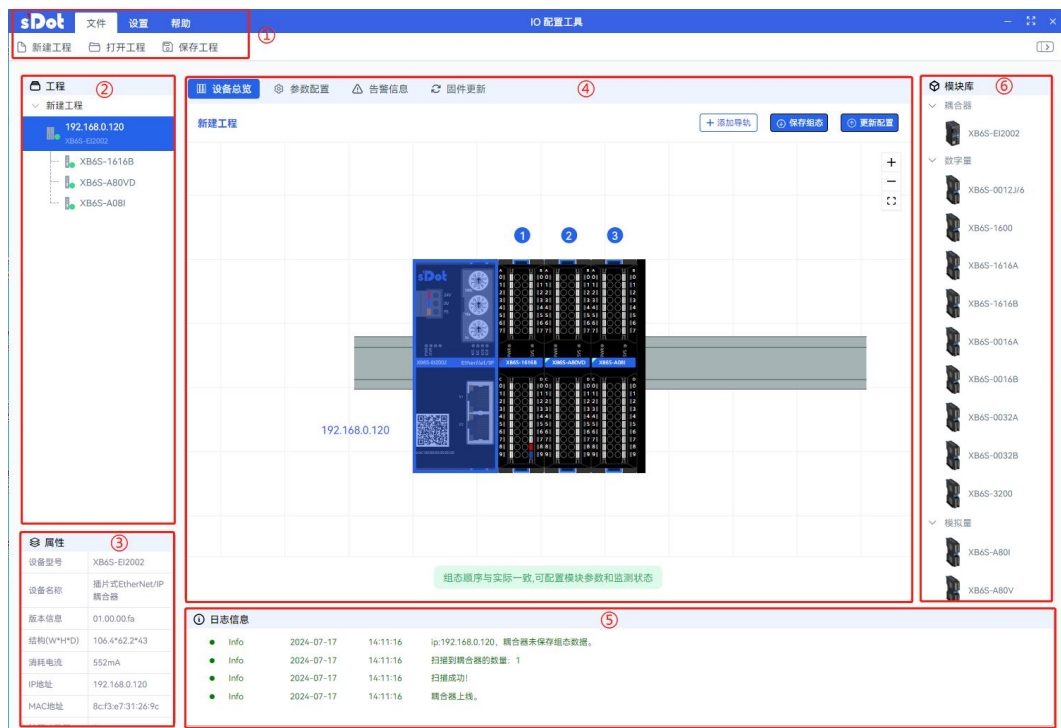
After verifying that the wiring is correct, power on the coupler module + I/O module device combination.

2、Scanning equipment

- a. Open the IO Config Tool software, select the network address and module IP address to be on the same network segment in the "Please select network card" drop-down box, and click "Scan devices", as shown in the figure below.



- b. After successfully scanning the device, you will enter the device overview page. The page mainly has six functions: ① menu bar, ② engineering bar, ③ module properties, ④ module configuration overview, ⑤ log information, and ⑥ module library, as shown in the figure below.



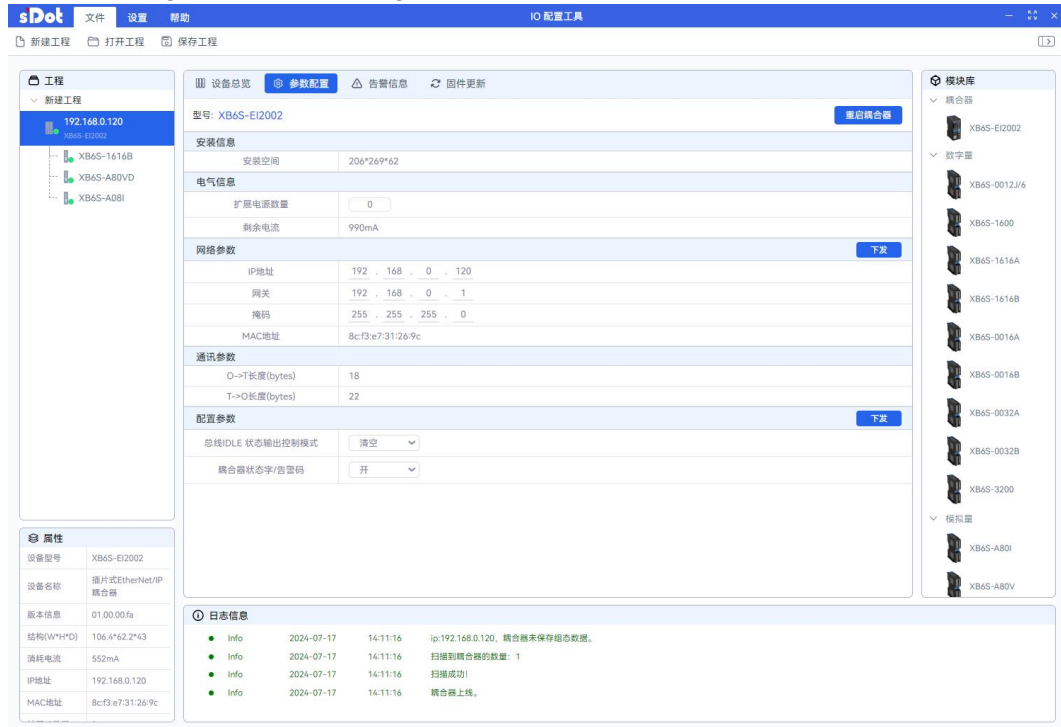
Note: You can view the coupler's IP address in the project panel; the log information shows the number of couplers detected.

3. Parameter settings

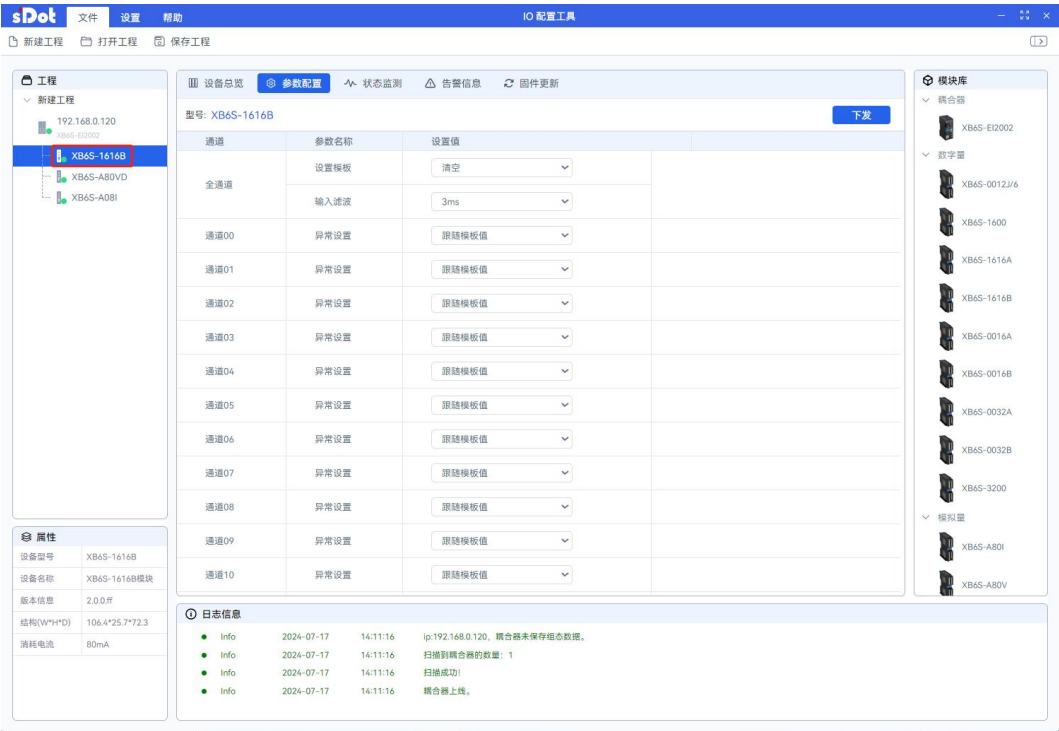
- a. On the device overview page, click the XB6S-EI2002 module, then click "Parameter Settings", as shown in the figure below.



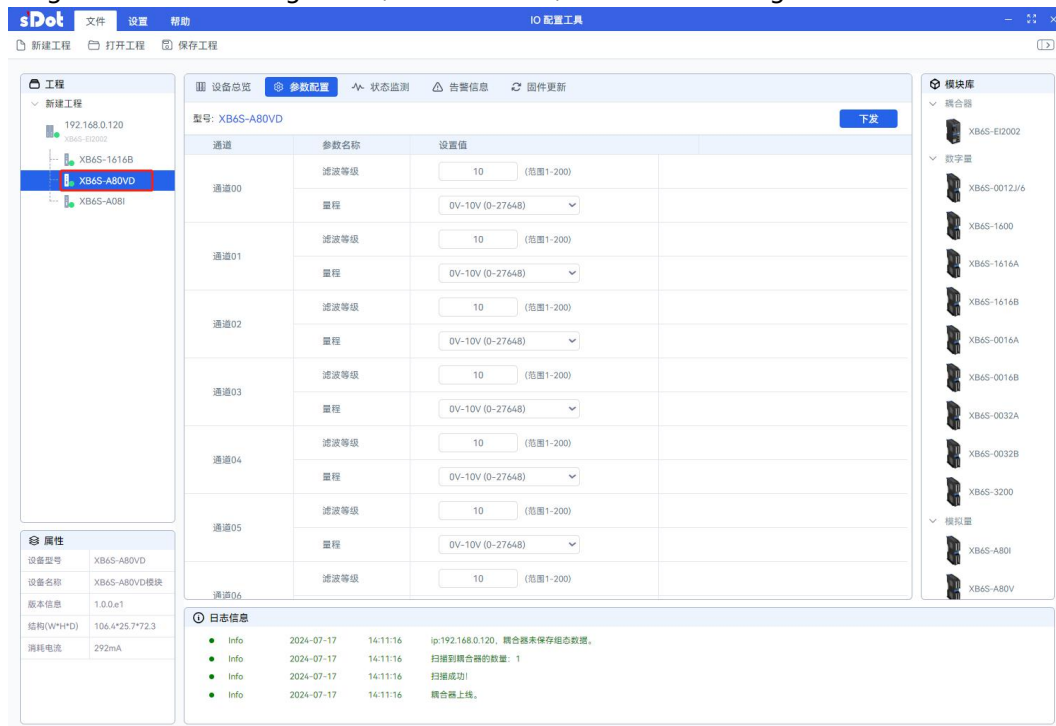
- b. existThe XB6S-EI2002 parameter settings page allows you to view the module's installation information, electrical information, and communication parameters. You can also configure the module's network and configuration parameters. After configuring the parameters, click "Deploy" and then "Restart Coupler" in sequence. The configured parameters will take effect after restarting, as shown in the figure below.



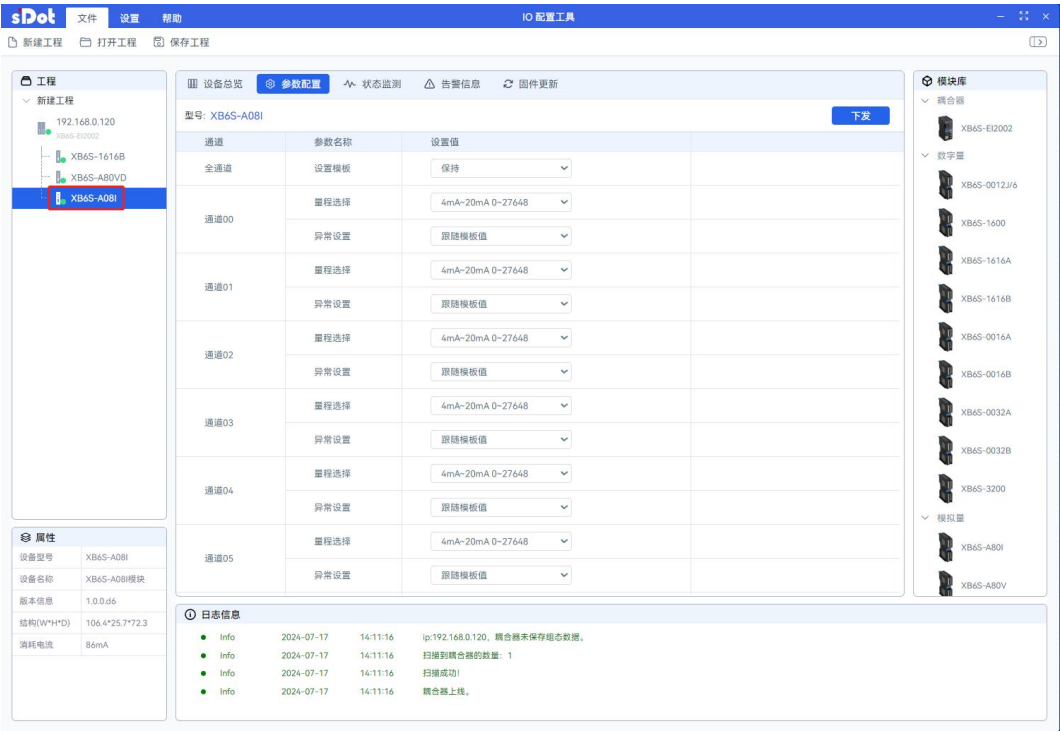
- c. Select the XB6S-1616B module in the left-hand engineering panel to enter the XB6S-1616B parameter setting page. Here you can configure the digital input filter and output signal clear/hold functions. The parameters can be configured according to actual usage needs. After configuration, click "Submit", as shown in the figure below.



- d. In the left-hand engineering panel, select the XB6S-A80VD module to enter the XB6S-A80VD analog voltage input module parameter setting page. Here you can configure the analog voltage range and analog input filter parameters. The parameters can be configured according to actual usage needs. After configuration, click "Submit", as shown in the figure below.

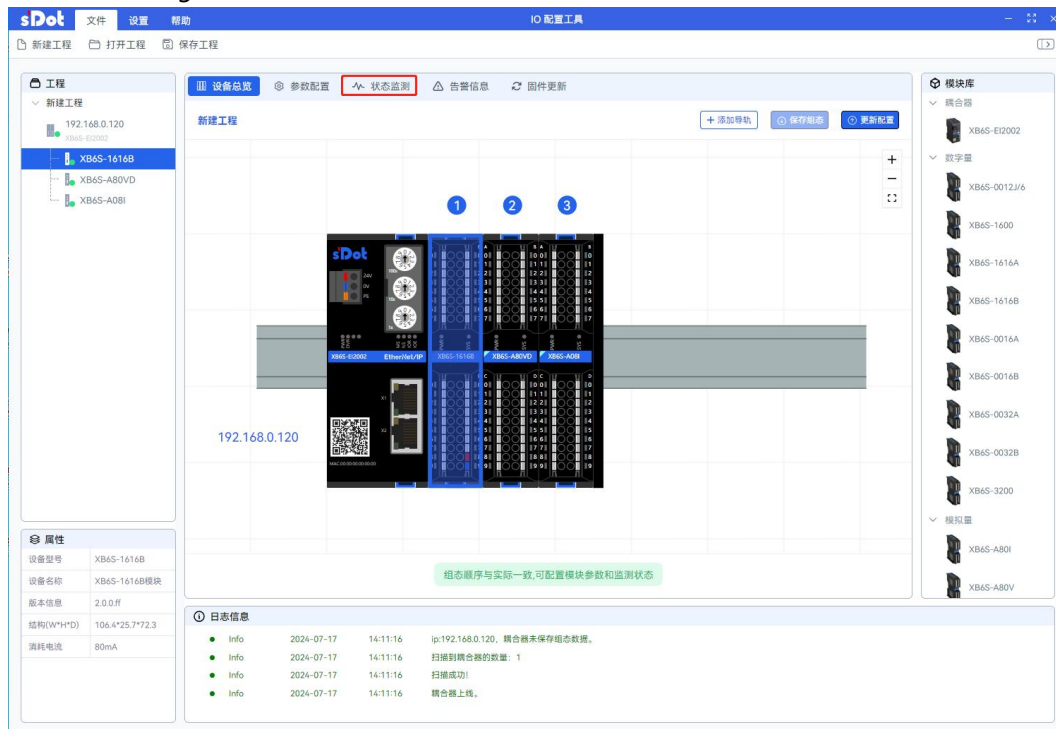


- e. Select the XB6S-A08I module in the left-hand engineering panel to enter the XB6S-A08I analog current output module parameter setting page. Here you can configure the analog current range and the analog output signal clear/hold parameters. The parameters can be configured according to actual usage needs. After configuration, click "Submit", as shown in the figure below.

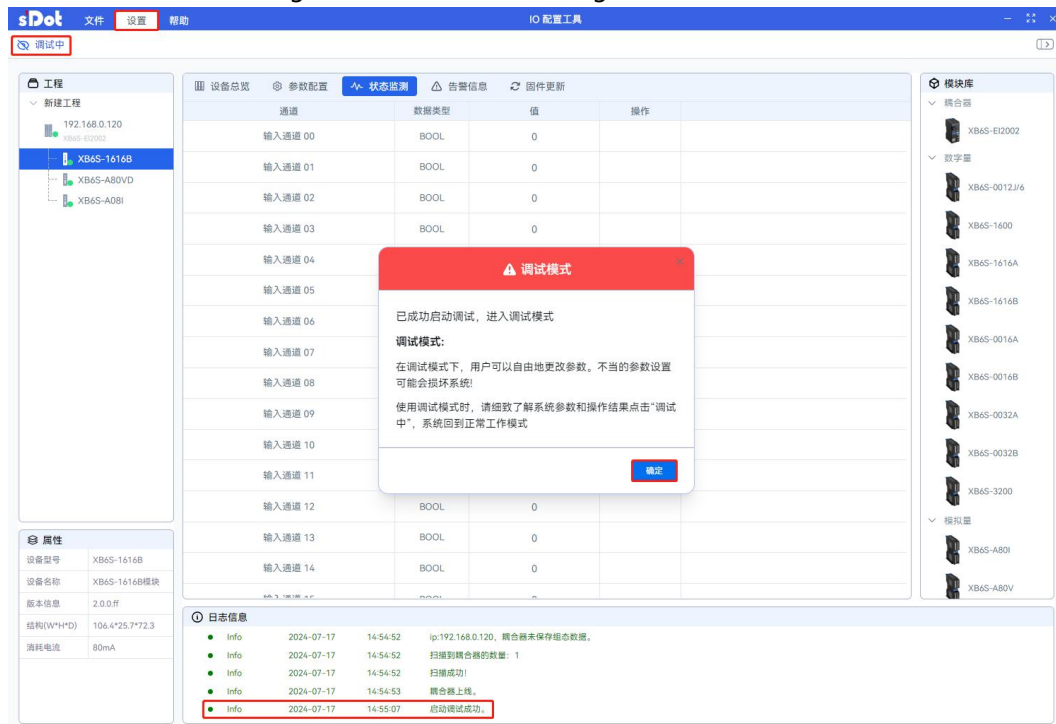


4. I/O functions

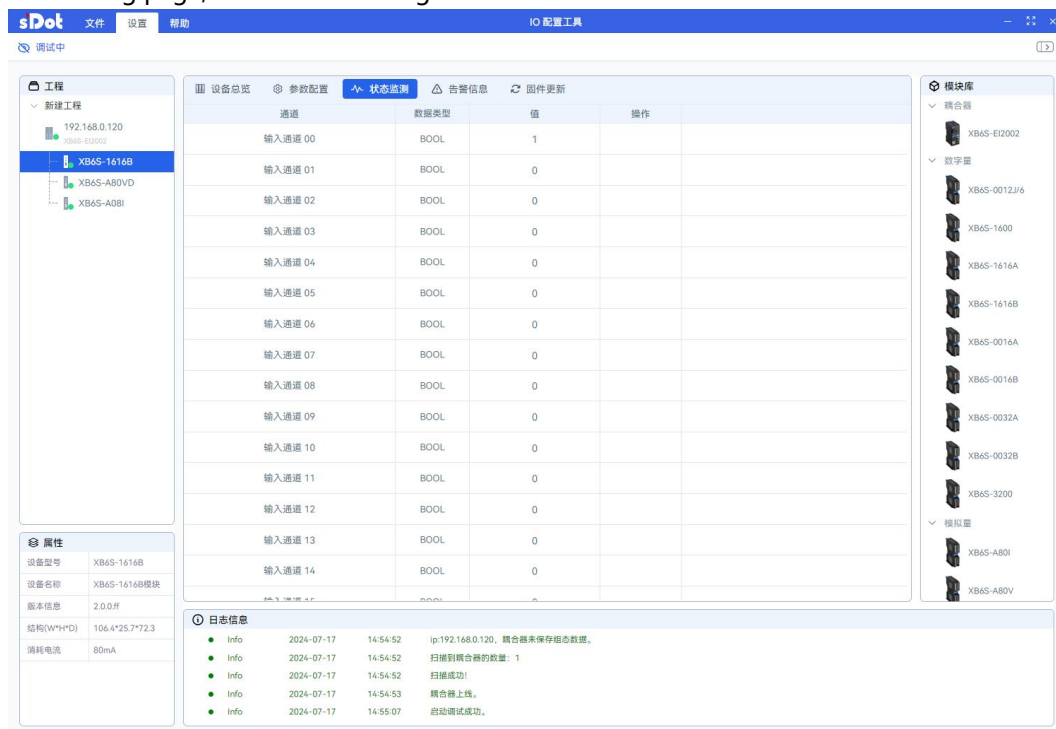
- a. On the device overview page, click the XB6S-1616B module, then click "Status Monitoring", as shown in the figure below.



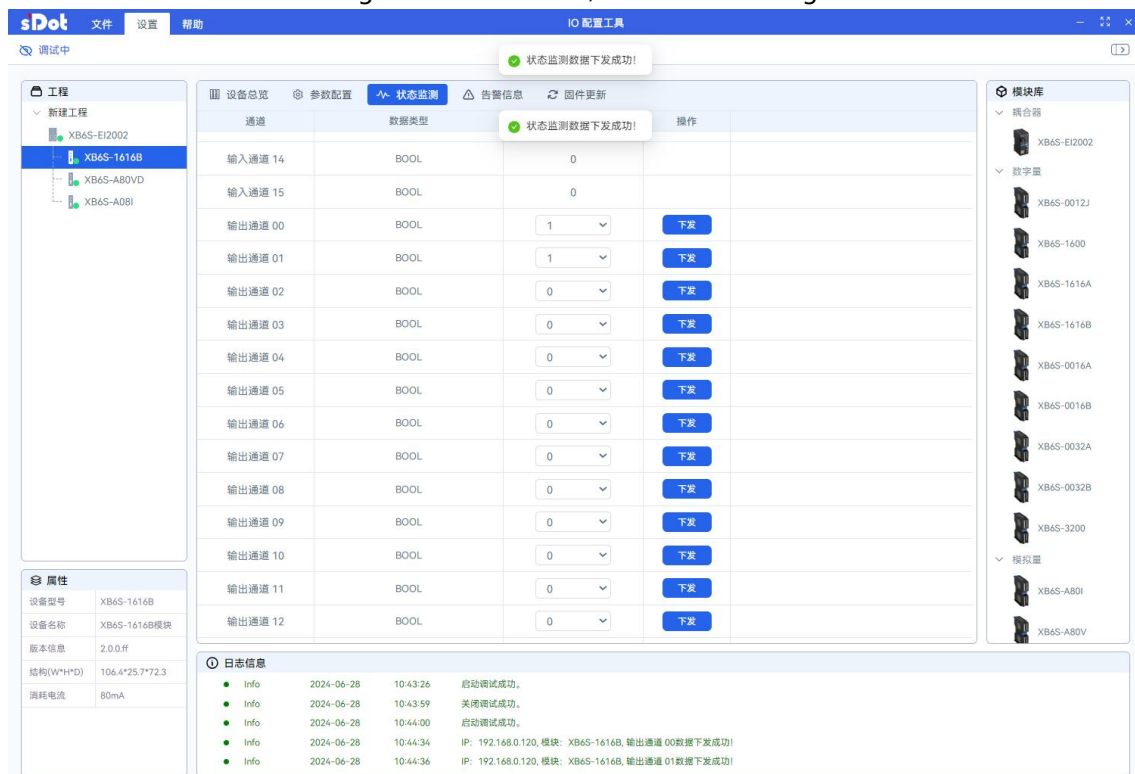
- b. Click "Settings -> Debugging" in the menu bar. A debug mode confirmation window will pop up. Click "OK" to enter debug mode, as shown in the figure below.



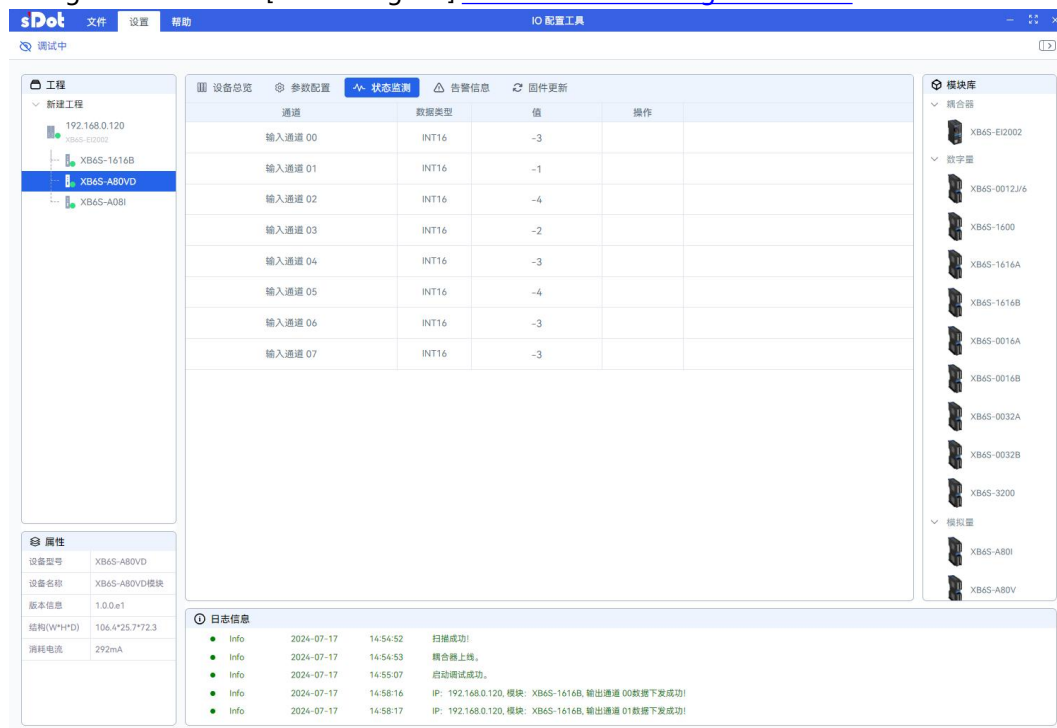
- c. Taking input channel 0 of the XB6S-1616B module as an example, when the module...Input channel 0 has a valid voltage input, and the input value can be monitored on the status monitoring page, as shown in the figure below.



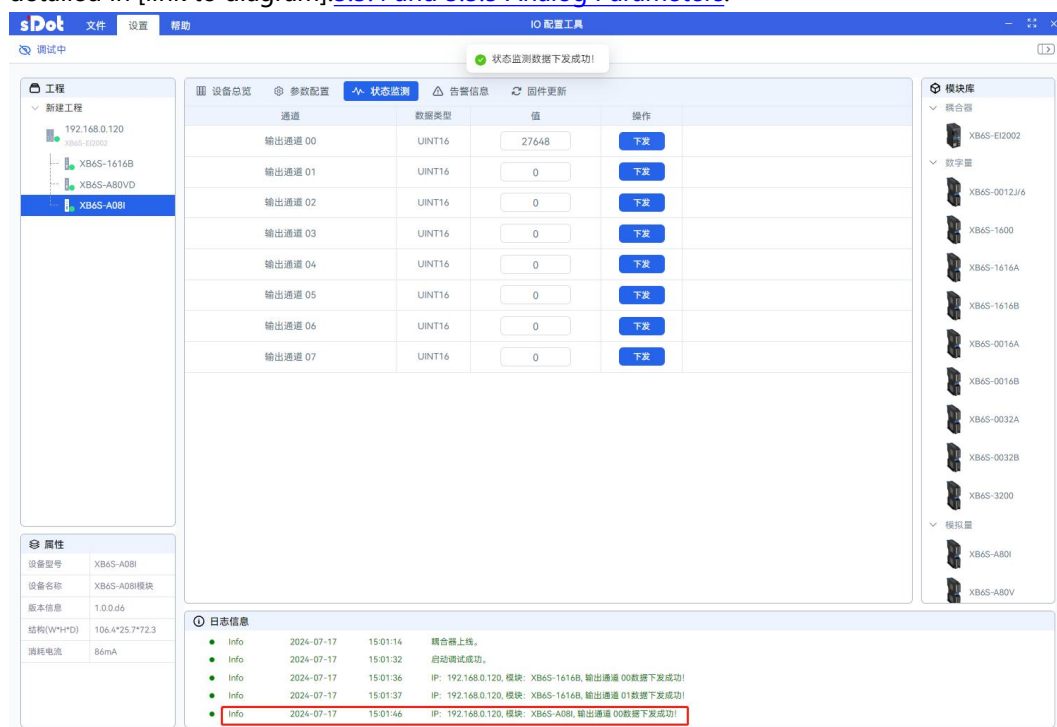
- d. The output channels of the XB6S-1616B module can be forced to output by modifying the channel values and clicking the "Send" button, as shown in the figure below.



- e. Select the XB6S-A80VD module in the left-hand engineering pane, switch to the XB6S-A80VD module's status monitoring page, and you can monitor the input voltage code value of each channel. As shown in the figure below, the correspondence between code values and voltages is detailed in [link to diagram]. [3.3.4 and 3.3.5 Analog Parameters](#).

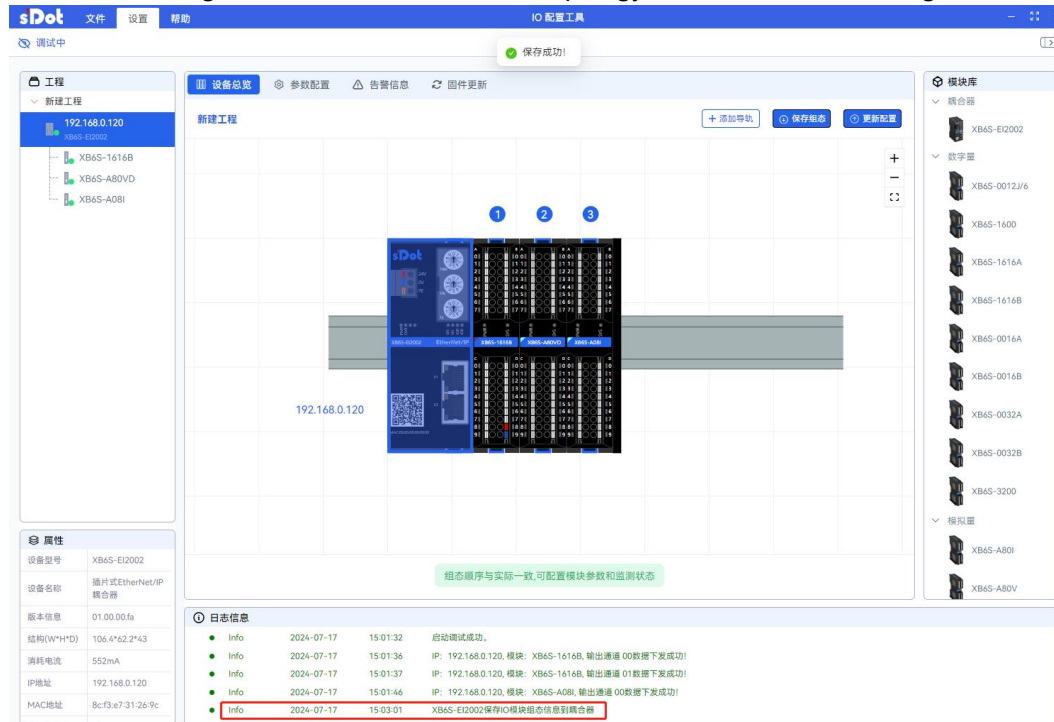


- f. Select the XB6S-A08I module in the left-hand engineering pane, switch to the XB6S-A08I module's status monitoring page, and write the current code value to force output for each channel. As shown in the figure below, the correspondence between code value and current is detailed in [link to diagram]. [3.3.4 and 3.3.5 Analog Parameters](#).

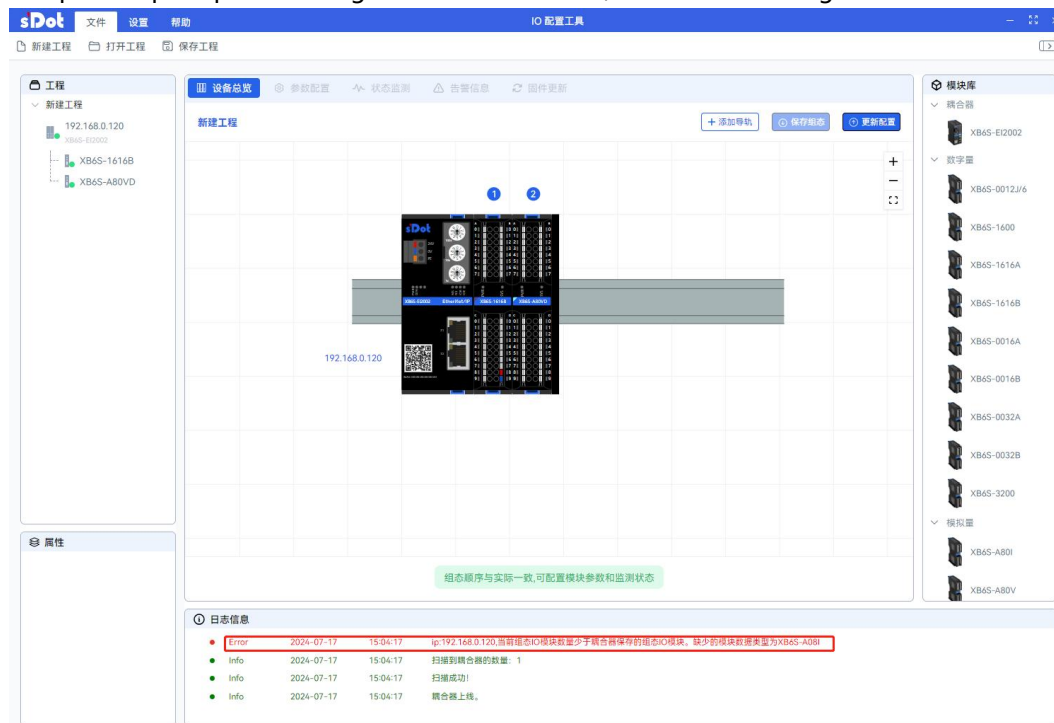


5. Topology state comparison function

- a. Click "Save Configuration" to save the current topology state, as shown in the figure below.

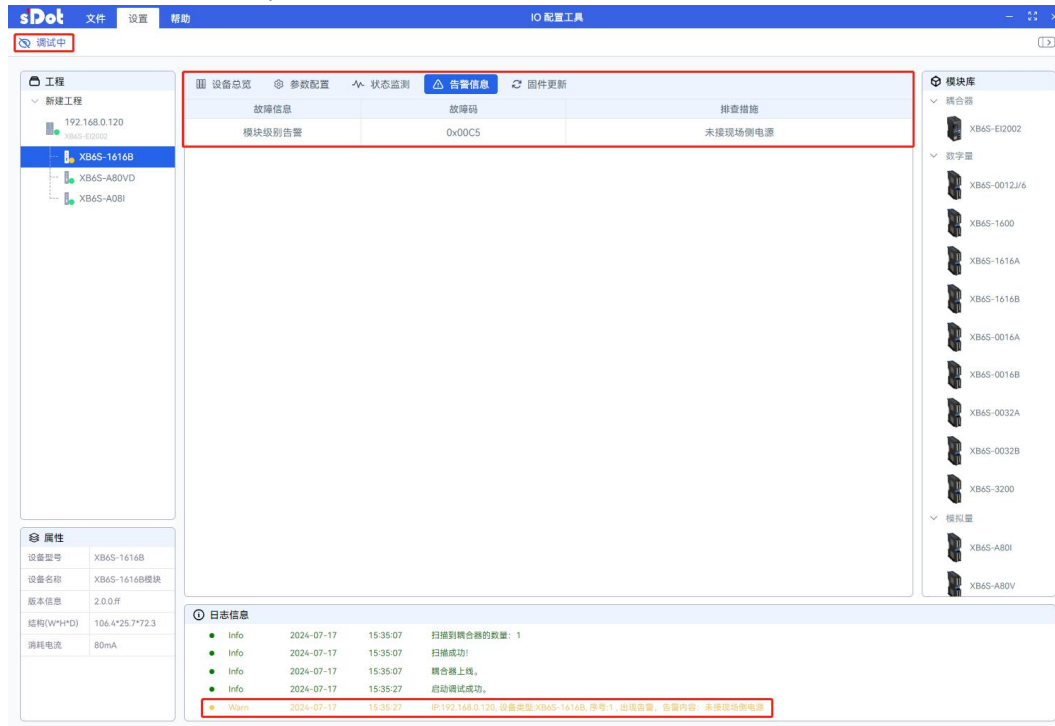


- b. When the topology changes, a power-on scan can be performed. View the topology status comparison prompts in the log information window, as shown in the figure below.



6. Fault Code Viewing

- a. Once in debug mode, click "Alarm Information" to view alarm information in the alarm information window, as shown in the figure below. The alarm code is Hex: 00c5, which means a voltage error and that the load-side voltage is not connected. You can check whether the field-side power supply is connected.



6.6.2 Application in KV STUDIO Ver.10G software environment

1、Preparation

- **Hardware environment**

- **Module preparation:** This guide uses the XB6S-EI2002+XB6S-1616B+XB6S-A80VD+XB6S-A08I topology as an example.
- **One computer, pre-installed with KV STUDIO Ver.10G software.**
- **EtherNet/IP dedicated shielded cable**
- **This instruction manual uses one Keyence PLC, specifically the KV-8000 model, as an example.**
- **One switching power supply**
- **Module mounting rails and rail fasteners**
- **Device configuration file**
Configuration file retrieval

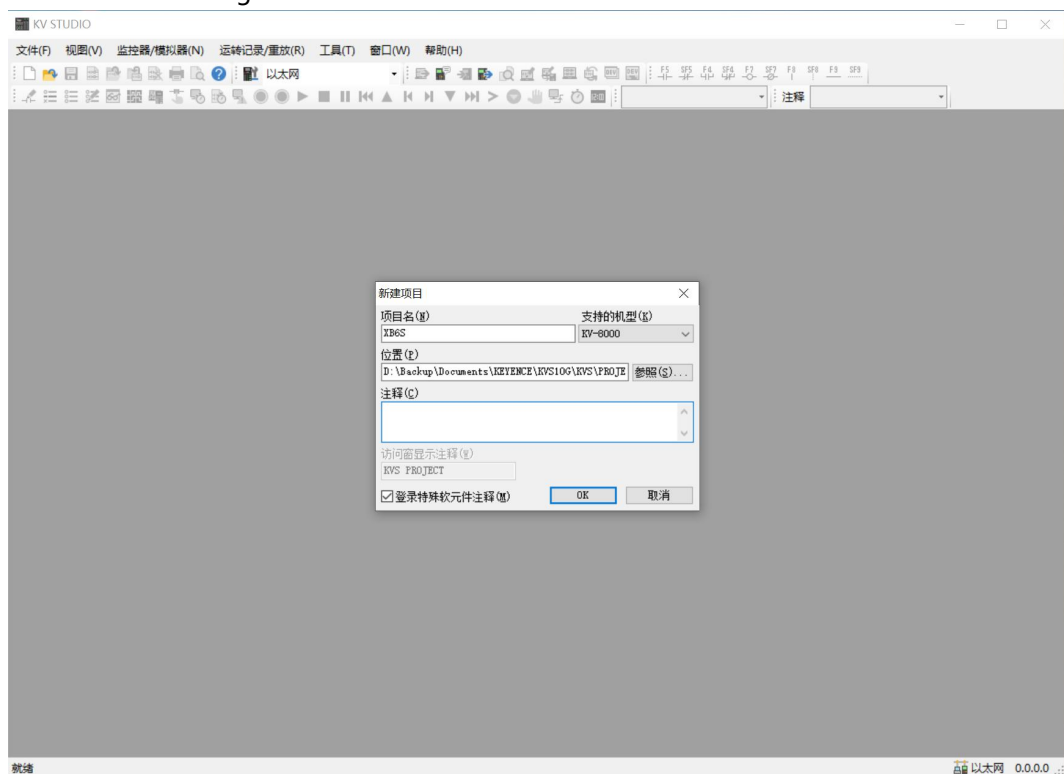
address:<https://www.solidotech.com/cn/resources/configuration-files>

- **Hardware configuration and wiring**

Please follow the instructions [4. Installation and Removal](#) and [5-wire connection](#) Required Operation"

2、Create a project

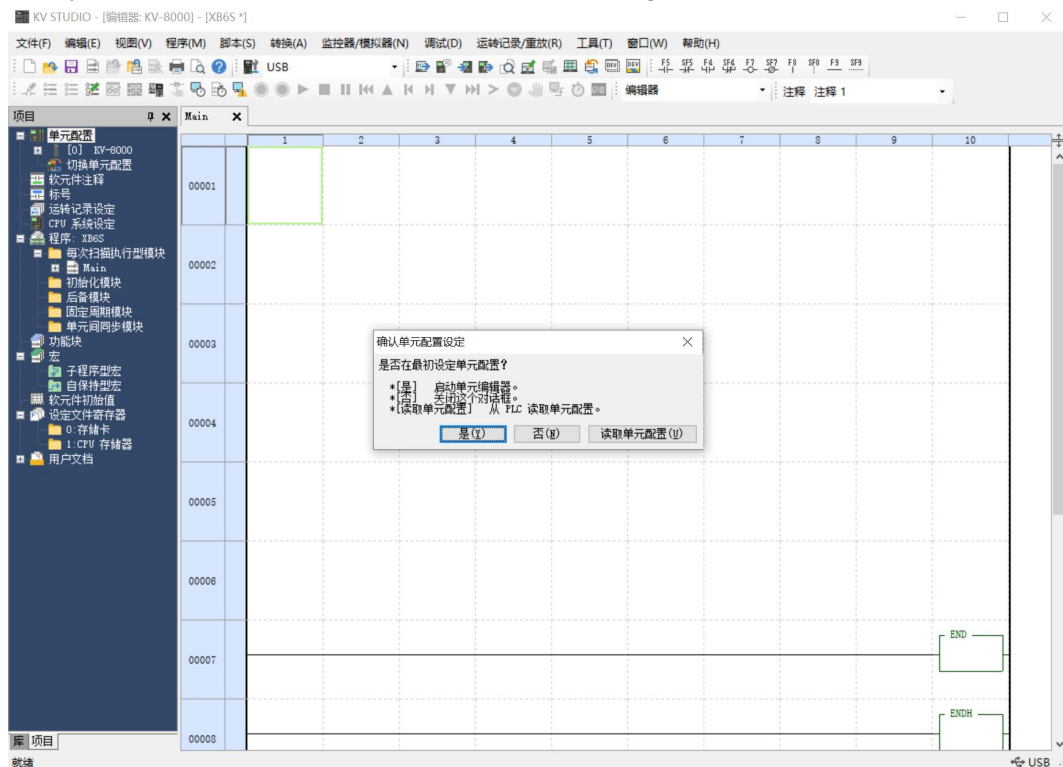
- Open KV STUDIO software and select "File".-> Create a new project.
- In the pop-up window, enter the "Project Name", select the "Supported Models", and "Location", as shown in the image below.



- ◆ Project name: Custom.
- ◆ Supported models: View the PLC appearance and select the corresponding model, for

example: KV-8000.

- c. A "Confirm Unit Configuration Settings" window will pop up. Choose to start the unit editor, close the dialog box, or read the unit configuration from the PLC as needed. Choose here "yes" Demonstration of operation As shown in the figure below.

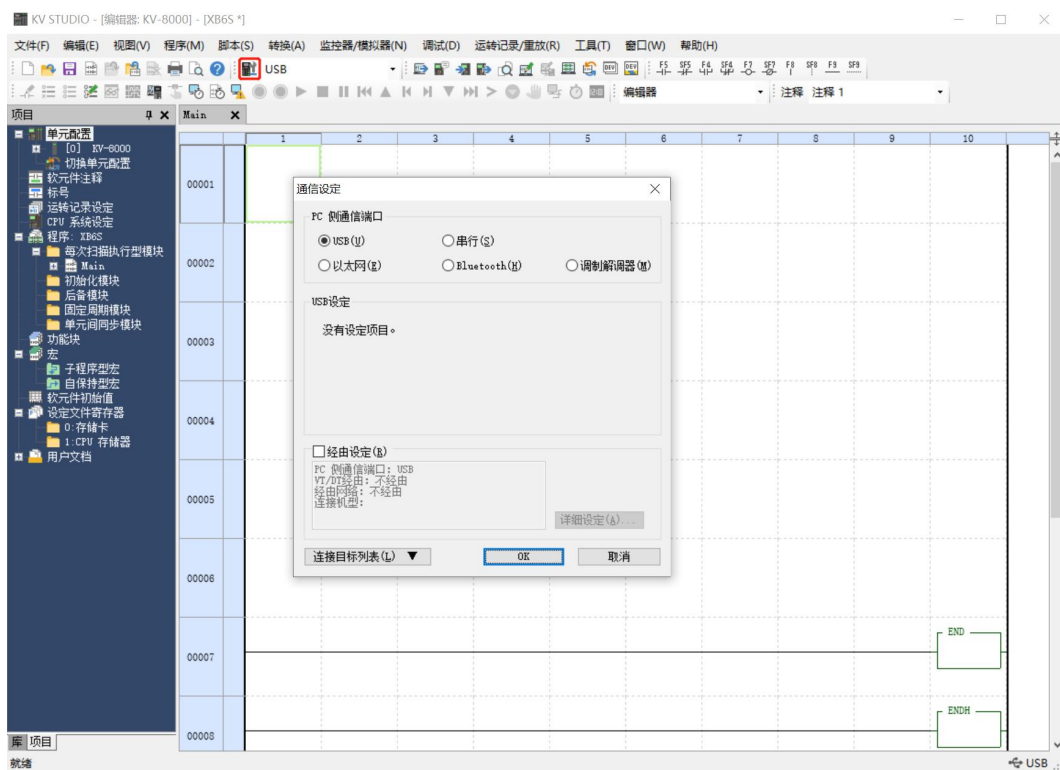


3. Communication settings

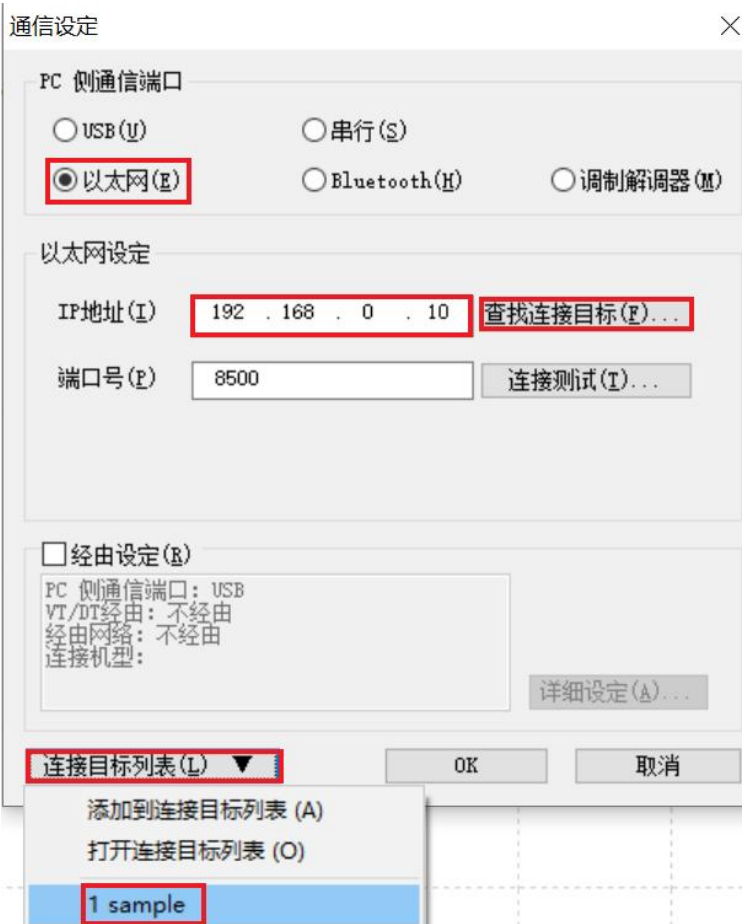
Select the communication method. If the PLC and the host computer software are connected via a network cable, select "Ethernet". If they are connected via USB, select "USB".

➤ Ethernet Operation Steps

- a. Click on the menu bar  Press the button to display the "Communication Settings" window, as shown in the image below.



- b. Select "Ethernet", click "Connection Target List", and select "1.sample", configuration IPFor the address, click "Find Connection Target". As shown in the figure below, the IP address is configured within the "192.168.0" network segment.



- c. In the pop-up window for finding the connection target, select the network card and click "Perform search", as shown in the figure

查找连接目标

选择网卡

网卡(N)

ASIX USB to Gigabit Ethernet Family Adapter #2

IP地址

192.168.0.254

子网掩码

255.255.255.0

端口号(P)

8500

执行查找(S)

中断(B)

在广播包可达到的范围内检索以太网连接单元。(仅限KV)

※连接单元的台数不同，网络的负载会变大。

检索结果

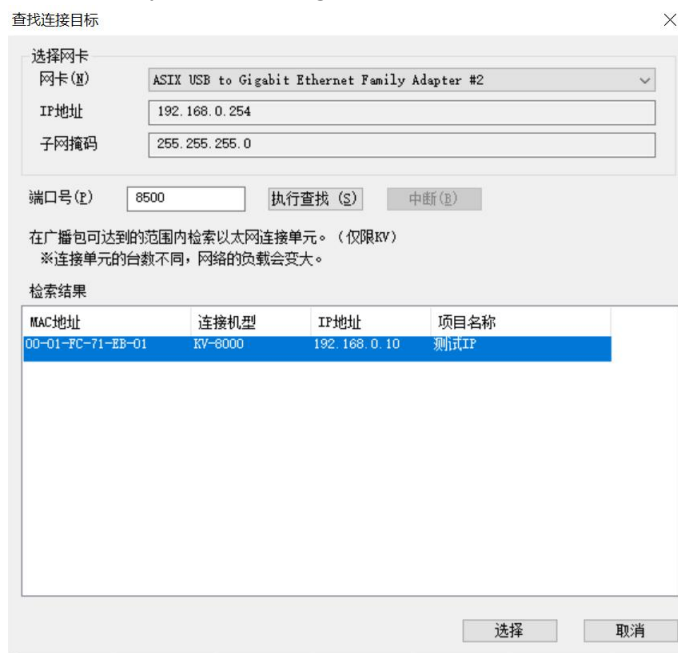
MAC地址	连接机型	IP地址	项目名称
-------	------	------	------

选择

取消

below.

- d. Select the P you are looking for. Click "Select", as shown in the image below.



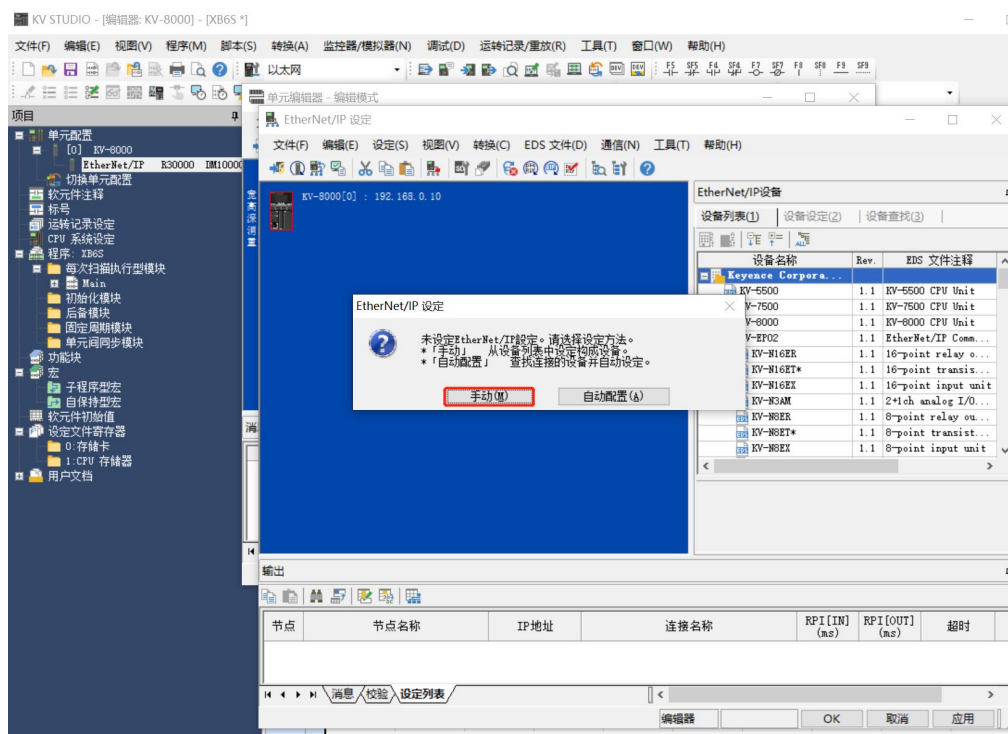
- e. Click "O" in the communication settings window. "Button".

➤ USB connection operation method

Select in the "Communication Settings" interface USB.

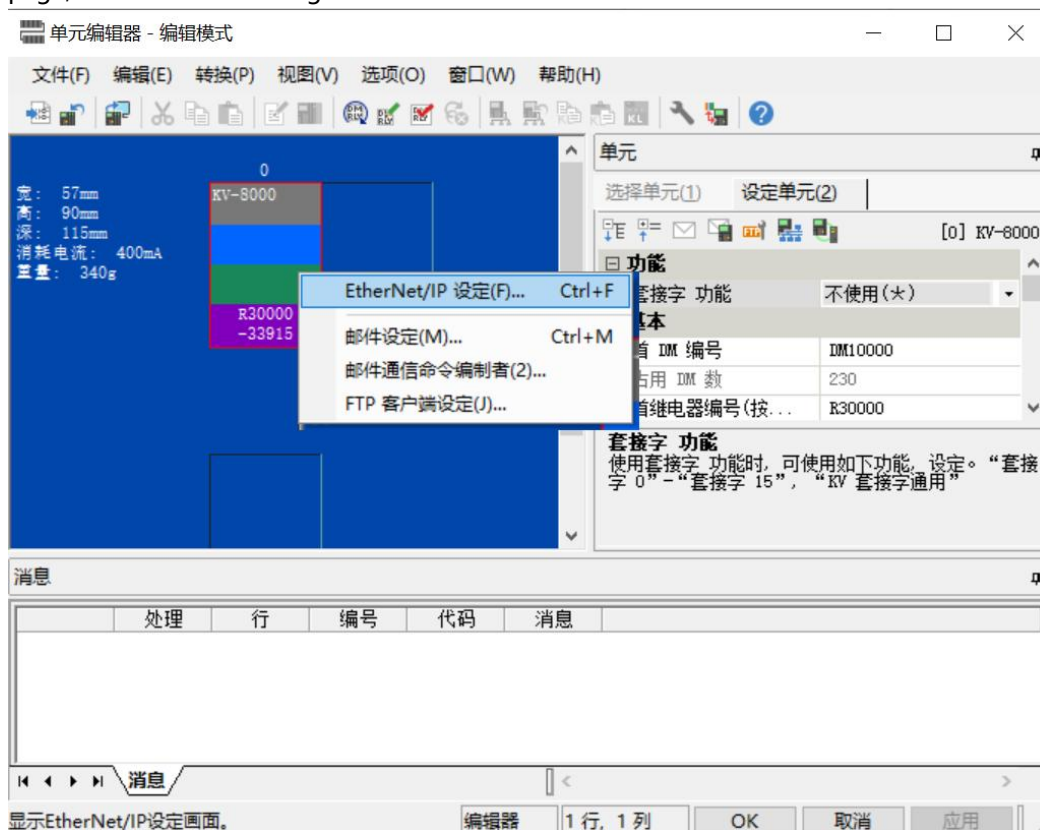
4、EtherNet/IP Configuration

- a. Double-click "Unit Configuration -> KV-8000 -> EtherNet/IP R30000 DM10000" in the left navigation tree to open the "EtherNet/IP Settings" window. Select "Manual" or "Automatic Configuration" as needed. Here, we'll demonstrate the operation using "Manual," as shown in the image below. After setting, click "OK" to close the window.

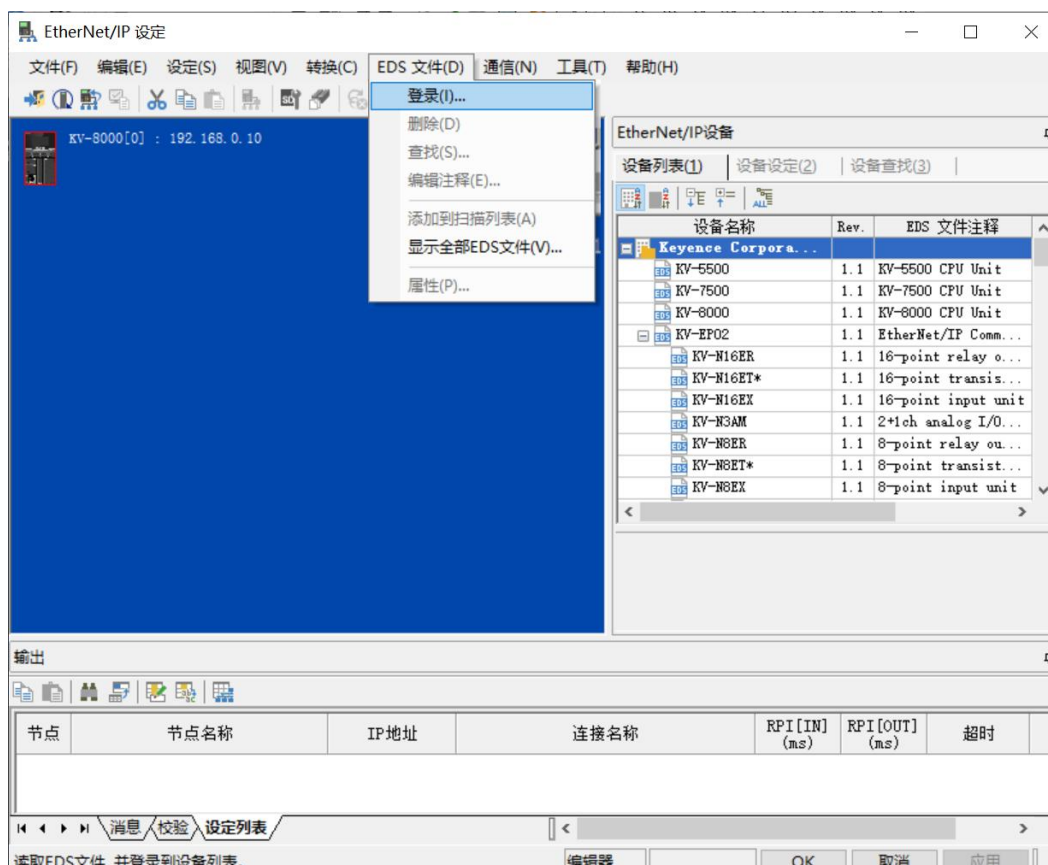


5. Install EDS file

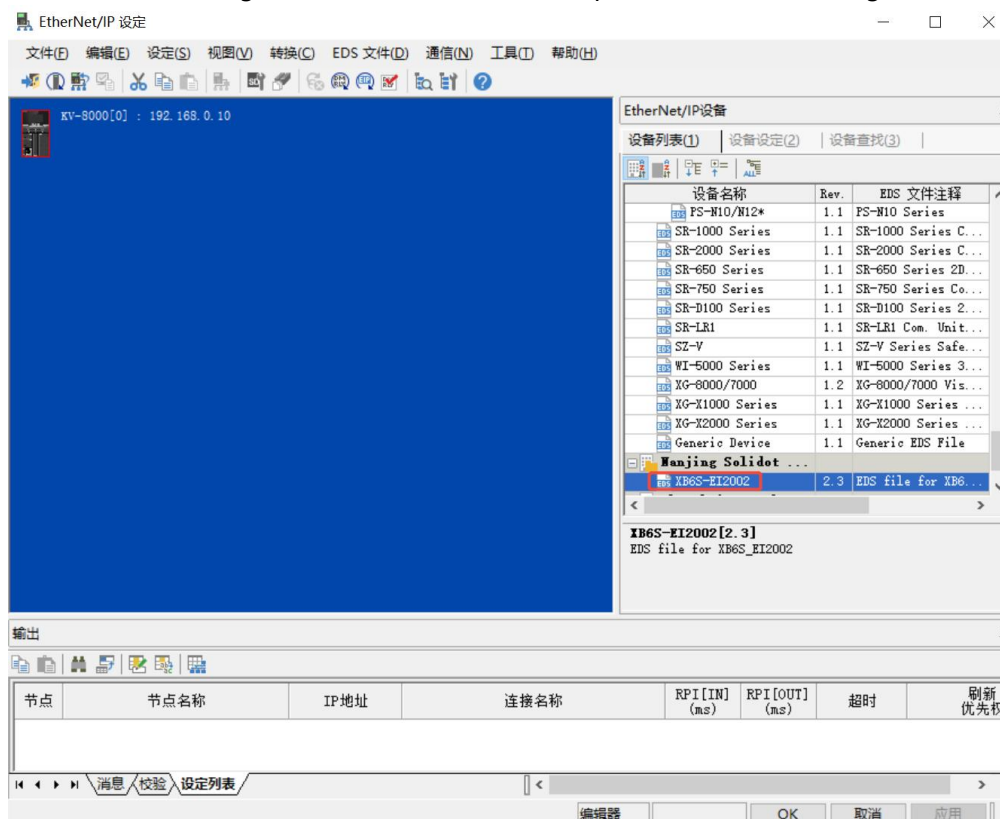
- Right-click K in the unit editing window V-8000. Select "EtherNet/IP Settings" to enter the settings page, as shown in the image below.



- Click "EDS File" in the menu bar of the "EtherNet/IP Settings" page, then click "Log In," as shown in the image below.



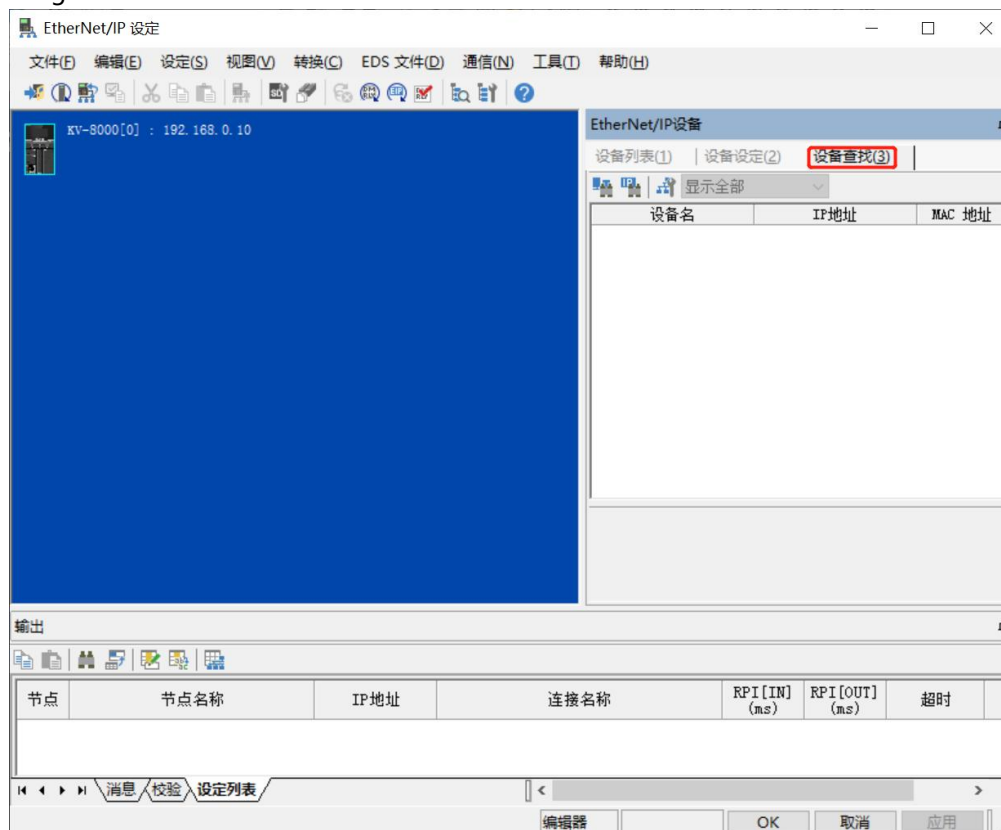
- c. In the folder where the EDS files are located, select the EDS file for the corresponding model, and click "OK". The configuration file installation is complete, as shown in the figure below.



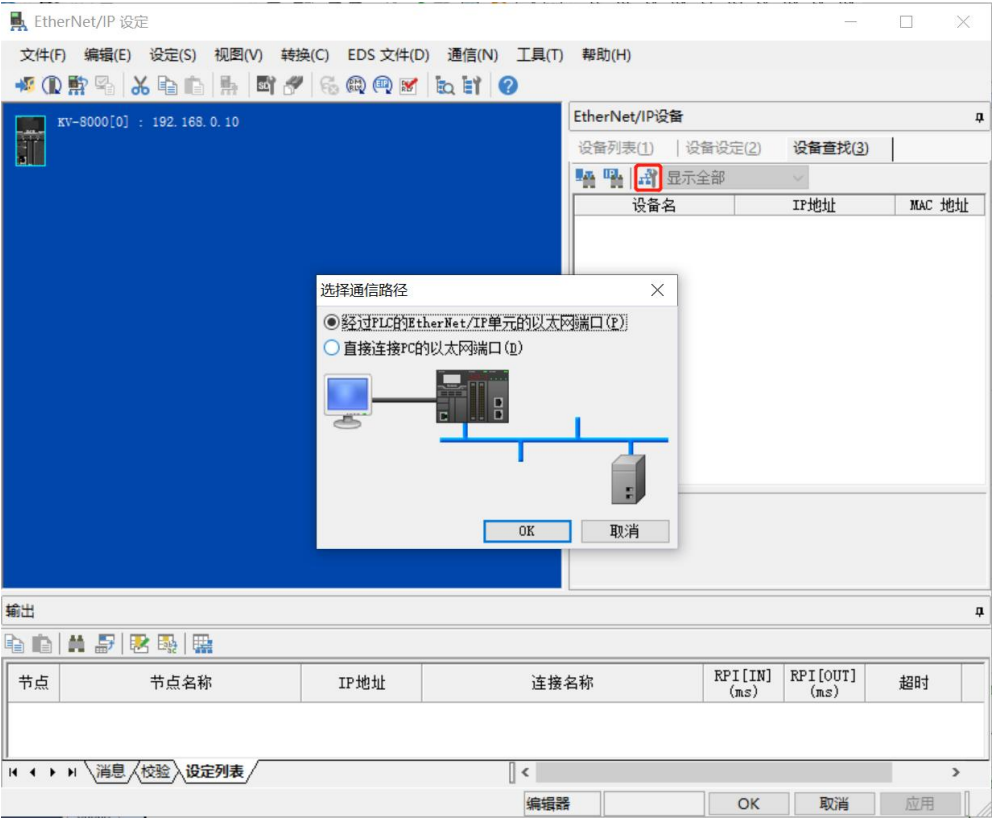
6、Topology configuration

Topology configuration can be done in two ways: "manual addition" and "automatic configuration". This configuration uses manual configuration.

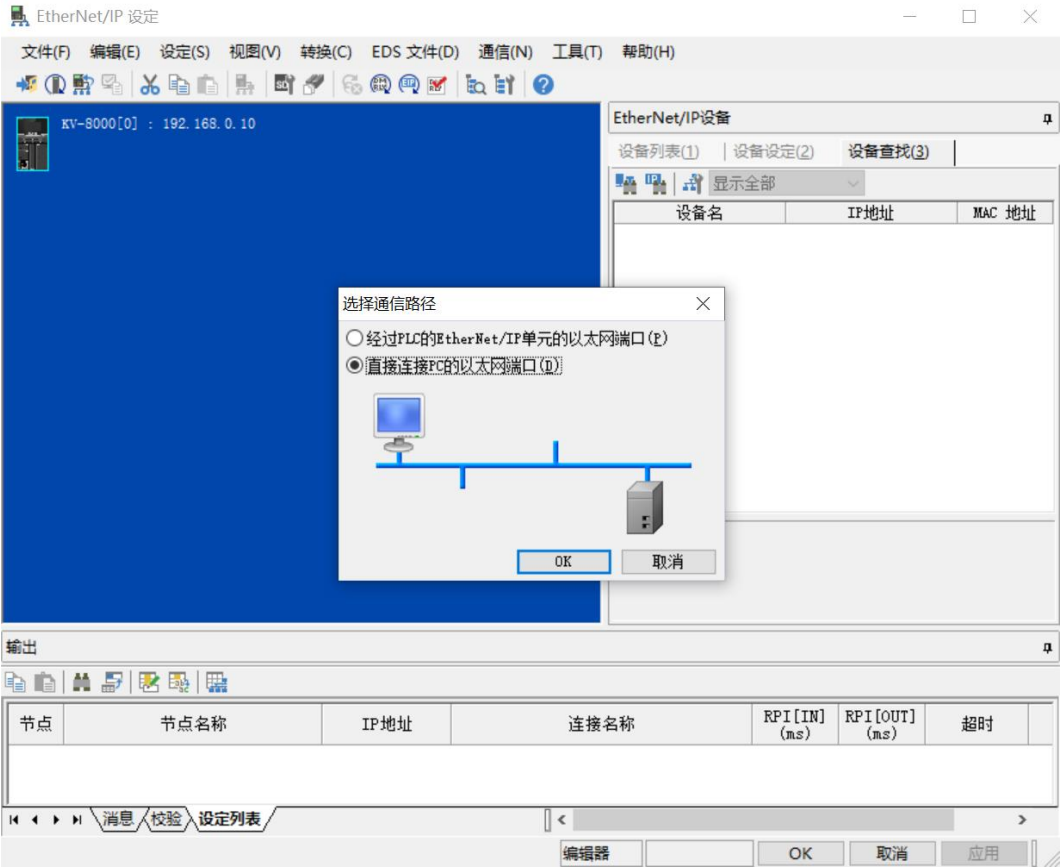
- a. Go to the "EtherNet/IP Settings" page and switch to the "Device Finder" tab, as shown in the image below.



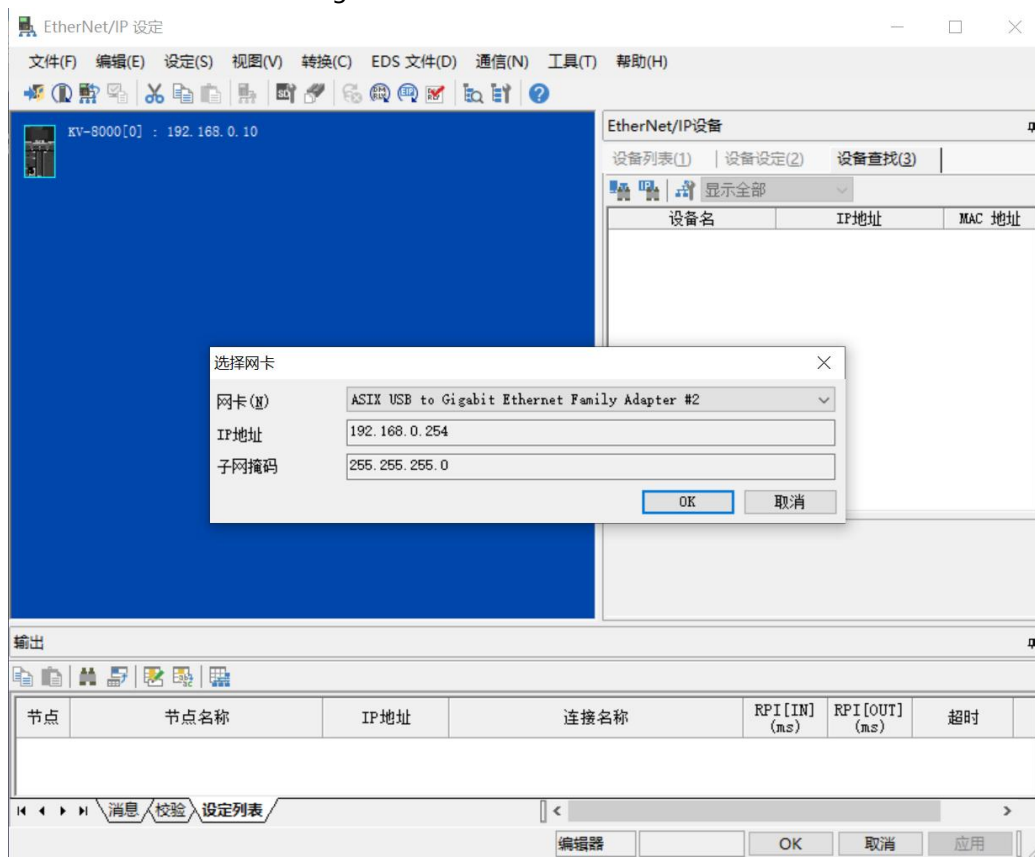
- b. Click  Select the communication path; the USB connection method is shown in the following figure.



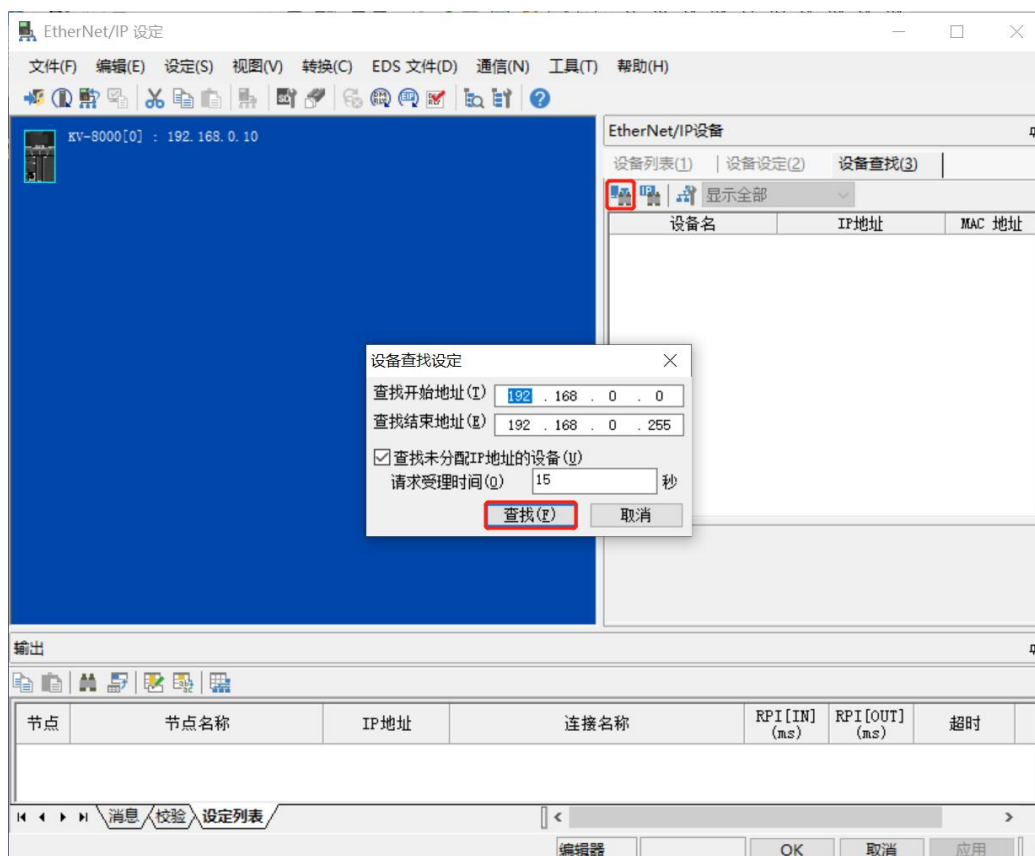
- c. "Ethernet port directly connected to the PC" This indicates the network cable connection method, as shown in the figure below."



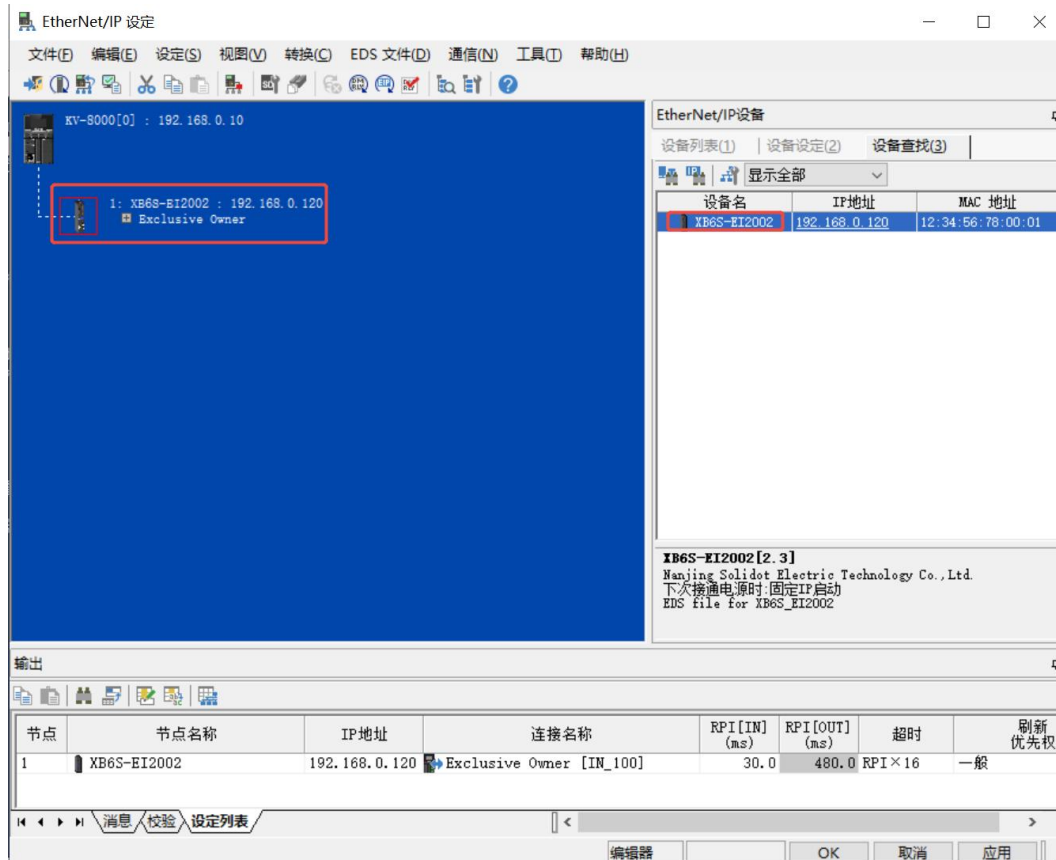
- d. Select "Connect directly to the PC's Ethernet port" and configure your local network card and IP address as shown in the image below.



- e. Click  Locate devices connected to the network. Set the IP address range to search for, and click "Search," as shown in the image below.



- f. After the search is complete, double-click the found device to add it to the configuration, as shown in the figure below.



7、Set IP address

On the found device screen, double-clickIPIn the address bar, configure the IP address in the pop-up window. The default address range is 192.168.0.

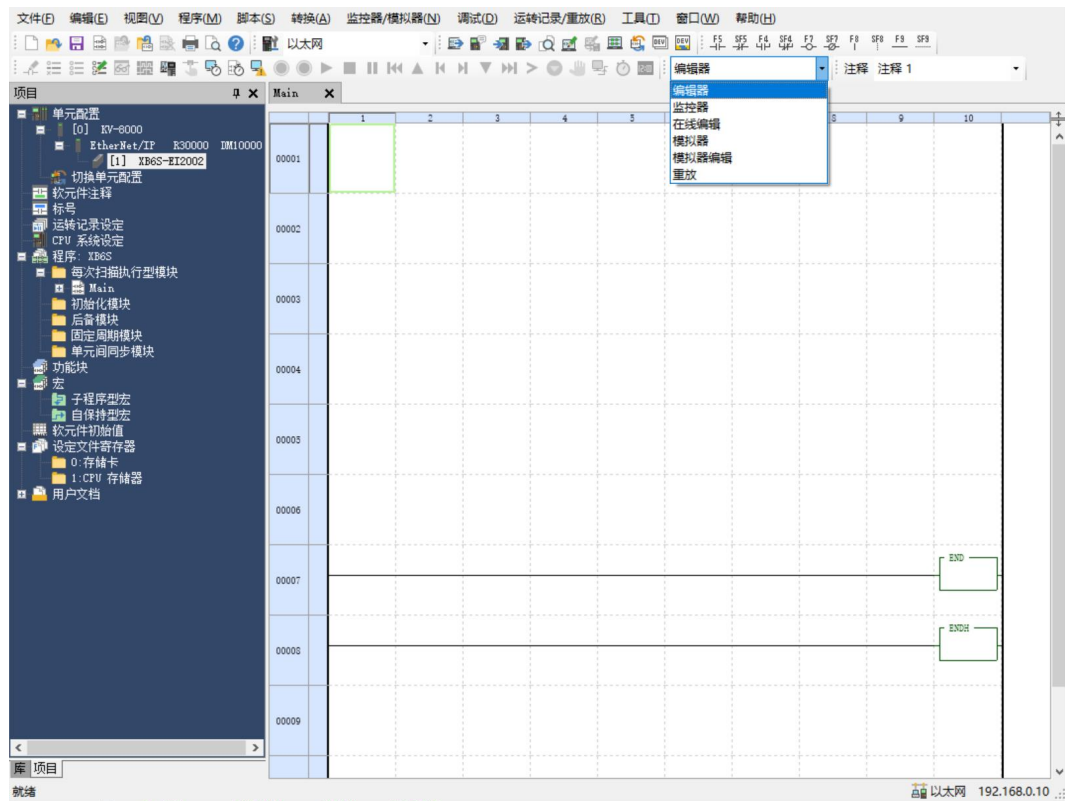
illustrate:

- The timeout for the IP address needs to be configured to 60 seconds.
- If the DIP switch has been configured with an IP address, then the IP address of the DIP switch shall prevail.

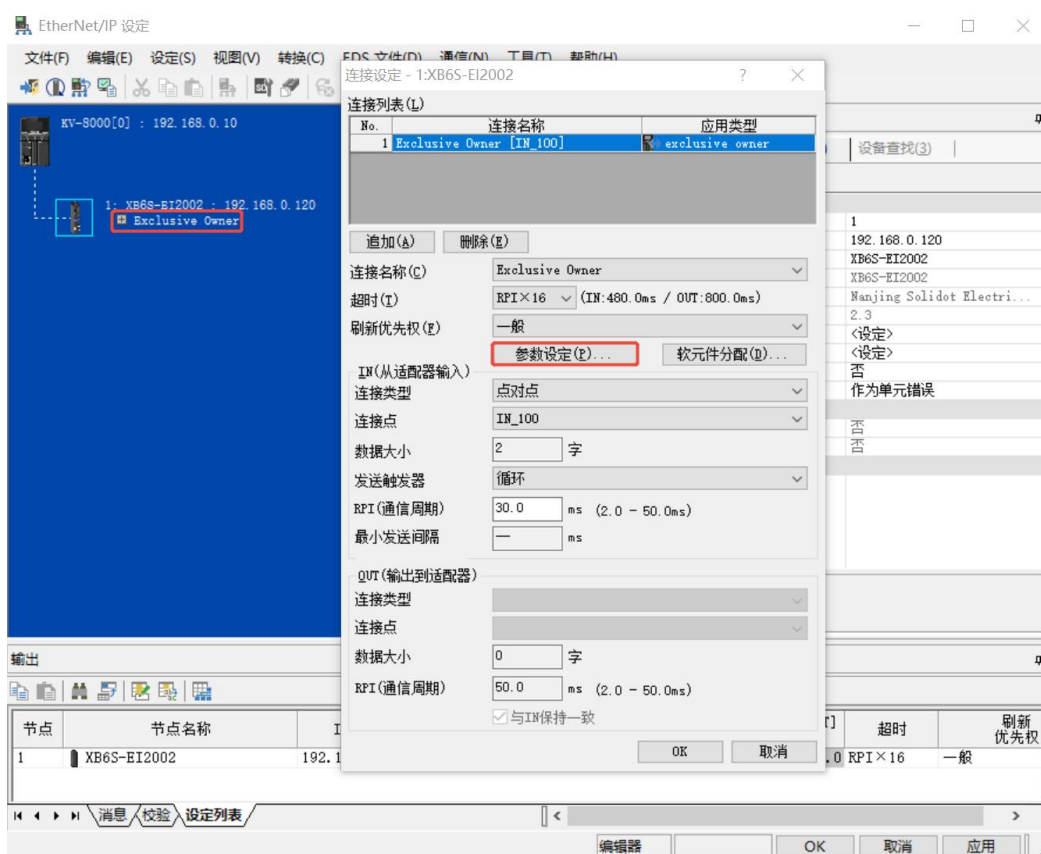
In this example, the module uses the default value.IPAddress is 192.168.0.120.

8、Parameter settings

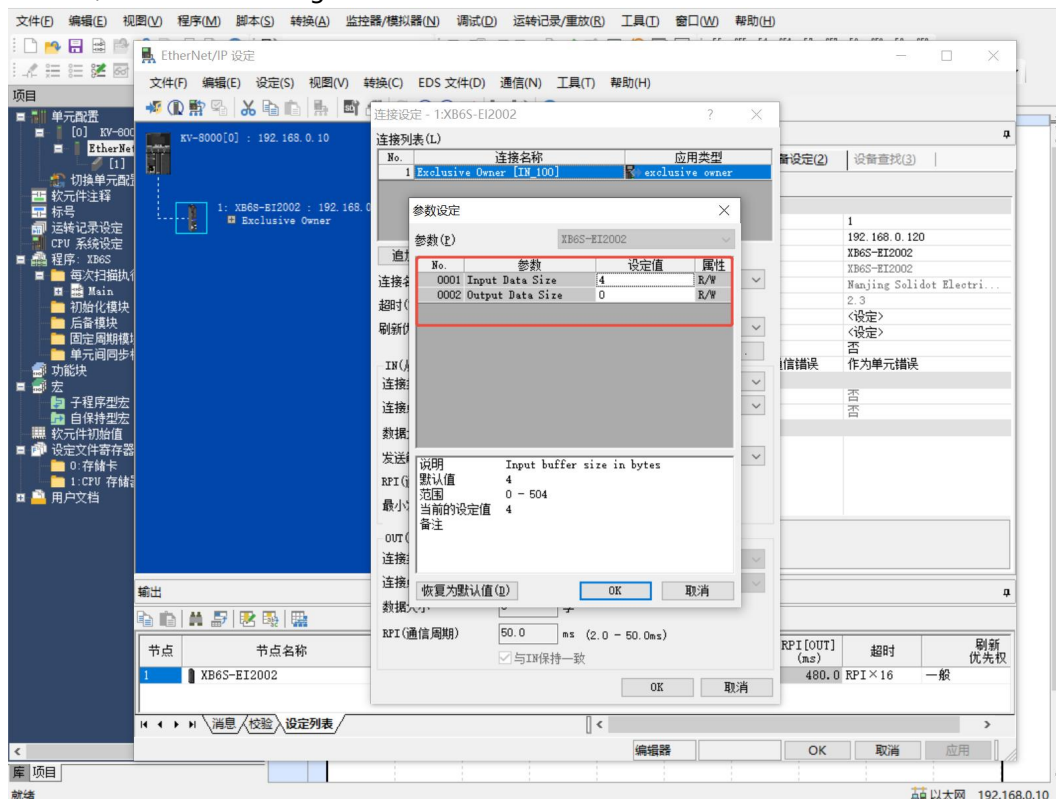
- a. Click the "Switch Mode" option in the menu bar to switch to editor mode, as shown in the image below.



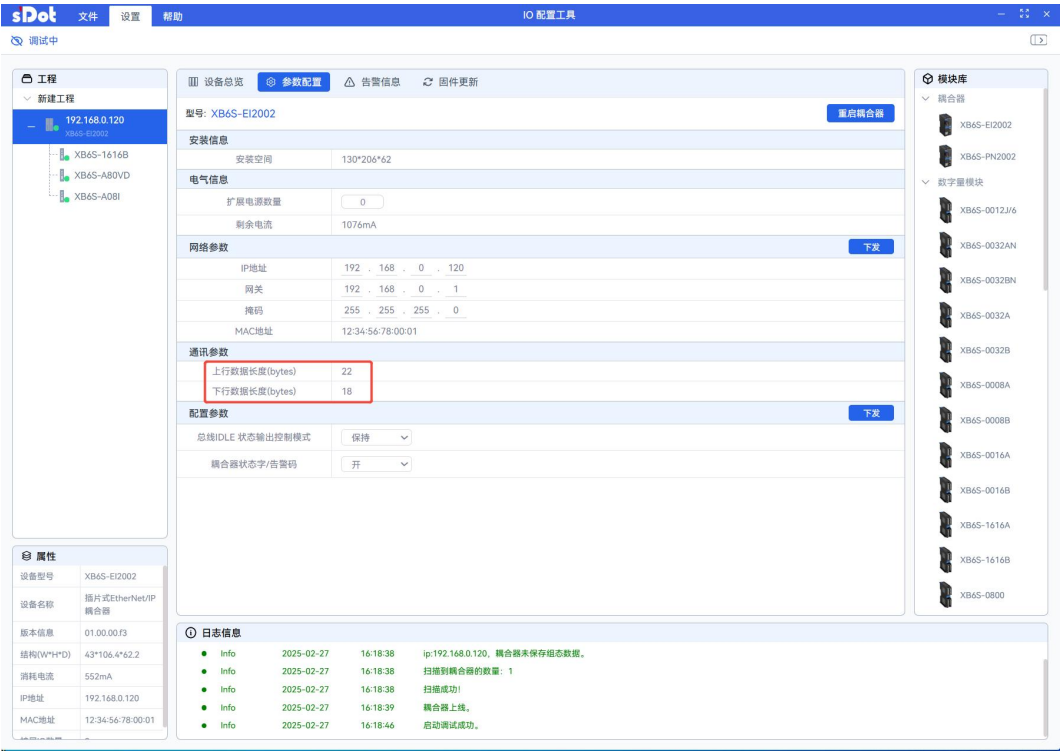
- b. Enter "EtherNet/IPOn the "Settings" page, click "Exclusive Owner" to open the "Connection Settings" window. In the "Connection Settings" window, click "Parameter Settings," as shown in the image below.



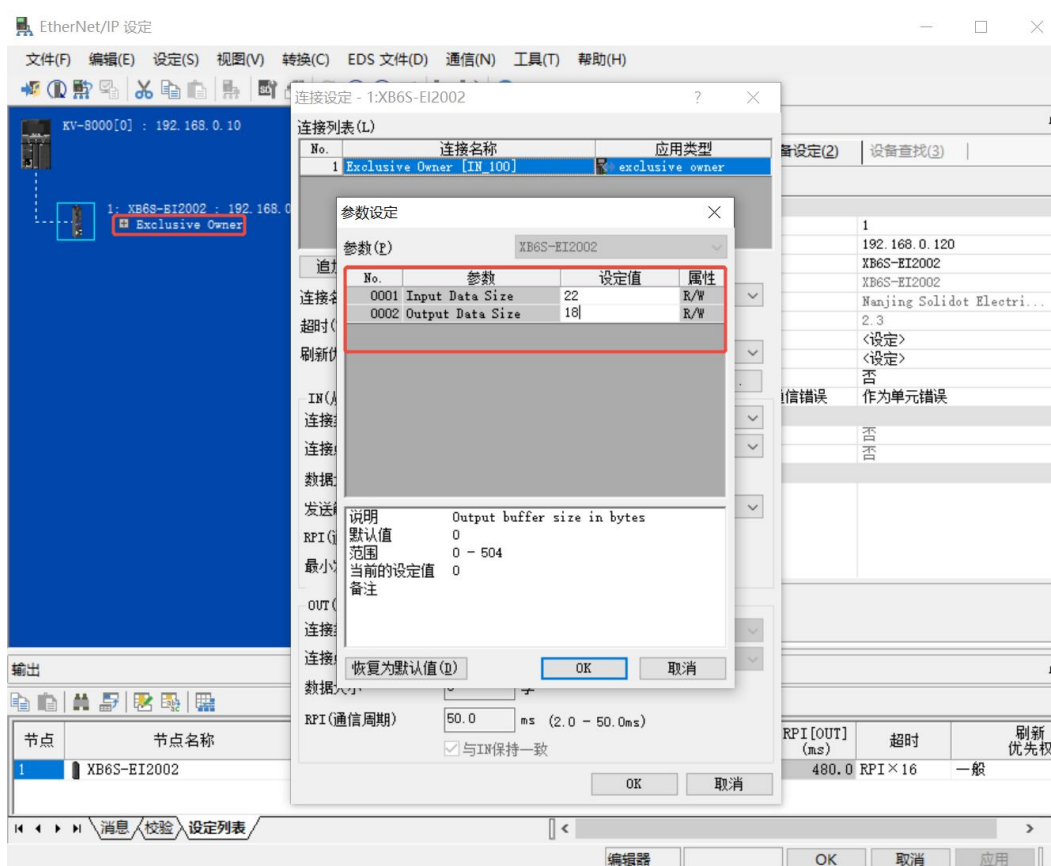
- c. In the "Parameter Settings" window, you can configure the uplink and downlink data of the module, as shown in the figure below.



- d. Through IO Config ToolThe software allows you to view the actual uplink and downlink data lengths used by the module, as shown in the image below.



- e. Double-click "Input Data Size" Enter 2 for the setting value following the parameter option. Double-click "Output Data Size" Enter 1 for the setting value following the parameter option. As shown in the figure below.

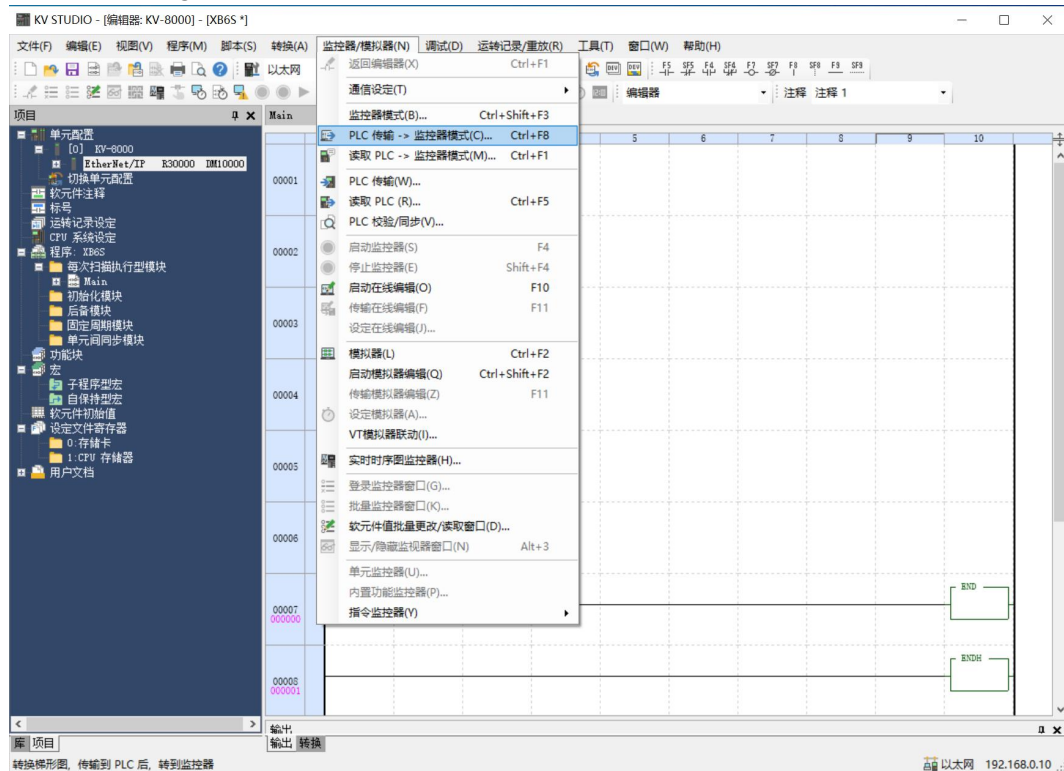


- f. After configuration, in the "Parameter Settings" window, click "O".K"Button".
- g. In the "Connection Settings" window, click "O"K"Button".
- h. In "EtherNet/IPIn the "Settings" window, click the "Apply" button, then click "O".K"Button".
- i. In the Cell Editor window, click the Apply button, then click the OK button.

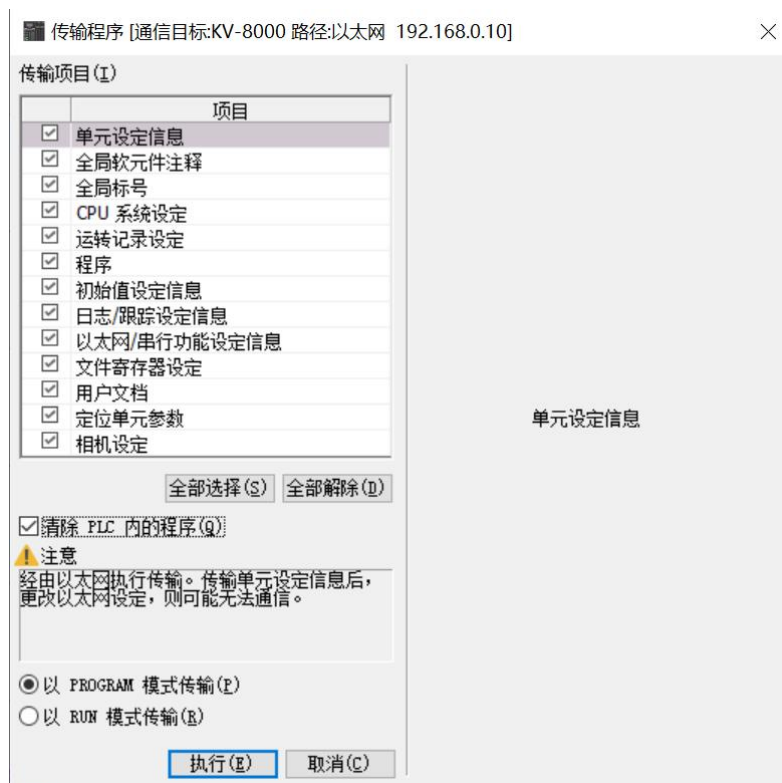
9、Configuration download

After the module configuration and parameter settings are completed, the process of downloading the data to the PLC is performed.

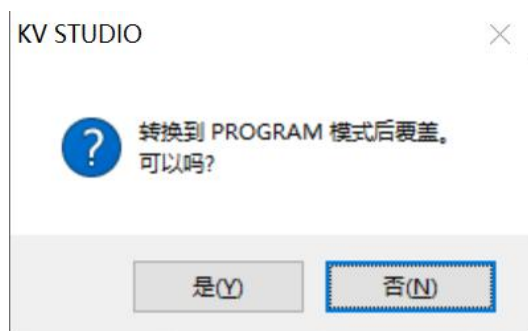
- a. Click "Monitor/Simulator (N)" in the menu bar.-> PLC transmission -> Monitor mode (C)" , as shown in the figure below.



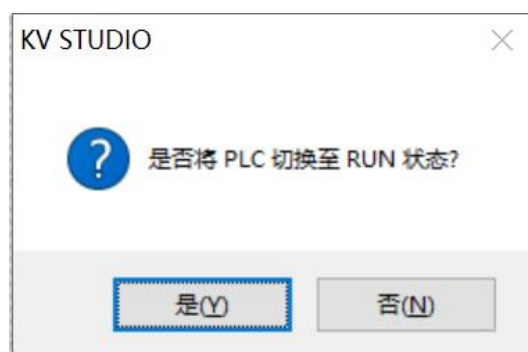
- b. In the pop-up "Transfer Program" window, check "Clear P".LC"Programs within", click "Select All", click "Execute", and download the program to P.LCAs shown in the figure below.



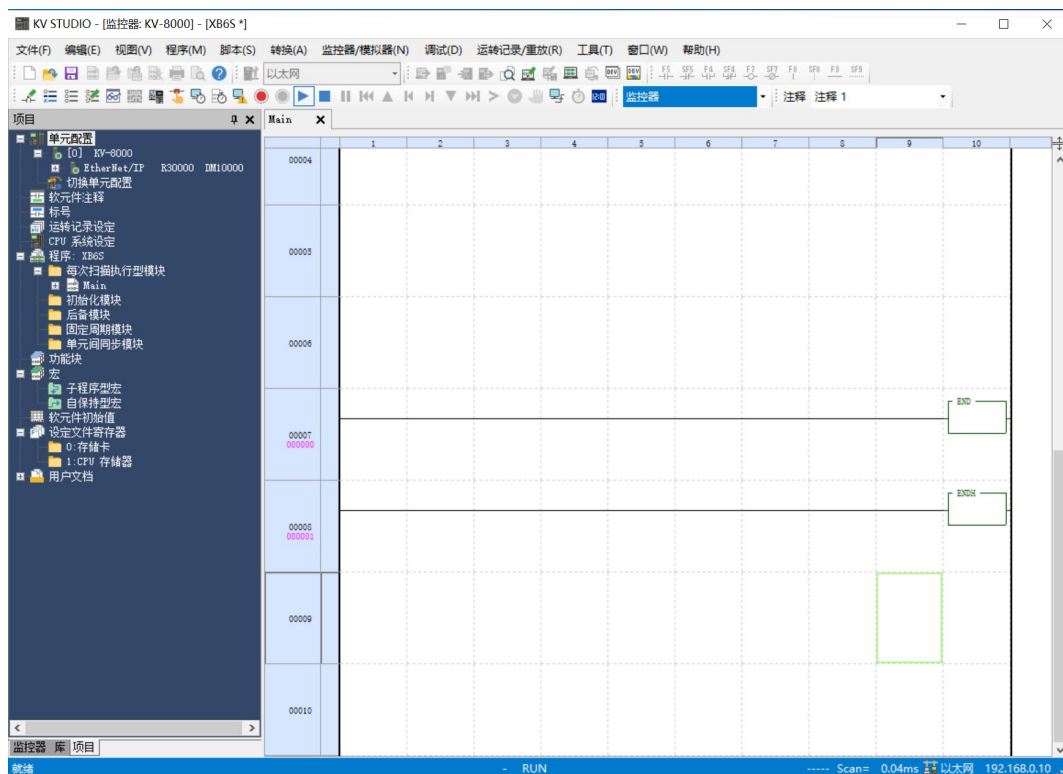
- c. A pop-up prompt box says "Switch to P"ROGRAM" Overwrite mode. Is that okay?" Click to select "Yes", as shown in the image below.



- d. Write PLCOnce completed, a prompt box will appear asking "Do you want to add P?"LCSwitch to RUN"Status", click to select "Yes", as shown in the figure below, to enter monitoring mode.

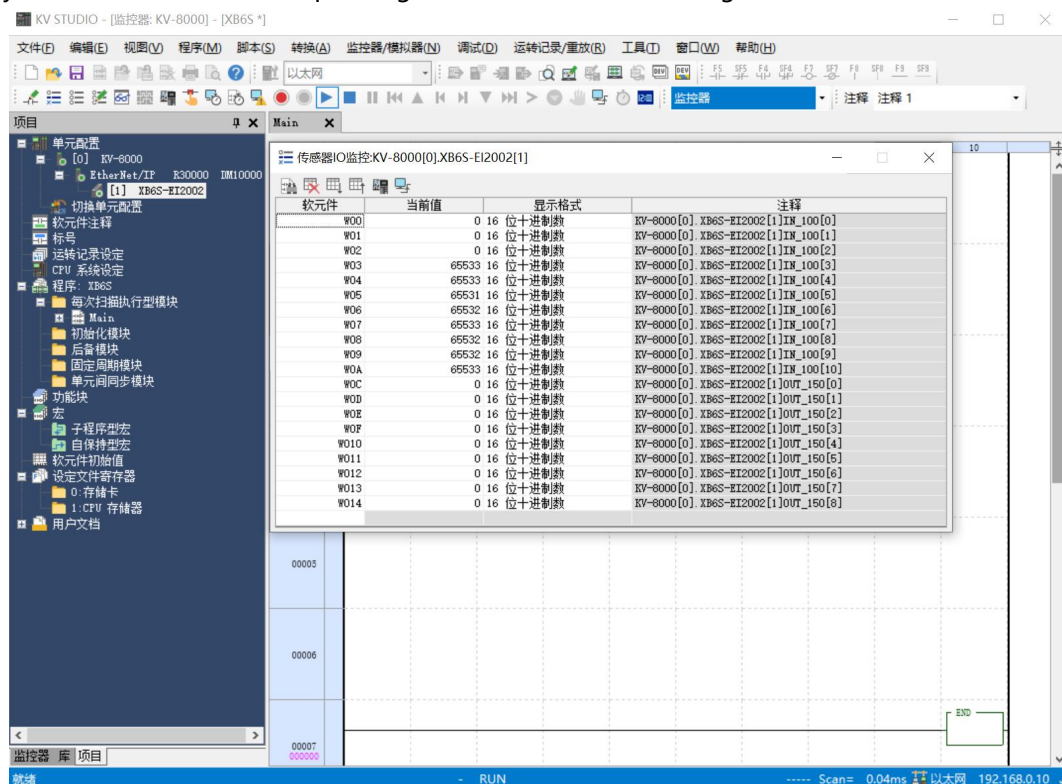


- e. After the configuration is downloaded, it will look like the image below.



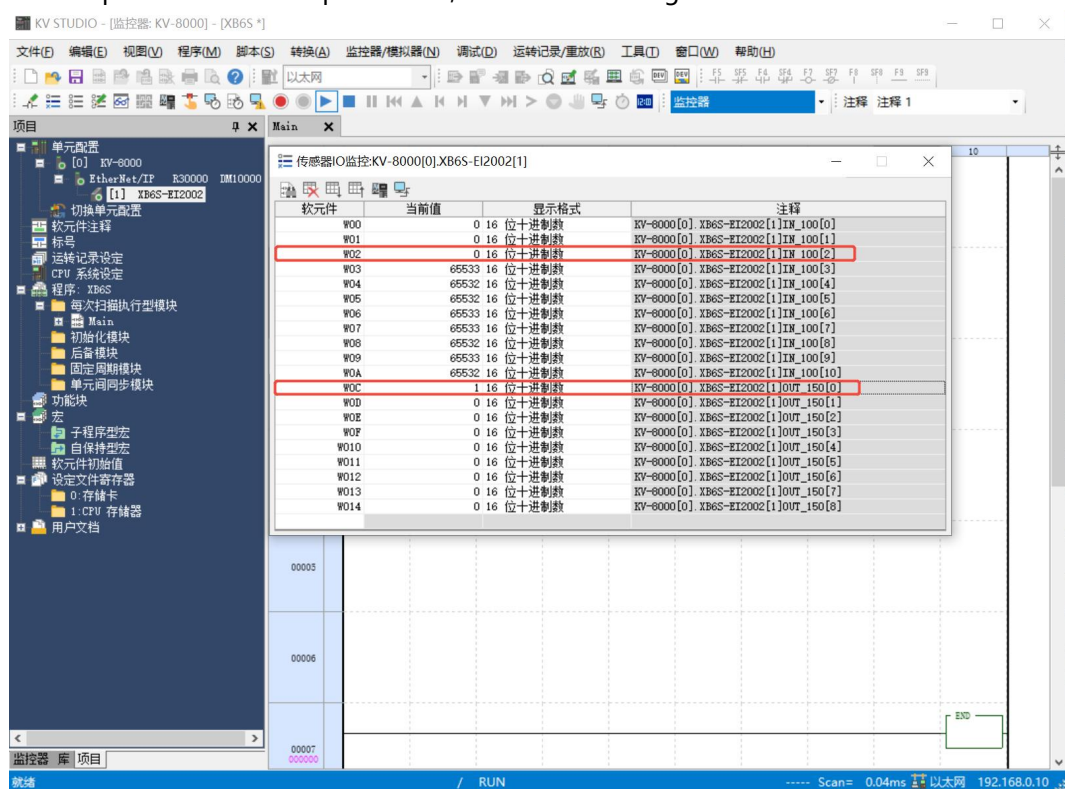
10. Data monitoring

- a. In monitoring mode, double-click the "XB6S-EI2002" icon to open the monitoring table, where you can monitor the corresponding module, as shown in the figure below.

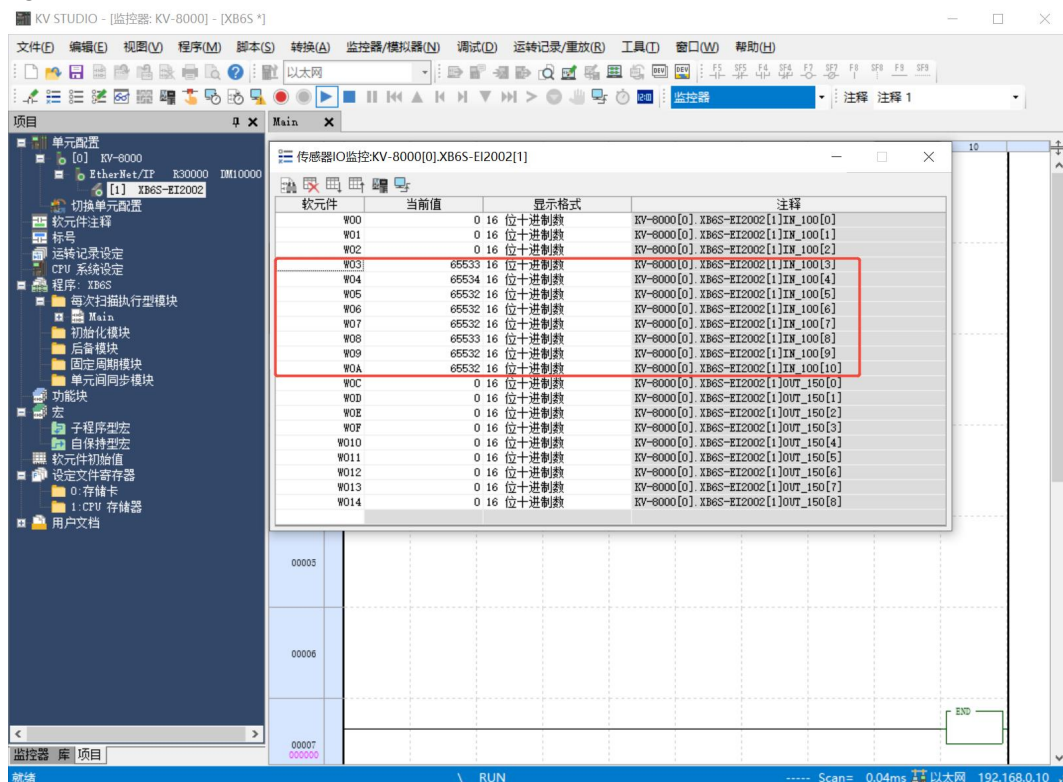


- b. When there is a valid voltage input to the input channel of the XB6S-1616B module, it can be

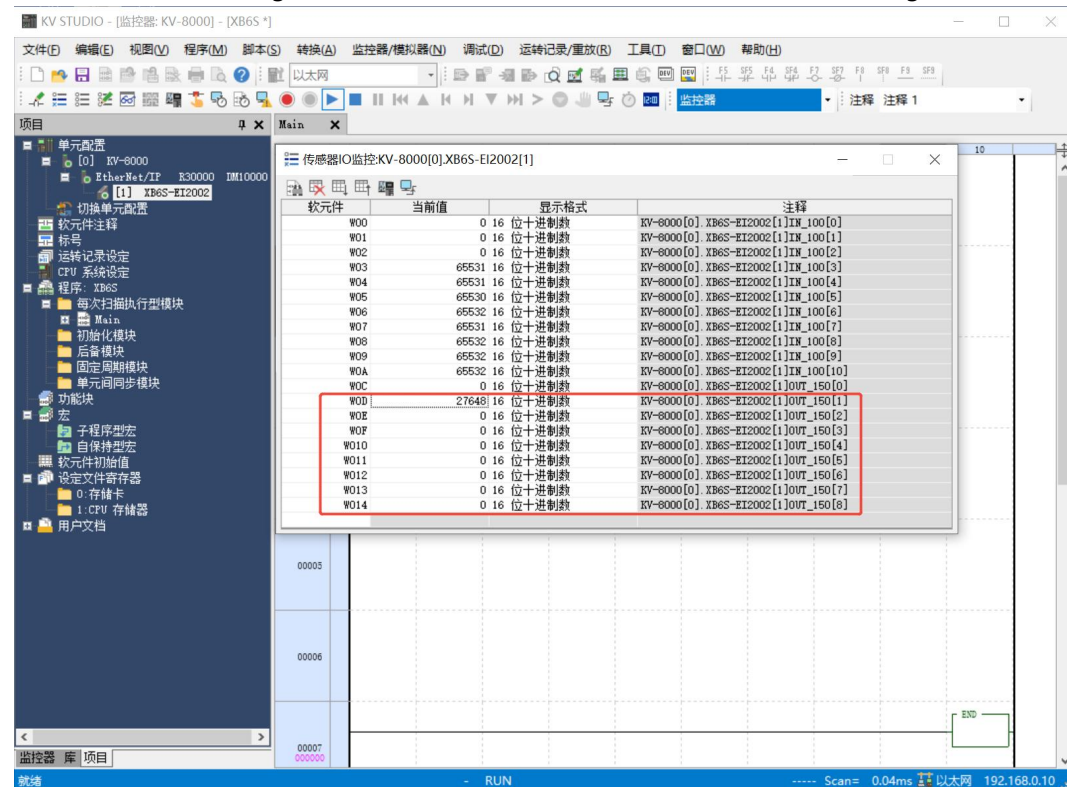
observed in the current value of W02; the output channel can be modified by double-clicking W0C to perform forced output control, as shown in the figure below.



- c. When there is voltage input to a channel of the XB6S-A80VD module, the input voltage code value of each channel can be observed in the current values of W03~W0A, as shown in the figure below.

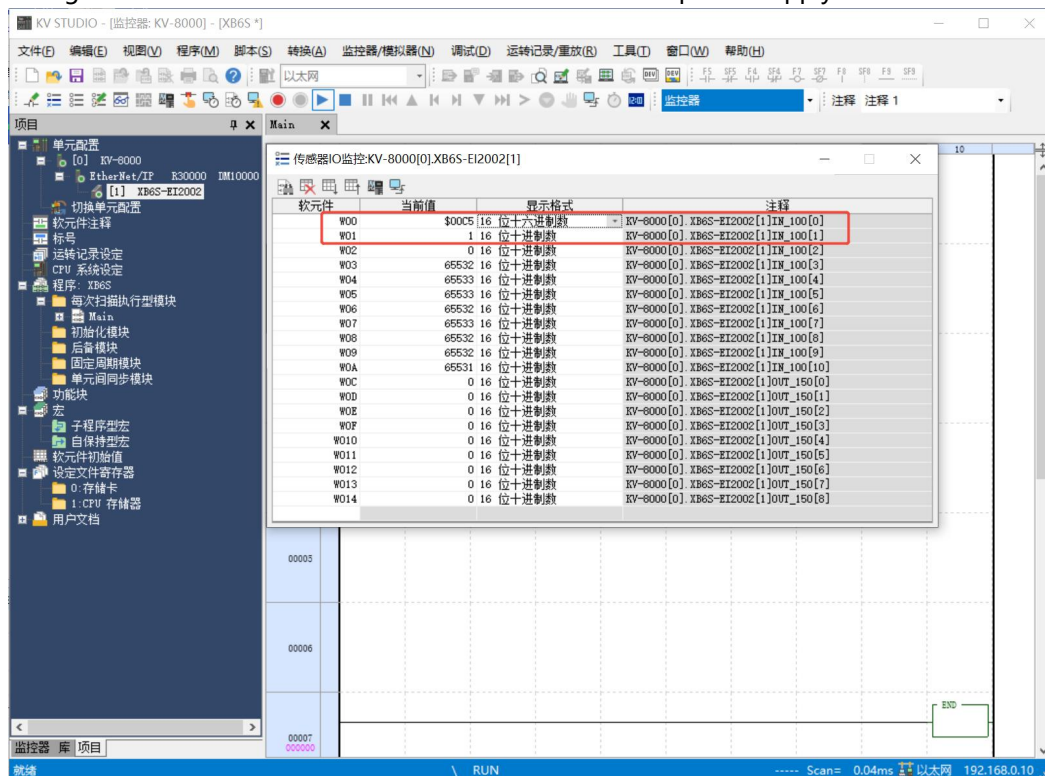


- d. The XB6S-A08I module can force output for each channel by double-clicking the current value of W0D~W014 and writing it into the current code value table, as shown in the figure below.

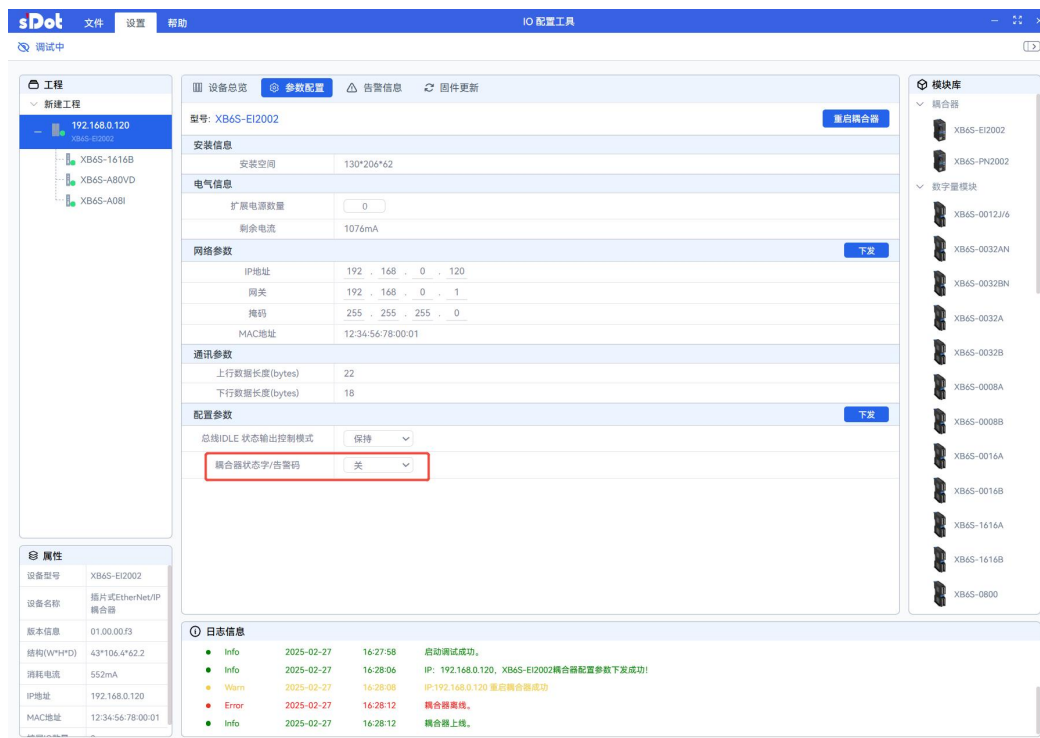


11、 Fault Code Viewing

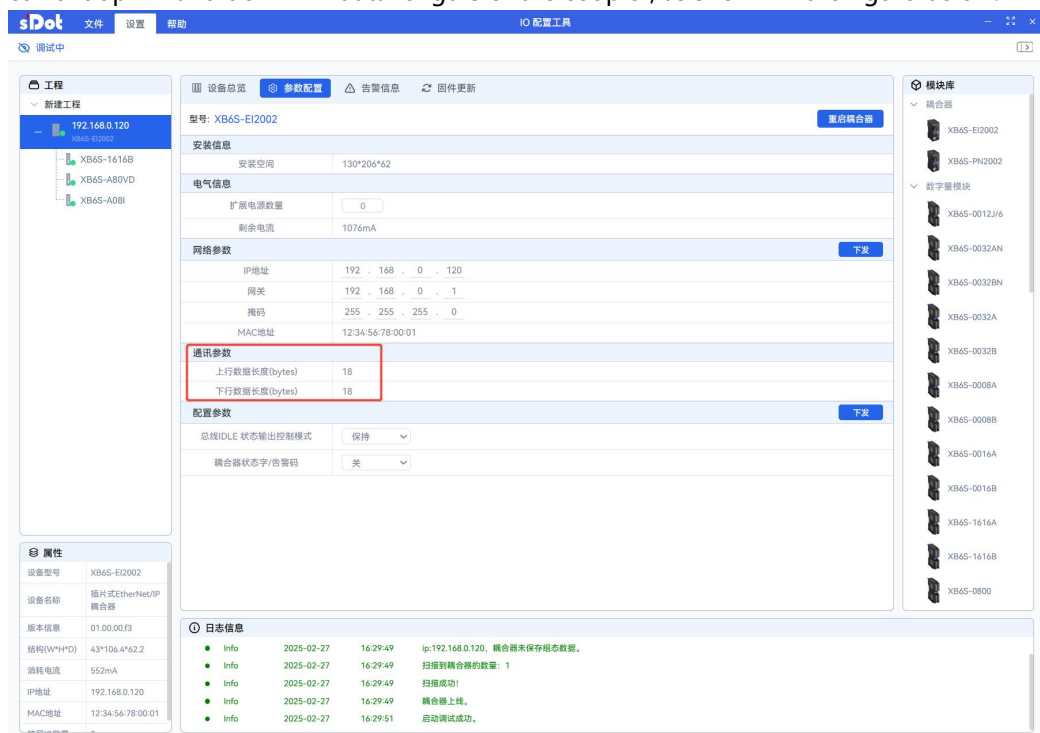
- a. When the load-side voltage of the XB6S-1616B module is not connected, the fault code can be observed from the current values of W00~W01. W00 corresponds to the alarm code of the module, and W01 corresponds to the station number of the module, as shown in the figure below. The alarm code is Hex: 00c5, which means that the voltage is wrong and the load-side voltage is not connected. You can check whether the field power supply is connected.



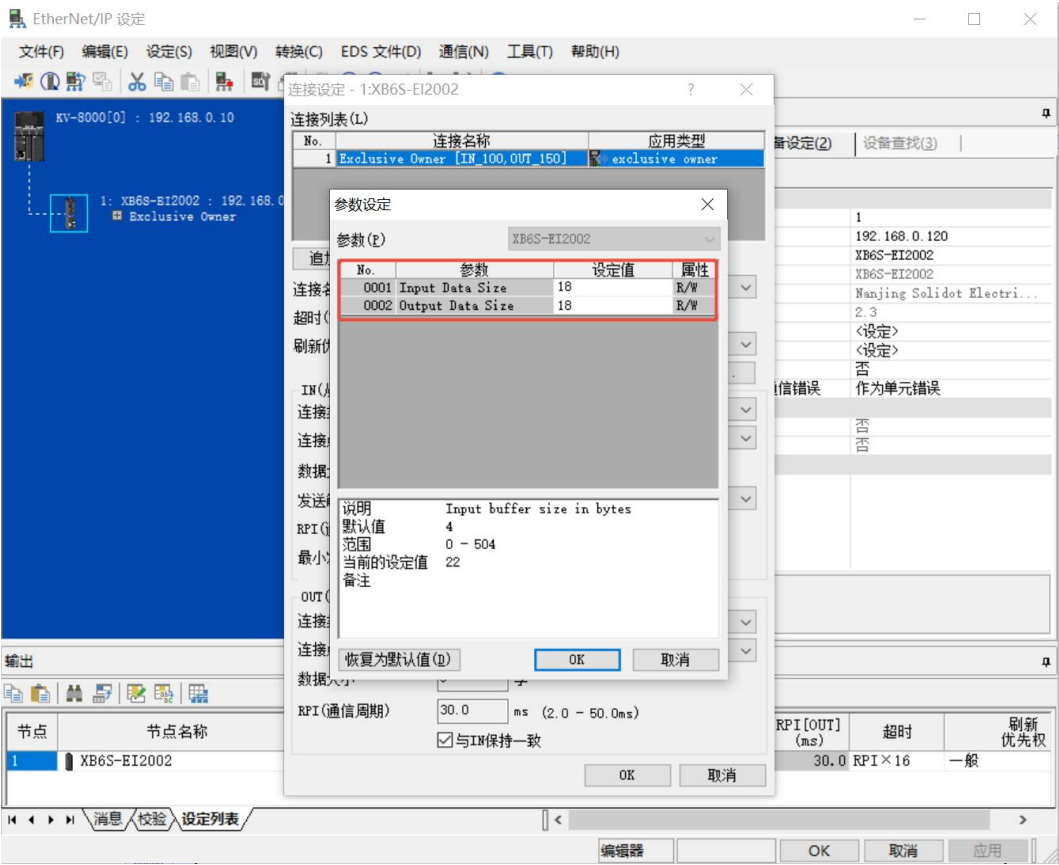
- b. To disable the coupler status word/alarm code viewing function using the IO Config Tool software, access the parameter configuration page of the XB6S-EI2002, select "Off" in the drop-down box for the coupler status word/alarm code parameter, click "Issue", and then click "Restart Coupler" or power on the device again, as shown in the figure below.



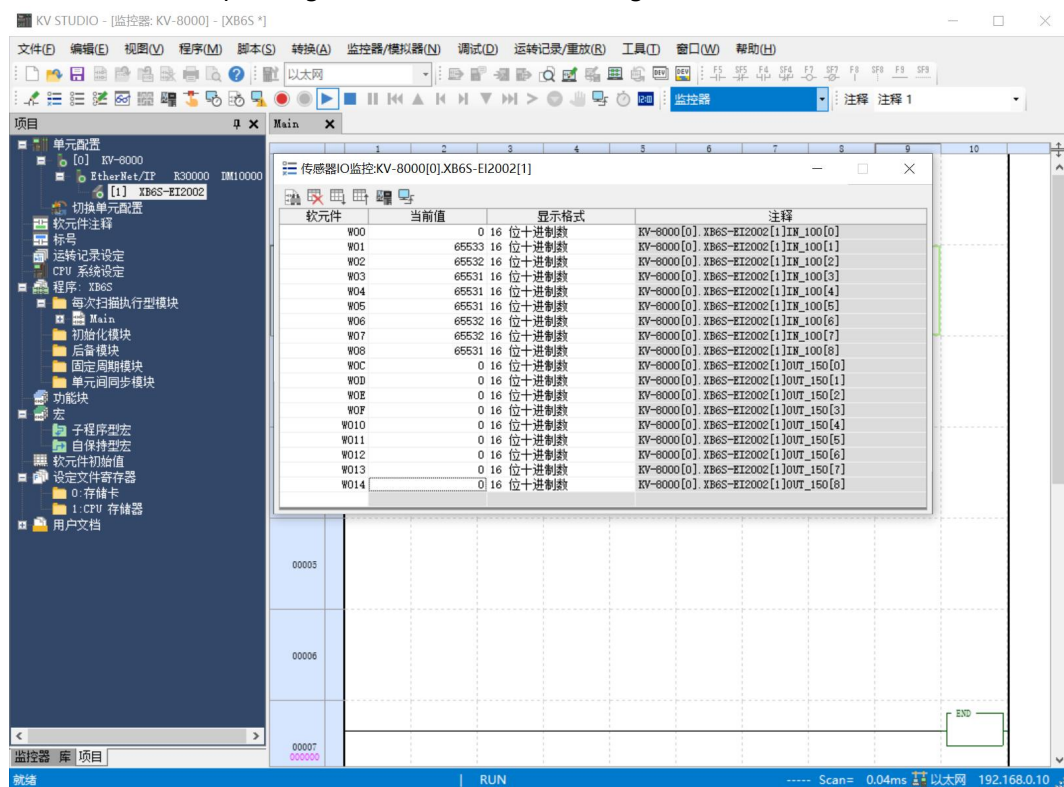
- c. After the coupler is online, you can click on the coupler's configuration parameters to view the current uplink and downlink data lengths of the coupler, as shown in the figure below.



- d. In KV STUDIO Ver.10GThe software's "parameter settings"etup parameterIn the window, modify the length of the upstream and downstream data, as shown in the image below. After setting, re-download the program to P.LCmiddle.



- e. In monitoring mode, double-click the "XB6S-EI2002" icon to open the monitoring table and monitor the corresponding module, as shown in the figure below.

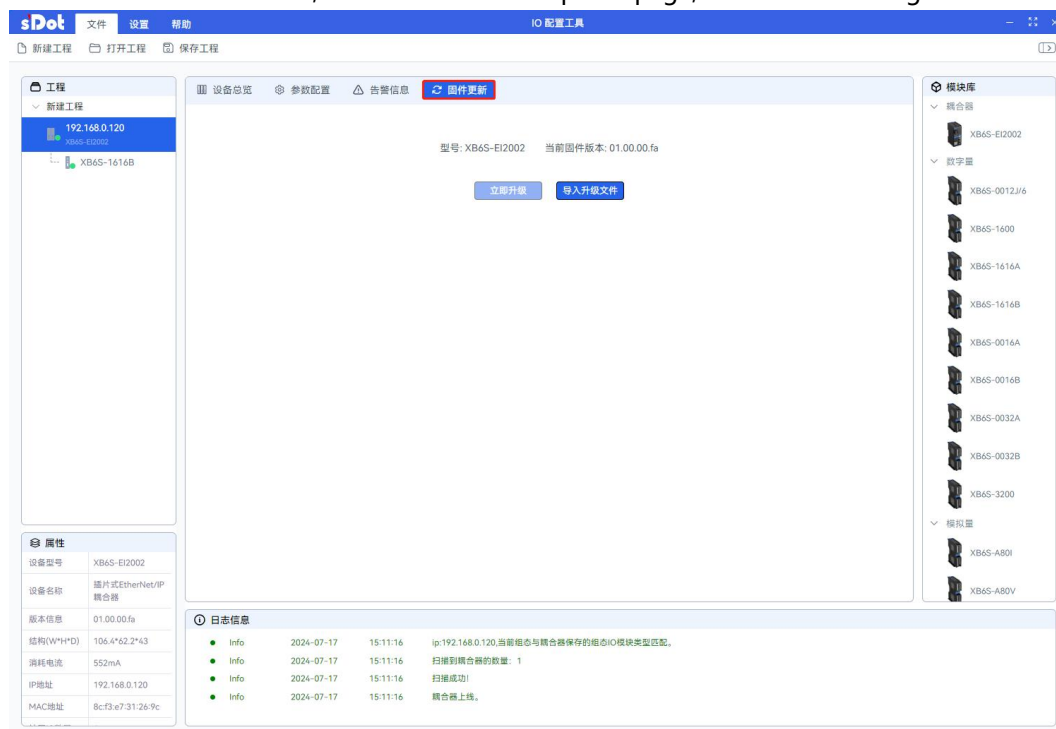


When the coupler status word/alarm code function is turned off, the current soft component and module correspondence is shown in the table below:

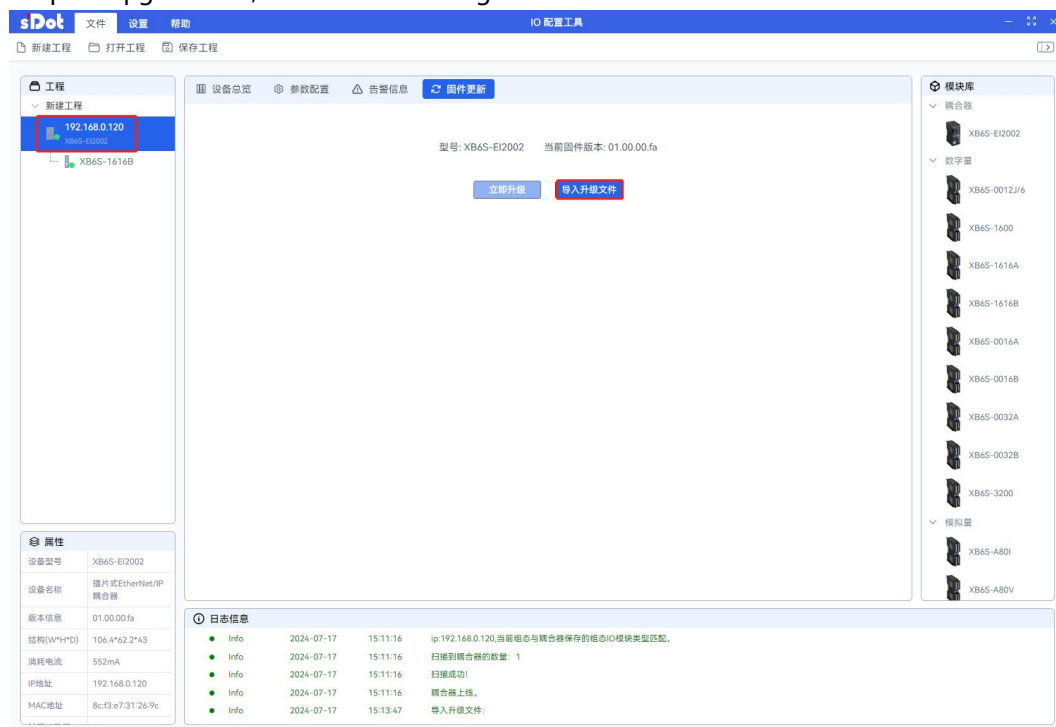
soft components	Corresponding module
W00	XB6S-1616B input channels
W01~W08	XB6S-A80VD
W0C	XB6S-1616B output channels
W0D~W014	XB6S-A08I

6.7 Firmware online upgrade

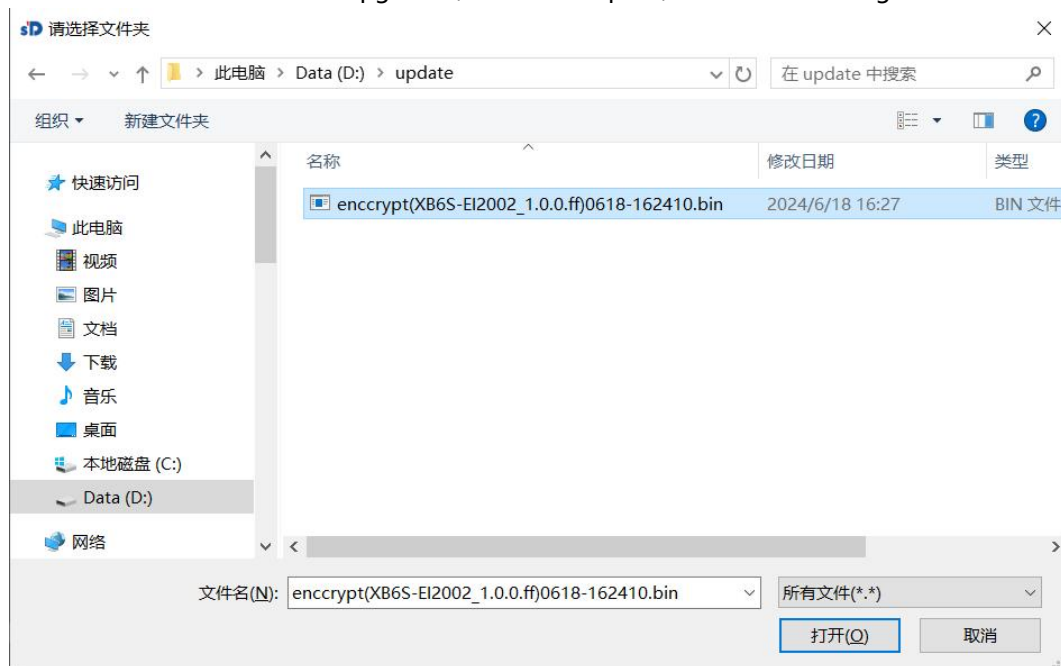
- 1、Taking the IO Config Tool software as an example, with the topology being XB6S-EI2002+XB6S-1616B, enter the firmware update page, as shown in the figure below.



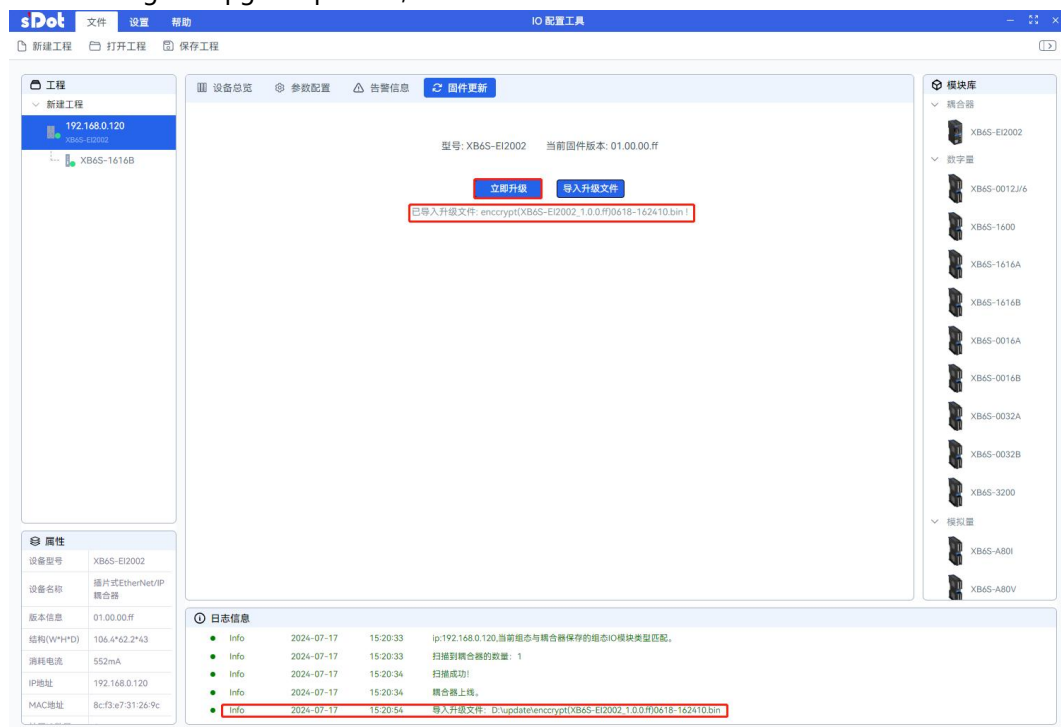
- 2、To upgrade the XB6S-EI2002 coupler, click "XB6S-EI2002" in the project pane on the left, then click "Import Upgrade File," as shown in the figure below.



- 3、 In the pop-up file opening window, select the "All Files" option, select the bin file corresponding to the module that needs to be upgraded, and click "Open", as shown in the figure below.



- 4、 After the upgrade file is successfully imported, click "Upgrade Now," as shown in the image below.
Note: During the upgrade process, other buttons in the software cannot be clicked.



5、Successful upgrade process for different modules

EtherNet/IP coupler online upgrade:

- 1) Once the progress bar is full, the IOR of the coupler starts flashing at 10Hz (on for 50ms and off for 50ms);
- 2) The IOR (Interference Orbit) changes from flashing at 10Hz to flashing at 1Hz, indicating a successful upgrade.

Online upgrade of IO module:

- 1) Once the progress bar is full, the coupler IOR and the SYS of the module being upgraded begin to flash at 10Hz (50ms on and 50ms off);
- 2) The SYS signal of the module being upgraded changes from 10Hz to off, indicating a successful upgrade (a power cycle is required after the upgrade to reconnect properly).
- 3) Other modules can be upgraded without interrupting power.