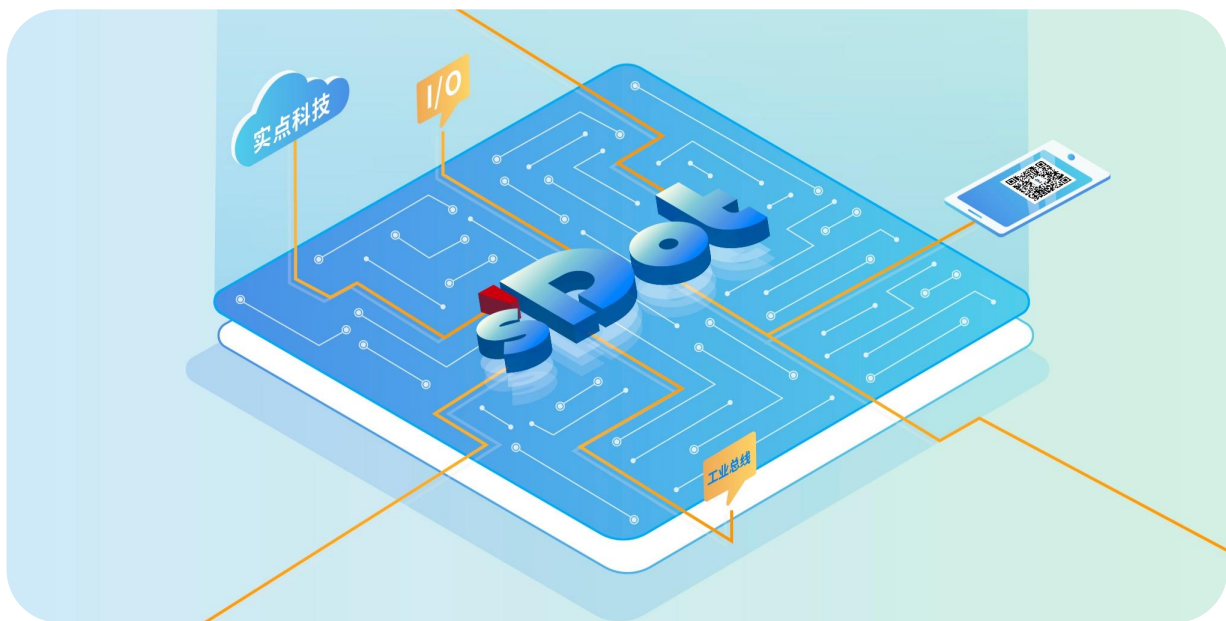




**EtherNet/IP**

**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.

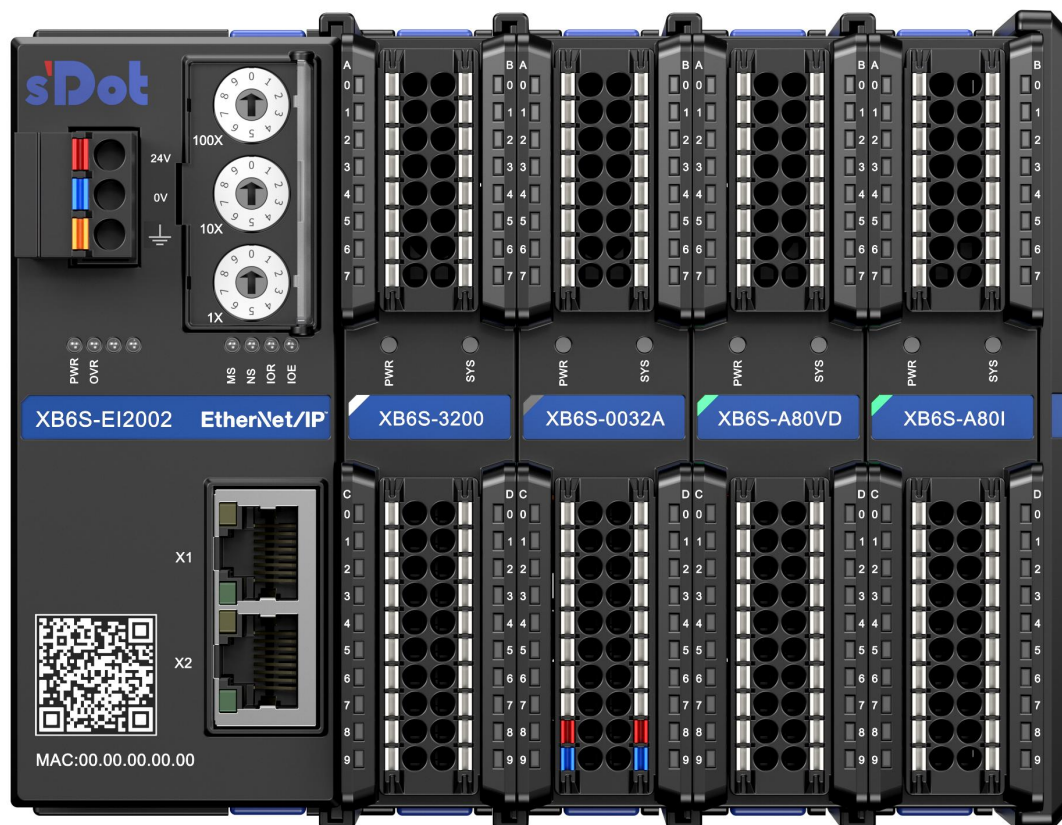
**Application method:** Applications employ a combination of modules such as couplers, digital signals, analog signals, temperature sensors, and extended power supplies.

**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.

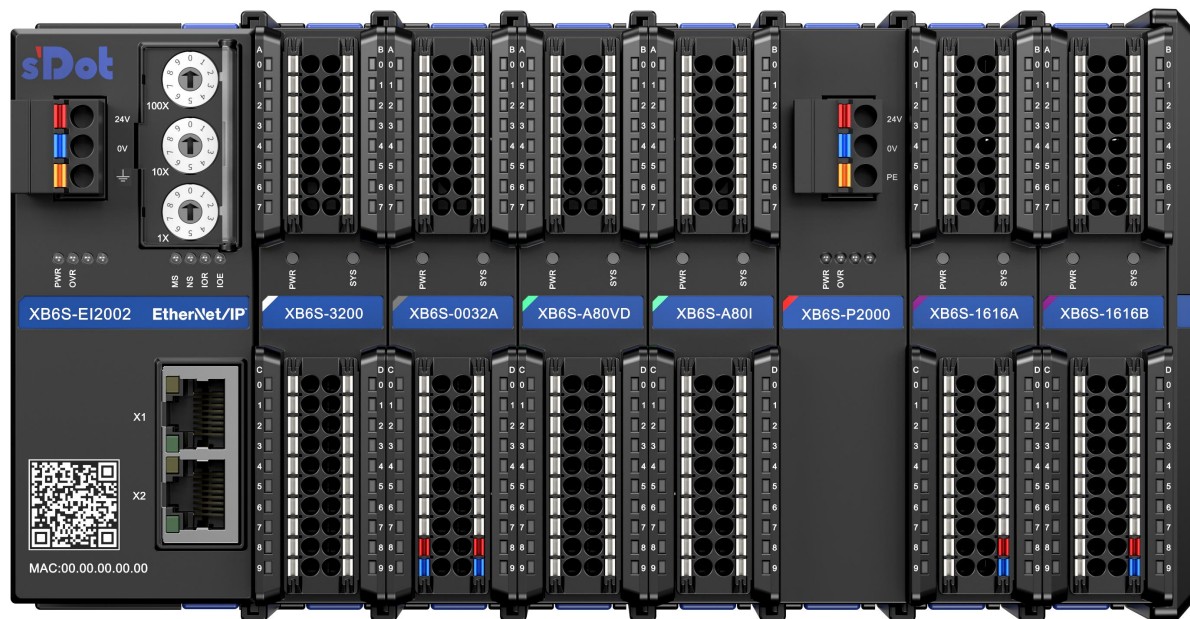
**Configuration rules:** The modules, from left to right, consist of a coupler module, a power module, an I/O module, and a terminal cover (which must be configured).

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<br>PN: PROFINET<br>EI: EtherNet/IP |
| (5)           | Power supply            | 20:2A                                           |
| (6)           | Number of network ports | 02: Dual network ports                          |

## 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<br>Default: Digital              |                    |        |                |         |                                                                                              |
| (5)           | Number of input signal points  | Analog: 0, 4, 8<br>Digital: 00, 08, 16, 32 |                    |        |                |         |                                                                                              |
| (6)           | Number of output signal points | Analog: 0, 4, 8<br>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<br>-10V~+10V, 0V~10V<br>-5V~+5V, 0V~5V, 1V~5V |
|               |                                | B                                          |                    | PNP    | /              |         |                                                                                              |
|               |                                | N                                          |                    | /      | MIL connectors | VD      | Differential signal, adjustable range: Disable<br>-10V~+10V, 0V~10V<br>-5V~+5V, 0V~5V, 1V~5V |
|               |                                | AN                                         |                    | NPN    |                |         |                                                                                              |
|               |                                | BN                                         |                    | PNP    |                |         |                                                                                              |
|               |                                | default                                    | NPN/PNP compatible | /      |                | I       | Single-ended signal, adjustable range: Disable<br>4mA~20mA, 0mA~20mA                         |
|               |                                | J                                          | /                  | relay  |                | ID      | Differential signal, adjustable range: Disable<br>4mA~20mA, 0mA~20mA<br>-20mA~+20mA          |
|               |                                |                                            |                    |        |                | default | Single-ended signal,                                                                         |

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

## 2.2 Module list

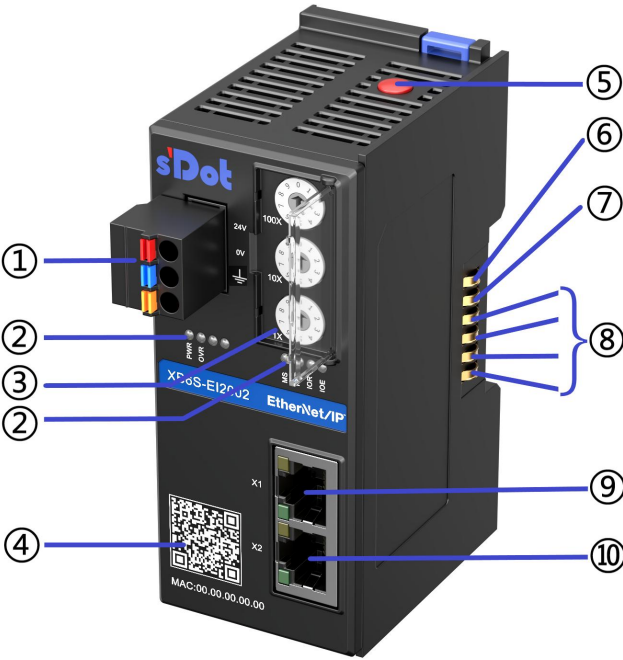
| Model        | Product Description                                                                                                                           |                                                                                          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| XB6S-EI2002  | EtherNet/IP busCoupler module                                                                                                                 |                                                                                          |
| XB6S-3200    | 32-channel digital input module, NPN/PNP compatible input, input filtering default 3ms                                                        |                                                                                          |
| XB6S-1600    | 16-channel digital input module, NPN/PNP compatible input, input filtering default 3ms                                                        |                                                                                          |
| XB6S-0800    | 8-channel digital input module, NPN/PNP compatible input, input filtering default 3ms                                                         |                                                                                          |
| XB6S-1616A   | 16-channel digital input/16-channel digital output module<br>Input is NPN/PNP compatible, input filtering default is 3ms, output is NPN type. |                                                                                          |
| XB6S-1616B   | 16-channel digital input/16-channel digital output module<br>Input is NPN/PNP compatible, input filtering 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 filtering 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:<br>Disable, 4mA~20mA, 0mA~20mA                                                                 |
| XB6S-A08V  | 8-channel analog voltage output module                                                                                                           | Single-ended signal, adjustable range:<br>Disable, -10V~+10V, 0V~10V, -5V~+5V,<br>0V~5V, 1V~5V                                        |
| XB6S-A04V  | 4-channel analog voltage output module                                                                                                           | Single-ended signal, adjustable range:<br>Disable, -10V~+10V, 0V~10V, -5V~+5V,<br>0V~5V, 1V~5V                                        |
| XB6S-A08I  | 8-channel analog current output module                                                                                                           | Single-ended signal, adjustable range:<br>Disable, 4mA~20mA, 0mA~20mA                                                                 |
| XB6S-A04I  | 4-channel analog current output module                                                                                                           | Single-ended signal, adjustable range:<br>Disable, 4mA~20mA, 0mA~20mA                                                                 |
| XB6S-A80   | 8-channel analog current & voltage compatible input module                                                                                       | Single-ended signal, adjustable range:<br>Disable, 0mA~20mA, 4mA~20mA,<br>-20mA~+20mA.<br>-10V~+10V, 0V~10V, -5V~+5V, 0V~5V,<br>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:<br>Disable, 0mA~20mA, 4mA~20mA,<br>-10V~+10V, 0V~10V.<br>-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-P2000 | Extended power module                                                                                                                            |                                                                                                                                       |
| XB6S-C18_2 | Public End Extension Module                                                                                                                      |                                                                                                                                       |
| XB6S-CVR00 | Terminal cover                                                                                                                                   |                                                                                                                                       |

# 3 Module Introduction

## 3.1 EtherNet/IP Coupler

### 3.1.1 Panel structure



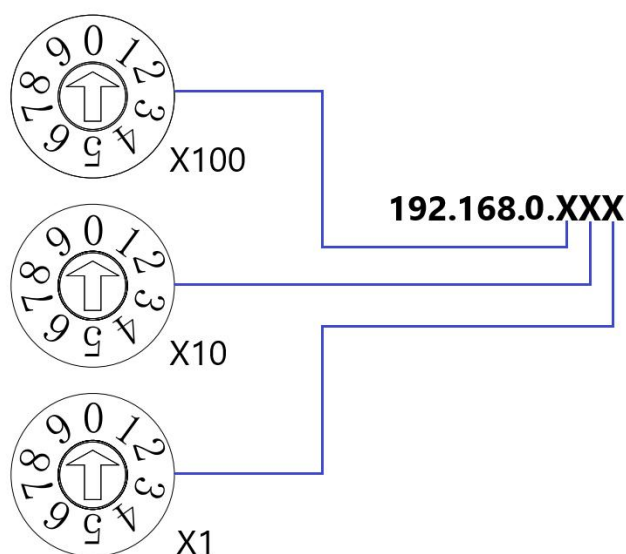
| Serial Number | Name                                               | Illustrate                                                 |
|---------------|----------------------------------------------------|------------------------------------------------------------|
| ①             | Power terminal                                     | 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<br>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.<br>The most significant 3 bytes of the IP address continue from the previous one.host computerSet value.<br>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<br>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

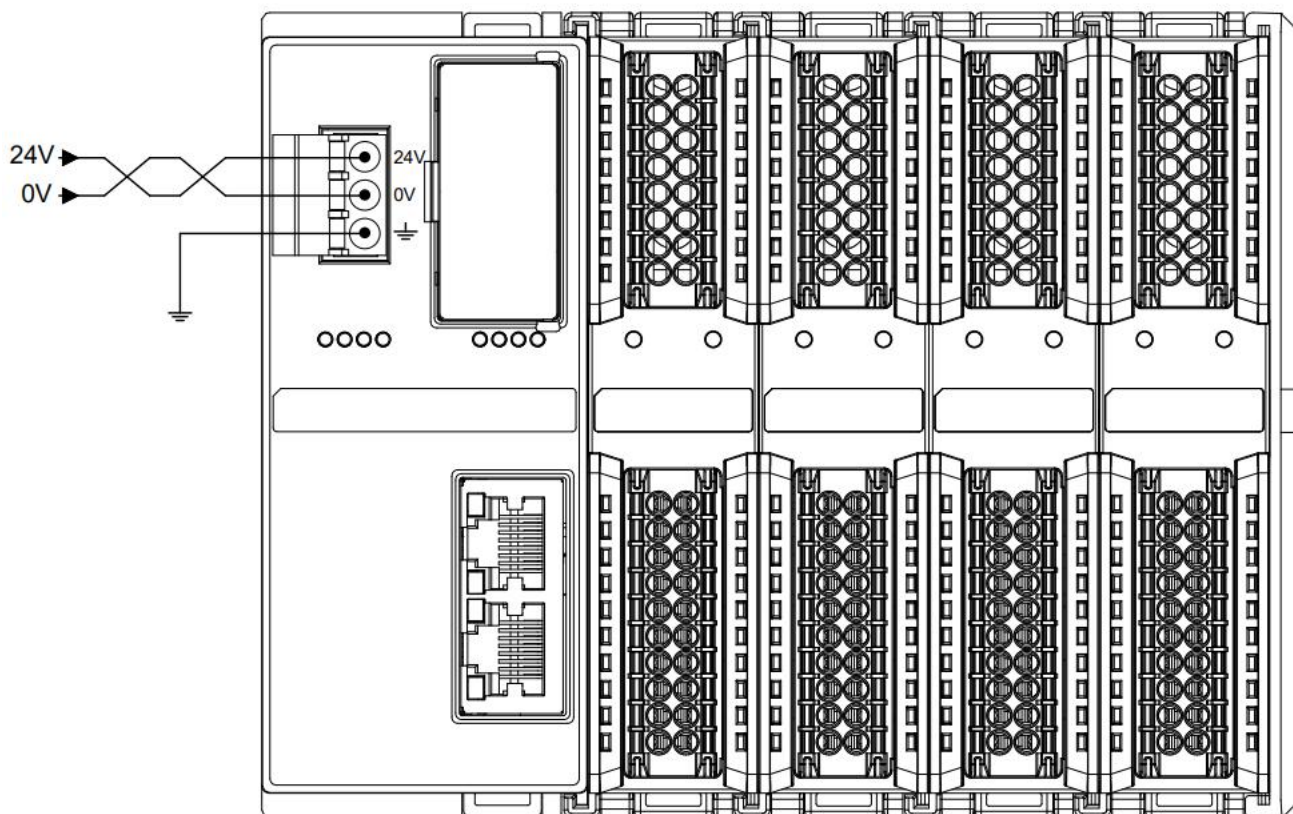
| General technical parameters  |                       |                                                                     |
|-------------------------------|-----------------------|---------------------------------------------------------------------|
| Specifications and dimensions |                       | 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<br>5Hz~8.4Hz,3.5mm,8.4Hz~150Hz,1g |

|  |                      |                                                                                                                                     |
|--|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|  |                      | X/Y/ZTriaxial10One cycle/Axial (1)00min)                                                                                            |
|  | Impact resistance    | IEC 60068-2-27Mechanical shock<br>150m/s <sup>2</sup> ,11ms, ±X/Y/Z Six directions<br>3Second-rate/Direction, Together18Second-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<br>EN 61131-2<br>EN IEC 61000-6-4<br>EN IEC 61000-6-2 |                                      |
|                                            |                         | LVD<br>EN 61010-1:2010/A1<br>EN IEC 61010-2-201           |                                      |
| RoHS certification                         |                         | EU Directive 2011/65/EU Annex II                          |                                      |

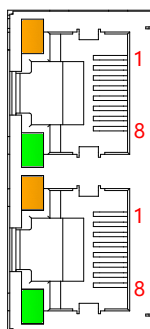
### 3.1.5 Power wiring diagram

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.



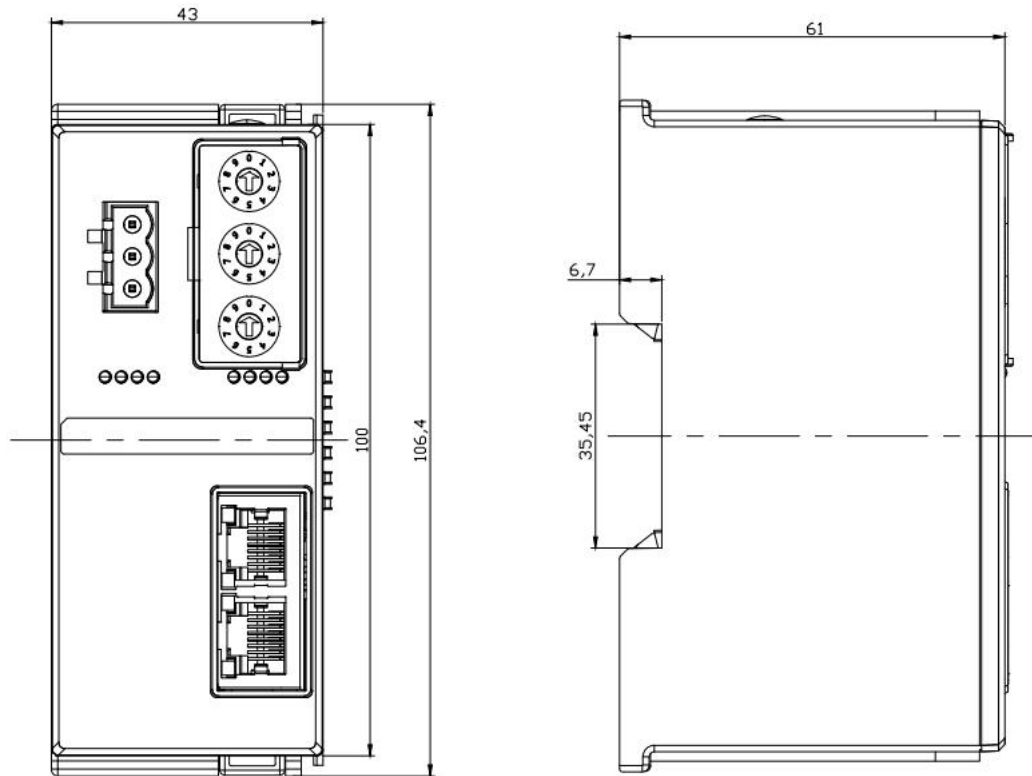
| pin number | Signal |
|------------|--------|
| 1          | TD+    |
| 2          | TD-    |
| 3          | RD+    |
| 4          | —      |
| 5          | —      |
| 6          | RD-    |
| 7          | —      |
| 8          | —      |

#### 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.

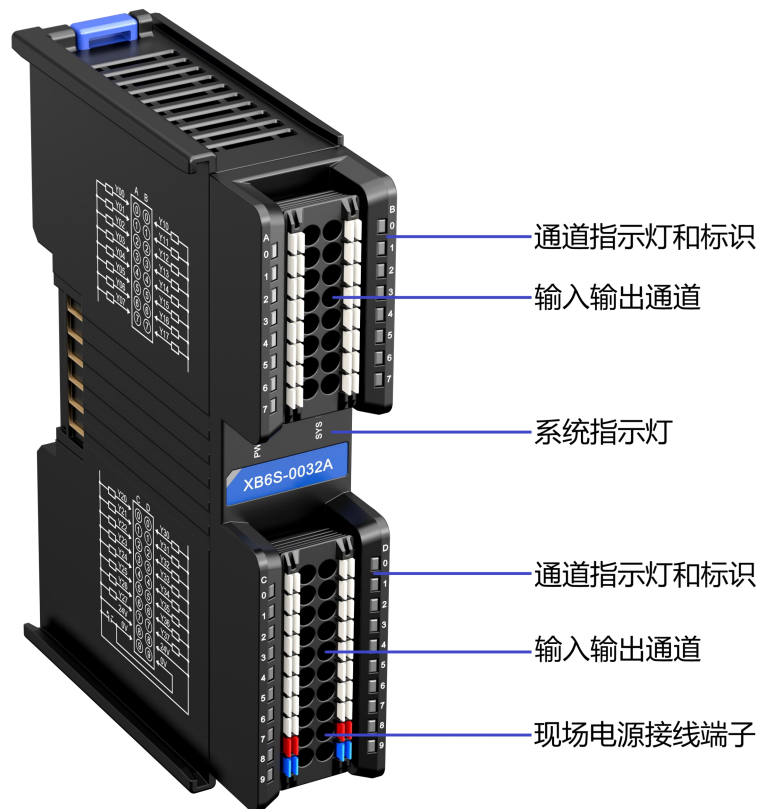
### 3.1.7 Outline Dimensions

#### 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<br>Sink input: NPN open-collector input form<br>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 filtering                      | No filtering, 0.1ms, 0.2ms, 0.5ms, 1ms, 2ms, 3ms (factory setting), 4ms...18ms, 19ms, 20ms                                 |            |           |           |
| Maximum input frequency              | 150Hz (Filtering 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<br>Sink input: NPN open-collector input form<br>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 filtering                      | No filtering, 0.1ms, 0.2ms, 0.5ms, 1ms, 2ms, 3ms (factory setting), 4ms...18ms, 19ms, 20ms                                 |            |
| Maximum input frequency              | 150Hz (Filtering 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) <a href="#">Figure 1</a>                                          |            | 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) <a href="#">Figure 1</a>                                          |      |       |       |
| 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) <a href="#">Figure 2</a> )                                                     |
| 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

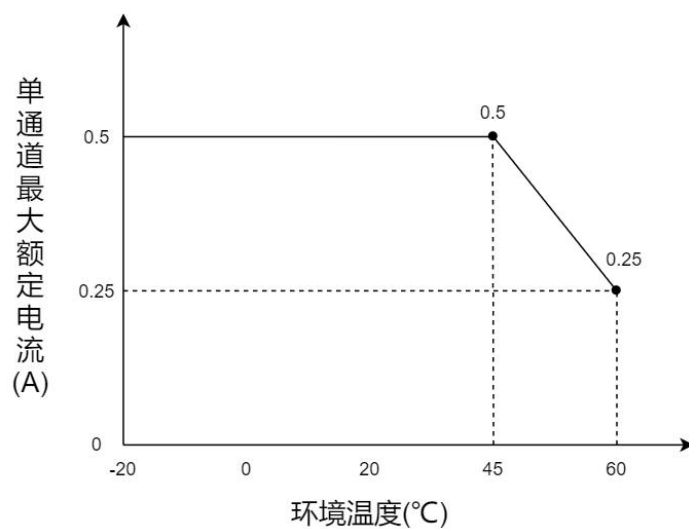
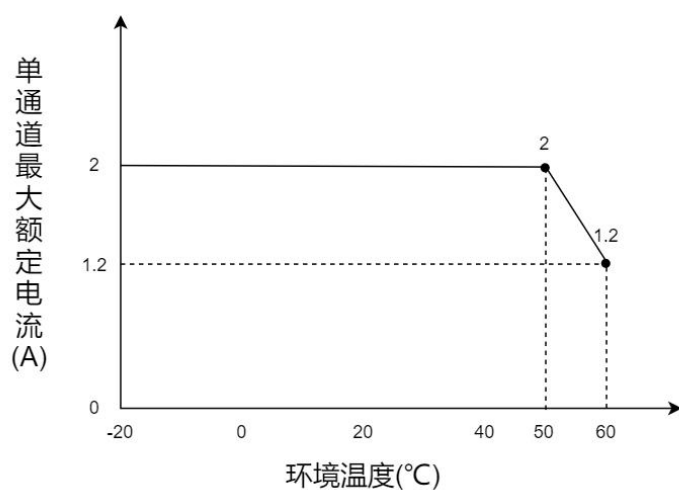


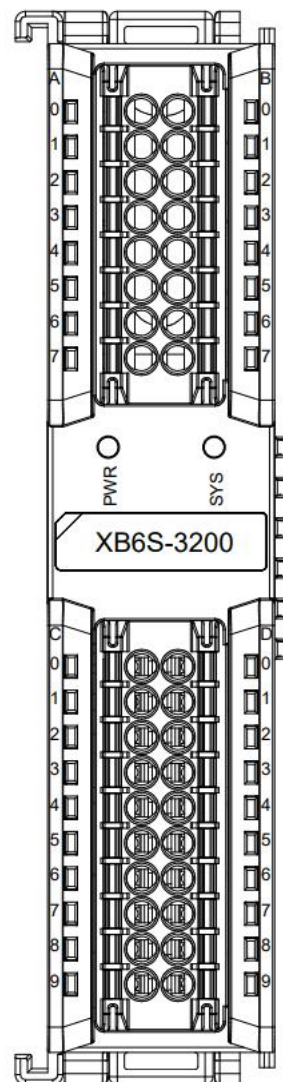
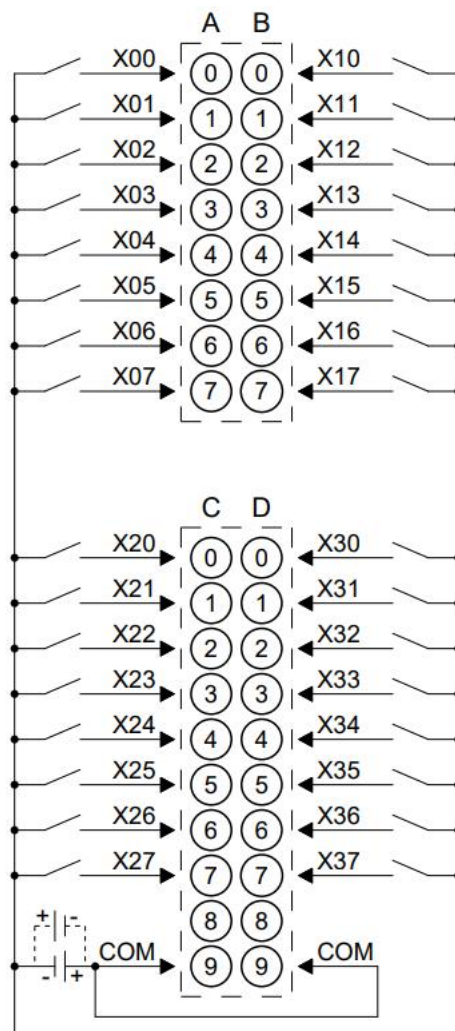
Figure 2:

继电器输出模块单通道最大额定电流与温度的关系图



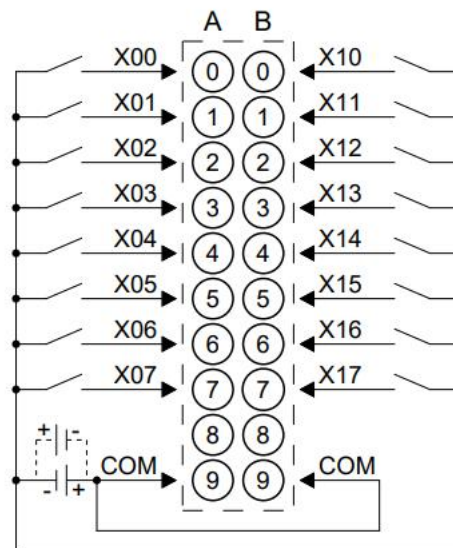
## 3.2.4 Wiring diagram

### 3.2.4.1 XB6S-3200

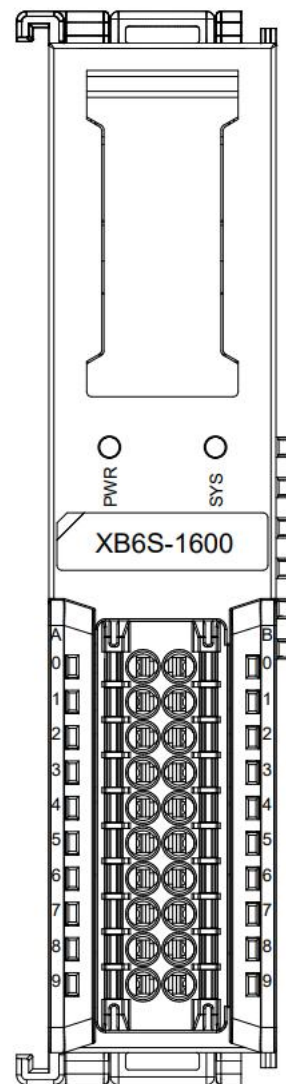


\*COM internal conduction; NPN/PNP compatible

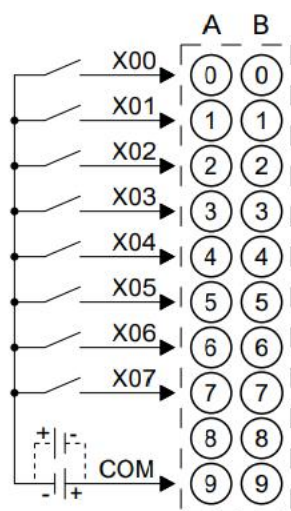
## 3.2.4.2 XB6S-1600



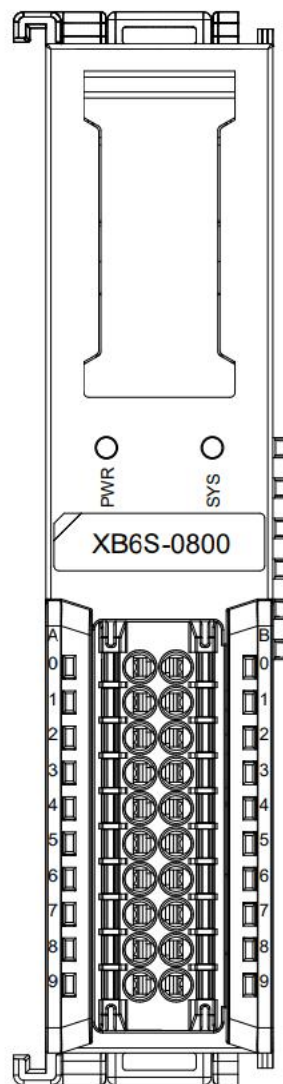
\*COM internal conduction; NPN/PNP compatible



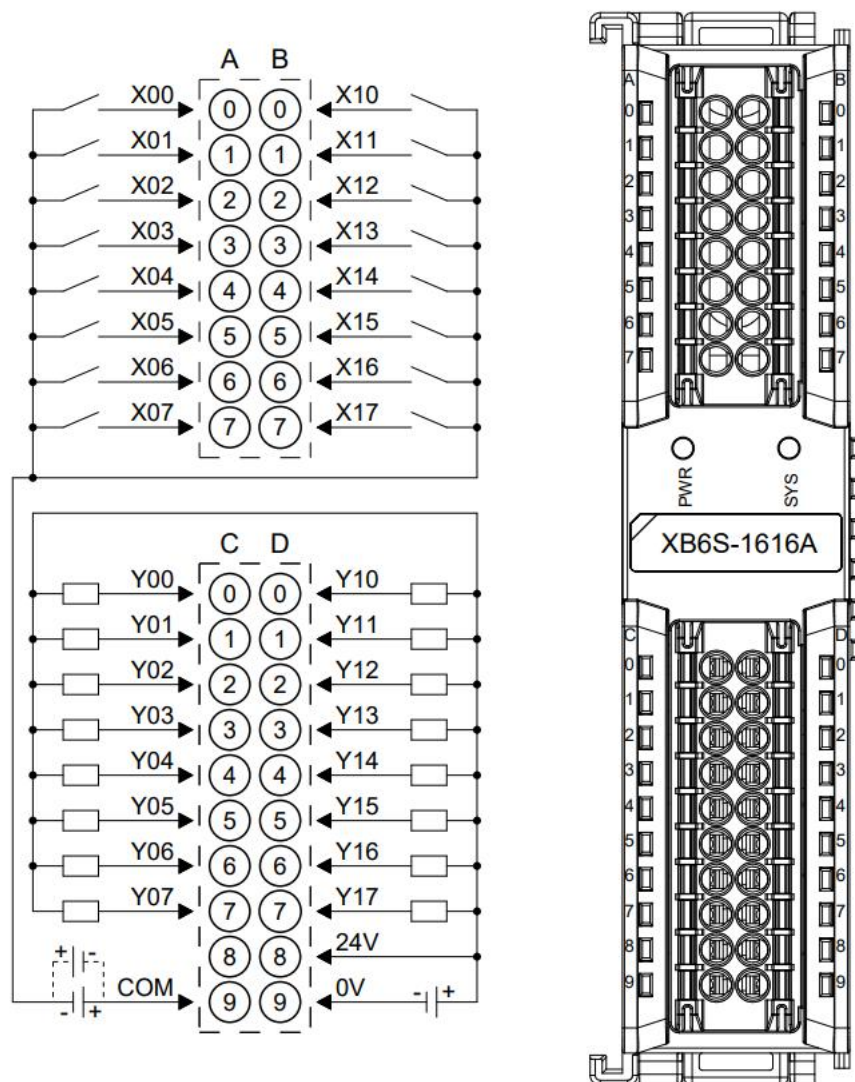
## 3.2.4.3 XB6S-0800



\*NPN/PNP compatible

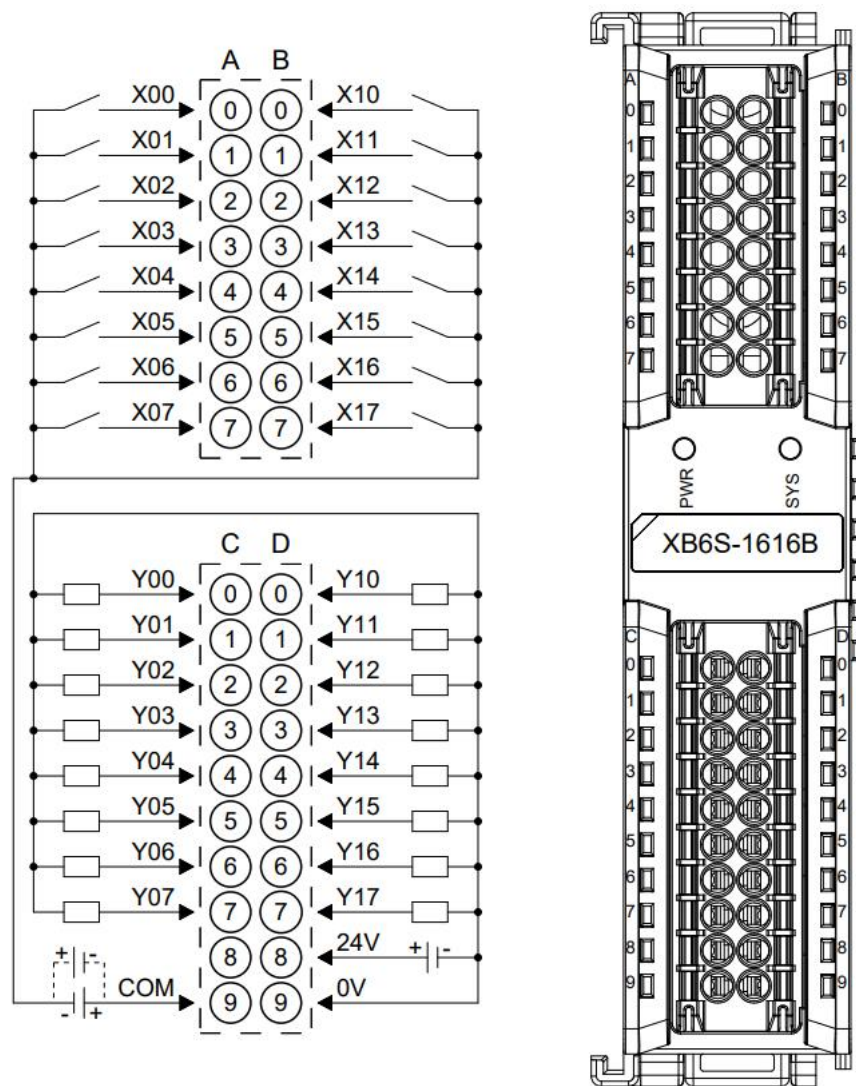


## 3.2.4.4 XB6S-1616A



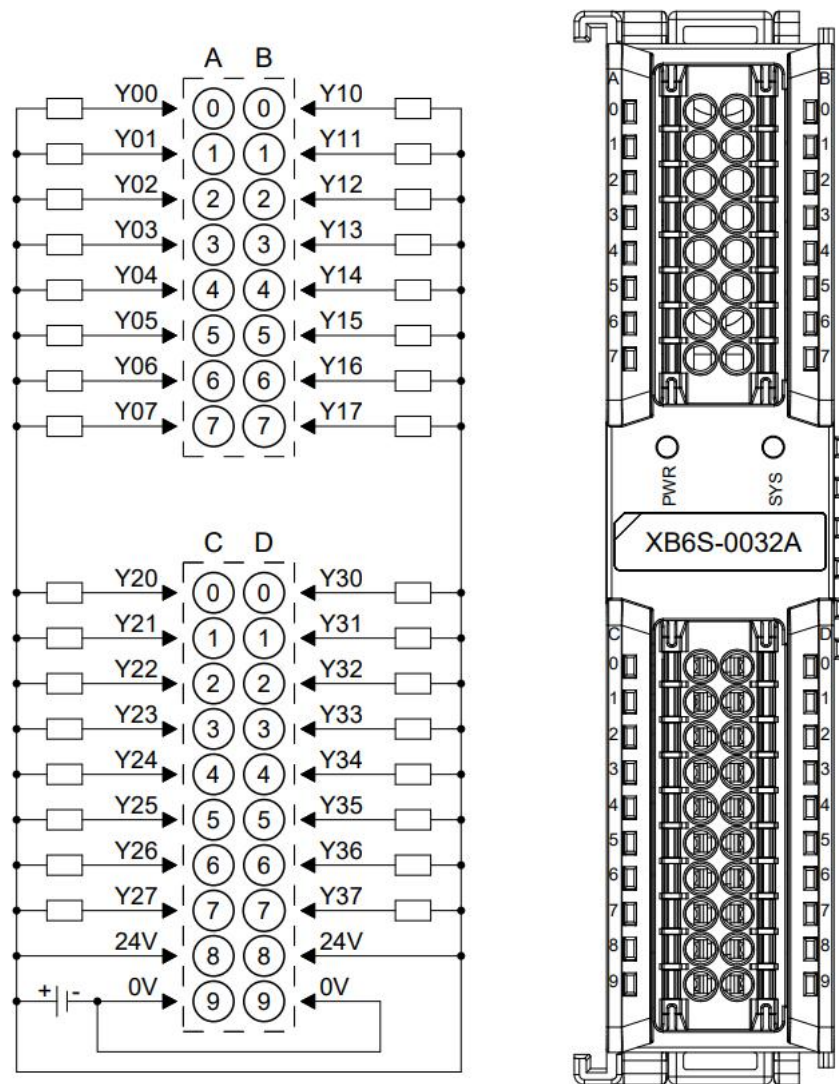
\*COM is the common terminal for DI, DI is NPN/PNP compatible, and DO is NPN.

## 3.2.4.5 XB6S-1616B



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

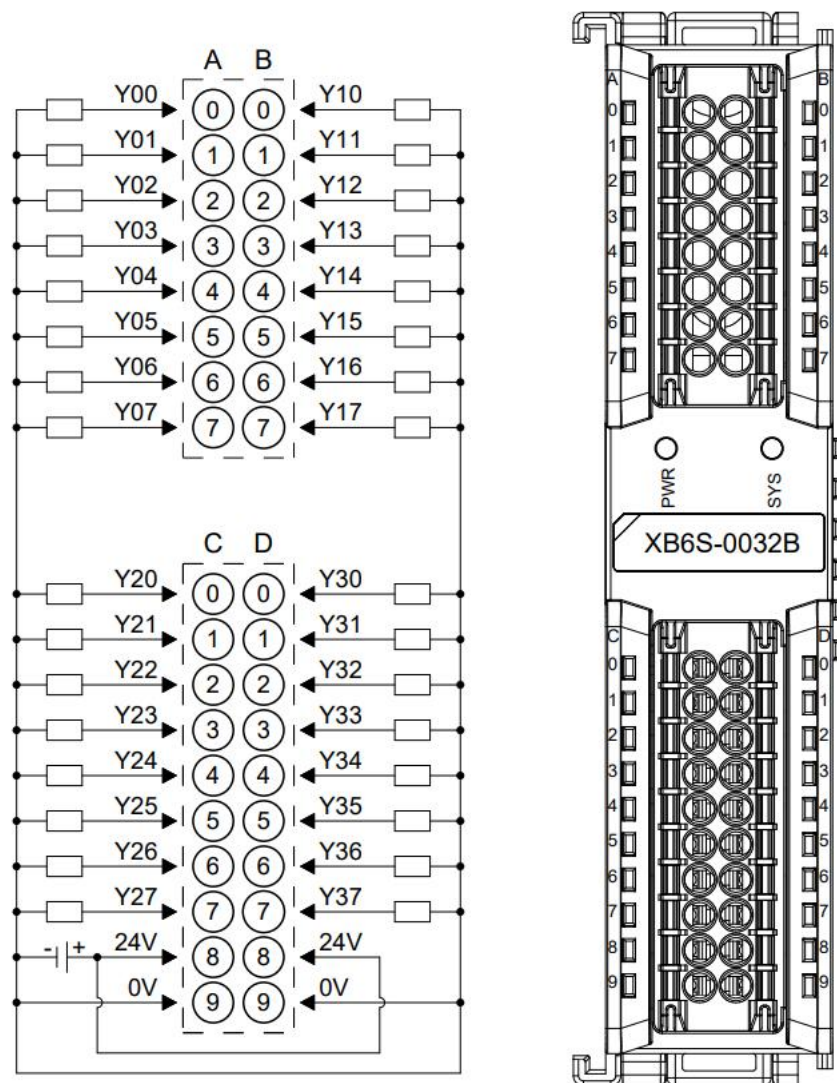
## 3.2.4.6 XB6S-0032A



\*24V internal conduction; 0V internal conduction

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

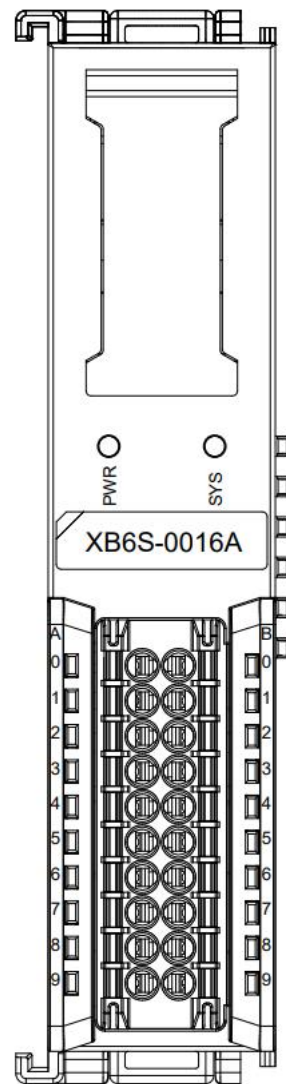
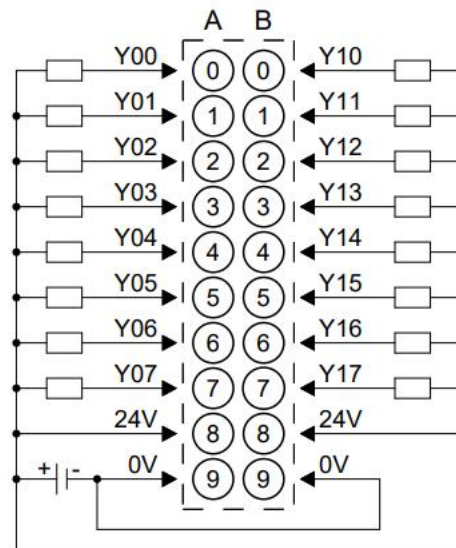
## 3.2.4.7 XB6S-0032B



\*24V internal conduction; 0V internal conduction

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

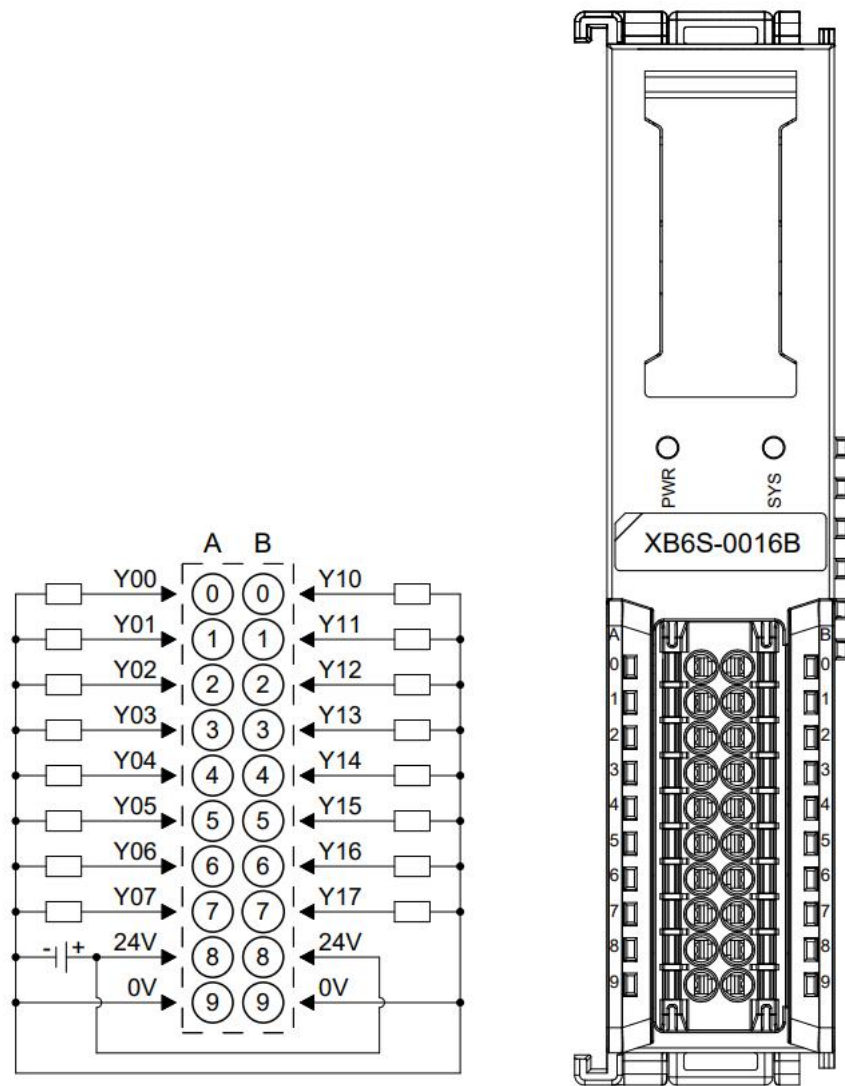
## 3.2.4.8 XB6S-0016A



\*24V internal conduction; 0V internal conduction

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

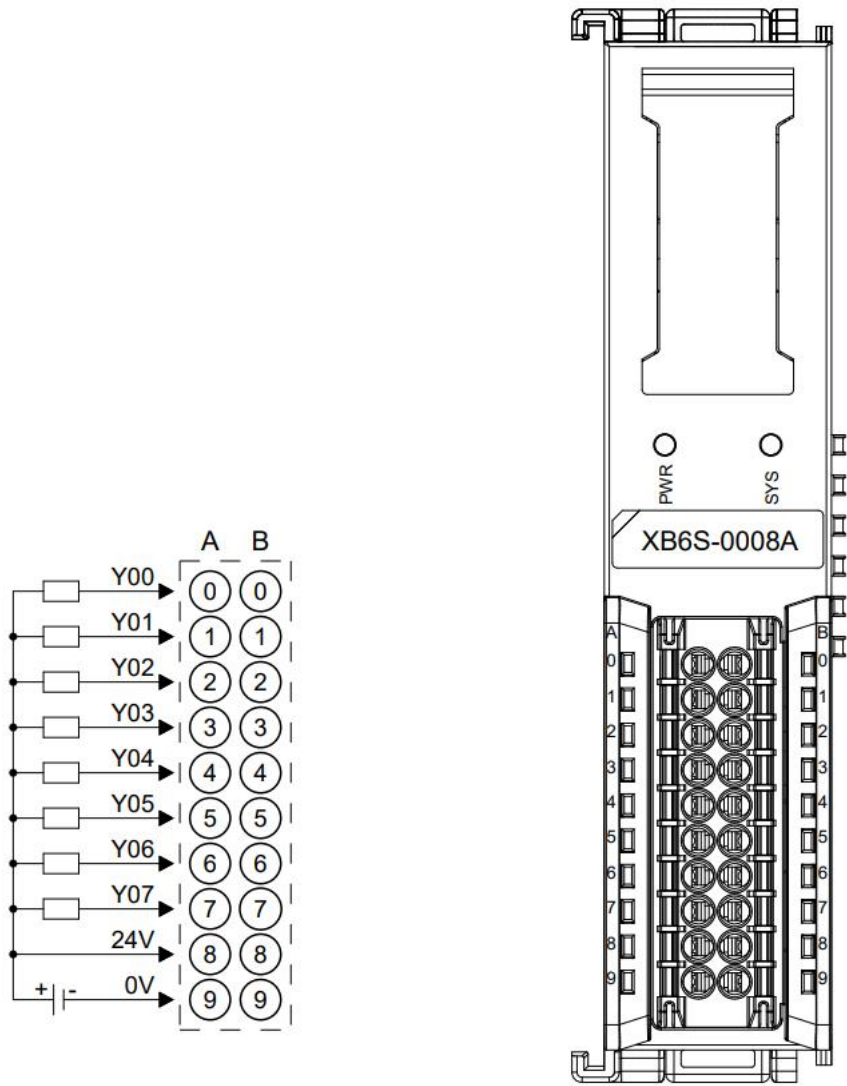
## 3.2.4.9 XB6S-0016B



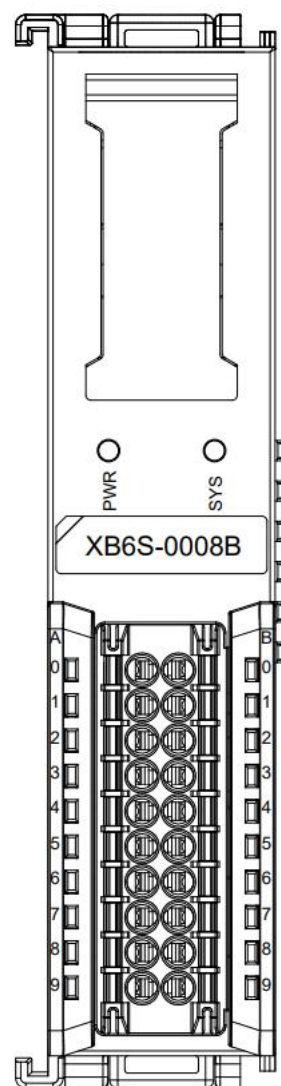
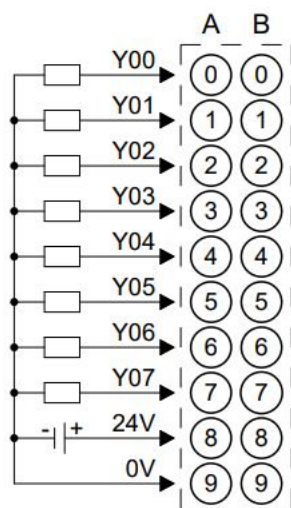
\*24V internal conduction; 0V internal conduction

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

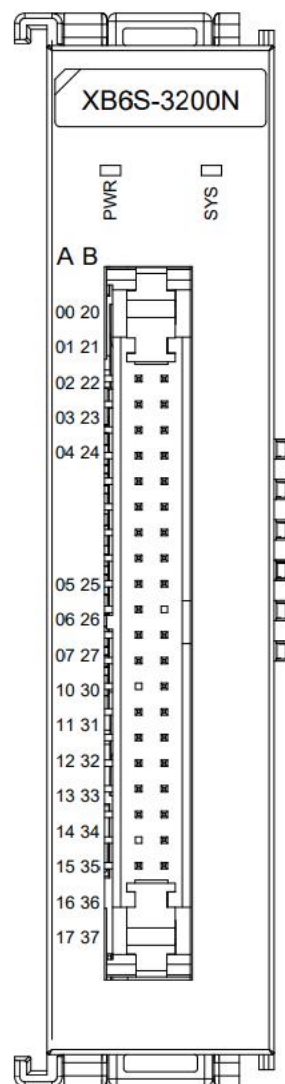
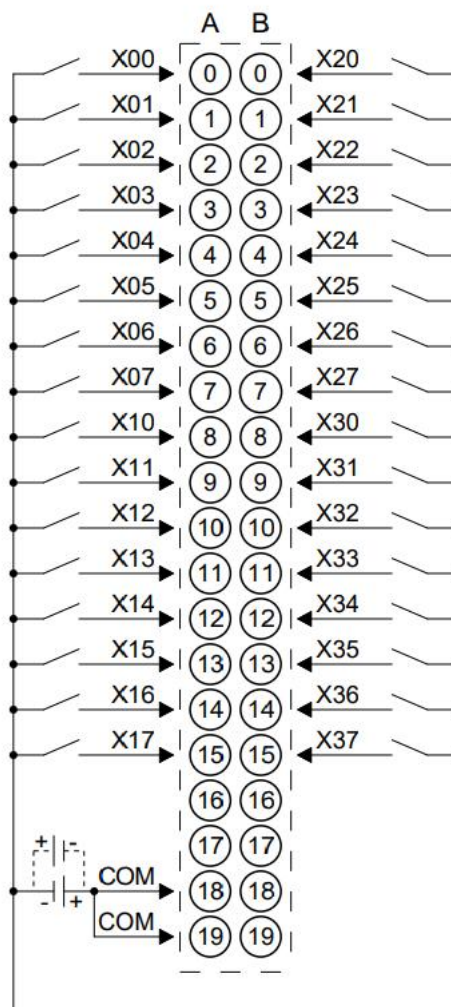
3.2.4.10 XB6S-0008A



## 3.2.4.11 XB6S-0008B

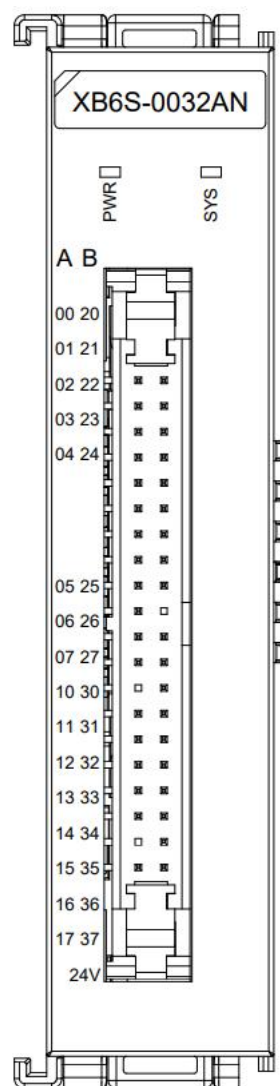
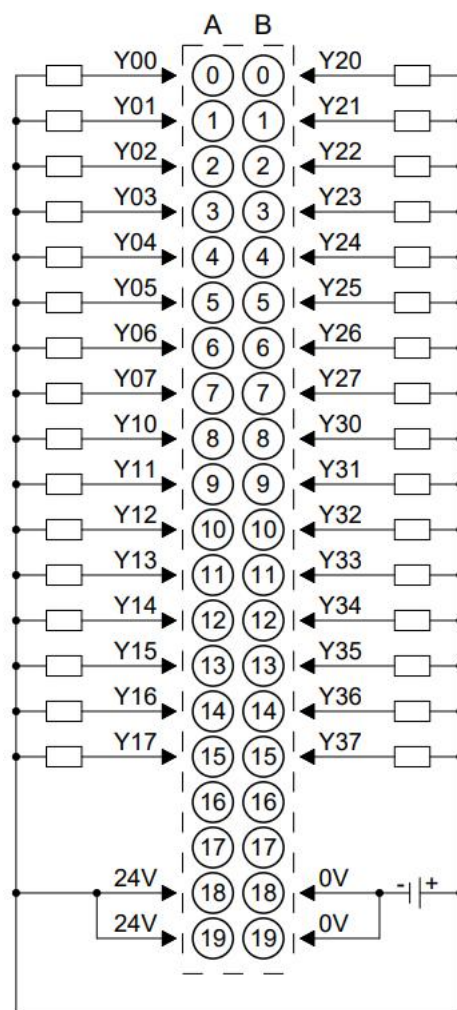


## 3.2.4.12 XB6S-3200N



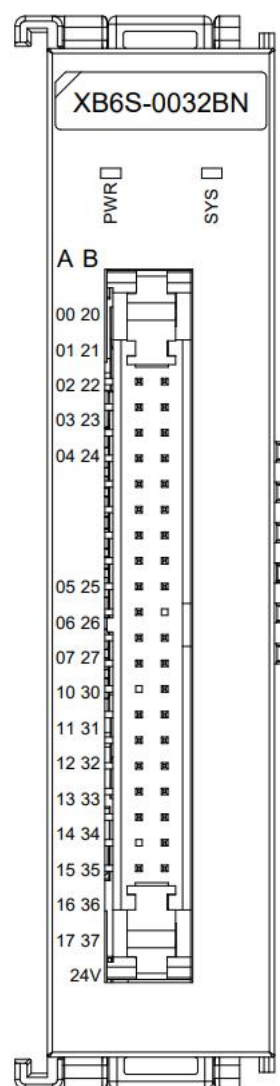
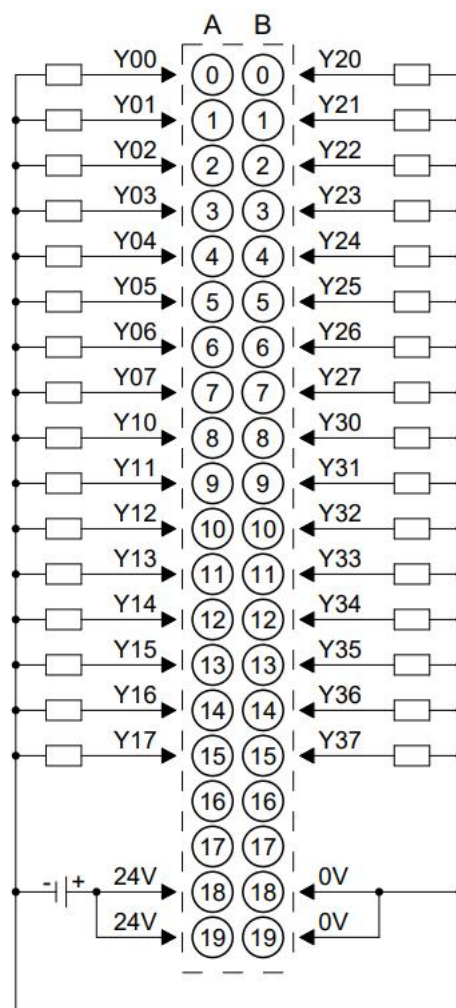
\*COM internal conduction; NPN/PNP compatible

## 3.2.4.13 XB6S-0032AN



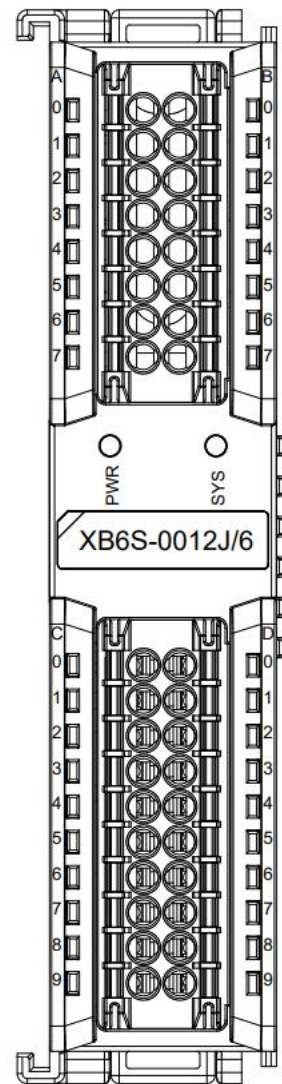
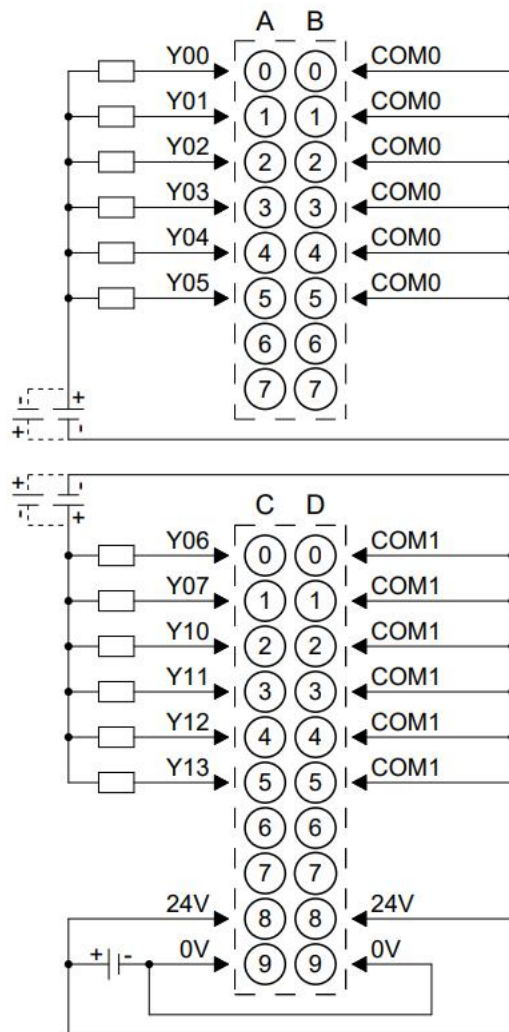
\*24V internal conduction; 0V internal conduction

## 3.2.4.14 XB6S-0032BN



\*24V internal conduction; 0V internal conduction

## 3.2.4.15 XB6S-0012J/6

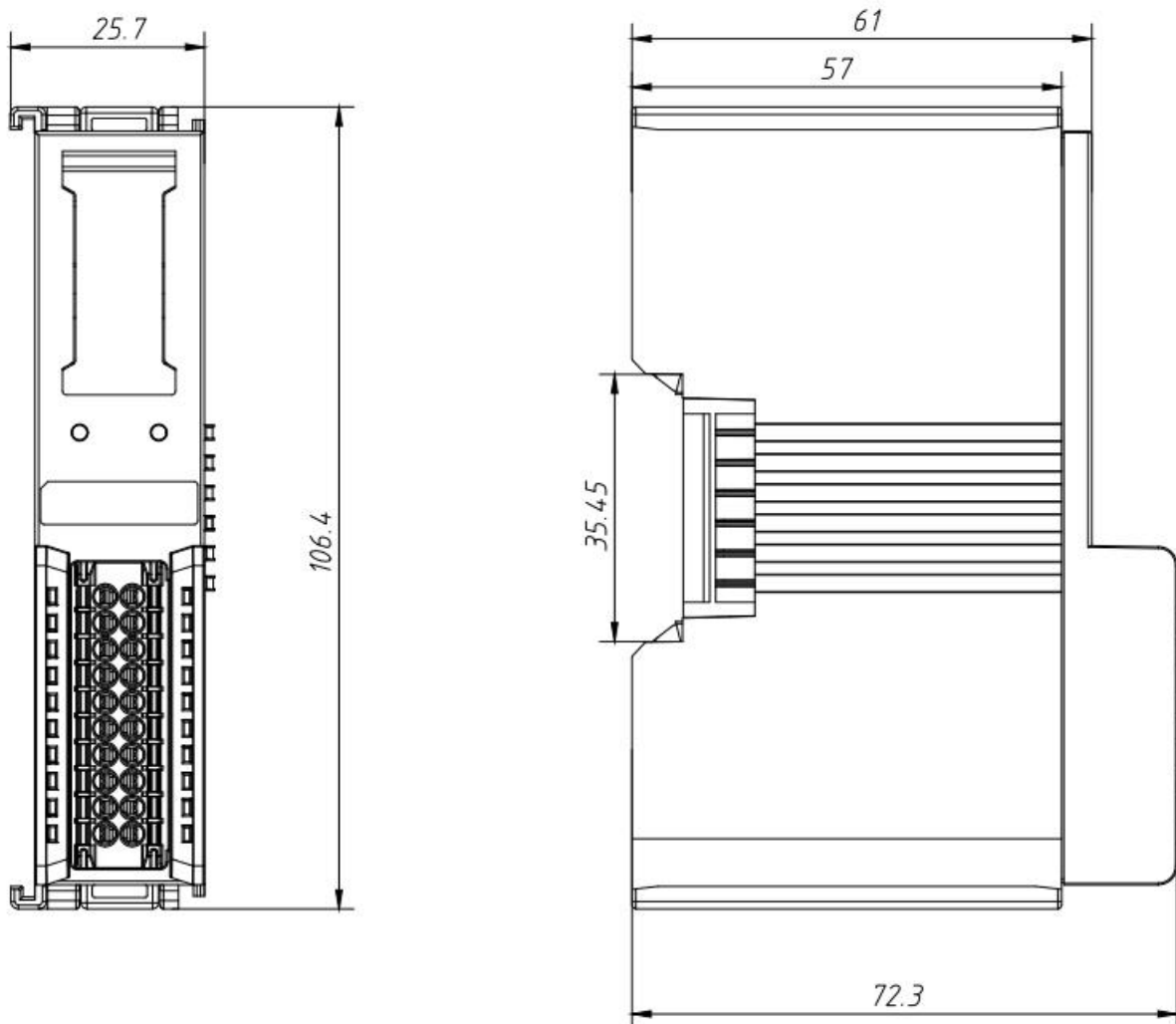


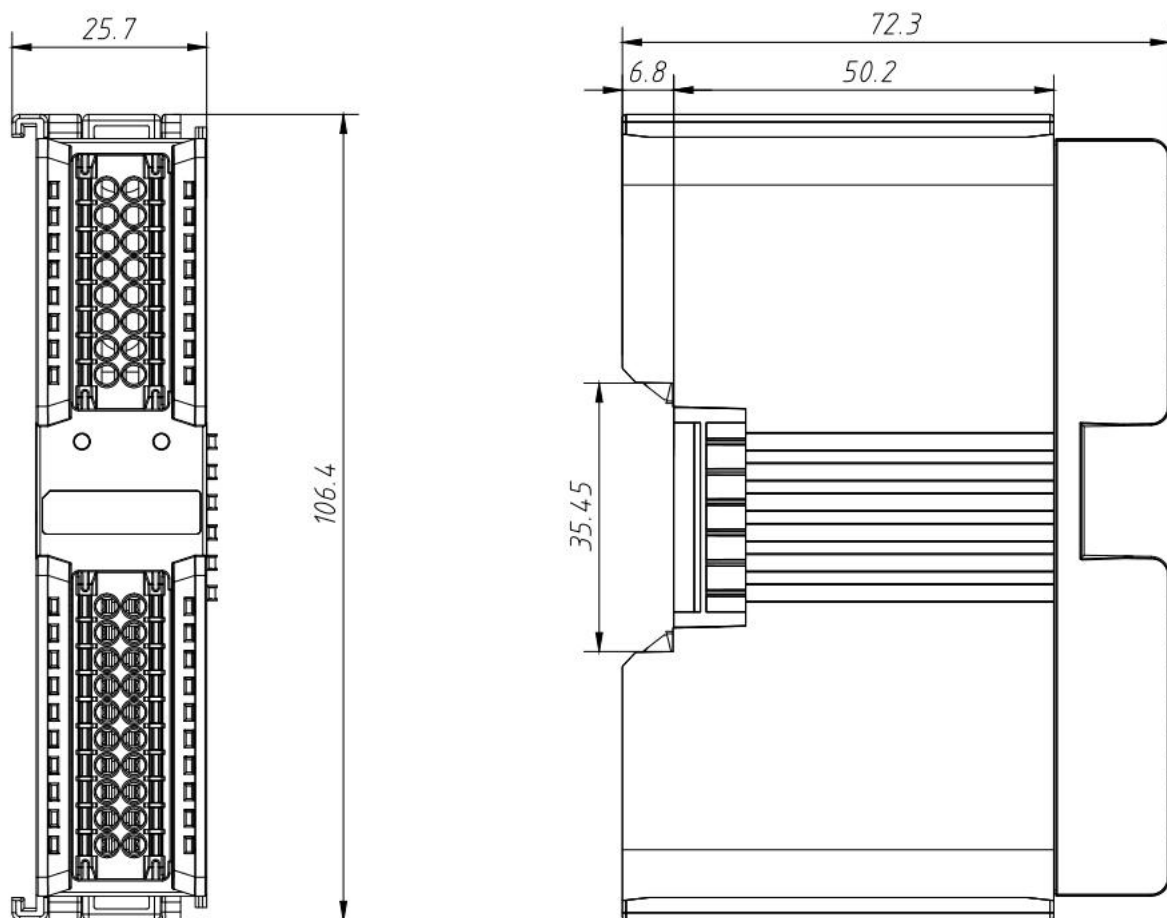
\*24V internal conduction; 0V internal conduction

\*COM0 is internally powered; COM1 is internally powered.

### 3.2.5 Outline Dimensions

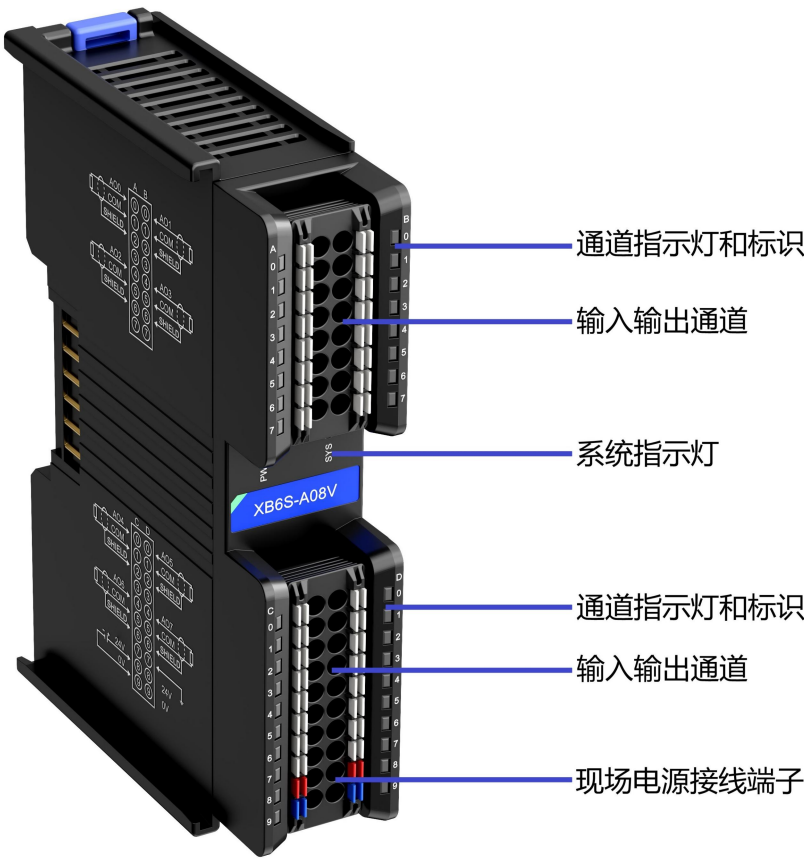
#### 8/16 channel digital I/O module dimensions (unit: mm)



**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. |
|--|-----------|--|-----|---------------------------------------------------------------------------|

### 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<br>(The measurement range is adjustable, with the default value being 0mA~20mA) |
| Input signal type                                        | Differential signaling                                                                                                                                 |                                                                                                                          |
| Channel reaction time                                    | 550us / ch<br>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 filtering                                          | 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                     | $\leq 260\text{mA}$                                                                                                                                                                                               | $\leq 110\text{mA}$                                                                                                                                                    |
| input points                                             | 8                                                                                                                                                                                                                 | 8                                                                                                                                                                      |
| Input type                                               | Voltage type                                                                                                                                                                                                      | Current type                                                                                                                                                           |
| Input signal                                             | Disable、 $-10\text{V}\sim+10\text{V}$ 、 $0\text{V}\sim10\text{V}$ 、 $-5\text{V}\sim+5\text{V}$ 、 $0\text{V}\sim5\text{V}$ 、 $1\text{V}\sim5\text{V}$ (range adjustable, default is $-10\text{V}\sim+10\text{V}$ ) | Disable, $4\text{mA}\sim20\text{mA}$ , $0\text{mA}\sim20\text{mA}$<br>(The measurement range is adjustable, with the default value being $0\text{mA}\sim20\text{mA}$ ) |
| Input signal type                                        | single-ended signal                                                                                                                                                                                               |                                                                                                                                                                        |
| Channel reaction time                                    | $560\mu\text{s}$ / ch<br>$770\mu\text{s}$ / 8ch                                                                                                                                                                   |                                                                                                                                                                        |
| resolution                                               | 16 bits                                                                                                                                                                                                           |                                                                                                                                                                        |
| Sampling rate (full channel)                             | $\leq 1\text{ksps}$                                                                                                                                                                                               |                                                                                                                                                                        |
| accuracy                                                 | $\pm 0.1\%$ at $25^\circ\text{C}$ , $\pm 0.3\%$ over the entire temperature range.                                                                                                                                |                                                                                                                                                                        |
| Input filtering                                          | 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 $+5\text{V}$ 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                                                                                                                                                                                                             | 110mA                                                                                                                                                                  |
| Power consumption                                        | 1.35W                                                                                                                                                                                                             | 0.55W                                                                                                                                                                  |
| 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<br>(The measurement range is adjustable, with the default value being 0mA~20mA) |
| Input signal type                                        | Differential signaling                                                                                                                                 |                                                                                                                          |
| Channel reaction time                                    | 300us / ch<br>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 filtering                                          | 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<br>(The measurement range is adjustable, with the default value being 0mA~20mA) |
| Input signal type                                        | single-ended signal                                                                                                                                    |                                                                                                             |
| Channel reaction time                                    | 400us / ch<br>700us / 4ch                                                                                                                              | 300us / ch<br>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 filtering                                          | 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<br>(The measurement range is adjustable, with the default value being 0mA~20mA) |
| Channel reaction time                                     | 400us / ch<br>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 $\Omega$ 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<br>(The measurement range is adjustable, with the default value being 0mA~20mA) |
| Channel reaction time                                     | 200us / ch<br>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 &amp; 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 filtering                                     | support                                                                                                                                                |          |
| Smooth series                                       | 1~200                                                                                                                                                  |          |
| Input impedance (voltage)                           | ≥100kΩ                                                                                                                                                 |          |
| Input impedance (current)                           | ≤100Ω                                                                                                                                                  |          |
| 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 &amp; 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 <a href="#">3.3.4.3 Voltage Input Module Code Value Table</a> |
| 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 <a href="#">3.3.4.4 Voltage Output Module Code Value Table</a> |
| 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<br>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<br>= $(65535/20) \times \text{Voltage}$ | Code value<br>= $(32767/10) \times \text{Voltage}$ | Code value<br>= $(55296/20) \times \text{Voltage}$ | Code value<br>= $(27648/10) \times \text{Voltage}$ |
| Voltage formula    | Voltage = (Code value * 20) / 65535                | Voltage = (Code value * 10) / 32767                | Voltage = (Code value * 20) / 55296                | Voltage = (Code value * 10) / 27648                |

Note: 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<br>e<br><br>Voltage | -5V~+5V                          | 0V~5V                           | 1V~5V                                    |
|--------------------------|----------------------------------|---------------------------------|------------------------------------------|
|                          | -27648~27648                     | 0~27648                         | 0~27648                                  |
|                          | code value                       | code value                      | code value                               |
| -5.07                    | -27980                           | -                               | -                                        |
| -5                       | -27648                           | -                               | -                                        |
| -4                       | -22118                           | -                               | -                                        |
| -3                       | -16588                           | -                               | -                                        |
| -2                       | -11060                           | -                               | -                                        |
| -1                       | -5530                            | -                               | -                                        |
| -0.07                    | -332                             | -332                            | -                                        |
| 0                        | 0                                | 0                               | -                                        |
| 0.94                     | 5198                             | 5198                            | -345                                     |
| 1                        | 5530                             | 5530                            | 0                                        |
| 2                        | 11060                            | 11060                           | 6912                                     |
| 3                        | 16588                            | 16588                           | 13824                                    |
| 4                        | 22118                            | 22118                           | 20736                                    |
| 5                        | 27648                            | 27648                           | 27648                                    |
| 5.06                     | 27980                            | 27980                           | 27933                                    |
| Code value<br>formula    | code<br>value=(55296/10)*Voltage | code<br>value=(27648/5)*Voltage | code<br>value=(27648/4)*Voltage-<br>6912 |
| Voltage<br>formula       | Voltage=(code<br>value*10)/55296 | Voltage=(code<br>value*5)/27648 | Voltage=(code<br>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<br>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<br>= $(65535/20) \times \text{Voltage}$ | Code value<br>= $(32767/10) \times \text{Voltage}$ | Code value<br>= $(55296/20) \times \text{Voltage}$ | Code value<br>= $(27648/10) \times \text{Voltage}$ |
| Voltage formula    | Voltage = (Code<br>value * 20)<br>/65535           | Voltage = (Code<br>value * 10)<br>/32767           | Voltage = (Code<br>value * 20)<br>/55296           | Voltage = (Code<br>value * 10)<br>/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<br>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<br>formula | code<br>value=(55296/10)*Voltage | code<br>value=(27648/5)*Voltage | code<br>value=(27648/4)*Voltage-<br>6912 |
| Voltage<br>formula    | Voltage=(code<br>value*10)/55296 | Voltage=(code<br>value*5)/27648 | Voltage=(code<br>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 <a href="#">3.3.5.3 Current Input Module Code Value Table</a> |
| 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 <a href="#">3.3.5.4 Current Output Module Code Value Table</a> |
| 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<br>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 =<br>$65535/16 * \text{current} - 16384$ | Code value =<br>$(65535/20) * \text{current}$ | Code value =<br>$(27648/16) * \text{current} - 6912$ | Code value =<br>$(27648/20) * \text{current}$ | Code value<br>$= (65535/40) * (\text{current} + 20)$ |

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<br>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 =<br>$65535/16 * \text{current} - 16384$ | Code value =<br>$(65535/20) * \text{current}$ | Code value =<br>$(27648/16) * \text{current} - 6912$ | Code value =<br>$(27648/20) * \text{current}$ |

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 <a href="#">3.3.6.3 Current &amp; Voltage Compatible Input Module Code Value Table</a> |
| 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 <a href="#">3.3.6.4 Current &amp; Voltage Compatible Output Module Code Value Table</a> |
| 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 &amp; Voltage Compatible Input Module Code Value Table

| range<br>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<br>formula | Code value =<br>(27648/20) * current | Code value = (27648/16) *<br>current - 6912 | Code value = (55296/40) *<br>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<br>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<br>= $(55296/20) \times \text{Voltage}$ | Code value<br>= $(65535/20) \times \text{Voltage}$ | Code value<br>= $(27648/10) \times \text{Voltage}$ | Code value<br>= $(32767/10) \times \text{Voltage}$ |
| 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~1V. The 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~1V. The 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<br>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~5V. The 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 &amp; Voltage Compatible Output Module Code Value Table

| range<br>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<br>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<br>= $(55296/20) \times \text{Voltage}$ | Code value<br>= $(65535/20) \times \text{Voltage}$ | Code value<br>= $(27648/10) \times \text{Voltage}$ | Code value<br>= $(32767/10) \times \text{Voltage}$ |
| Voltage formula    | Voltage = $(\text{Code value} \times 20) / 55296$  | Voltage = $(\text{Code value} \times 20) / 65535$  | Voltage = $(\text{Code value} \times 10) / 27648$  | Voltage = $(\text{Code value} \times 10) / 32767$  |

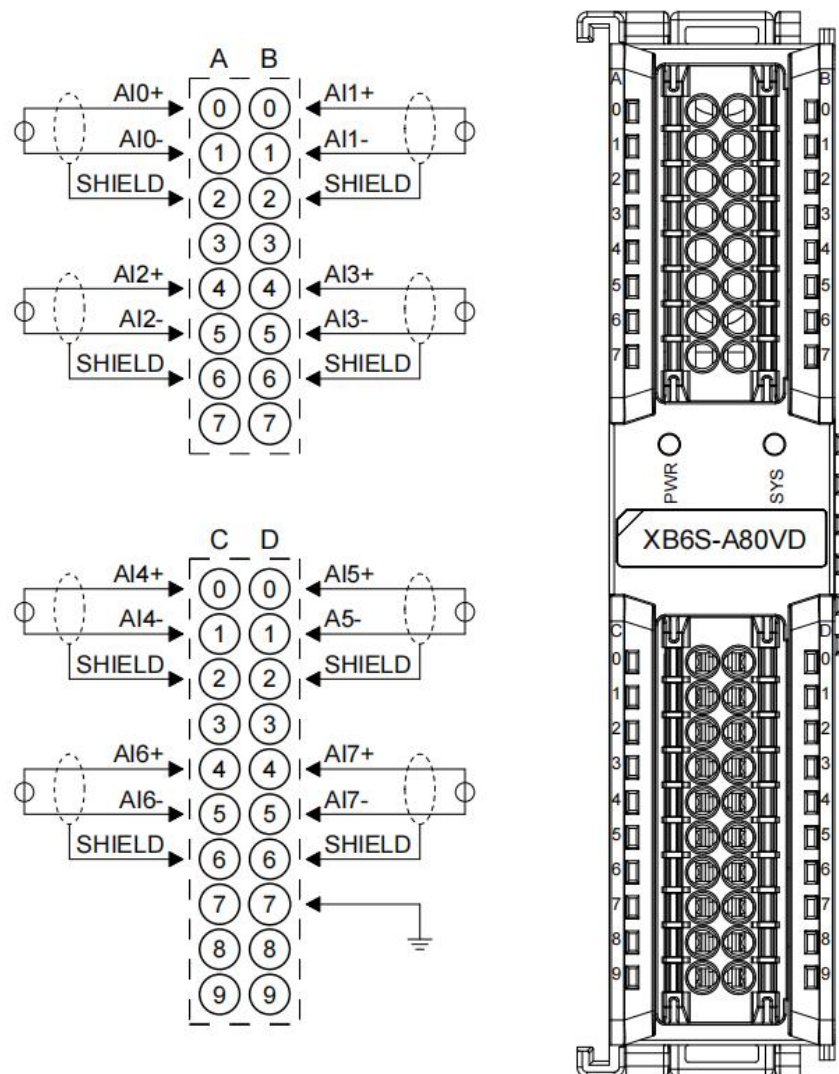
Note: Code values set outside the range for current & voltage compatible output modules will not take effect. For analog output modules, if the preset value of the cleared and retained parameters exceeds the code value range, the preset value will not take effect, and the previous valid value will be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

| range<br>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

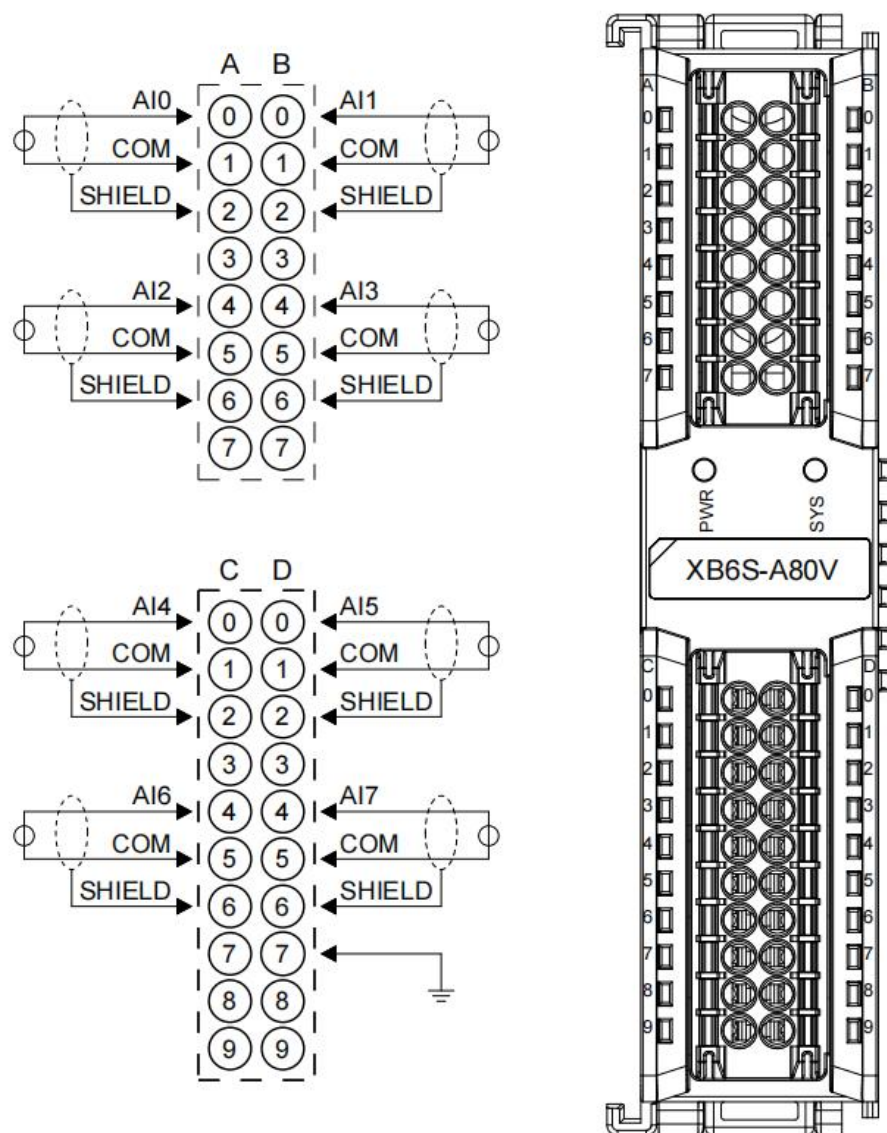
#### 3.3.7.1 XB6S-A80VD



\*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

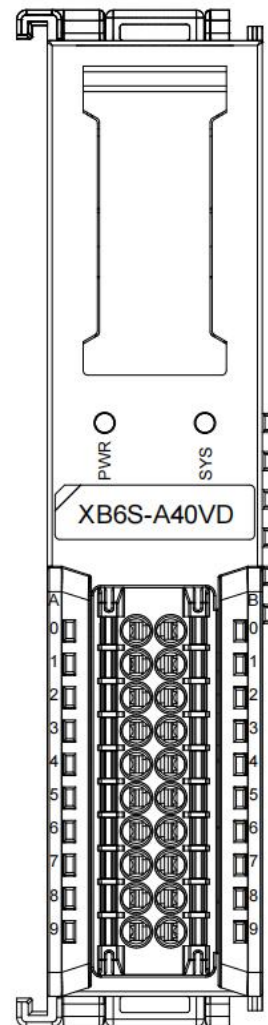
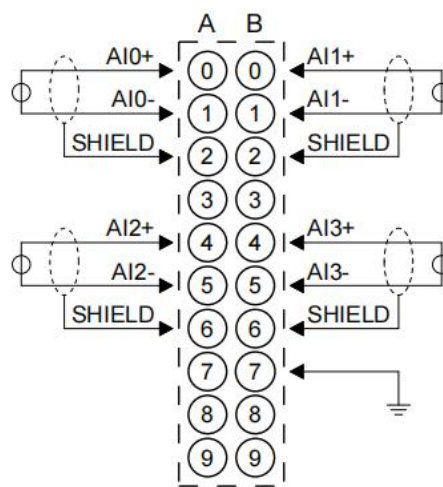


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

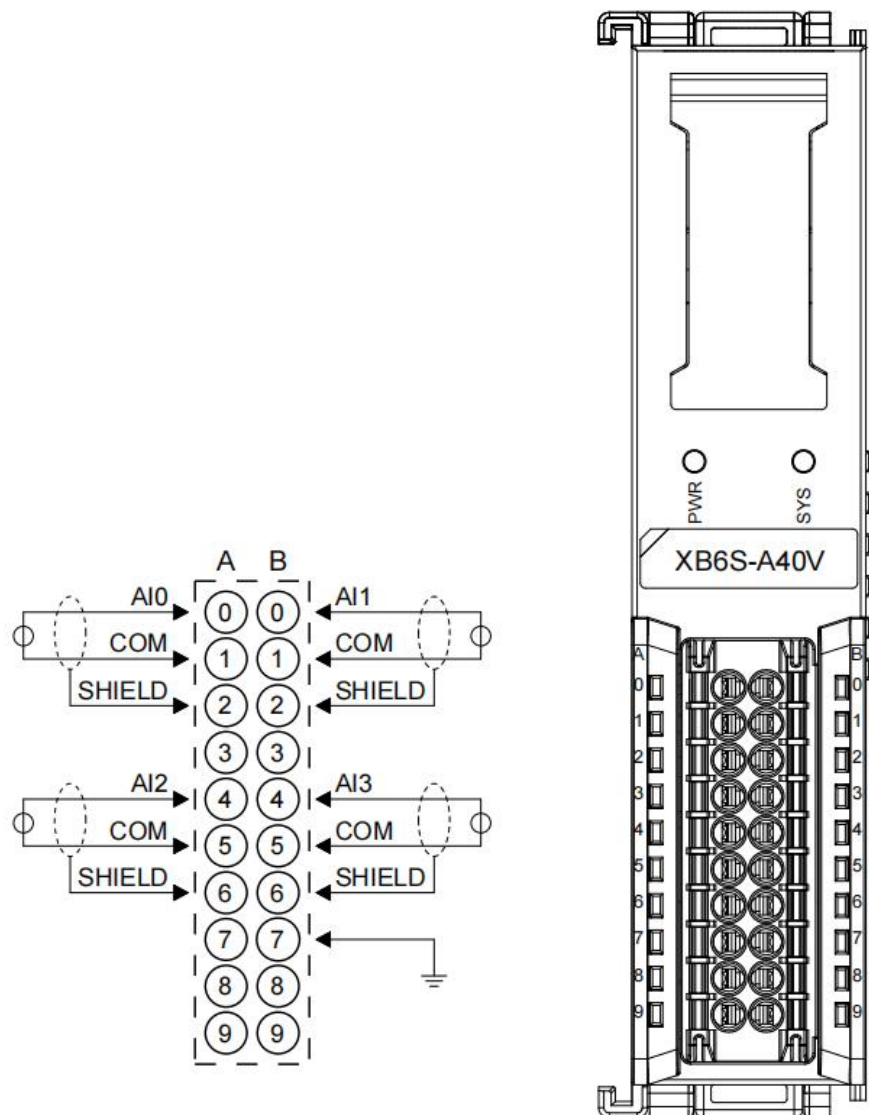
## 3.3.7.3 XB6S-A40VD



\*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

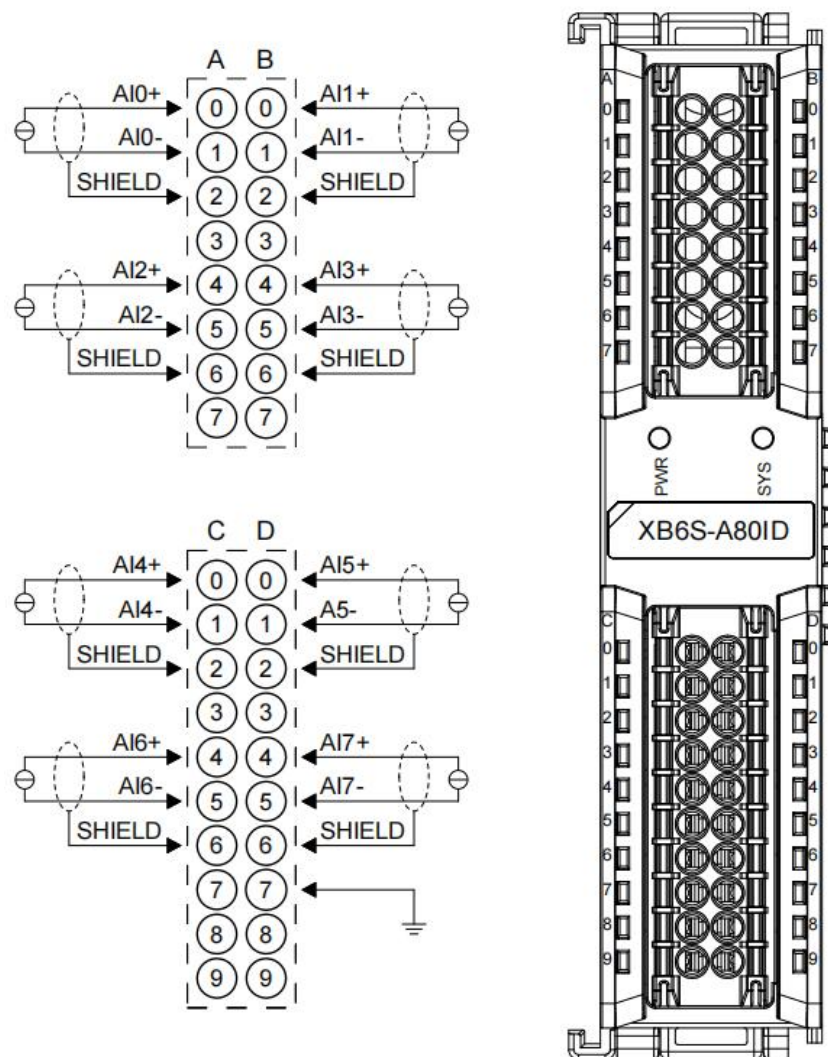


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

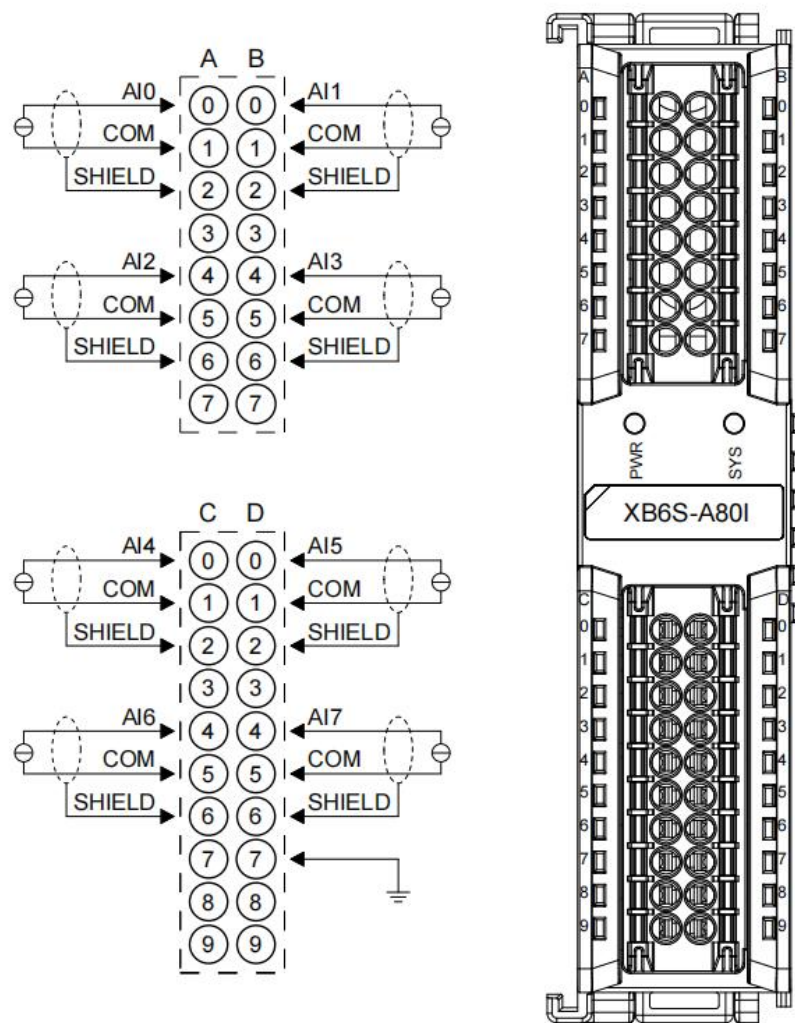
### 3.3.7.5 XB6S-A80ID



\*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

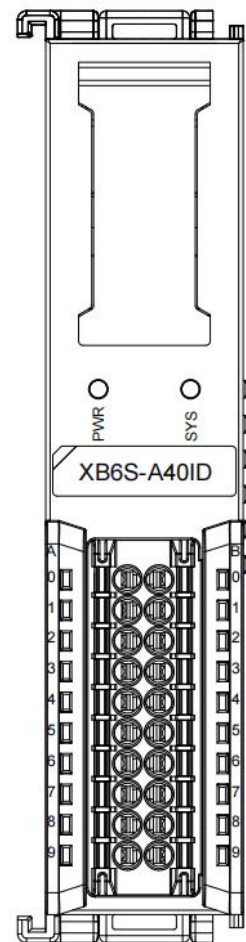
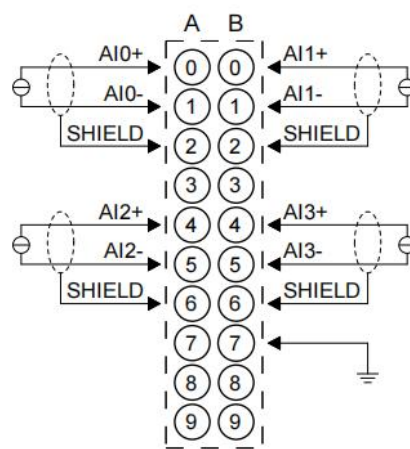


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

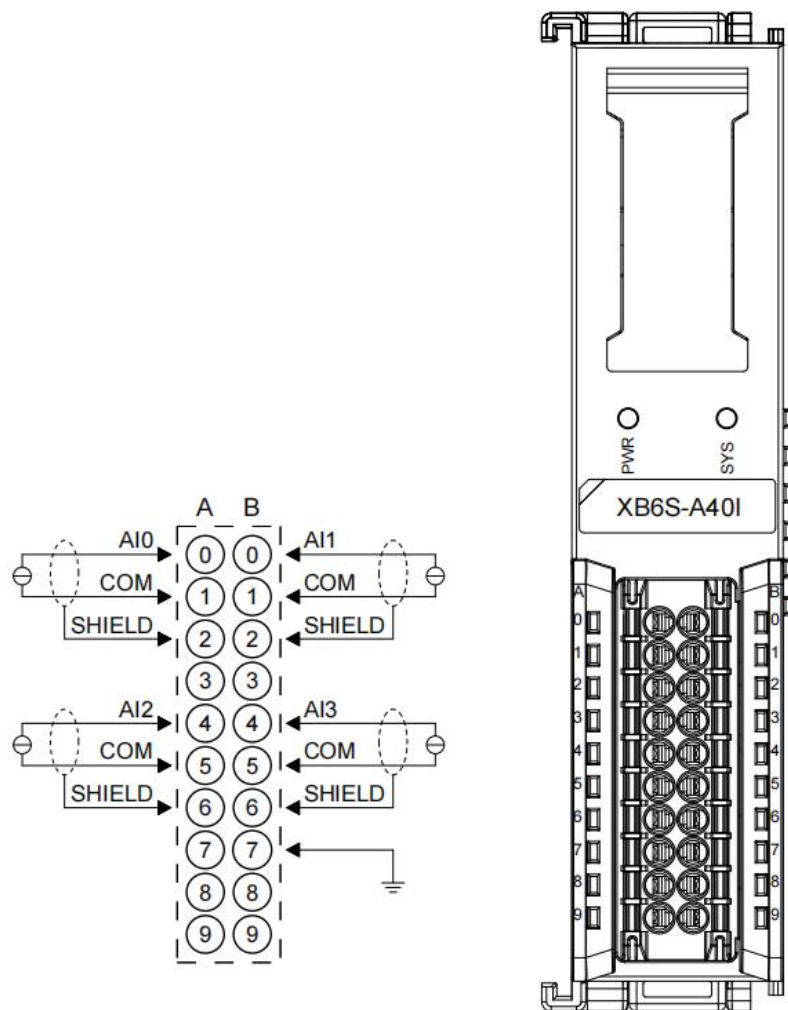
## 3.3.7.7 XB6S-A40ID



\*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

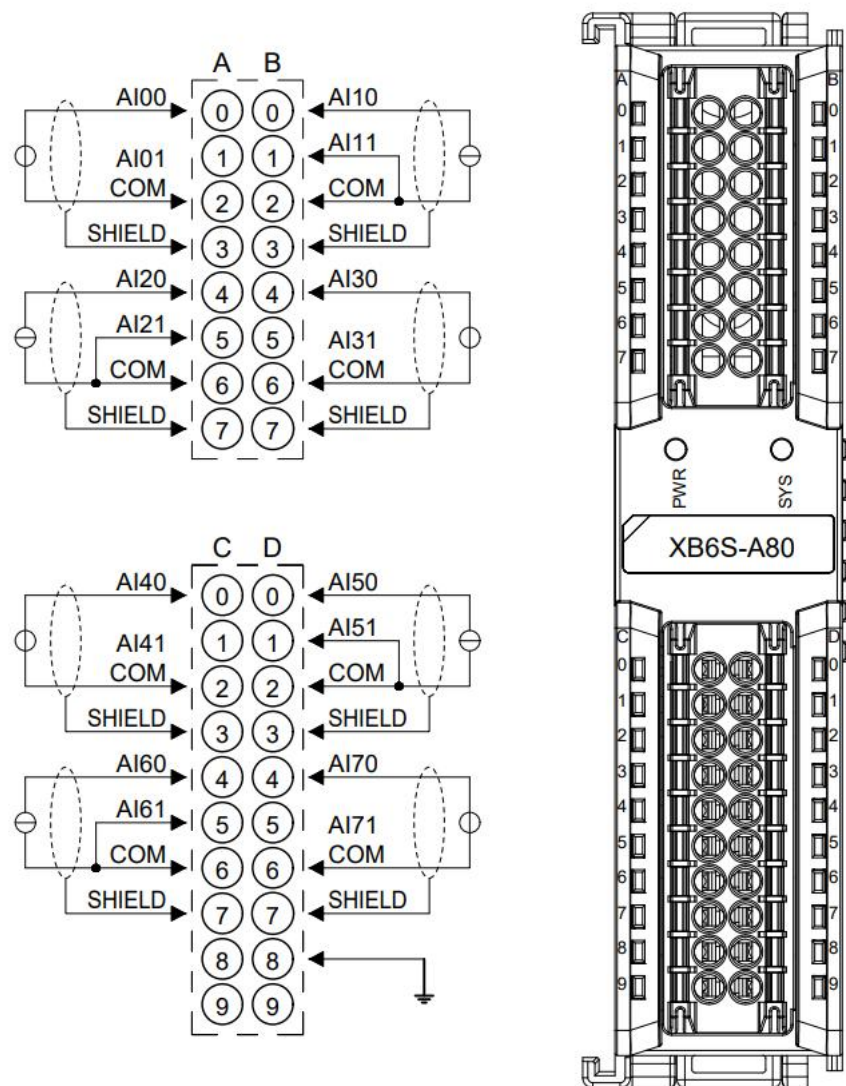


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

## 3.3.7.9 XB6S-A80



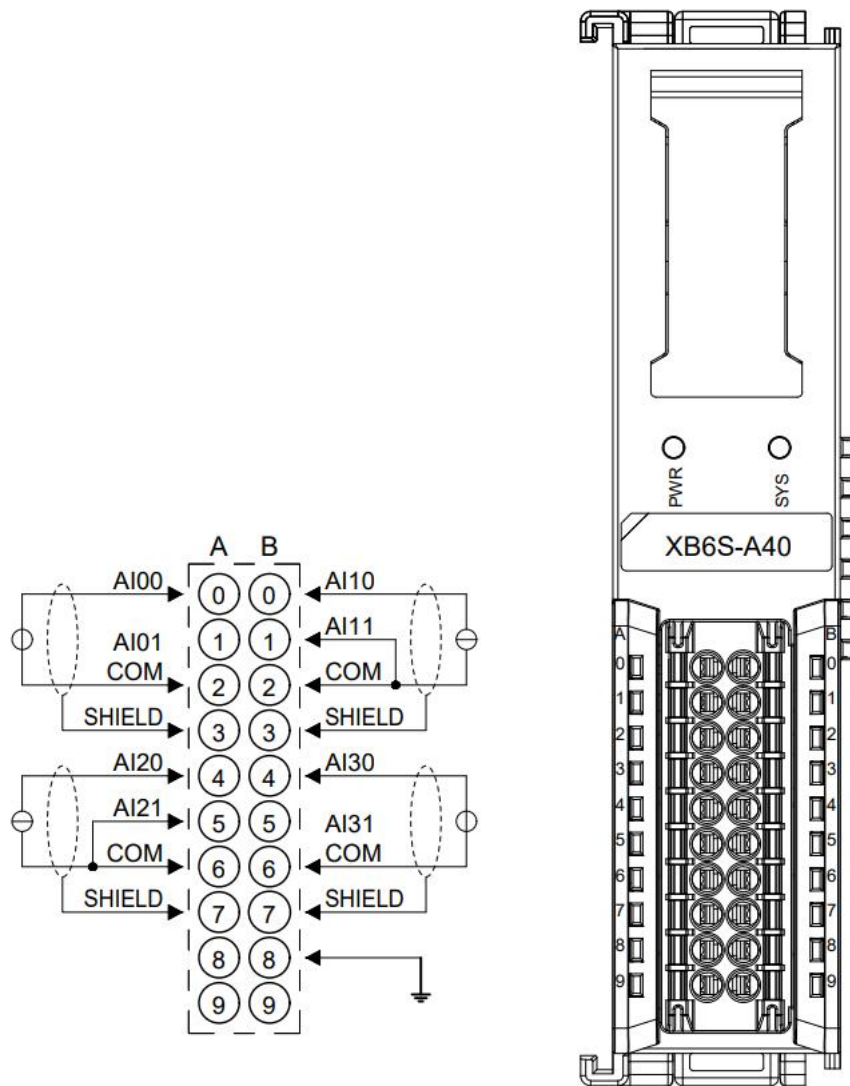
\*COM internal conduction, SHIELD internal conduction

\*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



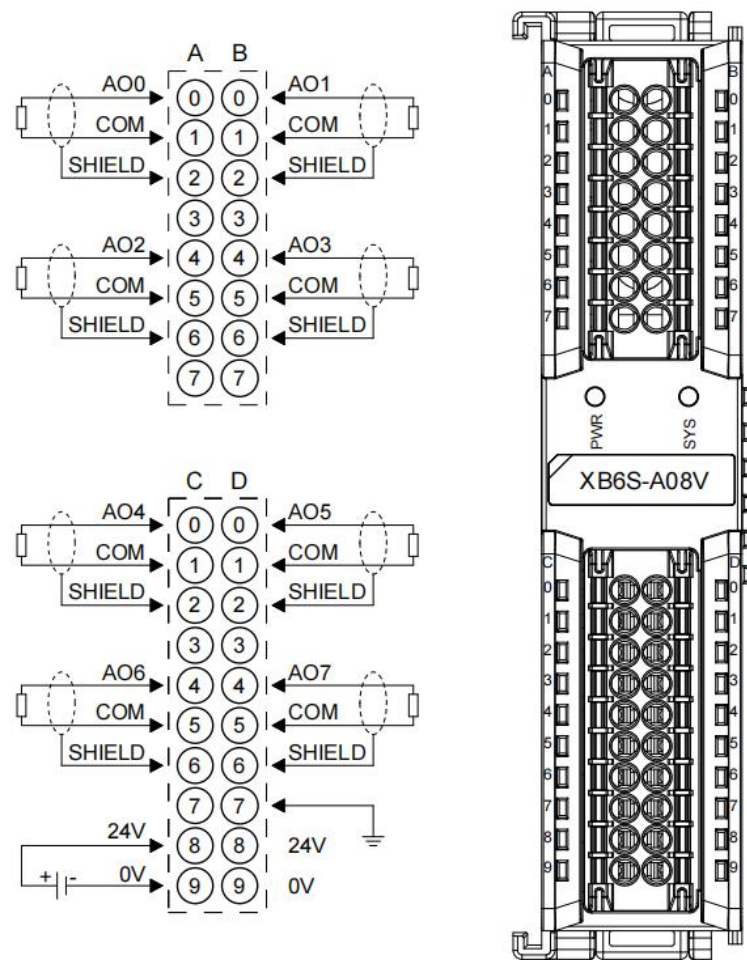
\*COM internal conduction, SHIELD internal conduction

\*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

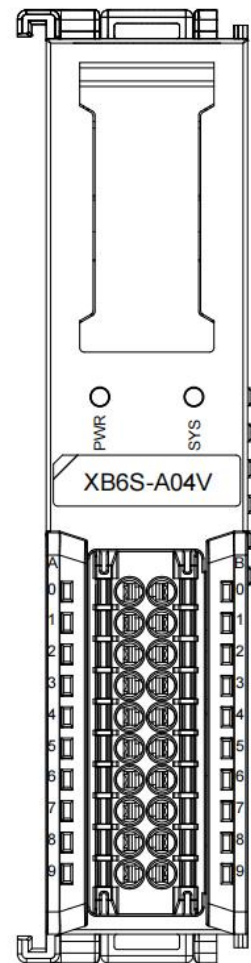
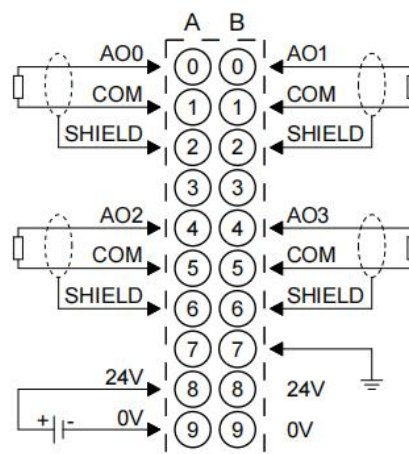


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

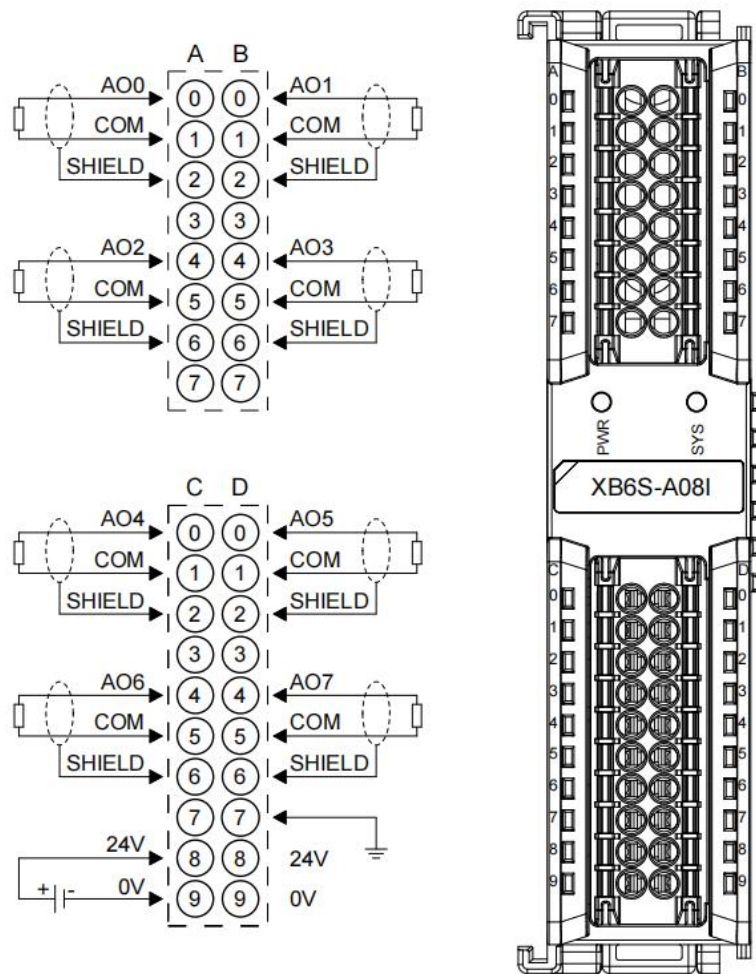
\*Shielded twisted-pair cables are recommended for signal cables.

## 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

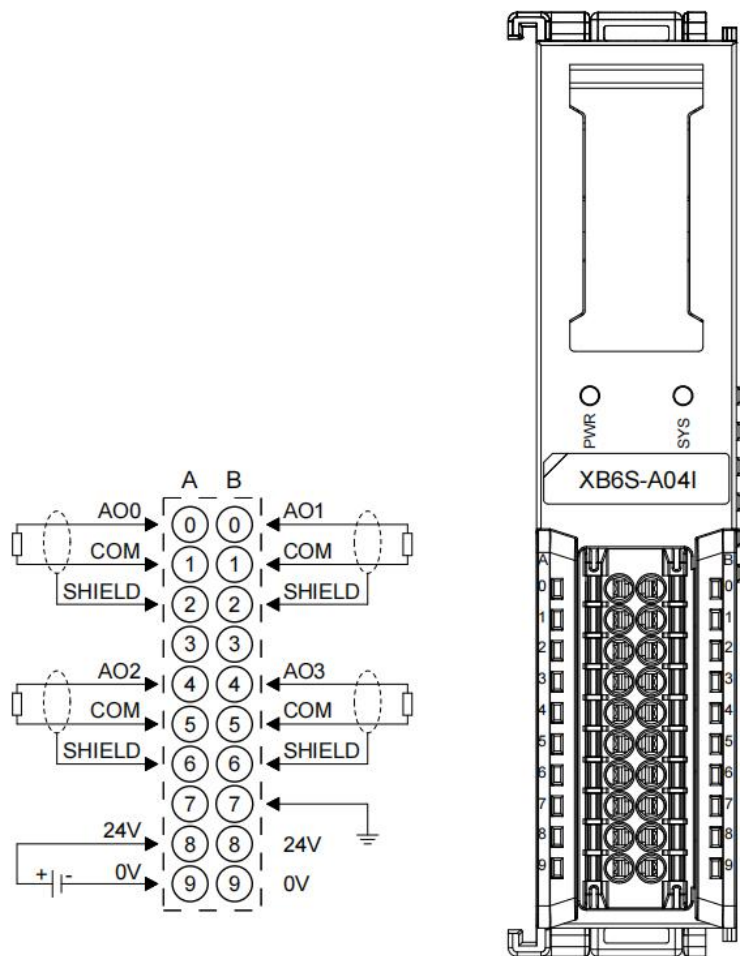


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

## 3.3.7.14 XB6S-A04I

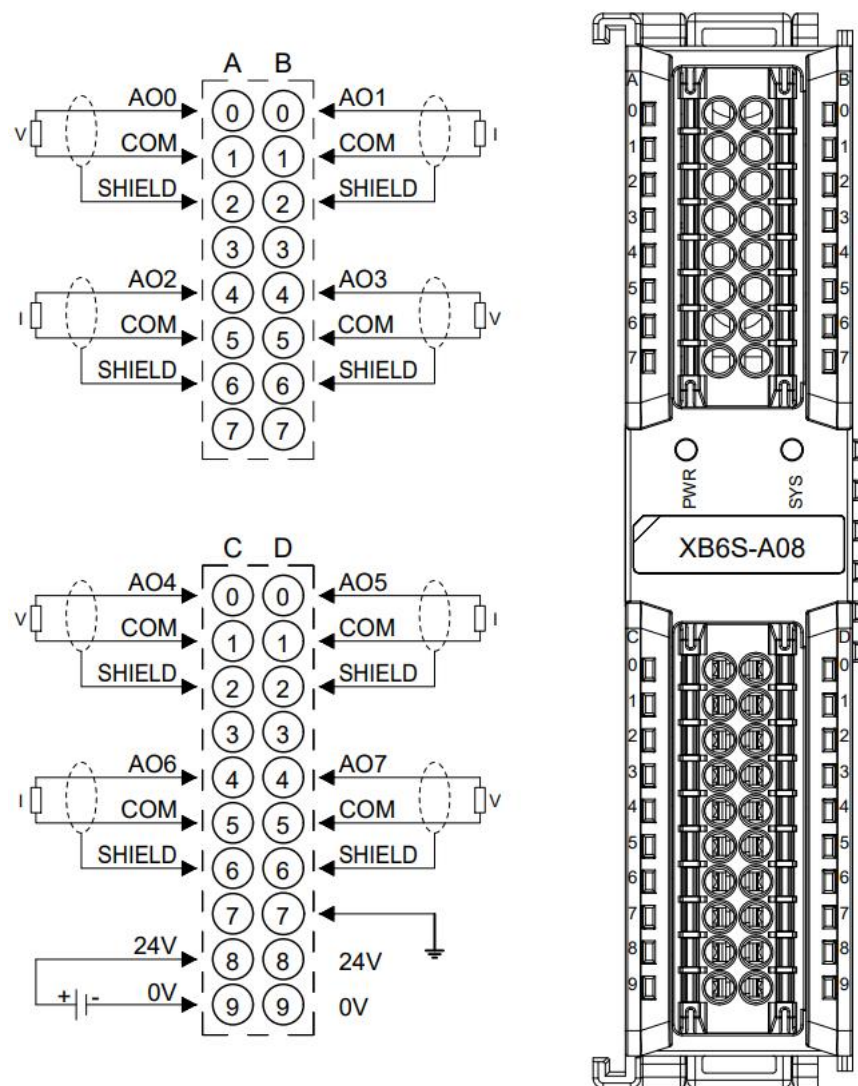


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

## 3.3.7.15 XB6S-A08

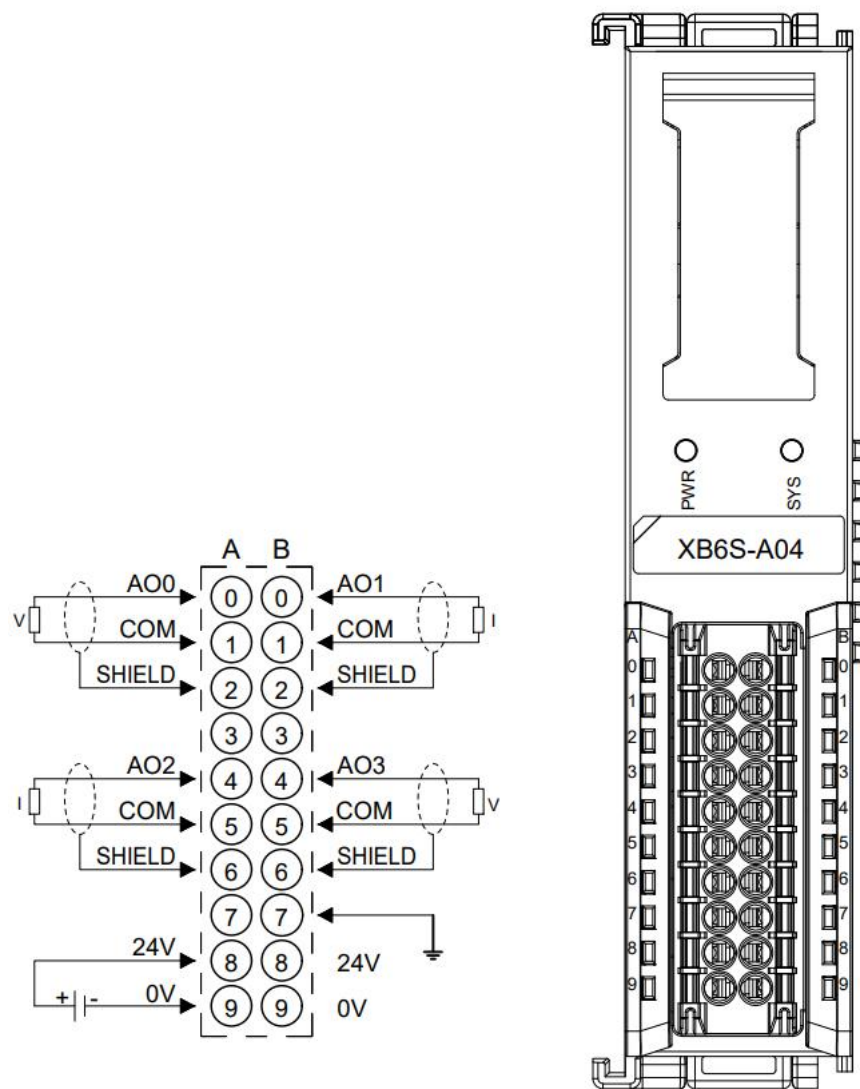


\*COM internal conduction, SHIELD internal conduction

\*All channel loads must originate from the same source.

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

## 3.3.7.16 XB6S-A04



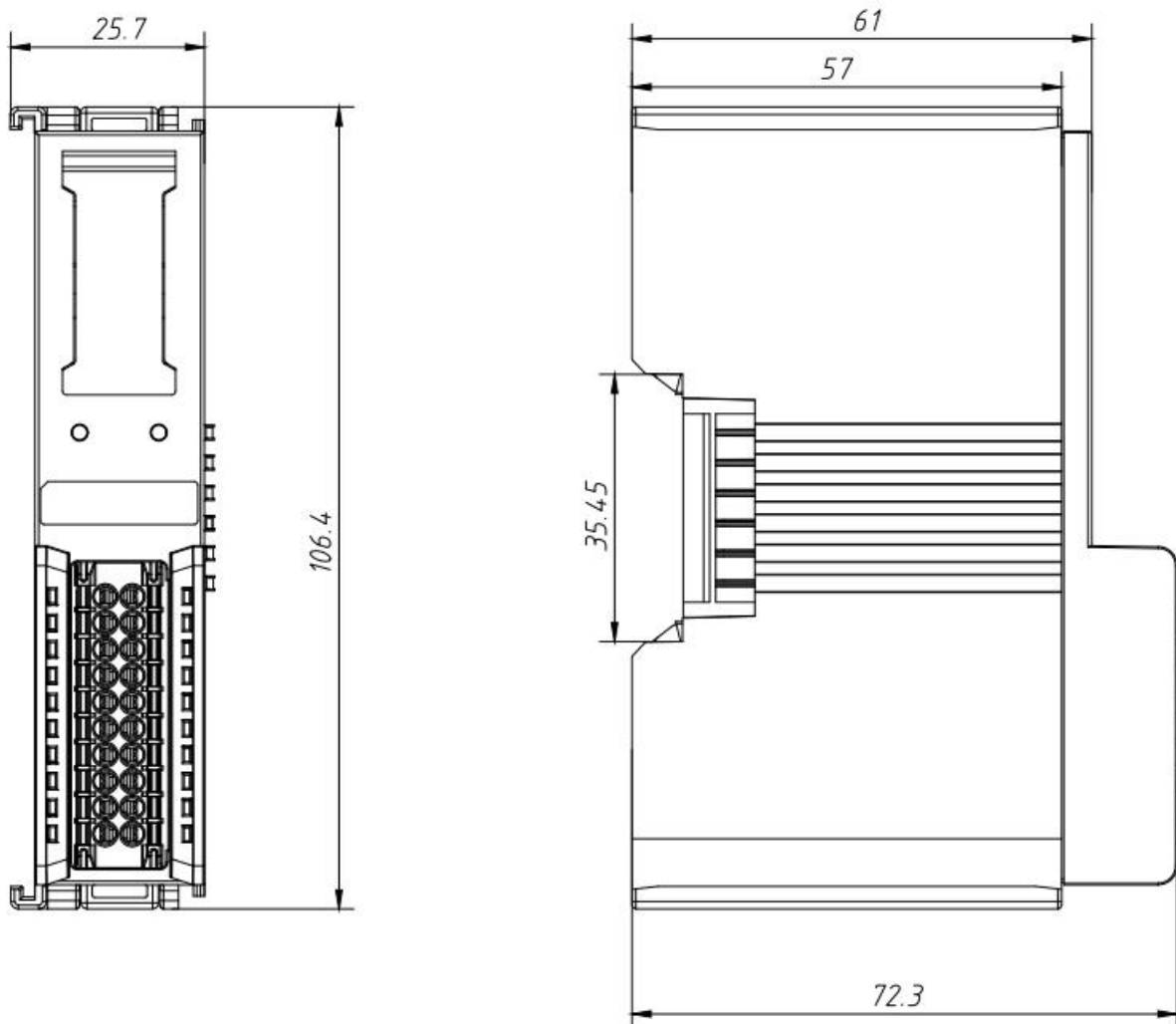
\*COM internal conduction, SHIELD internal conduction

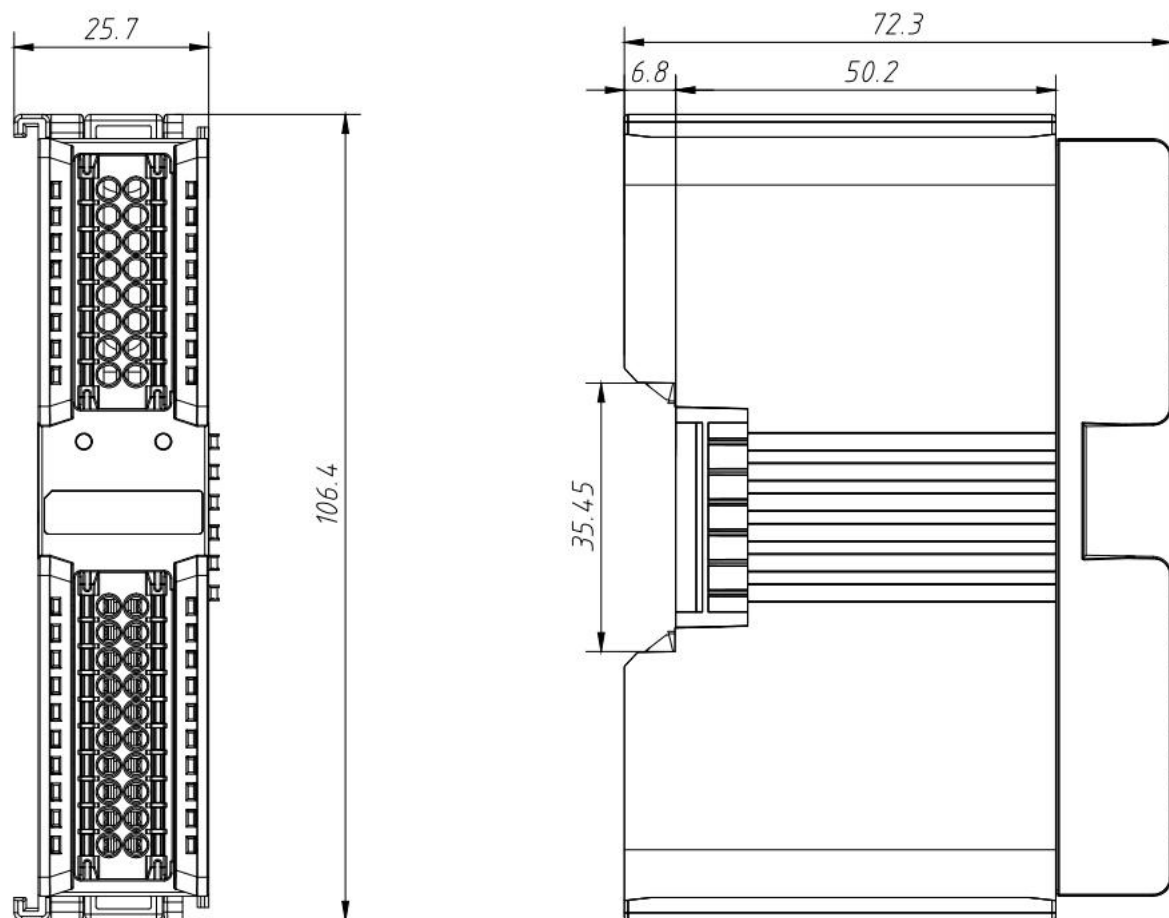
\*All channel loads must originate from the same source.

\*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



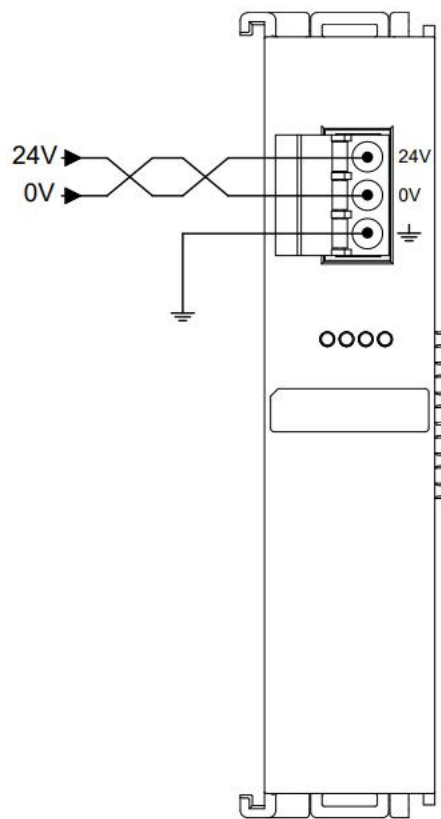
#### 3.4.2 Indicator light function

| 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

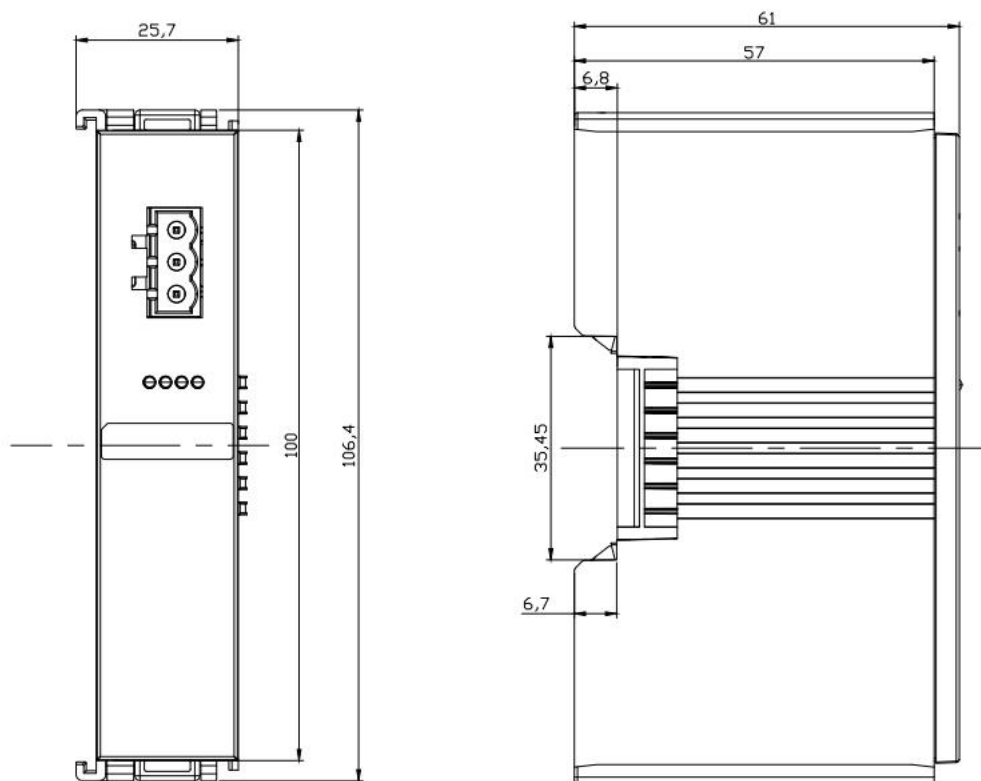
| Power parameters              |                                         |
|-------------------------------|-----------------------------------------|
| Input voltage                 | SELV Input<br>24VDC (18V~36V)           |
| Input current                 | 600mA (24VDC)                           |
| 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)

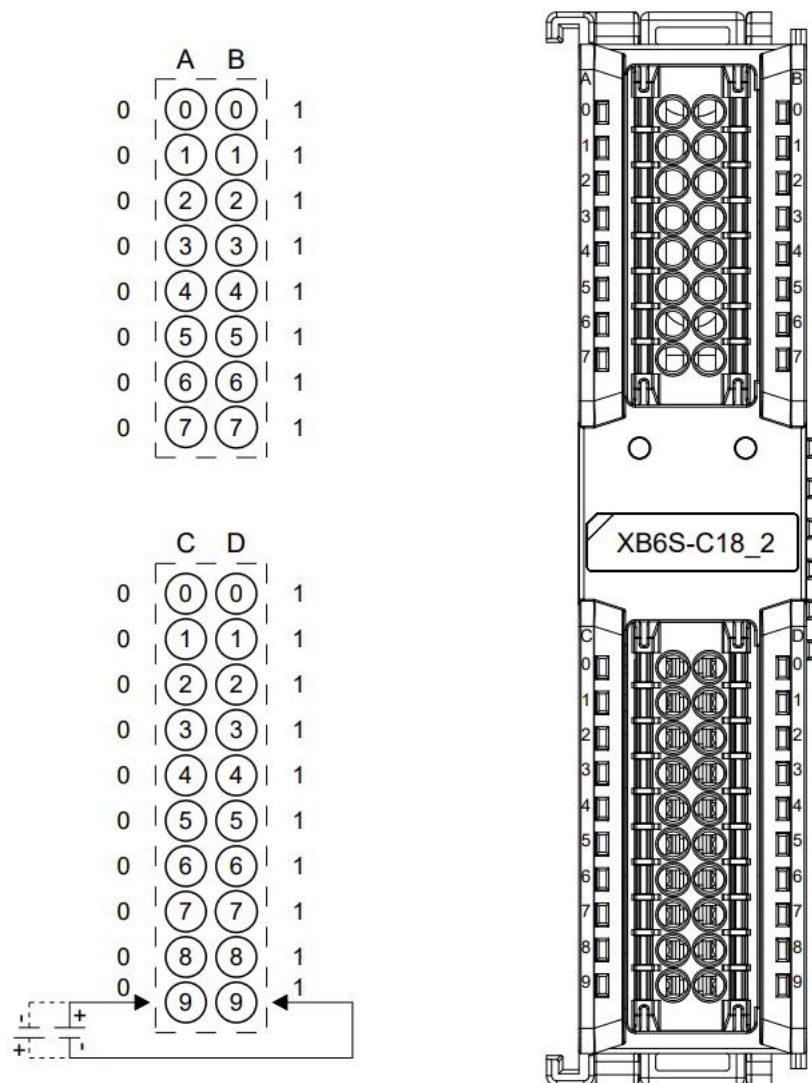


## 3.5 Public End Extension Module

### 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

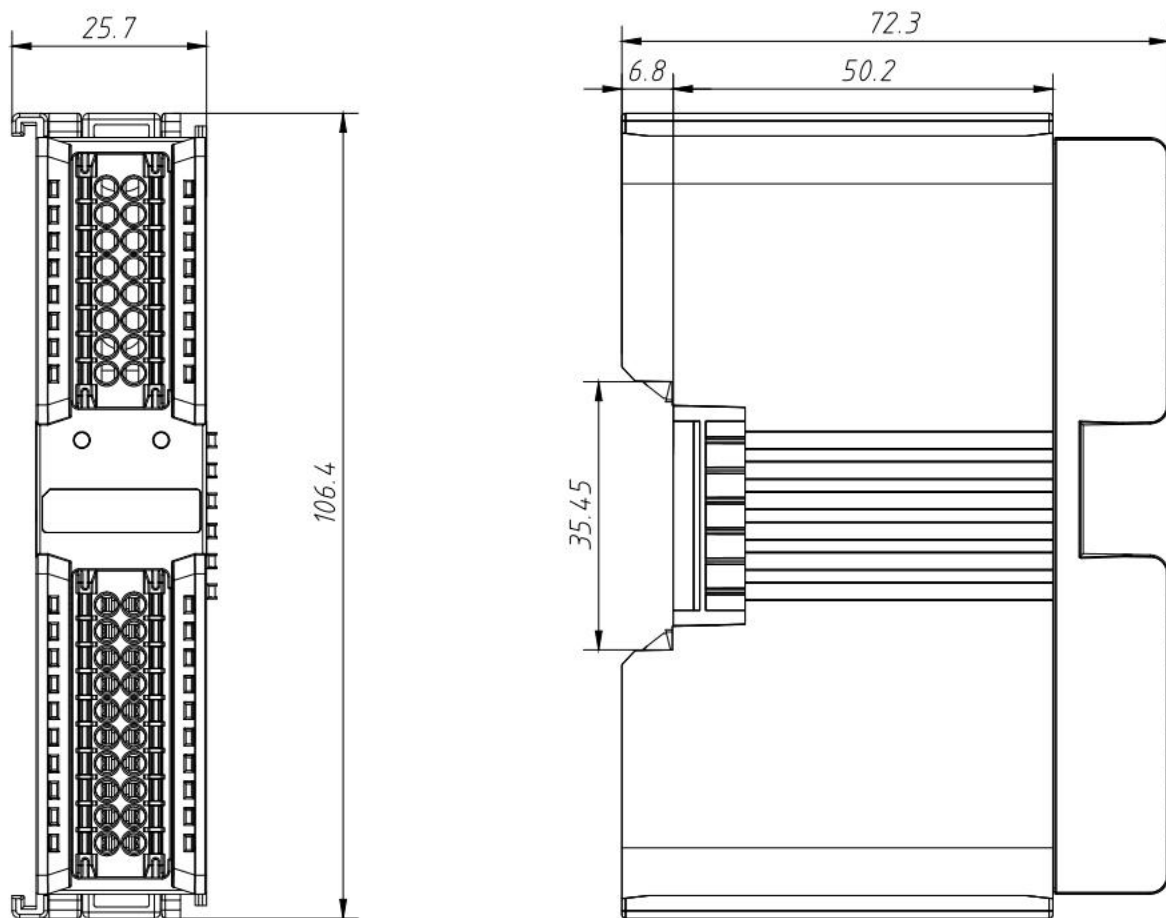


\*Channel identifier 0 indicates internal conduction.

\*Channel Identifier 1: Internal Conductor

### 3.5.3 Outline Dimensions

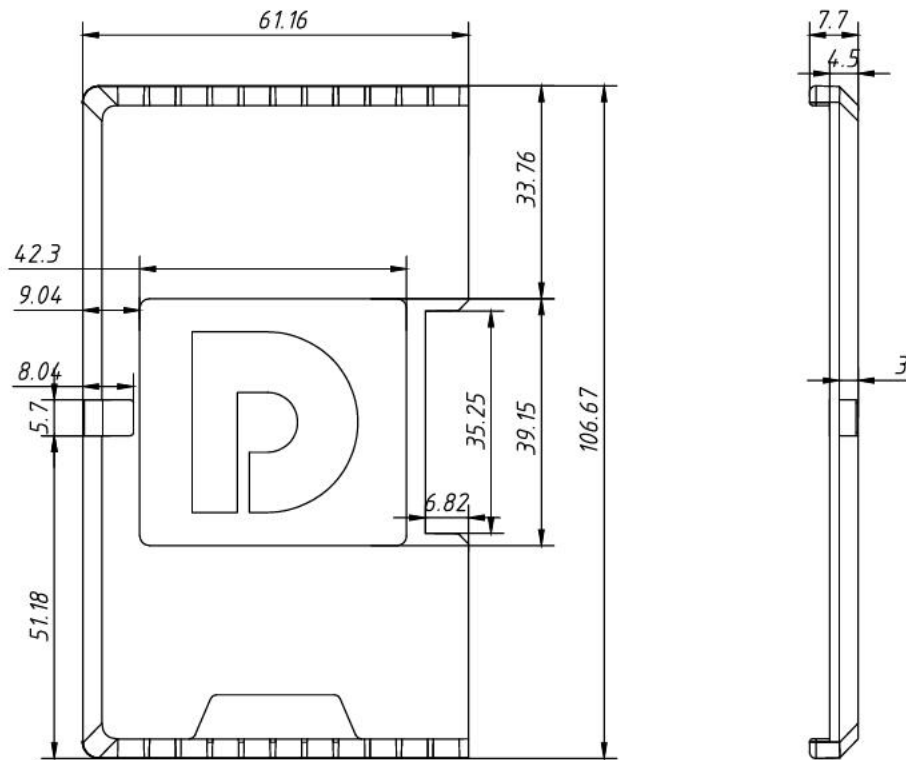
**External dimensions (unit: mm)**



## 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

---

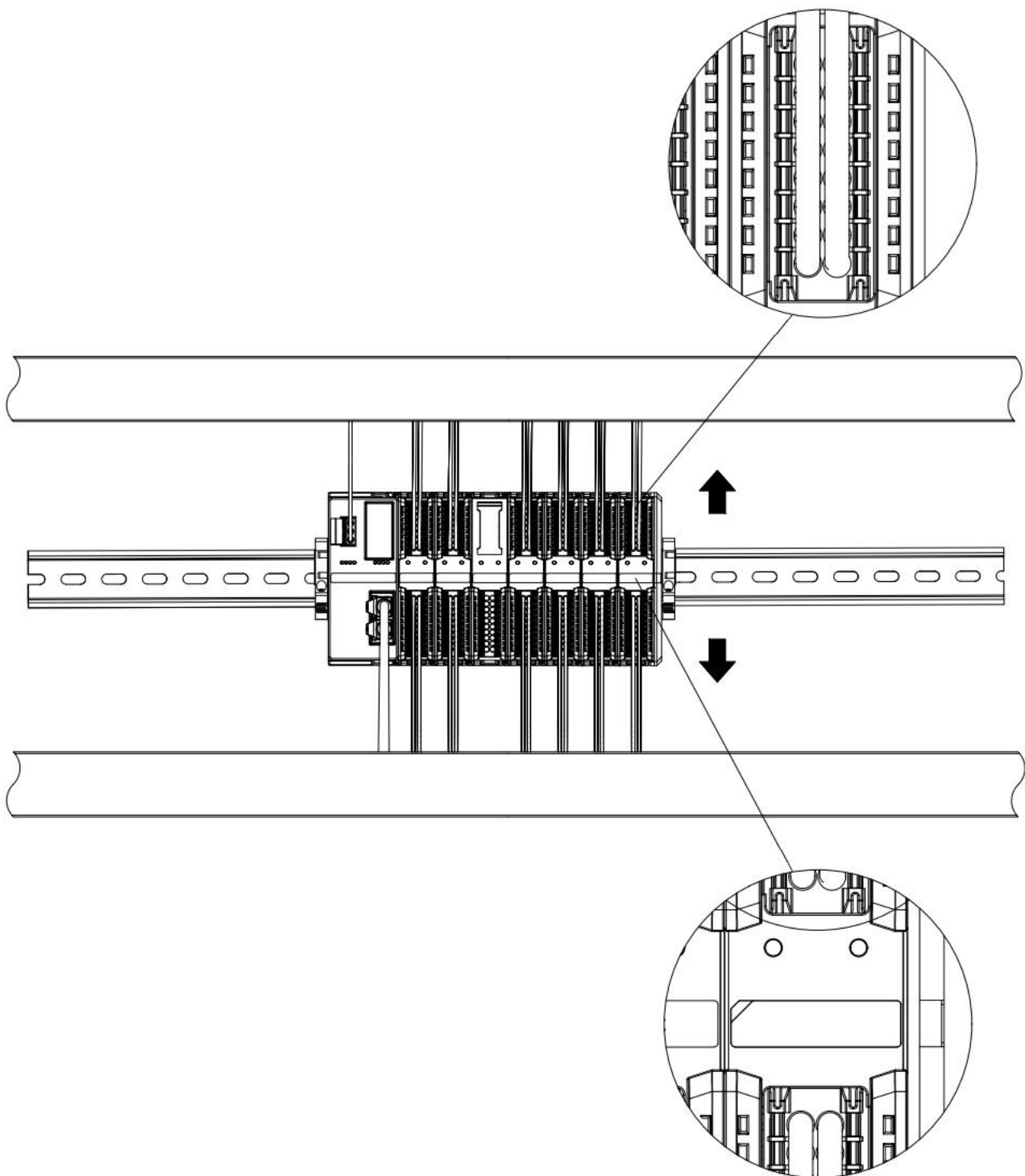
## 4.1 Installation Guide

### Installation/Removal Precautions

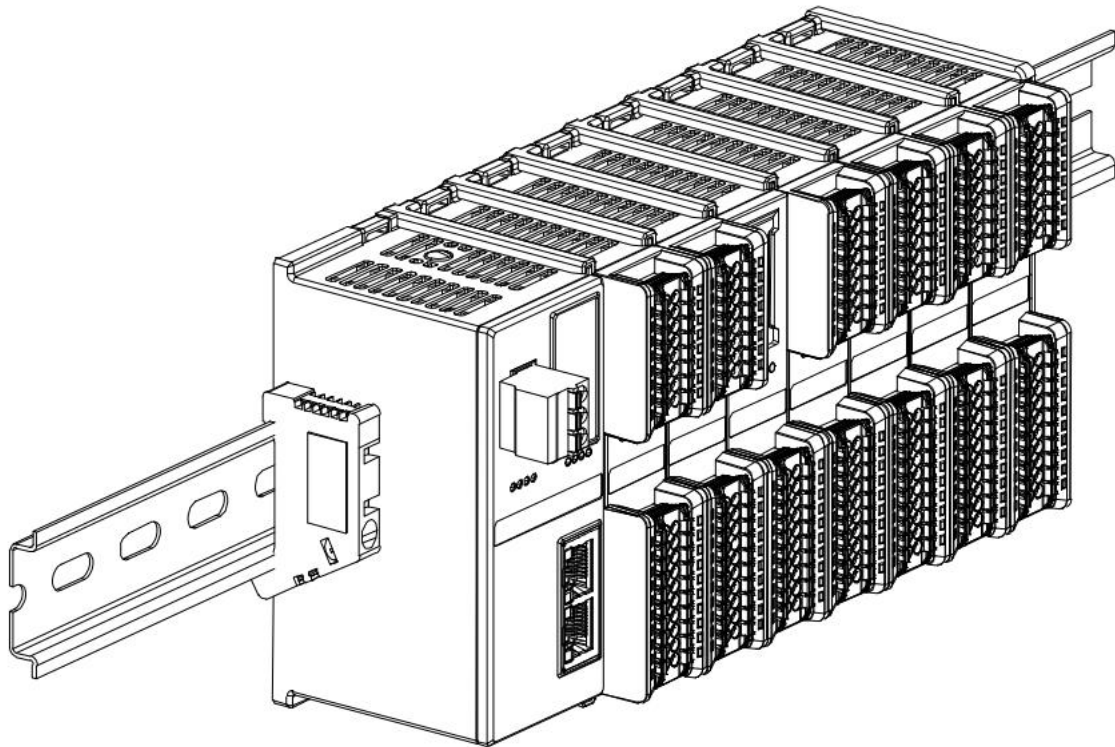
- The module has an IP20 protection rating and must be installed in a cabinet for indoor use.
- Ensure that the server rack has good ventilation (such as installing exhaust fans in the server rack).
- Do not install this device next to or above equipment that may cause overheating.
- Make sure to install 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.



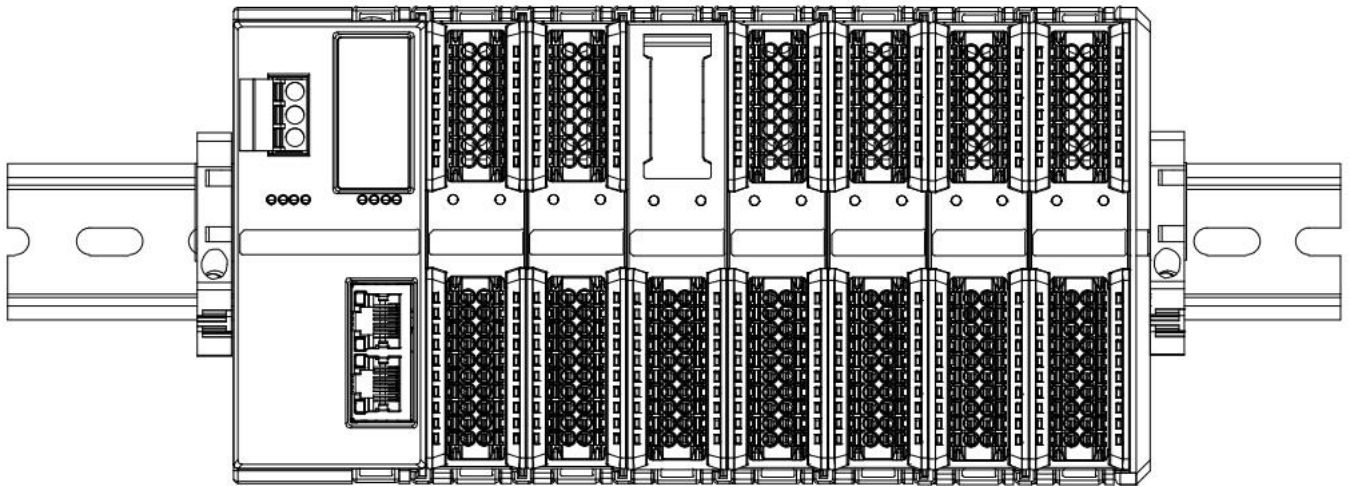
- If the device is not used in accordance with the product user manual, the protection it provides may be compromised.
-

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

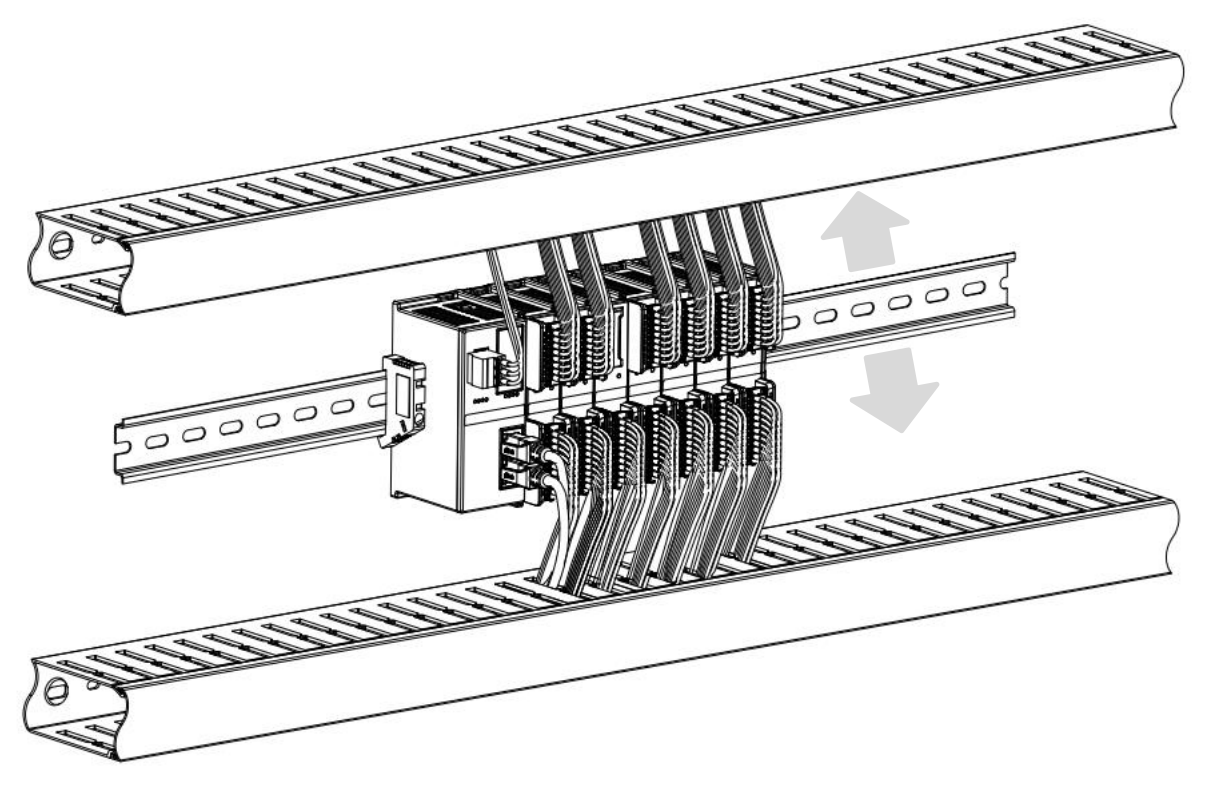
**Ensure the module is installed vertically on the fixed guide rail.**



**Be sure to install the guide rail fasteners.**



Module top and bottom wiring diagram



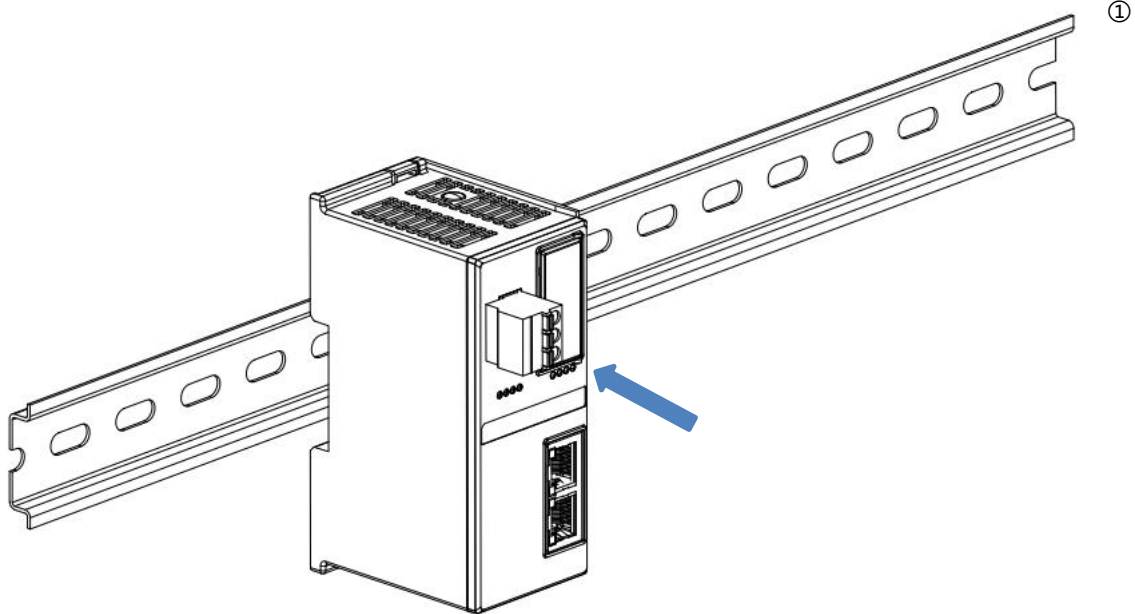
4.2 Installation and disassembly steps

| 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

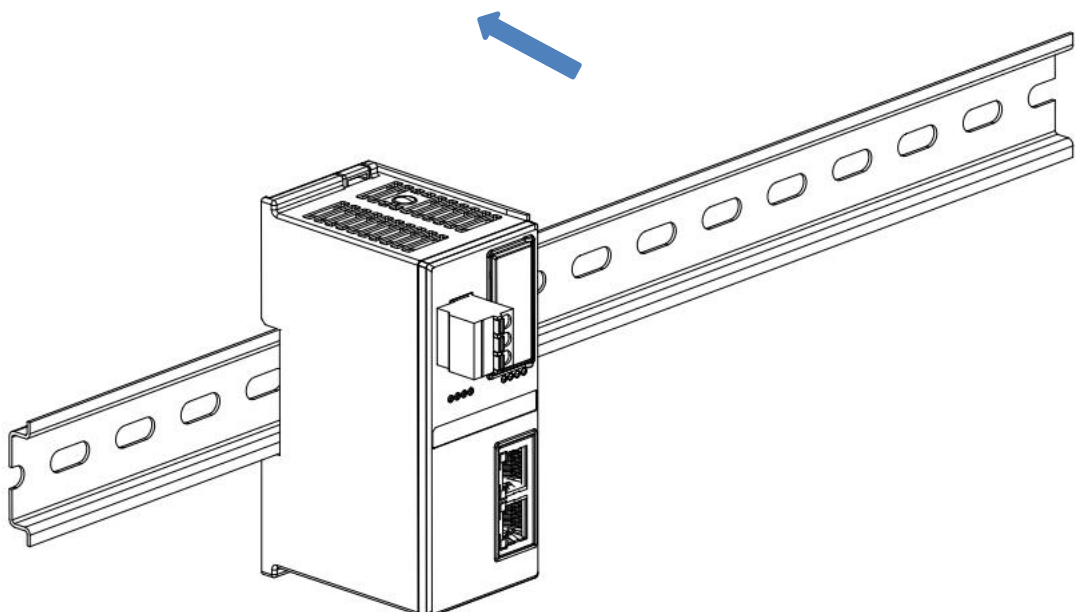
### Coupler module installation

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



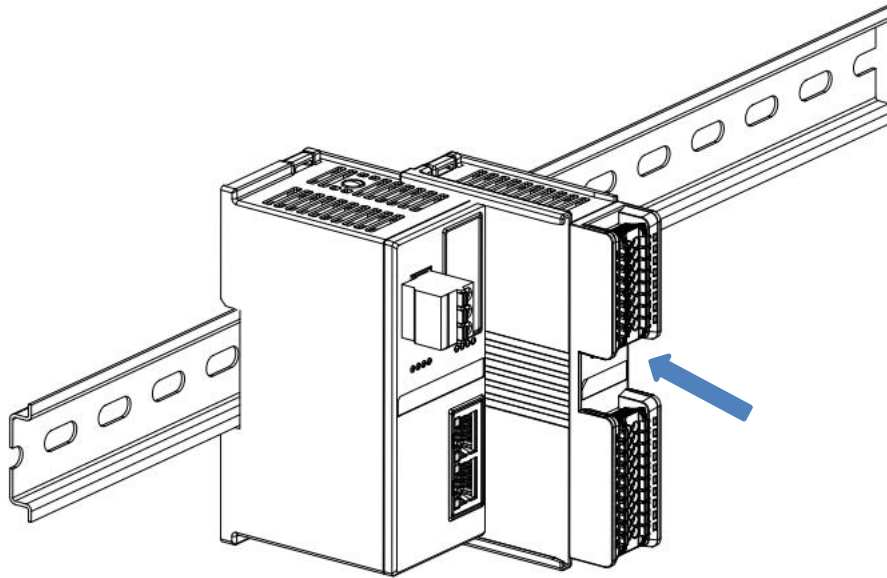
- Press the coupler module firmly into the guide rail direction until you hear a "click" sound, indicating that the module is installed in place, as shown in Figure ② below.

②

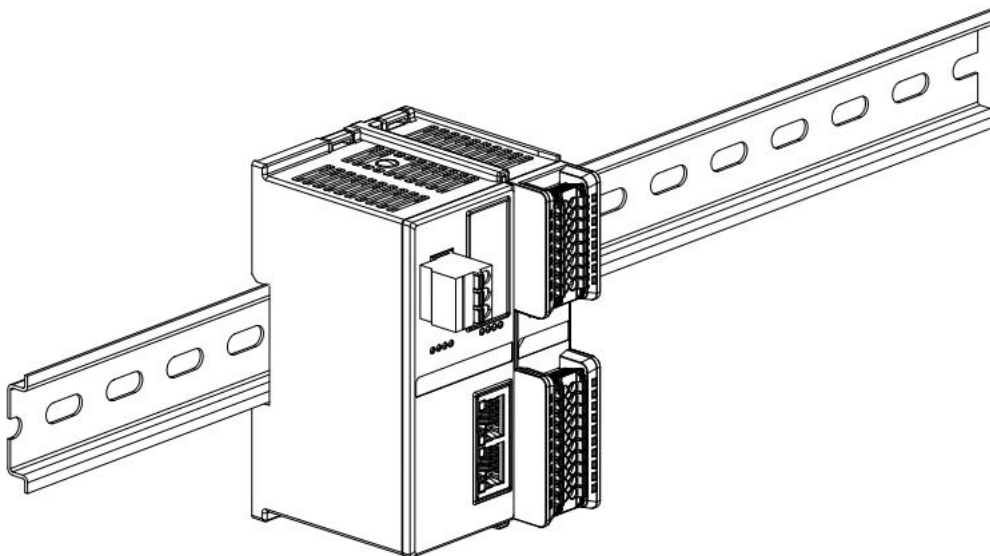


## I/O module installation

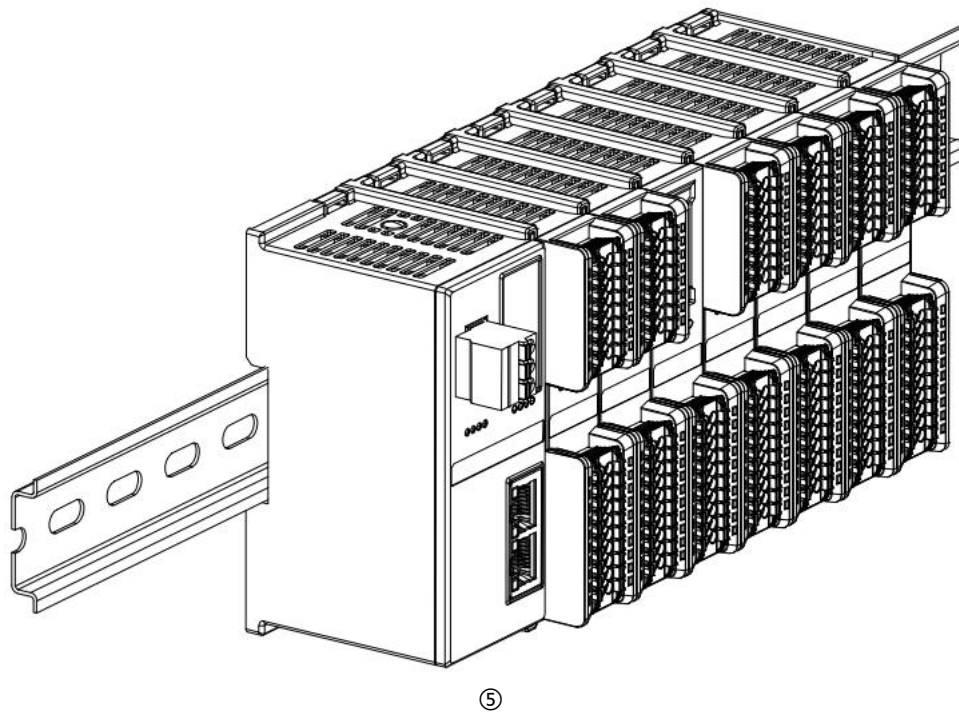
- Following the steps described above for installing the coupler module, install the required I/O modules or functional modules one by one, as shown in Figures ③, ④, and ⑤. Push them in until you hear a "click" sound, indicating that the module is installed in place.



③

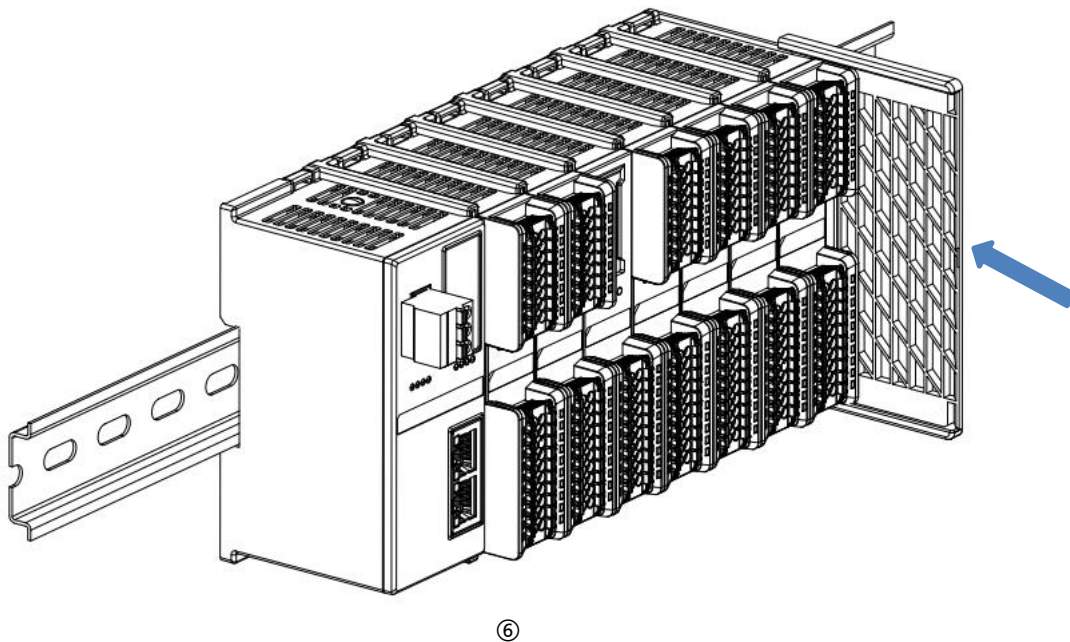


④

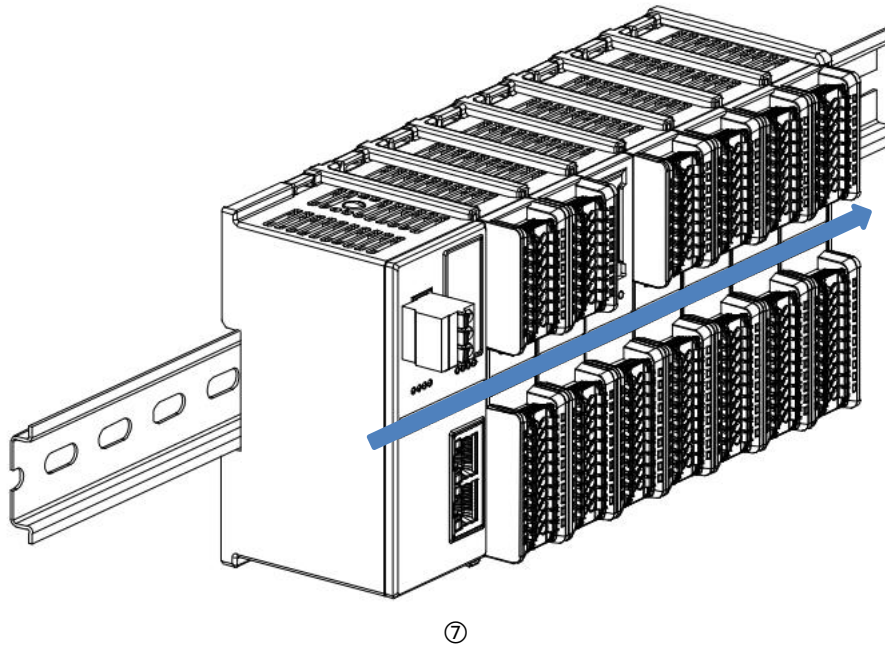


### Terminal cover installation

- 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.

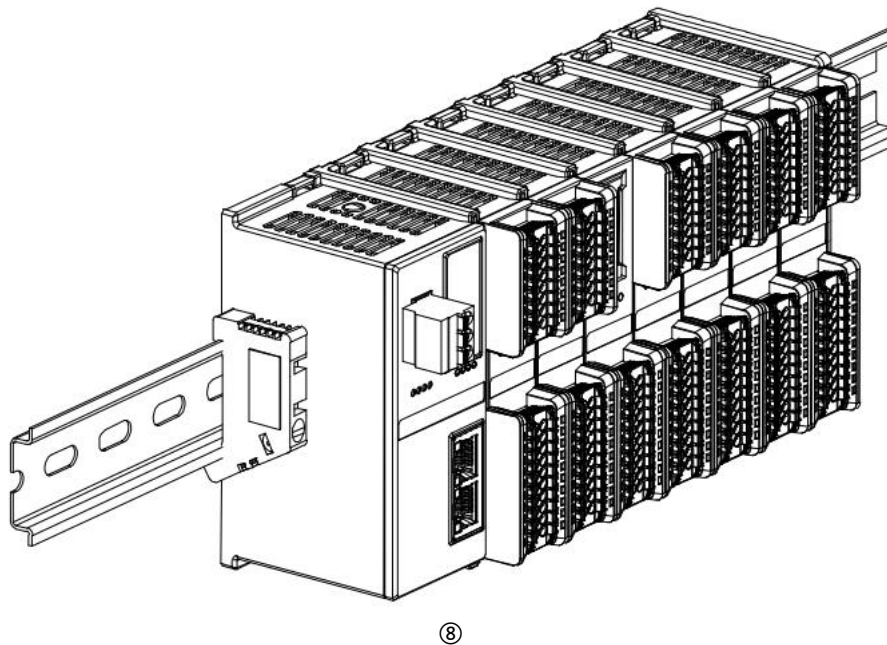


- After the terminal cover is installed, check whether the front of the entire module is flat, and ensure that all modules and end covers are installed in place and the front is flush, as shown in Figure 7 below.

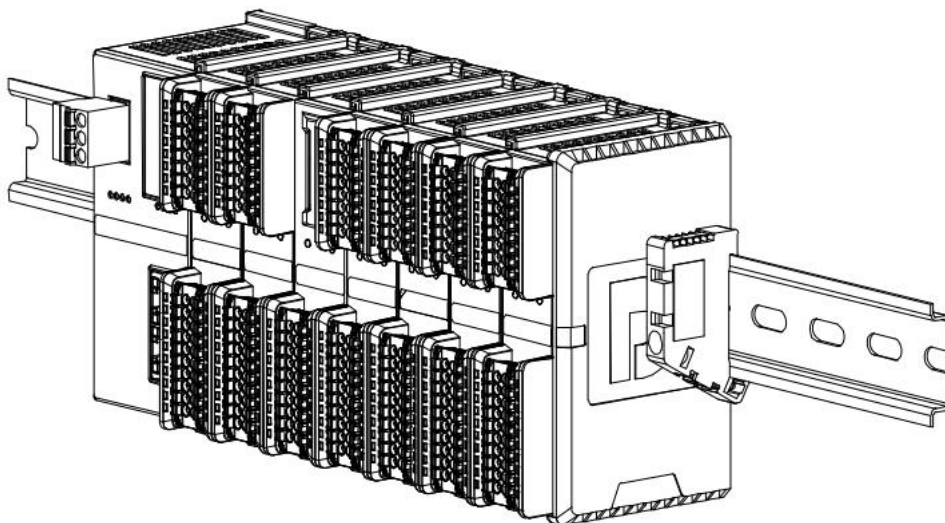


### Guide rail fastener installation

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



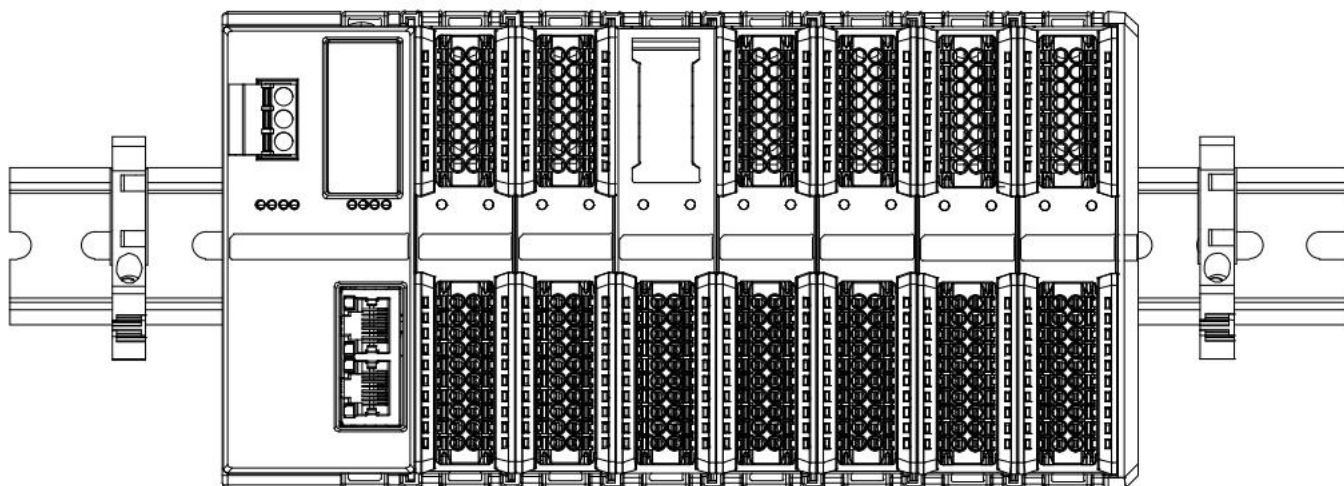
- Install the guide rail fastener on the right side of the terminal cover. First, push the guide rail fastener towards the coupler to ensure that the module is installed securely, and then tighten the guide rail fastener with a screwdriver, as shown in Figure 9 below.



9

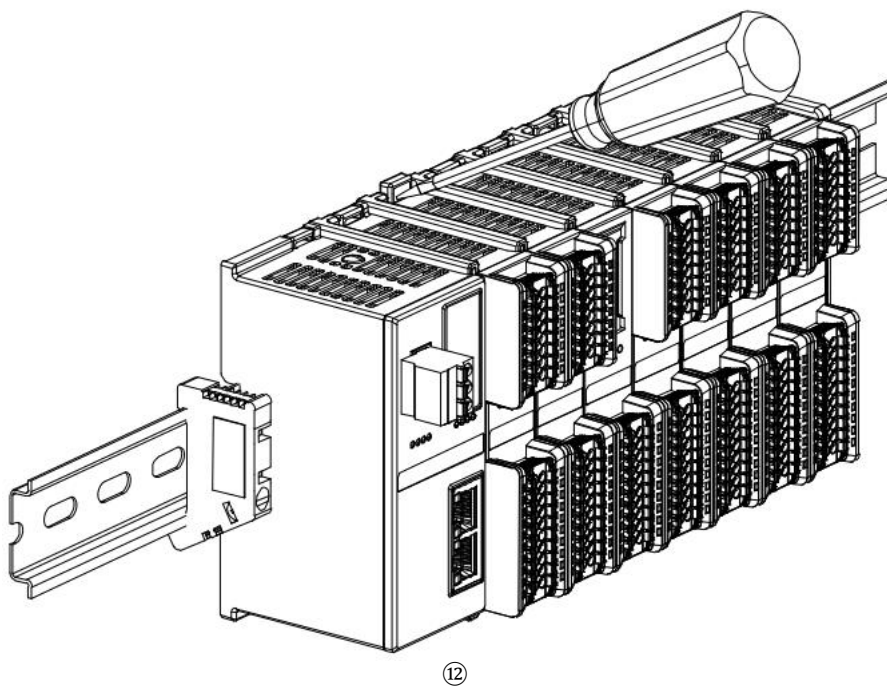
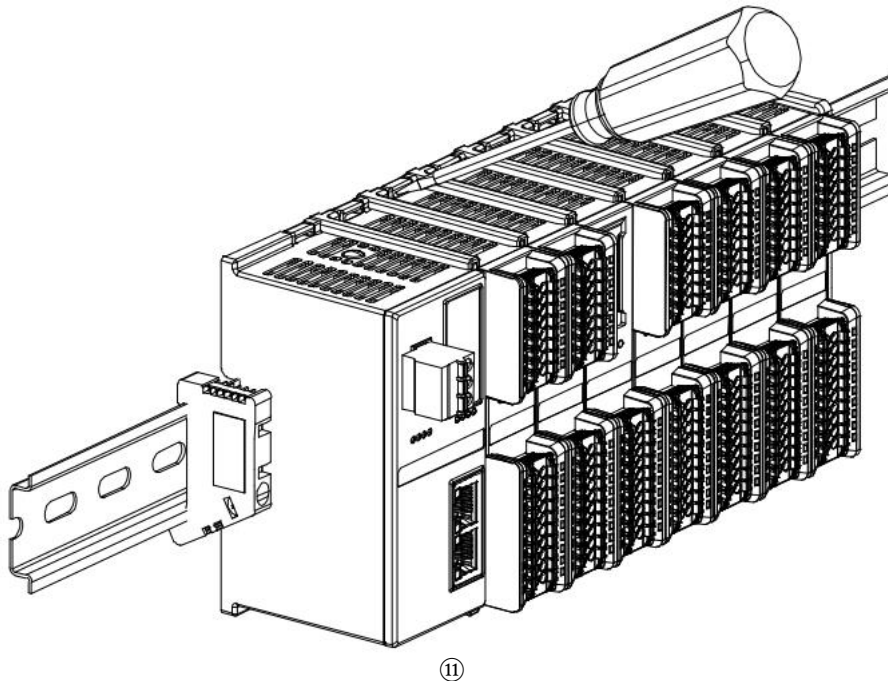
## Disassembly

- 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.

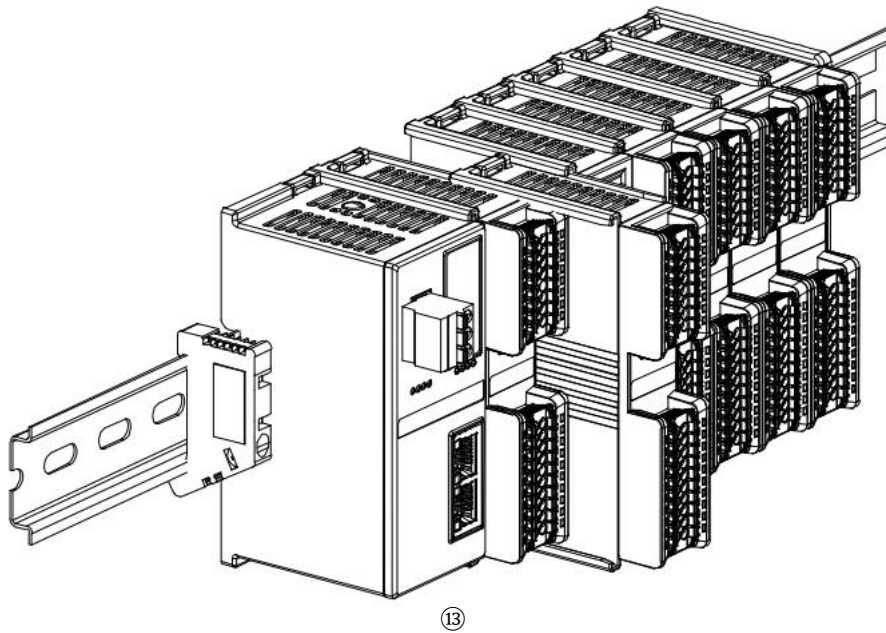


10

- 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 <sup>2</sup>            |
| Signal line terminals<br>(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 <sup>2</sup>            |
| Bus interface                                           | 2×RJ45         | UTP or STP of Category 5 or higher (STP recommended) |

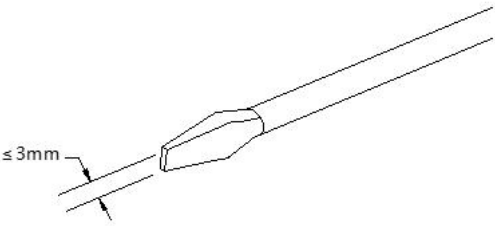
## 5.2 Wiring instructions and requirements

### 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.

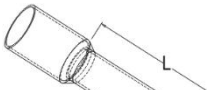


After stripping the wire to the corresponding length, the multi-strand flexible wire can be directly connected or used with the



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 <sup>2</sup> ) |
|  | 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<br>TM40-XXXX-1S |
|             |                                              | TM40-32BE              | TM40-XXXX-2<br>TM40-XXXX-2S |
| XB6S-0032AN | 32-channel digital output, NPN type          | TM40-32AE              | TM40-XXXX-1<br>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)

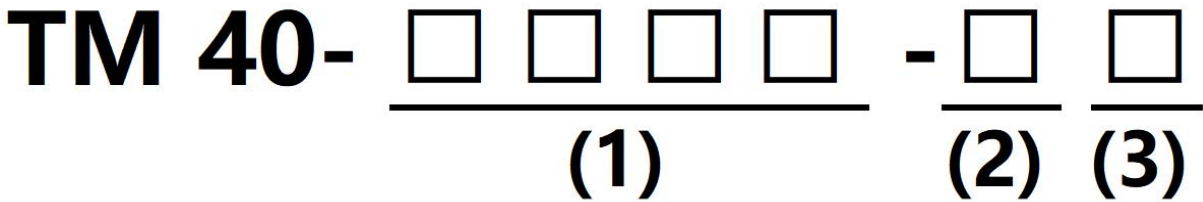
(2)

(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:<br>NPN type input<br>PNP type output<br>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

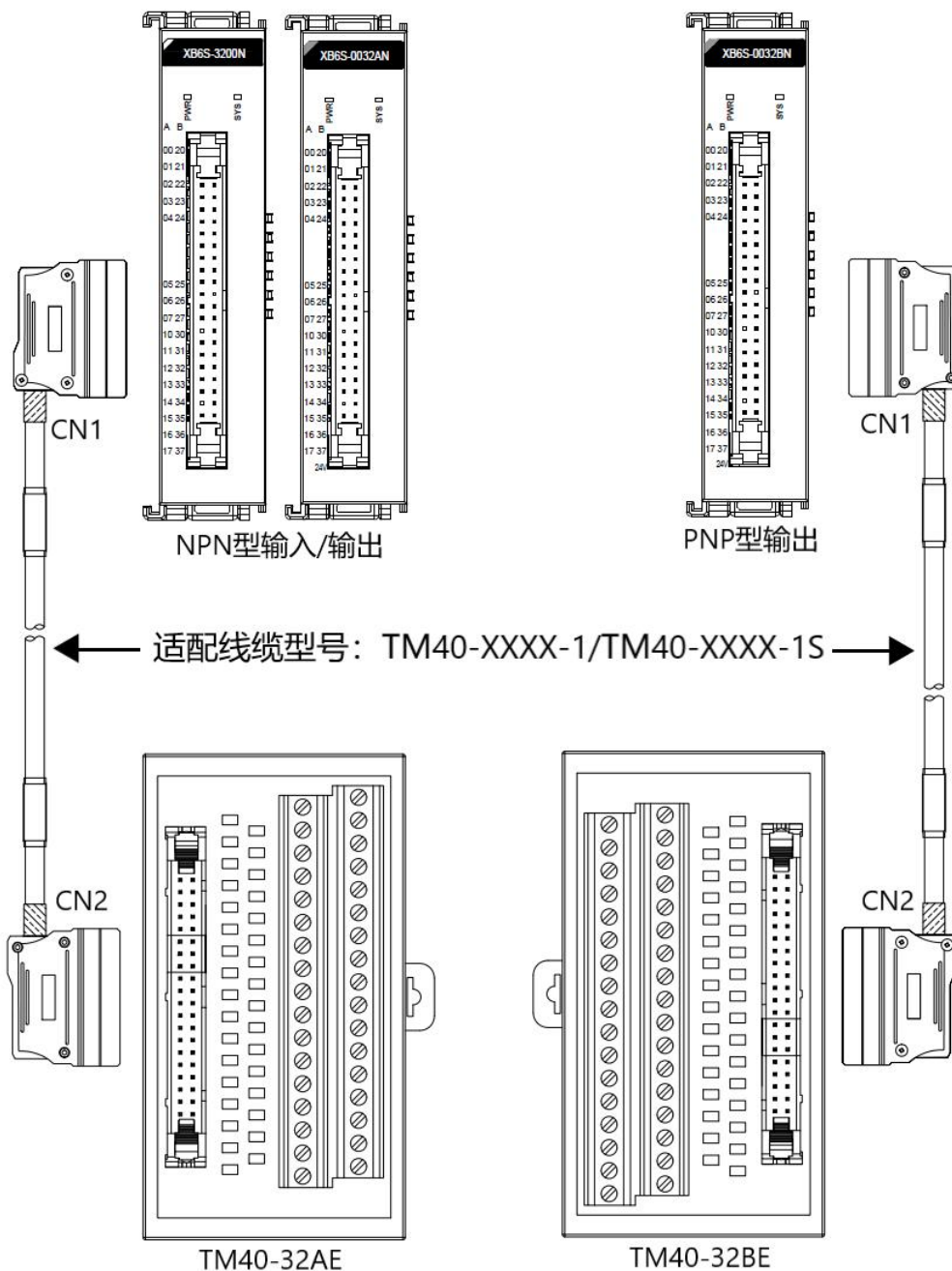
| Technical Specifications |                        |
|--------------------------|------------------------|
| Rated current            | 1A                     |
| Rated voltage            | DC24V                  |
| Suitable for wires       | 1.5mm²/AWG16 and below |

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

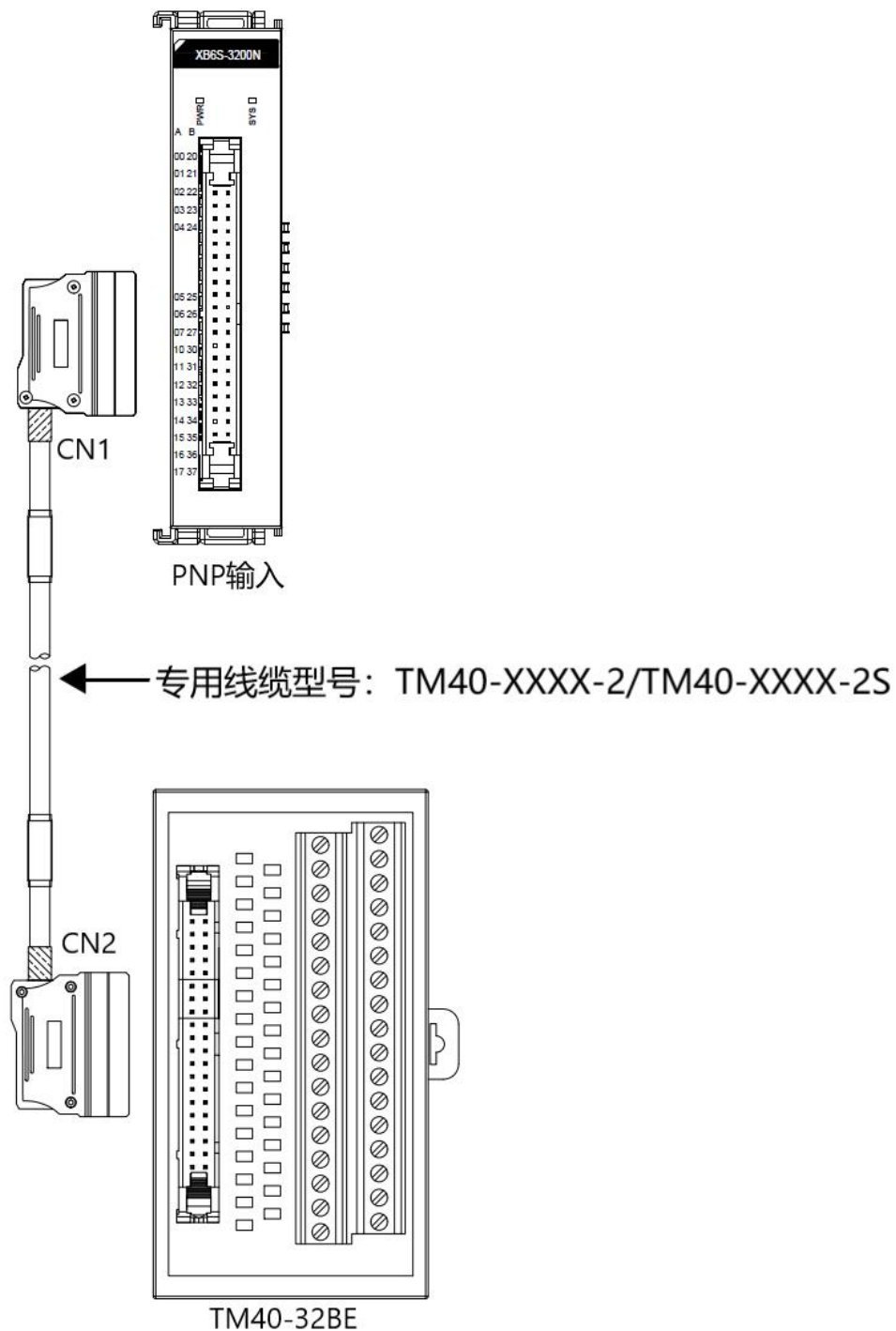
- Configuration examples for NPN type input, NPN type output, and PNP type output



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

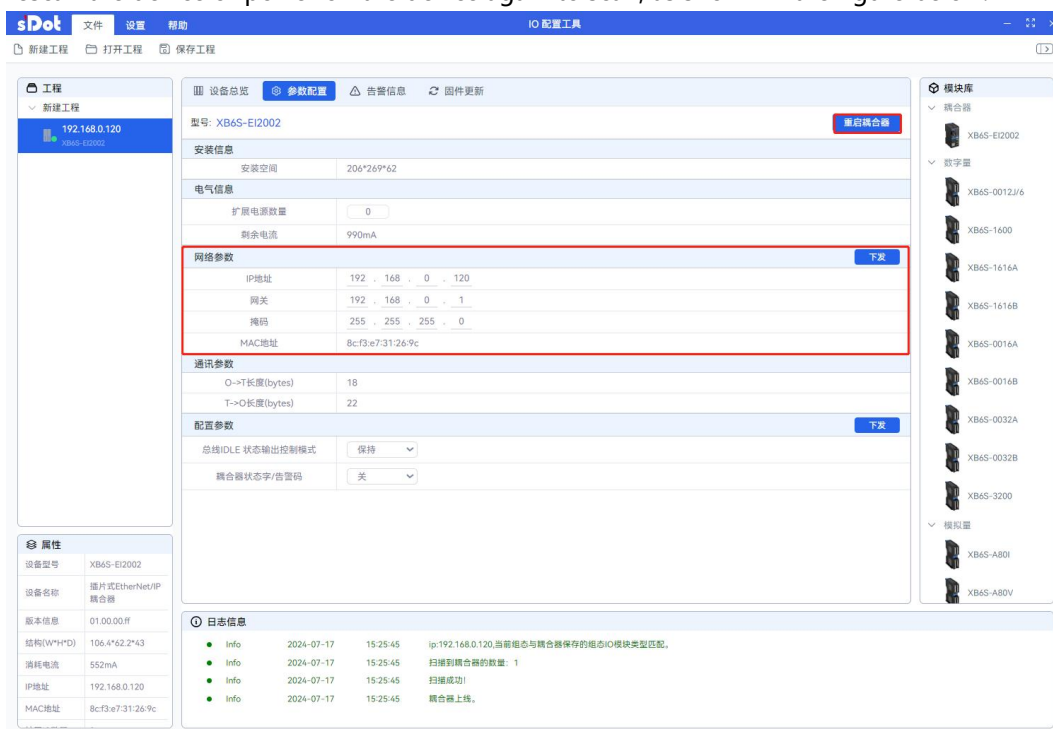
---

- 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.

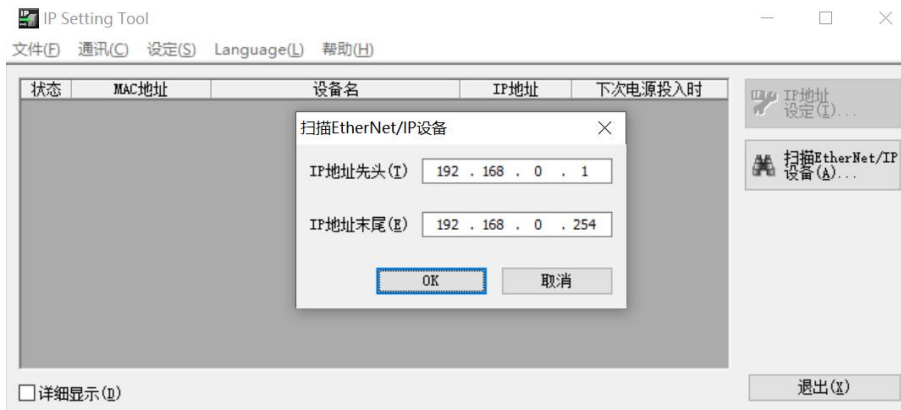
### 6.1.3 Set the IP address using the IP Setting Tool

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

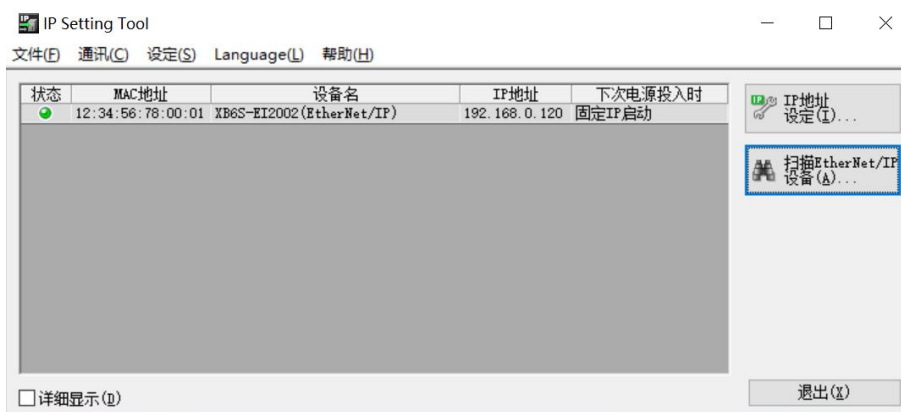
- a. Open the IP Setting Tool and click the "Scan EtherNet/IP Devices" button.



- 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                 |

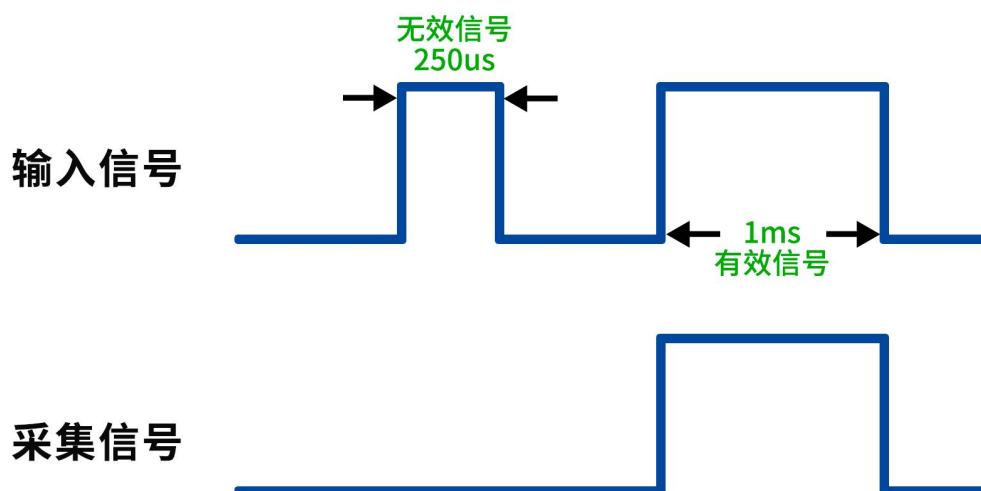
## 6.3 Parameter Description

### 6.3.1 Digital input filtering

Digital input filtering prevents unexpected rapid changes in input signals from causing switch contact skipping or electrical noise. Digital input filtering 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 filtering, 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 filtering

### ● Analog input filtering function

The analog input filtering 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.

### ● Filtering 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        | 16                         | 16                 | -                            | -                  |
| XB6S-A40        | 8                          | 8                  | -                            | -                  |
| 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

If there is no alarm status word, the XB6S-EI2002 will not occupy the uplink data length;

If an alarm status word is present, the XB6S-EI2002 will occupy 4 bytes. The first two bytes represent the alarm code of the current module, and the last two bytes represent the station number of the module. See [link to documentation] for details on how to view the status. [6.6.2 Fault Code Viewing](#).

**Note: The smaller the station number, the higher the priority of the alarm. For example, if station numbers 0 and 1 alarm at the same time, the alarm for station number 0 will be displayed until the alarm for station number 0 is cleared, and then the alarm for station number 1 will 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**

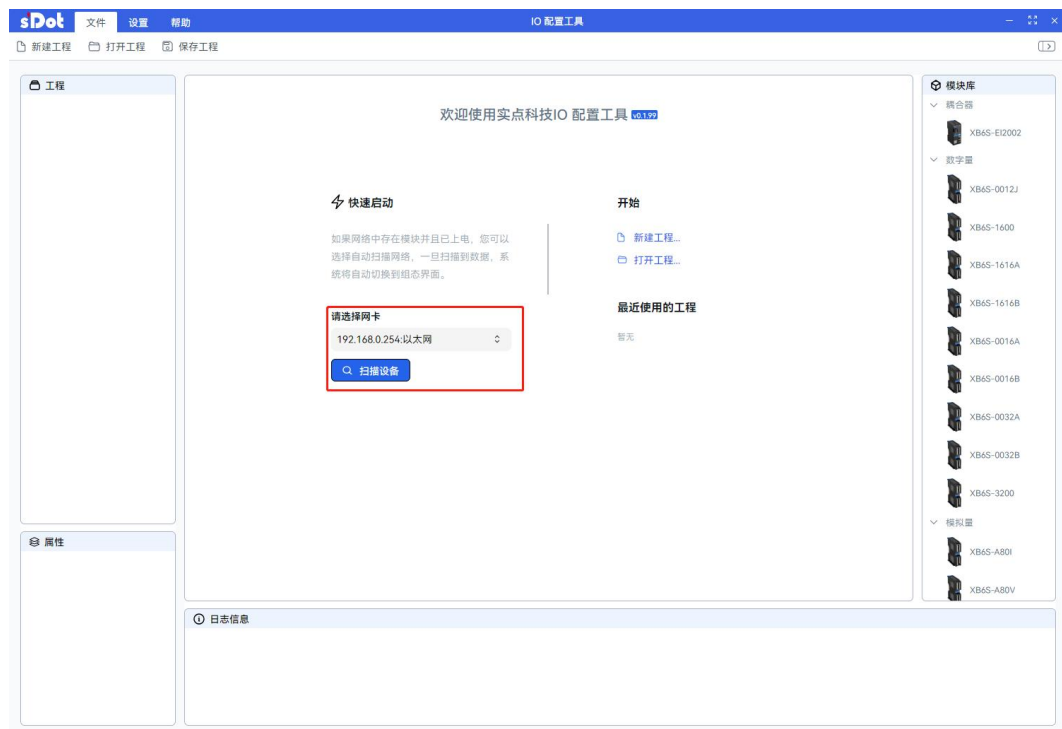
Please follow the instructions [4. Installation and Removal](#) and [5-wire connection](#) "Required Operation"

- **Module power-on**

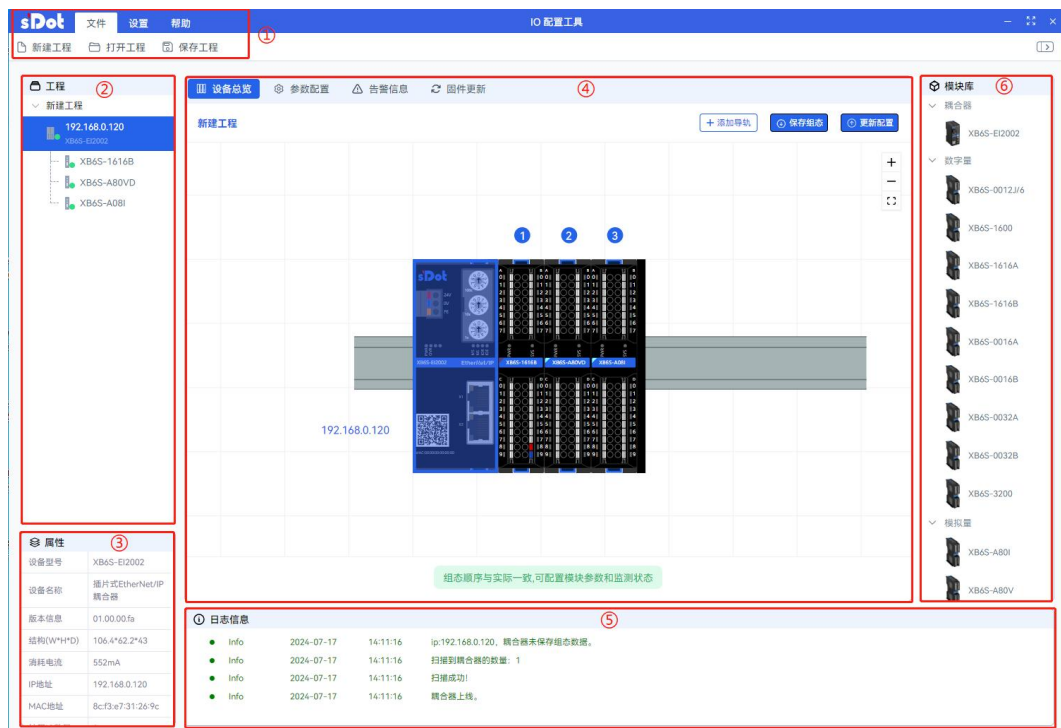
After verifying that the wiring is correct, power on the coupler module + I/O module device combination.

#### 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.



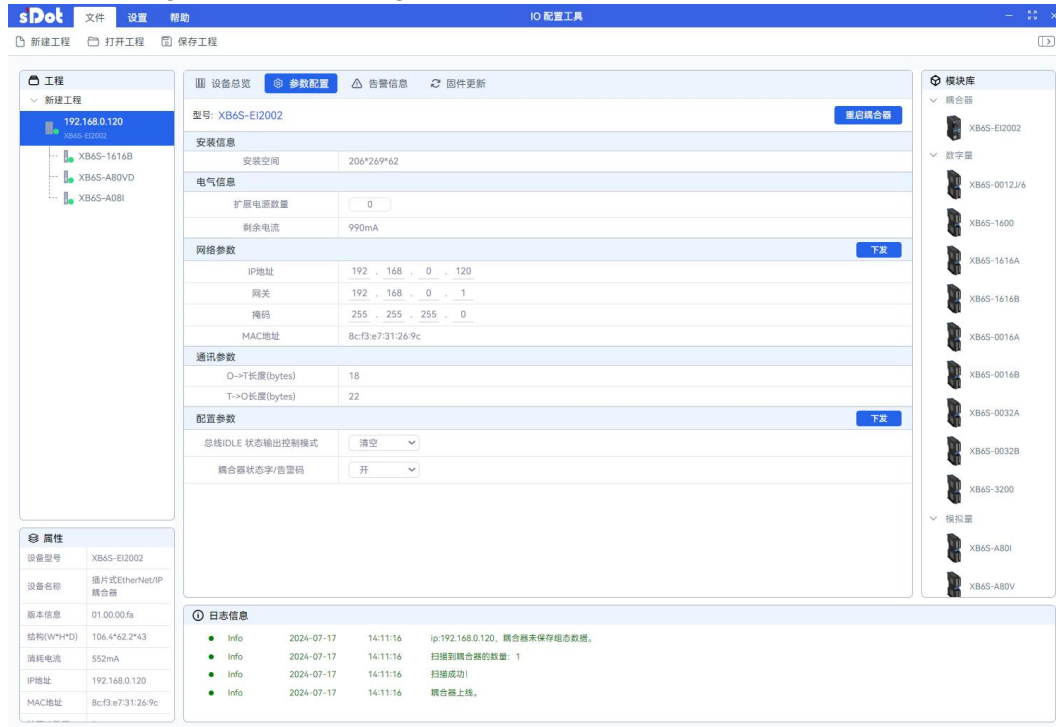
Note: You can view the coupler's IP address in the project panel; the log information shows the number of couplers detected.

### 3. Parameter settings

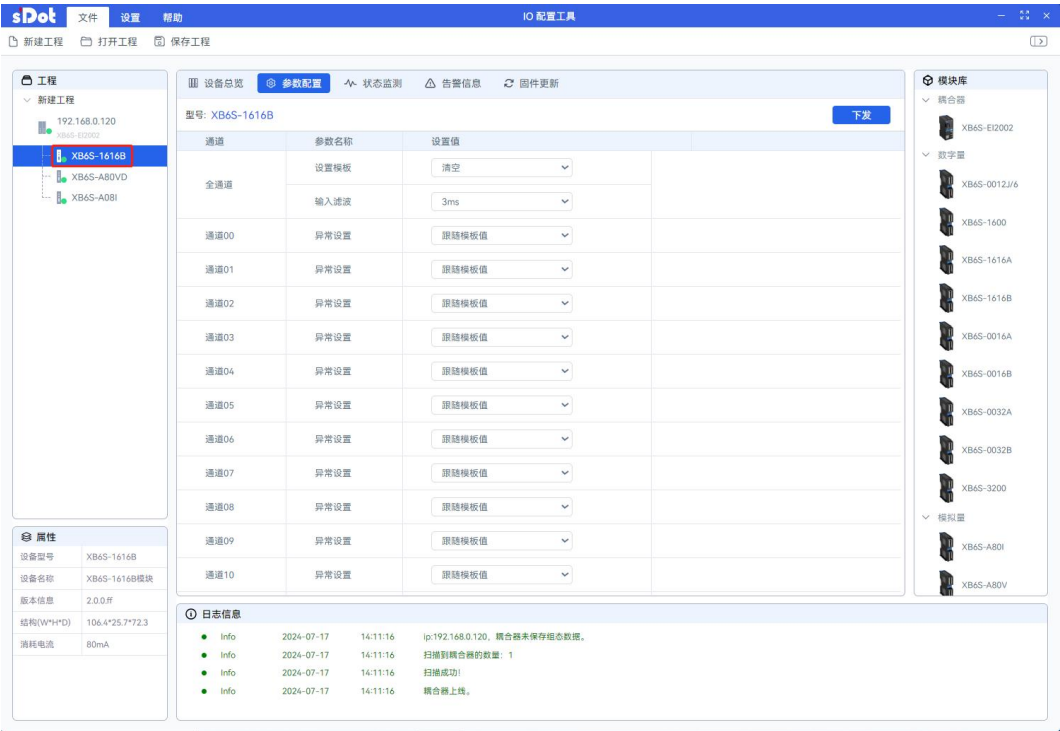
- a. On the device overview page, click the XB6S-EI2002 module, then click "Parameter Settings", as shown in the figure below.



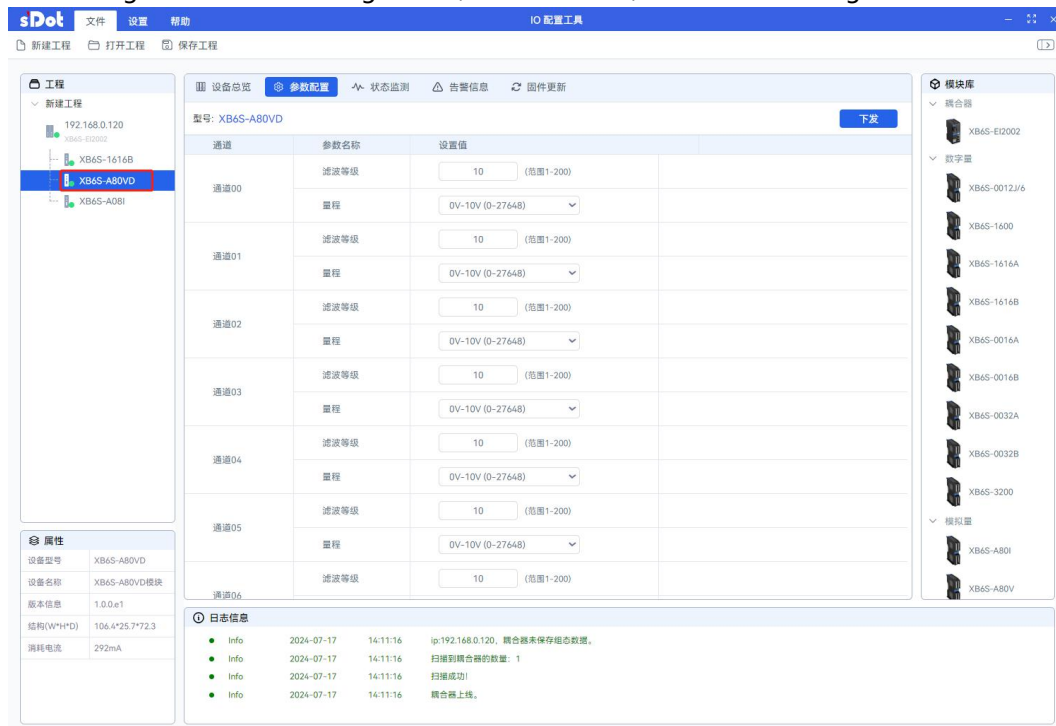
- b. existThe XB6S-EI2002 parameter settings page allows you to view the module's installation information, electrical information, and communication parameters. You can also configure the module's network and configuration parameters. After configuring the parameters, click "Deploy" and then "Restart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



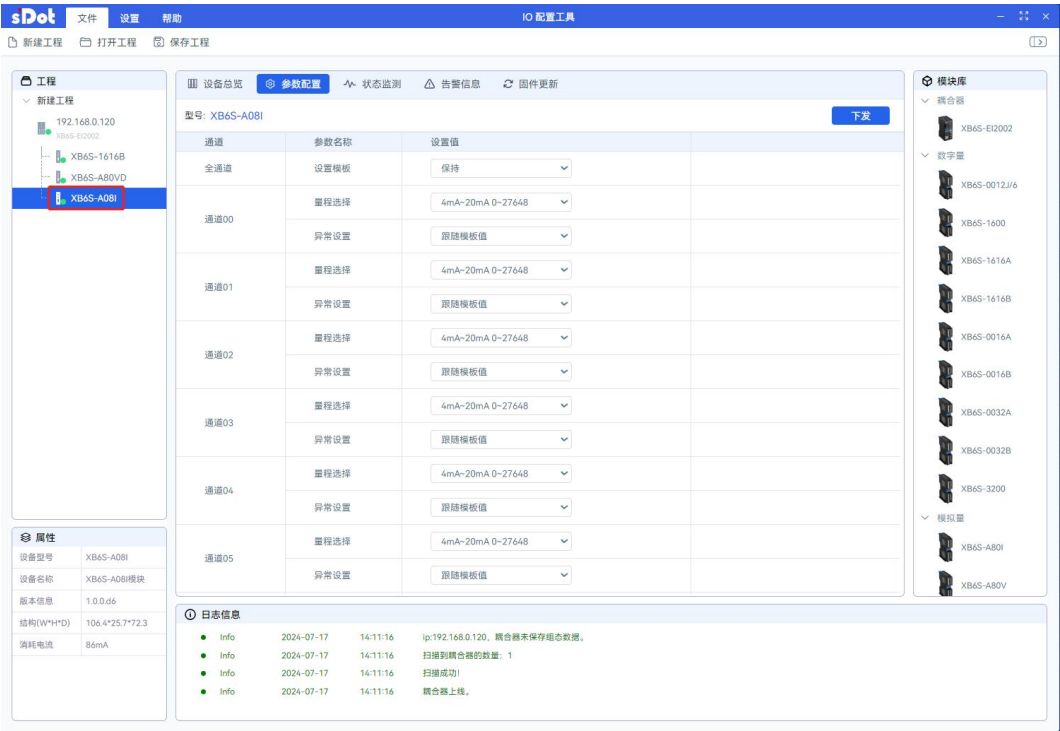
- c. Select the XB6S-1616B module in the left-hand engineering panel to enter the XB6S-1616B parameter setting page. Here you can configure the digital input filtering and output signal clear/hold functions. The parameters can be configured according to actual usage needs. After configuration, click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

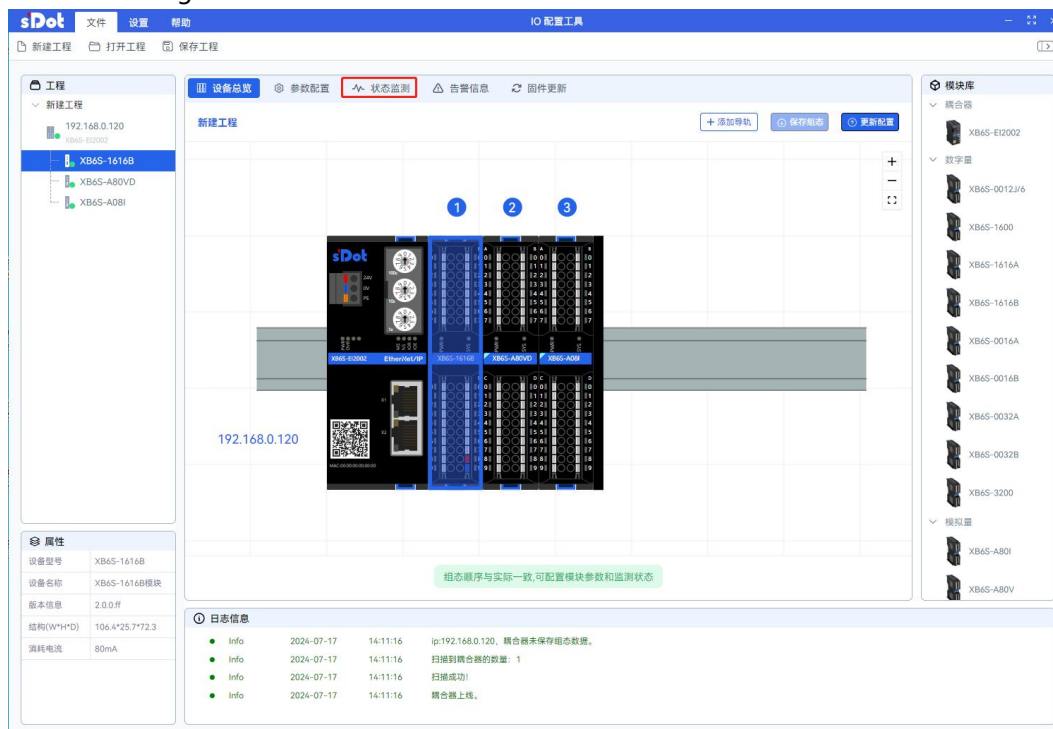


- e. Select the XB6S-A08I module in the left-hand engineering panel to enter the XB6S-A08I analog current output module parameter setting page. Here you can configure the analog current range and the analog output signal clear/hold parameters. The parameters can be configured according to actual usage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

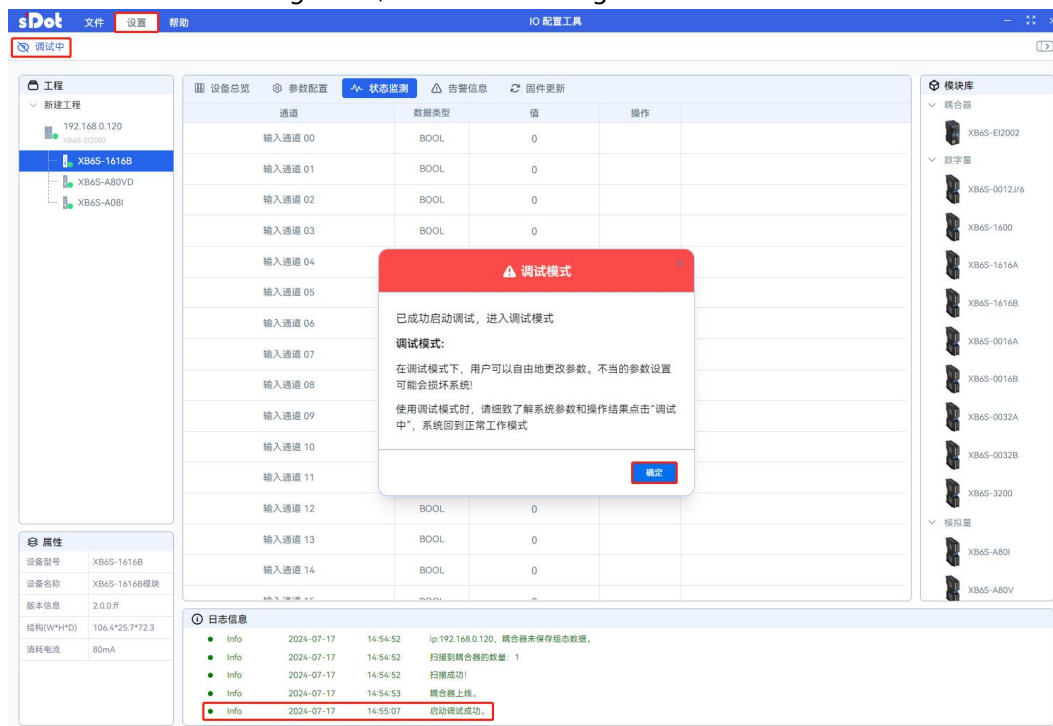


## 4. I/O functions

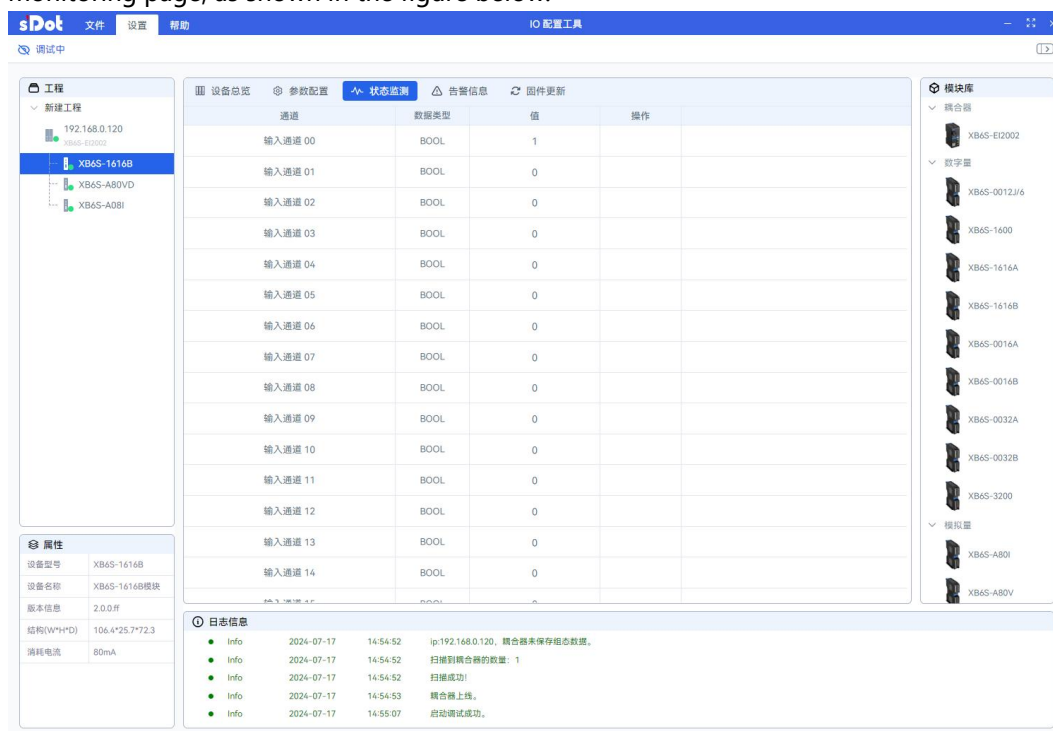
- a. On the device overview page, click the XB6S-1616B module, then click "Status Monitoring", as shown in the figure below.



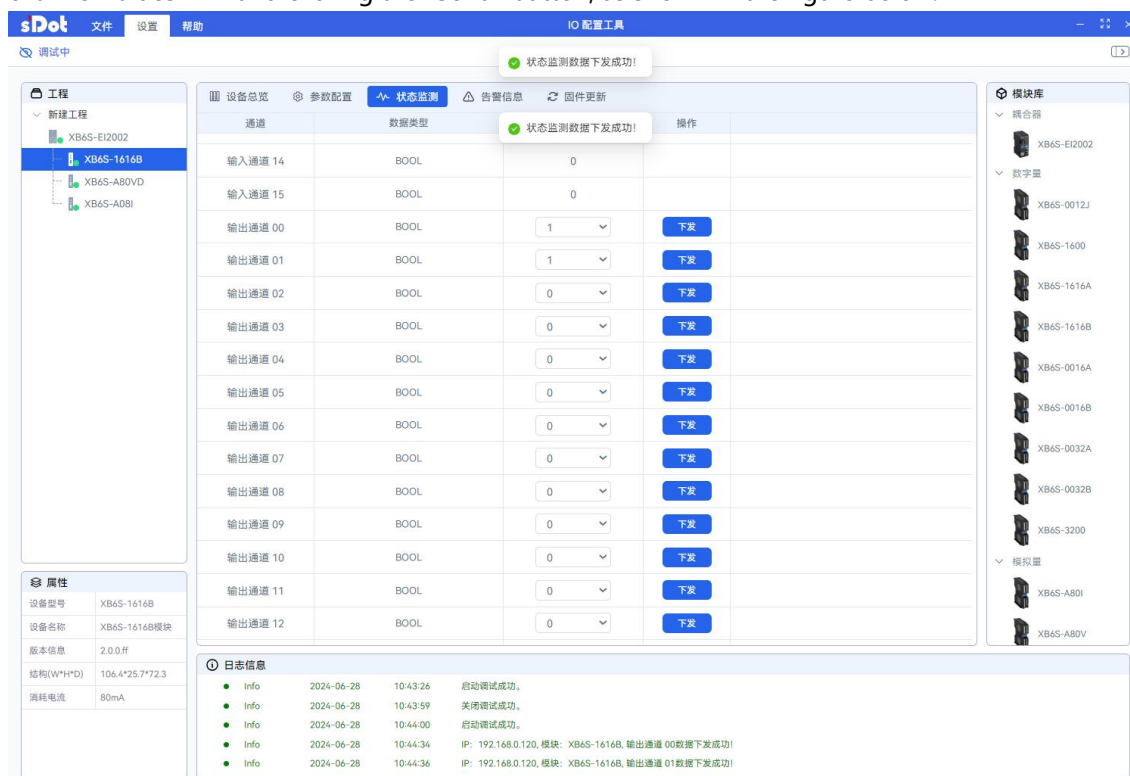
- b. Click "Settings -> Debugging" in the menu bar. A debug mode confirmation window will pop up. Click "OK" to enter debug mode, as shown in the figure below.



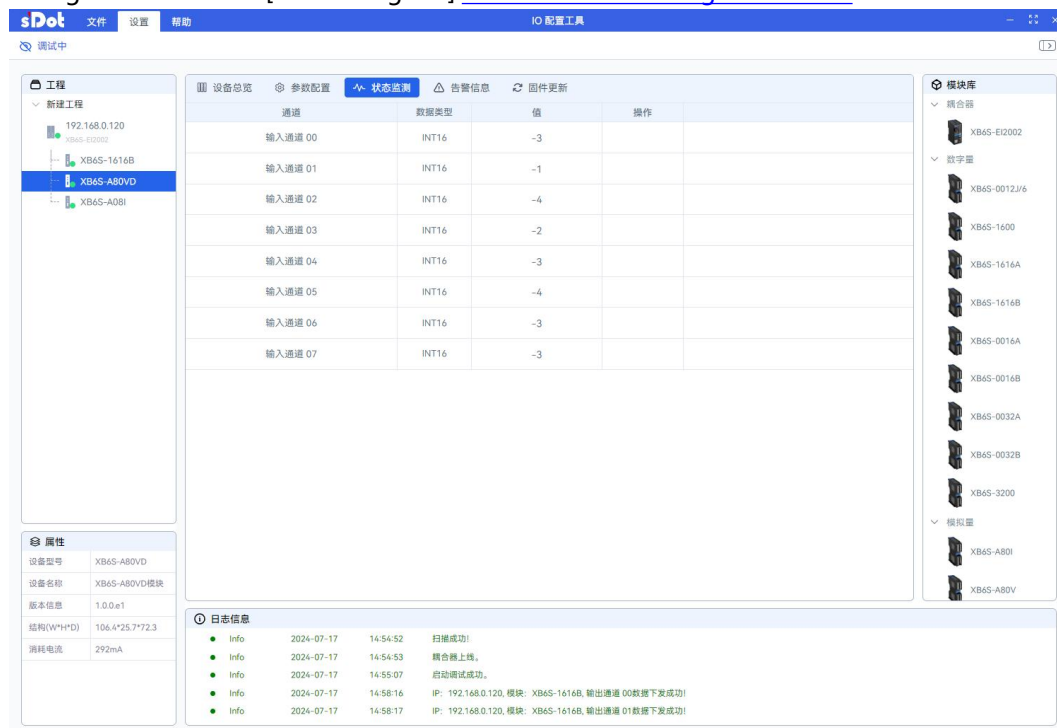
- c. Taking input channel 0 of the XB6S-1616B module as an example, when the module...Input channel 0 has a valid voltage input, and the input value can be monitored on the status monitoring page, as shown in the figure below.



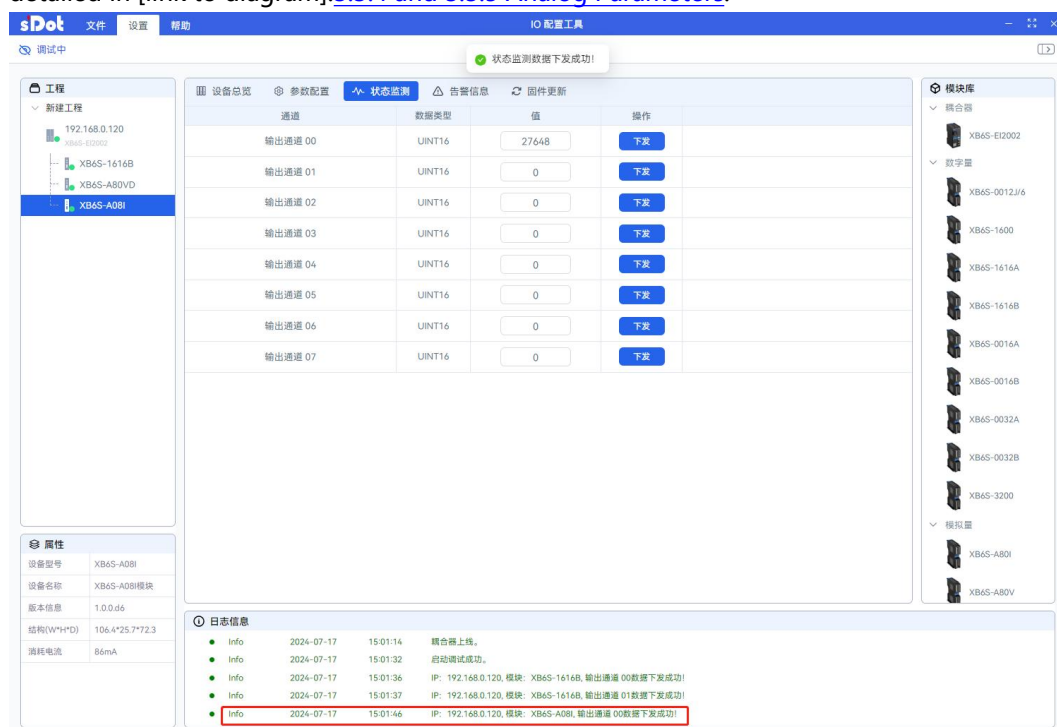
- d. The output channels of the XB6S-1616B module can be forced to output by modifying the channel values and clicking the "Send" button, as shown in the figure below.



- 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](#).

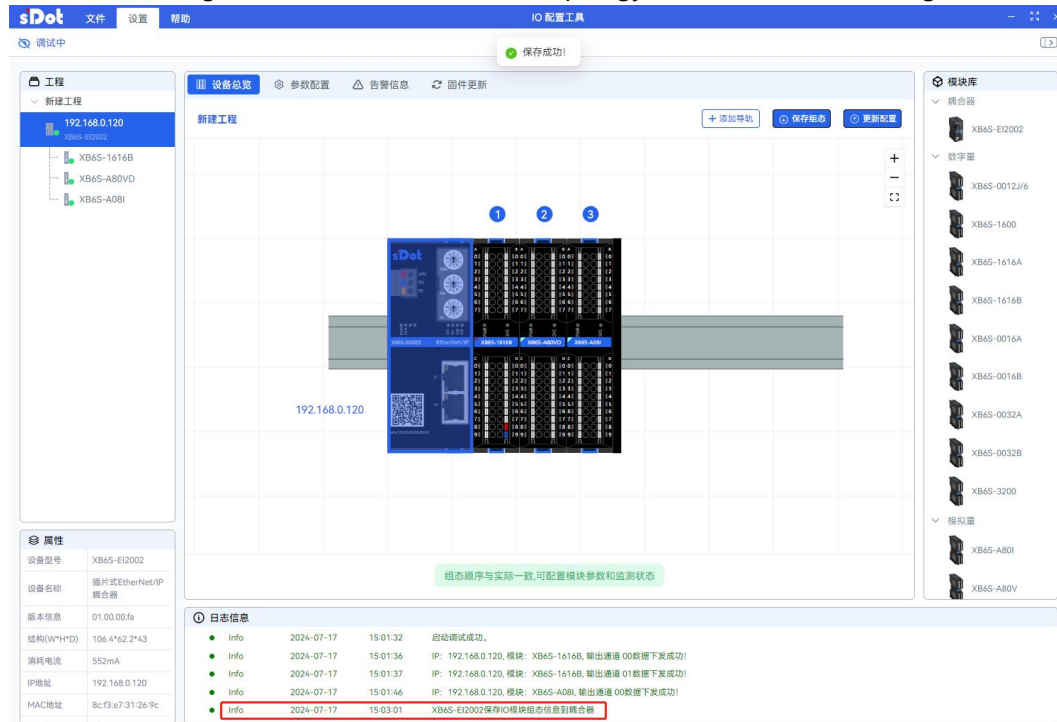


- f. Select the XB6S-A08I module in the left-hand engineering pane, switch to the XB6S-A08I module's status monitoring page, and write the current code value to force output for each channel. As shown in the figure below, the correspondence between code value and current is detailed in [link to diagram].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

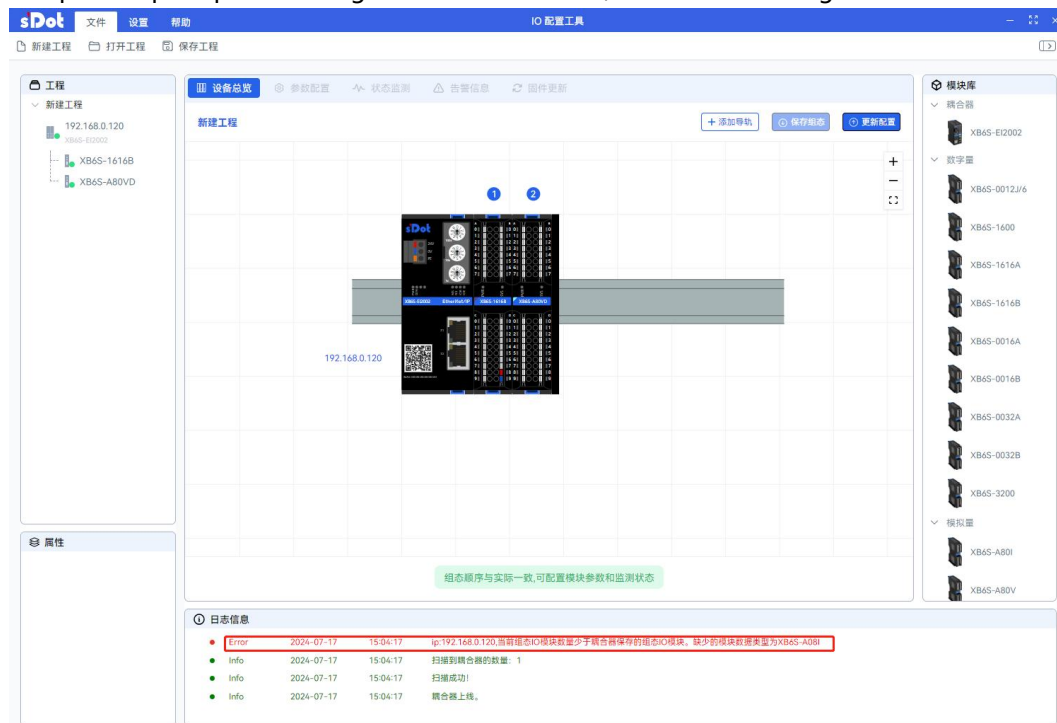


## 5. Topology state comparison function

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

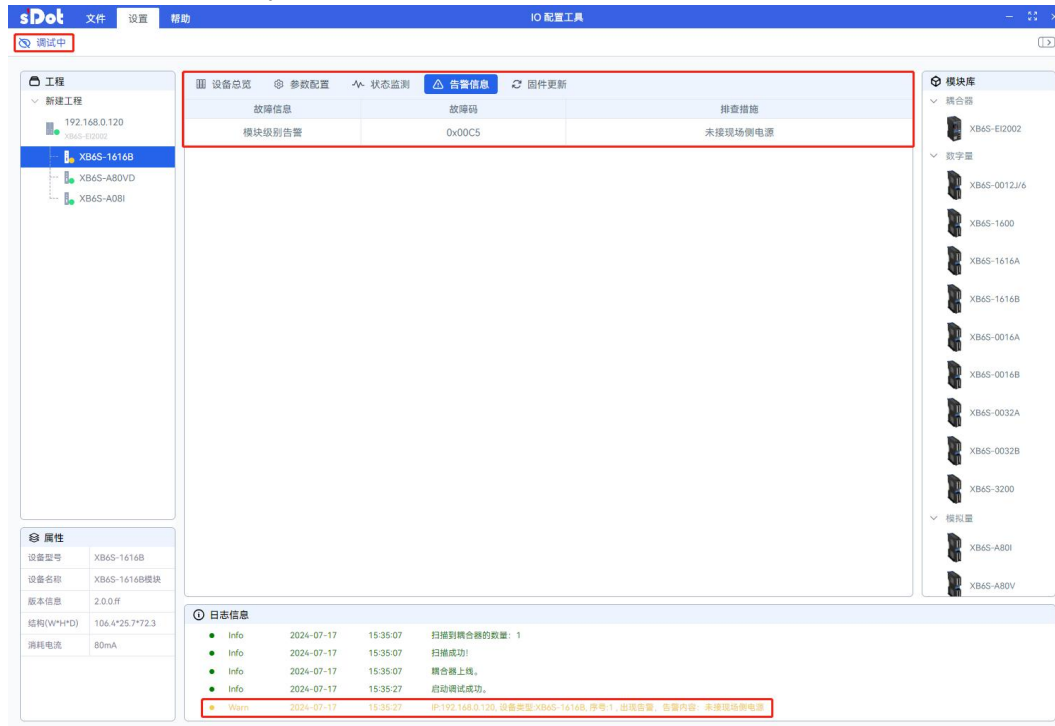


- b. When the topology changes, a power-on scan can be performed. View the topology status comparison prompts in the log information window, as shown in the figure below.



## 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

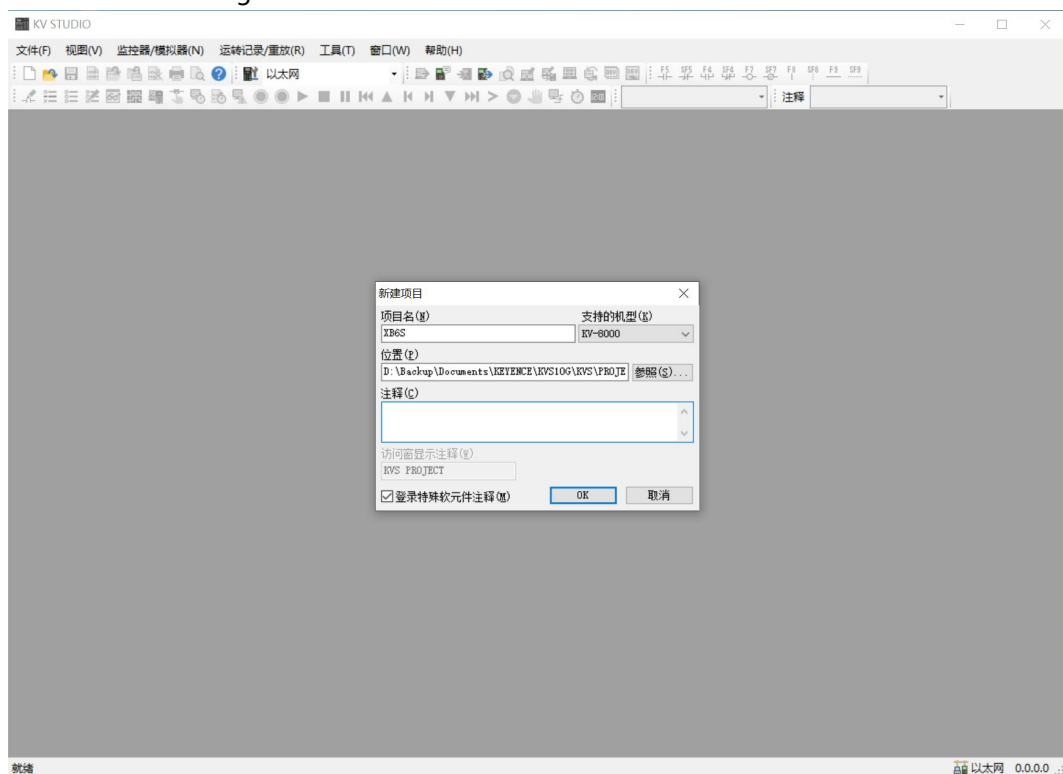
address: <https://www.solidotech.com/cn/resources/configuration-files>

- **Hardware configuration and wiring**

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

### 2、Create a project

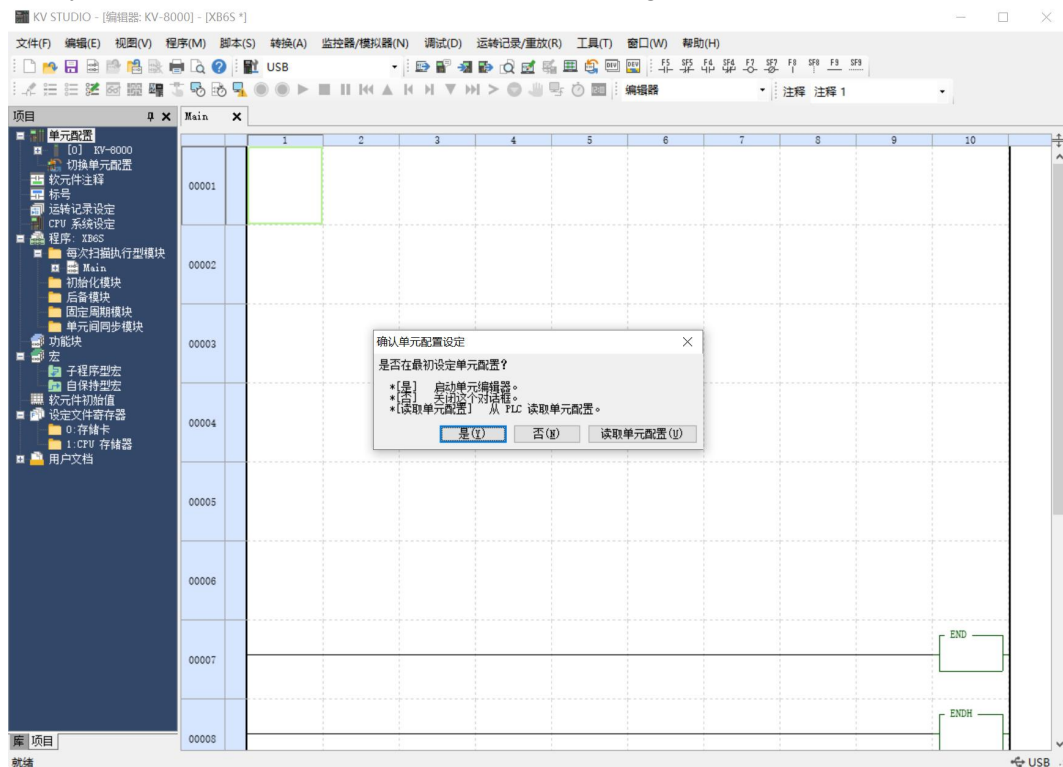
- a. Open KV STUDIO software and select "File".-> Create a new project.
- b. In the pop-up window, enter the "Project Name", select the "Supported Models", and "Location", as shown in the image below.



- ◆ 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.

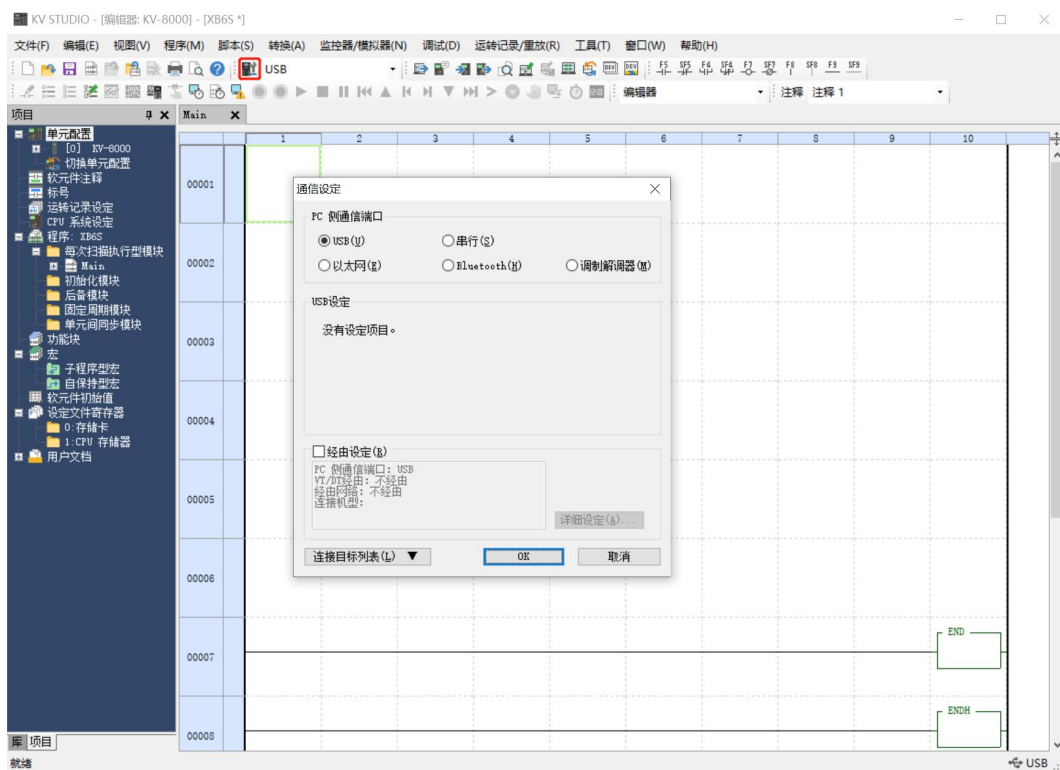


### 3. Communication settings

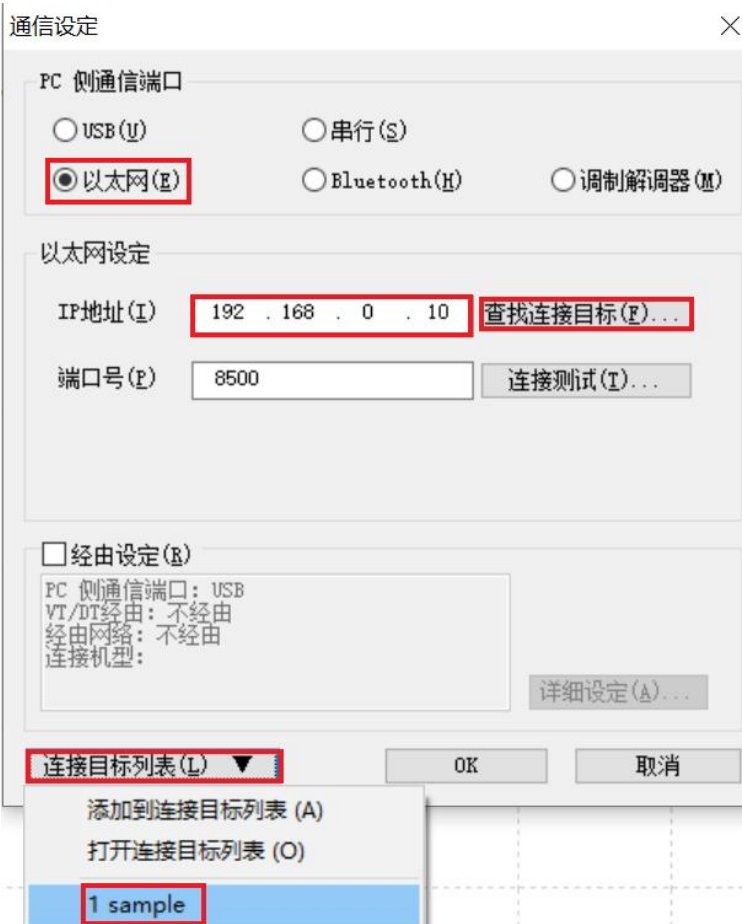
Select the communication method. If the PLC and the host computer software are connected via a network cable, select "Ethernet". If they are connected via USB, select "USB".

#### ➤ 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

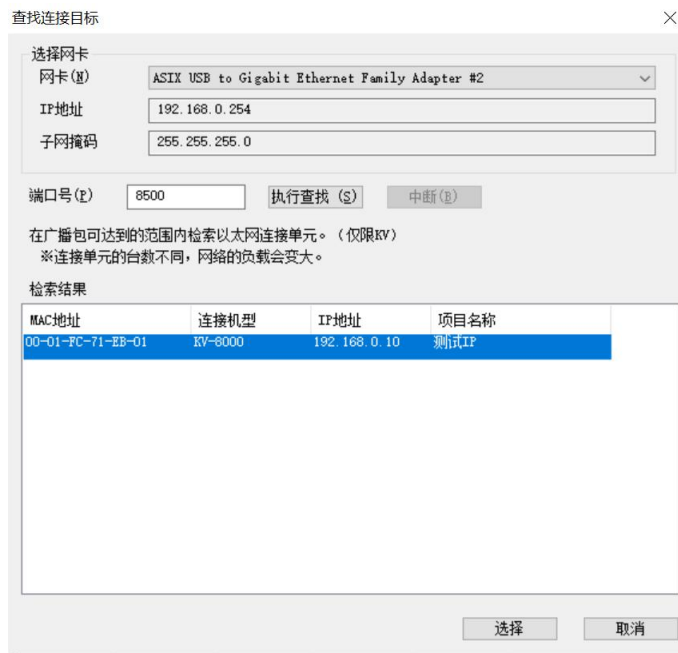
| MAC地址 | 连接机型 | IP地址 | 项目名称 |
|-------|------|------|------|
|-------|------|------|------|

选择

取消

below.

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



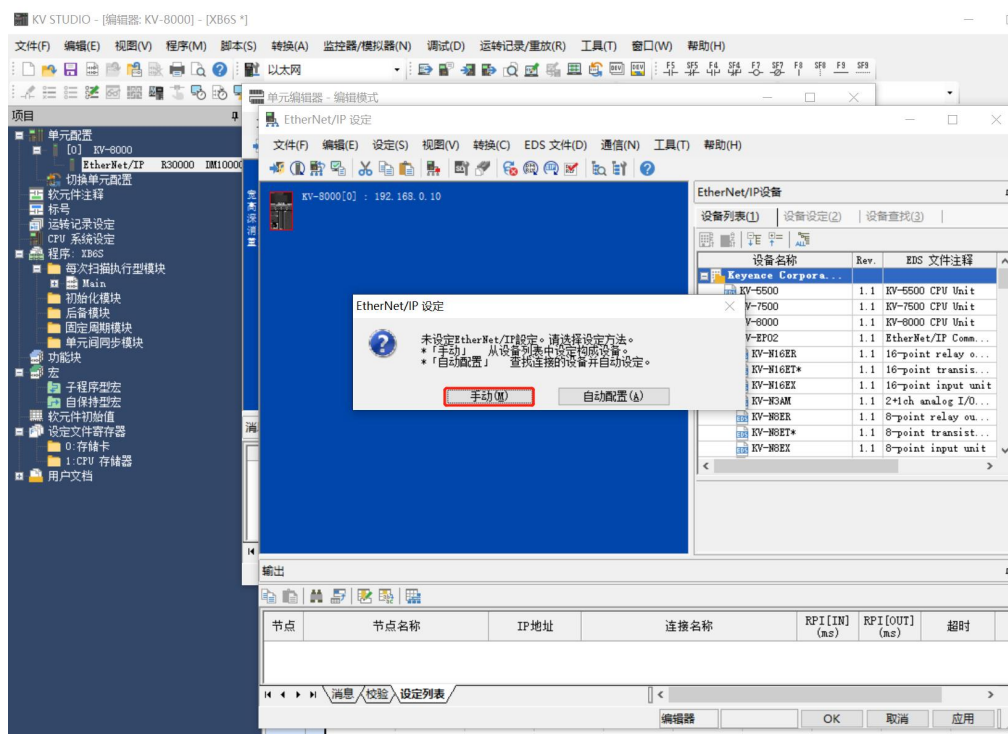
- e. Click "O" in the communication settings window. "Button".

#### ➤ USB connection operation method

Select in the "Communication Settings" interface USB.

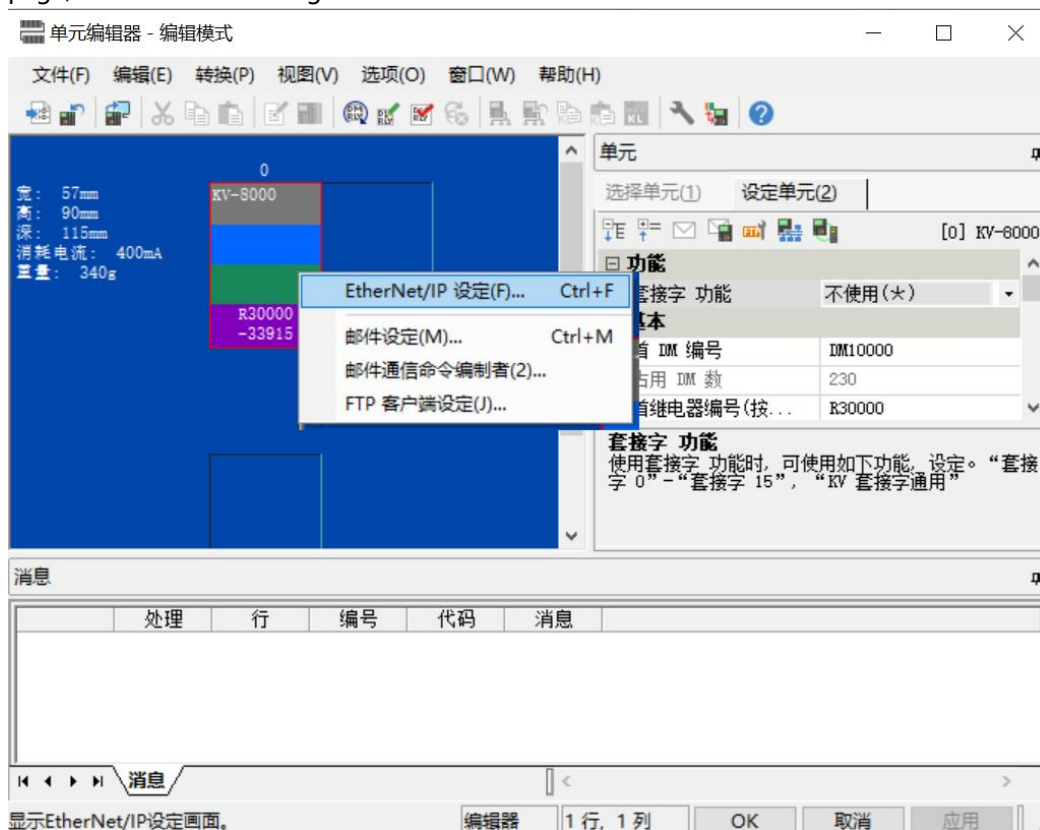
## 4、EtherNet/IP Configuration

- 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.

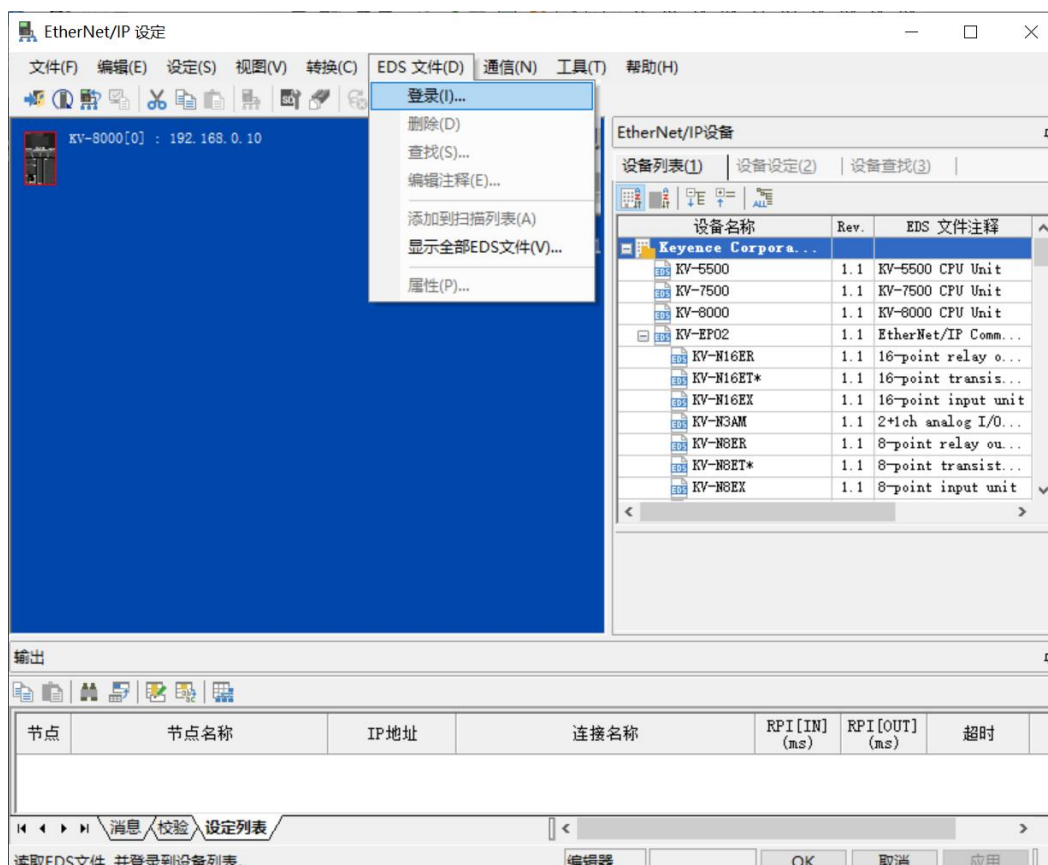


## 5. Install EDS file

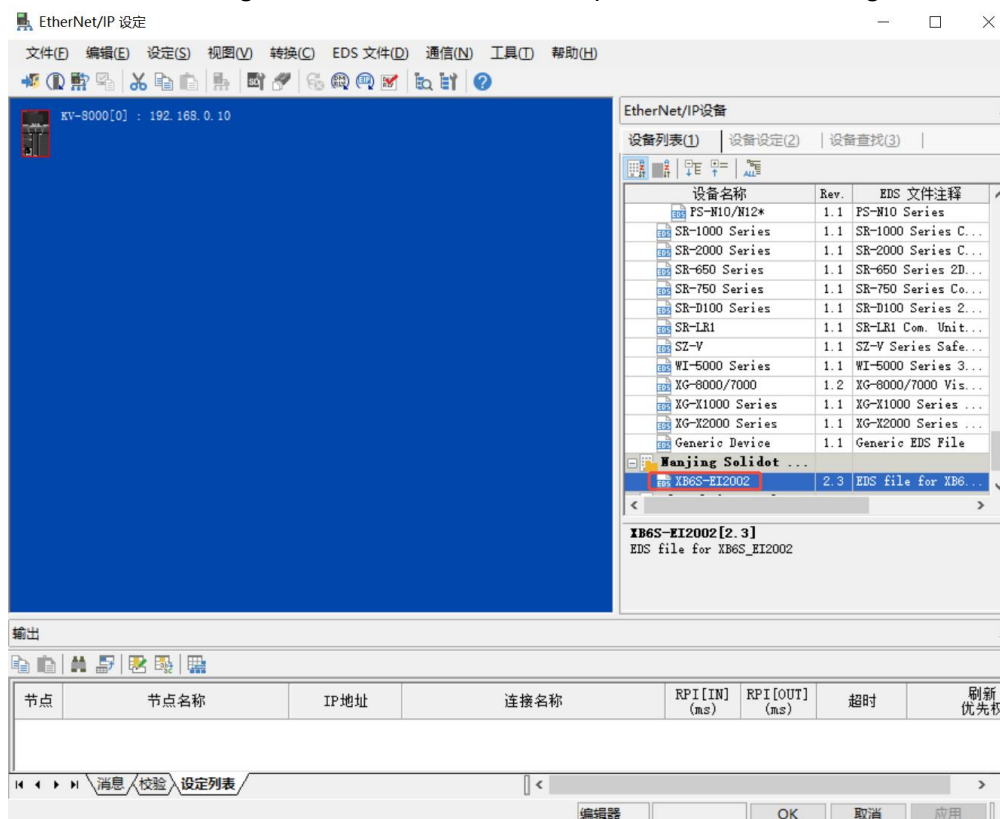
- Right-click K in the unit editing window V-8000. Select "EtherNet/IP Settings" to enter the settings page, as shown in the image below.



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



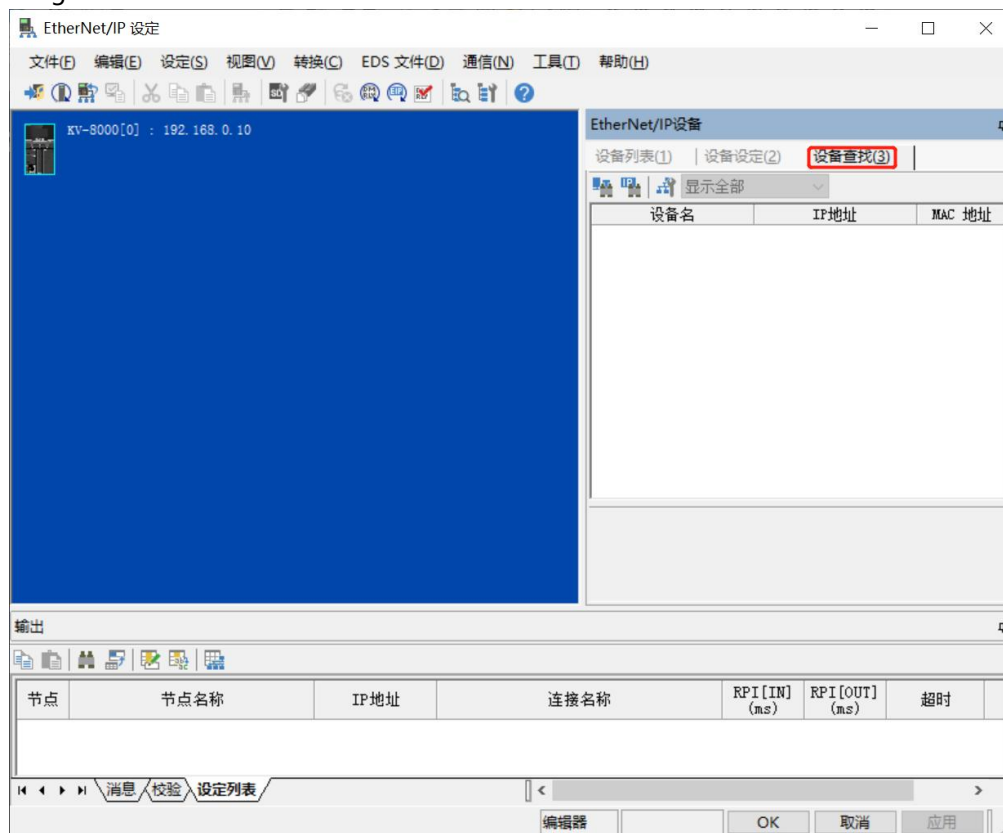
- c. In the folder where the EDS files are located, select the EDS file for the corresponding model, and click "OK". The configuration file installation is complete, as shown in the figure below.



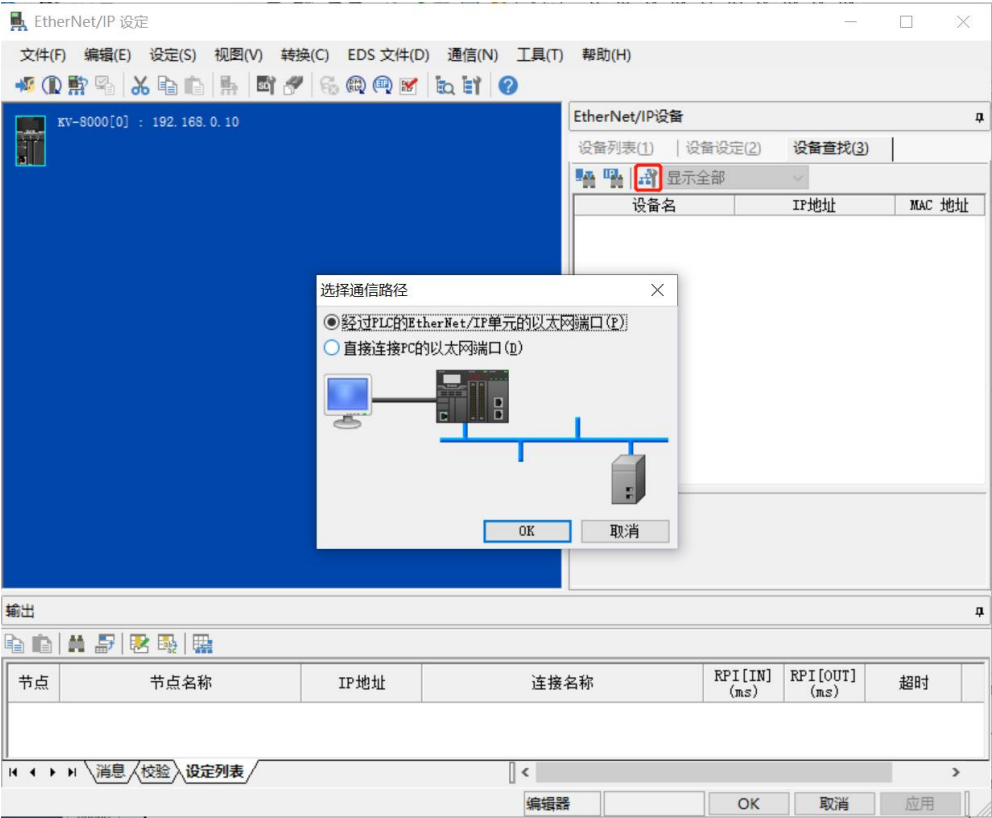
## 6、Topology configuration

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

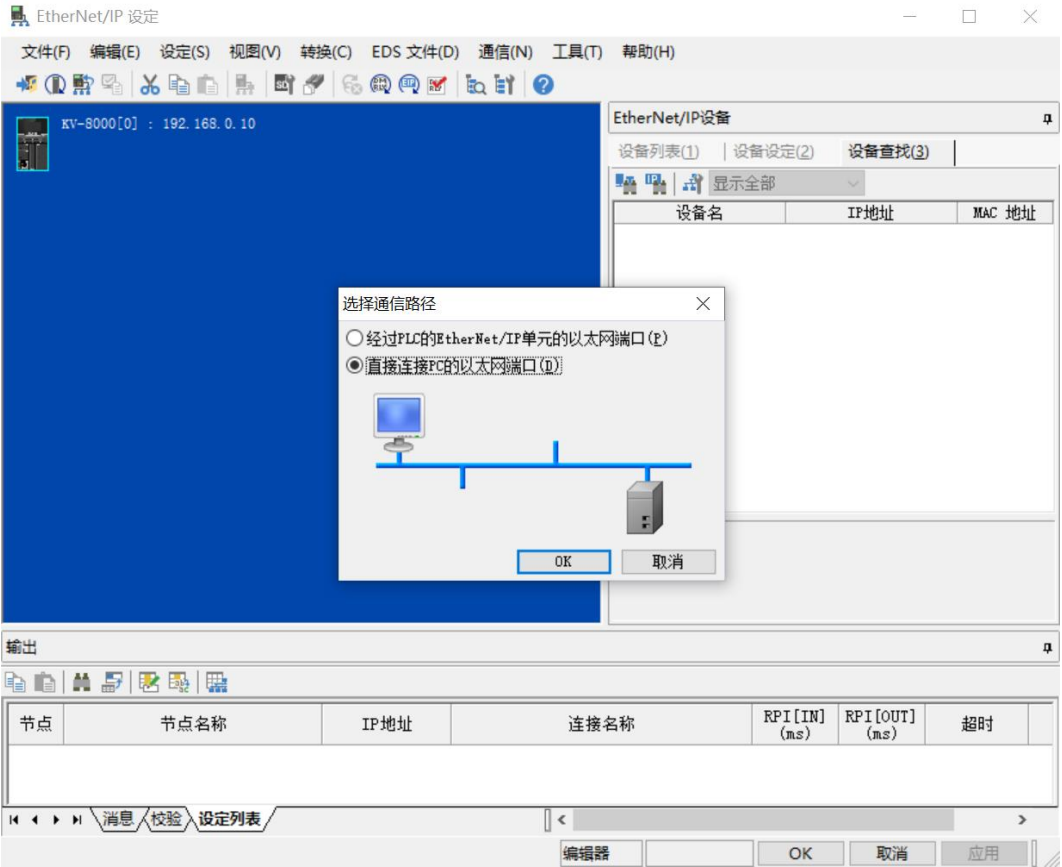
- a. Go to the "EtherNet/IP Settings" page and switch to the "Device Finder" tab, as shown in the image below.



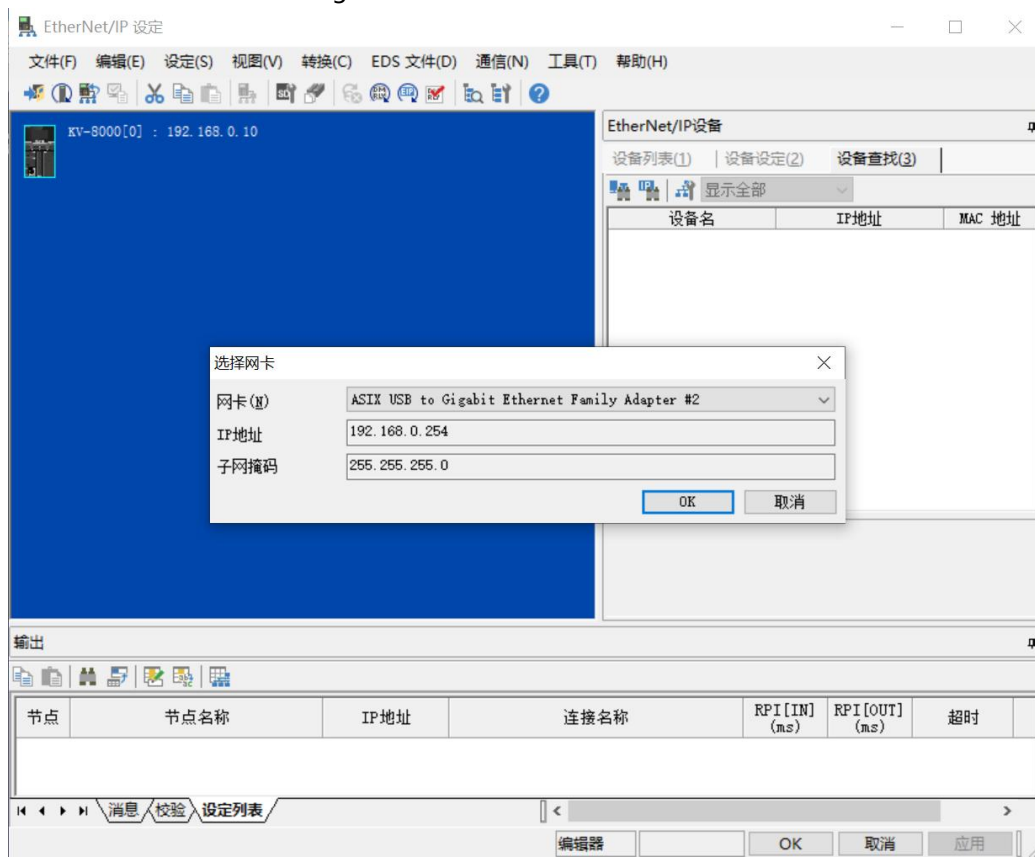
- b. Click  Select the communication path; the USB connection method is shown in the following figure.



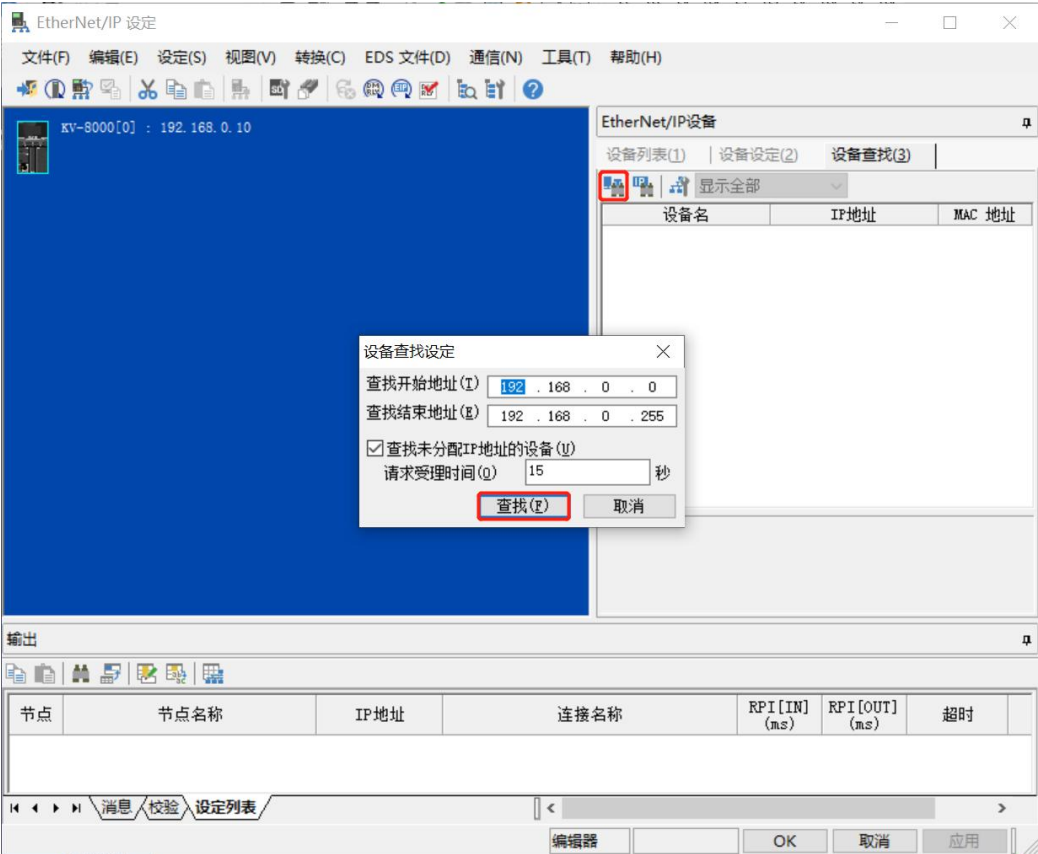
- c. "Ethernet port directly connected to the PC" This indicates the network cable connection method, as shown in the figure below."



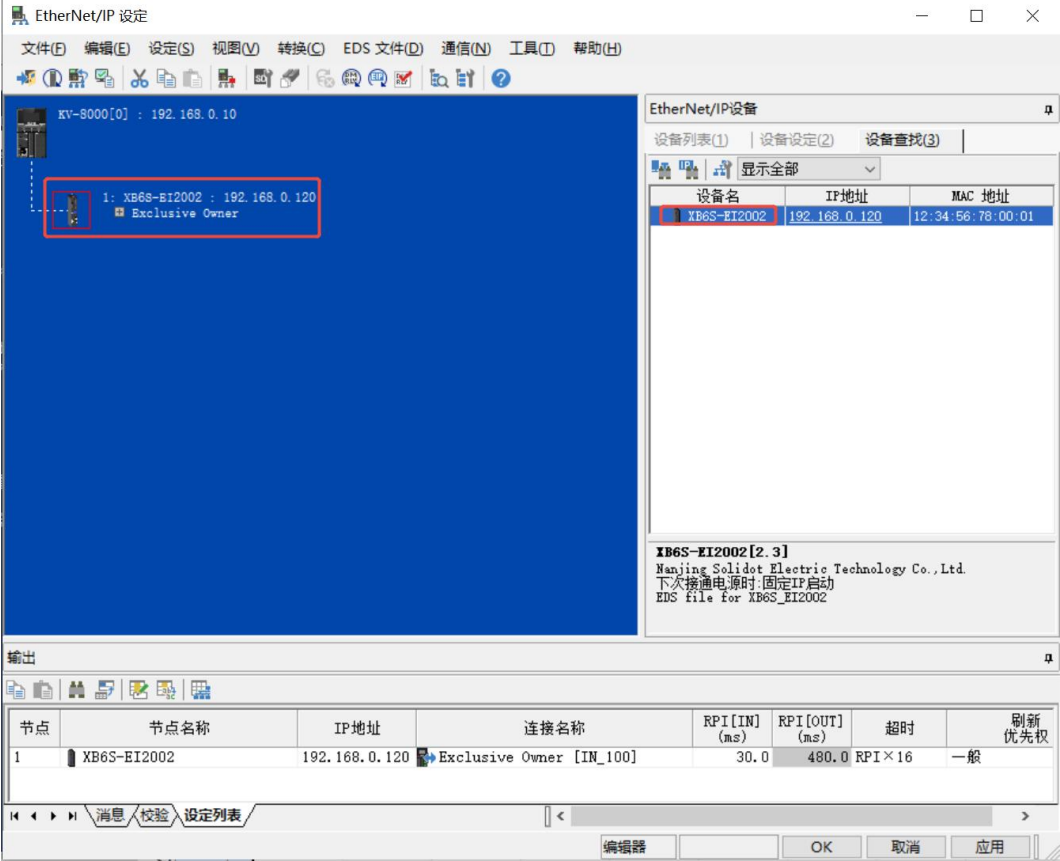
- d. Select "Connect directly to the PC's Ethernet port" and configure your local network card and IP address as shown in the image below.



- 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-click IP in the address bar, configure the IP address in the pop-up window. The default address range is 192.168.0.

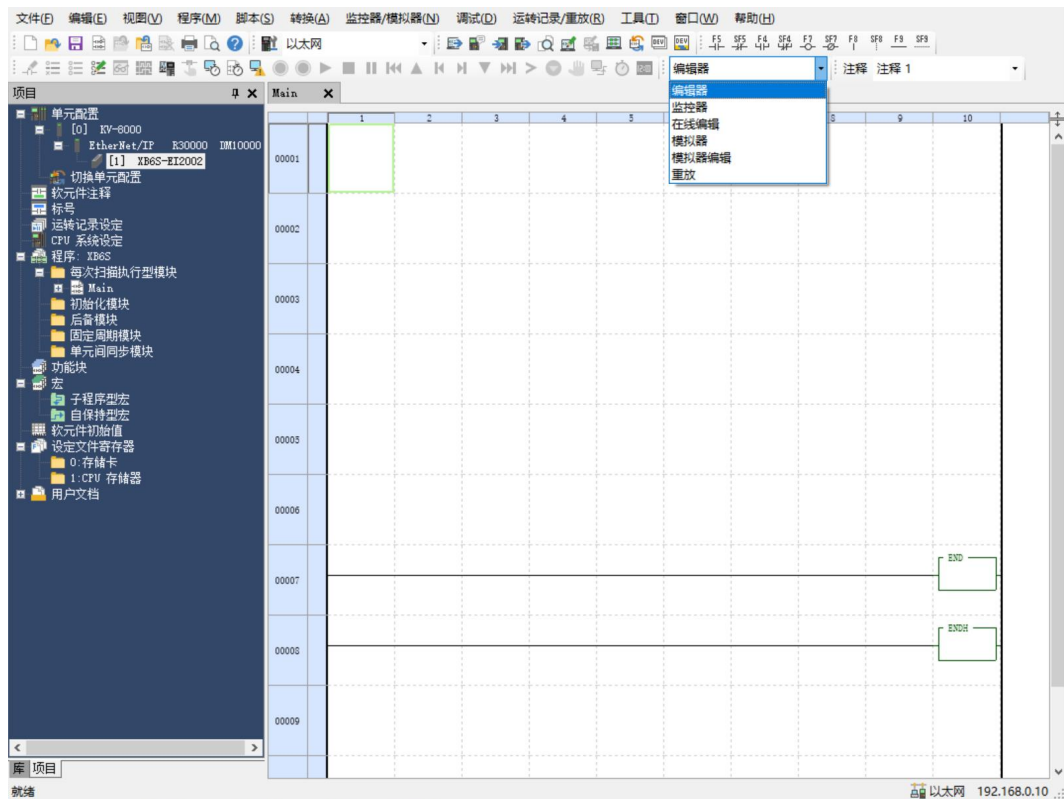
illustrate:

- 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.

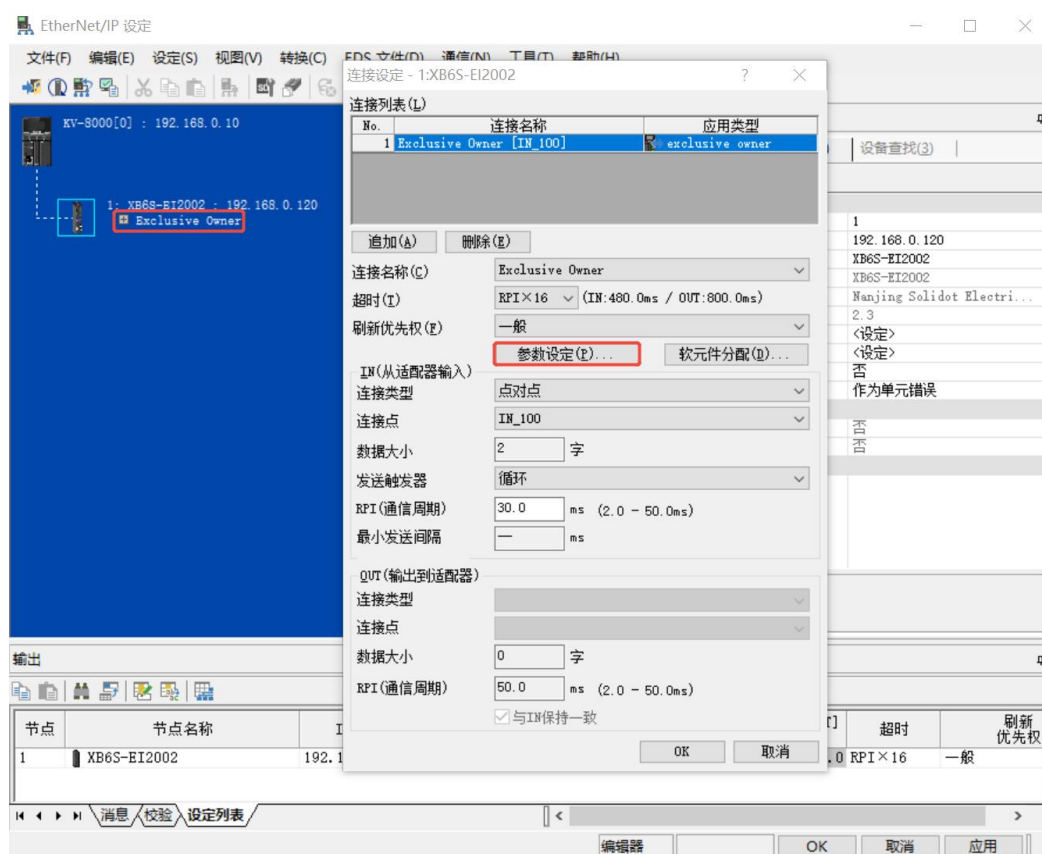
In this example, the module uses the default value. IP Address is 192.168.0.120.

## 8、Parameter settings

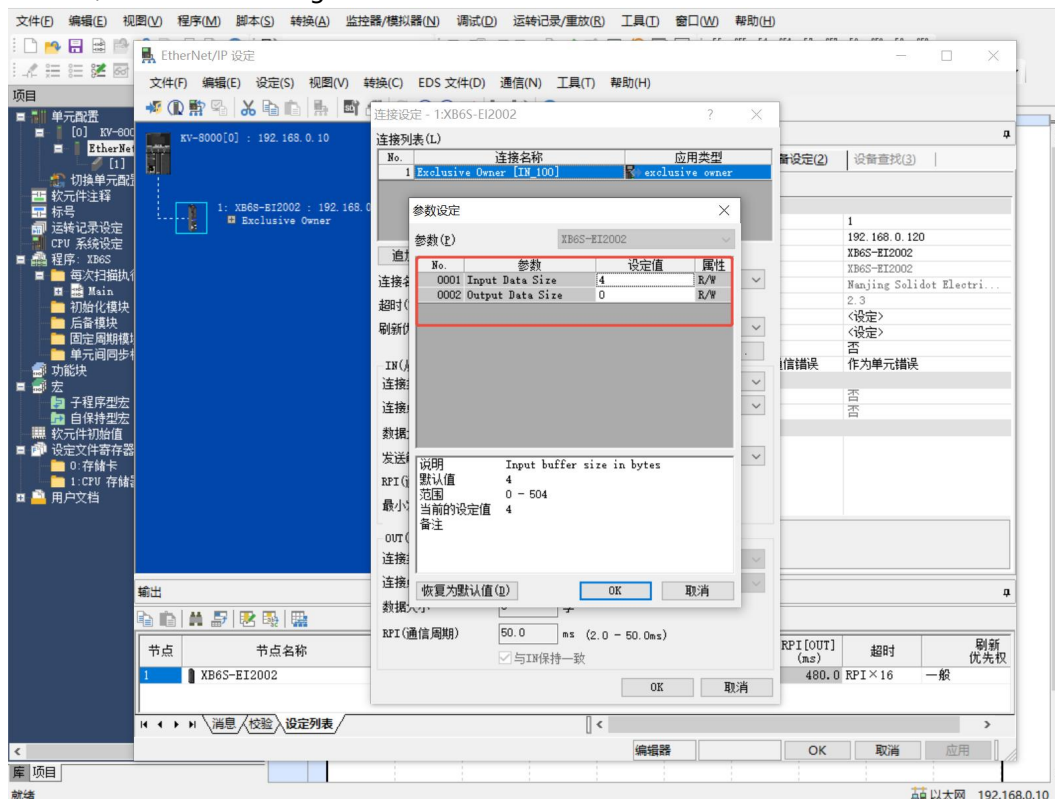
- a. Click the "Switch Mode" option in the menu bar to switch to editor mode, as shown in the image below.



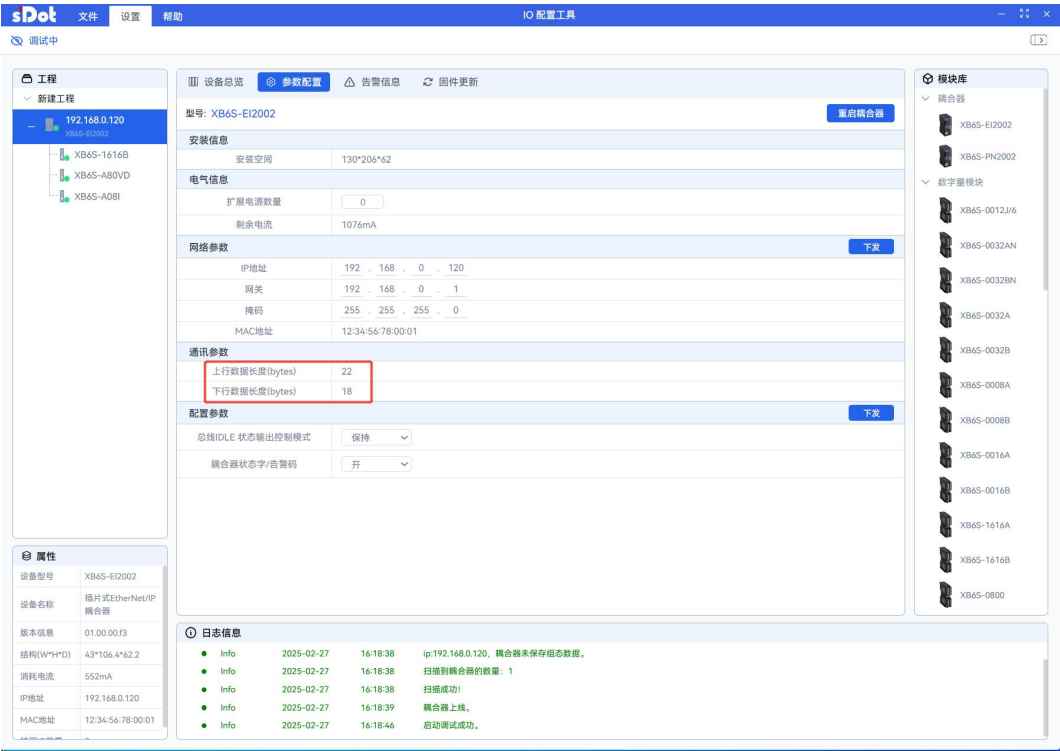
- b. Enter "EtherNet/IPOn the "Settings" page, click "Exclusive Owner" to open the "Connection Settings" window. In the "Connection Settings" window, click "Parameter Settings," as shown in the image below.



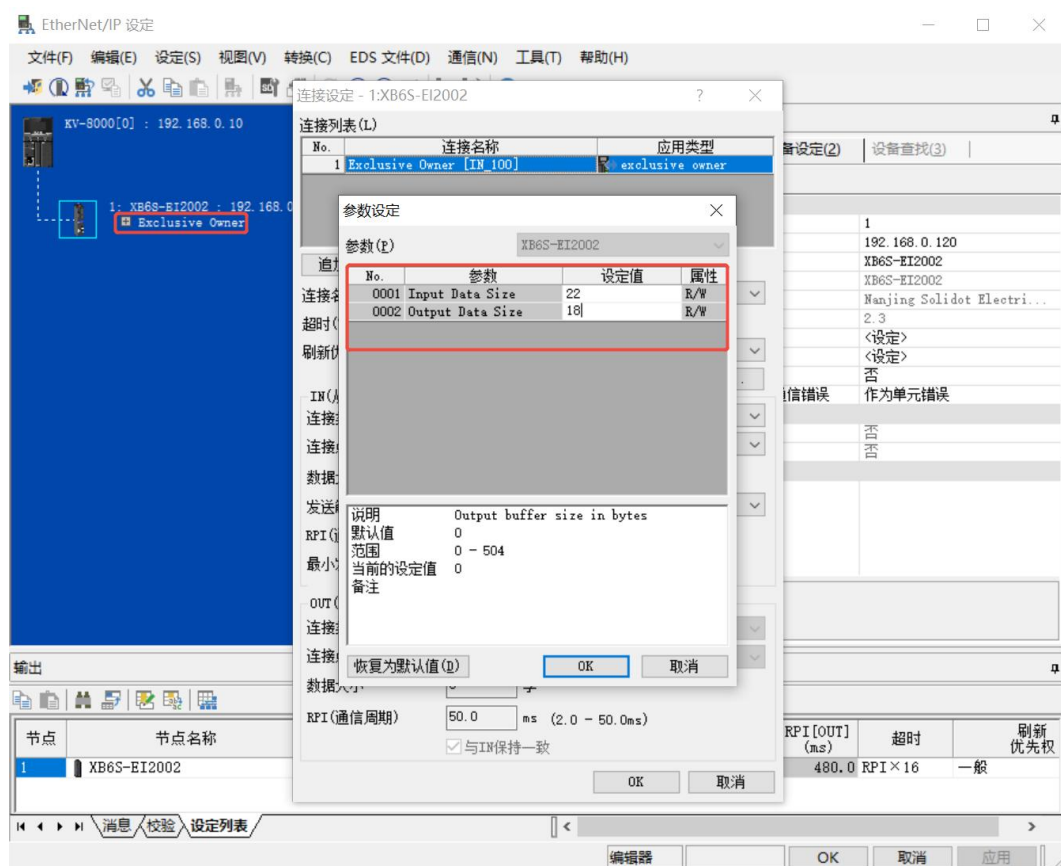
- c. In the "Parameter Settings" window, you can configure the uplink and downlink data of the module, as shown in the figure below.



- 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 "I"nput Data SizeEnter 2 for the setting value following the parameter option.2Double-click "O"utput Data SizeEnter 1 for the setting value following the parameter option.8As shown in the figure below.

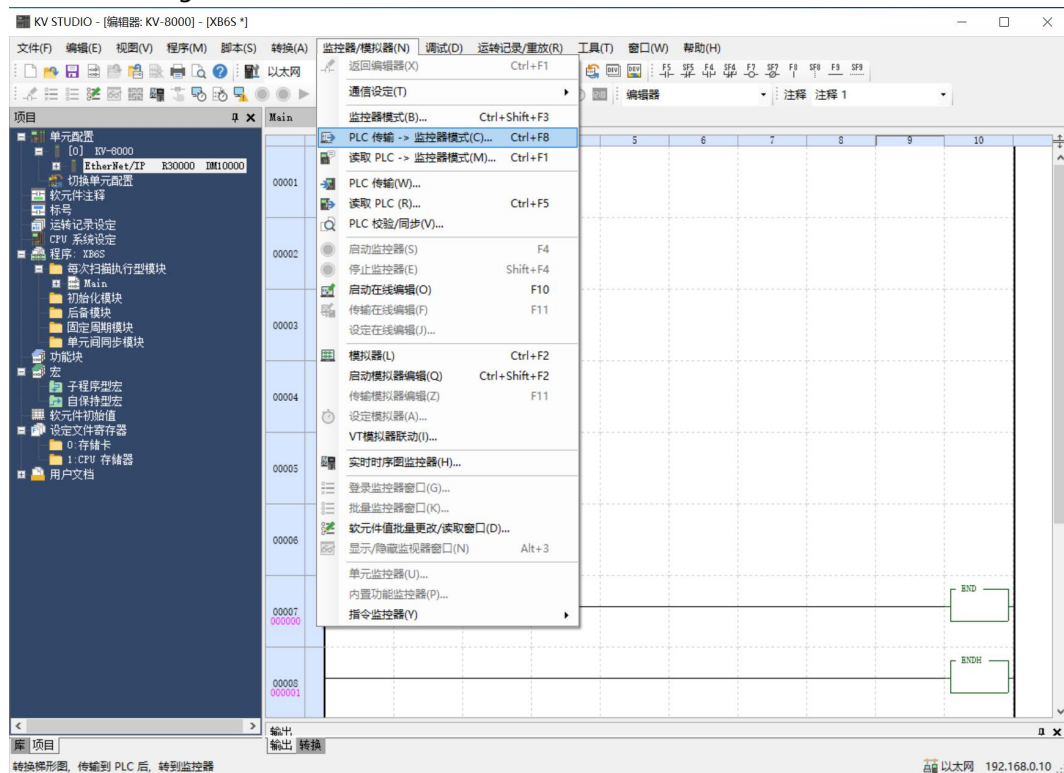


- f. After configuration, in the "Parameter Settings" window, click "O".K"Button".
- g. In the "Connection Settings" window, click "O"K"Button".
- h. In "EtherNet/IPIn the "Settings" window, click the "Apply" button, then click "O".K"Button".
- i. In the Cell Editor window, click the Apply button, then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

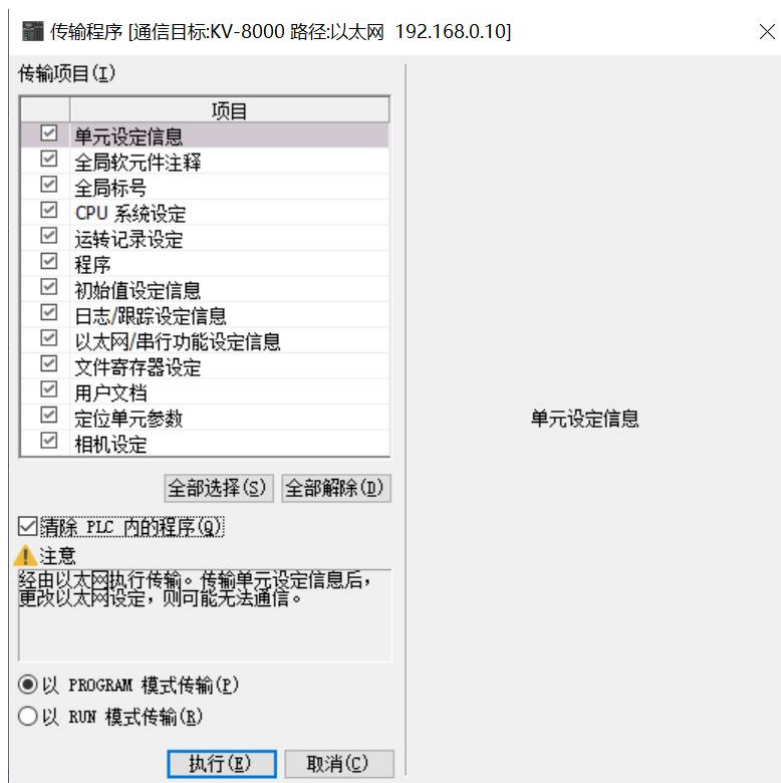
## 9、Configuration download

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

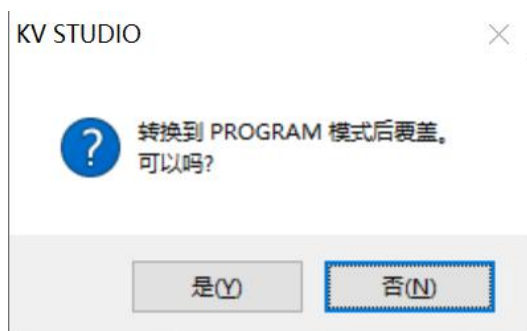
- a. Click "Monitor/Simulator (N)" in the menu bar.-> PLC transmission -> Monitor mode (C)" , as shown in the figure below.



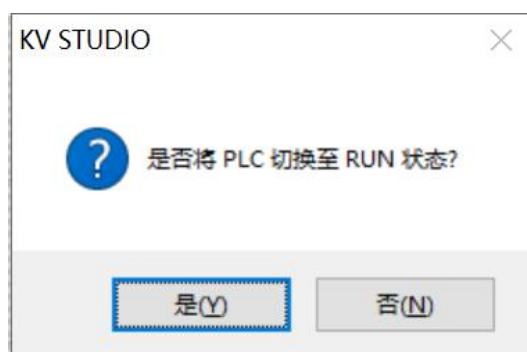
- b. In the pop-up "Transfer Program" window, check "Clear P".LC"Programs within", click "Select All", click "Execute", and download the program to P.LCAs shown in the figure below.



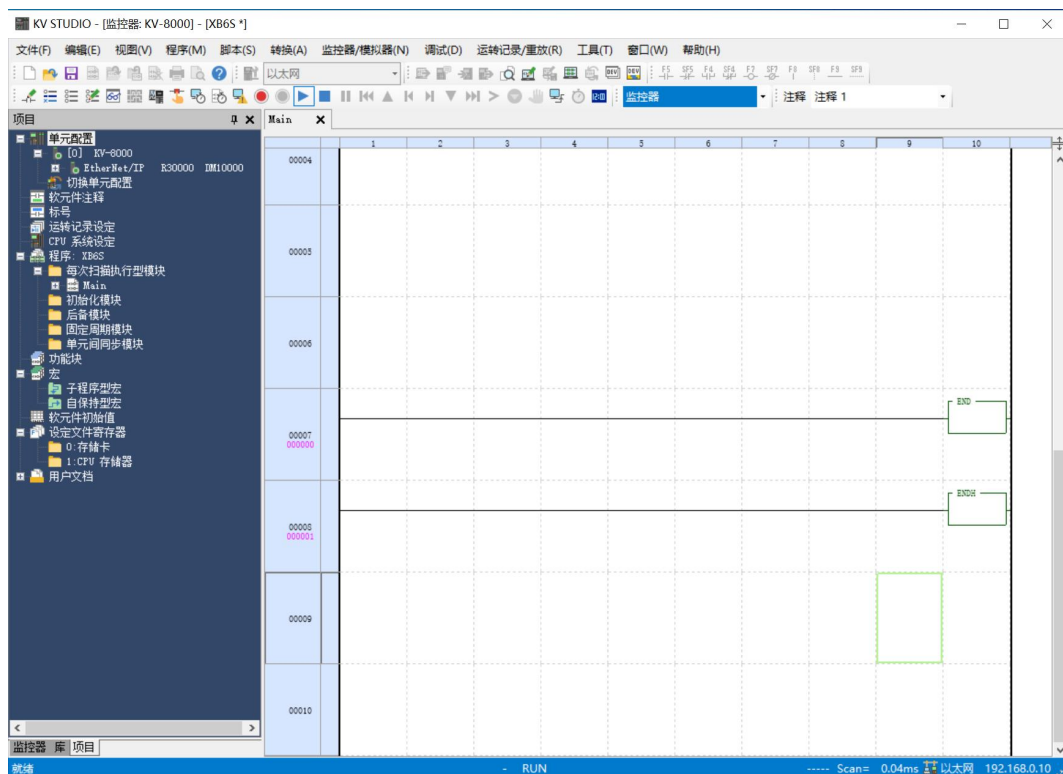
- c. A pop-up prompt box says "Switch to P"ROGRAM" Overwrite mode. Is that okay?" Click to select "Yes", as shown in the image below.



- 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.

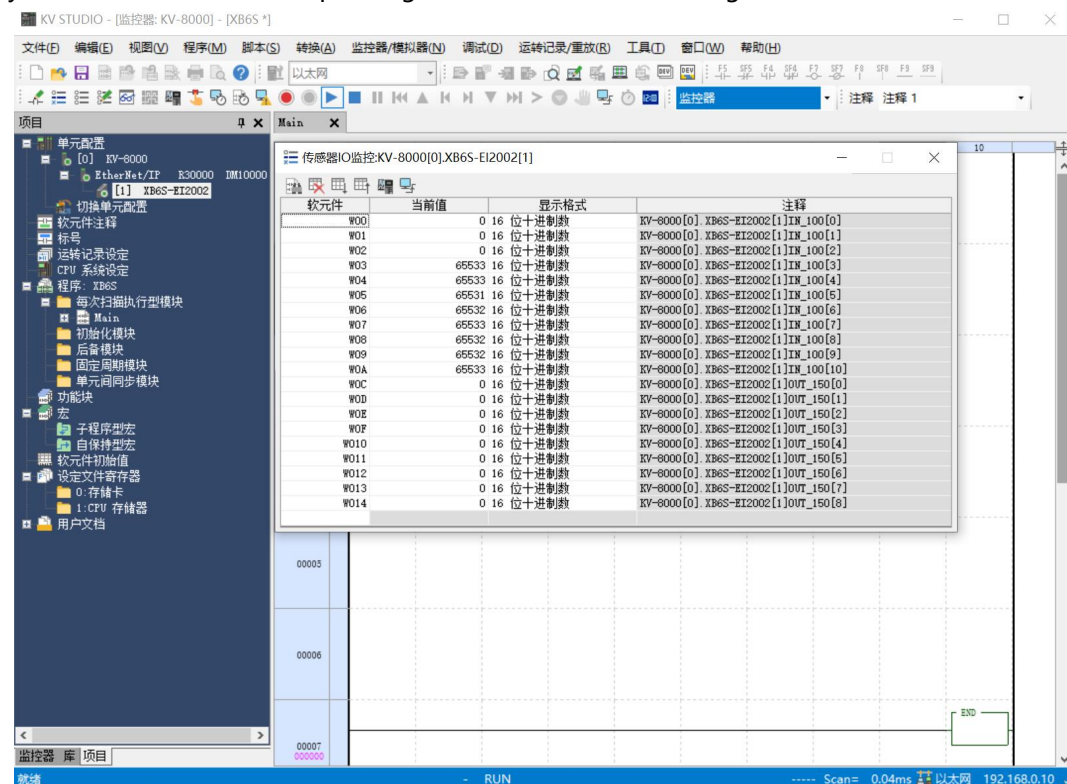


- e. After the configuration is downloaded, it will look like the image below.



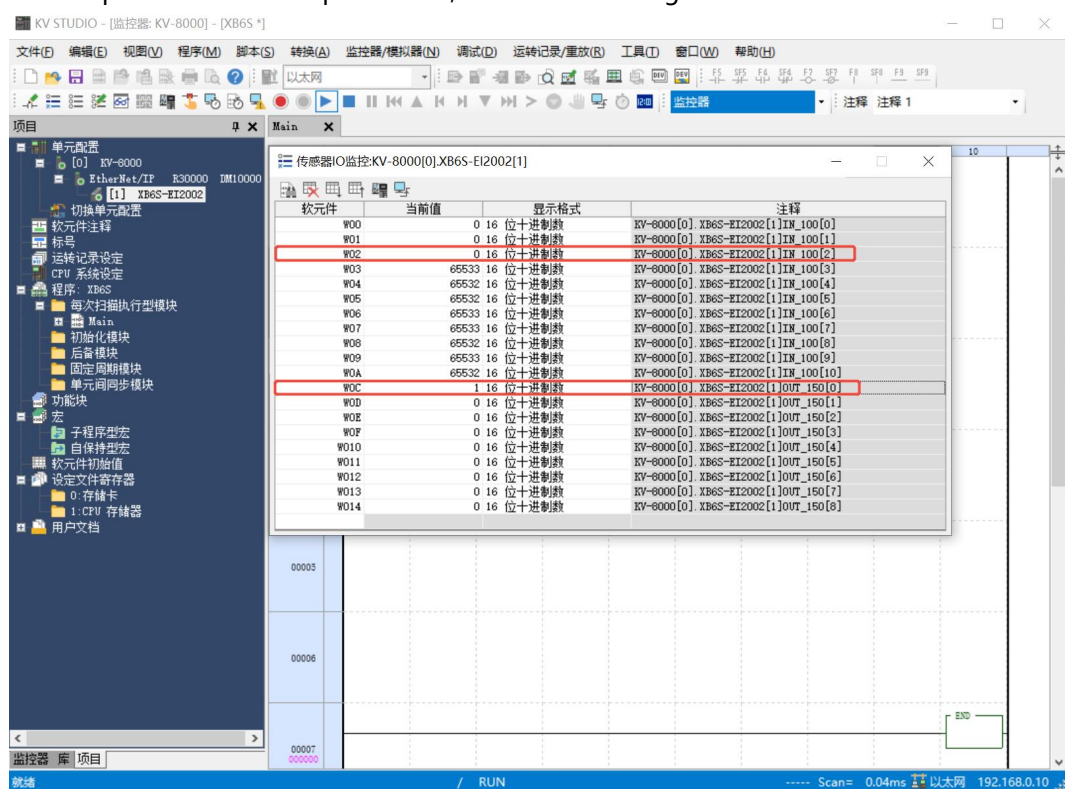
## 10. Data monitoring

- 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.

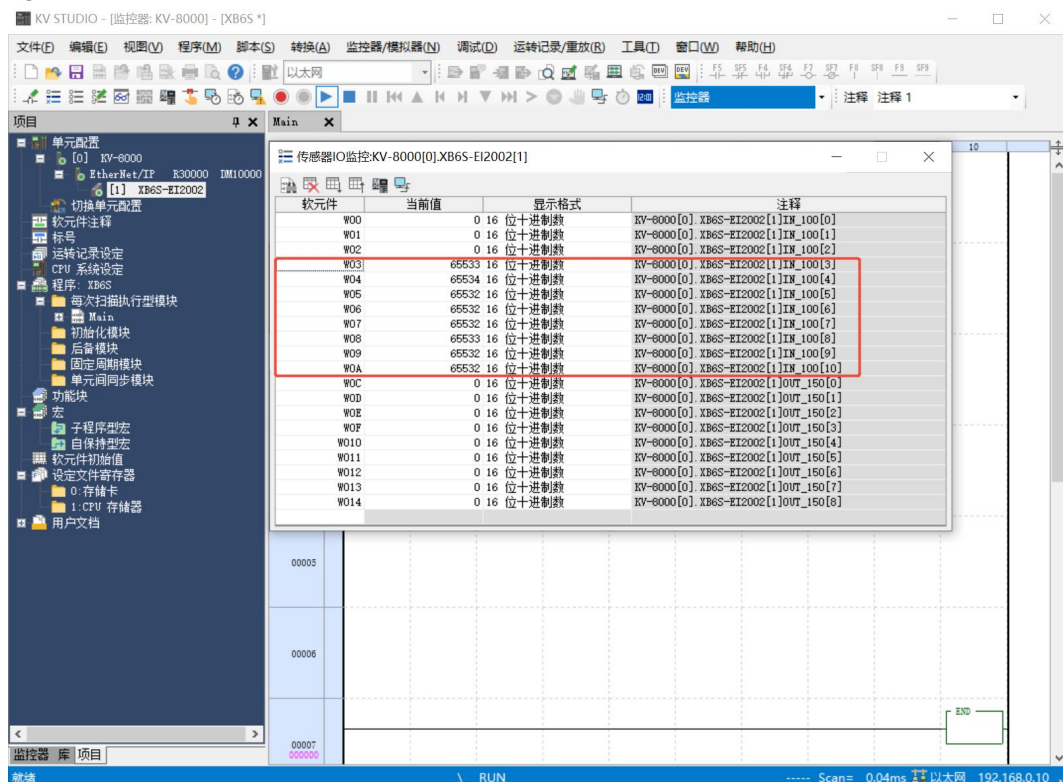


- b. When there is a valid voltage input to the input channel of the XB6S-1616B module, it can be

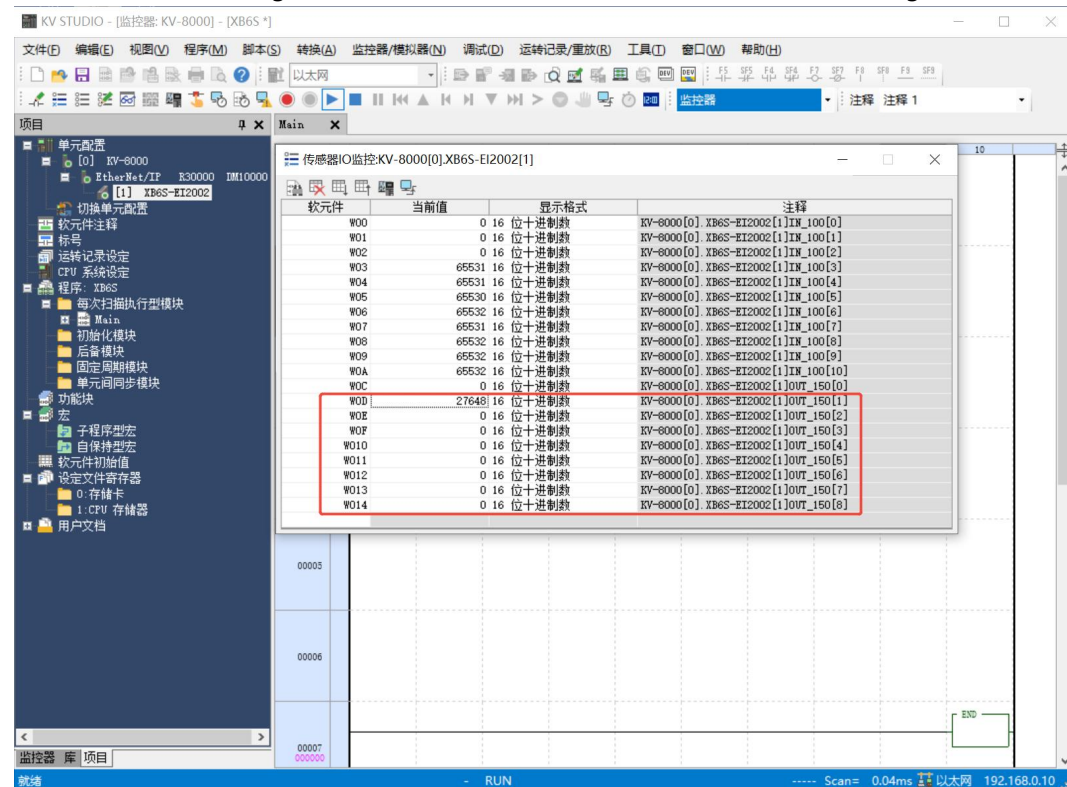
observed in the current value of W02; the output channel can be modified by double-clicking W0C to perform forced output control, as shown in the figure below.



- 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.

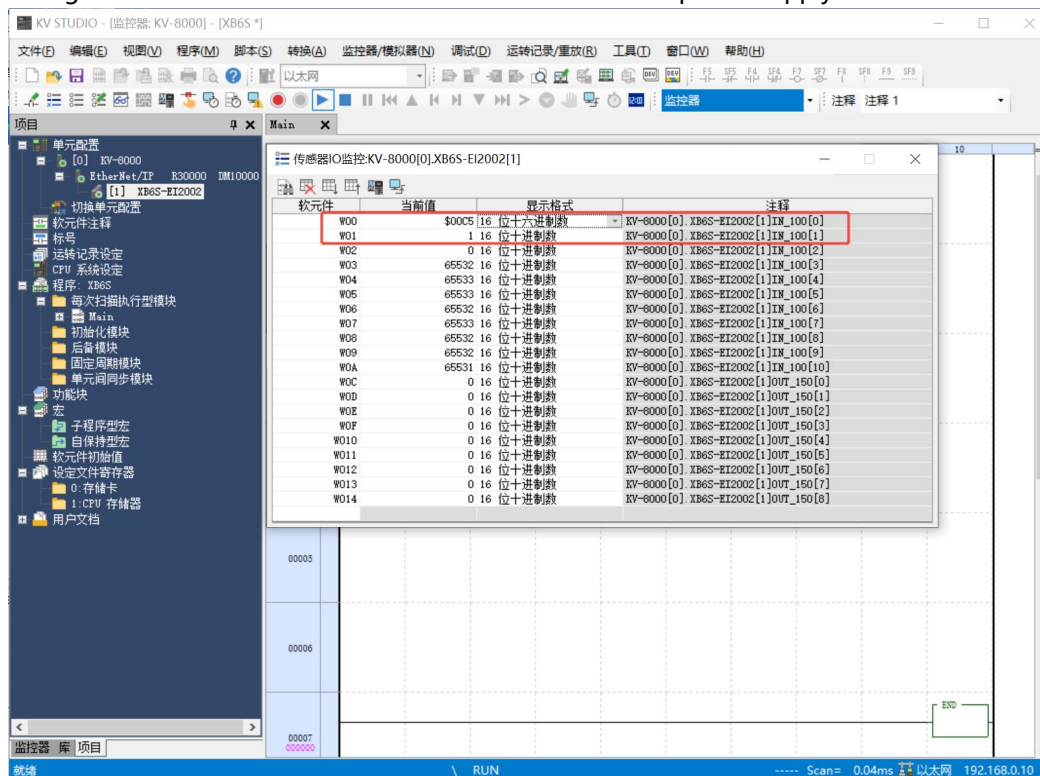


- d. The XB6S-A08I module can force output for each channel by double-clicking the current value of W0D~W014 and writing it into the current code value table, as shown in the figure below.

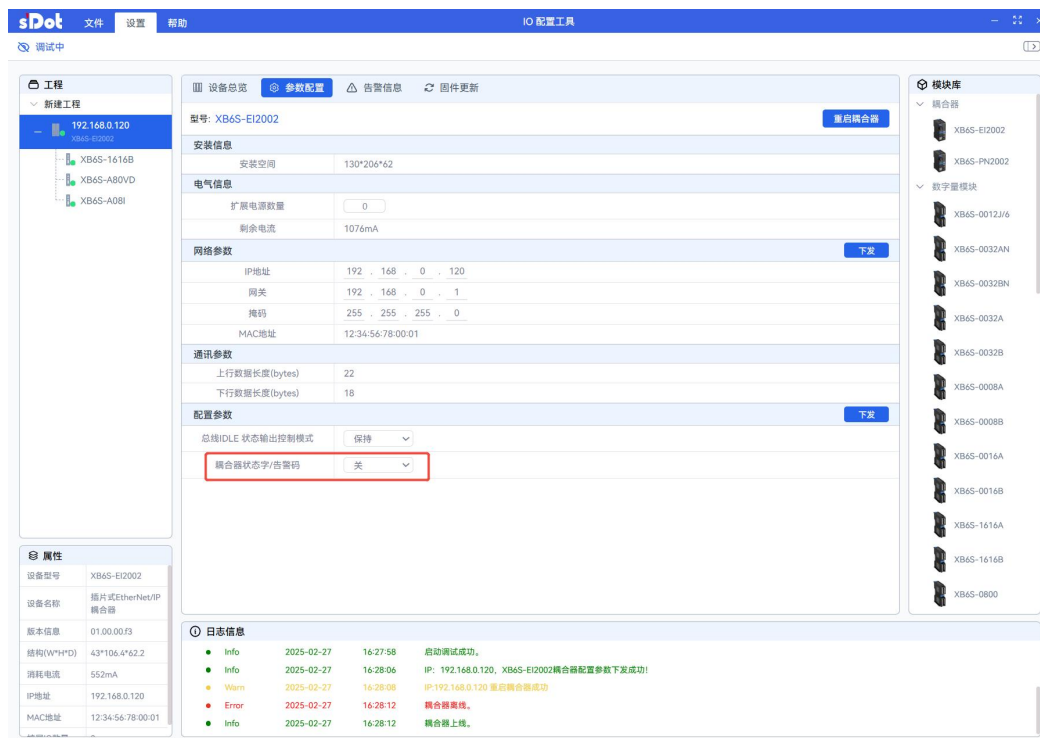


## 11、 Fault Code Viewing

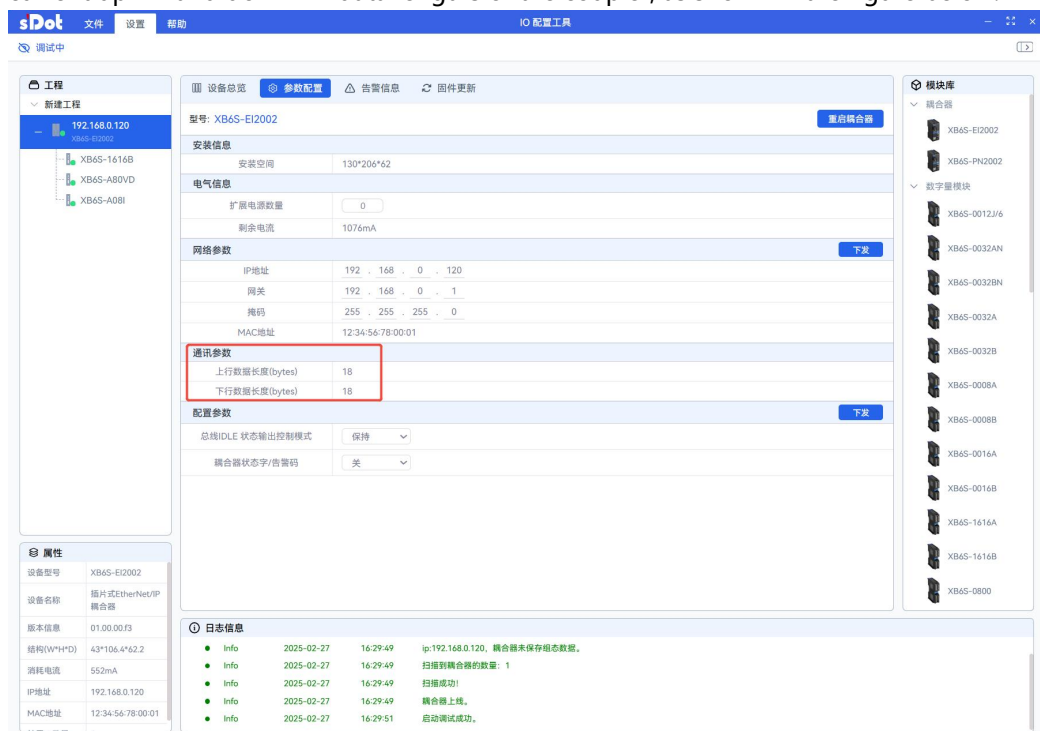
- a. When the load-side voltage of the XB6S-1616B module is not connected, the fault code can be observed from the current values of W00~W01. W00 corresponds to the alarm code of the module, and W01 corresponds to the station number of the module, as shown in the figure below. The alarm code is Hex: 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.



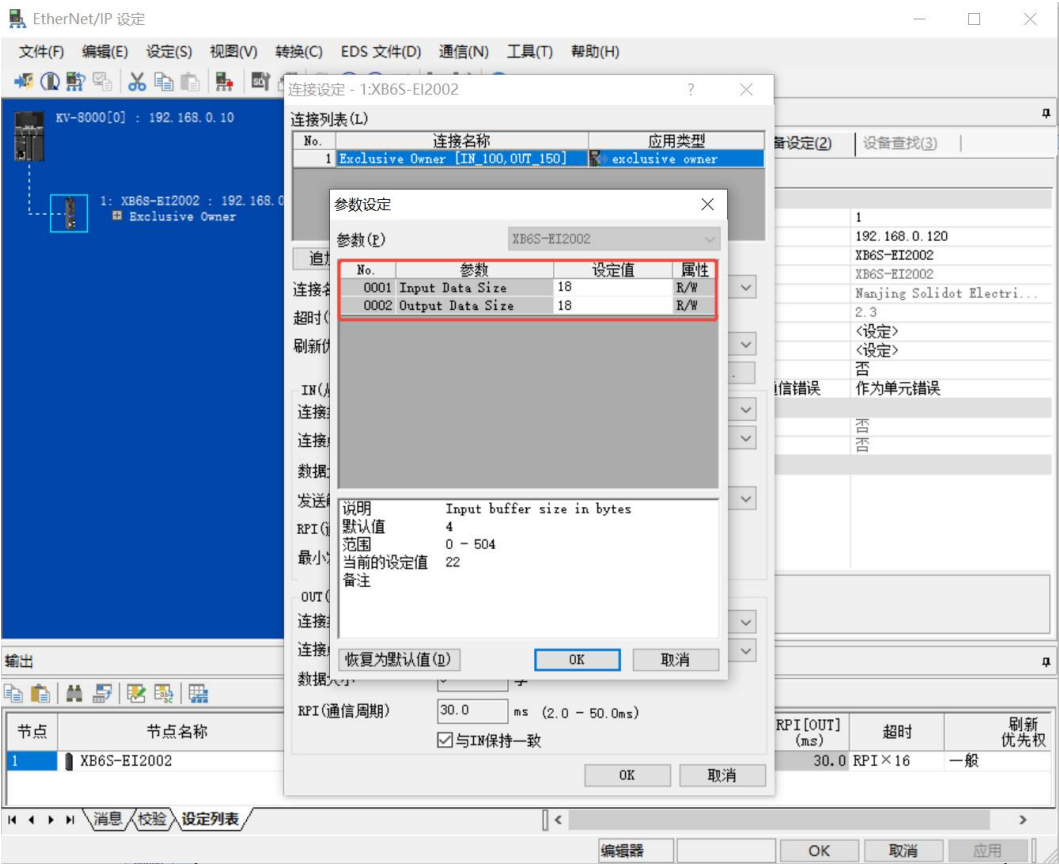
- b. To disable the coupler status word/alarm code viewing function using the IO Config Tool software, access the parameter configuration page of the XB6S-EI2002, select "Off" in the drop-down box for the coupler status word/alarm code parameter, click "Issue", and then click "Restart Coupler" or power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



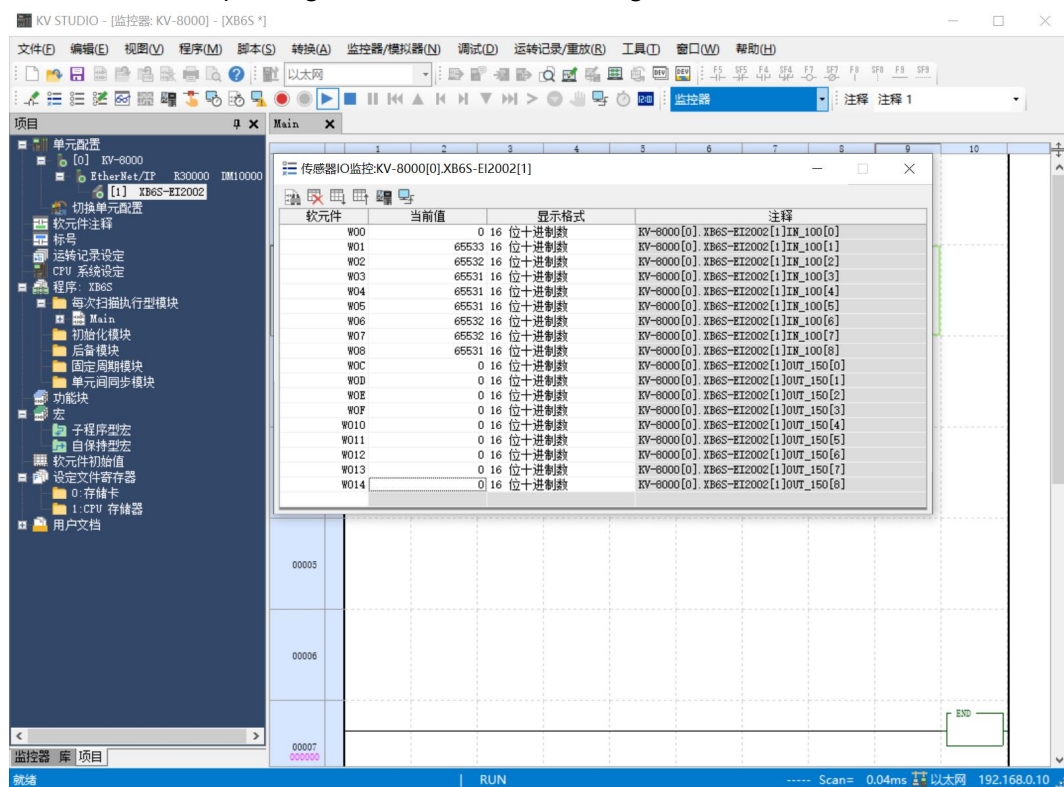
- c. After the coupler is online, you can click on the coupler's configuration parameters to view the current uplink and downlink data lengths of the coupler, as shown in the figure below.



- 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.

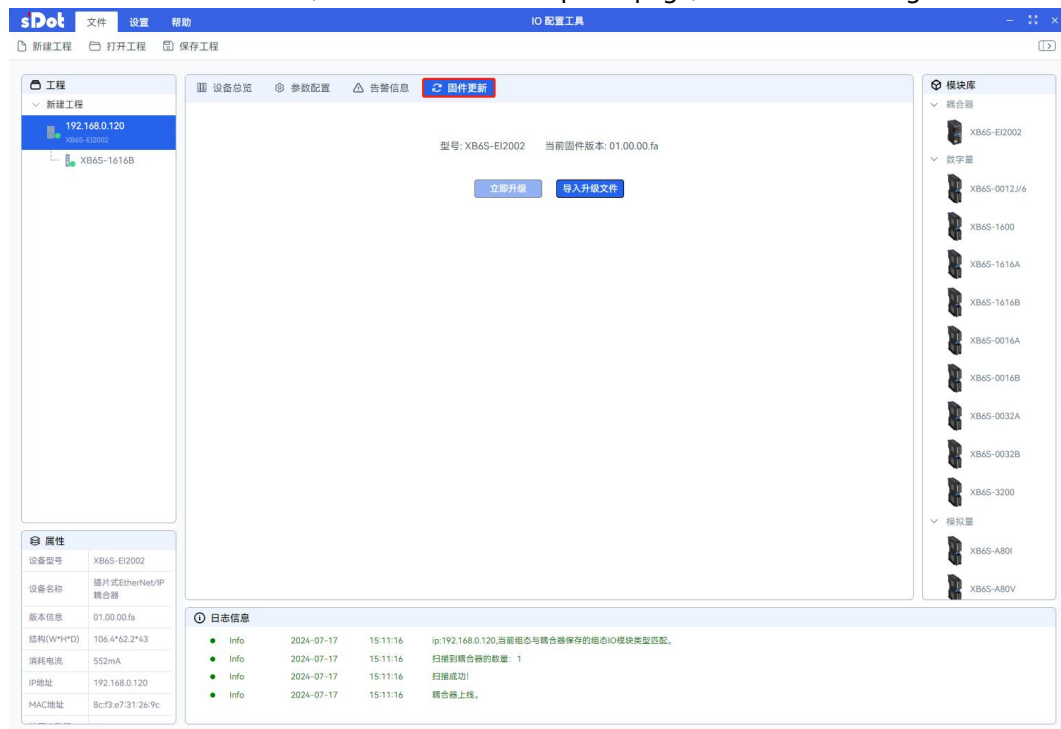


When the coupler status word/alarm code function is turned off, the current soft component and module correspondence is shown in the table below:

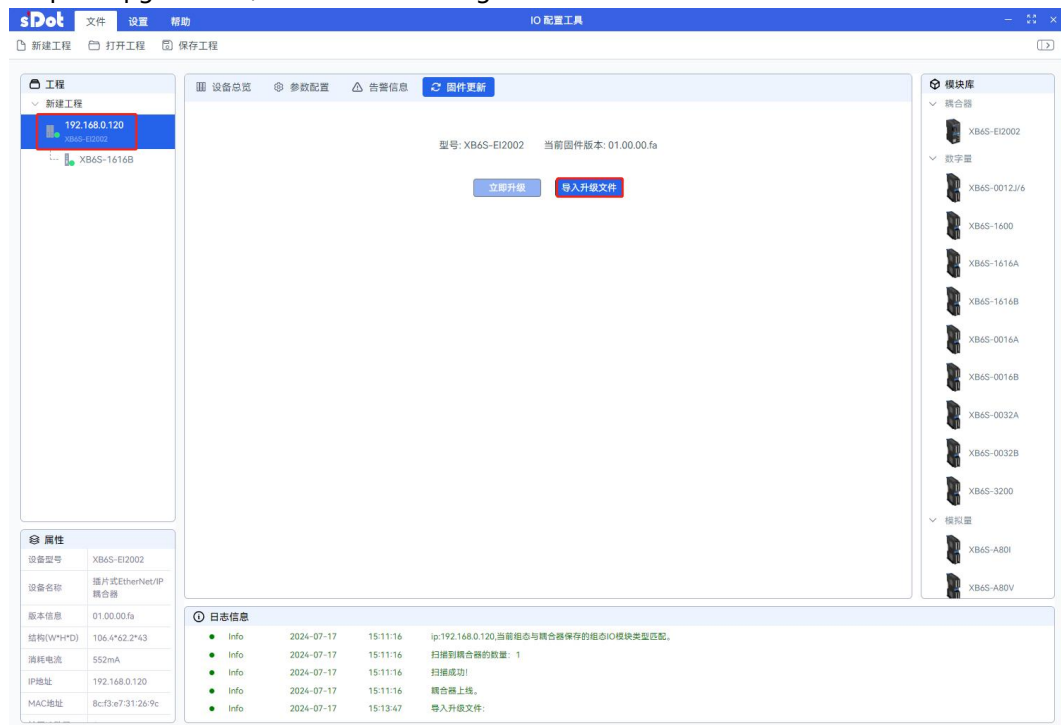
| soft components | Corresponding module       |
|-----------------|----------------------------|
| W00             | XB6S-1616B input channels  |
| W01~W08         | XB6S-A80VD                 |
| W0C             | XB6S-1616B output channels |
| W0D~W014        | XB6S-A08I                  |

## 6.7 Firmware online upgrade

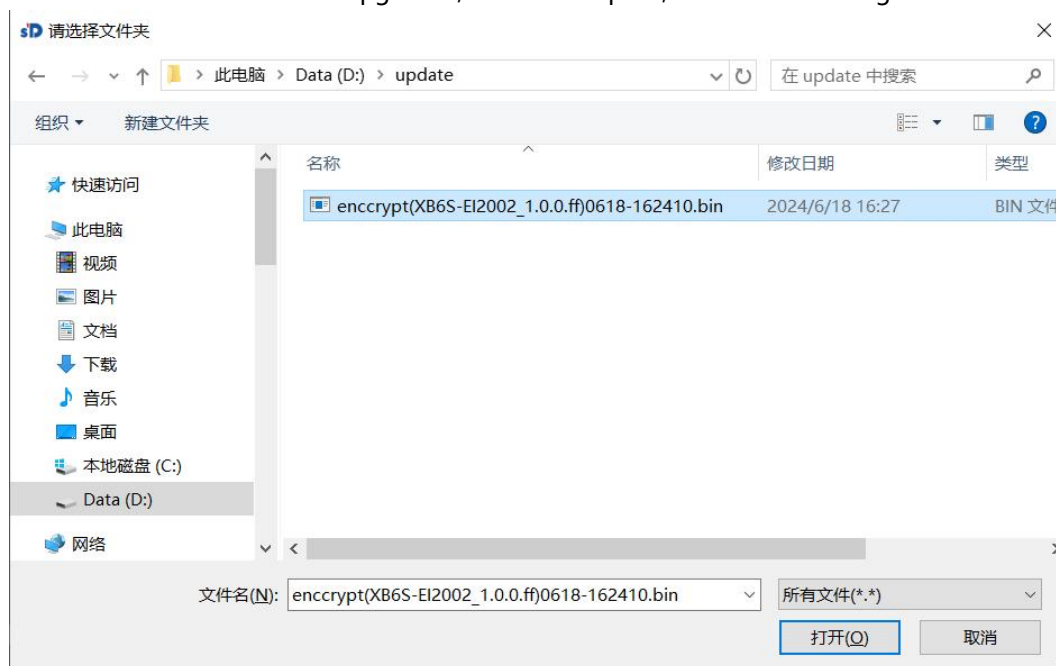
- 1、Taking the IO Config Tool software as an example, with the topology being XB6S-EI2002+XB6S-1616B, enter the firmware update page, as shown in the figure below.



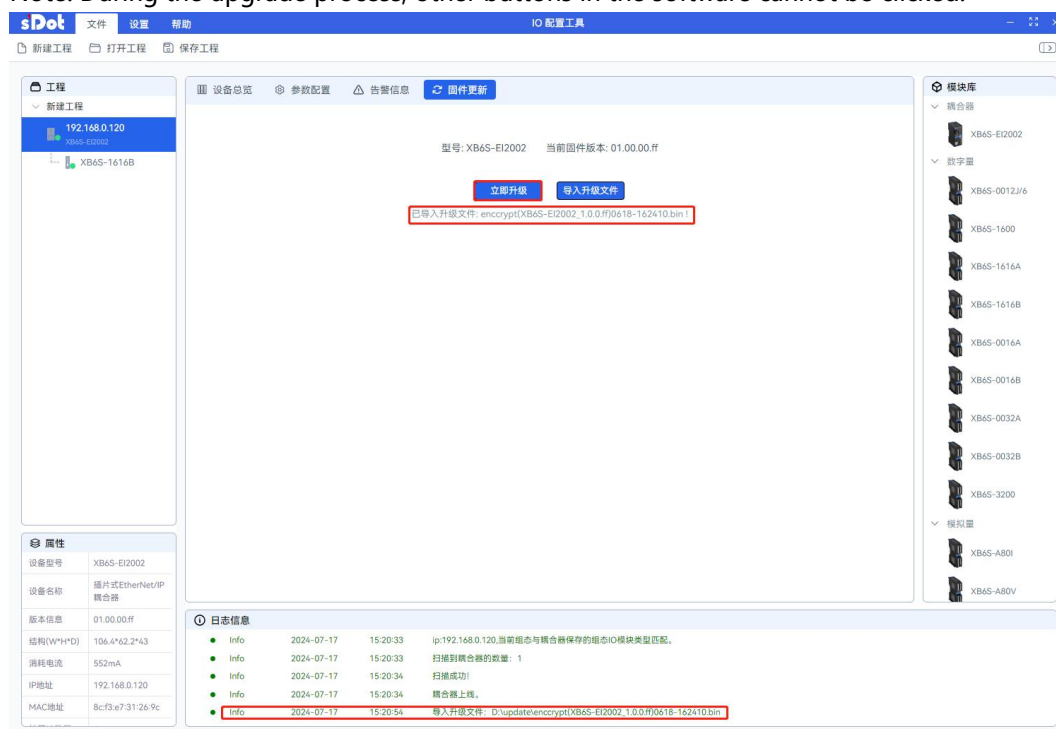
- 2、To upgrade the XB6S-EI2002 coupler, click "XB6S-EI2002" in the project pane on the left, then click "Import Upgrade File," as shown in the figure below.



- 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.