



EtherNet/IP

EI4 Series Integrated I/O

User Manual



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1 Product Features

1.1 Product overview

EI4 series integrated I/O modules with standard EtherNet/IP industrial Ethernet bus interface. The modules take up little space, are highly practical, and have a wide range of module types, providing users with a variety of choices for high-speed data acquisition, optimizing system configuration, simplifying on-site wiring, and improving system reliability.

1.2 Product features

- **Small volume**

Compact and small footprint.

- **High-speed**

100 Gigabit industrial Ethernet port.

- **Diverse functions**

I/O types are complete, including digital and analog modules, which can meet the application requirements of different applications.

- **Easy diagnosis**

Innovative channel indicator design, close to the channel, channel status at a glance, easy to detect and maintain.

- **Easy configuration**

Simple configuration, supports all major EtherNet/IP masters.

- **Ease of use assembly line**

DIN 35 mm standard rail installation.

Adopts spring-type terminals for easy and quick wiring.

2 Designation rules

2.1 Designation rules

EI 4 - A 8 0 V
(1) (2) (3) (4) (5) (6)

Serial number	Name	Description of values				
(1)	bus protocol	EI: Abbreviation for EtherNet/IP Protocol				
(2)	Product Series	4: integrated I/O				
(3)	I/O Type	A: Analog Empty: digital quantity				
(4)	Input Signal Points	Analog: 0, 4, 8 Digital: 0, 8, 16, 32				
(5)	Number of output signal points	Analog: 0, 4, 8 Digital: 0, 8, 16, 32				
(6)	Input/Output Characteristics	digital quantity			analog	
		encodings	importation	exports	encodings	Range
		A	NPN, 3ms	NPN, 0.5A	I	0~20 mA, 4~20 mA
		B	PNP, 3ms	PNP, 0.5A	V	-10~+10 V, 0~+10 V -5~+5 V, 0~+5 V 1~+5 V
		J	-	relay (electronics)		

2.2 Model List

Model	Product Description	
EI4-3200A	32-channel digital input module, NPN type	
EI4-3200B	32-channel digital input module, PNP type	
EI4-1616A	16-channel digital input/output module, NPN type	
EI4-1616B	16-channel digital input/output module, PNP type	
EI4-0032A	32-channel digital output module, NPN type	
EI4-0032B	32-channel digital output module, PNP type	
EI4-1600A	16-channel digital input module, NPN type	
EI4-1600B	16-channel digital input module, PNP type	
EI4-0016A	16-channel digital output module, NPN type	
EI4-0016B	16-channel digital output module, PNP type	
EI4-0808A	8-channel digital input/output module, NPN type	
EI4-0808B	8-channel digital input/output module, PNP type	
EI4-2408A	24-channel digital input, 8-channel digital output module, NPN type	
EI4-2408B	24-channel digital input, 8-channel digital output module, PNP type	
EI4-0824A	8-channel digital input, 24-channel digital output module, NPN type	
EI4-0824B	8-channel digital input, 24-channel digital output module, PNP type	
EI4-1612J	16-channel digital input (NPN/PNP type), 12-channel relay output module	
EI4-0012J	12-Channel Relay Output Module	
EI4-A80V	8-channel analog voltage input module	Optional range: -10 ~ +10 V, 0 ~ +10 V -5~+5 V, 0~+5 V 1~+5 V
EI4-A40V	4-channel analog voltage input module	
EI4-A08V	8-channel analog voltage output module	
EI4-A04V	4-channel analog voltage output module	
EI4-A80I	8-channel analog current input module	Optional range: 0~20 mA, 4~20 mA
EI4-A08I	8-channel analog current output module	
EI4-A40I	4-channel analog current input module	
EI4-A04I	4-channel analog current output module	
XX4-C10_4	Common terminal expansion module	

3 Product Parameters

3.1 General parameters

Interface parameter	
bus protocol	EtherNet/IP
Number of I/O stations	Depending on master station configuration
data transmission medium	Category 5+ UTP or STP (STP recommended)
transmission distance	≤100 m (distance between stations)
transmission rate	100 Mbps
bus interface	2×RJ45
Technical Parameters	
Configuration	Through the master
electric power source	24 VDC (18V~36V)
electrical isolation	500 VAC
weights	130g
sizes	102 x 72 x 25 mm
operating temperature	-10°C~+60°C
Storage temperature	-20°C~+75°C
relative humidity	95%, non-condensing
protection class	IP20

3.2 digital parameter

Digital input	
rated voltage	24 VDC (18V~30V)
Number of signal points	8, 16, 24, 32
Signal Type	NPN/PNP
"0" signal voltage (PNP)	-3~+3 V
"1" signal voltage (PNP)	15~30 V
"0" signal voltage (NPN)	15~30 V
"1" signal voltage (NPN)	-3~+3 V
Input Filtering	3 ms
Input Current	4 mA
Isolation method	Optically-coupled isolation
Isolated Withstand Voltage	500 VAC
Channel Indicator	Green LED
Digital output	
Rated voltage	24 VDC (18V~30V)
Number of signal points	8, 16, 24, 32
Signal Type	NPN/PNP
Load Type	Resistive loads, inductive loads
Single channel rated current	NPN type Max: 500 mA PNP type Max: 500 mA
port protection	Over-voltage and over-current protection
Isolation method	Optically-coupled isolation
Isolated Withstand Voltage	500 VAC
Channel Indicator	Green LED
Relay output	
rated voltage	24 VDC (18V~30V)
Number of signal points	12
Isolation method	Optically-coupled, relay
Rated load	Relay single output 2A
Common terminal wiring method	4 points/1 common terminal
Channel Indicator	Green LED

3.3 Analog parameter

3.3.1 Technical Parameters

Analog input	
Input Points	4, 8
Input signal (voltage type)	0: -10 to +10 V (-32768 to 32767) 1: 0~+10 V (0~65535) 2: -5 to +5 V (-32768 to 32767) 3: 0~+5 V (0~65535) 4: 1~+5 V (0~65535)
Input signal (current type)	0: 0~20 mA (0~65535) 1: 4~20 mA (0~65535)
Resolution (of a photo)	16 bit
Sampling rate	≤ 1 ksps
Accuracy	$\pm 0.1\%$
Input Impedance (Voltage Type)	≥ 2 k Ω
Input impedance (current type)	100 Ω
Isolation withstand voltage	500 VAC
Channel Indicator	Green LED

Analog output	
Output Points	4, 8
Output signal (voltage type)	0: -10 to +10 V (-32768 to 32767) 1: 0~+10 V (0~65535) 2: -5 to +5 V (-32768 to 32767) 3: 0~+5 V (0~65535) 4: 1~+5 V (0~65535)
Output signal (current type)	0: 0~20 mA (0~65535) 1: 4~20 mA (0~65535)
Resolution (of a photo)	16 bit
Accuracy	±0.1%
Load impedance (voltage type)	≥2 kΩ
Load impedance (current type)	≤200 Ω
Isolated Withstand Voltage	500 VAC
Channel Indicator	Green LED

3.3.2 Voltage Input/Output Range Selection and Code Value Table

Voltage input/output range selection and code value range					
Range Selection	0	1	2	3	4
Measurement range	-10~+10 V	0~+10 V	-5~+5 V	0~+5 V	1~+5 V
Code Value Range	-32768~32767	0~65535	-32768~32767	0~65535	0~65535
Voltage Input formula	$D=(65535/20)*U$	$D=(65535/10)*U$	$D=(65535/10)*U$	$D=(65535/5)*U$	$D=(65535/4)*U-16384$
voltage output formula	$U=(D*20)/65535$	$U=(D*10)/65535$	$U=(D*10)/65535$	$U=(D*5)/65535$	$U=(D+16384)*4/65535$
code value correspondence table	See Table 3-1 Voltage Code Value Table .				

Note: D denotes code value and U denotes voltage.

Tables 3- 1 Table of Voltage Code Values

Range voltage	0	1	2	3	4
	-10~+10 V	0~+10 V	-5~+5 V	0~+5 V	1~+5 V
	code value	code value	code value	code value	code value
-10	-32768	-	-	-	-
-9	-29491	-	-	-	-
-8	-26214	-	-	-	-
-7	-22938	-	-	-	-
-6	-19661	-	-	-	-
-5	-16384	-	-32768	-	-
-4	-13107	-	-26217	-	-
-3	-9830	-	-19661	-	-
-2	-6554	-	-13107	-	-
-1	-3277	-	-6554	-	-
0	0	0	0	0	-
1	3277	6554	6554	13107	0
2	6554	13107	13107	26214	16384
3	9830	19661	19661	39321	32768
4	13107	26214	26214	52428	49151
5	16384	32768	32767	65535	65535
6	19661	39321	-	-	-
7	22938	45875	-	-	-
8	26214	52428	-	-	-
9	29491	58982	-	-	-
10	32767	65535	-	-	-

	Code value = (65535/20) *Voltage	Code value = (65535/10) *Voltage	Code value = (65535/10) *Voltage	Code value = (65535/5) *Voltage	Code value = (65535/4) *Voltage - 16384
	Voltage = (code value * 20) / 65535	Voltage = (code value * 10) / 65535	Voltage = (code value * 10) / 65535	Voltage = (code value * 5) / 65535	Voltage = (code value + 16384)*4/65535

3.3.3 Current Input/Output Range Selection and Code Value Table

Analog Current Input/Output Range Selection and Code Value Range		
Range Selection	0	1
Measurement range	0~20 mA	4~20 mA
Code Value Range	0~65535	
Current input calculation formula	$D = (65535/20) * I$	$D = (65535/16) * I - 16384$
Current Output Calculation Formula	$I = (D * 20) / 65535$	$I = (D + 16384) * 16 / 65535$
code value correspondence table	See Table 3-2 for a table of current code values .	

Note: D : code value; I : current.

Tables 3- 2 Table of Current Code Values

Range Selection range	0	1
	0~20 mA	4~20 mA
Current	code value	code value
0	0	-
1	3277	-
2	6554	-
3	9830	-
4	13107	0
5	16384	4096
6	19661	8192
7	22937	12288
8	26214	16384
9	29491	20479
10	32768	24575
11	36044	28671
12	39321	32767
13	42598	36863
14	45875	40959
15	49151	45055
16	52428	49151
17	55705	53247
18	58982	57343
19	62258	61439
20	65535	65535
	Code value = (65535/20)*current	Code value = (65535/16) * current - 16384
	Current = (code value * 20) / 65535	Current = (code value + 16384)*16/65535

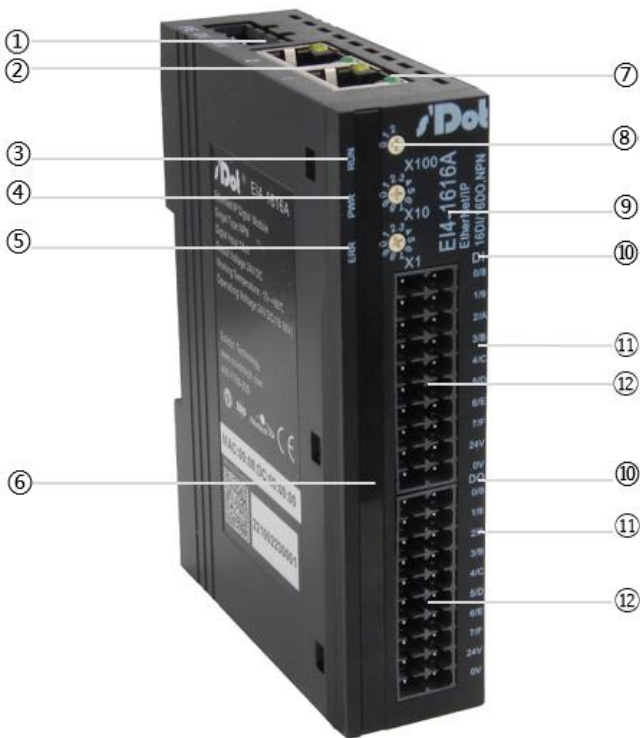
3.4 Common terminal expansion module parameters

Common terminal	
Rated voltage	125 VDC/AC 250V
Rated current	8 A
Number of public terminals	4 sets (10P/set)

4 Panel

4.1 Product structure

Name and function description of each part of the product



Serial number	Name	Description
①	Power connector	3P terminal
②	bus interface	2×RJ45
③	Operation Indicator	Module Operational Status
④	Power indicator	Module Power Status

⑤	warning indicator	Indicates module alarm status
⑥	Channel Signal Indicator	Indicates the corresponding channel status
⑦	Network Port Indicator	Link and data sending and receiving status
⑧	rotary switch	Setting the IP address
⑨	module identification	Labeling information such as module model, bus type, etc.
⑩	signal identification	Indication signal type
⑪	channel marking	Signal Corresponding Channel Identification
⑫	channel interface	2x20P terminals

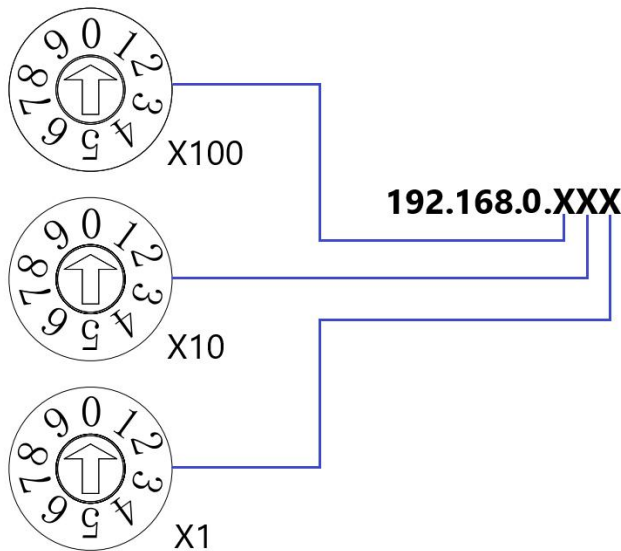
4.2 Indicator light function

Name	Markings	Color	Status	Description
Power indicator	PWR	Green	ON	Power supply is normal
			OFF	The product is not powered up or the power supply is abnormal
Operation status indicator	RUN	Green	ON	The device has established a connection
			1Hz flashing	Device has not established a connection, but IP address is acquired; device is undergoing a power-up test
			OFF	Device did not obtain an IP address; duplicate IP address or power cutoff
warning indicator	ERR	Red	ON	A major unrecoverable error occurs in the device
			1Hz flashing	Equipment is undergoing power-up testing; recoverable secondary anomaly occurs in equipment
			OFF	The equipment is normal or the power supply is cut off
Port Status Indicator	1	Green	ON	establish a network connection
			OFF	No network connection established or abnormal
		Yellow	Flashing	Connection established with data interaction
			OFF	No data interaction or exception
	2	Green	ON	establish a network connection
			OFF	No network connection established or abnormal
		Yellow	Flashing	Connection established with data interaction
			OFF	No data interaction or exception
Input Channel Status Indicator	0 to F	Green	ON	Module channels have signal inputs
			OFF	No signal input or abnormal signal input on module channel
Output Channel Status Indicators	0 to F	Green	ON	Module channels have signal outputs
			OFF	No signal output or abnormal signal output from module channel

4.3 Rotary switch

Rotary Dial Description

The method of setting the module IP address can be specified using the rotary switch, which is shown in the following figure:



Set value (decimal)	IP address setting method
000	Based on BOOTP settings.
001 to 254	Set the IP address in the range of 1 to 254 byte for the hundreds digit by "×100", for the tens digit by "×10", and for the ones digit by "×1". Setting in the range of 1 to 254. IP Address High 3Byte continuation of the value previously set via BOOTP. When the IP address is set to a value other than 000 by rotary switch in the factory factory state, the high 3Byte is 192.168.0.
255~	When the rotary switch is set to 255 or more, the module powers up with the last startup method and startup parameters.

The factory rotary switch is set to "000".

Remarks:

1、 Tool selection

When the module is shipped from the factory, it has been matched with the corresponding specifications of the screwdriver, please use the matching specifications of the screwdriver.

If you don't have a screwdriver, please use a screwdriver with a 2mm opening or a Phillips screwdriver to rotate the switch.

- 2、 Be sure to operate the IP settings with the rotary switch in the event of a power failure. If it is necessary to change the IP address during communication, the power must be turned on again after the new setting is completed for the new setting to take effect.**

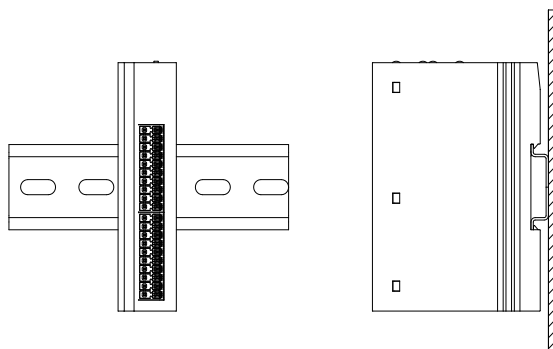
5 Installation and disassembly

Precautions for installation/disassembly

- Ensure that the cabinet is well ventilated (e.g., the cabinet is fitted with an exhaust fan).
- Do not install this equipment next to or above equipment that may cause overheating.
- Always install the module vertically and ensure sufficient spacing between the module and the surrounding equipment.
- Be sure to disconnect the power supply when installing/disassembling.

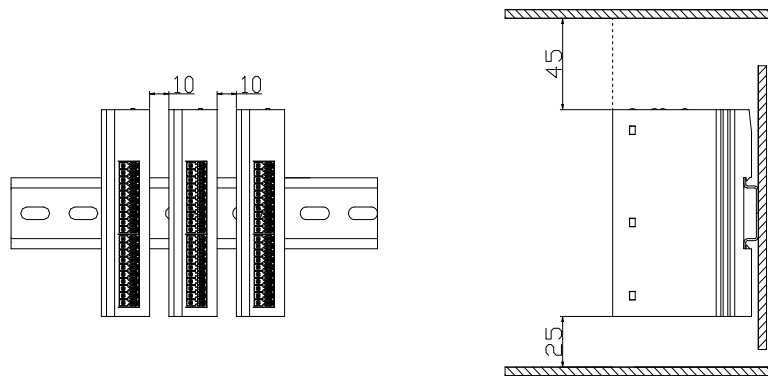
Installation instructions

- To maintain proper heat dissipation from the module, be sure to install the module vertically to ensure smooth airflow inside the module.



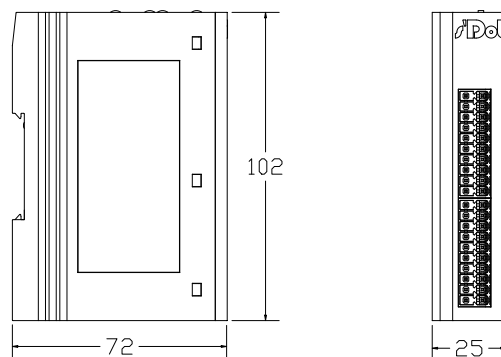
Minimum distance

Module protection level is IP20, need to be installed in the box or cabinet, when installing, module and other modules or heat generating equipment, module up and down and other equipment or wiring slot, please follow the minimum spacing shown in the figure below (unit: mm).



5.1 Dimensions

Outline specifications (unit: mm)



Installation method:

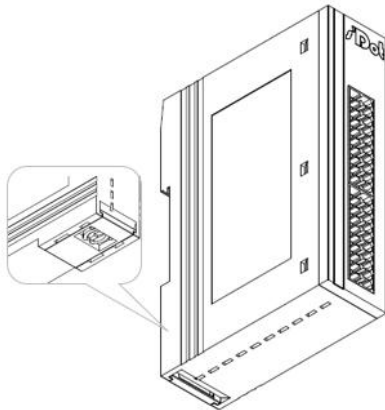
1. Top and bottom alignment;

2. DIN 35mm rail, snap-on installation.

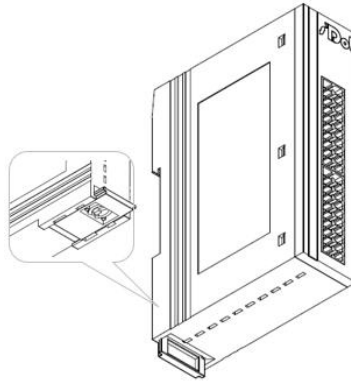
5.2 Installation and disassembly

Installation

Step

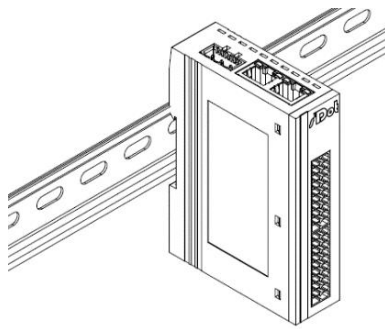


②

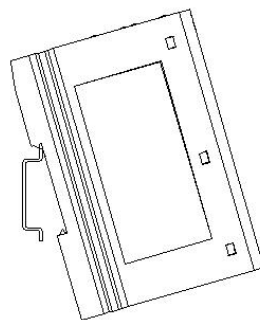


①

Push out the snap on the bottom of the module, as shown in Figure ①, to the position as shown in Figure ②, and hear the "click" sound.

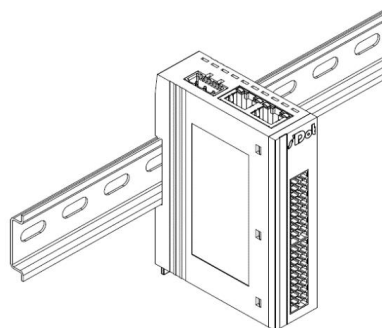


④



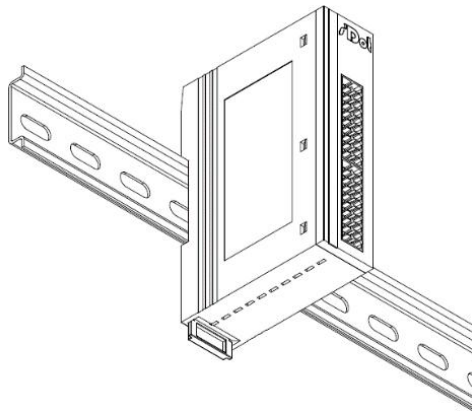
③

Align the upper edge of the module snap with the upper edge of the rail and place the module into the rail as shown in Figure ③④.



⑤

The module placement is shown in Figure ⑤.

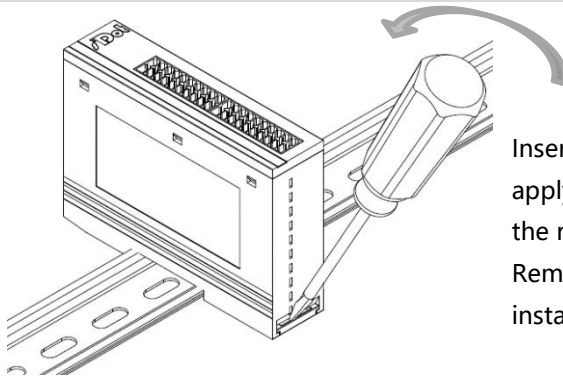


⑥

Push the snap in the direction of the rail and hear the ringing sound to complete the module installation, as shown in Figure ⑥.

Disassembly

Step



⑦

Insert a flat head screwdriver into the carabiner and apply force in the direction of the module (hear the rattle) as shown in Figure ⑦.
Remove the module by doing the opposite of installing the module.

6 Wiring

6.1 Wiring terminal

wiring terminal		
Signal wire terminal	Number of poles	2x20 P
	wire diameter	22~17 AWG 0.3~1.0 mm²
power supply terminal	Number of poles	3 P
	wire diameter	22~16 AWG 0.3~1.5 mm²
bus interface	2xRJ45	Category 5or better UTP or STP (STP recommended)

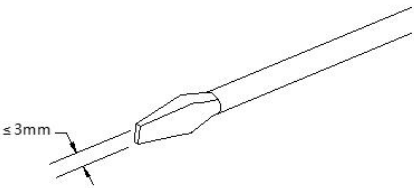
6.2Wiring instructions and requirements

Power supply wiring precautions

- The power supply on the module system side and that on the field side should be wired separately. Mixing should be avoided.
- PE must be reliably grounded.

Wiring Tool Requirements

Screw-free design for terminals, cable installation and removal using a screwdriver (bit width: ≤ 3 mm)



Stripped Wire Length Requirements

Recommended stripping length 10 mm.



Wiring Method

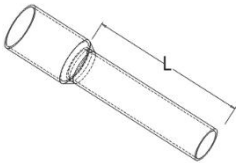
For single stranded hard wires, after stripping the corresponding length of wire, press down the button while inserting the single-strand wire.



For a multi-strand flexible wire, after stripping a required length, directly connect it or use a compatible cold-pressed terminal (tubular insulated terminal, as shown in the table below).

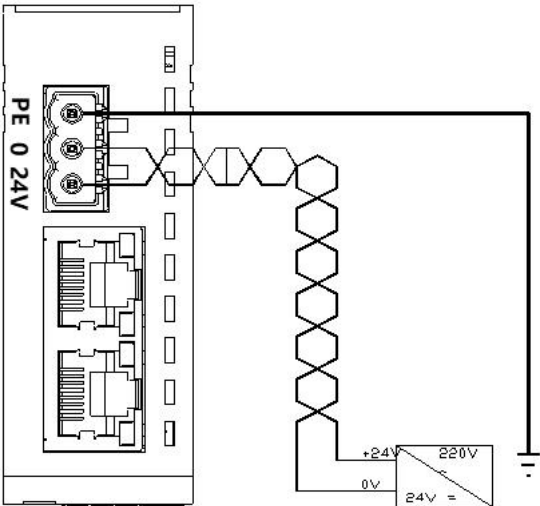


Press the button whiling inserting the wire.

Tube Insulation End Specification Sheet		
specification	Model	Cable section area(mm²)
 Tube insulated terminal L with a length of 10 mm	E0310	0.3
	E0510	0.5
	E7510	0.75
	E1010	1.0
	E1510	1.5

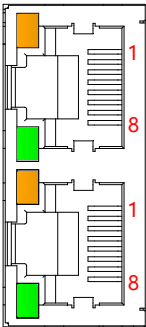
Power Wiring

Connect the DC24V power module using the given wiring method based on the circuit shown in the figure below, and meanwhile ground the PE reliably (twisted pair cable is recommended for power supply).



Bus Wiring

Standard RJ45 network interface with standard crystal connector is used, and the pin assignment is shown below.



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

⚠ Precautions

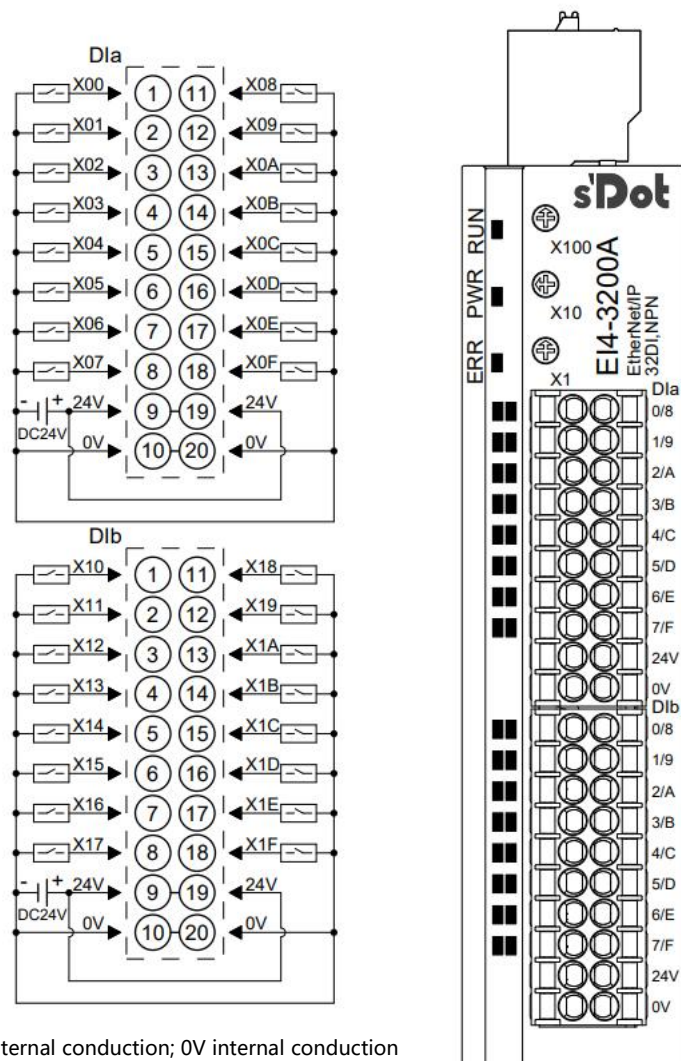
- Category 5 or higher-level double-shielded (braided wire + aluminum foil) STP cable is recommended as communication cable.
- The cable between any two devices should not exceed 100 m.

Signal and load power wiring

The load power supply is powered by DC24V power supply. For wiring of load power supply and signal lines, please refer to the wiring diagram of the corresponding I/O module and the wiring method to press the cables into the terminal blocks (specifically refer to [6.3 Wiring Diagram of I/O Module](#)).

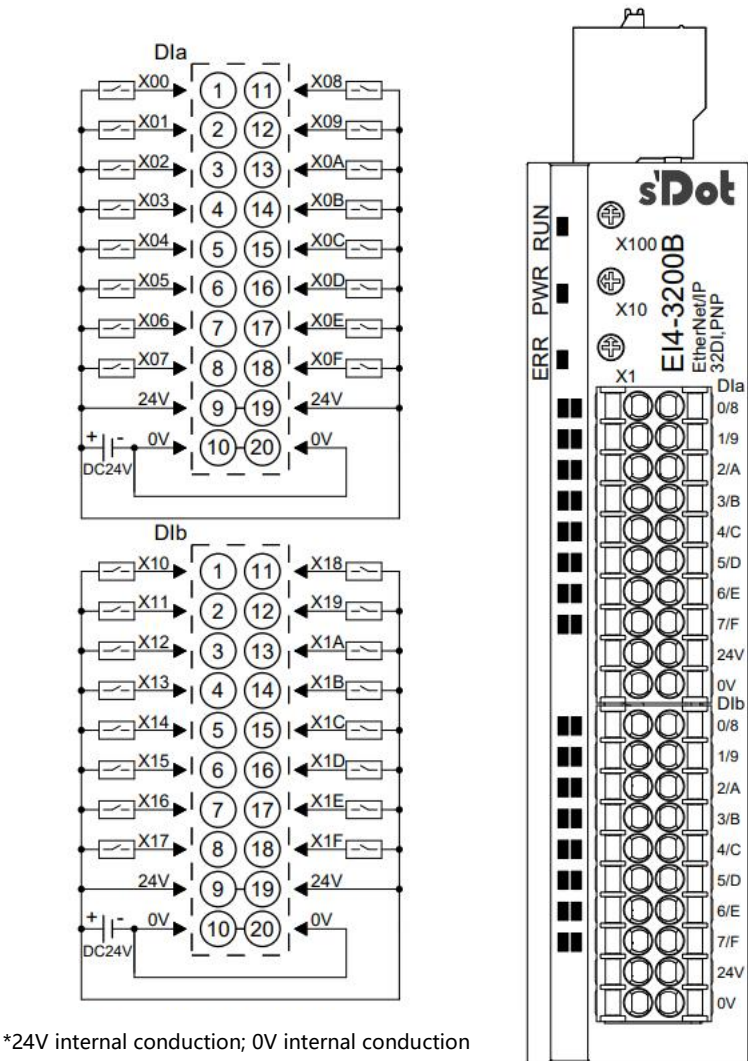
6.3 I/O Module Wiring Diagram

6.3.1 EI4-3200A

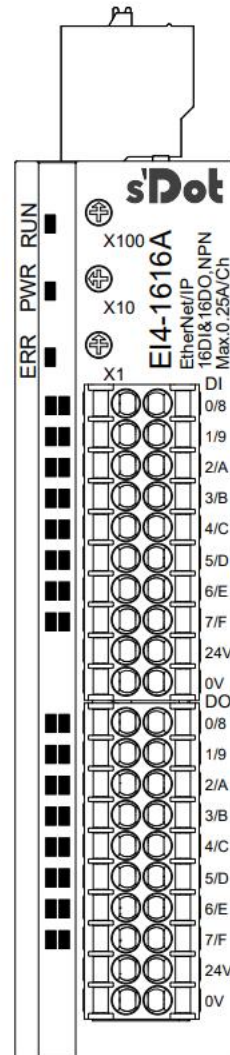
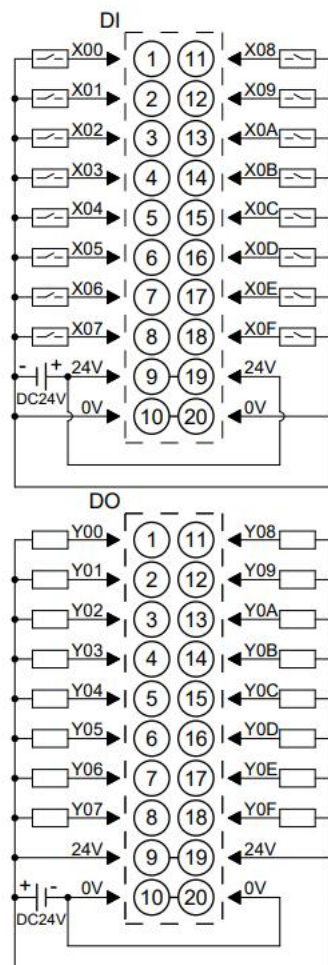


*24V internal conduction; 0V internal conduction

6.3.2 EI4-3200B



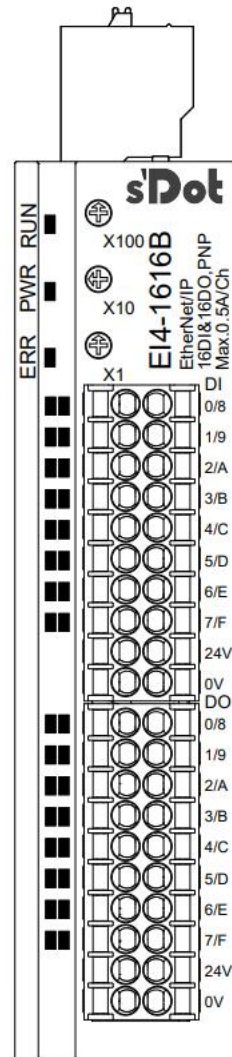
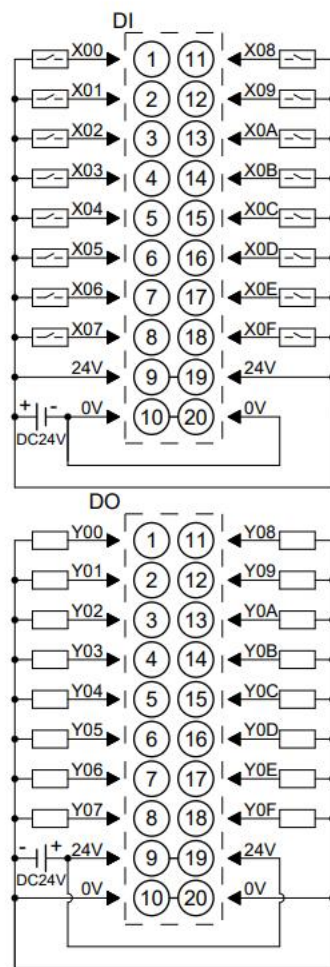
6.3.3 EI4-1616A



*24V internal conduction; 0V internal conduction;DI and DO do not communicate with each other

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

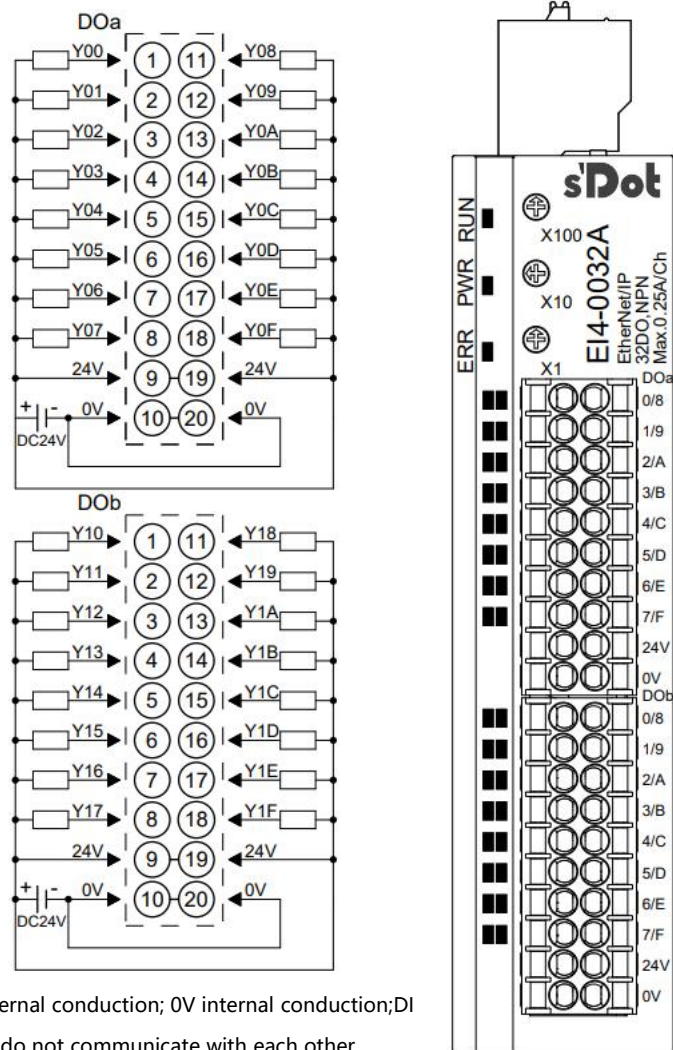
6.3.4 EI4-1616B



*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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

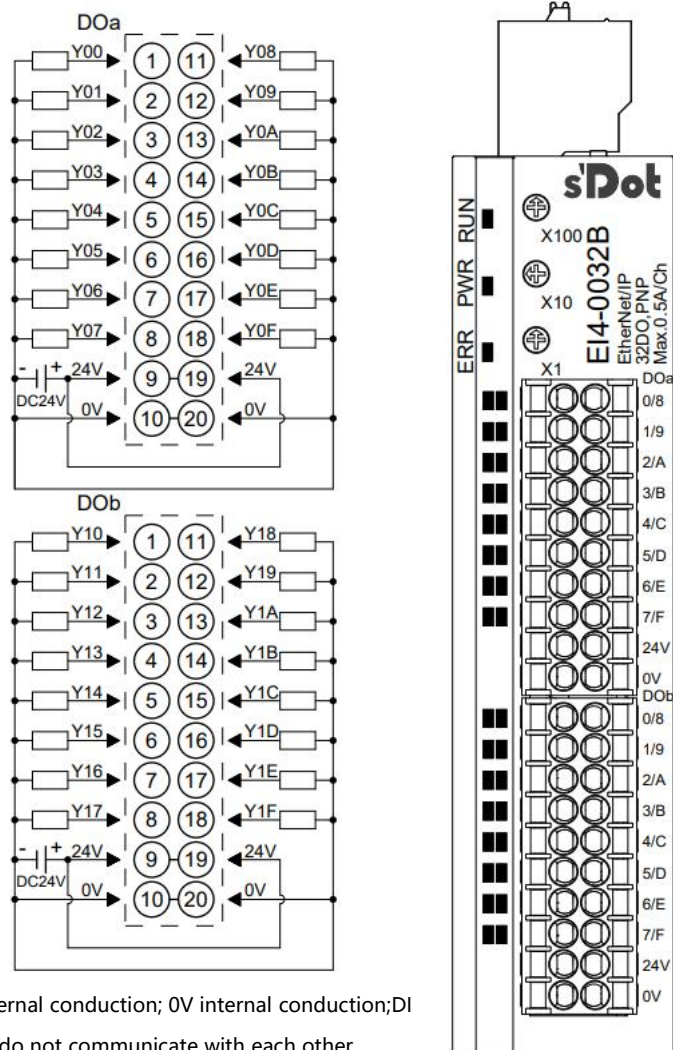
6.3.5 EI4-0032A



*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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

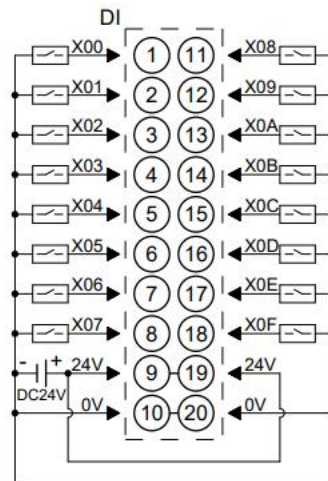
6.3.6 EI4-0032B



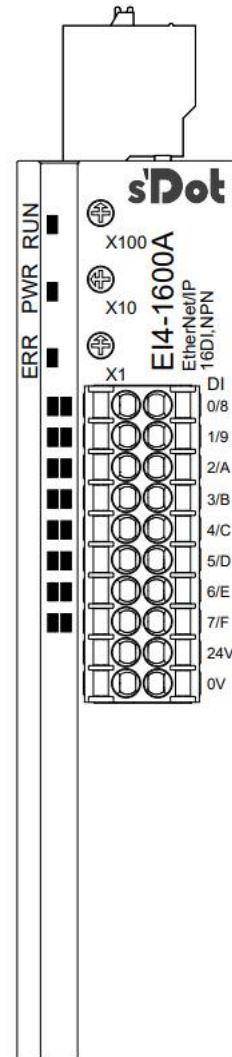
*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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

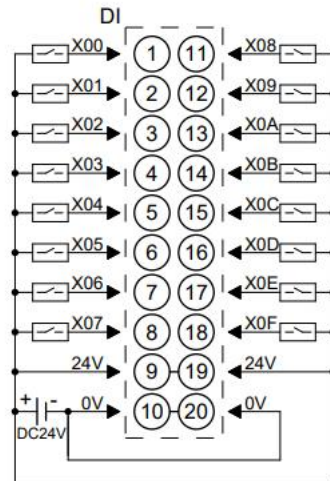
6.3.7 EI4-1600A



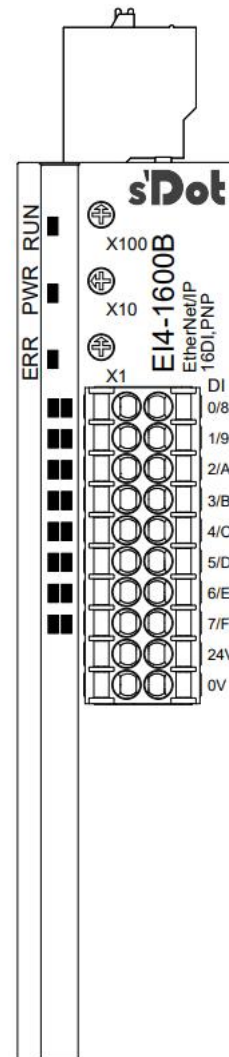
*24V internal conduction; 0V internal conduction



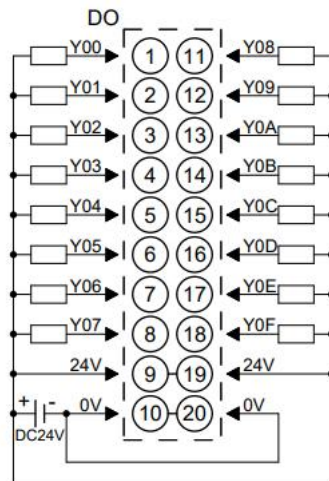
6.3.8 EI4-1600B



*24V internal conduction; 0V internal conduction

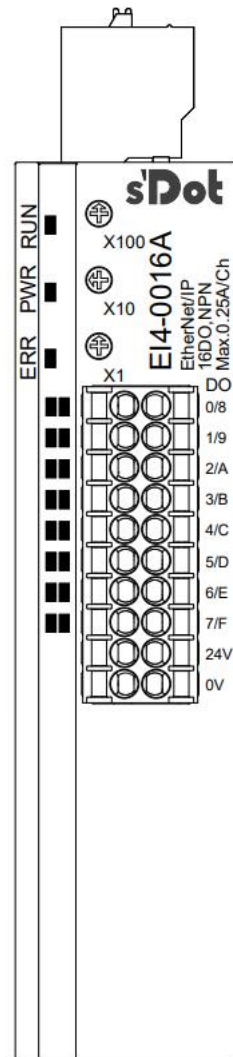


6.3.9 EI4-0016A

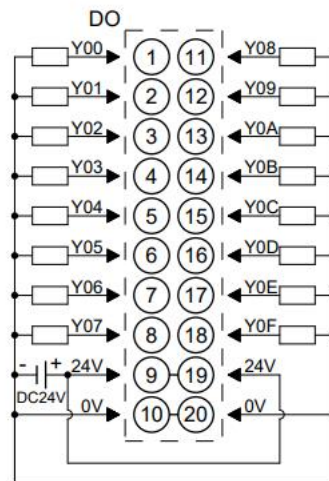


*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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

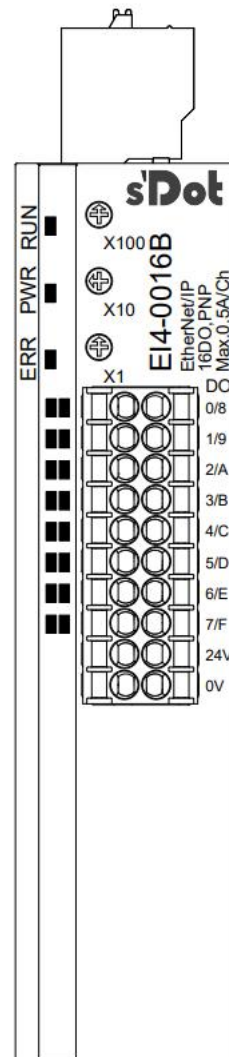


6.3.10 EI4-0016B

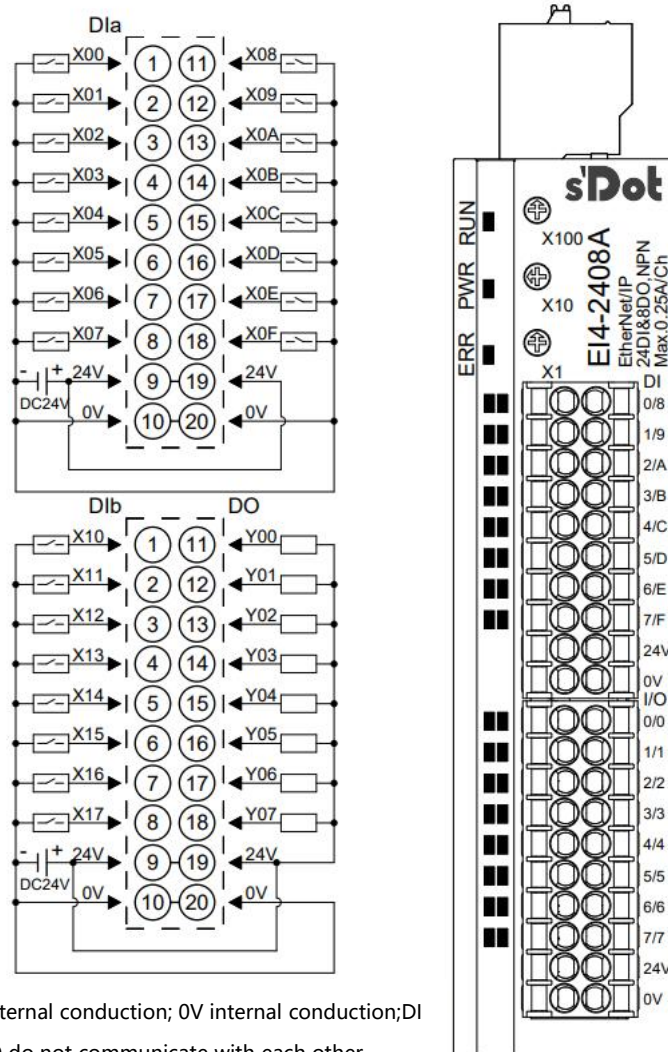


*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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



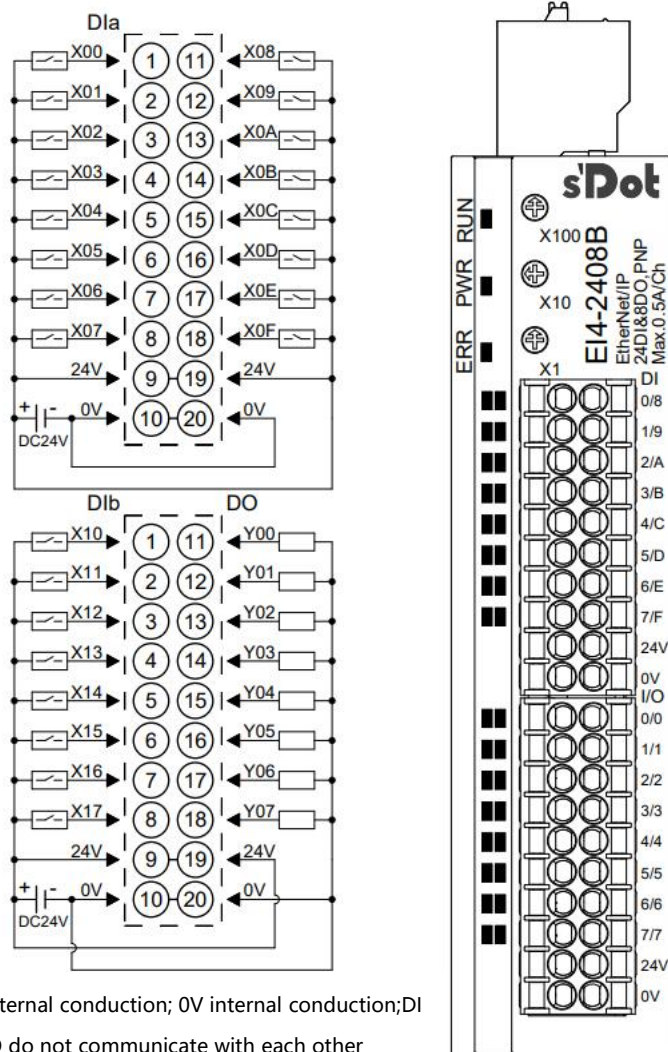
6.3.11 EI4-2408A



*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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

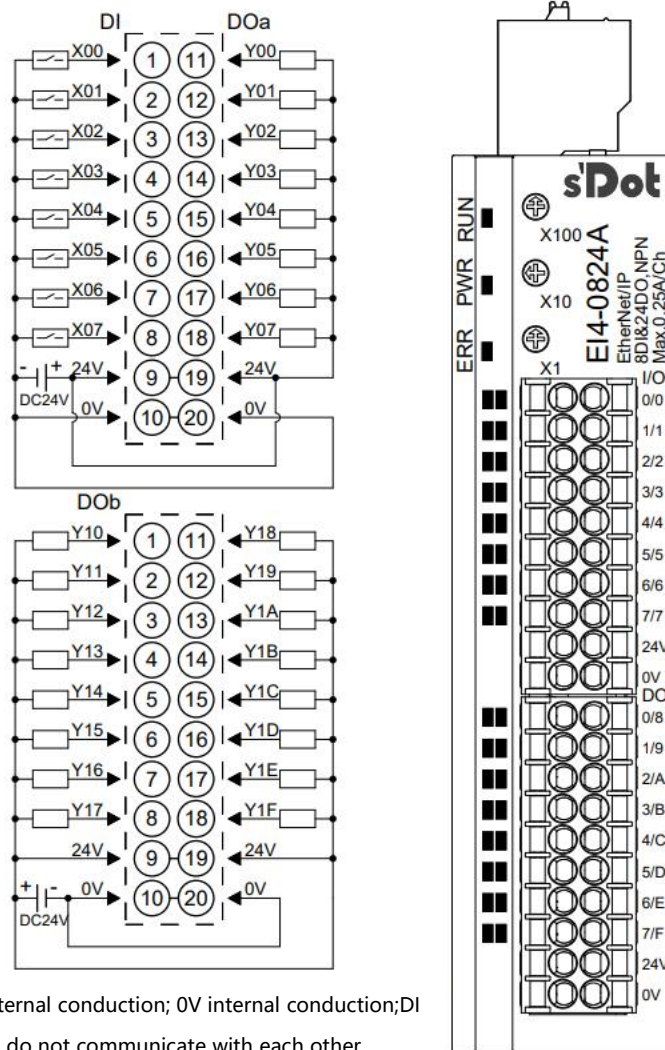
6.3.12 EI4-2408B



*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

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

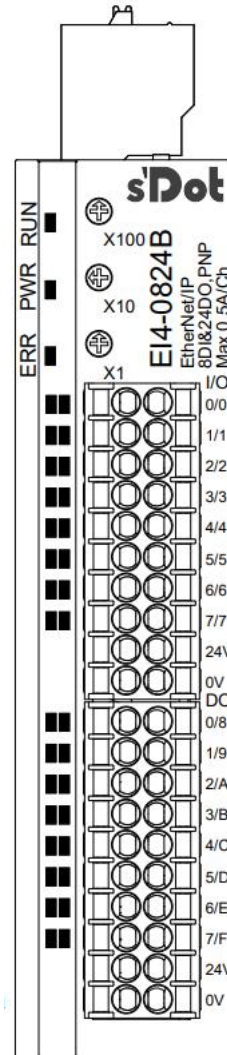
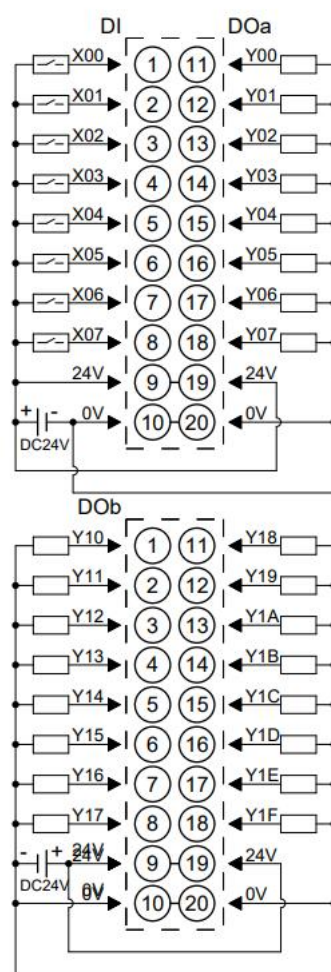
6.3.13 EI4-0824A



*24V internal conduction; 0V internal conduction;DI and DO do not communicate with each other

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

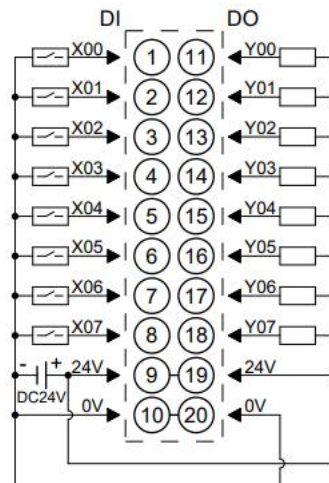
6.3.14 EI4-0824B



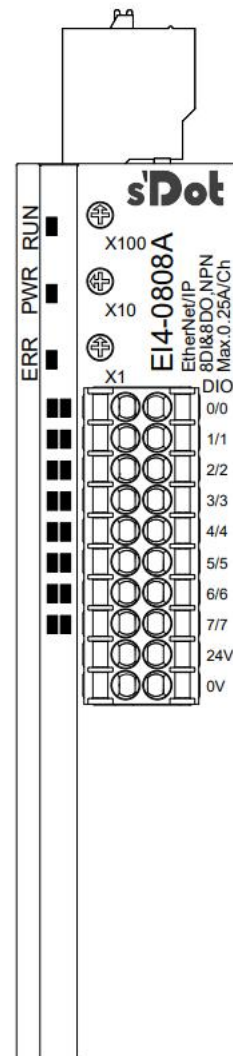
*24V internal conduction; 0V internal conduction;DI and DO do not communicate with each other

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

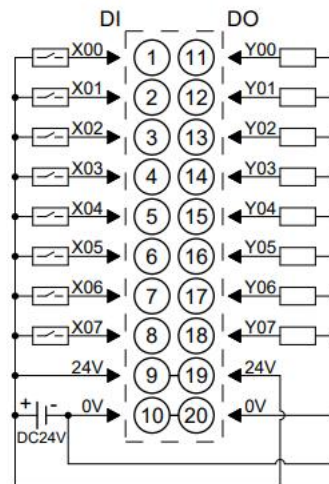
6.3.15 EI4-0808A



*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other
 *The load common terminal power supply must use the same power supply as the module

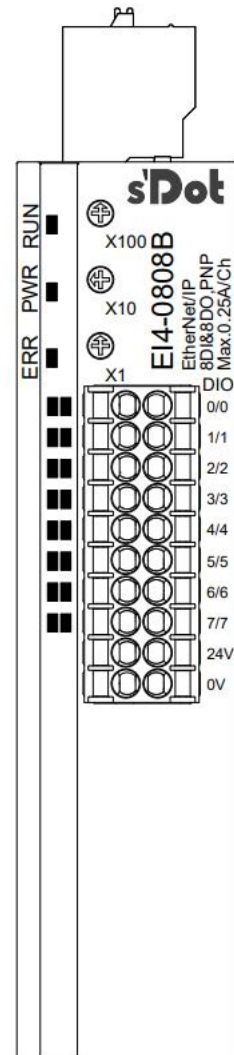


6.3.16 EI4-0808B

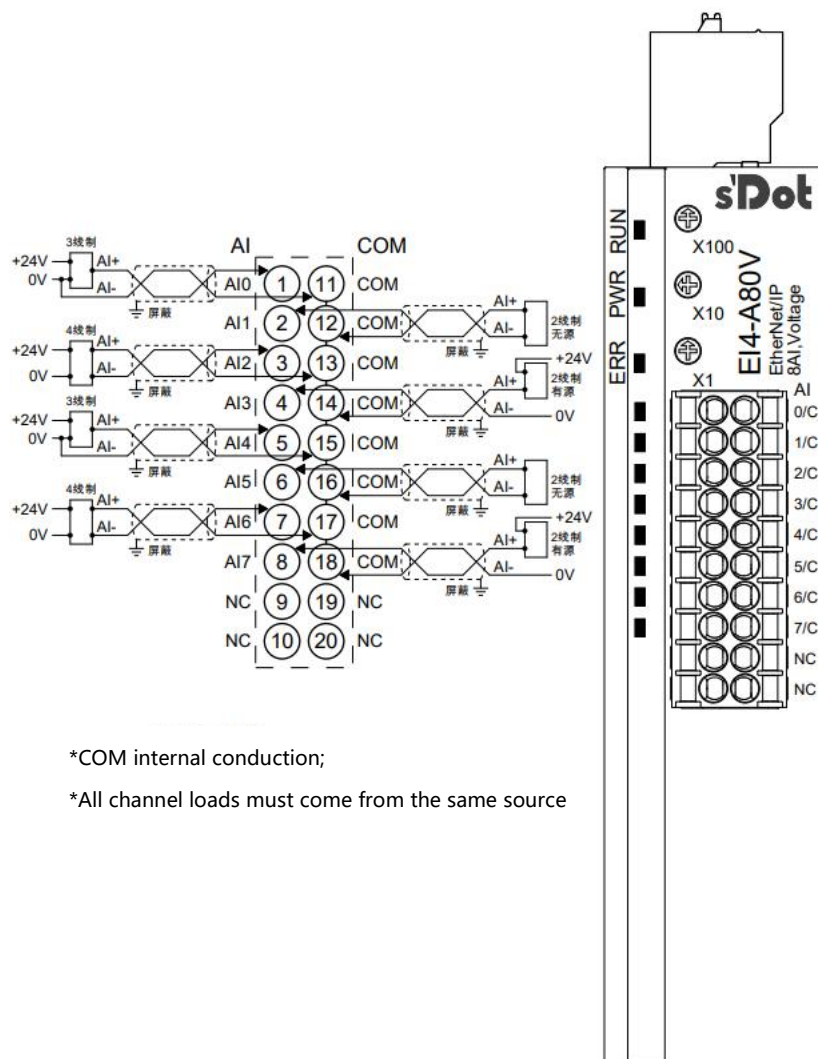


*24V internal conduction; 0V internal conduction; DI and DO do not communicate with each other

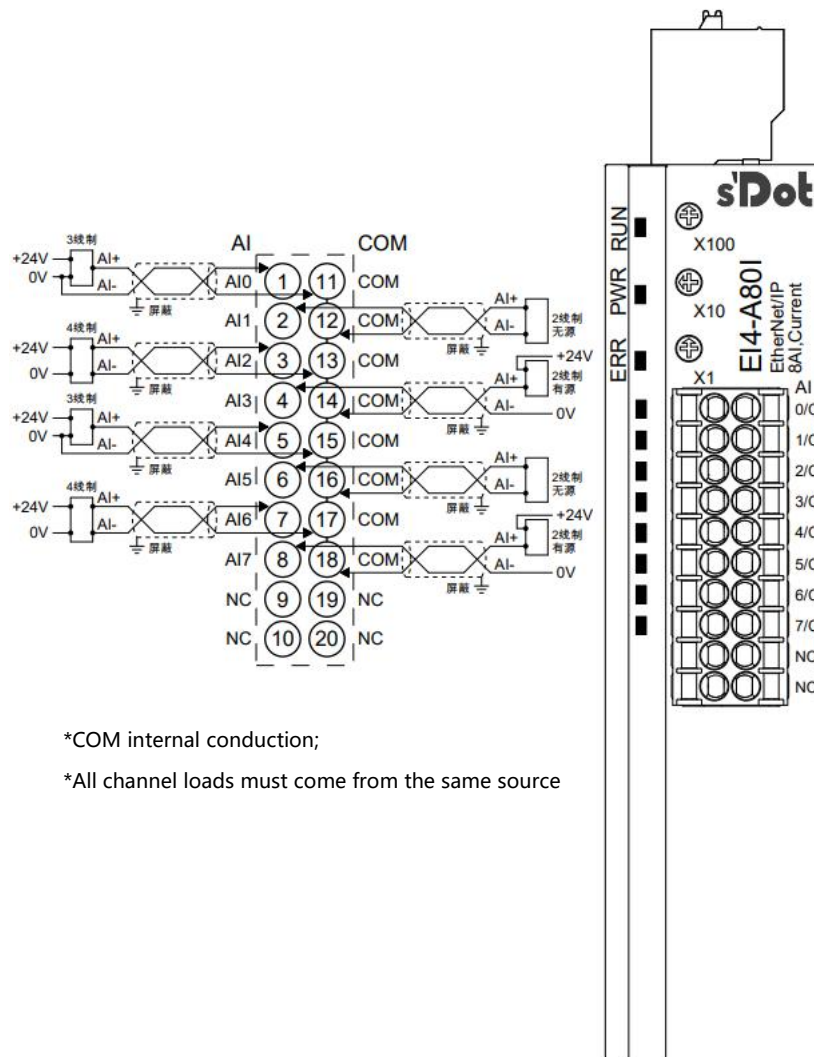
*The load common terminal power supply must use the same power supply as the module



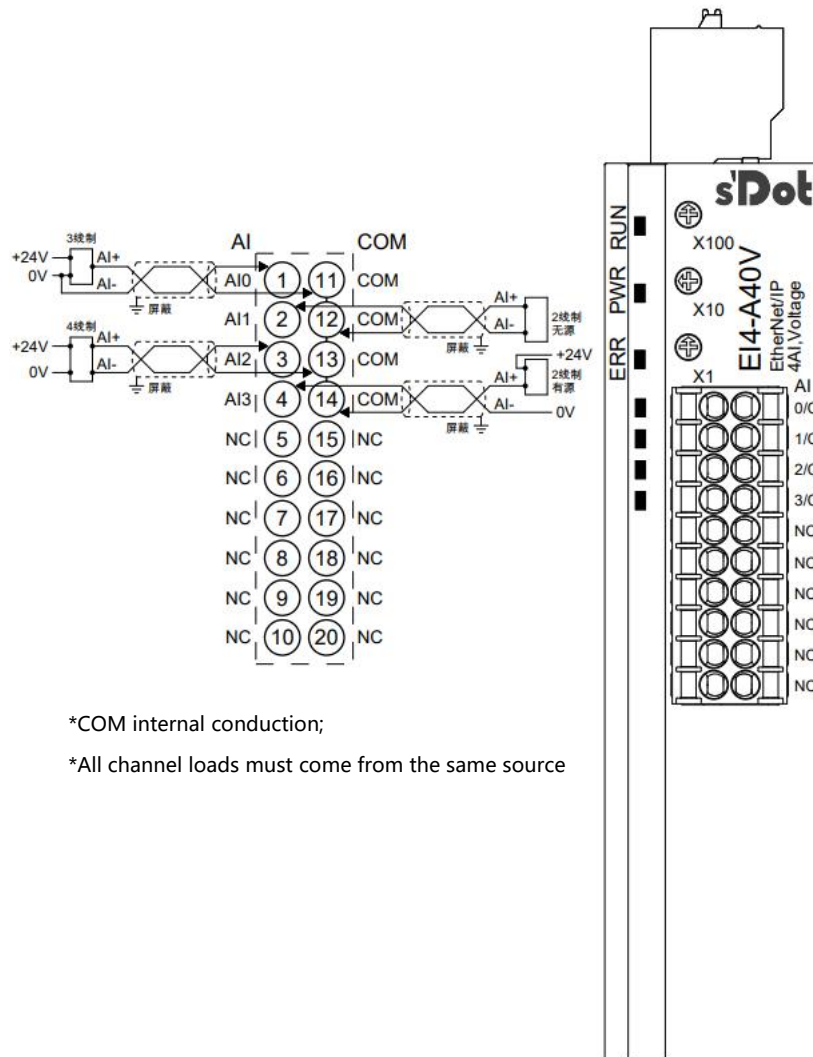
6.3.17 EI4-A80V



6.3.18 EI4-A80I



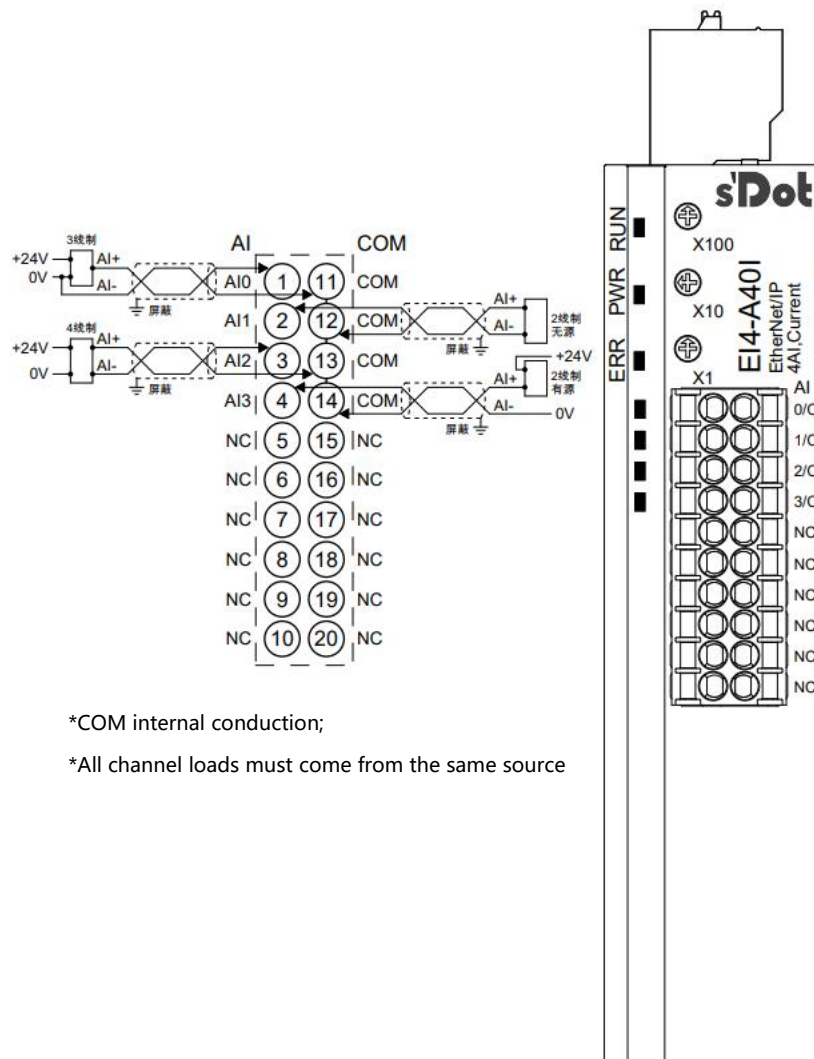
6.3.19 EI4-A40V



*COM internal conduction;

*All channel loads must come from the same source

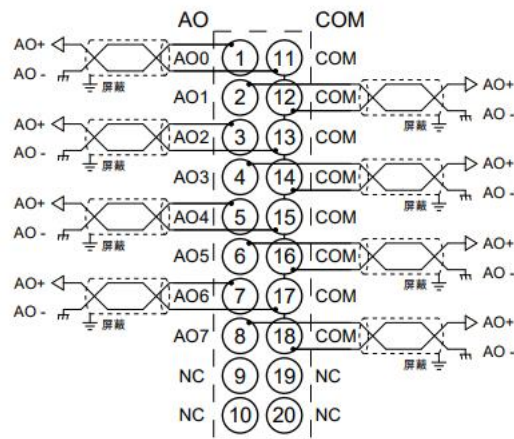
6.3.20 EI4-A40I



*COM internal conduction;

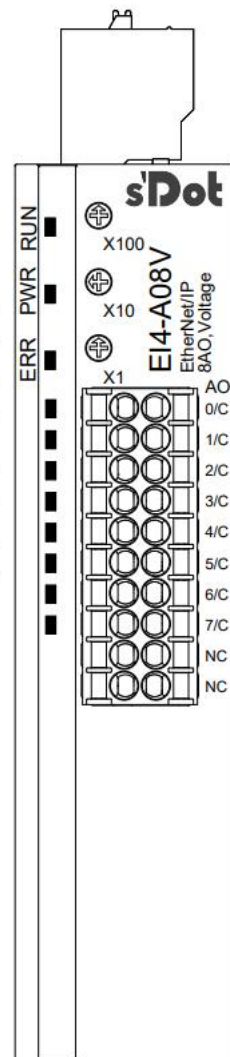
*All channel loads must come from the same source

6.3.21 EI4-A08V

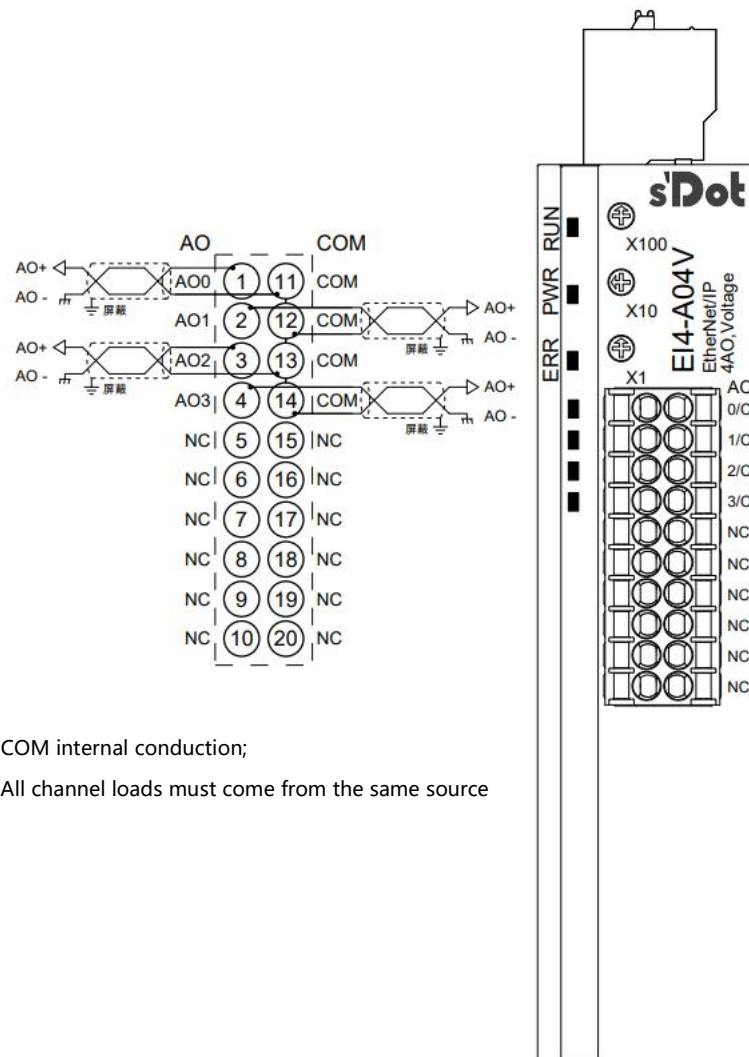


*COM internal conduction;

*All channel loads must come from the same source



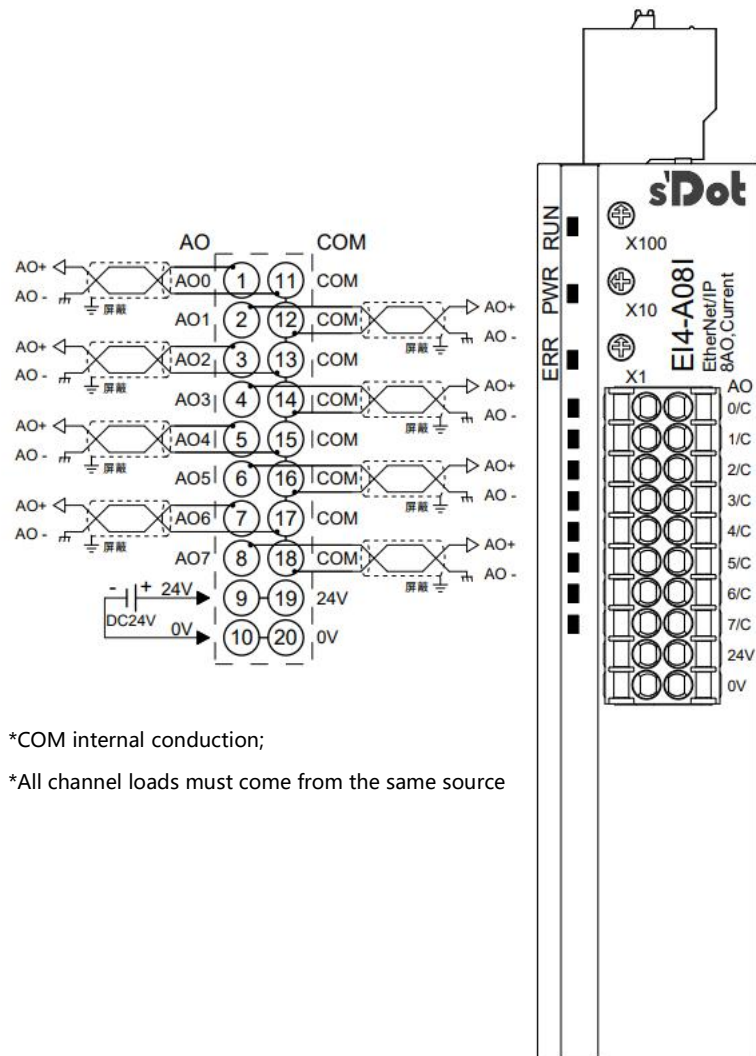
6.3.22 EI4-A04V



*COM internal conduction;

*All channel loads must come from the same source

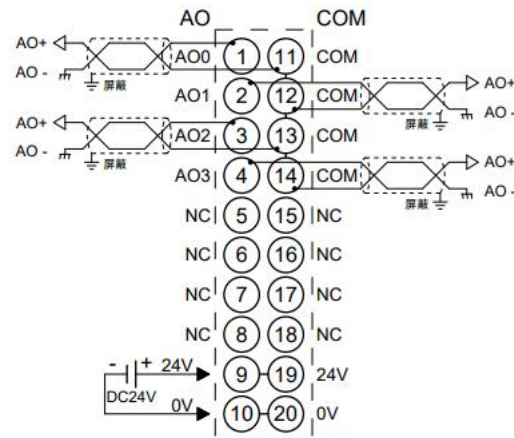
6.3.23 EI4-A08I



*COM internal conduction;

*All channel loads must come from the same source

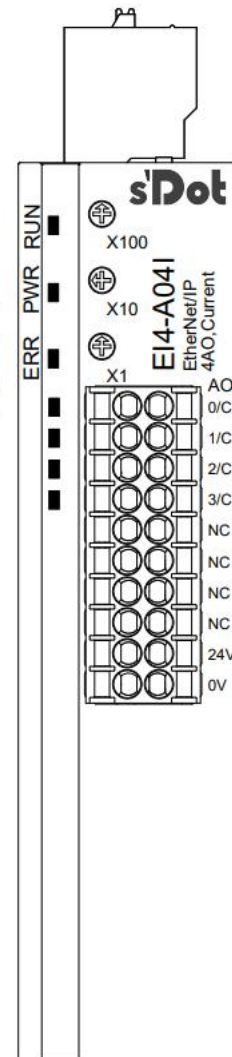
6.3.24 EI4-A04I



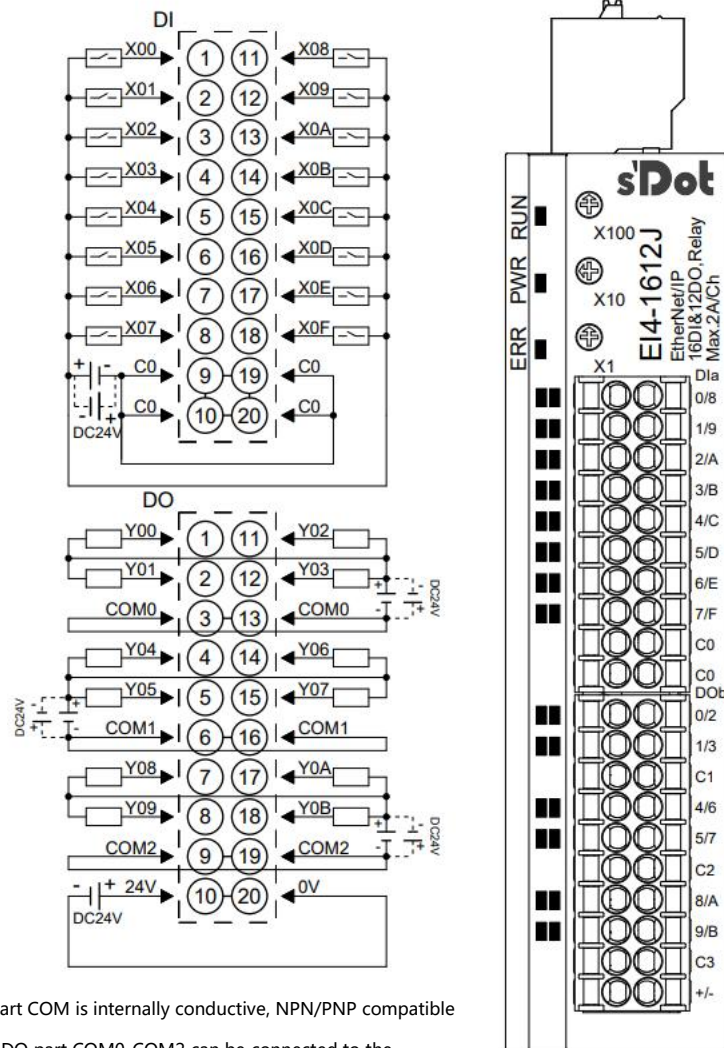
*COM internal conduction;

*All channel loads must come from the same source

*24V internal conduction; 0V internal conduction



6.3.25 EI4-1612J

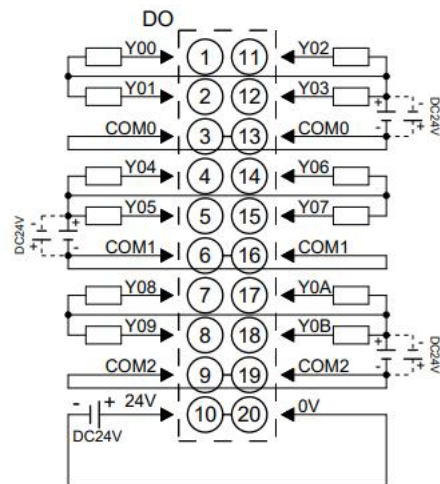


*DI part COM is internally conductive, NPN/PNP compatible

*The DO part COM0-COM2 can be connected to the positive or negative pole, and they are connected internally respectively. Only support DC48V.

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

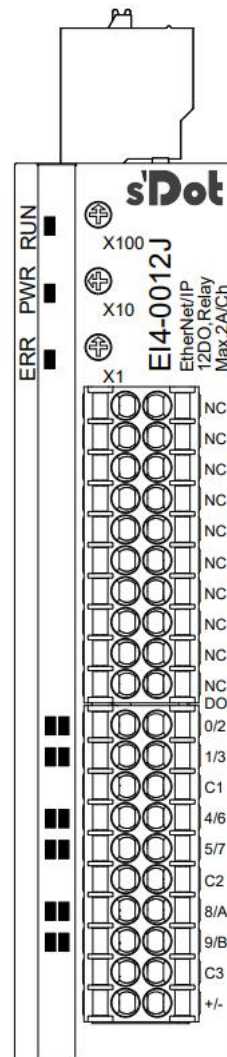
6.3.26 EI4-0012J



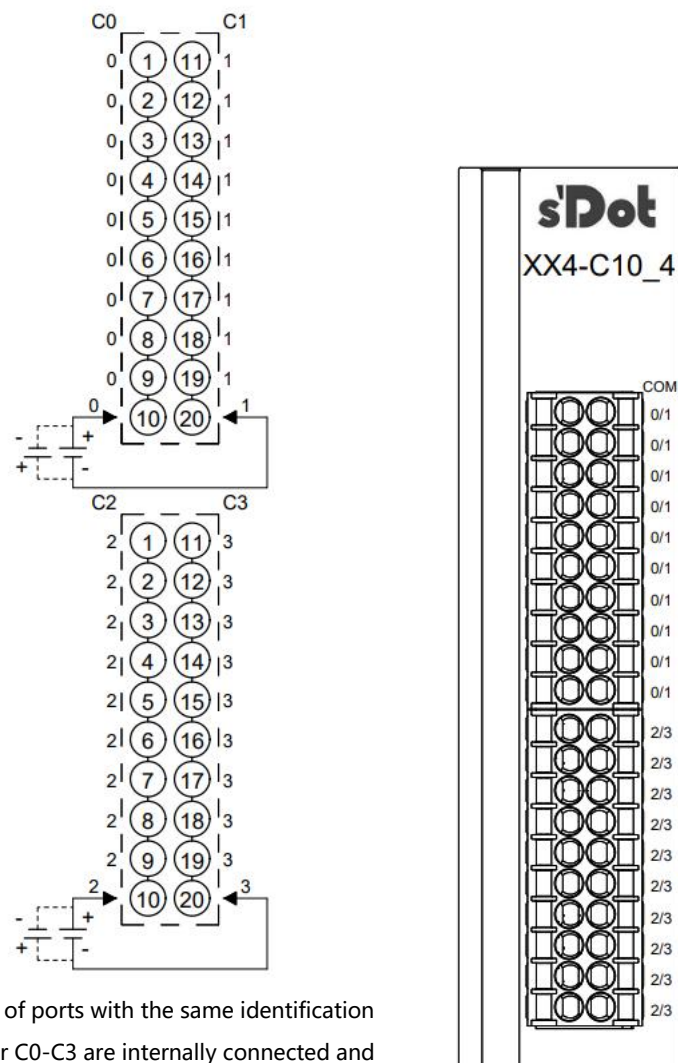
*DI part COM is internally conductive, NPN/PNP compatible

*The DO part COM0-COM2 can be connected to the positive or negative pole, and they are connected internally respectively. Only support DC48V.

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



6.4 Common Expansion Module Wiring Diagram



*A row of ports with the same identification number C0-C3 are internally connected and cannot communicate with each other.

7 Operation

7.1 Parameter and function configuration

This manual takes the KV STUDIO Ver.10G software platform as an example to introduce the module parameters, functions, and configuration methods.

7.1.1 Digital output clear/hold function

The clear/hold function is for modules with outputs. This function can configure the module output action under bus abnormality.

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

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

- **Configuration method**

- After adding a module, click "Exclusive Owner" on the right side of the module icon to enter the module settings window.
- Click on Parameter Settings to see the "Hold or Clear Parameter" option.
- Select 0 to clear, 1 to hold, and the parameter defaults to 0.
- Click "OK" to save the parameters.
- Select "Apply" and download to the controller before exiting the EtherNet/IP setup to make the parameters take effect.

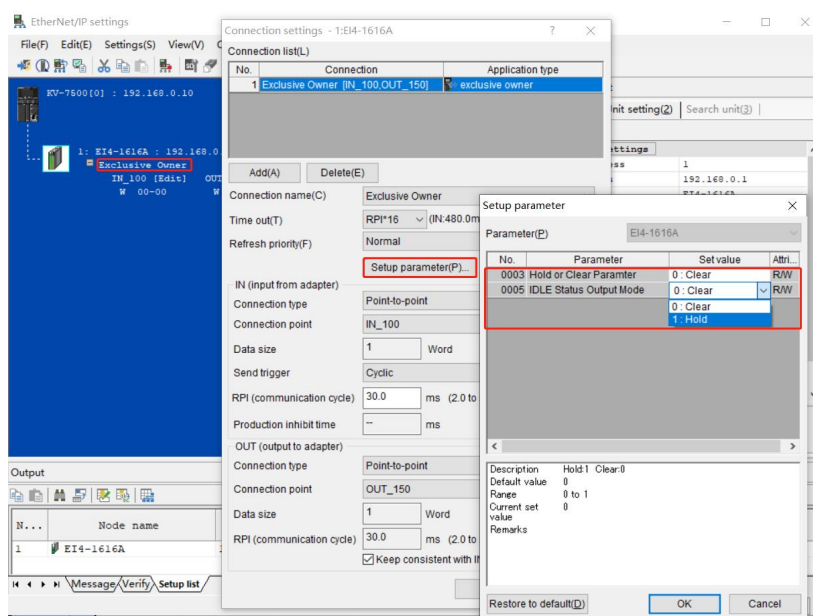
7.1.2 Module Output Action Configuration Function in Bus RUN/IDLE State

The output action configuration function in the RUN/IDLE state is for modules with outputs. When the bus state switches to the idle state, you can choose whether the module output action is to be maintained or cleared.

- **Configuration method**

- After adding a module, click "Exclusive Owner" on the right side of the module icon to enter the module settings window.
- Click Parameter Settings to see the "IDLE Status Output Mode" option.

- c. Select 0 for clear, select 1 for hold, and the parameter default setting is clear.
- d. Click "OK" to save the parameters, as shown below.



- e. Select "Apply" and download to the controller before exiting the EtherNet/IP setup to make the parameters take effect.

7.1.3 Analog range configuration function

The analog range setting function is for analog input/output modules and allows you to set the analog range.

● Configuration method

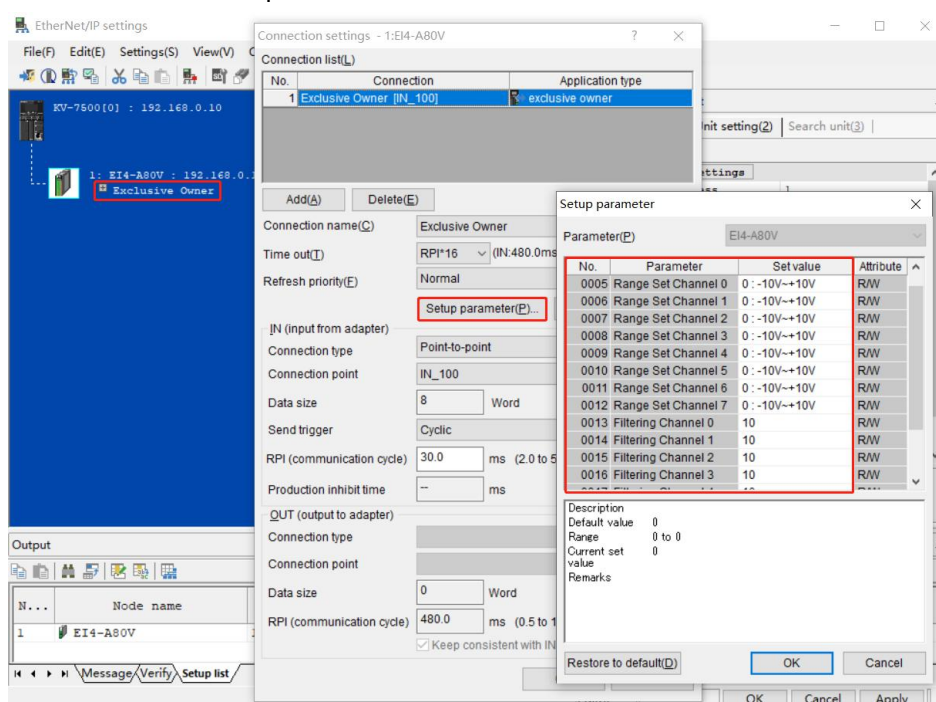
- a. After adding a module, click "Exclusive Owner" on the right side of the module icon to enter the module settings window.
- b. Click on the parameter setting, you can see the "Range Set Channel n" option, "n" stands for the channel number, each channel can be set individually range range.
- c. The default setting of the parameter is 0. For details, see ["3.3 Analog Parameters"](#).
- d. Click "OK" to save the parameters.
- e. Select "Apply" and download to the controller before exiting the EtherNet/IP setup to make the parameters take effect.

7.1.4 Analog filter parameter setting function

The analog filter parameter setting function is for analog input module, which can set the filtering time of analog input signal. Analog filtering, channel can be configured individually; configuration range 1~1024ms; when configuring 1, all channels sampling rate is 1ms, when configuring 200, all channels sampling rate is 200ms; default 10ms; analog output no filtering.

● Configuration method

- After adding a module, click "Exclusive Owner" on the right side of the module icon to enter the module settings window.
- Click on the parameter setting, you can see "Filtering Channel n" option, "n" stands for the channel number, each channel can be set individually filtering time.
- The default setting of the parameter is 10 in ms.
- Click "OK" to save the parameters, as shown below.



- Select "Apply" and download to the controller before exiting the EtherNet/IP setup to make the parameters take effect.

7.2 Modify IP Function

7.2.1 Setting the IP address by rotary switch

➤ **When the IP address is set by rotary switch from the factory status**

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

➤ **When setting the IP address with the rotary switch from the state where the IP address has already been set with BOOTP**

The IP address follows the high 3byte and the low 1byte of the IP address set by BOOTP to become the setting value of the rotary switch.

For example, if you change the setting of the rotary switch after setting it to 172.10.0.12 via the BOOTP

The IP address is 172.10.0.XXX (XXX is the setting of the rotary switch from 1 to 254).

Precautions

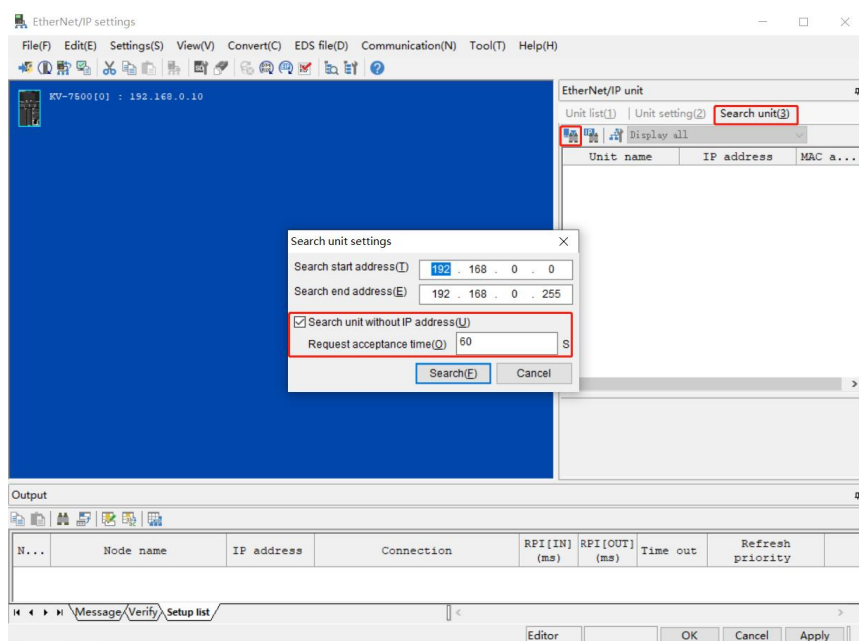
- For the description and operation of the rotary switch, refer to "[4.3 Rotary Switch](#)".
- When the module is shipped from the factory, the rotary switch is set to "000" and the IP address is not assigned.
- After the modification of the upper computer is completed, the module modifies the startup method to fixed IP startup and reboots automatically. The module starts up with the IP address consisting of the knob switch setting value and the assigned network segment.
- Abnormal rotary switch setting: When the rotary switch is set to non-1~254, the module starts with the previous startup method and parameters after powering up.

7.2.2 Setting the IP address from the upper computer KV STUDIO Ver.10G

Use the upper computer to scan the module, and click on the IP address column of the module to modify the IP address after scanning the module.

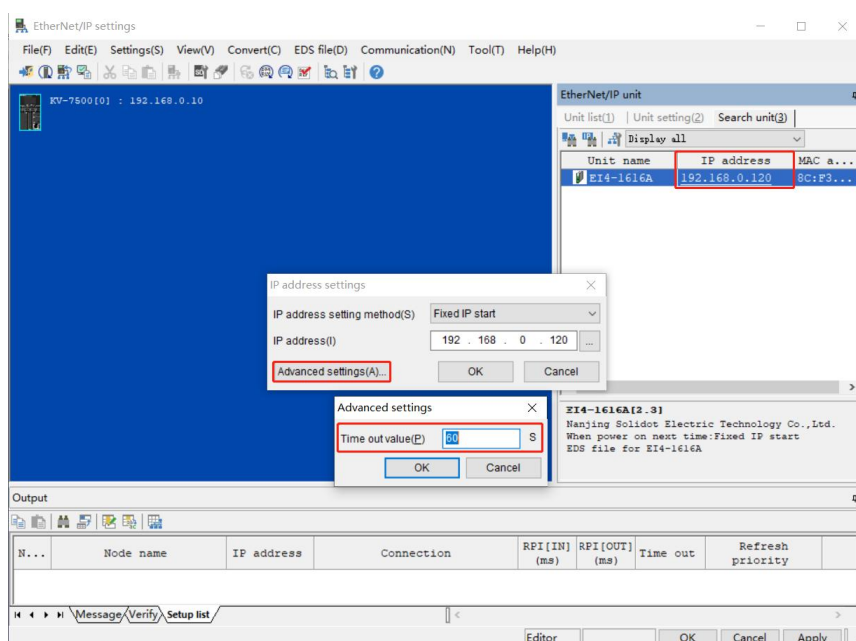
This section describes how to change the IP address, using the Keens KV-7500 and the upper computer KV STUDIO Ver.10G as an example.

1. scanning device



2. IP modification

Modify to the set IP address, click OK to set. If the scanned module has no IP address and the startup method is BOOTP or DHCP, you need to click Advanced Settings and set the timeout time to 60s.



Precautions

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

7.2.3 Restore Factory Settings

If the IP address is forgotten, lost or other abnormalities occur during use, the module can be reset by the IP address reset function to the module. The module can execute the operation of restoring factory settings through the special operation of the rotary switch as follows:

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

7.3 Module Configuration Description

7.3.1 Application in KV STUDIO Ver.10G software environment

1、Preparation

- **Hardware environment**
 - **Module preparation**

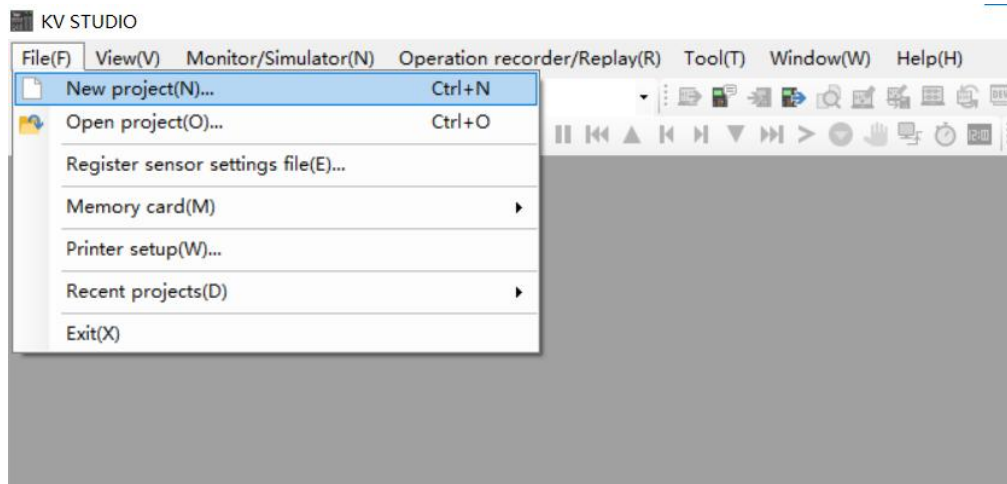
This description uses the EI4-1616A module as an example.
 - **A computer with pre-installed KV STUDIO Ver.10G software**
 - **Shielded cables for EtherNet/IP**
 - **One Keyence PLC, KV-7500 is used as an example for this description.**
 - **One switching power supply**
 - **Module installation guide rails and guide rail fixings**
 - **Device Configuration Files**

Configuration file access: <https://www.solidotech.com/documents/configfile>
- **Hardware configuration and wiring**

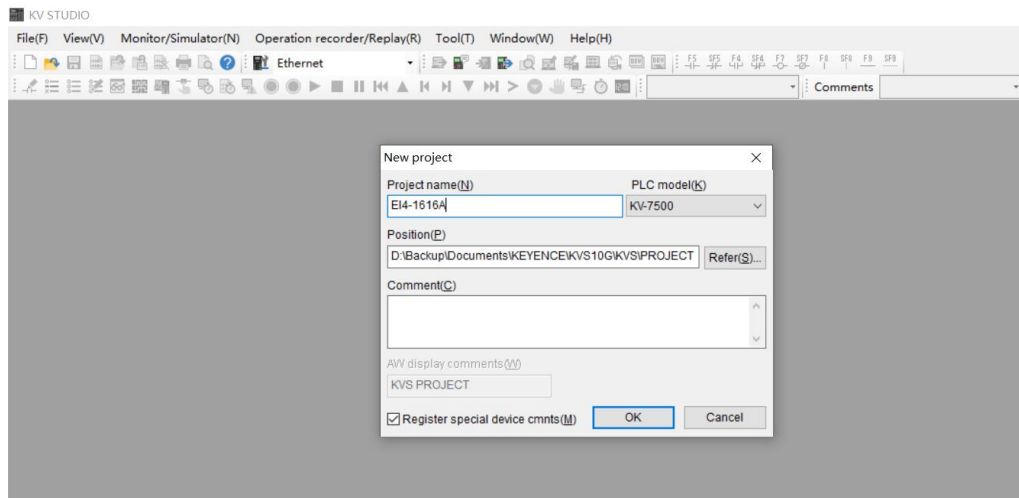
Follow "[5 installation and disassembly](#)" and "[6 Wiring](#)".

2、Create Project

- a. Open KV STUDIO software, select "File -> New Project", as shown below.



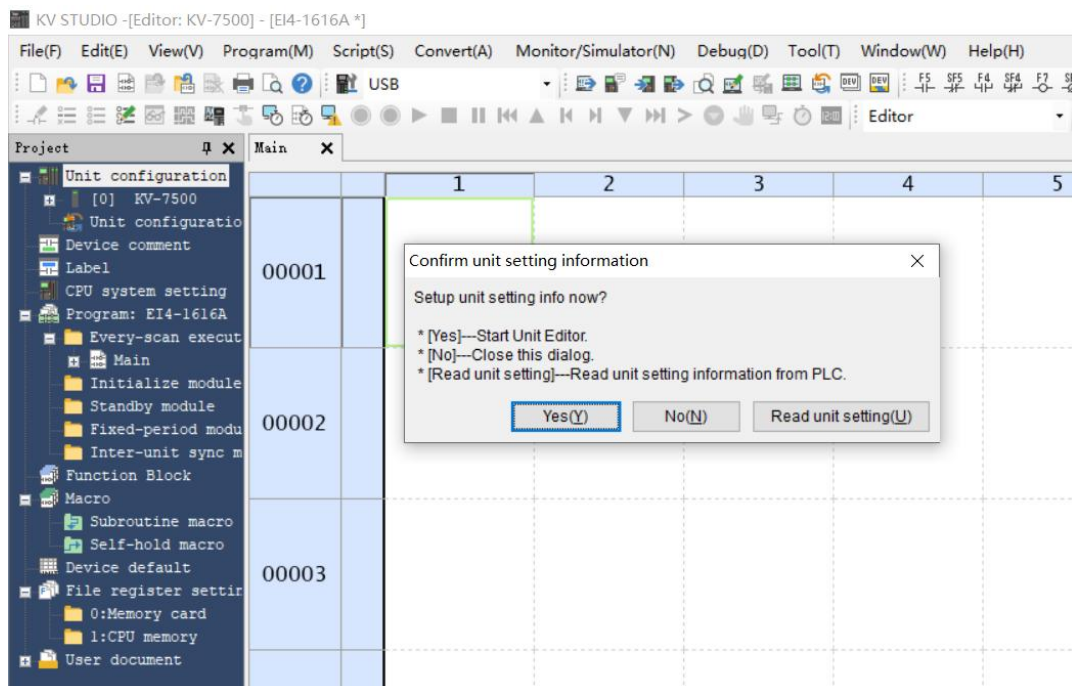
- b. In the pop-up box, fill in the "Item Name", select "Supported Models", "Location", as shown in the figure below.



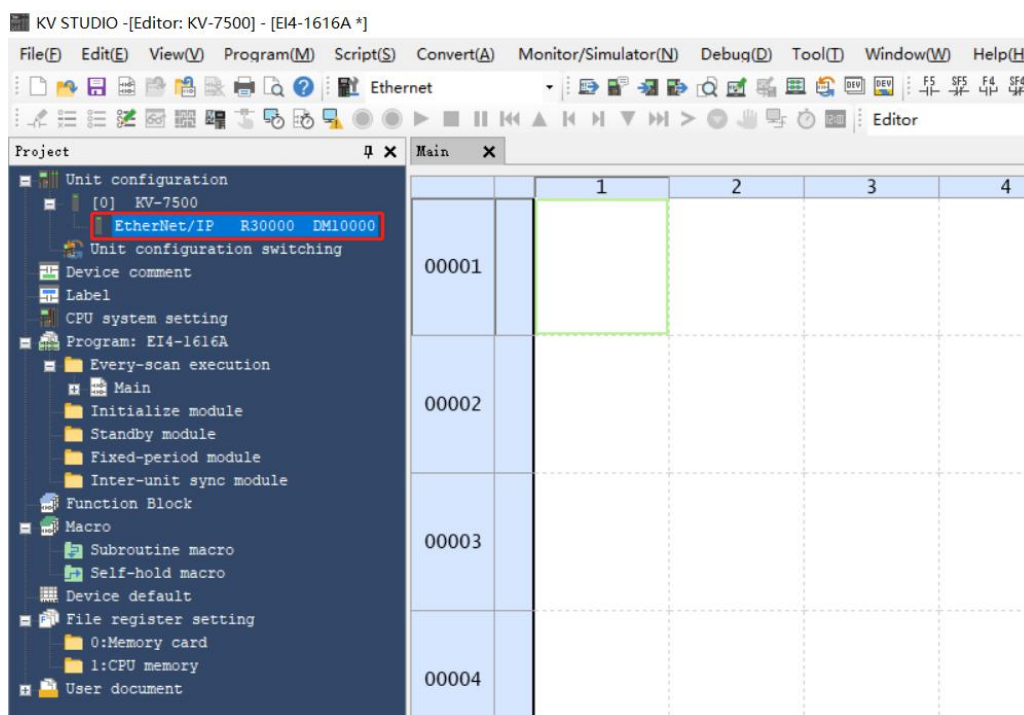
- ◆ Item name: Customize.
- ◆ Supported models: View the PLC appearance and select the corresponding model, e.g., KV-7500.

3. Turn on EtherNet/IP settings

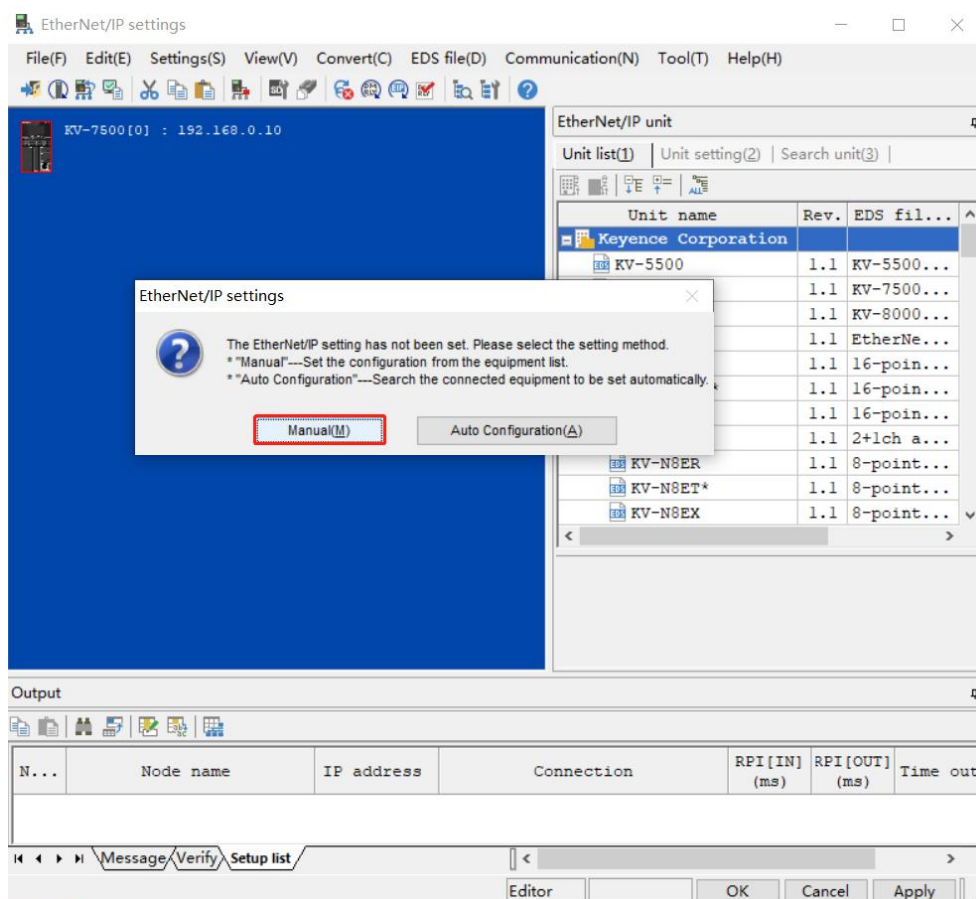
- a. The "Confirm Unit Configuration Settings" window pops up, and you can select to start the Unit Editor, close the dialog box, or read the unit configuration from the PLC as necessary. Select "No" to demonstrate the operation, as shown in the figure below.



- b. Double-click the "EtherNet/IP" cell as shown below.

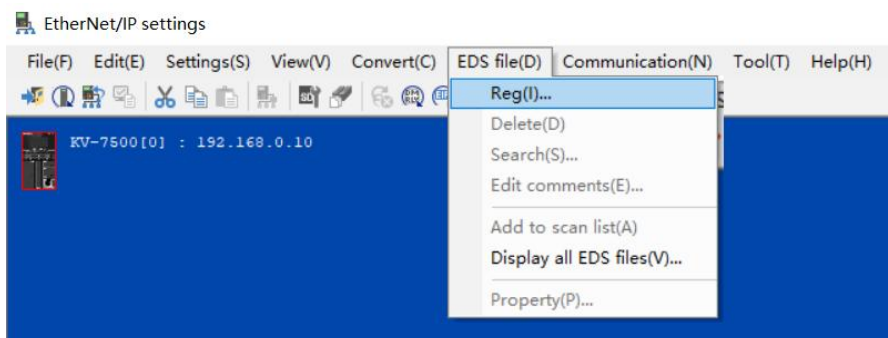


- c. Select "Manual" or "Auto Configuration" as needed. Here we choose "Manual" to demonstrate the operation, as shown in the figure below.

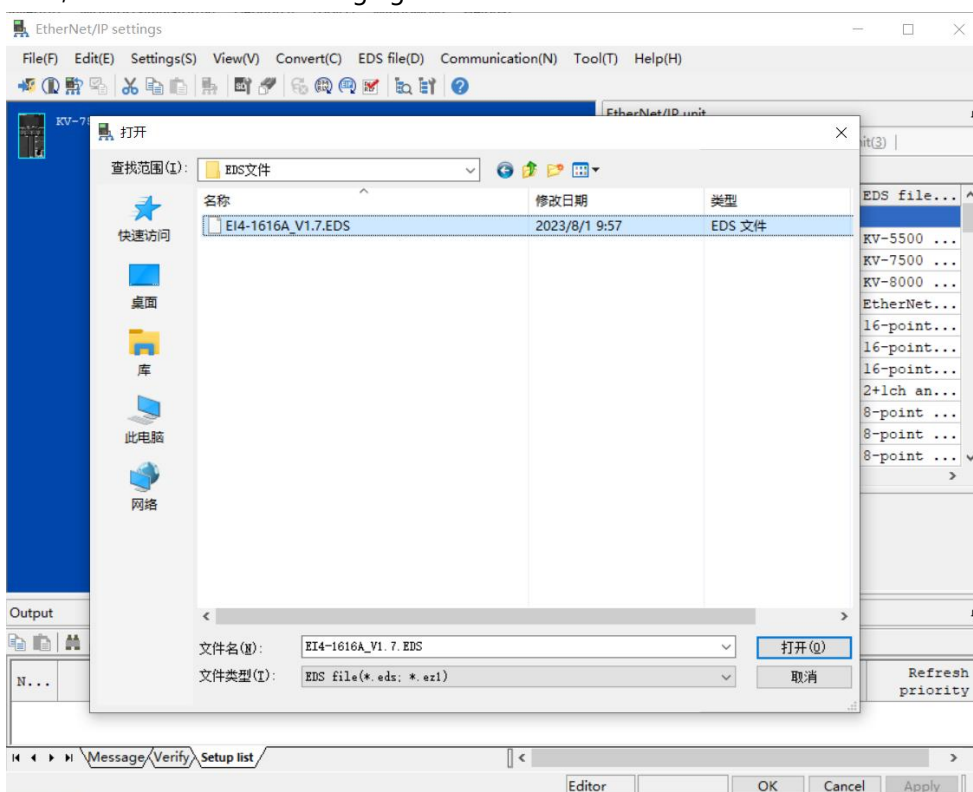


4. Installation of EDS files

- Double click "EtherNet/IP" in the left navigation tree to enter the "EtherNet/IP Settings" screen.
- Click "EDS File" in the menu bar of the "EtherNet/IP Settings" screen, and then click "Login" as shown in the following figure.



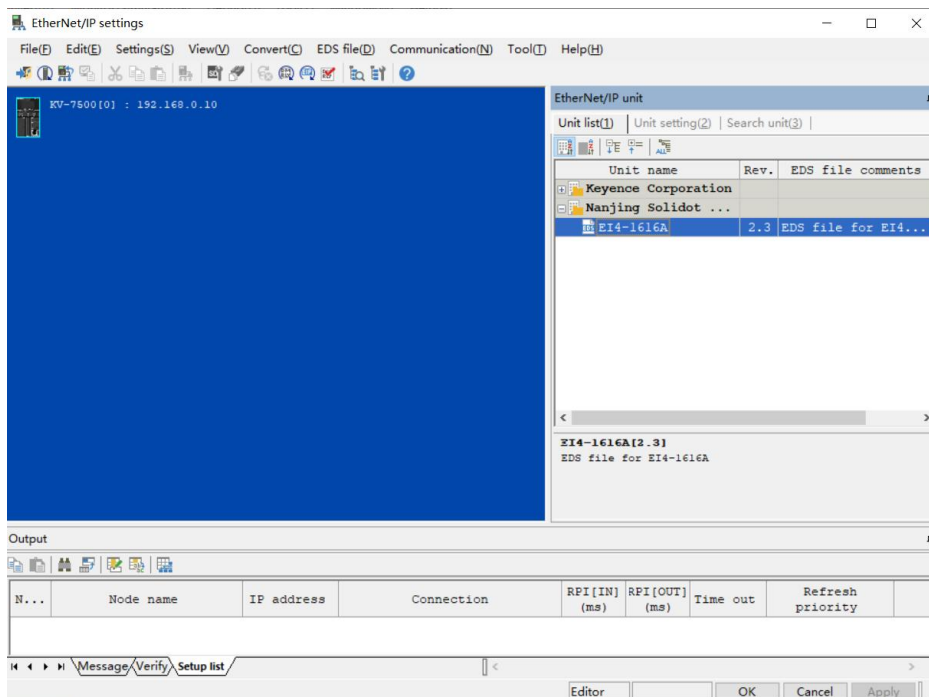
- In the folder where the EDS file is placed, select the EDS file of the corresponding model and click "OK", as shown in the following figure.



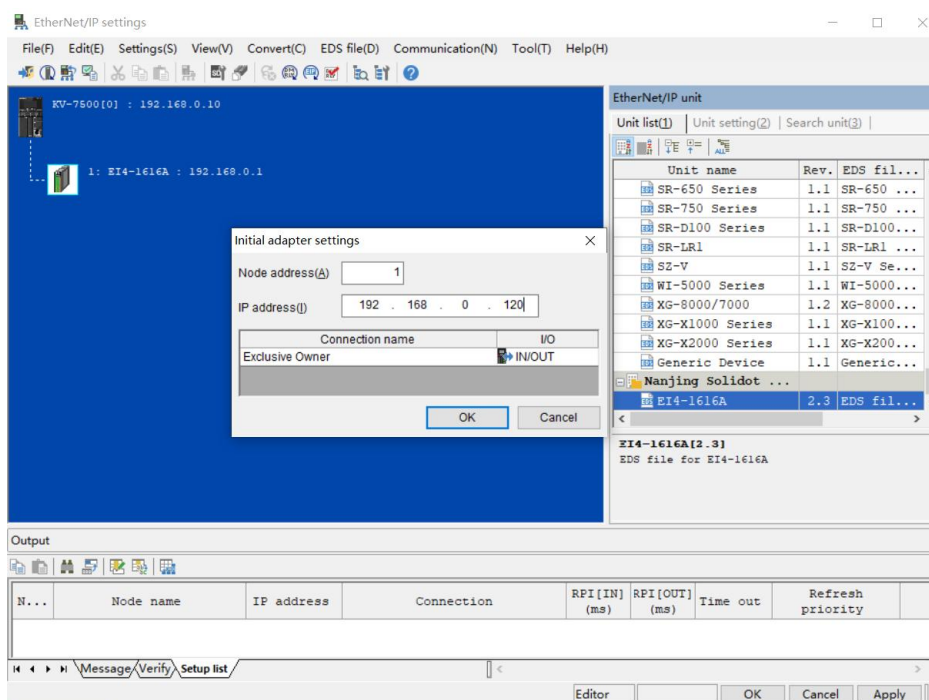
5. topological configuration

Topology configuration can be "manually added" and "automatic configuration" in two ways, this configuration using manual configuration, double-click or drag and drop the product model to the project area.

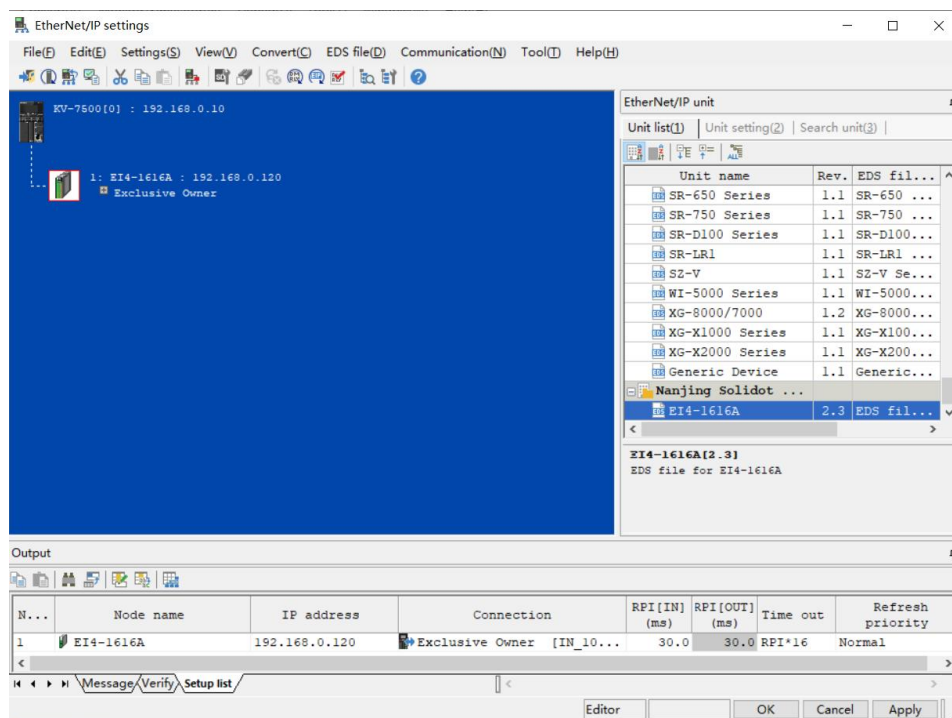
- a. Double-click the "EI4-1616A" device in the device list of "EtherNet/IP" device column to add it to the configuration, as shown in the following figure.



- b. Set the IP address of the module as shown below.



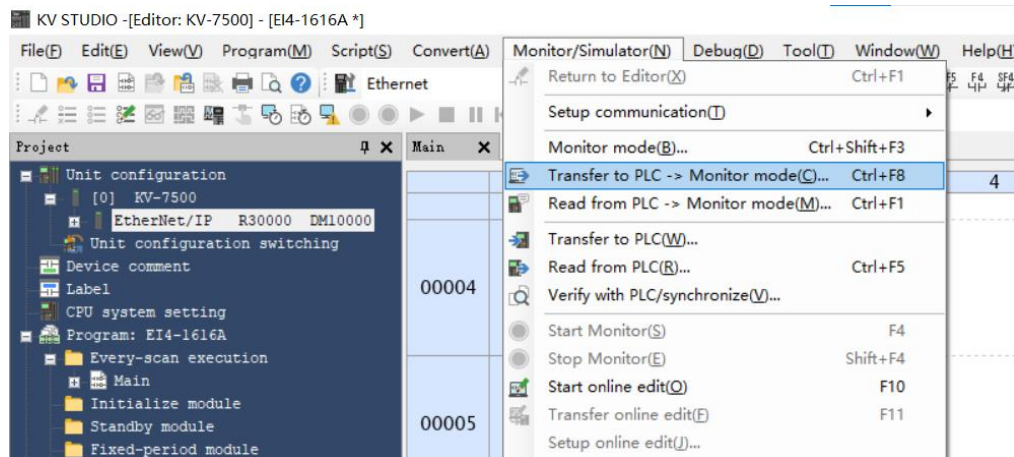
- c. Finish adding the device, as shown in the following figure.



6. Configuration Download

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

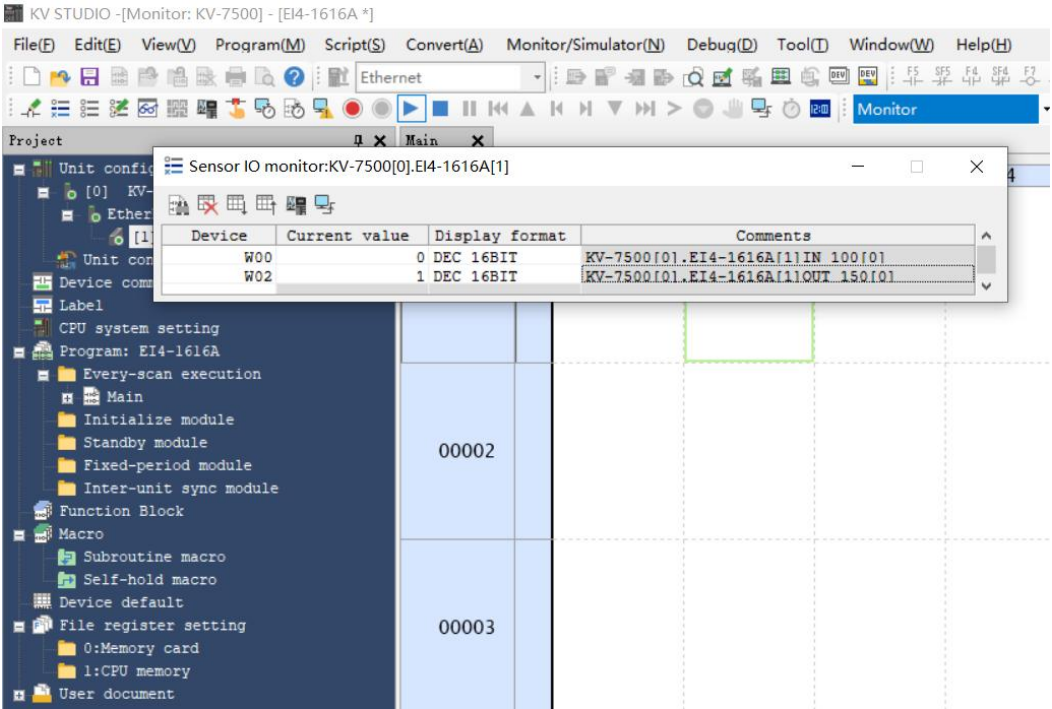
- a. Click "Monitor/Simulator (N) -> PLC Transfer -> Monitor Mode (C)" in the menu, as shown below.



- b. The transfer program window pops up, click "Execute" to download to the PLC.

7、data monitoring

- a. In monitoring mode, double click "EI4-1616A" icon to open the monitoring table, you can monitor the corresponding module, as shown in the following figure.



8 FAQ

8.1 Unable to scan to module

1. Check network line connections

Use windows command to ping the IP address of the module, such as ping through, then check the status of the indicator, such as ping can not be, then check the network line connection, such as the network line connection is not abnormal, then the device scanning request acceptance time is set to 60s to scan the module again, such as can be scanned to an unknown device, then the reason is not the module IP has not been assigned, re-assign the IP can be. If you still can not scan to the corresponding module, check the status of the indicator.

2. Checking Indicator Status

If the RUN light blinks, the IP address exists, but the controller and the module may not be in the same network segment, restore the module to factory settings and then reset the IP address. If the RUN light is off and the ERR light blinks, the module detects that a duplicate IP address may exist in the network. Troubleshoot the device with duplicate IP address and deal with it.

8.2 IP address assignment anomaly

1. Unable to scan to device under factory setup parameters

Modify the request receiving time during module search to 60s.

2. Timeout for IP address assignment using BOOTP

Click Advanced Settings in IP Address Settings and set the timeout time to 60 s. If this phenomenon occurs when the timeout time has already been set to 60 s, check whether the controller address is in the same network segment as the IP address assigned to the module.

3. Loss of assigned IP address after power failure

This is caused by not setting the module to boot with a fixed IP after using BOOTP to assign an IP address.

4. IP change using dip switches, no change in IP address

The IP address setting is out of the specified range or the IP address setting is 0. Verify that the dipswitch settings are as expected.