

Modbus TCP

RC Series Slice I/O

User Manual

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1 Product Overview

1.1 Product Introduction

RC series plug-in I/O modules adopt a structure that combines a coupler and an I/O module. RC-MT2200 is a module kit of RC series plug-in power modules and Modbus TCP couplers. The coupler connects the expandable I/O modules to the fieldbus control system. The I/O module communication backplane uses the X-bus bus, which has high real-time performance and a rich variety of modules. The Modbus TCP coupler supports configuring module parameters on the Web page and dynamically displays the status of the I/O module, providing users with high-speed data acquisition, optimized system configuration, simplified field wiring, and improved system reliability.

1.2 Product Features

- **Occupies fewer nodes**
A node consists of a bus coupler, 1 to 32 X-bus series I/O modules and an end cover.
- **Rich functional expansion**
It supports flexible expansion and has a full range of I/O types; it can integrate digital, analog, temperature, pulse and other modules to meet the needs of different application scenarios.
- **Flexible configuration**
Various types of plug-in I/O modules can be combined arbitrarily.
- **Strong compatibility**
The coupler communication interface complies with communication standards and supports mainstream Modbus TCP master stations.
- **Support abnormal alarm of slave station access**
It has the function of abnormal access alarm for slave module. When abnormal access occurs, the output is maintained and the input can be configured to be cleared or maintained.
- **Small size**
Compact structure and small space occupation.
- **Easy diagnosis**

The innovative channel indicator light design is close to the channel, so the channel status is clear at a glance and detection and maintenance are convenient.

- **Fast speed**

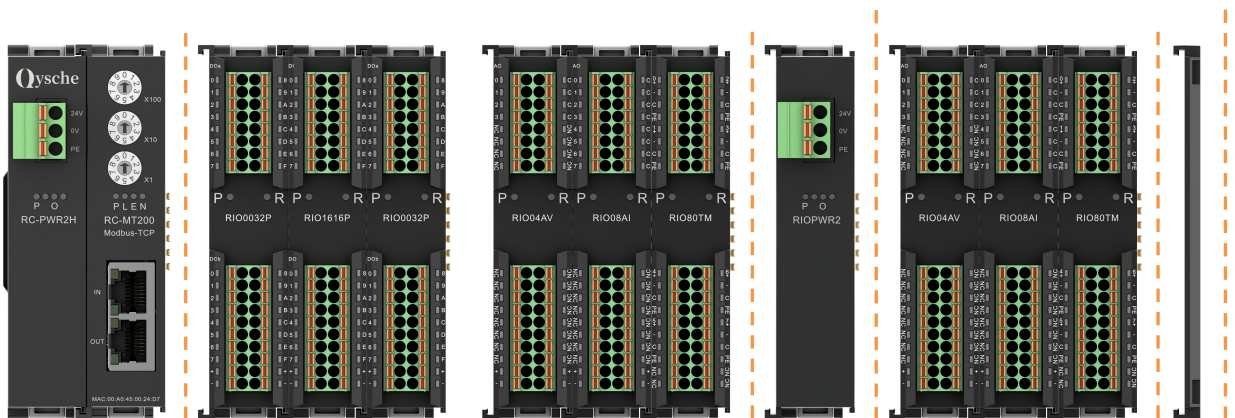
The backplane uses X-bus: the maximum scanning cycle is 1 ms.

- **Easy to install**

DIN 35 mm standard rail installation.

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

1.3 Application Configuration



Coupler modules

Application:

The application method combination of power

quantities, analog quantities, relays, temperature and other modules.

Application configuration:

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

Configuration rules:

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

I/O Modules Functional modules

adopts a modules, couplers, digital

Extensions Power Module

I/O Modules Functional modules

End caps

2 Model List

2.1 List of commonly used modules

model	Product Description	
RC-MT2200	Modbus TCP Coupler kit (power supply RC-PWR2H, coupler RC-MT200)	
RIOPWR2	Extension power module	
RIO3200P	32-channel digital input module, PNP type	
RIO0032P	32-channel digital output module, PNP type	
RIO1600P	16-channel digital input module, PNP type	
RIO0016P	16-channel digital output module, PNP type	
RIO0800P	8-channel digital input module, PNP type	
RIO0008P	8-channel digital output module, PNP type	
RIO1616P	16-channel digital input and output module, PNP type	
RIO80AV	8-channel analog voltage input module	Optional range: 0~+10 V, -10~+10 V
RIO40AV	4-channel analog voltage input module	
RIO04AV	4-channel analog voltage output module	
RIO40AI	4-channel analog current input module	Optional range: 0~20mA, 4~20mA
RIO08AI	8-channel analog current output module	
RIO04AI	4-channel analog current output module	
RIO0012J	12-channel relay output module	
RIO40TM	4-channel thermal resistor and thermocouple temperature acquisition module	
RIO80TM	8-channel thermal resistor and thermocouple temperature acquisition module	
RIOP20A	Pulse counting module	

3 Product Parameters

3.1 General parameters

General technical parameters		
Specifications and dimensions	Power Module	106 × 61 × 22.5 mm
	Coupler modules	106 × 61 × 22.5 mm
	I/O Modules	106 × 73 × 25.7 mm
weight	Power Module	110 g
	Coupler modules	80 g
	I/O Modules	90 g
Operating temperature	-10°C~+60°C	
Storage temperature	-20°C~+75°C	
Relative humidity	95%, non-condensing	
Protection level	IP20	

3.2 Power parameters

Power parameters		
Power Module	Working power supply	24 VDC (18V~30V)
	Output voltage	5 VDC
	Output Current	2 A
Coupler modules	Working power supply	5 VDC
	Working current	400 mA
I/O Modules	Working power supply	5 VDC

3.3 Interface parameters

Modbus TCP Interface Parameters	
Bus protocol	Modbus TCP
Data transmission medium	Ethernet CAT5 Cable
Transfer rate	100 Mbps
Transmission distance	≤100 m (station to station distance)
Bus interface	2 × RJ45
Number of client connections	8

3.4 Digital parameters

Digital input	
Rated voltage	24 VDC (18V~30V)
Signal Points	8, 16, 32
Signal Type	PNP
"0" signal voltage (PNP)	-3~+3 V
"1" signal voltage (PNP)	15~30 V
Input filtering	3 ms
Input Current	4 mA
Isolation method	Optocoupler Isolation
Isolation withstand voltage	500 VAC
Channel indicator light	Green LED light
Digital output	
Rated voltage	24 VDC (18V~30V)
Signal Points	8, 16, 32
Signal Type	PNP
Load Type	Resistive load, inductive load
Single channel rated current	PNP type Max: 500 mA
Port protection	Overvoltage and overcurrent protection
Isolation method	Optocoupler Isolation
Isolation withstand voltage	500 VAC
Channel indicator light	Green LED light

Relay output	
Rated voltage	24 VDC (18V~30V)
Signal Points	12
Isolation method	Optocoupler, relay
Rated load	2 A
Channel indicator light	Green LED light

3.5 Analog parameters

3.5.1 Technical Parameters

Analog input			
Enter points	4, 8		
Input signal (voltage type)	0~+10 V, -10 V~+10 V (range adjustable)		
Input signal (current type)	0~20 mA, 4~20 mA (adjustable range)		
Resolution	16 bit		
Sampling rate	RIO40AV, RIO80AV, RIO40AI	≤1 ksps	
Accuracy	RIO40AV, RIO80AV, RIO40AI	±0.1%	
Input impedance (voltage type)	≥2 kΩ		
Input impedance (current type)	100 Ω		
Isolation withstand voltage	500 VAC		
Channel indicator light	Green LED light		
Temperature input			
Number of channels	4, 8		
Sensor Type	Thermocouple	Thermal resistor	resistance
Connection	2-wire	2-wire, 3-wire	2-wire
	K: -200~1370°C J: -200~1200°C E: -200~1000°C S: -50~1690°C B: 50~1800°C	Pt100: -200~850°C Pt200: -200~600°C Pt500: -200~600°C Pt1000: -200~600°C	15Ω~3kΩ
Accuracy	±0.3%	±1°C	±0.1%
Sensitivity	0.1°C		±0.1Ω
Resolution	16 bits (int type)		
Channel indicator light	Green LED light		

Analog output			
Output points	4, 8		
Output signal (voltage type)	0~+10 V, -10 V~+10 V (range adjustable)		
Output signal (current type)	0~20 mA, 4~20 mA (adjustable range)		
Resolution	16 bit		
Accuracy	RIO04AV, RIO04AI, RIO08AI	±0.1%	
Load impedance (voltage	≥2 kΩ		

type)	
Load impedance (current type)	$\leq 500 \Omega$
Isolation withstand voltage	500 VAC
Channel indicator light	Green LED light

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

3.5.2 Voltage input/output range selection and code value table

Voltage input/output range selection and code value range				
Range selection	0	1	2	3
Range	-10V~+10V	0~+10 V	-10V~+10V	0~+10 V
Code value range	-32768~32767	0~32767	-27648~27648	0~27648
Voltage input Calculation formula	$D=(65535/20)*U$	$D=(32767/10)*U$	$D=(55296/20)*U$	$D=(27648/10)*U$
Voltage output Calculation formula	$U=(D*20)/65535$	$U=(D*10)/32767$	$U=(D*20)/55296$	$U=(D*10)/27648$
Code value Correspondence table	See also Table 3- 1 Voltage code value table.			

Note: D represents the code value, and U represents the voltage.

sheet3- 1Voltage code value table

Range Voltage	0 (default)	1	2	3
	-10V~+10V	0~+10 V	-10V~+10V	0~+10 V
	Code value	Code value	Code value	Code value
-10	-32768	-	-27648	-
-9	-29491	-	-24883	-
-8	-26214	-	-22118	-
-7	-22937	-	-19354	-
-6	-19661	-	-16589	-
-5	-16384	-	-13824	-
-4	-13107	-	-11059	-
-3	-9830	-	-8294	-
-2	-6554	-	-5530	-
-1	-3277	-	-2765	-
0	0	0	0	0
1	3277	3277	2765	2765
2	6554	6553	5530	5530
3	9830	9830	8294	8294
4	13107	13107	11059	11059
5	16384	16384	13824	13824
6	19661	19660	16589	16589
7	22937	22937	19354	19354
8	26214	26214	22118	22118
9	29491	29490	24883	24883
10	32767	32767	27648	27648
	Code value = (65535/20) * voltage	Code value = (32767/10) * voltage	Code value = (55296/20) * voltage	Code value = (27648/10) * voltage
	Voltage = (code value * 20) / 65535	Voltage = (code value * 10) / 32767	Voltage = (code value * 20) / 55296	Voltage = (code value * 10) / 27648

Note: For analog voltage input modules, when the channel input voltage exceeds 10V, the maximum code value is displayed. For analog voltage output modules, when the code value setting exceeds the maximum code value corresponding to the range in the table, the channel outputs 10V voltage.

3.5.3 Current input/output range selection and code value table

Analog current input and output range selection and code value range				
Range selection	0	1	2	3
Range	4~20 mA	0~20 mA	4~20 mA	0~20 mA
Code value range	0~65535		0~27648	
Current input calculation formula	$D=(65535/16)*I-16384$	$D=(65535/20)*I$	$D=(27648/16)*I-6912$	$D=(27648/20)*I$
Current output calculation formula	$I=(D+16384)*16/65535$	$I=(D*20)/65535$	$I=((D+6912)*16)/27648$	$I=(D*20)/27648$
Code value Correspondence table	See also Table 3- 2 Current code value table.			

Note: D represents the code value, and I represents the current.

sheet3- 2Current code value table

Range selection Range Current	0 (default)	1	2	3
	4~20mA	0~20mA	4~20mA	0~20mA
	Code value	Code value	Code value	Code value
0	-	0	-	0
1	-	3277	-	1382
2	-	6554	-	2765
3	-	9830	-	4147
4	0	13107	0	5530
5	4096	16384	1728	6912
6	8192	19661	3456	8294
7	12288	22937	5184	9677
8	16384	26214	6912	11059
9	20479	29491	8640	12442
10	24575	32768	10368	13824
11	28671	36044	12096	15206
12	32767	39321	13824	16589
13	36863	42598	15552	17971
14	40959	45875	17280	19354
15	45055	49151	19008	20736
16	49151	52428	20736	22118
17	53247	55705	22464	23501
18	57343	58982	24192	24883
19	61439	62258	25920	26266
20	65535	65535	27648	27648
twenty one	65535	65535	29376	29030
twenty two			31104	30413

22.81			32511	31538
22.96			32767	31743
twenty three				31795
23.52				32511
23.70				32767
twenty four				
25				
	Code value = (65535/16) * current - 16384	Code value = (65535/20) * current	Code value = (27648/16) * current - 6912	Code value = (27648/20) * current

Note: When the input current of range 2 is greater than 22.81 mA, the code value is displayed as 32767; when the specified code value is greater than 32511, the output current is 22.81 mA.

When the input current of range 3 is greater than 23.52 mA, the code value displayed is 32767; when the specified code value is greater than 32511, the output current is 23.52 mA.

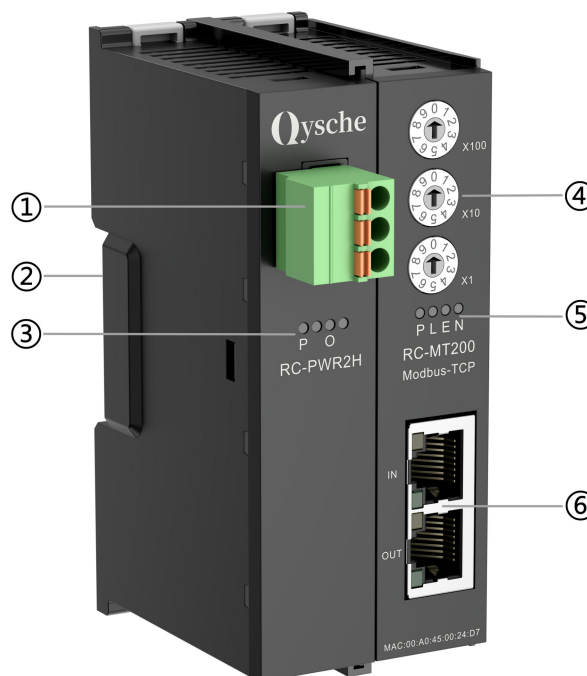
4 panel

4.1 Coupler Panel

4.1.1 Coupler structure

Product parts names and function

descriptions



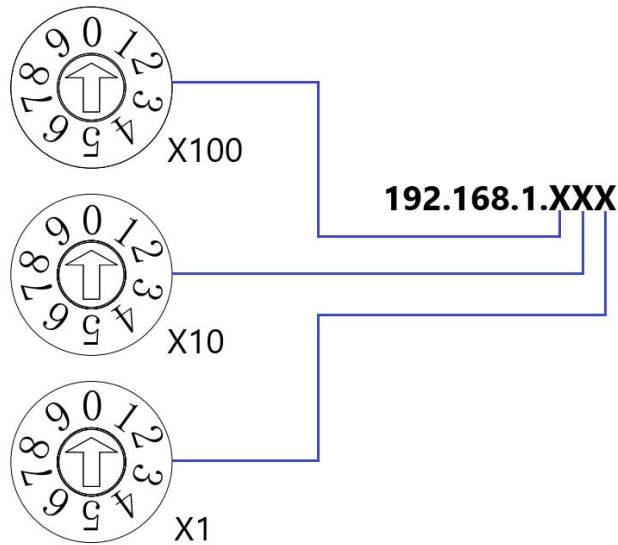
serial number	name	illustrate
①	Power Terminal Blocks	Spring-loaded terminal blocks
②	Guide rail slot	Suitable for DIN 35 mm rail fixing
③	Power label, indicator	Indicates power status

	light	
④	Rotary switches and markings	Set IP address, reset settings
⑤	System identification and indicator lights	Indicates power supply and module operation status
⑥	Bus interface	2 × RJ45

4.1.2 Rotary Switch

IP address setting

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



Setting value (decimal)	IP address setting method
000	The rotary switch is set to "000" at the factory, and the default IP address is 192.168.1.120. If it has been modified using the Web, the last setting value will be used when starting.
001 ~ 254	set upThe lower 1 byte of the IP address. Use "×100" for the hundreds digit, "×10" for the tens digit, and "×1" for theFor the individual digits,Set it within the range of 1 to 254. The high 3 bytes of the IP address continue from the previousWebSet value. workfactoryFactory statusDownBy rotatingTurn the switchWhen the IP address is set to a value other than 000, the upper 3 bytes are 192.168.1.
255 ~	When the rotary switch is set to 255 or above,After the module is powered on, it takes the default value or the last stored value.

Precautions

1. Tool selection
Screwdriver specifications: 3 mm opening.
2. The rotary switch IP must be set when the power is off.

3. If you need to modify the IP address after the new address is set, it will take effect only after the power is turned on again.

Reset function

1. Turn the rotary switch to 999 and power on the module.
2. After the module is powered on, turn the rotary switch back to 000 without cutting off the power.
3. After the rotary switch is turned back to 000, the module automatically restores the factory settings and the network parameters return to the default values.

4.1.3 Indicator light function

Power module identification and indicator light description			
Logo	color	state	Status description
P	green	Always on	Working power is normal
		Flash	Overload 80%, cut off the power supply to the subsequent load
		Off	The product is not powered or the power supply is abnormal
O	red	Off	Not overloaded
		Always on	Load reaches 90%
		Flash	Overload 80%, cut off the power supply to the subsequent load

Network port status indicator			
Logo	color	state	Status description
IN	green	Always on	Establishing a network connection
		Off	No network connection established or abnormal
	orange color	Flash	The connection is established and data is exchanged
		Off	No data interaction or exception
OUT	green	Always on	Establishing a network connection
		Off	No network connection established or abnormal
	orange color	Flash	The connection is established and data is exchanged
		Off	No data interaction or exception

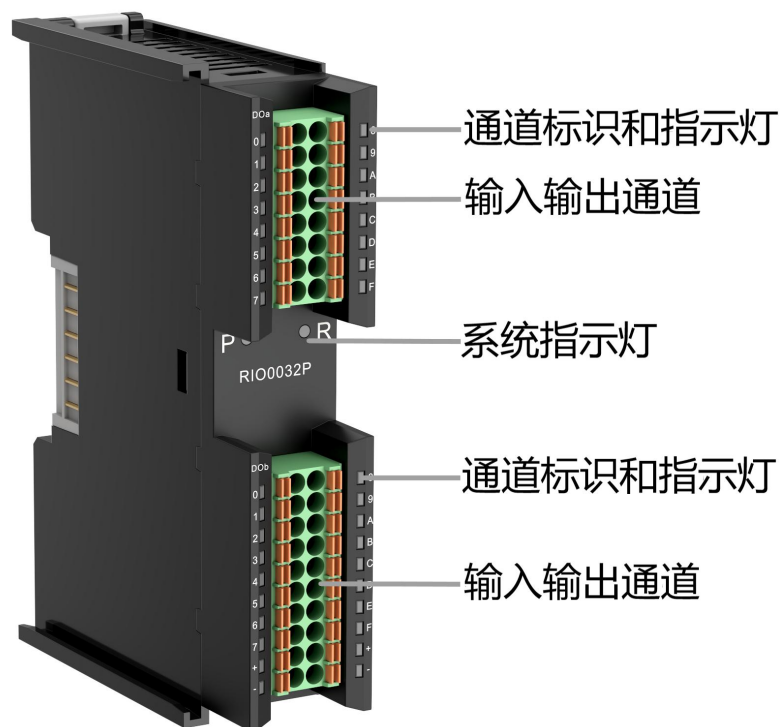
Coupler module identification and indicator lights				
name	Logo	color	state	Status description
Power indicator	P (PWR)	green	Always on	Power supply is normal
			Off	The product is not powered on or the power supply is abnormal
System	L (LINK)	green	Always on	I/O modules are connected and X-bus system is

indicator				interacting normally
			Flashing 1Hz	I/O modules are connected and the X-bus system is ready to interact
			Flashing 5Hz	I/O module is not connected, X-bus system configuration is abnormal
			Off	I/O module is not connected or abnormal
Warning indicator	E (ERR)	red	Flashing 1Hz	Modbus TCP communication connection not established
			Off	The equipment is operating normally
Network status indicator	N (NS)	green	Always on	The device has established a Modbus TCP connection and is exchanging data.
			Off	Disconnection or power failure

4.2 I/O Module Panel

Module parts name and function

description



I/O module indicator light description

Logo	color	state	Status description
P	green	Always on	Power supply is normal
		Off	The product is not powered on or the power supply is abnormal
R	green	Always on	The system is running normally
		Flashing 1 Hz	I/O modules are connected and the X-bus system is ready to interact
		Off	The device is not powered on, the X-bus does not exchange data, or an exception occurs.
Input channel indication	green	Always on	The module detection channel has signal input
		Off	The module channel has no signal input or the signal input is abnormal
Output channel indication	green	Always on	The module channel has signal output
		Off	The module channel has no signal output or the signal output is abnormal

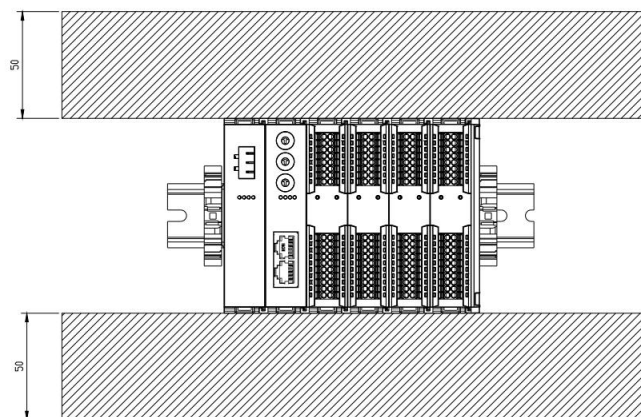
5 Installation and removal

5.1 Installation Guide

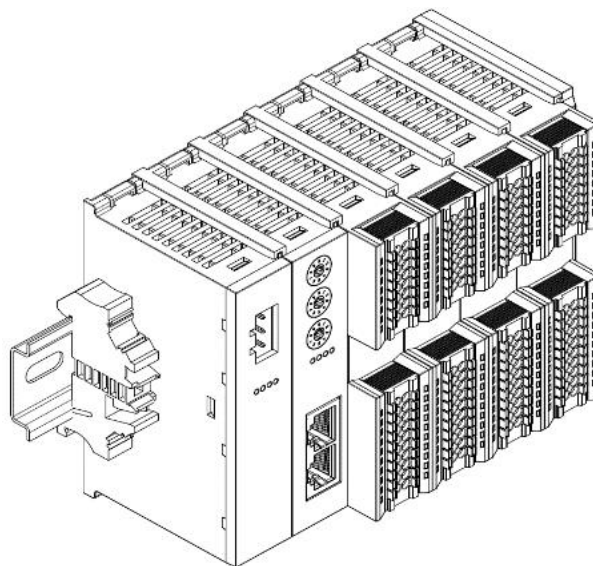
Installation\removal precautions

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

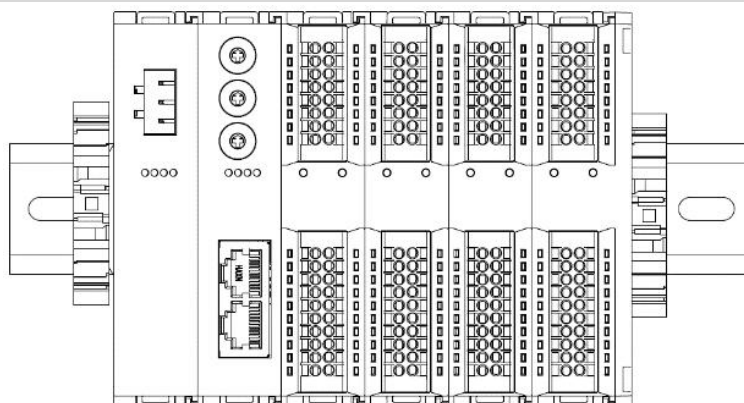
Minimum gap for module installation ($\geq 50\text{mm}$)



Ensure the module is installed vertically



Be sure to install the rail fixings



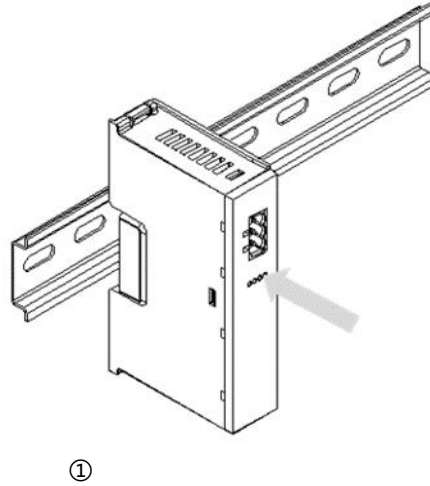
5.2 Installation and removal steps

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

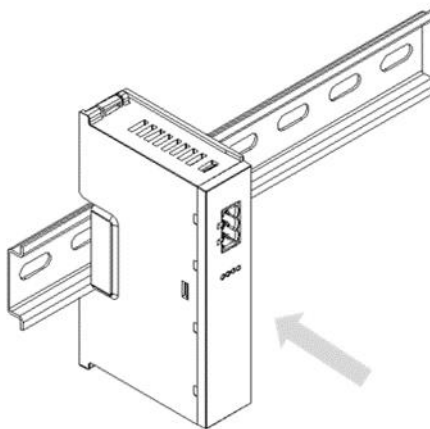
5.3 Installation Diagram

Power module installation

step



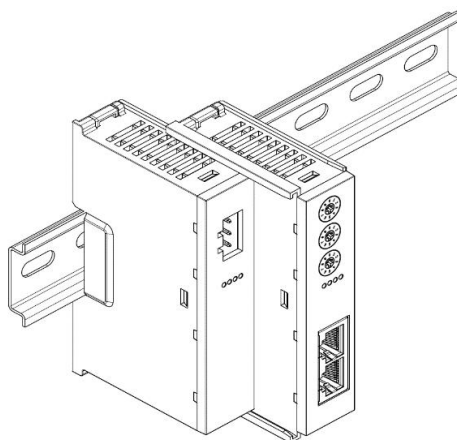
Insert the power module guide slot and align the guide rail vertically as shown in the left figure ①.



As shown in the left figure ②, press the power module hard until you hear a "click" sound, and the module is installed in place.

Coupler module installation

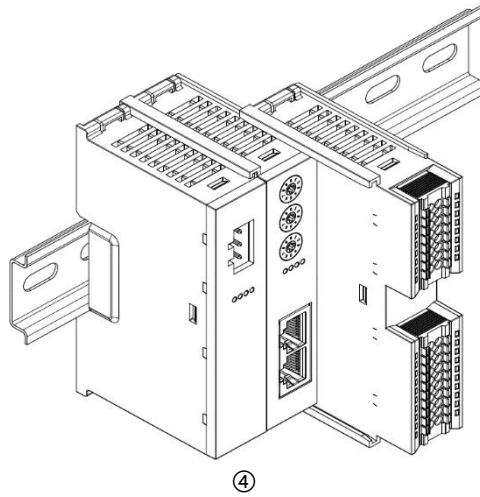
step



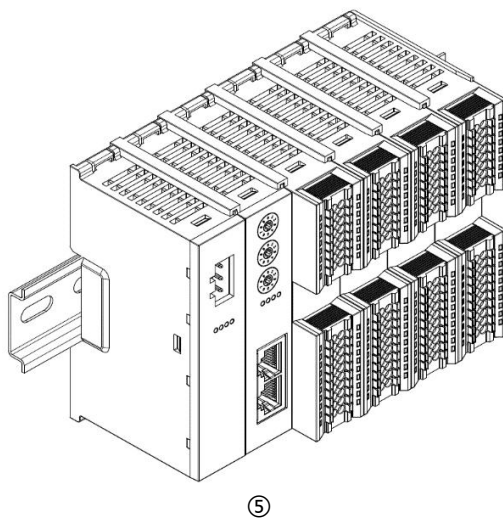
Align the left slot of the coupler module with the right side of the power module and push it in as shown in ③ in the left figure. Press the coupler module firmly until you hear a "click" and the module is installed in place.

I/O Module Installation

step

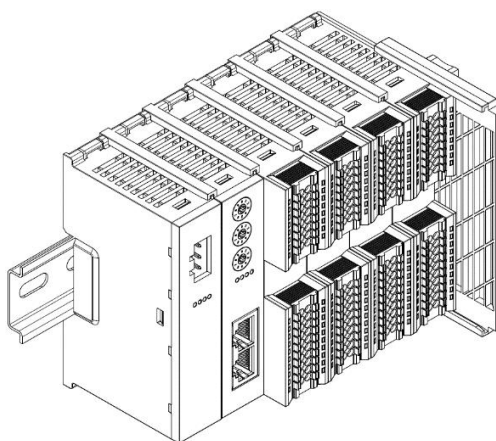


Follow the steps for installing the coupler module in the previous step and install the required I/O modules one by one, as shown in Figure ④ and Figure ⑤ on the left.



End cap installation

step

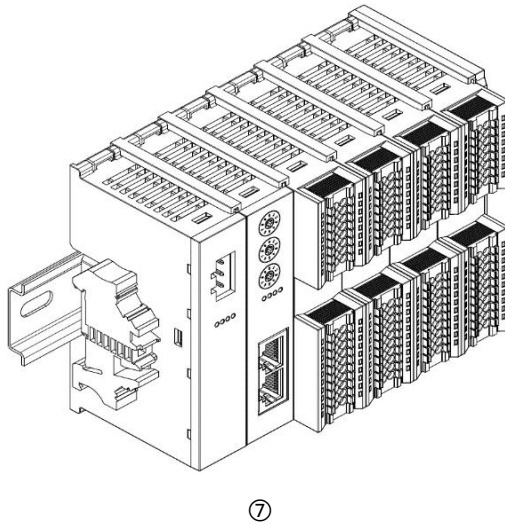


Install the end cover on the right side of the last module, as shown in the left figure ⑥. For installation methods, please refer to the installation method of the coupler module.

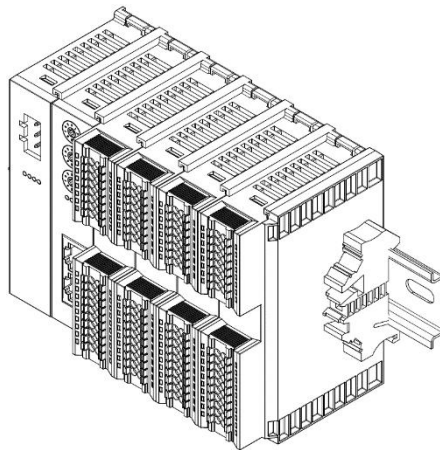
⑥

Rail fixing installation

step



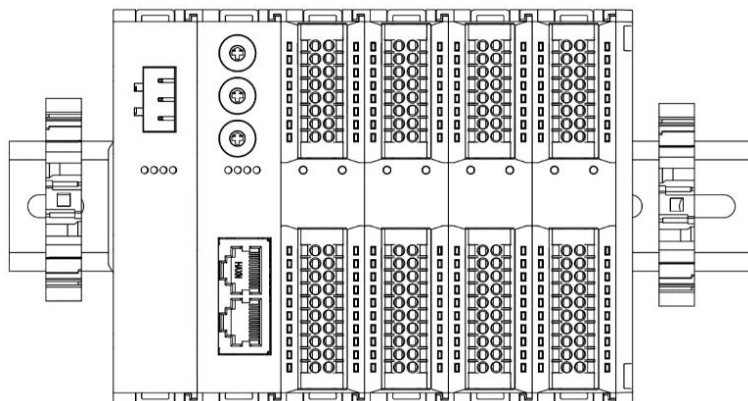
Install and lock the guide rail fixings close to the left side of the coupler, as shown in Figure ⑦ on the left.



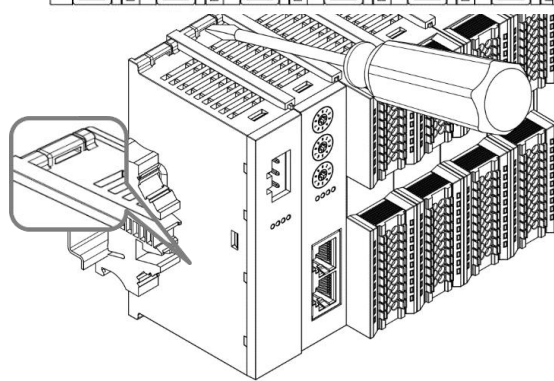
Install the guide rail fixture on the right side of the end cover. First push the guide rail fixture toward the coupler to ensure that the module is installed firmly, and then use a screwdriver to tighten the guide rail fixture, as shown in the left figure ⑧.

Disassembly

step

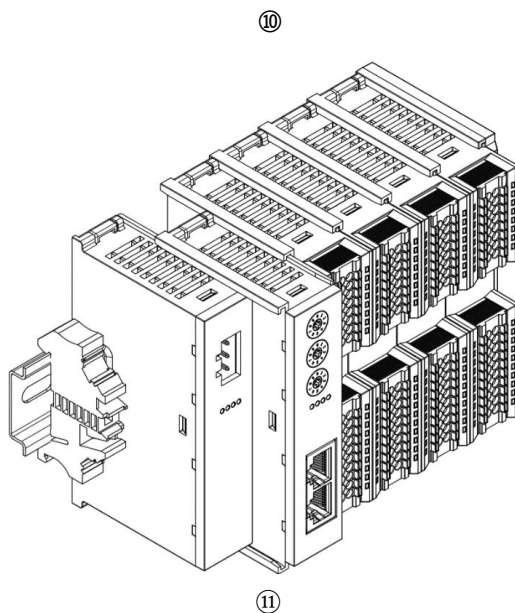


Use a screwdriver to loosen the guide rail fixing at one end of the module and move it to one side to ensure that there is a gap between the module and the guide rail fixing, as shown in Figure ⑨ on the left.



Insert a flat-head screwdriver into the buckle of the module to be removed, and apply force sideways in the direction of the module (you will hear a sound), as shown in the left figure ⑩.

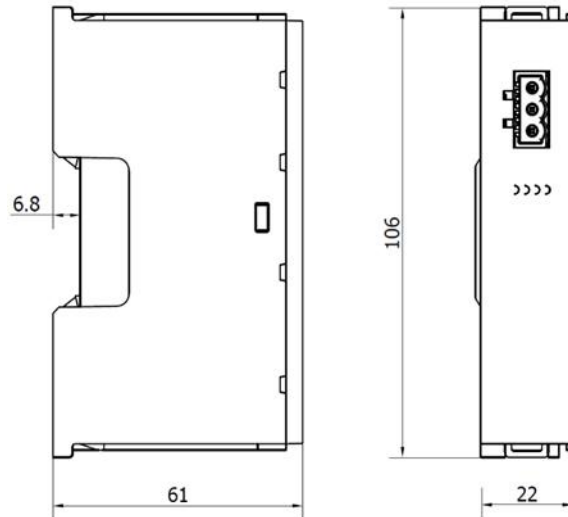
Note: Each module has a buckle on the top and bottom, and all modules are operated in the same way.



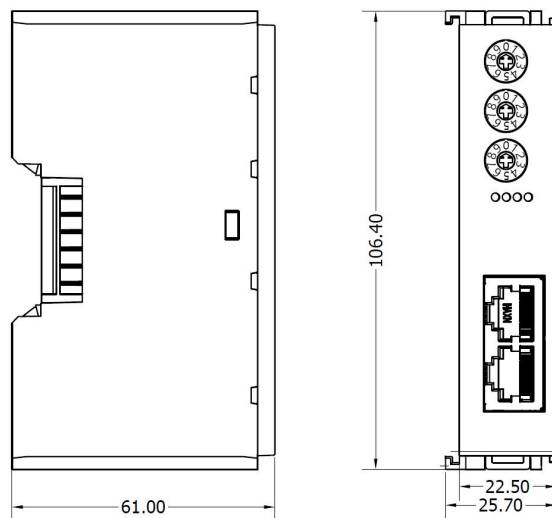
Follow the opposite operation of installing the module to remove the module, as shown in the left figure ⑪ shown.

5.4 Dimensions

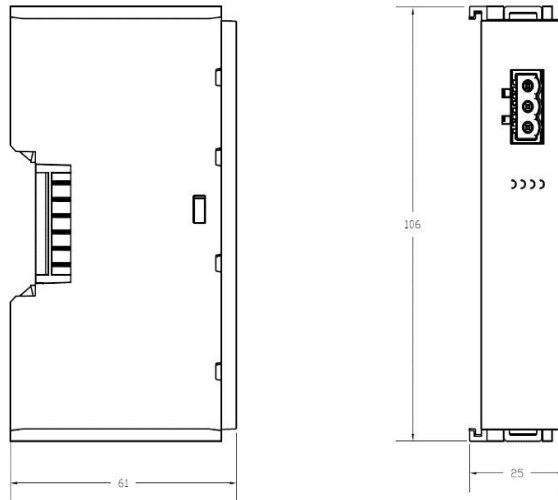
Power module dimensions (in mm)



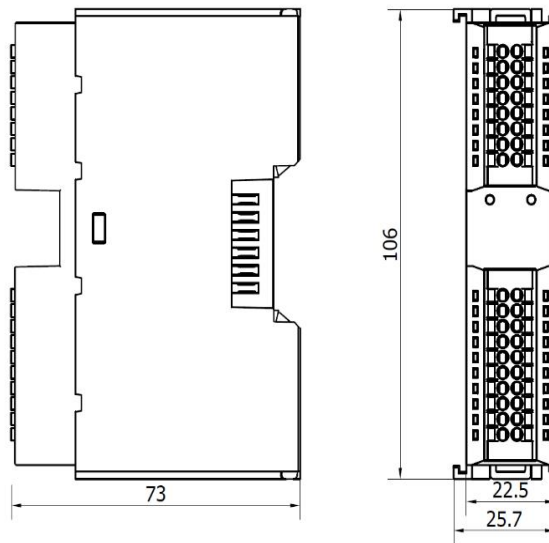
Coupler dimensions (mm)

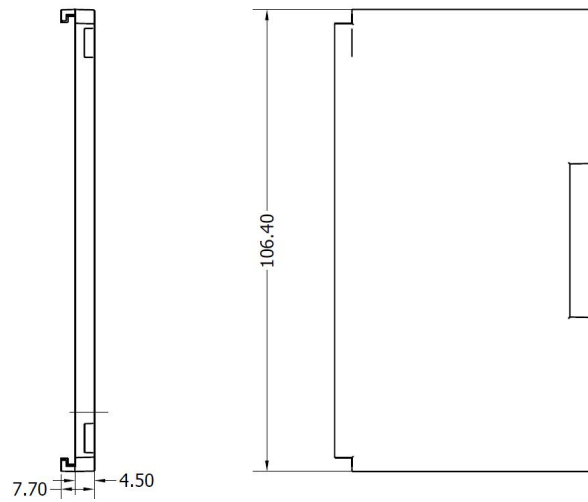


Extended power supply dimensions (in mm)



I/O module dimensions (in mm)



End cover dimensions (unit: mm)

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

6 wiring

6.1 Terminal Blocks

Terminal Blocks		
Signal line terminal	Number of poles	16 P
	Number of poles	20 P
	Wire diameter	twenty two~17 AWG 0.3~1.0 mm ²
Power Terminals	Number of poles	3P
	Wire diameter	twenty two~16 AWG 0.3~1.5 mm ²
Bus interface	2*RJ45	Category 5 or higher UTP or STP (STP is recommended)

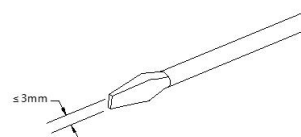
6.2 Wiring Instructions and Requirements

Power Wiring Precautions

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

Wiring tool requirements

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



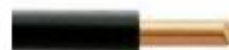
Stripping length requirements

The recommended cable stripping length is 10 mm.



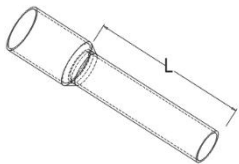
Wiring method

For single-strand rigid wire, after stripping the wire to the corresponding length, press the button and insert the single-strand wire at the same time.



For multi-strand flexible wires, after stripping the wires to the corresponding length, you can directly connect them or use the corresponding standard specifications of cold-pressed terminals (tubular insulated terminals, reference specifications are shown in the following table) to insert the wires while pressing the button.

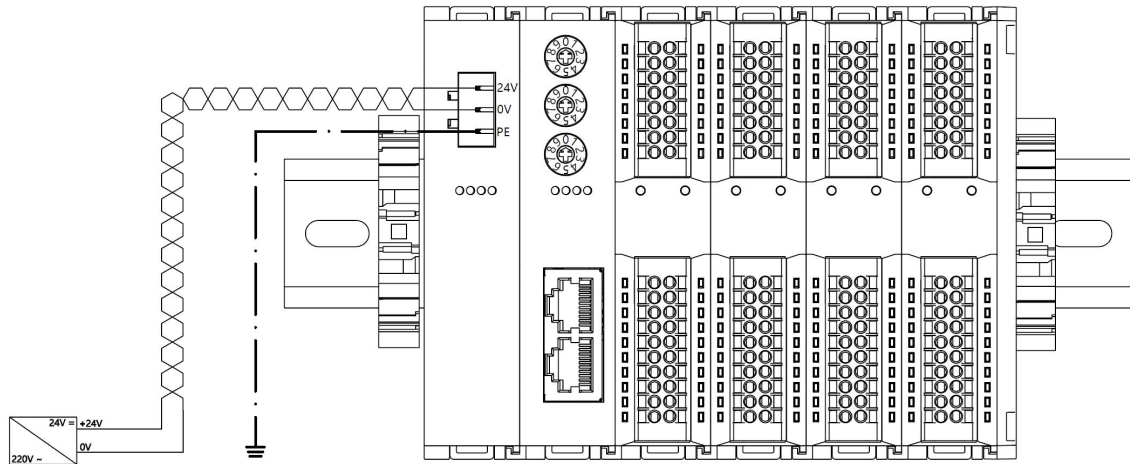


Specifications of tubular insulation terminals		
Specifications	model	Conductor cross-sectional area mm ²
 <p>Tube type insulated terminal L The length is 10mm</p>	E0310	0.3
	E0510	0.5
	E7510	0.75
	E1010	1.0
	E1510	1.5

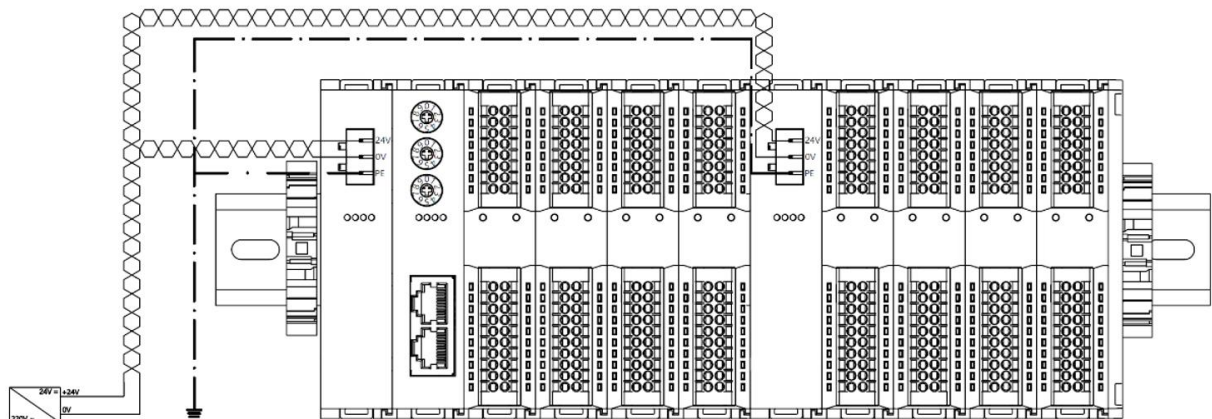
Power connection: Power module 3P terminal

Use a DC24V power module and refer to the wiring method. Connect the power supply according to the circuit shown in the figure below, and ground PE reliably (twisted pair cables are recommended for power cables).

- picture6- 1Coupler, I/O module, power supply wiring diagram



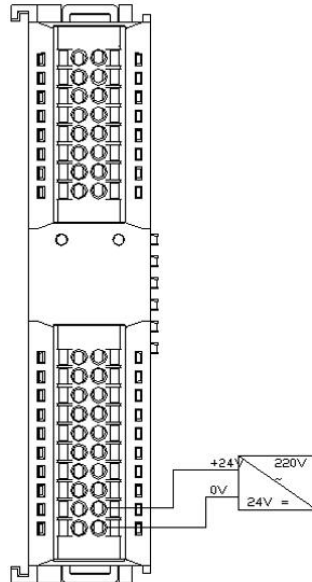
- picture6- 2Coupler, I/O module, power module, I/O module, power supply wiring diagram



Load power supply wiring: Field side 20P terminal

Press the signal cables into the terminal blocks according to the corresponding I/O module wiring diagram and wiring method.

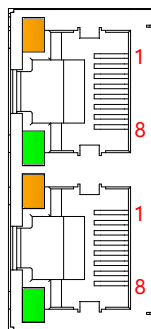
The load power supply uses a 24 VDC power supply. Refer to the wiring method and connect the power supply according to the circuit shown in the figure below (for details, refer to [6.3 I/O module wiring diagram](#)).



Signal terminal wiring: 16P\20P terminal

Press the signal cables into the terminal blocks according to the corresponding I/O module wiring diagram and wiring method.

Bus wiring: Industrial Ethernet bus communication interface

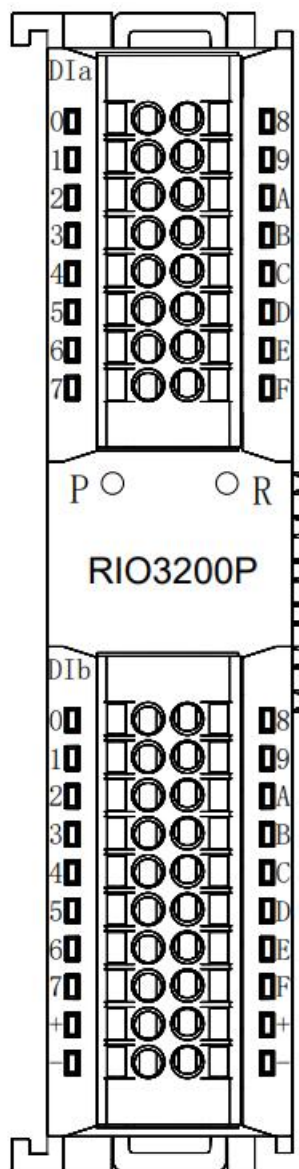
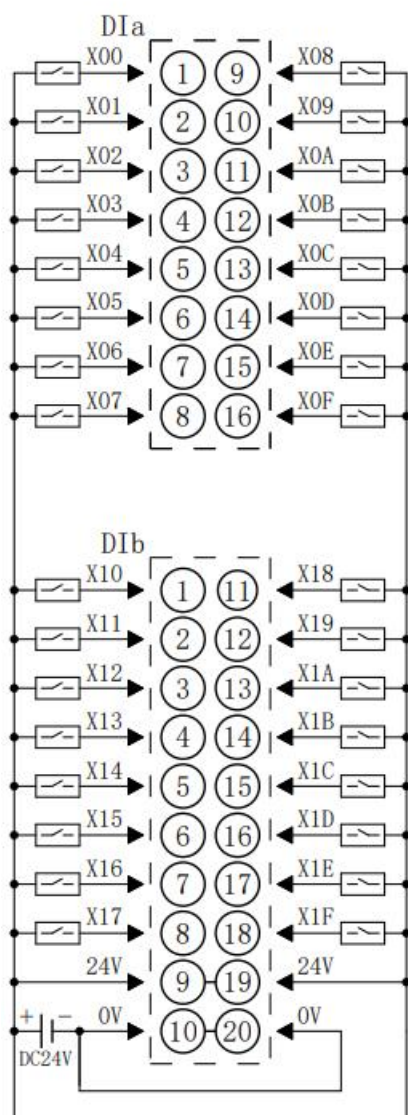


Pin Number	Signal
1	TD+
2	TD-
3	RD+
4	one
5	one
6	RD-
7	one
8	one

- It is recommended to use double-shielded (braided mesh + aluminum foil) STP cable of category 5 or higher as communication cable.
- Please strictly follow the signal direction of IN and OUT network ports when connecting network topology.

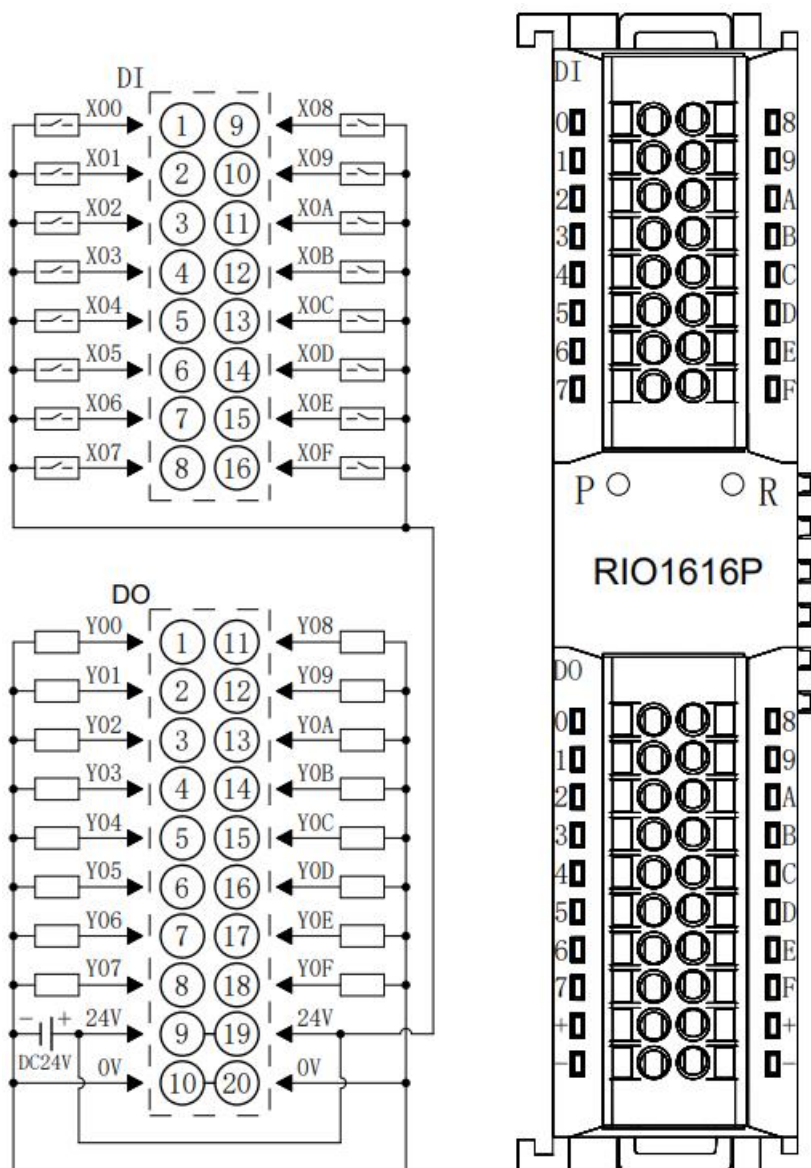
6.3 I/O module wiring diagram

6.3.1 RIO3200P



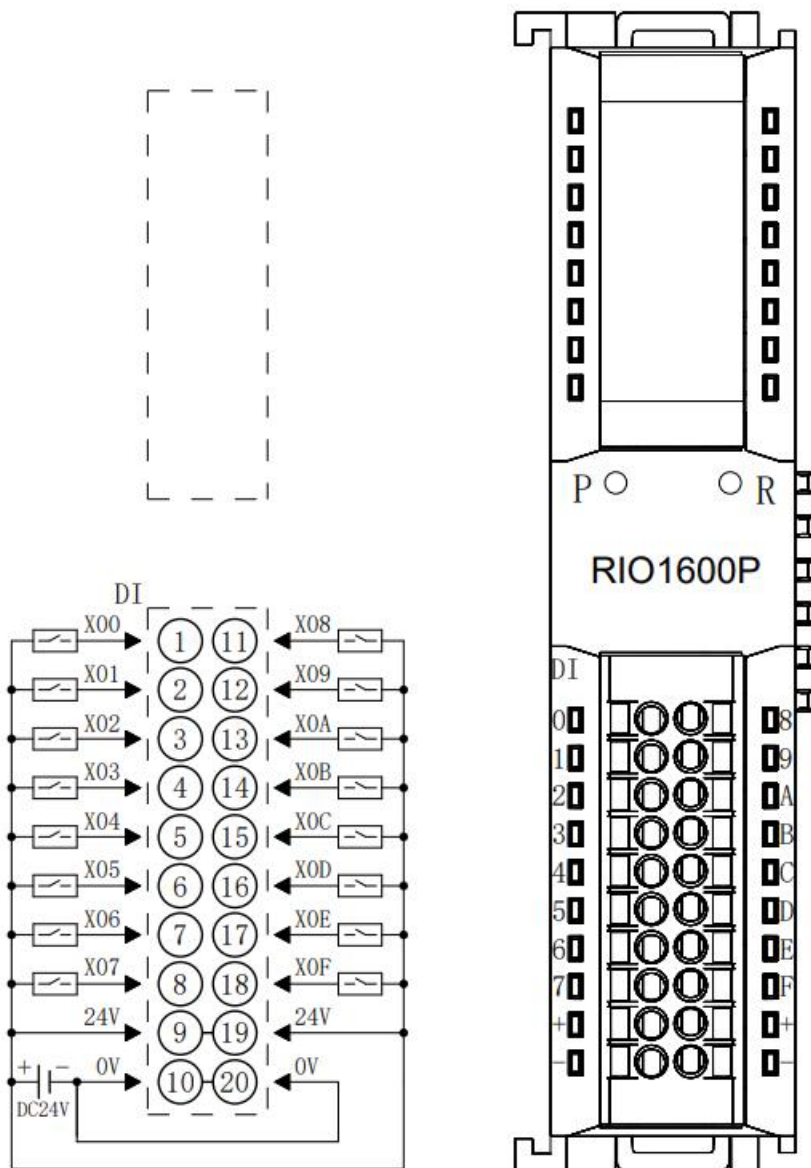
*24V内部导通;0V内部导通

6.3.2 RIO1616P



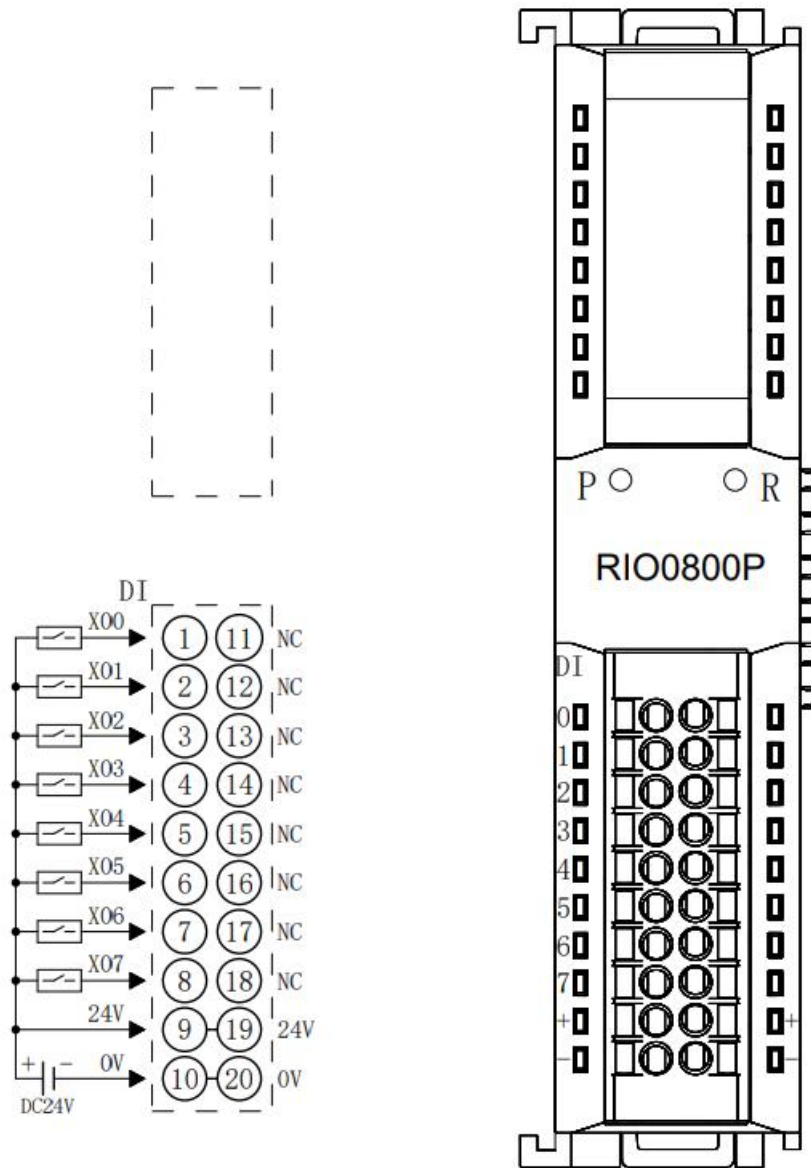
*24V内部导通;0V内部导通

6.3.3 RIO1600P



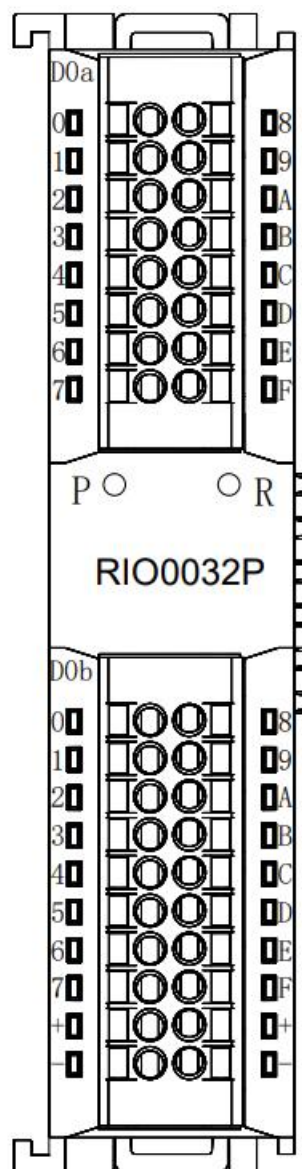
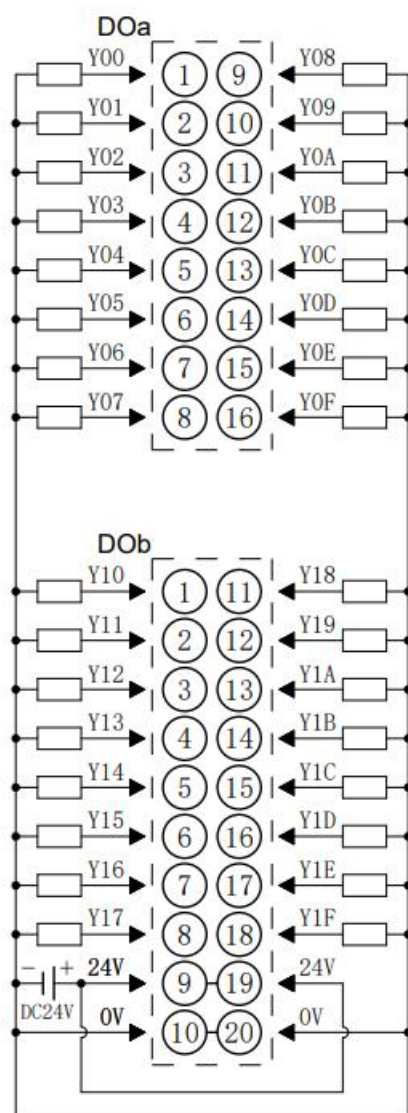
*24V内部导通;0V内部导通

6.3.4 RIO0800P



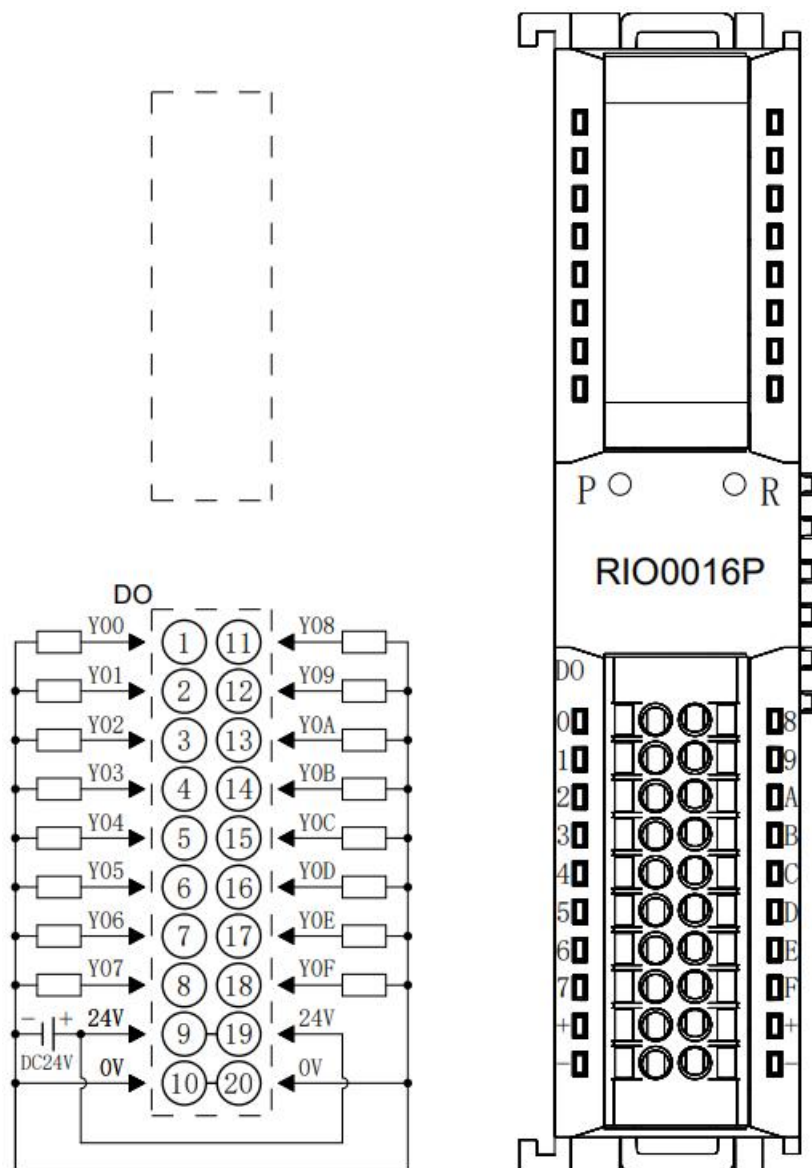
*24V内部导通;0V内部导通

6.3.5 RIO0032P



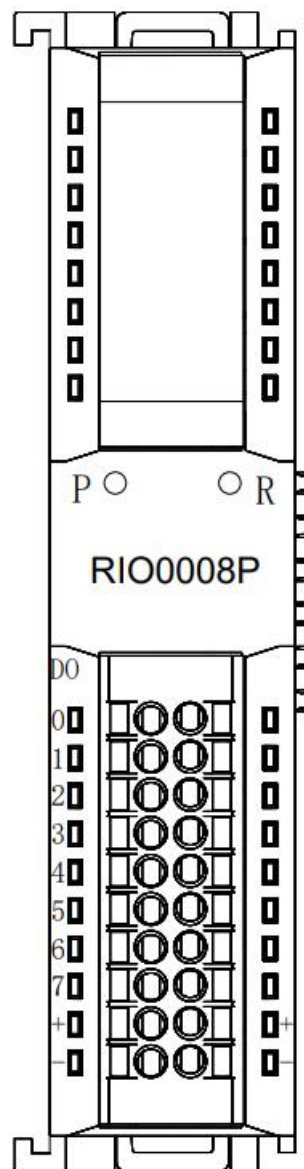
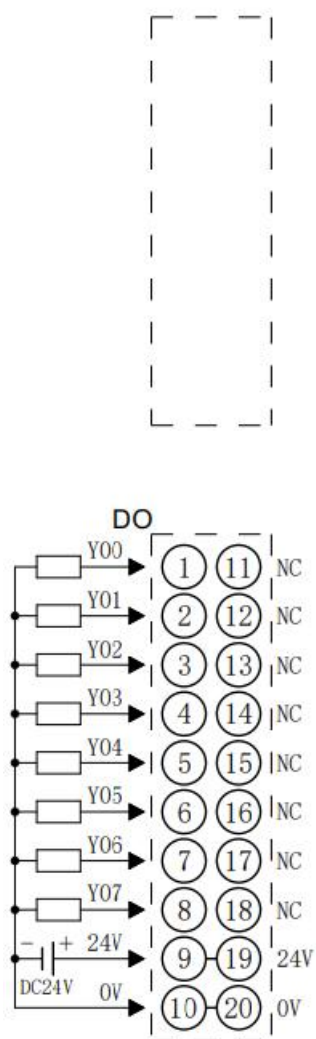
*24V内部导通;0V内部导通
 *负载公共端电源需与模块使用同一个电源

6.3.6 RIO0016P



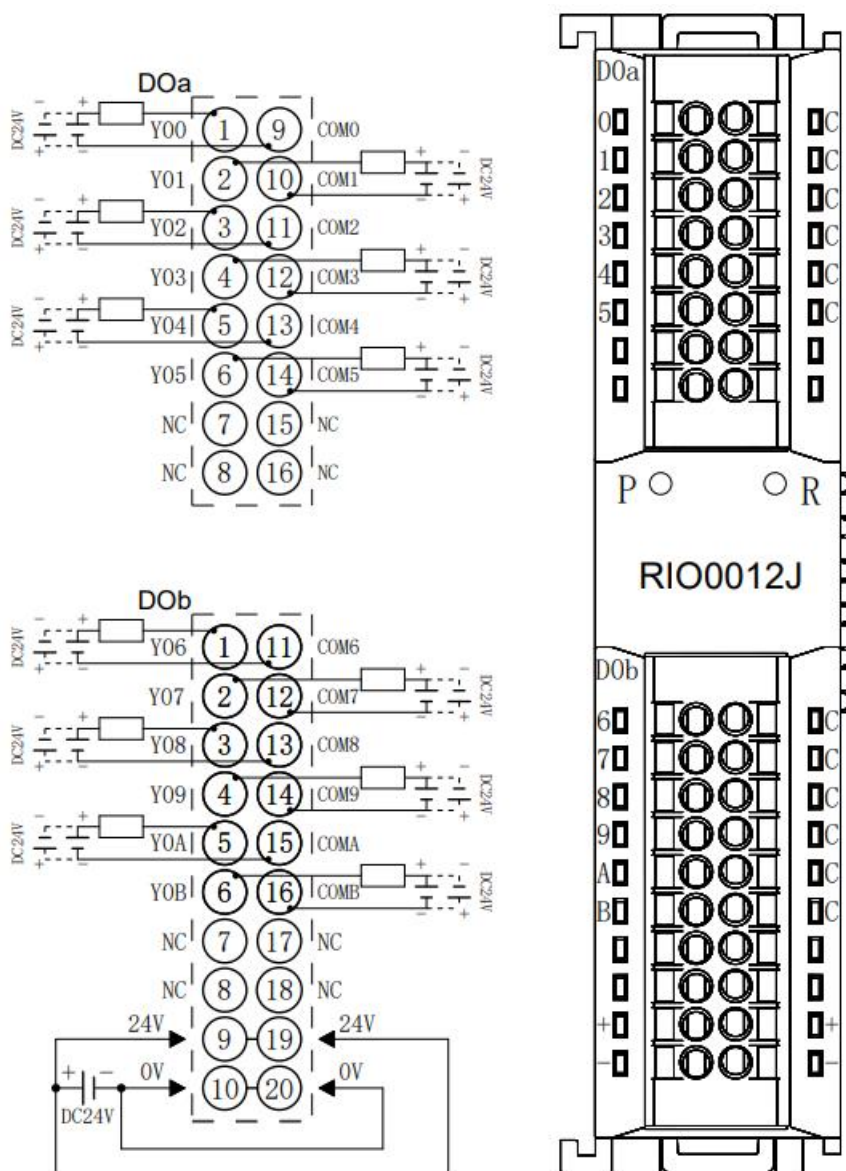
*24V内部导通;0V内部导通
 *负载公共端电源需与模块使用同一个电源

6.3.7 RIO0008P



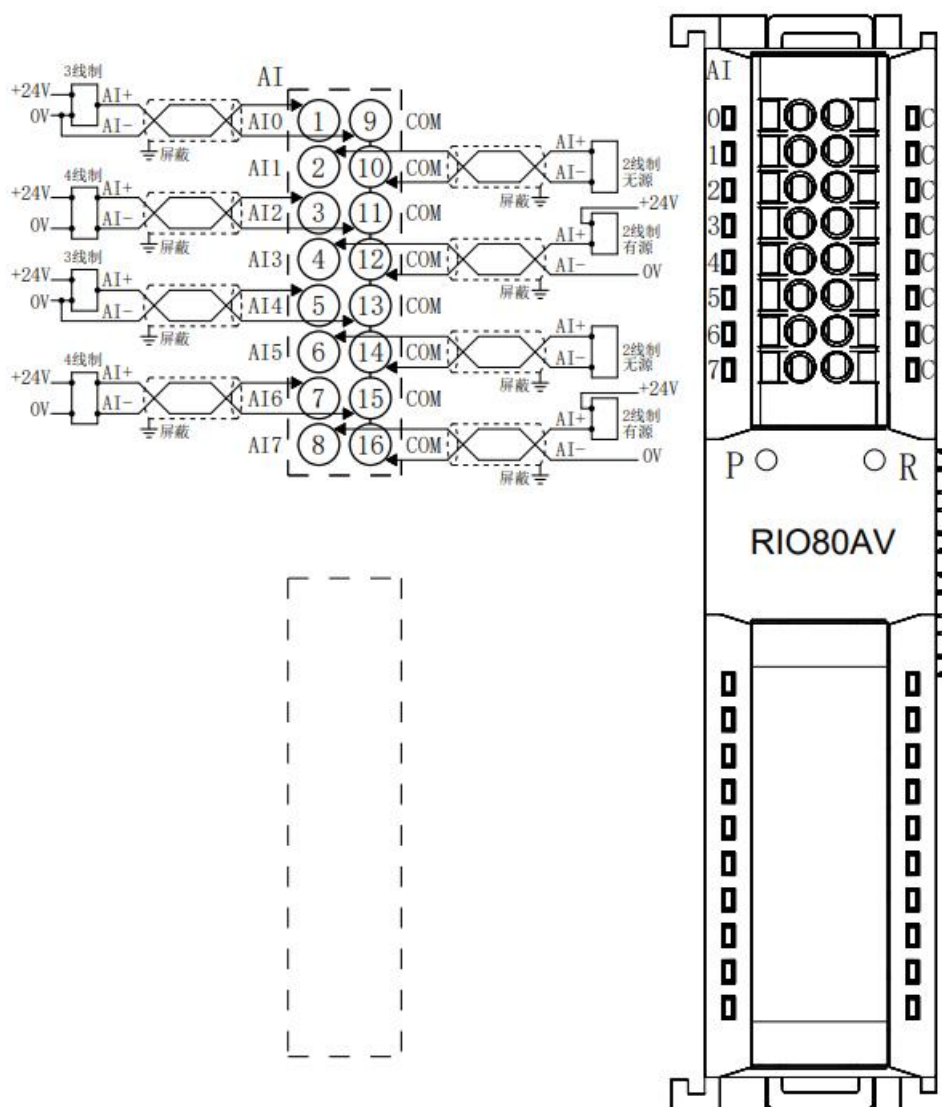
*24V内部导通;0V内部导通
*负载公共端电源需与模块使用同一个电源

6.3.8 RIO0012J



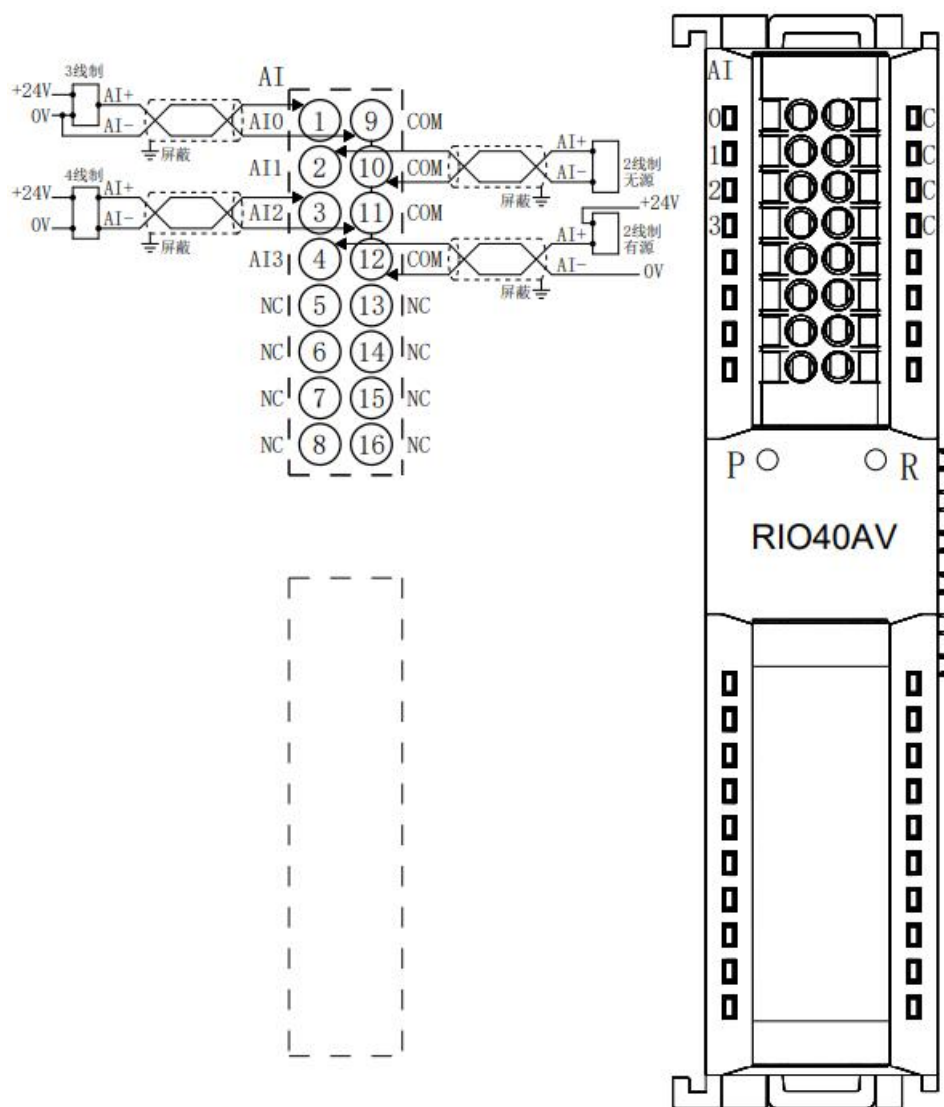
*24V内部导通;0V内部导通
 *负载公共端电源需与模块使用同一个电源
 *COM可接正极或负极,内部不互通,支持DC0-48V

6.3.9 RIO80AV



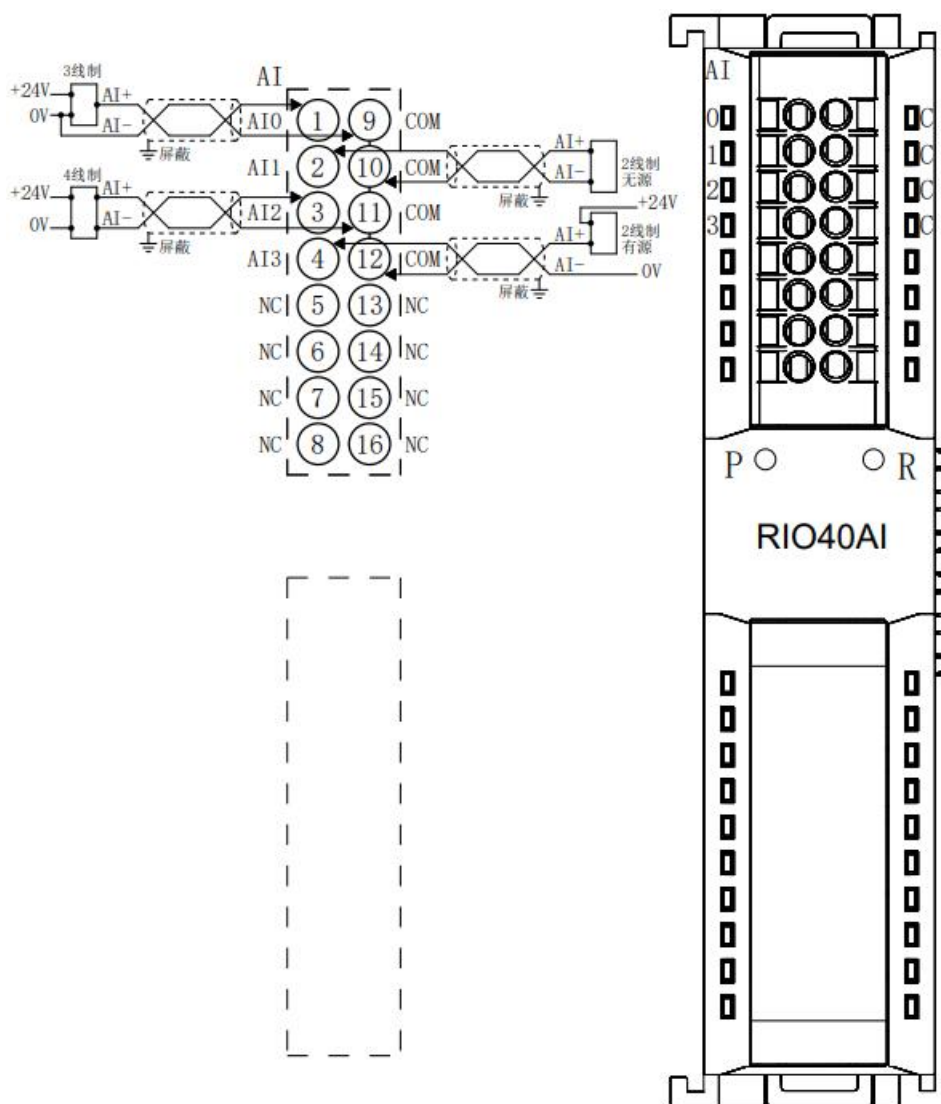
*COM内部导通
*所有通道负载需同源

6.3.10 RIO40AV



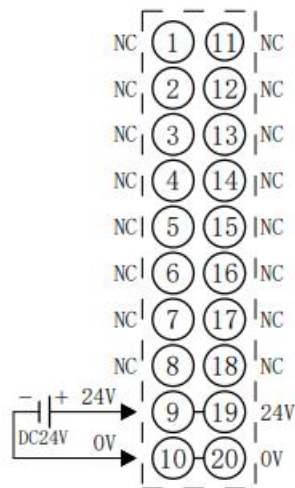
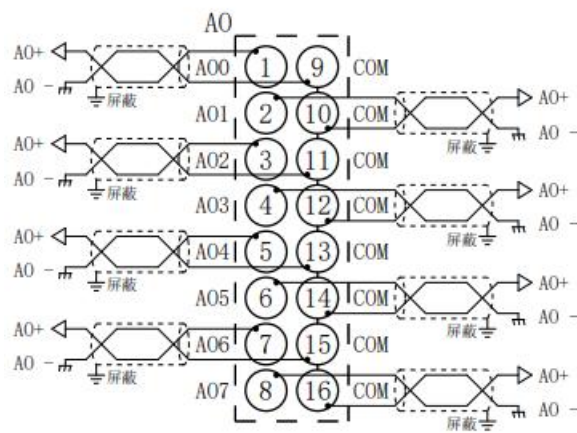
*COM内部导通
*所有通道负载需同源

6.3.11 RIO40AI

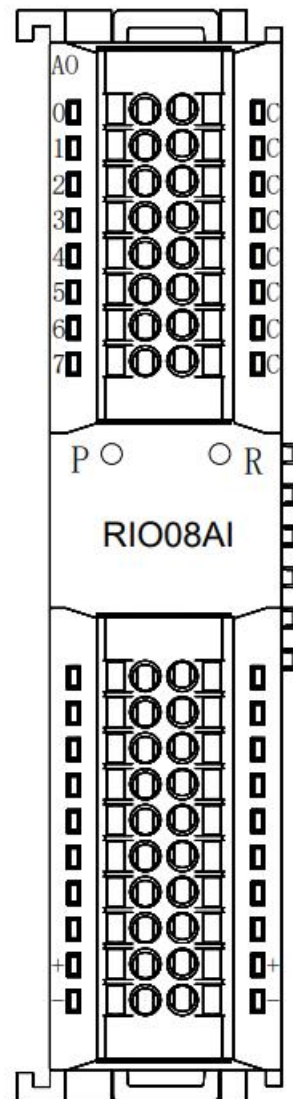


*COM内部导通
*所有通道负载需同源

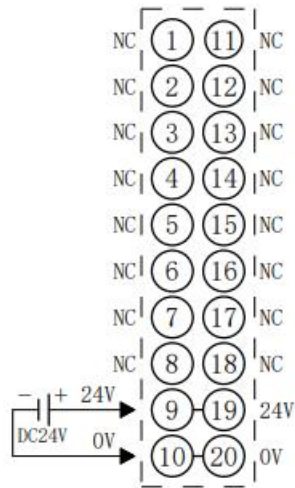
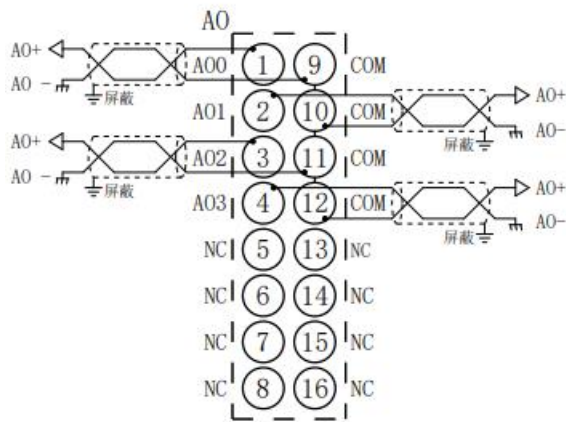
6.3.12 RIO08AI



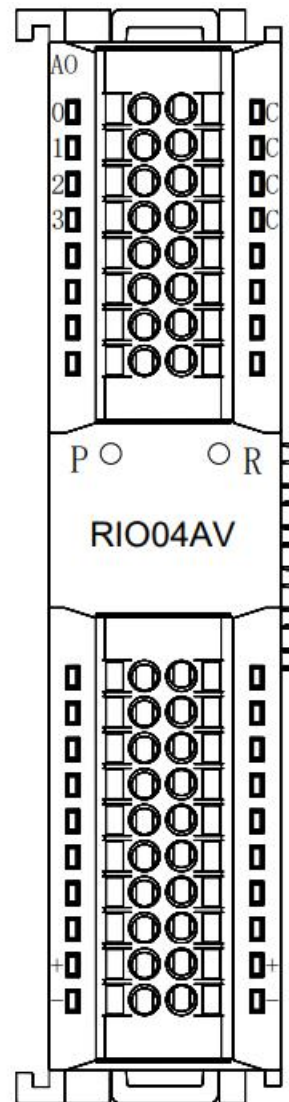
*COM内部导通
 *24V内部导通；0V内部导通



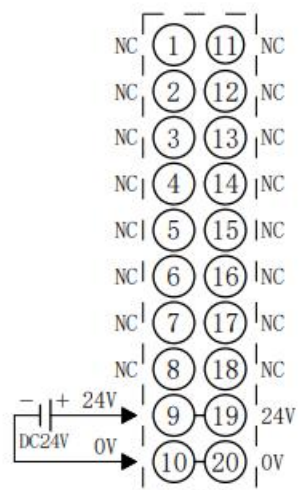
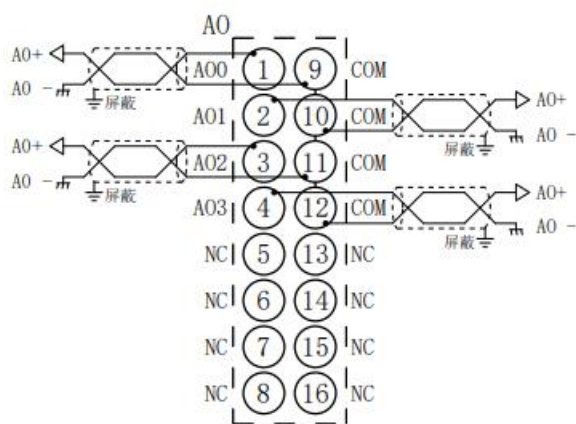
6.3.13 RIO04AV



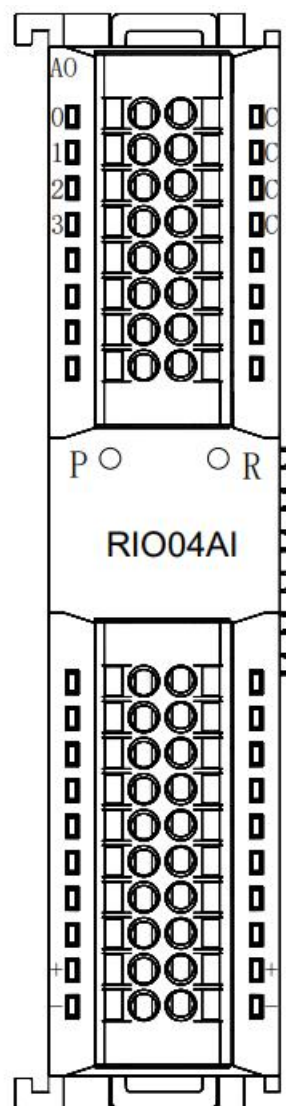
*COM内部导通
*24V内部导通；0V内部导通



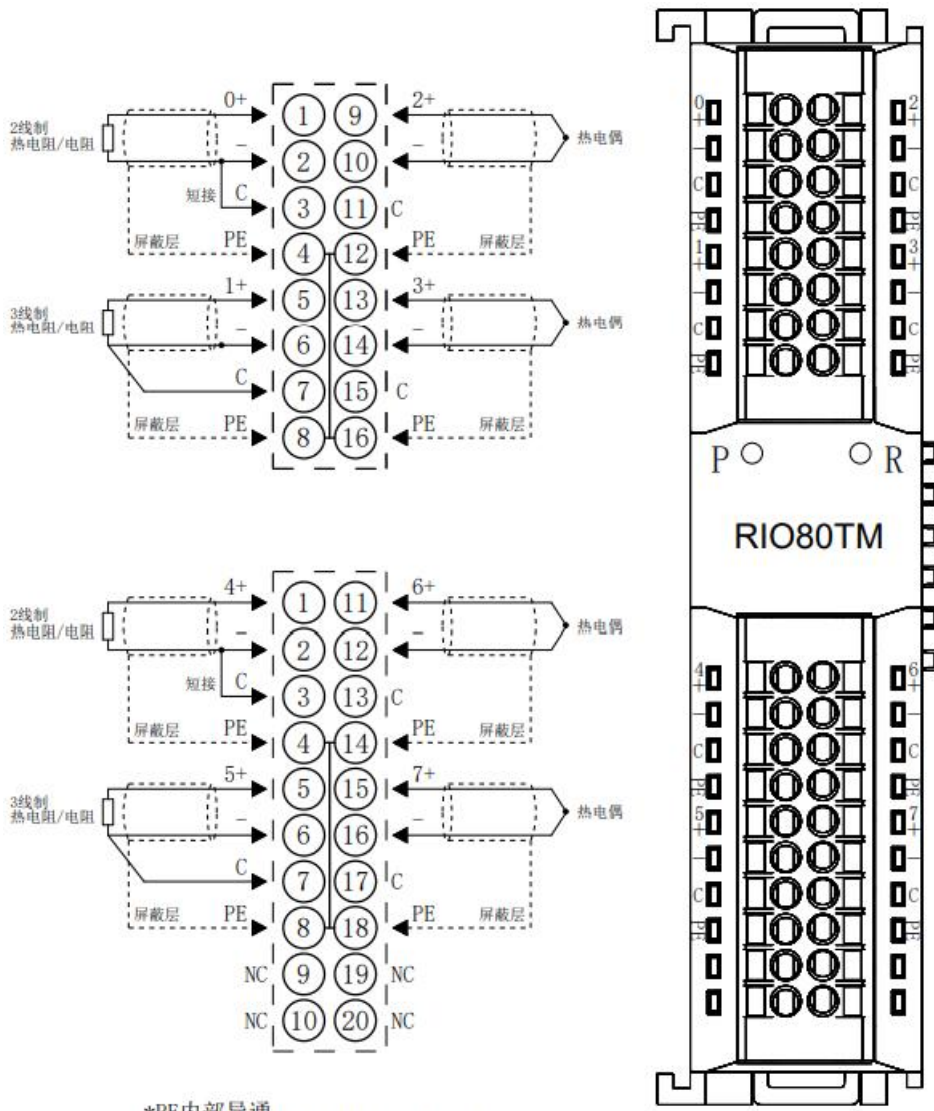
6.3.14 RIO04AI



*COM内部导通
 *24V内部导通；0V内部导通

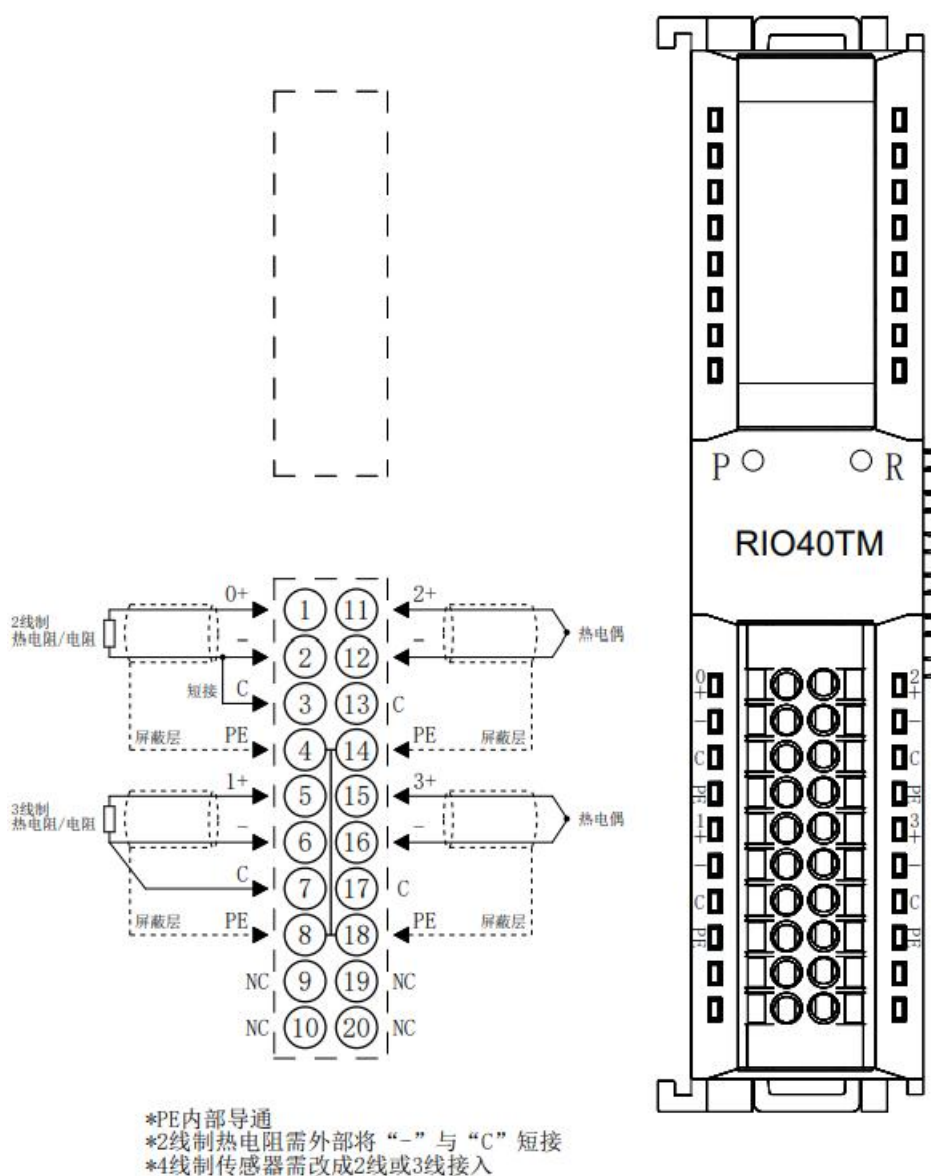


6.3.15 RIO80TM

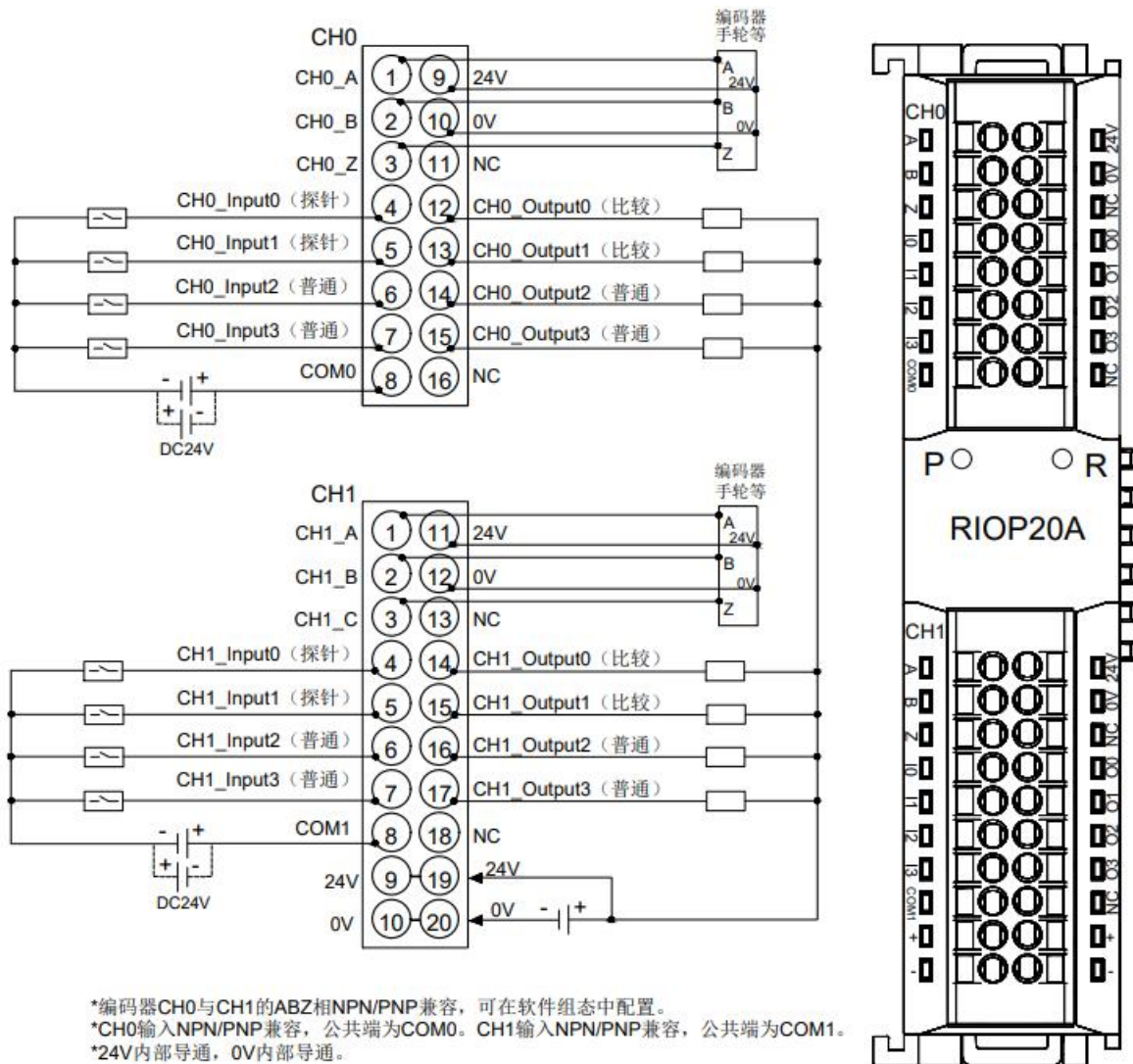


- *PE内部导通
- *2线制热电阻需外部将“-”与“C”短接
- *4线制传感器需改成2线或3线接入

6.3.16 RIO40TM



6.3.17 RIOP20A



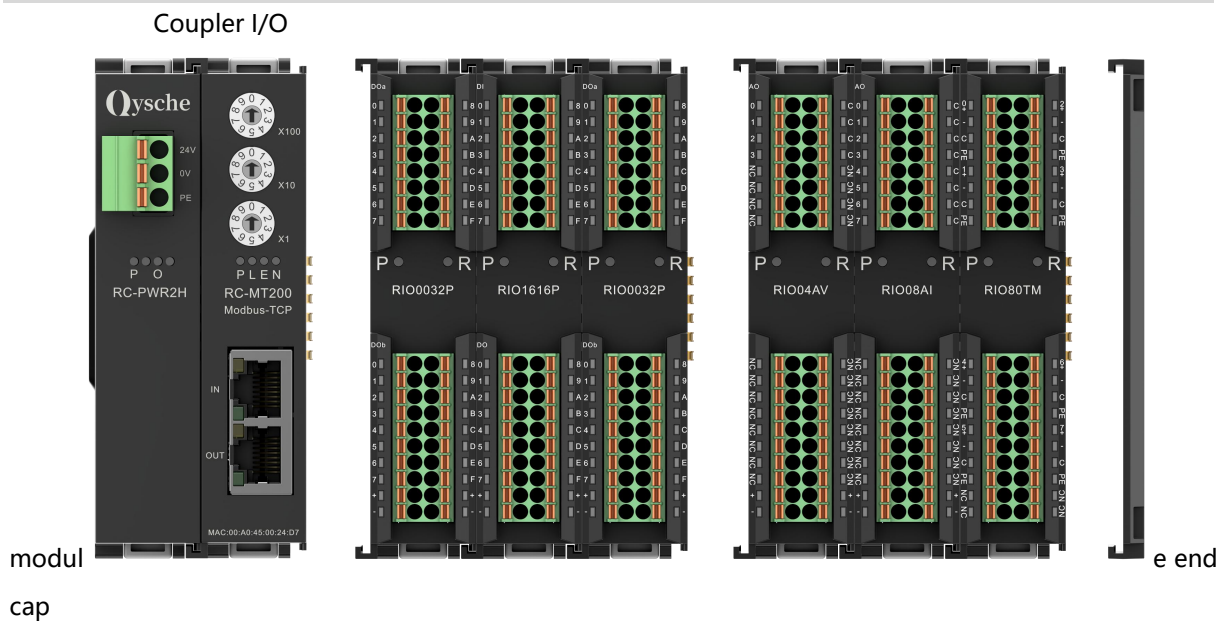
*编码器CH0与CH1的ABZ相NPN/PNP兼容，可在软件组态中配置。
 *CH0输入NPN/PNP兼容，公共端为COM0。CH1输入NPN/PNP兼容，公共端为COM1。
 *24V内部导通，0V内部导通。

7 use

7.1 Module Application

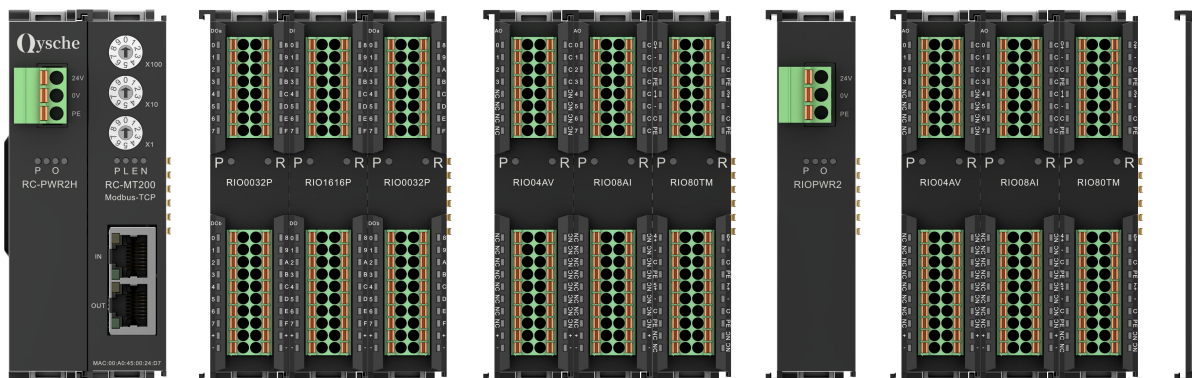
The product adopts the application mode of the combination of coupler, I/O module and end cover, and there are two combinations as follows.

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



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

Coupler I/O module Power supply module I/O module end cover



Module configuration quantity limit:

1. The number of I/O modules that can be configured with the coupler is ≤ 32 .
2. The number of analog modules cannot exceed 12, and the number of 8-channel analog inputs is not allowed to exceed 8.

The number of power supply and extended power supply modules that can be configured is limited to:

1. If the number of I/O modules configured in the system exceeds 10, an expansion power module must be added. The number of I/O modules configured after the expansion power module is added is ≤ 12 .

7.2 IP settings and modifications

7.2.1 Setting the IP address via the rotary switches

For a description and operation of the rotary switch, see "[4.1.2 Rotary switch](#)".

- **When the IP address is set by the rotary switch from the factory default**

The IP address is 192.168.1.XXX (XXX is the setting value of the rotary switch, ranging from 1 to 254).

- **When setting the IP address using the rotary switch after the IP address has already been set on the Web**

The IP address is the high 3 bytes of the IP address set via the Web, and the low 1 byte is the setting value of the rotary switch.

For example, if you change the rotary switch settings after setting it to 172.10.0.12 via the Web, The IP address is 172.10.0.XXX (XXX is the setting value of the rotary switch (1 to 254)).

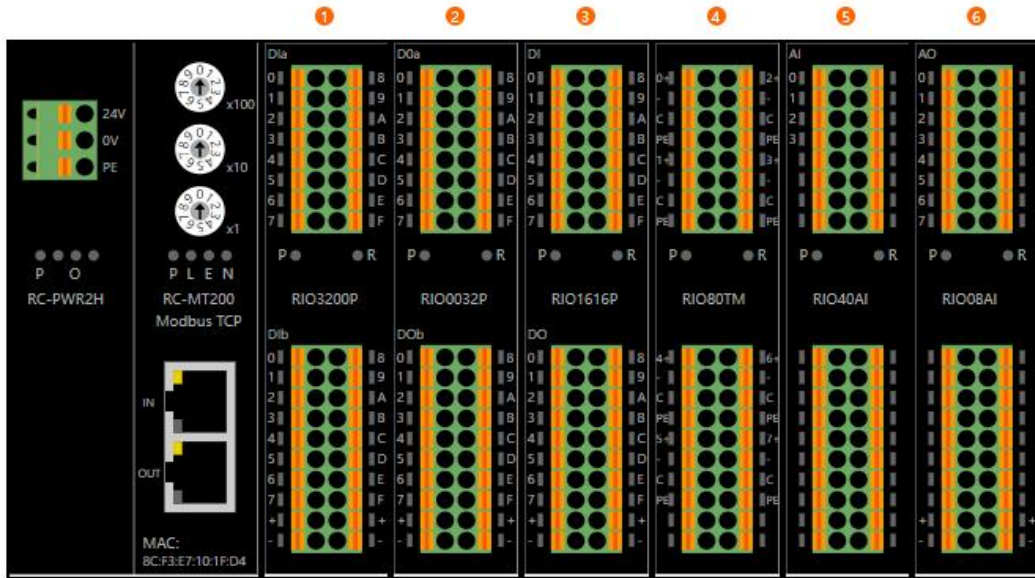
- **IP address settings via rotary switch take precedence over web settings**

1. When the rotary switch is set to 000, the IP value set on the Web will prevail.
2. When the rotary switch is set to 001-254, the IP address set by the rotary switch shall prevail;
 - At this time, the IP address set through the Web will be stored, and the IP address will still be based on the IP address set by the rotary switch;

When the rotary switch is set to 000 or 255~ again, the module will use the stored value of the IP address as the module IP address after it is powered on again. If there is no stored value, the default value will be used as the module IP address.

7.2.2 Setting IP address via the Web

After the coupler module is configured and connected to the system, enter the coupler's IP address in the browser to access the Web page. In the network parameter configuration function area, modify the IP address and click "Save and Restart". The coupler will automatically restart to take effect.



Configuring Network Parameters

MAC address:

IP address: . . .

Subnet Mask: . . .

Default Gateway: . . .

Output Clear / Hold: Clear Hold

Input Clear / Hold: Clear Hold

7.3 Restore factory settings

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

Restore the factory settings by rotating the switch. The specific operations are as follows:

1. Turn the rotary switch to 999 and power on the module.

2. After the module is powered on, turn the rotary switch back to 000 without cutting off the power.
3. After the rotary switch is turned back to 000, the module automatically restores the factory settings.
4. After the module is restored to factory settings, the IP address is restored to the factory settings.

7.4 Module parameter setting function

7.4.1 Digital input/output Clear/hold function

The clear/hold function is for modules with outputs. This function can configure the output action of the module when the communication is disconnected.

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

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

Configuration Method

See "[7.6.1 Application on the Web](#)".

***After the modification is completed, it is recommended to power on again.**

7.4.2 Digital input filter time

Digital input filtering prevents the program from responding to unexpected rapid changes in input signals, which may be caused by switch contact jumping or electrical noise. The digital input filter is currently configured to 3ms by default, and the supported setting range is 0~20ms. When configured to 3ms, it can filter out clutter within 3ms, and channels cannot be configured individually.

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

Configuration Method

See "[7.6.1 Application on the Web](#)".

***After the modification is completed, it is recommended to power on again.**

7.4.3 Analog filter setting function

Analog input filter function

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

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

Filter function configuration

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

The sampling rate of the 8-channel module is: 1.25kHz/8 channels (800us/8 channels);

The sampling rate of the 4-channel module is: 2.5kHz/4 channels (400us/4 channels).

Configuration Method

See "[7.6.1 Application on the Web](#)".

***After the modification is completed, it is recommended to power on again.**

7.4.4 Analog range configuration function

The analog range setting function is used to set the analog range (for details, see "[3.5 Analog parameters](#)").

Configuration Method

See "[7.6.1 Application on the Web](#)" .

***After the modification is completed, it is recommended to power on again.**

7.5 Module function code corresponding table

The MT coupler module supports a total of 9 function codes, the functions and meanings are shown in the following table:

Function code	English meaning	Chinese meaning	Operation Type
01	Read Coils	Read coil status	Bit Operations
02	Read Discrete Inputs	Read discrete input status	Bit Operations
03	Read Holding Registers	Read Holding Registers	Word Operation
04	Read Input Registers	Read Input Register	Word Operation
05	Write Single Coil	Writing a single coil	Bit Operations
06	Write Single Register	Writing a Single Holding Register	Word Operation
15	Write Multiple Coils	Writing multiple coils	Bit Operations
16	Write Multiple Registers	Writing multiple holding registers	Word Operation
twenty three	Read/Write Multiple Registers	Read/write multiple holding registers	Word Operation

The function codes, offset start addresses, address ranges and other information corresponding to different I/O modules are shown in the following table:

I/O module address mapping table					
DI(Input Bit)	DO(Output bit)	AI(Input Word)	AO(Output Word)	DI(Input Word)	DO(Output Word)
Function: 0x02	Function: 0x05 0x15 0x01(R)	Function: 0x03 0x04	Function: 0x06 0x16 0x03(R)	Function: 0x03	Function: 0x16 0x03(R)
Offset start address: 0x00	Offset start address: 0x00(R/W)	Offset start address: 0x00	Offset start address: hexadecimal:0x00(W) Decimal:0(W)	Offset start address: hexadecimal:0x5000	Offset start address: hexadecimal:0x3000(W) Decimal:12288(W)

			hexadecimal:0x2000 (R) Decimal:8192(R)	Decimal:20480	hexadecimal:0x4000(R) Decimal:16384(R)
Bit address range: 0~1023	Bit address range: 0~1023	Register address range:0~511	Register address range: 0x00~0x1FF(W) 0~511(W) 0x2000~0x21FF(R) 8192~8703(R)	Register address range: 0x5000~0x507F 20480~20607	Register address range: 0x3000~0x307F(W) 12288~12415(W) 0x4000~0x407F(R) 16384~16511(R)
Data length range:1~102 4	Data length range: 1~1024	Data length range:1~512	Data length range: 1~512	Data length range: 1~128	Data length range: 1~128
Offset address + length <= 1024 (R)	Offset address + length <= 1024 (R/W)	Offset address + length <= 512 (R)	Offset address + length <= 512 (W), 8704 (R)	Offset address + length <= 20608 (R)	Offset address + length <= 12416 (W), 16512 (R)

Note: The digital input DI/analog input AI module supports the read function, and the digital output DO/analog output AO supports the write and read back functions.

7.6 Bus module configuration instructions

7.6.1 Application on the Web

1、Preparation

- **Hardware Environment**

- **Module Preparation**

This description takes the RC-MT2200 module kit (power supply RC-PWR2H, coupler RC-MT200), RIO3200P, RIO0032P, RIO1616P, RIO80TM, RIO40AI, and RIO08AI as examples.

- **A computer, set the IP address of the computer and the module to the same network segment.**

Each coupler module is set with a default IP address when it leaves the factory. Usually the default IP address is as follows:

IP address: 192.168.1.120

Subnet Mask: 255.255.255.0

Gateway: 192.168.1.1

- **Standard network cable**

- **Module mounting rails and rail fixings**

- **Switching power supply**

- **Hardware configuration and wiring**

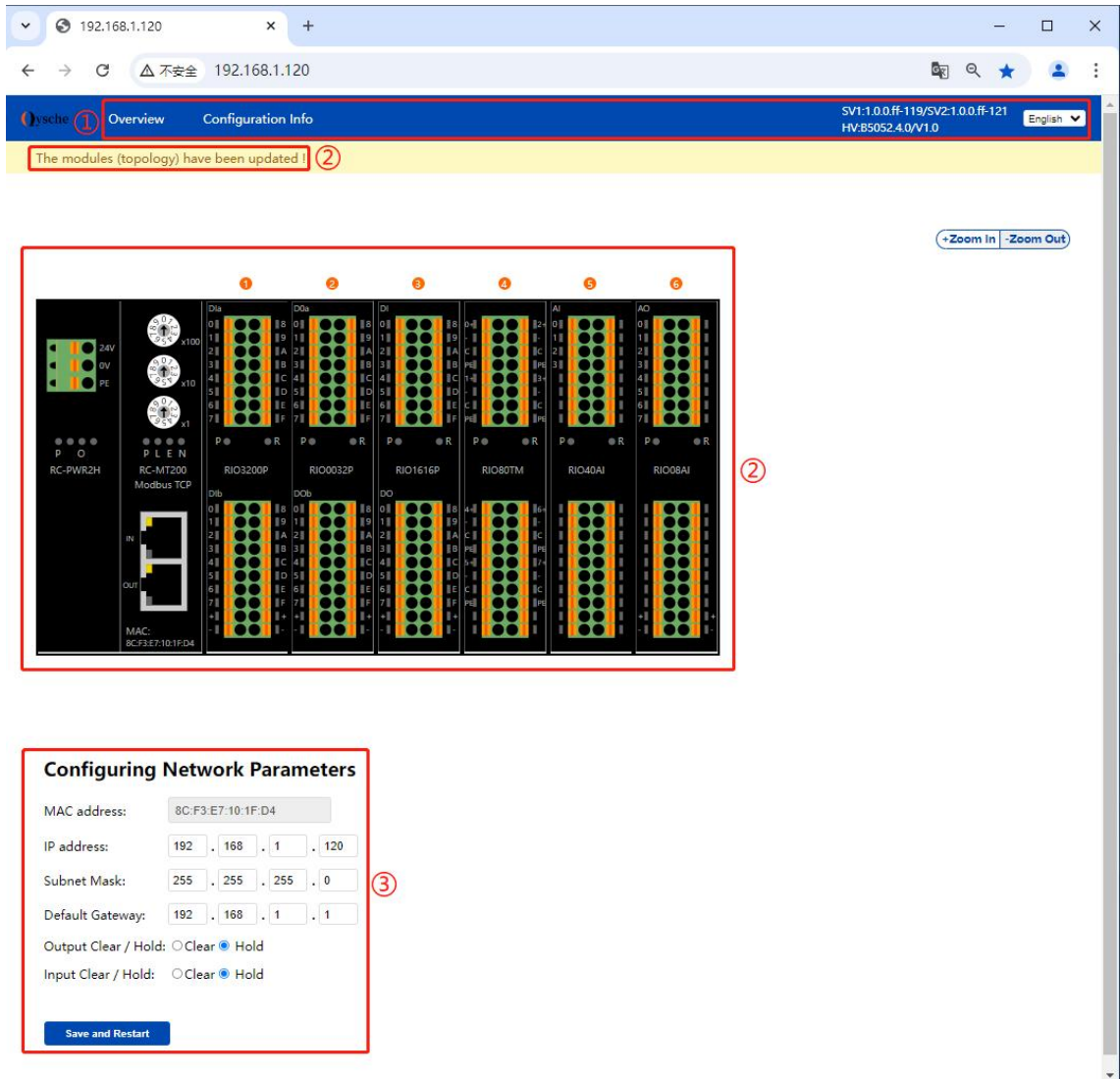
Please refer to "[5 Installation and removal](#)" "[6 Wiring](#)" Instructions to correctly connect the module to the system.

- **Module power on**

After checking that the wiring is correct, power on the RC-MT2200+I/O module device combination.

2. Browser access to the Web

- a. Open the browser and enter the IP address of the coupler to access the website, as shown in the figure below. The web homepage mainly has three functions: ① menu bar, ② module configuration overview, and ③ network parameter configuration.



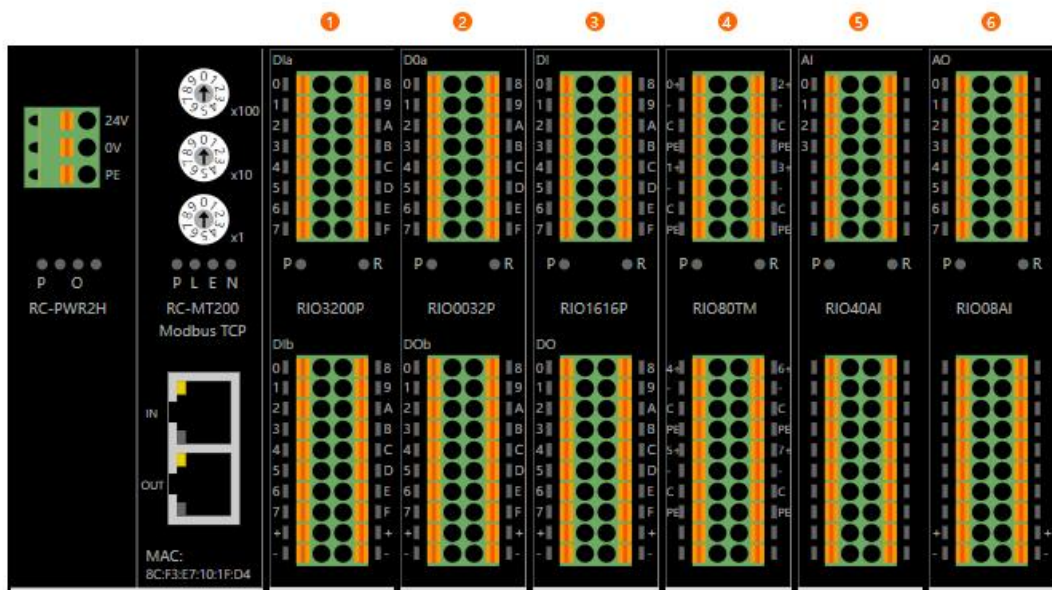
- b. The menu bar has configuration overview, configuration information viewing, coupler software and hardware version viewing, and Web page language switching functions. As shown in the figure below, the coupler software version SV1 information and hardware version HV information are displayed; the Web page supports four languages: Chinese, English, Russian, and German.



3. Configure network parameters, digital output clear/hold function and input clear/hold function

function

- a. You can see the network parameter configuration function at the bottom of the web homepage, as shown in the figure below.
 - MAC address in network parameters and RC-MT200 coupler panel screen printing MACThe address is the same,MACThe address cannot be changed.
 - After changing the five parameters, such as IP address, subnet mask, default gateway, digital output clear/hold function, and input clear/hold function, you need to click "Save and Restart" and the coupler will automatically restart to take effect. The input clear/hold function means that the input data can be configured to be cleared or held under abnormal circumstances.



Configuring Network Parameters

MAC address:

IP address: . . .

Subnet Mask: . . .

Default Gateway: . . .

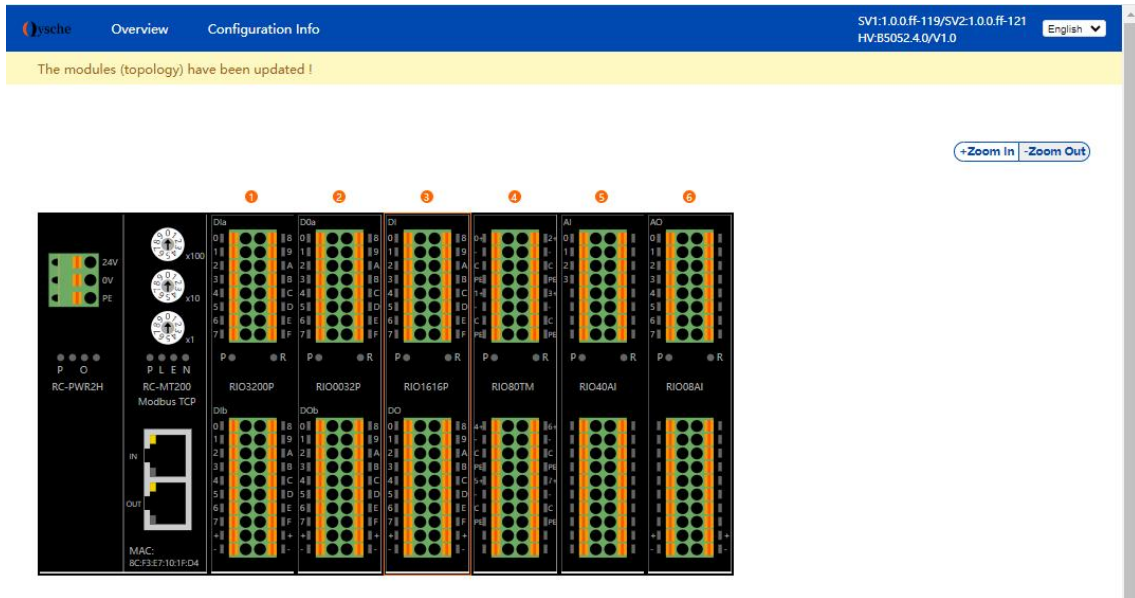
Output Clear / Hold: Clear Hold

Input Clear / Hold: Clear Hold

Save and Restart

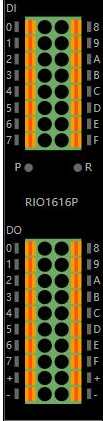
4. Module Configuration Overview

- a. On the Web homepage, you can see the module configuration diagram, as shown in the figure below. The channel indicators of the I/O modules and functional modules display the effective I/O input and output data in real time. When the system topology changes, such as adding or removing modules or changing the module topology sequence, the Web will automatically update the configuration overview after powering on and connecting successfully. After the update is complete, the upper left corner will prompt "Module (topology) has been updated!".



- b. On the module configuration overview page, you can click on an I/O module to enter the configuration and monitoring page of the module. For example, to configure RIO1616P, click on the module to enter the configuration and monitoring page, as shown in the figure below. On the digital module configuration and monitoring page, you can configure the digital input filter parameters. After the input filter parameters are configured through the drop-down menu, you need to click "Update" to complete the configuration; at the same time, you can monitor the input and output of the module in real time through the input and output channel values and the on and off of the indicator lights. Note: When the coupler and the master station (PLC) establish a connection and interact with process data, the module parameters cannot be configured, and forced configuration will return Error.

ysche
Overview
Configuration Info
SV1:1.0.0.ff-119/SV2:1.0.0.ff-121
HV:B5052.4.0/V1.0
English



Module3: RIO1616P

General Information:

- Module Identifier: : 0x0621
- Type: 16DI, 16DO PNP
- Hardware version number: V0.4.43.51
- Software version number: Vf7.1.0.2

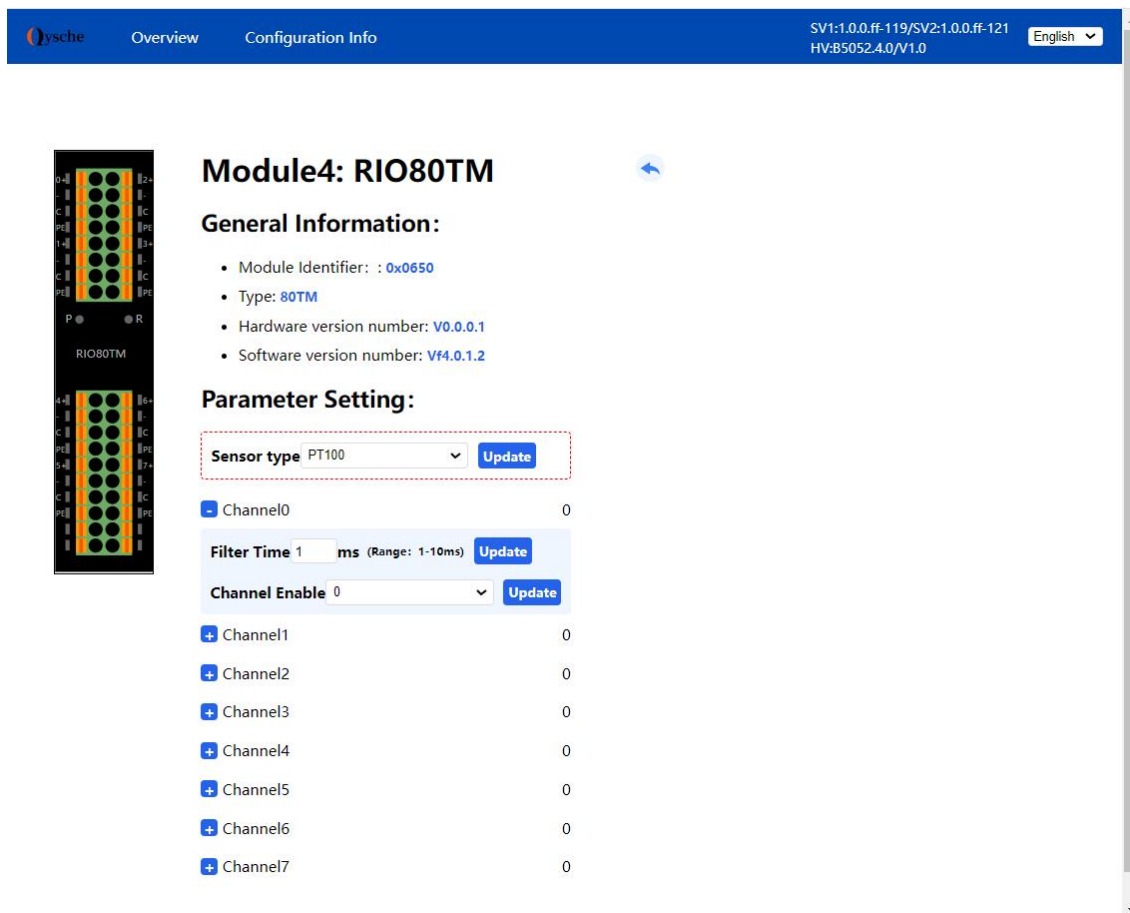
Parameter Setting:

Input Filter Update

DI

Channel0	0
Channel1	0
Channel2	0
Channel3	0
Channel4	0
Channel5	0
Channel6	0
Channel7	0
Channel8	0

- c. On the module configuration overview page, click "RIO80TM" to enter the temperature acquisition module configuration monitoring page, as shown below. On the temperature acquisition module configuration monitoring page, you can configure the sensor type, single channel filter time, and channel enable. After completing the configuration through the drop-down menu, click "Update" to complete the configuration. The module channel status can be monitored in real time through the module indicator status.



Module4: RIO80TM

General Information:

- Module Identifier : 0x0650
- Type: 80TM
- Hardware version number: V0.0.0.1
- Software version number: Vf4.0.1.2

Parameter Setting:

Sensor type PT100

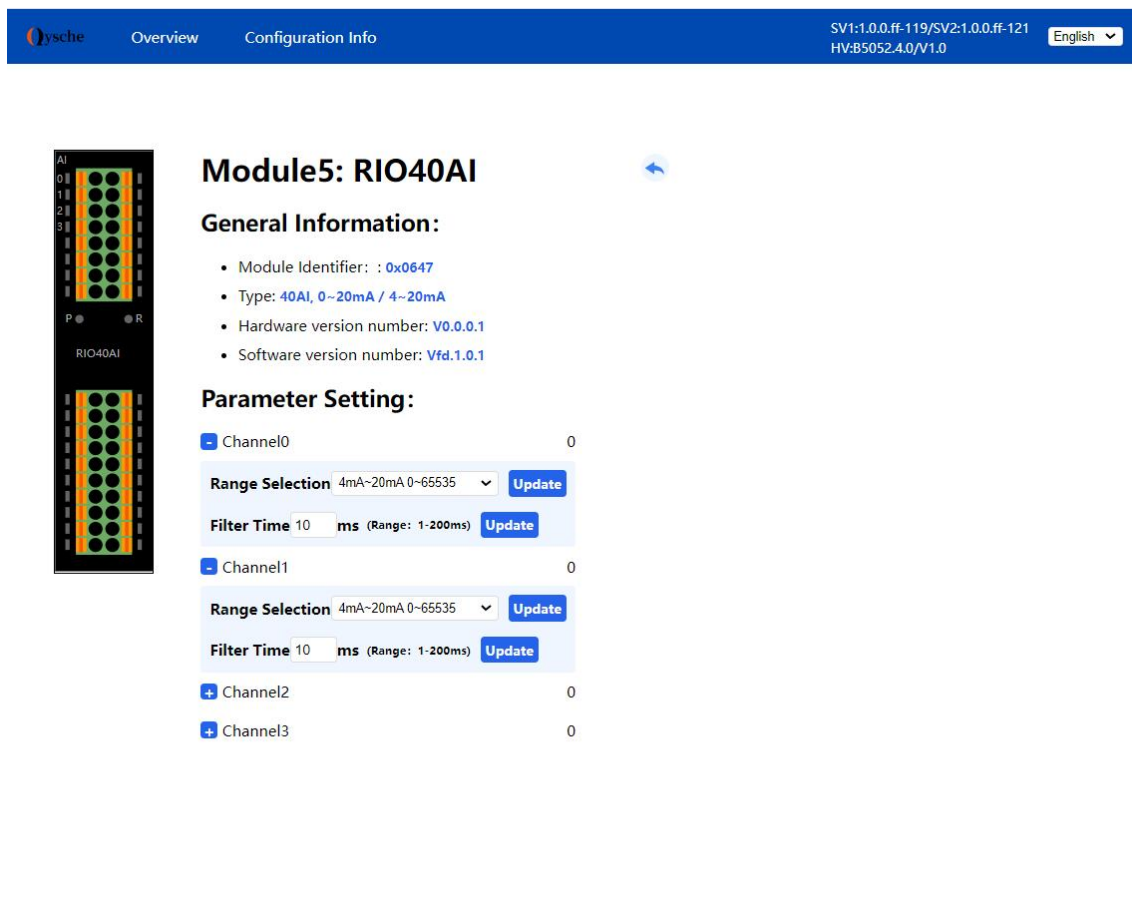
Channel0 0

Filter Time 1 ms (Range: 1-10ms)

Channel Enable 0

- Channel1 0
- Channel2 0
- Channel3 0
- Channel4 0
- Channel5 0
- Channel6 0
- Channel7 0

- d. On the module configuration overview page, click "RIO40AI" to enter the analog module configuration monitoring page, as shown below. On the analog module configuration monitoring page, you can configure the single channel filter time and single channel range. After completing the configuration through the drop-down menu, click "Update" to complete the configuration. The module channel status can be monitored in real time through the module indicator status.



The screenshot shows the configuration page for Module 5: RIO40AI. The page is divided into several sections:

- Navigation Bar:** Includes 'Overview' and 'Configuration Info' tabs, and a language dropdown set to 'English'.
- Module Information:**
 - Module Identifier: 0x0647
 - Type: 40AI, 0~20mA / 4~20mA
 - Hardware version number: V0.0.0.1
 - Software version number: Vfd.1.0.1
- Parameter Setting:**
 - Channel0:** Range Selection: 4mA~20mA 0~65535, Filter Time: 10 ms.
 - Channel1:** Range Selection: 4mA~20mA 0~65535, Filter Time: 10 ms.
 - Channel2:** Value: 0.
 - Channel3:** Value: 0.

5. Configuration information and I/O address mapping table

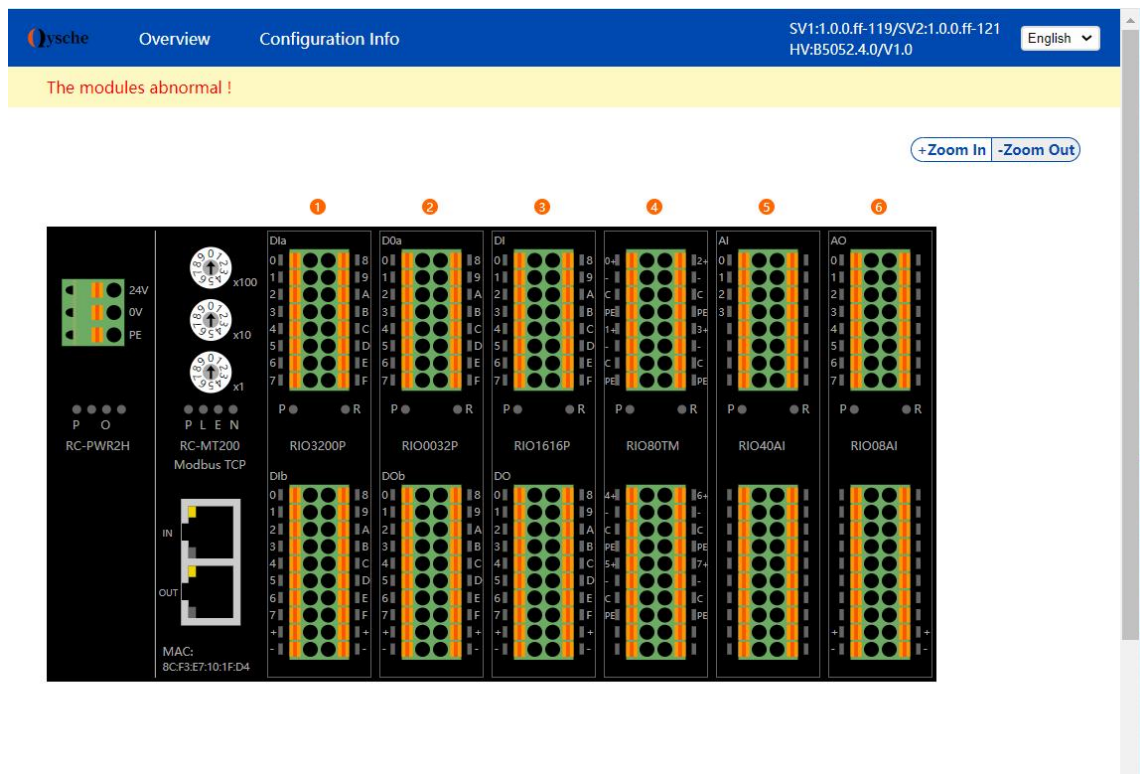
- Click "Configuration Information" in the Web menu bar to switch to the configuration information page, as shown below. On the configuration information page, you can view the access information and I/O address mapping table of the current module. According to the I/O address mapping table, users can operate the module clearly and quickly through the host computer or PLC.

The screenshot shows a web-based configuration interface for the RC-MT2200 coupler. At the top, there's a navigation bar with 'Overview' and 'Configuration Info' tabs. A yellow banner indicates 'The modules (topology) have been updated!'. Below this, six modules are displayed in a row, numbered 1 to 6. Each module has a grid of pins labeled with functions like DI, DO, AI, AO, DIb, DOB, AIb, AOb. Below the modules is a configuration table.

Configuration Info		Total number of installed modules: 6		Function Code: 01, 02, 03, 04, 05, 06, 15, 16, 23			
Sequence	Model	IO module address mapping table					
		DI (Input Bit)	DO (Output Bit)	AI (Input Word)	AO (Output Word)	DI (Input Word)	DO (Output Word)
		Function: 0x02 Addr:0x00 (R)	Function: 0x05 0x15 0x01 (R) Addr:0x00 (R/W)	Function: 0x03 0x04 Addr:0x00 (R)	Function: 0x06 0x16 0x03 (R) Addr:0x00 (W) Addr:0x2000 (R)	Function: 0x03 Addr:0x5000 (R)	Function: 0x16 0x03 (R) Addr:0x3000 (W) Addr:0x4000 (R)
0	RC-MT200						
1	RIO3200P	0-31				0-1	
2	RIO0032P		0-31				0-1
3	RIO1616P	32-47	32-47			2	2
4	RIO80TM			0-7	0-7		
5	RIO40AI			8-11			
6	RIO8AI				8-15		

6. Abnormal alarm for slave module access

- a. The web page adds an alarm function, the prerequisite is that the coupler and the host computer software are in a connected communication state. When the module connected to the coupler is abnormal, the page prompts "slave module abnormality", as shown in the figure below. When the slave module is abnormal, the output channel maintains the original output state, and the input channel can be configured to clear or maintain the state.



- b. The host computer also supports the abnormal alarm function of slave module access. The host computer uses 0x03 function code, offset start address 0x6000, length 1, and can read whether the connected module is abnormal. 1 represents normal and 0 represents abnormal. For the host computer configuration method, see [7.6.2 Application in CODESYS V3.5 software environment](#).

7.6.2 Application in CODESYS V3.5 software environment

1、Preparation

- **Hardware Environment**

- **Module Preparation**

This description takes the RC-MT2200 module kit (power supply RC-PWR2H, coupler RC-MT200), RIO3200P, RIO0032P, RIO1616P, RIO80TM, RIO40AI, and RIO08AI as examples.

- **A computer with CODESYS V3.5 and CODESYS Control Win V3 - x64 SysTray software pre-installed**

Set the computer's IP address and the module's IP address to the same network segment.

Each coupler module is set with a default IP address when it leaves the factory. Usually the default IP address is as follows:

IP address: 192.168.1.120

Subnet Mask: 255.255.255.0

Gateway: 192.168.1.1

- **Standard network cable**

- **Module mounting rails and rail fixings**

- **Switching power supply**

- **Hardware configuration and wiring**

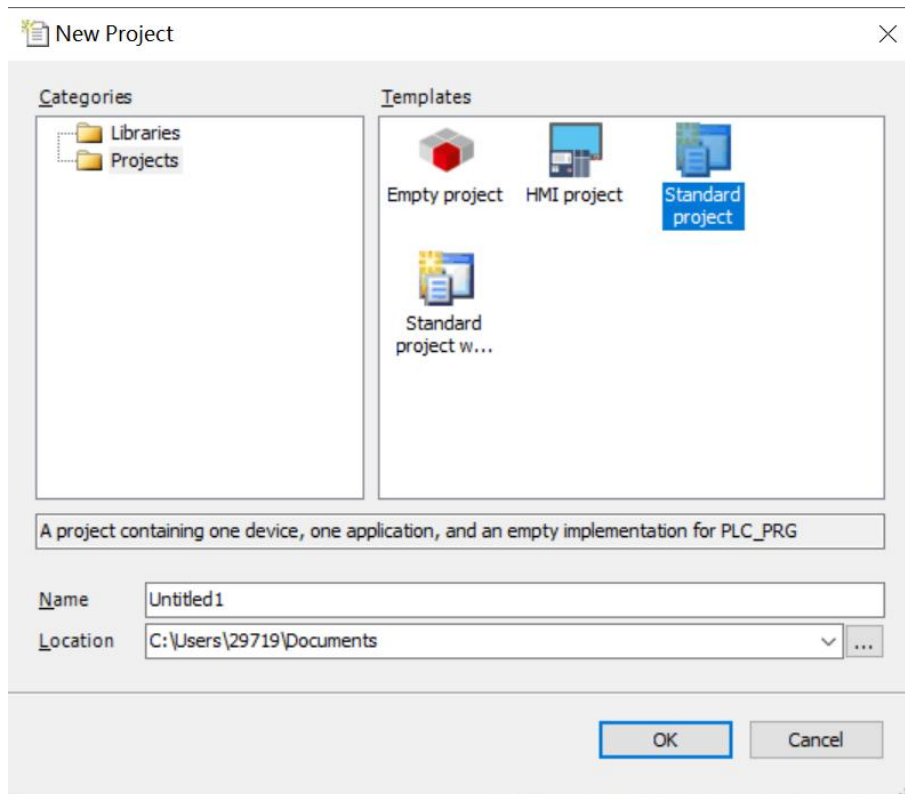
Please refer to "[5 Installation and removal](#)" "[6 Wiring](#)" Instructions to correctly connect the module to the system.

- **Module power on**

After checking that the wiring is correct, power on the RC-MT2200+I/O module device combination.

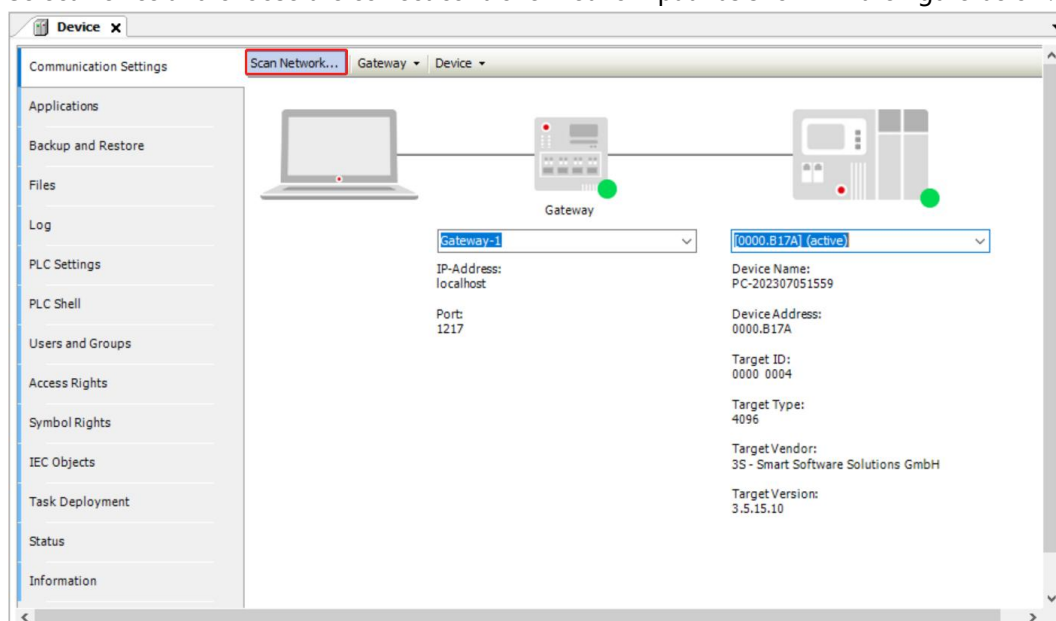
2、New Construction

- a. Log in to CODESYS, click "File -> New Project", enter a name, and click "OK", as shown in the figure below.



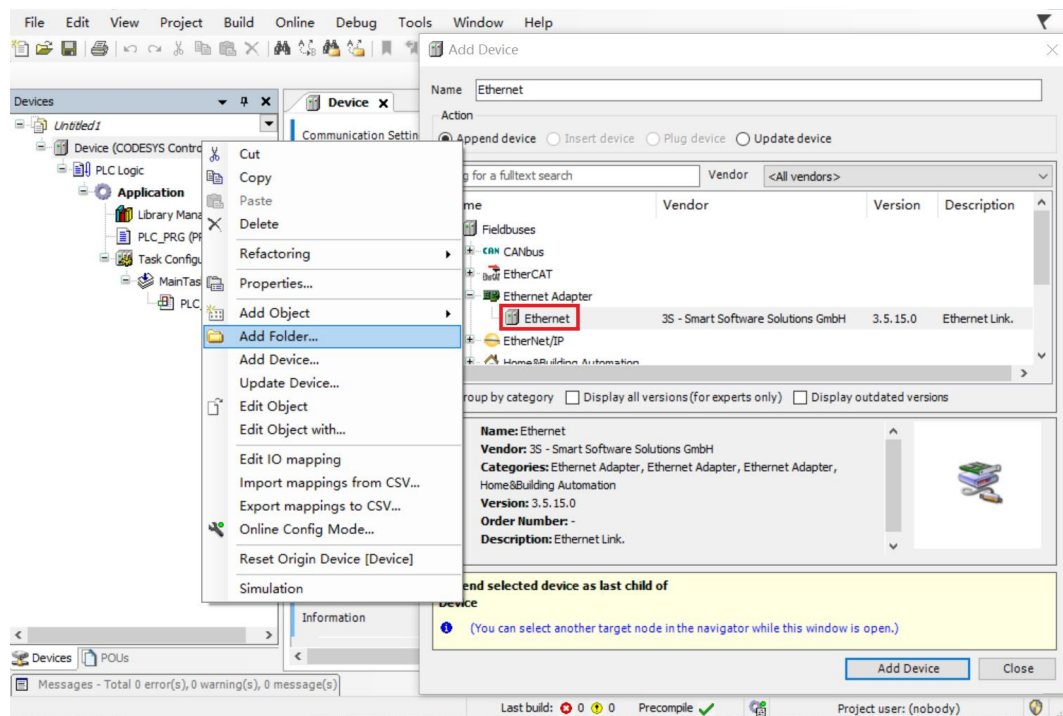
3. Scan the network

- Use "CODESYS Control Win V3 - x64 SysTray" to start the PLC. Find "CODESYS Control Win V3 - x64 SysTray" in the lower right corner of the computer and right-click and select "Start PLC".
- Double-click Device (CODESYS Control Win V3 X64) in the navigation tree on the left of CODESYS and click Scan Network.
- Select Device and choose the correct controller network path as shown in the figure below.



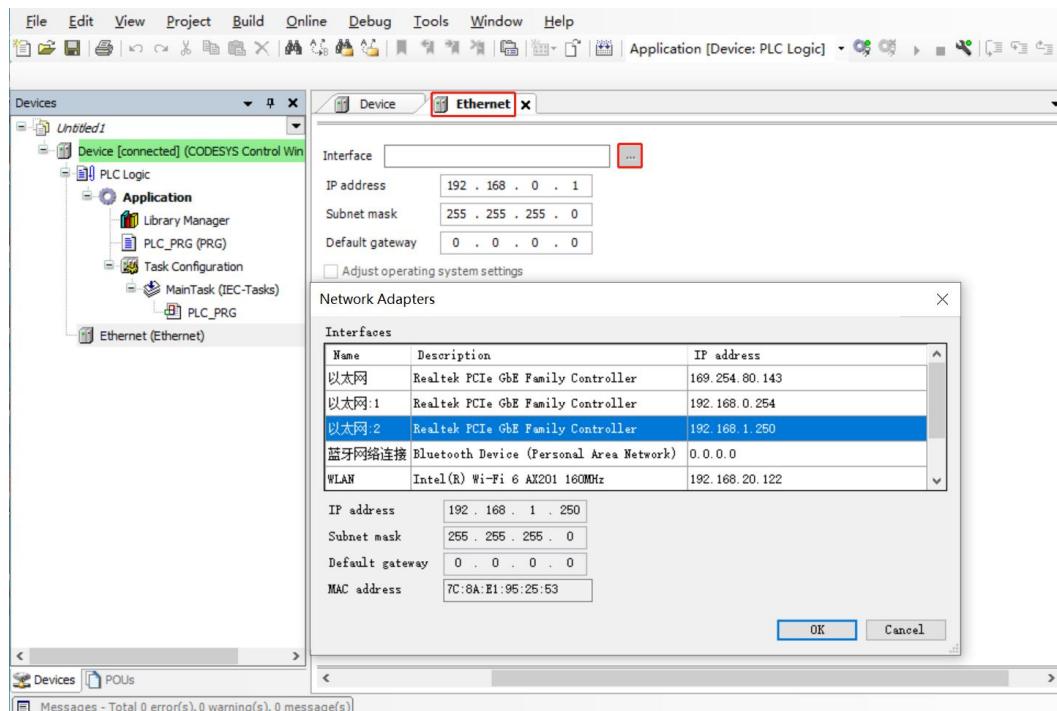
4. Add Ethernet

- a. Right-click "Device (CODESYS Control Win V3 X64)" in the navigation tree on the left of CODESYS, click "Add Device", select "Ethernet Adapters -> Ethernet" and add it as shown in the picture below.



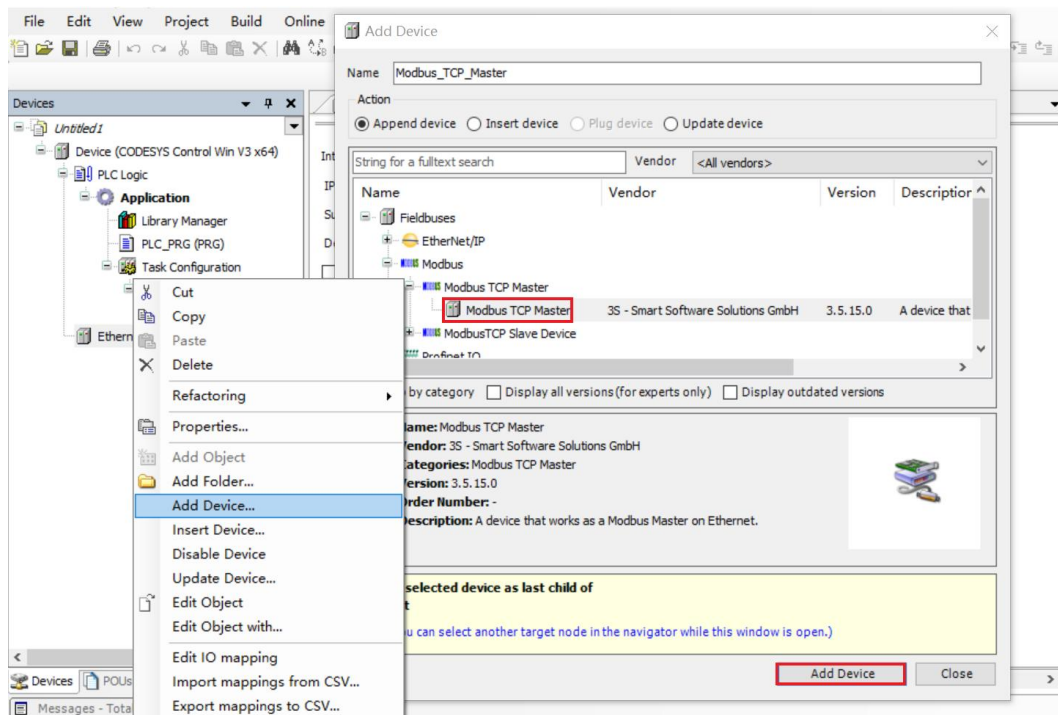
5. Configuring Ethernet network parameters

- a. Double-click "Ethernet (Ethernet)" in the left navigation tree to open the main menu on the right. Click "...". Open the network adapter window and select Ethernet. The master station IP and the coupler IP must be in the same network segment, as shown in the figure below.

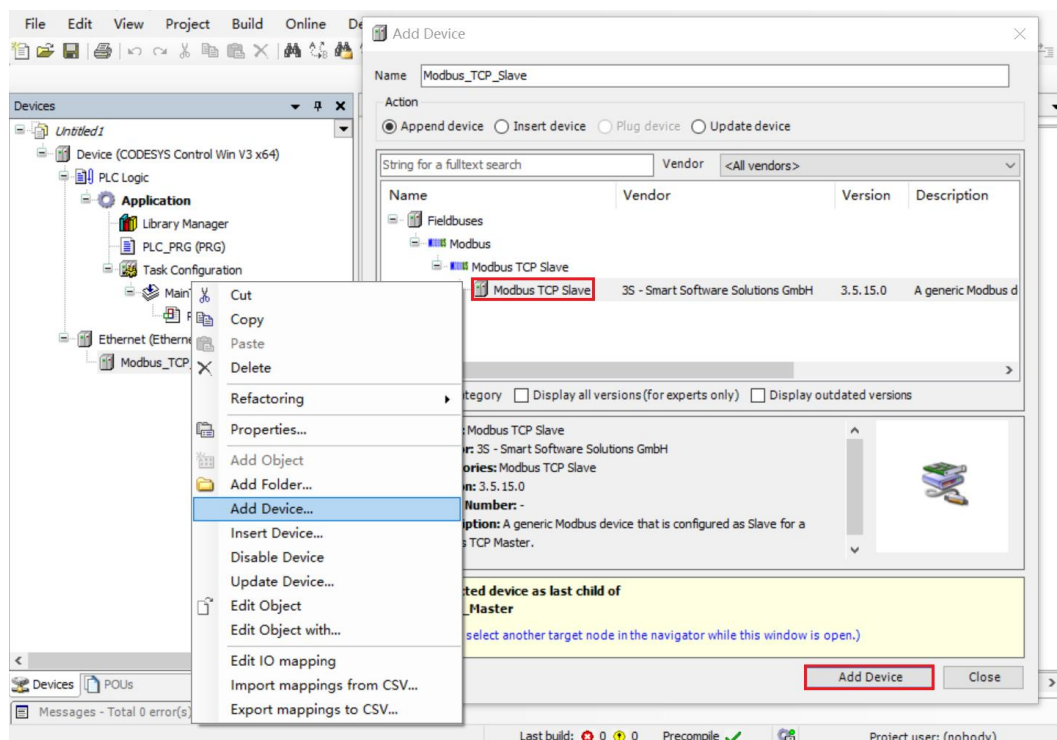


6. Add Modbus TCP Master and Modbus TCP Slave

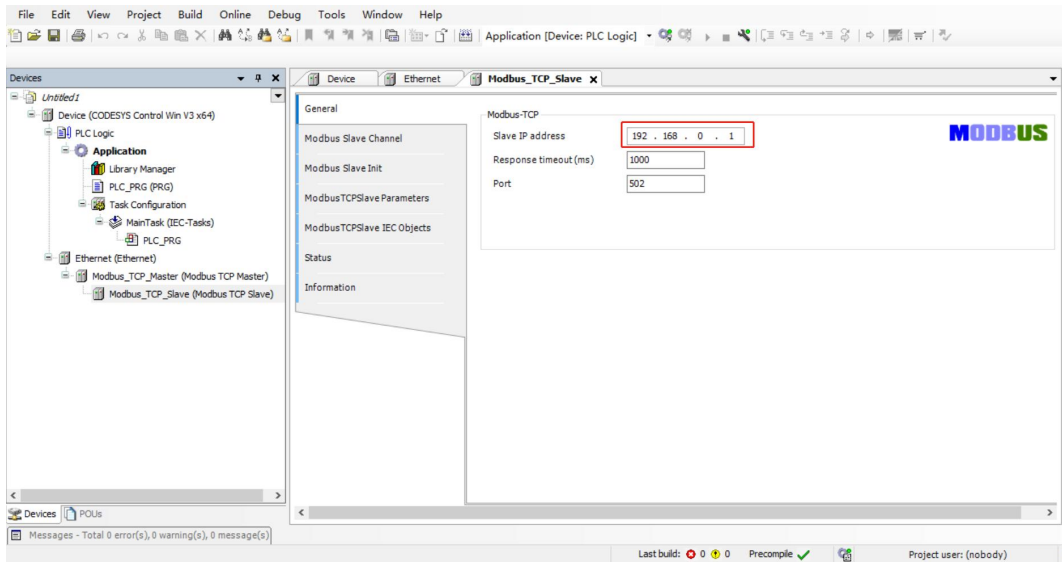
- a. Right-click "Ethernet (Ethernet)" in the left navigation tree, click "Add Device", select "Modbus TCP Master" and add it as shown in the figure below.



- b. Right-click "Modbus TCP Master" in the left navigation tree, click "Add Device", select "Modbus TCP Slave" and add it as shown in the figure below.



- c. Double-click in the left navigation tree "Modbus TCP Slave" Open the main menu on the right, click "General" to configure Modbus TCP Slave, the slave IP address is the IP address of the coupler, the response time is "1000", and the port number is "502", as shown in the figure below.

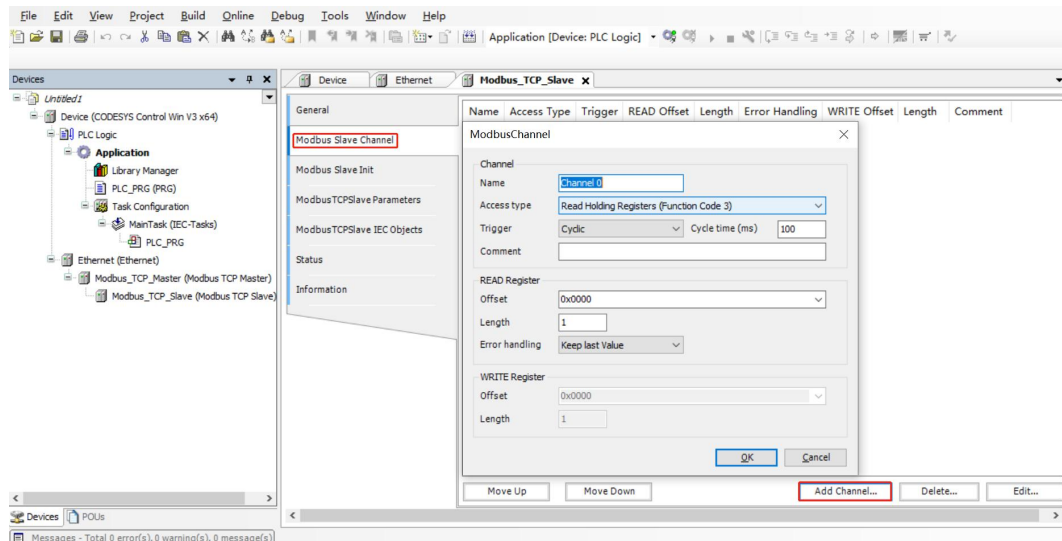


7. Configure the IO channels of the slave

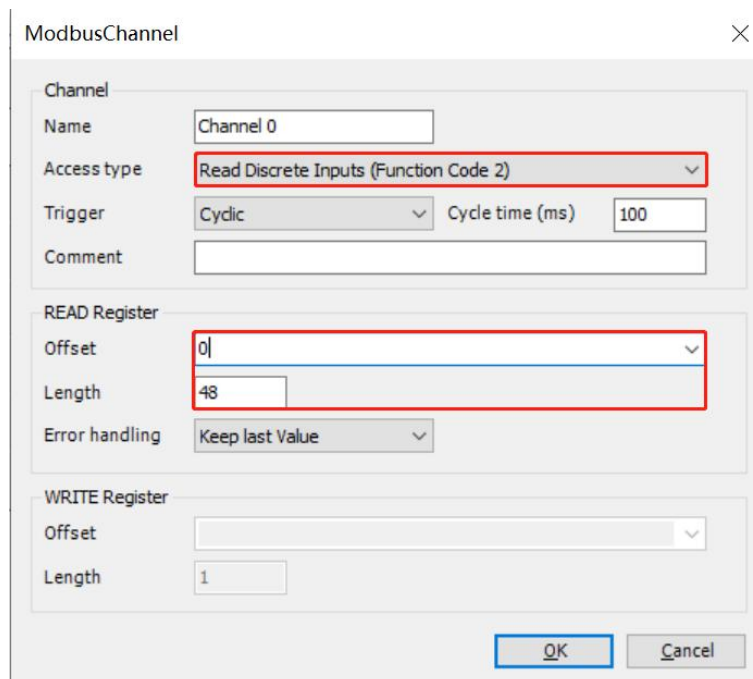
- a. Through the Web tool, you can view the IO module address mapping table of the topology structure, and see the function code of each module, the offset starting address and the monitoring address range corresponding to the module, as shown in the figure below.

Configuration info		Total number of installed modules: 6		Function Code: 01, 02, 03, 04, 05, 06, 15, 16, 23			
Sequence	Model	IO module address mapping table					
		DI (Input Bit)	DO (Output Bit)	AI (Input Word)	AO (Output Word)	DI (Input Word)	DO (Output Word)
		Function: 0x02 Addr:0x00 (R)	Function: 0x05 0x15 0x01 (R) Addr:0x00 (R/W)	Function: 0x03 0x04 Addr:0x00 (R)	Function: 0x06 0x16 0x03 (R) Addr:0x00 (W) Addr:0x2000 (R)	Function: 0x03 Addr:0x0000 (R)	Function: 0x16 0x03 (R) Addr:0x3000 (W) Addr:0x4000 (R)
0	RC-MT200						
1	RIO3200P	0-31				0-1	
2	RIO032P		0-31				0-1
3	RIO1616P	32-47	32-47			2	2
4	RIO80TM			0-7	0-7		
5	RIO40AI			8-11			
6	RIO8AI				8-15		

- b. On the main page on the right side of Modbus TCP Slave, click "Modbus Slave Channel", and then click "Add Channel" to pop up the Channel 0 configuration window, as shown in the figure below.



- c. Digital input modules RIO3200P and RIO1616P, **DI (Input Bit)** The corresponding function code is 02, the offset address is 0x00, and the address range is 0~31 and 32~47, that is, 48 bits. In the Channel 0 configuration window, the access type, that is, the function code, is 02 Read Discrete Inputs, the read register offset is 0, and the length is 48. After the settings are completed, click "OK", as shown in the figure below. (You can also customize the offset address and length according to actual needs by referring to the IO module address mapping table)



- d. For digital output modules RIO0032P and RIO1616P, the write function code corresponding to DO (Output Word) is 16, the offset address is 0x3000 (decimal: 12288), and the address range is 0~1 and 2, that is, 3Word. On the main page on the right side of Modbus TCP Slave, click "Add Channel" to pop up the Channel 1 configuration window.

In the Channel 1 configuration window, the access type is The function code is 16 Write Multiple Registers, the write register offset is 12288, and the length is 3. After the settings are completed, click "OK", as shown in the figure below.

ModbusChannel

Channel Name: Channel 1

Access type: Write Multiple Registers (Function Code 16)

Trigger: Cyclic Cycle time (ms): 100

Comment:

READ Register

Offset: 0

Length: 1

Error handling: Keep last Value

WRITE Register

Offset: 12288

Length: 3

OK Cancel

- e. The function codes corresponding to AI (Input Word) of RIO80TM and RIO40AI modules are 03 and 04, the offset address is 0x00, and the address range is 0~7 and 8~11, that is, 12 Word. On the main page on the right side of Modbus TCP Slave, click "Add Channel" to pop up the Channel 2 configuration window.

In the Channel 2 configuration window, the access type is The function codes are 03 Read Holding Registers and 04 Read Input Registers (choose one), the read register offset is 0, and the length is 12. After the settings are completed, click "OK", as shown in the figure below.

ModbusChannel

Channel Name: Channel 2

Access type: Read Holding Registers (Function Code 3)

Trigger: Cyclic Cycle time (ms): 100

Comment:

READ Register

Offset: 0x0000

Length: 12

Error handling: Keep last Value

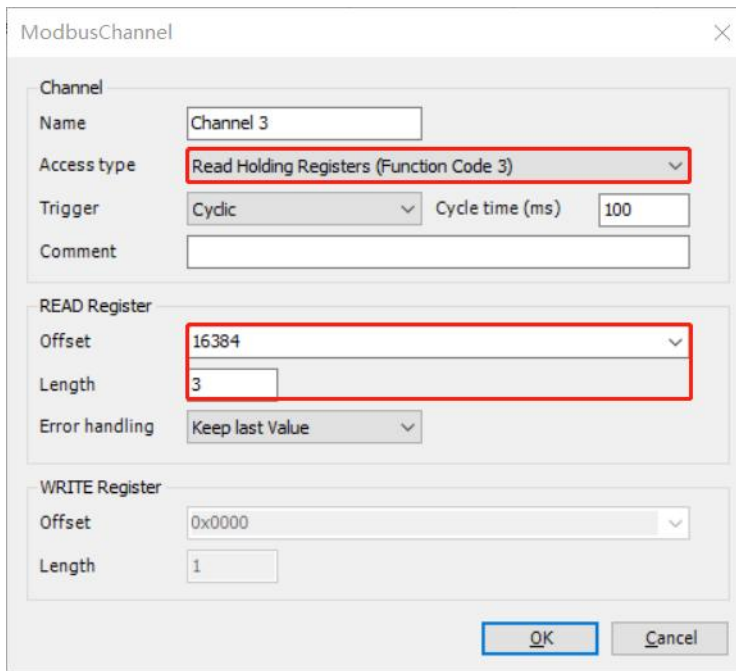
WRITE Register

Offset: 0x0000

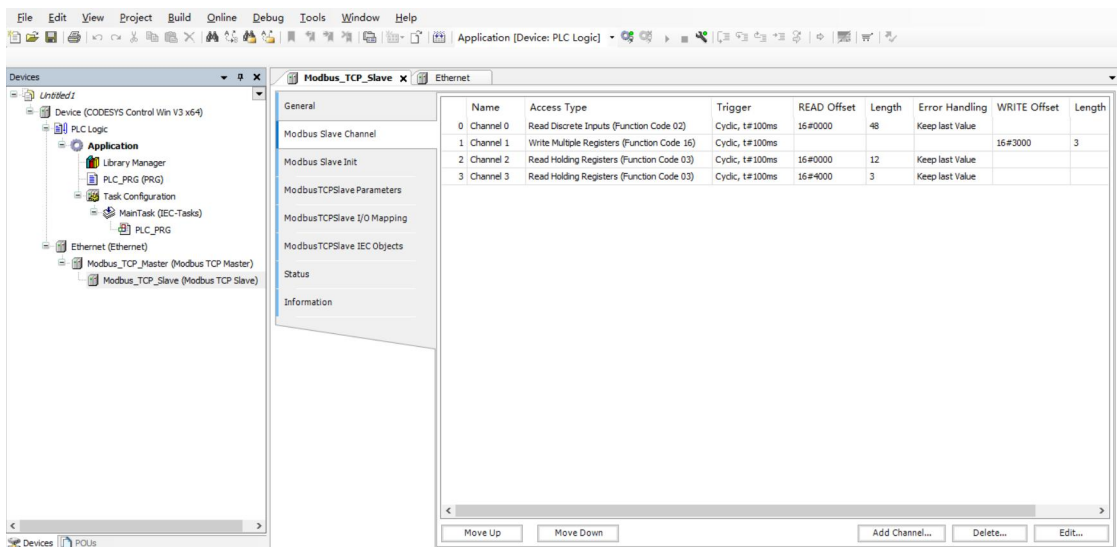
Length: 1

OK Cancel

- f. Digital output modules RIO0032P and RIO1616P, **DO (Output Word)** The function code corresponding to the readback function is 03, the offset address is 0x4000 (decimal: 16384), and the address range is 0~1 and 2, that is, 3Word. On the main page on the right side of Modbus TCP Slave, click "Add Channel" to pop up the Channel 3 configuration window. In the Channel 3 configuration window, set the access type (function code) to 03 Read Holding Registers, the write register offset to 16384, and the length to 3. After completing the settings, click OK, as shown in the following figure.

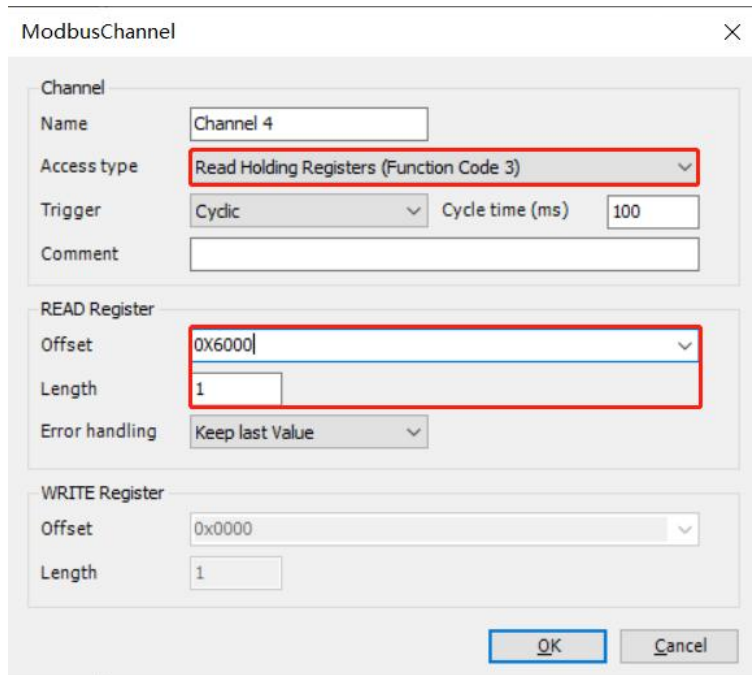


- g. The monitoring functions of other modules are similar. After the configuration is completed, you can view the configuration information on the Modbus slave channel main page, and you can also add, delete and edit, as shown in the figure below.

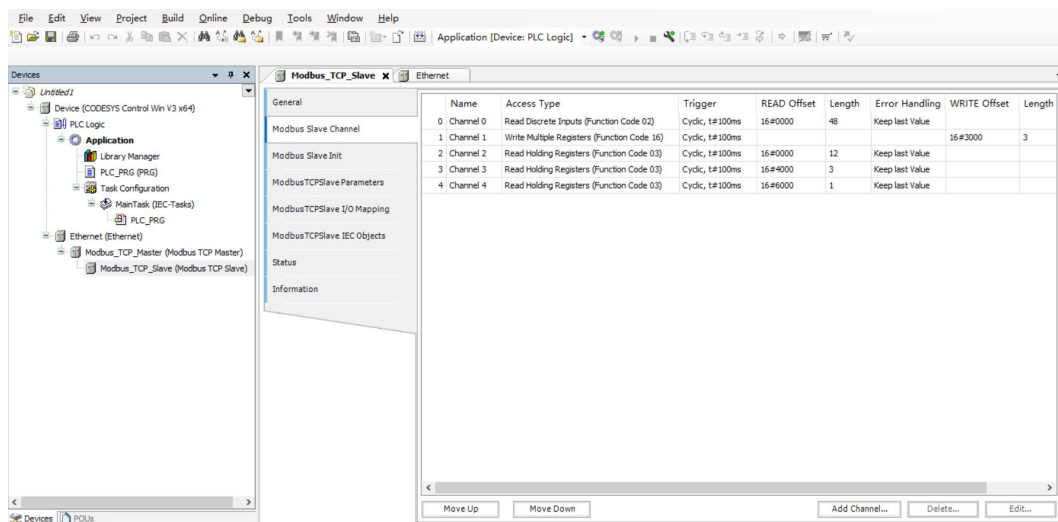


8. Abnormal alarm function for slave module access

- a. The host computer synchronously supports the abnormal alarm function of slave module access. The host computer uses 0x03 function code, offset start address 0x6000, length 1, and can read whether the connected module is abnormal. 1 represents normal and 0 represents abnormal. On the main page on the right side of Modbus TCP Slave, click "Add Channel" to pop up the Channel 4 configuration window. In the Channel 4 configuration window, the access type, that is, the function code, is 03 Read Holding Registers, the write register offset is 0x6000, and the length is 1. After the settings are completed, click "OK", as shown in the figure below.

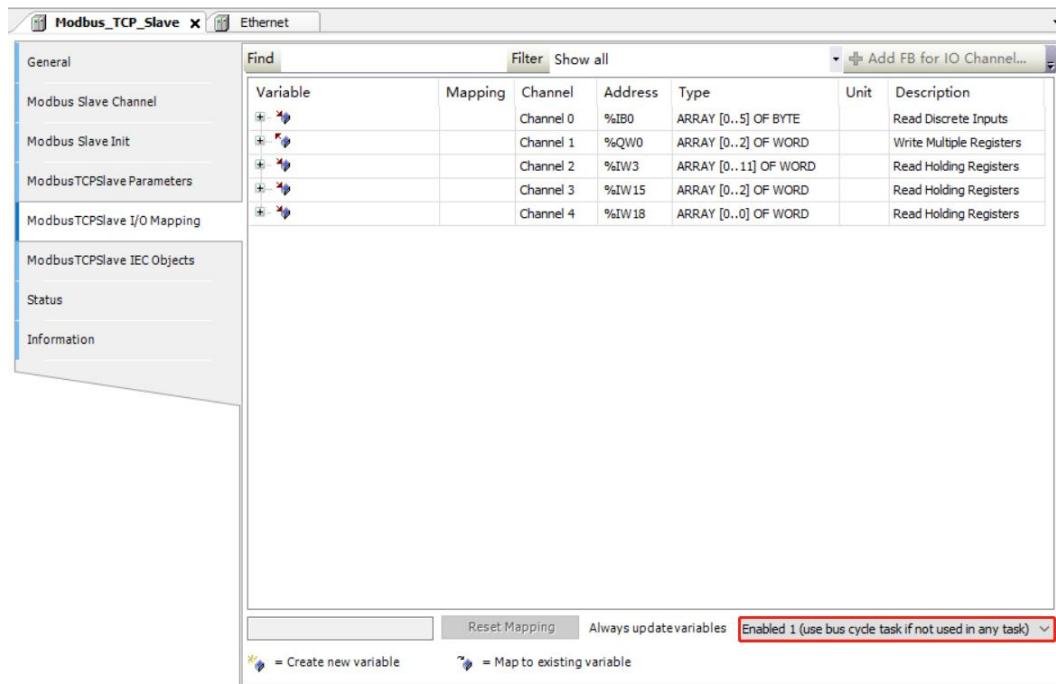


- b. After the configuration is completed, you can view the configuration information on the Modbus slave channel main page, as shown in the figure below.

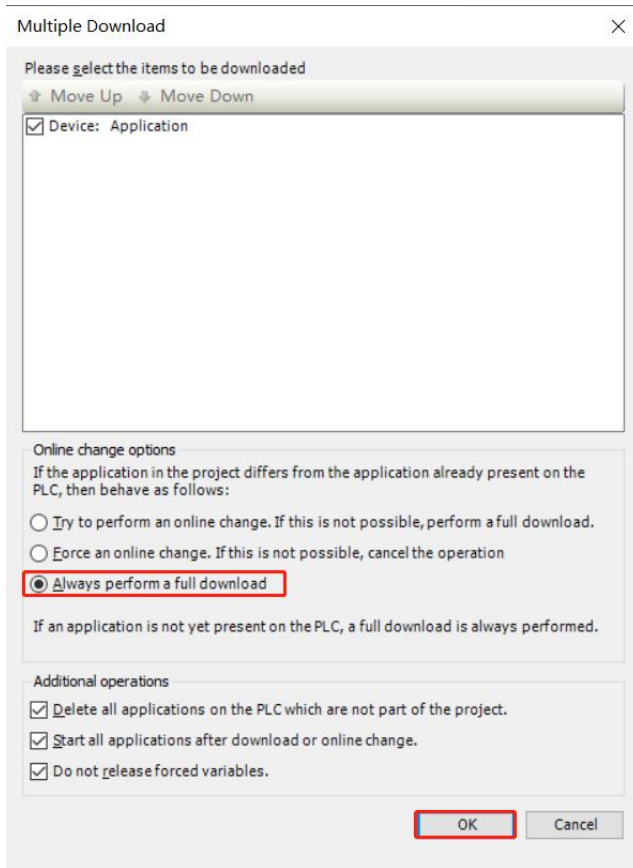


9、IO Verification

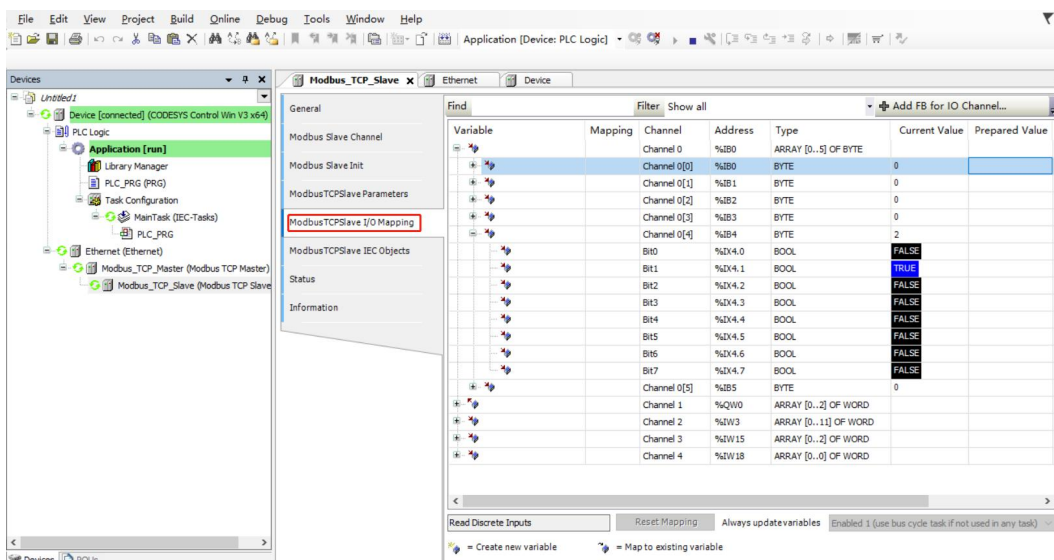
- a. On the main page on the right side of Modbus TCP Slave, click "ModbusTCPSlaveI/O Mapping" to monitor the IO module. The variable options are updated in the lower right corner. Select "Enable 1", as shown in the following figure.



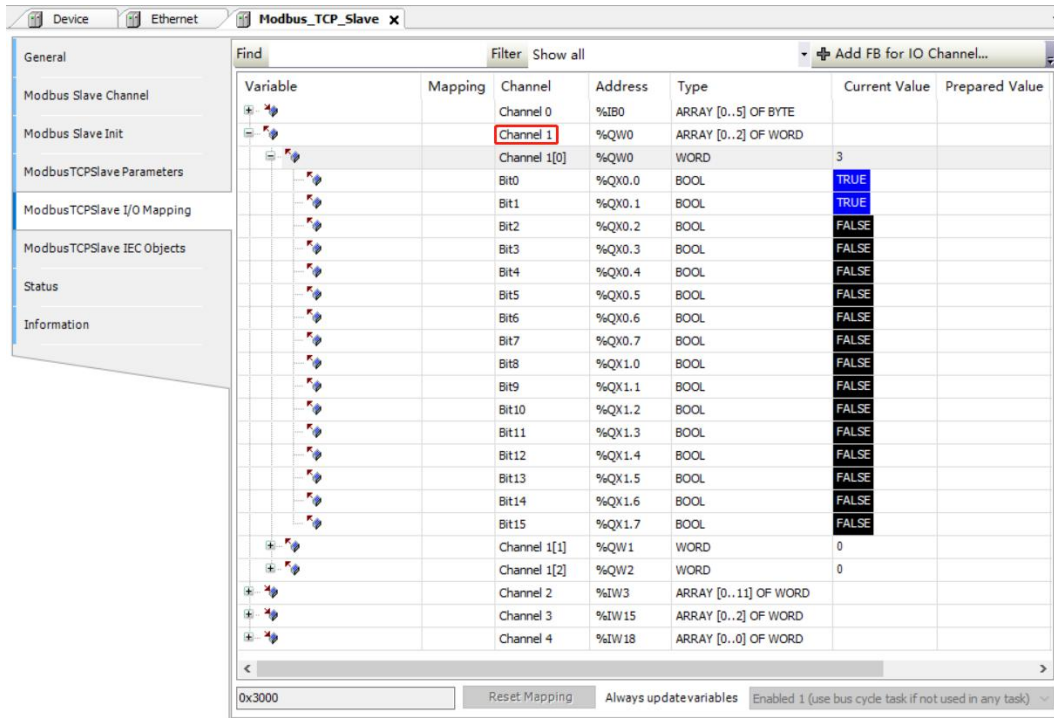
- b. Click "Compile -> Compile" in the menu bar to compile.
- c. Click "Online -> Login" on the menu bar or click the login icon to log in.
- d. Click "Online -> Multiple Downloads" on the menu bar, select "Always perform full download" in the Multiple Downloads window, and click "OK", as shown in the figure below.



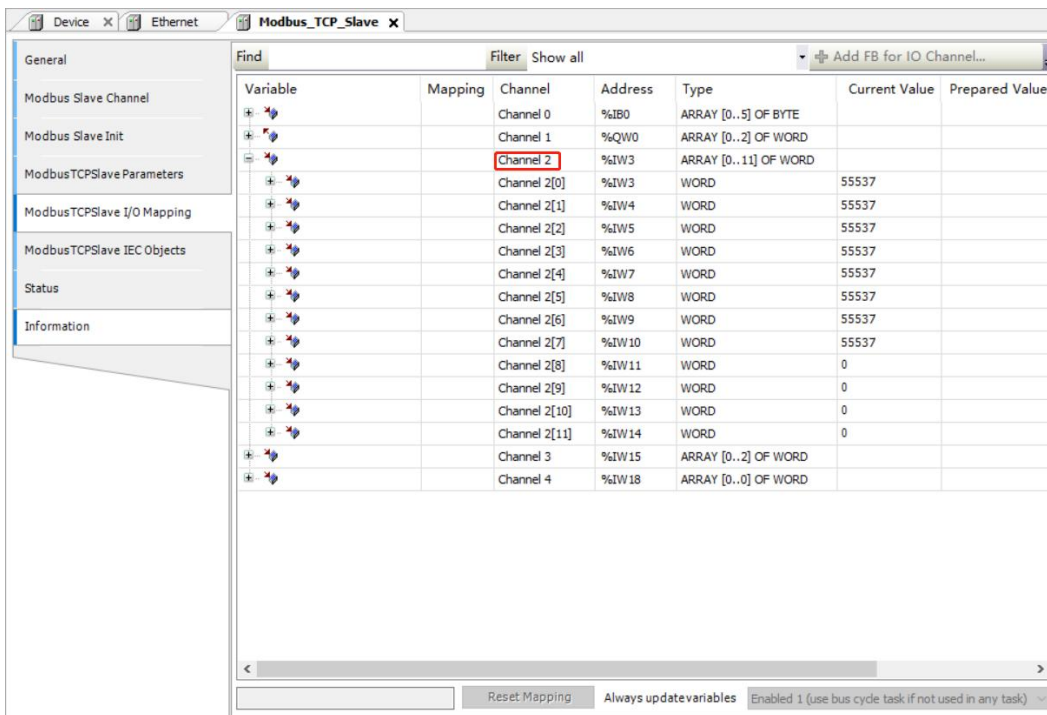
- e. After logging in and downloading, you can monitor the channel values of the IO module in real time on the "ModbusTCPSlave I/O Mapping" page, as shown in the figure below. Channel 0 is the channel monitoring page for the digital input module. Channel 0[0]~[3] corresponds to each DI channel of RIO3200P, and Channel 0[4]~[5] corresponds to each DI channel of RIO1616P.



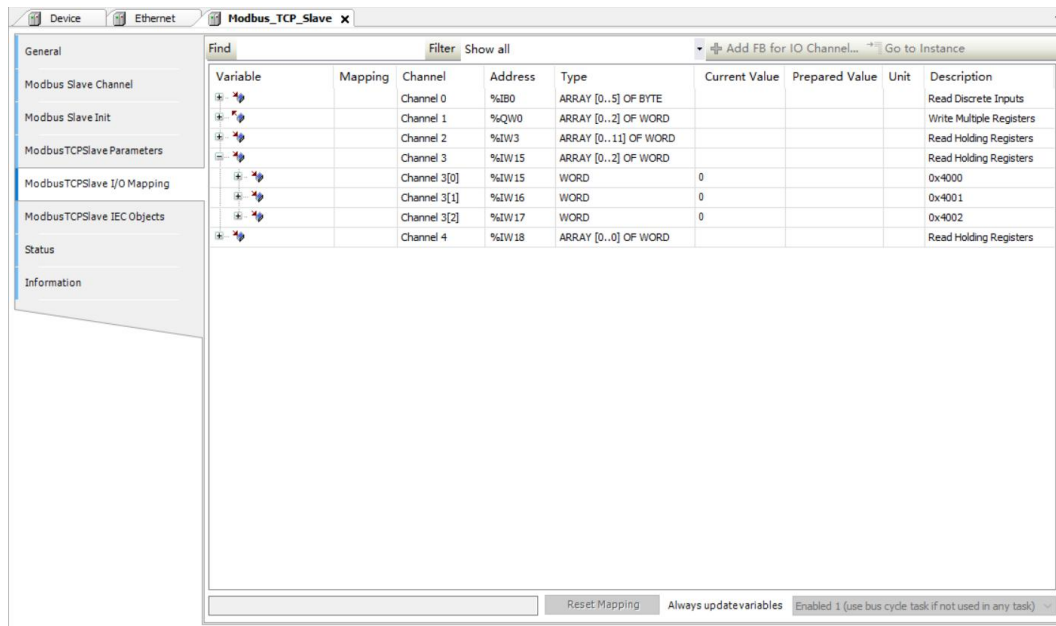
- f. Channel 1 is the channel monitoring page of the digital output module. Channel 1[0]~[1] corresponds to each DO channel of RIO0032P, and Channel 1[2] corresponds to each DO channel of RIO1616P. You can write a value to each channel for forced output, as shown in the following figure.



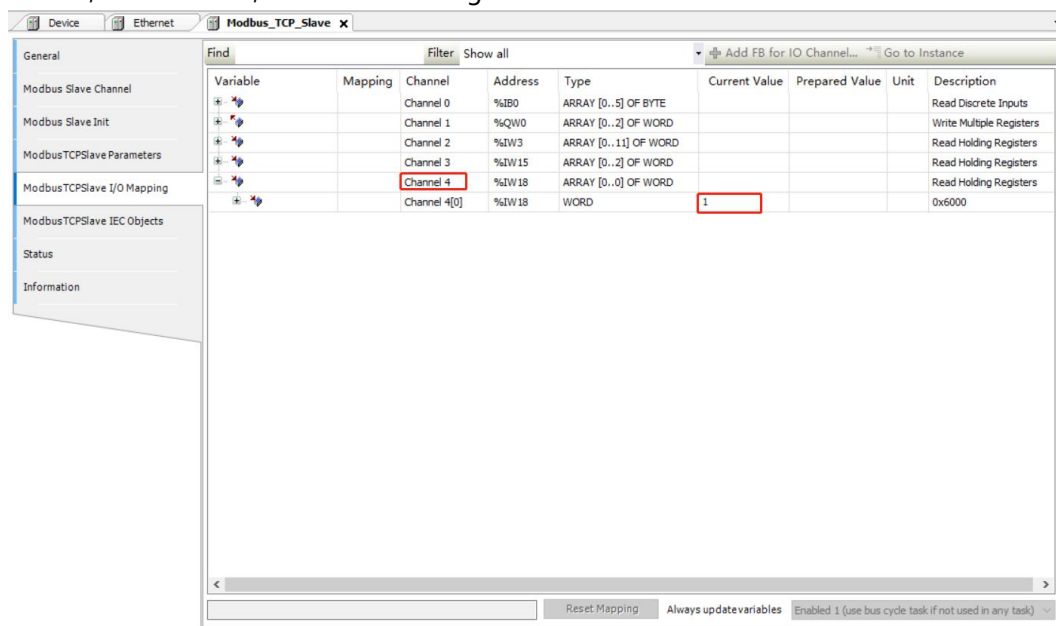
- g. Channel 2 is the channel monitoring page for the analog input module. Channel 2[0]~[7] corresponds to RIO80TM, and Channel 0[8]~[11] corresponds to RIO40AI, as shown in the figure below.



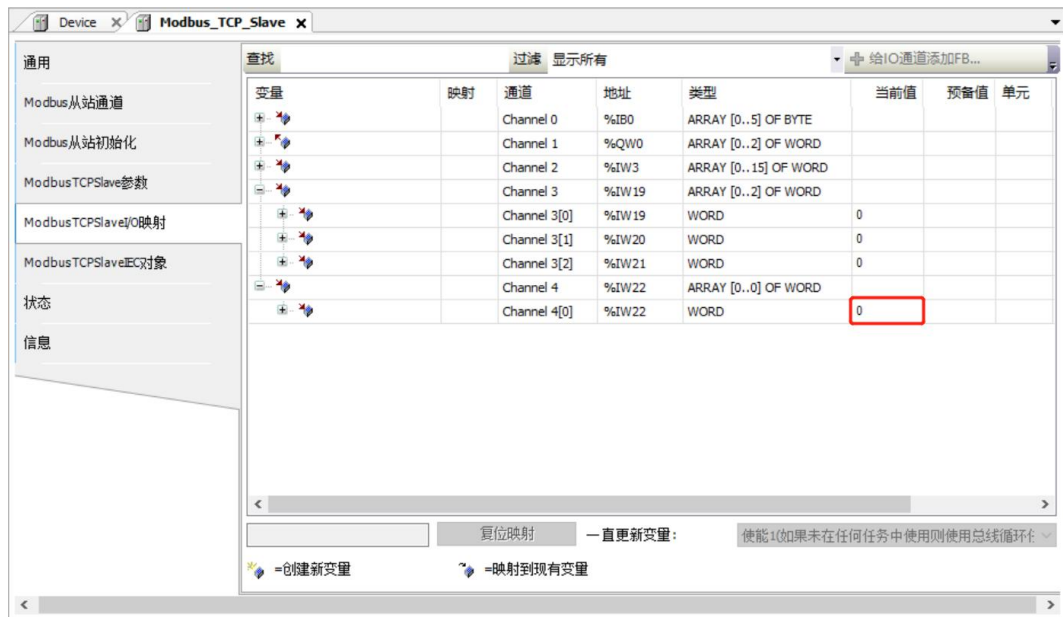
- h. Channel 3 is the channel readback function monitoring page of the digital output module. Channel 3[0]~[1] corresponds to each DO channel of RIO0032P, and Channel 3[2] corresponds to each DO channel of RIO1616P. The value written to each channel can be read, as shown in the following figure.



- i. Channel 4 is the abnormal alarm function for slave module access. When the slave module is normal, the value is 1, as shown in the figure below.



- j. When the slave module is accessed abnormally, the value is 0, as shown in the figure below.



- k. When the slave module is connected abnormally, the output channel maintains the original output state, and the input channel is cleared or maintains the input state, as shown in the figure below.

