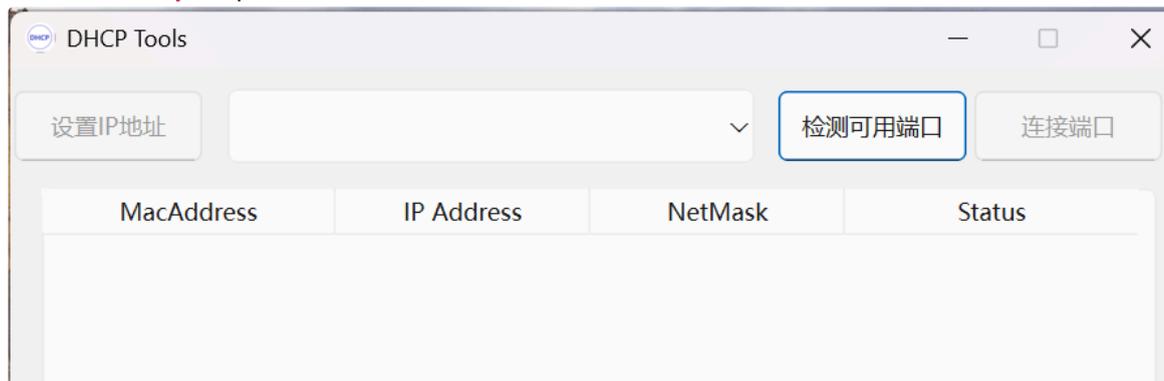


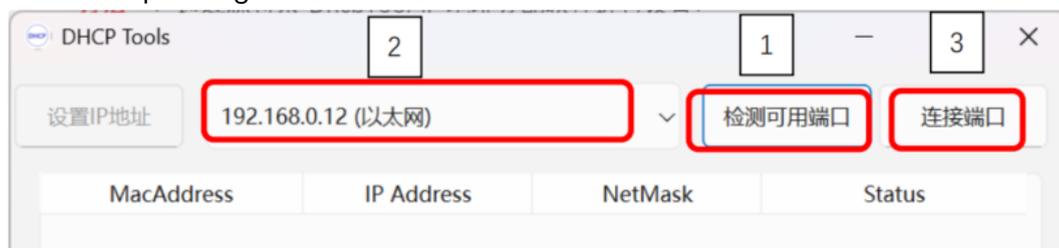
1. Set the IP address of the Sentinel Modbus/TCP IO-Link Master module

Method 1: Using Sentinel “DhcpTool” IP Assignment Software

1. First, download “DhcpTool V1.2” from the Sentinel official website and install it (**Windows 10 or above only**). Open the software.



2. Connect the Sentinel Modbus/TCP IO-Link Master module to the PC, then set the module IP address.
Set the address switches to **0xFF** (set **ADDR_H = F** and **ADDR_L = F** on the right-side window; refer to the manual). This means: **DHCP mode — the device waits continuously for an IP assignment after power-up**.
After setting the switches, power-cycle the module. At this time, the **BUS red LED will flash**. Then click **“Detect Available Port”**, select the local port, and click **“Connect Port”**.
3. The lower area will display the scanned Sentinel Modbus/TCP IO-Link Master module(s), with the corresponding **MAC address** shown in front.

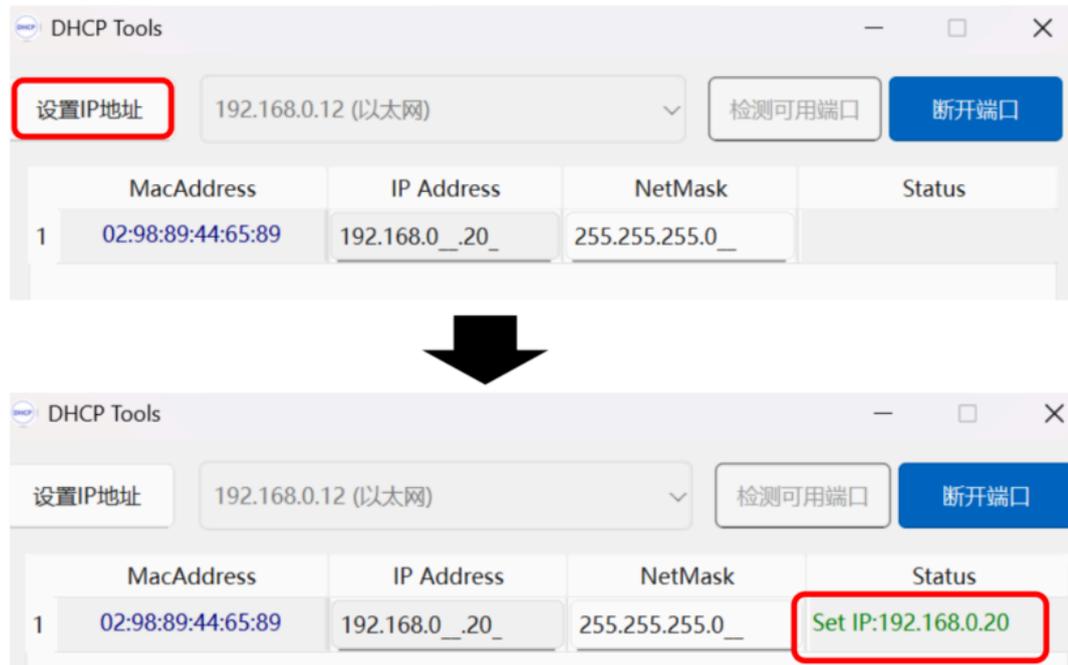


4. Enter the IP address under **“IP Address”**, e.g. **192.168.0.20**, then click **“Set IP Address”** at the upper-left.
A green IP address will appear under **“Status”** for the module, indicating the IP has been set successfully. You may then close the software. After the IP is set, the **BUS red LED will stop flashing**.

After configuration, set the address switches as follows:

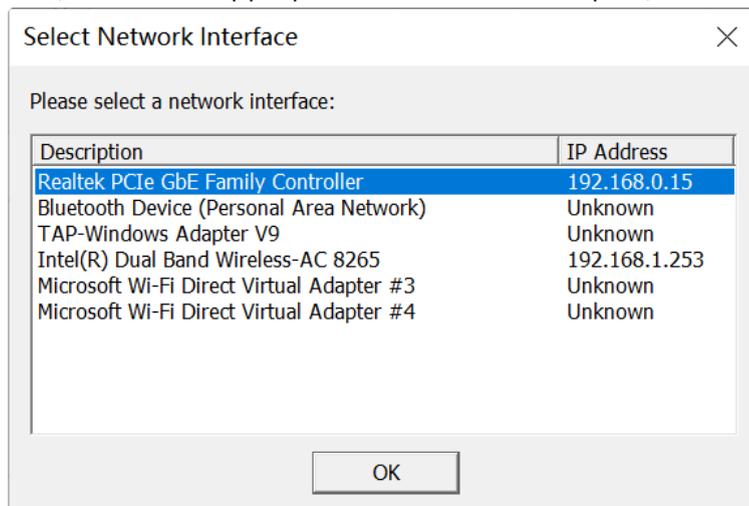
- Set to **0x00**: **Run using the last DHCP-assigned IP address**. After each power cycle, the module will use the previously assigned address (e.g. **192.168.0.20**).
- Set to **0x01 – 0xFE**: The **first three octets** follow the DHCP-assigned subnet; the **fourth octet** is defined by the switch setting.

Example: If **ADDR_H = 1** and **ADDR_L = 4**, the module IP address will be **192.168.0.20**.



Method 2: Using Third-Party IP Configuration Software

1. In this example, use Rockwell/AB “**Bootp-DHCP Tool**”. Before setting, set the module address switches (ADDR_H / ADDR_L on the right-side window; refer to the manual) to **0xFF**, i.e. **DHCP mode — wait continuously for IP assignment after power-up**. After setting the switches, power-cycle the module. The **BUS red LED will flash**. Open the tool, select the appropriate PC network adapter, and click “**OK**”.



2. Double-click the scanned module, enter the IP address to be assigned (**the module IP must be in the same subnet as the PC IP**), then click “**OK**”.

After configuration, the **BUS red LED will stop flashing**. You may then set the address switches to:

- **0x00**: Run using the last DHCP-assigned IP address after each power cycle.
- **0x01 — 0xFE**: First three octets follow the DHCP-assigned subnet; the fourth octet follows the switch value.

BootP DHCP EtherNet/IP Commissioning Tool

File Tools Help

Add Relation Discovery History Clear History

Ethernet Address (MAC)	Type	(hr:min:sec)	#	IP Address	Hostname
02:98:89:44:55:89	DHCP	11:22:08	4		

Entered Relations

Ethernet Address (MAC)	Type	IP Address	Hostname	Description
------------------------	------	------------	----------	-------------

Errors and warnings

Unable to service DHCP request from 02:98:89:44:55:89.

Relations 0 of 256



Add Relation Discovery History

Ethernet Address (MAC)	Type	(hr:min:sec)	#	IP Address	Hostname
02:98:89:44:55:89	DHCP	11:22:08	4		

Ethernet Address (MAC)

New Entry

Server IP Address: 192.168.0.15

Client Address (MAC): 02:98:89:44:55:89

Client IP Address: 0 . 0 . 0 . 0

Hostname:

Description:

OK Cancel



New Entry [X]

Server IP Address: 192.168.0.15

Client Address (MAC): 02:98:89:44:55:89

Client IP Address: 192 . 168 . 0 . 10

Hostname:

Description:

OK Cancel



BootP DHCP EtherNet/IP Commissioning Tool [Min] [Max] [X]

File Tools Help

Add Relation Discovery History Clear History

Ethernet Address (MAC)	Type	hr:min:sec	#	IP Address	Hostname
02:98:89:44:55:89	DHCP	11:38:06	5	192.168.0.10	

Entered Relations

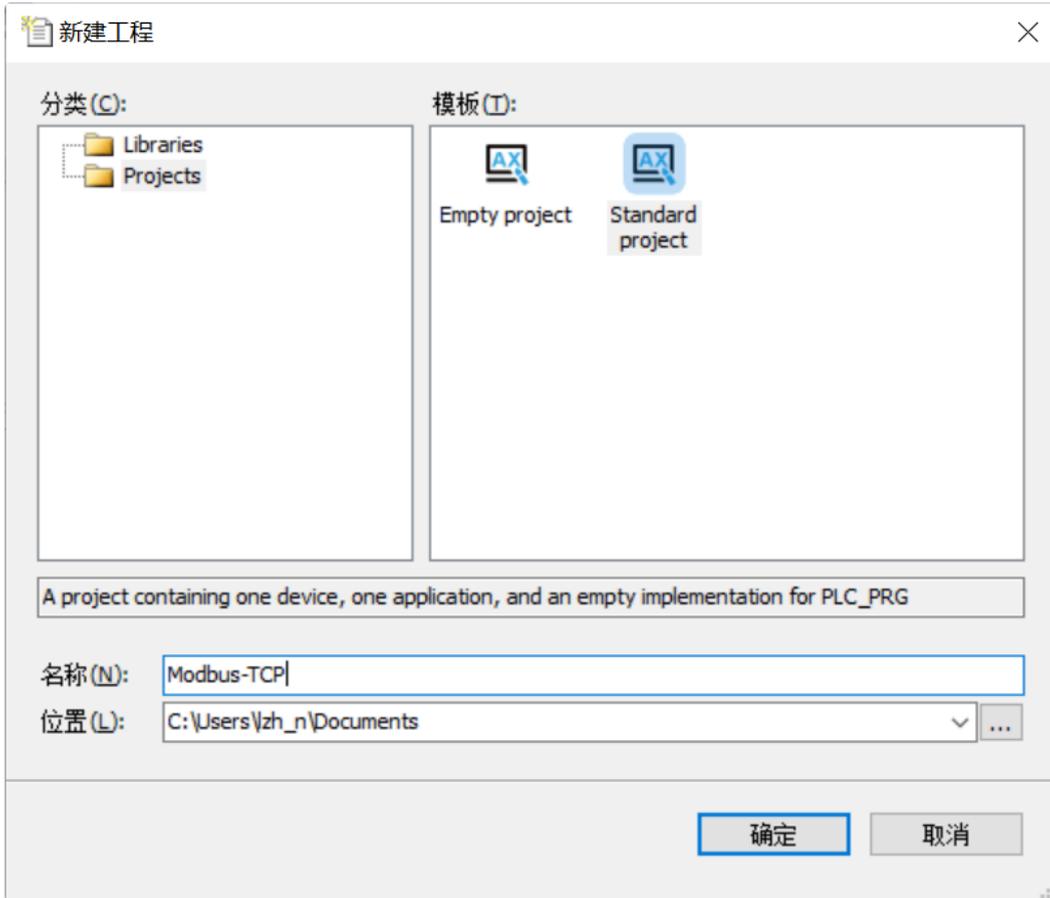
Ethernet Address (MAC)	Type	IP Address	Hostname	Description
02:98:89:44:55:89	DHCP	192.168.0.10		

Errors and warnings: Sent 192.168.0.10 to Ethernet address 02:98:89:44:55:89

Relations: 1 of 256

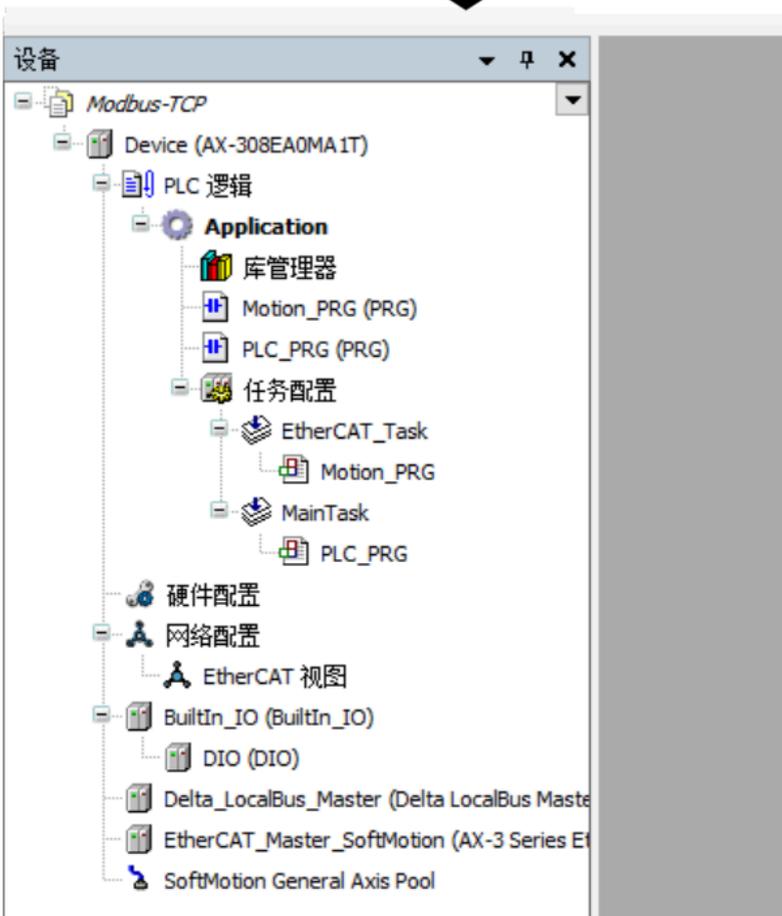
2. Open DIADesigner-AX 1.3 and create a new project

Open **DIADesigner-AX 1.3**, create a **Standard Project**, and customize a **Name**. Click **“OK”**.



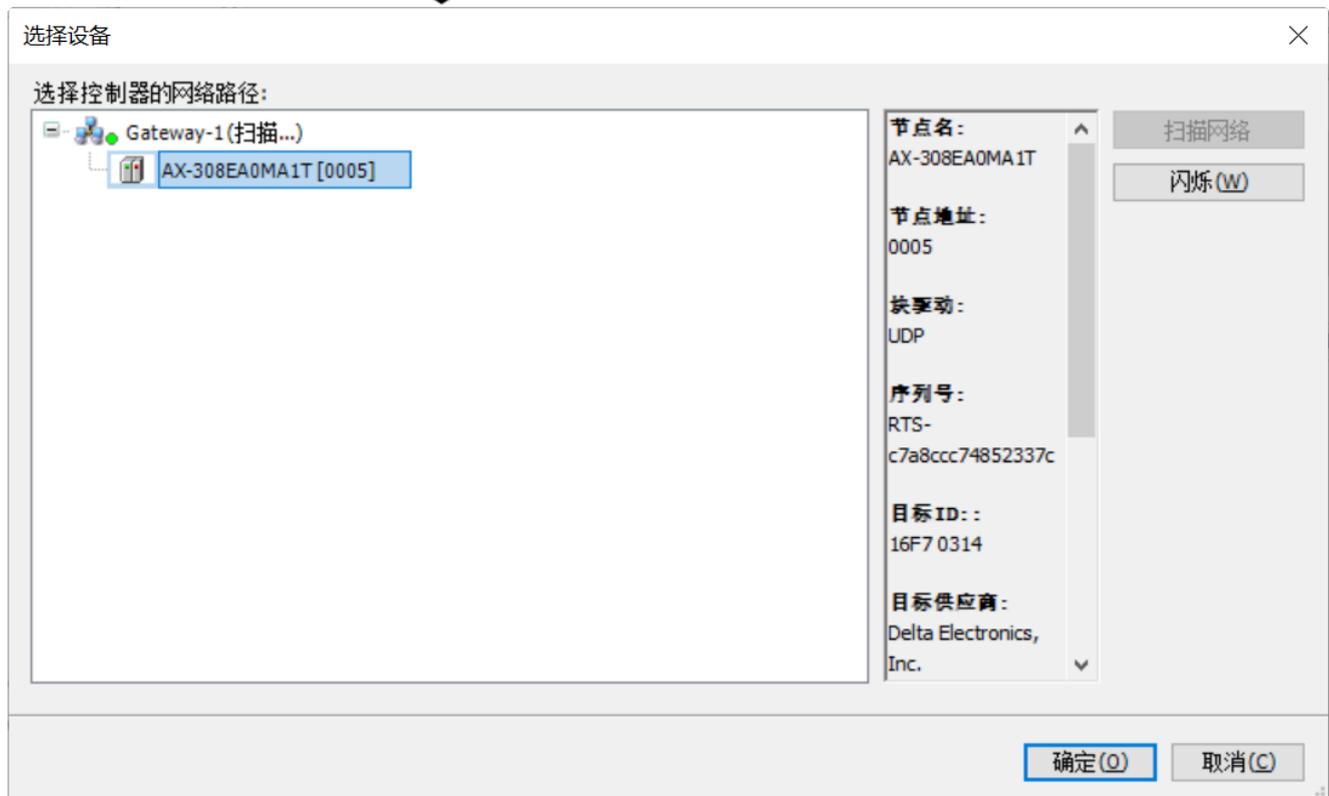
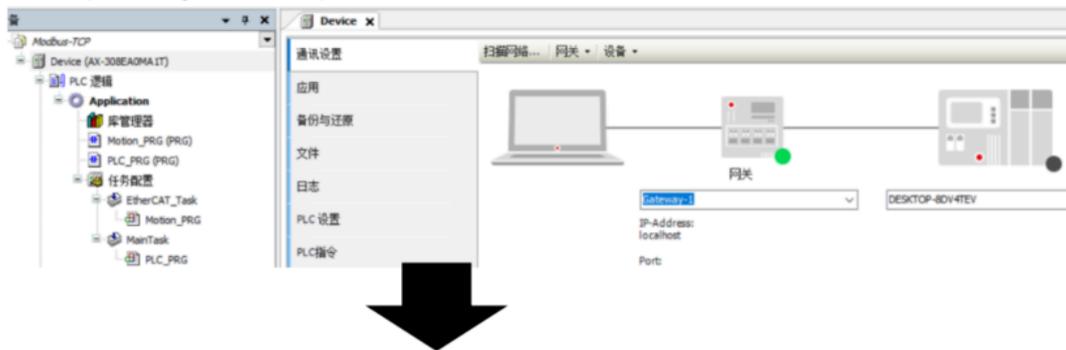
3. Select the corresponding PLC

Select the PLC model and click “OK”.

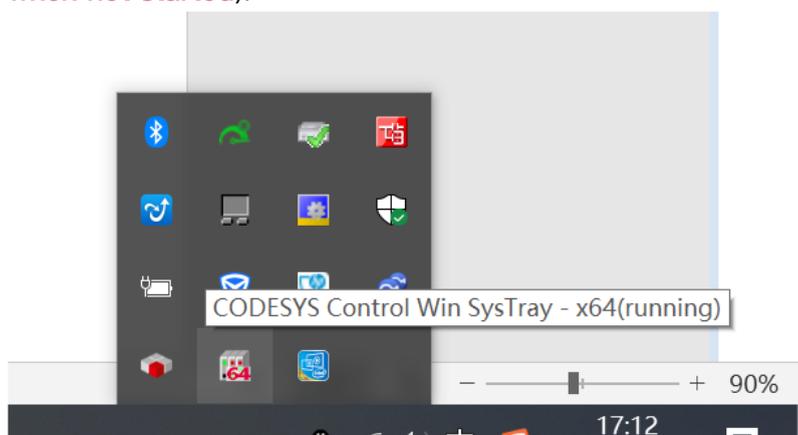


4. Scan the network path

Double-click “Device (AX-308EA0MA1T)”, click “Scan Network” on the right, select the corresponding network path, and click **OK**.

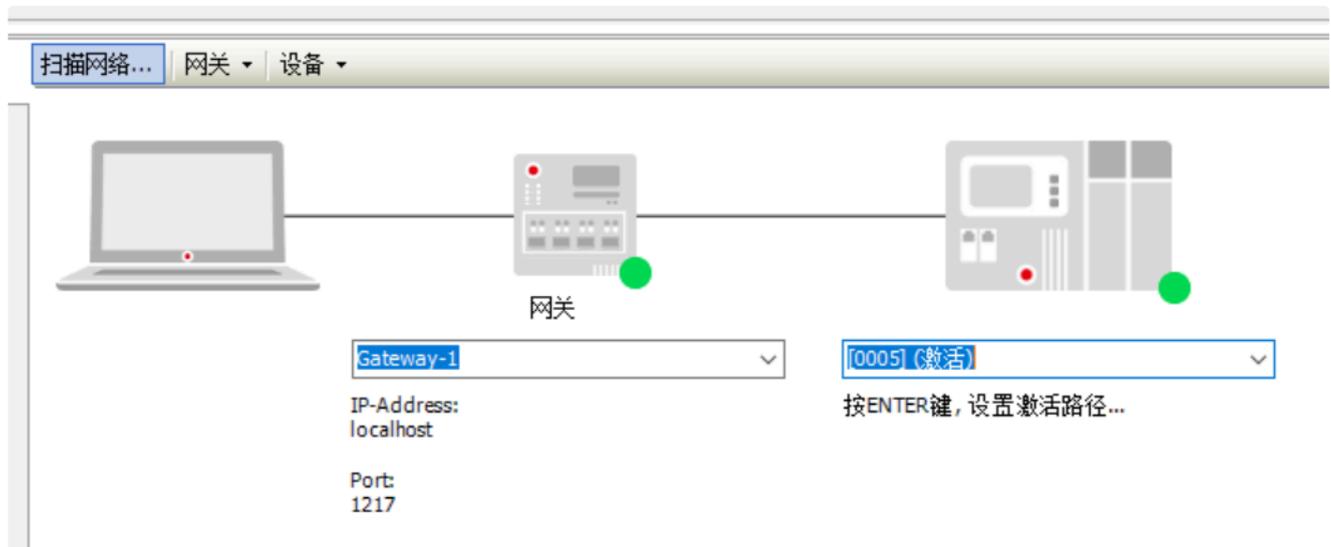


Note: If the network path cannot be scanned, check whether the **Gateway** and **Controller** at the bottom-right of the menu are started. Ensure both are in **Started** status (red when started, gray when not started).



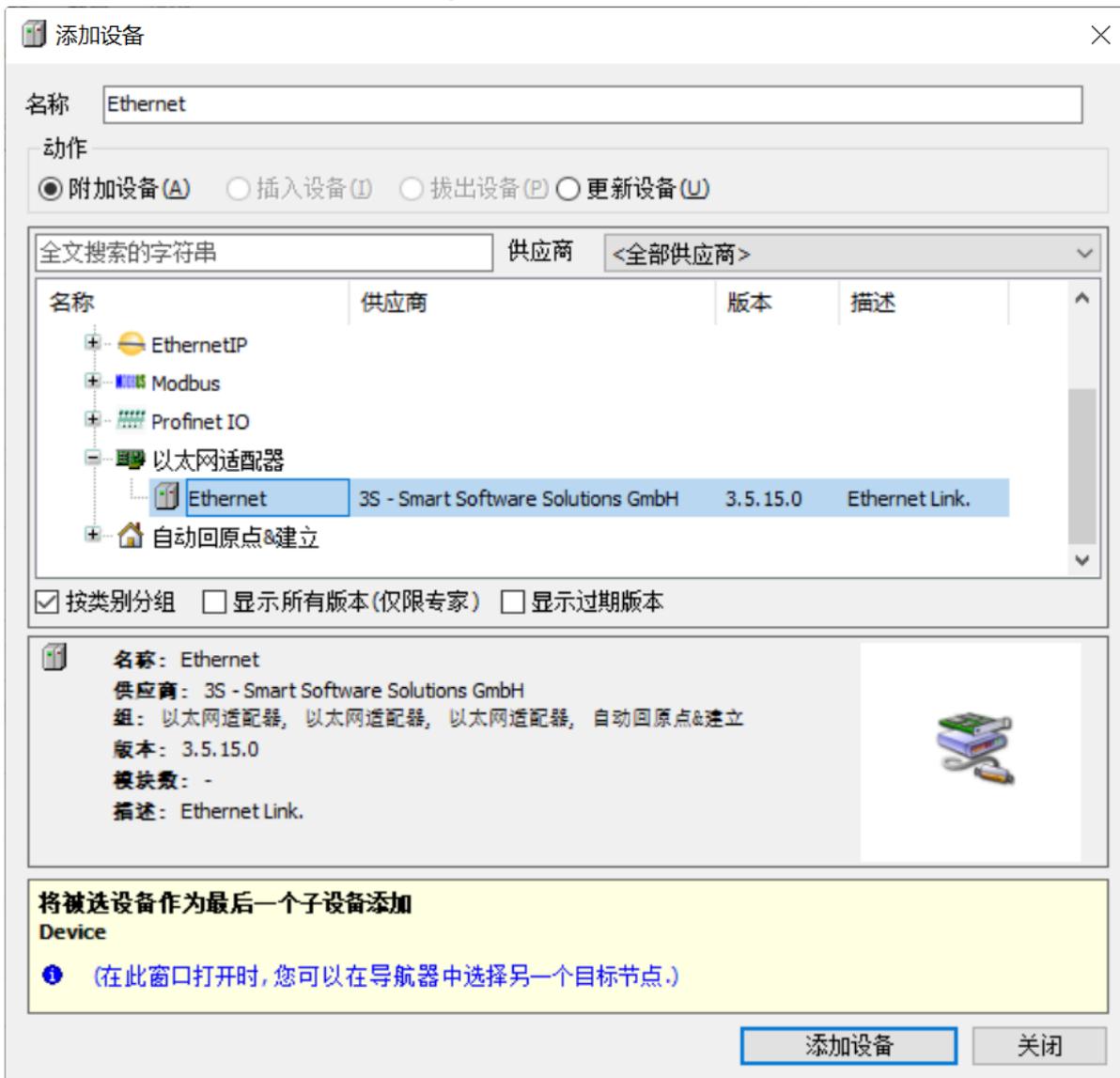
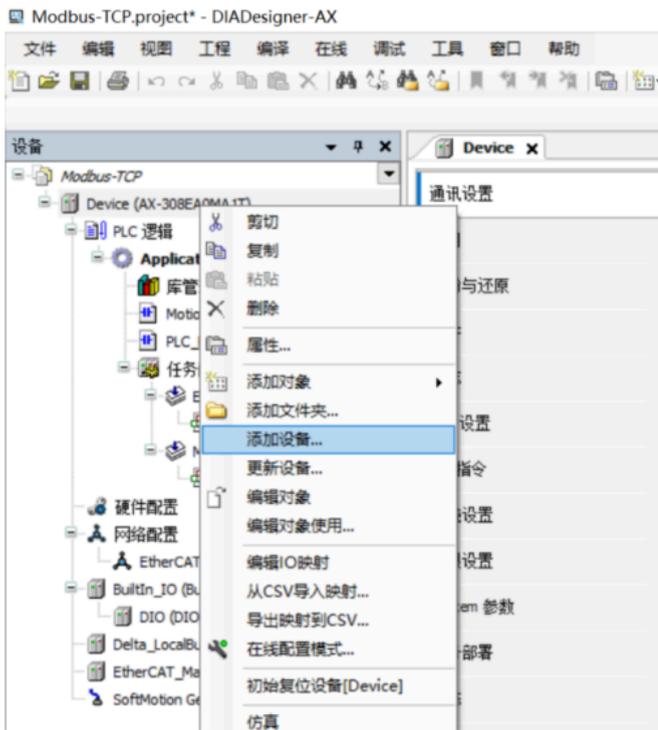
5. Confirm online status

At this point, the **middle green dot** indicates the gateway is running normally, and the **right green dot** indicates the controller has been scanned and is online.



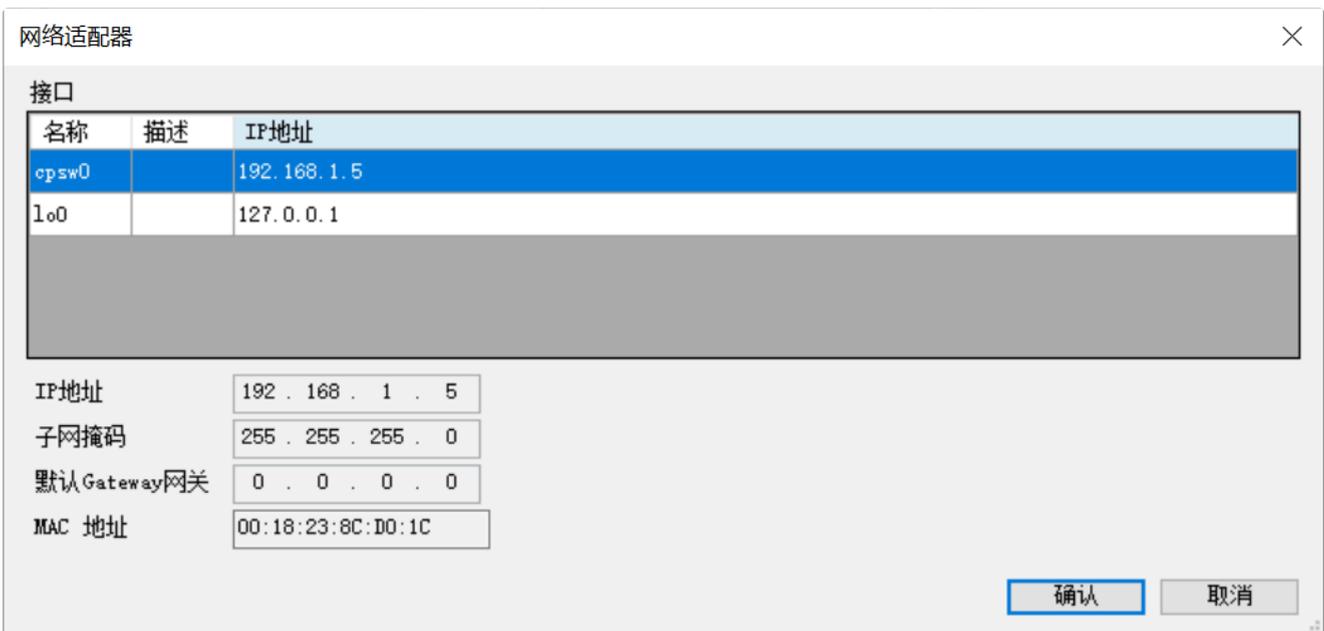
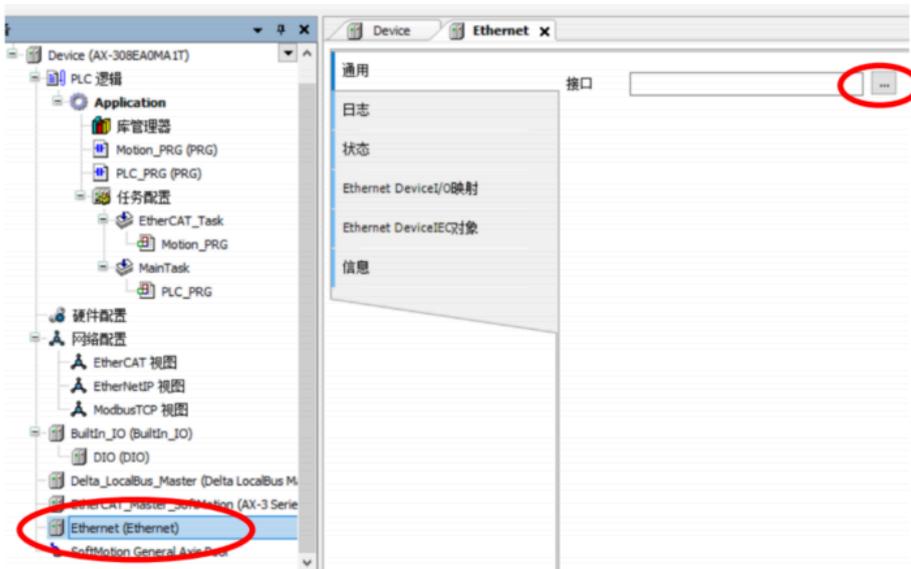
6. Add an Ethernet master

Right-click **“Device (AX-308EA0MA1T)”** → select **“Add Device”** → in the dialog, select the Ethernet adapter **“Ethernet”** → click **“Add Device”**.



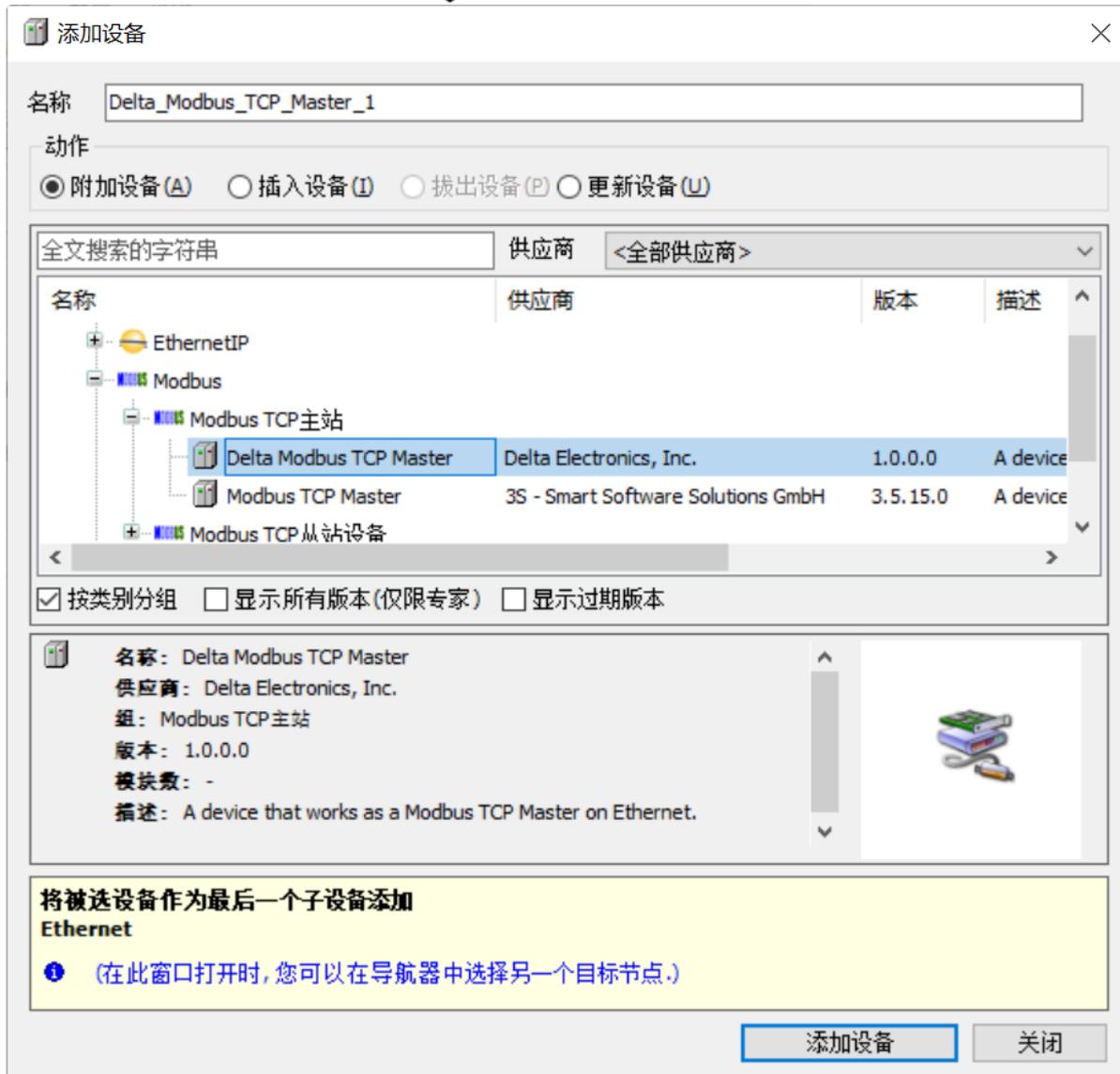
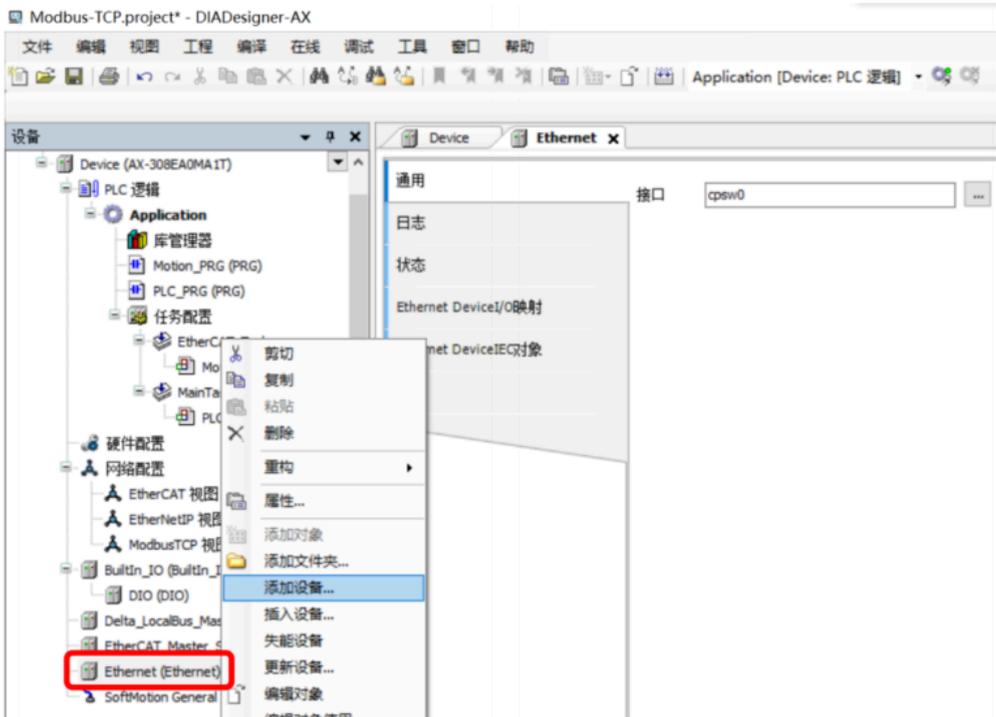
7. Configure the Ethernet interface

Double-click the left navigation item **“Ethernet (Ethernet)”** → click **“General”** → click **“...”** next to **“Interface”** → select the appropriate interface in the dialog → click **“Confirm”**.



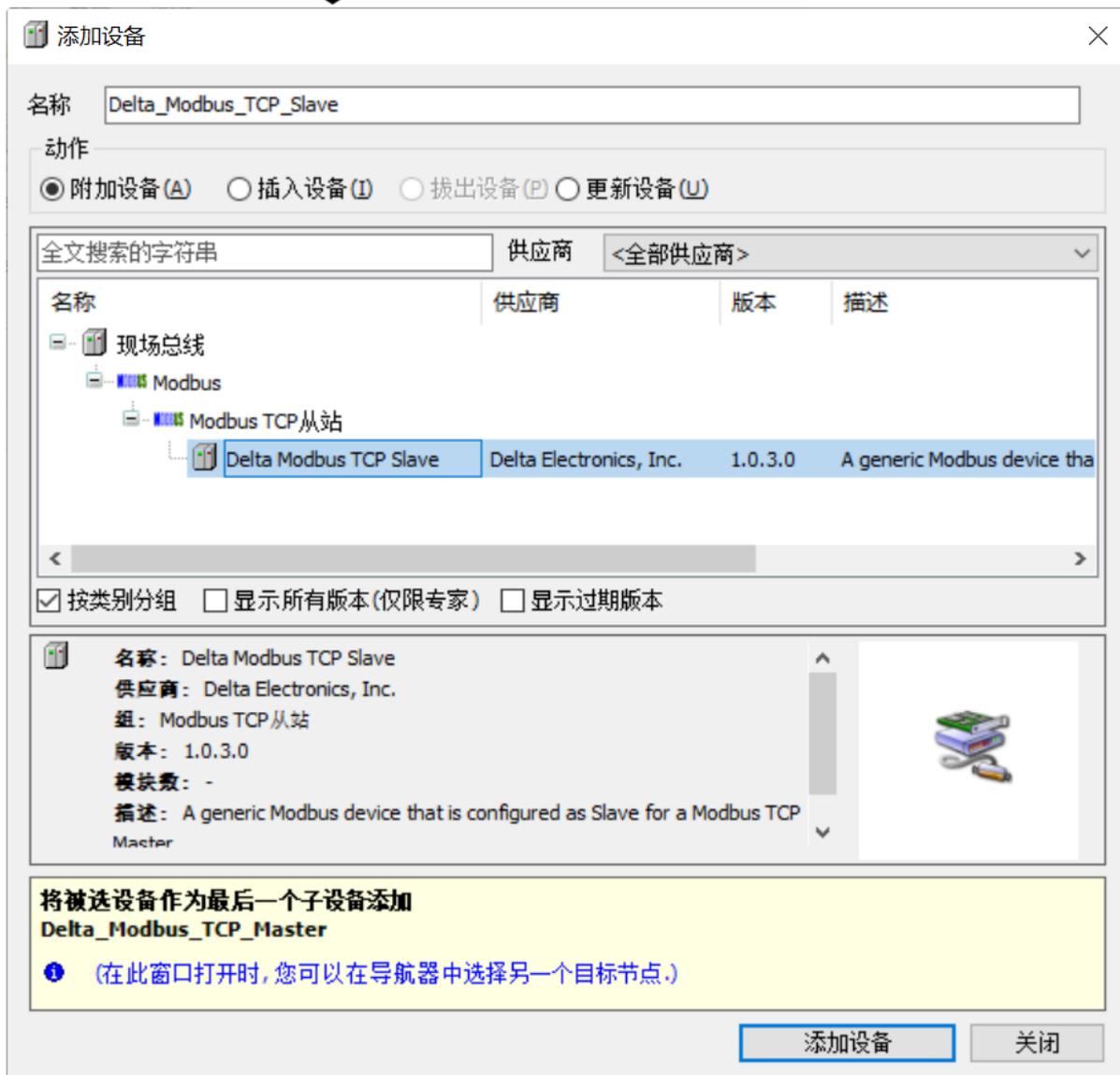
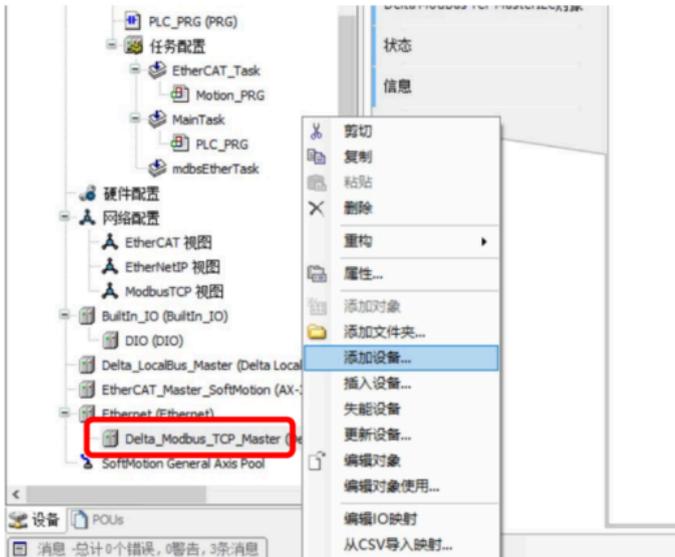
8. Add a Modbus TCP Master

Right-click **“Ethernet (Ethernet)”** → **“Add Device”** → under **Modbus TCP Master**, select **“Delta Modbus TCP Master”** → click **“Add Device”**.



9. Add a Modbus TCP Slave

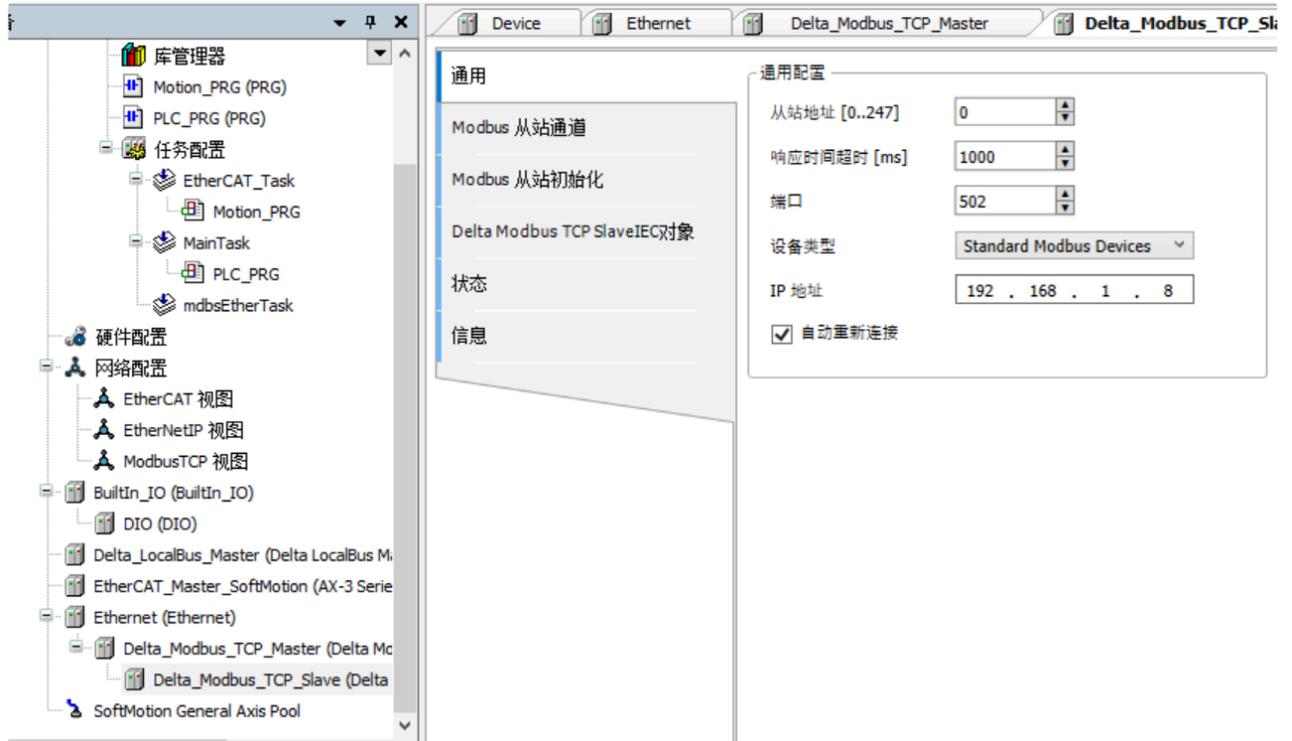
Right-click “Delta Modbus TCP Master” in the left navigation tree → “Add Device” → under Modbus TCP Slave, select “Delta Modbus TCP Slave” → click “Add Device”.



10. Configure Modbus TCP Slave parameters

Double-click “**Modbus TCP Slave**” in the left navigation tree. In the right main menu, click “**General**” and set the parameters as shown below:

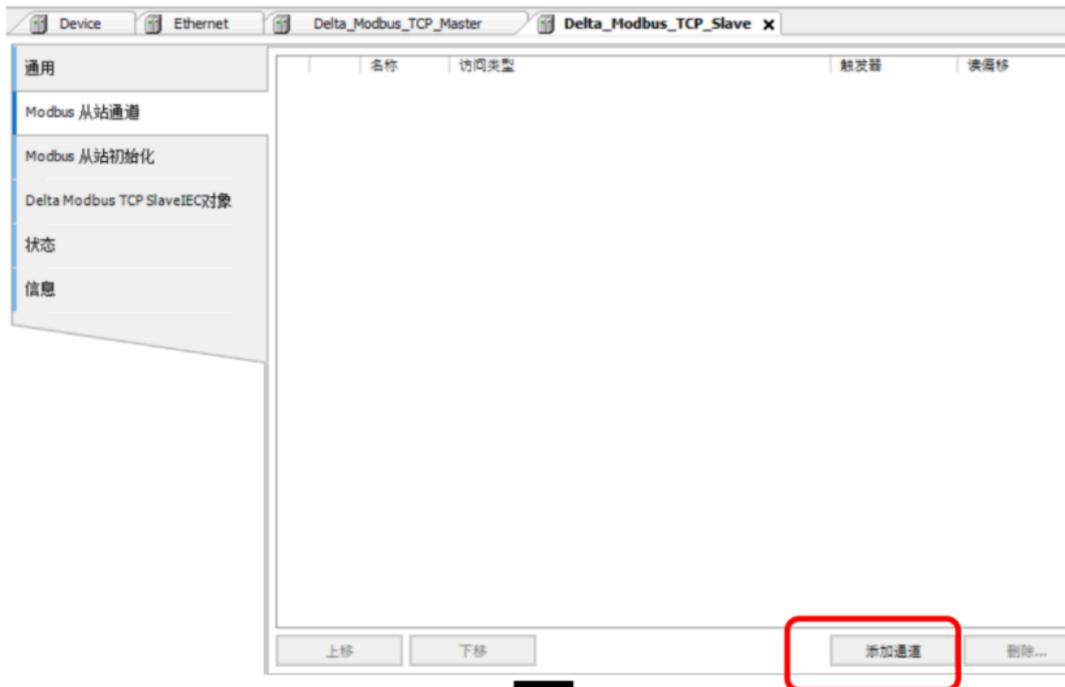
- Slave IP address: **192.168.0.8**
- Response time: **1000**
- Port: **502**



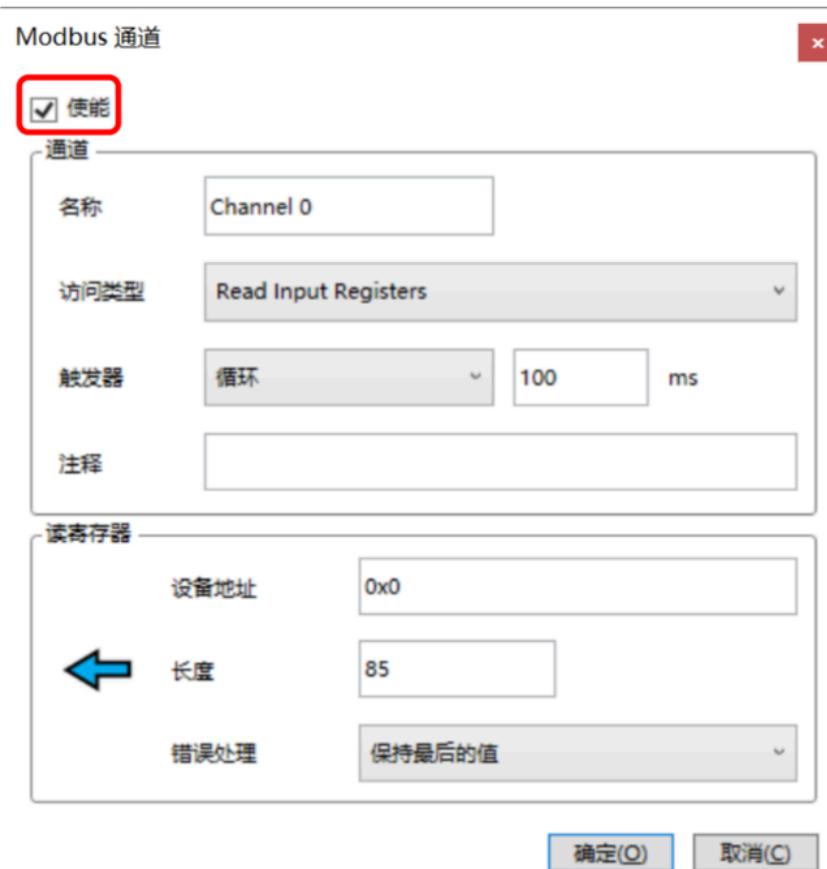
11. Create Channel 0 for reading input registers

Click “**Modbus Slave Channels**” → “**Add Channel**”.

- Display name: **channel 0**
 - If reading input data: select “**Read Input Registers**”
 - Device address: **0** (start reading from address 0)
 - Length: **85** (read 85 words; maximum per channel is 100)
 - Enable: check “**Enable**” at the top
- Click “**OK**”.



Read Input registers



12. Add another channel to read all input words

For the Sentinel Modbus/TCP IO-Link Master:

- Input data occupies **Word[0]–Word[132], 133 words total** (see Appendix for mapping). Because one channel can read a maximum of 100 words, a single channel cannot read all input words. Add a second channel as follows:
- Access type: **Read Input Registers**
- Device address: start from **85**, i.e. **16#55 (0x55)**
- Length: remaining **48** words

Modbus 通道 ✕

使能

通道

名称	<input type="text" value="Channel 1"/>
访问类型	<input type="text" value="Read Input Registers"/>
触发器	<input type="text" value="循环"/> <input type="text" value="100"/> ms
注释	<input type="text"/>

读寄存器

设备地址	<input type="text" value="0x55"/>
← 长度	<input type="text" value="48"/>
错误处理	<input type="text" value="保持最后的值"/>

13. Create channels for writing output registers

Output data occupies **Word[0]–Word[127], 128 words total**. Since one channel supports a maximum of 100 words, you must create **two** channels for writing holding registers:

- **Channel 2**: write output data for **ports 1–4**
 - **Channel 3**: write output data for **ports 5–8**
- Configuration is shown below.



使能

通道

名称	<input type="text" value="Channel 2"/>
访问类型	<input type="text" value="Write Multiple Registers"/>
触发器	<input type="text" value="循环"/> <input type="text" value="100"/> ms
注释	<input type="text"/>

写寄存器

	设备地址	<input type="text" value="0x0"/>
	长度	<input type="text" value="64"/>

确定(O)

取消(C)



使能

通道

名称	<input type="text" value="Channel 3"/>
访问类型	<input type="text" value="Write Multiple Registers"/>
触发器	<input type="text" value="循环"/> <input type="text" value="100"/> ms
注释	<input type="text"/>

写寄存器

	设备地址	<input type="text" value="0x40"/>
	长度	<input type="text" value="64"/>

确定(O)

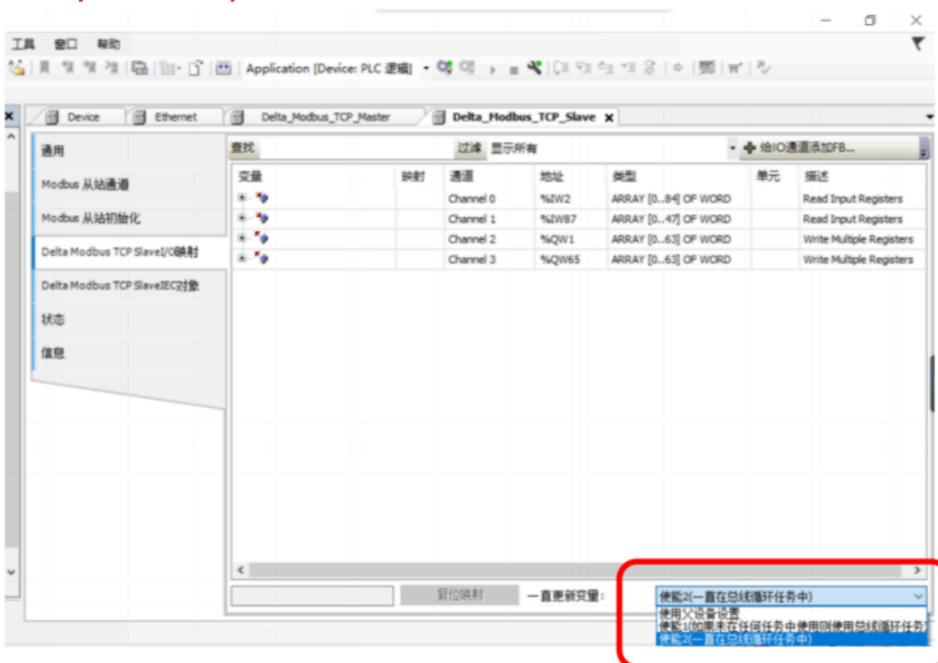
取消(C)





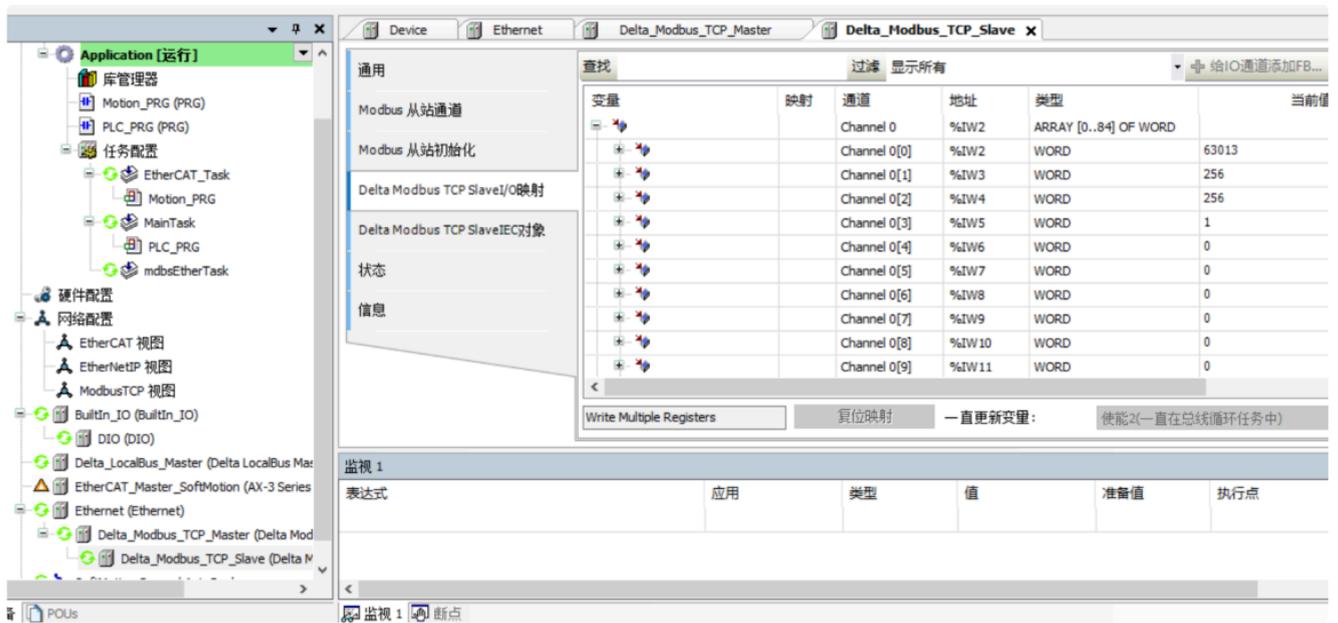
14. Enable continuous variable update

Go to “Delta Modbus TCP Slave I/O Mapping” → set “Always Update Variables” to “Enable 2 (Always in Bus Cycle Task)”.



15. Compile, download, and run

Perform [Compile] → [Login To] → [Yes, Confirm Download] → [Start] to monitor input/output data.



Appendix

1) IO-Link Process Data Input (Occupies 133 Words)

Supported function code: **F04 (Read Input Registers)**

Modbus引用编号 WORD	Modbus数据地址 WORD	IO-LINK字节 BYTE	描述																		
30001	0	Byte0	8位代表8个端口当前IO-LINK状态: 1正常通信, 0未通信 <table border="1"> <tr> <td>位</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td>端口</td> <td>C8</td> <td>C7</td> <td>C6</td> <td>C5</td> <td>C4</td> <td>C3</td> <td>C2</td> <td>C1</td> </tr> </table>	位	7	6	5	4	3	2	1	0	端口	C8	C7	C6	C5	C4	C3	C2	C1
		位	7	6	5	4	3	2	1	0											
端口	C8	C7	C6	C5	C4	C3	C2	C1													
Byte1	8位代表8个端口IO-LINK断线记录: 1有过断线, 0未有过断线 <table border="1"> <tr> <td>位</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> <tr> <td>端口</td> <td>C8</td> <td>C7</td> <td>C6</td> <td>C5</td> <td>C4</td> <td>C3</td> <td>C2</td> <td>C1</td> </tr> </table>	位	7	6	5	4	3	2	1	0	端口	C8	C7	C6	C5	C4	C3	C2	C1		
位	7	6	5	4	3	2	1	0													
端口	C8	C7	C6	C5	C4	C3	C2	C1													
30002	1	Byte2	C1端口断线次数																		
		Byte3	C2端口断线次数																		
30003	2	Byte4	C3端口断线次数																		
		Byte5	C4端口断线次数																		
30004	3	Byte6	C5端口断线次数																		
		Byte7	C6端口断线次数																		
30005	4	Byte8	C7端口断线次数																		
		Byte9	C8端口断线次数																		
30006 - 30021	5 - 20	Byte10 - Byte41	C1端口过程输入数据 (32Byte)																		
30022 - 30037	21 - 36	Byte42 - Byte73	C2端口过程输入数据 (32Byte)																		
30038 - 30053	37 - 52	Byte74 - Byte105	C3端口过程输入数据 (32Byte)																		
30054 - 30069	53 - 68	Byte106 - Byte137	C4端口过程输入数据 (32Byte)																		
30070 - 30085	69 - 84	Byte138 - Byte169	C5端口过程输入数据 (32Byte)																		
30086 - 30101	85 - 100	Byte170 - Byte201	C6端口过程输入数据 (32Byte)																		
30102 - 30117	101 - 116	Byte202 - Byte233	C7端口过程输入数据 (32Byte)																		
30118 - 30133	117 - 132	Byte234 - Byte265	C8端口过程输入数据 (32Byte)																		

2) IO-Link Process Data Output (Occupies 128 Words)

Supported function codes:

- **F03 (Read Holding Registers)**

- **F16** (Write Holding Registers)
- **F23** (Read/Write Holding Registers)

Modbus引用编号 WORD	Modbus数据地址 WORD	IO-LINK字节 BYTE	描述
40001 - 40016	0 - 15	Byte0 - Byte31	C1端口过程输出数据 (32Byte)
40017 - 40032	16 - 31	Byte32 - Byte63	C2端口过程输出数据 (32Byte)
40033 - 40048	32 - 47	Byte64 - Byte95	C3端口过程输出数据 (32Byte)
40049 - 40064	48 - 63	Byte96 - Byte127	C4端口过程输出数据 (32Byte)
40065 - 40080	64 - 79	Byte128 - Byte159	C5端口过程输出数据 (32Byte)
40081 - 40096	80 - 95	Byte160 - Byte191	C6端口过程输出数据 (32Byte)
40097 - 40112	96 - 111	Byte192 - Byte223	C7端口过程输出数据 (32Byte)
40113 - 40128	112 - 127	Byte224 - Byte255	C8端口过程输出数据 (32Byte)