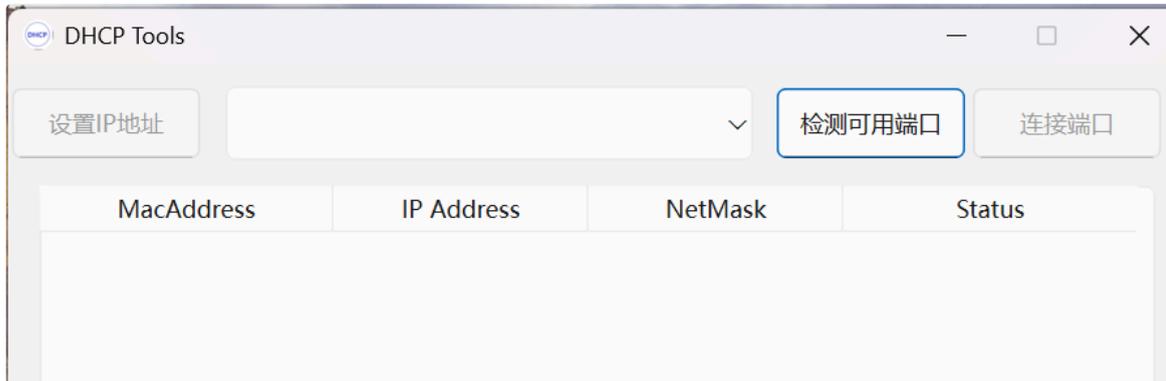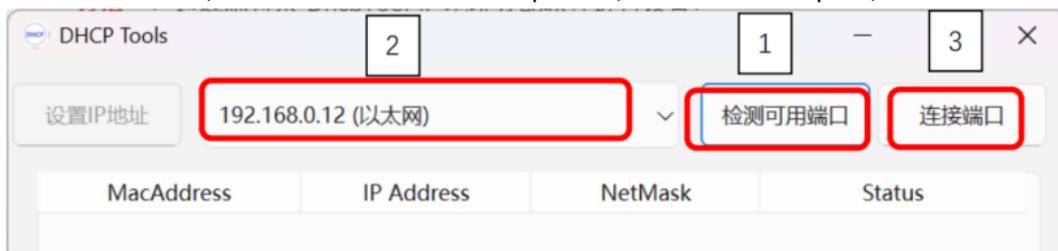1、Set the IP address of the Sentinel Modbus TCP IO-LINK master module.

Method 1: Set the IP address via Sentinel "DhcpTool" IP assignment software：
① First, download "DhcpTool V1.2" from the Sentinel official website and install it (Windows 10 or above only). Then open the software.

② Connect the Sentinel Modbus TCP IO-LINK master module to the PC. Then set the module IP rotary switches to "0XFF" (set ADDR_H = F and ADDR_L = F on the right side; refer to the manual), which means: DHCP mode — after power-on, the module keeps waiting for IP assignment.
After setting the switches, power-cycle the module. At this time, the module BUS red LED will flash.
In the software, click "Detect available ports", find the local port, then click "Connect port".


③ The scanned Sentinel Modbus TCP IO-LINK master module will appear in the lower area; the front field corresponds to the MAC address.
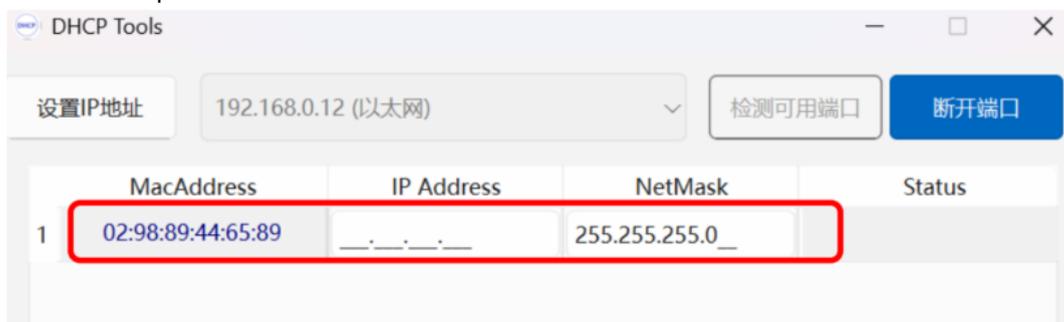
④ Enter the IP address under "IP Address", e.g. "192.168.0.20", then click "Set IP Address" at the upper left. After the setting is completed, a green IP address will be displayed under "Status" for that module, indicating the IP has been successfully configured. You can then close the software.
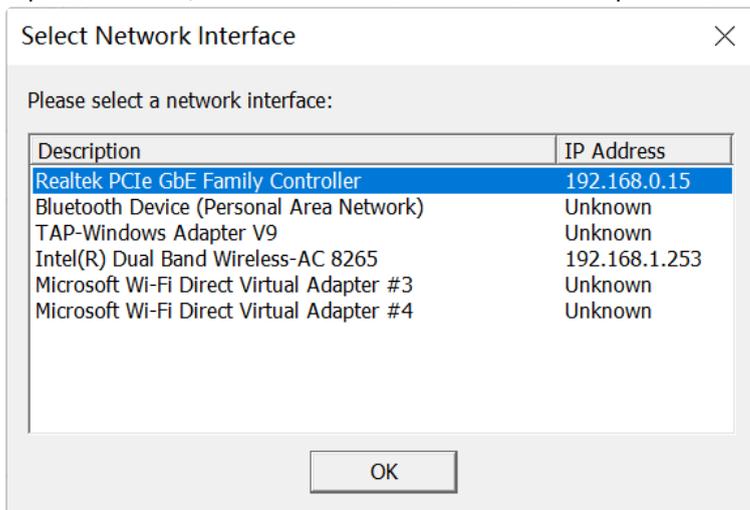After the IP is set, the module BUS red LED will stop flashing.

- You can set the IP rotary switches to 0X00, meaning: Run using the last DHCP-assigned IP address. Then every time the module is powered off/on, it will use the previously assigned address (i.e. 192.168.0.20).

- Alternatively, the rotary switches can be set to 0x01 — 0xFE. In this case, the first three octets follow the DHCP-assigned subnet, and the fourth octet follows the rotary switch value (for example, set ADDR_H = 1 and ADDR_L = 4, then the module IP address will also be 192.168.0.20).
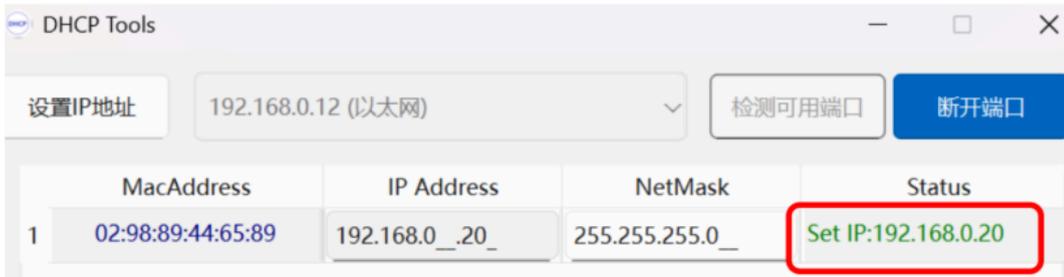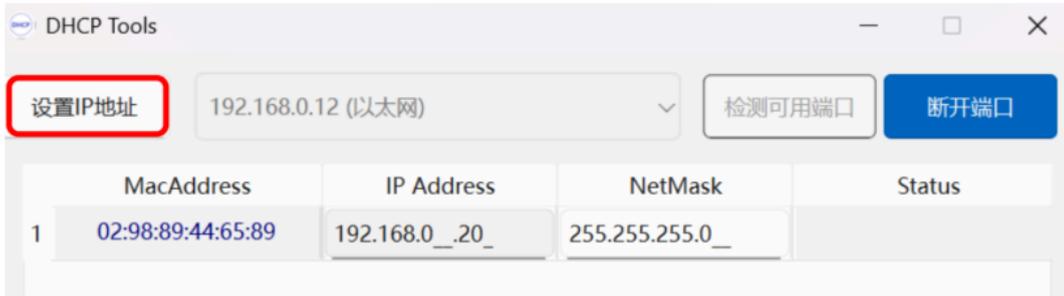
Method 2: Set the IP address via third-party configuration software:

① In this example, AB "Bootp-DHCP Tool" is used. Before setting, set the module IP rotary switches (ADDR_H and ADDR_L on the right side; refer to the manual) to 0XFF, meaning: DHCP mode — after power-on, the module keeps waiting for IP assignment.

After setting the switches, power-cycle the module. At this time, the module BUS red LED will flash. Open the tool, select the correct network adapter on the PC, then click "OK".

② Double-click the scanned module, enter the IP address you want to set (the IP must be in the same subnet as the PC IP), then click "OK". After configuration, the module BUS red LED will stop flashing.

You can set the IP rotary switches to 0X00 to run with the last DHCP-assigned IP after each power cycle. Alternatively, set them to 0x01 — 0xFE, where the first three octets follow the DHCP-assigned subnet, and the fourth octet follows the rotary switch value.

BootP DHCP EtherNet/IP Commissioning Tool

File Tools Help

Add Relation

Clear History

Discovery 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					

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

Ethernet Address (MAC)

2、In this example, an Inovance EVO521 PLC is used to connect one Sentinel Modbus TCP IO–LINK master (ELMT–8IOL–0001). Meanwhile, an 8–channel 4—20 mA analog input sub–station (SIOL–M12–8AI) is connected to Port 2.

In this case, you need to enable the IO–LINK function on Port 2 via rotary switches. According to the manual, PORT_H and PORT_L control enabling/disabling the 8 IO–Link ports.

If only Port 2 is enabled and all other ports are disabled, the corresponding binary is 2#0000 0010, which equals 16#02 in hexadecimal. Therefore, set PORT_H = 0 and PORT_L = 2, then power–cycle
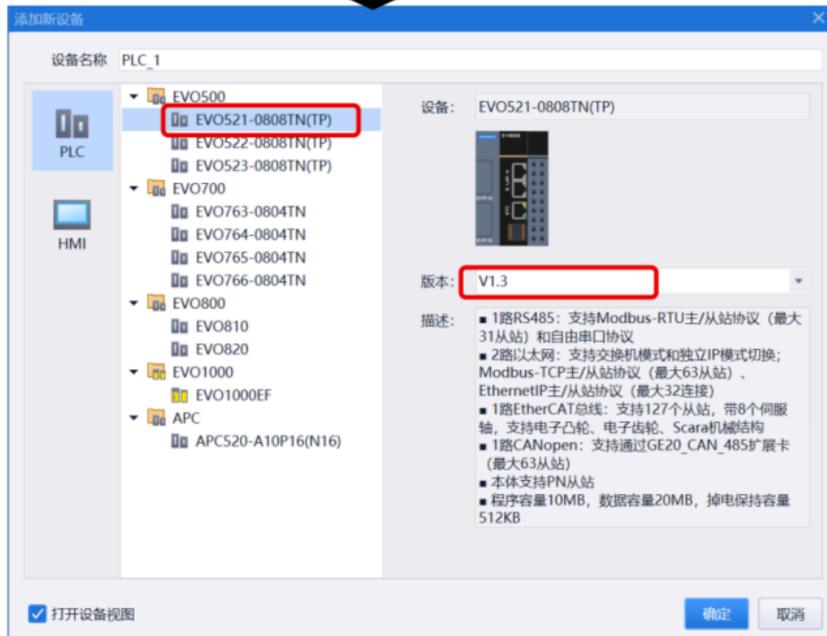
the module.

旋码	PORT_H				PORT_L			
端口	8	7	6	5	4	3	2	1
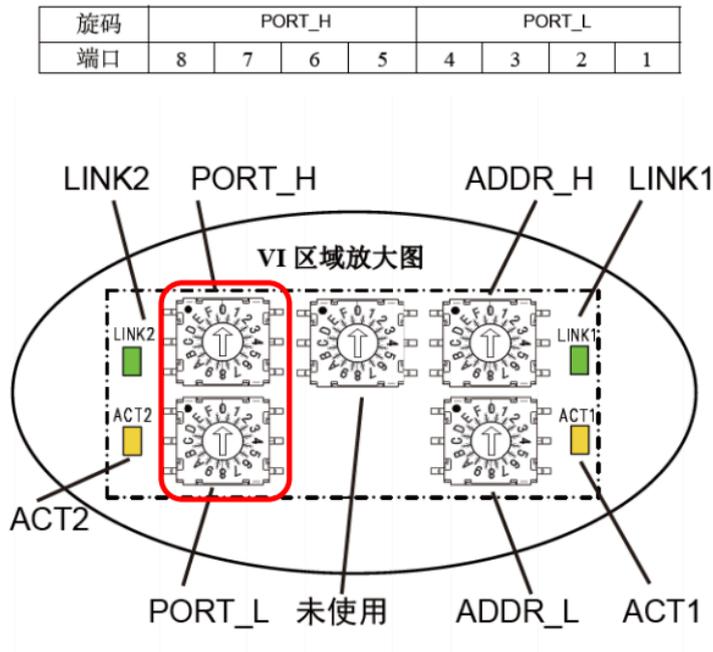
3、Open Inovance programming software iFA Evolution, create a new project, set the project name and storage path, then click "Create".
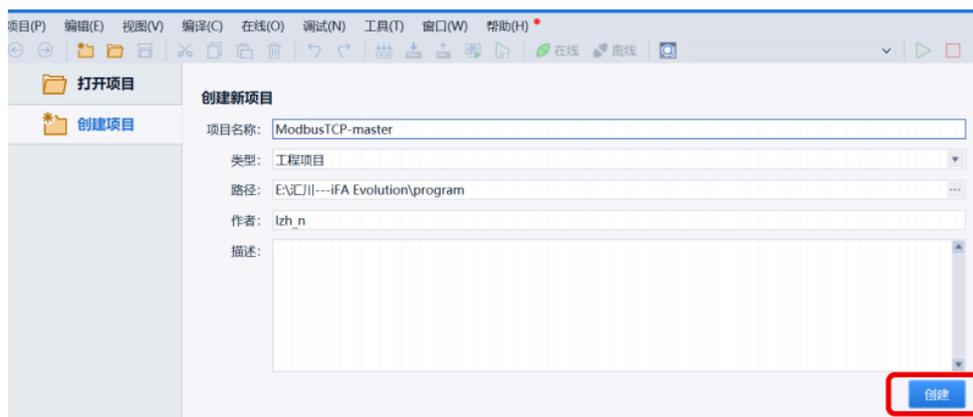
4、Double-click "Add Device" in the left panel. In the pop-up dialog, select the correct PLC model (in this example: EVO521-0808 TP（TN）, version V1.3), then click "OK".

5、In the left project tree, find "Hardware Configuration" → "LAN1（EtherNet）". Right-click and choose "Add Device". In the dialog, select "ModbusTCP Master", then click "Add Device".
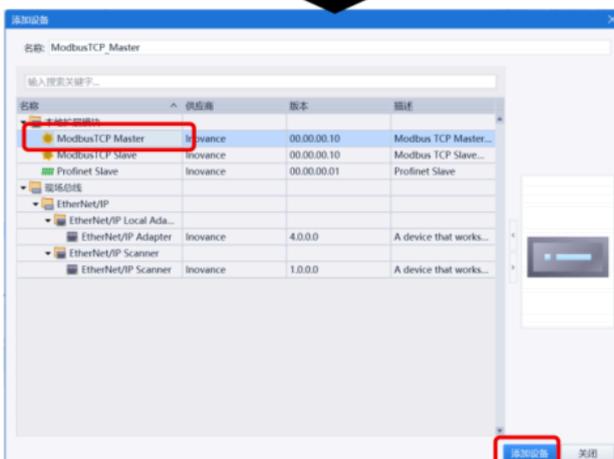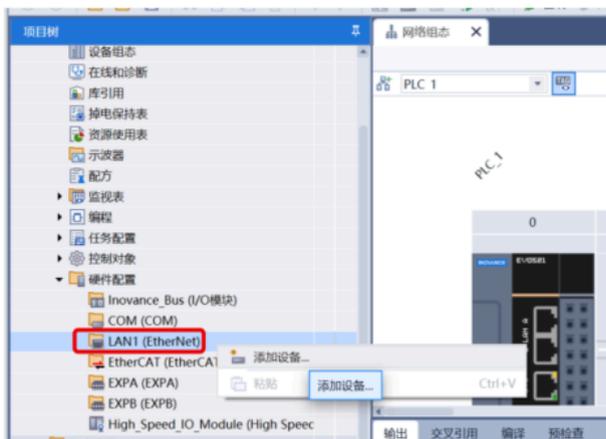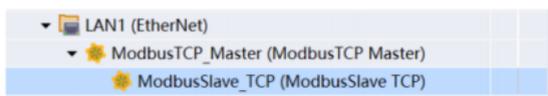
6、A new item "ModbusTCP_Master(ModbusTCP Master)" will be added under "LAN1（EtherNet）".

7、Right-click "ModbusTCP_Master(ModbusTCP Master)" and click "Add Device". In the dialog, select "Modbus Slave TCP", then click "Add Device".
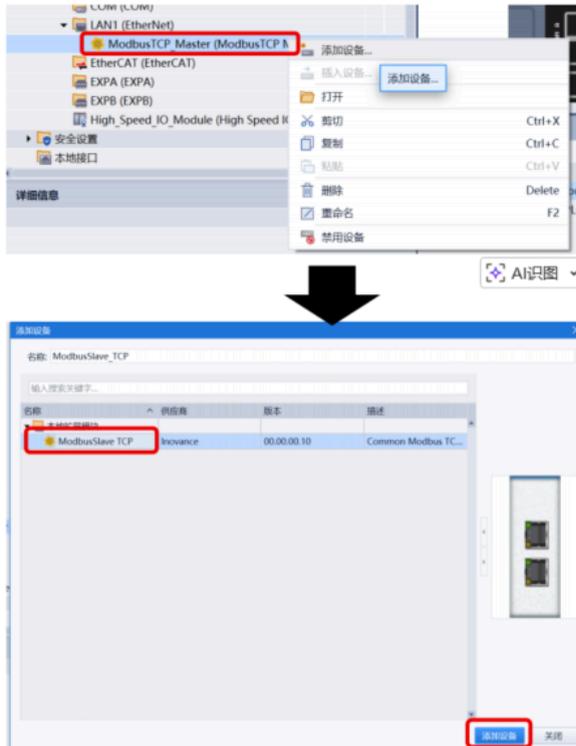
8、A Modbus TCP slave has now been added.

9、Double-click "Modbus Slave_TCP（Modbus Slave TCP）". On the right, click "Modbus TCP Slave Settings", and enter the previously set Sentinel IO-LINK master module IP address in "Slave IP Address".
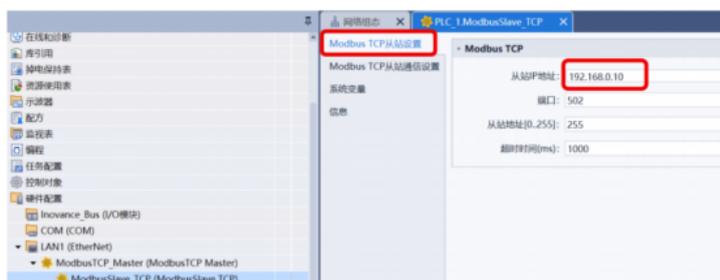
10、Click "Modbus TCP Slave Communication Settings". Here, we will add input/output communication entries to use signals from sub-stations connected to the master's ports. Then click

"Add Row".

11、Add "Channel1" first. Set "Read/Write Type" to "Read Input Registers (Function Code 04)" so that sub–station input signals can be read. "Read Length" is the length of data to read, up to a maximum of 125.

12、For the Sentinel Modbus TCP IO–LINK master, inputs occupy Word[0]—Word[132], totaling 133 words. Since the maximum length per read is 125, one channel cannot read all inputs at once. Therefore, inputs can be read in two segments (see the appendix for detailed mapping), for example:

Channel1: set "Read Input Registers (FC04)", "Read Offset" = 0, "Read Length" = 117, meaning it reads all input data before Port 8

Channel2: set "Read Input Registers (FC04)", "Read Offset" = 117, "Read Length" = 16, meaning it reads the input data of Port 8

With Channel1 and Channel2, you can read all input data from all 8 ports of the IO–LINK master

13、Similarly, outputs occupy Word[0]—Word[127], totaling 128 words, but the maximum channel length is 123, so outputs also cannot be written in a single channel. To write all outputs completely, outputs can be written in two segments (see the appendix for detailed mapping). When writing outputs, set "Read/Write Type" to "Write Multiple Registers (Function Code 16)", for example:

Channel3: set "Write Multiple Registers (FC16)", "Write Offset" = 0, "Write Length" = 112, meaning it writes all output data before Port 8
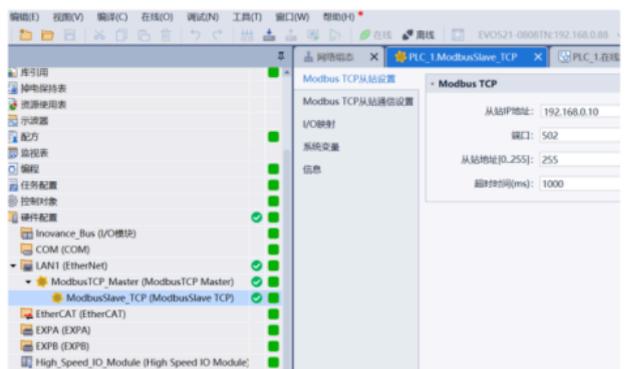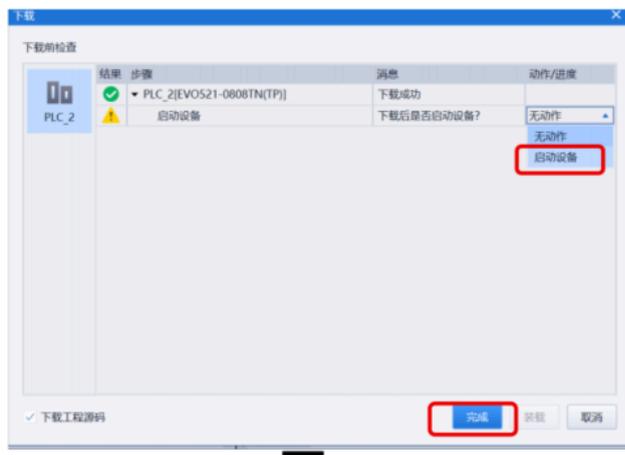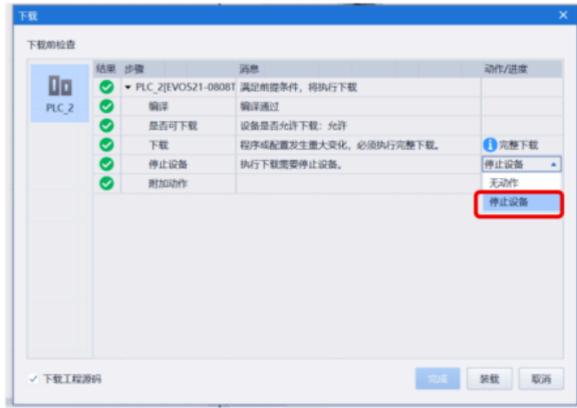
Channel4: set "Write Multiple Registers (FC16)", "Write Offset" = 112, "Write Length" = 16, meaning it writes the output data of Port 8

**With Channel3 and Channel4, you can write all output data for all 8 ports of the IO-LINK master**

14、After configuration, download the program by clicking "Download" in the menu.

15、Click "Online", then click "I/O Mapping". In this example, Port 2 of the master is connected to an 8-channel analog input sub-station (each channel occupies 2 bytes; the sub-station occupies 8 words total). By checking the appendix, you can see that the Port 2 input data address is Channel1[21] — Channel1[36].

When 4 mA is input on Channel 8 of the sub–station, the reading at Channel1[28] is about 4000 (for the 4–20 mA module, 4–20 mA corresponds to 4000–20000).
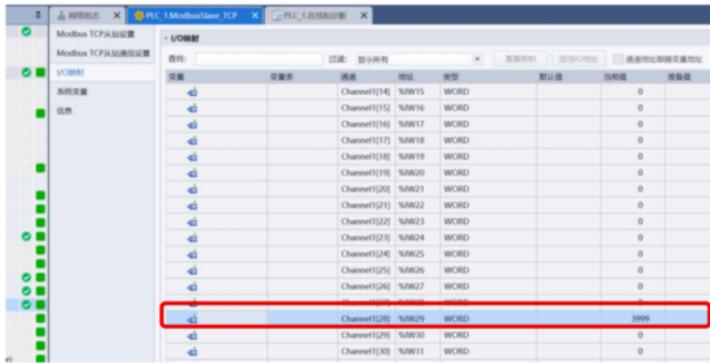
附录

1、IO–LINK process data input (occupies 133 Words)

Supports 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 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 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)

Supports 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）