PROFINET

C2S-PN Series

Fieldbus Valve Terminal

User Manual

s'Dot

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1   Product Introduction

1.1 Product Overview

The C2S-PN series valve terminal is a control module integrating valve terminal technology and PROFINET bus technology, through this product, decentralized control and centralized management and control of industrial sites can be achieved, optimized system design, fast construction, and simplified debugging, performance testing, diagnosis and maintenance of complex systems. Product adopts mold It has a modular structure, takes up little space, has pluggable terminal blocks, can be quickly connected, has simple configuration, supports all major mainstream PROFINET master stations, and can be widely used in industrial control systems.
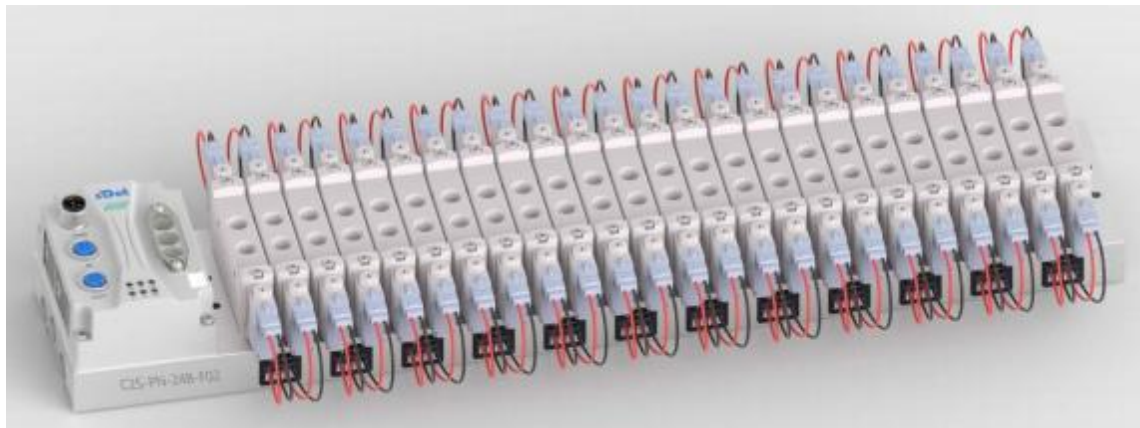
1.2 Product Features

- Support PROFINET industrial Ethernet protocol
- M12 bus interface, supports cascade communication
- Supports up to 24-port dual control solenoid valves
- Modular structure, small space occupied
- Simple wiring, fast construction and convenient maintenance

- Support customization, supports mainstream solenoid valves, making selection simple and fast
- Support remote diagnosis and reduce troubleshooting difficulties

2 Designation rules

2.1 Designation rules

serial number	meaning	Value description				
(1)	product type	C2S				
(2)	bus protocol	PN: PROFINET protocol abbreviation				
(3)	Solenoid valve position	08：8 ports	12: 12 ports	16: 16 ports	20: 20 ports	24: 24 ports
(4)	Electronic control type	B: Dual electric control (compatible with single electric control)				
(5)	Solenoid valve model code	See the solenoid valve model code table below for details.				

Solenoid valve model code list:

brand	code	Valve spacing	series	Supported solenoid valve models
AirTAC	A01	19	4V1	4V110/ 4V120/ 4V130
	A02	23	4V2	4V210/ 4V220/ 4V230
	A04	10.5	7V0	7V0510/ 7V0520/ 7V0530
	A05	16	7V1	7V110/ 7V120/ 7V130
	A06	19	7V2	7V210/ 7V220/ 7V230
	A07	19	5V1	5V110/ 5V120/ 5V130
	A08	23	5V2	5V210/ 5V220/ 5V230
FESTO	F01	10.5	VUVG-LK10	VUVG-LK10-T32/ VUVG-LK10 -M52 VUVG-LK10-B52/ VUVG-LK10- P52
			VUVG-L10	VUVG-L10-T32/ VUVG-L10 -M52 VUVG-L10-B52/ VUVG-L10-P 52
	F02	16	VUVG-LK14	VUVG-LK14-T32/ VUVG-LK14 -M52 VUVG-LK14-B52/ VUVG-LK14- P52
			VUVG-L14	VUVG-L14-T32/ VUVG-L14 -M52 VUVG-L14-B52/ VUVG-L14-P52
SMC	S01	10.5	SY3	SY3120/ SY3220/ SY3320 SY3420/ SY3520
	S02	16	SY5	SY5120/ SY5220/ SY5320 SY5420/ SY5520
	S03	19	SY7	SY7120/ SY7220/ SY7320/ SY7420/ SY7520
CKD	C01	10.5	4GD1	4GD119R/ 4GD129R/ 4GD139R 4GD149R/ 4GD159R
	C02	16	4GD2	4GD219R/ 4GD229R/ 4GD2 39R 4GD249R/ 4GD259R

Note: Valve spacing (K value) unit: mm.

2.2 Model list

model	Product Description
C2S-PN-08B-()	8-position dual control solenoid valve
C2S-PN-12B-()	12-position dual control solenoid valve
C2S-PN-16B-()	16-position dual control solenoid valve
C2S-PN-20B-()	20-position dual control solenoid valve
C2S-PN-24B-()	24-position dual control solenoid valve

Note: () The brackets represent the solenoid valve model code and support customization.

3 Product parameters

3.1 General parameters

| Interface parameters	
Bus protocol	PROFINET
Data transmission medium	UTP or STP over Category 5 (STP recommended)
Transmission distance	≤100 m (distance between stations)
Bus interface	2 × M12,4Pin,D-code, hole end
Technical Parameters	
System power	18~36 VDC
Rated current consumption	30 mA
Electrical isolation	500 V
Load power supply	24 VDC (±25%)
Output points	0~48
Single channel current	Max: 250 mA
Power connection method	M12,5Pin,A-code, pin end
Power interface surge protection	support
Power interface reverse connection protection	support
Channel short circuit protection	support
Channel open diagnosis	support
Channel short circuit diagnostics	support
weight	Product models vary
size	Product models vary (See 5.1 Dimensional Diagram for details)

Operating temperature	-5~+50℃
Storage temperature	-20~+75℃
Relative humidity	95%, no condensation
Protection level	IP20

4 Panel

4.1 Product structure

Names and function of each part of the product
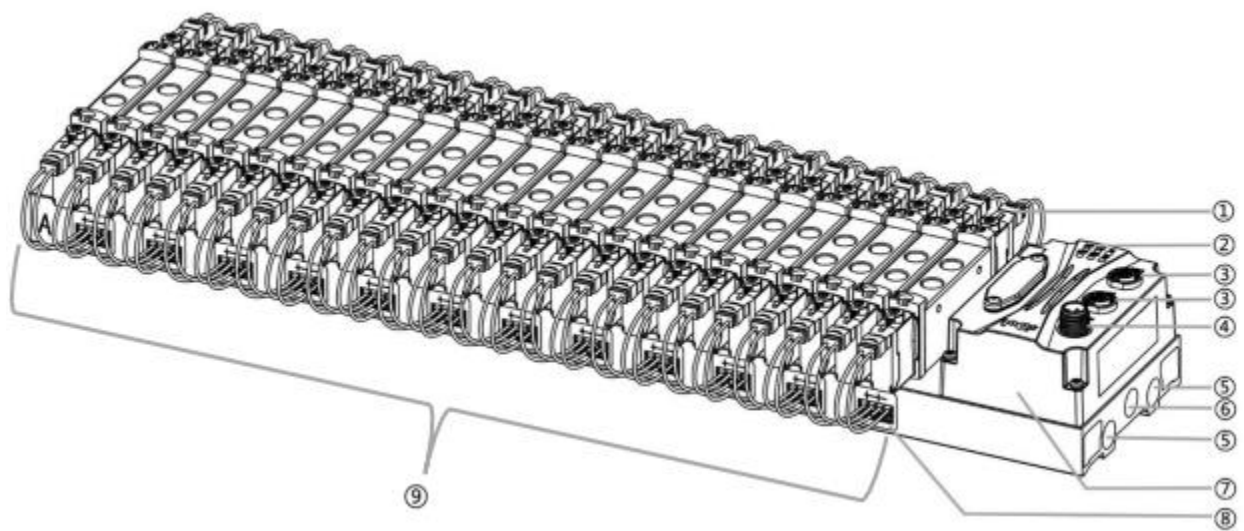
Serial number	Name	Descriptions
①	Solenoid valve	For details, see " Solenoid Valve Model Code Table "
②	LED indicator	Indicates power, operation and bus status
③	Bus interface	2 × M12,4Pin,D-code, hole end
④	Power interface	1 × M12,5Pin,A-code, pin end
⑤	Vent hole	G1/4
⑥	Air intake hole	G1/4
⑦	Communication unit	Valve terminal communication and control body
⑧	Solenoid valve wiring socket	4Pin
⑨	Manifold	Valve terminal body, with A and B silk screen printing on both sides

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		of the tail

4.2 Indicator function

Name	ID	Color	state	status description
System power indicator	U_S	green	ON	The power supply is normal
			OFF	The product is not powered on or the power supply is abnormal.
Load power indicator light	U_L	green	ON	The power supply is normal
			OFF	The product is not powered on or the power supply is abnormal.
Network indicator light IN	L/A0	green	ON	Establish a network connection
			Flashing	Network connection and data exchange
			OFF	No data interaction or exception
Network indicator OUT	L/A1	green	ON	Establish a network connection
			Flashing	Network connection and data exchange
			OFF	No data interaction or exception
Network alarm indicator light	BF	red	ON	Both network ports are not wired
			Flashing	1Hz: Abnormal network connection
			OFF	Network connection is normal
System alarm indicator light	SF	red	ON	The system is working abnormally
			OFF	The system is running normally or is not powered on

5

Installation

5.1 Dimensional drawing

Overall Specifications　(unit:mm)

Plug, muffler, connector adapters: G1/4

L size											
Number of digits	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**
K=10.5	59.5	80.5	101.5	122.5	143.5	164.5	185.5	206.5	227.5	248.5	269.5
K=16	76	108	140	172	204	236	268	300	332	364	396
K=19	88	126	164	202	240	278	316	354	392	430	468
K=23	103	149	195	241	287	333	379	425	471	517	563
P size											
Number of digits	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**
K=10.5	136.5	157.5	178.5	199.5	220.5	241.5	262.5	283.5	304.5	325.5	346.5

K=16	153	185	217	249	281	313	345	377	409	441	473
K=19	165	203	241	279	317	355	393	431	469	507	545
K=23	180	226	272	318	364	410	456	502	548	594	640

5.2 Solenoid valve assembly sequence

- **Valve terminal adapted to solenoid valve**
  For details about the solenoid valve adapted to the valve terminal, see " 2.1 Designation Rules"

  Solenoid valve model code list" .

- **Solenoid valve installation sequence**
  The installation of the solenoid valve starts from the communication unit end and is installed in sequence.

  The installation sequence of dual solenoid valves: starting from the communication unit end, install the dual solenoid valves in order from the 1st to the Nth position. The assembly sequence as shown below.

  The installation sequence of the single solenoid valve installation: starting from the communication unit end, install the single solenoid valve in sequence from the 1st to the Nth position., solenoid valve connection The cable can be on side A, The assembly sequence is shown in the figure below.
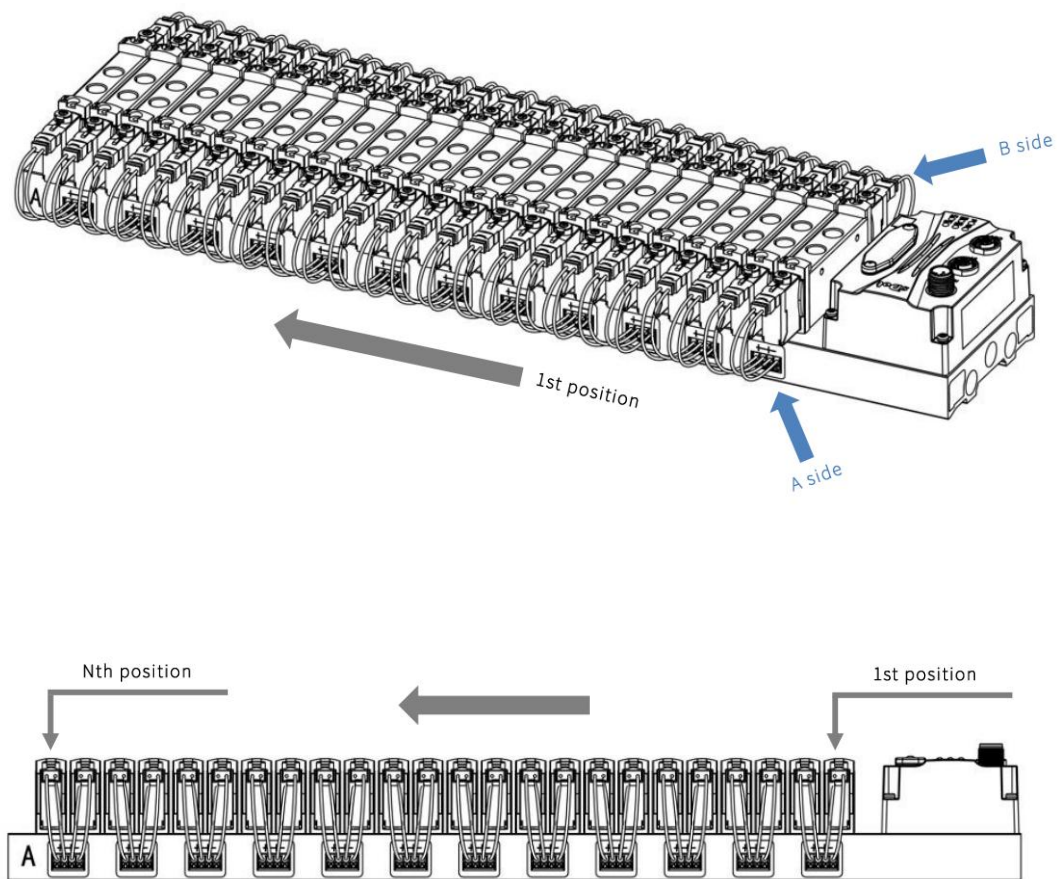
6 Wiring

6.1 Solenoid valve wiring

Valve terminal block distribution

The valve terminal blocks are distributed on both sides of the valve terminal manifold, namely side A and side B. Sides A and B can be distinguished according to the silk screen on the tail of the valve terminal manifold. Take valve terminal C2S-PN-24B-F02 as an example, The distribution of terminals on side A and B is shown in the figure below.

A side solenoid valve wiring terminal

B side solenoid valve wiring terminal
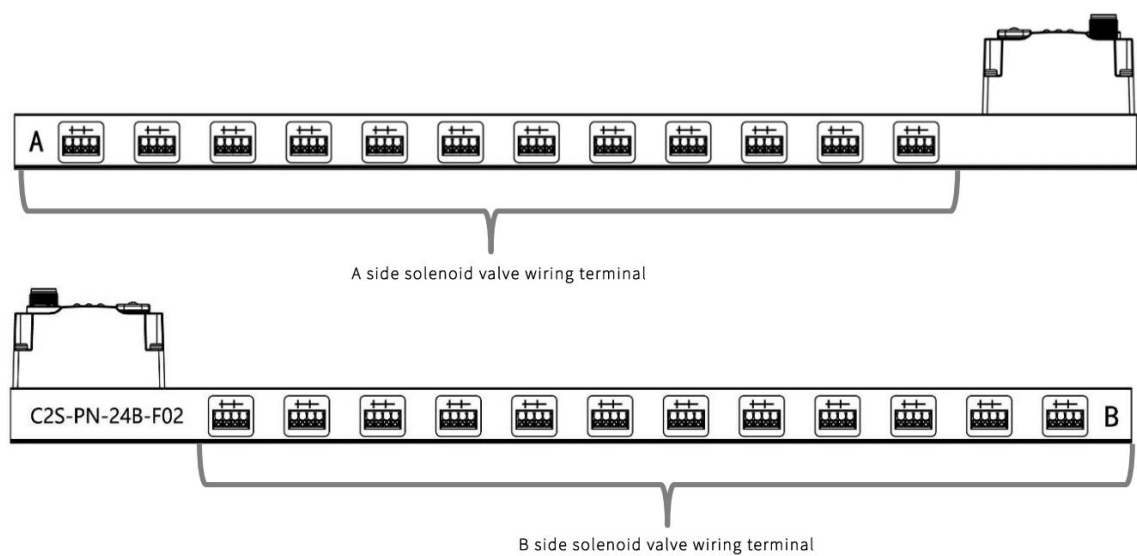
Terminals		
Terminal block	Number of poles	4P
	Wire diameter	22~17AWG 0.3~1.0 mm²

Wiring tool requirements

The solenoid valve terminal block adopts a screw-free design, and a flat-   ed
to install and remove the cable (Specification: ≤2mm).

Stripping length requirements

The recommended cable stripping length for the solenoid valve
terminal block is 10 mm

Wiring method

For single-strand hard wires, after stripping the corresponding length

of wires, Push the button while inserting the single strand wire.

Multi-stranded flexible wires, after stripping the corresponding length

of wires, can be connected directly or used in conjunction with the
corresponding standard specifications of cold-pressed terminals (tube
type insulated terminals, reference specifications are shown in the table
below), press button at the same time insert the wire.

Specification table of tubular insulating terminals		
Specification requirements	model	Wire cross-sectional area mm²
	E0310	0.3
	E0510	0.5
	E7510	0.75
The length of the tubular insulated terminal L is 10 mm	E1010	1.0

● **Solenoid valve wiring**

For different types of valve terminals, corresponding 4-pin sockets are configured on both sides of the manifold. A group of "+" and "-" can drive a solenoid valve coil. As shown below, A1 and A2 can drive a solenoid valve coil respectively.
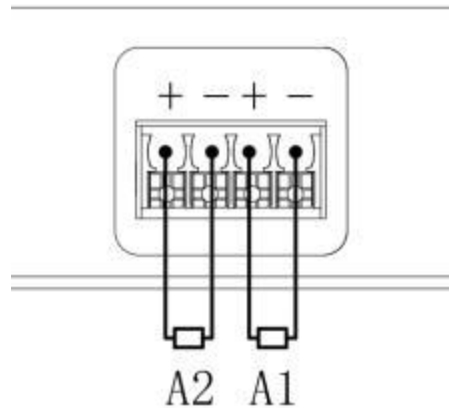
● **Valve terminal wiring**

Starting from the communication unit end, the solenoid valve coils on both sides of the manifold A and B correspond one to one. The corresponding relationship between the channel and the solenoid valve coil is shown in the figure below.
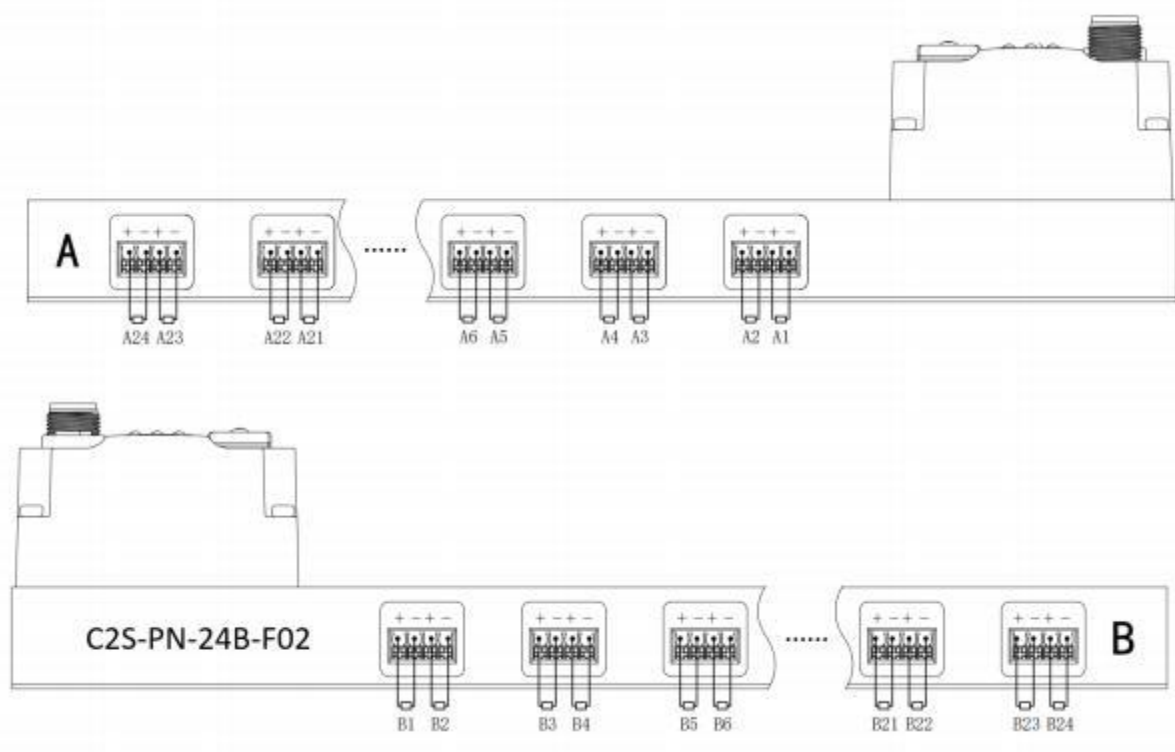
Solenoid valve wiring principles:

- Please strictly follow " 5.2 Solenoid valve assembly sequence " to install.

- AX and BX can be connected to a dual solenoid valve, and AX can be connected to a single solenoid valve. Please strictly follow the table for wiring , otherwise it may cause the solenoid valve to not work or malfunction. "✕" means no wiring.

Double control solenoid valve wiring (all valves are double control solenoid valves)								
terminal	A1	B1	A2	B2	A3	B3	A4	B4	…
Solenoid valve No.	1		2		3		4		…

terminal	…		A22	B22	A23	B23	A24	B24
Solenoid valve No.	…		22		23		24	
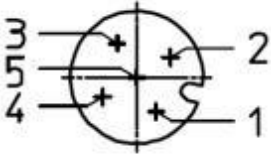
Note: This example uses C2S-PN-24B-() valve terminal. The 24-position dual control solenoid valve is taken as an example. The wiring of other valve terminals with different specifications is different.

Dual control solenoid valve wiring (all access valves are single control solenoid valves)								
terminal	A1	B1	A2	B2	A3	B3	A4	B4	…
Solenoid valve No.	1	✕	2	✕	3	✕	4	✕	…

terminal	…		A22	B22	A23	B23	A24	B24
Solenoid valve No.	…		22	✕	23	✕	24	✕

Note: This example uses the C2S-PN-24B-() valve terminal, which is only connected to a single control solenoid valve . The wiring of other valve terminals of different specifications will be different.

6.2 Power wiring

power interface, M12,A-code			
	Pin	Function	Wire core color
	1	24 VDC , working power supply	Brown
	2	24 VDC , load power supply	white
	3	GND , working power supply	blue
	4	0 V , load power supply	black
	5	PE ,Protective grounding	Grey
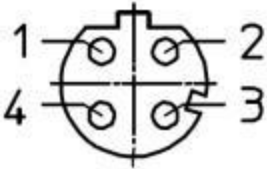
The power wiring is shown in the figure below:
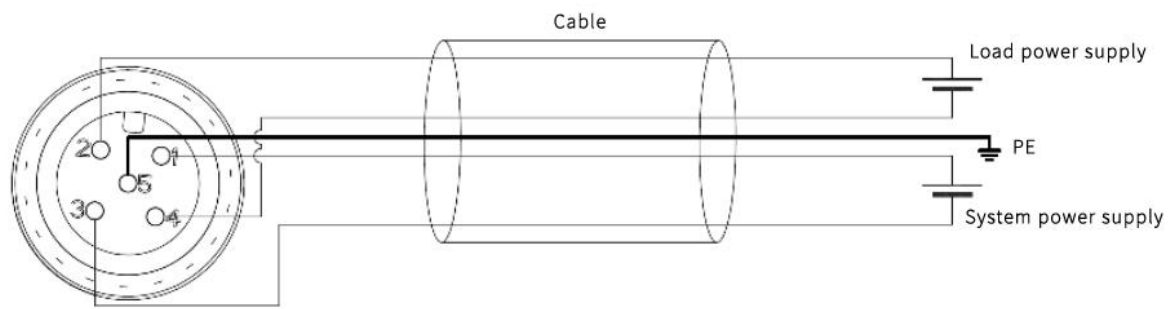
☞ Precautions

● The module system side power supply and the field side power supply must be configured and used separately. Do not mix them.

● PE must be reliably grounded.

6.3 Bus wiring

fieldbus interface, M12,D-code		
	Pin	Function
	1	TD+, send data+
	2	RD+ , receive data+
	3	TD- ,send data-
	4	RD- ,Receive data-
	-	Housing, shield/protective ground

☞ Precautions

● Category 5 or higher double shielding (braid + aluminum foil) recommended STP cables serve as communication cables.

● The length of cables between devices cannot exceed 100 m.

7

Operation

7.1 Control method

The solenoid valve of the valve terminal is controlled in byte mode. One byte controls 4 valves; at the same time, it can be controlled in bit mode , a set of 8 positions, control 1->8 pass channel, the channel value is If the channel value is 1, the corresponding solenoid valve is open, and if the channel value is 0, the corresponding solenoid valve is closed. The 24-position dual control solenoid valve has a total of 6 sets of control positions, a total of Controls 48 channels. Taking the 24-position dual control solenoid valve as an example, the output control function of the valve terminal is introduced. The control method is shown in the table below.

control method	valve[1..4]							
Channel address	valve[1..4] [0]	valve[1..4] [1]	valve[1..4] [2]	valve[1..4] [3]	valve[1..4] [4]	valve[1..4] [5]	valve[1..4] [6]	valve[1..4] [7]
Coil	A1	B1	A2	B2	A3	B3	A4	B4
Solenoid valve No.	1		2		3		4	

control method	valve[5..8]							
Channel address	valve[5..8] [0]	valve[5..8] [1]	valve[5..8] [2]	valve[5..8] [3]	valve[5..8] [4]	valve[5..8] [5]	valve[5..8] [6]	valve[5..8] [7]
Coil	A5	B5	A6	B6	A7	B7	A8	B8
Solenoid valve No.	5		6		7		8	

control method	valve[9..12]							
Channel address	valve[9..12] [0]	valve[9..12] [1]	valve[9..12] [2]	valve[9..12] [3]	valve[9..12] [4]	valve[9..12] [5]	valve[9..12] [6]	valve[9..12] [7]
Coil	A9	B9	A10	B10	A11	B11	A12	B12
Solenoid valve No.	9		10		11		12	

control method	valve[13..16]							
Channel address	valve[13..16] [0]	valve[13..16] [1]	valve[13..16] [2]	valve[13..16] [3]	valve[13..16] [4]	valve[13..16] [5]	valve[13..16] [6]	valve[13..16] [7]
Coil	A13	B13	A14	B14	A15	B15	A16	B16
Solenoid valve No.	13		14		15		16	

control method	valve[17..20]							
Channel address	valve[17..20] [0]	valve[17..20] [1]	valve[17..20] [2]	valve[17..20] [3]	valve[17..20] [4]	valve[17..20] [5]	valve[17..20] [6]	valve[17..20] [7]
Coil	A17	B17	A18	B18	A19	B19	A20	B20
Solenoid valve No.	17		18		19		20	

control method	valve[21..24]							
Channel address	valve[21..24] [0]	valve[21..24] [1]	valve[21..24] [2]	valve[21..24] [3]	valve[21..24] [4]	valve[21..24] [5]	valve[21..24] [6]	valve[21..24] [7]
Coil	A21	B21	A22	B22	A23	B23	A24	B24
Solenoid valve No.	twenty one		twenty two		twenty three		twenty four	

7.2 Diagnostic functions

C2S-PN valve terminal has open circuit diagnosis (Open load) and short circuit or overtemperature diagnosis (Short circuit or overtemperature). Only the valve is closed Only when the valve is closed can an open circuit be detected, and only when the valve is open can a short circuit be detected.

The diagnostic function is consistent with the control method, and diagnostic information is also sent in Byte or bit mode. On the premise that the valve is closed, valve open circuit diagnostic information open. If the load value is 0, it is normal, and 1 means the corresponding valve is open . On the premise that the valve is open, the valve short circuit/overtemperature diagnostic information Short circuit or If the overtemperature value is 0, it is normal. 1 means the corresponding valve has a short circuit/over temperature.

Open circuit diagnosis (Open load) and short circuit/overtemperature diagnosis (Short circuit or overtemperature) channel diagnostic information and solenoid valve The relationship should be consistent. Taking open circuit diagnosis as an example, the relationship is as shown in the table below.

Diagnostic function	Open load[0..7]							
Channel address	Open[0..7][0]	Open[0..7][1]	Open[0..7][2]	Open[0..7][3]	Open[0..7][4]	Open[0..7][5]	Open[0..7][6]	Open[0..7][7]
Coil	A1	B1	A2	B2	A3	B3	A4	B4
Solenoid valve No.	1		2		3		4	

Note: Open in the table The abbreviation of load is Open , the same below.

Diagnostic function	Open load[8..15]							
Channel address	Open[8..15][0]	Open[8..15][1]	Open[8..15][2]	Open[8..15][3]	Open[8..15][4]	Open[8..15][5]	Open[8..15][6]	Open[8..15][7]
Coil	A5	B5	A6	B6	A7	B7	A8	B8
Solenoid valve No.	5		6		7		8	

Diagnostic function	Open load[16..23]							
Channel address	Open[16..23][0]	Open[16..23][1]	Open[16..23][2]	Open[16..23][3]	Open[16..23][4]	Open[16..23][5]	Open[16..23][6]	Open[16..23][7]
Coil	A9	B9	A10	B10	A11	B11	A12	B12
Solenoid valve No.	9		10		11		12	

Diagnostic function	Open load[24..31]							
Channel address	Open[24..31][0]	Open[24..31][1]	Open[24..31][2]	Open[24..31][3]	Open[24..31][4]	Open[24..31][5]	Open[24..31][6]	Open[24..31][7]
Coil	A13	B13	A14	B14	A15	B15	A16	B16
Solenoid valve No.	13		14		15		16	

Diagnostic function	Open load[32..39]							
Channel address	Open[32..39][0]	Open[32..39][1]	Open[32..39][2]	Open[32..39][3]	Open[32..39][4]	Open[32..39][5]	Open[32..39][6]	Open[32..39][7]
Coil	A17	B17	A18	B18	A19	B19	A20	B20
Solenoid valve No.	17		18		19		20	

Diagnostic function	Open load[40..47]							
Channel address	Open[40..47][0]	Open[40..47][1]	Open[40..47][2]	Open[40..47][3]	Open[40..47][4]	Open[40..47][5]	Open[40..47][6]	Open[40..47][7]
Coil	A21	B21	A22	B22	A23	B23	A24	B24
Solenoid valve No.	21		22		23		24	

7.3 Parameter description

7.3.1 Output signal clear/hold function

The clear/hold function is aimed at the output signal of the valve terminal. This function can configure the output action of the valve terminal in the abnormal state of the bus.

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

Keep output: When communication is disconnected, the valve terminal output channel always keeps output.

The function supports full-channel settings, single-channel settings, and 8-channel batch settings grouped according to driver chips, which can better meet actual use needs.

This manual uses TIA Portal V17 is taken as an example to introduce the parameter configuration method. For details, see 7.4.1 Parameter Configuration .

7.4 Configuration application

7.4.1 In TIA Application in Portal V17 software environment

1. Preparation

- **Hardware environment**
  - ➢ **Valve terminal model C2S-PN-24B**
  - ➢ **A computer with TIA pre-installed Portal V17 software**
  - ➢ **Special shielded cable for valve terminal**
  - ➢ **A Siemens PLC, this description uses Siemens S7-1200 CPU1214C DC/DC/DC as an example**
  - ➢ **One switching power supply**
  - ➢ **Device profile**
    Configuration file acquisition address: https://www.solidote ch.com/documents/configfile
- **Hardware configuration and wiring**
  Please follow " 5 Installation " " 6 Wiring " requires action

2. New construction

a. Open TIA Portal V17 software, click Create New Project, click the "Create" button after completing all information input, as shown in the figure below.
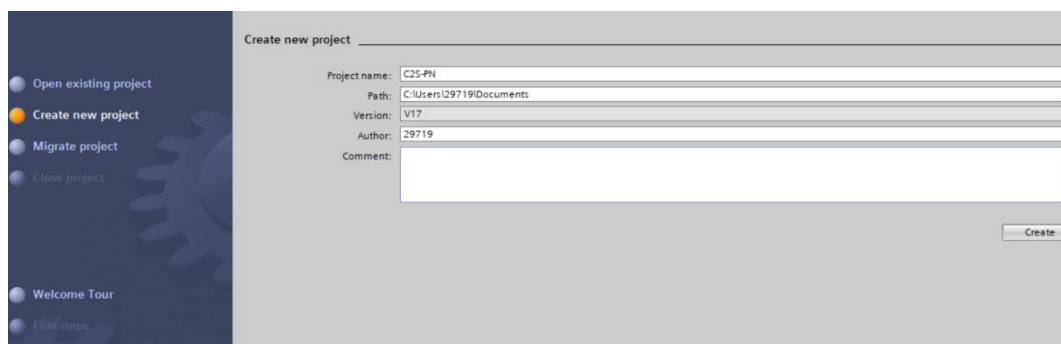
- ◆ Project name: Custom, you can keep the default.
- ◆ Path: The project keeps the path, which can be kept as default.
- ◆ Version: You can keep the default.
- ◆ Author: You can keep the default.
- ◆ Note: Customized, optional.

3. Add PLC controller

a. Click "Configure A Device" as shown in the figure below.
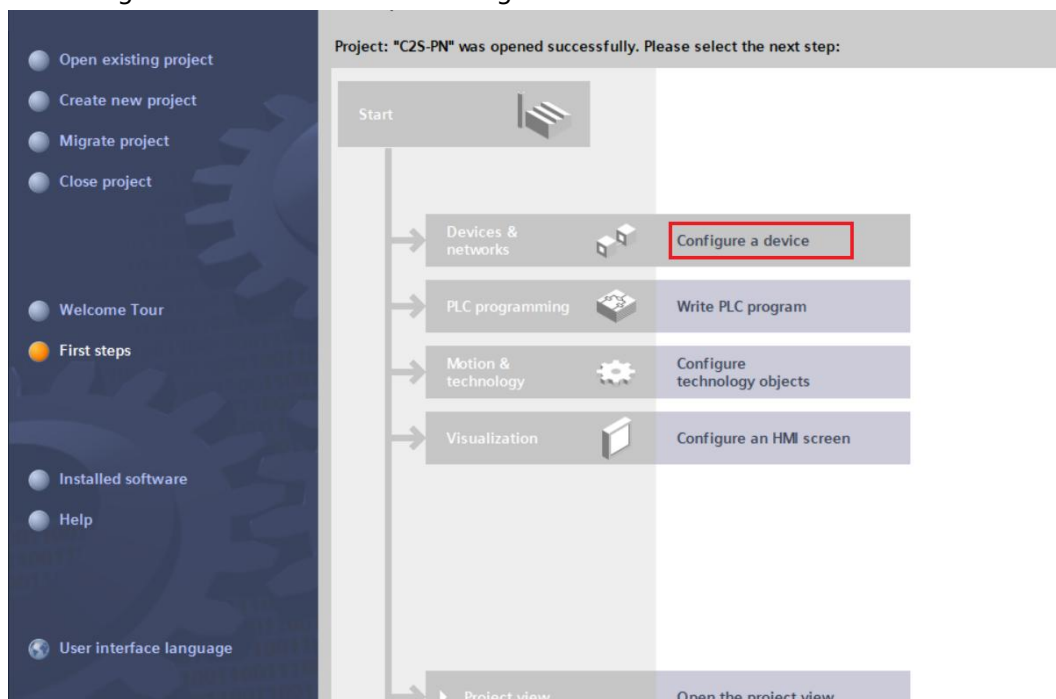
b. Click "Add New Device", select the PLC model currently used, and click "Add",As shown below .
You can view it after adding it The PLC has been added to the device navigation tree.
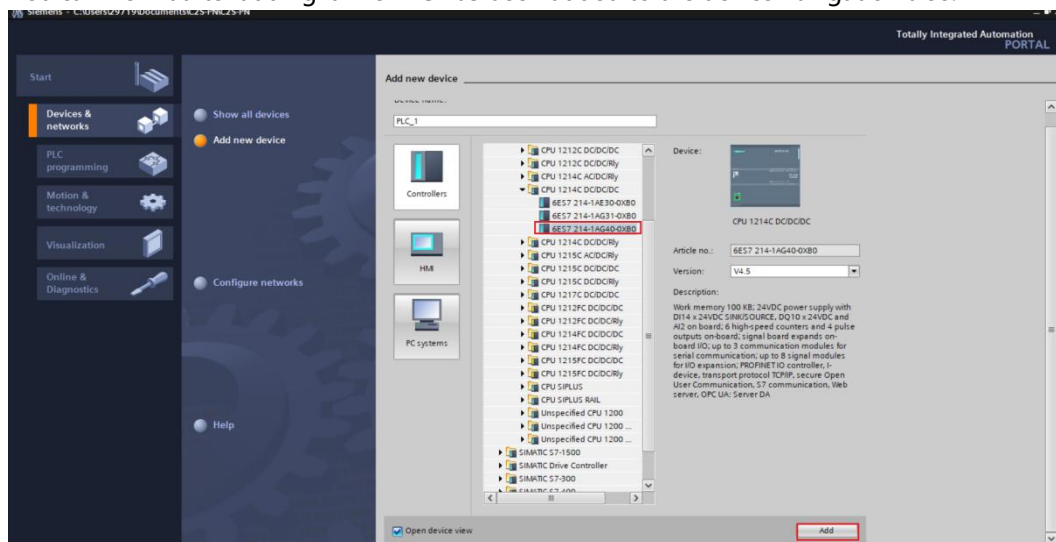
4. Scan for connected devices

a. Click "Online Access -> Update accessible devices" in the left navigation tree, as shown below.
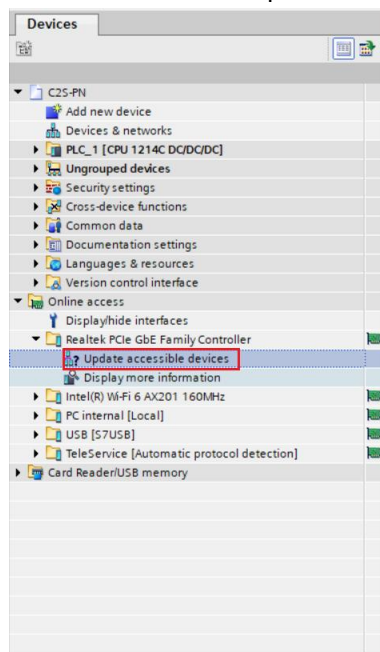
b. After the update is completed, the connected slave devices are displayed, as shown in the figure below.
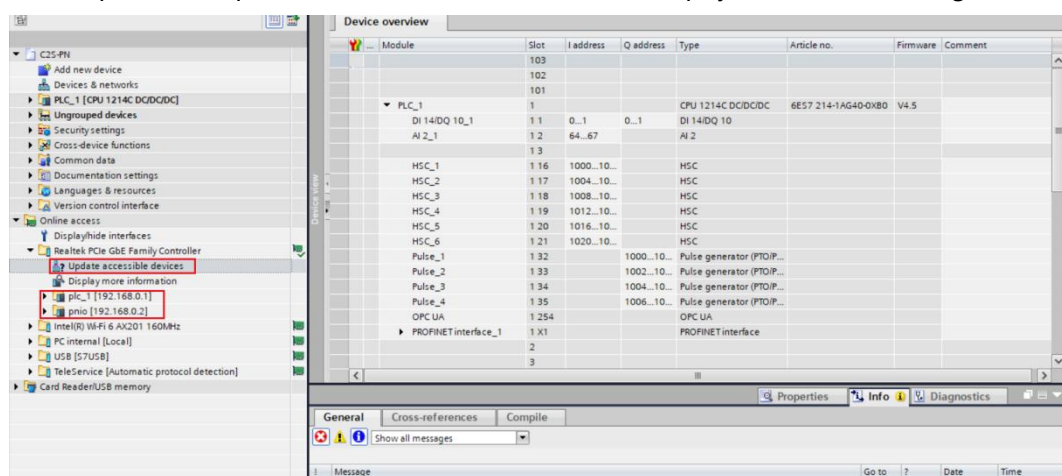
The computer's IP address must be in the same network segment as the PLC. If not, modify the computer's IP address and repeat the above steps.

the IP address and configuration name of the current slave. say. Click on Assign IP address", first fill in the "Subnet Mask", then fill in the "IP address" , click "Assign IP Address" at the bottom , As shown below.
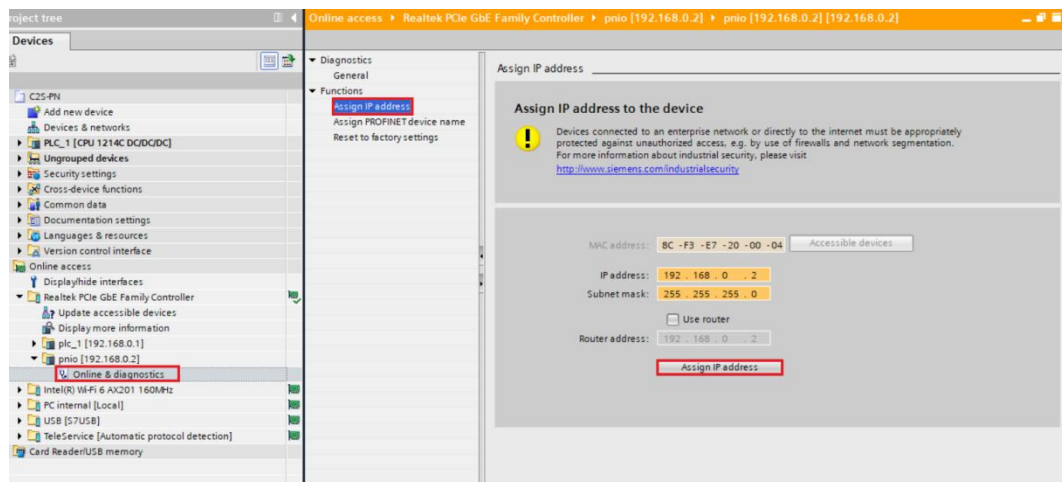
d. Click "Assign PROFINET Device Name", fill in the "PROFINET Device Name", and click "Assign Name", as shown in the figure below.
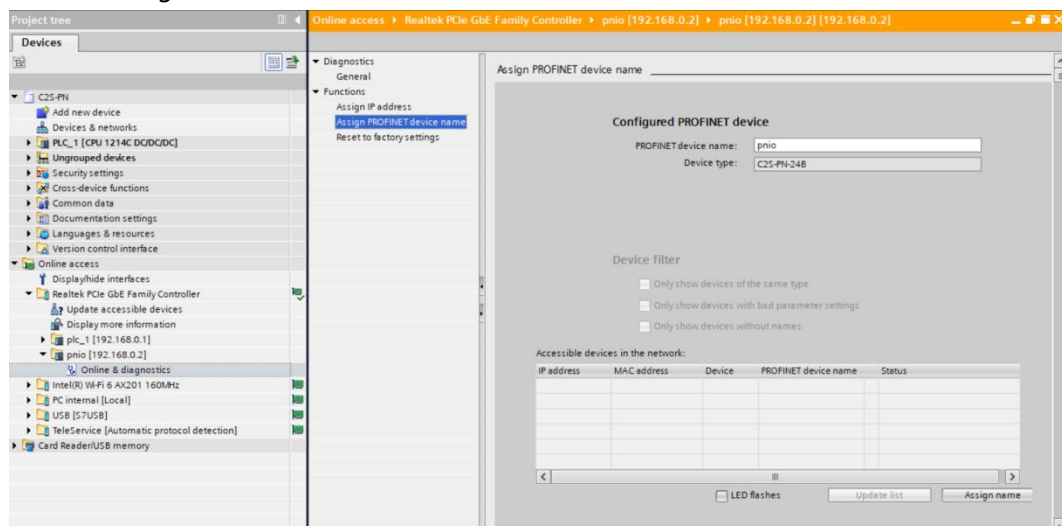
5. Add to GSD Configuration file

a. In the menu bar, select "Options- >Manage Generic Station Description File (GSDML)(D)".

b. Click "Source Path" to select the file.

c. View the GSD to be added Is the status of the file "Not yet installed", click the "Install" button if it is not installed. If it is installed , click the "Cancel", skip the installation steps.
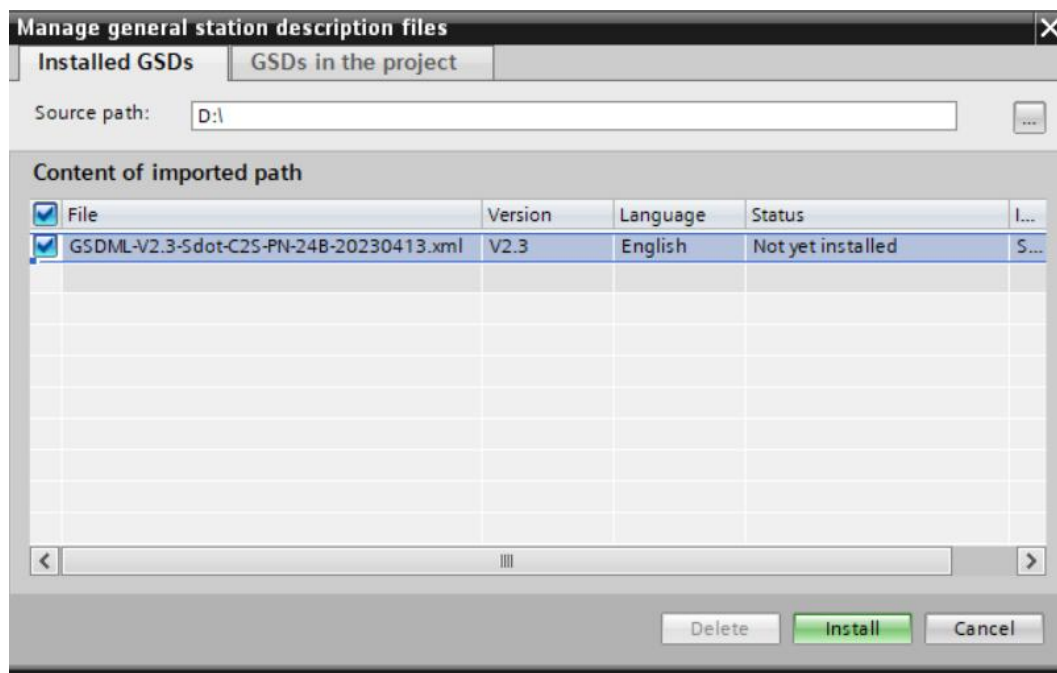
6. Add slave device

a. Double-click "Devices and Networks" in the left navigation tree.

b. Click the "Hardware Catalog" vertical button on the right, and the catalog is displayed as shown below.
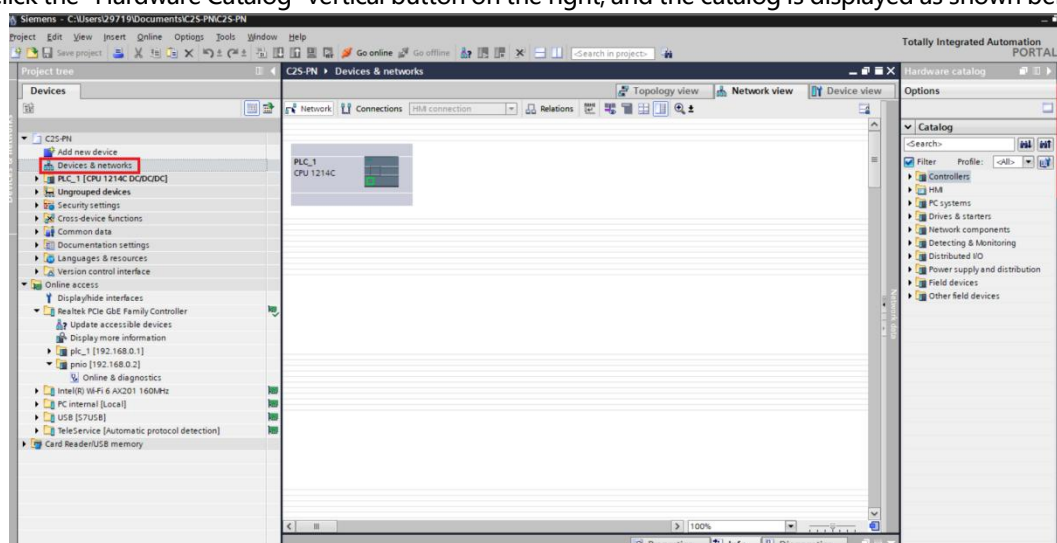
c. Find the "C2S-PN-24B" module in the hardware directory, drag or double-click "C2S-PN-24B" to "
Network View",As shown below. If you want to connect multiple modules, you can connect
them under the "Hardware Catalog" on the right., add modules in sequence according to the
actual topology.
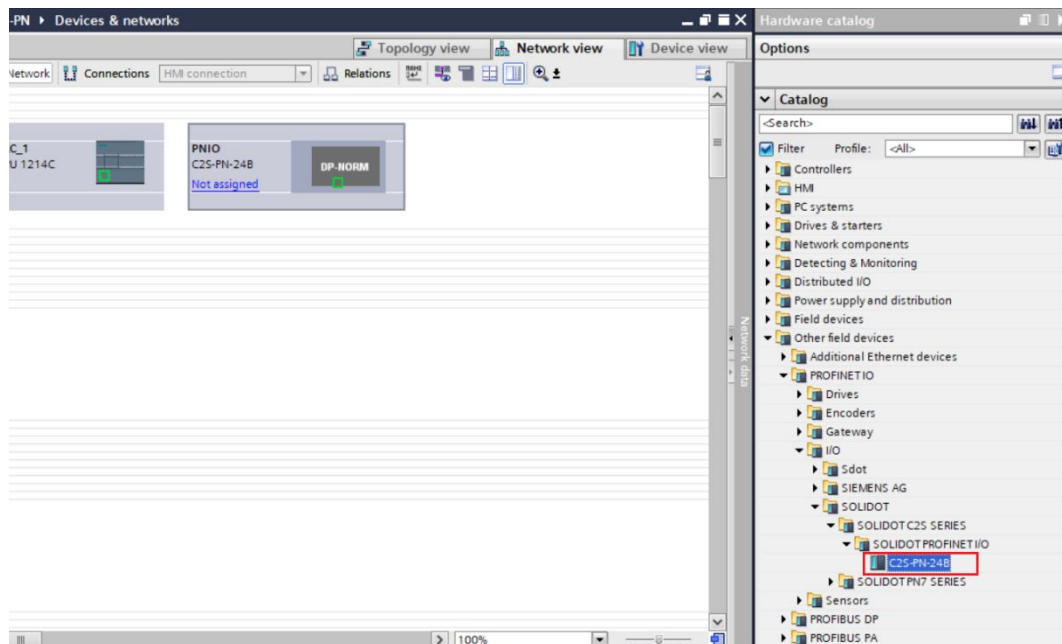
d. Click "Unassigned (blue font)" on the slave device and select "PLC_1.PROFINET Interface_1", as
shown in the figure below.
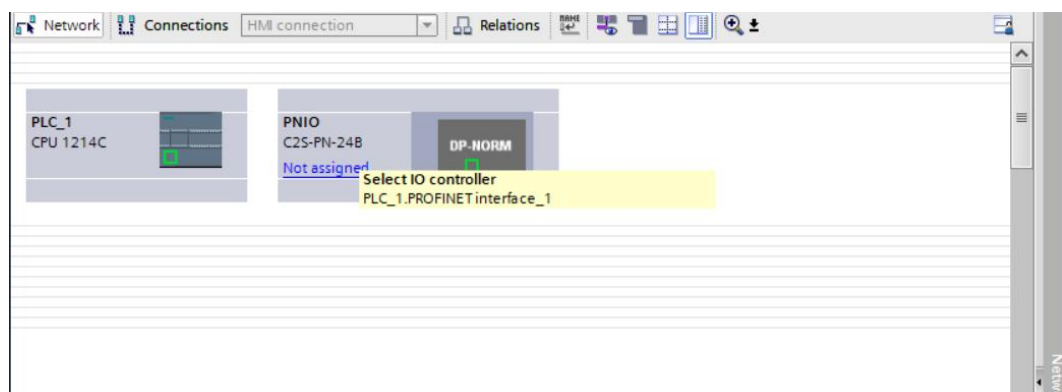
e. After the connection is completed, as shown in the figure below.
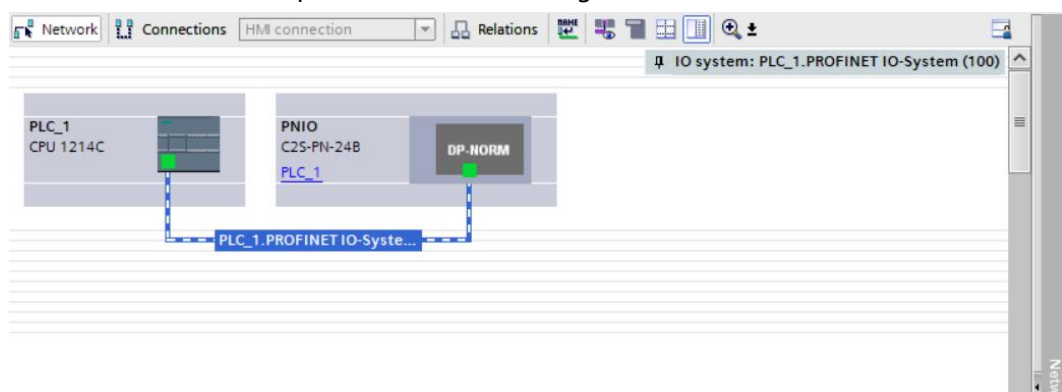
f. Click the device name to rename the device, as shown in the figure below.
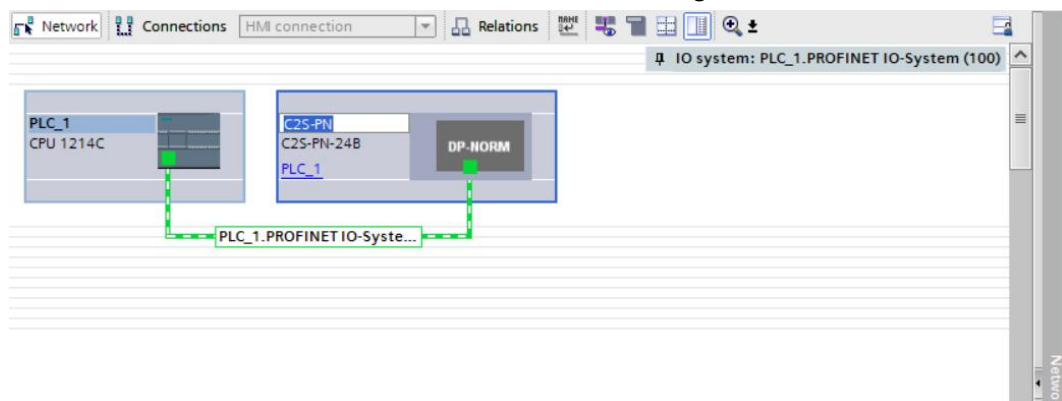
g. Click "Device View" to enter the device overview. You can see the topology configuration information, including the I/O address automatically assigned by the system. , the I/O address can Make your own changes as shown below.

7. Assign device name

a. Switch to "Network View", right-click the connection line between PLC and C2S-PN-24B, and select "Assign Device Name" ,As shown below.
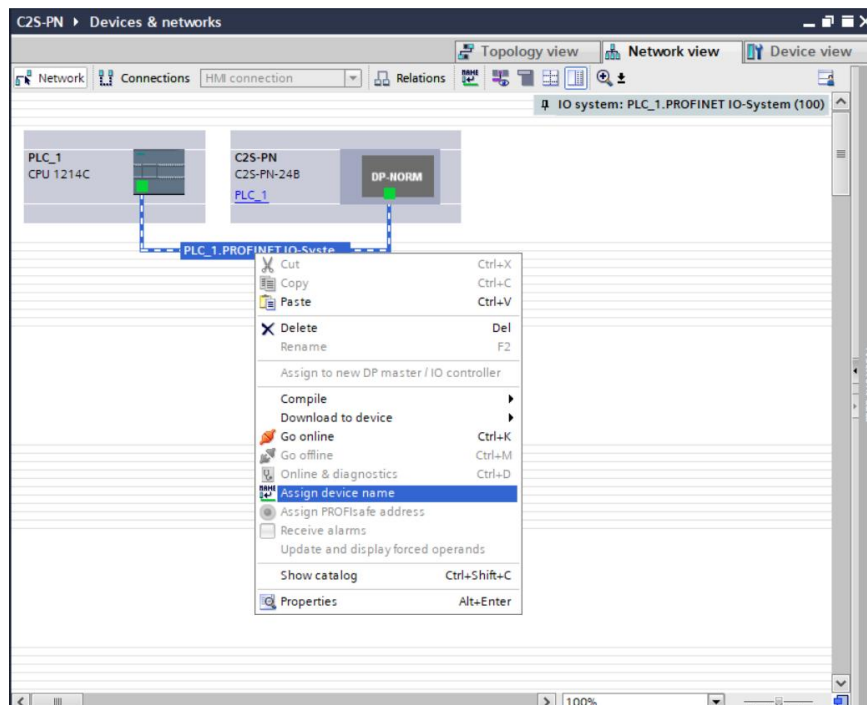
b. The "Assign PROFINET Device Name" window pops up, as shown in the figure below.
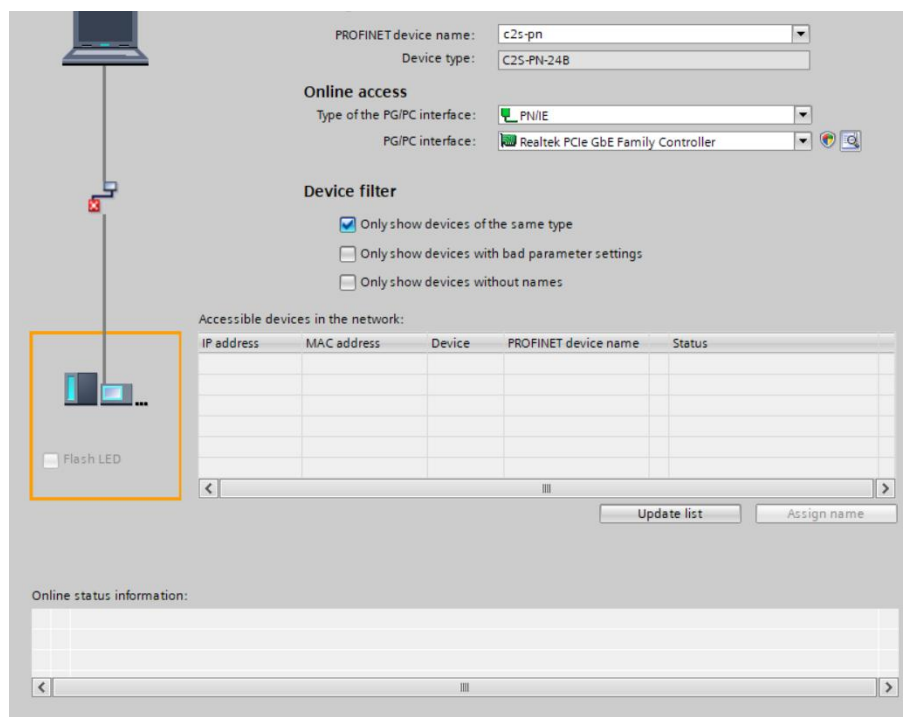
Check whether the MAC address on the module silk screen is the same as the MAC address of the assigned device name.

◆ PROFINET Device name: "Assign PROFINET device name"The name set in .

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◆ PG/PC Type of interface: PN/IE.

◆ PG/PC Interface: The actual network adapter used.

c. Select the slave device in turn, click Update List, and click Assign Name. Check the status of the node in "Accessible Nodes in the Network" Whether the status is "OK", as shown in the figure below.
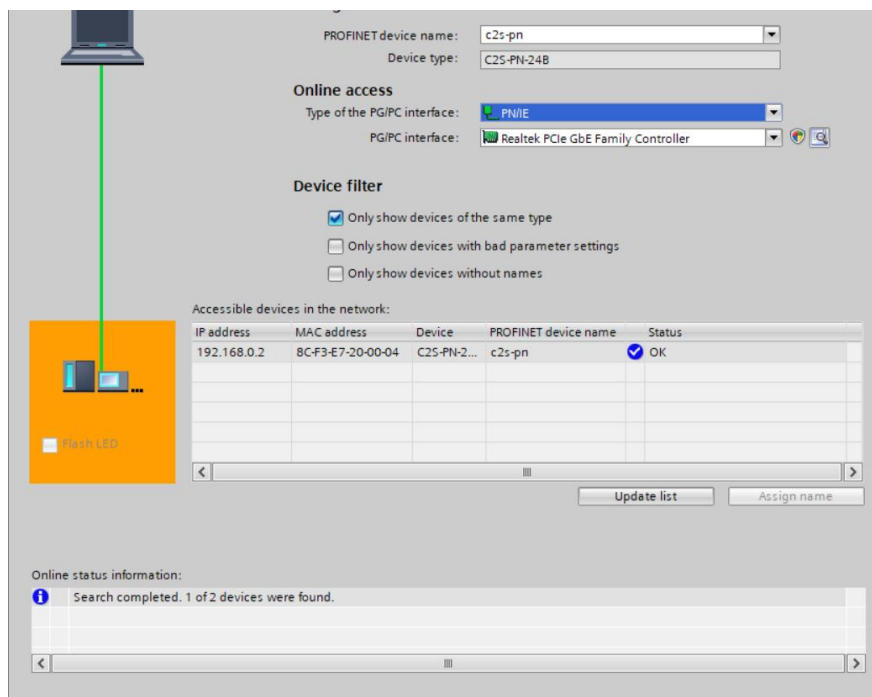
d. Click Close.

8, Download configuration structure

a. In "Network View"center, selected PLC.

b. Click the button in the menu bar to download the current configuration to in PLC.

c. In the pop-up "Download extension to device" interface, configure the configuration as shown below.
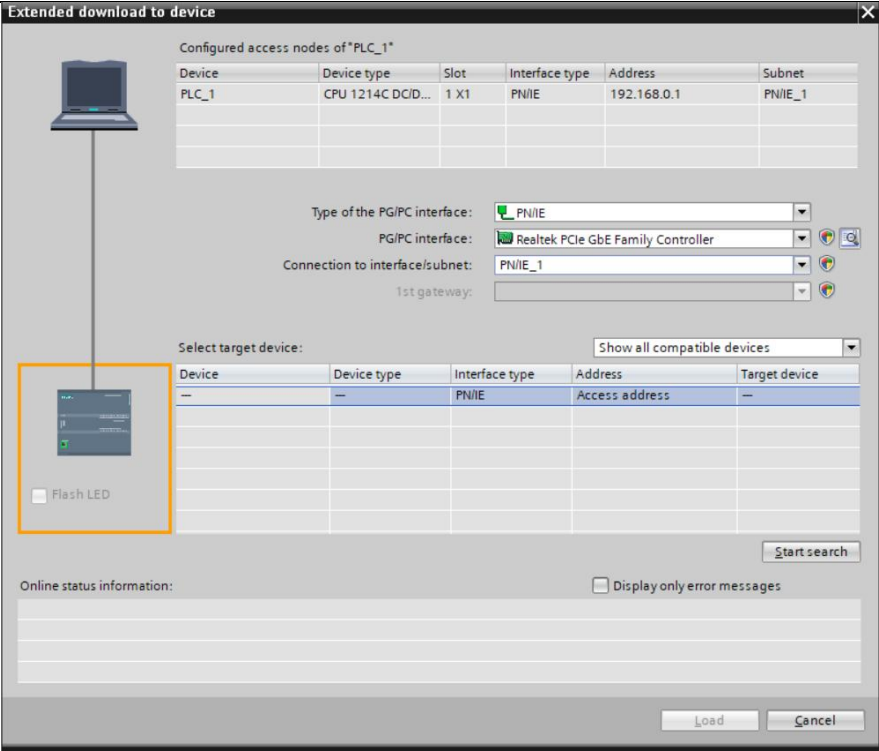
d. Click the "Start Search" button, as shown in the figure below.
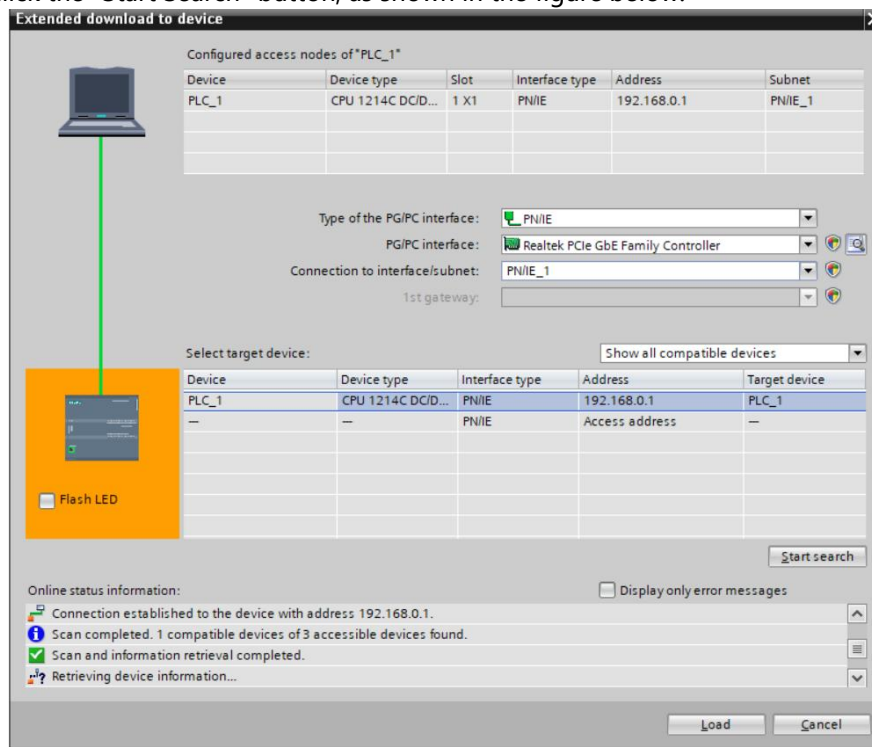
e. Click "Download".

f. Select "Continue without synchronization" ,As shown below.
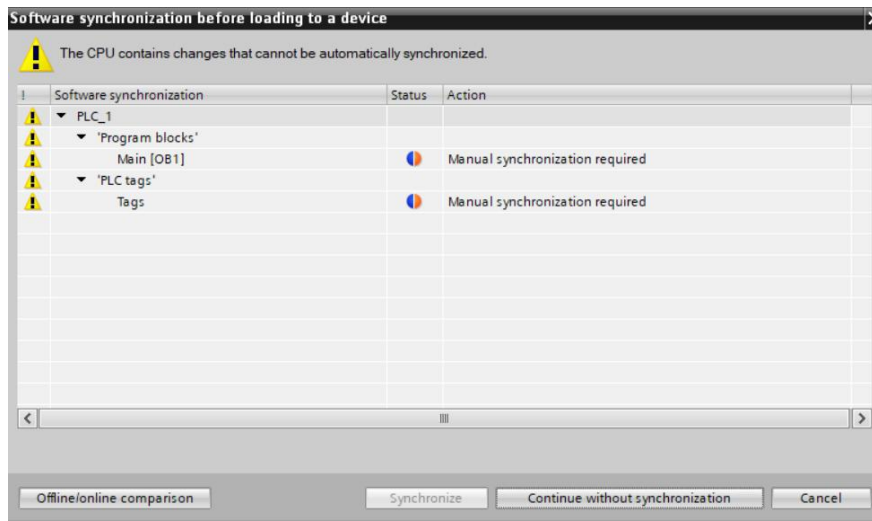
g. Select "Stop All".
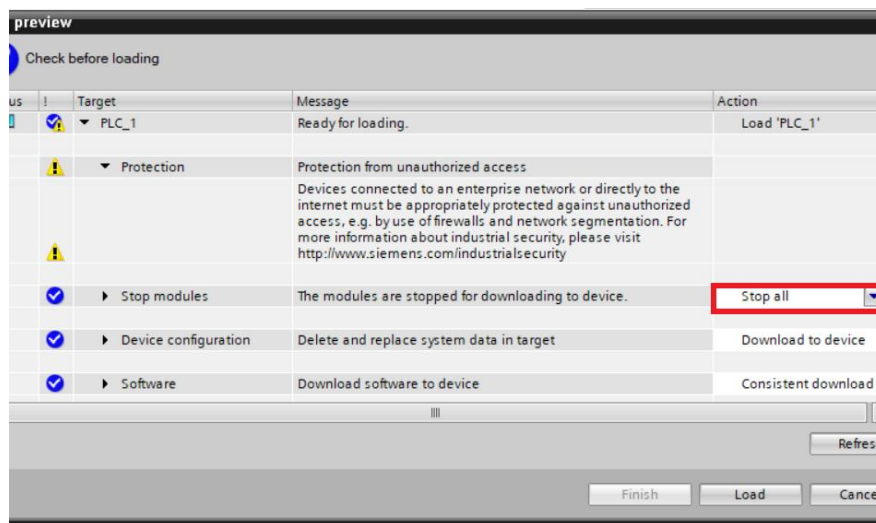
h. Click "Load".
i. Click "Finish".
j. Power on again the device.

9. Communication connection

a. Click the button, and then click the "Go Online" button. If the icons are all green, the connection is successful, as shown in the figure below.

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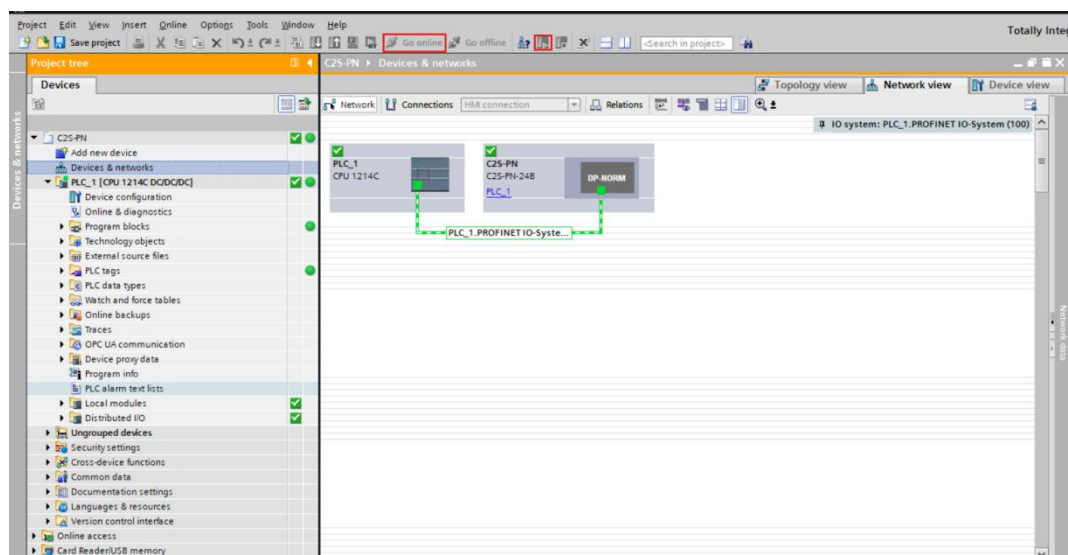
10. Parameter setting

a. Open "Network View", in offline mode, right-click the module view icon part and click "Properties",As shown below.
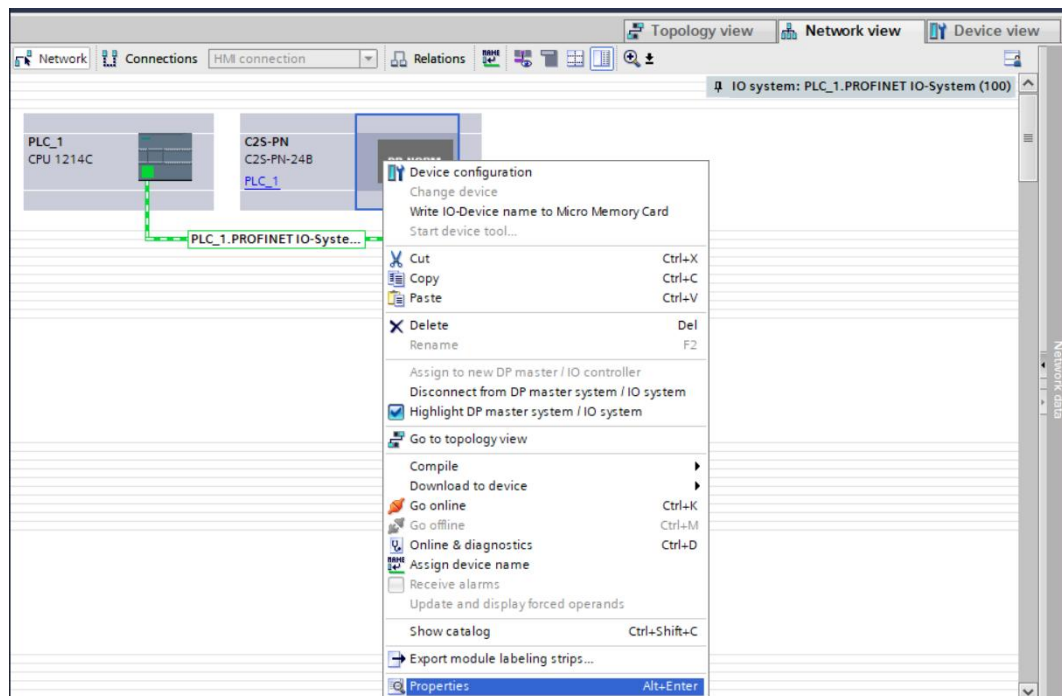
b. On the properties page, click "Module Parameters", As shown below. Parameters can be configured according to actual usage needs. After the configuration is completed, restart Download the program to the PLC, The PLC and modules need to be powered on again .
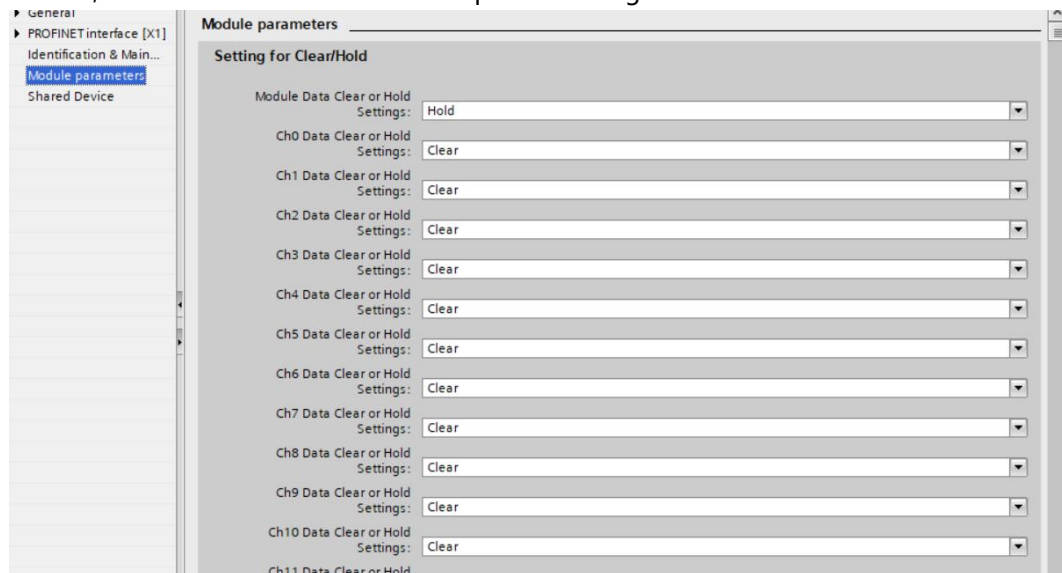
c. Output signal clear/hold parameter function, module clear and hold function as a whole Module Data Clear or Hold Settings, you can choose Clear, Hold or Clear_Hold_By_Channel ,As shown below.
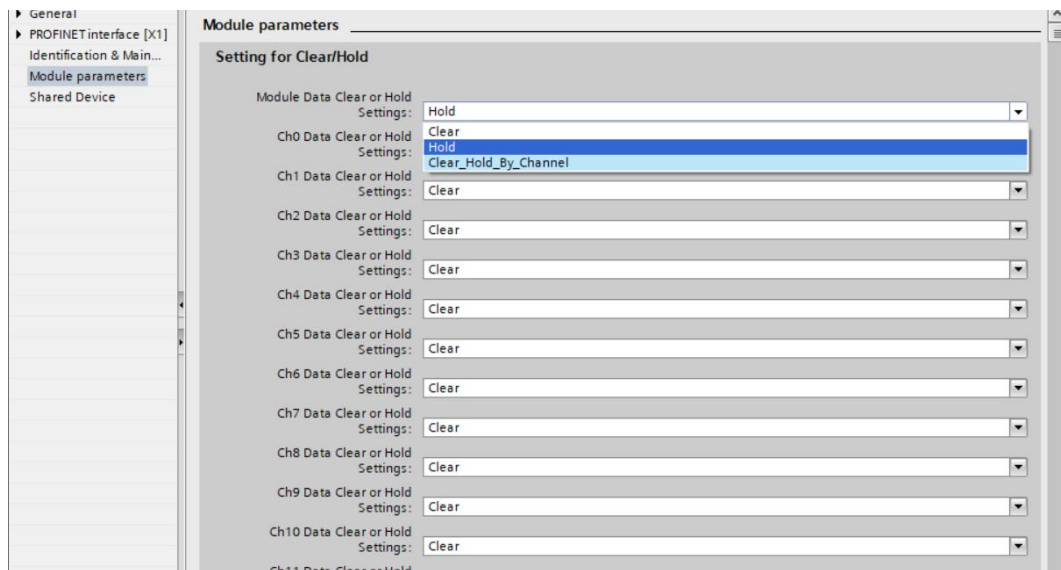
d. Output signal clearing/holding parameter function, module single channel clearing and holding function Chx Data Clear or Hold Settings. The premise for the single channel setting to take effect is to change the overall function Module Data Clear or Hold Settings is set to Clear_Hold_By_Channel, then Set the function of each channel, you can choose Clear or Hold ,As shown below.
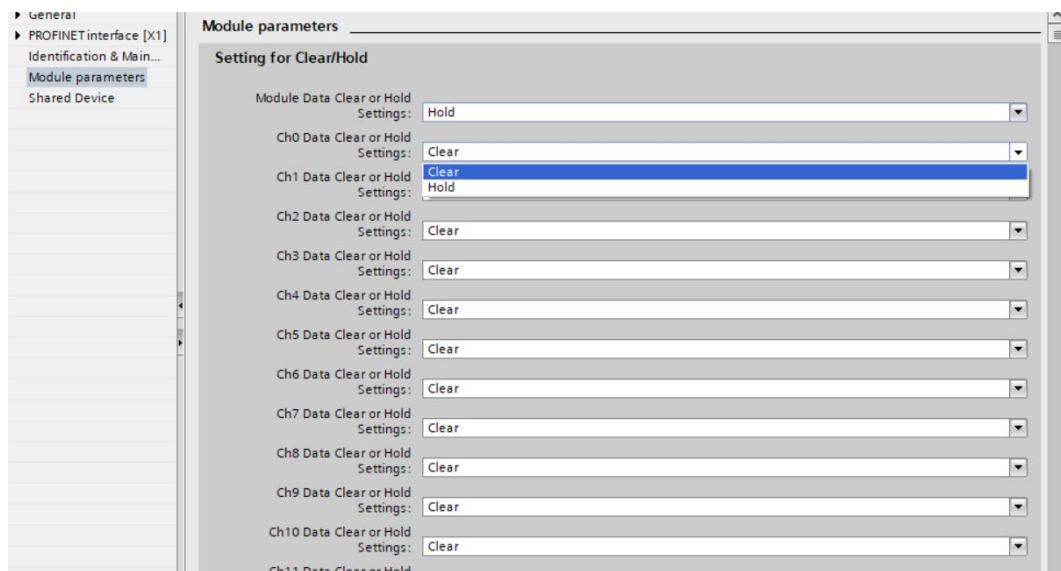
11. Function verification

a. Expand the project navigation on the left and select "Monitoring and Enforcement Table" ,As shown below.
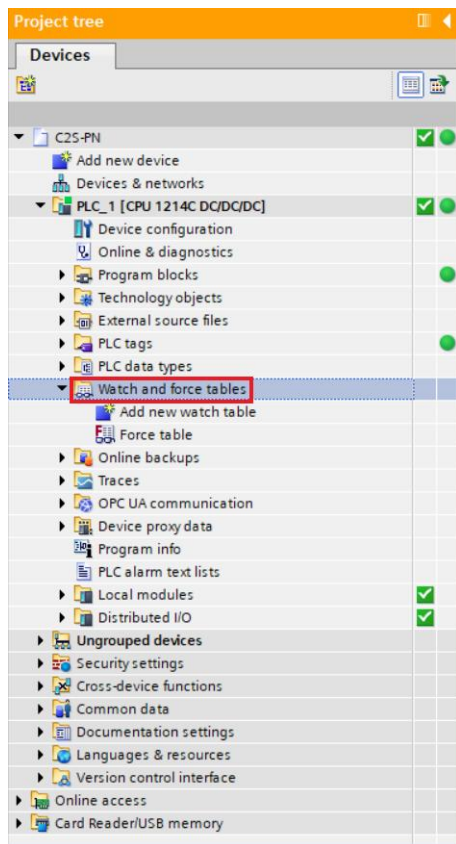
b. Double-click "Add New Monitoring Table" and the system will add a new monitoring table, as shown in the figure below.
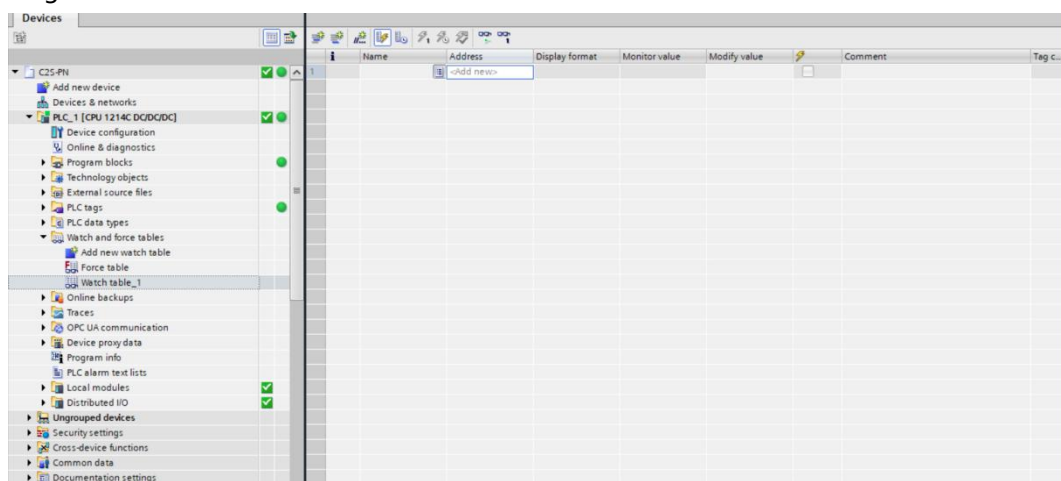
c. Open Device View , check the channel Q address (channel address of the output signal) and I
address of the module C2S-PN-24B in the device overview (channel address of the input signal).
For example, it is found that the "Q address" of the C2S-PN-24B module is 2 to 7, and " I address" is
2 to 13,As shown below.

d. Fill in the input and output channel addresses in the address cells of the monitoring table, for

example, write "QB2" to "QB7" , "IB2" to "IB13" , press "Return "Car key" , after filling in everything,

click ⬚ the button to monitor the data, as shown in the figure below. For ease of viewing, in the

comment cell

Fill in the functional meaning corresponding to each address.

● **Open circuit** diagnosisOpen load[0..7],Open load[8..15],Open load[16..23],Open
load[24..31],Open load[32..39],Open load[40..47] , 48 channels can be independently
diagnosed.

● **Short circuit/overtemperature diagnosisShort** circuit or overtemperature[0..7], Short
circuit or

overtemperature[8..15]、Short circuit or overtemperature[16..23]、Short circ uit or
overtemperature[24..31]、Short circuit or overtemperature[32..39]、Short ci rcuit
or overtemperature[40..47] , 48 channels can be independently diagnosed .

● **Valve terminal output control function**, 24-position dual control solenoid valves, grouped by
driver chips, A total of 6 groups of channels, valve[1..4],

valve[5..8], valve[9..12], valve[13..16], valve e[17..20], valve[21..24], each group has 8 channels, Total 48 channel output control.

e. **Open load diagnosis** , when the channel solenoid valve coil output is closed (that is, 0), the diagnostic value is valid.

in Open load[0..7]~Open l At the "monitoring value" corresponding to oad[40..47], you can view the solenoid valves corresponding to each group of channels in the entire valve terminal. Open circuit diagnostic value, if a group of channel solenoid valve coils are all normal, it will be **0** , if any solenoid valve has an open circuit, it will not be **0** .
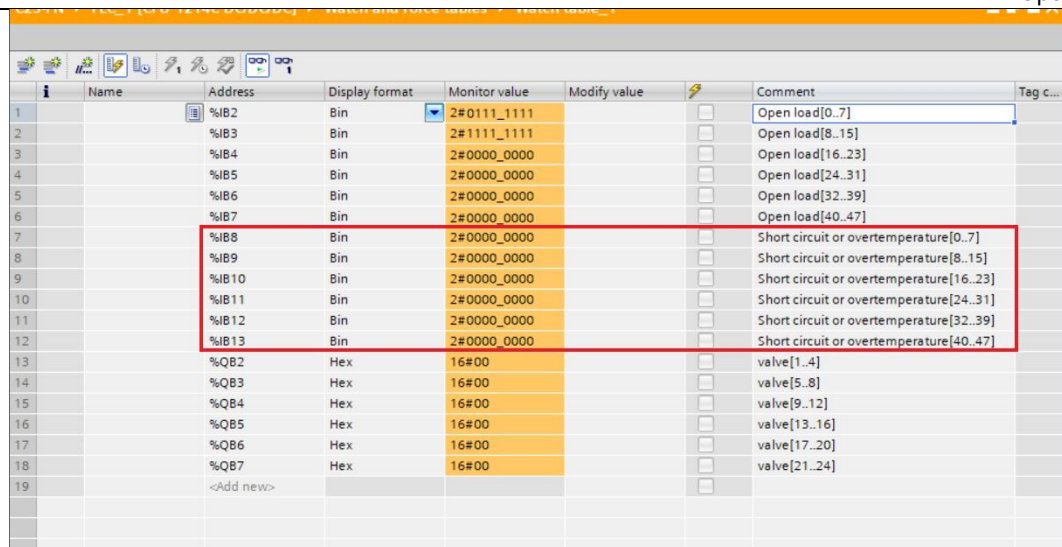
Switch the display format of IB2~IB7 to binary, you can view the open circuit diagnostic value of each channel solenoid valve. If the value is **1** , the valve is open. If it is **0** , it is normal. As shown below.

f. **Short circuit or overtemperature diagnosis** , when the channel solenoid valve coil output is turned on (that is, 1), the diagnostic value efficient.

In Short circuit or overtemperature [0..7]~ Short circuit or The "monitoring value" corresponding to overtemperature [40..47] At , you can view the solenoid valve short circuit/over-temperature diagnostic value corresponding to each group of channels in the entire valve terminal. If there is a solenoid valve with short circuit/over-temperature, it is not **0** , and it does not appear. Short circuit/overtemperature is **0** .

Switch the display format of IB8~IB13 to binary, you can view the short circuit/overtemperature diagnostic value of each channel solenoid valve. If the value is **1** , the solenoid valve Short circuit/over temperature occurs, the value is **0** means there is no short circuit/overtemperature, as shown in the figure below.

	i	Name	Address	Display format	Monitor value	Modify value		Comment	Tag c...
1			%IB2	Bin	2#0111_1111			Open load[0..7]	
2			%IB3	Bin	2#1111_1111			Open load[8..15]	
3			%IB4	Bin	2#0000_0000			Open load[16..23]	
4			%IB5	Bin	2#0000_0000			Open load[24..31]	
5			%IB6	Bin	2#0000_0000			Open load[32..39]	
6			%IB7	Bin	2#0000_0000			Open load[40..47]	
7			%IB8	Bin	2#0000_0000			Short circuit or overtemperature[0..7]	
8			%IB9	Bin	2#0000_0000			Short circuit or overtemperature[8..15]	
9			%IB10	Bin	2#0000_0000			Short circuit or overtemperature[16..23]	
10			%IB11	Bin	2#0000_0000			Short circuit or overtemperature[24..31]	
11			%IB12	Bin	2#0000_0000			Short circuit or overtemperature[32..39]	
12			%IB13	Bin	2#0000_0000			Short circuit or overtemperature[40..47]	
13			%QB2	Hex	16#00			valve[1..4]	
14			%QB3	Hex	16#00			valve[5..8]	
15			%QB4	Hex	16#00			valve[9..12]	
16			%QB5	Hex	16#00			valve[13..16]	
17			%QB6	Hex	16#00			valve[17..20]	
18			%QB7	Hex	16#00			valve[21..24]	
19			<Add new>						

g.Channel **output control**, if you want any group of solenoid valve coil outputs in the valve terminal to turn on, taking the first group of channels as an example, you can modify the Enter "FF" in the "Value" cell. Click ![button] button to write, you can open the first group of solenoid valve coil channels, and the other channels open and output in the same way , as shown in the figure below.

	i	Name	Address	Display format	Monitor value	Modify value		Comment	Tag c...
1			%IB2	Bin	2#0000_0000		☐	Open load[0..7]	
2			%IB3	Bin	2#1111_1111		☐	Open load[8..15]	
3			%IB4	Bin	2#0000_0000		☐	Open load[16..23]	
4			%IB5	Bin	2#0000_0000		☐	Open load[24..31]	
5			%IB6	Bin	2#0000_0000		☐	Open load[32..39]	
6			%IB7	Bin	2#0000_0000		☐	Open load[40..47]	
7			%IB8	Bin	2#0000_0000		☐	Short circuit or overtemperature[0..7]	
8			%IB9	Bin	2#0000_0000		☐	Short circuit or overtemperature[8..15]	
9			%IB10	Bin	2#0000_0000		☐	Short circuit or overtemperature[16..23]	
10			%IB11	Bin	2#0000_0000		☐	Short circuit or overtemperature[24..31]	
11			%IB12	Bin	2#0000_0000		☐	Short circuit or overtemperature[32..39]	
12			%IB13	Bin	2#0000_0000		☐	Short circuit or overtemperature[40..47]	
13		▤	%QB2	Hex ▼	16#FF	16#FF	☑ ⚠	valve[1..4]	
14			%QB3	Hex	16#00		☐	valve[5..8]	
15			%QB4	Hex	16#00		☐	valve[9..12]	
16			%QB5	Hex	16#00		☐	valve[13..16]	
17			%QB6	Hex	16#00		☐	valve[17..20]	
18			%QB7	Hex	16#00		☐	valve[21..24]	
19			<Add new>				☐		

7.4.2 Application in STEP 7-MicroWIN SMART software environment

1. Preparation work

- **Hardware environment**
  - ➢ **Valve terminal model C2S-PN-24B**
  - ➢ **One computer, pre-installed with STEP 7-MicroWIN SMART V2.6 software**
  - ➢ **Special shielded cable for valve terminal**
  - ➢ **A Siemens PLC. This description takes Siemens S7-200 SMART as an example.**
 - ➢ **One switching power supply**
  - ➢ **device profile**
    Configuration file acquisition address: https://www.solidote ch.com/documents/configfile
- **Hardware configuration and wiring**
  Please follow " 5 Installation " " 6 Wiring " requires action

2, Add PLC

a. Open STEP 7-MicroWIN SMART software.

b. Double-click the left navigation tree ▦ CPU ST30 button to pop up the "System Blocks" window. ,
   select the CPU model corresponding to the PLC, Click OK button button, As shown below.
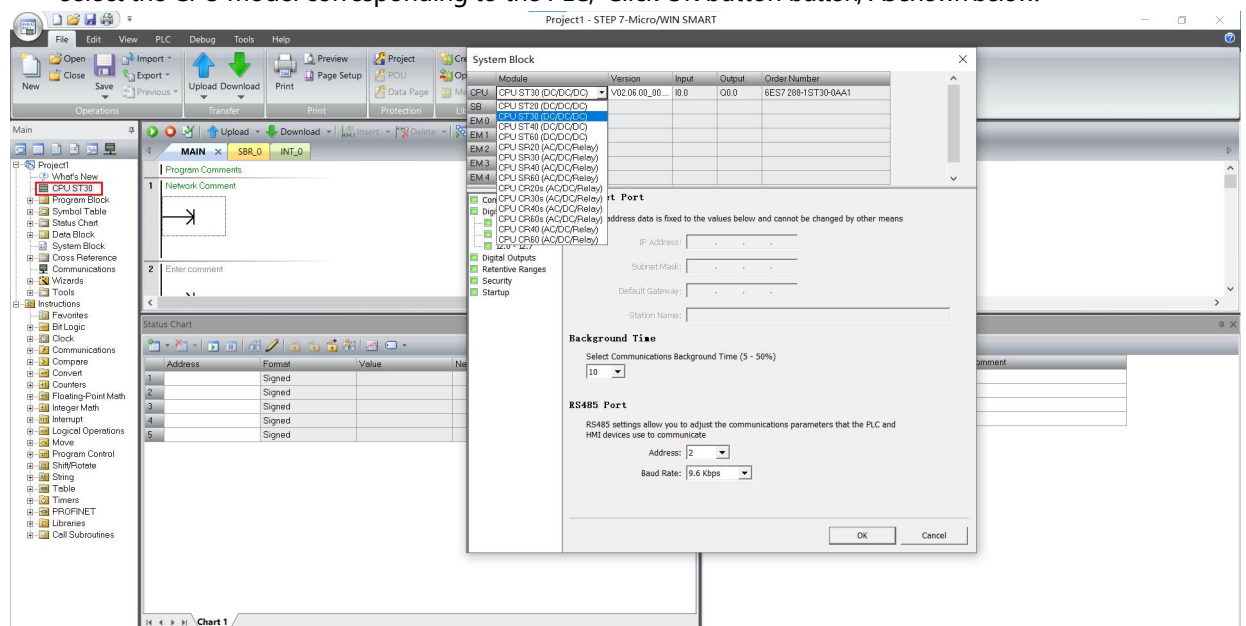
c. Click the navigation tree [icon] 通信 button on the left to pop up the "Communication" window, switch

the communication interface to the interface actually used by the PLC, and click "Find"

CPU" button to find the PLC, as shown in the figure below.
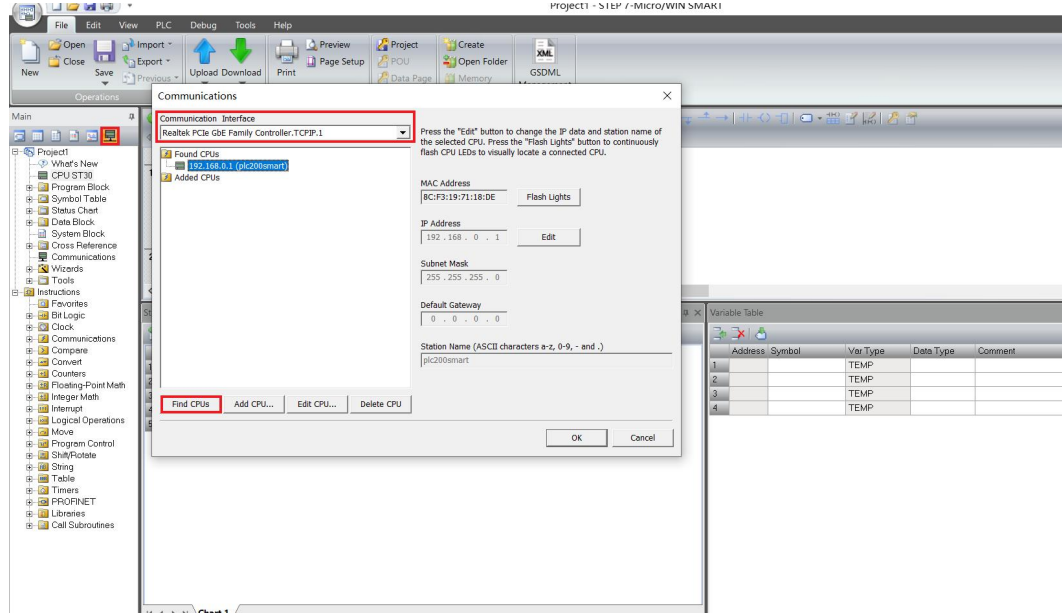
d. Click the "Edit" button in the communication window, the edit button switches to the setting button, the IP address input box lights up, and the IP address and computer interface are modified. The IP address is in the same network segment. After the modification is completed, click the "Set" button again. After the setting is completed, click the " OK" button, as shown in the figure below.

Note: You can only modify the IP address of the computer's Ethernet interface, as long as it is in the same network segment as the PLC address.
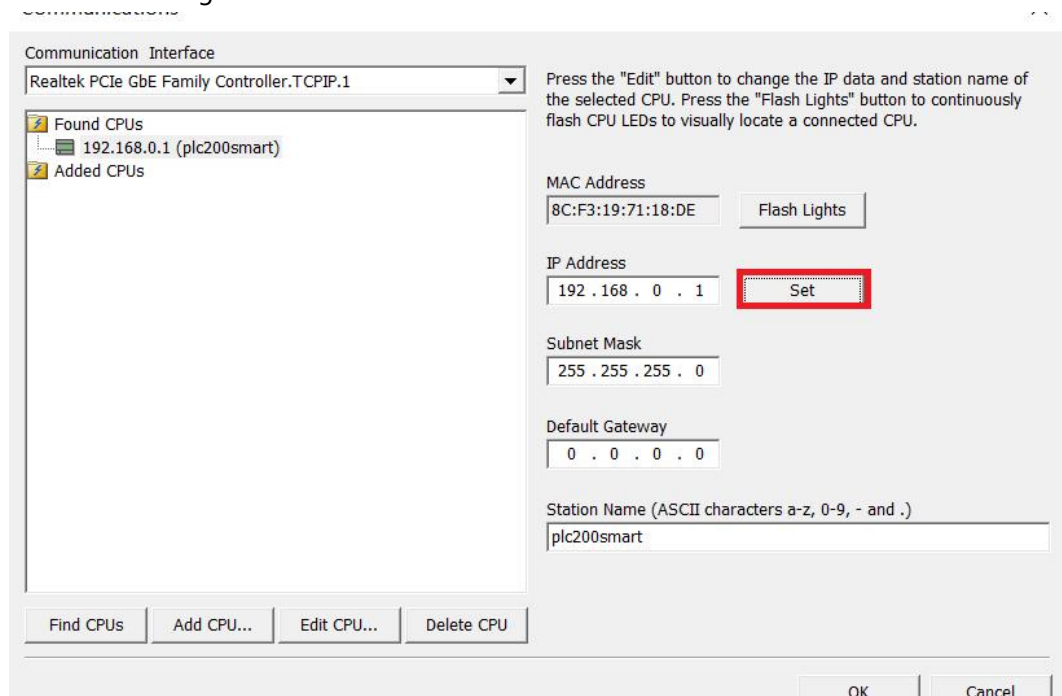
3. Import GSD file

a. Click "File- > GSDML Management" , click the "Browse" button in the GSDML management window, and select the GSDML to import file, click the "Confirm" button,   As shown below.
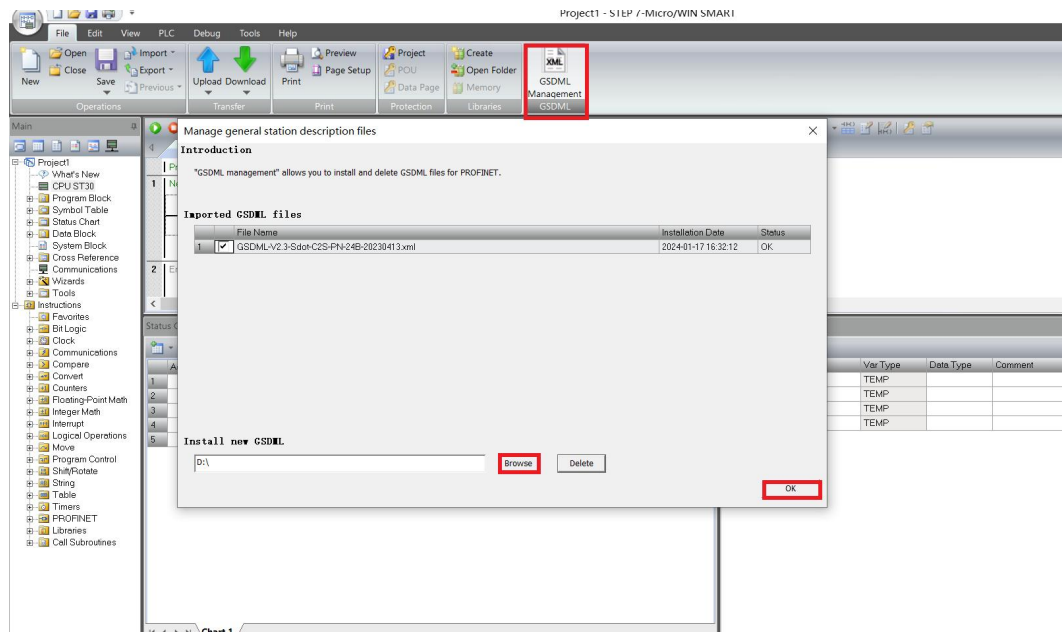
4. Find device

a. Click "Tools- > Search PROFINET device", the Find PROFINET device window pops up, switch the communication interface to PLC real-time Click "Find Device" to find the interface you are actually using, as shown in the figure below.
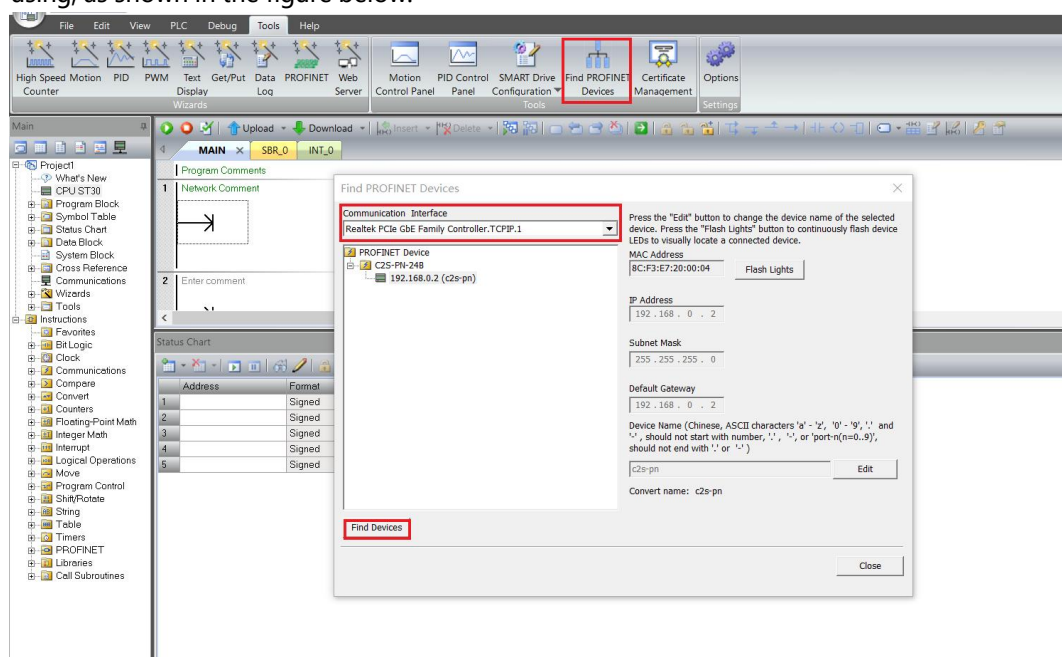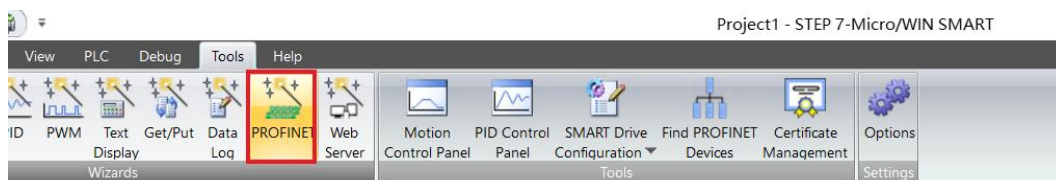
b. Click the "Edit" button to edit the module name. After editing is completed, click the "Set" button, as shown in the figure below.
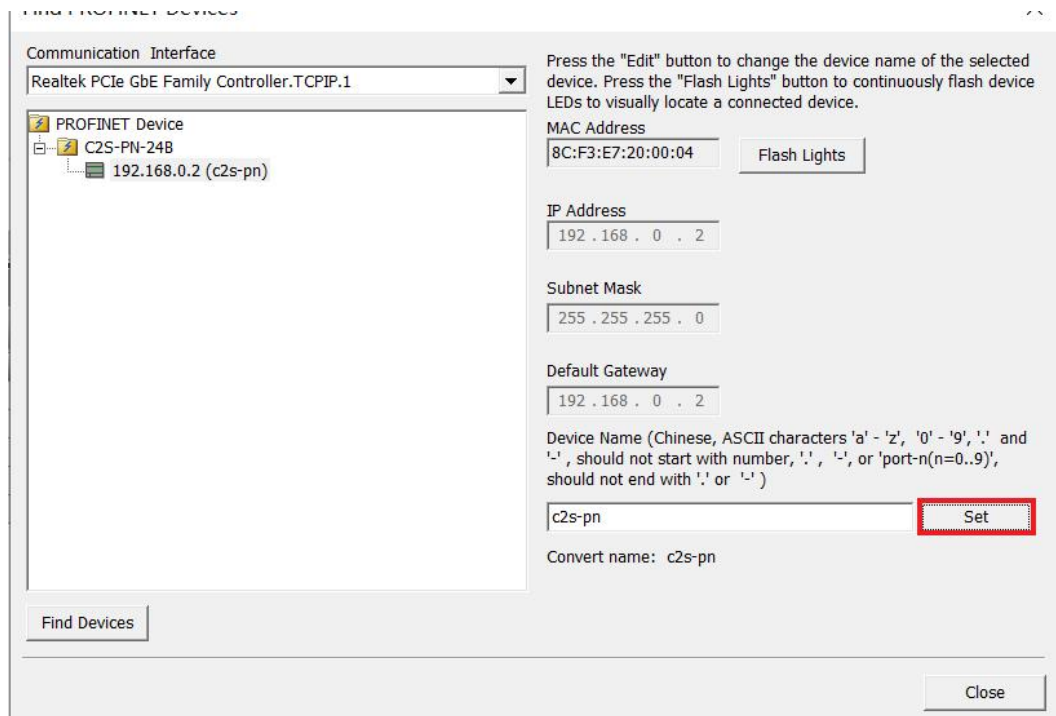
5. Configuring the PROFINET network

a. Click "Tools- > PROFINET", open the PROFINET configuration wizard ,As shown below.

b. On the PROFINET configuration wizard page, select the PLC role as "Controller" ,As shown below.
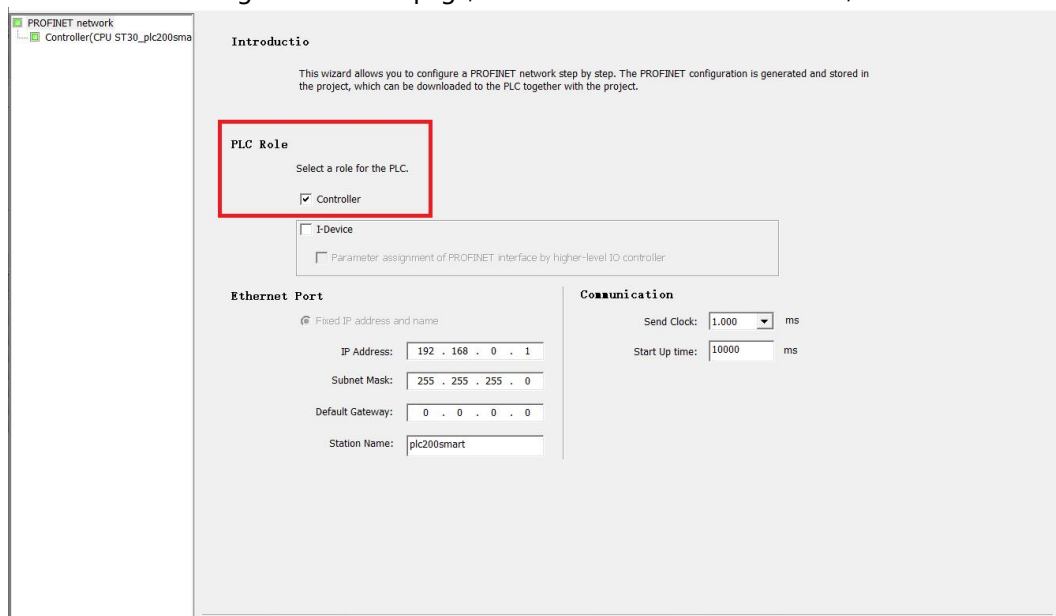
c. Click "Next" to enter the controller configuration page, add the device from the device directory tree on the right, select C2S-PN-24B , and click "Add" Add" button, as shown below.
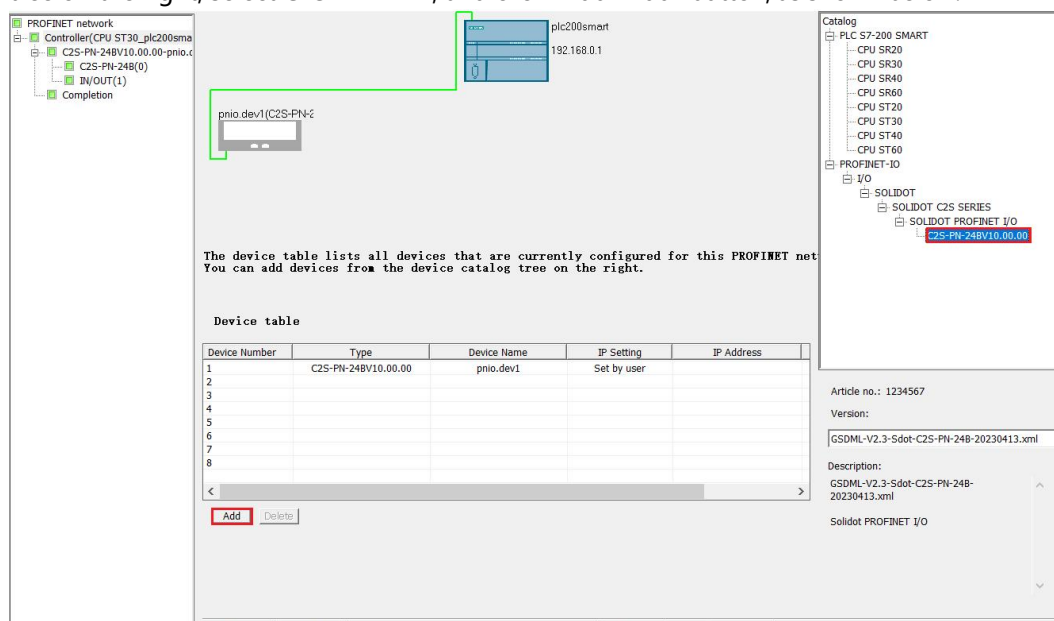
d. Double-click the input box below the device name and enter the device name, which needs to be consistent with the name set when searching for the device; double-click the input box below the IP address. Enter the IP address. After the input is completed, it is as shown in the figure below. If there are other modules in the configuration, they can be added and configured in the same way .
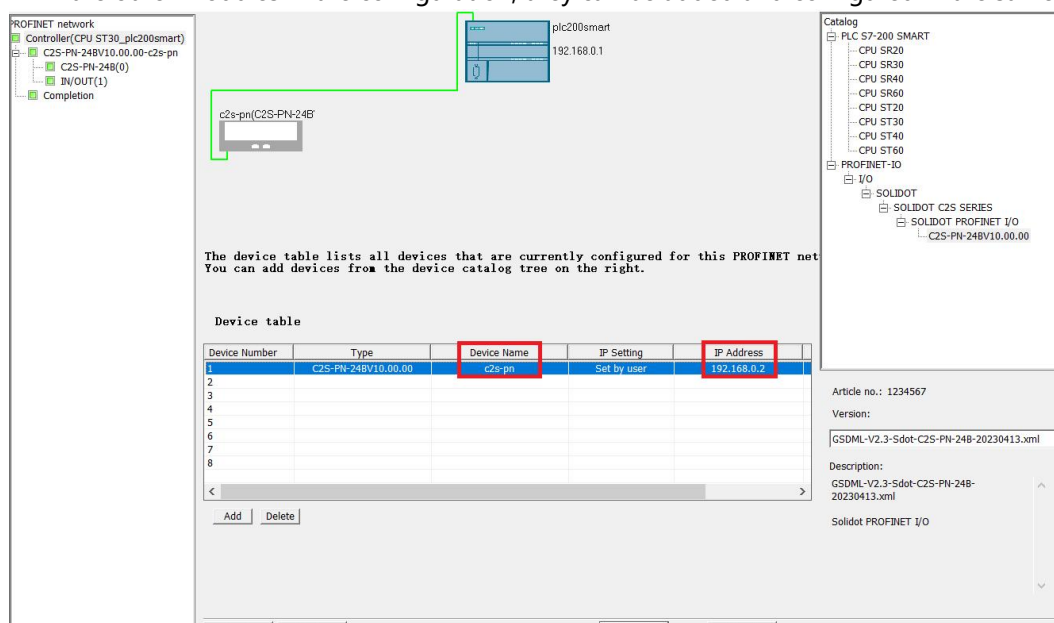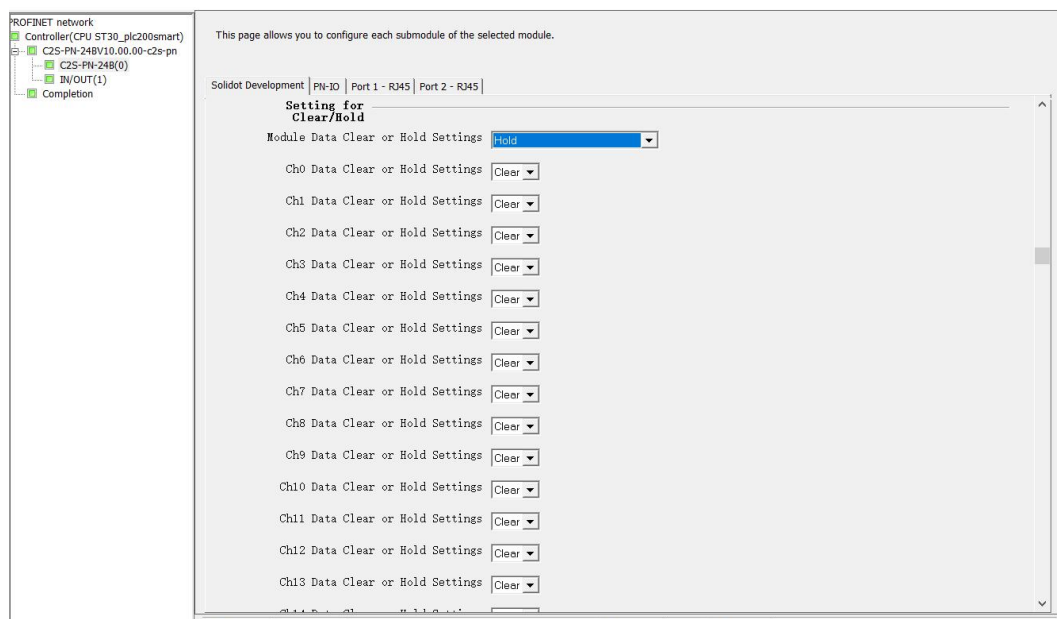

Note: The device name must be consistent with the module name , the IP address needs to be set in the same network segment as the PLC.

e. Click the "Next" button. You can see that the input and output starting addresses of the module are 128, as shown in the figure below.
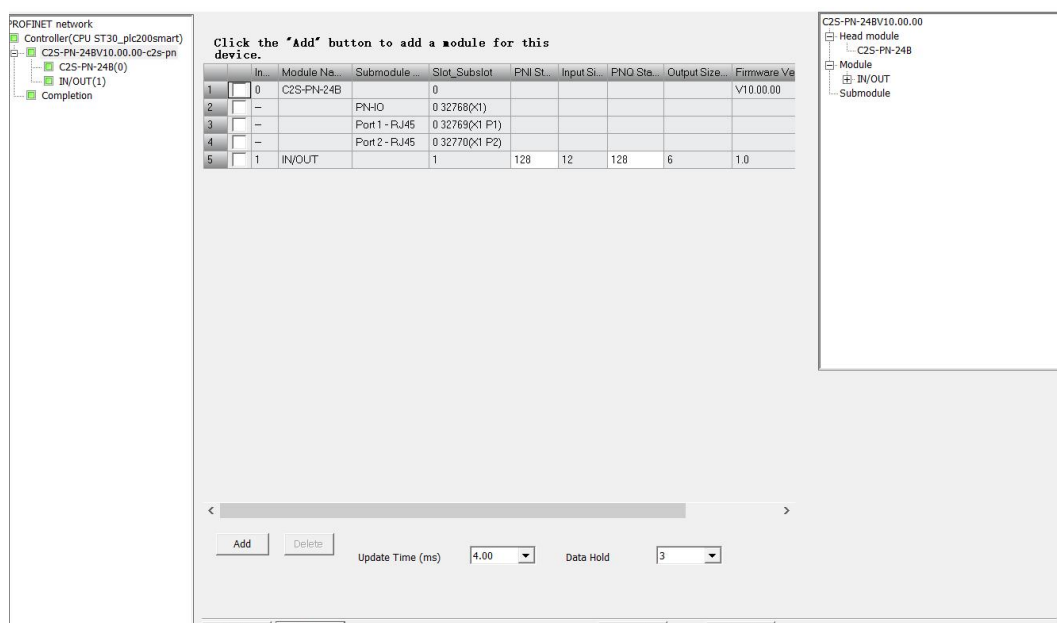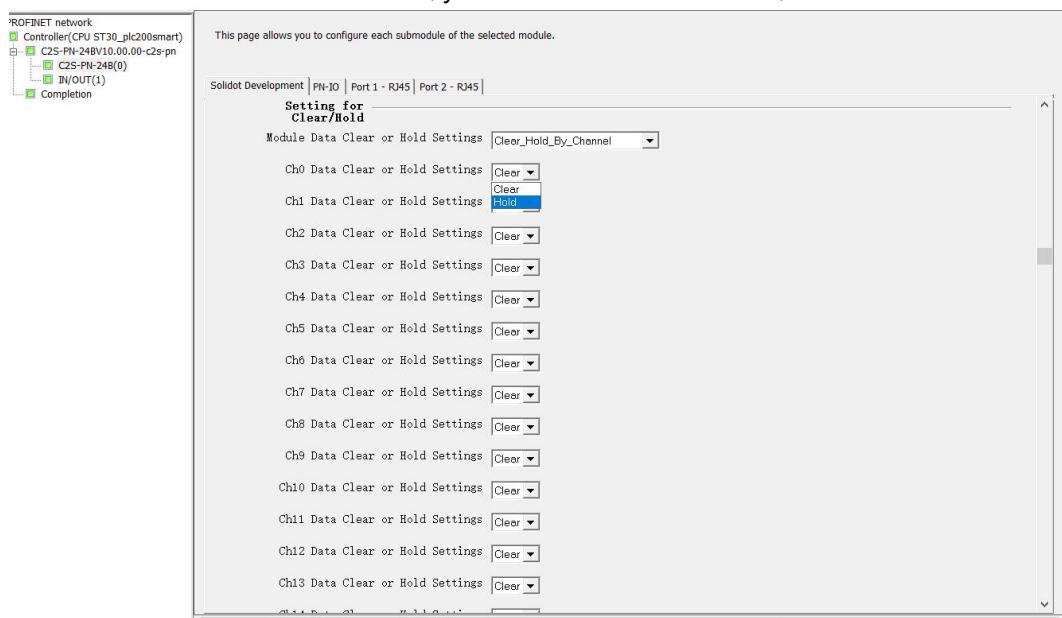

f. Click the "Next" button to see the module configuration parameter page, as shown in the figure below.

g. Output signal clear/hold parameter function, module clear and hold function as a whole Module Data Clear or Hold Settings, you can choose Clear, Hold or Clear_Hold_By_Channel ,As shown below.
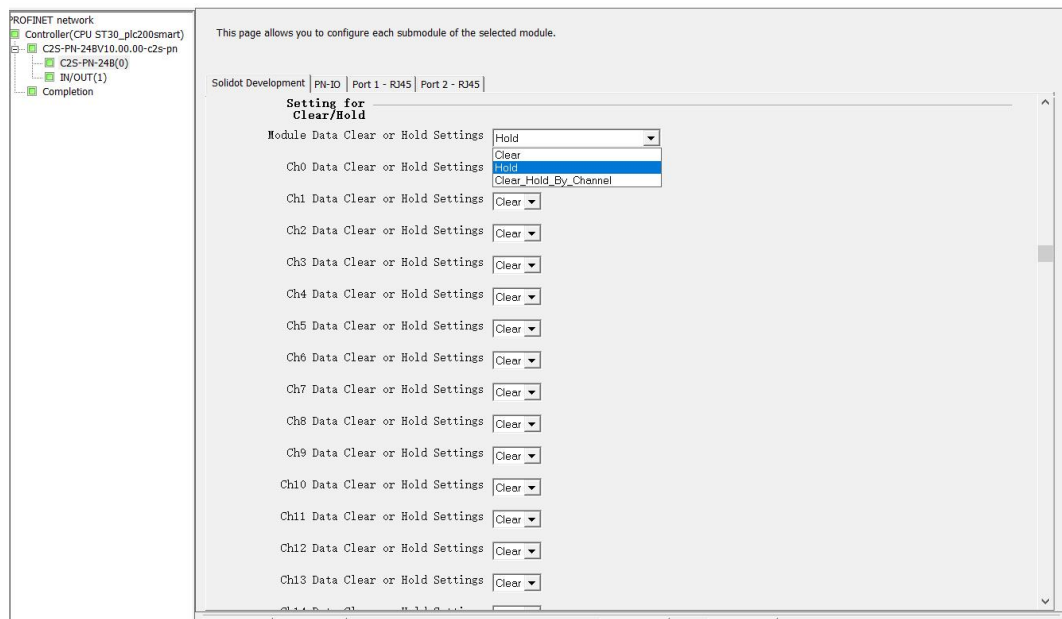

h. Output signal clear/hold parameter function, module single channel clear and hold function Chx Data Clear or Hold Settings. The premise for the single channel setting to take effect is to change the overall function Module Data Clear or Hold Settings is set to Clear_Hold_By_Channel, then Set the function of each channel, you can choose Clear or Hold ,As shown below.
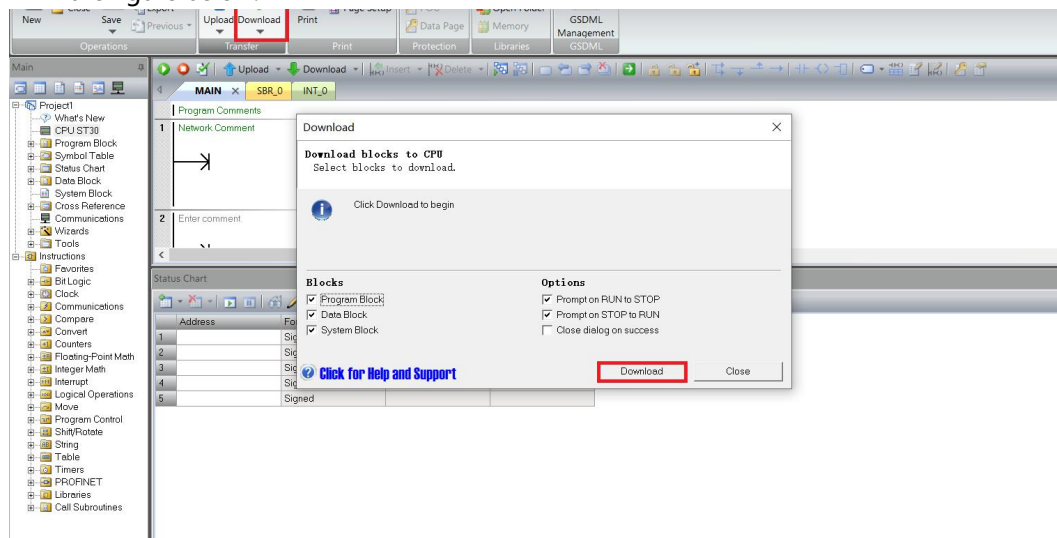
i. Click the "Next" button to complete the configuration wizard. Click the "Generate" button to complete the network configuration, as shown in the figure below.
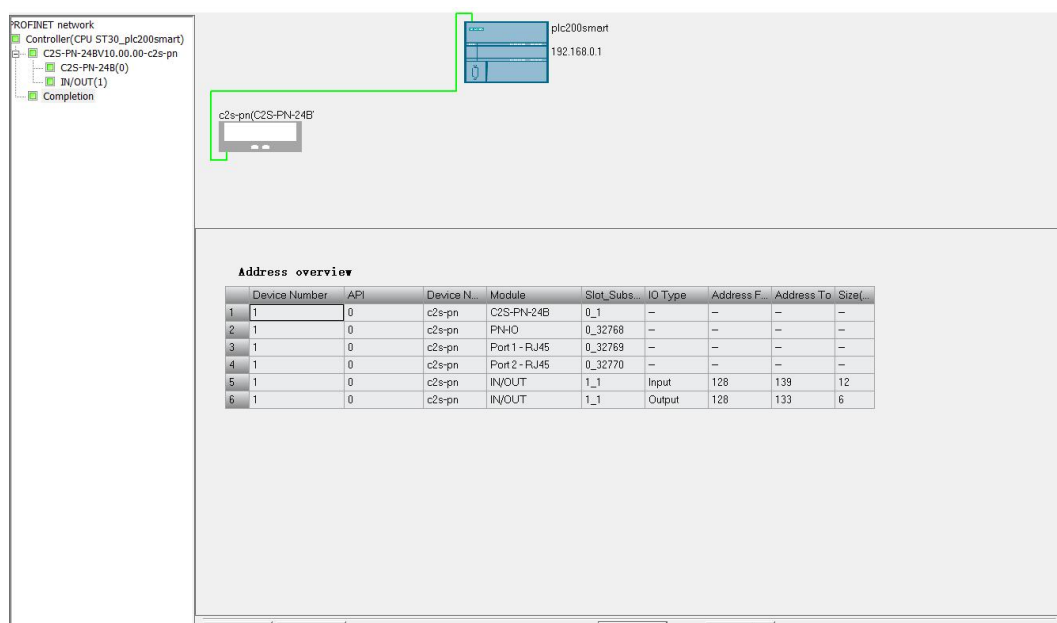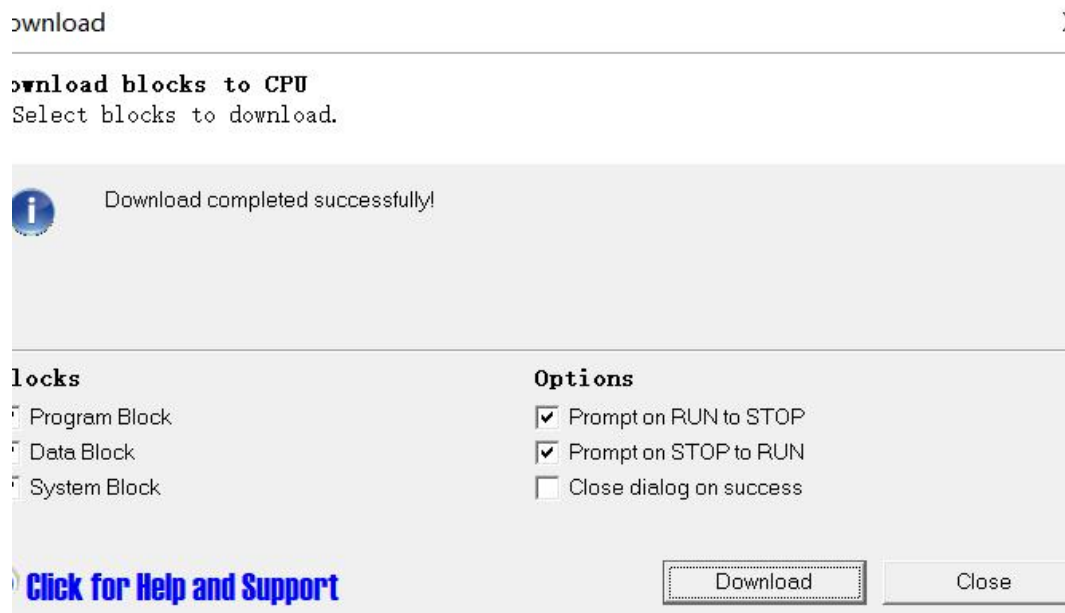

6. Download program

a. Click "File- >Download" button, a download window will pop up, click the "Download" button, as shown in the figure below.
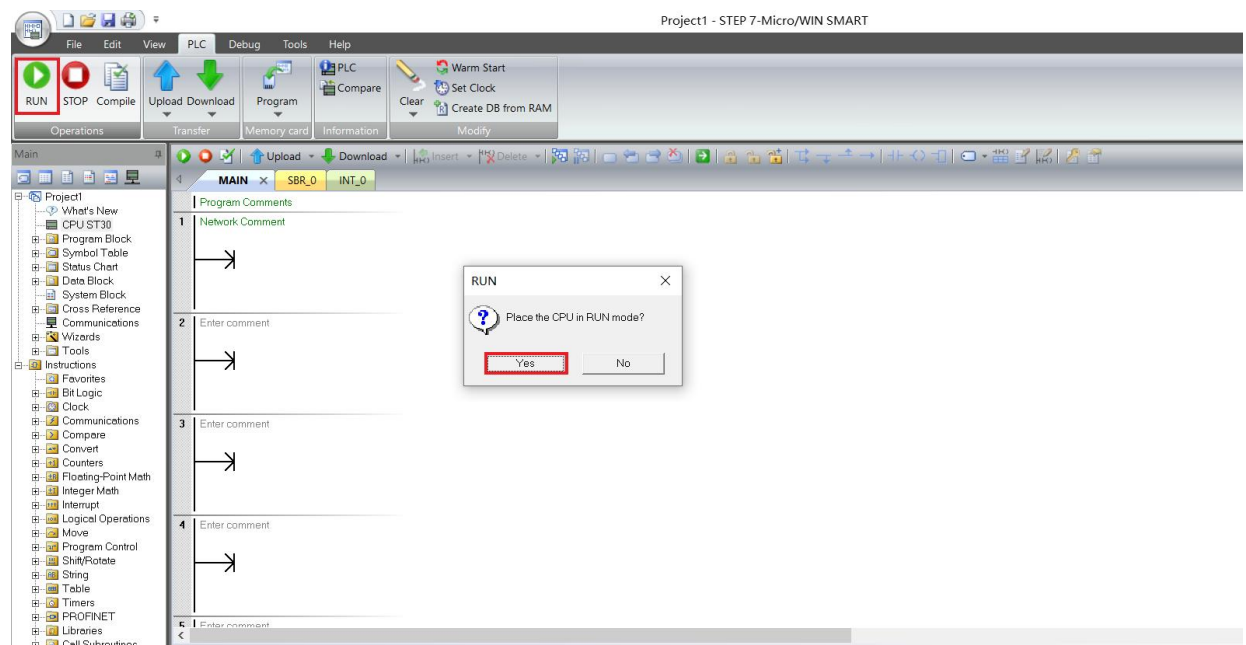
b. After the download window prompts that the download has been successfully completed, click the "Close" button.

Note: After the download is completed, power on the module again.

7. Functional Verification

a. Click the menu bar "PLC -> RUN" button, a confirmation window will pop up, click "Yes" to confirm, as shown in the figure below.

b. Click "Status Chart- > Chart 1" , enter the corresponding channel address and data format in Chart 1, you can modify the module here Perform forced output and input monitoring operations.
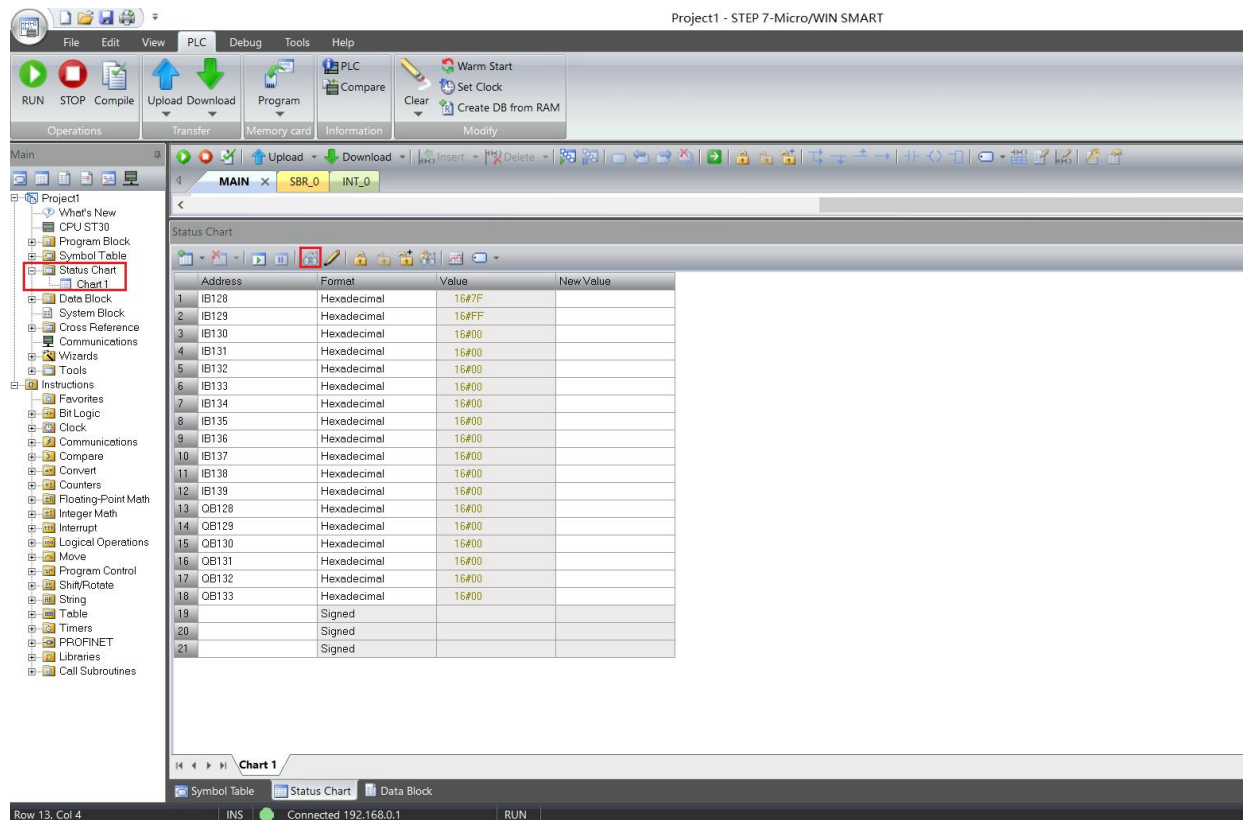
c. **Open circuit diagnosis Open load** , the output of the solenoid valve coil in the channel is closed (th at is, 0), the diagnostic value is valid.

At the "current value" corresponding to IB128~IB133, you can view the solenoid valve open circuit diagnostic value corresponding to each group of channels in the entire valve terminal. If the solenoid valve coils are all normal , it is **0.** If any solenoid valve is open , it is not. **0** .

Switch the display format of IB128~IB133 to binary , you can check the open circuit diagnostic value of each channel solenoid valve. If the value is **1** , the valve is open. A value of **0** is normal. As shown below.
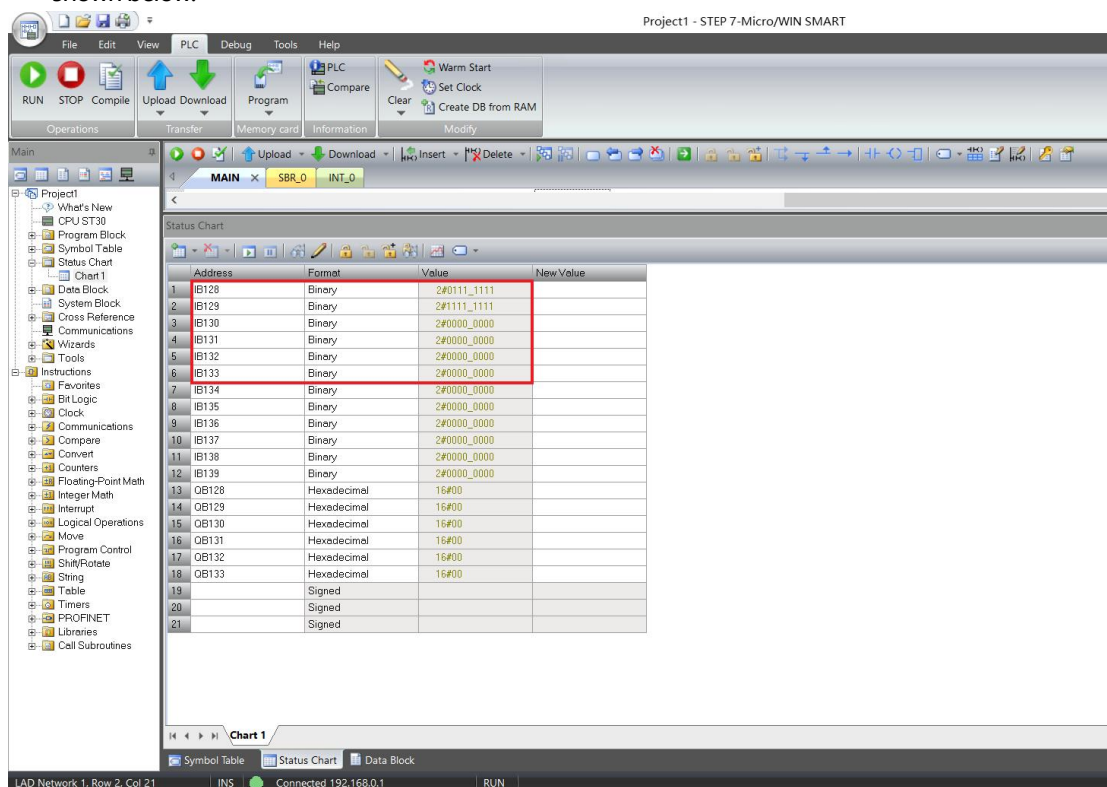
d. **Short circuit or overtemperature diagnosis ,** when the channel solenoid valve coil output is turned on (that is, 1), the diagnostic value efficient. At the " current value" corresponding to IB134~IB139 , You can view the solenoid valve short circuit/over-temperature diagnostic value corresponding to each group of channels in the entire valve terminal . If there is a solenoid valve with a short circuit/over temperature, it will not be **0** , and if there is no short circuit/over temperature, it will be **0** .

Switch the display format of IB134~IB139 to binary , you can view the short circuit/overtemperature diagnostic value of each channel solenoid valve. If the value is **1** , the The solenoid valve has a short circuit/over temperature, and the value is **0** means there is no short circuit/overtemperature, as shown in the figure below.
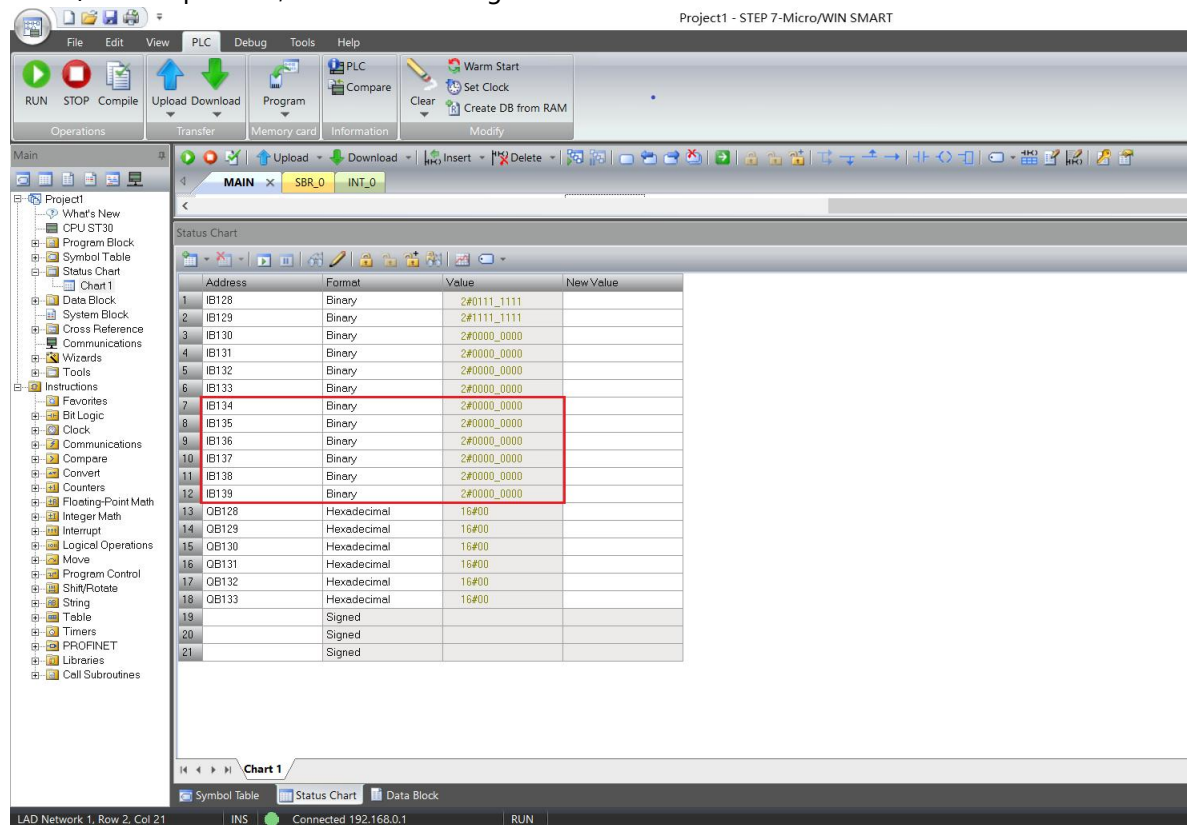
e.Channel **output control**, if you want any group of solenoid valve coil outputs in the valve terminal to turn on, taking the first group of channels as an example, you can enter "16#FF" in the "New Value" cell of QB128 and click the write button, you can open the first group of solenoid valve coil channels, and other channels open the output method 1 To, as shown below.
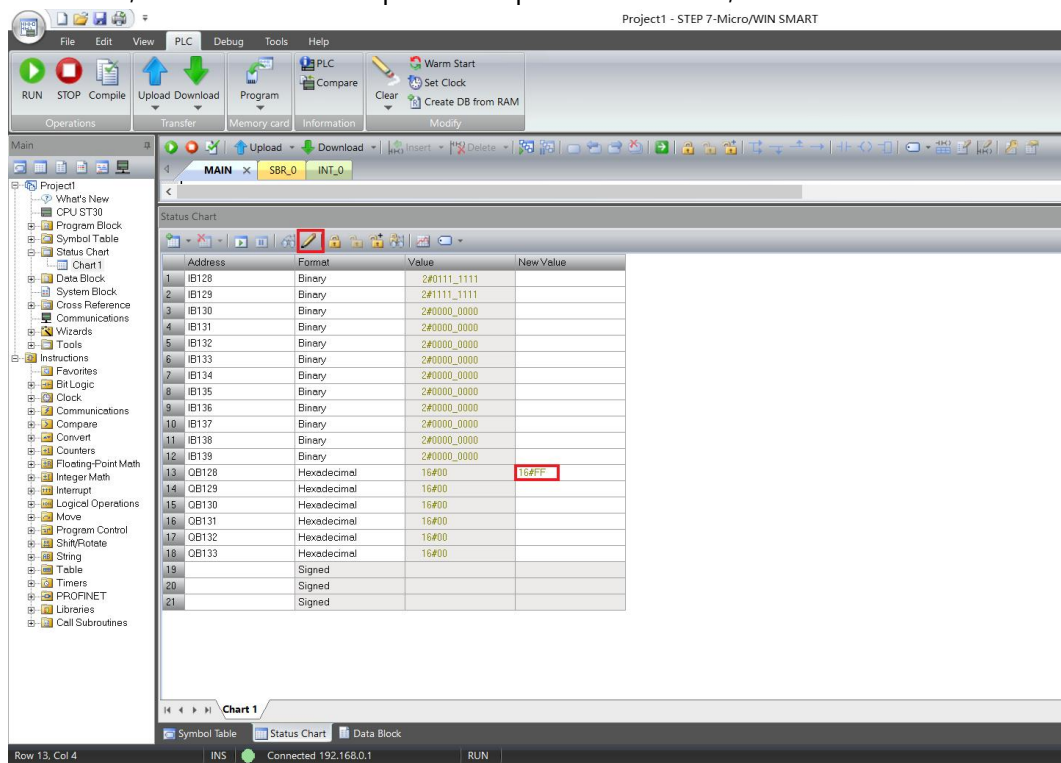
8 FAQ

8.1 When updating accessible devices, the device cannot be found

1. Confirm that TIA Portal software is installed correctly.

2. Make sure that no other software is occupying the network adapter used by the Porto software.
3. Confirm that the network cable, network card, and network port can work normally.
4. Check whether the IP address or MAC address conflicts.

8.2 The load button is gray when downloading the configuration.

1. Confirm that there are no forced values in the PLC.

2. Confirm that the PLC is in a stopped state.