PROFINET

PN7 Series Integrated I/ O

User Manual

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V 1.01	2 023.03.09	1. Modify 3.1 general parameter U_S consumption current to 40mA , and 3.2 digital parameter input filtering to 3ms. 2. Modify the system current consumption in 6.1 and 6.2 to 40mA . 3. Add 7.1.1 digital input filter function description.	Chen Yun
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1 product description

1.1 Product Introduction

PN7 series integrated I/O module adopts PROFINET industrial Ethernet bus interface. It is a PROFINET slave device with standard IO equipment. It can be compatible with PROFINET networks of multiple manufacturers, providing users with high-speed data collection, optimizing system configuration, and simplifying on-site wiring, improving system reliability and etc, a variety of options.

1.2 Product Features

- Input and output configurable
  Input or output function switching can be achieved by configuring DIO channel parameters .
- IP67 protection level
  Suitable for harsh industrial environments.
- Compact size
  Ideal for applications where space is limited.
- High speed
  Based on high-performance communication chips.
- Easy to diagnose
  The innovative channel indicator light design is close to the channel, the channel status is clear at a glance, detection and maintenance are convenient.
- Easy to configure
  The configuration is simple and supports all major mainstream PROFINET master stations.
- Wiring is quick and easy
  Using standard cables, wiring is simple.

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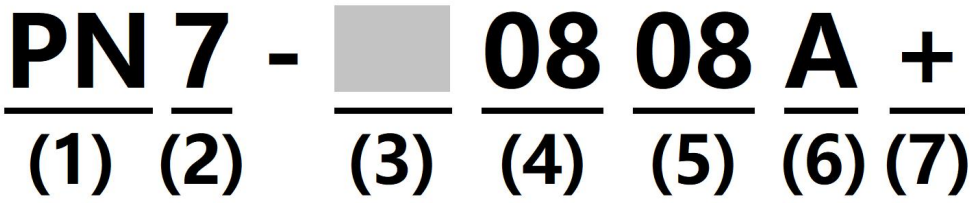
2 Naming rules

2.1 Naming Rules



serial number	meaning	Value description		
(1)	bus protocol	PN: PROFINET protocol abbreviation		
(2)	Protection level	7 : IP 67		
(3)	I/O type	Default: digital		
(4)	Input signal points	16 : 16 channel input	08 : 8 channel input	0 0 : 0 channel input
(5)	Output signal points	16 : 16 channel output	08 : 8 channel output	0 0 : 0 channel output
(6)	signal type	A：NPN	B：PNP	
(7)	Channel characteristics	+: Channel configurable input/output	Default: channel type is fixed and cannot be configured	

2.2 Model List

model	Product Description
PN7-1600A	16-channel digital input module , NPN type
PN7-0016A	16-channel digital output module , NPN type
PN7-0808A	8-channel digital input and output module , NPN type

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PN7-1600B	16-channel digital input module , PNP type
PN7-0016B	16-channel digital output module , PNP type
PN7-0808B	8-channel digital input and output module , PNP type
PN7-0016A+	16-channel digital input and output configurable module , NPN type
PN7-0016B+	16-channel digital input and output configurable module , PNP type

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3 Product parameters

3.1 General Parameters

Interface Parameters	
bus protocol	PROFINET
bus interface	2×M12-D, 4Pin, female, blue
electrical isolation	500 VAC
data transmission medium	Category 5 or above UTP or STP (STP recommended)
Transmission distance	≤100 m (distance between stations)
Technical Parameters	
Configuration method	Via main station
Power interface	2×M12-L, 5Pin, male & female, red
Power supply	24VDC (18V～30V)
U_S total current	Max : 16A
US current consumption	≤ 40mA
U_L total current	Max : 16A
U_L consumption current	25mA +Sensor supply current +Load output current
Electrical isolation between GND_S and GND_L	yes
Weight	480g
Size	225×62×35.1mm
Operating temperature	-25℃～+70℃
Storage temperature	-40℃～+85℃
Relative humidity	95%, no condensation
Protection level	IP67

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3.2 Digital Parameters

Digital input						
Product model	PN7-1600A	PN7-1600B	PN7-0808A	PN7-0808B	PN7-0016A	PN7-0016B
Rated voltage	24 VDC (18V~30V)				-	
signal points	16		8			
input interface	8×M12-A, 5 Pin, Female					
signal type	NPN	PNP	NPN	PNP		
" 0" signal voltage	15~30V	-3~+3 V	15~30V	-3~+3V		
" 1" signal voltage	-3~+3 V	15~30V	-3~+3V	15~30V		
Input filtering	3ms					
Input Current	4mA					
Sensor power supply sum	Max : 2A (from U_L)					
Isolation method	Optically-coupled isolation					
Isolation withstand voltage	500VAC					
Channel indicator light	Green LED light					
Digital output						
Rated voltage	-		24 VDC (18V~30V)			
signal points			8		1 6	
Output Interface			8×M12-A, 5 Pin, Female			
signal type			NPN	PNP	NPN	PNP
Load type			Resistive load, inductive load			
Single channel rated current			Max : 500 mA (from U_L)			
Output total current			Max: 4 A (from U_L)		Max: 8 A (from U_L)	
Port protection			Overcurrent protection			
Isolation method			Optically-coupled isolation			
Isolation withstand voltage			500VAC			
Channel indicator light			Green LED light			

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digital input		
Product number	PN7-0016A+	PN7-0016 B +
Rated voltage	24 VDC (18V~30V)	
signal points	Input and output are configurable , up to 16 points	
input interface	M12-A, 5 Pin, Female	
signal type	NPN	PNP
" 0" signal voltage	15~30V	-3~+3 V
" 1" signal voltage	-3~+3 V	15~30V
Input filtering	3ms	
Input Current	4mA	
Sensor power supply sum	Max : 2A (from U_L)	
Isolation method	Optically-coupled isolation	
Isolation withstand voltage	500VAC	
Channel indicator light	Green LED light	
Digital output		
Rated voltage	24 VDC (18V~30V)	
signal points	Input and output are configurable , up to 16 points	
Output Interface	M12-A, 5 Pin, Female	
signal type	NPN	PNP
Load type	Resistive load, inductive load	
Single channel rated current	Max : 500 mA (from U_L)	
Output total current	Max: 8 A (from U_L)	
Port protection	Overcurrent protection	
Isolation method	Optocoupler isolation	
Isolation withstand voltage	500VAC	
Channel indicator light	Green LED light	

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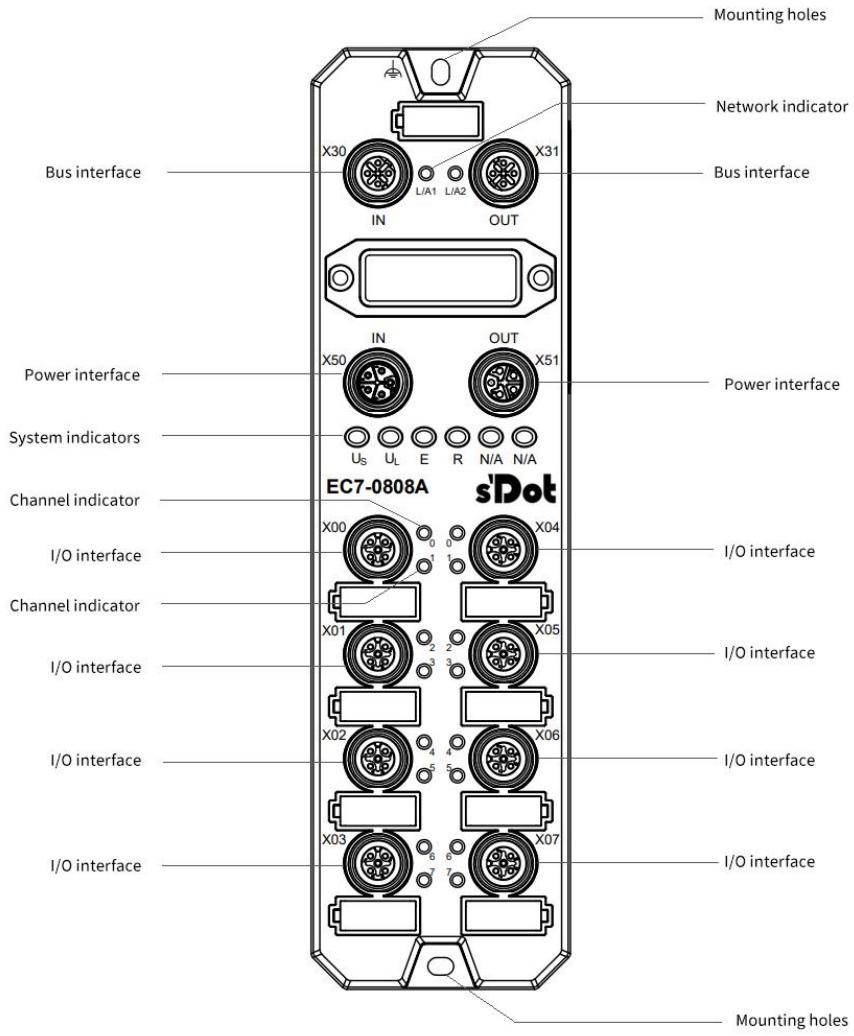
4 panel

4.1 Product Structure

Names of each part of the product



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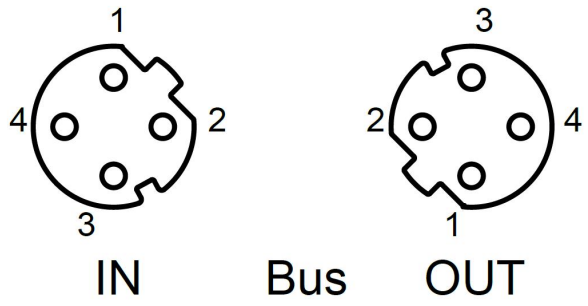
4.2 Indicator Function

Name	ID	Color	State	Status description
Network indicator IN	L/A1	green	ON	Establish a network connection
			Flashing	Network connection and data exchange
			OFF	No data interaction or exception
Network indicator OUT	L/A2	green	ON	Establish a network connection
			Flashing	Network connection and data exchange
			OFF	No data interaction or exception
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.
Running status indicator RUN	R	green	ON	Module runs normally
			OFF	Module operation abnormality
System alarm indicator light	SF	red	ON	The system is working abnormally
			OFF	The system is running normally or is not powered on
Network alarm indicator light	BF	red	ON	Network connection abnormality
			OFF	Network connection is normal
Input channel indicator	0 ~ F	green	ON	The module channel has signal input
			OFF	There is no signal input in the module channel or the signal input is abnormal.
Output channel indicator	0 ~ F	green	ON	The module channel has signal output
			OFF	The module channel has no signal output or the signal output is abnormal.

4.3 Bus Interface Definition

Bus interface connection view (M12-D, 4 Pin, female end) **Definition**



Pin	Function
1	TX + , data + for sending
2	RX + , receiving data +
3	TX - , data for sending -
4	RX - , receiving data -

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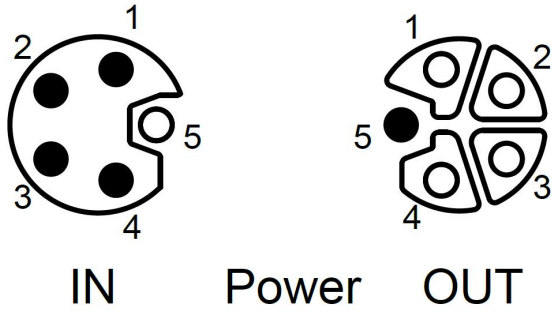
4.4 Power Interface Definition

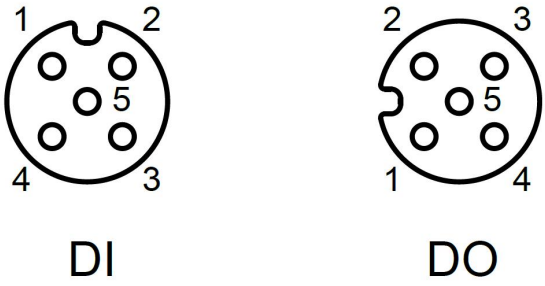
Power interface connection view (M12- L, 5 Pin, male & female)	Definition



P in	Function	Wire core color
1	+24V U_S	Brown
2	0V GND_L	White
3	0V GND_S	Blue
4	+24V U_L	Black
5	PE	Gris

4.5 I/O Interface Definition

I/ O interface connection view (M12-A,5 Pin, female)	Definition



P in	Function	Wire core color
1	+24V U_L / NC	Brown
2	DI/DO B	White
3	0V GND_L	Blue
4	DI/DO A	Black
5	PE	Gris

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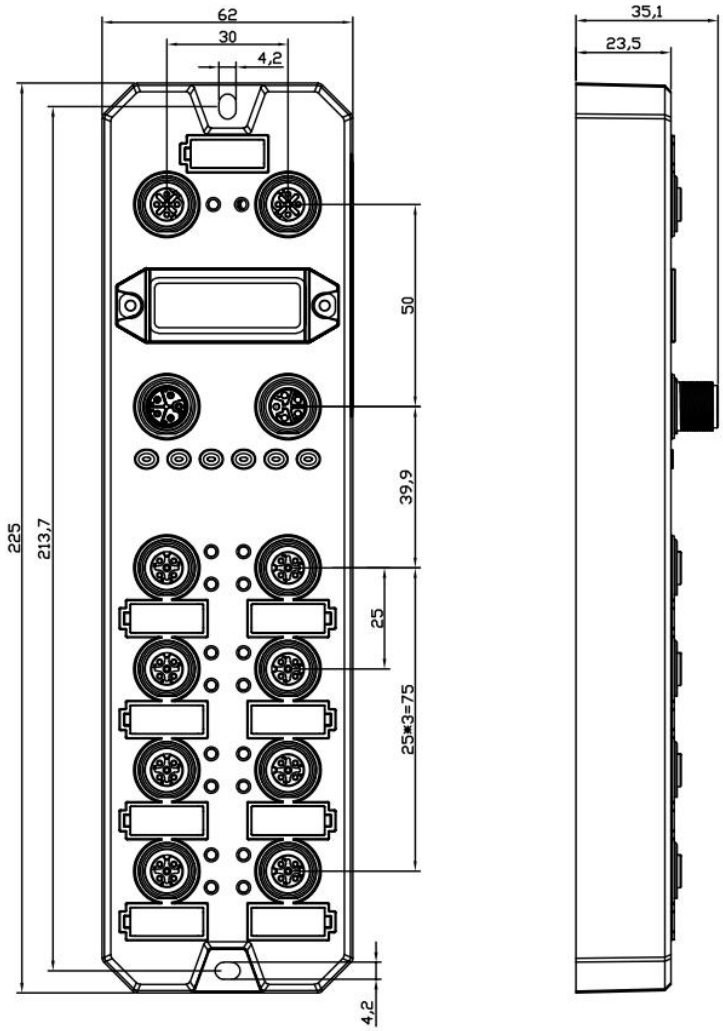
5 Installation and wiring

5.1 Dimensional Drawing

Overall specifications (unit: mm)



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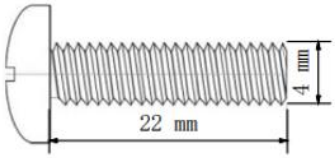
5.2 Installation Environment Requirements

In order to give full play to the performance of the PN7 module and improve its reliability, please avoid installing it in the following places :

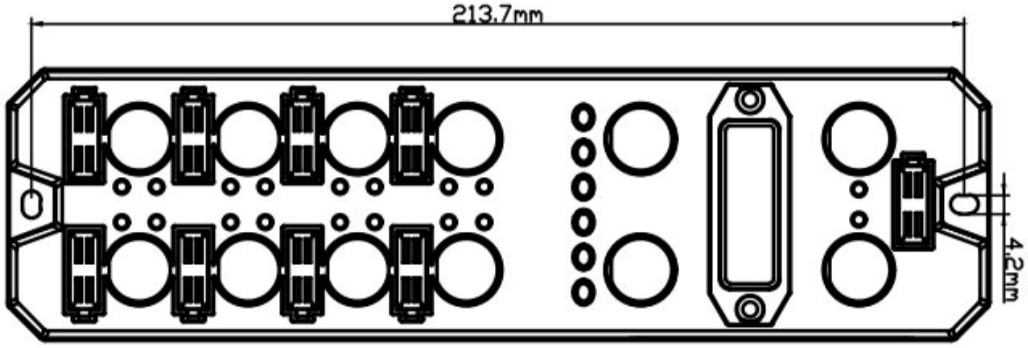
- Places exposed to direct sunlight
- Places where the ambient temperature or relative humidity exceeds module specifications
- Places with corrosive gases and flammable gases
- Places with acid, oil, and chemical droplets
- Places with dust, iron filings and sparks flying
- Places where the module body is directly subject to impact or vibration
- Places with strong electric fields, magnetic fields, radiation, and static electricity interference
- Places with power lines and AC power lines nearby

5.3 Module installation

◆ Please use M4*22mm and above screws to fasten the module body .



◆ The module mounting hole dimensions are as shown in the figure below.



☛ Precautions

- The transparent cover on the module is a reserved rotary switch cover. The cover has been tightened before leaving the factory. Please do not disassemble it at will to avoid damaging the IP67 protection level.
- Please fix the module correctly. Failure to do so may cause failure due to vibration.

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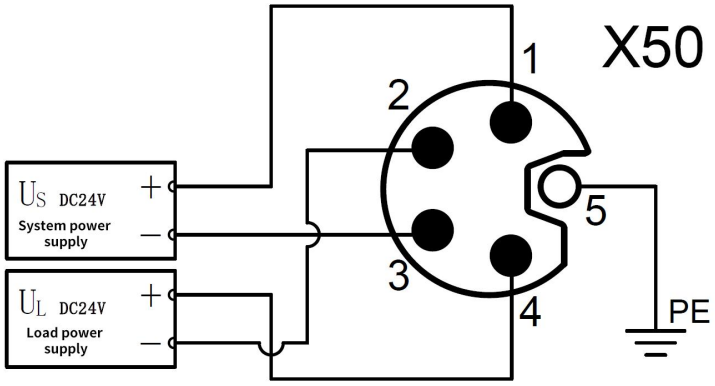
5.4 Wiring Guide

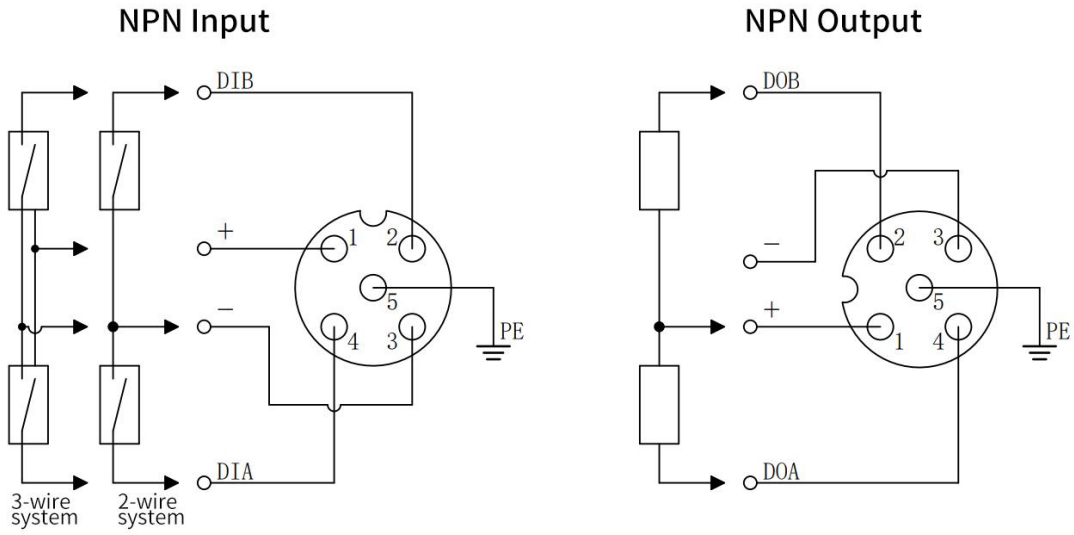
5.4.1 Power Interface Wiring Diagram



☛ Precautions

- It is recommended that the system power supply and load power supply use different switching power supplies to ensure the stability of operation.
- For power supply rules, please refer to the " Power Supply Rules " chapter.

5.4.2 I/ O Interface Wiring Diagram



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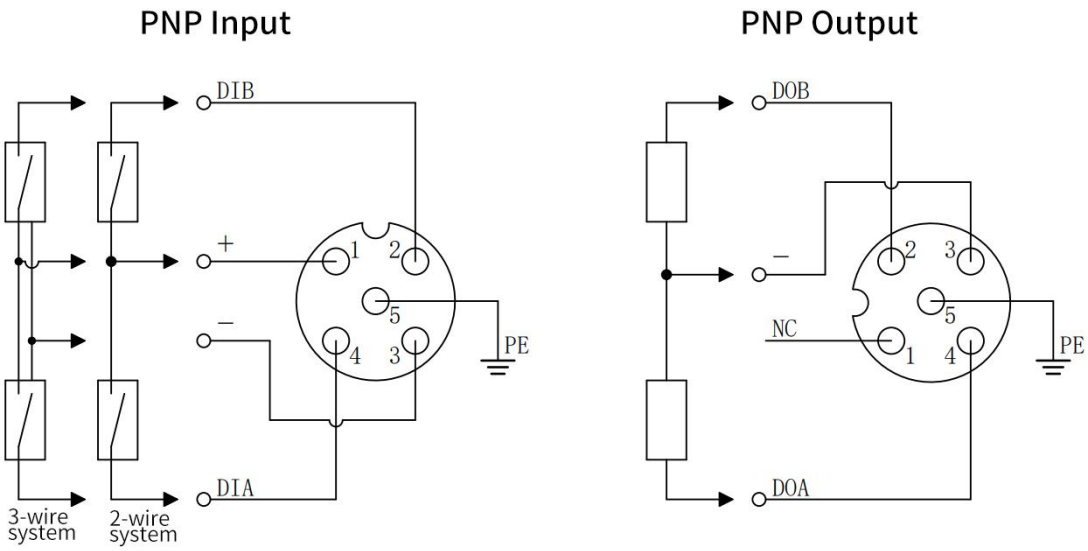

☛ Precautions

- Please install the waterproof cap provided by the module on the unused connector interface and tighten it, to avoid damaging the IP67 protection level.
- Pin 1 of the PNP output interface is NC, pin 1 of other types of interfaces is +24V U_L.

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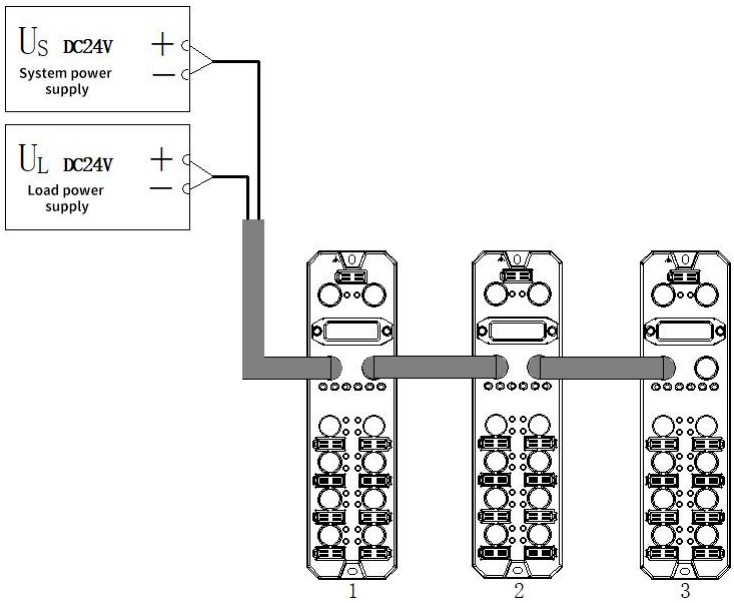
6 Power supply rules

6.1 Direct power supply rules

The power supply of each module is directly connected from the switching power supply without using the OUT interface. The total current consumption of the load power supply of each module should be ≤8A.



The voltage drop in the power cable varies depending on the total current consumption of the module's load power supply and the cable material. The following table shows the voltage drop when using our company's standard cables.

Total current consumption of the power supply (A)	Voltage drop at different cable lengths (V)			
	1m	3m	5m	10m
8	0.64	1.12	1.6 0	2.72
7	0.56	0.98	1.4 0	2.38
6	0.48	0.84	1.2 0	2.04

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5	0.40	0.70	1.00	1.70
4	0.32	0.56	0.80	1.36
3	0.24	0.42	0.60	1.02
2	0.16	0.28	0.40	0.68
1	0.08	0.14	0.20	0.34

■ Calculation example of total module current consumption when directly powered

For example, module 1 is PN7-1600A, module 2 is PN7-0808A, and module 3 is PN7-0016A . The usage of each module is as shown in the following table :

module name	I /O port			external connection device	
	port name	Pin name	I/O mode	Product name	Specification
Module 1	Port 1 ~8	Pin4	DI (input current 4mA)	3-wire sensor	Current consumption: 30mA
		Pin2	DI (input current 4mA)		Current consumption: 30mA
Module 2	Port 1 ~4	Pin4	DI (input current 4mA)	3-wire sensor	Current consumption: 30mA
		Pin2	DI (input current 4mA)		Current consumption: 30mA
	Port 4 ~8	Pin4	DO	The electromagnetic valve	Load current: 500mA
		Pin2	DO		Load current: 500mA
Module 3	Port 1 ~8	Pin4	DO	The electromagnetic valve	Load current: 500mA
		Pin2	DO		Load current: 500mA

Calculate the total current consumption . The calculated current of a single module is as shown in the following table:

module name	Power supply type	Total current consumption calculation items	Calculation results
Module 1	System power U_S	System current consumption	Module system side power consumption 40 mA
	Load power U_L	Module input current and sensor current consumption	for all ports (sensor current consumption) + (channel input current * Enter points) = (30mA * 16) + (4mA * 16) = 544mA
Module 2	System power U_S	System current consumption	Module system side power consumption 40mA
	Load power U_L	Module input current and sensor current consumption	For ports 1 ~4 (Sensor current consumption) + (Channel

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			input current * Enter points) = (30mA * 8) + (4mA * 8) = 272mA
		Load output current	For ports 5~8 Channel output current * number of output points = 500 mA * 8 = 4A
Module 3	System power U_S	System current consumption	Module system side power consumption 40mA
	Load power U_L	Load output current	For ports 1 ~8 Channel output current * number of output points = 500 mA * 16 = 8A

To sum up, the current consumption of each module is as follows:

- For the system power supply U_S, each module consumes 40mA.
- For load supply U_L:

U_L of module 1 (PN7-1600A) is 544 mA , which is less than the maximum current of the module load power supply U_L of 8 A.

U_L of module 2 (PN7-0808A) is 272 mA + 4A = 4.272A , which is less than the maximum current of the module load power supply U_L of 8A.

U_L of module 3 (PN7-0016A) is 8A , which is equal to the maximum current of the module load power supply U_L 8A.

In this example, since the total current consumption of each module satisfies the sum of module load power supply current consumption ≤ 8A, the requirement is met .

6.2 Series power supply rules

The modules are powered in series through the OUT interface. The total current consumption of the load power supply of each module should be ≤ 8A, and the total current consumption of the system power supply and load power supply of all modules should be ≤ 16A.

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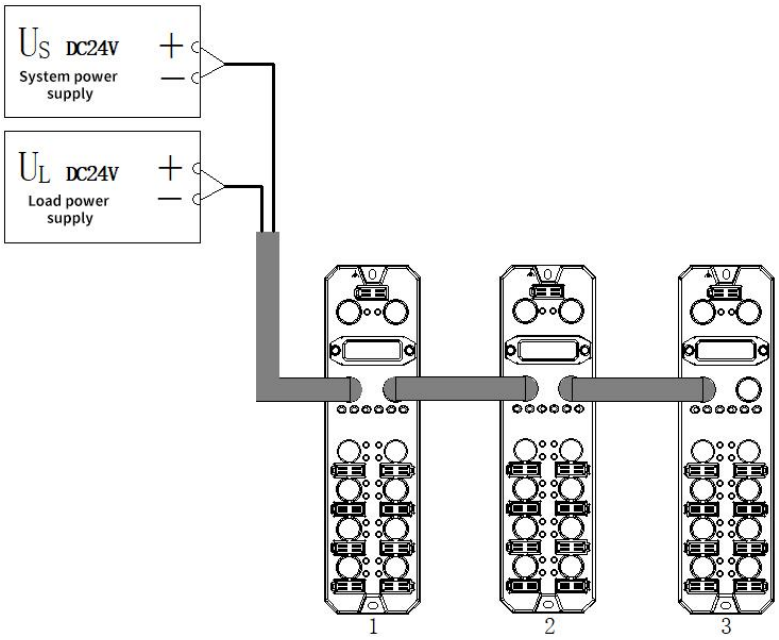

When power is supplied in series, the consumption current of the series-connected modules will flow inside the module, so a voltage drop will occur in the internal circuit of the module. The voltage drop in the power cable varies depending on the total current consumption of the module's load power supply and the cable material. The following table shows the voltage drop when using our company's standard cables.

Total current consumption of the power supply (A)	Voltage drop in the module’ s internal circuit (V)	Voltage drop at different cable lengths(V)			
		1m	3m	5m	10 m
16	0.64	1.28	2.24	3.20	5.44
15	0.60	1.20	2.10	3.00	5.10
14	0.56	1.12	1.96	2.80	4.76
13	0.52	1.04	1.82	2.60	4.42
12	0.48	0.96	1.68	2.40	4.08
11	0.44	0.88	1.54	2.20	3.74
10	0.4 0	0.80	1.40	2.00	3.40
9	0.36	0.72	1.26	1.80	3.06
8	0.32	0.64	1.12	1.60	2.72
7	0.28	0.56	0.98	1.40	2.38
6	0.24	0.48	0.84	1.20	2.04
5	0.20	0.40	0.70	1.00	1.70
4	0.16	0.32	0.56	0.80	1.36
3	0.12	0.24	0.42	0.60	1.02
2	0.08	0.16	0.28	0.40	0.68
1	0.04	0.08	0.14	0.20	0.34

☛ Precautions

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- The total current consumption of the load power supply of each module should be ≤8A .
- As shown in the figure above, when powered in series, the sum of the current consumption of the system power supply and load power supply of all modules should meet the rule of "1+2+3" ≤ 16A .

■ Calculation example of total current consumption of modules when powered in series

For example, module 1 is PN7-1600A, module 2 is PN7-0808A, and module 3 is PN7-0016A . The usage of each module is the same as " Example of calculation of total module current consumption when directly powered " .

Calculate the total current consumption :

U_S = 40mA + 40mA + 40mA = 120mA

U_L = 544mA + 4.272A + 8A = 12.816A

In this example, since the total current consumption of the system power supply U_S and load power supply U_L of all modules meets the rule of "1+2+3" ≤ 16A, the requirements are met .

☛ Precautions

- In series power supply mode, if the total current consumption of the system power supply U_S or the total current consumption of the load power supply U_L exceeds 16A, please change some modules to the direct power supply mode to ensure that the total current consumption of the system power supply U_S or the total current consumption of the load power supply U_L ≤16A.

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7 Use

7.1 Parameters and function configuration

7.1.1 Digital input filter function

Digital input filtering prevents the program from responding to unexpected rapid changes in the input signal, which may occur due to switch contact jumps or electrical noise. The current fixed configuration of digital input filtering is 3ms, which can filter out clutter within 3ms. Channels cannot be configured individually.

3 ms input filter time of ms represents a single signal changing from "0" to "1", or from "1" to "0" for 3 ms can be detected, and shorter than 3 ms single high or low pulse of ms will not be detected.

7.1.2 Output clear hold function

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

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

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

7.1.3 Channel input and output configuration

For modules with configurable input and output , parameters can be configured to enable each channel to implement input or output functions , and each channel can be configured independently.

This manual uses TIA Portal V17 as an example to introduce the parameter configuration method. For detailed steps, see Parameter Settings .

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7.2 Configuration module application

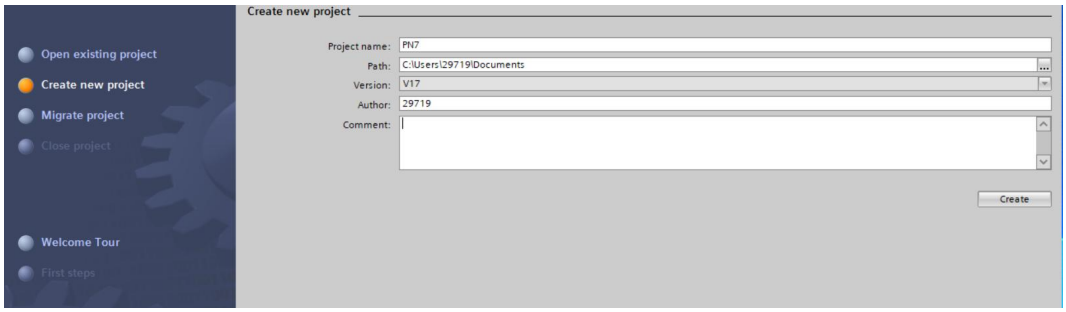
7.2.1 Application in TIA Portal V17 software environment

1、Preparation

- **Hardware environment**
  - **Module model PN7-0016A+**
  - **One computer with TIA Portal V17 software pre-installed**
  - **PROFINET special shielded cable**
  - **A Siemens PLC. This description uses a Siemens S7-1 200 CPU1214C DC /DC/DC as an example**
  - **One switching power supply**
  - **Module installation guide rails and guide rail fixings**
  - **Device configuration profile**
    Configuration file acquisition address: https://www.solidotech.com/documents/configfile
- **Hardware configuration and wiring**
  Please follow the requirements of " 5 Installation and Wiring "

2、New Construction

a. Open the TIA Portal V17 software , click "Create New Project" , and click "Create" after entering all the information, as shown in the figure below.



- Project name: Customized, 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.
- Comment: Customized, optional.

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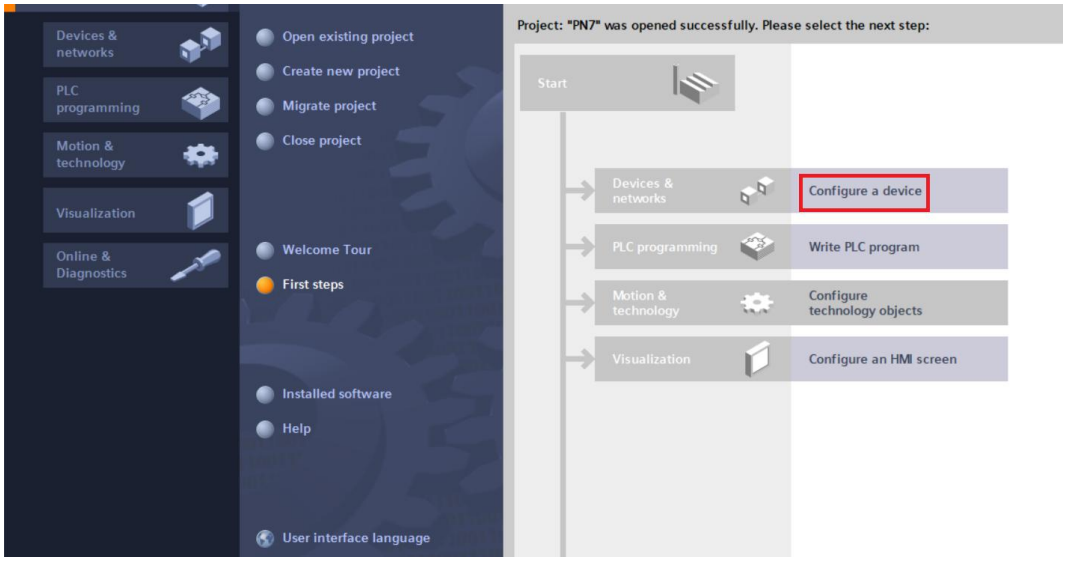
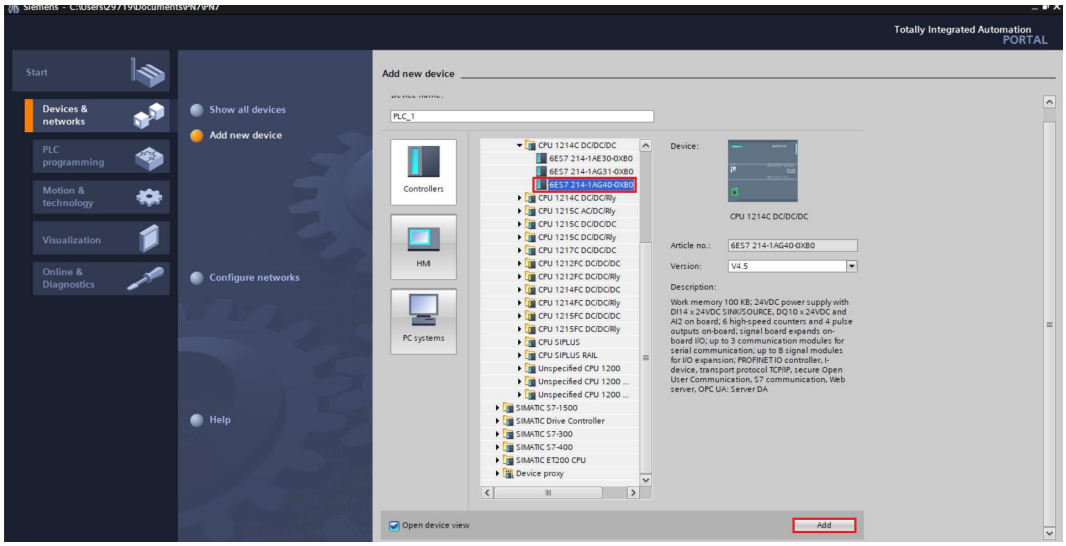
3、Add PLC controller

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 in the figure below. After the addition is completed, you can see that the PLC has been added to the device navigation trees.



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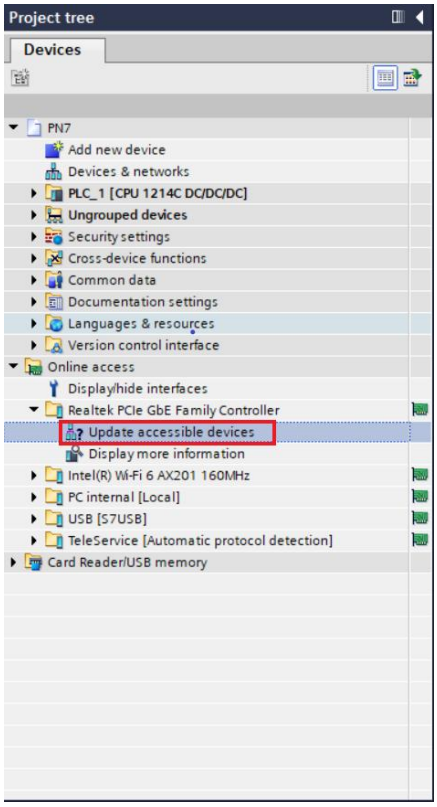
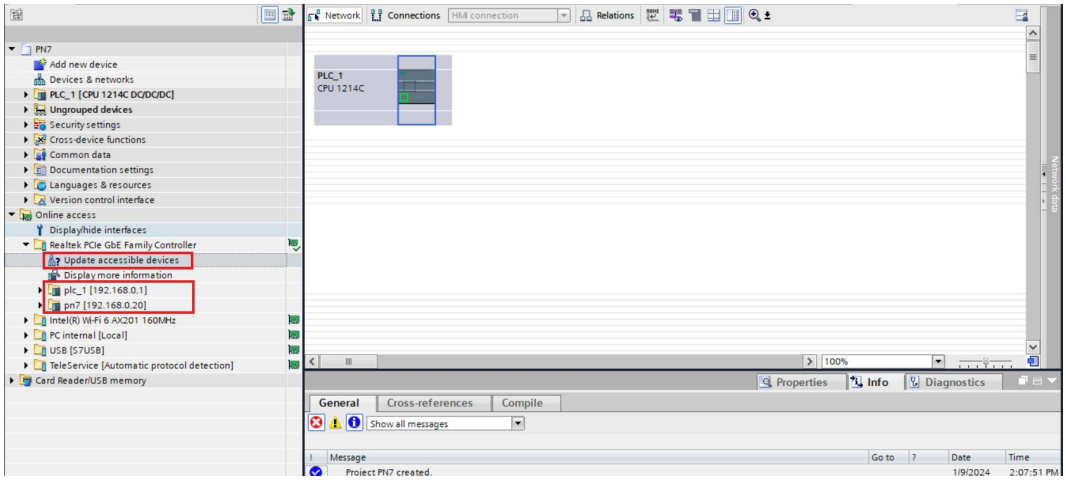
4、Scan for connected devices

a. Click "Online Access -> Update Accessible Devices" in the left navigation tree, as shown in the figure 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.

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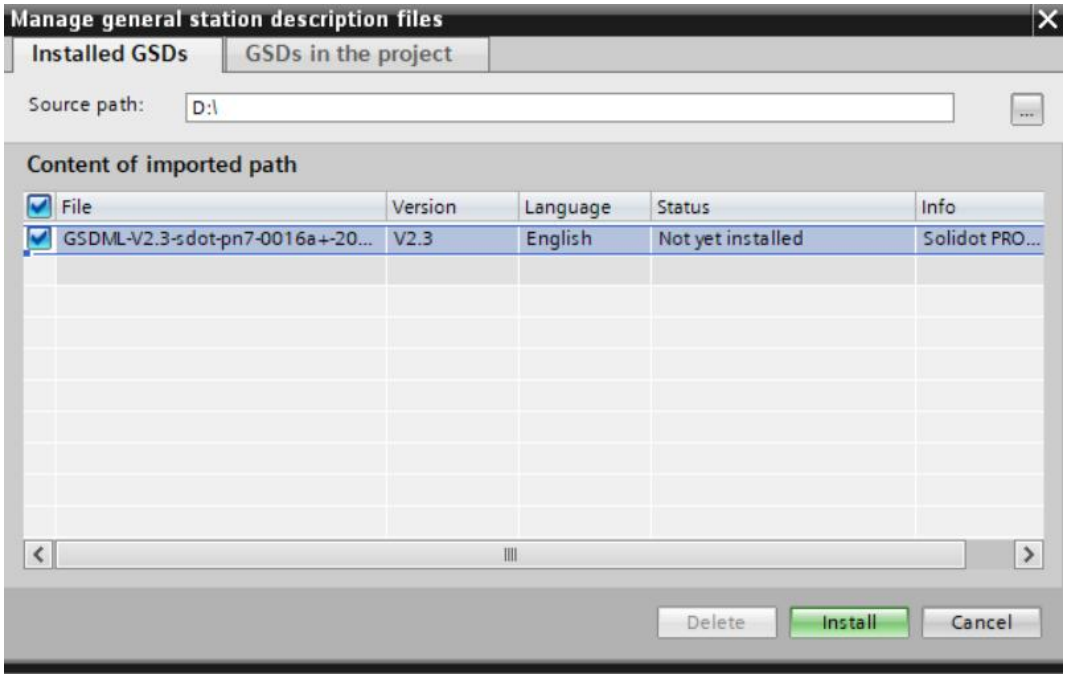
5、Add GSD configuration file

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

b. Click “Source Path” to select the file.

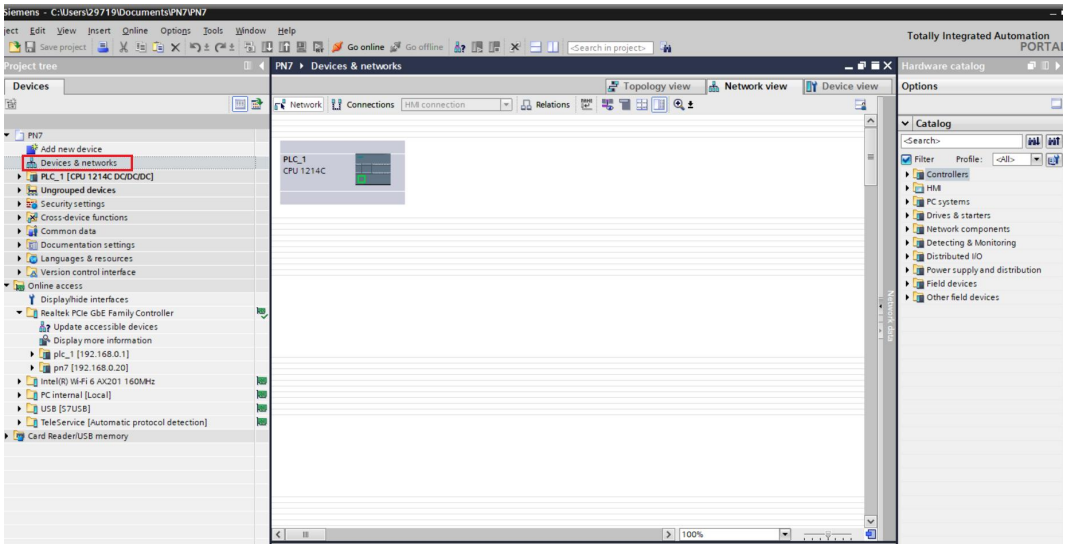
c. whether the status of the GSD file to be added is "Not yet installed" . If it is not installed, click the "Install" button . If it is already installed, click "Cancel" to skip the installation step.



6、Add slave device

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

b. Click the "Hardware Catalog" vertical button on the right, and the catalog is displayed as shown below .



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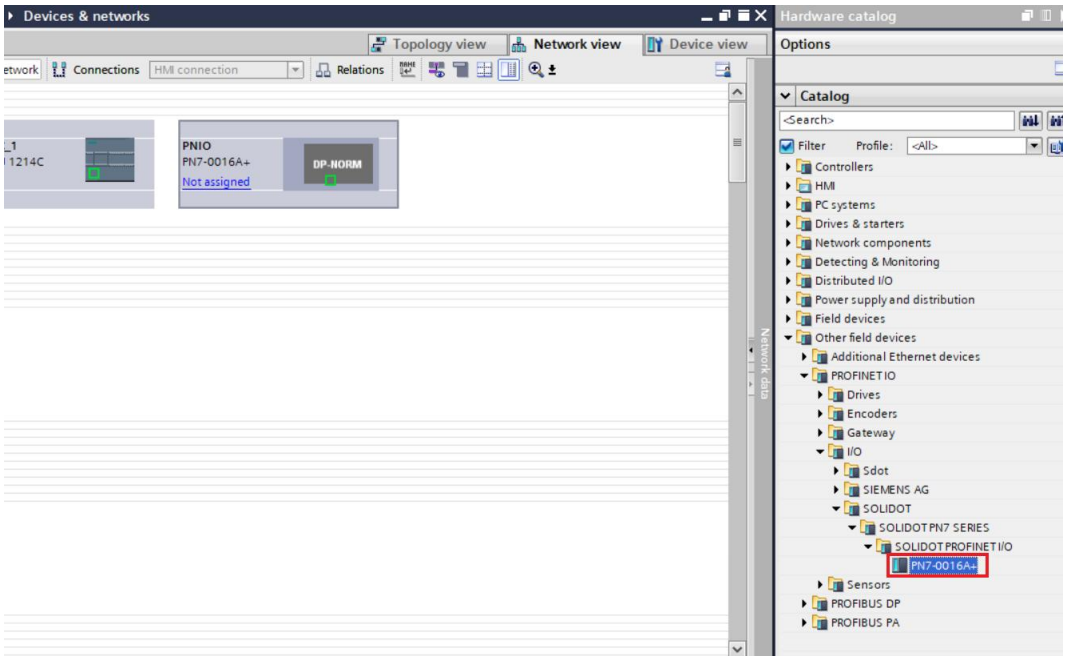
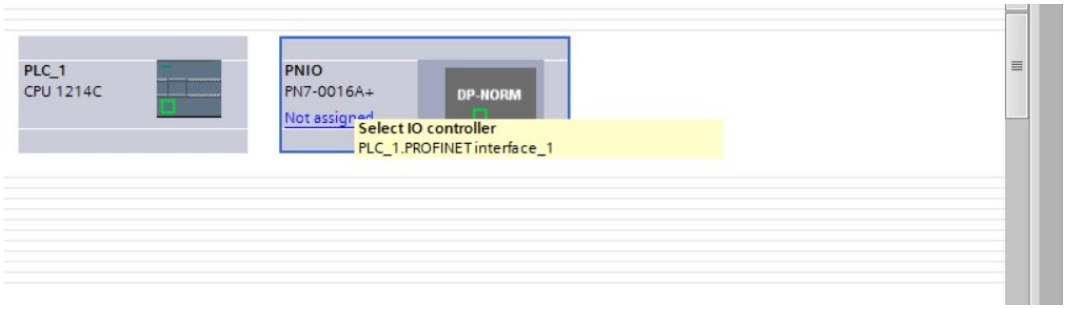
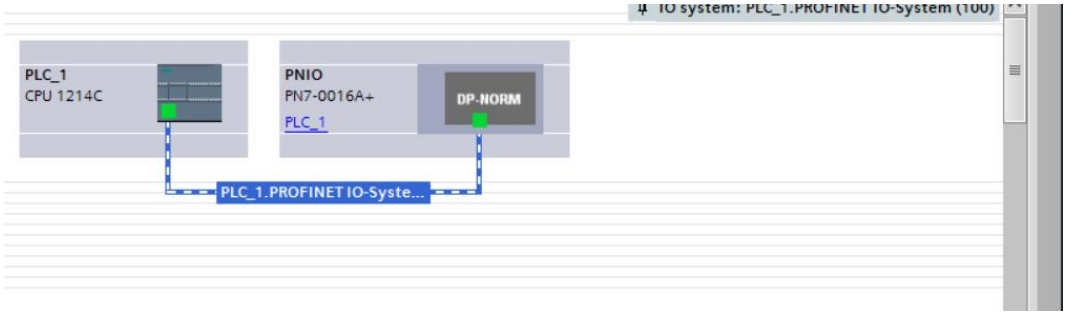
c. “PN7-0016A+” in the search box of the hardware catalog to search for the module . After the search is completed, drag or double-click "PN7-0016A+" to "Network View", as shown in the figure below. If you connect multiple modules, you can add modules in sequence according to the actual topology under the "Hardware Catalog" on the right.



d. Click "Not assigned (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, it is as shown in the figure below.



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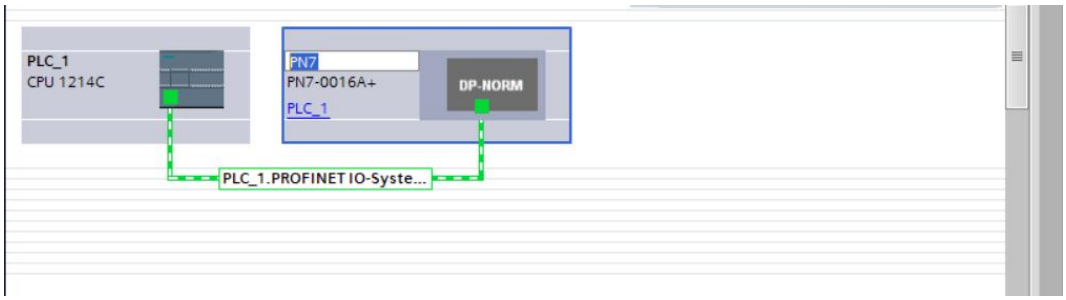
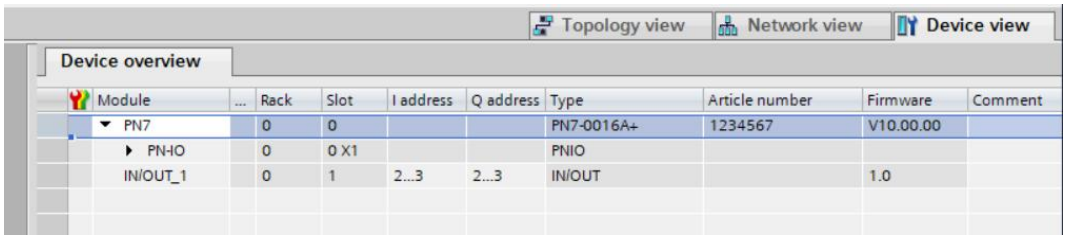
f. Click the device name to rename the device, as shown in the figure below.

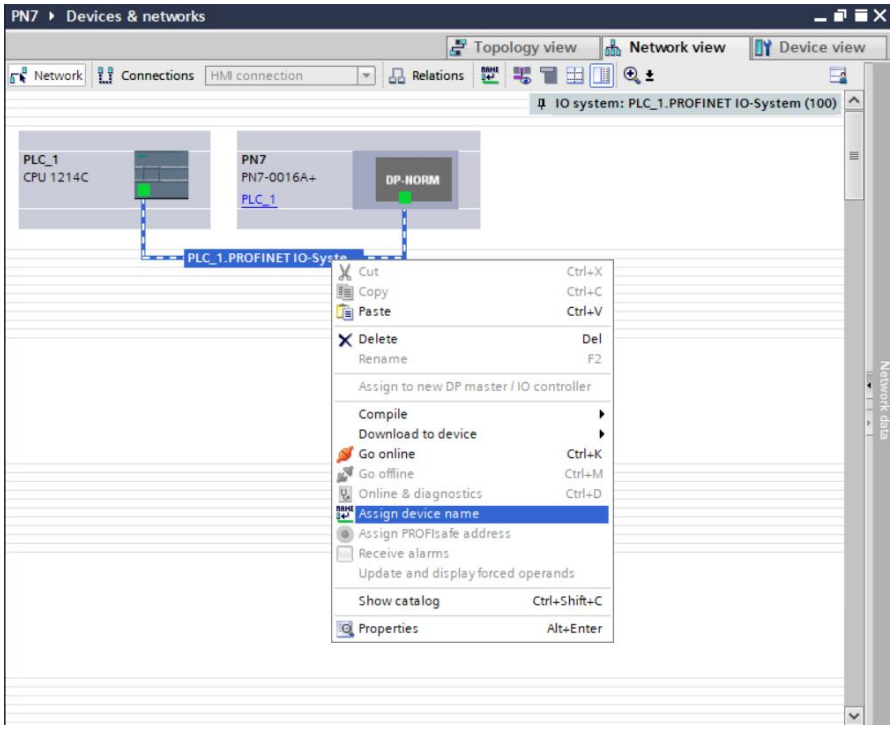


g. Click "Device View" to enter the device overview. You can see the topology configuration information, including the I/O address automatically assigned by the system . The I/ O address can be changed by yourself, as shown in the figure below.



7、Assign device name

a. Switch to "Network View", right-click the connection line between PLC and PN7, and select "Assign Device Name" , as shown in the figure below.



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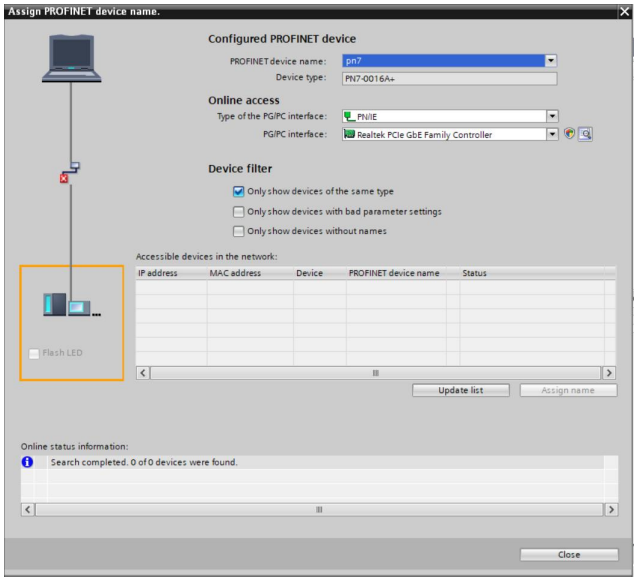
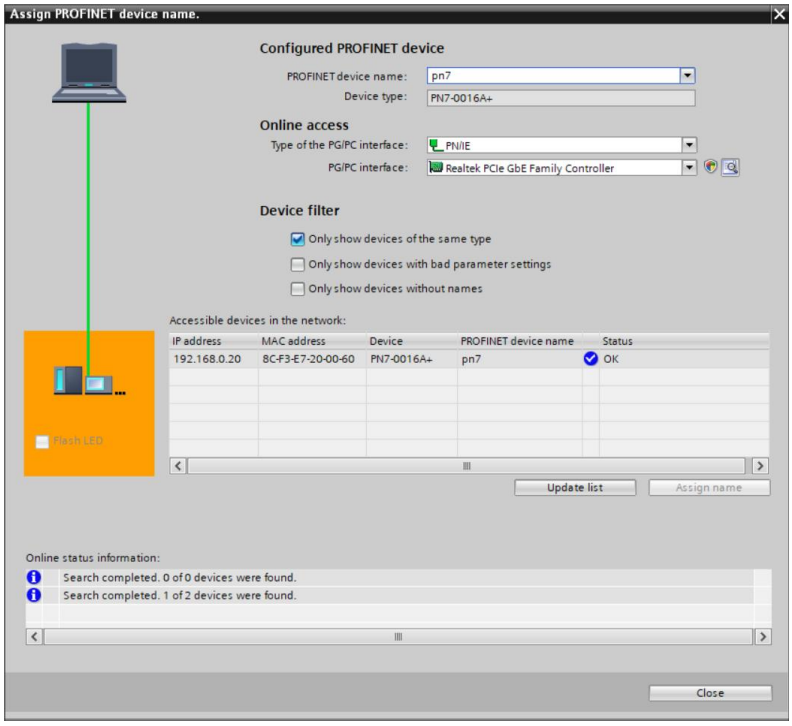
b. "Assign PROFINET Device Name" interface pops up, as shown in the figure below.



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: The name set in " Assign PROFINET device name ".
- Type of PG/PC 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 whether the status of the node in "Accessible Nodes in the Network" is "OK", as shown in the figure below.



d. Click “Close”.

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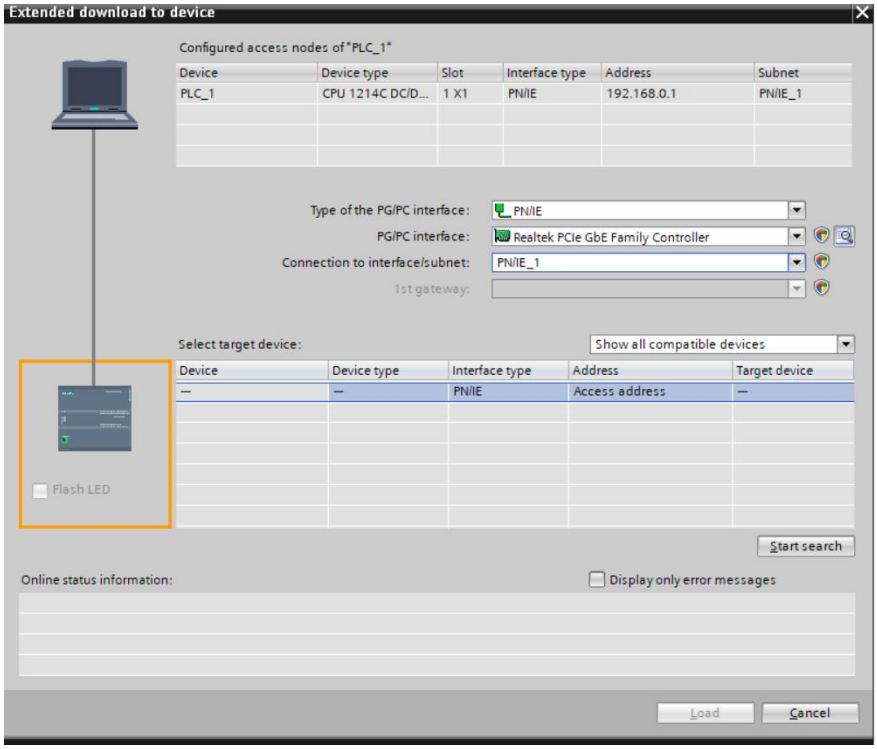
8、Download configuration structure

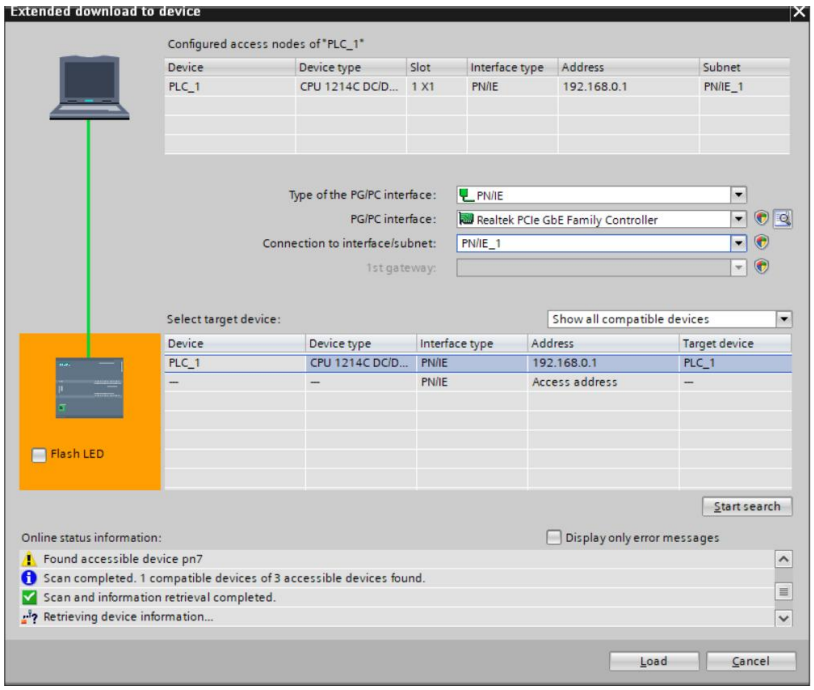
a. In the "Network View", select the PLC.

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

c. In the pop-up "Extended download to device" interface, the configuration is as shown in the figure below.



d. Click the "Start Search" button as shown in the image below.



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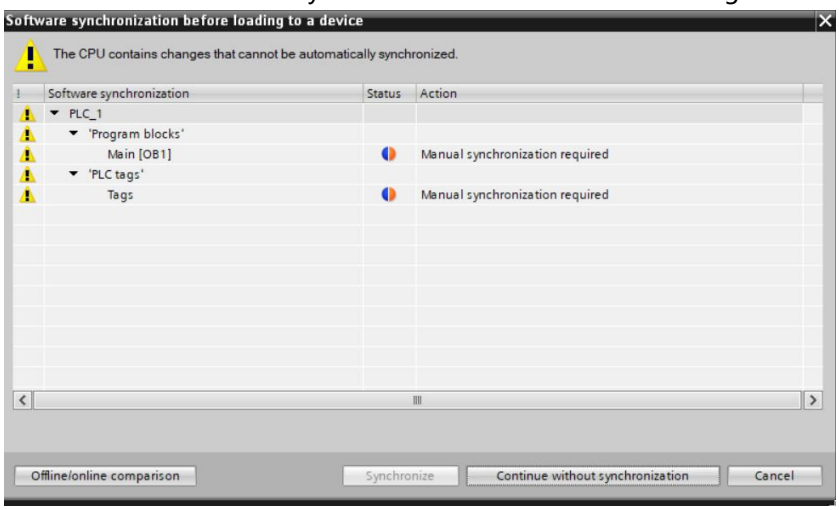
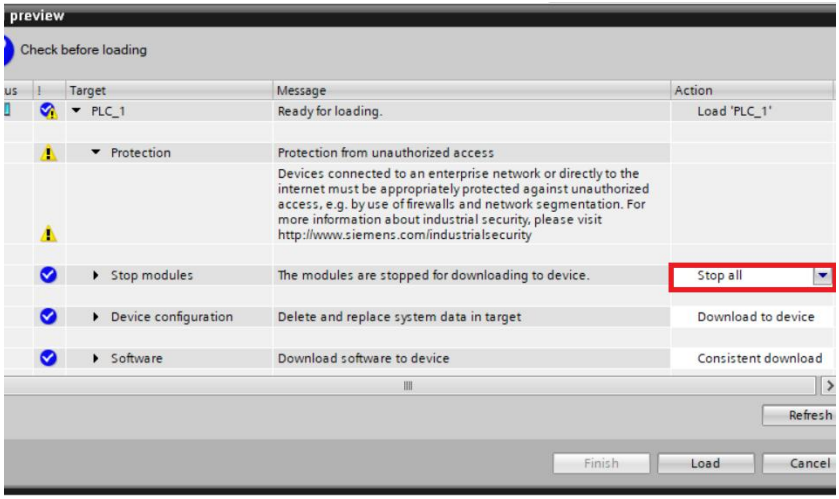
e. Click "Load".

f. Select "Continue without synchronization" as shown in the image below.



g. Select "Stop All".



h. Click "Load".

i. Click "Finish".

j. Power on again the device.

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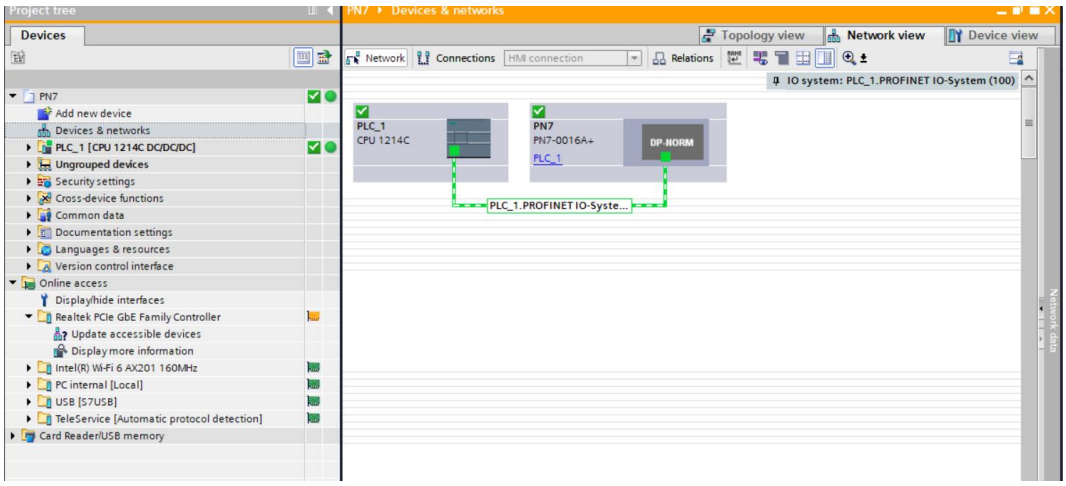
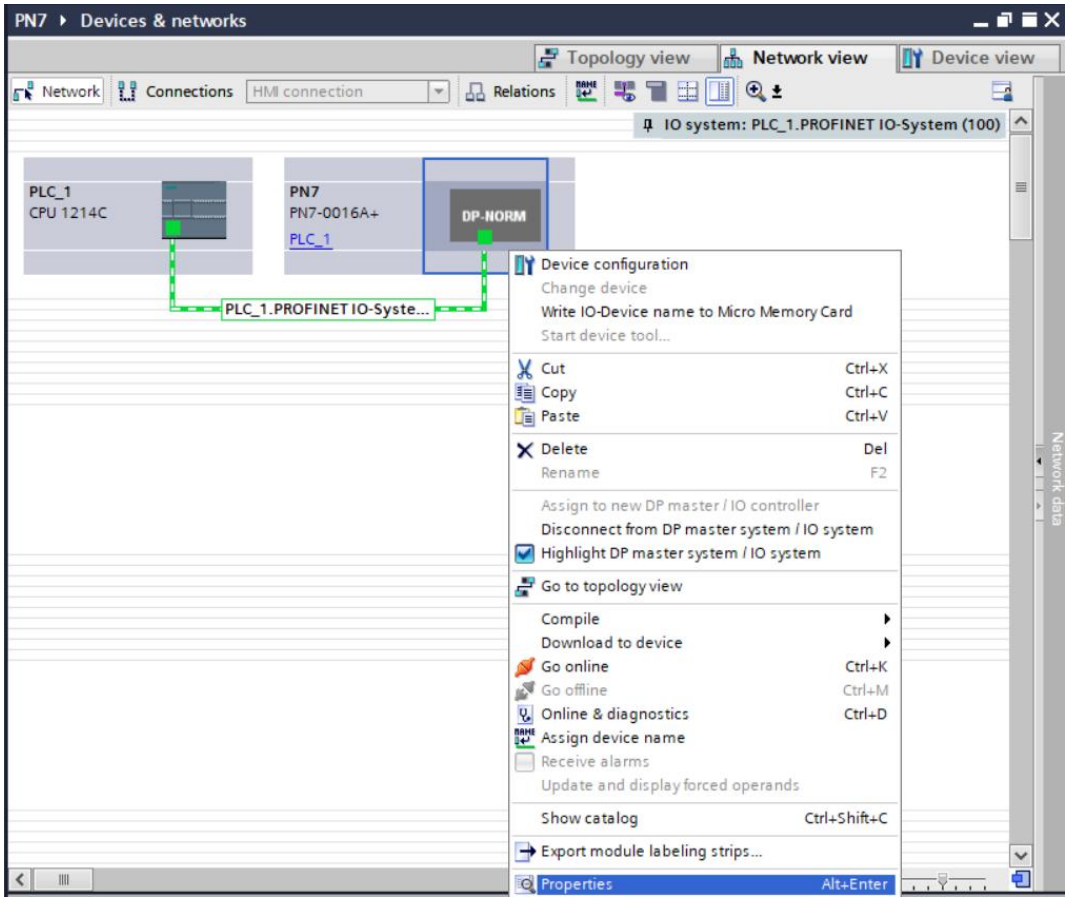
9、Communication connection

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



10、 Parameter settings

a. Open the " Network View" , and in the offline state, right-click the coupler view icon part and click "Properties", as shown in the figure below.



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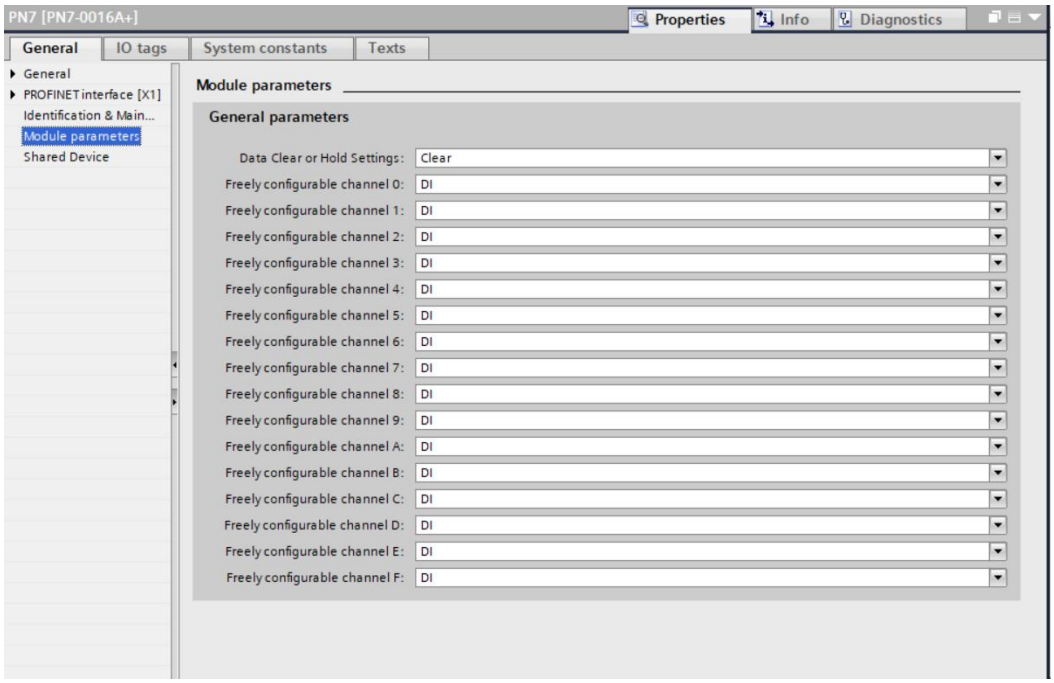
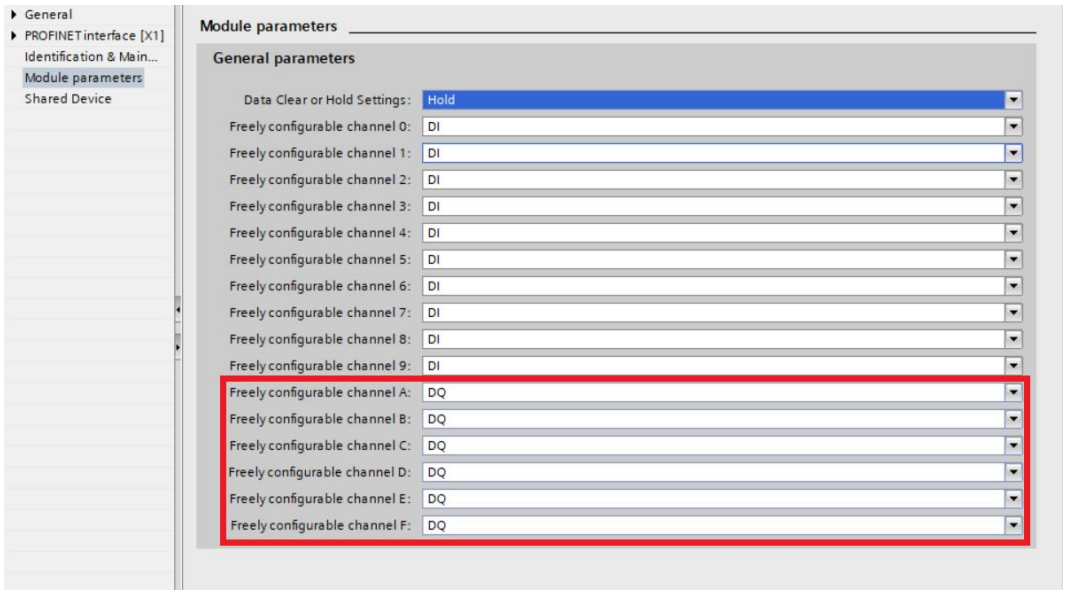
b. On the properties page, click "Module Parameters", as shown in the figure below. The output clear holding parameters and channel input and output configuration parameters can be configured according to actual use needs. After the configuration is completed, re-download the program to the PLC. The PLC and module need to be powered on again.



c. For example, configure channels 0~9 as input types, and configure channels A~F as output types, as shown in the figure below. After the configuration is completed, re-download the program to the PLC. The PLC and module need to be powered on again.



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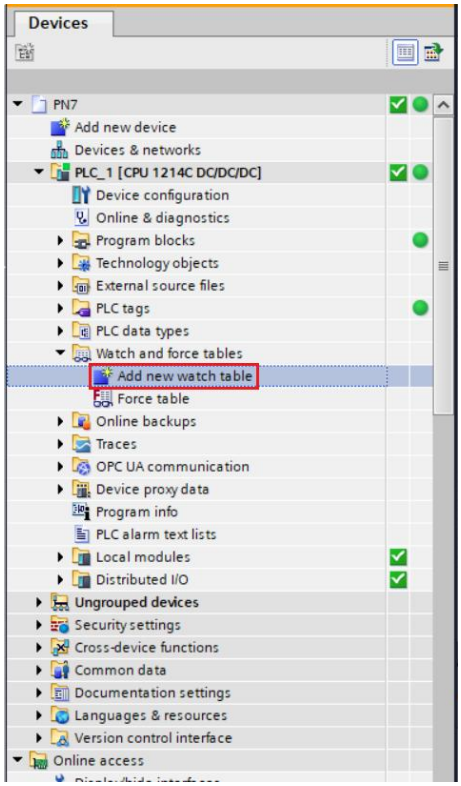
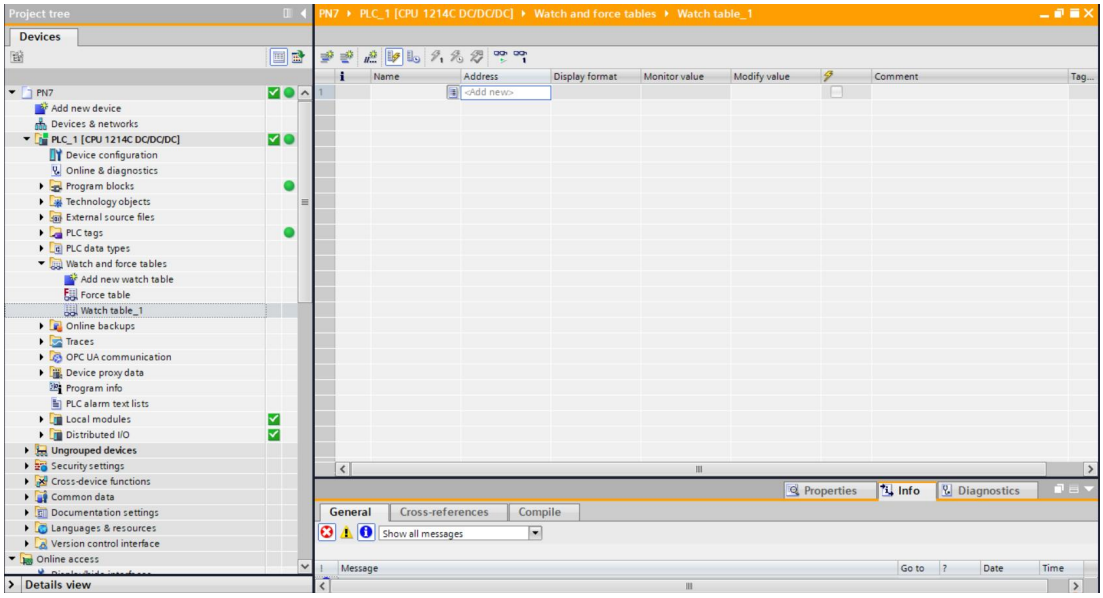
11、 Functional Verification

a. Expand the project navigation on the left and select "Monitoring and Enforcement Table", as shown in the figure below.



b. Double-click "Add New Monitoring Table" to add a new monitoring table to the system, as shown in the figure below.



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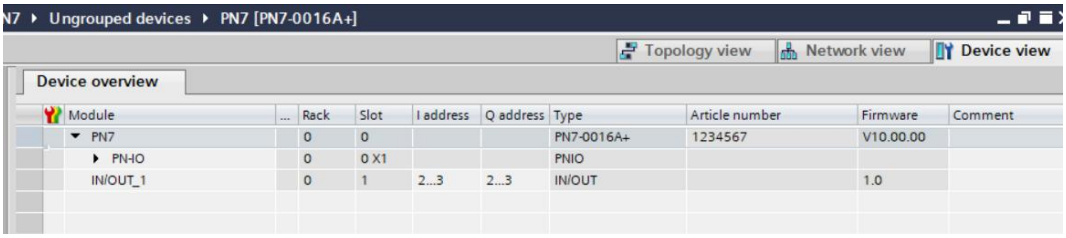
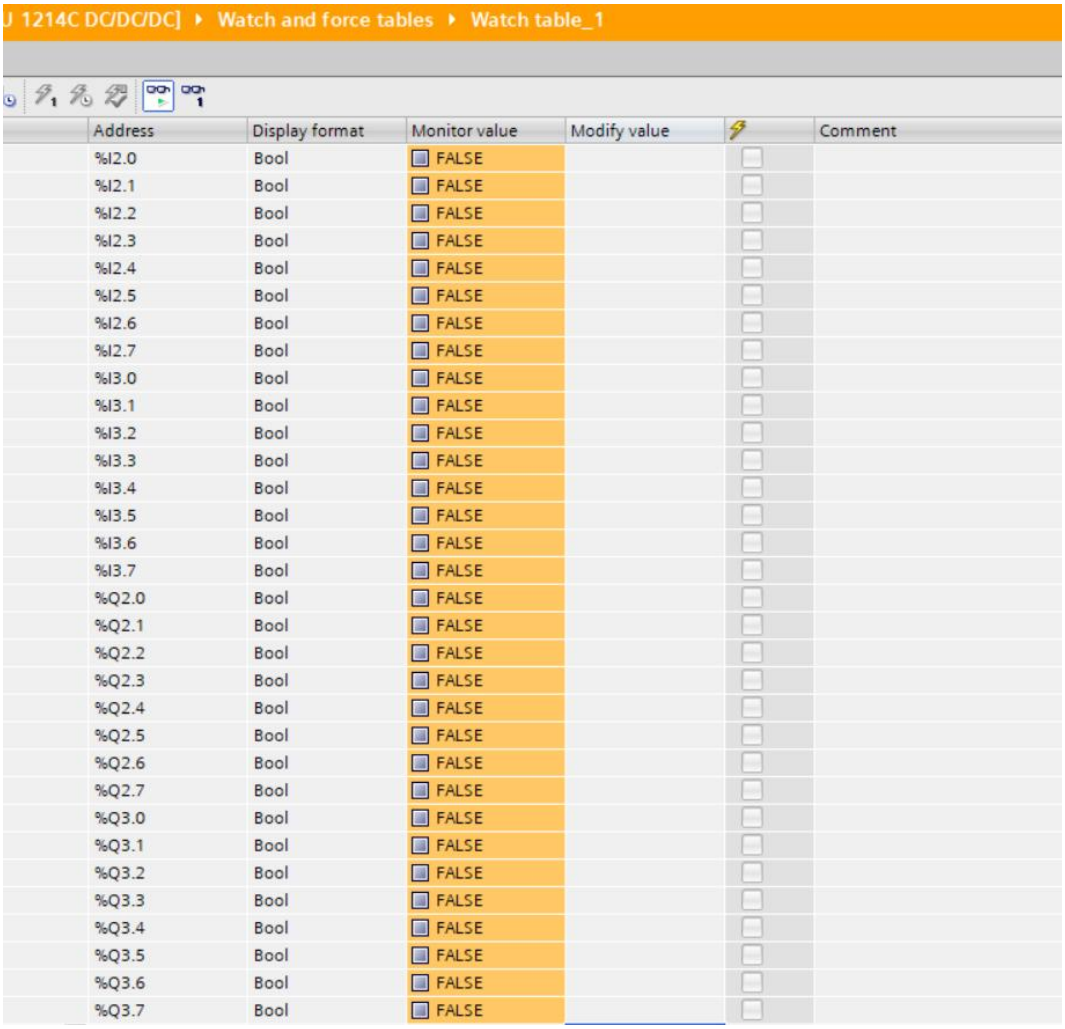
c. Open the " Device View" and view the channel Q address (channel address of the output signal) and I address (channel address of the input signal) of the module PN7-0016A + in the device overview .

For example, it is found that the "Q address" of the PN7-0016A + module is 2~3 and the "I address " is 2~3 , as shown in the figure below.



Module	...	Rack	Slot	I address	Q address	Type	Article number	Firmware	Comment
PN7		0	0			PN7-0016A+	1234567	V10.00.00	
PN-IO		0	0 X1			PNIO			
IN/OUT_1		0	1	2...3	2...3	IN/OUT		1.0	

d. Fill in the input and output channel address in the address cell of the monitoring table. Module channels 0~9 are input types, and configuration channels A~F are output types . For example, write "%I 2.0 " ~ "%I 3.7", "% Q2. 0" ~ "% Q3.7" , press "Enter" , after filling in all, click the button to monitor the data, as shown in the figure below. Input channels 0~9 correspond to "%I 2.0 " ~ "%I 3.1" in the monitoring table , and output channels A~F correspond to "% Q3.2" ~ "% Q3.7" in the monitoring table .



Address	Display format	Monitor value	Modify value	Comment
%I2.0	Bool	FALSE		
%I2.1	Bool	FALSE		
%I2.2	Bool	FALSE		
%I2.3	Bool	FALSE		
%I2.4	Bool	FALSE		
%I2.5	Bool	FALSE		
%I2.6	Bool	FALSE		
%I2.7	Bool	FALSE		
%I3.0	Bool	FALSE		
%I3.1	Bool	FALSE		
%I3.2	Bool	FALSE		
%I3.3	Bool	FALSE		
%I3.4	Bool	FALSE		
%I3.5	Bool	FALSE		
%I3.6	Bool	FALSE		
%I3.7	Bool	FALSE		
%Q2.0	Bool	FALSE		
%Q2.1	Bool	FALSE		
%Q2.2	Bool	FALSE		
%Q2.3	Bool	FALSE		
%Q2.4	Bool	FALSE		
%Q2.5	Bool	FALSE		
%Q2.6	Bool	FALSE		
%Q2.7	Bool	FALSE		
%Q3.0	Bool	FALSE		
%Q3.1	Bool	FALSE		
%Q3.2	Bool	FALSE		
%Q3.3	Bool	FALSE		
%Q3.4	Bool	FALSE		
%Q3.5	Bool	FALSE		
%Q3.6	Bool	FALSE		
%Q3.7	Bool	FALSE		

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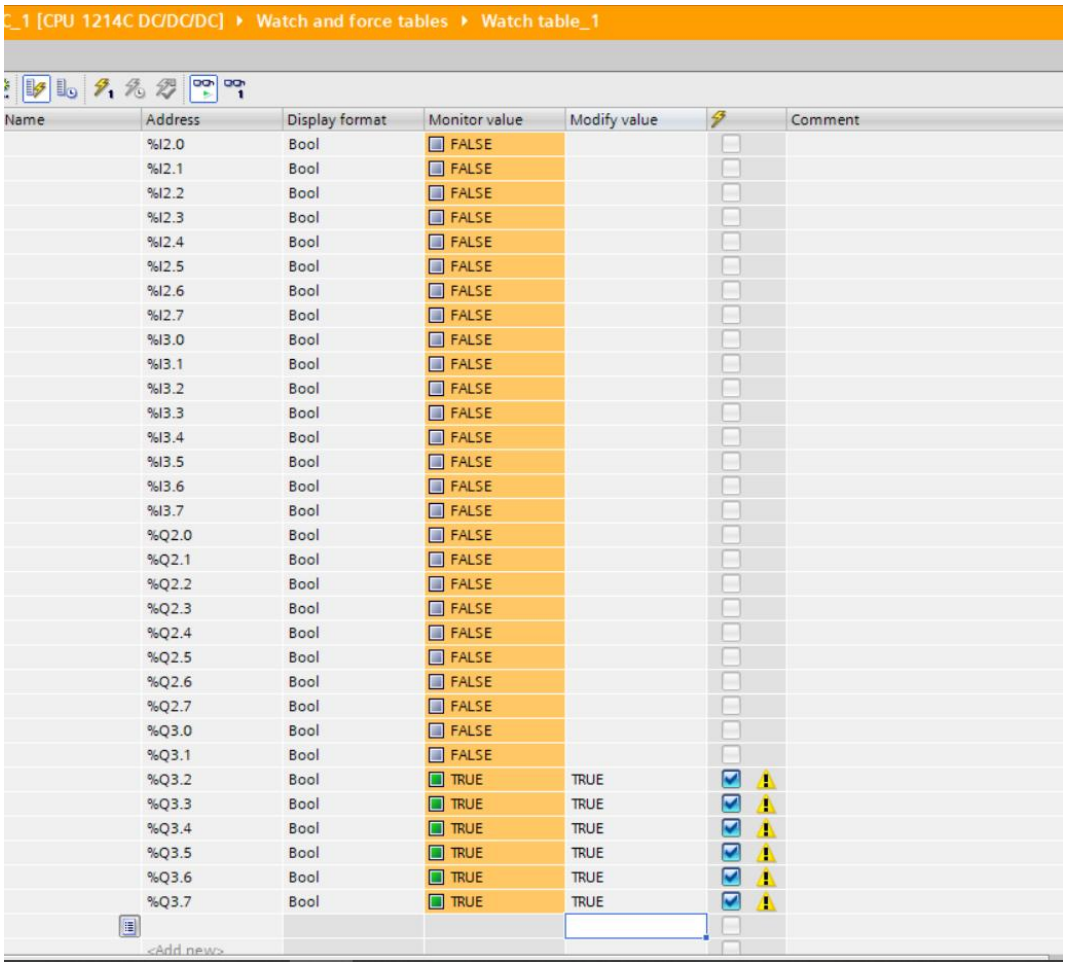
e. In the "Modified Value" cells of "% Q3.2" ~ "% Q3.7" write "1", click the button to write, and see the corresponding output channel A~F indicators light up, as shown in the figure below .



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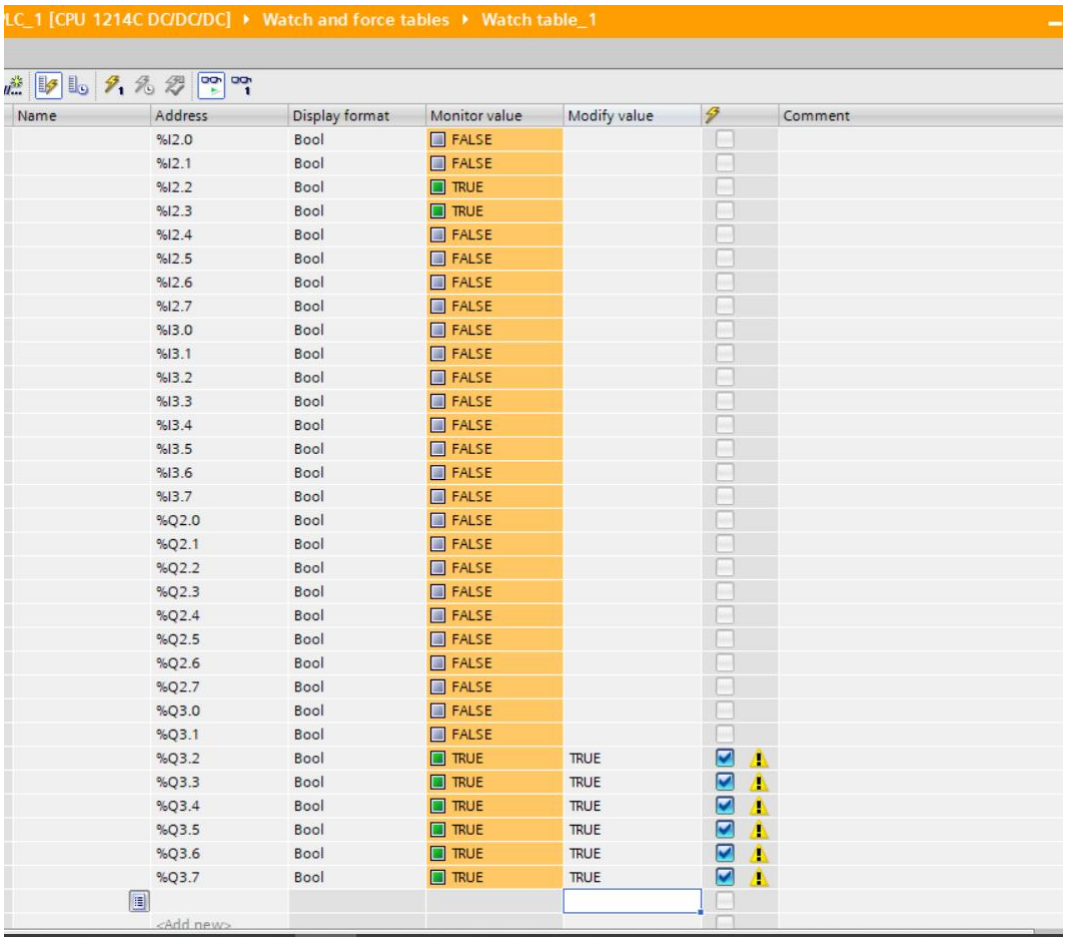
f. 2 and channel 3 of the module input valid voltages, the input values can be monitored in " %I2.2" ~ "%I2.3" , as shown in the figure below.



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7.2.2 In STEP 7 - MicroWIN Application under SMART software environment

1、Preparation

- **Hardware environment**
  - **Module model PN7-0016A+**
  - **One computer, pre-installed STEP 7-MicroWIN SMART V 2.6 software**
  - **PROFINET special shielded cable**
  - **A Siemens PLC. This description uses a Siemens S7-200 SMART as an example**
  - **One switching power supply**
  - **Module installation guide rails and guide rail fixings**
  - **device profile**

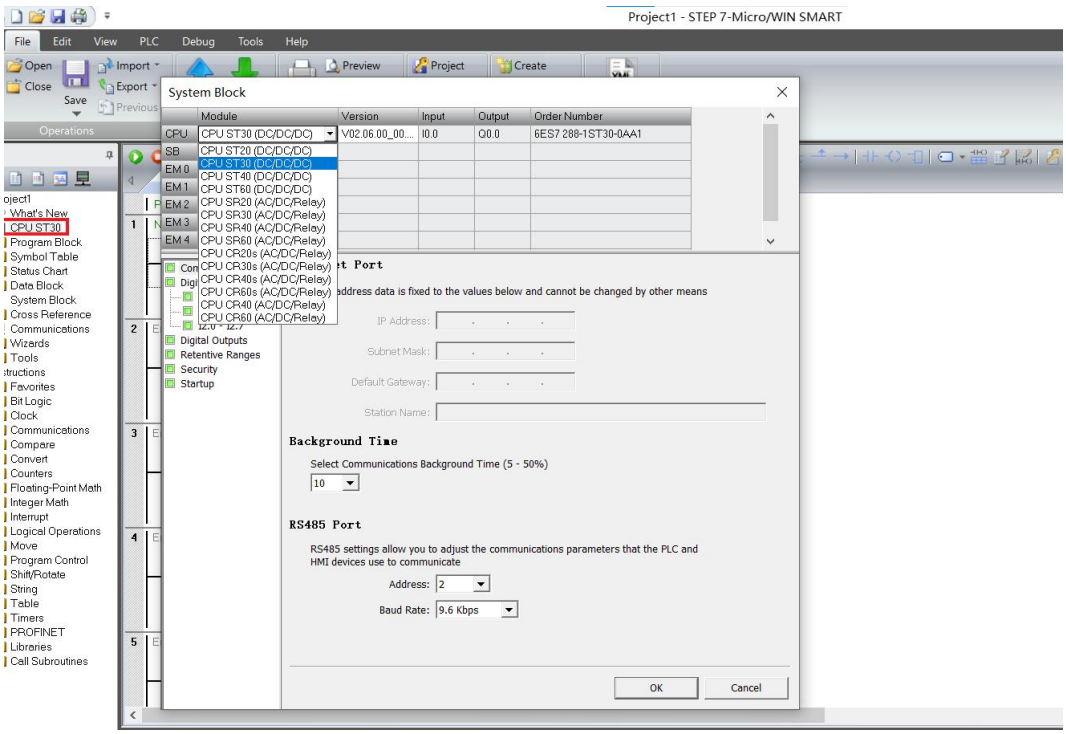
    Configuration file acquisition address: https://www.solidotech.com/documents/configfile
- **Hardware configuration and wiring**

  Please follow the requirements of " 5 Installation and Wiring "

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 Block" interface, select the CPU model corresponding to the PLC , and click the "OK" button, as shown in the figure below.



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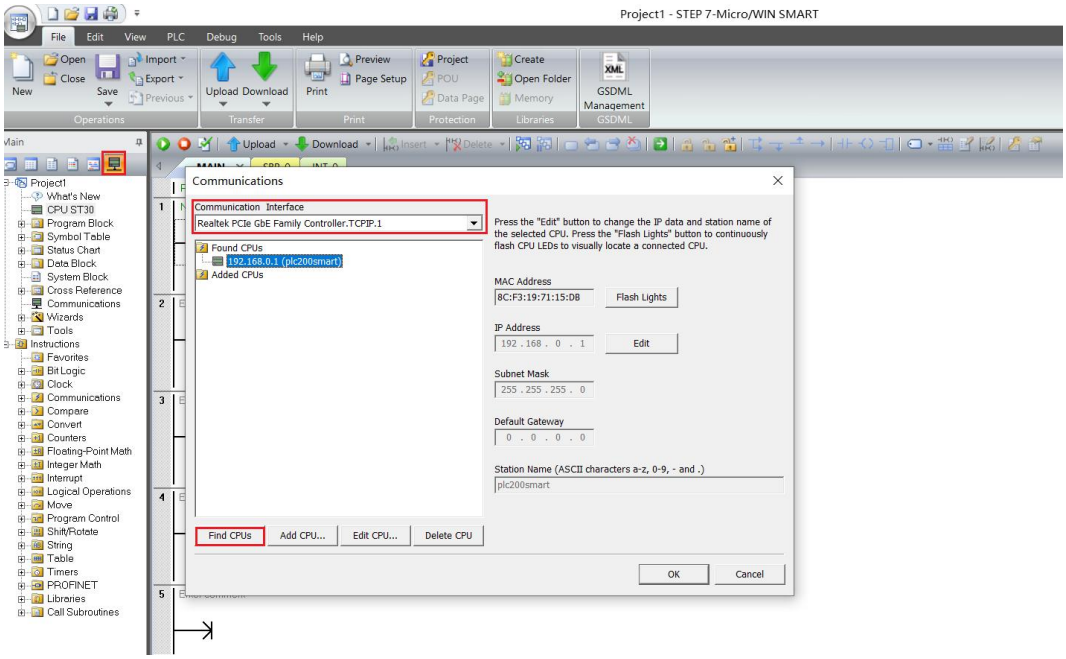
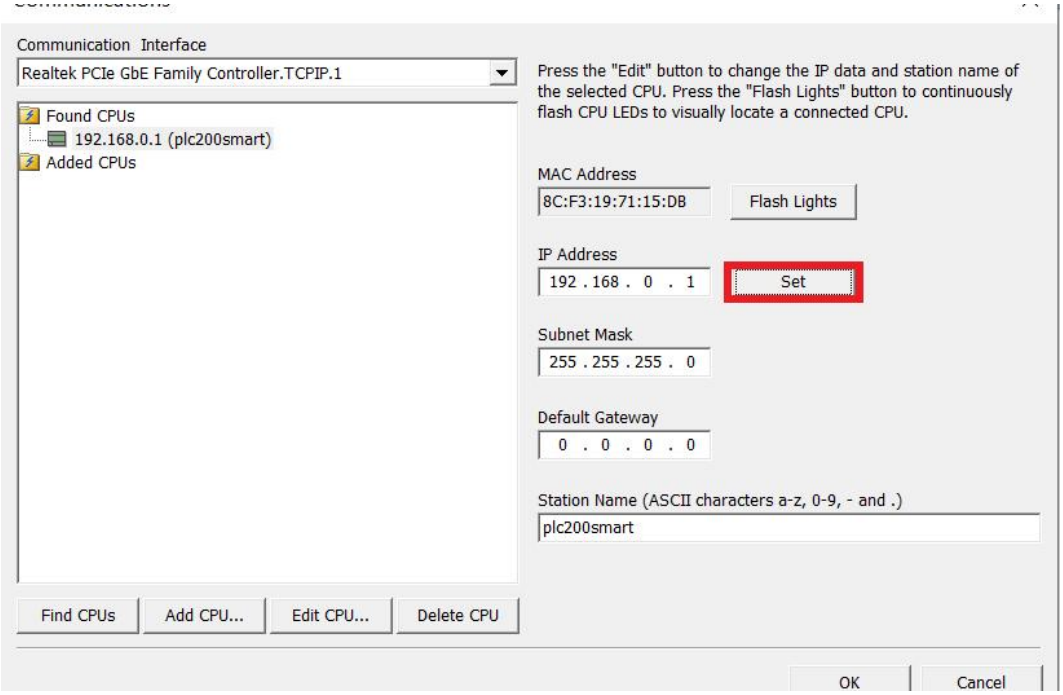
c. Click the left navigation tree 通信 button to pop up the "Communications" window, switch the communication interface to the interface actually used by the PLC, click the "Find CPUs" button, and find the PLC, as shown in the figure below .



d. Click the "Edit" button in the communication window. The Edit button switches to the Settings button. The IP address input box lights up. Modify the IP address and the IP address of the computer interface in the same network segment. After the modification is completed, click the "Set" button again. After the settings are 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.



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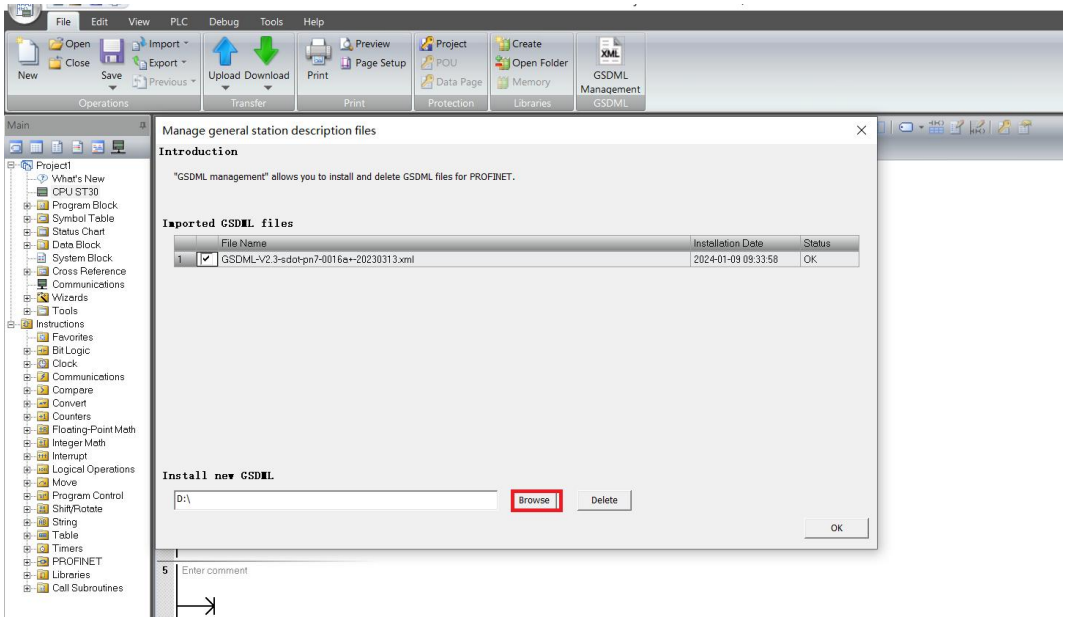
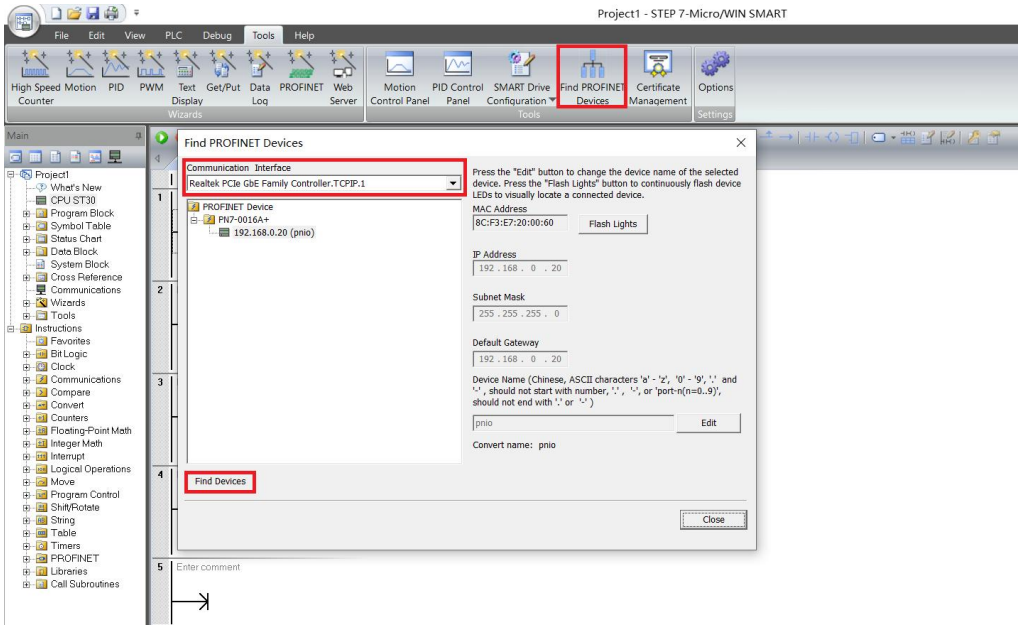
3、Import GSD file

a. Click "File- > GSDML Management" in the menu bar , click the "Browse" button in the GSDM L management interface select the GSDML file to be imported , and click the "Confirm" button, as shown in the figure below.



4、Find device

a. the menu bar "Tools- > Find PROFINET Device ", a window for searching for PROFINET device will pop up , switch the communication interface to the interface actually used by the PLC, and click "Find devices", as shown in the figure below.



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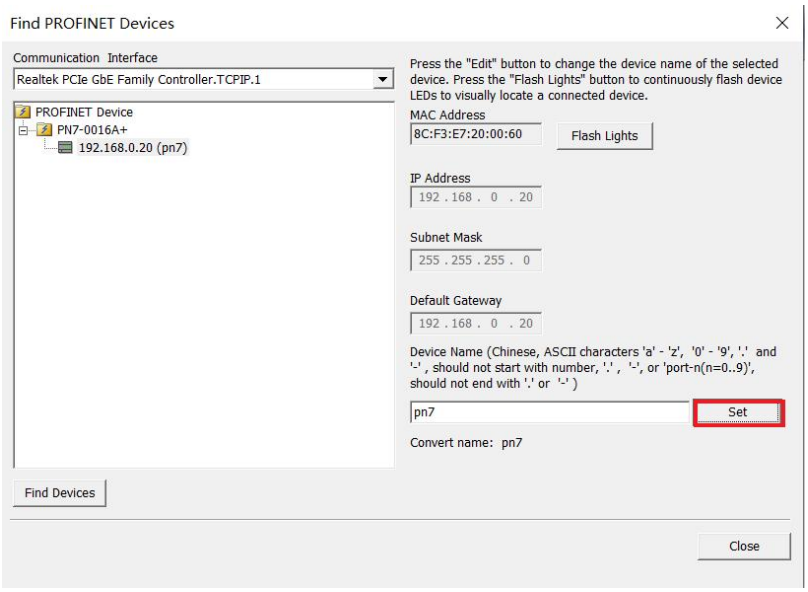
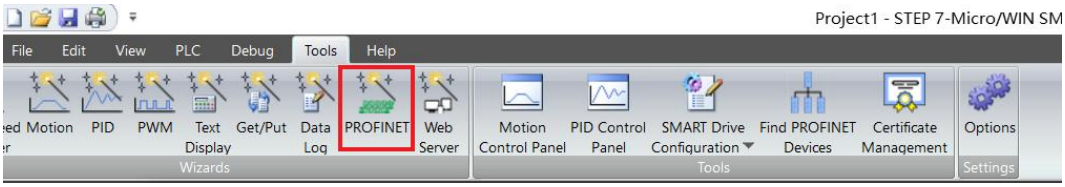
b. Click the "Edit" button to edit the module name. After editing is completed, click the "Set" button, as shown in the figure below.

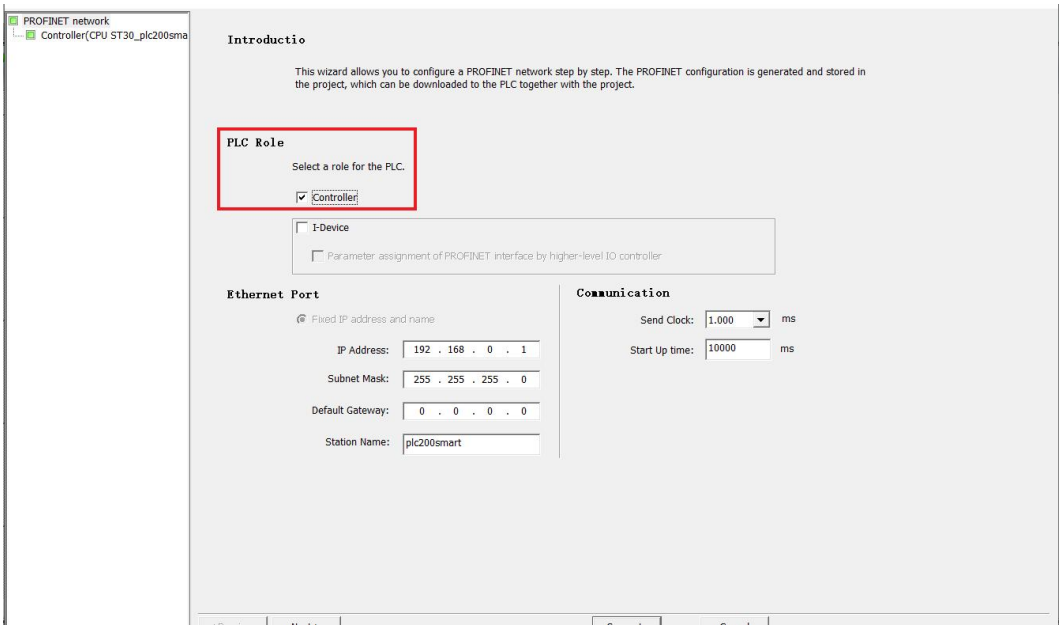


5、Configuring the PROFINET network

a. Click "Tools->PROFINET" in the menu bar to open the PROFINET configuration wizard, as shown in the figure below.



b. On the PROFINET configuration guidance page, select the PLC role as "Controller" , as shown in the figure below.



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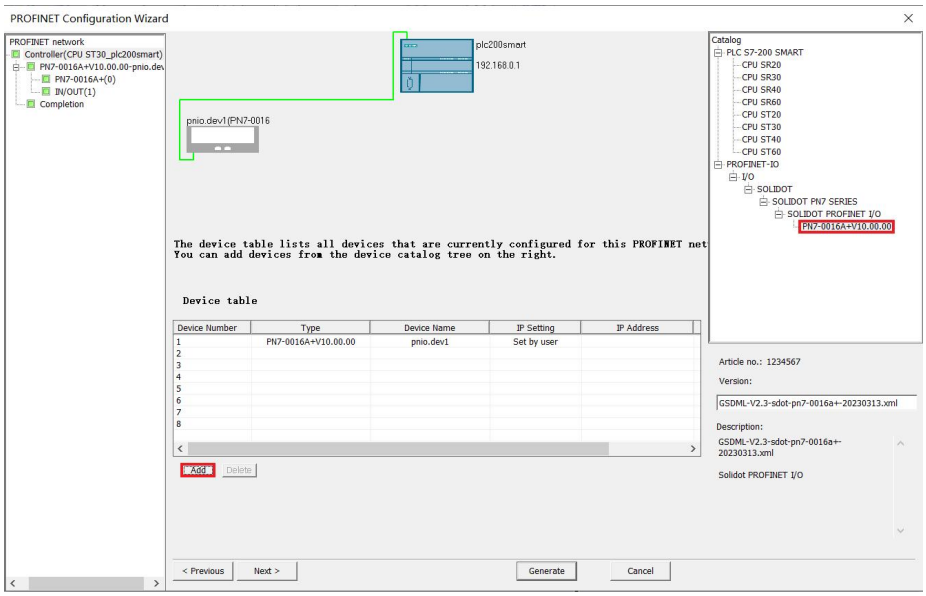
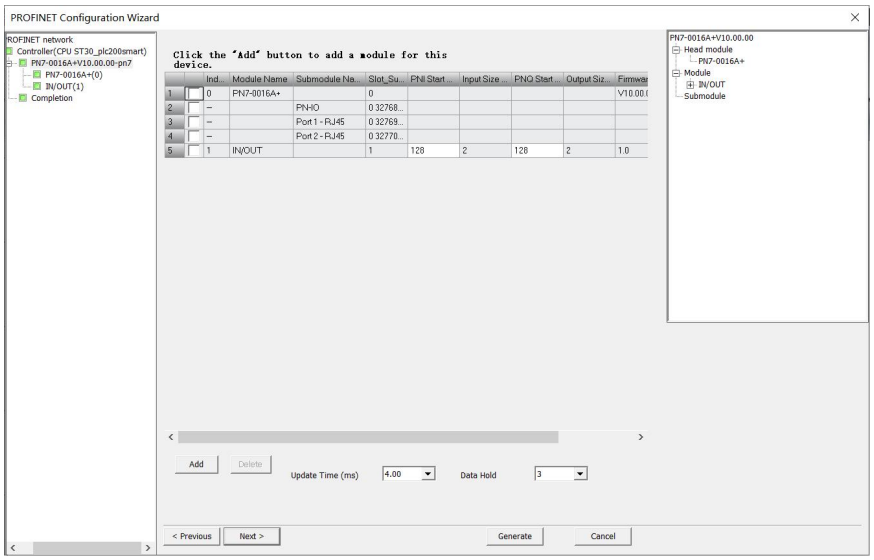
c. Click "Next" to enter the controller configuration page, add the device from the device directory tree on the right, select PN7-0016A+ , and click "Add", as shown in the figure below.



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 and 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, and the IP address must be set in the same network segment as the PLC .

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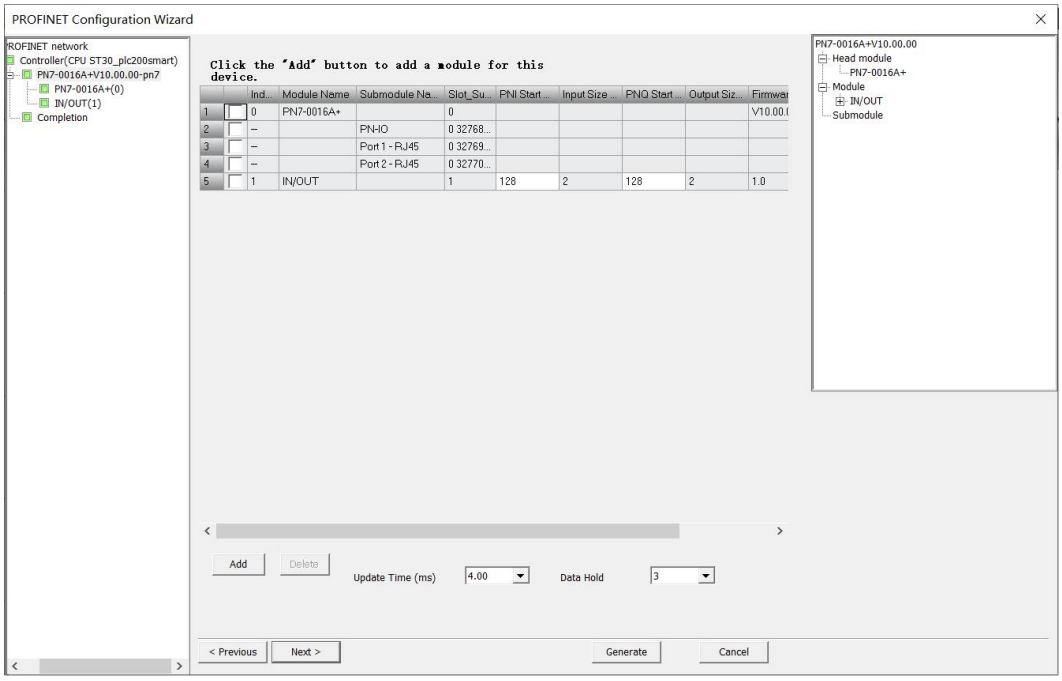
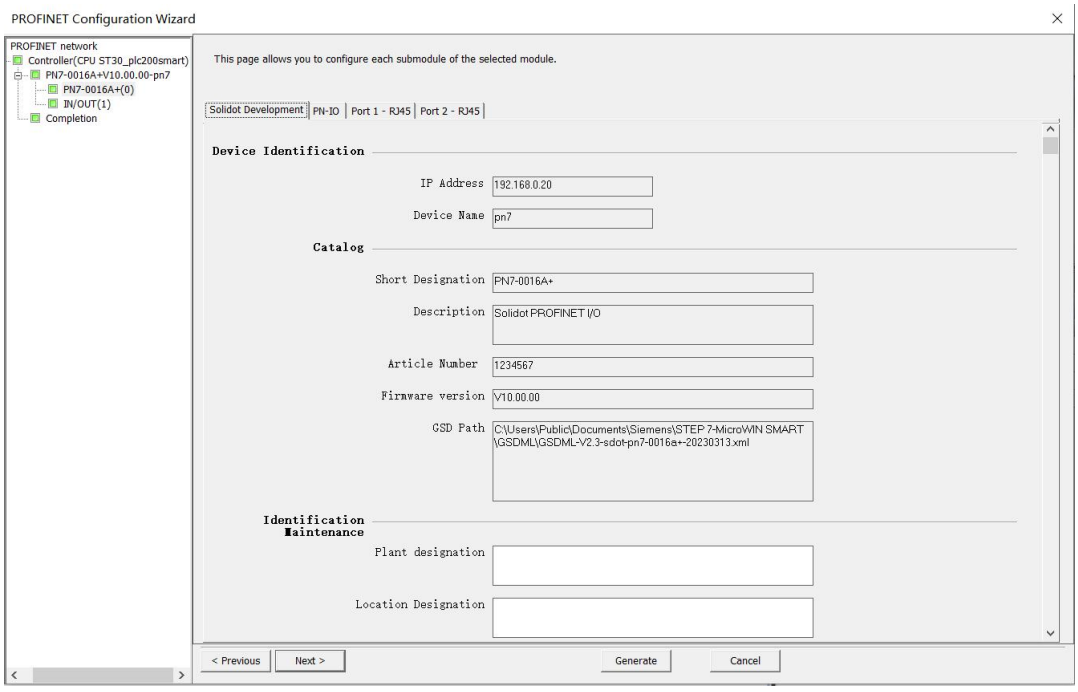
e. Click "Next" and you can see that the input and output starting addresses of the module are both 128 , as shown in the figure below.



f. Click "Next" to see the module's device information, as shown in the figure below.



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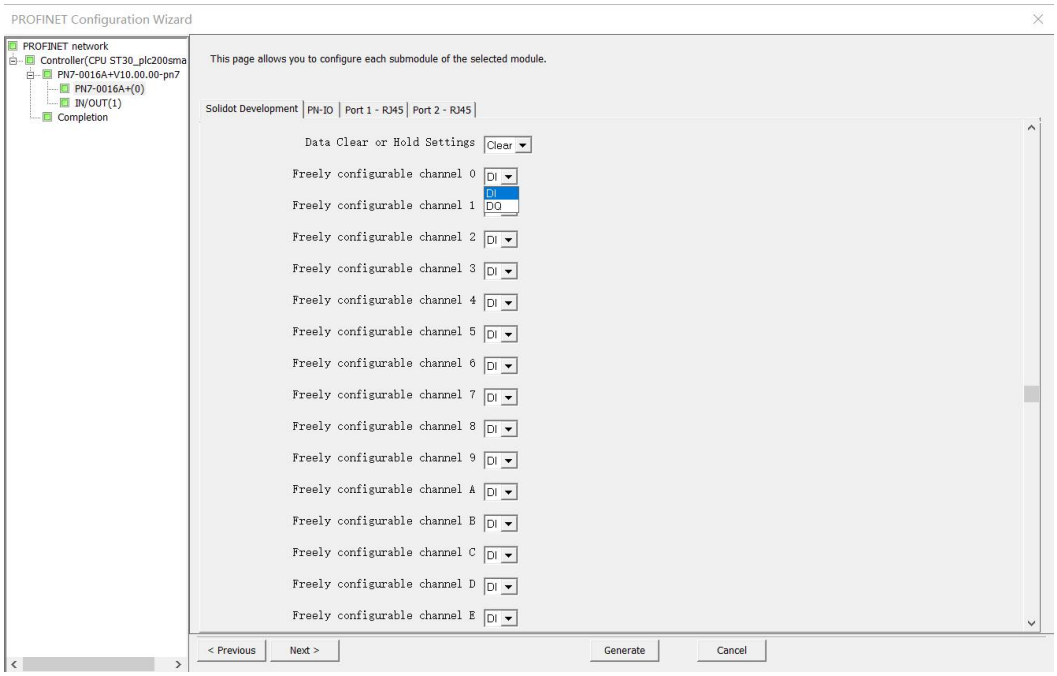
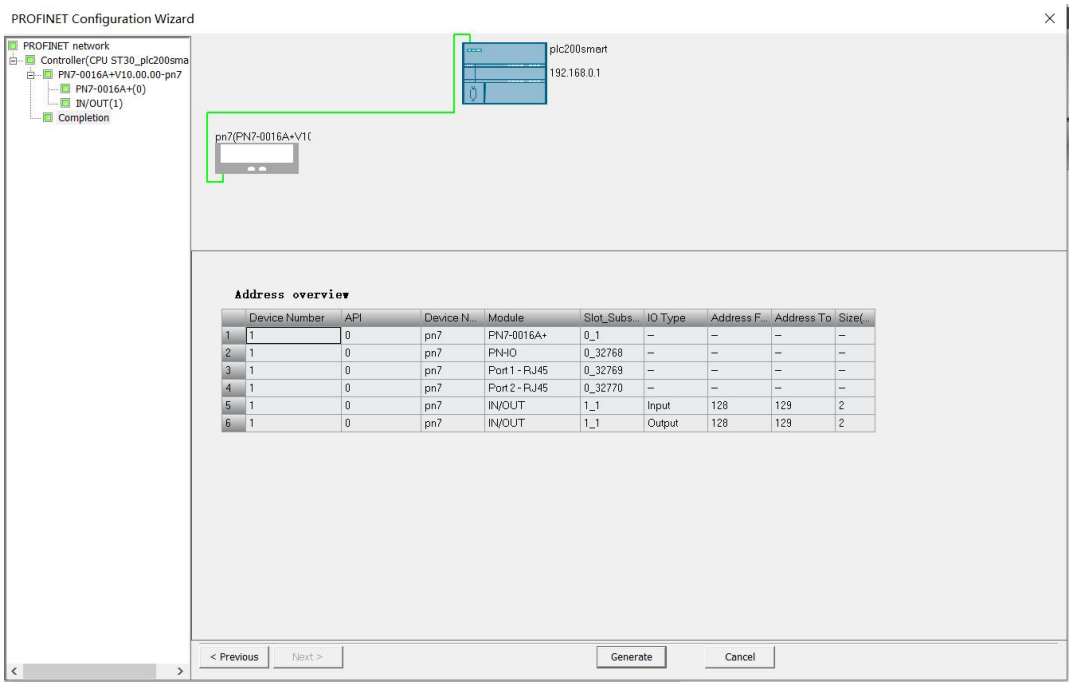
g. Pull down the module information page and you can see the parameter configuration information of the module, as shown in the figure below. The output clearing hold parameters and channel input and output configuration parameters can be configured according to actual use needs. For example, configure channels 0~9 as input types, and configure channels A~F as output types.



h. Click "Next" and then click "Next" again. The network configuration is as shown in the figure below. Click “Generate” to complete the configuration.



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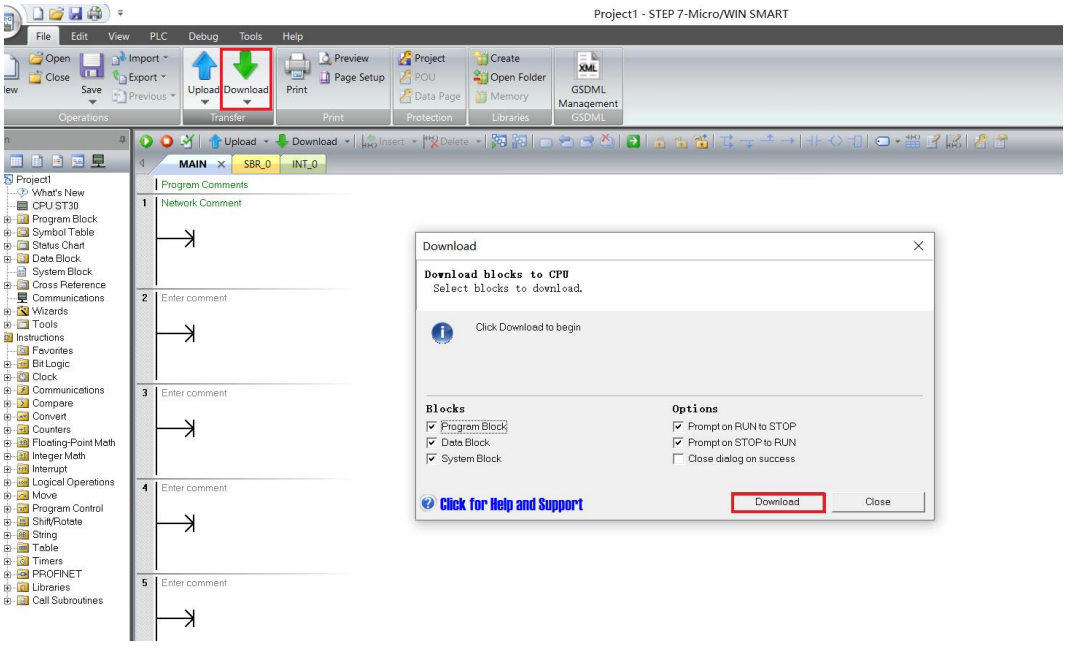
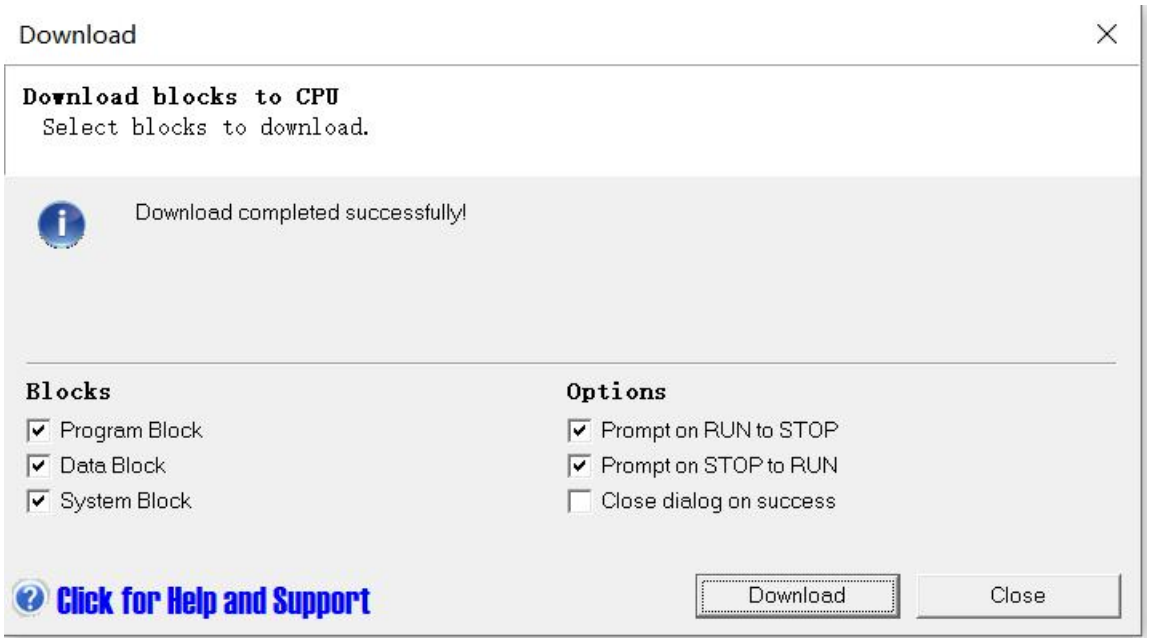
6、Download program

a. " File- > Download" button in the menu bar to pop up the download window, click "Download", as shown in the figure below.



b. After the download window prompts that the download has completed successfully, click "Close".



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

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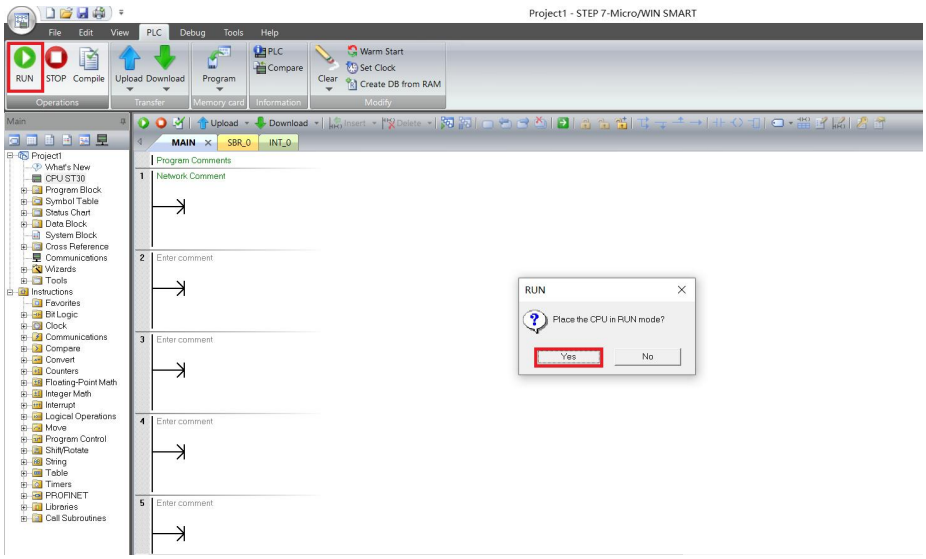
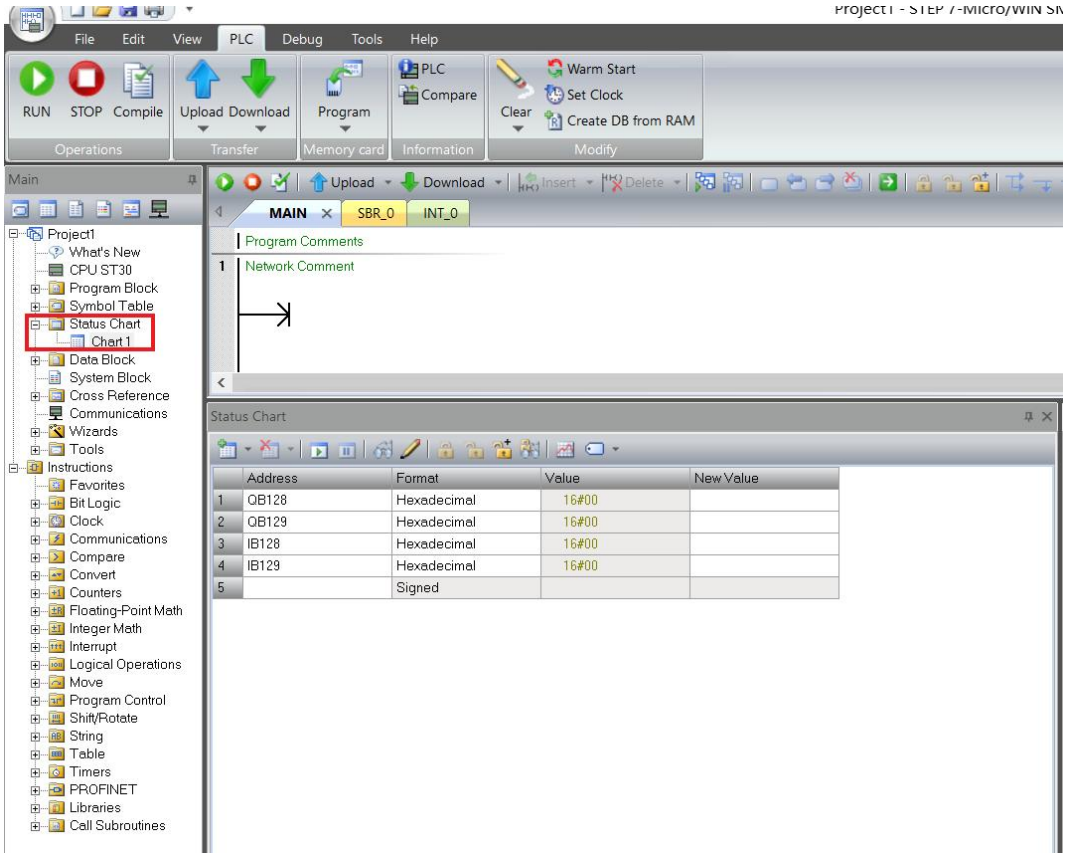
7、Functional Verification

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



b. Click " Status Chart -> Chart 1" in the left navigation tree and enter the corresponding channel address and data format in Chart 1. You can perform forced output and input monitoring operations on the IO module here.



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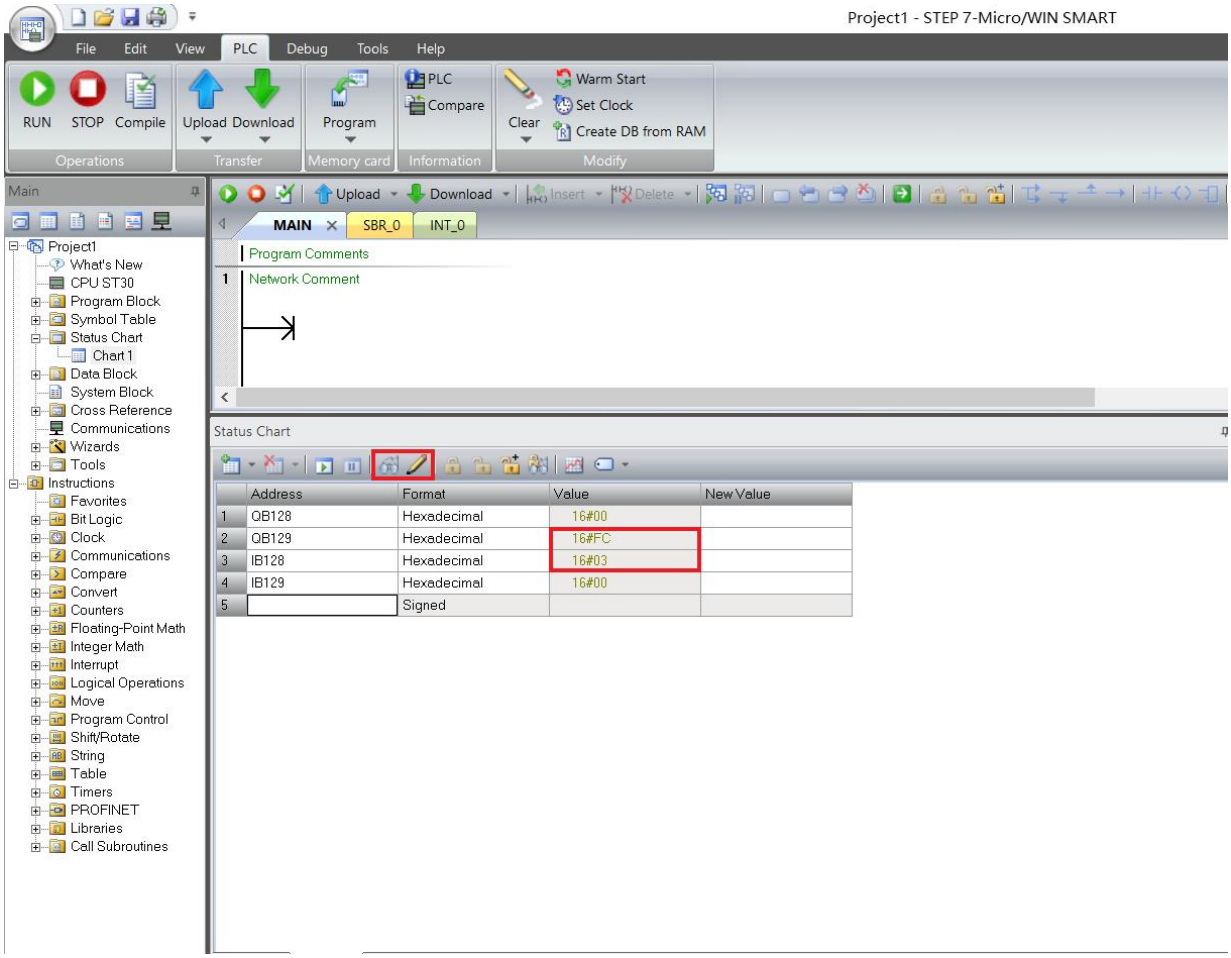
c. the new value input box corresponding to the output line QB 129 of the state chart, the output value can be written. For example, if "252 " is written, the values of the six output A~F channels are all set to 1, and all the output channel lights are on. When the module's input channels 0~1 have valid voltage input, the input value can be monitored in IB 128 , as shown in the figure below.



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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.

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