

ES Series Profinet Communication Expansion Cards

Instructions for use



Profinet Communication Extension Card Data Sheet Code: xxxxxxxxx Version: V1.0 Effective Date:

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Catalogue

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Profinet technology

Preface

Thank you for buying a Profinet card from Cumark New Technologies, an industrial Ethernet technology that supports the IEEE 802.XX protocol and can be implemented using standard Ethernet chips to support real-time communication. Profinet is an industrial Ethernet technology that supports the IEEE 802.XX protocol and can be implemented using standard Ethernet chips. Our Profinet cards are designed and developed in strict compliance with the Profinet protocol specification and can be used to communicate easily with Profinet experts that support this specification.

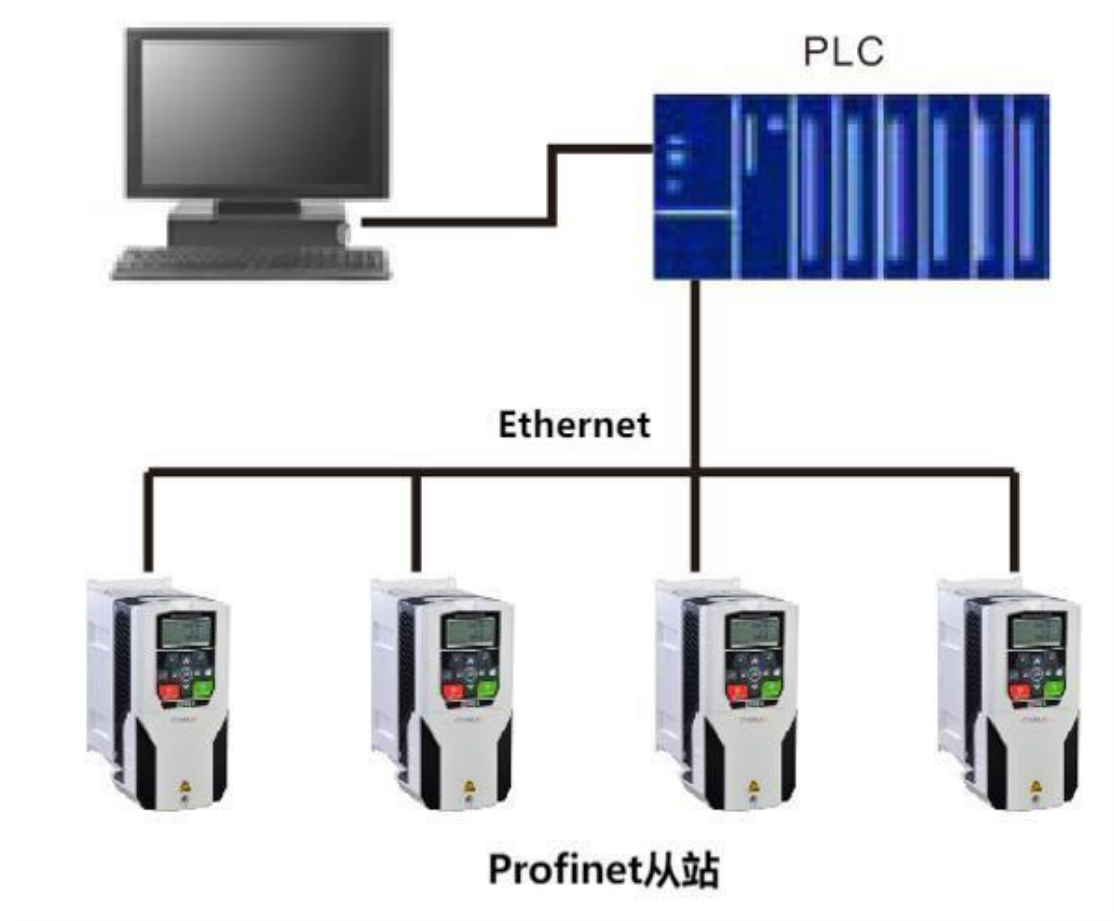
This manual is a technical document that comes with the machine. Please read it carefully and keep it in a safe place. If you have any questions or special requests during the use of the machine, please feel free to contact our office or distributor, or contact our Customer Service Centre directly, and we will be happy to help you.

We are committed to the continuous improvement of our products and therefore the information in this series is subject to change without notice. Please accept our apologies.

1. Product Overview

1.1 Product Features

The Profinet card is a slave device in the Profinet communication network and the PLC acts as the master. The Profinet communication network is shown in the following diagram.



1.2 Technical specifications

- 1) Full support for the Profinet protocol specification.
- 2) The Profinet card communicates with the frequency converter using the SPI method.

2. Installation instructions

2.1 Installation and environment

The Profinet card is embedded in the inverter. Before installation, be sure to disconnect the power supply and wait until the power indicator of the inverter is completely switched off before installing. The installation method is shown in Figure 2-1.

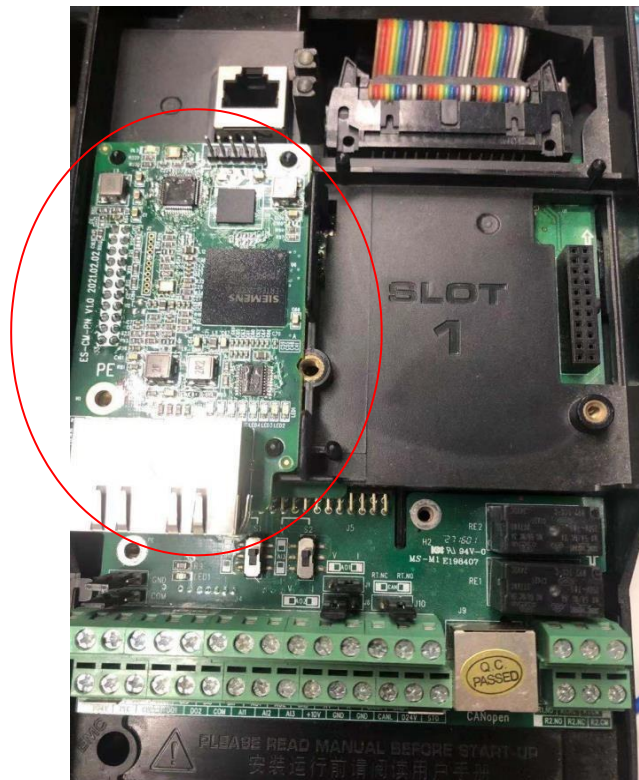


Figure 2-1 Profinet card installation method

Mechanical and electrical installation instructions.

- 1) Make sure the drive is powered down before installation.
- 2) After removing the front cover of the drive and inserting the card (in the SLOT2 slot) as shown above, lock it with the M3*8 screws included in the box.
- 3) F1-F3 profile drives only need to be locked with the left-hand side screw, F4 profile and above with both left and right-hand sides.
- 4) Complete the wiring after checking that the model number is correct.
- 5) The wiring is standard fiber optic cable.

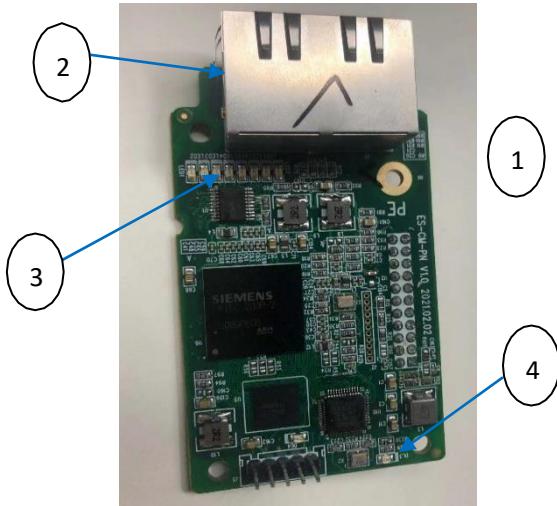
- 6) To prevent interference, use qualified wiring of electrical strength and keep other control, motor and power cables at a distance of 15cm or more.
- 7) Please use this product in indoor environments free from corrosive gases, liquids and dust and dirt.

Application environment requirements.

工作温度	-10°C to 50°C (无凝露无冻结)
储存温度	-40°C to 70°C (无凝露)
环境湿度	95%RH 以下 (无凝露)
震动	(IEC 60068-2/-6. Test Fc) Max. 0.1mm (5 to 13.2Hz); max. 7m/s ² (13.2 to 100Hz) 正弦振动

2.2 Profinet card interface description

2.2.1 Schematic diagram of the product interface



Serial number	Name	Description
1	Profinet card to frequency converter Mouth	Connection to inverter
2	Ethernet ports	Two Ethernet ports for connection to the Profinet expert and other Profinet slaves
3	Indicator light LED1	Communication status sign
	Indicator light LED2	Idle
	Indicator light LED3	Idle
	Indicator light LED4	Idle
4	Indicator lamp DL3	Power status sign

2.3 Communication indicator

	Perpetual extinction	Always bright	Blinking (1Hz)
LED1	Communication not working or indicator light Damage	Communication is normal	Communication fault status
DL3	Abnormal power supply or loss of indicator light Bad	Power supply normal	

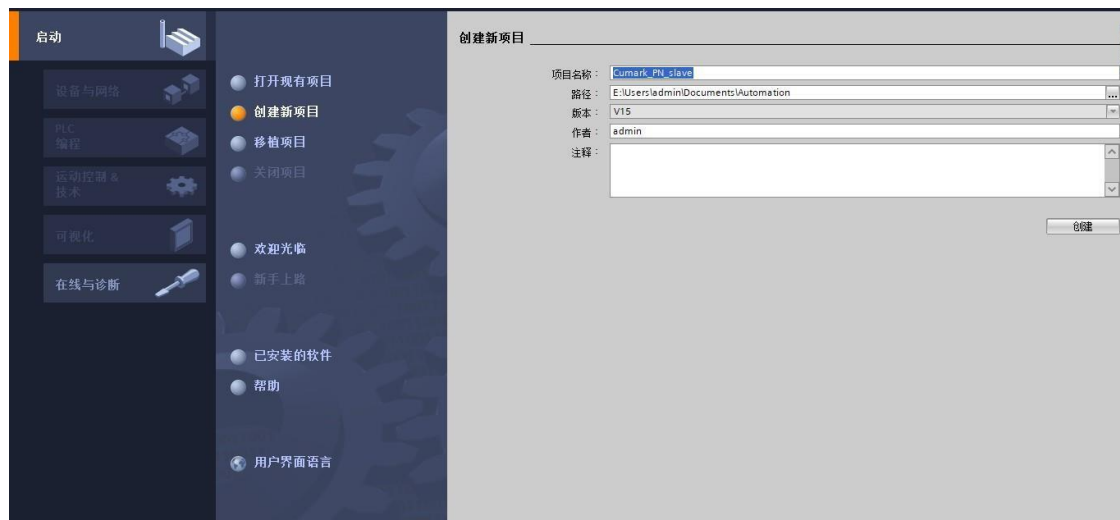
3 Communication system construction

3.1 New construction projects

Here, we illustrate the new process by building a master-slave communication network using a SIEMENS S7-1200 PLC with the Profinet communication module CM1243-5 as master and a Profinet (Cumark_PN_slave) card as slave.



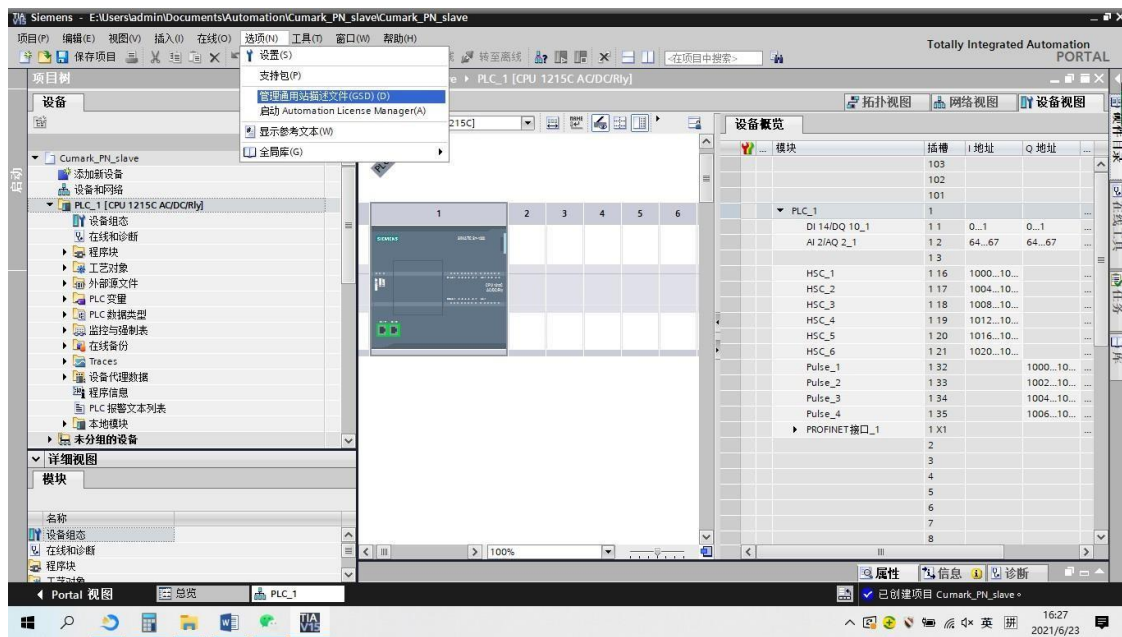
- 1) Double click on the "TIA Portal V15" icon to open the system development environment (as shown on the right)
- 2) Select 'Create New Project' on the launch screen and click 'Create' to create a project



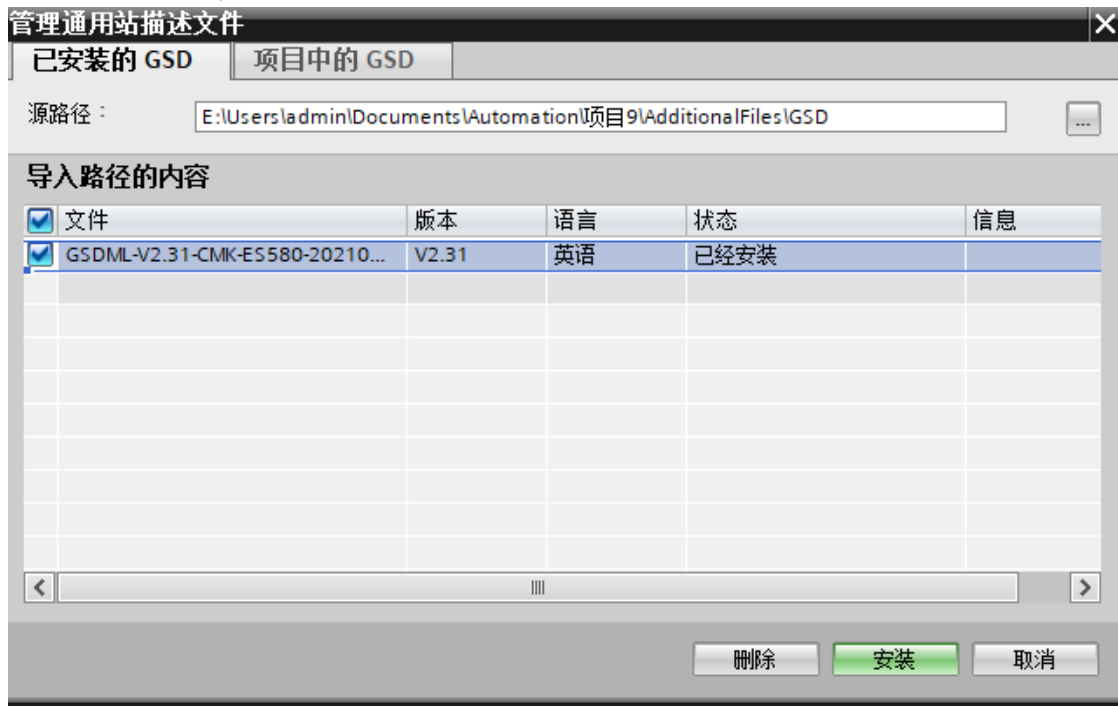
- 3) Add a SIMATIC S7-1200 site to your project



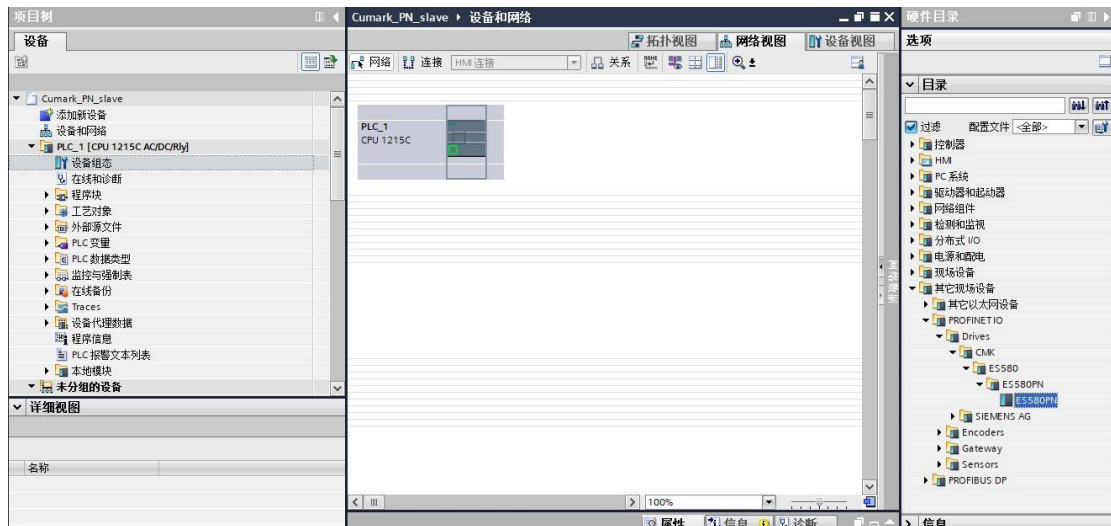
- 4) In the "Options" menu item check "Manage Generic Station Description File (GSD)"





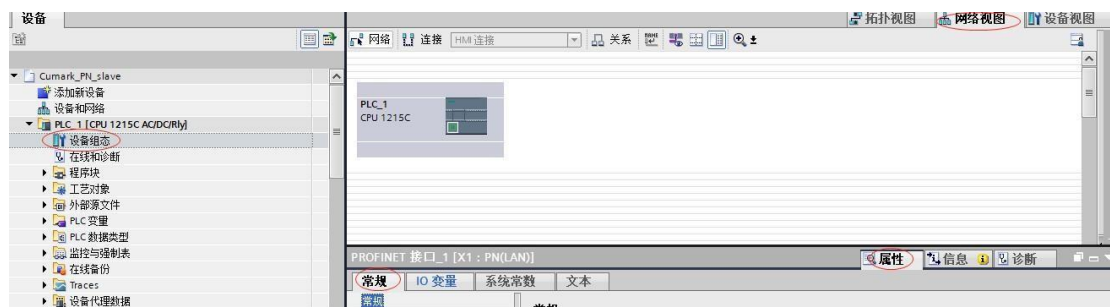
- 5) Click on "Browse" in the Management Gateway Description File section to find the directory where the "GSDML-V2.31-CMK- ES580-20210529.xml" file is found. Once you have selected the GSD file, click on "Install" to start installing the GSD file (you do not need to install it if the file status shows that it is already installed)



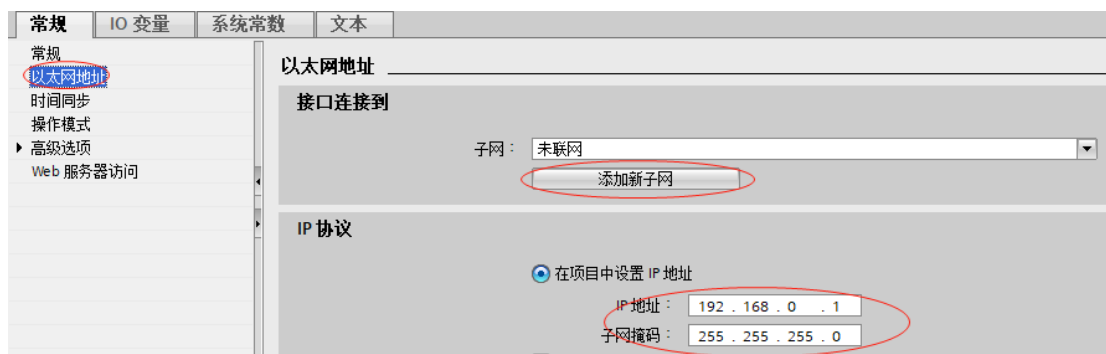
- 6) When the installation is complete, close the Manage Generic Station DescriptionFile dialog. The installation result can be seen in the hardware directory.



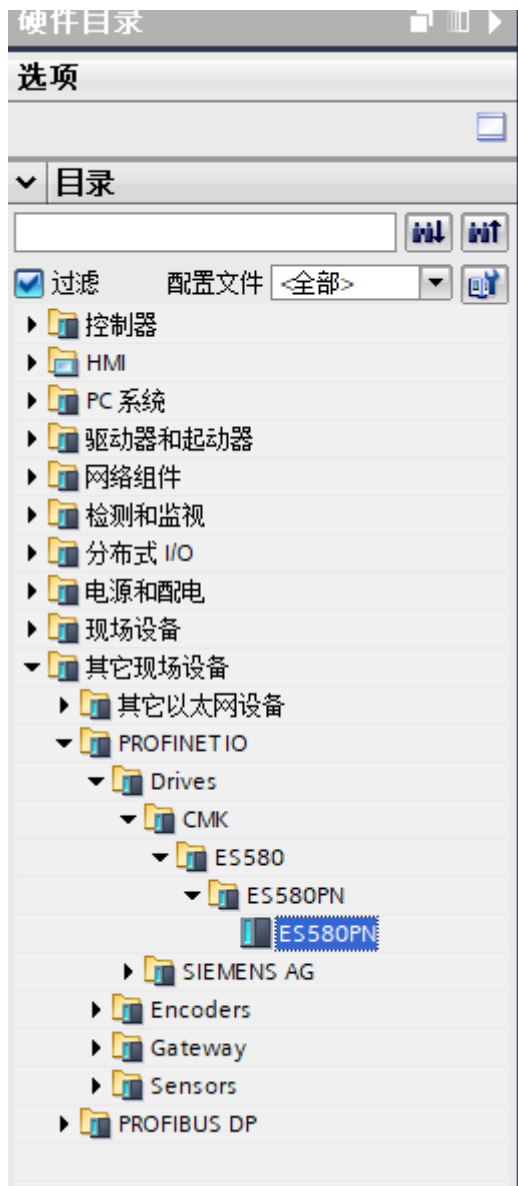
- 7) Click on the "Device Configuration" Icon in the  **设备组态** Interface, switch to the network view, select the Profinet interface of the PLC and switch to the "Properties" "General" of this port.  **网络视图**



- 8) After setting the IP address and subnet mask of the PLC master, click on "Add new subnet"



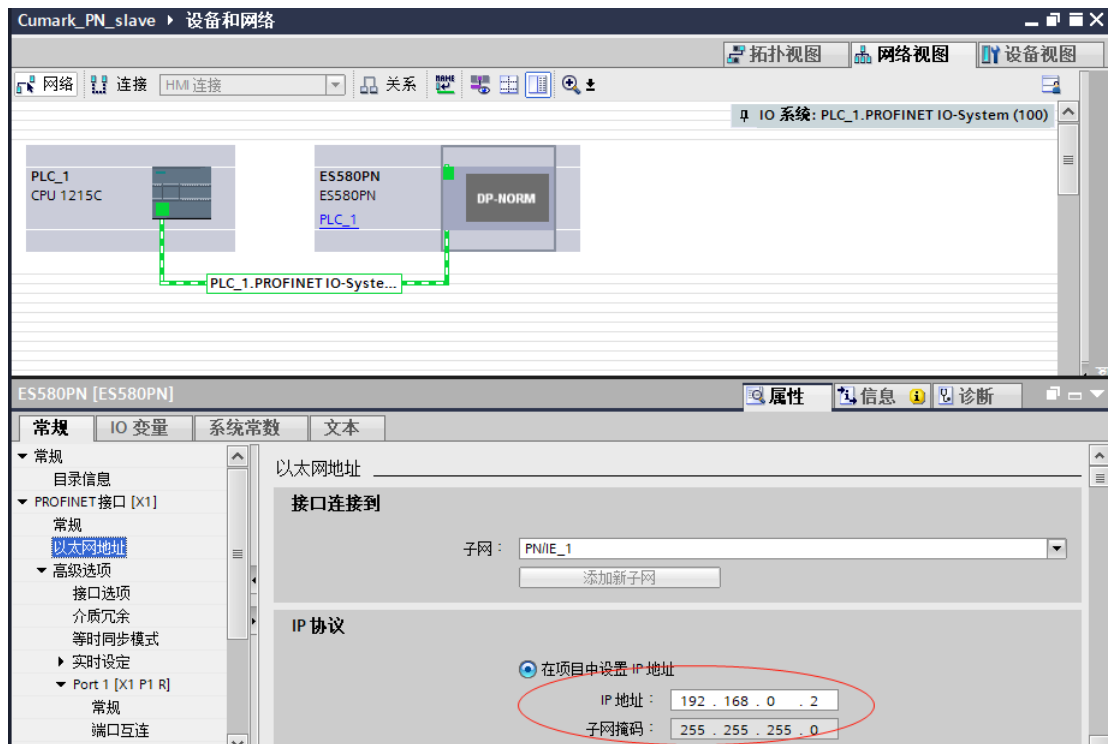
- 9) Find the ES580PN in the "Hardware Directory" on the right-hand side and double click on the ES580PN directly.



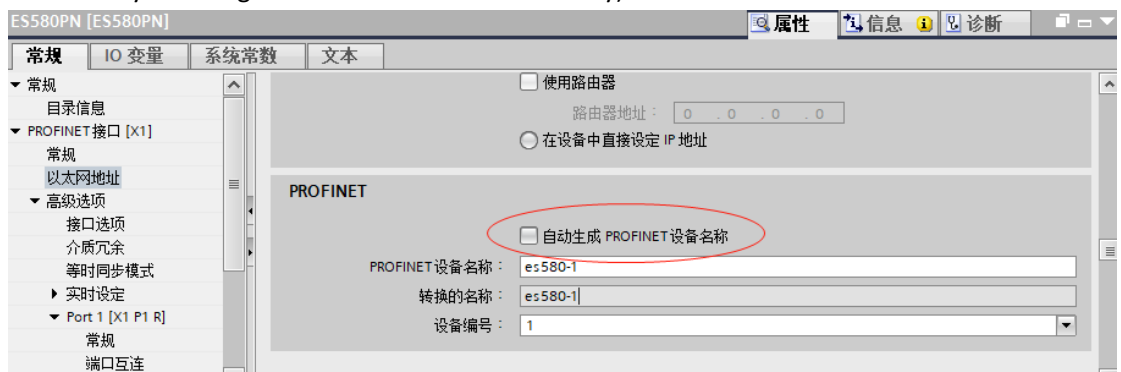
- 10) Click on "Unassigned" and select the master system to which the slave needs to be connected.



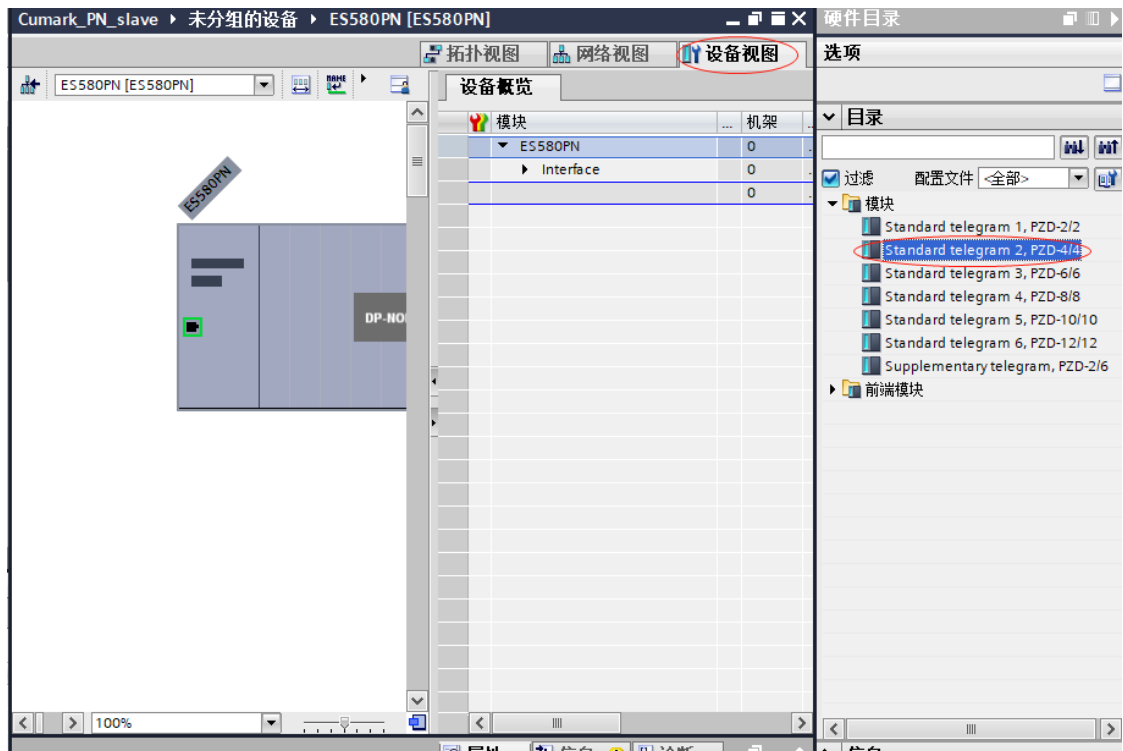
- 11) Select the slave and set the IP address in "Properties" -> "General" -> "PROFINET interface [X1]" -> "Ethernet address". Set the IP address in "Ethernet address"



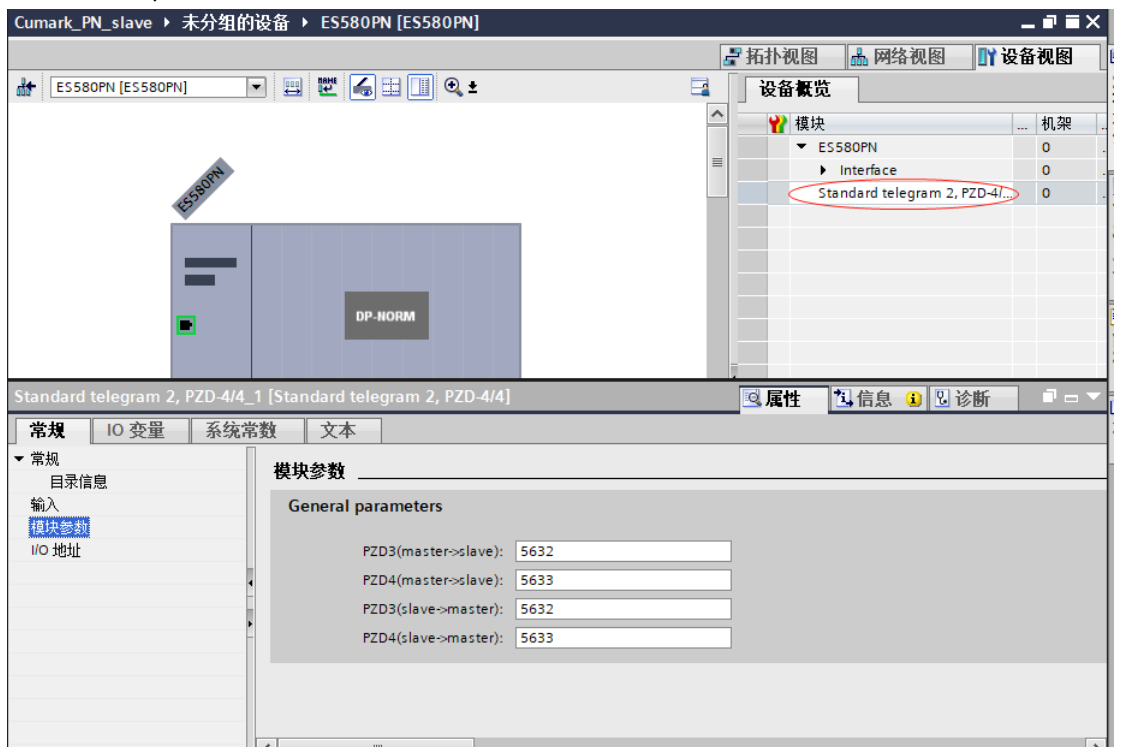
- 12) On the above screen, drag the scroll bar and under "PROFINET", remove the tick in front of "Automatically generate PROFINET device name" and enter the name of the slave device you wish to set after "PROFINET device name". After "PROFINET Device Name", enter the name of the slave device you wish to set (you can also leave the box checked to allow the system to generate the name automatically)



- 13) Select the slave, switch to "Device view" and under "Hardware directory" -> "Modules" double-click to select the data length to be configured for the slave. Select the data length to be configured for the slave.



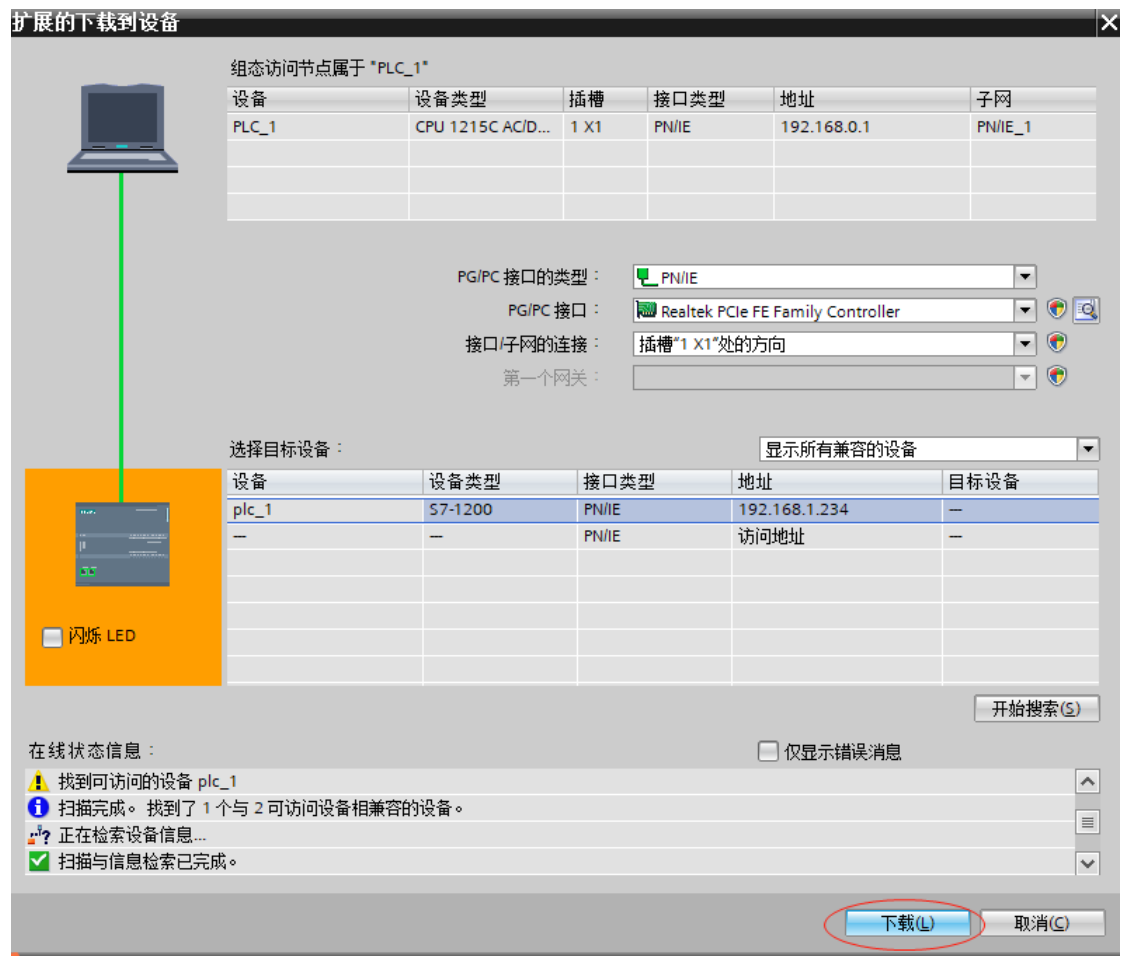
- 14) Configuration PZD: PZD1 and PZD2 are solid configurations and cannot be changed by the user (PZD1 is the field bus control word, PZD2 is the fieldbus given 1) PZD3 to PZD4 are user-defined periodic data interactions, which are set in the hardware configuration. After completing step 4, select the message format in the same screen and select "Module parameters" under "Properties" -> "General".



Pad(master->slave) means the master writes the corresponding address of the slave, and Pad(slave->master) means the master reads the corresponding

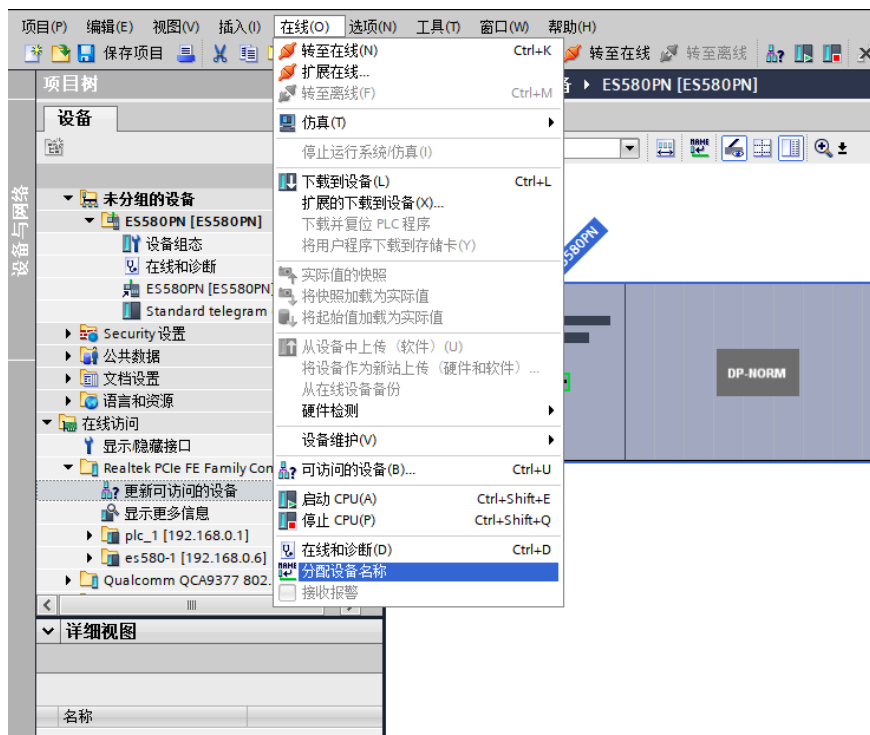
address of the slave. P22.01, set PZD3(master->slaver), PZD4(master->slaver),PZD3(slave->master), PZD4(slave->master) and fill in the value of this line with 5632 and 5633 can read and write P22.00 and P22.01 parameters. Each slave needs to set the PZD mapping individually as required (if the mapping is the same for all slaves, select a slave that has already been set, press CTRL+C, then select the Profaned bus in the configuration and press CTRL+V to change the device name and IP address directly). Switch back to Network View and if you need to add more stations, repeat the above, or if the configuration is the same, select the slave and copy it directly, then change the IP address and device name (note: device names must not match).

15) Download configuration: Save the configured configuration network, set the IP address of the PC to the same network segment as the PLC (be careful not to duplicate the IP of the slave in the configuration, you can also set the PC to automatically assign IP) compile, click on download, select the interface and click on "Star search".

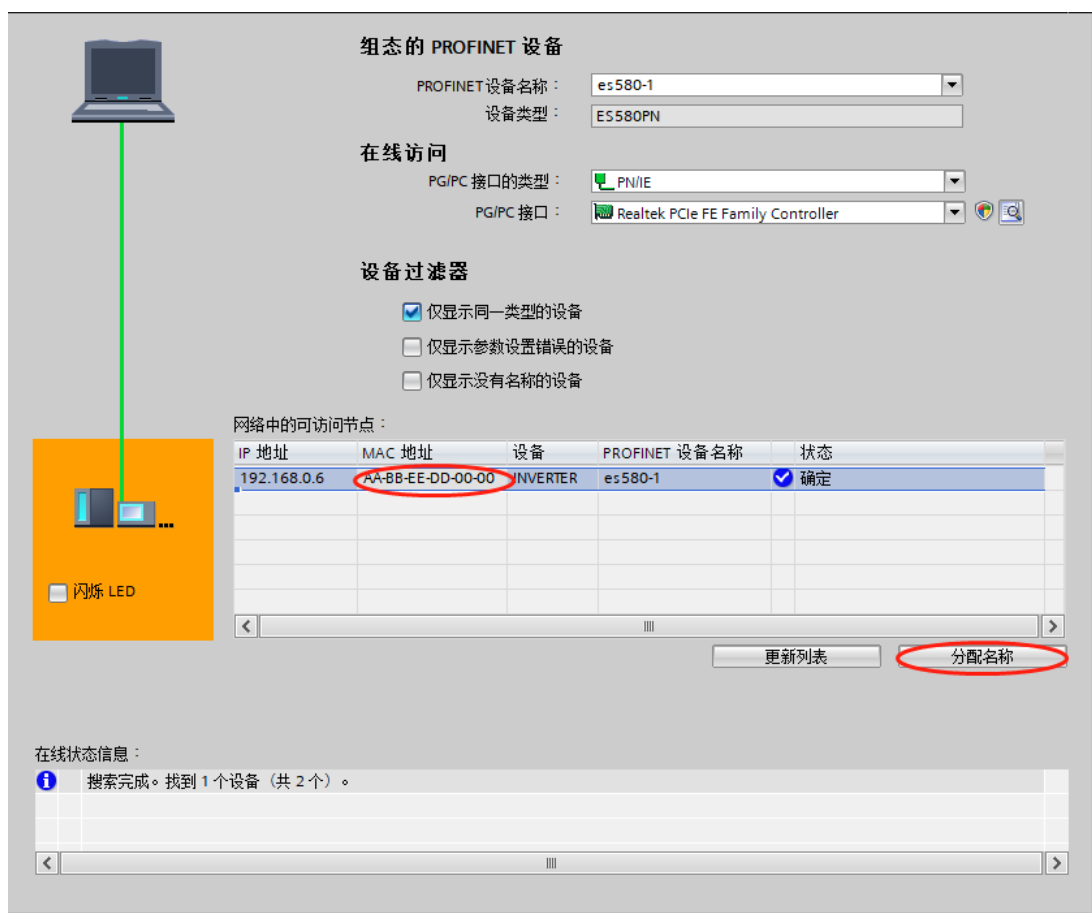


16) Name of assigned equipment

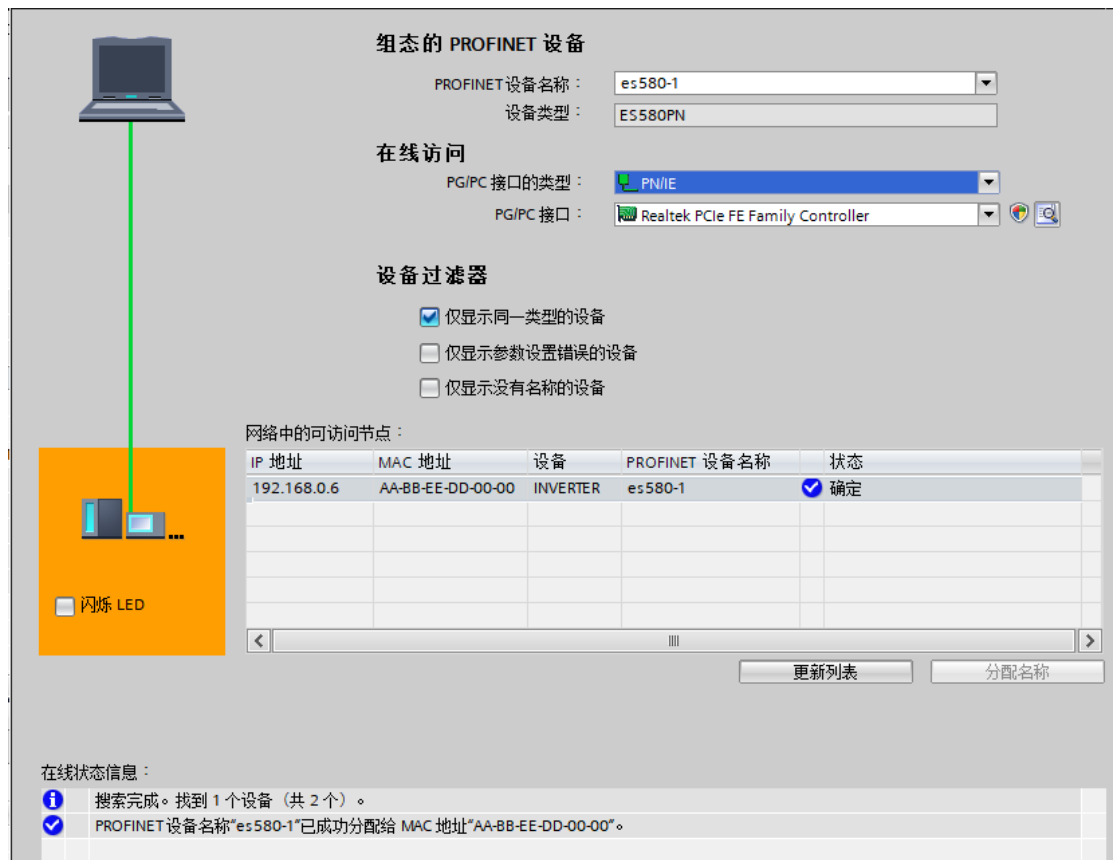
Once downloaded, you will also need to assign names to the slaves that do not have device names assigned to them. Select the slave and under "Online" click on "Assign device name" (or select the slave and click on the right-click menu)



Each slave has its own unique MAC address. If there are multiple devices of the same type in the same network, the devices should be distinguished according to their MAC addresses and click on "Assign Name".



When the message shown below is displayed, the device name has been written successfully. The "PROFINET device name" displayed should be the same as the one shown in the "PROFINET devices configured" diagram above.



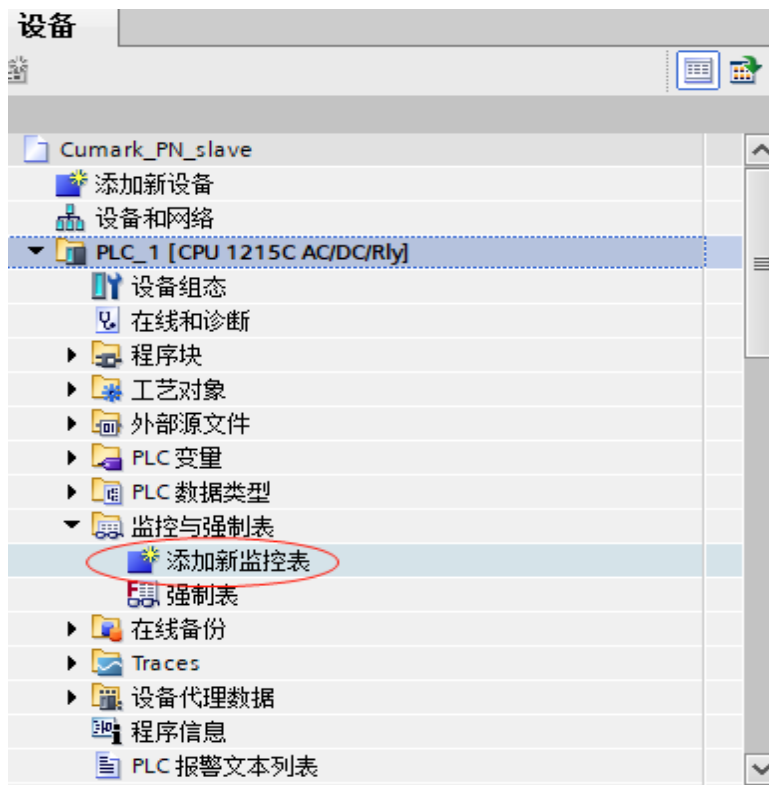
After assigning the corresponding slave to the device, close or drop down the "PROFINET device name" and select another name to continue assigning the name of the other station.

The slave receives the assigned name and saves it, the master relies on the device name to distinguish the individual slaves (MAC addresses are not intuitive in use, assigning a device name binds the device name to the MAC address) Caution.

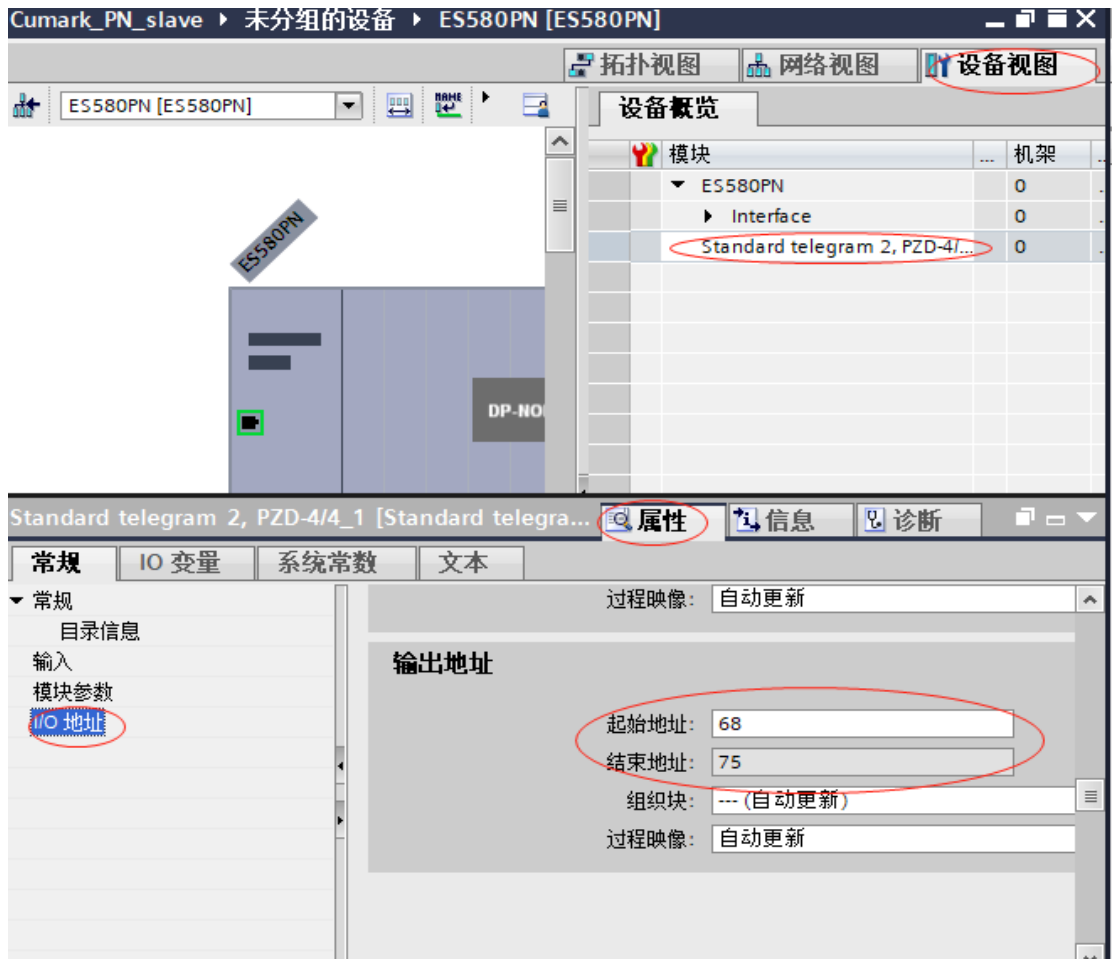
- ◆ Each device name is allowed to be assigned to only one slave in the network.
- ◆ The name of the equipment at the site in the configuration must be reassigned after the name has been changed.
- ◆ Once the IP address has been changed, simply download the modified configuration to the PLC and it will take effect without the need to reassign a name.

All the above operations complete the operation of the Profinet slave, and the corresponding program can be written in the PLC to control the frequency converter.

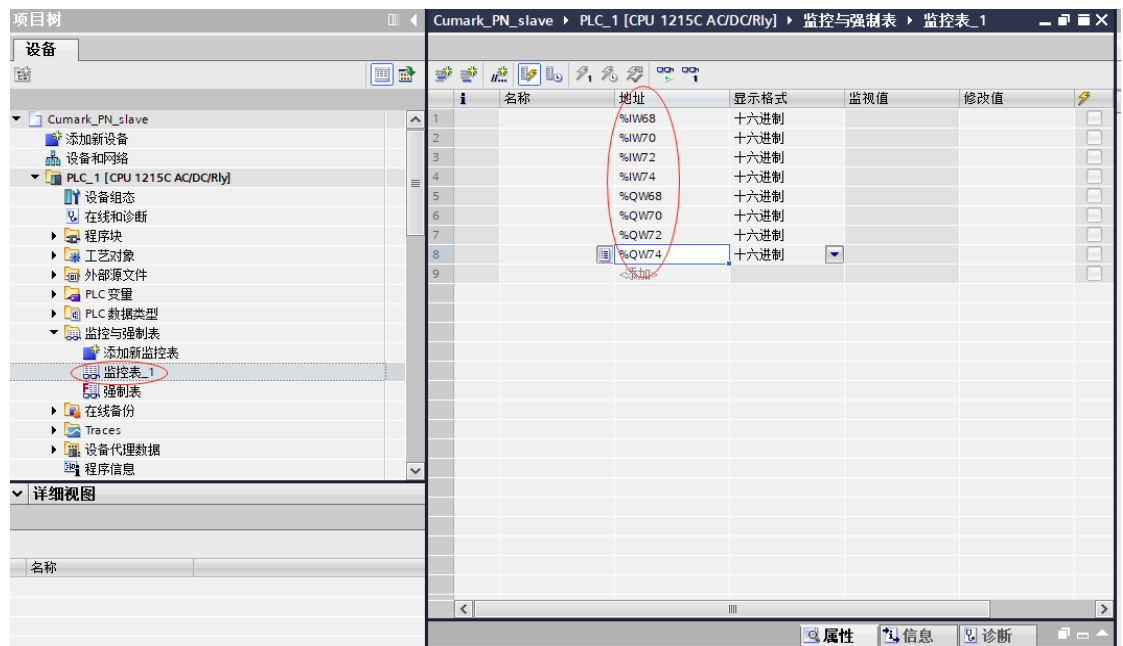
17) Double click to add a new monitoring table




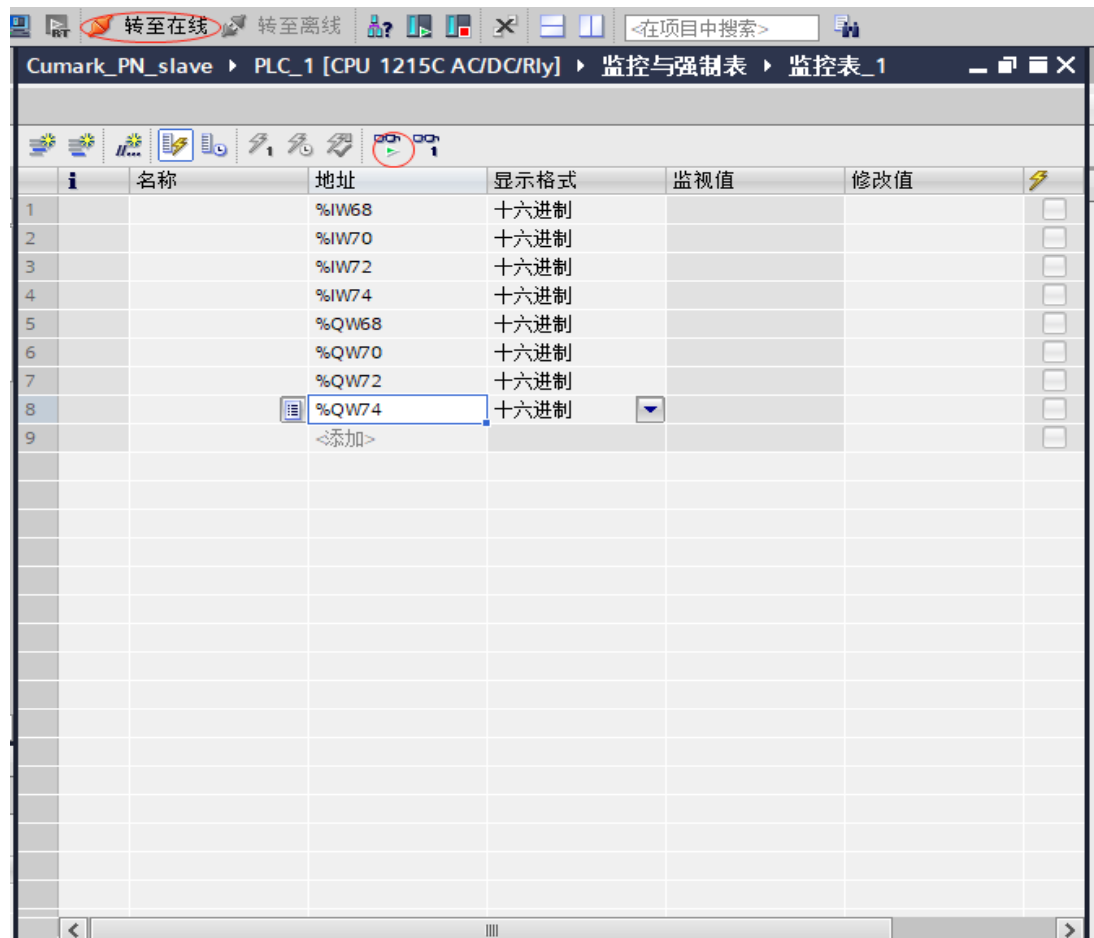
- 18) To view the range of read and write addresses: click on the ES580PN, switch to "Device View", select "Properties" for "standard telegram2", then click on "IO Addresses" under "General". Under "General", click on "IO Address", you can see the start and end addresses



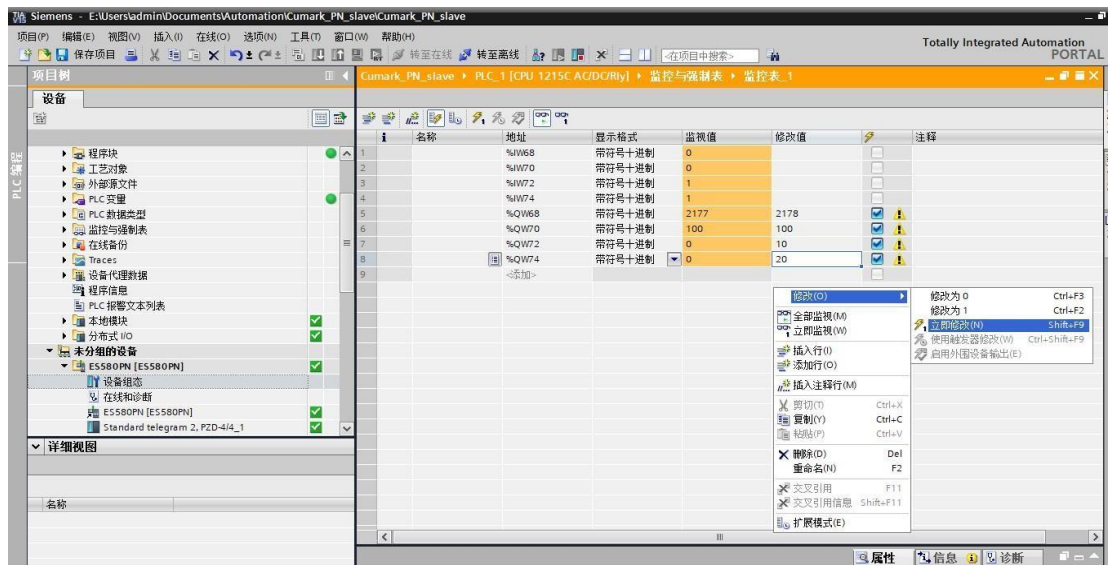
- 19) Add monitoring address: click "Monitoring Table 1", enter the address in the address column of the table, IW means read address (slave->master), QW means write address (master->slave), the address is set in one word length, so it is set in two bytes intervals



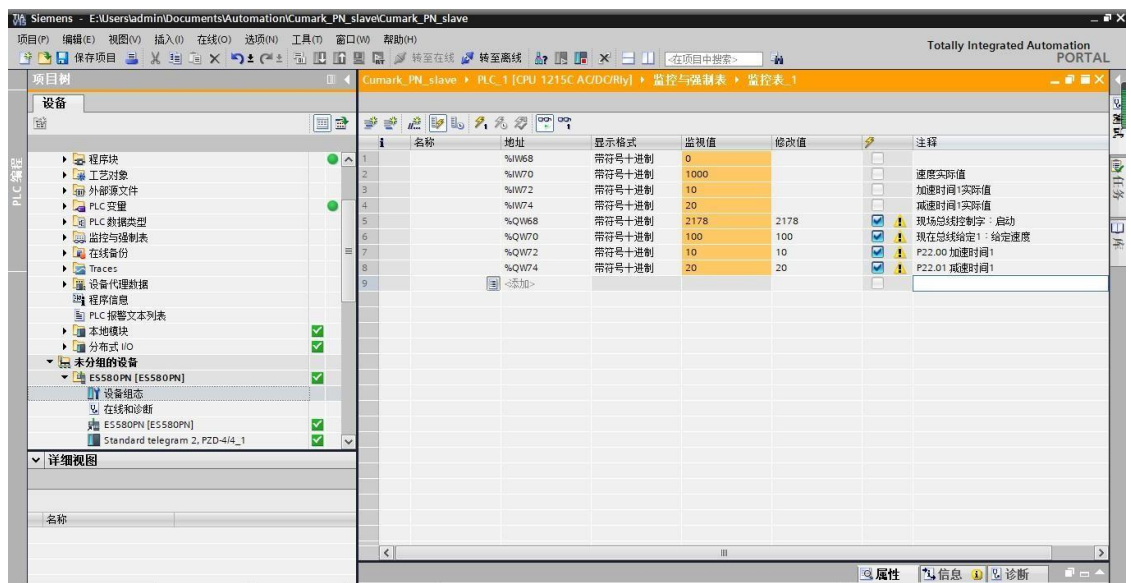
- 20) Click on "Go Online"  转至在线 and then "Monitor All"



- 21) Modify the display format to decimal, QW68, QW70QW72, QW74
- Enter 2178, 100, 10, 20 in the Modify column (2178: start, 100: given speed 100rpm, 10: P22.00 acceleration time 1 set to 0.1s, 20: P22.01 deceleration time 1 set to 0.2s), then right click and select All Modify



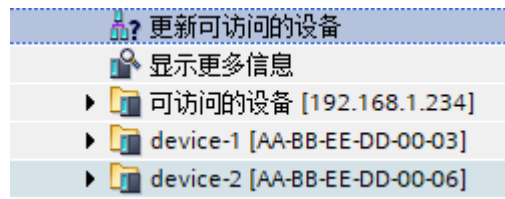
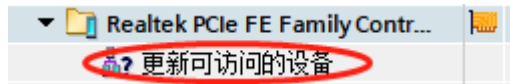
You can see that IW70, IW72 and IW74 are checking values of 1000, 10 and 20, which means that the parameters are read and written normally.



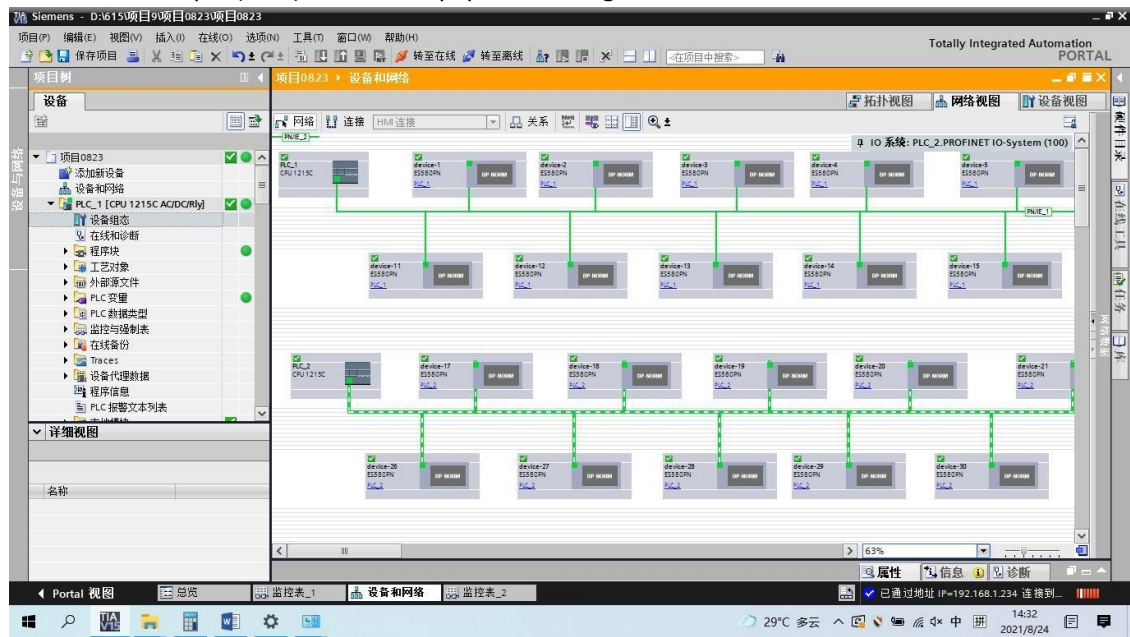
The diagram above shows the PLC controlled inverter starting at a given speed. The specific parameters of the inverter are set as follows

- 10.00 (remote 1 start function) set to 5 (fieldbus)
 - 11.02 (remote 1 control mode) set to 0 (speed)
 - 21.00 (speed ref1 source) is set to P.02.15 Fieldbus give 1.
 - 50.00 (fieldbus enable) set to 1 (enable)
 - LOC/REM local/remote mode set to remote mode.
- 22) Multiple profinet slave connections
- Set the 51.08 slave address: each slave address is different (essentially, the MAC address is different)

2. The drive is re-powered, and the device is scan



3. Follow the steps 9) - 21) above for equipment configuration



3.2 Transmission control

Fieldbus control word (corresponds to parameter address 06.05)

Fieldbus control words		
Position	Name	Information
0	Stop (shutdown)	1 = Drive shutdown.
		0 = Keep current state.
1	Start(start)	1 = Drive starts.
		0 = Keep current state.
2	Stop Mode OFF2 (Emergency stop mode)	1 = Forced to emergency stop mode
3	Stop Mode OFF3 (Free stop mode)	1 = Forced to free stop mode
4	Local ctrl (Local control)	1 = Request for local control.
5	Stop Mode ramp (Deceleration stop mode)	1 = Forced to deceleration stop mode
6	Stop Mode coast (Free stop mode)	1 = Forced to free stop mode
7	Run enable (Run enable)	1 = Run enable. 0 = operation disabled.
8	Reset (Reset)	0->1 Reset drive fault
9	Jog1(Tap 1)	1 = Tap 1 to start.
10	Jog2(Tap 2)	1 = Tap 2 to start.
11	Remote (Remote control)	1 = Request for remote control.
12	Ramp in 0	1 = Forcing the ramp generator input to 0.
13	Ramp hold	1 = Forcing the output of the given ramp generator to remain unchanged.
14	Ramp out 0	1 = Forcing the output of the given ramp generator to 0.
15	Ext2 sel	1 = Reverse command

Status word

Bit Number	Name	Description
0	Ready to Switch On	1: Start-up ready
1	Switched On	1: Activated
2	running	1: Permission to work has been granted
3	Fault	1: Fault
4	Coast stop	1: Free stop
5	Quick Stop	1: Emergency shutdown
6	Switch On Disabled	1: Start-up ban
7	Warning	1: Warning
8	Ref Inverted	1: Set to a negative value
9	Remote	1: Remote control
10	Target Reached	1: Set speed has been reached
11	Internal Limit Active	1: Internal restrictions
12-15	Reserved	

4 Troubleshooting

Fault 1.

[illegible]

Reason 1: Device name not changed, see [Change device name](#)

above for solution Reason 2: Device name not assigned, see

Assign device name above for solution

Fault 2: Multiple slaves cannot be scanned when connected

Cause: 1. 51.08 Slave address not set or duplicate settings; 2. Drive not re-powered after setting