GTAKE

User Manual

EPC-CM35-PROFINET (Communication cards)

EPC-CM35-User manual for PROFINET communication card

Suitable for GK900

Colophon

Edition	Change content
A00	First edition released

Disclaimer

The information in this product document is accurate and reliable at the time of release. GTAKE Electric reserves the right to make changes to the specifications and descriptions in this manual without prior notice.

Technical Support

If you require assistance with product installation or configuration, please contact

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Explain：

1. The XML files used in the manual are for reference only. Please contact the manufacturer to obtain the corresponding XML files.
2. When using the ProfiNet communication card, relevant inverter parameters must be correctly configured.
3. The version of the ProfiNet card can be checked via the keypad using parameters U2.15 and U2.16.
4. If the customer intends to use Beckhoff PLC, please inform the manufacturer in advance.
5. Recommended network cable: double-shielded twisted pair, CAT.6E or higher.

1. Product introduction and new projects

1.1 Product introduction

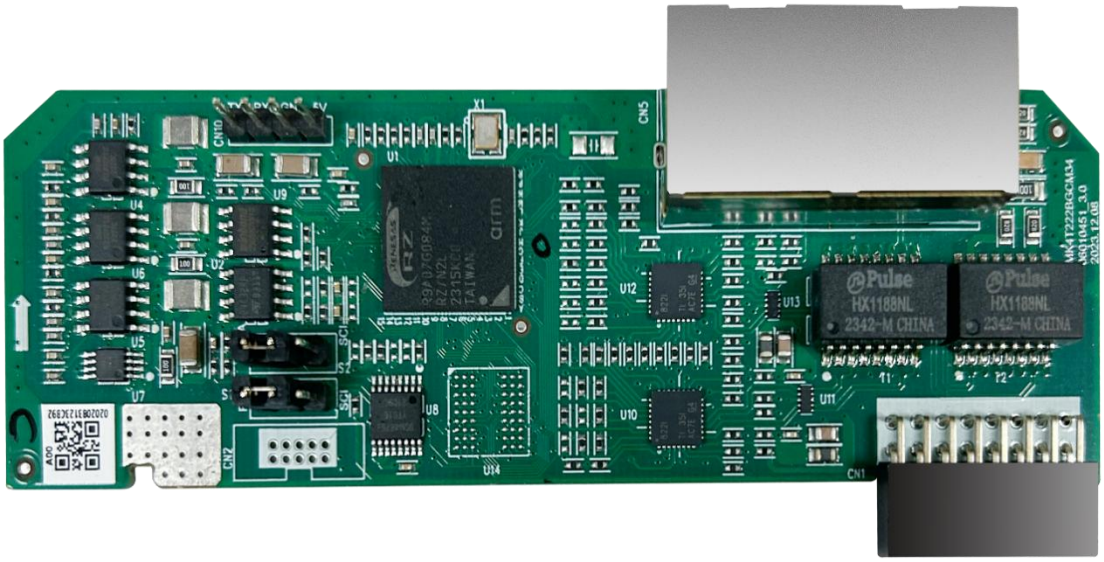


Fig. 1-1 EPC-CM35 product appearance diagram

1.2 Port definition and jumper switch description

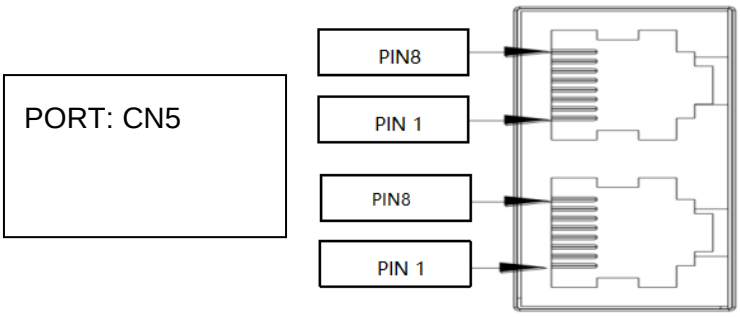


Fig 1-2 Port definition

Jump switch	functional description	Factory Settings
S1& S2	Flash: Normal mode	Flash
	SCI: Burn mode	

Tab 1-1 Jump switch description

1.3 Start New Projects

Open the "TIA Portal" of Boto software to create a new project--> input the project name--> create. As shown in Figure 3:

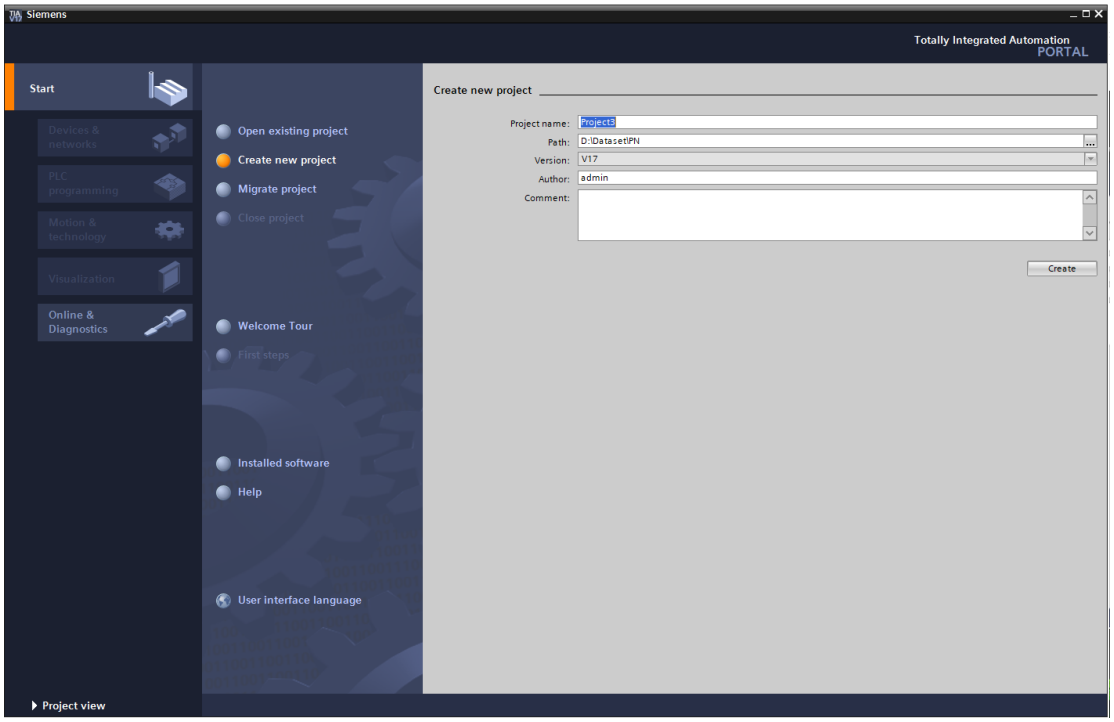


Figure 3

Click the project view to enter the main screen, as shown in Figure 4:

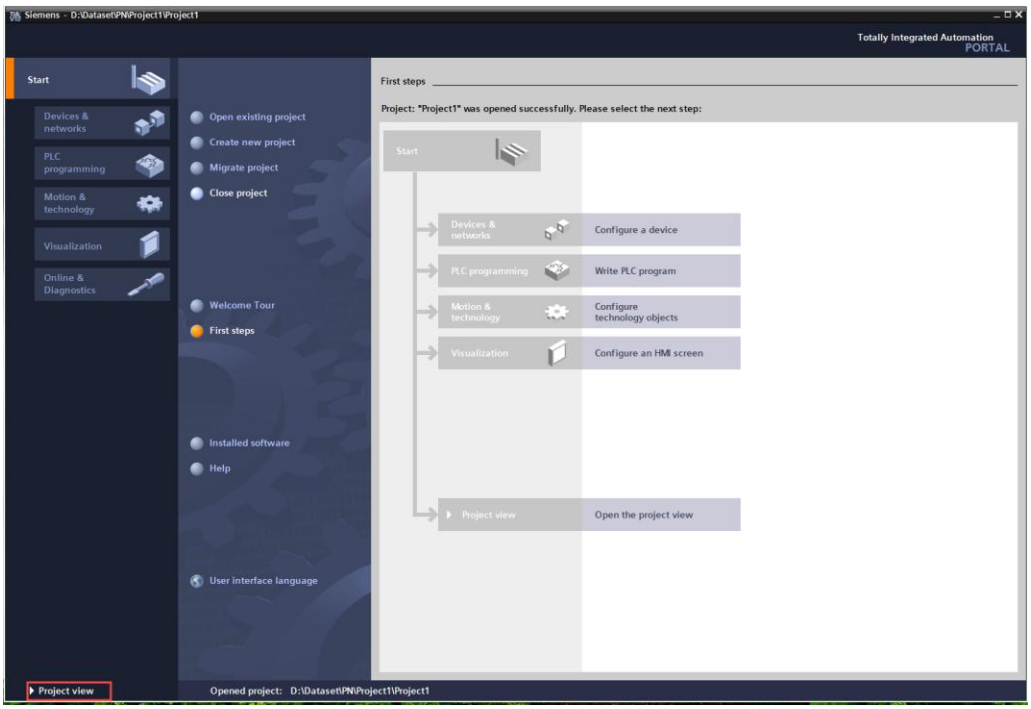


Figure 4

2. Install GSD file

Select the menu bar "Options" —— "Manage Common Site Description File", as shown in Figure 5:

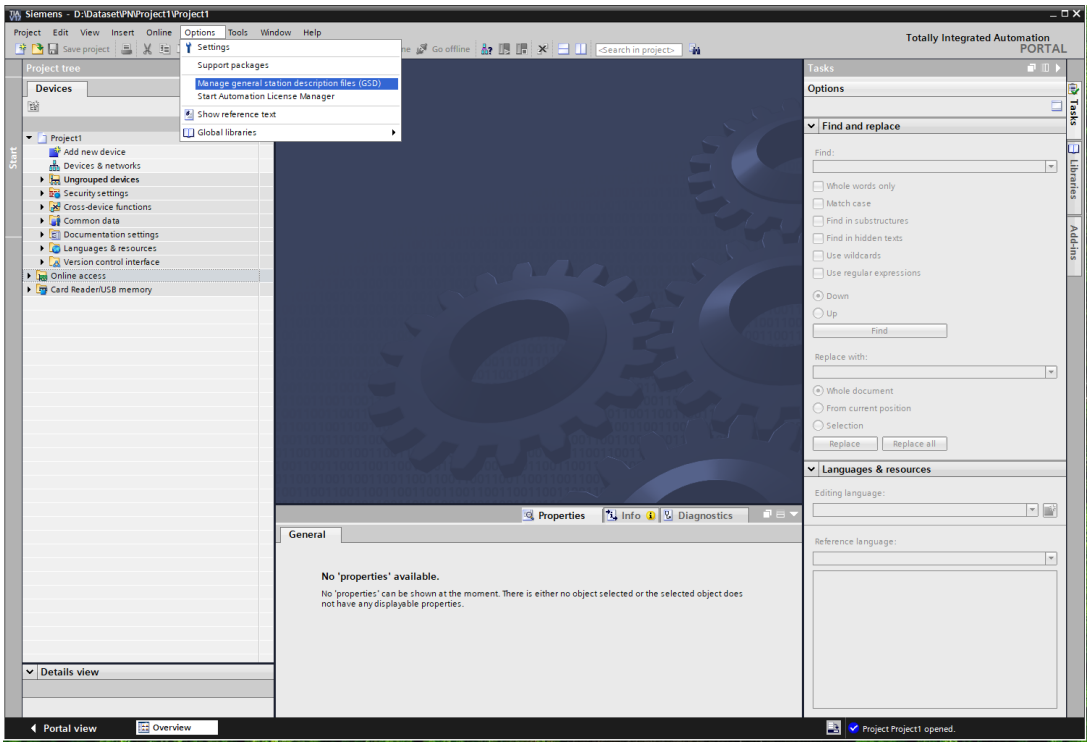


Figure 5

Select the GSD file to be installed, click "install", and wait for the installation to complete, as shown in Figure 6:

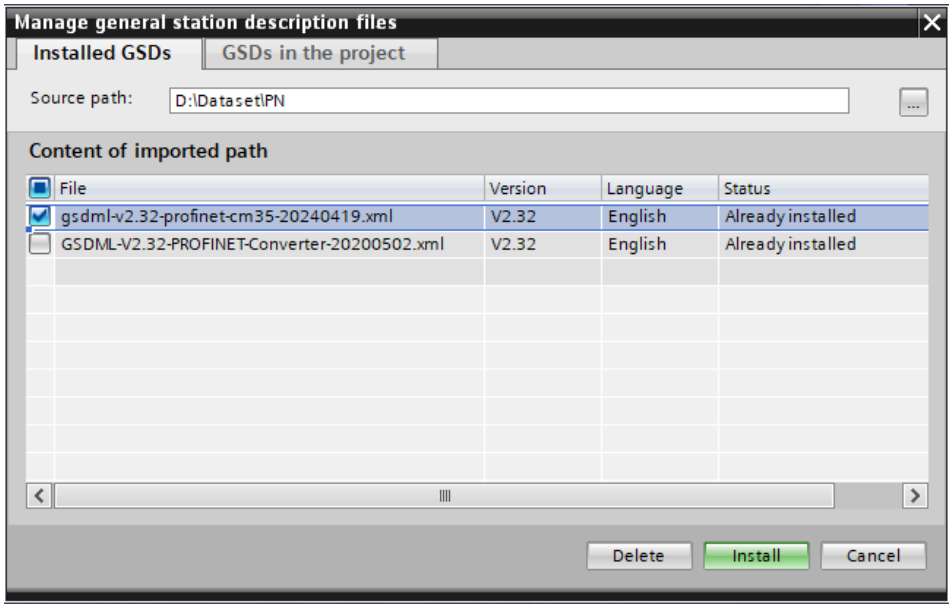


Figure 6

3. Add PLC and module

Click "Add New Device" in the "Project Tree", select the corresponding PLC model in the controller, as shown in Figure 7:

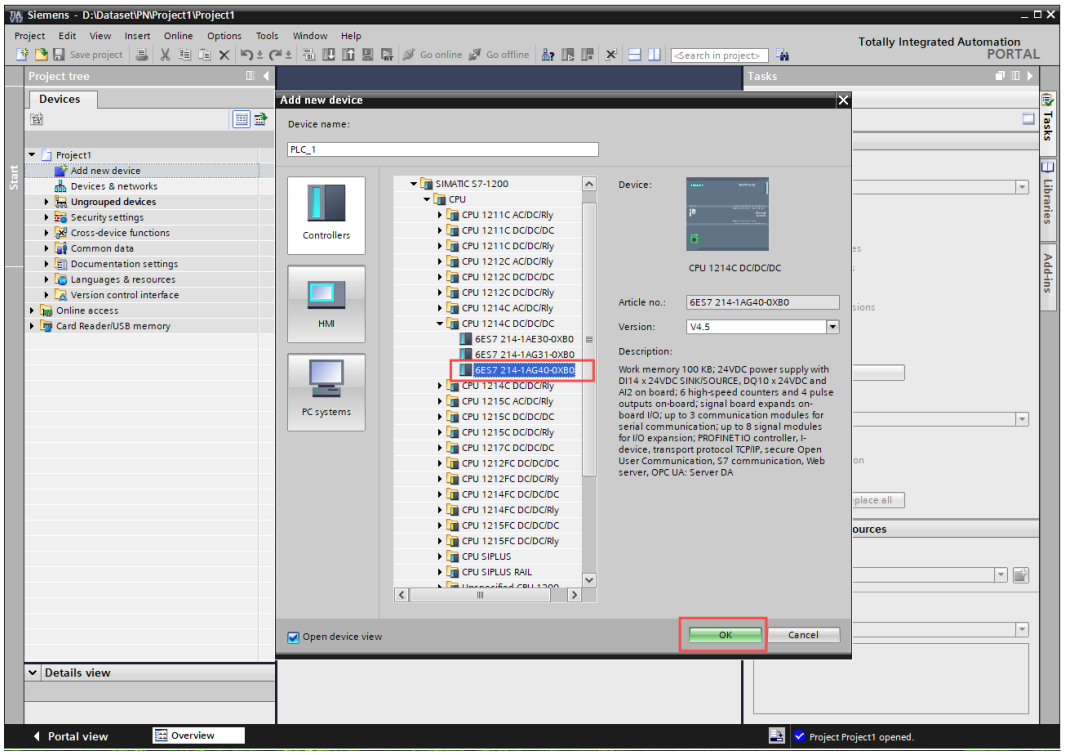


Figure 7

Double-click "Equipment and Network" in the "Project Tree", and in the "Network View" window, select the inverter module in the "Hardware Directory" on the right, as shown in Figure 8:

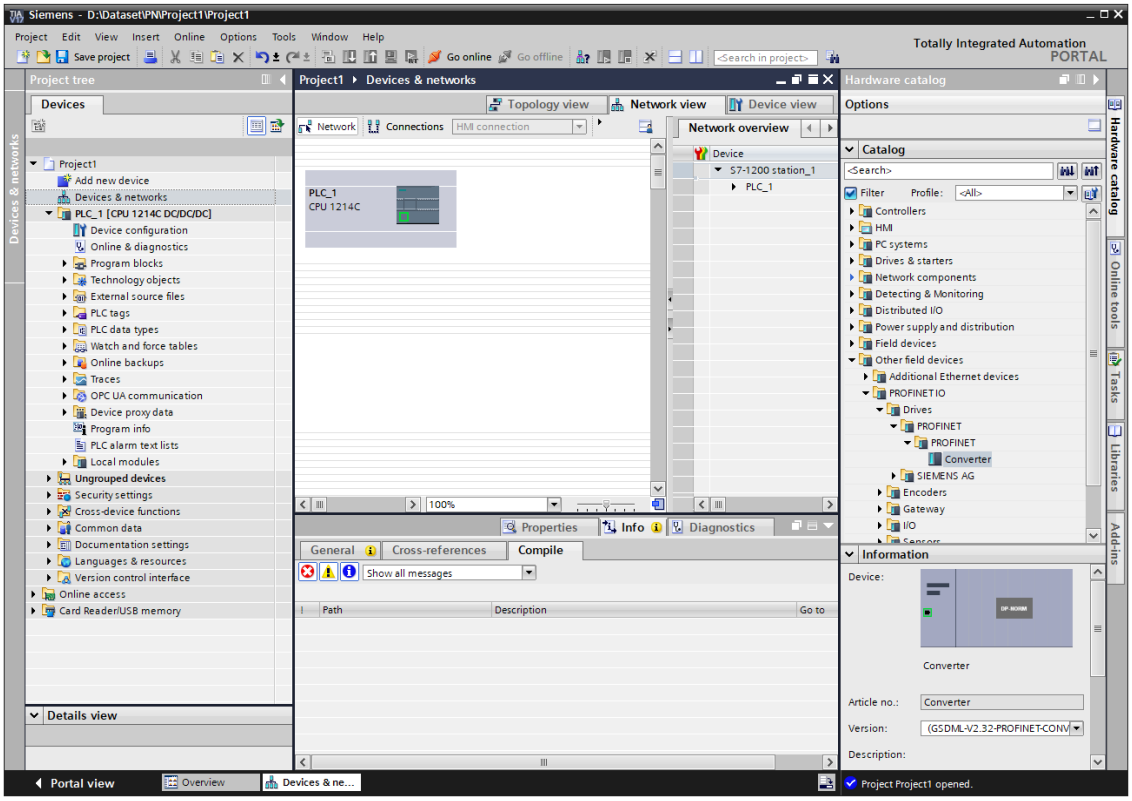


Figure 8

4. Set the equipment IP and equipment name of the project

Click the "Unassigned" icon of the inverter, select "PLC_1. PROFINET interface", you can establish the ProfiNet connection between the PLC and the inverter, as shown in Figure 9:

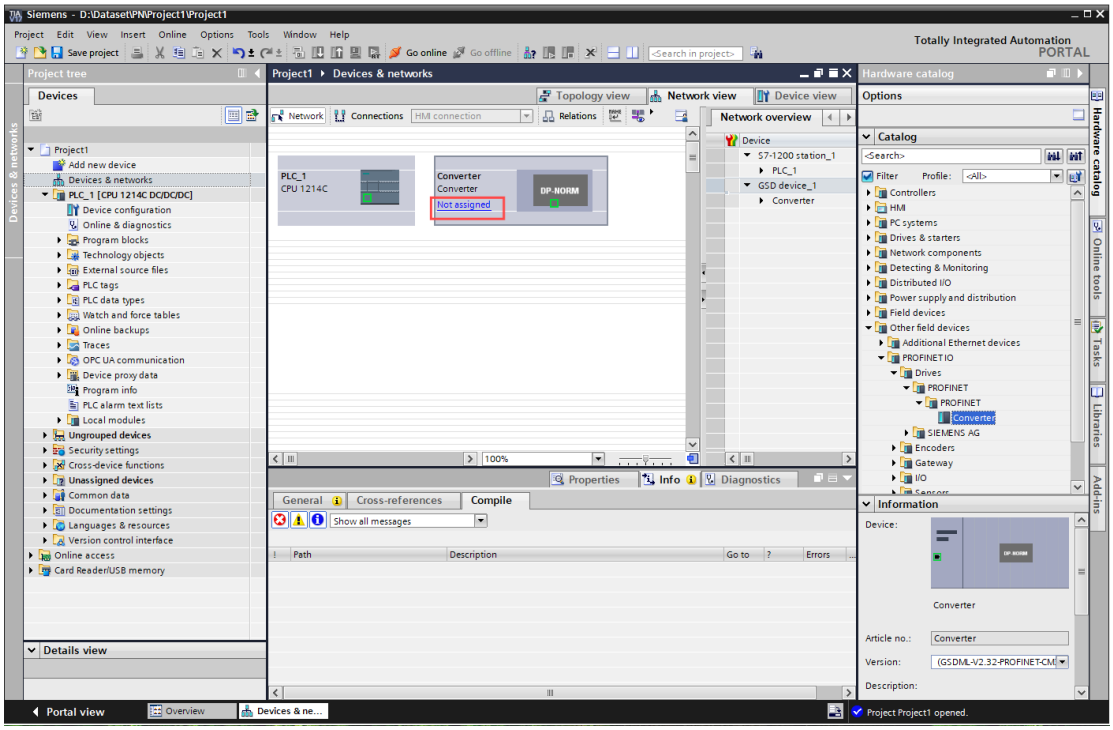


Figure 9

ProfiNet After the connection is established, as shown in Figure 10:

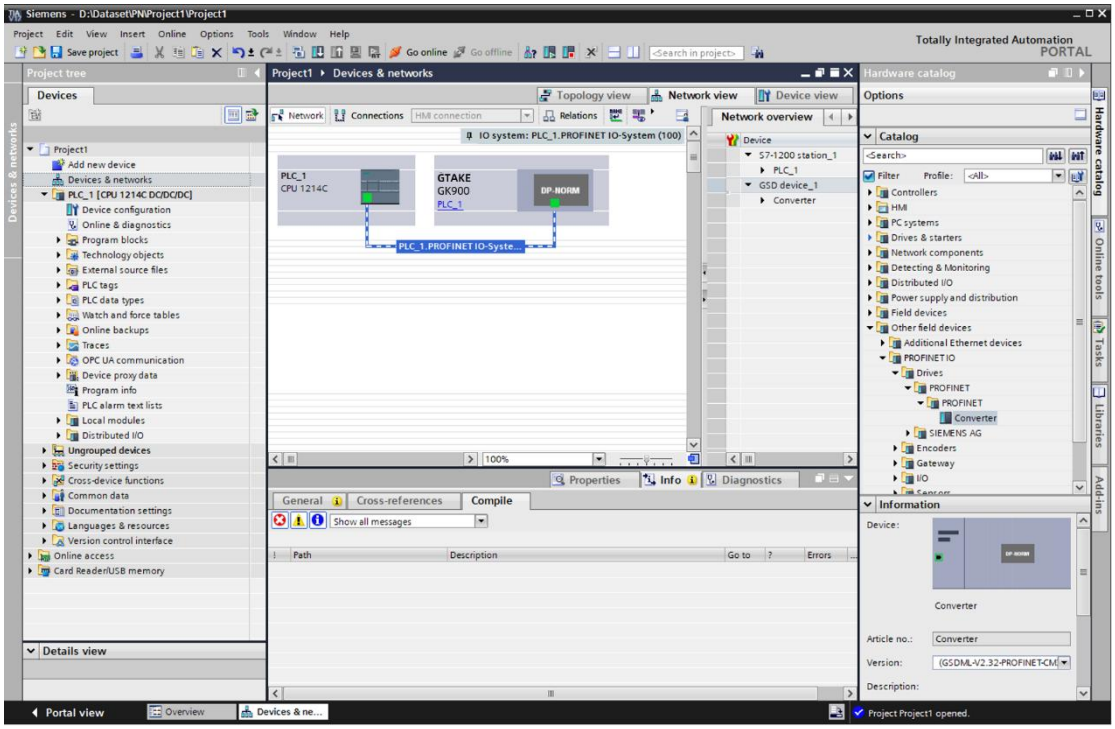


Figure 10

Double-click PLC icon to enter "Device View", click "PLC_1" in the device overview, and then set PLCs IP address, subnet mask, device name, etc. in the "Property" window, as shown in Figure 11:

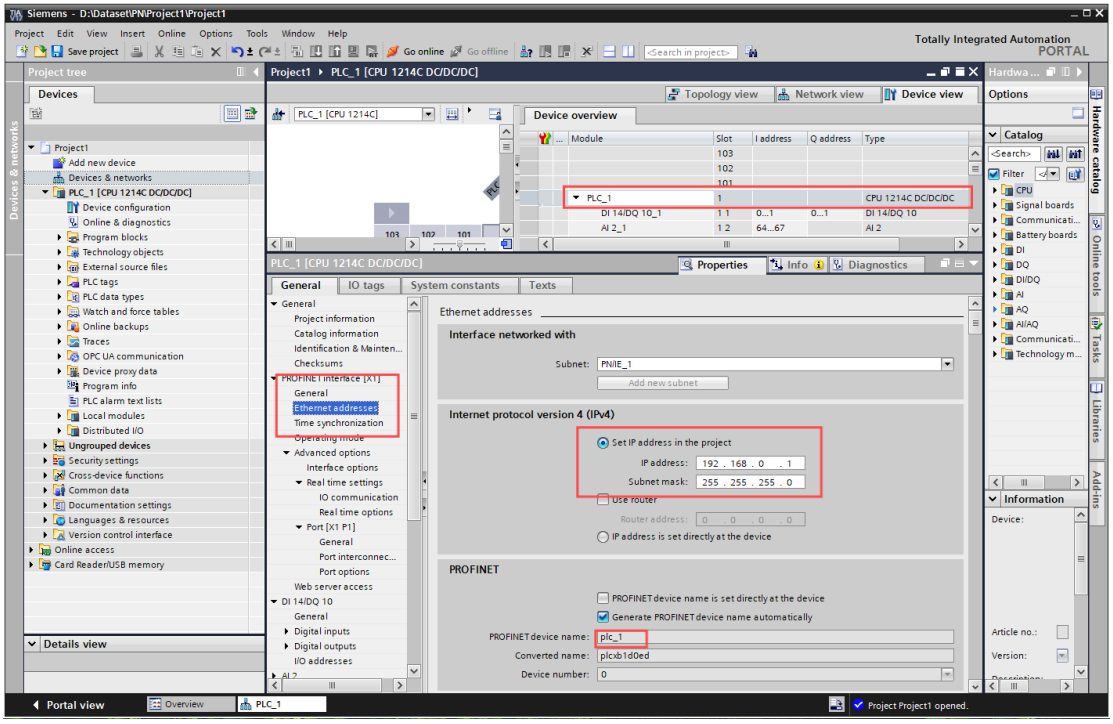


Figure 11

Double-click the inverter icon to enter the "Device View", click "Interface" in the device overview, and then you can set the IP address and device name of the inverter in the "Property" window, as shown in Figure 12:

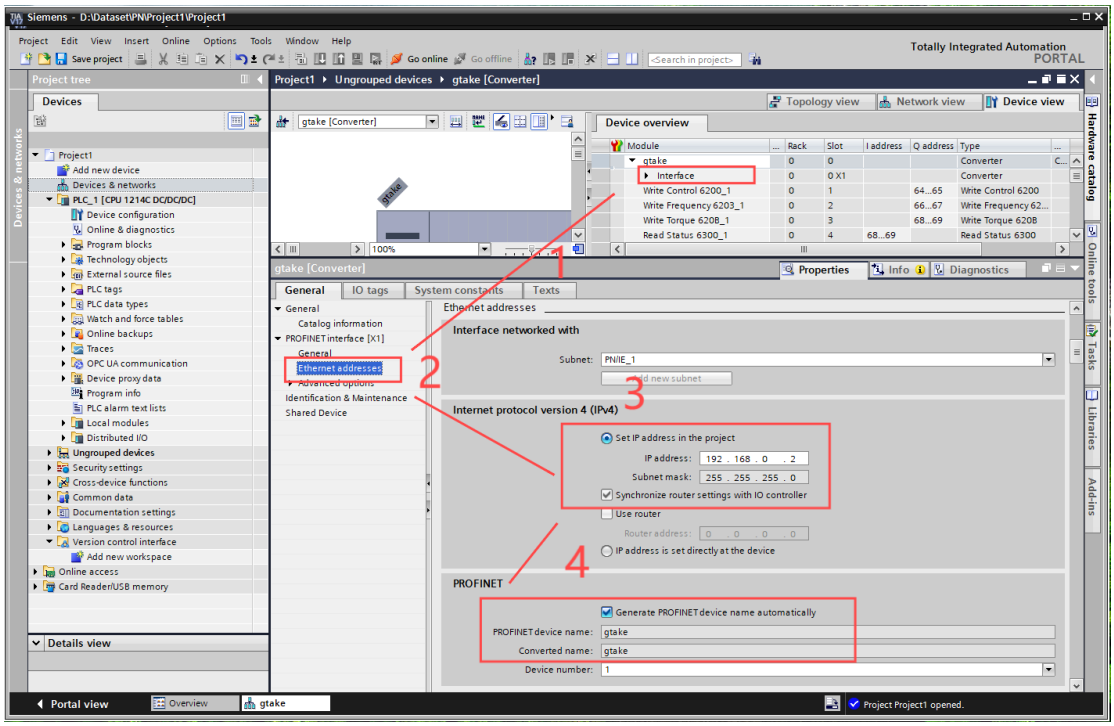


Figure 12

5. Modify the actual device IP and device name

Connect the computer, PLC and frequency converter with network cable. In the "project tree", select the network card of the computer, double-click "Update accessible devices", as shown in Figure 13:

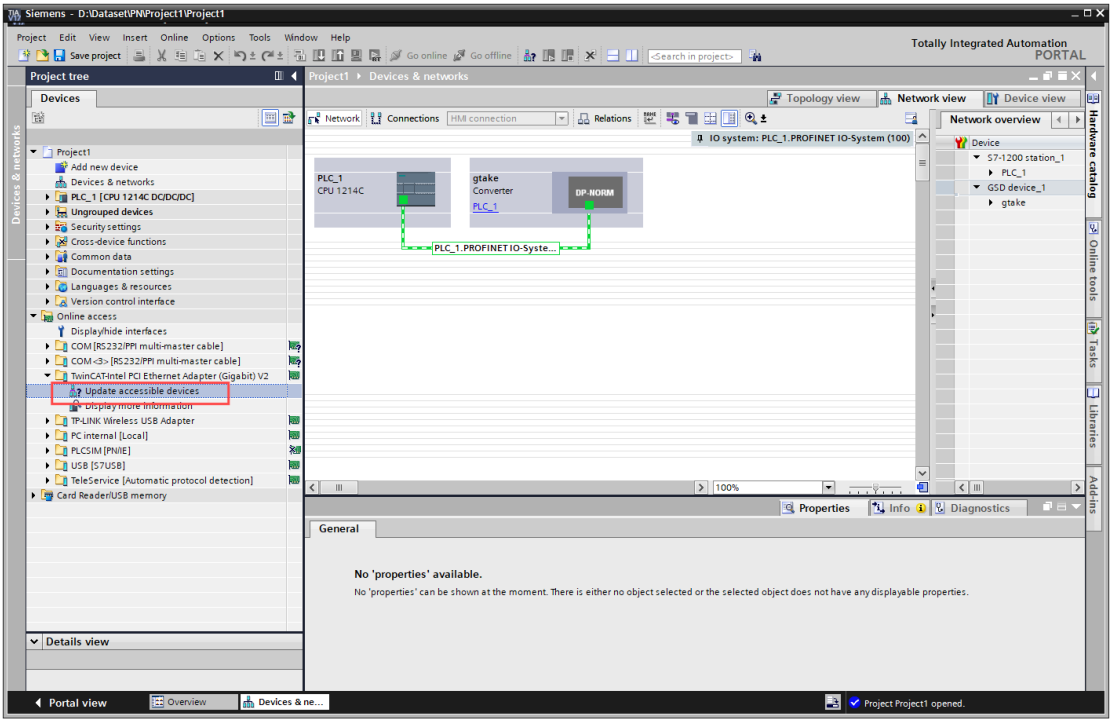


Figure 13

Wait for the software to scan, and display "2 devices found on the network", which are arranged in the "project tree", as shown in Figure 14:

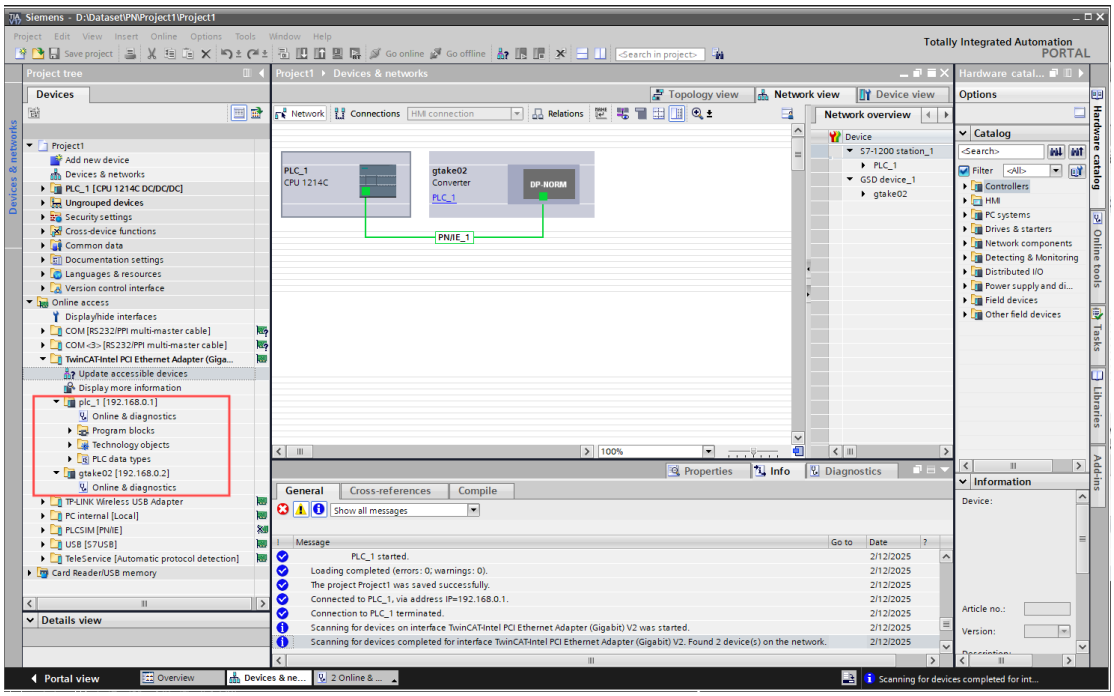


Figure 14

Double-click PLC_1s "Online and Diagnosis", select "Allocate IP Address", modify the IP address and subnet mask, and click the "Allocate IP Address" button, as shown in Figure 15:

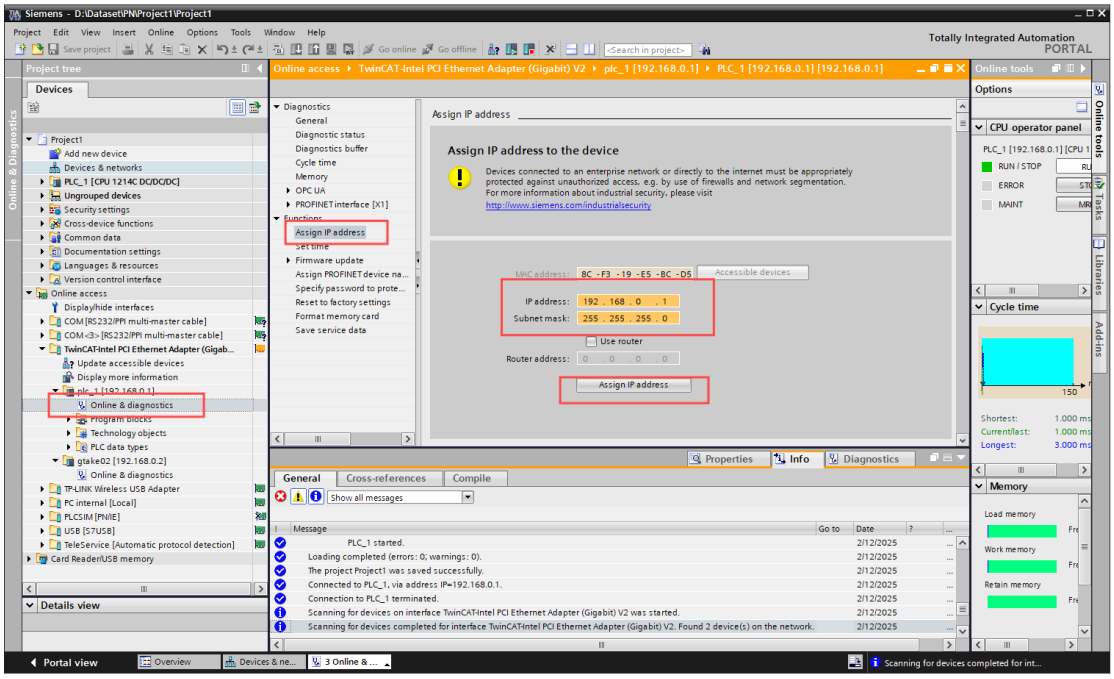


Figure 15

Select "Allocate Name", modify the PROFINET device name, and click the "Allocate Name" button, as shown in Figure 16:

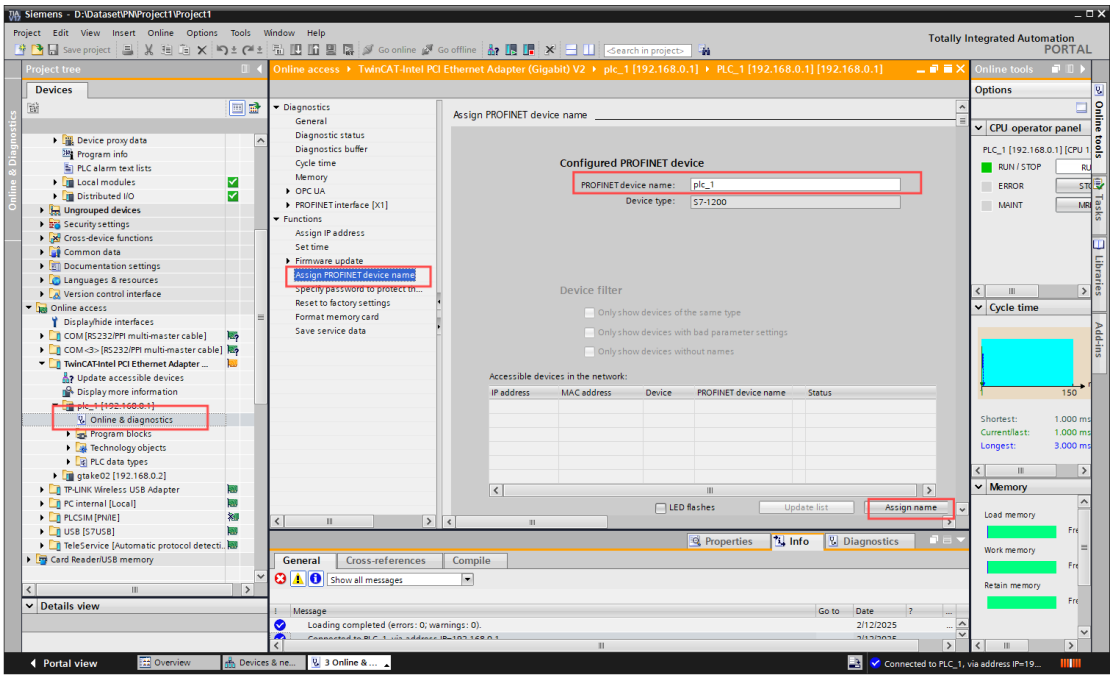


Figure 16

In the same way, the IP address and device name of the frequency converter can be modified according to the above operation.

Note that the Profinet board needs to be repowered after the device name or IP address is changed.

6. Configure the inverter command

In the "Device View" of the inverter, all available models will be displayed in the "Hardware Directory" on the right, and double-click to add them to the "Device Overview".

[Add read/write parameters]:

Double-click Master-Slave or Slave-Master (you can add multiple, and it is recommended to read and write continuously when adding multiple) as shown in Figure 17,18:

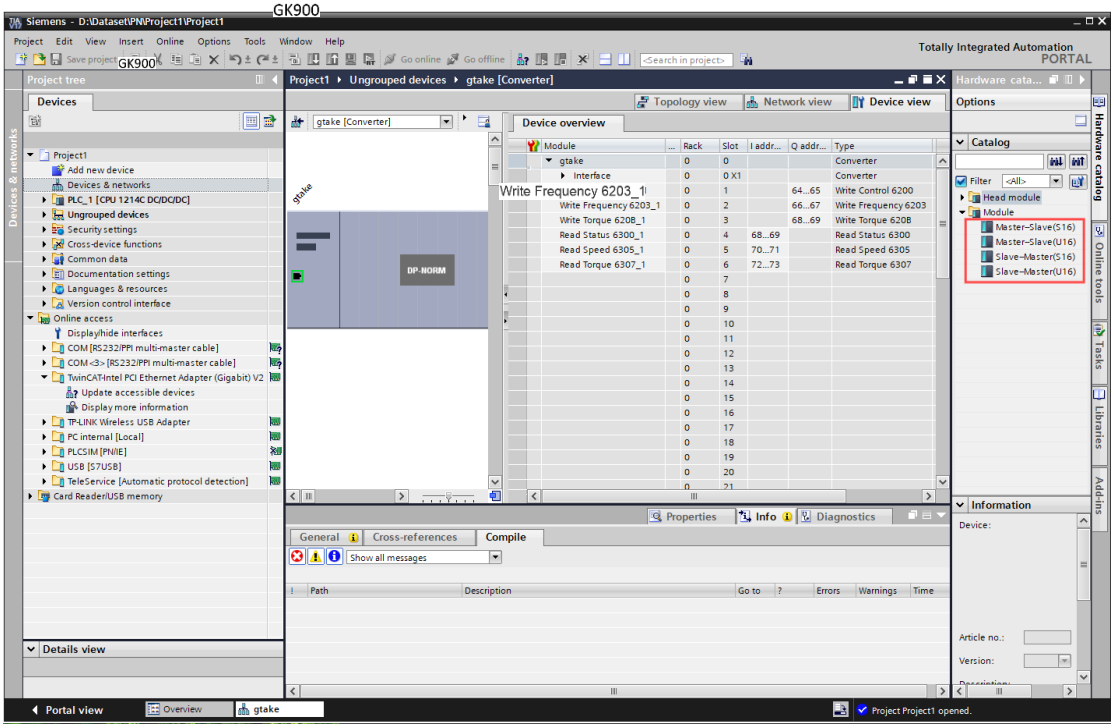


Figure 17

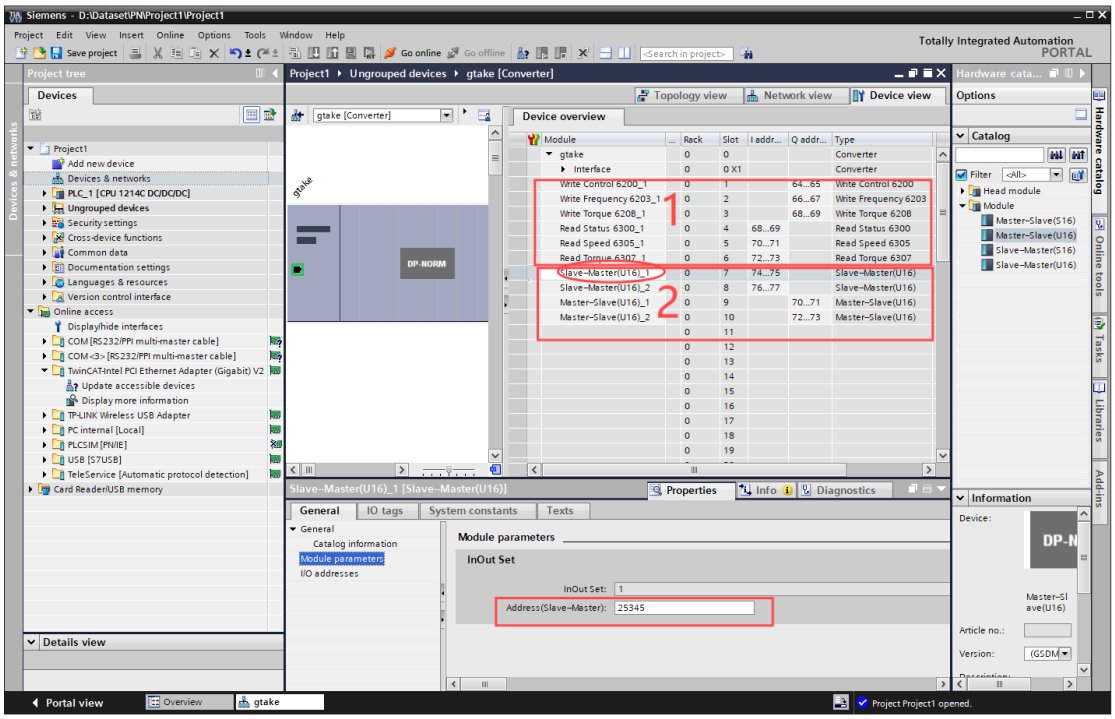


Figure 18

The "1" part in Figure 16 is a fast read/write area with 6 fixed addresses, which means that customers do not need to configure addresses again. They are as follows:

- Write Control 6200_1 Write control word (command word)
- Write Torque 620B_1 write torque (-2000~2000 corresponds to-200.0%~200.0%)
- Write Frequency 6203_1 write the main frequency to 0x6203
- Read Status 6300_1 Read status word
- Read Speed 6305_1, current running speed
- Read Torque 6307_1 Read output torque

The "2" part in Figure 16 is the free read and write area, which can add multiple read and write registers continuously.

Slave-Master (U16) indicates that a parameter is read, and its read address is configured in the corresponding module parameter.

Master-Slave (U16) indicates writing a parameter, and the write address is configured in the corresponding module parameter.

Note: U16, unsigned 16-bit integer 0-65535.

S16, a signed 16-bit integer-32768 to 32767.

When using U16 and S16, pay attention to the range of specific function codes to avoid read/write exceptions.

7. PLC programming example

A. Drive start and stop

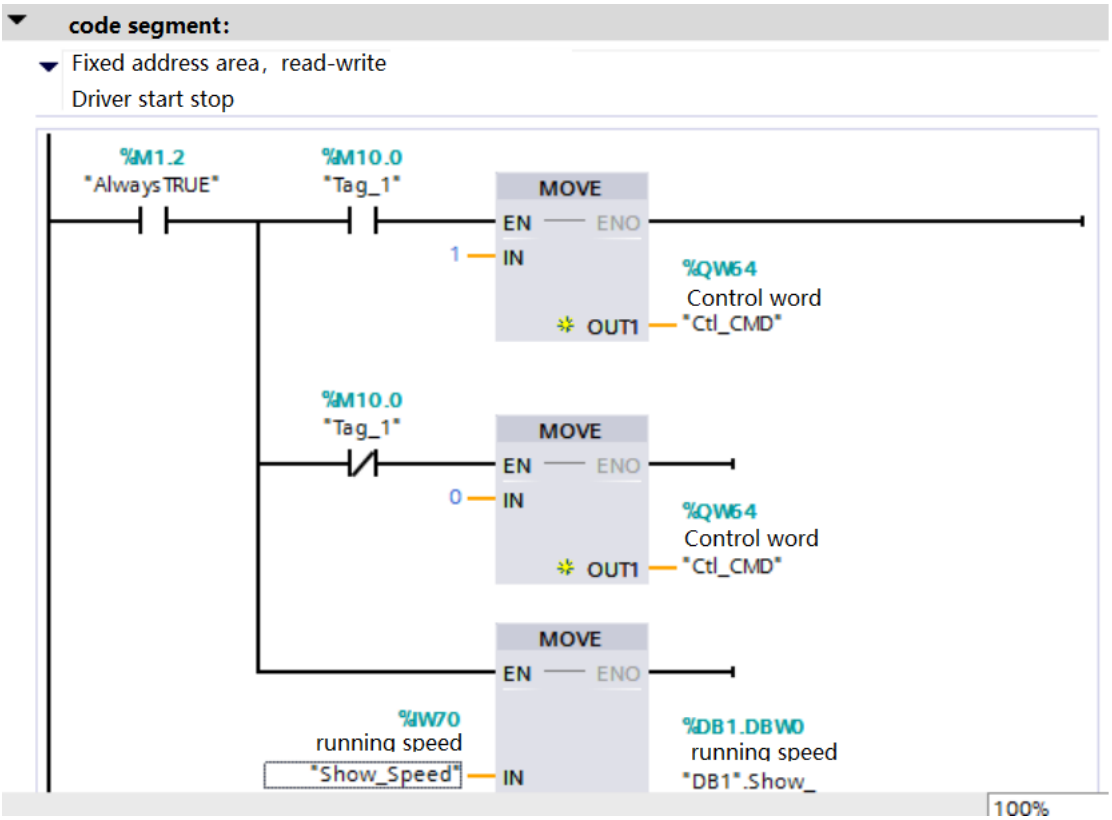


Figure 19

B. Write frequency, read operation frequency

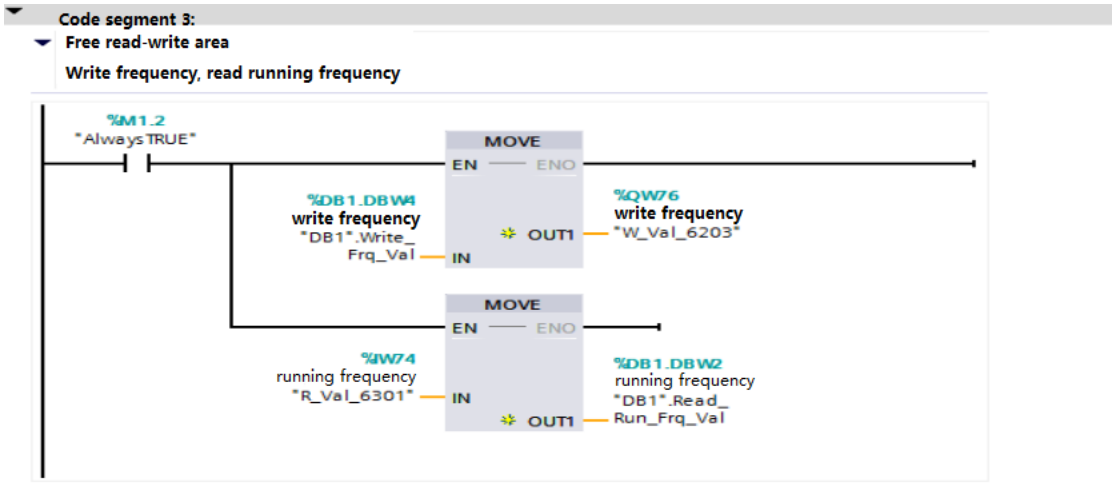


Figure 20

8. Compilation and download

At this point, our hardware and software configuration has been completed, and we will download the project to the PLC of Siemens S7-1200. In the "Equipment and Network" view, you can see the "Compile" button and the "Download" button, as shown in Figure 21:

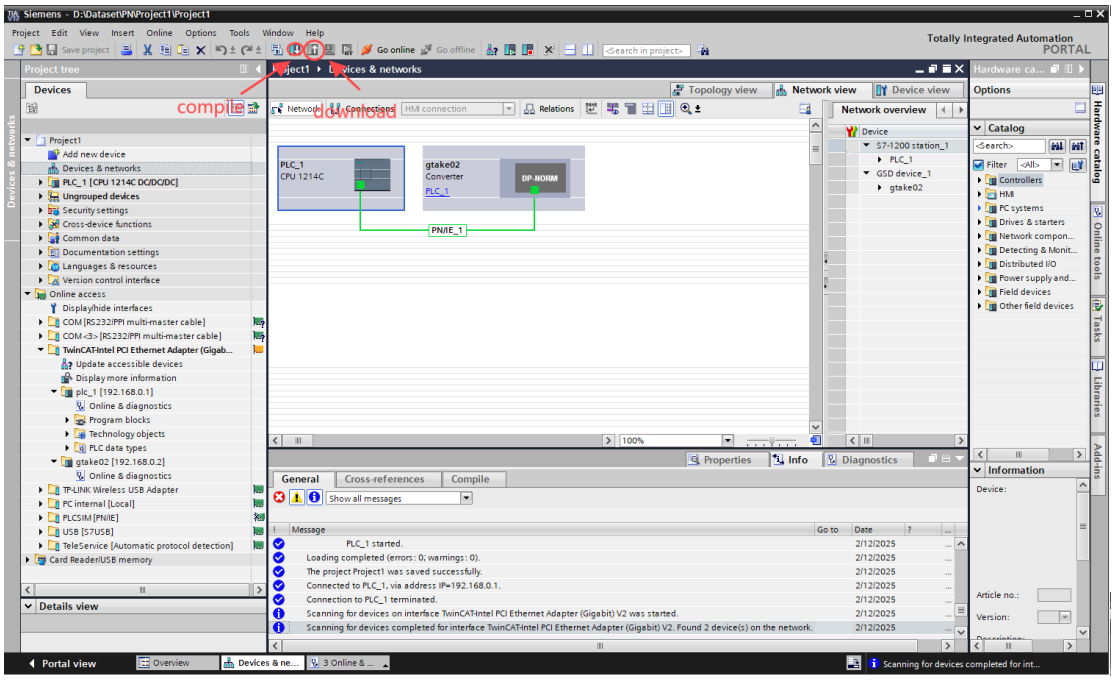


Figure 21

First compile the project, then click the "Download" button, set the network according to Figure 22, and click "Start search".

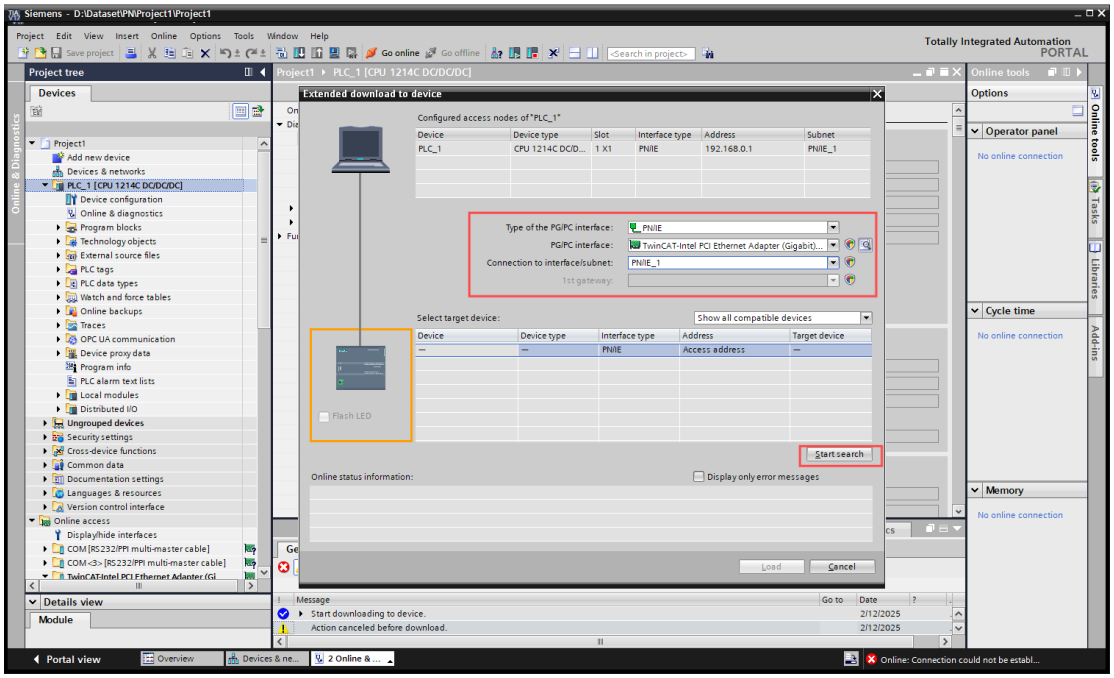


Figure 22

After searching for the actual connected PLC, it shows as shown in Figure 23. After checking that the "device type", "IP address", and "device name" are correct, click the "download" button.

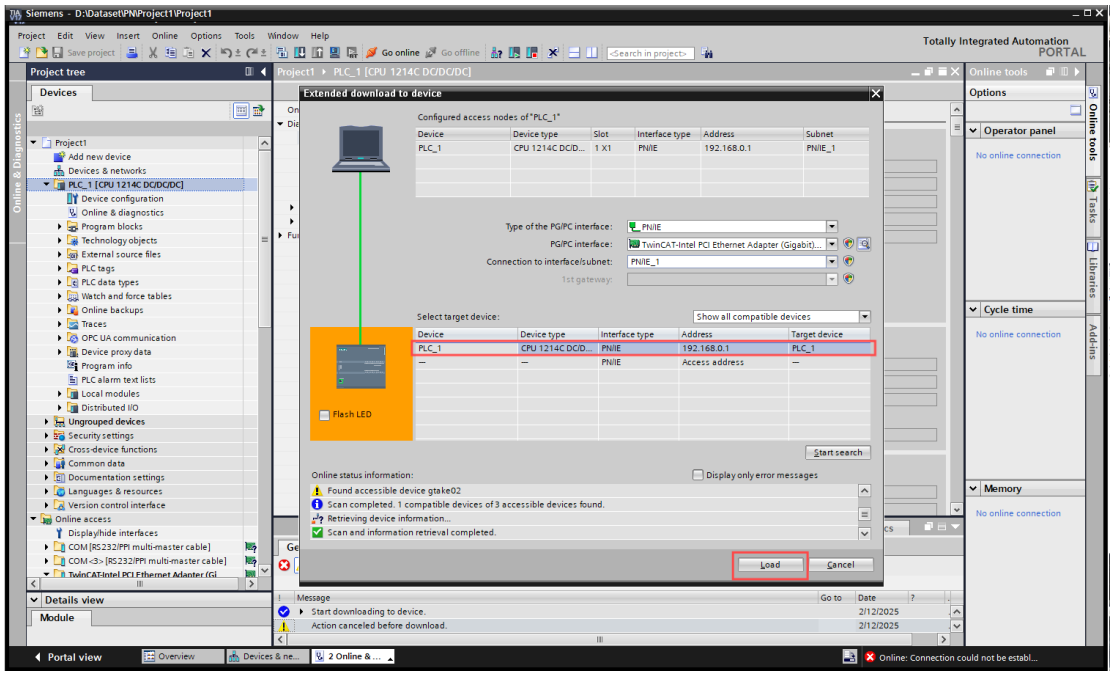


Figure 23

In the pop-up dialog box, set "Stop All" and "Consistent Download", as shown in Figure 24:

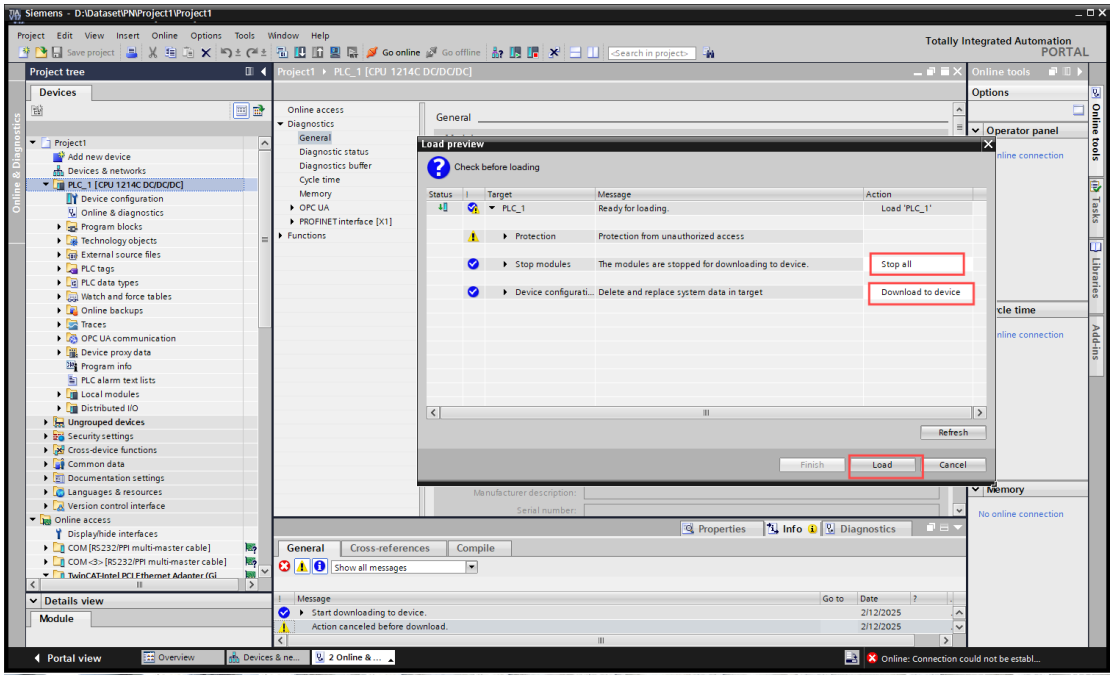


Figure 24

Finally, check "All Start" in the pop-up dialog box and click "Finish".

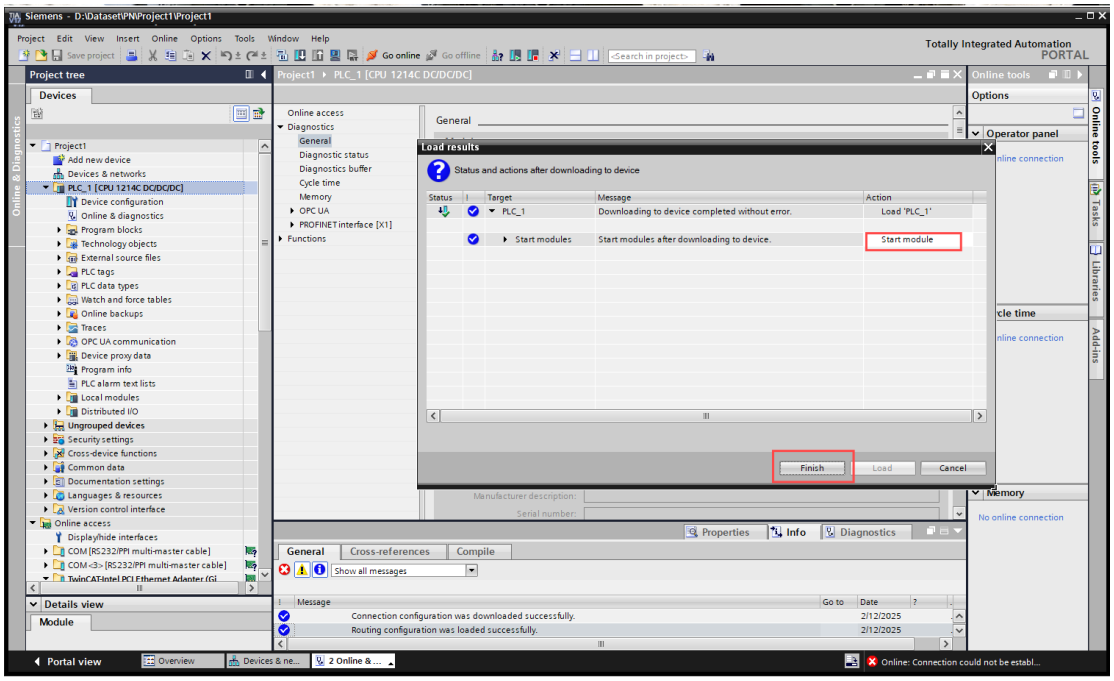


Figure 25

9. Quickly modify device name

Regarding the modification of the device name for ProfiNet cards, users can also make changes through the "STEP 7-MicroWIN SMART" software in addition to using Tia portal. Select "Tools" — "Find PROFINET Device," scan to the device, and click "Edit" to change the device name. As shown in Figure 26:

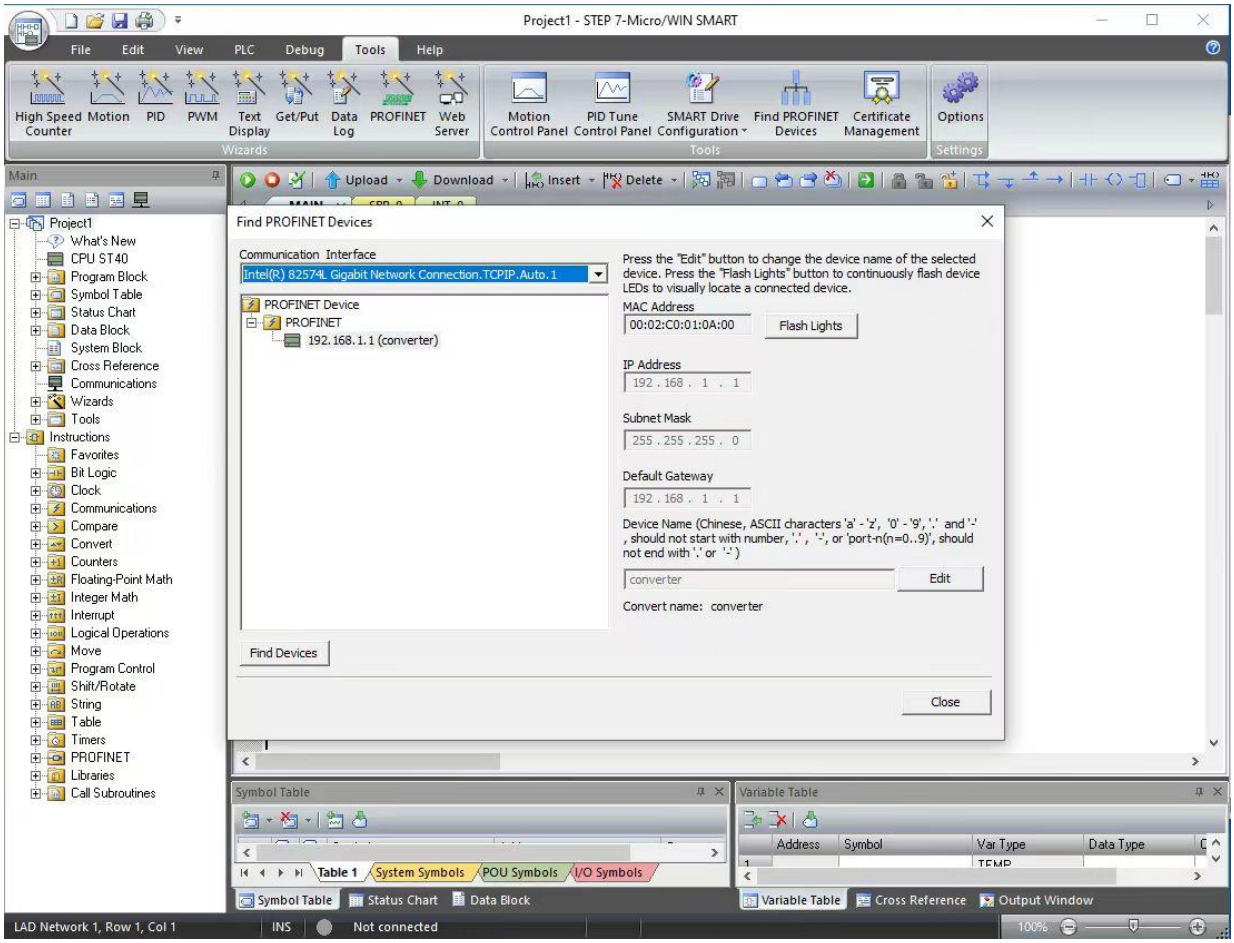


Figure 26

10. Common parameter address table

Control parameter table (only write):

Register decimal address	Register hexadecimal address	Parameter name
25088	0x6200	Control command word
25089	0x6201	Frequency main setting mode is set
25090	0x6202	Frequency auxiliary setting method is set
25091	0x6203	The main frequency is given
25092	0x6204	Auxiliary frequency given
25093	0x6205	Multiple frequency segments are given
25094	0x6206	PLC frequency given
25095	0x6207	PID digital percentage of the given value (0~100.0%)
25096	0x6208	PID feedback percentage (0~100.0%)
25097	0x6209	Electric torque limit (0~200.0%)
25098	0x620A	Brake torque limit (0~200.0%)
25099	0x620B	Torque setting (-200.0%~200.0%)
25100	0x620C	Torque control forward speed limit (lower frequency ~ upper frequency)
25101	0x620D	Torque control reversal speed limit (lower frequency ~ upper frequency)
25102	0x620E	Simulate AO1 channel Settings
25103	0x620F	Simulate AO2 channel Settings
25104	0x6210	Digital DO output channel Settings
25105	0x6211	Set the frequency from the machine in a given proportion (0~100 0.0%)
25106	0x6212	Virtual terminal communication is given
25107	0x6213	Accelerated time 1
25108	0x6214	Deceleration time 1

25088 control word table

Control word (bit)	Value	meaning	functional description
BIT0	0	The Run command is invalid	Stop the frequency converter
	1	The Run command is valid	Start the frequency converter
BIT1	1	reverse	Set the direction of operation when the operation command is valid
	0	Forward	
BIT2	1	Jog	
	0	Jog is invalid	
BIT3	1	The reset command is valid	
	0	The reset command is invalid	
BIT4	1	Free parking is effective	
	0	Free parking is not allowed	
BIT15～ BIT5	00000 0B	continue to have	

For example, write 1 to the control command word with address 25088 to start forward; write 2 to start reverse;

Write 0 to indicate deceleration and stop; write 16 to indicate free stop; write 8 to indicate reset.

Status parameter table (read only):

Register decimal address	Register hexadecimal address	Parameter name
25344	0x6300	Run status word 1
25345	0x6301	Current operating frequency
25346	0x6302	output
25347	0x6303	output voltage
25348	0x6304	output power
25349	0x6305	running speed
25350	0x6306	busbar voltage
25351	0x6307	output torque
25352	0x6308	External counters
25353	0x6309	Actual length high characters
25354	0x630A	Actual length low word
25355	0x630B	Status of switch input terminal
25356	0x630C	Status of switch output terminal
25357	0x630D	Operating frequency setting
25358	0x630E	PID setting
25359	0x630F	PID feedback
25360	0x6310	Set the length
25361	0x6311	Set acceleration time 1
25362	0x6312	Set the deceleration time 1
25363	0x6313	AI1 (unit: V)
25364	0x6314	AI2 (unit: V)
25365	0x6315	AI3 (unit: V) (negative value shows the corresponding number of digits)
25366	0x6316	DI (unit: kHz)
25367	0x6317	First run failure
25368	0x6318	The second operation failed
25369	0x6319	The third (most recent) operation failure
25370	0x631A	Run to display parameters
25371	0x631B	Stop display parameters
25372	0x631C	Frequency converter control mode is given
25373	0x631D	Frequency given way
25374	0x631E	Frequency main given method
25375	0x631F	Frequency is set to a given number
25376	0x6320	Frequency auxiliary method

Register decimal address	Register hexadecimal address	Parameter name
25377	0x6321	Frequency is assigned to a given number
25378	0x6322	Frequency converter status word 2
25379	0x632 3	The inverter is currently faulty

25344 status word 1-bit definition table

Status word (bit)	Value	meaning	remarks
BIT0	1	Frequency converter operation	
	0	The frequency converter is shut down	
BIT1	1	Inverter reversal	
	0	The frequency converter is running forward	
BIT3～ BIT2	00B	constant speed	
	01B	quicken	
	10B	moderate	
BIT4	0	Not reaching the main setting	
	1	Get to the main setting	
BIT7～ BIT5	continue to have	continue to have	
BIT15～ BIT8	0x 00～ 0xFF	Fault code	0: indicates that the frequency converter is normal. Non-0: indicates that there is a fault. Refer to Chapter 7 for the meaning of specific fault codes.

Other commonly used parameter tables (read and write):

FC	name	scope	decimal address	hexadecimal address
b0-02	Frequency is set to a given number	Lower limit frequency ~ upper limit frequency	514	0x0202
b2-01	Accelerated time 1	0s～ 600. 00s/600 0.0s/60 000 s	1025	0x0401
b2-02	Deceleration time 1	0s～ 600. 00s/600 0.0s/60 000 s	1026	0x0402
d2-00	Speed/torque control selection	0: Speed control 1: Torque control	3072	0x0C00
d2-20	Torque digital set value	-200.0%～200.0%	3092	0x0C14
F4-34	Electronic gears are smaller than molecules	1～ 30000	5922	0x1722
F4-35	The electronic gear is the denominator	1～ 30000	5923	0x1723

For other function codes, please refer to the GK900 manual, and the address conversion relationship is shown in the following table:

Function code group	Register address high byte hexadecimal	Register address high byte decimal	Function code group	The high byte of the register address is hexadecimal	Register address high byte decimal
A0	0x00	0	E1	0x12	4608
A1	0x01	256	F0	0x13	4864
b0	0x02	512	F1	0x14	5120
b1	0x03	768	F2	0x15	5376
b2	0x04	1024	F3	0x16	5632
C0	0x05	1280	F4	0x17	5888
C1	0x06	1536	F5	0x18	6144
C2	0x07	1792	F6	0x19	6400
C3	0x08	2048	H0	0x1A	6656
C4	0x09	2304	H1	0x1B	6912
d0	0x0A	2560	H2	0x1C	7168
d1	0x0B	2816	L0	0x1D	7424
d2	0x0C	3072	L1	0x1E	7680
d3	0x0D	3328	U0	0x1F	7936
d4	0x0E	3584	U1	0x20	8192
d5	0x0F	3840	U2	0x21	8448
d6	0x10	4096	Frequency converter control parameter group	0x62	25088
E0	0x11	4352	Frequency converter status parameter group	0x63	25344

For example, the hexadecimal address of the register for the function code parameter b0-02 of the inverter is 0x 0 202 (base 10,512+02=514), and the hexadecimal address of the register for the function code parameter b0-10 of the inverter is 0x 02 0 A (base 10,512+10=522).

11. Electrical connection description

The EPC-CM35 module uses a standard RJ45 socket to connect with the PROFINET master station. Its pin signal definition is consistent with the standard Ethernet pin, and both crossover and straight lines can be used.

The topology supported by EPC-CM 35 module includes bus, star, tree, etc., and a variety of networking can be realized by reasonable use of switches.

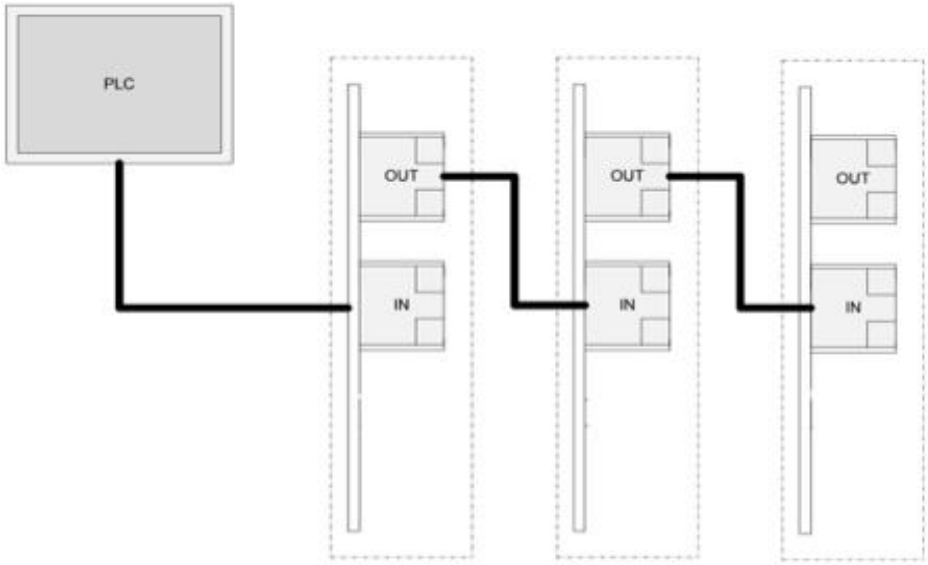


Figure 27 Bus topology diagram

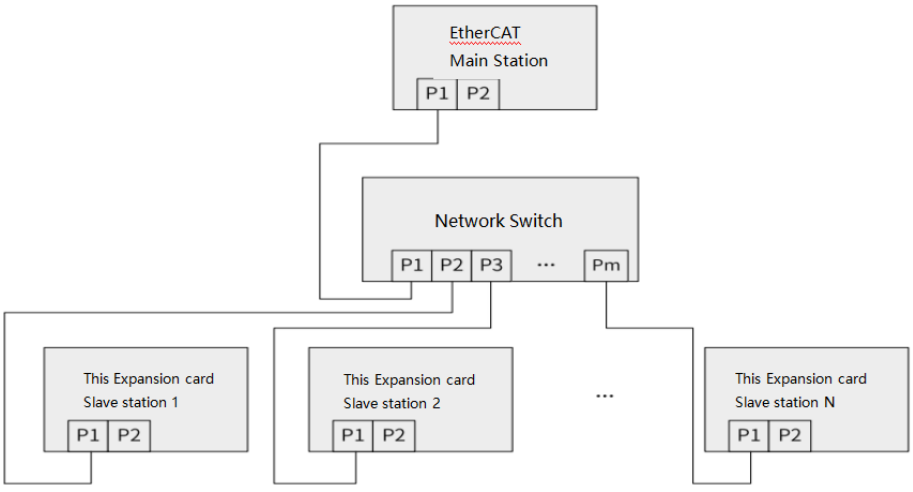


Figure 28 Star topology diagram

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