Instructions of EPC-NET02

【Description】:

1. This manual does not apply to ProfiNet cards before V4.01 version, please refer to the A00 version manual for the old version of ProfiNet cards.

2. The xml file used in the manual is only an example, please contact the manufacturer to obtain the corresponding xml file.

3. When using ProfiNet card, you need to correctly set the relevant parameters of the inverter.

4. The ProfiNet card version number can be viewed through the keyboard U0.62.

5. If the customer adopts Bever PLC, please explain it in advance with the factory.

1. New projects

Open the Botu software "TIA Portal" to create a new project — > enter a project name — > create. Figure 1:

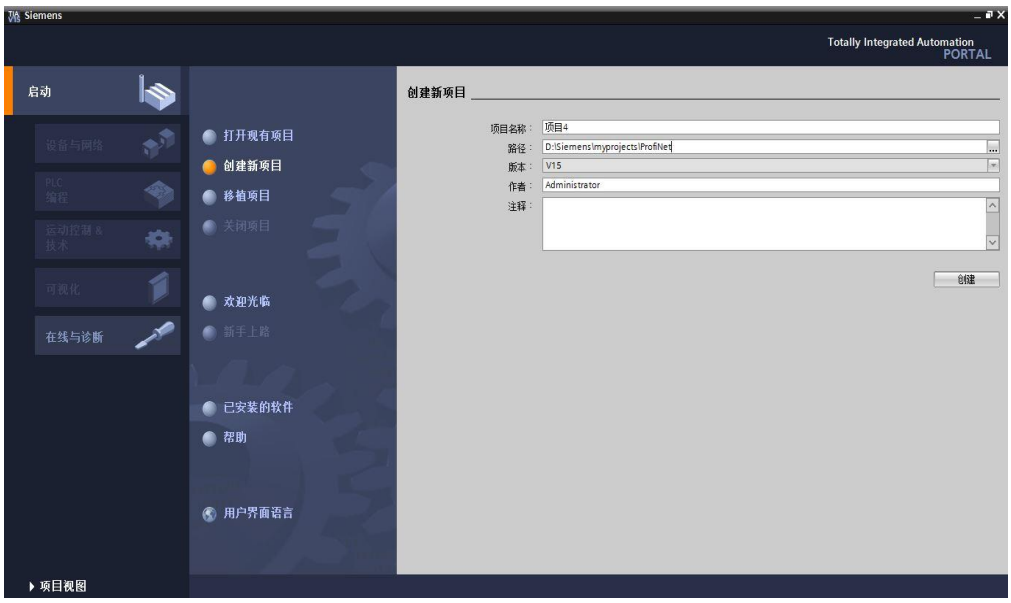


Figure 1

Click project view to enter the main screen, as shown in Figure 2:



Figure 2

2. Install the GSD file

Select the menu bar "Options" - "Manage Generic Site Profiles", as shown in Figure 3:

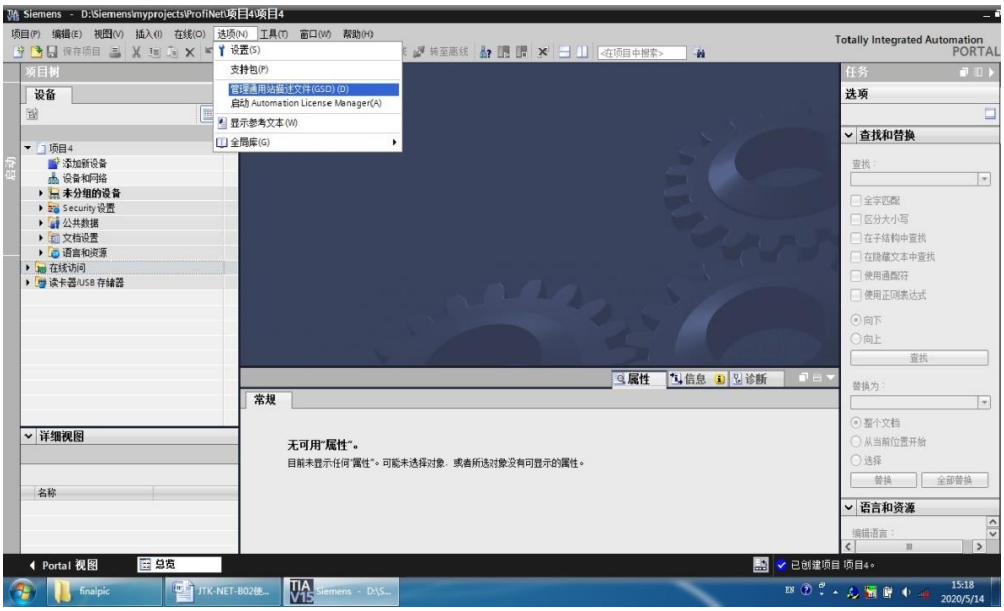


Figure 3

Select the GSD file you want to install, click "Install" and wait for the installation to be completed, as shown in Figure 4:

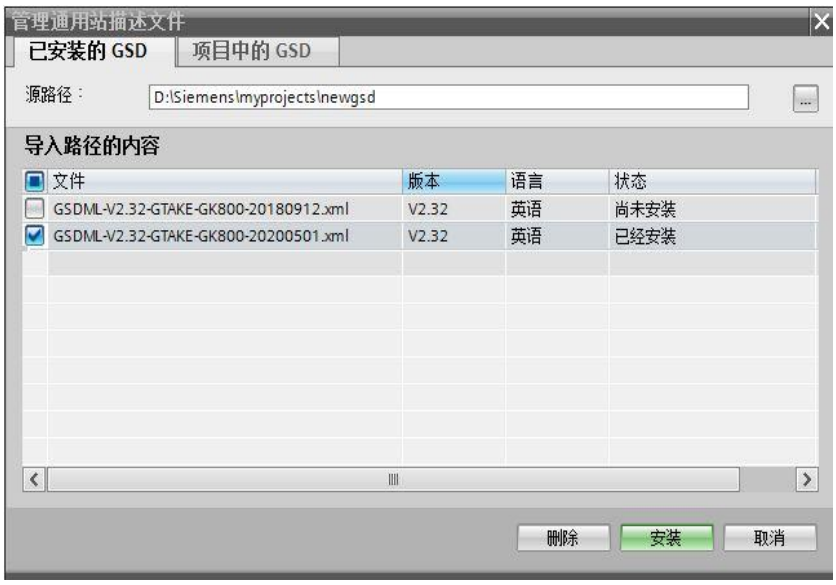


Figure 4

3. Add PLC and module

Click "Add New Device" in the "Project Tree" and select the corresponding PLC model in the controller, as shown in Figure 5:

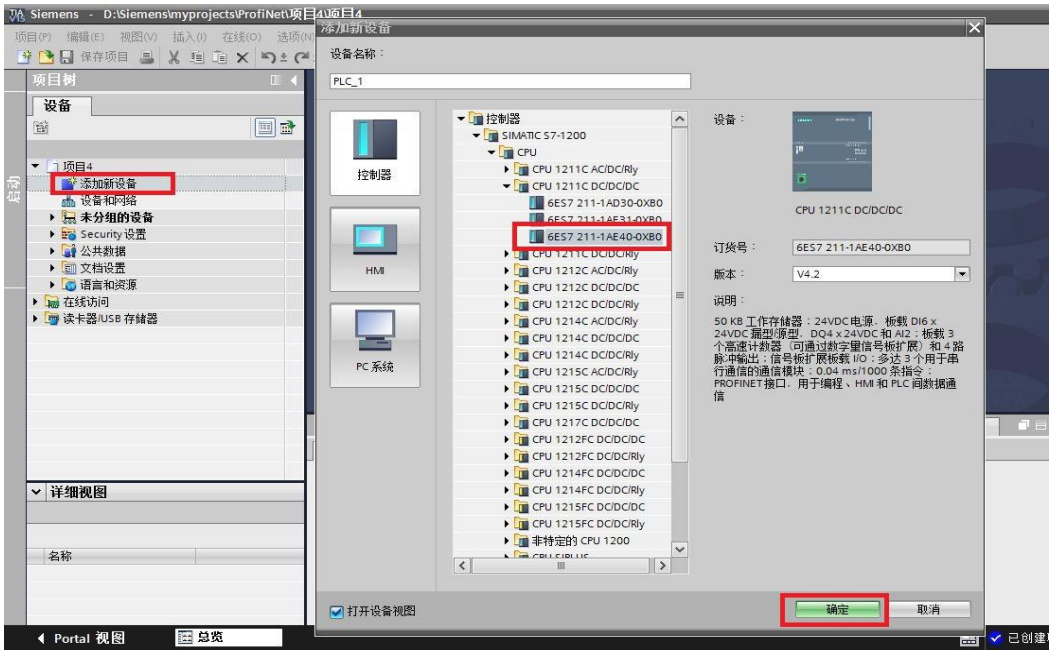


Figure 5

Double-click "Devices and Networks" in the "Project Tree", under the "Network View" window, select the inverter module in the "Hardware Catalog" on the right, as shown in Figure 6:

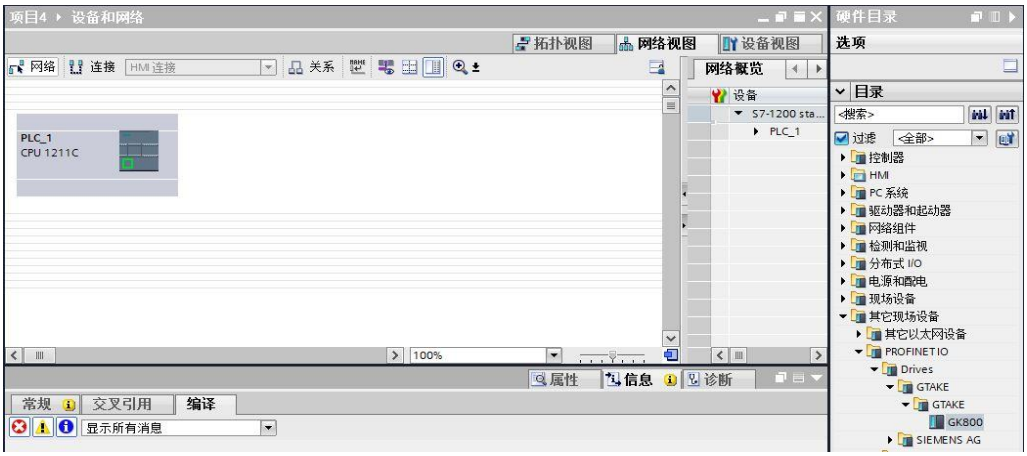


Figure 6

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

Click on the "Unassigned" icon of the drive and select "PLC_1. PROFINET interface", which can establish a ProfiNet connection between the PLC and the frequency converter, as shown in Figure 7

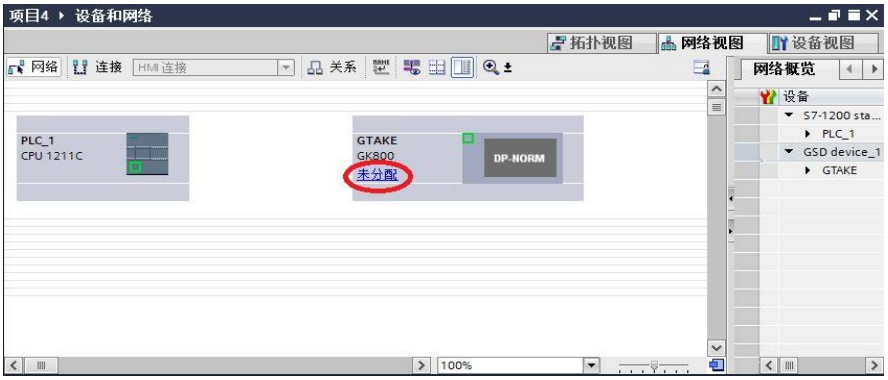


Figure 7

After the ProfiNet connection is established, as shown in Figure 8:

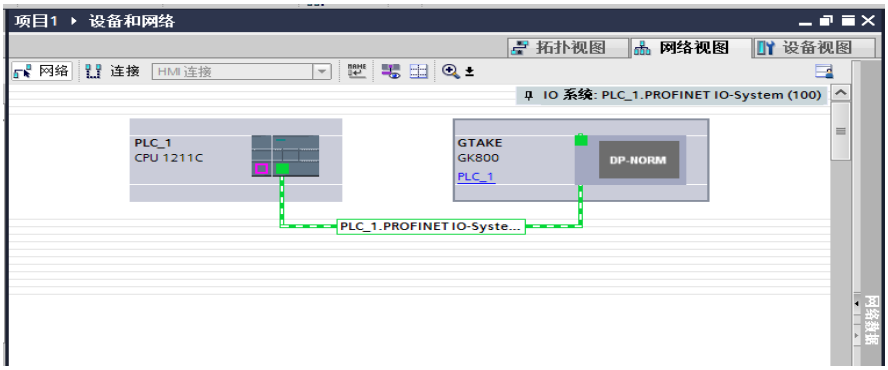


Figure 8

Double-click the PLC icon to enter the "Units View", click "PLC_1" in the device overview, and then in the "Properties" window you can set the IP of the PLC Address, subnet mask, device name, etc., as shown in Figure 9:

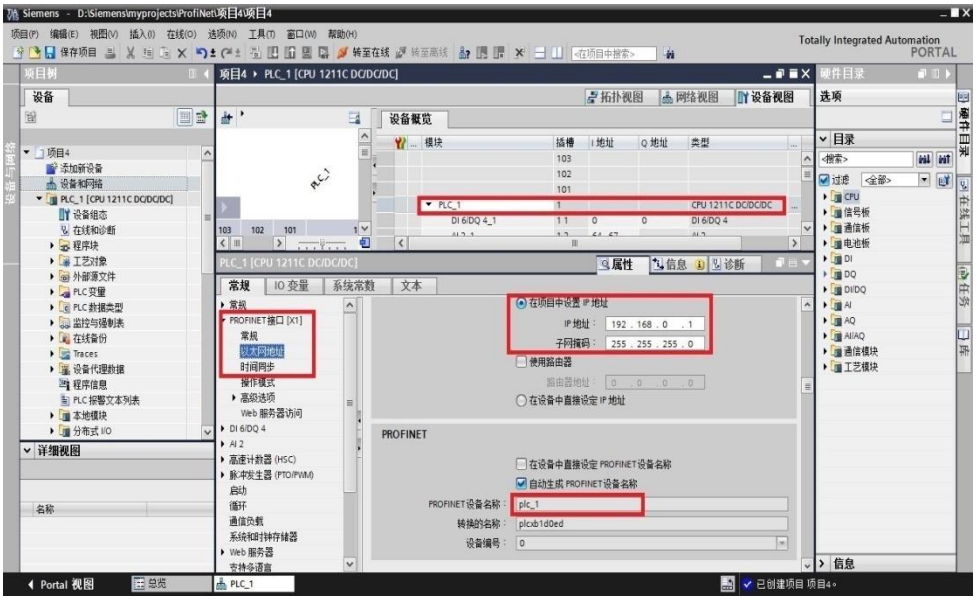


Figure 9

Double-click the inverter icon, enter the "Unit View", click "Interface" in the device overview, and then in the "Properties" window you can set the IP address of the inverter, device name, etc., as shown in Figure 10:

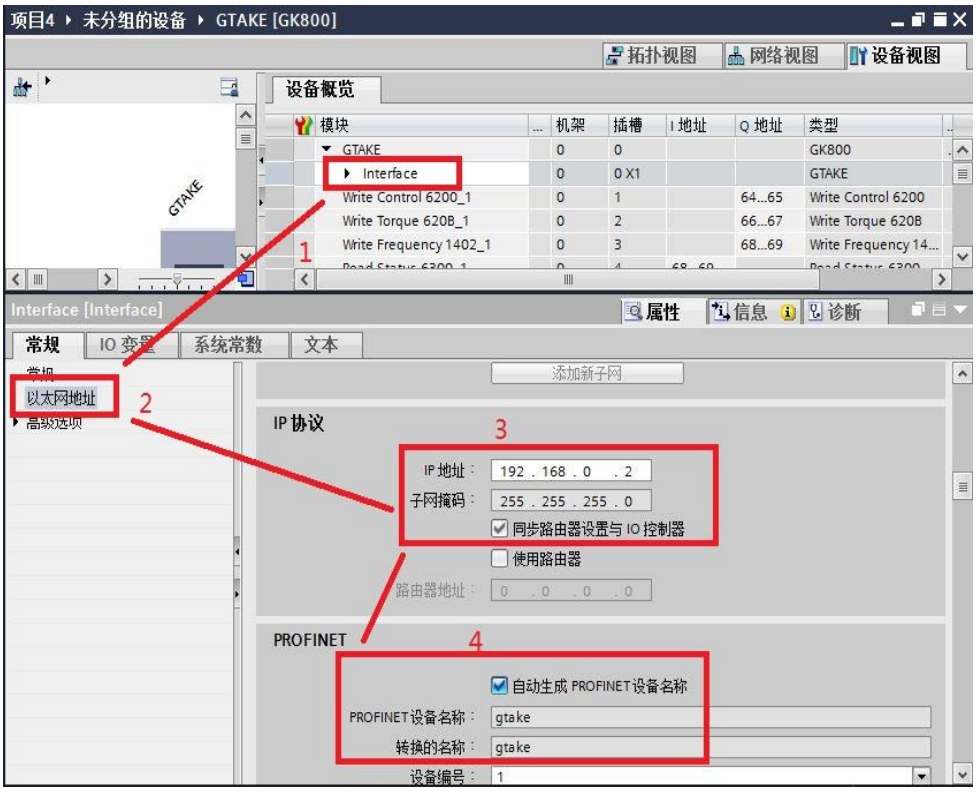


Figure 10

5. Modify the actual device IP and device name

Connect the computer, PLC, and frequency converter with a network cable, select the computer's network card in the "Project Tree", and double-click "Update Accessible Devices", as shown in Figure 11:

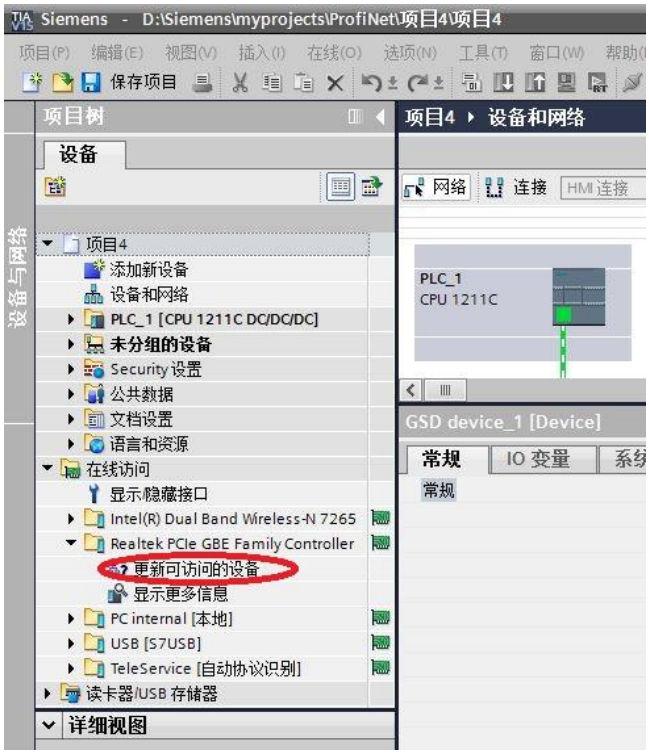


Figure 11

Wait for the software to scan and display "2 devices found on the network", arranged in the "Project Tree", as shown in Figure 12:

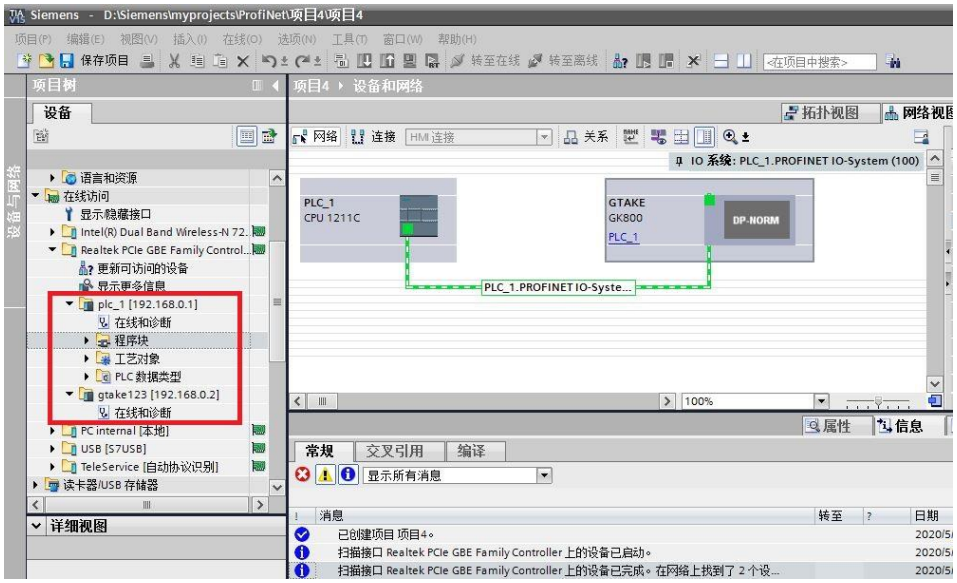


Figure 12

Double-click "Online and Diagnostic" in the P LC_1, select "Assign IP Address", modify the IP address and subnet mask, and click the "Assign IP Address" button, as shown in the figure 13：

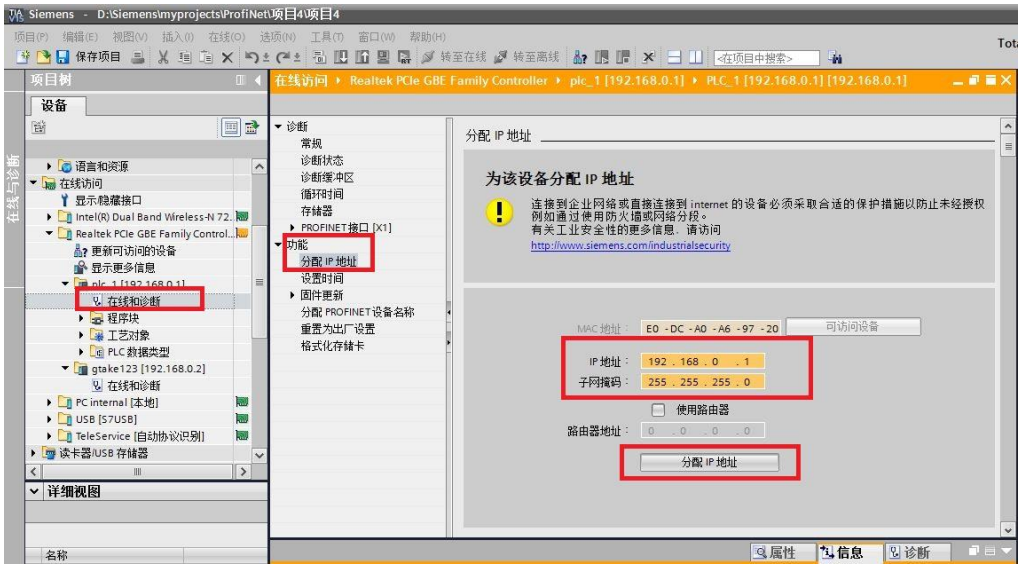


Figure 13

Select "Assignment Name", modify the PROFINE device name, and click the "Assign Name" button, as shown in Figure 14:

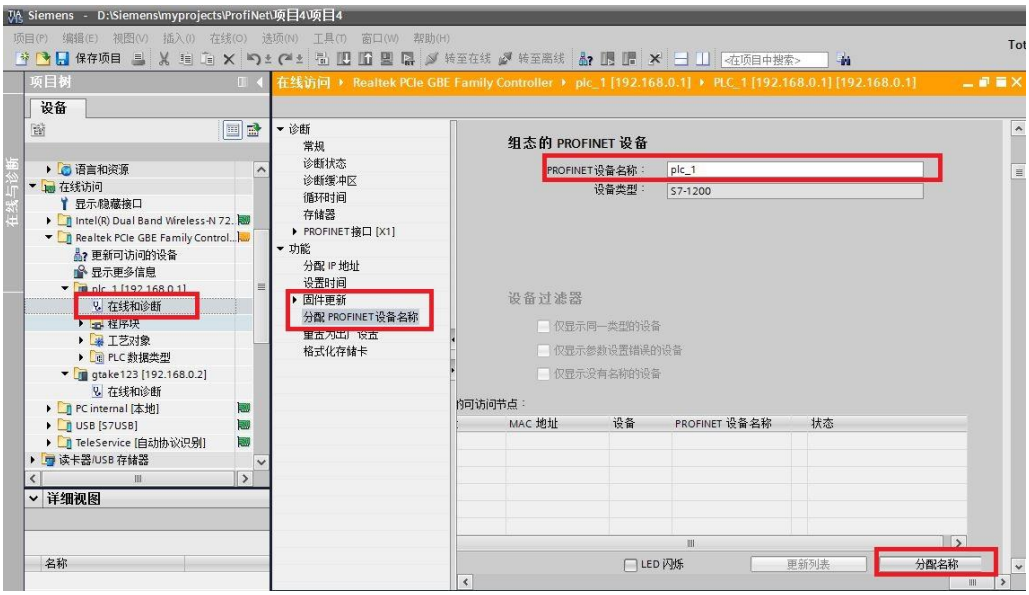


Figure 14

Similarly, the IP address and device name of the frequency converter can be modified as described above.

Note that after changing the device name or IP address, the Profinet board needs to be powered on again.

6. Configure the inverter instructions

In the Units View of the drive, all the models that can be added are displayed in the Hardware Catalog on the right, and can be added to the Device Overview by double clicking.

【Add read and write parameters】:

Double-click Master-Slave or Slave-Master (you can add multiple, when adding more than one, it is recommended to read consecutive additions, write consecutive additions) as shown in Figure 15, 1 6：

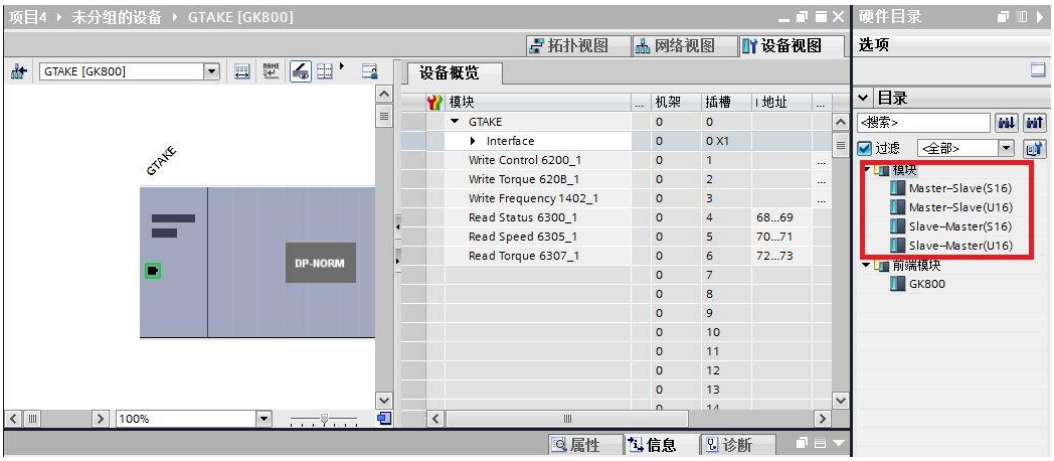


Figure 15

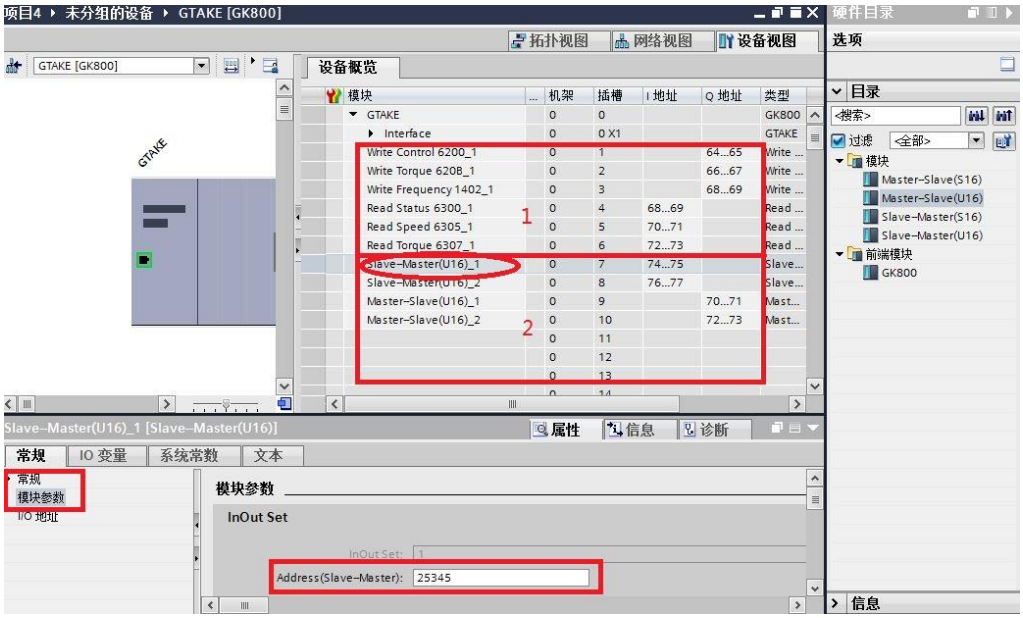


Figure 16

The "1" section in Figure 16 is a fast read and write area for six fixed addresses, i.e., the customer does not need to configure the address. They are:

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 1402_1	Write multi-band speed frequency F1-02
Read Status 6300_1	Read status word

Read Speed 6305_1	Read run speed
Read Torque 6307_1	Read output torque

The "2" section in Figure 16 is a free read-write area, and multiple read-write registers can be added consecutively.

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

Master-Slave(U16) means to write a parameter, and its write address is configured in the corresponding module parameter.

Note: U16 Unsigned 16bit integer 0-65535

S16 Signed 16bit integer -32768~32767

When using U16 and S16, pay attention to the range of specific function codes to avoid reading and writing anomalies

7. Examples of PLC programming

1. Drive start, stop

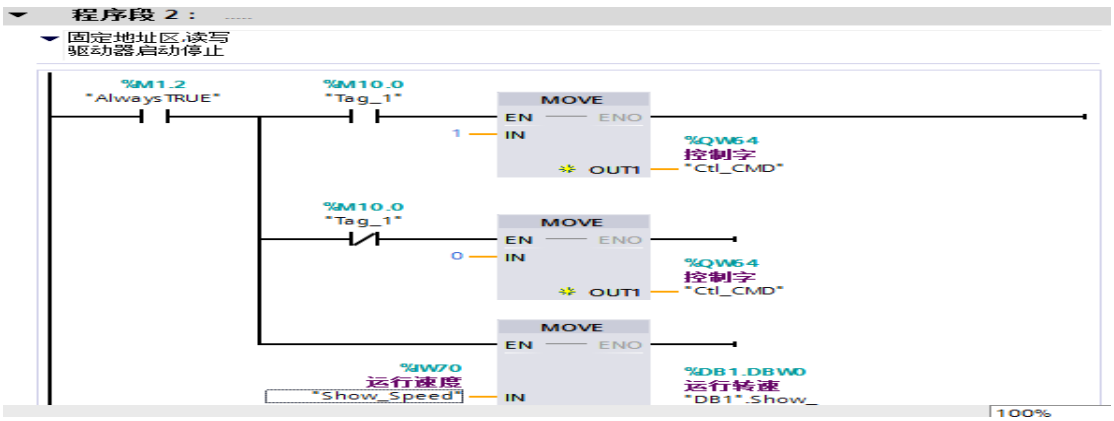


Figure 17

2. Write frequency, read operation frequency

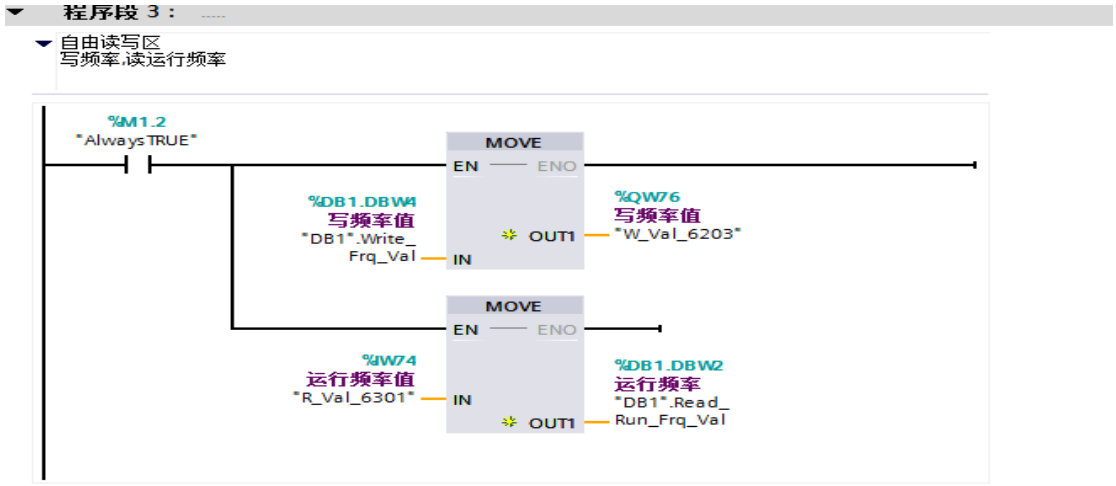


Figure 18

VIII. Compilation and Download

At this point, our hardware and software configuration is complete, and we will download the project to the PLC of the Siemens S7-1200 below. Under the "Devices and Networks" view, you can see the "Compile" button and the "Download" button, as shown in Figure 19:

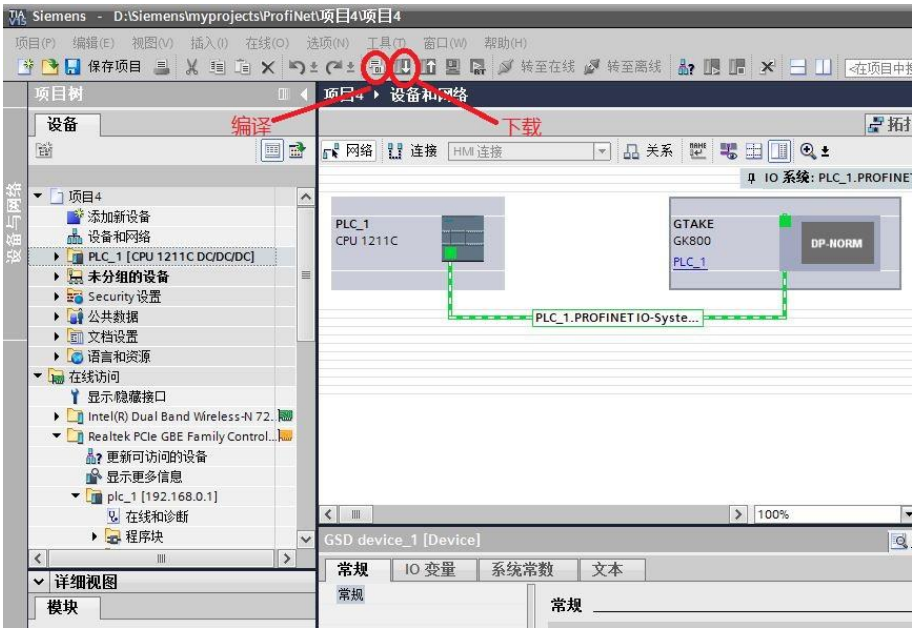


Figure 19

First compile the project, then click on the "Download" button, after setting up the network according to Figure 20, click "Start Search".

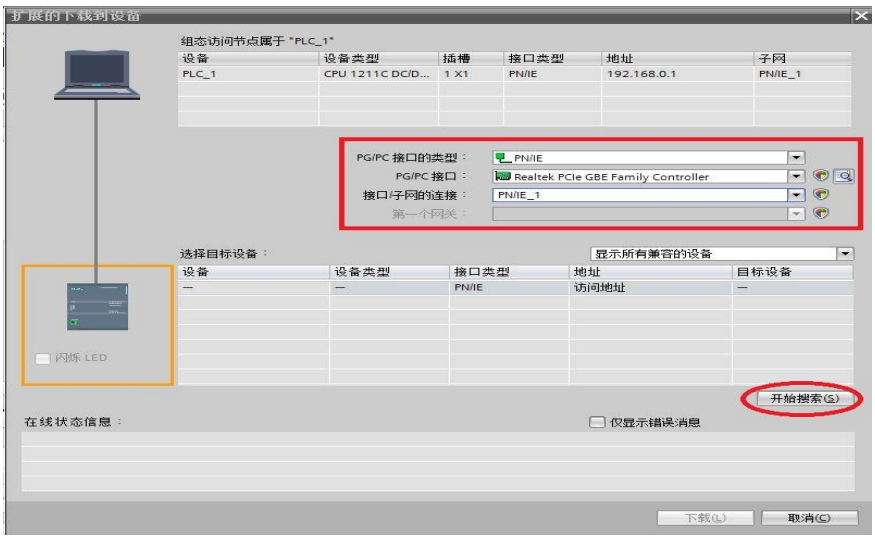


Figure 20

After searching for the actual connected PLC, it is shown in Figure 21. After checking that the "Device Type", "IP Address", "Device Name" are correct, click the "Download" button.

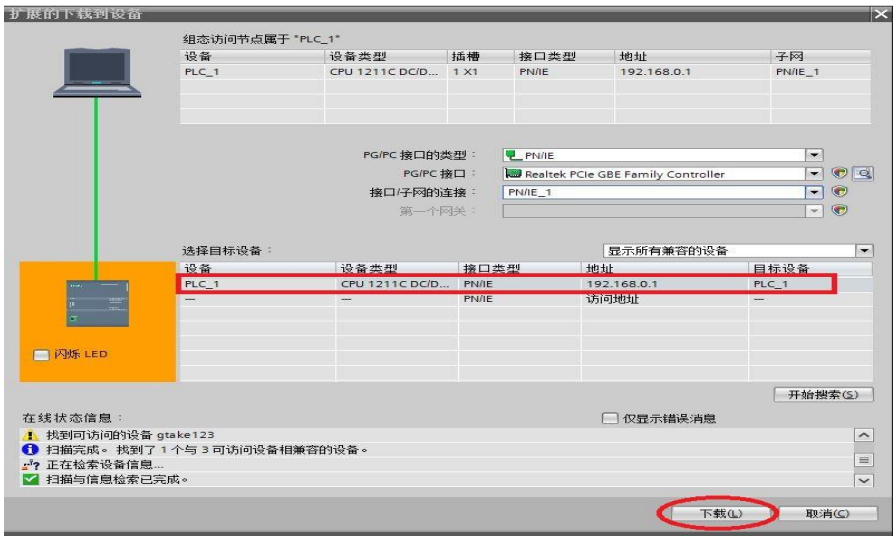


Figure 21

In the pop-up dialog box settings, generally select "Stop All" and "Consistent Download", as shown in Figure 22:

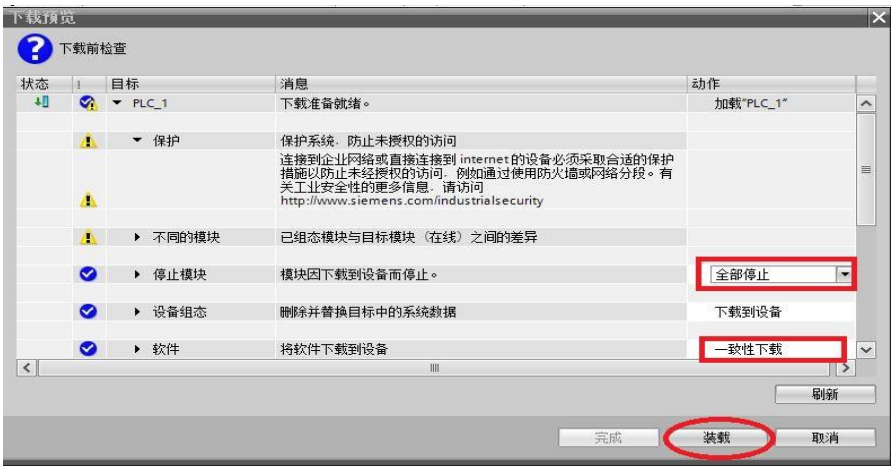


Figure 22

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

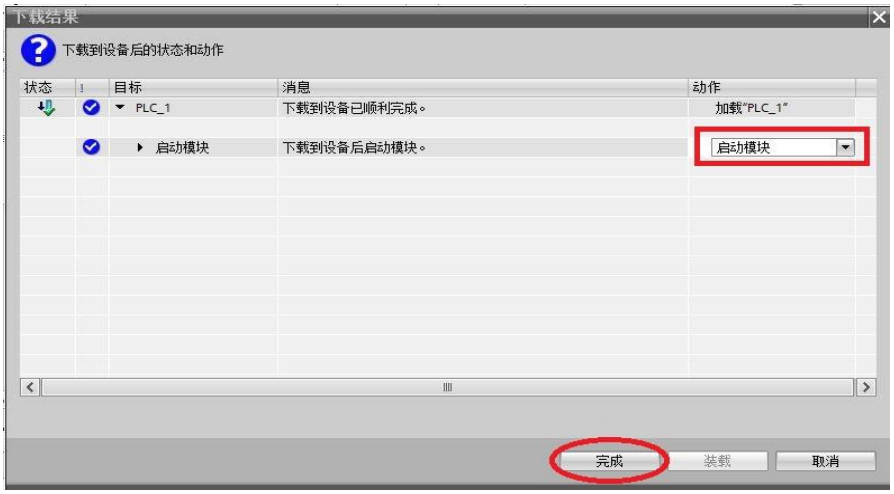


Figure 23

9. Quickly modify the name of the device

In addition to the Botu software, users can also modify the name of the ProfiNet card device through the "STEP 7-MicroWIN SMART" software. Select "Tools" - "Find PROFINET Device", scan the device and click "Edit" to change the device name. As shown in Figure 24:

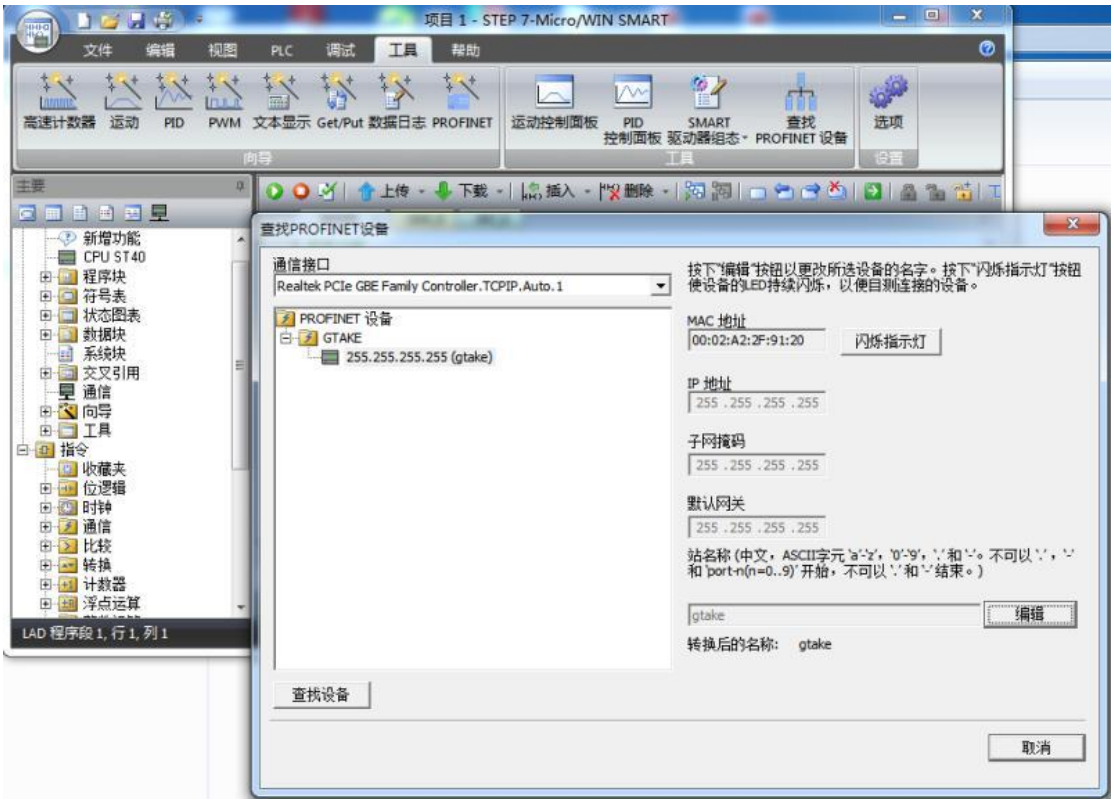


Figure 24

10. Address table of common parameters

Control parameter table (write only):

Register decimal address	Register hexadecimal address	Parameter name
25088	0x6200	Control command words
25089	0x6201	The frequency is set in the main setting mode
25090	0x6202	Frequency auxiliary setting mode setting
25091	0x6203	The main frequency is given
25092	0x6204	Auxiliary frequency given

Register decimal address	Register hexadecimal address	Parameter name
25093	0x6205	The multi-segment frequency is given
25094	0x6206	The PLC frequency is given
25095	0x6207	PID number given percentage (0 to 100.0%)
25096	0x6208	PID feedback percentage (0 to 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 controls the forward speed limit (lower limit frequency ~ upper limit frequency).
25101	0x620D	Torque control inversion speed limit (lower limit frequency ~ upper limit frequency).
25102	0x620E	Analog AO1 channel settings
25103	0x620F	Analog AO2 channel settings
25104	0x6210	Digital DO output channel setting
25105	0x6211	The slave frequency is set at a given scale (0 to 100 0.0%.).
25106	0x6212	Virtual terminal communication is given
25107	0x6213	Acceleration time 1
25108	0x6214	Deceleration time 1

25088 Controls the word list

Control Word (Bit)	value	Meaning	Feature description
BIT0	0	The run command is invalid	Stop the drive
	1	The run command is valid	Start the frequency converter
BIT1	1	rollback	Sets the direction of operation when the run command is valid
	0	Positive turn	
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 void	
BIT15～BIT5	000000B	retain	

For example, writing 1 to a control command with address 25088 indicates a forward start; Write 2 to indicate a reversal start;

Write 0 to indicate a deceleration stop; Write 16 for free parking; Write 8 to reset.

Status parameter table (read-only):

Register decimal address	Register hexadecimal address	Parameter name
25344	0x6300	Run status word 1
25345	0x6301	The current operating frequency
25346	0x6302	Output current
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	The actual length is high
25354	0x630A	The actual length is low
25355	0x630B	Switch input terminal status
25356	0x630C	Switching output terminal status
25357	0x630D	Operating frequency setting
25358	0x630E	PID settings
25359	0x630F	PID feedback
25360	0x6310	Set the length
25361	0x6311	Set the acceleration time1
25362	0x6312	Set the deceleration time1
25363	0x6313	AI1 (Unit: V).
25364	0x6314	AI2 (Unit: V).

Register decimal address	Register hexadecimal address	Parameter name
25365	0x6315	AI3 (Unit: V) (Negative values show the complement of the corresponding numeric amount).
25366	0x6316	DI (unit: kHz).
25367	0x6317	First operational failure
25368	0x6318	Second operational failure
25369	0x6319	Third (most recent) operational failure
25370	0x631A	Run the display parameters
25371	0x631B	Shutdown display parameters
25372	0x631C	The frequency converter control mode is given
25373	0x631D	Frequency given in a way
25374	0x631E	Frequency is the main given mode
25375	0x631F	The frequency is set by the given number
25376	0x6320	Frequency is secondary to a given mode
25377	0x6321	Frequency is supplemented by a numerical setting
25378	0x6322	Inverter status word 2
25379	0x6323	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 drive is shut down	
BIT1	1	Inverter inversion	
	0	The frequency converter is rotating	
BIT3～BIT2	00B	Constant speed	
	01B	hasten	
	10B	decelerate	
BIT4	0	Did not reach the main setting	
	1	Reach the main settings	
BIT7～BIT5	retain	retain	
BIT15～BIT8	0x00～0xFF	Fault code	0: Indicates that the frequency converter is normal. Non-0: Indicates a fault, and the meaning of the specific fault code is referred to in Chapter 7.

Other common parameter tables (readable and writable):

Function code	name	range	Decimal address	Hexadecimal address
b0-02	The frequency is set by the given number	Lower limit frequency ~ upper limit frequency	514	0x0202
b2-01	Acceleration time 1	0s～600.00s/6000.0s/60000s	1025	0x0401
b2-02	Deceleration time 1	0s～600.00s/6000.0s/60000s	1026	0x0402
d2-00	Speed/torque control selection	0: Speed control 1: Torque control	3072	0x0C00
d2-20	Torque digital setpoint	-200.0%～200.0%	3092	0x0C14
F4-34	Electron gear ratio molecules	1～30000	5922	0x1722
F4-35	Electronic gear ratio denominator	1～30000	5923	0x1723

For other function codes, see the GK800 manual, and the address translation relationship is shown in the following table:

Function code groups	The register address is high byte hexadecimal	Register address high byte decimal	Function code groups	Register address high byte 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	Inverter status	0x63	25344

Function code groups	The register address is high byte hexadecimal	Register address high byte decimal	Function code groups	Register address high byte hexadecimal	Register address high byte decimal
			parameter group		

For example, the register address of the inverter function code parameter b0-02 is hexadecimal 0x0202 (decimal 512 + 02 = 514), The register hex address of the inverter function code parameter b 0-10 is 0x020 A (decimal 512+10=522）。