XB6-P20D

Encoder Count Module

User Manual

Nanjing Solidot Electronic Technology Co., LTD

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Catalogue

1 Product overview

1.1 Product profile

XB 6-P20D for XB6 series encoder counting module, using the X-bus bottom bus, bus module supports two orthogonal encoder signal input, ring count, Z phase reset, four latch channel can be any collocation, fit the company XB 6 series coupler module, module small space, high real-time, for user high speed data acquisition, optimize system configuration, simplify the field wiring, improve system reliability provides various options.

1.2 product features

- binary channels
  Two-channel encoders are supported.
- Linear counts
  Support for a 32-bit linear count of 0~4294967295.
- Count the fold rate
  Support for 4 x / 2 x / 1 x count.
- Hardware lock storage
  Four latch channels can be configured arbitrarily.
- Z phase zero
  Automatic empty count value at a specific pulse.
- small volume
  Compact structure, small space occupancy.
- fast speed
  Based on the high-performance communication chip, parallel interface, fast speed.
- Easy diagnosis
  Innovative channel indicator light design, close to the channel, clear at a glance, convenient detection and maintenance.
- Easy configuration

The configuration, simple configuration, support PROFINET main station, EtherCAT main station, Ether N et / IP main station and other major mainstream main stations.

- Easy to install

  DIN 35 mm Standard guide rail installation

  Using shrapnel type wiring terminal, wiring is convenient and fast.

2 Product Parameter

2.1 General parameters

interface parameters		
product model	XB6-P20D	
bus protocol	X-b us	
Process data volume: Downlink	12 Bytes	
Process data volume: uplink	20 Bytes	
figure IO	Input: 4 Ch ， PNP/NPN	Output: 4 Ch ， PNP
refresh rate	1 ms	
technical parameter		
Encoder input	2 channel	
Encoder signal	orthogonal	
count rate	≤500 kHz	
Z phase zero	support	
Hardware lock-in function	Latch signal is configurable	
Compare output functions	Unsupported for the time being	
Counting fold rate setting	4 x / 2 x / 1 x (default 4 x)	
Resolution Settings	Support, 0~65535 (default 0)	
Ring count	Supported, 0 to resolution count fold-1	
Linear counts	Support, 0~4294967295	
Count the initial value setting	support	
Hardware filtering	Support, 0~15 (default 7)	
Count range selection	Support, 0~4294967295	
counting in reverse	support	
outline dimension	106×73×25.7mm	
weight	100g	
mode of connection	Screw-free quick plug in	
way to install	35mm guide rail installation	

3 Panel

3.1 modular architecture

Name of the product parts

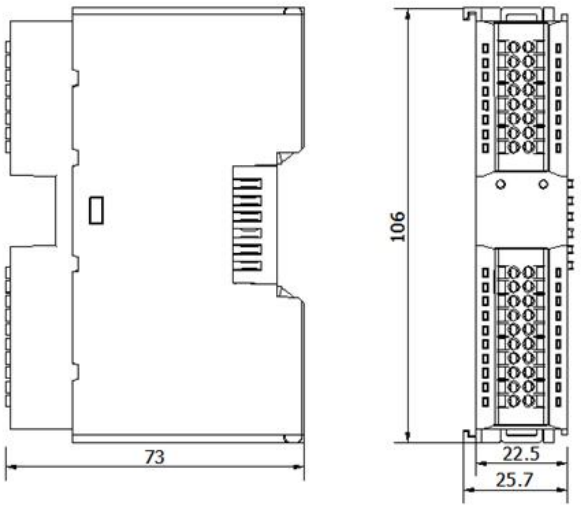
3.2 Indicator light function

name	characteristic	pigment	state	state description
power light	P	green	Often bright	The power supply is normal
			extinct	The product is not powered on or the power supply is abnormal
Communication indicator light	R	green	Often bright	The system is running normally
			Slim 1Hz	The module is connected and the X-bus system is ready for interact
			extinct	Device was not powered, X-bus did not interact with data or abnormal
Encoder to input the AB phase indicator light	A +/A-	green	Often bright	The encoder has enabled
	B +/B-		extinct	The encoder is not able to make
Encoder input Z phase indicator light	Z +/Z-	green	Often bright	The encoder Z-phase reset function is enabled
			extinct	The encoder Z-phase reset function is not enabled
Input the channel indicator light	I 0~I 3	green	Often bright	The channel has a signal input
			extinct	The channel has no input or abnormal signal input
Output channel indicator light	O0~O 3	green	Often bright	The channel has a signal output
			extinct	Channel has no output or abnormal signal output

4 Installation and disassembly

4.1 outline dimension

Outline specification (in mm)



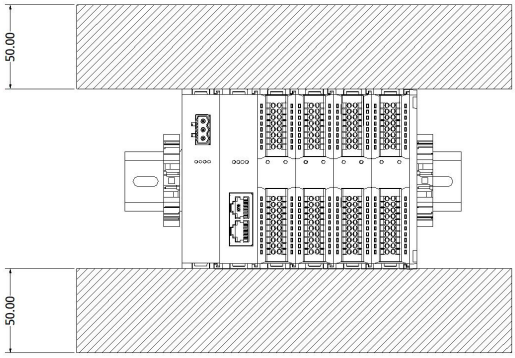
4.2 Installation guide

Installation \ Removal considerations

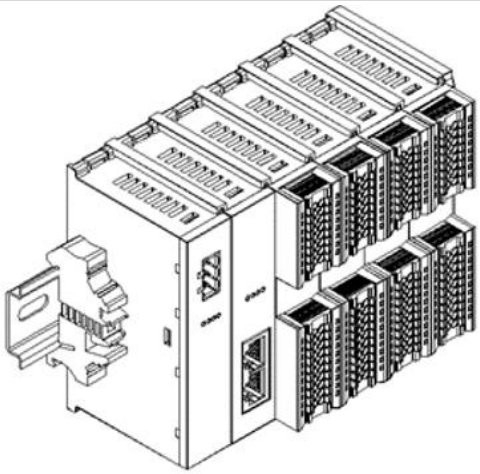
- Ensure that the cabinet has good ventilation measures (such as the cabinet with exhaust fans).
- Do not install this equipment next to or above the equipment that may cause overheating.
- Be sure to install the module vertically and maintain the surrounding air circulation (at least 50mm of air circulation space above and below the module).
- After the module is installed, always install the guide rail fittings at both ends to secure the module.

- The disassembly must be done when the power supply is cut off.

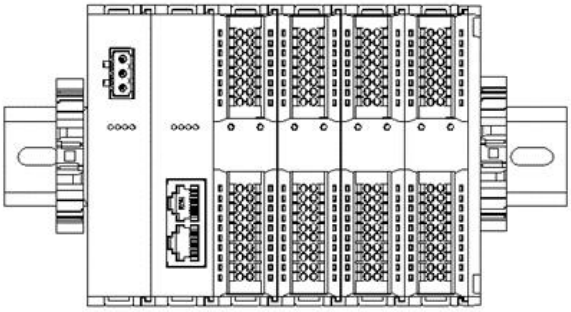
Minimum clearance (50mm)



Ensure that the module is installed vertically



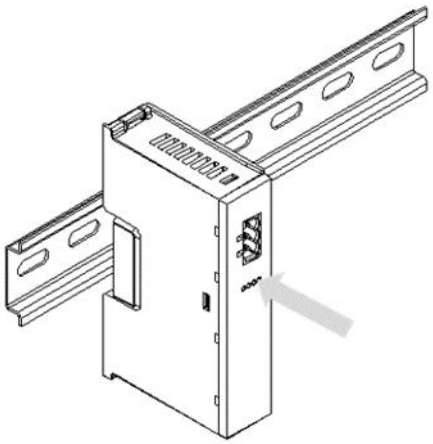
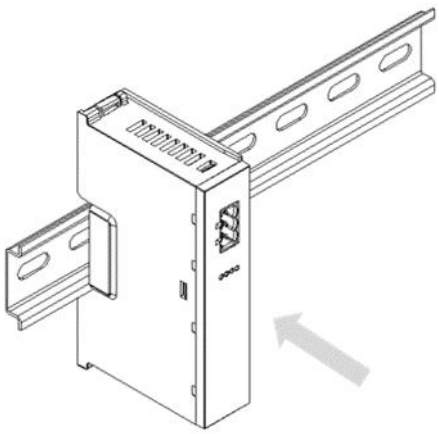
Be sure to install the guide rails and fittings



4.3 Install the disassembly step

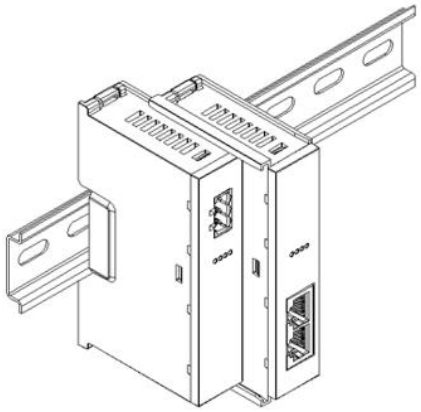
Assembly and removal of the module	
Module installation steps	1. Install the power supply module on the fixed guide rail first.
	2. Install the coupler and the required I / O module on the right side of the power supply module.
	3. After installing all the required I / O modules, install the end cover to complete the assembly of the module.
	4. Install guide rail fixings at both ends of the power supply module and end cover to fix the module.
Module disassembly step	1. Release the guide rail attachment parts at both ends of the module.
	2. Use a one-word screwdriver to pry open the module buckle.
	3. Pull out the disassembled module.

4.4 Schematic diagram of installation

Power supply module installation	**step**
	Vertical align the rail of the power module as shown in Figure ① on the left.
	As shown in the ② on the left, press the power module and hear the "click" sound, the module is installed in place.

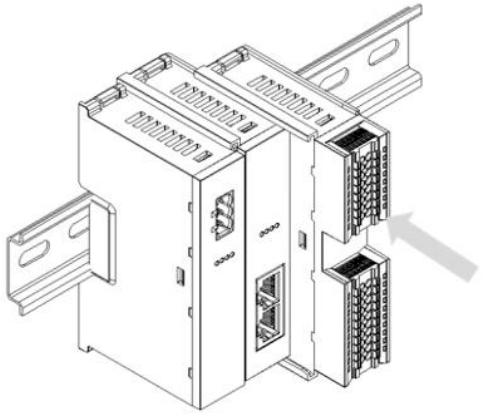
②

Installation of the coupler module	step



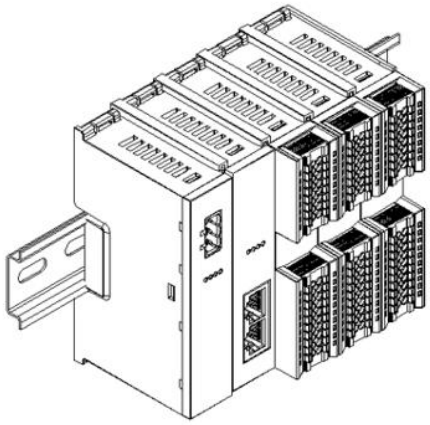
Aign the left slot of the coupler module to the right side of the power module as shown in Figure ③ on the left.
Press hard, the coupler module, hear the "click" sound, the module is installed in place.

The I / O module installation	step



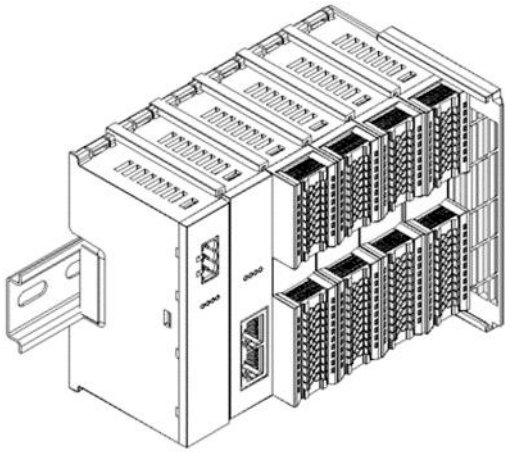
Follow the steps of installing the coupler module in the previous step, and install the required I / O modules one by one, as shown in Figure ④ and Figure ⑤ on the left.

④



⑤

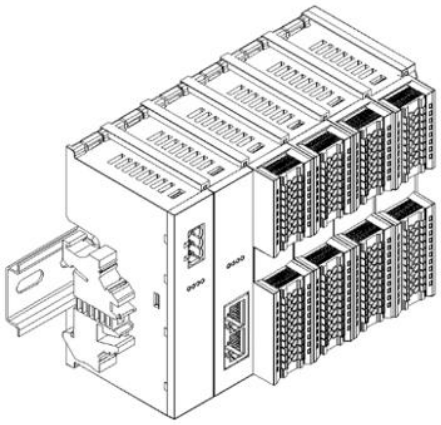
End cover with	step



Install the end cover on the right side of the last module, as shown in the left figure ⑥. Please refer to the installation method of the coupler module.

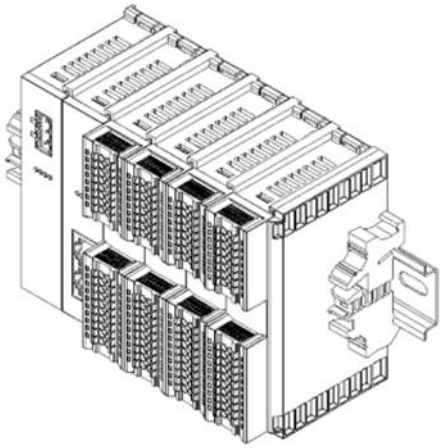
⑥

Install the guide rail fixtures	step



Install and lock the left side of the coupler as shown in the ⑦ on the left.

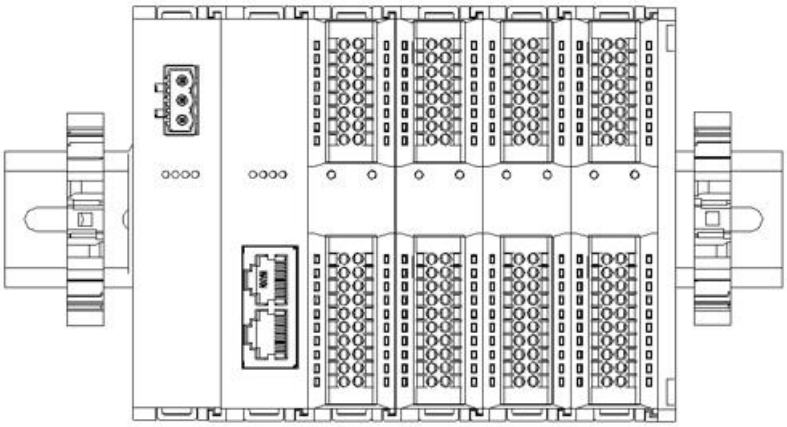
⑦



Install the guide rail attachment on the right side of the end cover, first push the guide rail attachment to the coupler to ensure that the module is installed and lock the guide rail attachment with a screwdriver, as shown in the left figure ⑧.

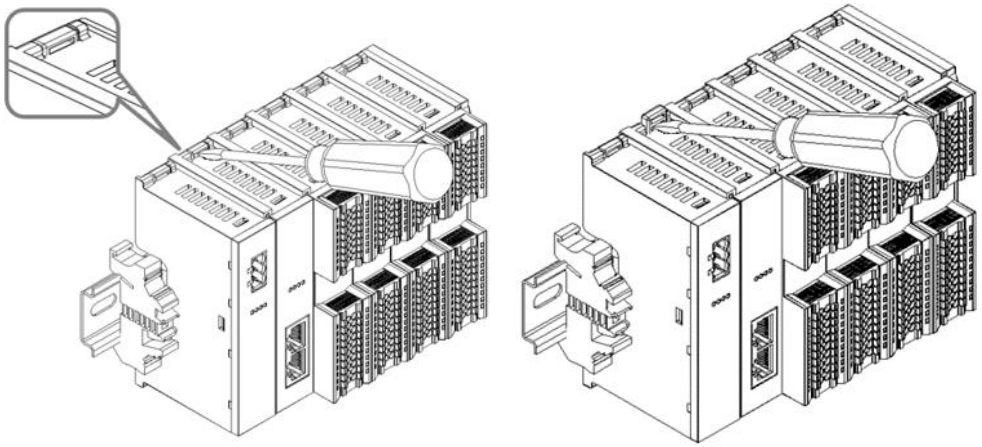
⑧

dismantle	step



⑨

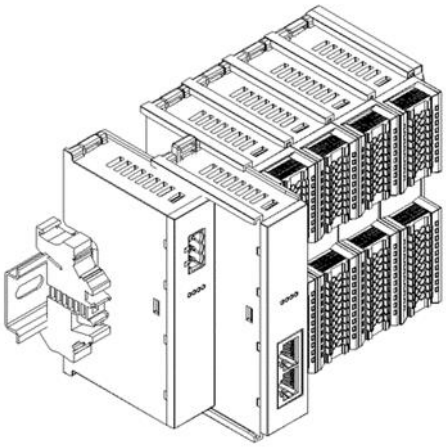
Release the rail holder at one end of the module with a screwdriver and remove it to one side to ensure that there is a gap between the module and the rail holder, as shown in Figure ⑨ on the left.



⑩ ⑪

Insert the word flat head into the buckle of the module to be removed and force in the direction of the lateral module (hear noise) as shown in the ⑩ and ⑪ on the left.

Note: Each module has a buckle on each level, and they all operate according to this method.

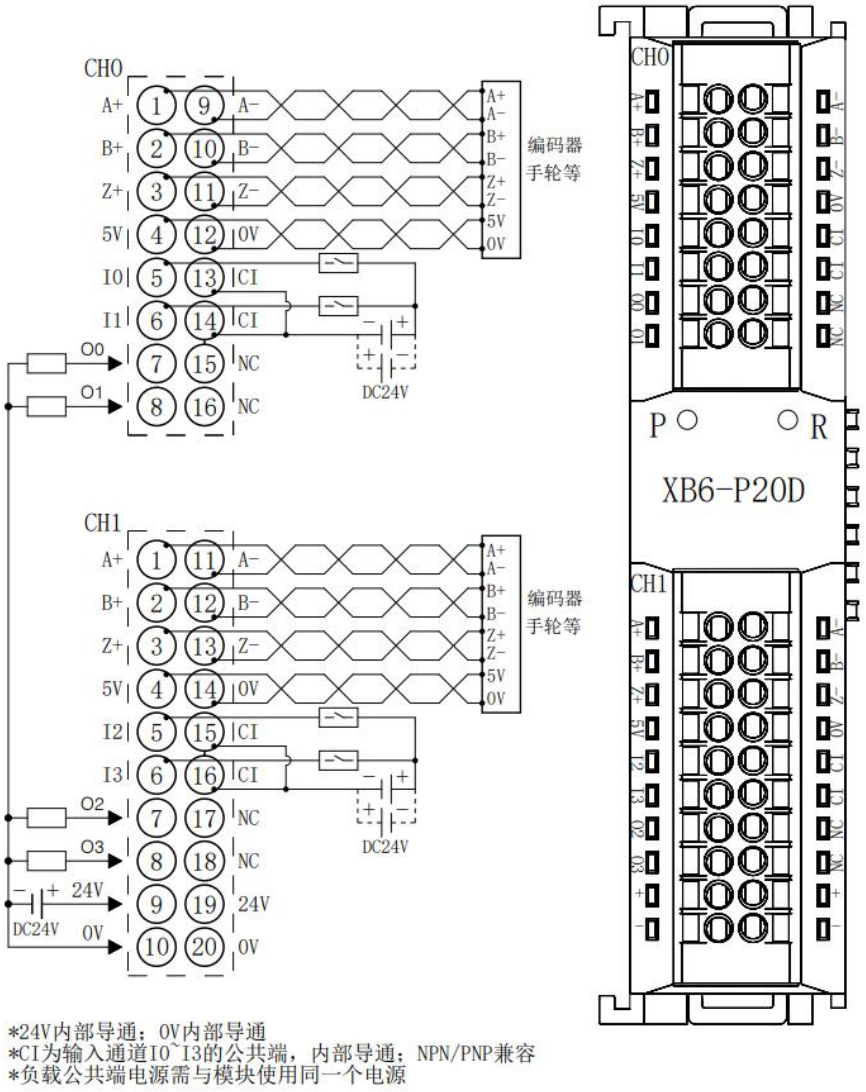


⑫

Follow the installation module and remove the module as shown in the ⑫ on the left.

5 wiring

5.1 hookup



*24V内部导通；0V内部导通
*CI为输入通道I0~I3的公共端，内部导通；NPN/PNP兼容
*负载公共端电源需与模块使用同一个电源

- For the safety of people and equipment, it is recommended to disconnect the power supply during wiring operation.

5.2 Terminal terminal termination definition

CH 0					
Terminal serial number	**Terminal identification**	**explain**	**Terminal serial number**	**Terminal identification**	**explain**
1	A +	Encoder A trust number input +	9	A -	Encoder A credit number output-
2	B+	Encoder B trust number input +	10	B-	Encoder B credit number output-
3	Z +	Encoder Z credit number input +	11	Z -	Encoder Z credit number output-
4	5V	The 5V encoder power supply	12	0V	The 0V encoder power supply
5	I 0	Numeric quantity input channel 0	13	CI	Input the channel common end
6	I 1	Digit quantity input channel 1	14	CI	Input the channel common end
7	O0	Digital quantity output channel 0	15	NC	Empty terminal
8	O 1	Digital quantity output channel 1	16	NC	Empty terminal
CH 1					
Terminal serial number	**Terminal identification**	**explain**	**Terminal serial number**	**Terminal identification**	**explain**
1	A+	Encoder A trust number input +	11	A-	Encoder A credit number output-
2	B+	Encoder B trust number input +	12	B-	Encoder B credit number output-
3	Z +	Encoder Z credit number input +	13	Z -	Encoder Z credit number output-
4	5V	The 5V encoder power supply	14	0V	The 0V encoder power supply
5	I2	Digital quantity input channel 2	15	CI	Input the channel common end
6	I3	Digital quantity input channel 3	16	CI	Input the channel common end

7	O2	Digital quantity output channel 2	17	NC	Empty terminal
8	O3	Digital quantity output channel 3	18	NC	Empty terminal
9	+	24V	19	+	24V
10	-	0V	20	-	0V

6 Make use of

6.1 process data

Upink data 20Bytes					
BITARR	**Var Name**	**Var Content**	**D atatype**	**A ccess**	**Length**
0	Latch0 Valid	Encoder 1: The probe input is valid	B OOL	RO	1b
1	Latch1 Valid	Encoder 2: The probe input is valid	B OOL	RO	1b
2	SetCounter0_Finished	Encoder 1: Initial value setting is complete	B OOL	RO	1b
3	SetCounter1_Finished	Encoder 2: Initial value setting is complete	B OOL	RO	1b
4	Compare0_valid	Encoder 1: compare output valid	B OOL	RO	1b
5	Compare1_valid	Encoder 2: compare the output is valid	B OOL	RO	1b
6	CounterDir0	Encoder 1: Count direction	B OOL	RO	1b
7	CounterDir1	Encoder 2: Count direction	B OOL	RO	1b
8	Mutiple 0 error	Encoder 1: times rate error	B OOL	RO	1b
9	Mutiple1 error	Encoder 2: times rate error	B OOL	RO	1b
10	Frequency0 error	Encoder 1: wrong frequency	B OOL	RO	1b
11	Frequency1 error	Encoder 2: wrong frequency	B OOL	RO	1b

12~15	Reserved	obligate	B OOL	RO	1b
16	Counter Value0	Encoder 1: Count value	UDINT	RO	4B
17	Counter Value1	Encoder 2: Count value	UDINT	RO	4B
18	Latch Value0	Encoder 1: Latch value	UDINT	RO	4B
19	Latch Value1	Encoder 2: Latch value	UDINT	RO	4B
20	D I	Quantity input	BOOL	RO	2B

Downlink data is 12B yte s					
BITARR	**Var Name**	**Var Content**	**D atatype**	**A ccess**	**Length**
0	Latch0_Enable	Encoder 1: Latch is enabled	B OOL	R W	1b
1	Latch1_Enable	Encoder 2: Latch is enabled	B OOL	R W	1b
2	Z Phase0_Enable	Encoder 1: Z phase zero-enabled	B OOL	R W	1b
3	Z Phase1_Enable	Encoder 2: Z phase zero enabled	B OOL	R W	1b
4	Compare0_Enable	Encoder 1: Compare output enable	B OOL	R W	1b
5	Compare1_Enable	Encoder 2: Compare the output to enable it	B OOL	R W	1b
6	Counter0Dir_Inv	Encoder 1: counting direction reversal	B OOL	R W	1b
7	Counter1Dir_Inv	Encoder 2: counting direction reversal	B OOL	R W	1b
8	ENC_Enable0	Encoder 1: Encoder enables	B OOL	R W	1b
9	ENC_Enable1	Encoder 2: Encoder enables	B OOL	R W	1b
10	POWER_LOSS_HOLD0_ENABLE	Encoder 1: power power enabled	B OOL	R W	1b
11	POWER_LOSS_HOLD1_ENABLE	Encoder 2: drop power saving enabled	B OOL	R W	1b
12	CLEAR_VALUE0	Encoder 1: count zero	B OOL	R W	1b
13	CLEAR_VALUE1	Encoder 2: zero zero	B OOL	R W	1b
10~15	Reserved	obligate	B OOL	R W	1b
16	Set Counter0 Value	Encoder 1: Initial value setting	UDINT	R W	4B
17	Set Counter 1 Value	Encoder 2: Initial value setting	UDINT	R W	4B
18	D O	Digital quantity output / PNP	BOOL	R W	2B

data specification:

name	description	span	meaning
Latch Valid	Latch signal active bit of the encoder[1]	0	Encoder invalid latch, L atchVal invalid content
		1	Encoder valid latch, L atchVal content valid
SetCounter Finished	The encoder initialization value sets the valid value[1]	0	Encoder initialization value setting is invalid / not set
		1	The encoder initialization value setting is valid
Compare valid	The encoder compares the output of the valid bits[1]	0	Encoder not enabled to compare output / no valid output
		1	The encoder has a valid output
CounterDir	Encoder count direction	0	corotation
		1	reversal
Mutiple error	Encoder multiplier set error[1]	0	Encoder multiplier setting is correct
		1	Encoder multiplier set error
Frequency error	Encoder frequency set error[1]	0	Encoder frequency setting is correct
		1	Encoder frequency set error
C ounter Value	Coder gauge values	[0~2^{32}-1]	Capture and save the count value at some time.
L atch Value	Encoder latch count value	[0~2^{32}-1]	Capture and save the latch count value at some time.
D I	When the corresponding channel input signal is valid, the position 1 is 0 when the input is invalid.	0	Invalid input signal
		1	The input signal is valid
Latch Enable	The latch function of the encoder enables the	0	forbidden
		1	start using
Z Phase Enable	The Encoder Z-phase function is enabled	0	forbidden
		1	start using
Compare Enable	Encoder comparison output enables	0	forbidden
		1	start using
Counter Dir_Inv	The encoder counts in the reverse direction and enables it	0	forward direction
		1	opposite direction
ENC_Enable	Encoder count enables	0	cease
		1	firing
POWER_LOSS_HOLD_ENABLE	The power is saved to enable	0	forbidden
		1	start using

CLEAR_VALUE	Calculate the value of zero	0	forbidden
		1	start using
Set Counter Value	The encoder count value sets the initialization value	[0~2^{32}-1]	Set the initial value, and after starting the count, start the count from the initialization value
D O	When the corresponding channel output signal is valid, the position 1 is zero when the output is invalid.	0	The output signal is invalid
		1	The output signal is valid

Note [1]: The encoder probe input effective mark Latch Valid, the encoder initial value setting completion mark SetCounter Finished, the encoder compares the output effective mark Compare valid, the encoder, the ratio error mark Mutiple error, the encoder, the frequency error mark Frequency error function is not supported.

6.2 Configuration parameter definition

Configuration parameter 72 Byte					
BITARR	**Var Name**	**Var Content**	**D atatype**	**A ccess**	**Length**
0	Encoder1 Resolution	Encoder 1 resolution	UDINT	R W	2B
1	Encoder2 Resolution	Encoder 2 resolution	UDINT	R W	2B
2	Encoder1 Filter	Encoder 1 filter	UDINT	R W	2B
3	Encoder2 Filter	Encoder 2 filter	UDINT	R W	2B
4	Encoder1 Count Multiples	Encoder 1 count multiplier	UDINT	R W	2B
5	Encoder2 Count Multiples	Encoder 2 count multiplier	UDINT	R W	2B
6	Encoder1 Count Range	Encoder 1 count range	UDINT	R W	2B
7	Encoder2 Count Range	Encoder 2 count range	UDINT	R W	2B
8	Encoder1 Latch Signal	Encoder 1 latch signal	UDINT	R W	2B
9	Encoder2 Latch Signal	Encoder 2 latch signal	UDINT	R W	2B

data specification:

name	description	Windows default	span	meaning
Encoder1 Resolution	Encoder 1 resolution	0	0~65535	This parameter can achieve the maximum (0~65535 * 4) range ring count
Encoder2 Resolution	Encoder 2 resolution	0	0~65535	This parameter can achieve the maximum (0~65535 * 4) range ring count
Encoder1 Filter	Encoder 1 filter	7	0~15	This parameter can set the encoder filter parameter
Encoder2 Filter	Encoder 2 filter	7	0~15	This parameter can set the encoder filter parameter
Encoder1 Count Multiples	Encoder 1 count multiplier	4	1~4	This parameter achieves 4 / 2 / 1 fold count with default 4 fold count
Encoder2 Count Multiples	Encoder 2 count multiplier	4	1~4	This parameter achieves 4 / 2 / 1 fold count with default 4 fold count
Encoder1 Count Range	Encoder 1 count range	0	0	Counting range: 0~4294967295
			1	counter range: -2147483648~+21474836487[2]
Encoder2 Count Range	Encoder 2 count range	0	0	Counting range: 0~4294967295
			1	counter range: -2147483648~+21474836487[2]
Encoder1 Latch Signal	Encoder 1 latch signal	0	1	I 0 multiplexes the latch trigger channel of the encoder 1
			2	I 1 multiplexes the latch trigger channel of the encoder 1
			4	I 2 multiplexes the latch trigger channel of the encoder 1
			8	I 3 multiplexes the latch trigger channel of the encoder 1
Encoder2 Latch Signal	Encoder 2 latch signal	0	1	I 0 multiplexes the latch trigger channel of the encoder 2

			2	I 1 multiplexes the latch trigger channel of the encoder 2
			4	I 2 multiplexes the latch trigger channel of the encoder 2
			8	I 3 multiplexes the latch trigger channel of the encoder 2

Note [2]: Coder count range Encoder Count Range temporarily does not support count range-2147483648~ + 21474836487.

6.3 Use the case

- **tally function**

  ENC _ Enablex (x: 0-1 represents the encoder channel, the same below) is set to 1, start the encoder count, under the default parameters, the module is in [0,4294967295] counting in range, with the counting value being feedback in Counter Valuex in ascending data, and counting direction in Count er Dirx.

  Note: In the initial use, note the A / B wiring sequence, the reverse count value will overflow from 0 to 4294967295. In this state (excluding multiple overflow), the actual number of pulses = the number of pulses displayed in 4294967296.

- **Z phase zero function**

  The Z phase zero function is not turned on by default. By setting Z Phasex_Enable to 1, the counter Z phase zero function is enabled. For the application scenario with mechanical zero, the count value can be automatically emptied under a specific pulse, and the count value can be fed in Counter Valuex in the uplink data.

- **Set the counting direction**

  When CounterxDir _ Inv is set to 1, you can change the original counting direction of the encoder. For example, the original counting direction is increased clockwise, and the counting direction becomes decreased downward when the other conditions remain unchanged.

- **Initialize the setting function**

  Setting Set Counterx Value can modify the counter starting value, for example, set Set Counterx Value to 1000. After the count is started, the count value will increase / decrease from 1000.

- **Ring counting function**

  The resolution parameter Encoderx Resolution of the configuration parameter encoder is set, for example, set the resolution Encoderx Resolution is 400 and the count rate Encoder x Count Multiples is 4, then the encoder count range is within [0,1600-1], and the resolution parameter Encoderx Resolution is set by default to 0, and the ring count function is not started.

- **Hardware lock-in function**

  Setting the latch channel Encoderx Latch Signal of the configuration parameter encoder, for example, setting Encoder1 Latch Signal to 15, means that the encoder enables I0, I1, I2, I3, and the encoder 2 does not enable the latch channel. Encoder 1 and encoder 2 cannot open the same latch channel, namely Encoder1 Latch Signal & Encoder2 Latch Signal=0.

  The hardware latch function is activated by setting Latchx_Enable to 1.

  Note: This parameter setting should be set before counting the enabling parameter ENC _ Enablex.

  When the count is valid during operation, with the active level in the latch signal, the current count value is Counter Valuex latch and hold, and the latch value is feedback in the Latch Valuex of the uplink data.

◆ **Encoder input module function configuration for example**

a) Locking function:

Encoder1 Latch Signal Is set to 7; Encoder2 Latch Signal is set to 8; indicates that encoder 1 enables I0, I1, I2 latch channels, and encoder 2 enables I3 latch channel. Encoder 1 and encoder 2 cannot open the same latch channel, that is, the Encoder1 Latch Signal & Encoder2 Latch Signal is 0.

② Ring counting function:

Encoderx Resolution Is set to 1000; Encoderx Count Multiples is set to 4; the encoder will count annular between 0 to 3999.

Note: 1. Reload Deveices is required after the configuration parameters, otherwise the configuration parameters cannot take effect.

2. Latch enabling Latch Enable, count reverse enabling CounterxDir _ inv, initial value setting function Set Counterx Value need to be enabled or set before starting to count enabling ENC _ Enablex.

6.4 Module configuration description

6.4.1 Application in the TwinCAT3 software environment

1、dead work

- **hardware environment**
  - **Module model XB 6-P20D**
  - **Power supply module, EtherCAT coupler, end cover**

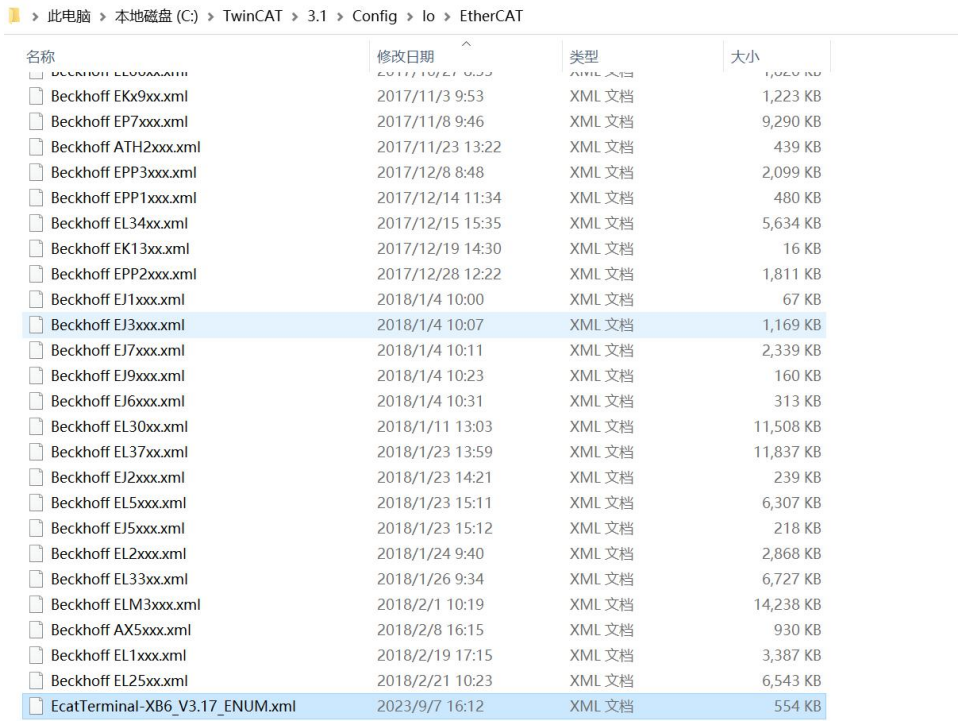
  This description takes the XB 6-P 2000H power supply, the XB 6-EC 0002 coupler as an example
  - **One computer, pre-installed with Twin CAT3 software**
  - **EtherCAT Special shielding cable**
  - **Hand wheel / encoder / orthogonal pulse transmitter, etc**
  - **Switch power supply**
  - **Module installation of guide rail and guide rail fixings**
  - **Device Profile**

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

  Please follow the"4. Installation and disassembly" "5. Wiring"Requires the operation

2、 Preset profile

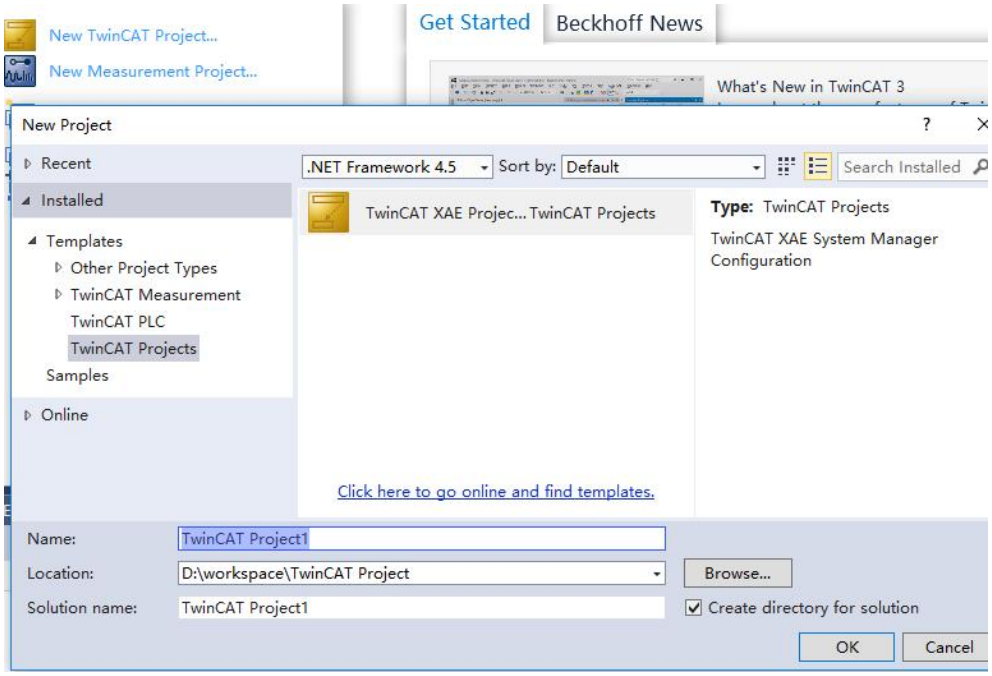
To the ESI profile (EcatTerminal-XB6_V3.17_ENUM. The xml) is placed under the TwinCAT installation directory "C: \ TwinCAT \ 3.1 \ Config \ Io \ EtherCAT", as shown in the figure below.



3、 Create the project

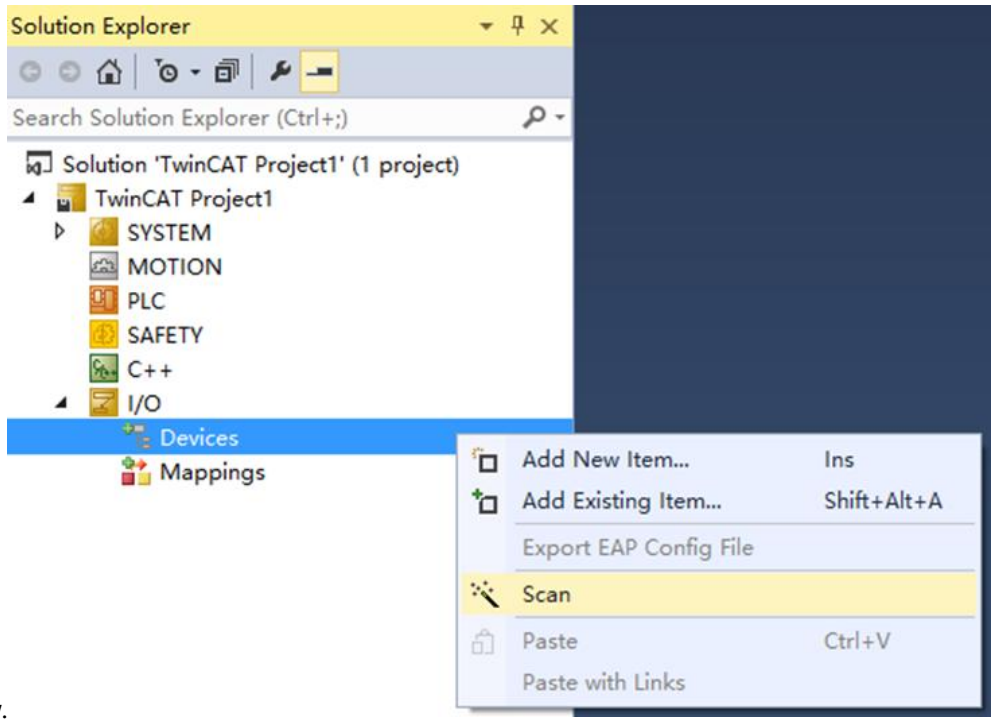
a. Click the TwinCAT icon in the lower right corner of the desktop, select "TwinCAT XAE (VS xxxx)", and open the TwinCAT software, as shown in the figure below.

b. Click "New TwinCAT Project", and "Name" and "Solution name" correspond to the project name and solution name respectively, and "Location" correspond to the project path, these three can choose the default, and then click "OK", the project was created successfully, as shown in the following figure.



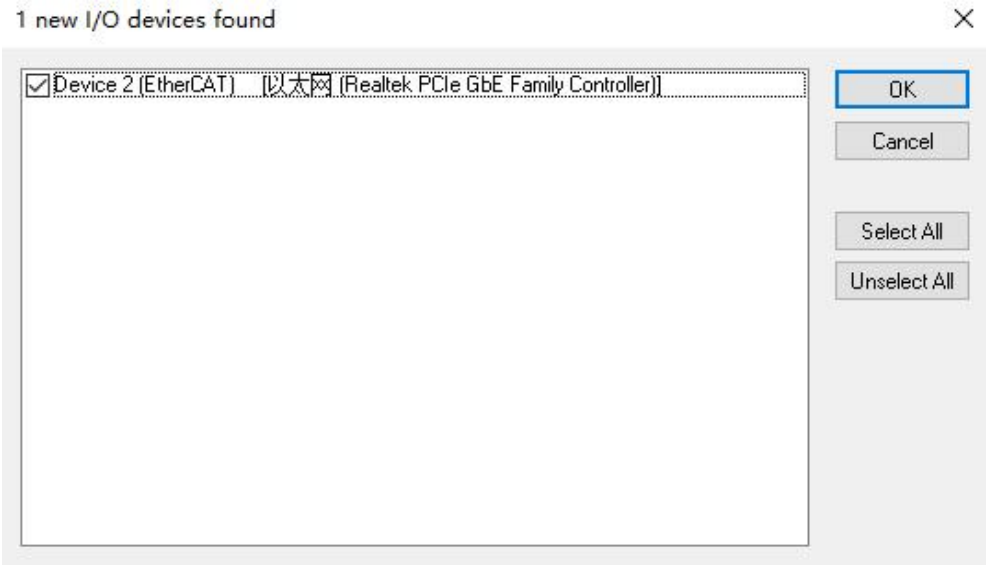
4、scanner

a. After creating the project, right-click the Scan option under I / O-> Devices to scan the station device, as shown in the figure

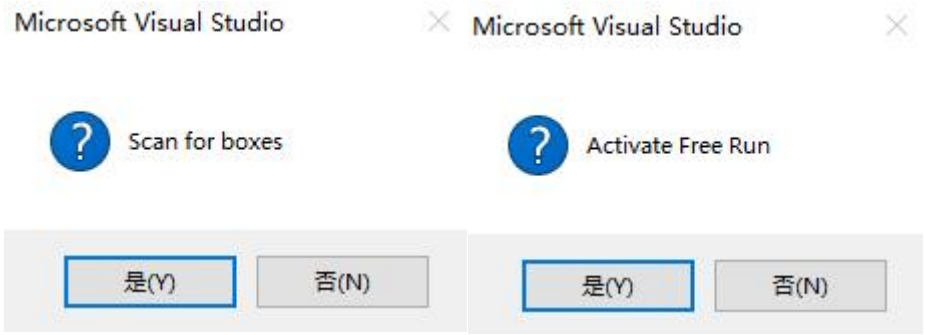


below.

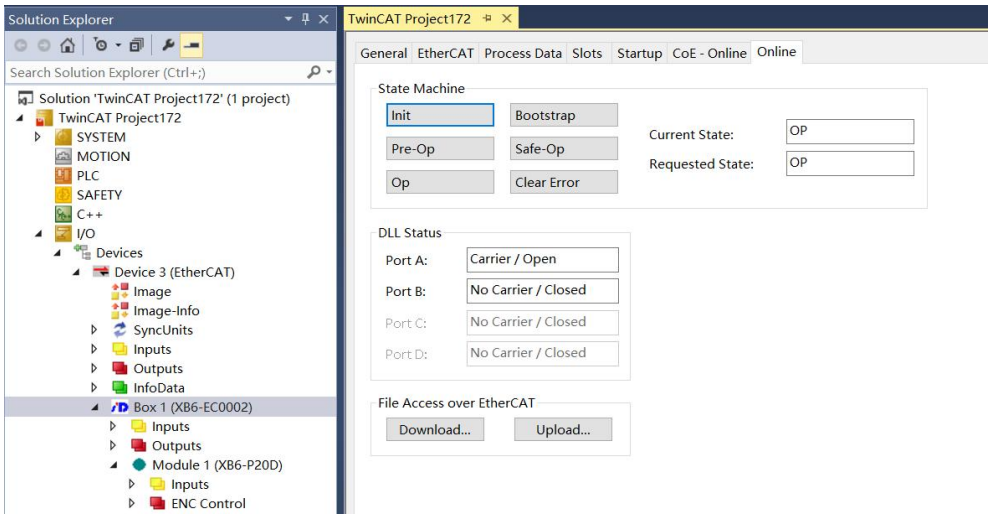
b. Check the Local Connection network card as shown in the figure below.



c. Popup Scan for boxes, click select Yes; popup Activate Free Run, click select Yes, as shown in the figure below.

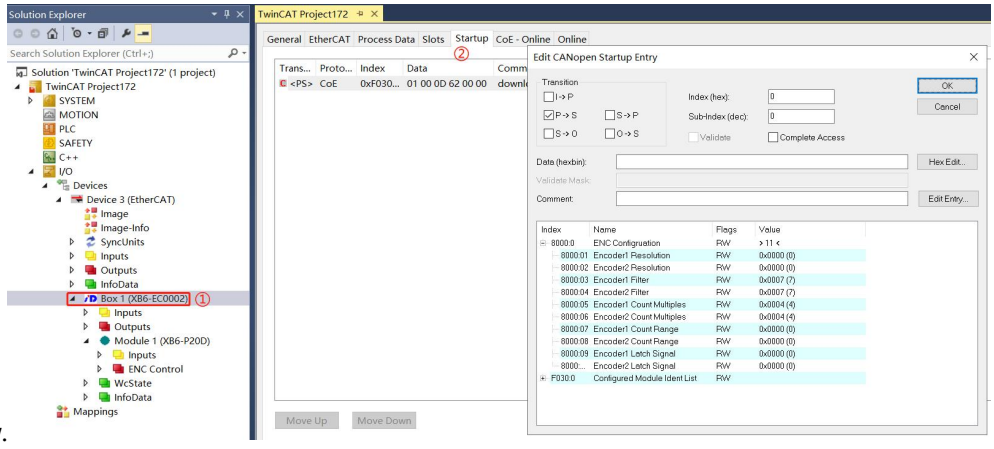


d. After scanning the device, the left navigation can see B ox1 (XB 6-EC0002) and M odule1 (XB 6-P20D), can see the TwinCAT in "Online" at "OP" state, can observe the slave device RUN light is always on, as shown in the figure below.

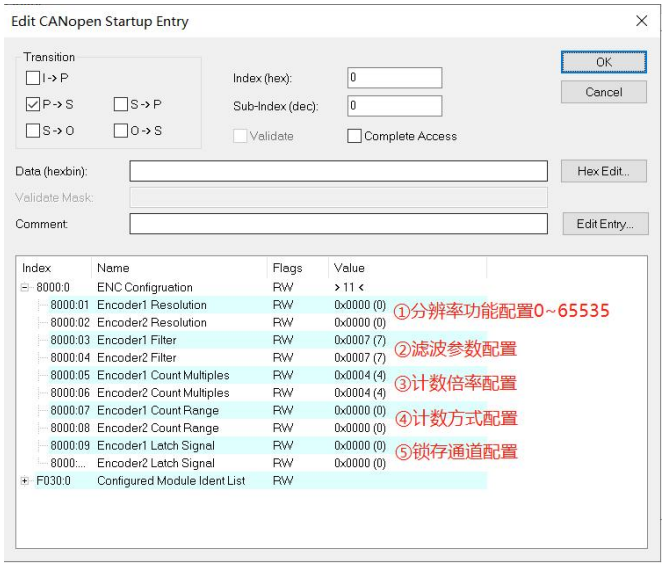


5、 Validate basic functions

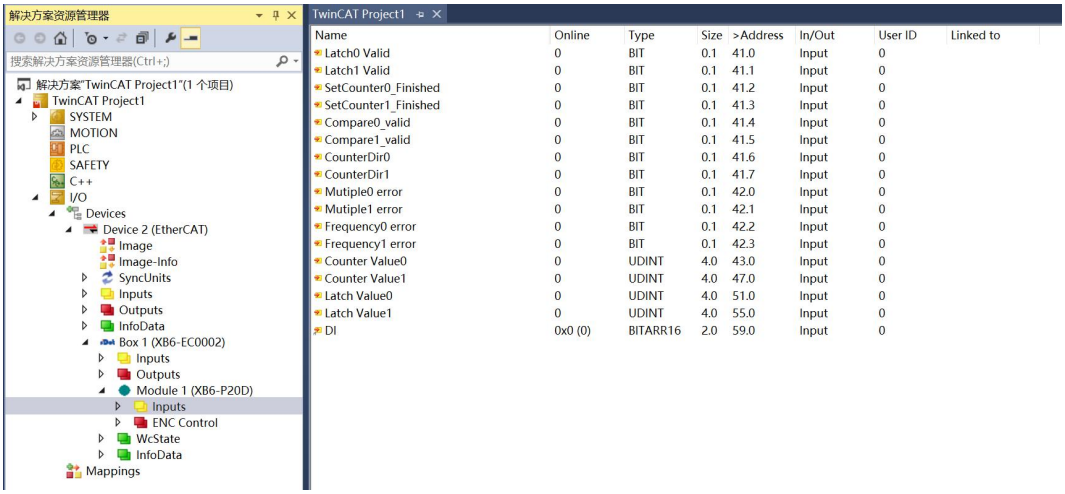
a. Click the left navigation tree "Box 1-> Startup-> New" to enter the configuration parameter editing page, as shown in the figure below.



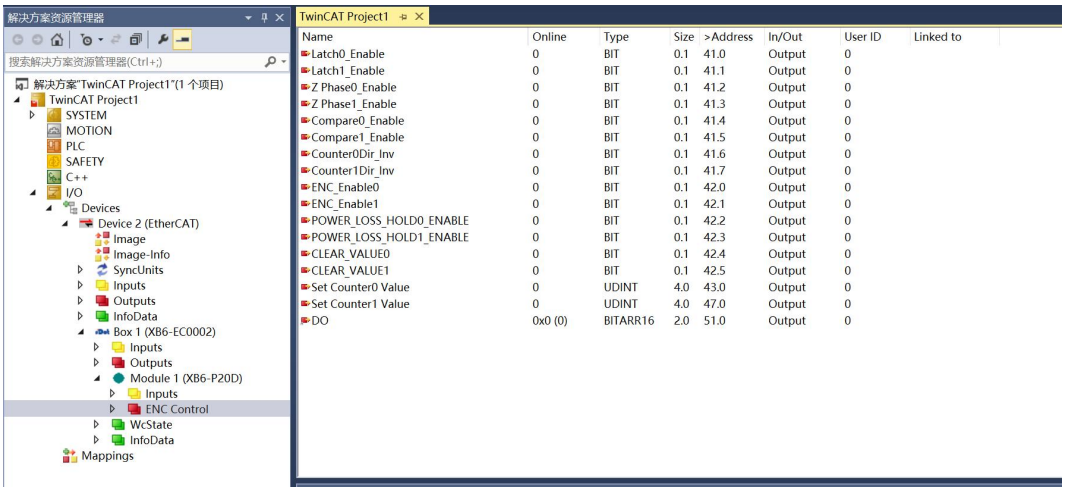
b. In the Edit CANopen Startup Entry popup, click "+" ahead of Index 2000:0 to expand the configuration parameters menu, and you can see 10 configuration parameters. Click any parameter to make relevant configuration, as shown in the figure below.



c. The left navigation tree "Module-> Inputs" displays the upstream data of the encoder input module, used to monitor the status of the encoder, as shown in the following figure.



d. The left navigation tree "Module-> ENC Control" displays the descending data of the encoder input module, used to view the output status of the encoder, as shown in the figure below.



6.4.2 Application in the TIA Portal V14 software environment

1、dead work

- **hardware environment**
  - **Module model XB 6-P20D**
  - **Power supply module, PROFINET coupler, end cover**

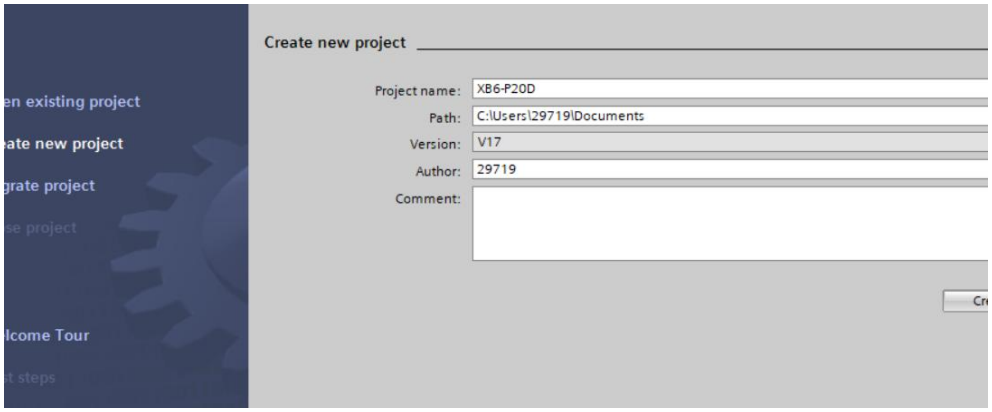
  This description takes the XB 6-P 2000H power supply, the XB 6-PN 0002 coupler as an example
  - **One computer, pre-installed with TIA Portal V14 software**
  - **PROFINET Special shielding cable**
  - **Hand wheel / encoder / orthogonal pulse generator, etc**
  - **One for Siemens PLC**
  - **Switch power supply**
  - **Module installation of guide rail and guide rail fixings**
  - **Device Profile**

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

  Please follow the"4. Installation and disassembly" "5. Wiring"Requires the operation

2、new construction

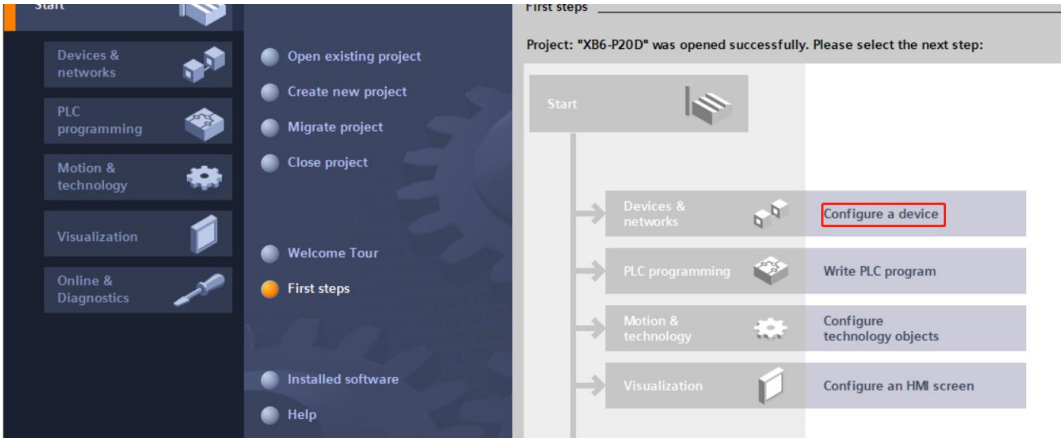
a. Open the TIA Portal V14 software, and click Create a New Project.



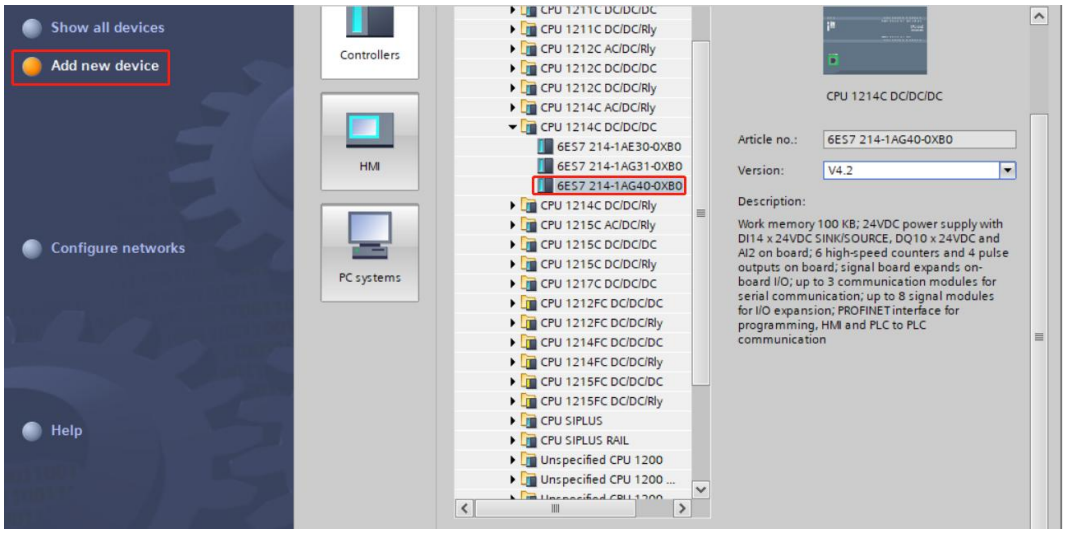
- Project name: custom, can default.
- Path: The Project maintains the path, but to keep the default.
- Version: Keep the default.
- Author: Keep the default.
- Note: Custom, not available.

3、 Add a PLC controller

a. Click on the Configuration Devices.

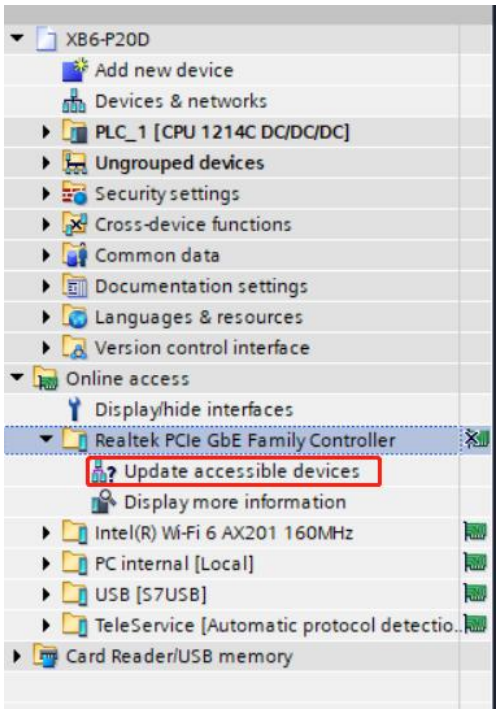


b. Click Add New Device, select the current PLC model, and click Add, as shown in the figure below. After the add completes, you can see that the PLC has been added to the device navigation tree.

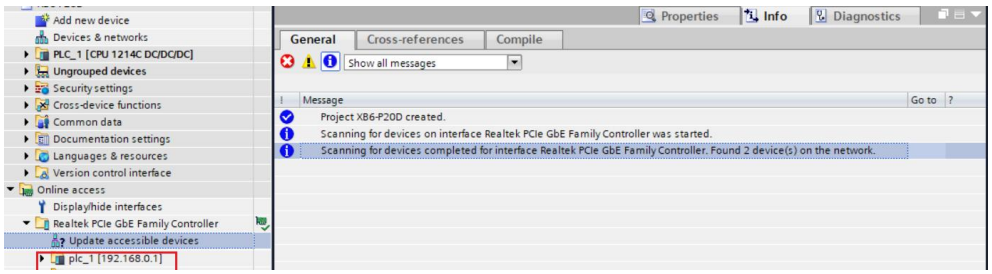


4、 Scan the connection device

a. Click the left navigation tree Online Access-> Update accessible devices, as shown in the figure below.



b. After the update, display the connected slave equipment, as shown in the figure below.



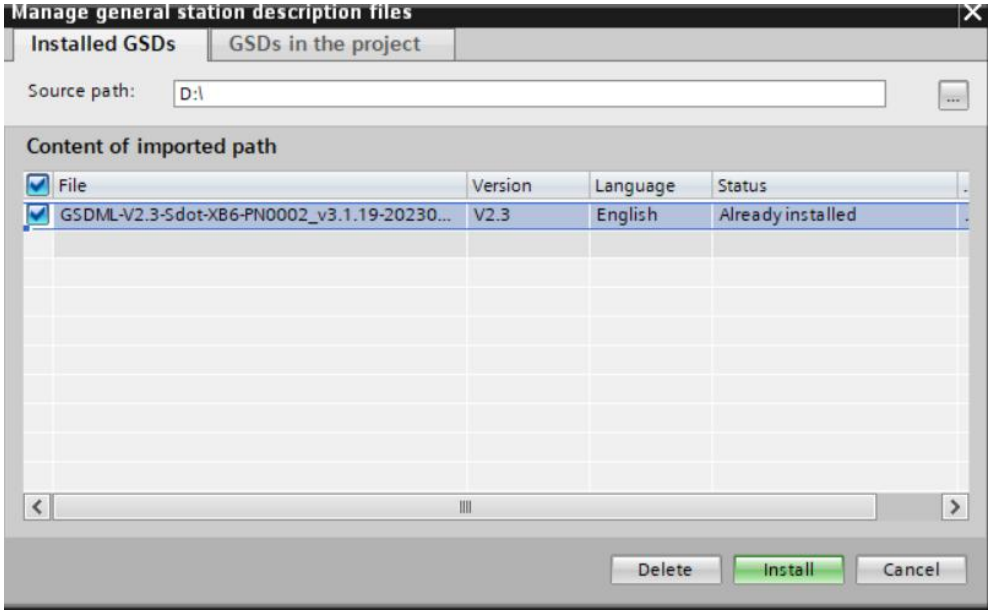
The IP address of the computer must be in the same segment as the PLC. If it is not in the same segment, repeat the above steps after modifying the IP address of the computer.

5、 Add a GSD configuration file

a. In the menu bar, select Options-> Manage Common Site Description File (GSDML) (D).

b. Click the Source Path to select the file.

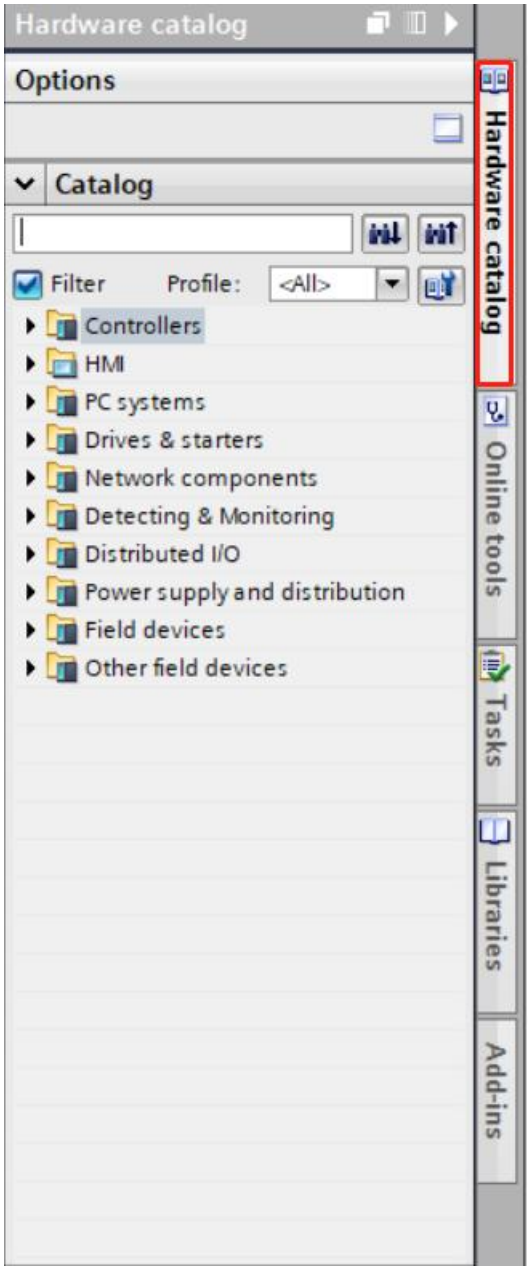
c. Check whether the status of the GSD file to add is Not installed, and click the Install button is not installed. If installed, click Cancel to skip the installation step.



6、 Add from station device

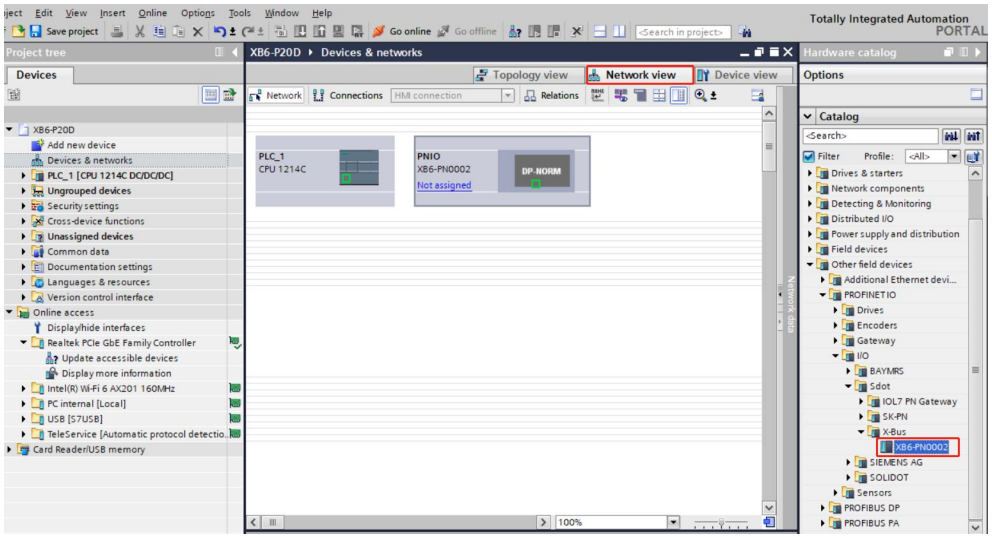
a. Double-click the navigation bar "Devices and Networks" on the left.

b. Click the "Hardware Directory" vertical row button on the right, and the directory display is shown in the figure below.

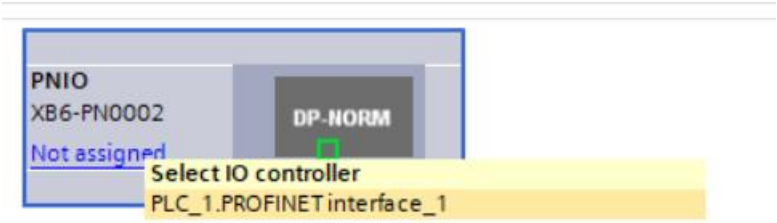


c. Select "Other Field Equipment-> PROFINET IO-> I / O-> Sdot-> X-Bus-> XB 6-PN0002".

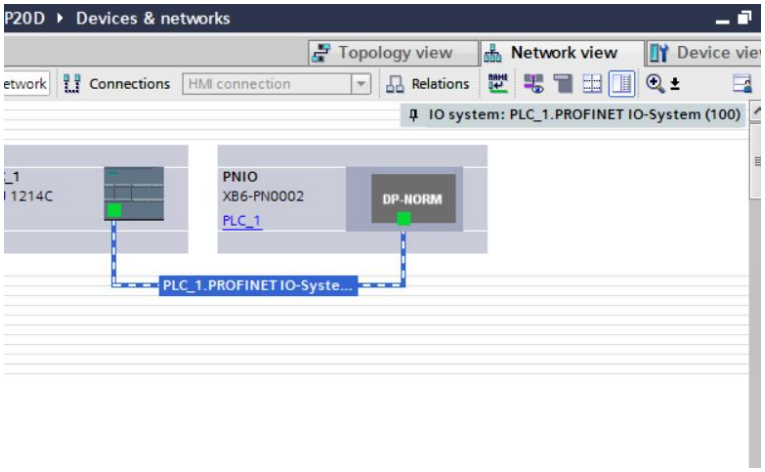
d. Drag or double-click XB 6-PN0002 to Network View, as shown below.



e. Click Unassigned (blue font) on the slave device and select PLC_1.PROFINET Interface _1, as shown in the figure below.

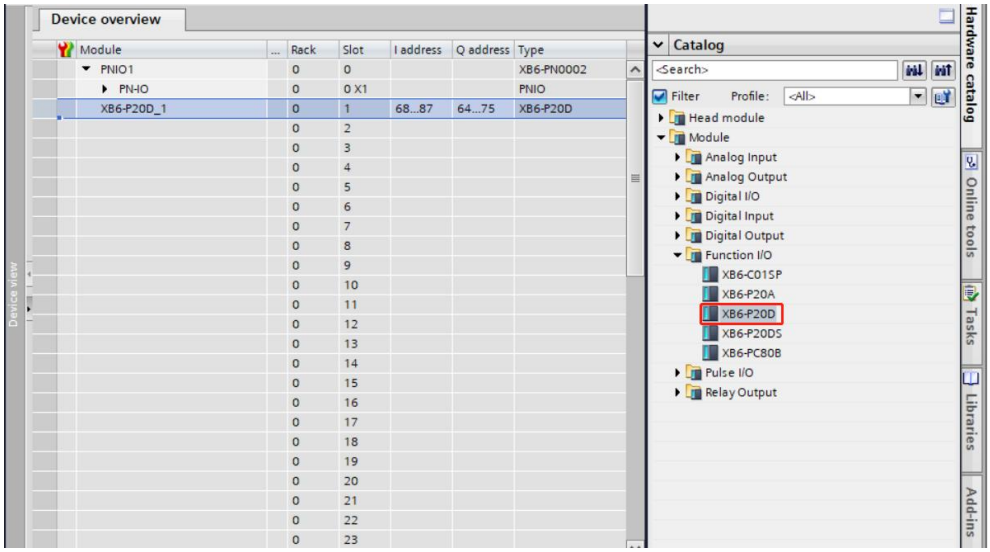


f. After the connection is completed, as shown in the figure below.



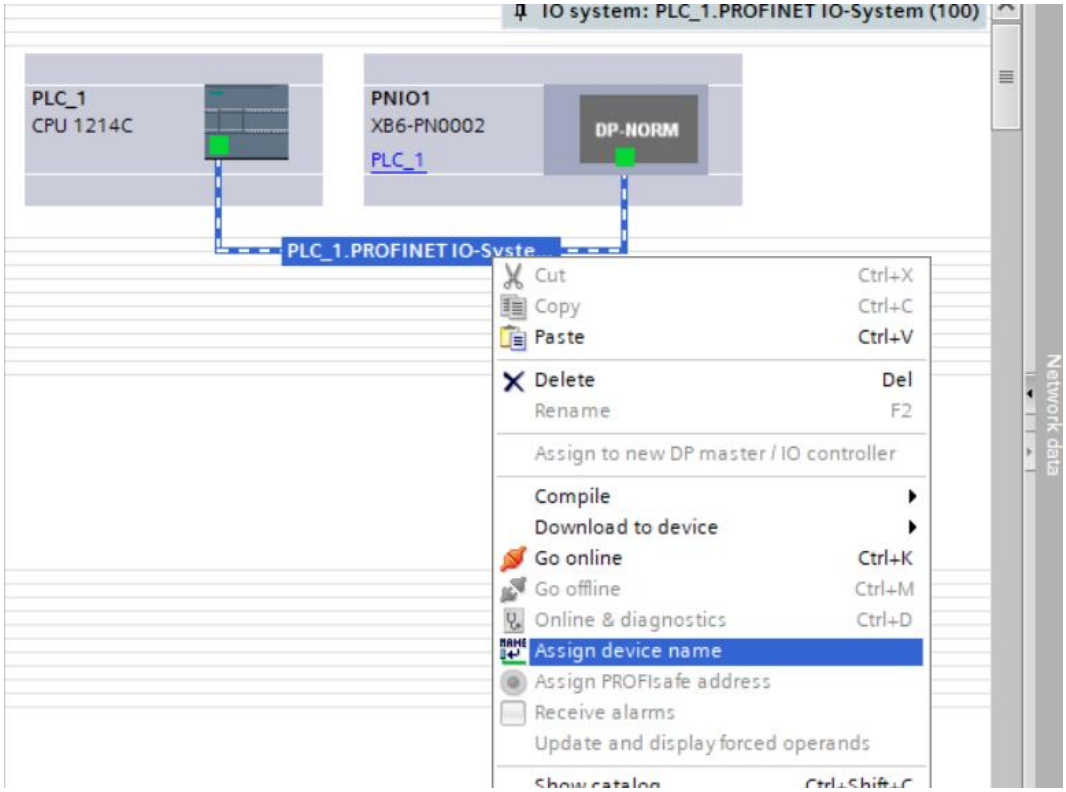
g. Click the device name and rename the device, as shown below.

h. Click Device View to enter the device overview of the coupler. In the right Module directory, add I / O modules according to the actual topology (the order must be consistent with the actual topology, otherwise the communication is unsuccessful), as shown in the following figure.

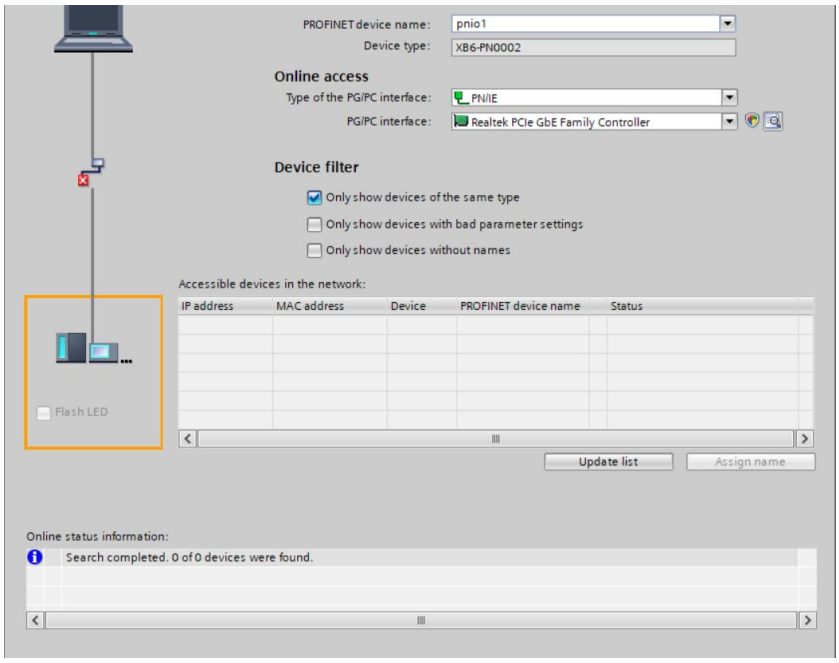


7、 Assign the device name

a. Switch to Network View, right-click the cable for the PLC and PNIO 1, and select Assign Device Name.



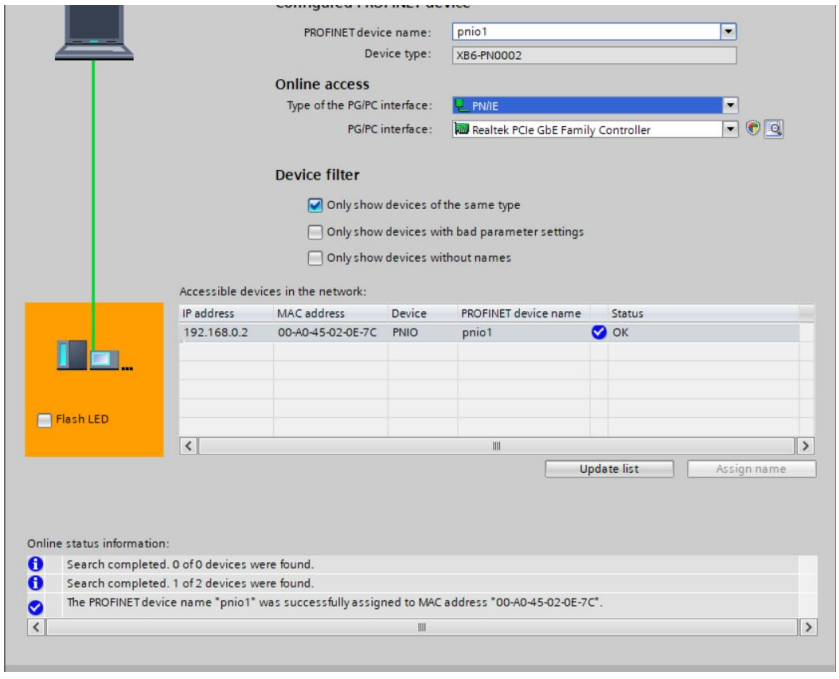
b. The Assign PROFINET Device Name, window appears, as shown in the figure below.



See if the MAC address on the coupler screen is the same as the MAC address for the assigned device name.

- PROFINET Device Name: Name set in Assign slave Station IP Address and Device Name.
- Type of PG / PC interface: PN / IE.
- PG / PC interface: the actual used network adapter.

c. Select From Station Device, click Update List, and click Assign Name. Check whether the status of the accessible nodes in the network is OK, as shown in the figure below.



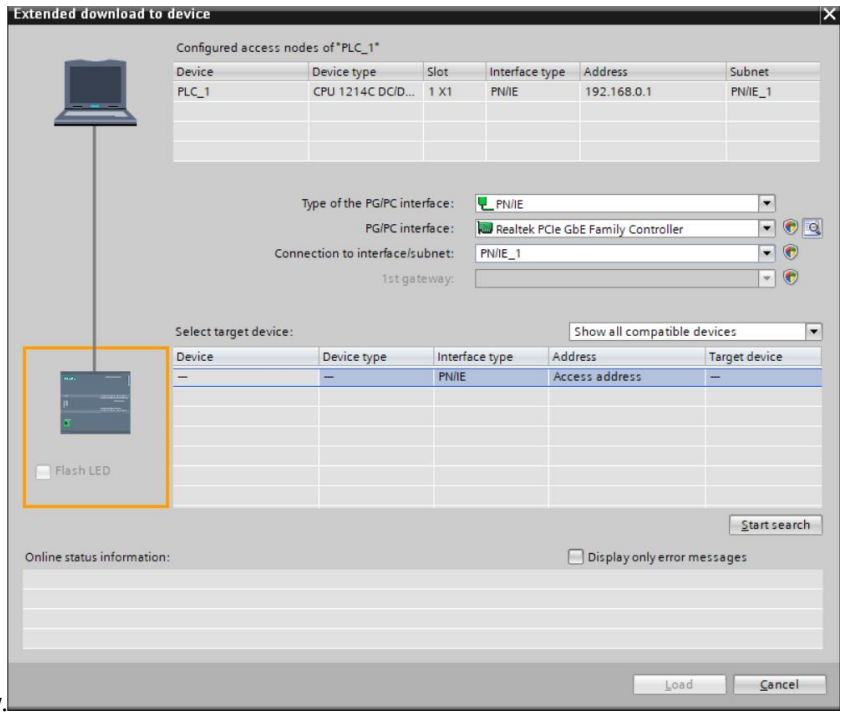
d. Click on Close.

8、 Download the configuration structure

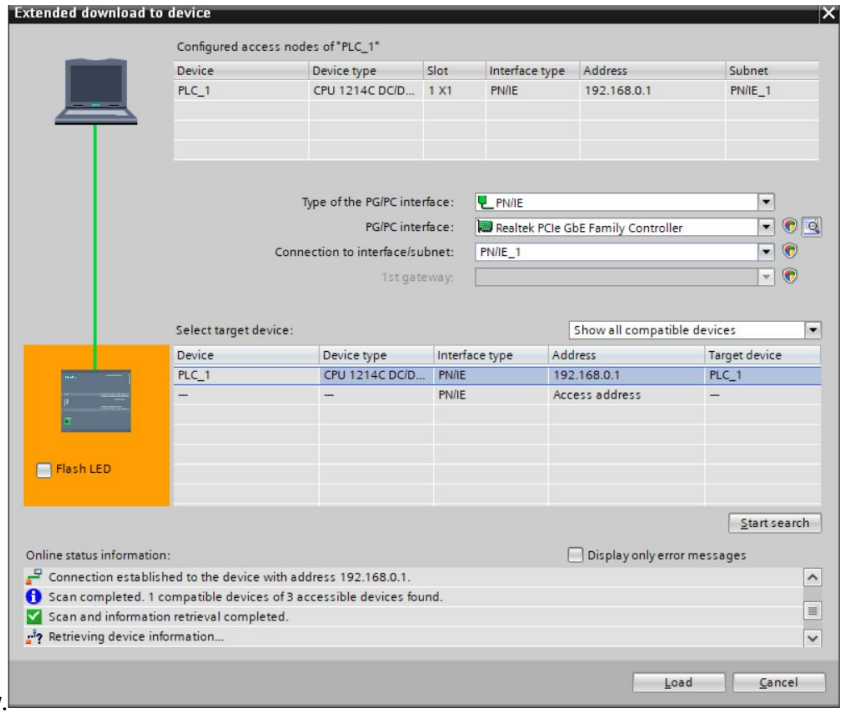
a. In the Network View, select the PLC.

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 shown in the figure below.

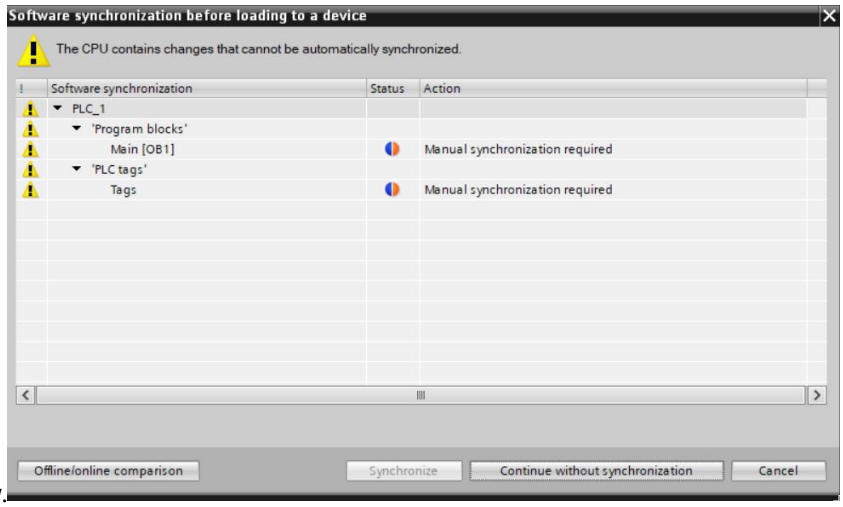


d. Click the Start Search " button, as shown in the figure below.

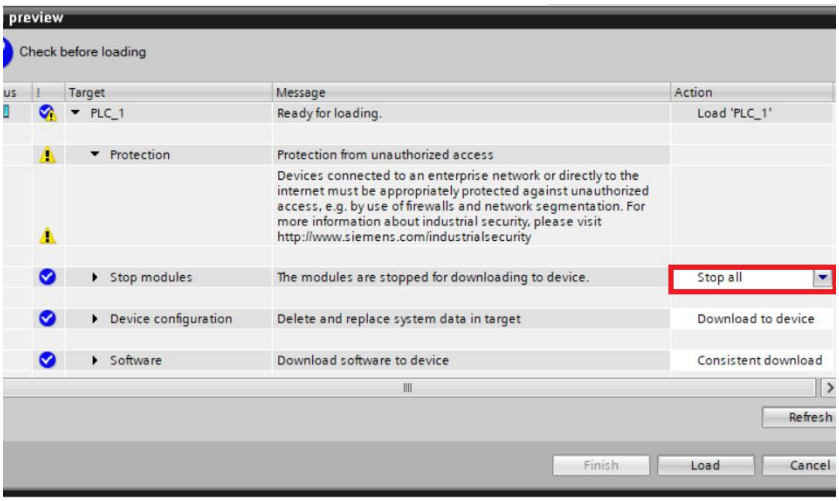


e. Click on Download.

f. Select, Continue without synchronization, as shown in the figure below.



g. Select the Stop it All option.



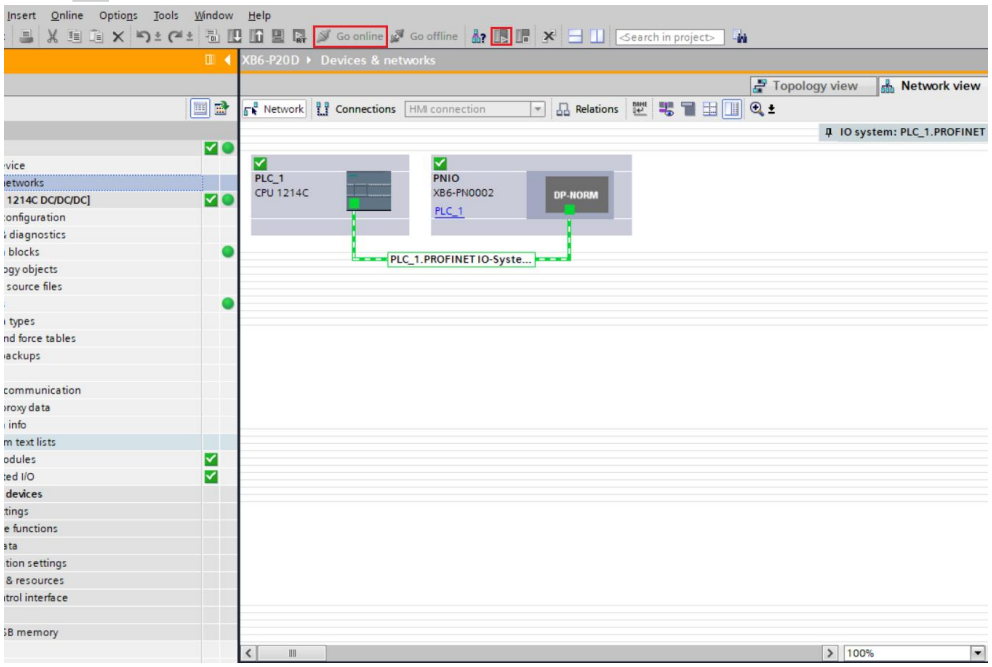
h. Click on the Mount.

i. Click on Finish.

j. Repower the device.

9、communication junction

a. Click the button, then click the Go Online button, as shown in the figure below.



10、 Check the equipment indicator lamp

XB 6-P2000H: The P lamp is always on in green.

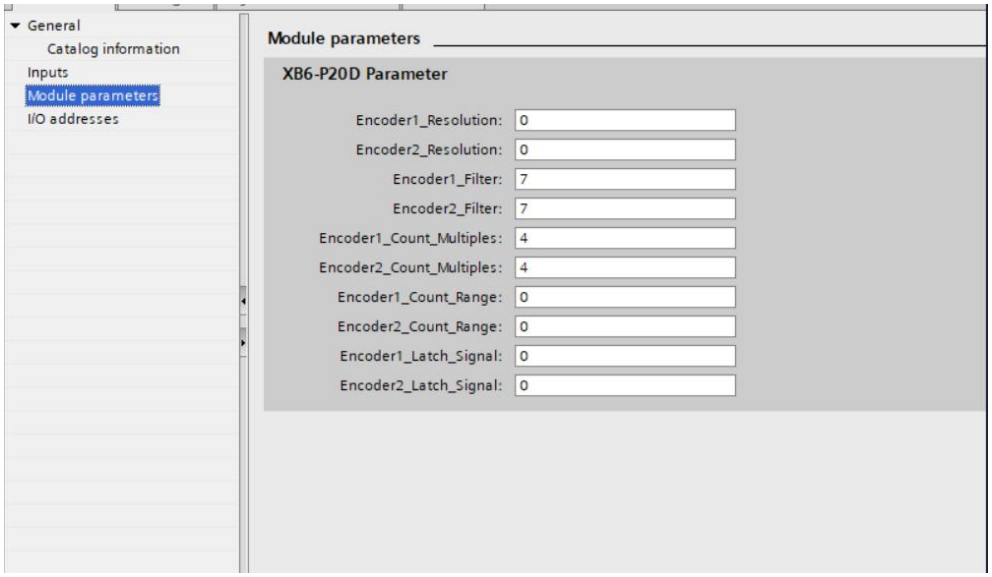
XB 6-PN0002: P light is always green, L light is always on, B light is not on, R light is always on.

I / O module: P is always on and R is always on.

11、 parameter setting

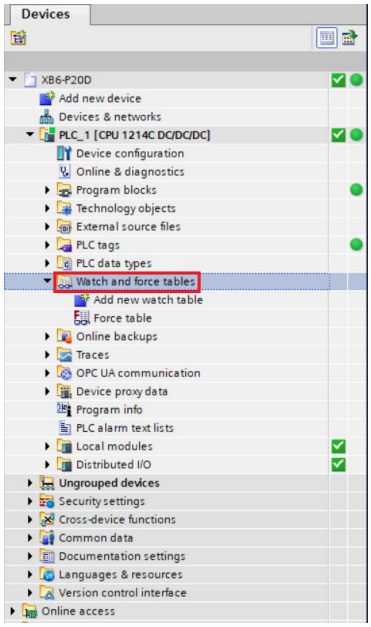
a. Open the Device View.

b. Select the XB 6-P20D module and click "Module Parameters" as shown in the following figure. The parameters can be configured according to the actual use needs. After the configuration is completed, the program can be downloaded again to the PLC. The PLC and the module need to be powered on again.

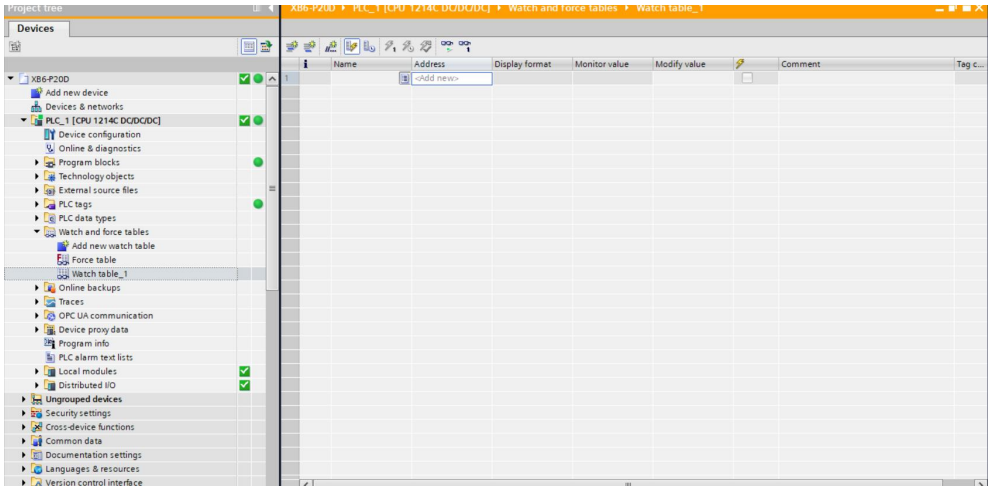


12、 I/O test and verify

a. Expand the item navigation on the left and select the Monitoring and Force Table, as shown in the figure below.



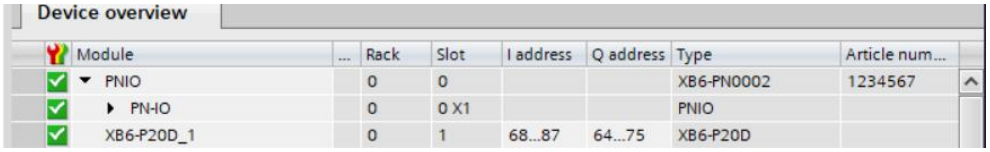
b. Double-click "Add a new monitoring table", and the system adds a new monitoring table, as shown in the following figure.



c.  Click the button.

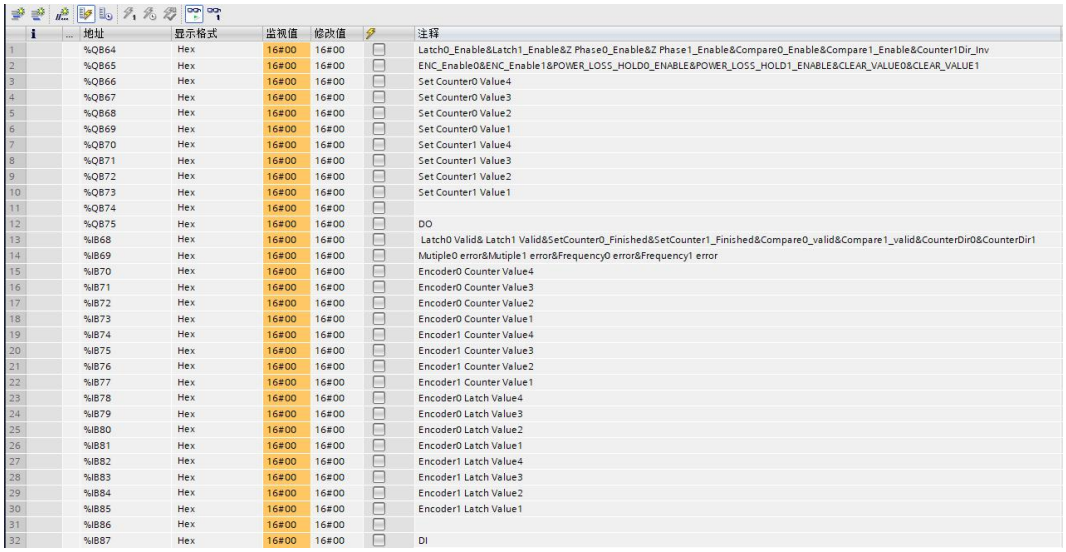
d. Open the Device View and view the channel Q address (the channel address of the output signal) or I address (the input channel address of module XB 6-P 20DS) in the device Overview.

For example, the "Q address" of the XB 6-P20D module is 64 to 75, and the "I address" is 68 to 87, as shown in the figure below.



e. .... In the monitoring table address cell, enter " QB 64.... QB 75 "," I B68I B 87 ", press" Enter key ", the system display is shown in the figure below.

f. Enter IB + I Address in the address bar to monitor the input module.



g. Enter the value in the Modify Value cell, and click Write to view the channel light.

6.4.3 Application in the CODES YS V3.5 software environment

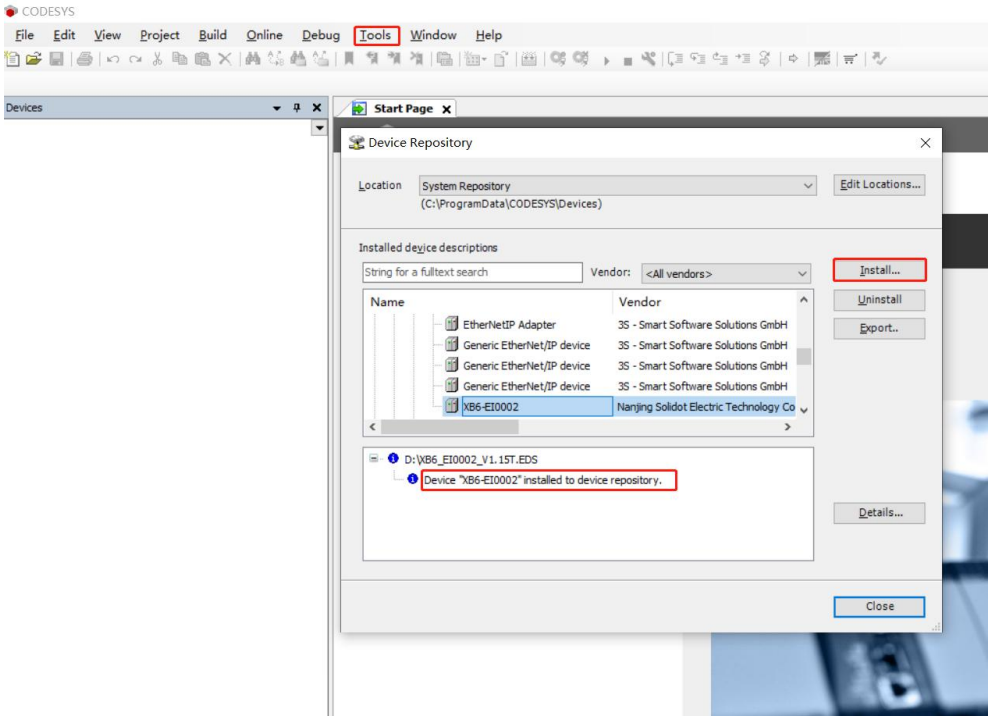
1、dead work

- **hardware environment**
  - **Module model XB6-P20D**
  - **Power supply module, EtherNet / IP coupler, end cover**
    This description takes the XB 6-P2000H power supply, the XB 6-EI 0002 coupler as an example
  - **One computer, pre-installed with CODESYS V3.5 software**
  - **EtherNet / IP special shielded cable**
  - **Hand wheel / encoder / orthogonal pulse generator, etc**
  - **Switch power supply**
  - **Module installation of guide rail and guide rail fixings**
  - **Device Profile**
    Profile acquisition address:https://www.solidotech.com/documents/configfile
- **Hardware configuration and wiring**
  Please follow the"4. Installation and disassembly" "5. Wiring"Requires the operation

2、 Create the project

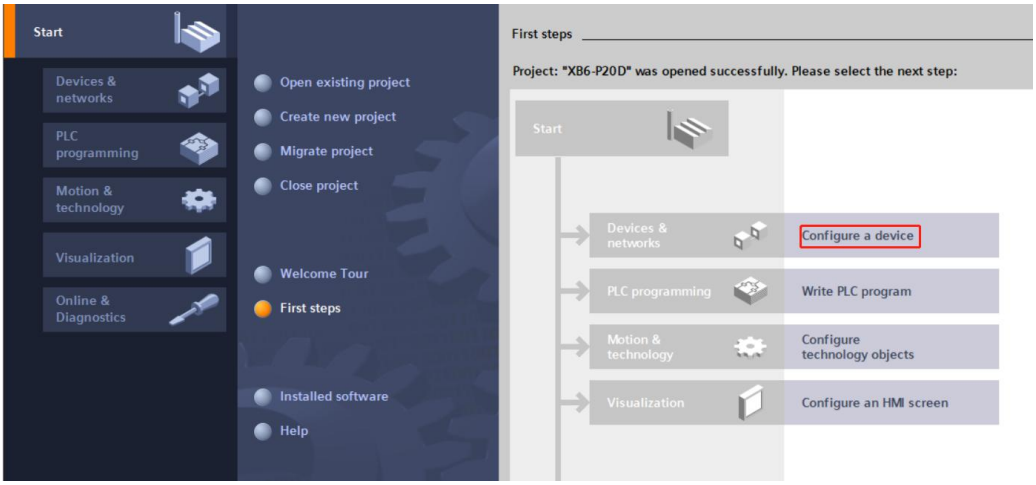
a. Open the CODESYS software and select Tools-> Device Repository.

b. Display the device storage window, click Install, and select the relevant EDS file for installation. Successful installation shows that the device "xxxx" has been installed to the device repository, as shown in the figure below.



3、 Create the project

a. Click File, select New Project, enter the project name, and click OK, as shown in the figure below.

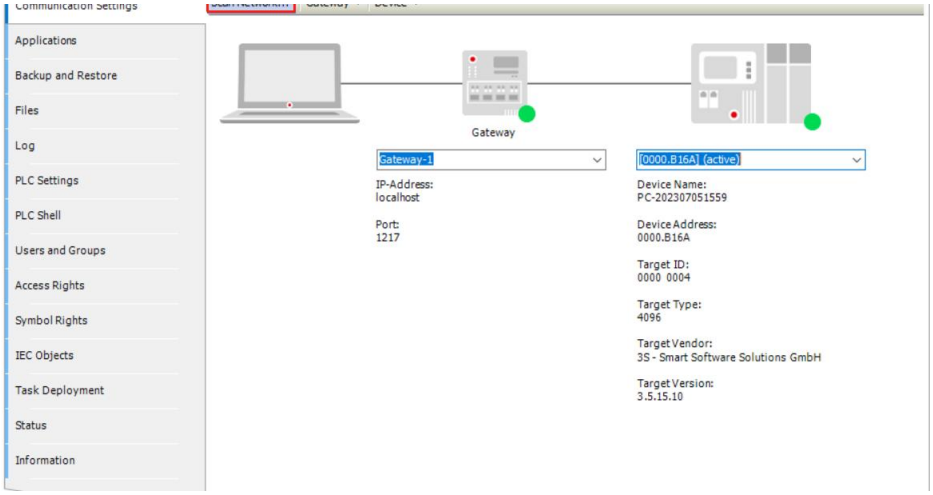


4、 Add the Ethernet

a. Start the PLC using the term 'CODESYS Control Win V3-x64 SysTray'.

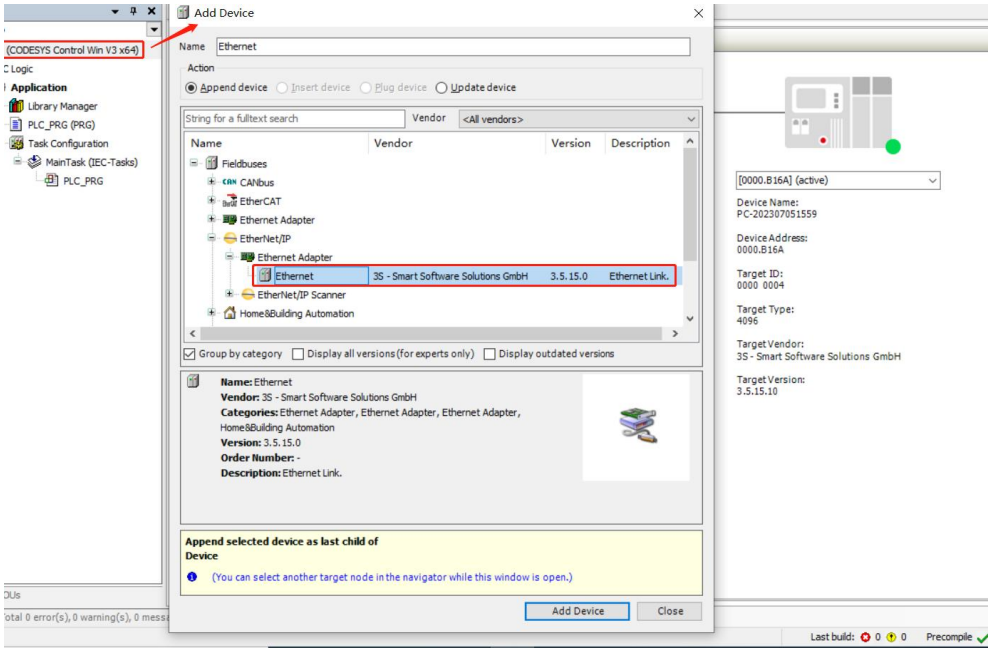
b. Double-click Device (CODESYS Control Win V3 X 64) in the left navigation tree, and click Scan Network.

c. Select device, scan network, network is active, as shown in the figure below.



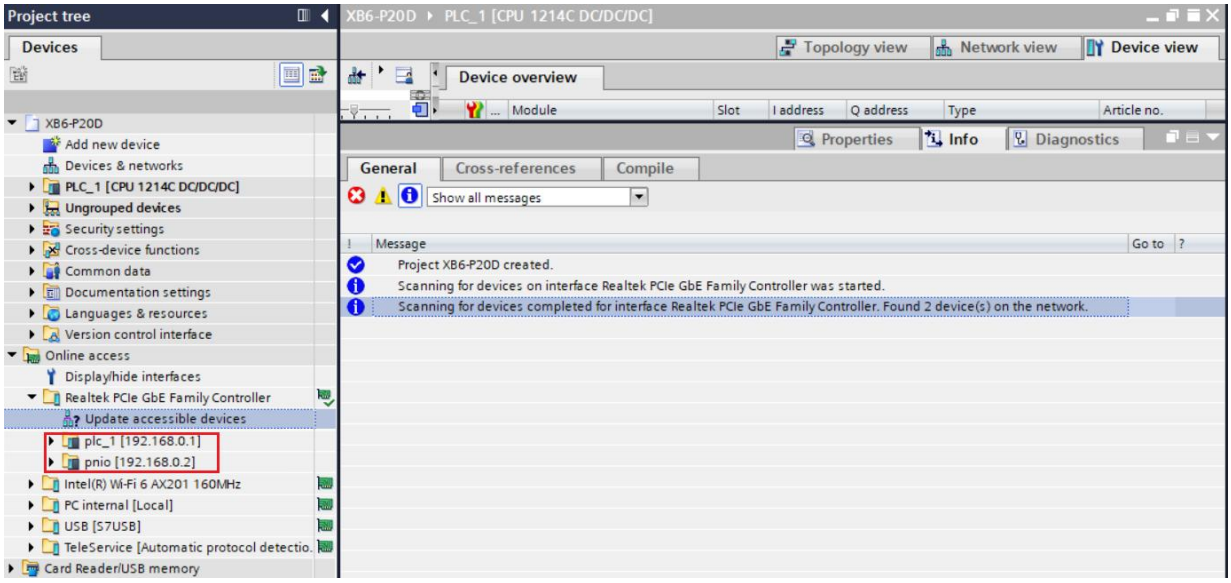
d. Select Device (CODESYS Control Win V3 X 64) in the left navigation tree, and right click select Add Device.

e. Select the "E thernet IP-> Ethernet Adapter-> E thernet", as shown in the figure below.



f. Right-click the Ether net (Ether net) in the left navigation tree, and select Add Devices.

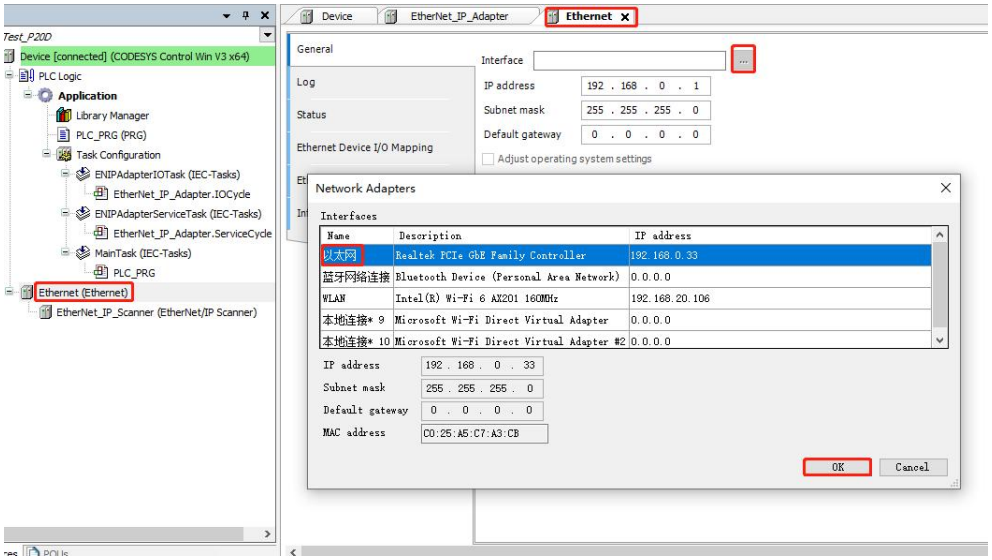
g. Select the Ether net IP-> E thernet IP Scanner-> Ether net / IP S canner, and click Add Device, as shown in the figure below.



5、 Configure "Ethernet IP"

a. Double-click the left navigation tree, Ether net (Ether net), to open the Configuration window.

b. On the Universal tab, click the right side of the Interface, select the network adapter, and finally click OK, as shown in the image below.

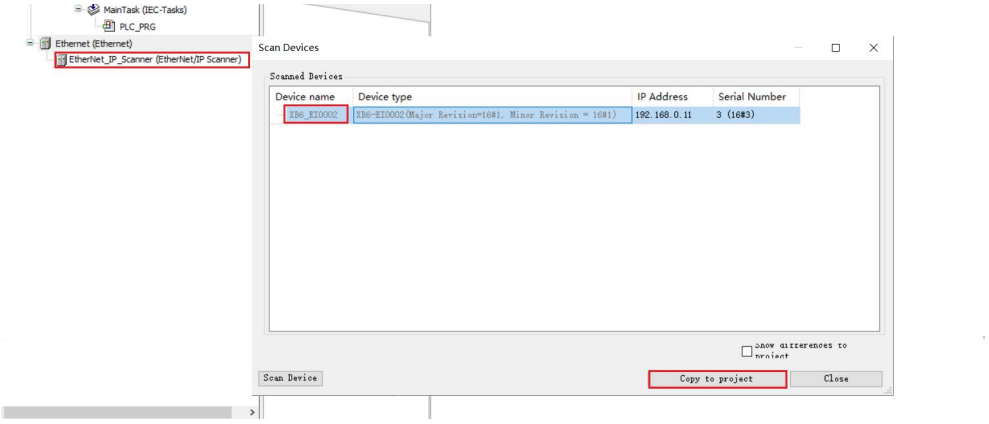


6、 Add equipment

a. Click the Login device.

b. Right-click Ethe r N et _IP_S canner (Ethe r N et / IP S canner) in the left navigation tree, and select Scan Device.

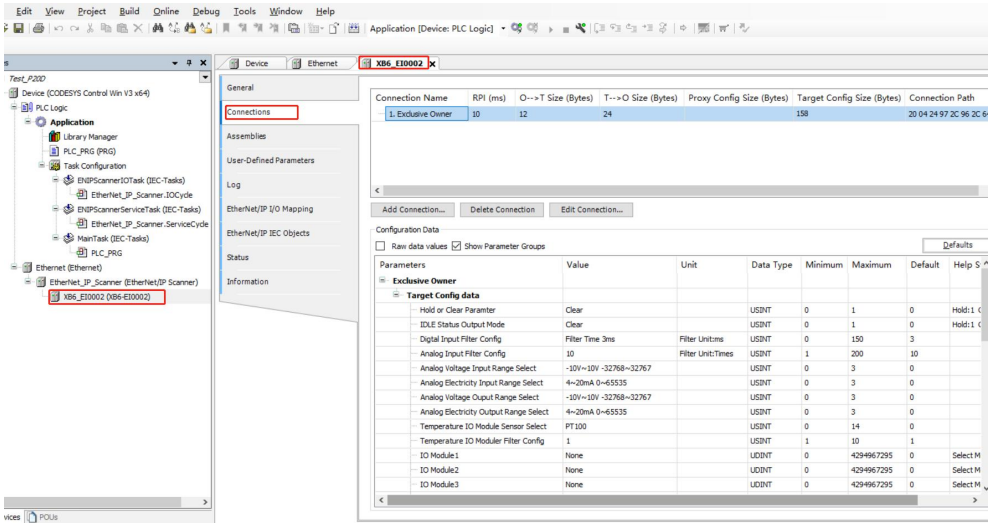
c. When the scan is complete, select XB 6 _ E I 0002 and click Copy to Project, as shown in the figure below.



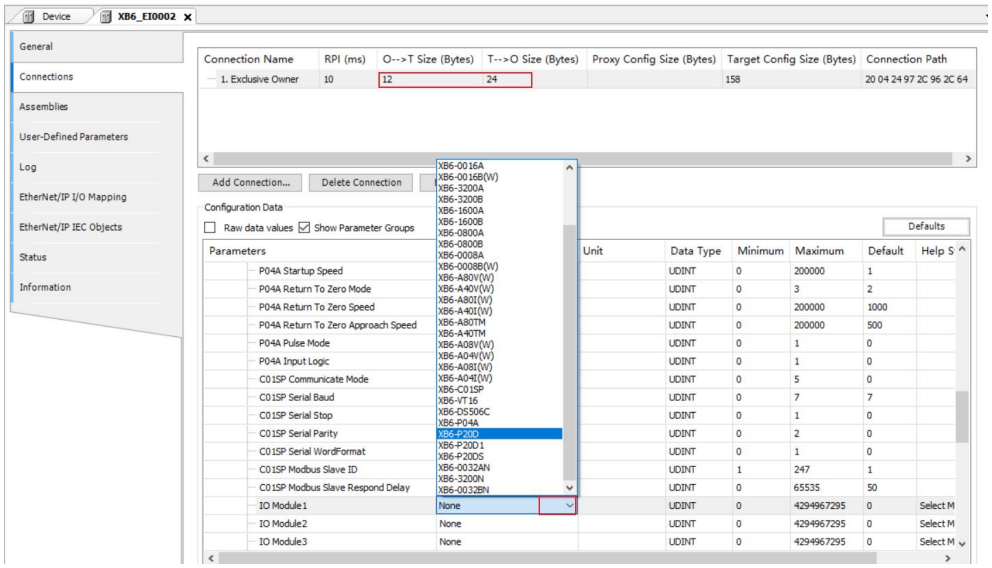
7、 Parameter settings and I / O module addition

The parameter setting function is used to configure configuration uplink data, downlink data, digital quantity emptying holding, input filtering, analog range, configuration configuration, etc.

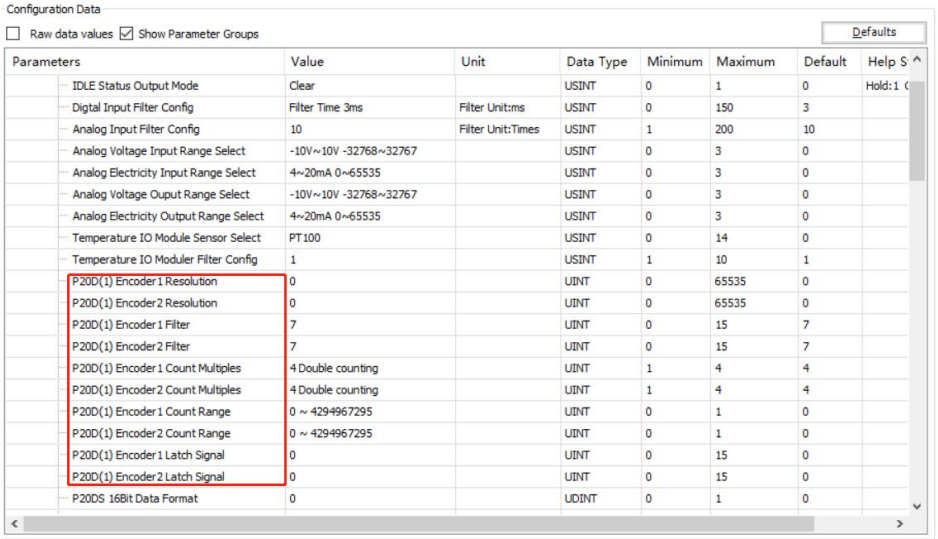
a. Double-click the device to open the Device Configuration window and switch to the Connect page, as shown in the figure below.



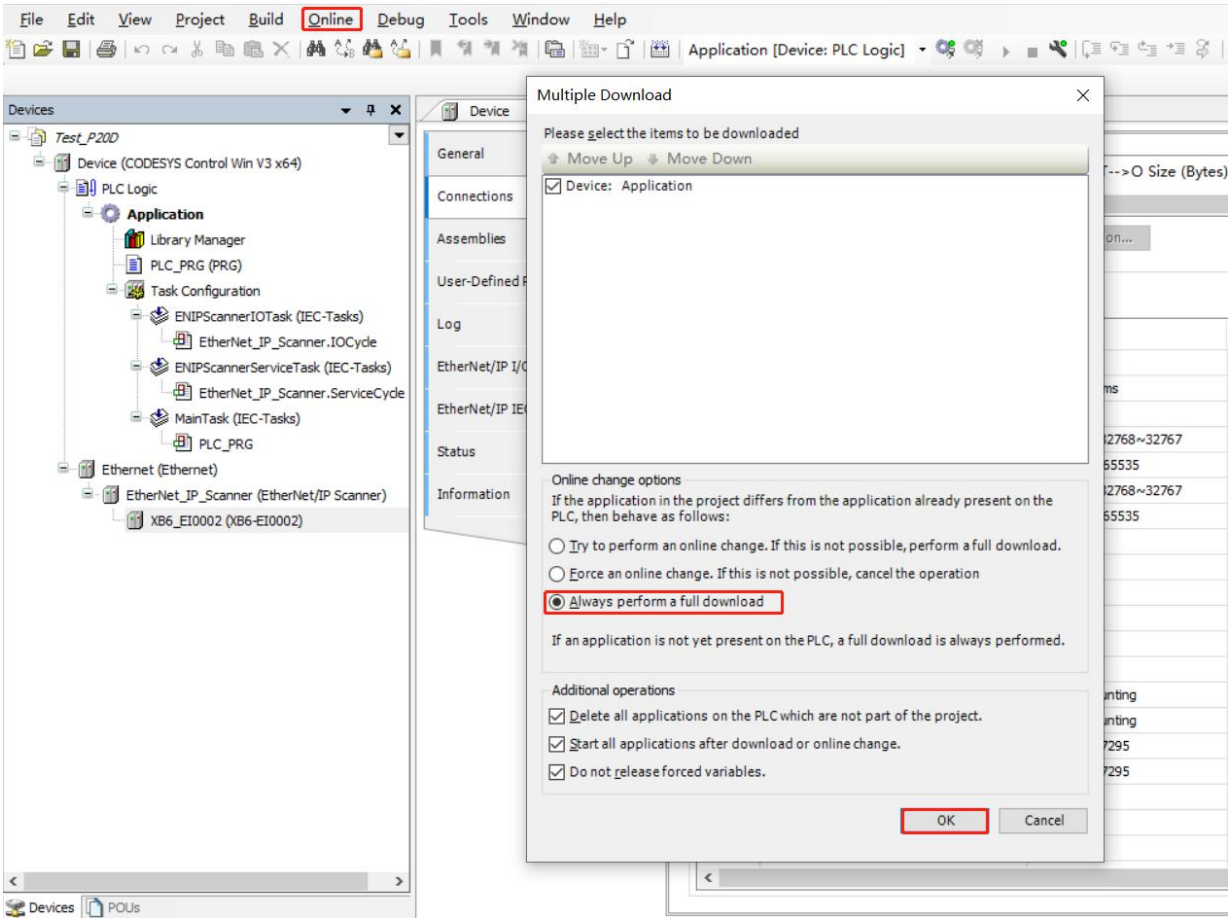
b. Modify the parameter value to add the I / O module in order according to the system configuration, as shown in the figure below.



c. The configuration parameter setting area of the XB 6-P20D module, as shown in the following figure.



d. Click the menu bar "Online-> Multiple Download", display the multiple download window, select "Always Do Full Download", and click "OK", as shown in the figure below.



e. After the download, click, system online.

8、 Check the equipment indicator lamp

XB 6-P2000H: P lamp, green always light.

XB 6-EI0002: P lamp is always green, L lamp is always on, E lamp is not on, N lamp is always on.

I / O module: P is always on and R is always on.

9、 Data monitoring

a. Click the button, log out, and switch to the E ther N et / IPI / O Mapping tab.

b. In the lower right drop-down list, select Enabling 1 mode.

c. Click Login, and the monitoring page is shown in the figure below.