



User Manual

用户手册



Storm67 Series Remote IO module

PROFINET_RT Protocol

ETHERNET/IP Protocol

CC-LINK IE FIELD BASIC Protocol

ETHERCAT Protocol

Version Information

Version Number	Modification Date	Version Description	Modifier
V1.00	2024.04.20	Release version	Liu Xiaofeng

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Document Usage Instructions

This document outlines the product's functional specifications, installation, operation, and settings, as well as information related to network protocols. This document is intended for use by well-trained electrical automation engineers only.

Patent Information

The designer of this product has obtained patent protection for its appearance and technical implementation methods. Any attempt to copy, imitate, or reverse engineer it may violate the law.

Safety Matters

This product is a professional equipment for industrial use and can only be operated by personnel with electrical operation experience. Before use, please carefully read this manual and follow the instructions to avoid causing personal injury or product damage.

This product is designed to meet the IP67 protection level.

Software Download

Please log in to the official website of Wuxi Lekko Automation Technology Co., Ltd. at www.latcos.cn to download.

CATALOGUE

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1.Product Overview

Preface

This product is a professional equipment designed for industrial use. Only personnel with electrical operation experience can operate it. Before use, please carefully read this manual and follow the instructions to avoid causing personal injury or product damage.

Product Features:

- IP67 protection rating

Suitable for harsh industrial environments

- Compact size

Suitable for applications with limited space

- Fast speed

Based on high-performance communication chips

- Easy to diagnose

Innovative channel indicator design, close to the channels, the channel status is clearly visible, making detection and maintenance convenient

- Rich communication protocols

Main industrial communication protocols include PROFINET, EtherCAT, EtherNet/IP, CC-Link IE Field Basic, etc.

- Simple wiring

Simple and quick wiring using standard cables



2. Naming Rules

2.1 Naming Rules

STM **0808P-PN**

(1)
(2)
(3)
(4)
(5)
(6)

Number	Meaning	Explanation
(1)	Series Number	STM:STORM67 系列模块的简称
(2)	I/O Type	None: Digital quantity
(3)	Input Points	00:0 channel input, 08:8 channel input, 16:16 channel input
(4)	Output Points	00:0 channel output, 08:8 channel output, 16:16channel output
(5)	Signal Type	P:PNP, N:NPN
(6)	Bus Protocol	PN:PEOFINET、 EA:EtherCAT、 EP:EtherNet/IP CE:CC-Link IE Field Basic

Table 1 Hardware Parameters of Coupler

2.2 Model list

Model	Product Description
STM1600P-PN	16-channel digital input module, PNP, PROFINET
STM0808P-PN	8-channel digital input/output module, PNP, PROFINET
STM0016P-PN	16-channel digital output module, PNP, PROFINET
STM1600N-PN	16-channel digital input module, NPN, PROFINET
STM0808N-PN	8-channel digital input/output module, NPN, PROFINET
STM0016N-PN	16-channel digital output module, NPN, PROFINET
STM1600P-EP	16-channel digital input module, PNP, EtherNet/IP
STM0808P-EP	8-channel digital input/output module, PNP, EtherNet/IP
STM0016P-EP	16-channel digital output module, PNP, EtherNet/IP
STM1600N-EP	16-channel digital input module, NPN, EtherNet/IP
STM0808N-EP	8-channel digital input/output module, NPN, EtherNet/IP
STM0016N-EP	16-channel digital output module, NPN, CC-Link IE Field Basic
STM1600P-CE	16-channel digital input module, PNP, CC-Link IE Field Basic
STM0808P-CE	8-channel digital input/output module, PNP, CC-Link IE Field Basic
STM0016P-CE	16-channel digital output module, PNP, CC-Link IE Field Basic
STM1600N-CE	16-channel digital input module, NPN, CC-Link IE Field Basic
STM0808N-CE	8-channel digital input/output module, NPN, CC-Link IE Field Basic
STM0016N-CE	16-channel digital output module, NPN, EtherCAT-Link IE Field Basic
STM1600P-EA	16-channel digital input module, PNP, EtherCAT
STM0808P-EA	8-channel digital input/output module, PNP, EtherCAT
STM0016P-EA	16-channel digital output module, PNP, EtherCAT
STM1600N-EA	16-channel digital input module, NPN, EtherCAT
STM0808N-EA	8-channel digital input/output module, NPN, EtherCAT
STM0016N-EA	16-channel digital output module, NPN, EtherCAT



3. Product Specifications

3.1 General parameters

Communication interface parameters	
Bus protocol	PROFINET、EtherCAT、EtherNet/IP、CC-Link IE Field Basic
Bus interface	2*M12,4PIN,D-Code
Electrical isolation	500V
Data transmission medium	5 categories or more of UTP or STP (STP is recommended)
Transmission distance	$\leq 100\text{m}$ (length of a single network cable)
Technical Specifications	
Configuration method	Through the programming software corresponding to the main station
Power interface	2*M12,5PIN,L-Code
Power supply	18~36VDC
U_S Total current	Max:16A
U_S Consumption current	$\leq 40\text{mA}$
U_L Total current	Max:16A
U_L Consumption current	25mA + sensor power supply current + load output current
Electrical isolation between GND_S and GND_L	Yes
Weight	Approximately 520g
Size	200×60×30mm
Working temperature	-25~70°C
Storage temperature	-40~85°C
Relative humidity	5% - 95% no condensation
Protection level	IP67

3.2 Input and Output Electrical Components

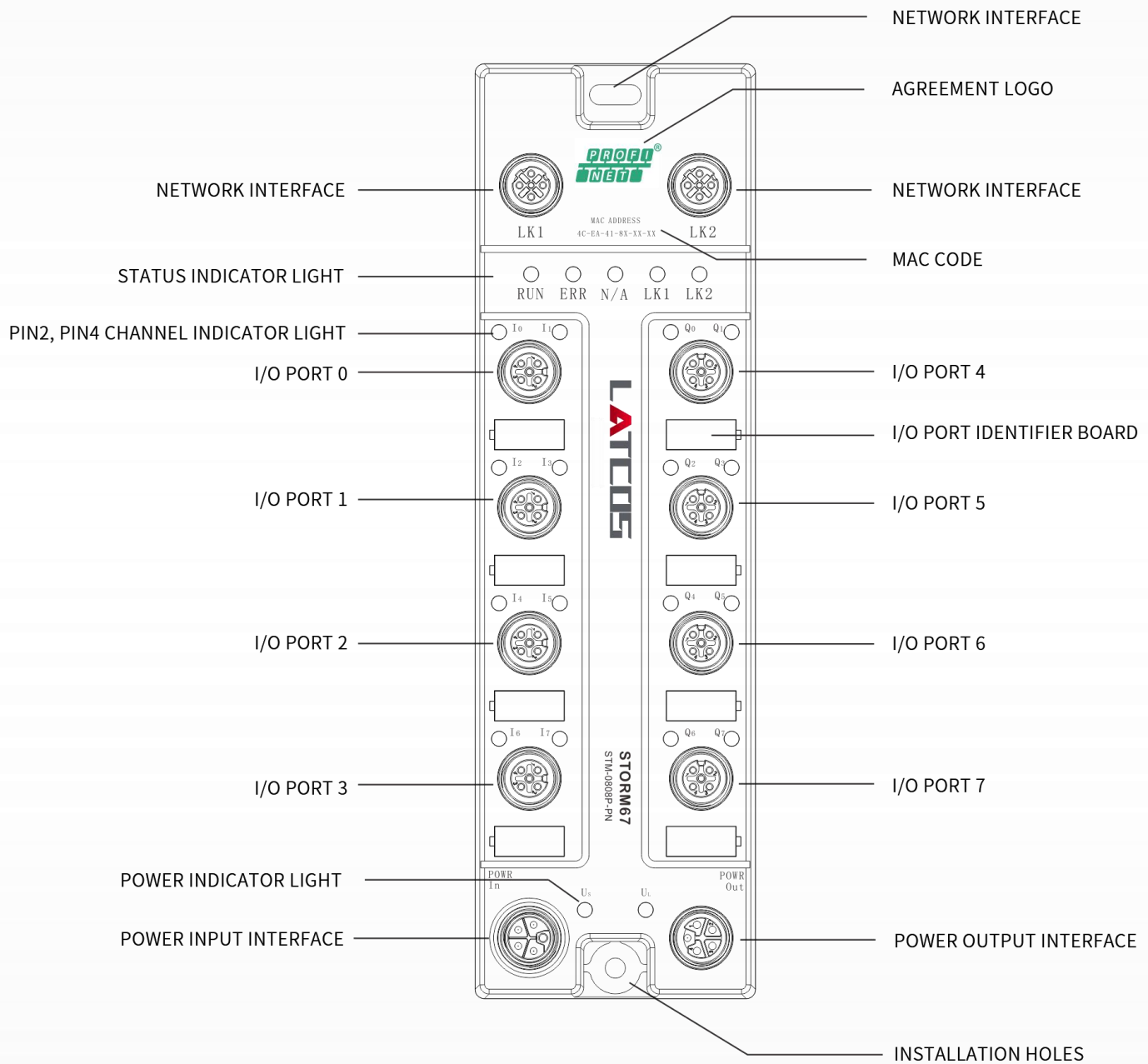
Product model	STM1600P-XX	STM1600N-XX	STM0808P-XX	STM0808N-XX	STM0016P-XX	STM0016N-XX
Digital quantity input						
Rated voltage	24VDC(±25%)				-	
Counting	16		8			
Input interface	8*M12,5PIN,A-Code					
Signal type	PNP	NPN	PNP	NPN		
"0" signal voltage	-3~+3V	15~30V	-3~+3V	15~30V		
"1" signal voltage	15~30V	-3~+3V	15~30V	-3~+3V		
Input filtering	3ms					
Input current	4mA					
Power supply current of the sensor	MAX:2A(From U _L)					
Isolation method	Optical isolation					
Isolation withstand voltage	500V					
Channel indicator light	Green LED lamp					
Digital output						
Rated voltage	-		24VDC(±25%)			
Points			16		8	
Output interface			8*M12,5PIN,A-Code			
Signal type			PNP	NPN	PNP	NPN
Load type			Resistive load, inductive load			
Single-channel rated current			MAX:500mA(From U _L)			
Total output current			MAX:4A(From U _L)		MAX:8A(From U _L)	
Port protection			Overcurrent, overload, and short-circuit protection			
Isolation method			Optical isolation			
Isolation withstand voltage			500V			
Channel indicator light			Green LED lamp			



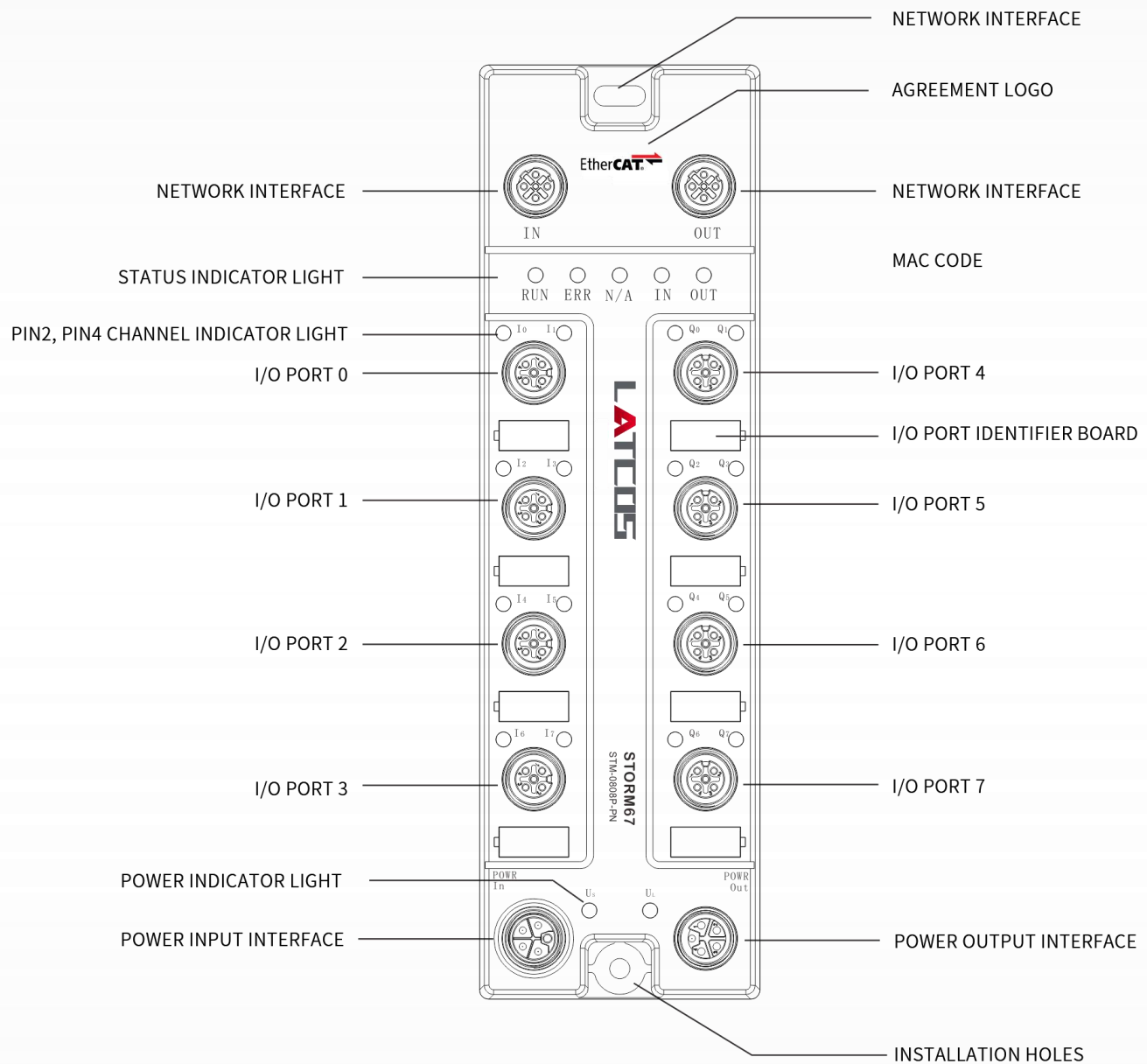
4. Product Panel Introduction

4.1 Module Structure

Introduction to each part of the module: STM-XXXXX-PN/EP/CE



Introduction to Each Part of the Module: STM-XXXXX-EA



4.2 LED indicator function

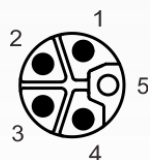
Logo	Name	Color	Status	Description
RUN	Operating status indicator light	green	Constantly on	Module is operating normally
			Turn off	Module is not operating
ERR	System alarm indicator light	red	Constantly on	Module has malfunctioned
			Turn off	System is operating normally or not powered on
N/A	-	-	-	-
* ₁ LK1 (IN)	Network indicator light 1	green	Constantly on	Establish network connection
			Flashing	Network connection with data interaction
			Turn off	No data interaction or abnormality
* ₁ LK2 (OUT)	Network indicator light 2	green	Flashing	Establish network connection
			Turn off	Network connection with data interaction
			Constantly on	No data interaction or abnormality
Us	System power indicator light	green	Constantly on	Normal power supply
			Turn off	Module not powered on or abnormal power supply
UL	Load power indicator light	green	Constantly on	Normal power supply
			Turn off	Module not powered on or abnormal power supply
I ₀ ~I _F	Input channel indicator light	green	Constantly on	Signal input on module channel
			Turn off	No signal input or abnormal signal input on module channel
Q ₀ ~Q _F	Output channel indicator light	green	Constantly on	Signal output on module channel
			Turn off	No signal output or abnormal signal output on module channel

*₁ In the PROFINET, EtherNET/IP, and CC-Link IE Field Basic protocols, the identifiers are: LK1, LK2. In the EtherCAT protocol, they are: IN, OUT.

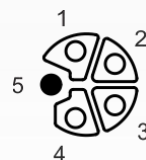
4.3 Electrical connection of the interface

4.3.1 Power interface (M12 L-code)

Power input port definition



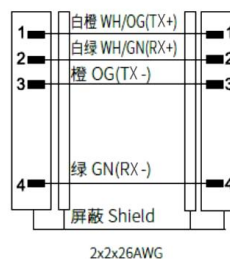
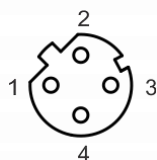
Power output port definition



Pin number	Function	Description	Wire core color
1	US+	+24V (system power supply)	Brown
2	UL-	0V (load power supply)	White
3	US-	0V (system power supply)	Blue
4	UL+	+24V (load power supply)	Black
5	PE	Protective grounding PE	Grey

4.3.2 Network interface (M12 D-code)

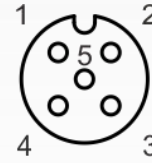
Network interface definition



Pin number	Function	Description
1	TX+	Send data +
2	RX+	Receive data +
3	TX-	Send data -
4	RX-	Receive data -

4.3.3 IO interface (M12 A-code)

IO Interface Definition



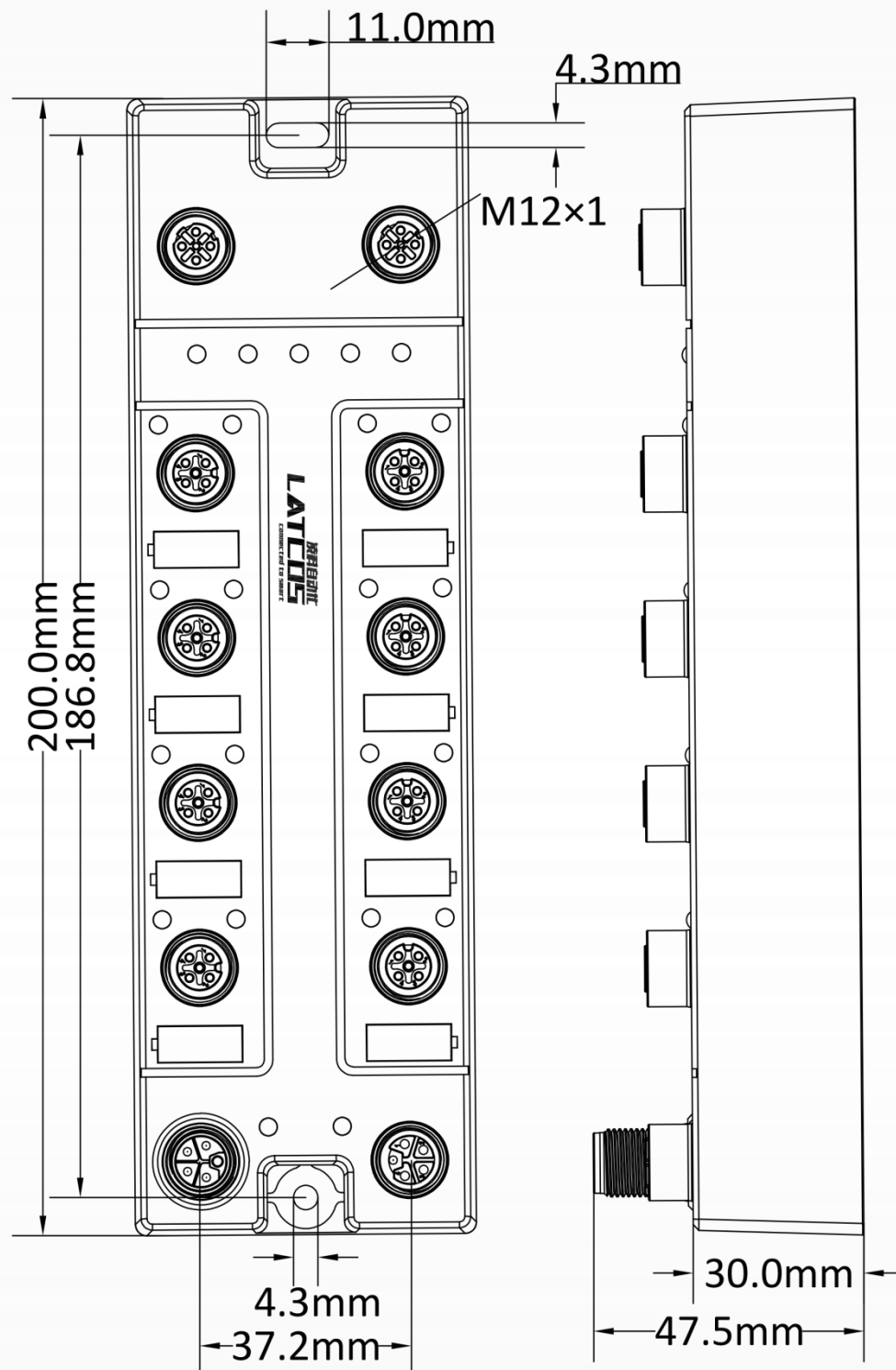
Pin number	Function	Description	Wire core color
1	UL+	+24V (for load power supply)	Brown
2	DI/DO B	Signal input/output B	White
3	UL-	0V (for load power supply)	Blue
4	DI/DO A	Signal input/output A	Black
5	PE	Protective grounding PE	Grey



5. Installation and wiring

5.1 Dimensions drawing of the shape

Shape specifications (unit: mm)



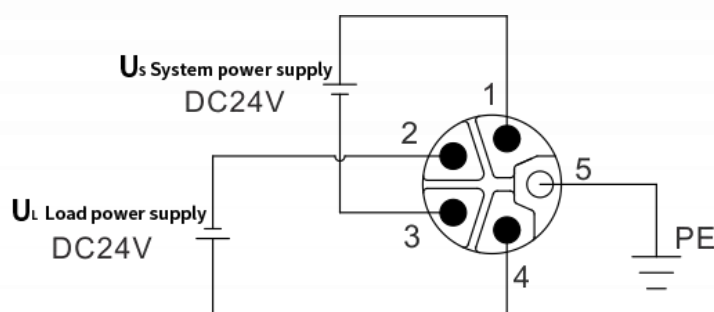
5.2 Installation environment requirements

Please avoid installing in the following locations:

- Areas exposed to direct sunlight
- Locations where the environmental temperature or relative humidity exceeds the specifications of the module
- Areas with corrosive gases, flammable gases
- Areas with acid, oil, and chemical droplets
- Areas with dust, iron filings, and sparks flying
- Locations where the module body is directly subjected to severe impact and vibration
- Areas with strong electric fields, magnetic fields, radiation, and static interference
- Locations near power lines, high-voltage alternating current lines

5.3 Connection instructions

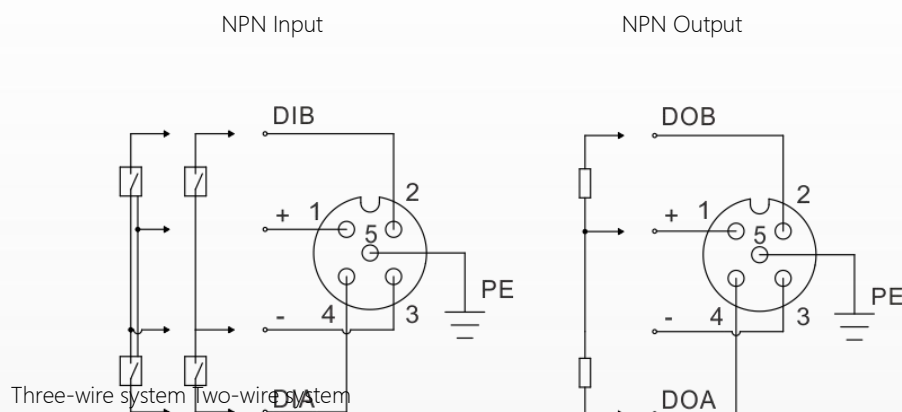
5.4.1 Power interface wiring diagram

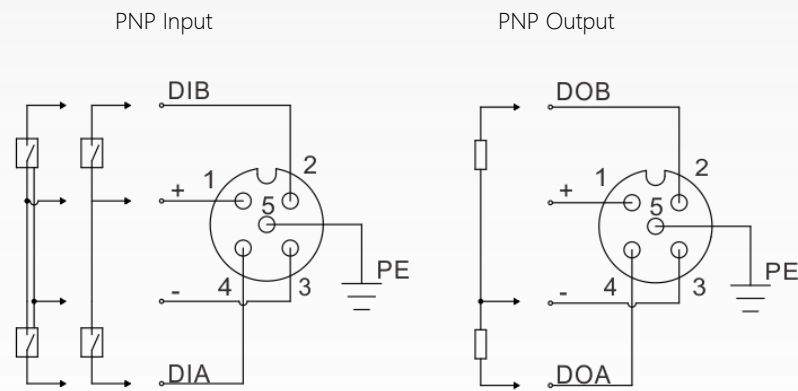


Notes for Attention

- The power supply of the recommendation system and the load power supply are respectively powered by different switching power supplies to ensure the stability of operation.
- The power supply rules refer to the "Power Supply Rules" section.

5.4.2 IO interface wiring diagram





Three-wire system Two-wire system

Notes for Attention

- Please install the waterproof cap provided with the module on the unused connector interface and tighten it to achieve the IP67 protection level.
- Regarding the digital input, please follow the input guidelines of EN61131-2, Type 2.

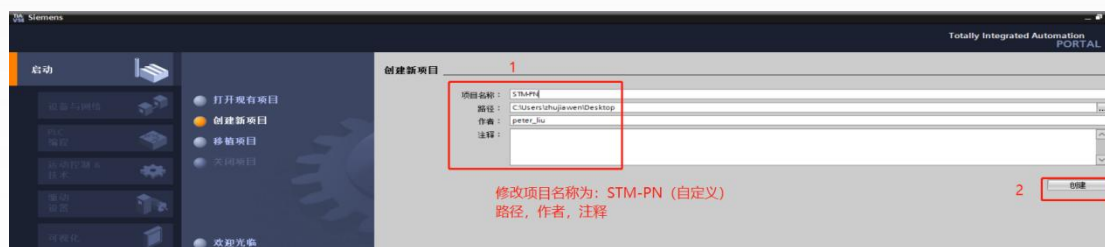


6. Communication Configuration Case

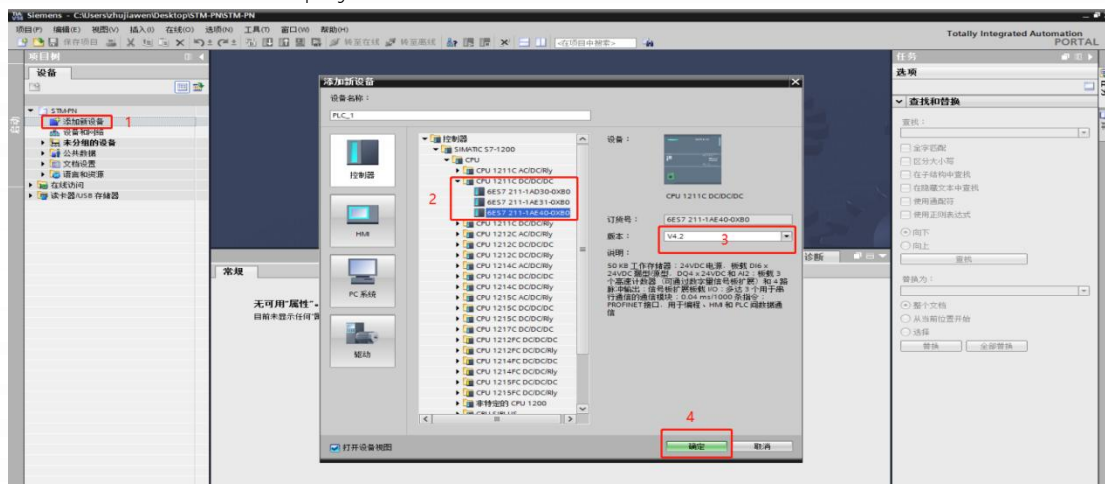
6.1 Introduction to Connecting STM0808P-PN with S7-1200 (TIA V14)

6.1.1 New project

Power on the STM0808P-PN module and the S7-1211C DC/DC/DC. Connect the network cable to the PC. Open the Siemens TIA V14 software. Create a new project named "STM-PN".

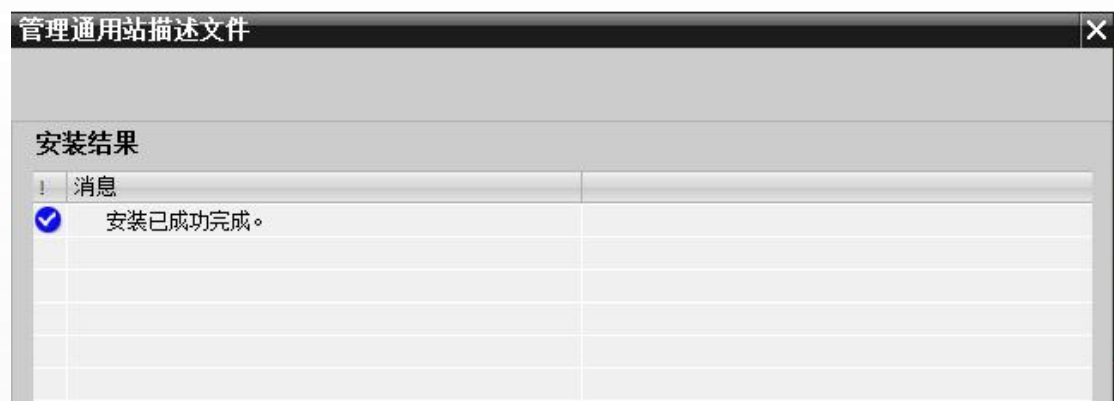
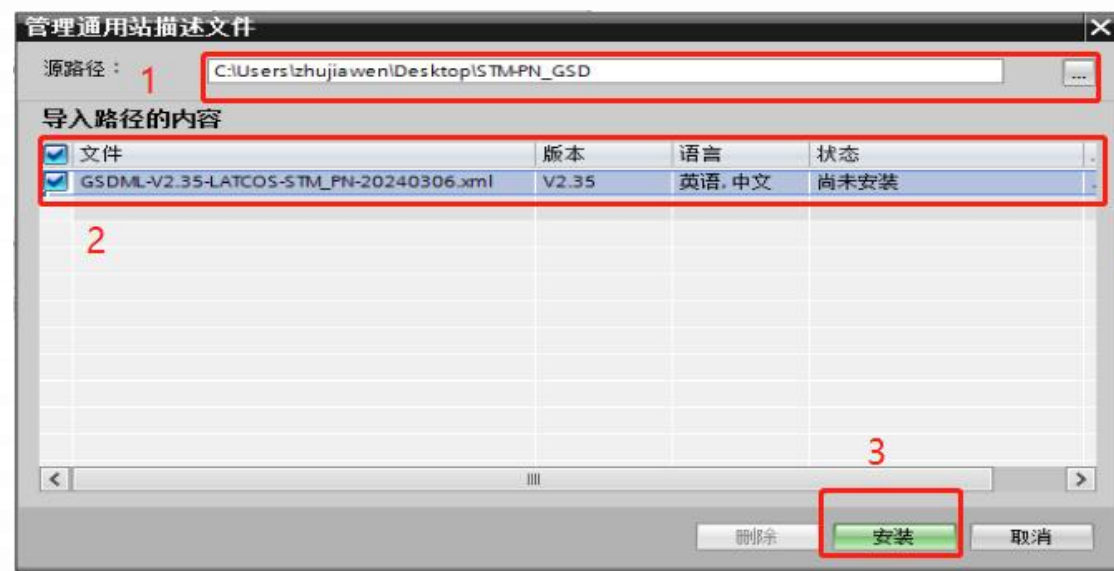
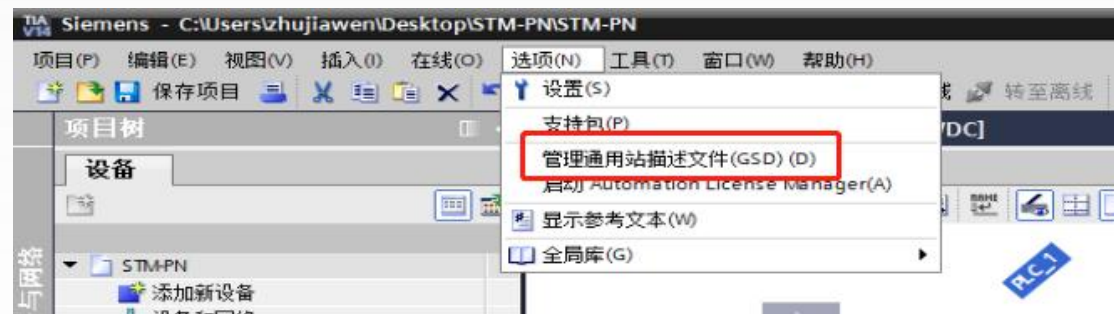


Add the Siemens PLC, enter the project view, in the device column of the project tree, click "Add New Device" under the STM-PN project, add the PLC S7-1211C DC/DC/DC, and click "Confirm".



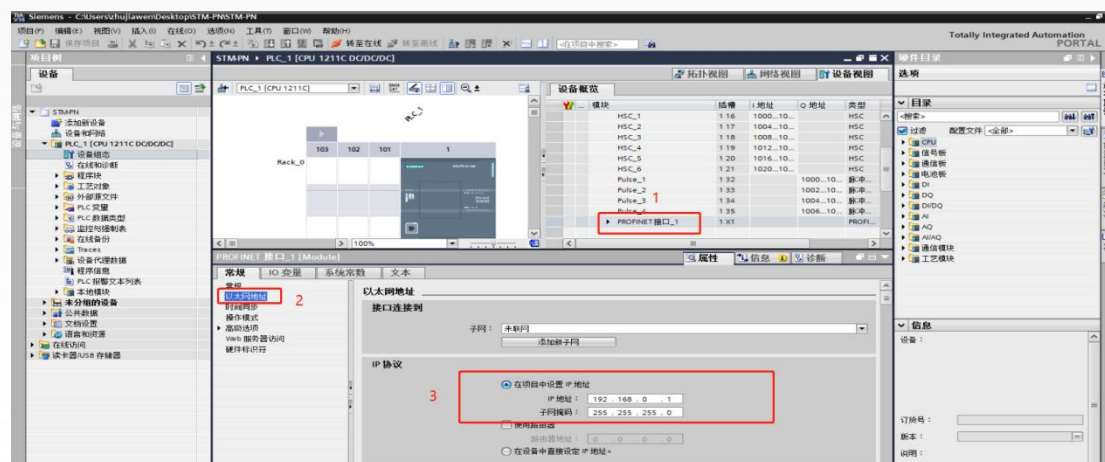
6.1.2 Import of GSD file

Click on "Options" - "Manage General Site Description File (GSD)". In the pop-up dialog box, locate the GSD file for STM-PN, select the GSD file, and click "Install". After the installation is complete, the hardware directory will be automatically updated.



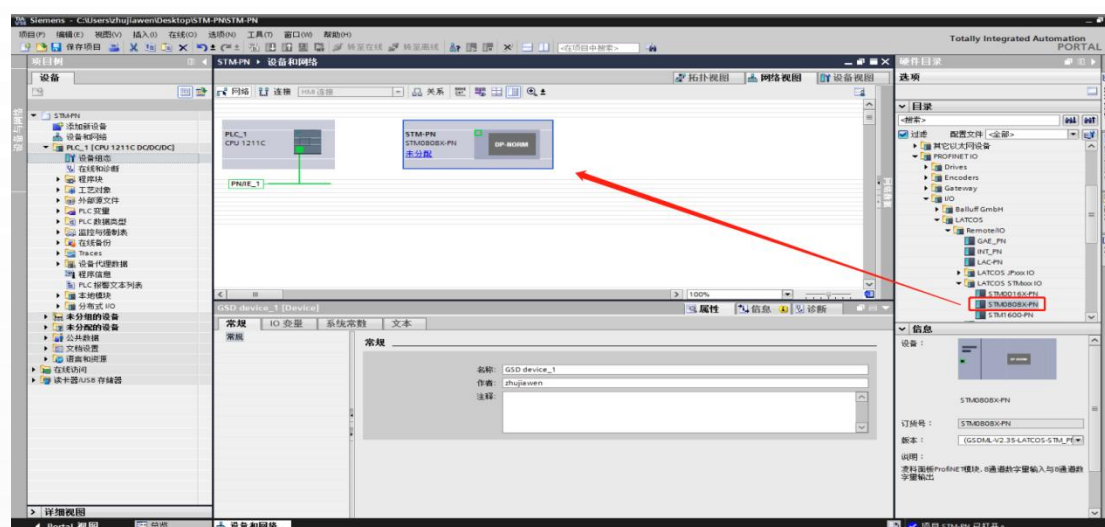
6.1.3 Set PLC parameters

In the device view, select the PLC network port and set the network port parameters.

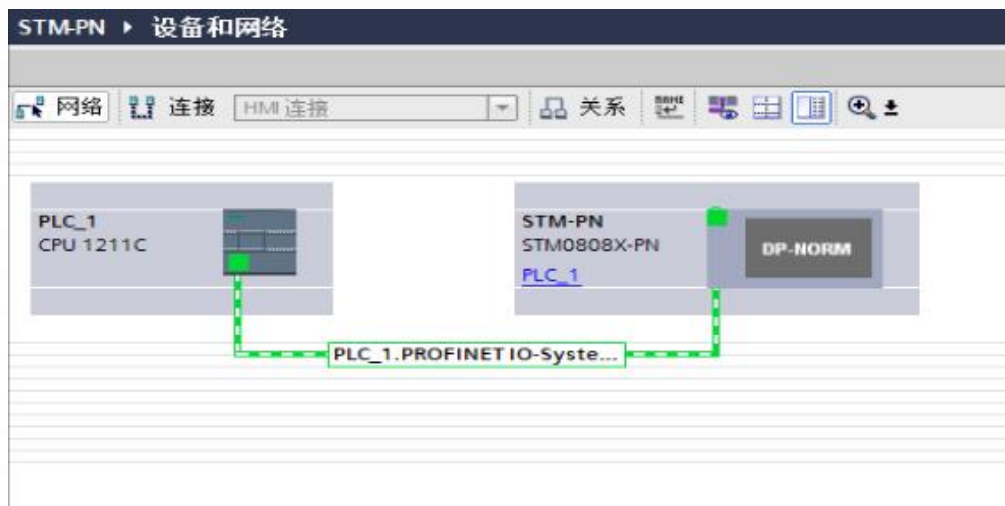
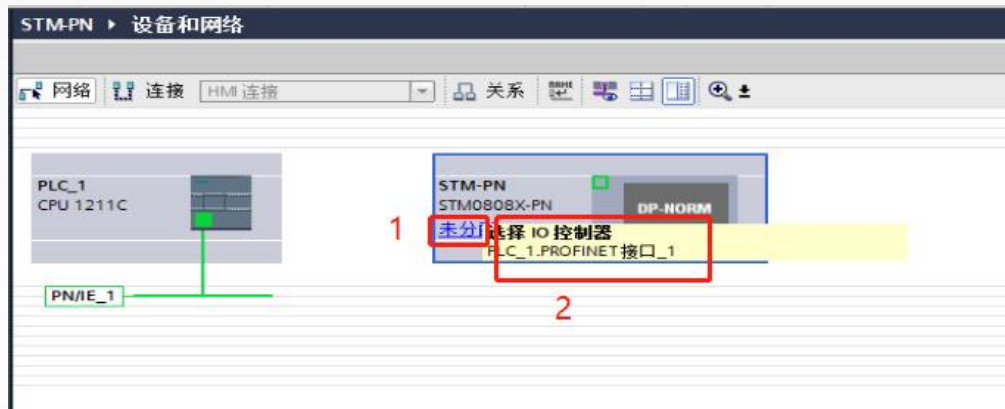


6.1.4 Add module

In the network view, first drag the STM0808X-PN module into the network view, and then assign the network interface to "PLC_1. PROFINET IO-System".



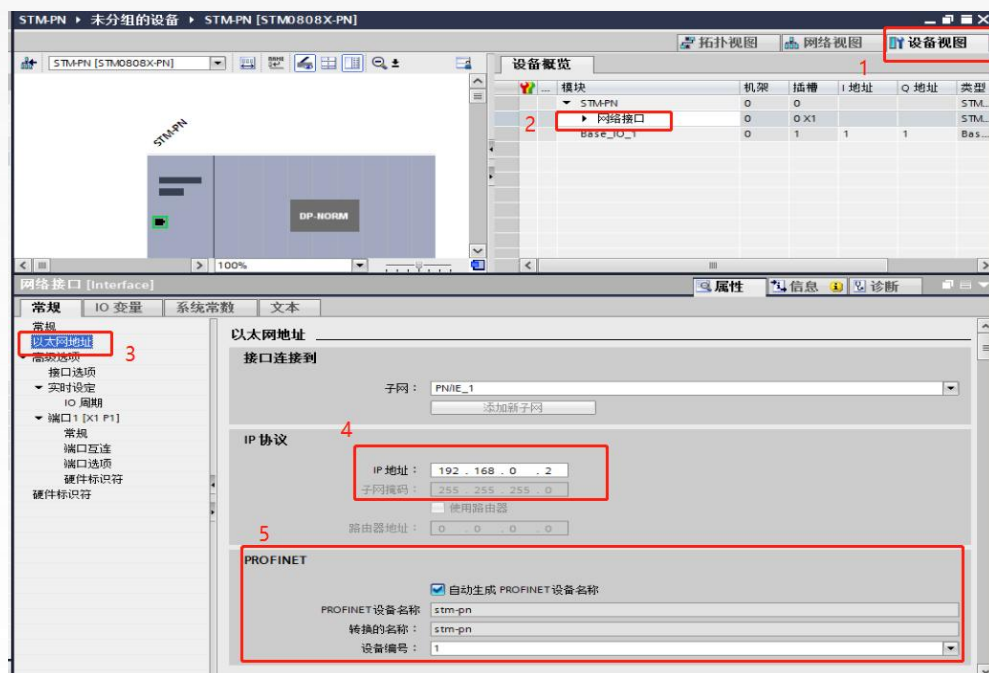
Click on the blue "Unallocated" text, select the IO controller "PLC_1.PROFINET Interface_1", and assign the module STM0808X-PN to the network interface of "PLC_1.PROFINET IO-System"



Double-click the IO module to enter the device view.

Click the network interface, modify the Ethernet parameters, and you can assign the module's IP address (192.168.0.2). The module's PROFINET device name is "STM-PN".

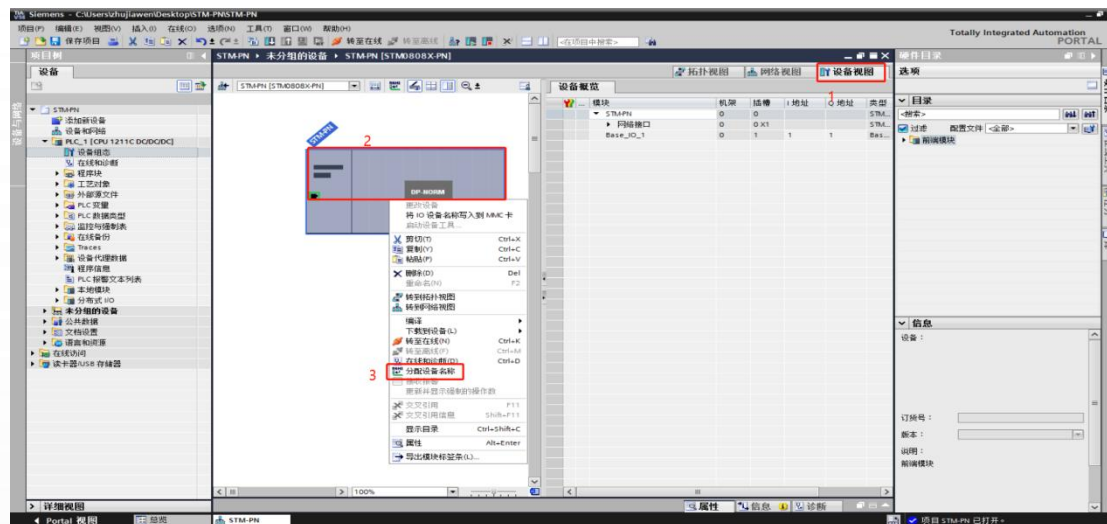
Note: The name must be consistent with the internal name of the module.



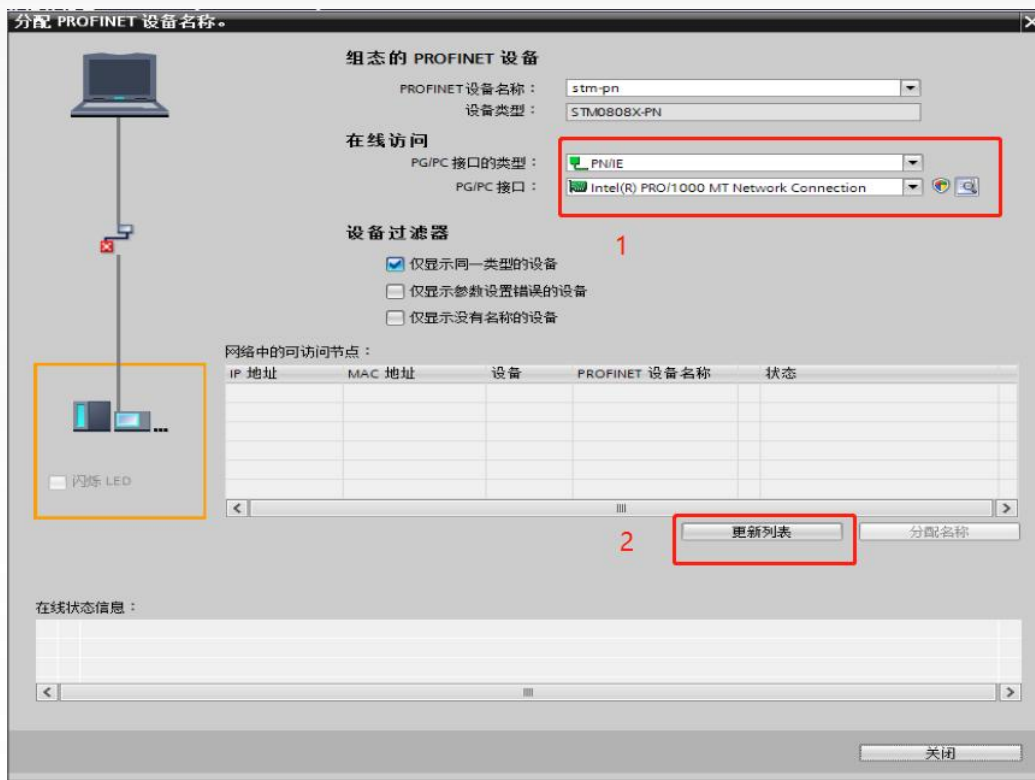
6.1.5 Modify the device names within the module

The device names are directly assigned through the module of the network view.

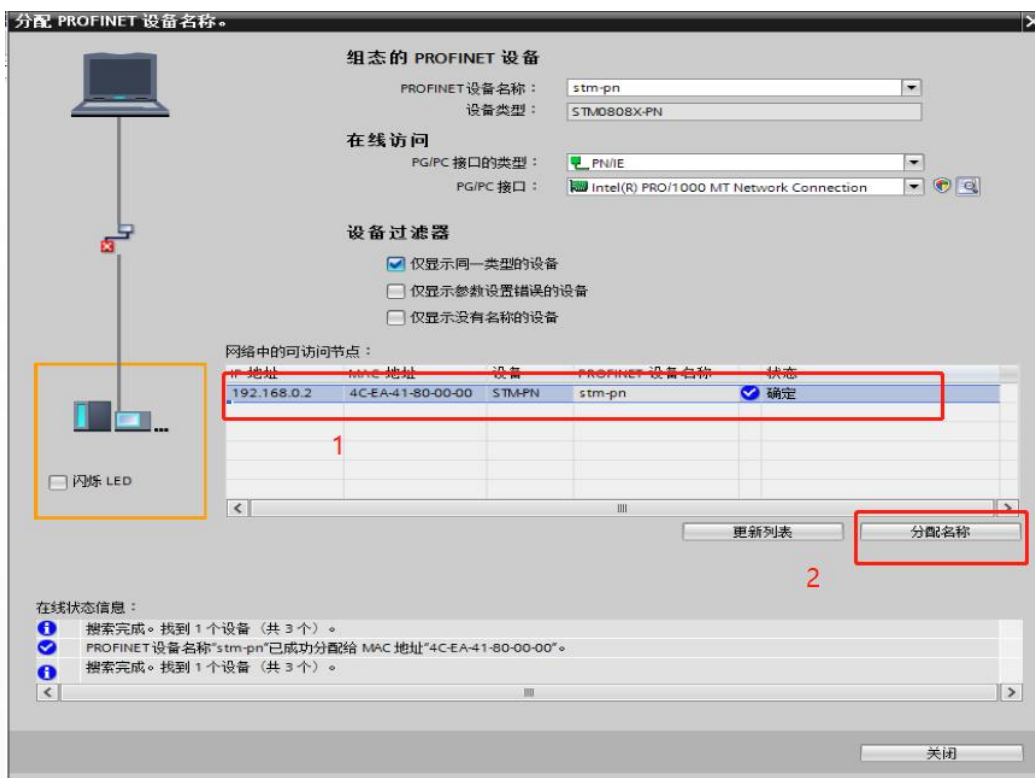
In the device view, right-click on the module icon to open the drop-down menu, and select "Assign Device Name". This operation needs to be performed in an offline state.



Select the correct network card and then update the directory



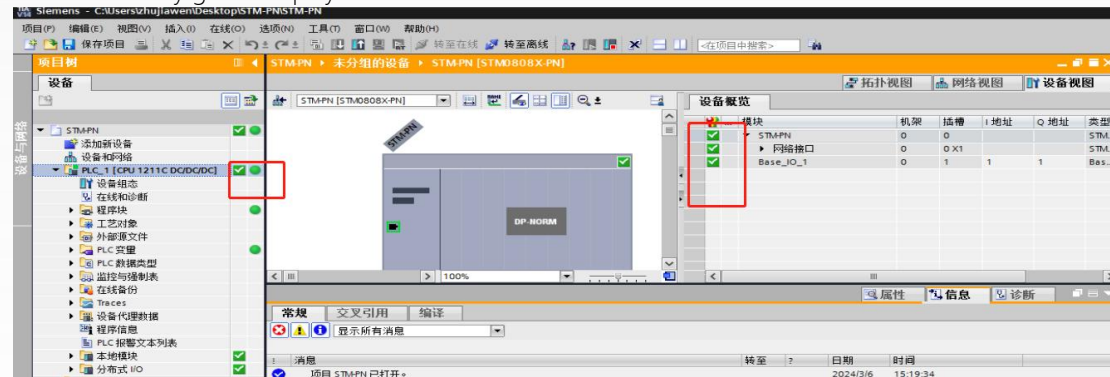
Select the corresponding module allocation device name based on the MAC code.



After the setting is completed, when the PLC is powered on, it will allocate IP addresses based on the devices in the network. It is essential to ensure that the hardware device names are consistent with the software device names.

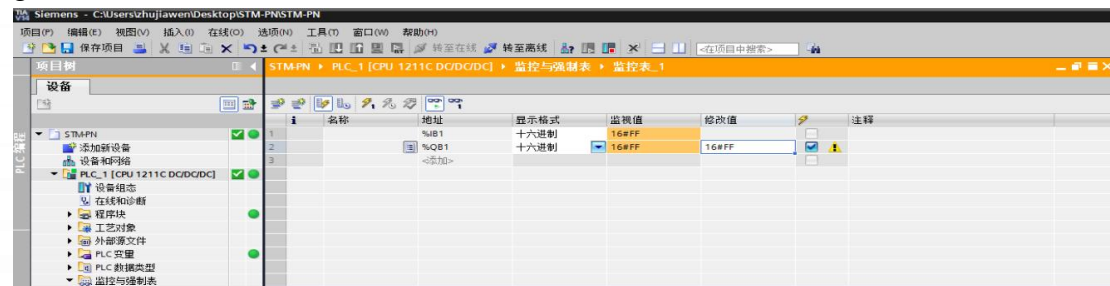
6.1.6 Download the PLC program

Download the PLC program, then switch to the online mode. Check the connection status of the modules. A fully green display indicates a normal connection.



6.1.7 Hardware configuration completed

Save, compile, download. Click "Go Online". At the same time, you can add a new monitoring table and monitor the on-site IO values online on the monitoring table.



6.2 Getting Started with Connecting STM0808P-CE to Mitsubishi FX5U Series PLC

6.2.1 Introduction to the LAEConfig Software Interface



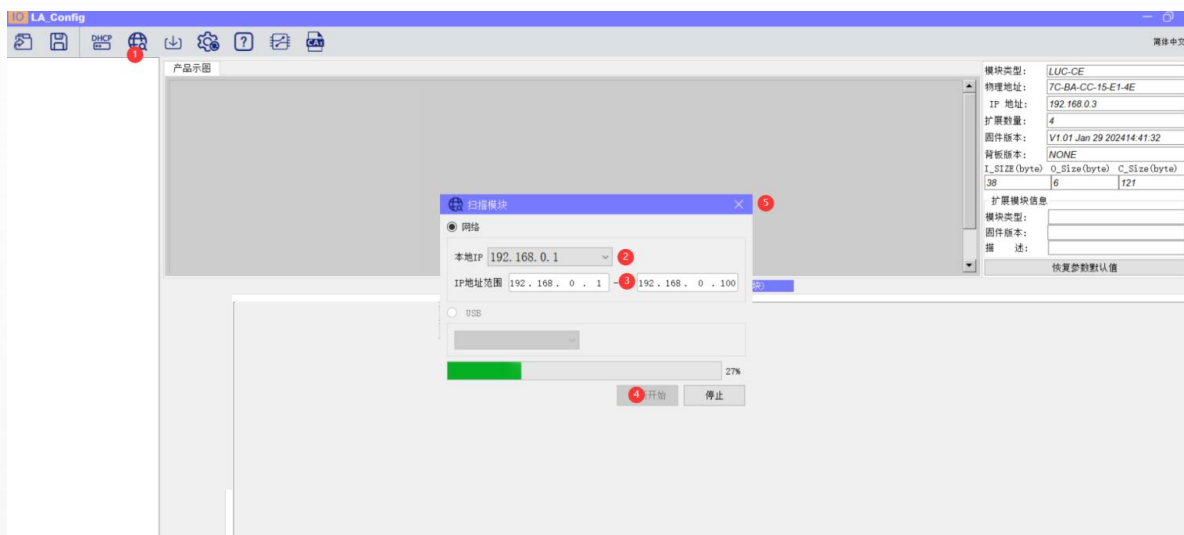
本软件界面包含了：工具栏，模块信息树形目录，参数设定区，模块信息显示区等等。



6.2.2 Scan the hardware in the network

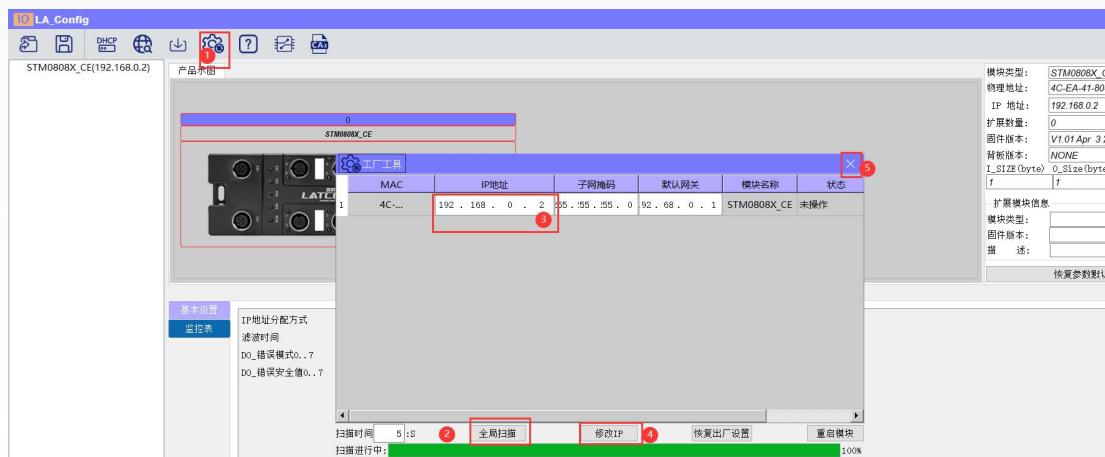


Click the "Scan Module" button , set the IP address range that needs to be scanned (in the display area), and ensure that the network IP parameters of the computer are in the same network segment as the set ones. Click "Start" to enter the scanning stage. Modules that are scanned will be displayed within the set IP range.



6.2.3 Modify the IP address of the module

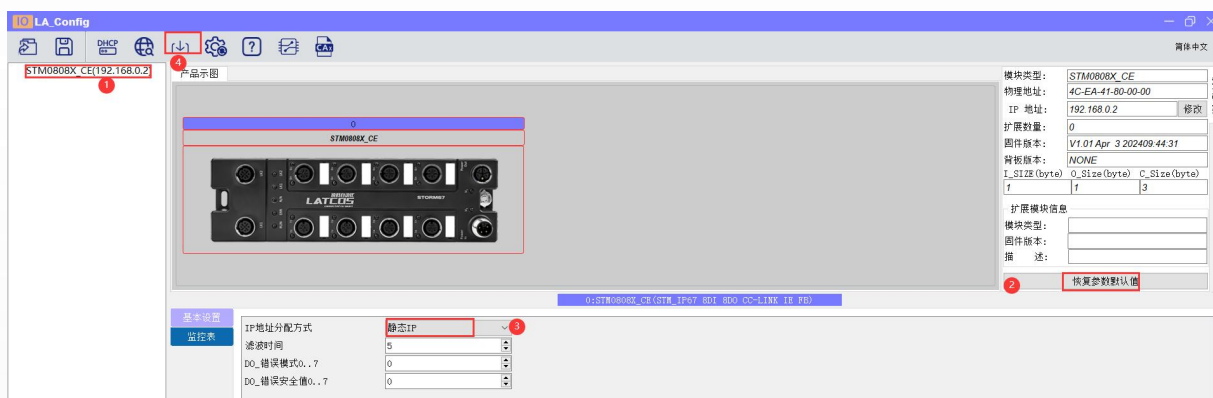
Click the button  on the toolbar, select "Global Scan", choose the IP address to be modified, and then click "Modify IP Address". This will start the process of allocating IP addresses. The success of the allocation can be shown in the status column at the end.



6.2.4 Modify the parameters of the module

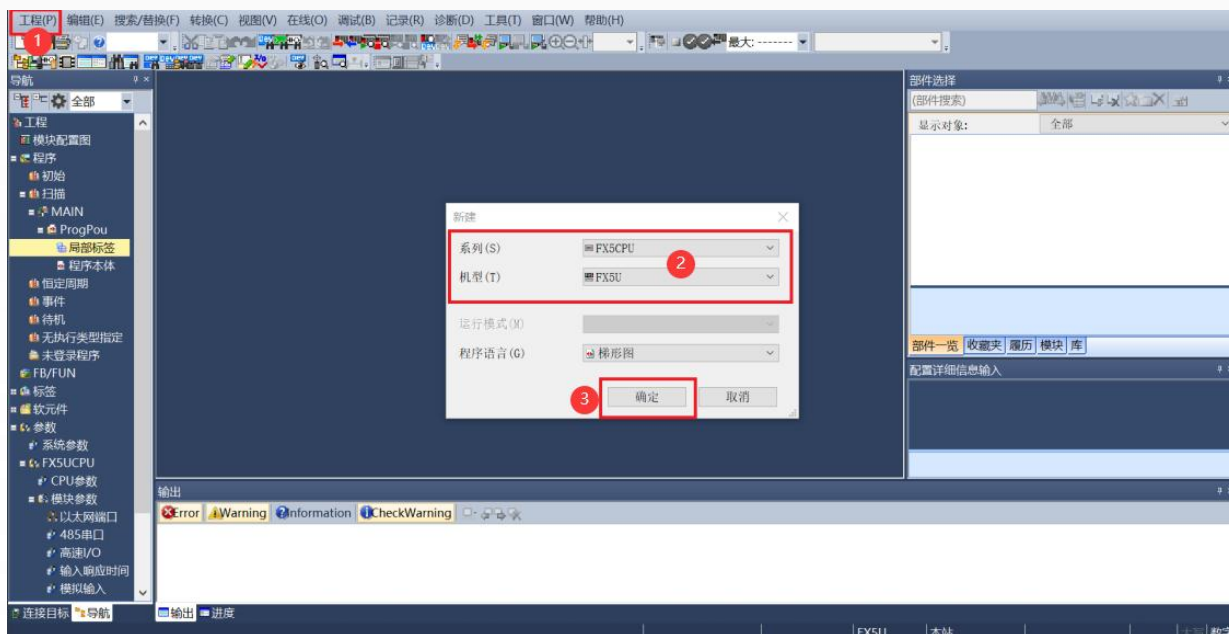
Modify STM0808 parameters: Click on the STM0808 module, then click "Restore default parameters". Select "Static IP" for the IP address allocation method. Change the filter time to 5. Adjust the remaining parameters according to your usage needs. Set the module parameters in the parameter

setting area. After setting is complete, click "Download module parameters" .



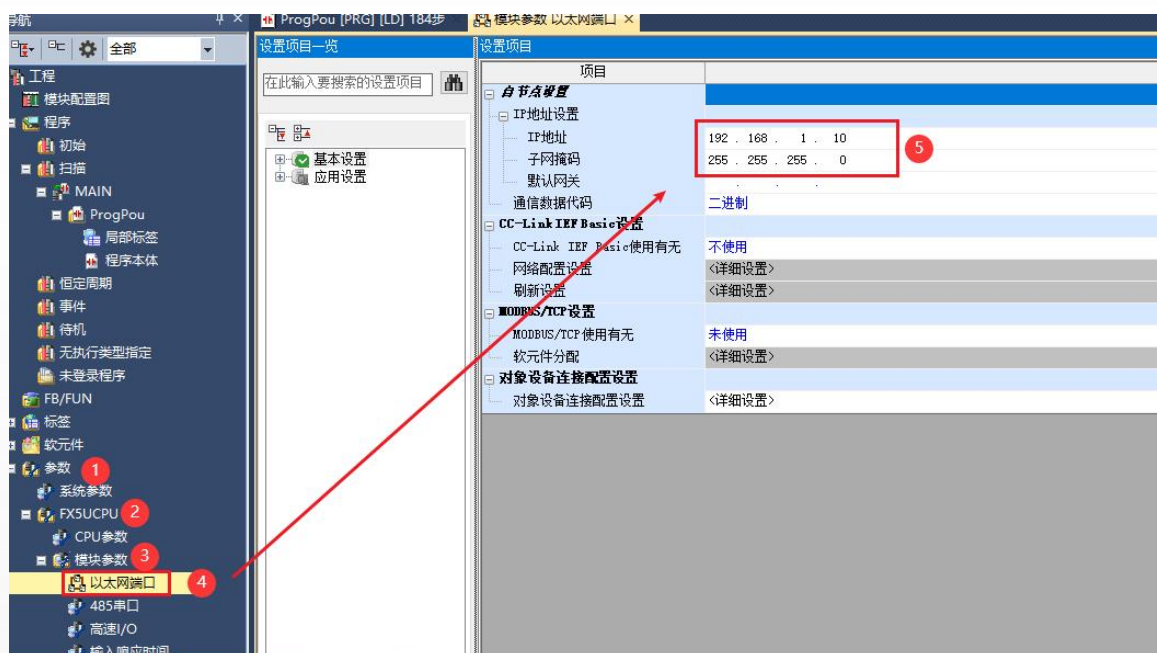
6.2.5 New construction project

Open the GX Words 3 software, select "Project" from the menu bar, then choose "New". Select the PLC series and the CPU model. For this example, let's take the 5U series CPU as an example. As shown in the figure.



6.2.6 Parameter settings

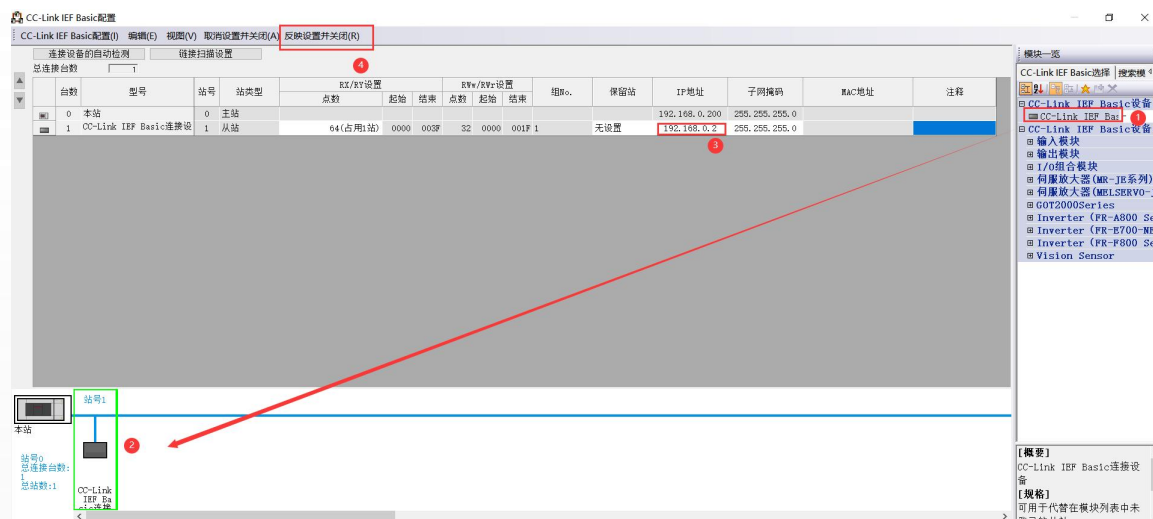
1. Open GX-Works3, create a new project, then expand the left navigation bar in sequence to "Parameters" - "FX5U Parameters" - "Module Parameters", and double-click "Ethernet Port" to set the IP address and subnet mask of the PLC.



2. Find "CC-LINK IEF Basic Settings", double-click "Not in Use" to change it to "In Use", then find "Network Configuration Settings", double-click "Detailed Settings" to configure the slave station parameters.



3. In the "Module List" on the right, find "CC-LINK IEF BASIC Connecting Device" and add it to the network. The parameter settings are as shown in the following figure.



4. IP Address: Select the module IP address scanned by the config software, or you can enter the address modified through the software.

- 1) Station number: Start from 1. In this case, it is 2.
 - 2) Point number: Fill in the length of the register address of the target device. It can be set to 64, 128, 192, 256. Here, there is only one module, so set it to 64.
 - 3) 3) After setting, click "Reaction Settings and Close" to close the configuration screen and "Apply" the configuration.
5. Find "Refresh Settings", double-click "Detailed Settings", and configure the slave station parameters.

项目	设置
自节点设置	
IP地址设置	
IP地址	192 . 168 . 0 . 200
子网掩码	255 . 255 . 255 . 0
默认网关	192 . 168 . 0 . 201
通信数据代码	二进制
CC-Link IEF Basic设置	
CC-Link IEF Basic使用有无	使用
网络配置设置	<详细设置>
刷新设置	<详细设置>
MODBUS/TCP设置	
MODBUS/TCP使用有无	未使用
软元件分配	<详细设置>
对象设备连接配置设置	
对象设备连接配置设置	<详细设置>

说明
 设置刷新。
 设置用于自动执行链接软元件(RX/RV/RWr/RWw)与CPU软元件(用户软元件、文件寄存器、刷新数据寄存器)间的数据传送。
 此外,设置CC-Link IE现场网络Basic时,需要执行网络配置设置与刷新设置。

检查(K) 恢复为默认(U) 应用(A)

6. Click on "Refresh Target", "Software Name", and "Points" on the CPU side. Set the specified soft components RWr-D500 and RWw-D600. Click "Check" to confirm there are no errors, and then click "Apply".

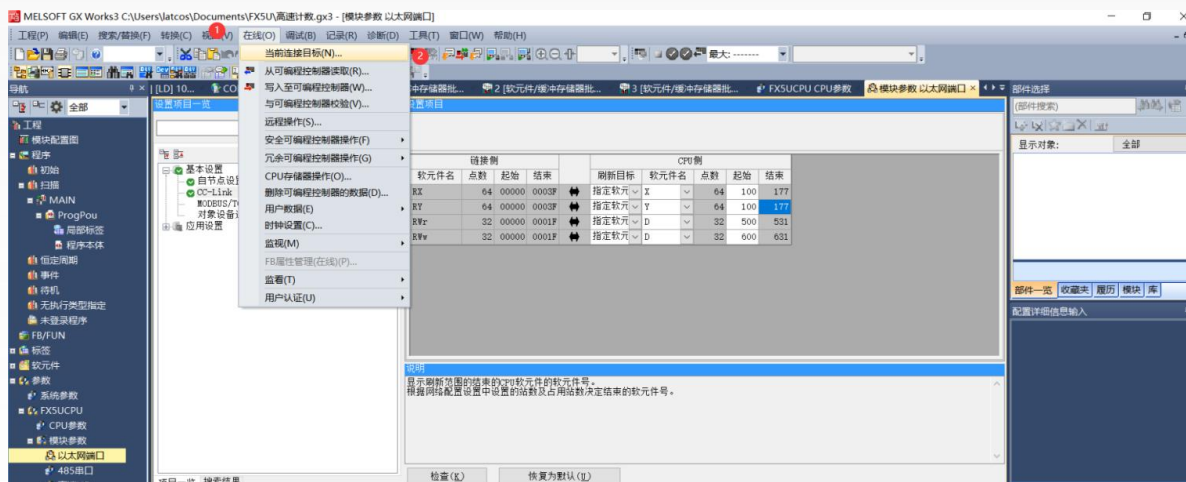
链接侧				CPU侧				
软元件名	点数	起始	结束	刷新目标	软元件名	点数	起始	结束
RX	64	00000	0003F	指定软元 X	X	64	100	177
RY	64	00000	0003F	指定软元 Y	Y	64	100	177
RWr	32	00000	0001F	指定软元 D	D	32	500	531
RWw	32	00000	0001F	指定软元 D	D	32	600	631

说明
 显示刷新范围的结束的CPU软元件的软元件号。
 根据网络配置设置中设置的站数及占用站数决定结束的软元件号。

项目一览 搜索结果 检查(K) 恢复为默认(U) 应用(A)

6.2.7 Program Download

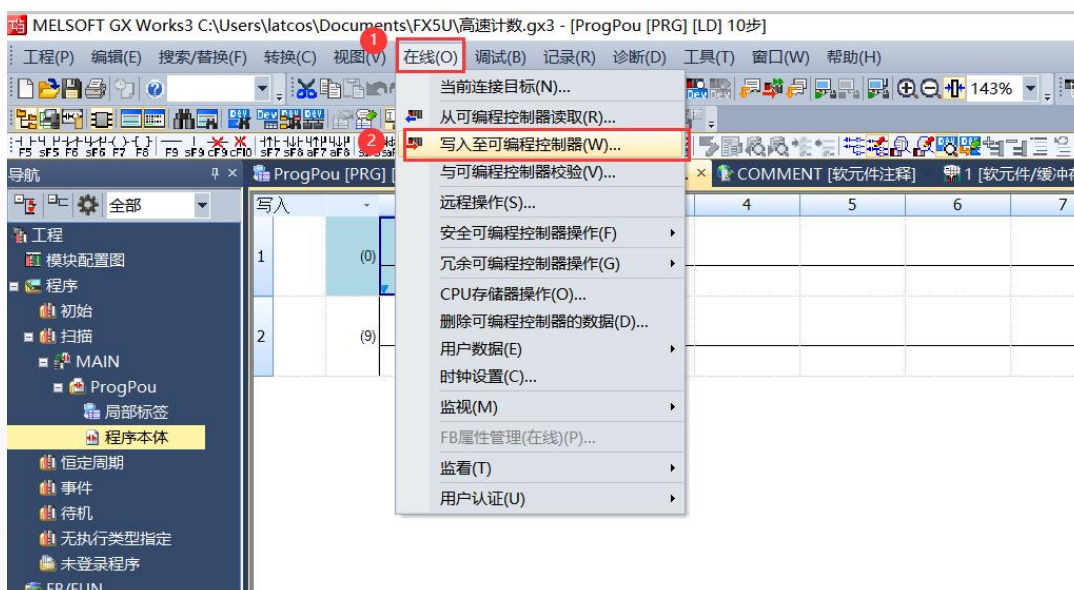
Click on the menu bar, then "Online", and select the current connection target.



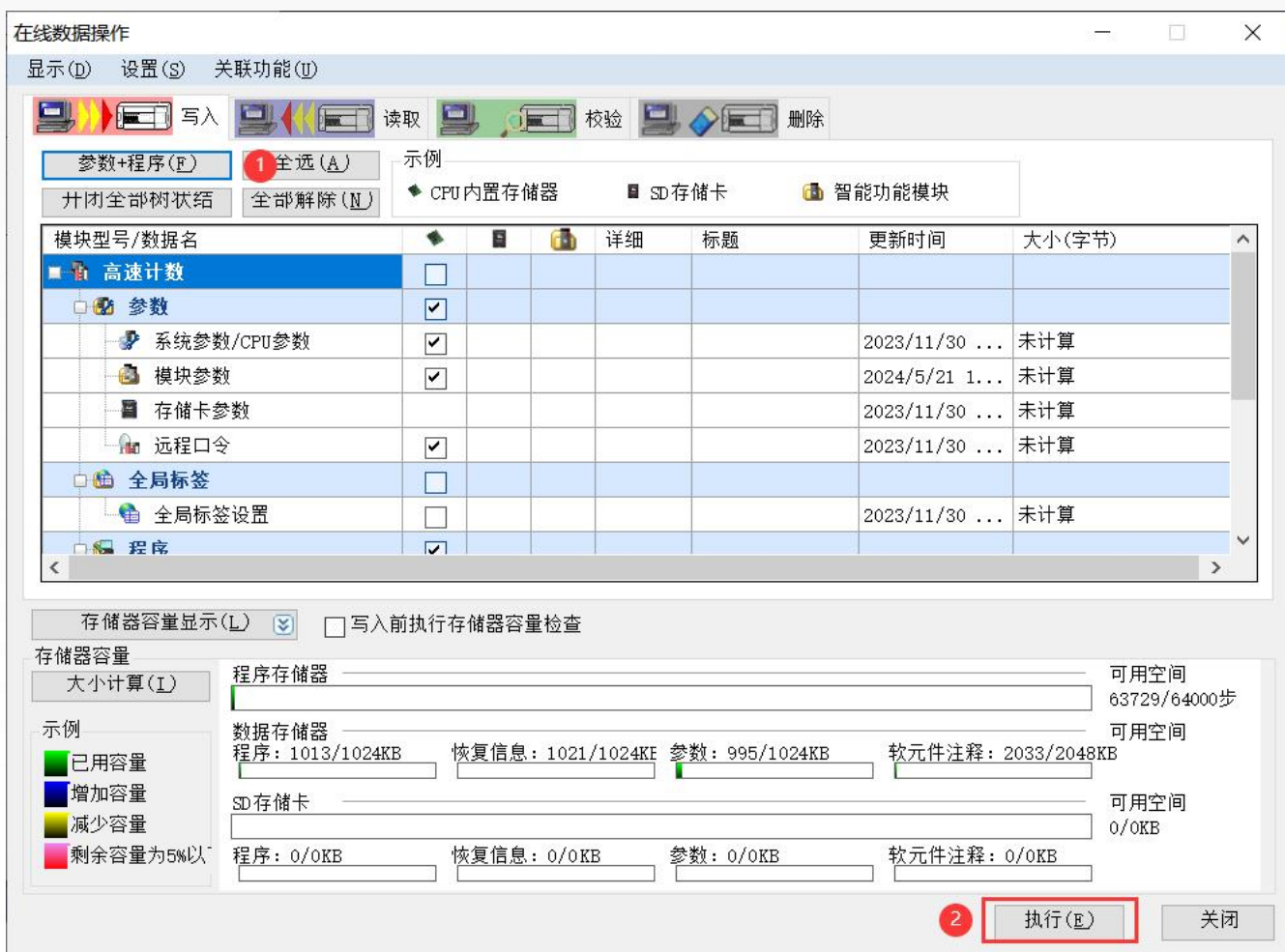
Select the appropriate adapter and conduct communication tests.



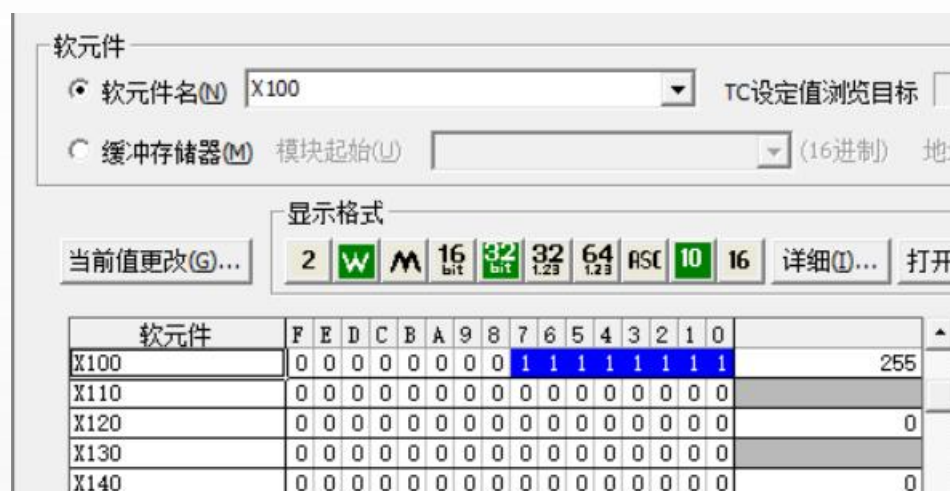
Click online and write it into the programmable controller



Click on "Parameters + Programs" and select "Execute".



The starting address of the X100 soft component is X100. Monitoring the status of this address indicates the input status of STM-0808.



6.3 Getting Started with Connecting STM0808P-EA to TwinCAT 3

6.3.1 Project Preparation

Using the IP67 module with EtherCAT bus (STM0808P-EA), taking the Beckhoff TwinCAT 3 as the EtherCAT master station as an example, establish EtherCAT communication with the STM0808P-EA module. Note:

A 100M Ethernet adapter with an Intel chip must be used. Other network adapters may not support EtherCAT.

1) Install TwinCAT 3.

Windows XP system: It is recommended to use tcat_2110_2230.

Windows 7 32-bit system: It is recommended to use tcat_2110_2248.

2) Copy the EtherCAT configuration file (STM-EA20240226.xml) of the IP67 module (STM0808P-EA) to the TwinCAT installation directory.

TwinCAT 2 directory: TwinCAT\IO\EtherCAT

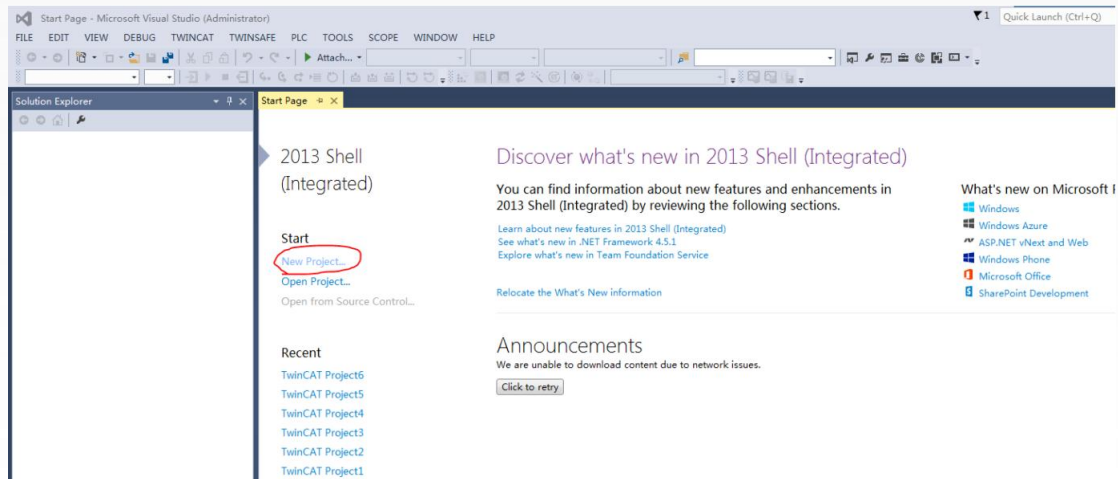
TwinCAT 3 directory: TwinCAT\3.1\config\IO\EtherCAT

TwinCAT 3 will be used as an example in the next section. The operation steps for

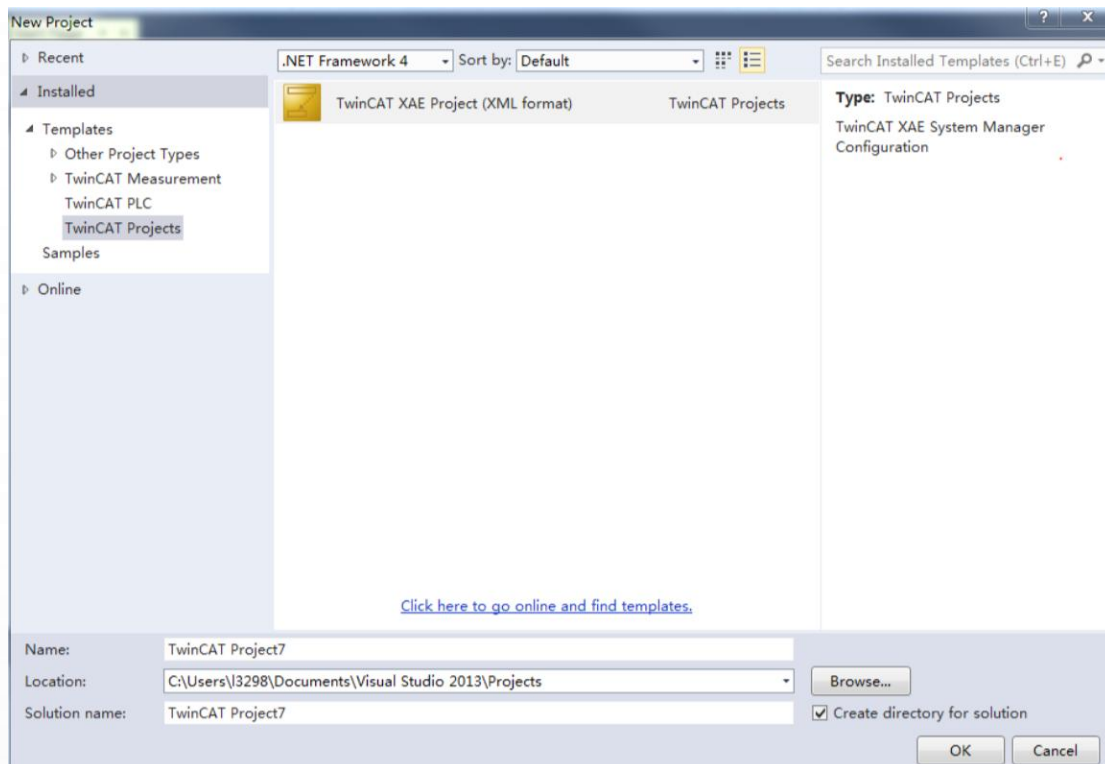
TwinCAT 2 are similar.

6.3.2 New Project

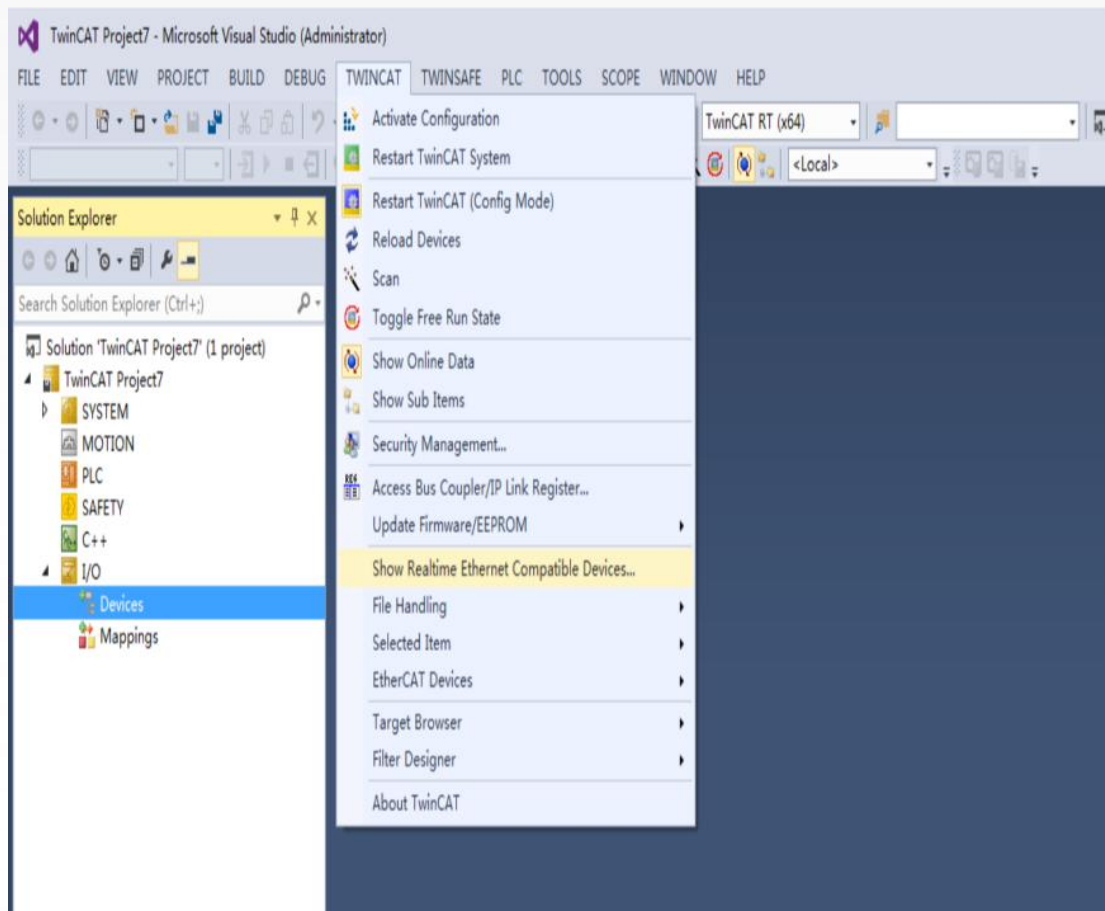
Start TwinCAT and click "New Project" to create a project.



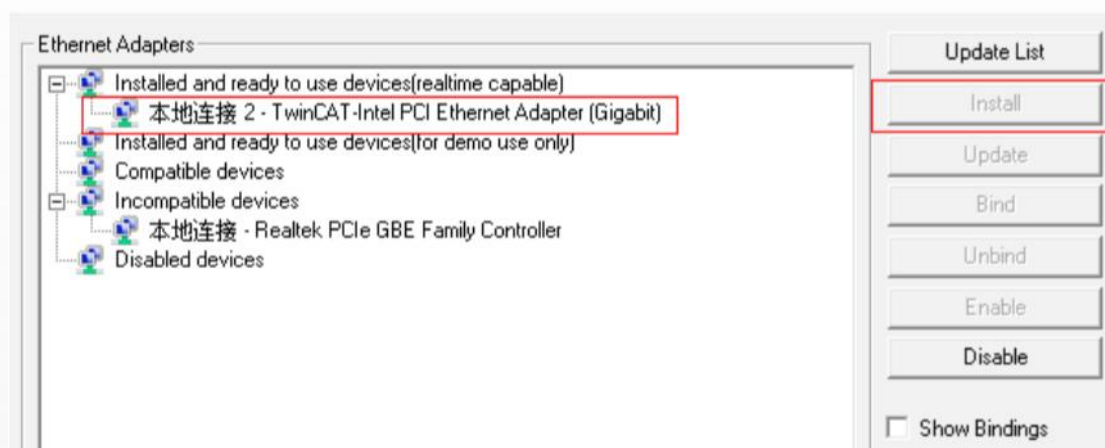
Click "OK"



6.3.3 Install the TwinCAT network adapter driver.

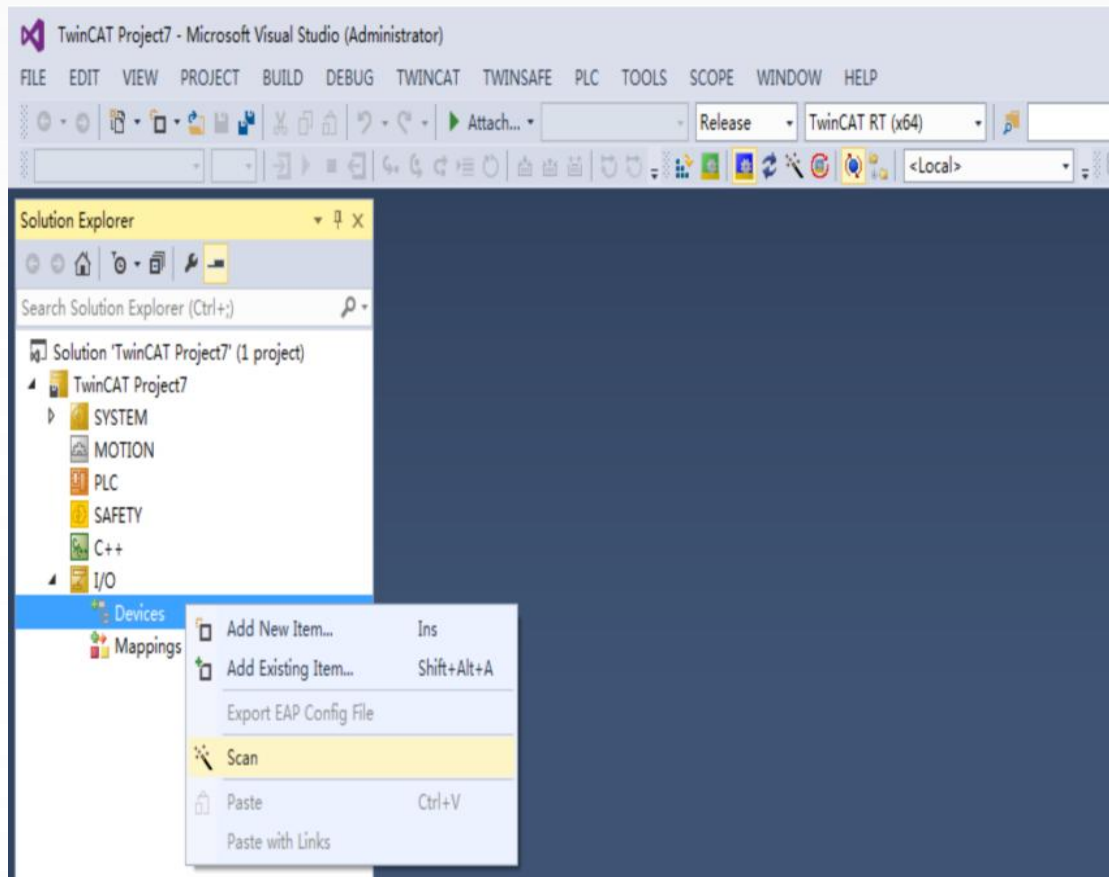


Select TWINCAT > Show Real Time Ethernet Compatible Devices... 。 In the displayed dialog box, select the local network adapter in the incompatible device, and then click "Install". After the installation process, the installed network adapter will be displayed in the "Installed and Ready-to-Use Devices" section.

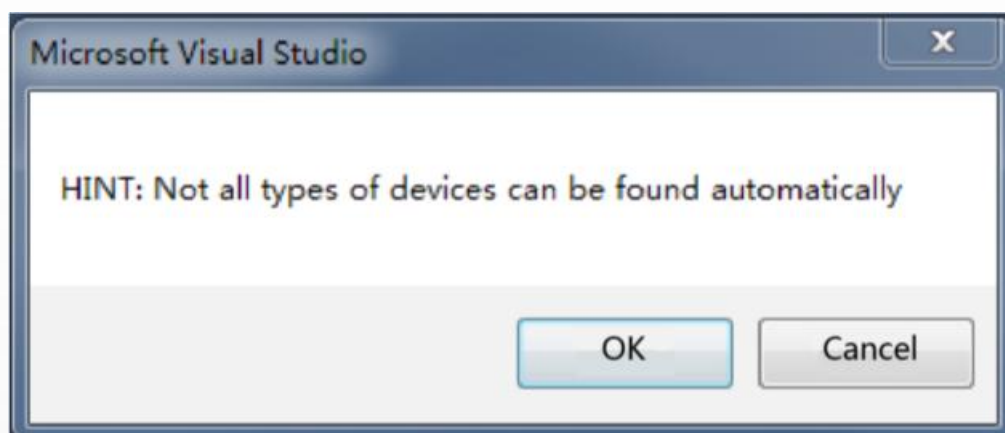


6.3.4 Search Equipment

Create a project, right-click on the device, and then click "Scan" to search for the device, as shown in the figure below.



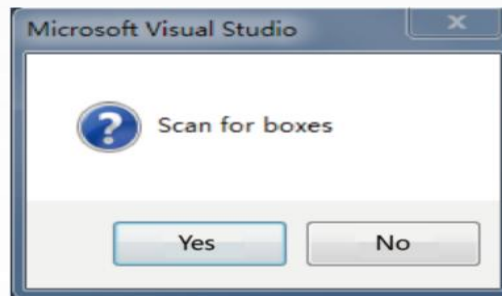
Click "OK"



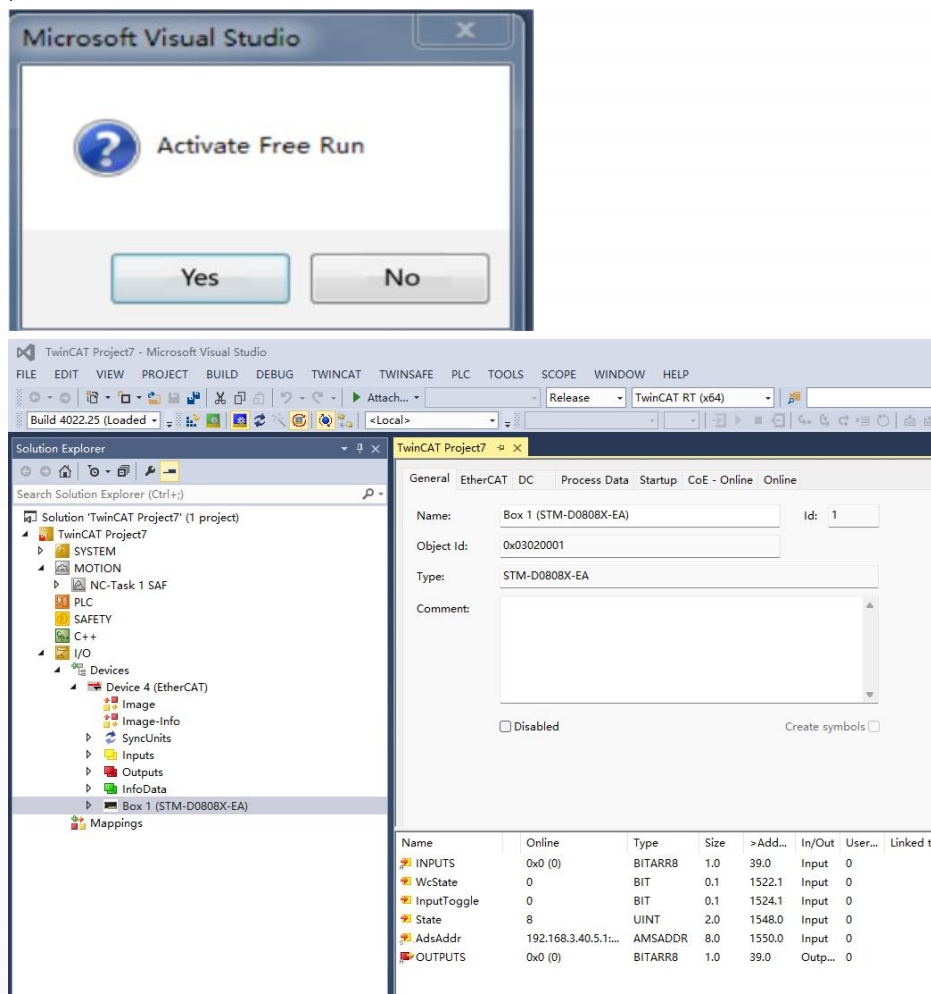
Click "OK"



Click "Yes"

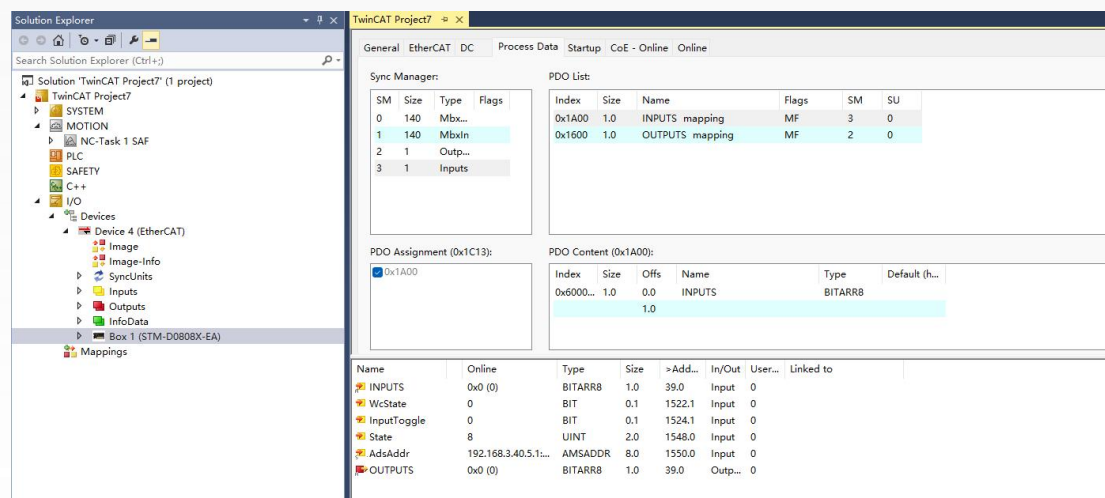


Click "No". At this point, the device search is completed, as shown in the following picture:

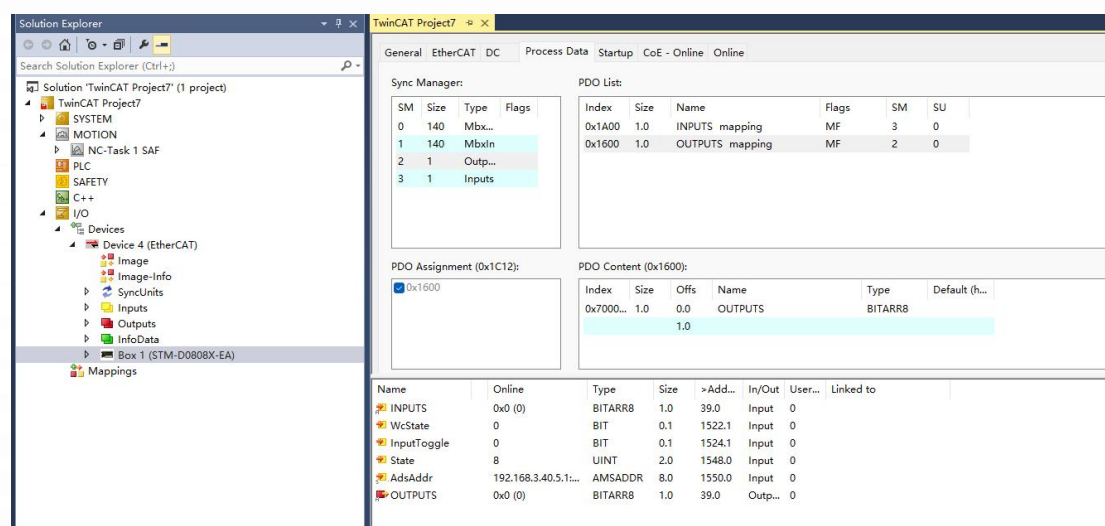


6.3.5 Configuring PDO Parameters

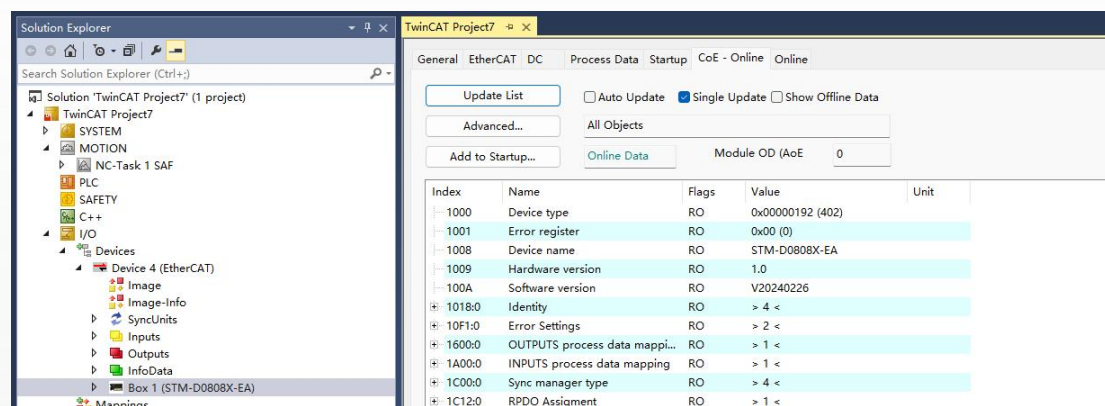
1. Configure TPDO. When configuring TPDO, select 0x1A00.



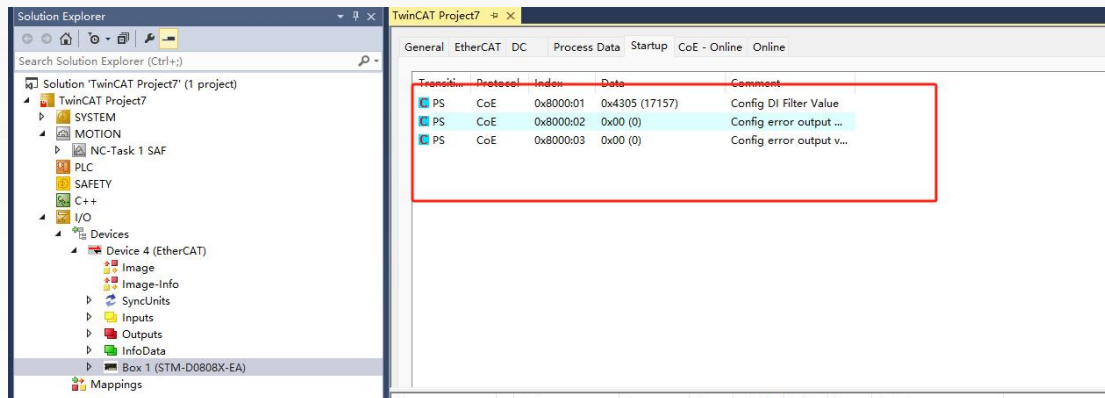
2. Configure RPDO. When configuring RPDO, select 0x1600.



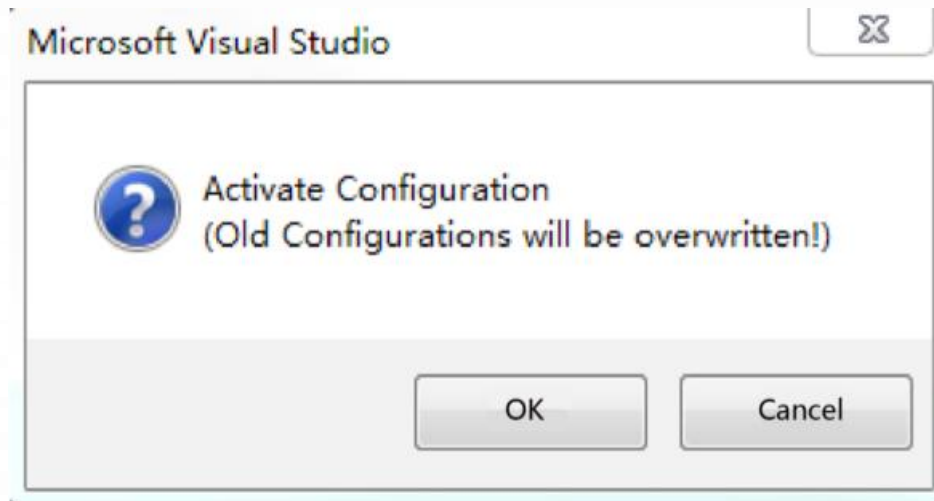
3. View the SDO data list. After the OP status is activated, you can view the real-time data in the SDO data list.



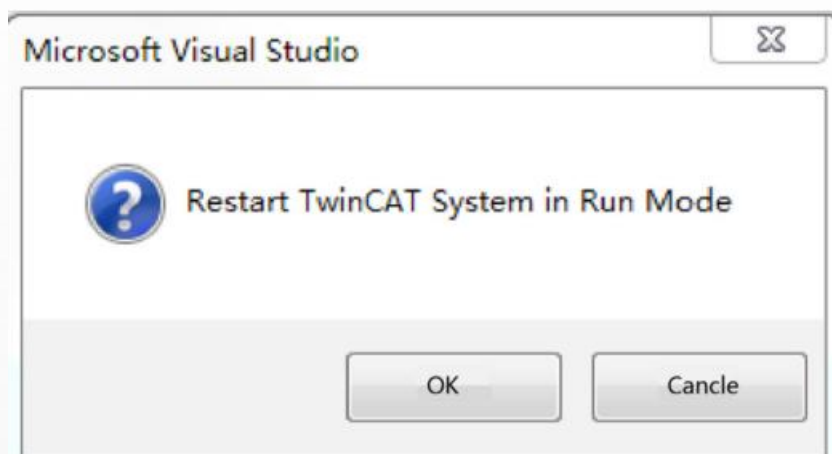
4. Startup Parameter Settings



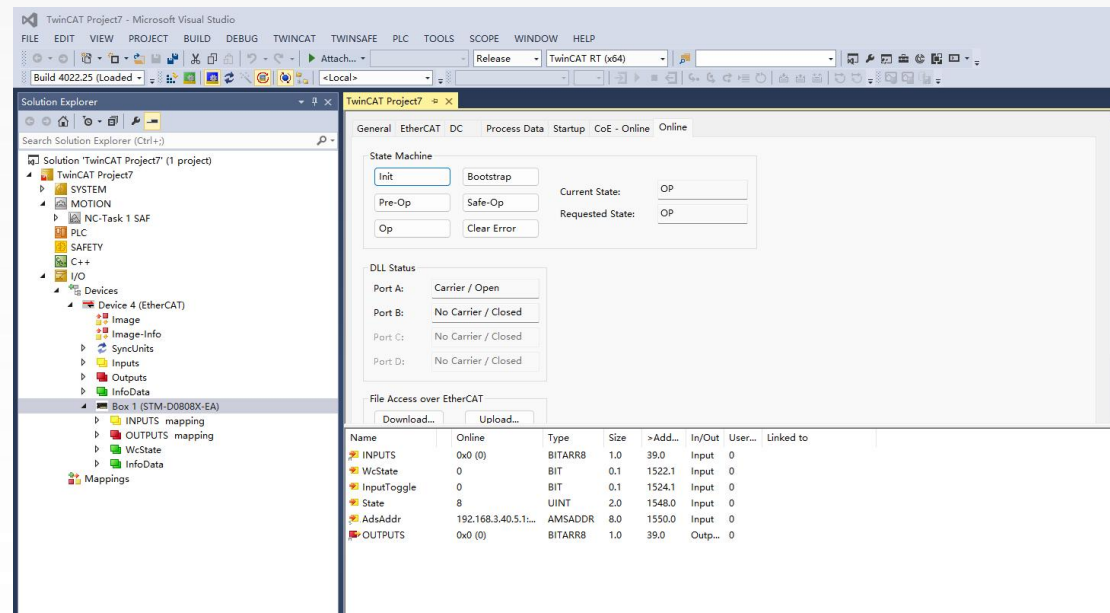
5. Activate the configuration and switch to the running mode. Clicking  will display the following dialog box.



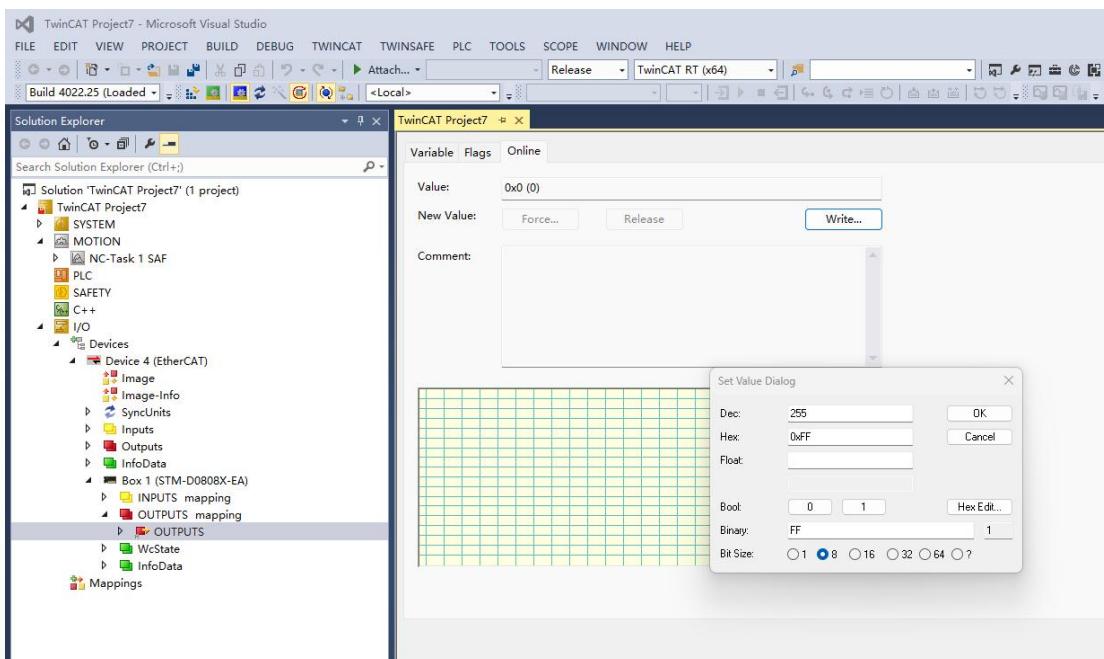
Click "OK"



Click "OK" to enter the OP state.



Control the output points through PDO. By configuring the RPDO, write the corresponding values to control the output points of the module.



Official website



先进自动化控制及工业网络技术



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