Programmable Controller

B 2341

User Manual

V1.00

B Series - Programmable Controller

Odot Automation System Co., Ltd.

Legal Notices

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Safety Information

Important Information

Before attempting to install, operate, repair, or maintain the device, please read the instructions below carefully and familiarize yourself with the device by reviewing it. The following specific information may appear elsewhere in text or on the device to alert the user to potential hazards or to draw attention to information about clarifying or simplifying a process. If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be voided.

⚠ DANGER
DANGER INDICATES A DANGEROUS SITUATION THAT, IF NOT AVOIDED, COULD RESULT IN SERIOUS BODILY INJURY OR EVEN DEATH.

⚠ WARNING
WARNINGS INDICATE DANGEROUS SITUATIONS THAT, IF NOT AVOIDED, COULD RESULT IN SERIOUS PERSONAL INJURY OR EVEN DEATH.

⚠ CAUTION
CAUTION INDICATES A DANGEROUS SITUATION THAT, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE PERSONAL INJURY OR EVEN DEATH.

Note
Note is used to indicate hazards that are not related to personal injury.

Please note

The installation, operation, repair and maintenance of electrical equipment is restricted to qualified personnel. Odot Automation does not assume any consequences arising from the use of this information.

A qualified person is a person who has the skills and knowledge related to the manufacture and operation of electrical equipment and its installation, and who has been trained in safety to detect and avoid the associated hazards.

Personnel qualifications

Only those who are properly trained, familiar with, and understand the contents of this manual and all other relevant product documentation are authorized to use this product.

Qualified personnel must be able to identify possible hazards, usually from mechanical, electrical or electronic equipment, arising from the setting of parameters and the modification of parameter values. Qualified personnel must be familiar with the standards, regulations and regulations designed to prevent industrial accidents and must comply with them when designing and building systems.

Intended Use

The products described in or referred to in this document, together with their software, accessories and options, are expansion modules designed for industrial use and should be used in accordance with the relevant instructions, instructions, examples, and safety instructions in this document and other supporting documents.

The use of this product must comply with all applicable safety laws and regulations, specified requirements and technical parameters.

Given the planned application, you must conduct a risk assessment before using this product. Appropriate safety-related measures must be taken based on the results of the

assessment.

Since this product should be used as an integral part of an overall machine or process, personnel safety must be ensured through the design of the entire system.

This product must be used with the specified cables and accessories. Please use only original parts and original replacement parts.

Any use other than those expressly permitted is prohibited and may result in unintended harm.

Cyber security tips

A. Use controllers and devices only in protected environments to minimize network exposure and ensure that they cannot be accessed from the outside.

B. Use firewalls to protect the control system network and separate it from the rest of the network.

C. If remote access is required, use a VPN (Virtual Private Network) tunnel.

D. Restrict access to development and control systems through physical means, operating system capabilities, etc.

E. Protect development and control systems with the latest virus detection solutions.

About this manual

Document scope

This guide describes the design parameters and CODESYS programming examples of the B2341 programmable controller, and provides an overview of the B2341 product features, function descriptions, configuration methods, wiring diagrams, and installation details.

Validity Statement

In line with our continuous improvement policy, we will continually revise the content to make it clearer and more accurate.

Odot Automation System Co., Ltd. reserves the right of final interpretation of this manual.

Product Information

DANGER

There is a risk of electric shock, explosion, or arc flash

- Disconnect all devices from power, including connected devices, before removing any covers, or installing or removing any accessories, hardware, cables, or wires, except in specific circumstances specified in the appropriate hardware guidelines for this device.
- As instructed, it is important to use a voltage sensing device with an appropriate rating to detect a power outage at the appropriate place and time.
- Replace and tighten all covers, accessories, hardware, cables, and wires, and confirm that the ground connection is correct before powering on the device.
- When operating this equipment and related products, the specified voltage must be used.

Failure to follow these instructions will result in death, personal injury, or serious injury.

DANGER

There may be a risk of explosion

- Do not connect or disconnect the device unless it has been unplugged or the location

is determined to be non-hazardous.

• The USB port (if equipped) should only be used if it is determined that the work area is a non-hazardous area.

Failure to follow the instructions may result in the loss of the protection provided by the device, which may result in serious consequences such as death, personal injury, or damage to the device.

⚠ Warning

Loss of control

• The designer of any control scheme must take into account the possibility of a failure of the control path and provide a way for certain critical control functions to return to a safe state in the event of a path failure and after a path failure. These critical control functions include emergency stops, overrun stops, power failure restarts, and similar safety measures.

• For critical control functions, separate or redundant control paths must be provided.

• The system control path may include a communication link. Implicit unforeseen transmission delays or link failures must be taken into account.

• Follow all accident prevention regulations and local safety guidelines.

• In order to guarantee correct operation, the equipment must be thoroughly tested separately for each execution before it is put into service.

Failure to follow the instructions may result in the loss of the protection provided by the device, which may result in serious consequences such as death, personal injury, or damage to the device.

WARNING

UNEXPECTED DEVICE OPERATION

• USE ONLY SOFTWARE APPROVED BY SICHUAN ZERO AUTOMATION THAT CAN BE USED WITH THIS EQUIPMENT.

• UPDATE THE APPLICATION EACH TIME YOU MAKE CHANGES TO THE PHYSICAL HARDWARE CONFIGURATION.

FAILURE TO FOLLOW THE INSTRUCTIONS MAY RESULT IN THE LOSS OF THE

PROTECTION PROVIDED BY THE DEVICE, WHICH MAY RESULT IN SERIOUS CONSEQUENCES SUCH AS DEATH, PERSONAL INJURY, OR DAMAGE TO THE DEVICE.

WARNING

UNEXPECTED DEVICE OPERATION

THE RISK ASSESSMENT SHOULD INCLUDE THE POSSIBILITY OF COMMUNICATION FAILURES BETWEEN THE LOGIC CONTROLLER AND ANY I/O EXPANSION MODULES.

IF THE IO MODULE OUTPUT SIGNAL "KEEP CURRENT" DOES NOT MATCH YOUR APPLICATION REQUIREMENTS WHEN THE I/O EXPANSION BUS IS FAULTY, OTHER SCENARIOS SHOULD BE USED TO ENSURE THAT THE APPLICATION CAN COPE WITH THE BUS ERROR EVENT.

THE STATUS OF THE I/O EXPANSION BUS IS MONITORED USING A DEDICATED SYSTEM WORD AND APPROPRIATE MEASURES ARE TAKEN AS DETERMINED BY THE RISK ASSESSMENT.

FAILURE TO FOLLOW THE INSTRUCTIONS MAY RESULT IN THE LOSS OF THE PROTECTION PROVIDED BY THE DEVICE, WHICH MAY RESULT IN SERIOUS CONSEQUENCES SUCH AS DEATH, PERSONAL INJURY, OR DAMAGE TO THE DEVICE.

Version information

The following changes have been made to the document:

Date	Version	Modifications	Author
2024-11-20	V1.0	Release version	YPP

Ownership Information

Disclaimer

This document is intended only to assist readers in the use of the product, and the Company shall not be liable for any loss or error arising from the use of the information in this document. The products and texts described in this document are constantly being developed and improved. The Company reserves the right to modify this document without notifying the User.

Software downloads

If you need to download the device description file or IO Config software, please log in to the official website of Odot Automation: www.odot.cn, select the corresponding product page on the support and service page, and click Download. To download Codesys software, please log in to the www.codesys.cn page to download it.

Disclaimer of Warranties

Product Usage

Note
• When installing, operating, and maintaining the equipment, do not exceed any of the ratings specified in the electrical characteristics; • When installing, operating, and maintaining the equipment, do not exceed any of the ratings specified in the environmental characteristics. Do not use the product

in the following places: places with dust, oil fumes, conductive dust, corrosive gases, and flammable gases; Do not expose to high temperatures, condensation, wind and rain; Vibration and shock will also cause damage to the product;
Failure to follow the instructions may render the protection provided by the device null and may result in minor bodily injury or damage to the device.

Disclaimer of Warranties

The Company shall not be liable for any damage or malfunction of the equipment caused by:

1. Transportation damage: equipment damage caused by improper transportation or packaging;
2. Natural factors: damage caused by lightning strikes, voltage fluctuations, water ingress or natural disasters (such as fires, floods, etc.);
3. Improper use: damage caused by overload, non-standard operation, unauthorized modification or use of unqualified accessories;
4. Unauthorized maintenance: equipment failure caused by unauthorized maintenance or alteration;
5. Other non-product reasons: damage caused by other reasons that have nothing to do with the equipment itself.

Repair services

1. For the damage caused by the above reasons, the company will charge the repair fee according to the actual situation.
2. Outside the warranty period, the company provides paid maintenance services, and the cost is charged according to the maintenance situation.

Assumption of Risk

The company shall not be liable for casualties, property damage or other related losses caused by the use of the equipment. All risks are borne by the user.

Catelog

1 Product Overview

1.1 Brief Introduction

The B2341 programming environment is Codesys, a programmable controller that follows the IEC61131-3 international standard, and supports five programming languages: ladder diagram (LD), instruction list (IL), structured text (ST), function block diagram (CFC), and sequential function diagram (SFC). The maximum number of expansion modules is 4, the user program storage supports 1 Mbytes, the power-down protection zone is 4 Kbytes, and Modbus TCP client and server are supported. It has rich instructions, reliable functions, good adaptability, compact structure, easy to expand, cost-effective, strong versatility, programming, monitoring, debugging, and on-site operation are very convenient, and the Ethernet interface on the CPU supports Modbus TCP client function, and supports access to the data of the third-party Modbus TCP server; Supports Modbus TCP server function and supports third-party Modbus TCP clients to access data.

Supported I/O expansion modules include:

A. Digital input module

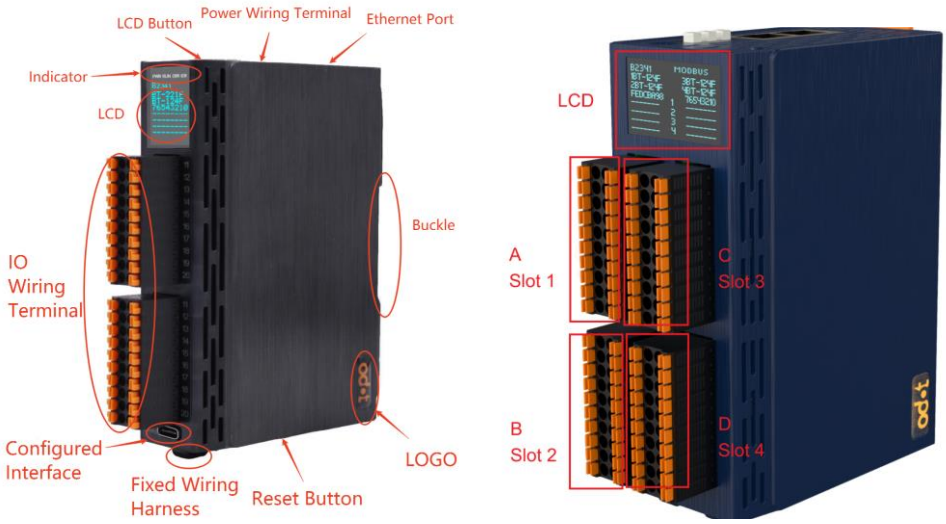
B. Digital output module

C. Analog input module

D. Analog output module

E. Special function module

1.2 Module Features



1. Optional IO modules, a single module supports up to 16 channels.

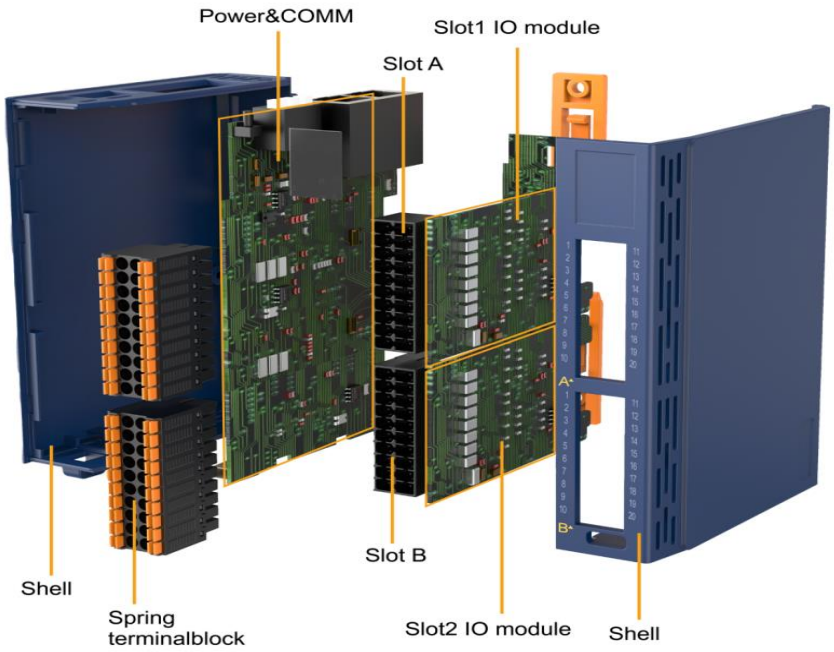
2. It can be expanded up to 4 modules and supports 64 channels.

3. With LCD display, it can view communication parameters, IO channel status, module version and other information.

4. Plastic shell, small size, easy to install.

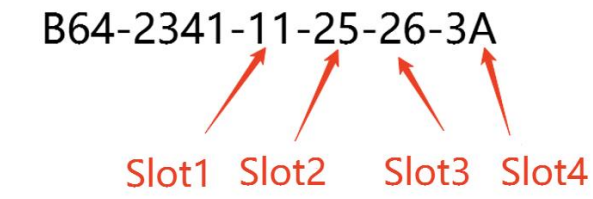
1.3 Modular Structure

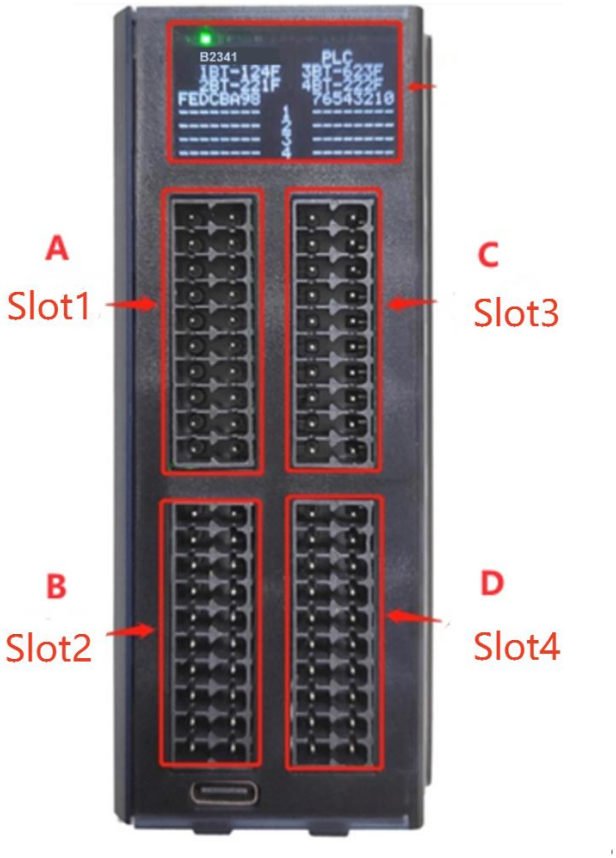
ODOT B series is integrated I/O module with modular combinations inside. The power supply and COMM board are at the bottom, and the IO module communicates with the COMM board through the backplane (the green module as below). It could support expansion max of 4 IO slots (only 2 IO slots are installed in below diagram).



Example: 1.B32-2341-25-11

2.B64-2341-11-25-26-3A





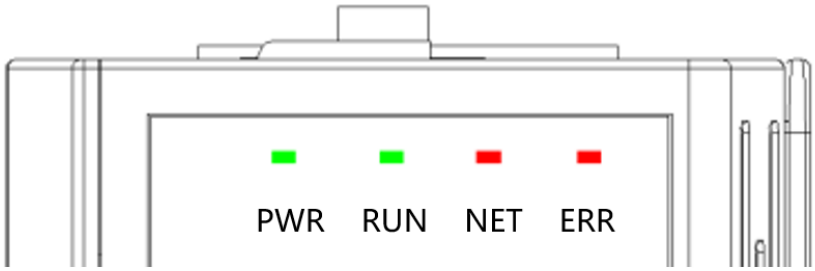
1.4 Module Selection Table

No.	Name	Module	Module sort	Module description	Status
1	B32	BOXIO-32	32 channel sets	32 channel shell, small LCD display, 32 backplanes	Published
2	B64	BOXIO-64	64 channel sets	64 channel shell, big LCD display, 64 backplanes	Published
3	2341	B2341	COMM board	PLC function, Support Modbus TCP Client and Server, use the Codesys software programming	Published
4	-11	BT-124F	DI	16 channel / digital input / 24VDC /dual direction, the input high & low level is valid	Published
5	-25	BT-221F	DO	16 channel / digital output / 24VDC / sink, the output low level is valid	Published
6	-26	BT-222F	DO	16 channel / digital output / 24VDC / source, the output high level is valid	Published
7	-3A	BT-3158	AI	8 channels voltage input, 0~5VDC/0~10VDC/±5VDC/±10VDC, 12-bit	Published
8	-3G	BT-3168	AI	8 channels voltage input, 0~5VDC/0~10VDC/±5VDC/±10VDC, 16 bit	Published
9	-3B	BT-3238	AI	8 channels / current input / 0&4-20mA, 16 bit single-ended,	Published
10	-3C	BT-3244	AI	4 channels/current input /0&4-20mA, ±20mA, 16-bit, single-ended bipolar,	Published
11	-3D	BT-3714	AI	4 channels thermal resistance input, RTD-PT100	Published
12	-3E	BT-3724	AI	4 channels thermal resistance input, RTD-PT1000	Published
13	-3F	BT-3804	AI	4 channels Thermocouple input, TC-J / K/ E / T / S / R / B / N type, fixed filtering parameters	Published
14	-4P	BT-4234	AO	4 channels current output, 0&4-20mA, 16-bit, single-ended,	Published
15	-4Q	BT-4154	AO	4 channels voltage output, 0~5VDC/0~10VDC/±5VDC/±10VDC, 16-bi	Published
16	-5A	BT-5102	Special module	2 channels orthogonal/pulse encoder input, 5V single-ended, 1.5MHz	Published
17	-5B	BT-5112	Special module	2 channels orthogonal/pulse encoder input, 24V single-ended, 1.5MHz	Published
18	-5C	BT-5121	Special module	1 channel SSI encoder input, 5V differential, 2MHz	Published

19	-5D	BT-5141	Special module	1 channel orthogonal/pulse encoder input, 5V differential, 10MHz	Published
20	-5G	BT-5312	Special module	2-Channel Modbus Serial Port Module	Published
21	-6V	BT-623F	Special module	8 channels / digital input, source & sink /NPN&PNP/ 24VDC, supports counter function (counter frequency up to 200Hz); 8 channels / digital output / source / PNP / 24Vdc/0.5A	Published

1.5 LED Indicator

The LED status indicator allows the user to easily check the power and communication status of the communication board and I/O module, as well as the operating status of the I/O channel. For detailed indicator status, refer to the indicator description.

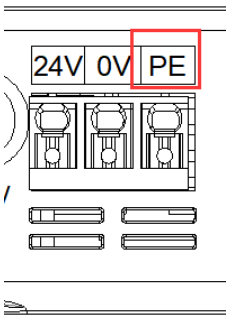


1.6 LCD Screen

The front of the module provides 8*8 and 16*8 LCD interfaces, which can view the model, IO module channel working status, and version information of the module. For the details of the LCD screen, you can view the corresponding chapters of the corresponding module.

1.7 Grounding Protection

In order for the system and the instruments connected to it to operate reliably and to guarantee measurement and control accuracy. The module is provided with a ground terminal at the top.



1.8 Wiring

Use a push-in connection to connect single wires or crimp terminal (ferrule) wires without any additional tools. Users save time on cabling and guarantee a secure connection regardless of wiring experience.

The wiring harness fixed end at the bottom of the module is used to fix the cable when the IO module is connected to a multi-strand cable.

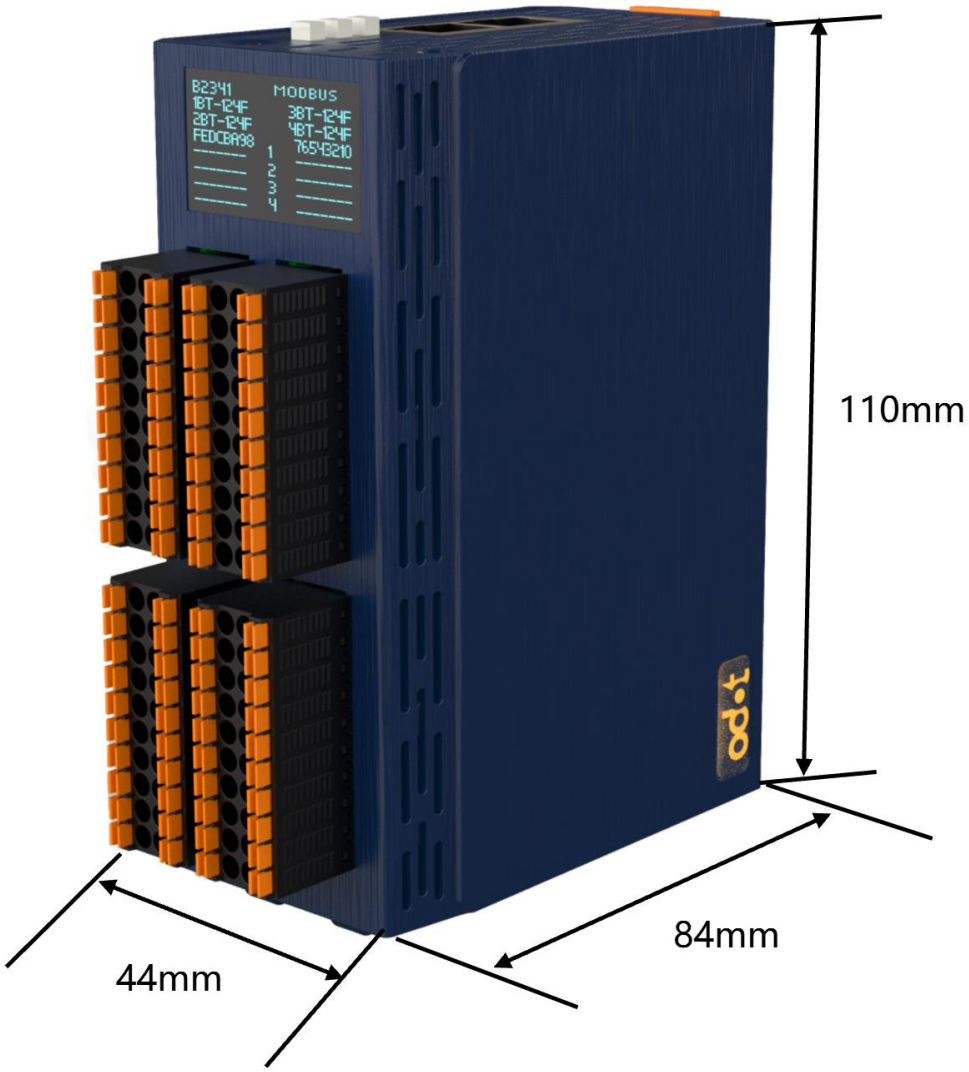
1.9 Rail Mounting

The DIN rail can be mounted safely and reliably on a 35 mm DIN rail.

1.10 Installation Dimensions

B32 module installation size: 110*84*28mm, plus IO terminal: 110*100*28mm

B64 module installation size: 110*84*44mm, plus IO terminal: 110*100*44mm



2 Module Parameter

2.1 Technical Parameter

General Parameters	
System Power	Supply: 19.2-28.8VDC (nominal: 24VDC) Protection: power supply anti-reverse polarity protection
Power Consumption	100mA@24VDC
Internal BUS Supply Current	Max.2.5A@5.0VDC
Isolation	The system power to field power: isolation
IO Modules Supported	B32:2 B64:4
Wiring	Max.1.5mm² (AWG 17)
Environment Specification	
Operating Temperature of Vertical Installation	-20℃~60℃
Operating Temperature of Horizontal Installation	-20℃~50℃
Relative Humidity	5%~95%RH, no condensation
Storage Temperature	-40℃~85℃
Storage Humidity	5%~95%RH, no condensation
Ingress Protection Rating	IP20
EMC specifications	Comply with IEC61131-2、IEC61000-4
Programming Specifications	
Programming Software	Codesys V3.5.19.70
Programming Language	IEC61131-3(LD、IL、ST、CFC、SFC)
Maximum Task Status	5
Program Memory	1M Bytes
Data Storage	1M Bytes
Power-down Protection Area	3K Bytes
Maximum Expansion Module Input	1K Bytes
Maximum Expansion Module Output	1K Bytes
Maximum Number of Tasks	5

Bitwise Operations Cycle	0.21us
Word Operation Cycle	0.21us
Double Word Operation Cycle	0.64us
Minimum Program Run Cycle	1ms
RTC	Not supported
Communication Parameters	
Communication Interface	2*RJ45
Network Port Parameters	10/100Mbpa self-adaptive, full-duplex
Modbus TCP Client	Supports up to 5 Modbus TCP server connections
Modbus TCP Server	Supports up to 5 Modbus TCP client connections

⚠WARNING

There is a risk of electric shock, explosion, or arc flash

Disconnect all devices from power, including connected devices, before removing any covers, or installing or removing any accessories, hardware, cables, or wires, except in specific circumstances specified in the appropriate hardware guidelines for this device.

As instructed, it is important to use a voltage sensing device with an appropriate rating to detect a power outage at the appropriate place and time.

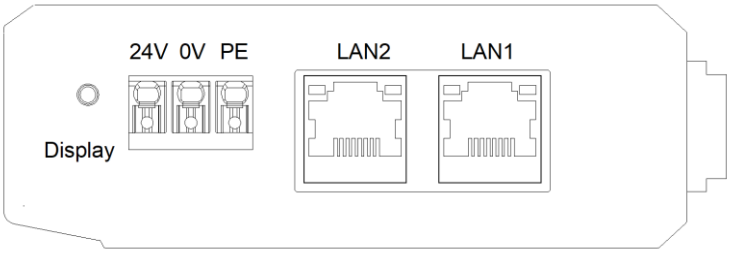
Replace and tighten all covers, accessories, hardware, cables, and wires, and confirm that the ground connection is correct before powering on the device.

When operating this equipment and related products, the specified voltage must be used.

Failure to follow the instructions may result in the loss of the protection provided by the device, which may result in serious consequences such as death, personal injury, or damage to the device.

2.2 Hardware Interfaces

2.2.1 System Power and Network Interfaces

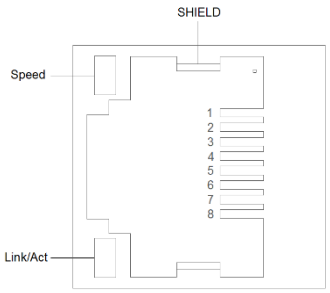


1. The wiring of the system power module adopts 3Pin 3.5mm pitch spring terminal, and the terminal is defined as follows:

NO.	Mark	Definition
1	PE	Ground terminal
2	0V	The power input is negative
3	24V	The power input is positive

2.Modbus TCP network interfaces

LAN1/LAN2 switch cascading function is supported, 10Mbps/100Mbps adaptive rate.



Speed: Network speed Indicator (Green)

ON:100Mbps

OFF:10Mbps

Link/Act: Link status Indicator, Active Indicator (orange)

ON: Link UP

OFF: Link DOWN

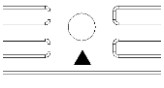
Flash: Active

SHIELD: RJ45 crystal head shield interface

RJ45 interface pin definition

Pin	Definition	Description
1	TD+	Transmit+
2	TD-	Transmit -
3	RD+	Receive+
4	--	--
5	--	--
6	RD-	Receive -
7	--	--
8	--	--

2.2.2 Reset button



Reset

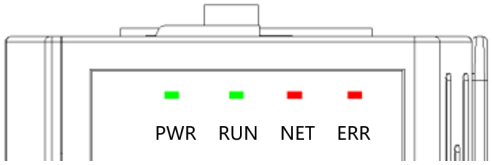
Reset: Reset the module button, press and hold the button for more than 5 seconds, and all parameters of the module will be restored to the default value.

2.2.3 Configuration interface

Config

Config: Configuration port, a standard Type-C interface used to configure device parameters and upgrade firmware.

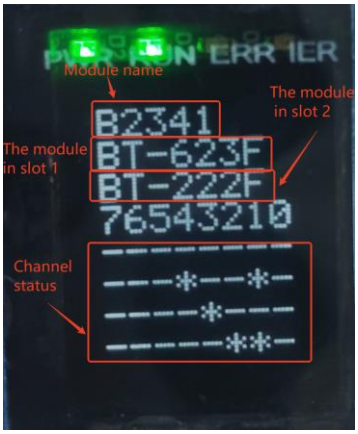
2.2.4 LED Indicators

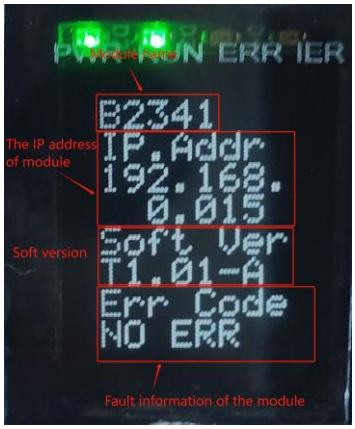


PWR Power indicator (Green)	Definition
ON	The system power supply is normal
OFF	The system power supply is abnormal
RUN Device operation indicator (Green).	Definition
Flash	The PLC is in RUN mode
OFF	The PLC is in STOP mode
NET Network Status Indicator (Red)	Definition
Flash	The number and type of I/O modules configured on the PLC are the same as those on the backplane
OFF	The number and type of I/O modules configured on the PLC are inconsistent with those on the backplane
ERR IOError Indicator (Red)	Definition
Flash	The I/O module is abnormal
OFF	The I/O module is in the normal state

2.2.5 LCD Display Interface

The initial display interface of the LCD is as follows, which can display the module model, the slot module model, and the channel situation. (Channels have input or output value channels that display "*", and no input or output channels display "-".）





The module information display is 2 pages in total, The first line of each page represents the module name B2341, the first page mainly displays information such as channel status and module type, the second page mainly displays information such as the IP address of the module.

Page 1: Information such as channel status and its module name.

Line 1: the module name B2341;

Line 2: the module BT-623F located in slot 1;

Line 3: the module BT-222F in slot 2;

Lines 4-8: the channel input or output status, the channel has input or output value channels show "*", and the no input and output channels show "-";

Page 2: Software version information

Line 1: the module model name (B2341).

Lines 2-4: the IP address information for the module (192.168.0.15).

Lines 5-6: the app version information for the module

Lines 7-8: the module's fault information

The module information display is 2 pages in total, the first number in the first line of each page indicates the slot number (1) of the module, shown at the back is the module BT-623F.The first page mainly displays the channel status and information, module types and other information, and the second page mainly displays the software version information.

Page 1: Channel status and information, module name.

Line 1: the slot number (1) in which the module is located, and its module name BT-623F;

Line 2: the module type 8DI&8DO;

Line 3-6: channel input or output display;

8DI: Line 3-4

Lines 3 - 4: 8DI input display, there is a display corresponding indication of the corresponding channel, and when there is no input, it is displayed as "-" from right to left,

1. For example, there are 8 inputs, and the 4th line is displayed as:

76543210

2. If there is no input in 8 channels, it will be displayed as:

----

3. After the module is connected and disconnected after communication, the application layer is disconnected, and this line is displayed as:

__fault_ 8DO:

Line 5-6:

Lines 5 - 6 : the 8DO output display, there is a display corresponding to indicate the corresponding channel, and when there is no output, it is displayed as "-" from right to left,

1. For example, 8 channels have outputs, and line 6 is displayed as:

76543210

2. If there is no output in 8 channels, it will be displayed as:

----

3. After the communication board is connected to the master station and then disconnected, the application layer is disconnected, and after the fault output is executed, this line is displayed as: __fault_

Page 2: Software version information

Line 1: the slot number (1) in which the module is located, and its module model name (BT-623F).

Lines 3 - 4: show the IAP version information (V2.02) for the module

Lines 6 - 7: show the APP version information (V2.03) of the module

Note: The module information display is 2 pages in total, the first number in the first row of each page represents the slot number of the module, the module is displayed later, the first page mainly displays the channel status, information prompt, and its

module type and other information, and the second page mainly displays the software version information.

Page 1: Information such as channel status and its module type

Line 1: the slot number (2) in which the module is located and its module name (BT-222F).

Line 2: the type of module (16DO Src).

Lines 4 – 5: the channel output display prompt, there is a display corresponding to indicate the corresponding channel, and when there is no output, it is displayed as "-" from right to left,

1. For example, 16 channels have outputs, and these two lines are displayed as:

76543210 FEDCBA98

2. For example, when there is no output for 16 channels, it will be displayed as:

-------- --------

3. After joining the communication board and connecting with the master station and then disconnecting, the application layer is disconnected, and after the fault output is executed, these two lines are displayed as:

__fault_ __fault_

Page 2: Software version information

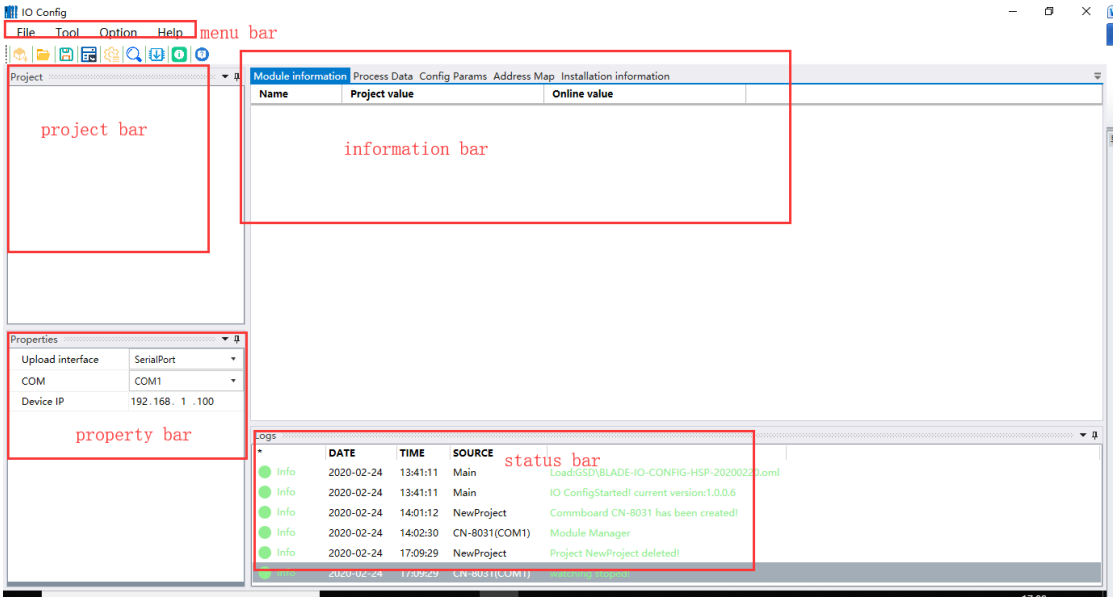
Line 1: the slot number (2) where the module is located, and its module name (BT-222F).

Lines 3 – 4: the IAP version information (V2.02) for the module

Lines 6 – 7: the APP version information (V3.02) of the module

3 IO Config Software

3.1 Software Interface



menu bar: The menu of the IO-Config software.

Toolbar: Commonly used user menus.

Project Window: Displays the currently established projects.

Properties window: Displays the specific parameters of the current project.

Main Window:

Basic Information: The module name, module number, hardware version, software version, module description, current consumption, and device manufacturer of the module.

Process data: It can be used to monitor channel data online.

Parameters: Modifiable module parameters.

Address Table: The address area occupied by the I/O module.

Installation Information: The module description, current consumption, module size, residual current, and product images.

Message window: Outputs the operation log of the current operation.

3.2.1 Menu Bar

File

Menu	Submenu	Description
Project	Create a new project	Create a new project
	Open the project	Open a saved project
	Save all	Save the current project
	Save As	Save the current project as a new project
Quit		Exit the software

Tool

Menu	Description
Search for the device	A new window pops up to search for devices by network or serial communication
Firmware upgrades	A new window pops up for firmware upgrade for B2341 device and I/O module

Options

Menu	Description
Configuration	It can modify the software display language, software interface display color, and device library description file path

Help

Menu	Description
About	It can view the company information and the version number of the configuration software
Exception help	A new window pops up, an abnormal exit reminder, please install Microsoft patches for Windos7 Sp1/XP and the following versions.

3.2.2 Toolbar

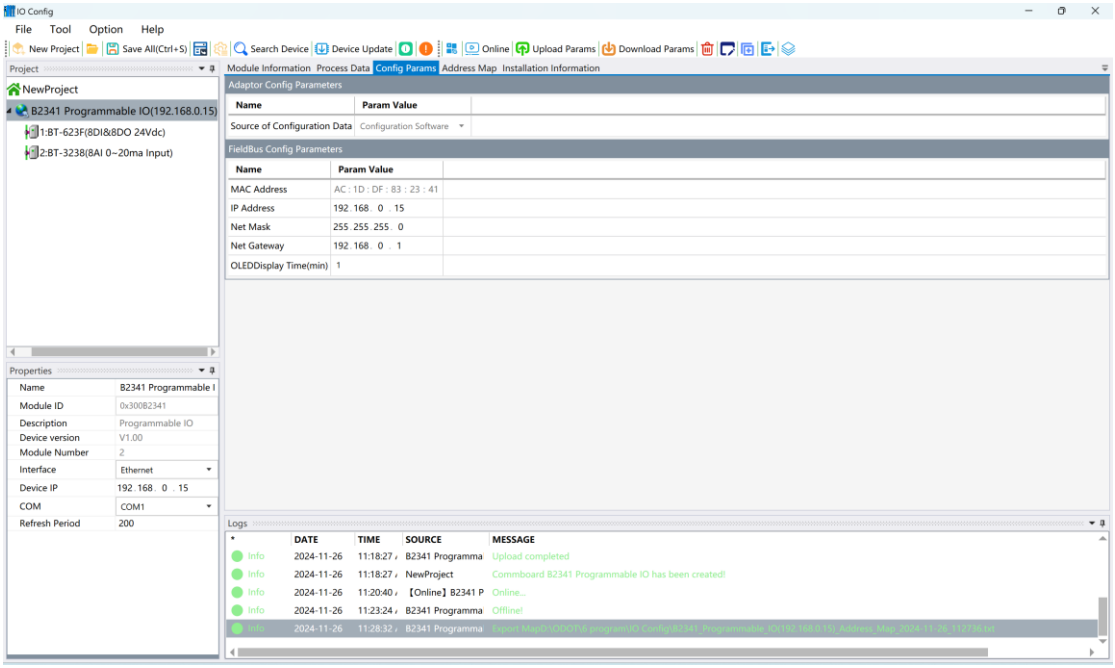
Menu general shortcut icons:

Icon	Name	Menu	Description
	Create a new project	File - Project - New Project	Create a new project
	Open the project	File - Project - Open Project	Open a saved project
	Save all	File-Project-All Save	Save the current project
	Save As	File-Project-Save As	Save the current project as a new project
	Configuration	Option -	Modify the display language,

		Configuration	accent color, and device library description
	Search Device	Tools - Search devices	A new window pops up, search for the device
	Firmware upgrades	Tools - Firmware Upgrade	A new window pops up for module firmware upgrade
	About	Help - about	To view the information, the version number of the configuration software
	Exception help	Help - Exception Help	A new window pops up, an abnormal exit reminder, WIN7 sp1/XP system versions below please install Microsoft patches.

3.2.3 Project Window

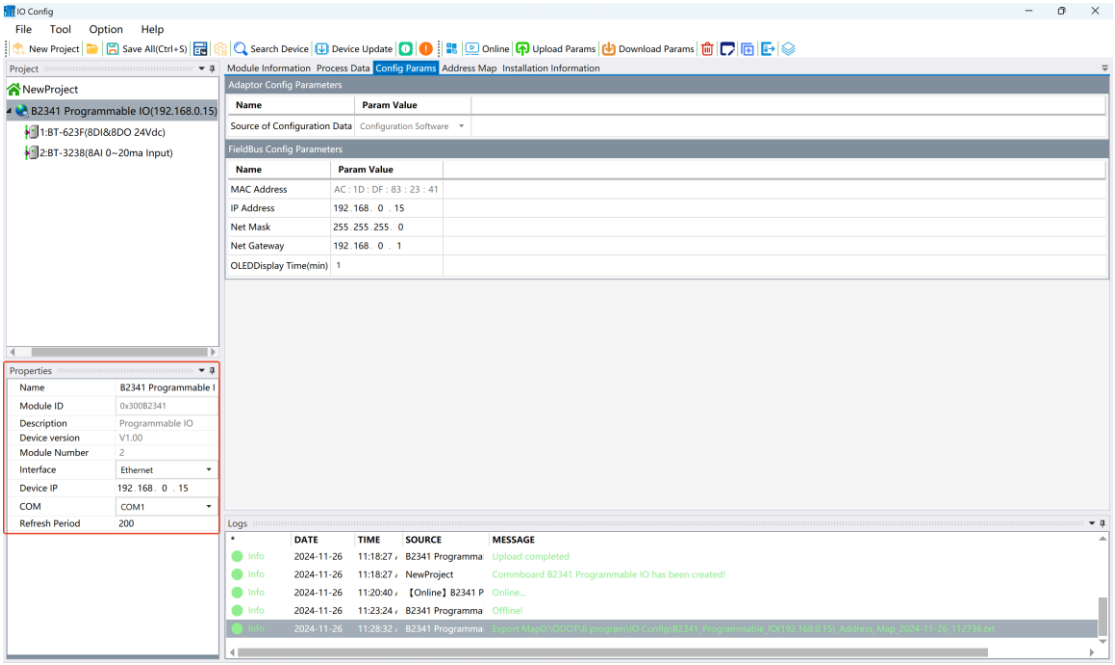
Displays the currently established projects.



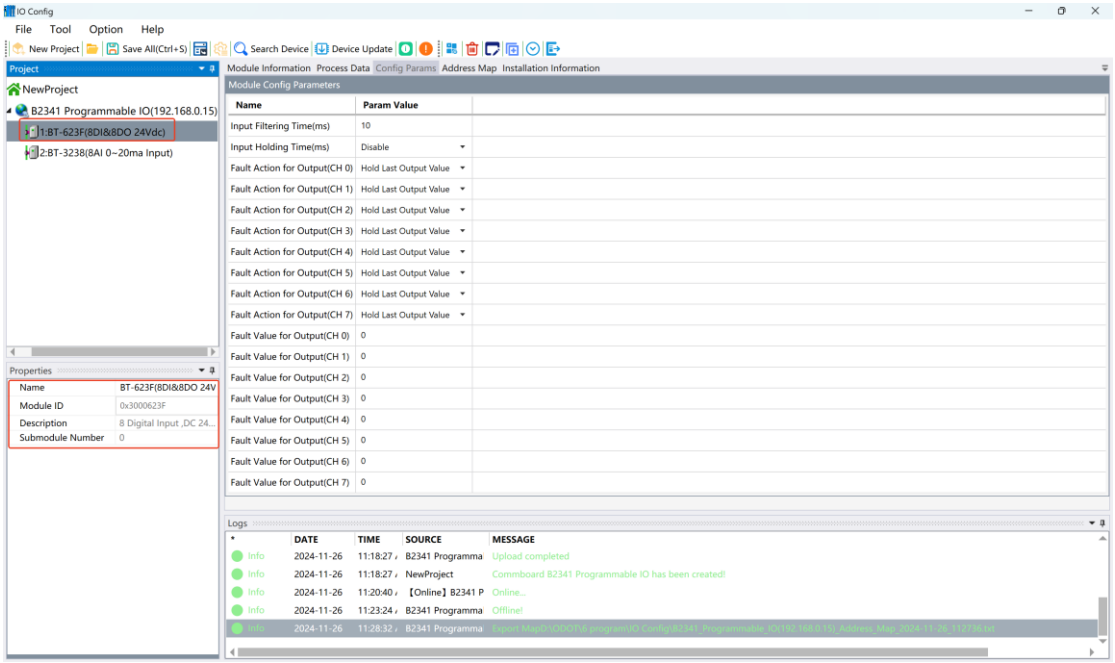
3.2.4 Properties Window

The Properties window displays the specific parameters of the current item.

Adapter module, PLC (module name, module number, module description, device version, number of modules, interface selection, device IP address, serial slogan, online refresh cycle).

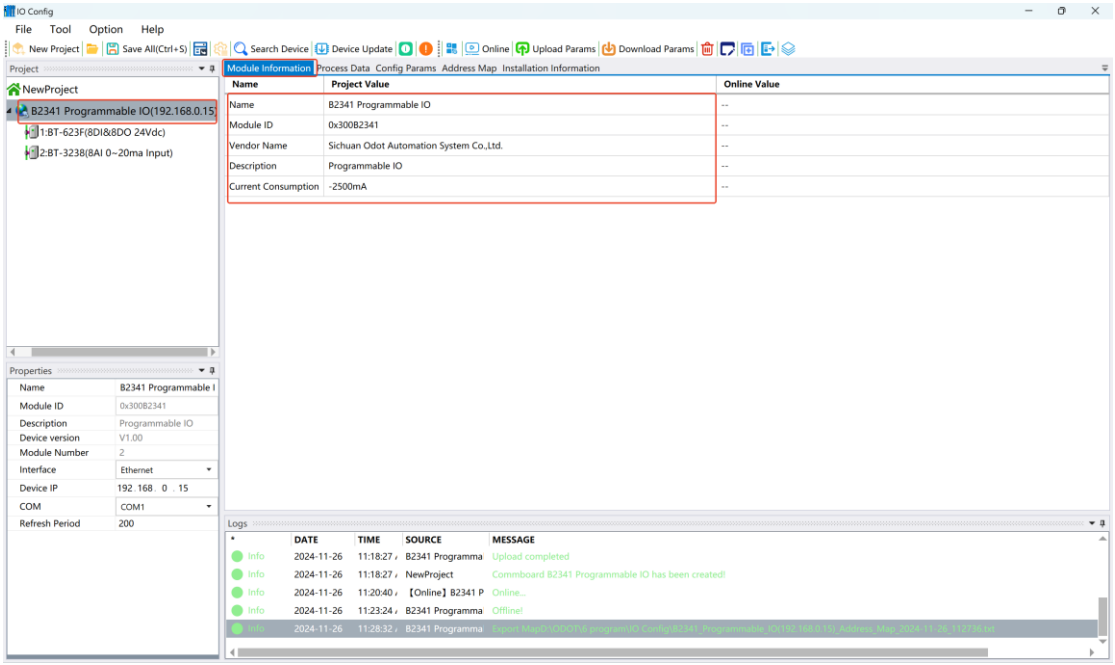


I/O module (module name, module number, module description, number of submodules)

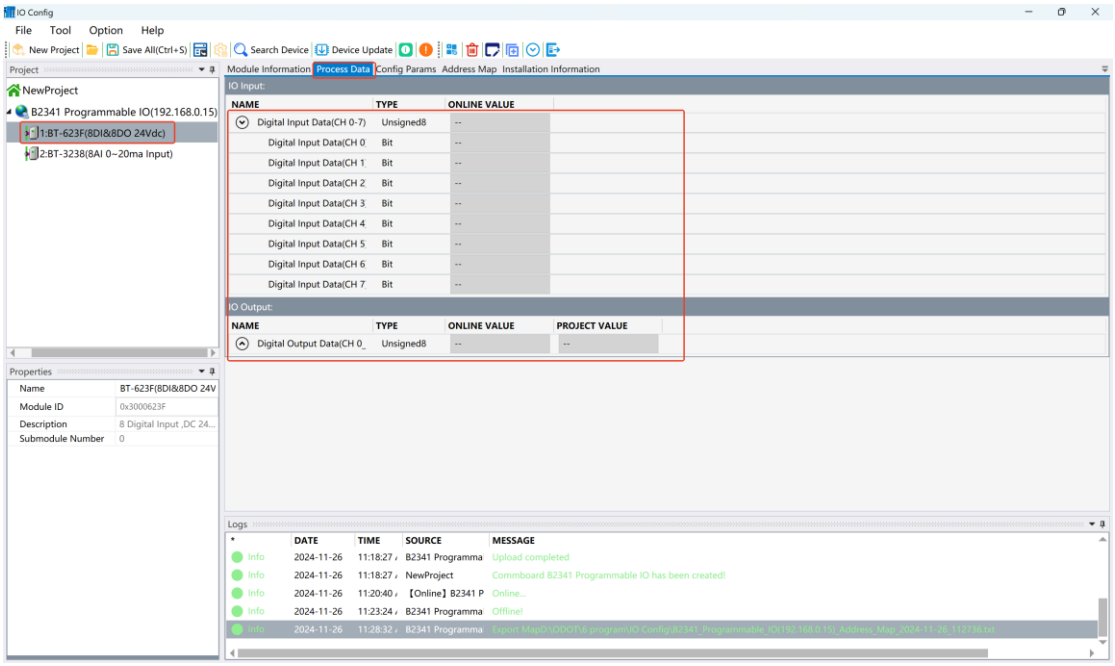


3.2.5 Main window

Basic information: The module name, module number, hardware version, software version, module description, current consumption, and equipment manufacturer of the adapter module, PLC and I/O module can be displayed.

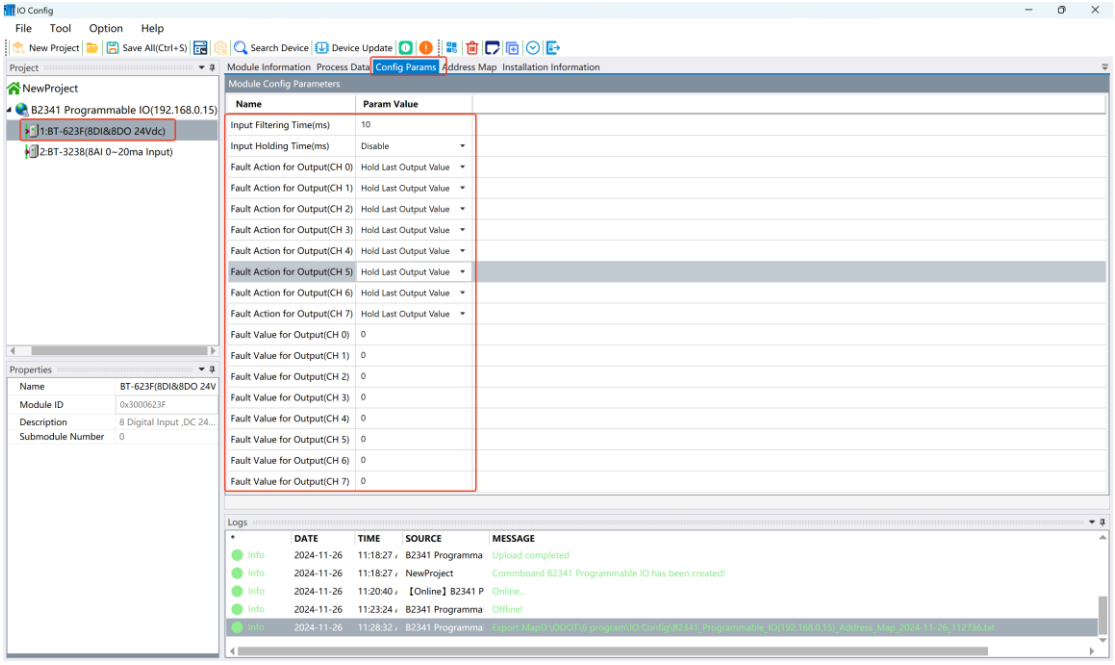


Process data: Displays the channel information of the I/O module for online monitoring of the channel data.

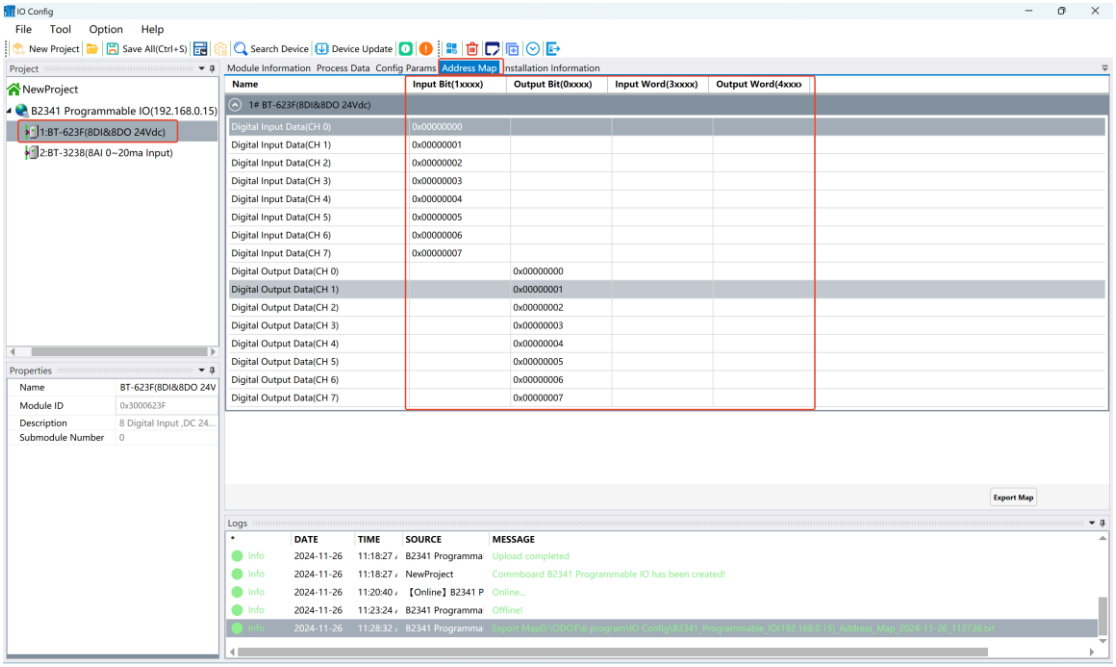


Configuration parameters: module parameters of display adapter modules, PLC and

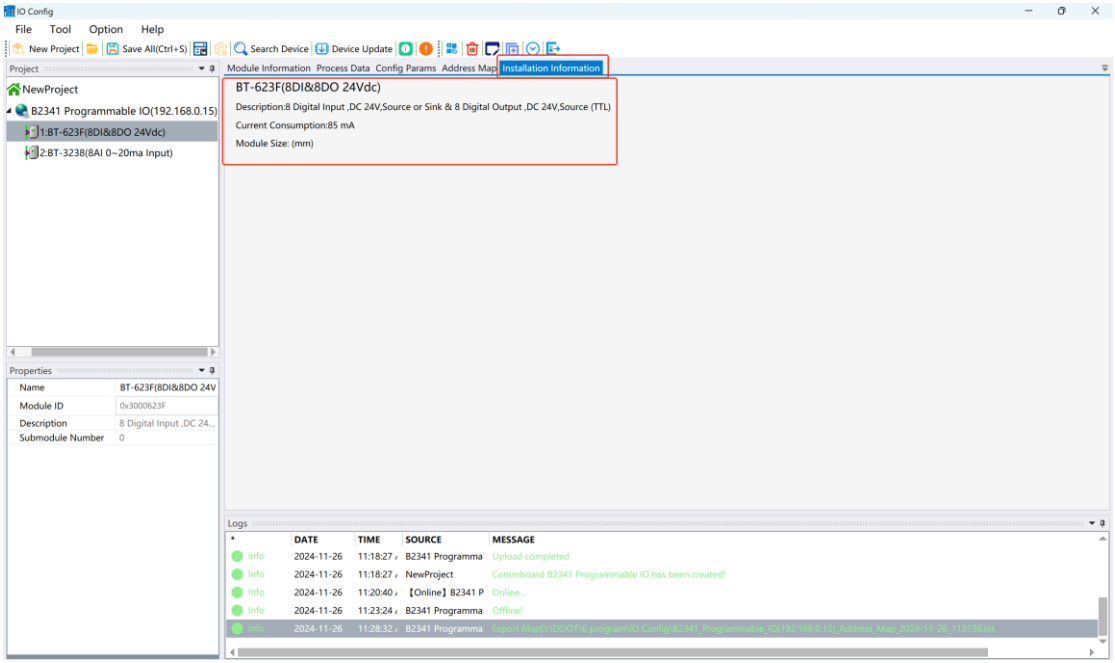
I/O modules, and module parameters that can be modified.



Address Table: Displays the storage area where the input and output channels of the I/O module are located.

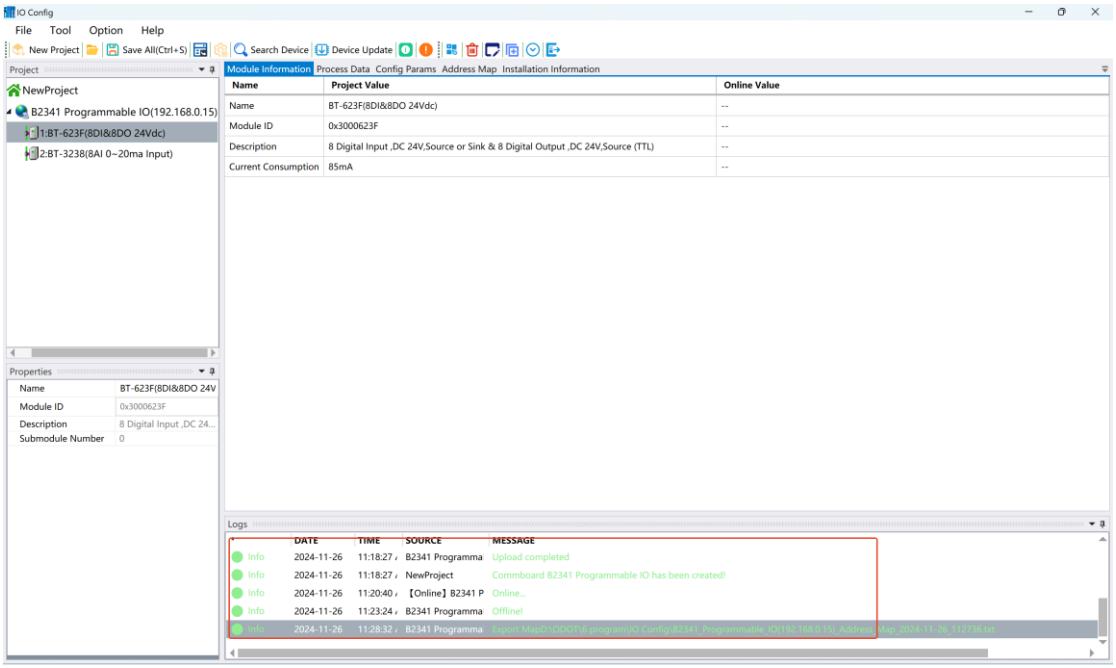


Installation information: Module description, current consumption, module size, residual current, and product pictures of adapter modules, PLCs, and I/O modules can be displayed.



3.2.6 Message window

Displays the real-time information of the current operation, and displays all operation log records such as creating a new project, uploading, downloading, modifying configuration parameters, and copying and pasting output.



3.2.7 Shortcut key

Shortcut key	Menu	Description
Ctrl + C	Engineering/PLC,	Copy modules for engineering, PLCs,

	Adapter - Copy	adapters, and I/O modules
Ctrl + V	Engineering/PLC, Adapter-Paste	Paste modules for engineering, PLC, adapters, and I/O modules
Delete	Engineering/PLC, Adapter - Delete	Delete modules for engineering, PLC, adapters, and I/O modules
Ctrl + S	File-Project-All Save	Save the configuration project
Ctrl + M	PLC, adapter - export address table	Export address tables for PLCs, adapters, and I/O modules

3.3 Software Features

3.3.1 Function

A. Module selection.

B. View the module configuration parameters and the data address of the module.

C. Modify the module configuration parameters.

D. Online debugging module.

E. Search for the device.

F. Firmware upgrades.

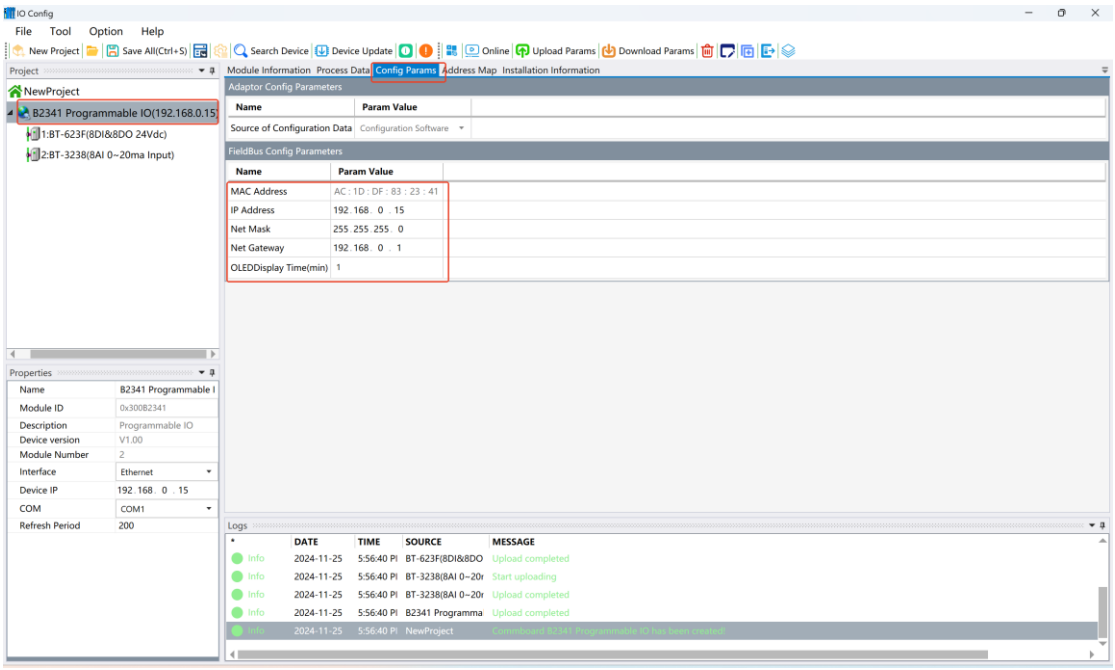
3.3.2 Communication Interface

The Ethernet interface is used as the communication interface for B2341 device upload and download, I/O module upload and download, modification of mounted I/O module parameters, online testing, and firmware upgrade.

3.3.3 View the Configuration Parameters

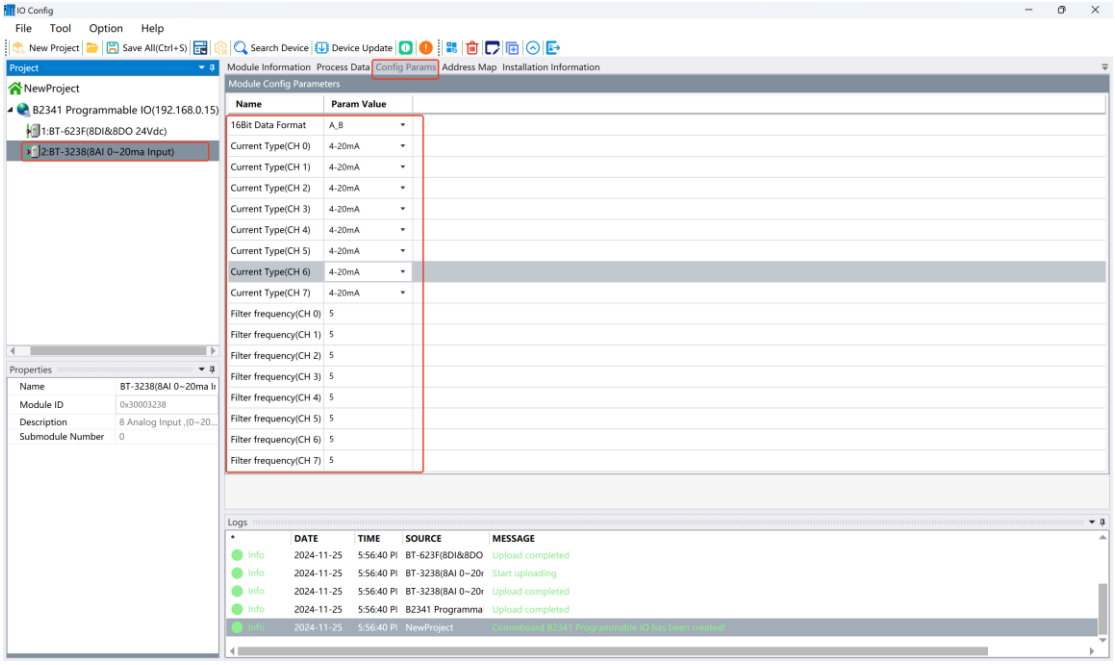
For B2341 devices and different I/O modules, click Configuration Parameters to view the default configuration parameters of the module.

B2341 default parameter interface:



The I/O module uses the 16DO module (BT-222F) as an example, and the default parameter interface is as follows, and the configuration parameters of other I/O

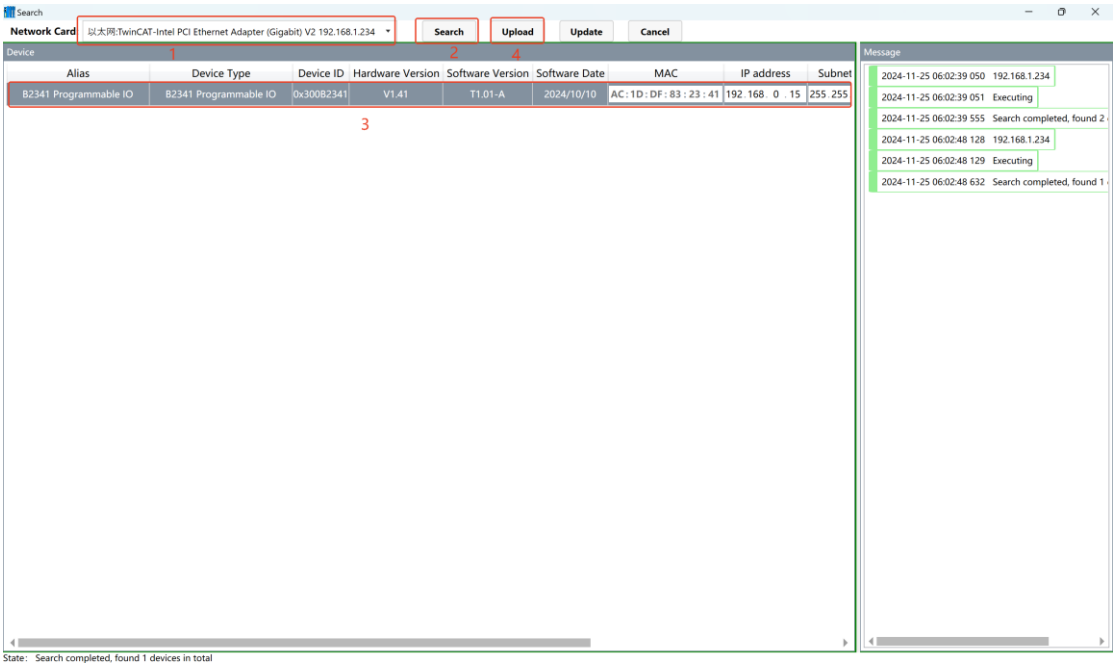
modules are viewed in the same way.



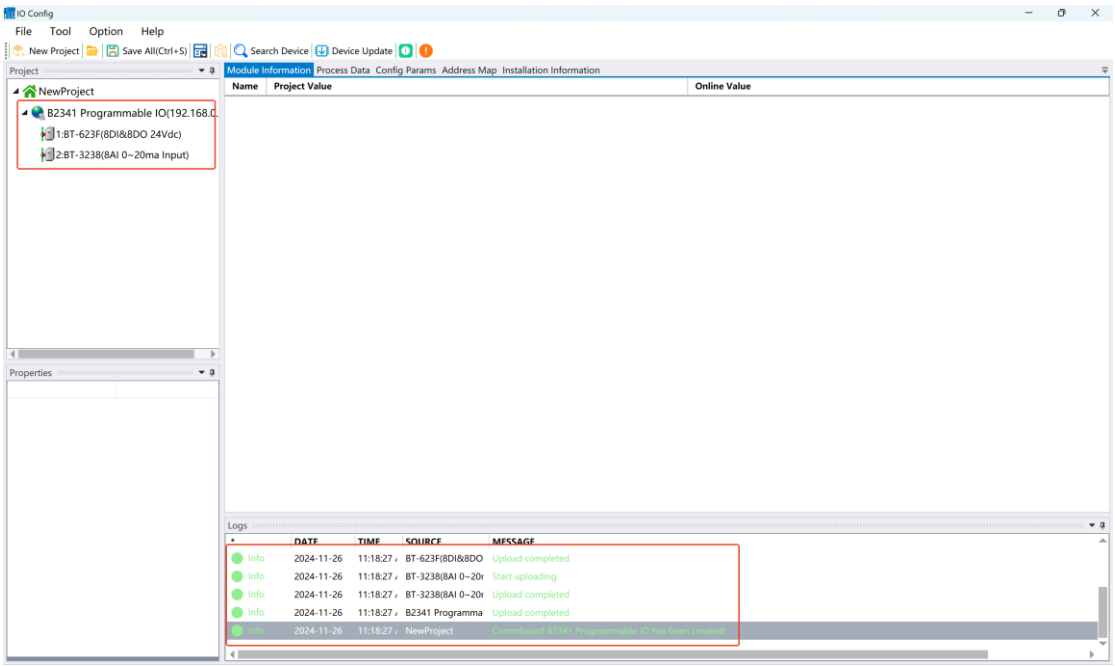
3.3.4 Modify the Configuration Parameters

The configuration parameters of the B2341 and the I/O module can be modified in the IO-Config software. B2341 parameters must be modified with the help of IO-Config software.

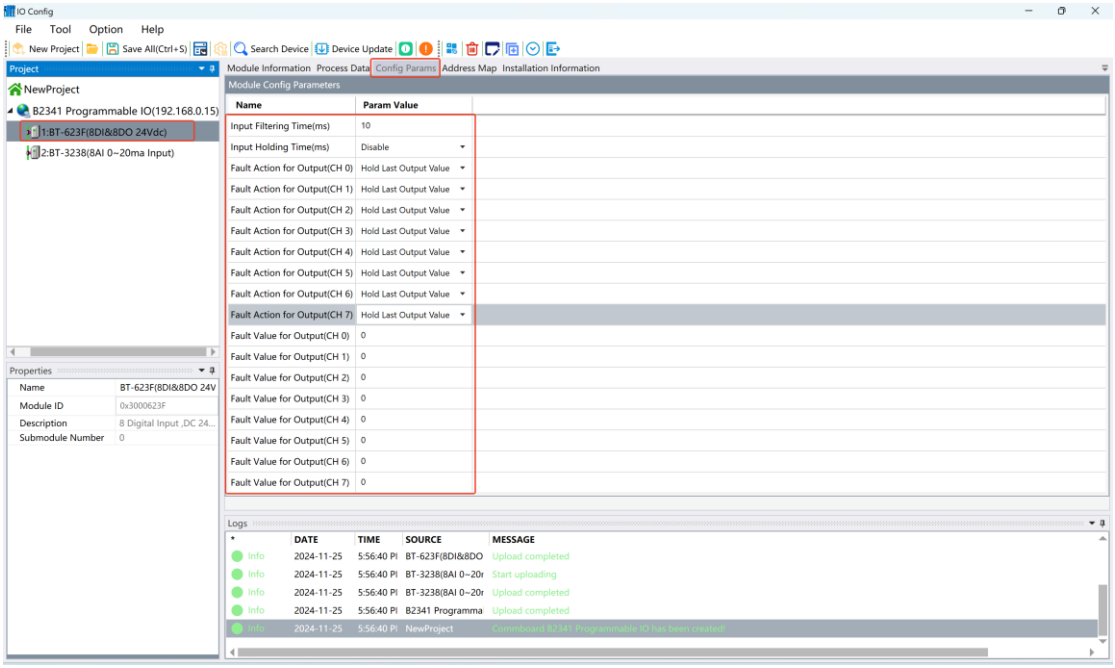
Take the B2341 PLC and BT-623F and BT-3238 modules as examples to demonstrate the module parameter configuration. The B2341 uses Ethernet to configure the interface, click search for devices Search Device, Follow the steps shown below to upload device.



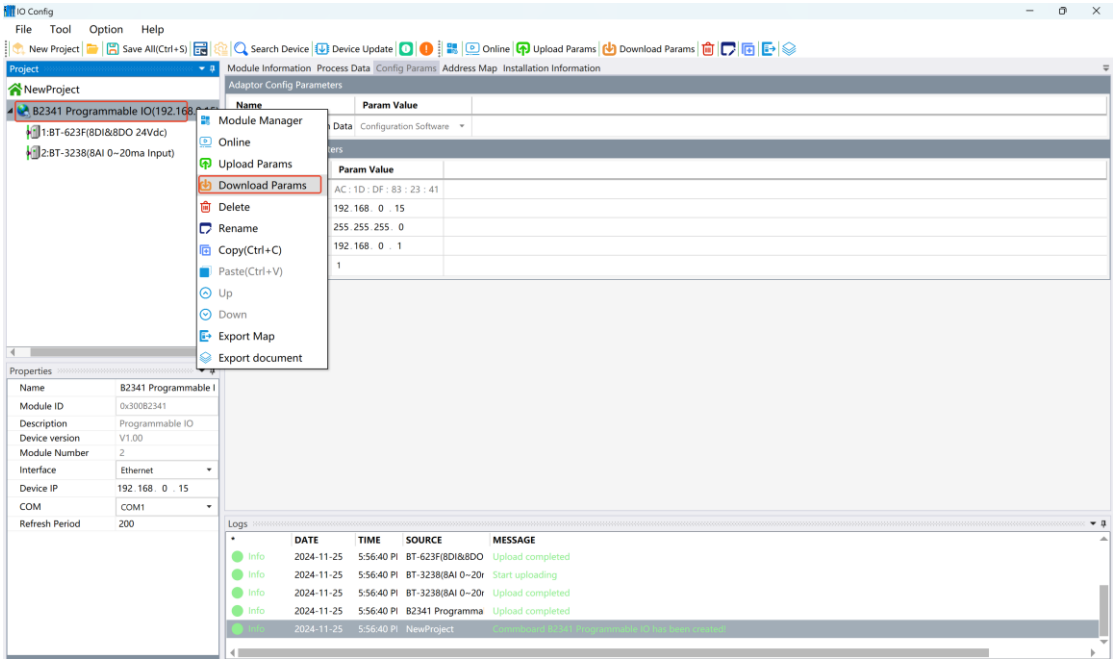
The software will automatically create the project, as shown in the following figure.



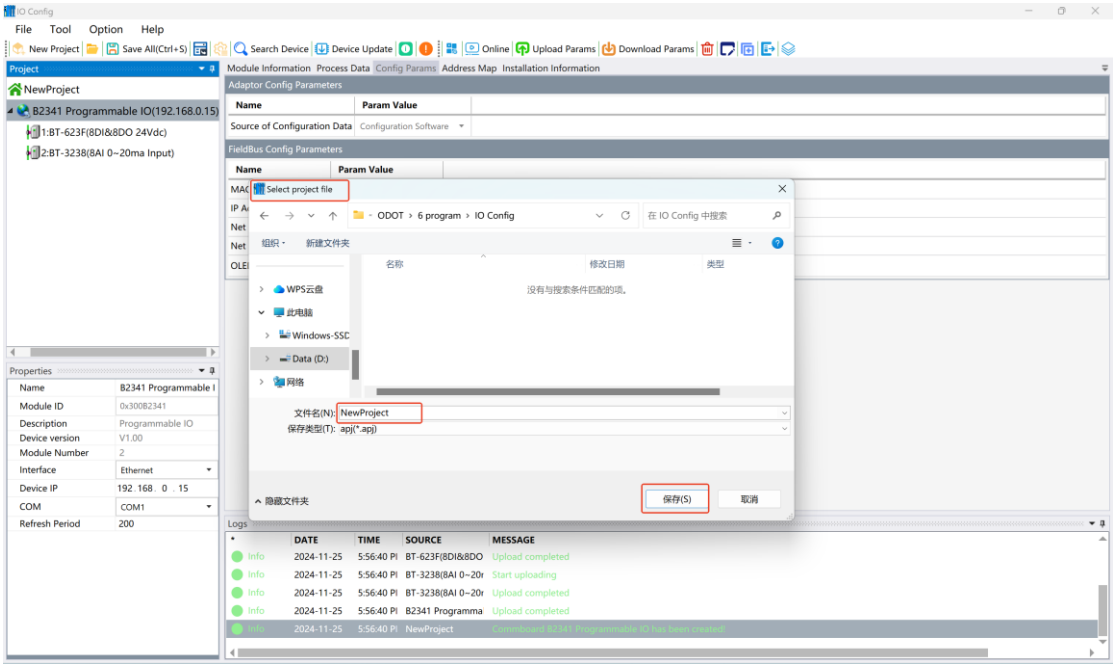
Then modify the parameters of the module.



After the setup is complete, right-click the B2341 device in the project directory bar – "Download Configuration". The configuration parameters of the B2341 device and I/O modules can be modified.



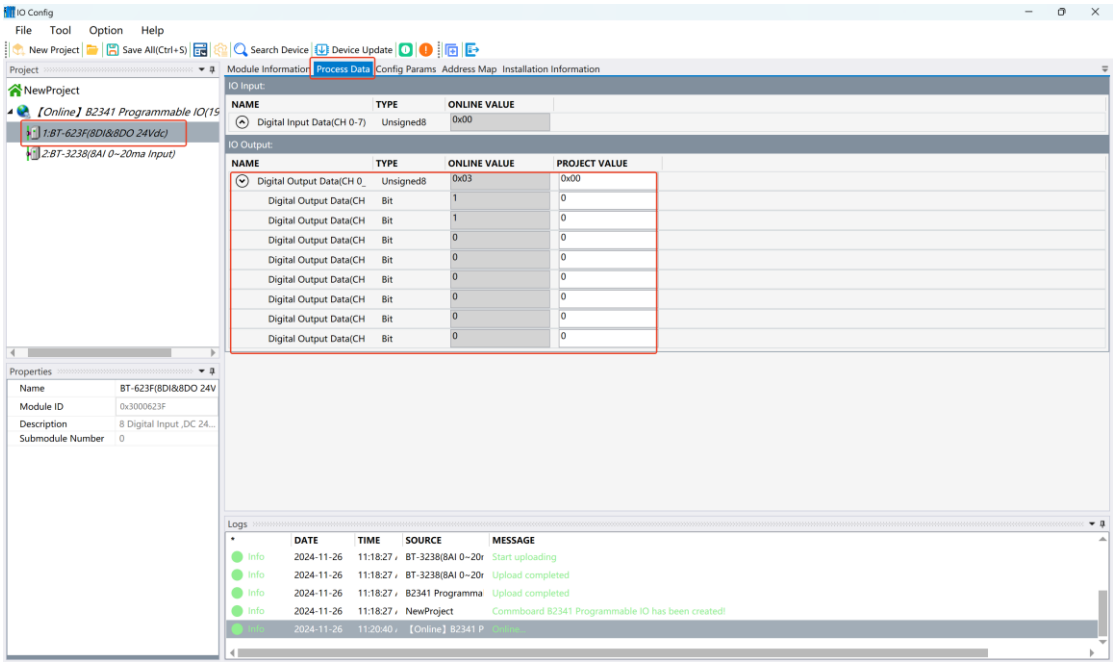
After all module parameters are modified, click the shortcut key 'Save All' or press the keyboard shortcut 'Ctrl +S' to save the entire configuration project file.



3.3.5 Online Debugging

First, search for the device and upload the project, right-click on the B2341 device, and select Online. The I/O module real-time data can be monitored in the "Process Data" interface of the main window.

For example, the BT-623F module in slot 1 can be used to view the real-time changes of I/O points.

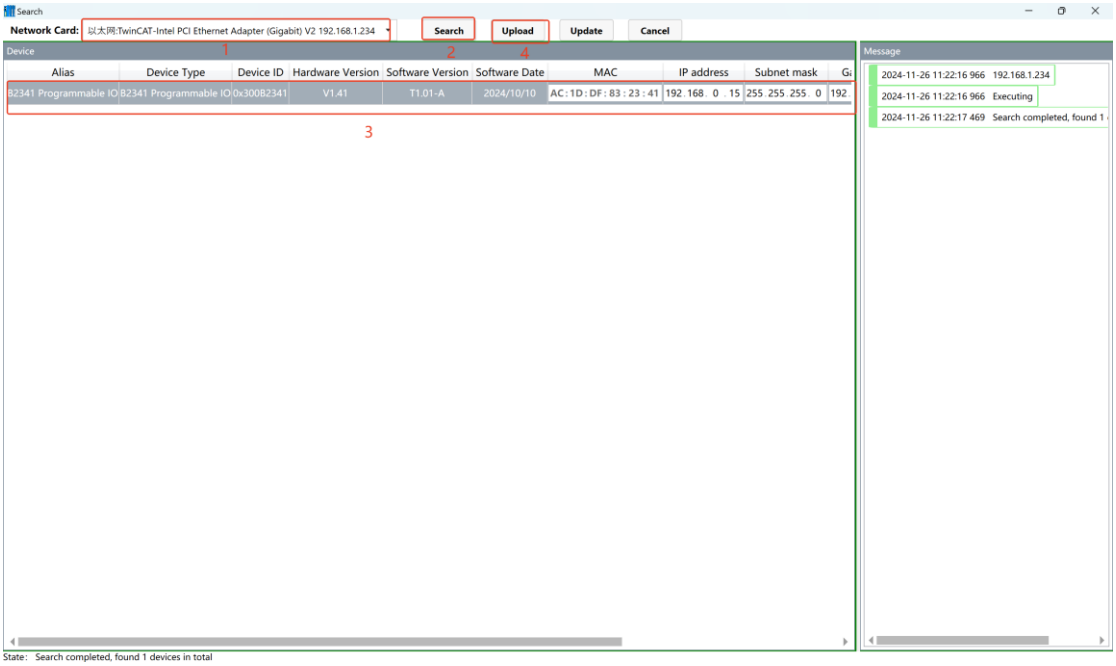


Note: For digital input modules, it can right-click on the module and manually add the

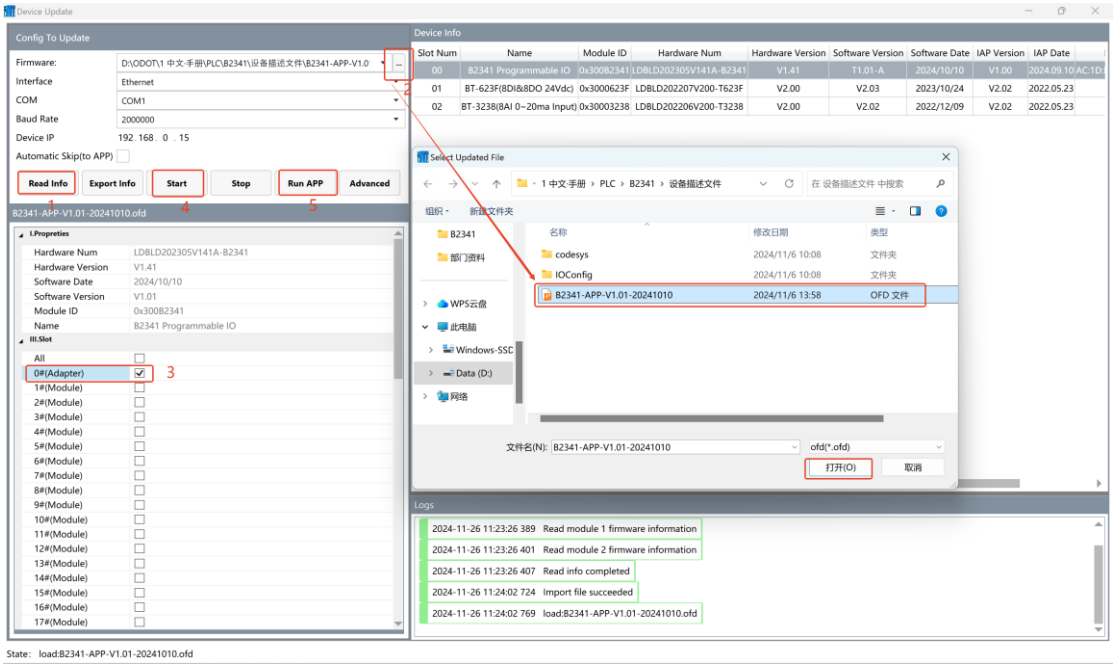
'Counting Submodule'. After the addition is complete, please download the configuration again.

3.3.6 Device Firmware Upgrade

Open the IO-Config configuration software, click Search for Devices Search Device, and follow the steps shown below.



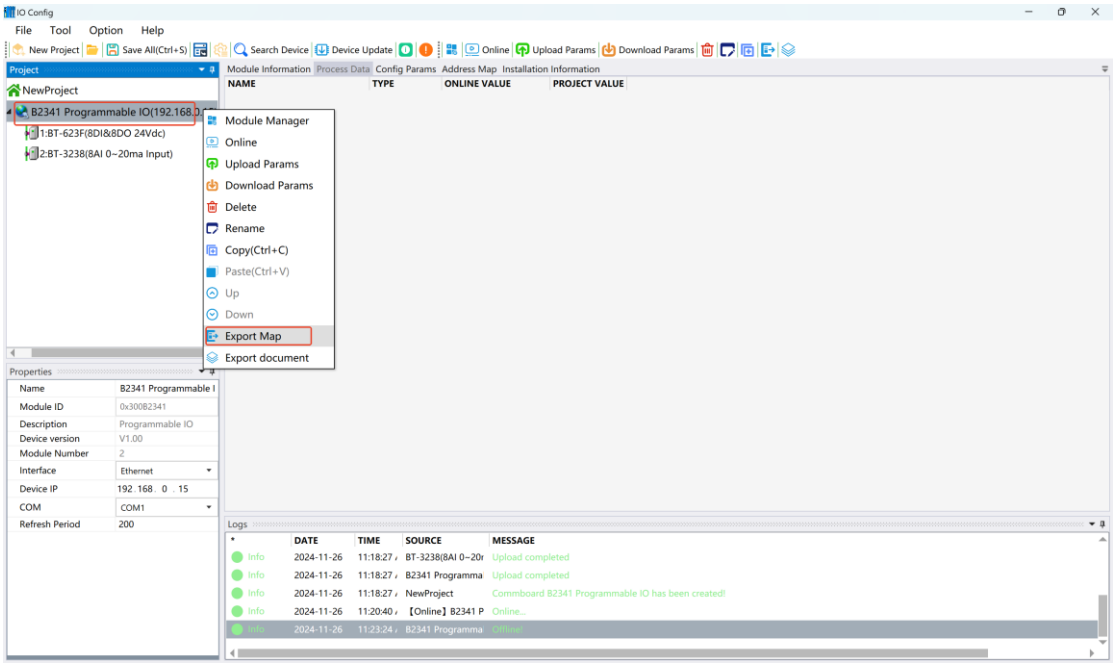
In the pop-up interface, set the upgrade file, select the interface and set 'Ethernet', then 'Read Device Information', check the devices to be upgraded, set 'Auto Jump', and then click 'Start Upgrade' and wait for the upgrade to complete.



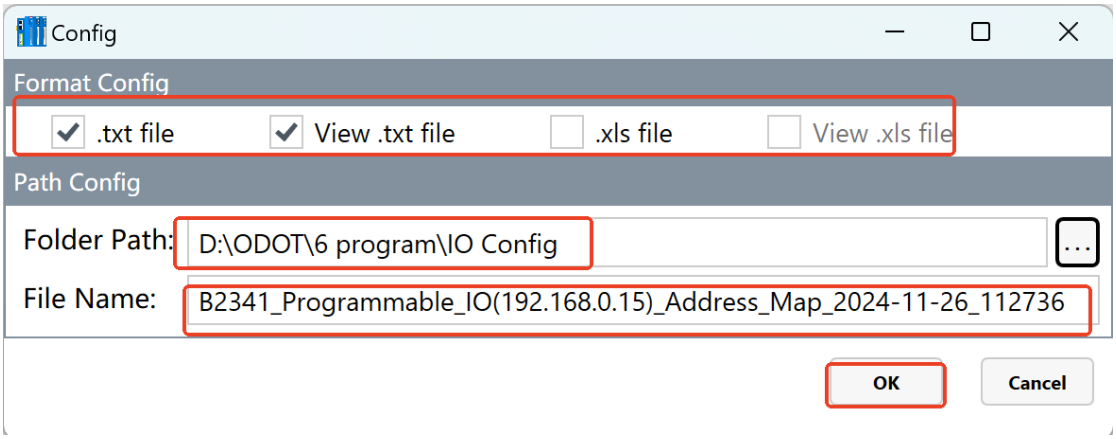
The above is the process of firmware upgrade, and the I/O module can be upgraded using this method.

3.3.7 Data Export

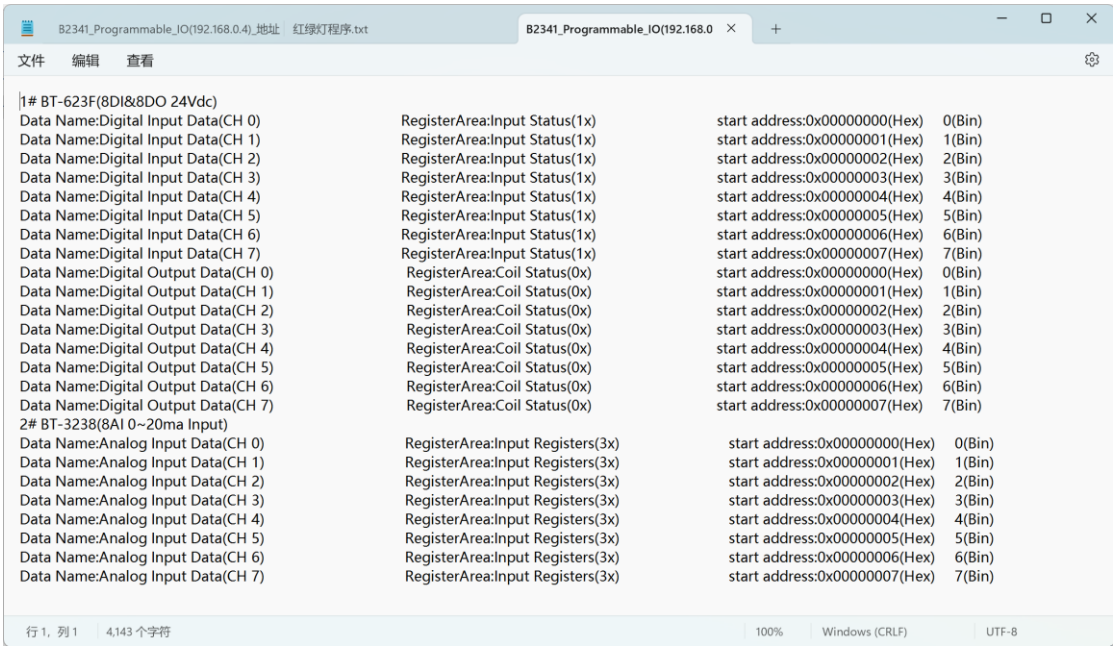
Once the project is set up, then right-click on 'B2341 Device' and select 'Export Address Table'.



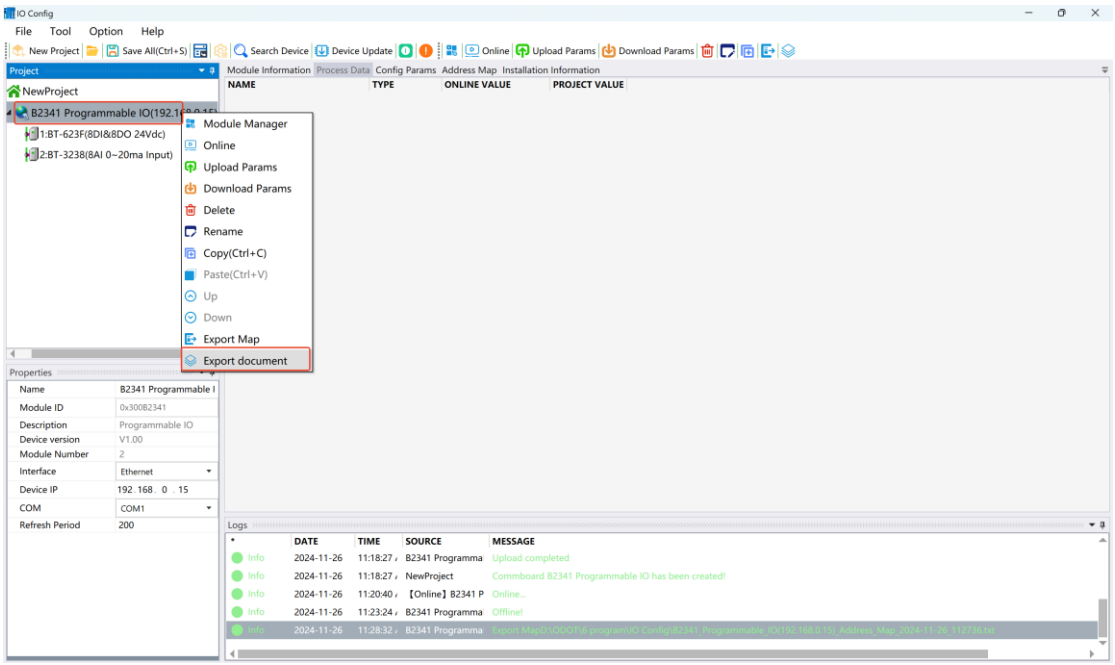
In the pop-up window, select the file format, output file directory, and file name, and then click Confirm.



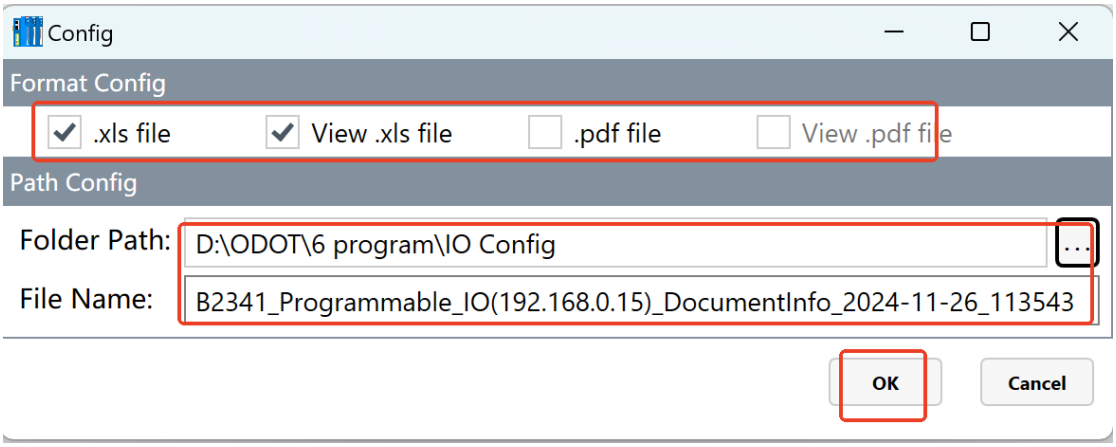
The following is an example of the generated file:



Export Document After setting up the project, right-click on the B2341 device and select Export Document.



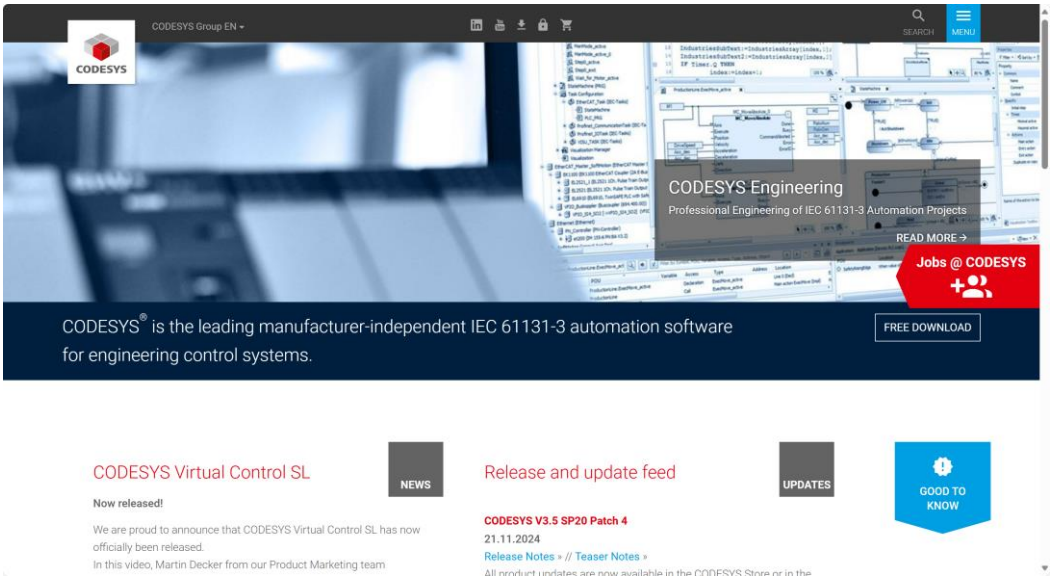
In the pop-up window, select the file format, output file directory, and file name, and then click Confirm.



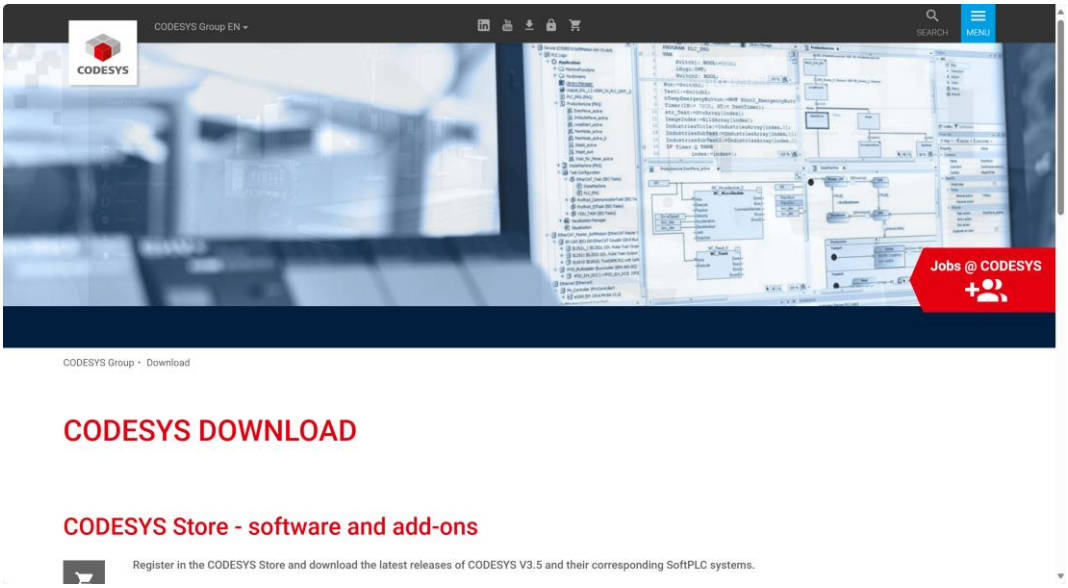
4 Programming Software (Codesys)

4.1 Programming Software Installation

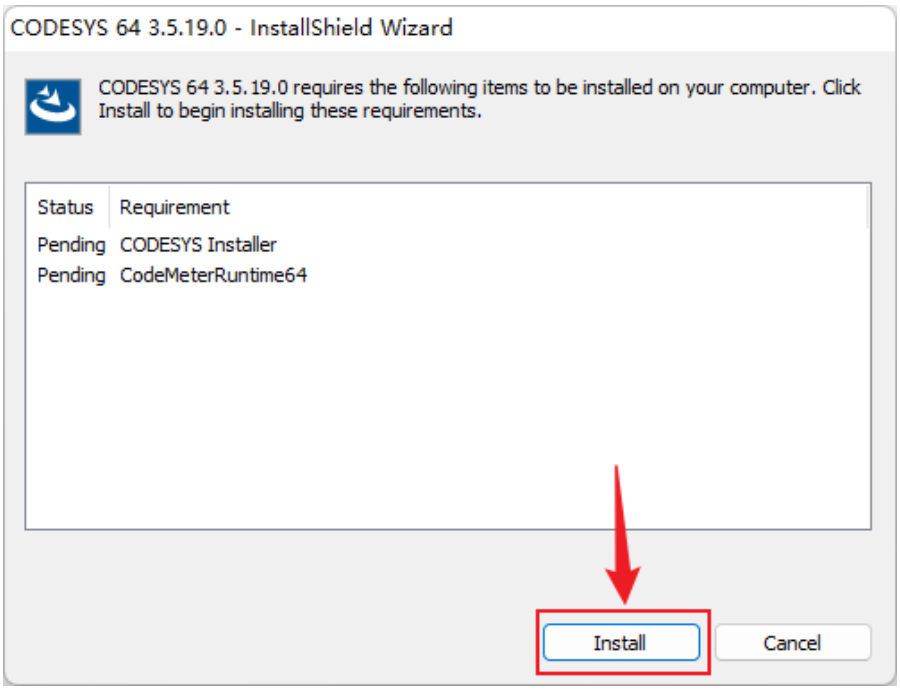
The CODESYS V3.5.19.20 programming software can be downloaded from the CODESYS website or installed according to the software installation package provided by the company. The SP19 version is used as an example for installation and demonstration. Log in to the www.codesys.cn, then find the download section and click:

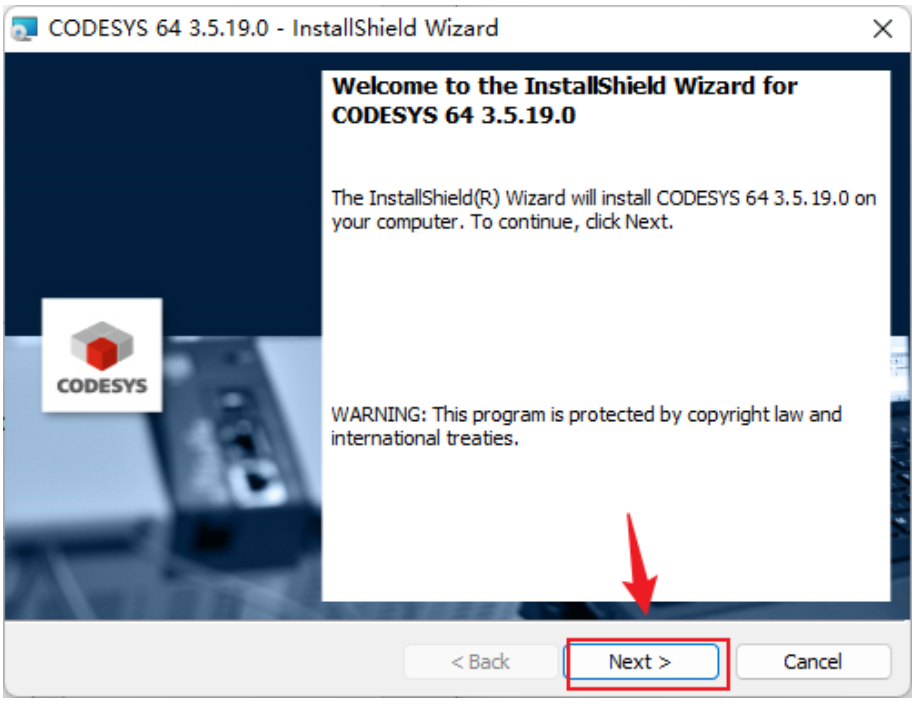


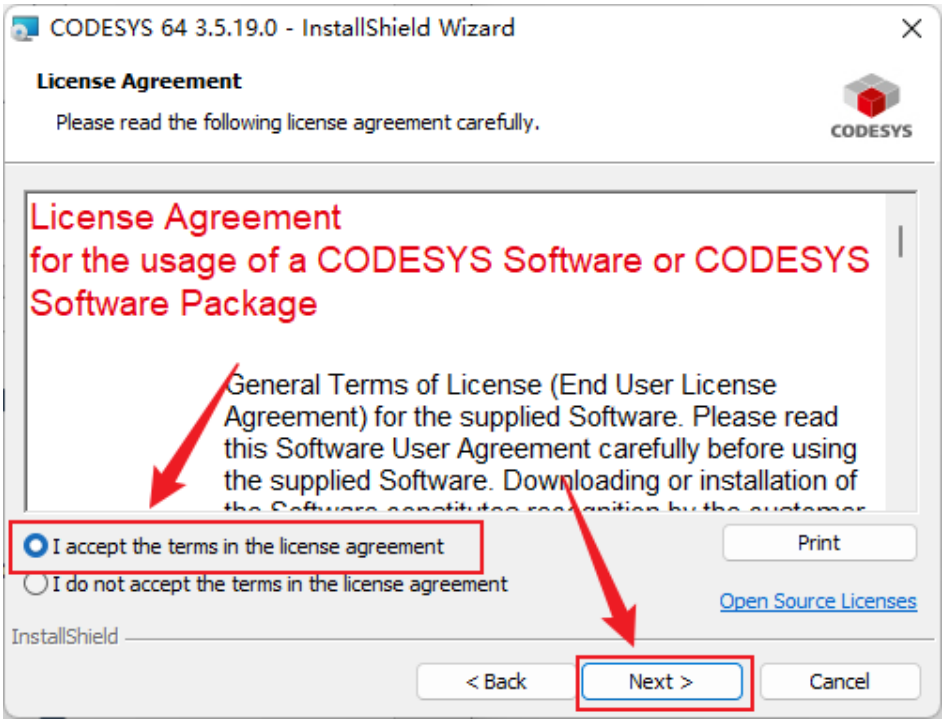
Then enter the download page, and select the appropriate installation package to download according to the configuration of the computer:

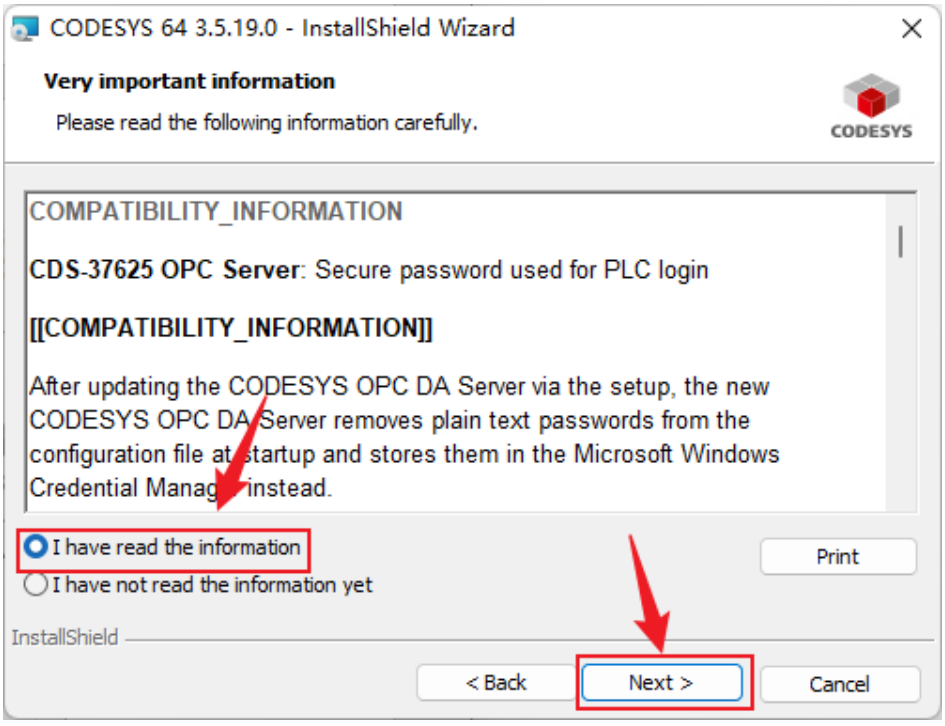


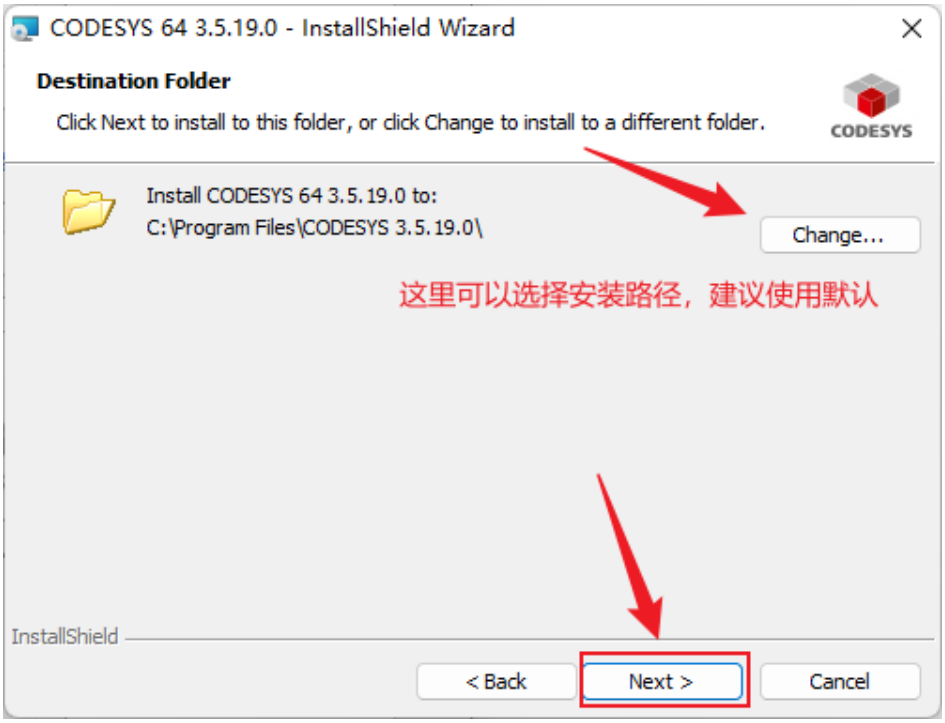
After the download is complete, double-click the installation package and follow the steps in the pop-up window:

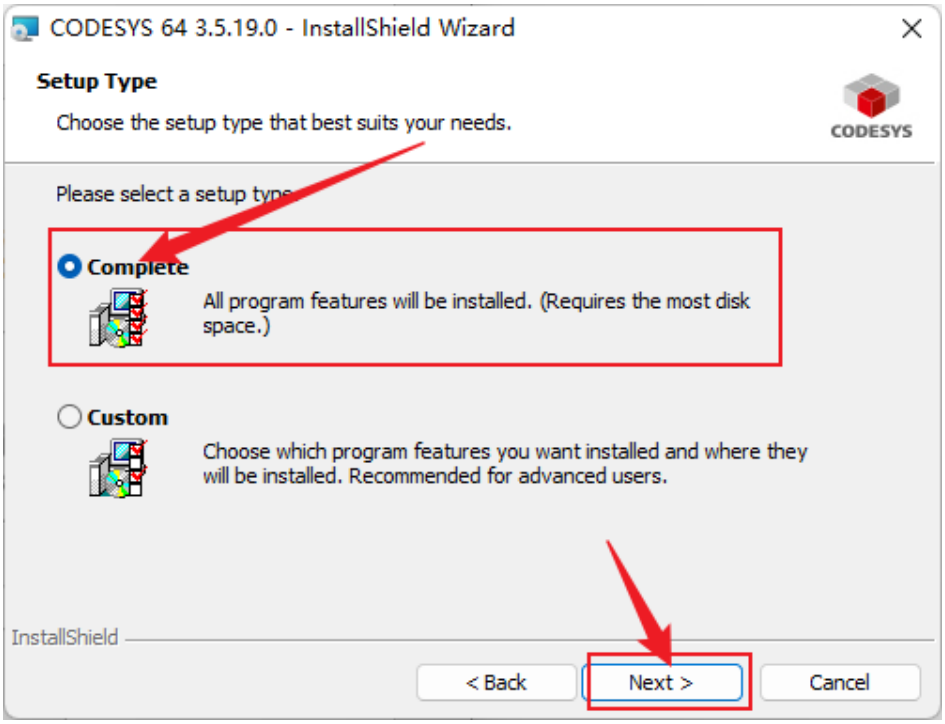


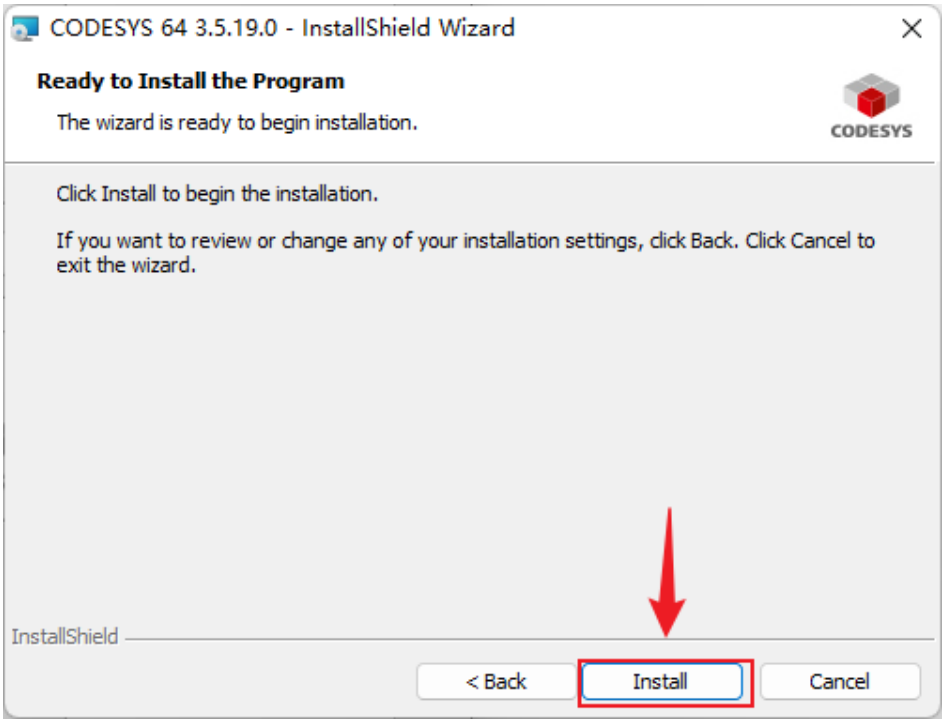



CODESYS 64 3.5.19.0 - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
CODESYS
License Agreement
for the usage of a CODESYS Software or CODESYS Software Package
General Terms of License (End User License Agreement) for the supplied Software. Please read this Software User Agreement carefully before using the supplied Software. Downloading or installation of
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
Open Source Licenses
InstallShield
< Back
Next >
Cancel


CODESYS 64 3.5.19.0 - InstallShield Wizard
Very important information
Please read the following information carefully.
CODESYS
COMPATIBILITY_INFORMATION
CDS-37625 OPC Server: Secure password used for PLC login
[[COMPATIBILITY_INFORMATION]]
After updating the CODESYS OPC DA Server via the setup, the new CODESYS OPC DA Server removes plain text passwords from the configuration file at startup and stores them in the Microsoft Windows Credential Manag instead.
I have read the information
I have not read the information yet
Print
InstallShield
< Back
Next >
Cancel

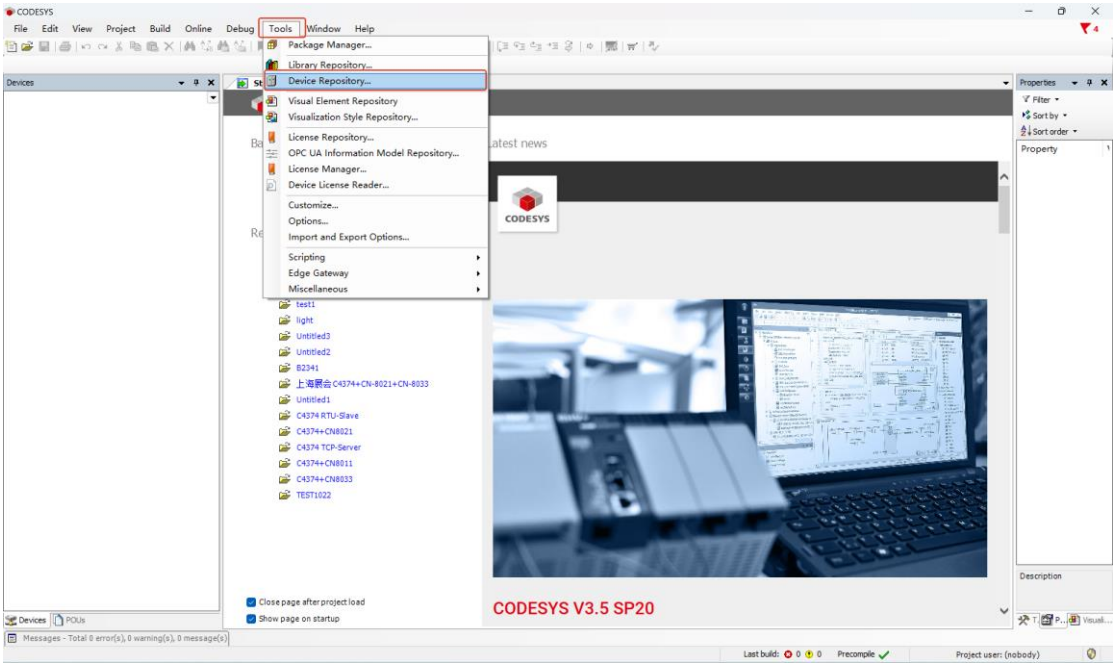

CODESYS 64 3.5.19.0 - InstallShield Wizard
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
CODESYS
Install CODESYS 64 3.5.19.0 to:
C:\Program Files\CODESYS 3.5.19.0\
Change...
这里可以选择安装路径，建议使用默认
InstallShield
< Back
Next >
Cancel


CODESYS 64 3.5.19.0 - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
CODESYS
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

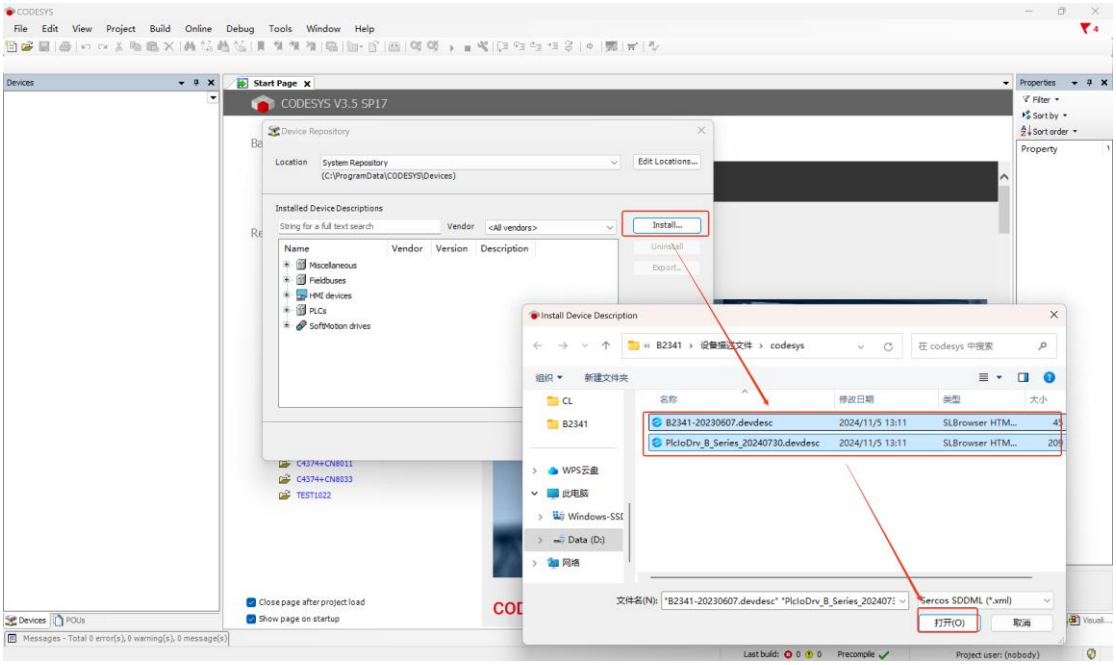

CODESYS 64 3.5.19.0 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
CODESYS
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

4.2 Use of Codesys Software

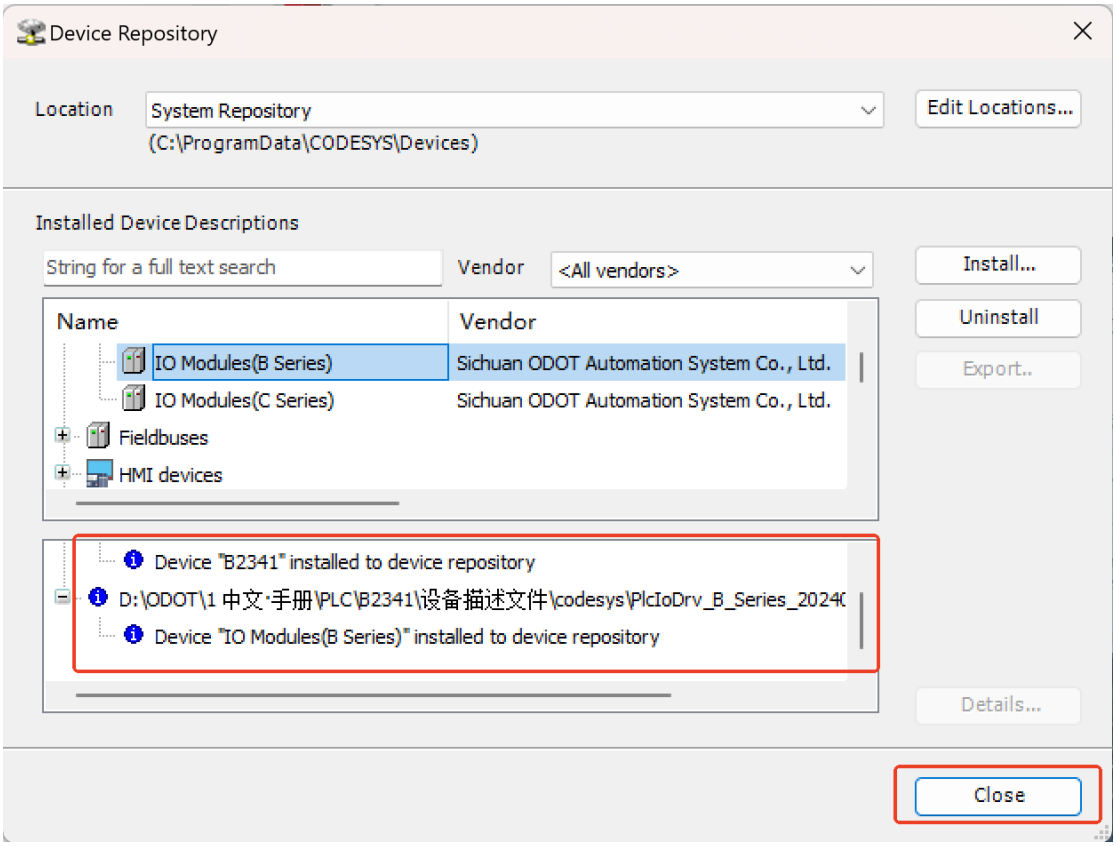
Double-click the generated shortcut, run the Codesys programming software, and select "Tools-- Device Repository" in the menu toolbar.



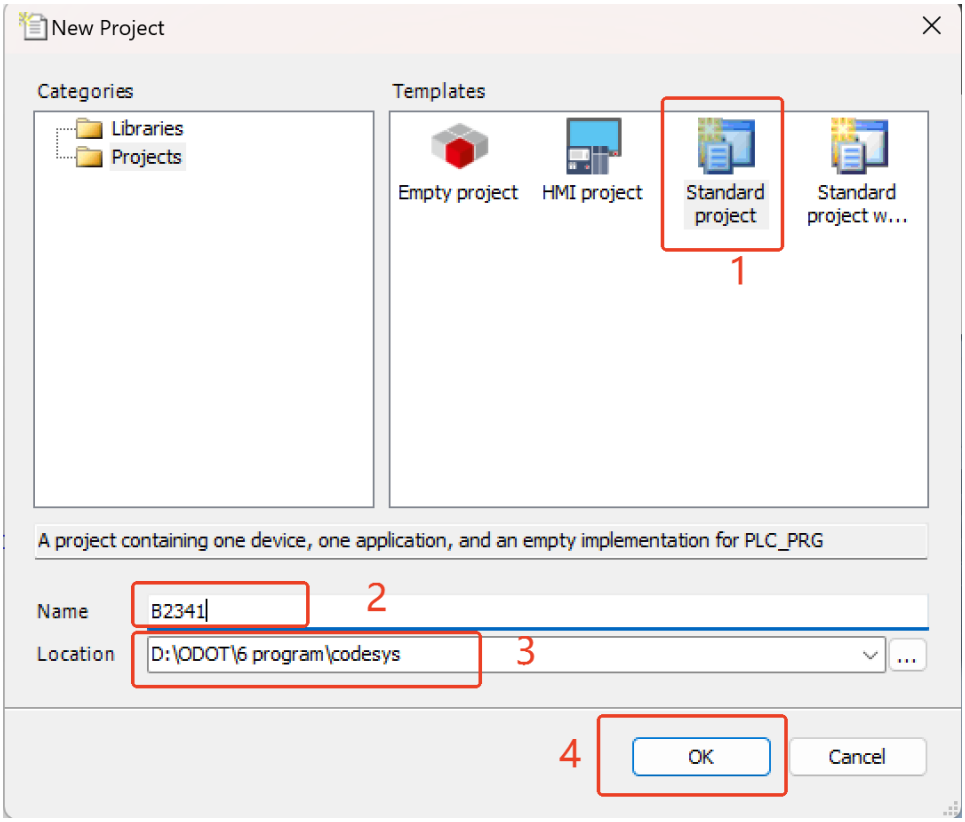
In the pop-up window, click Install, select the device description file of the B2341 (including the B2341 device and the IO module), and click Open.



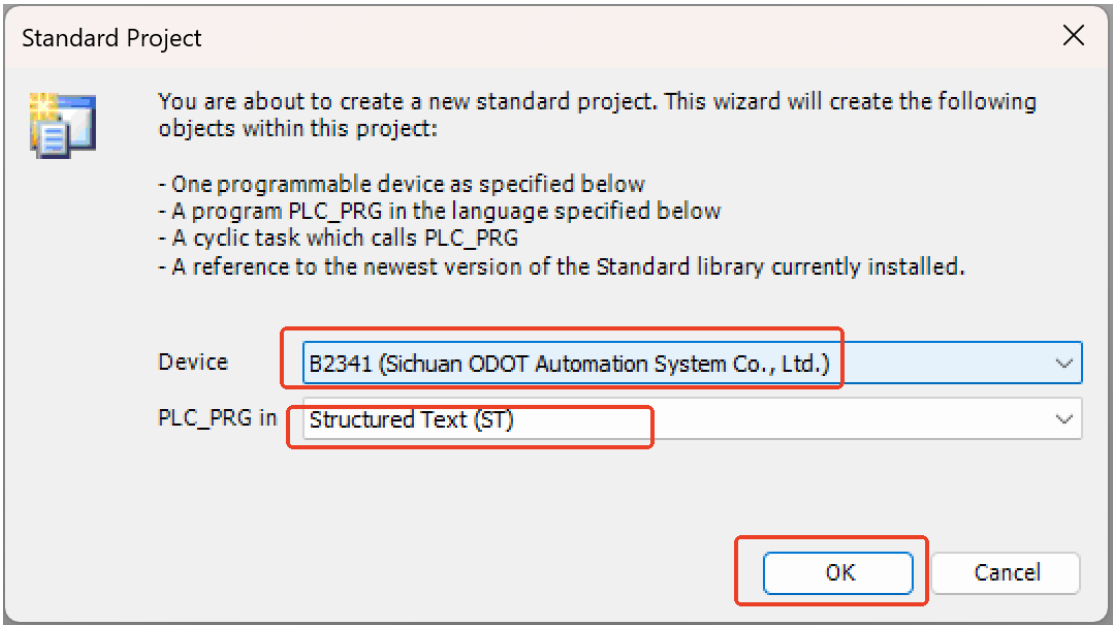
Close the device repository interface when finished.



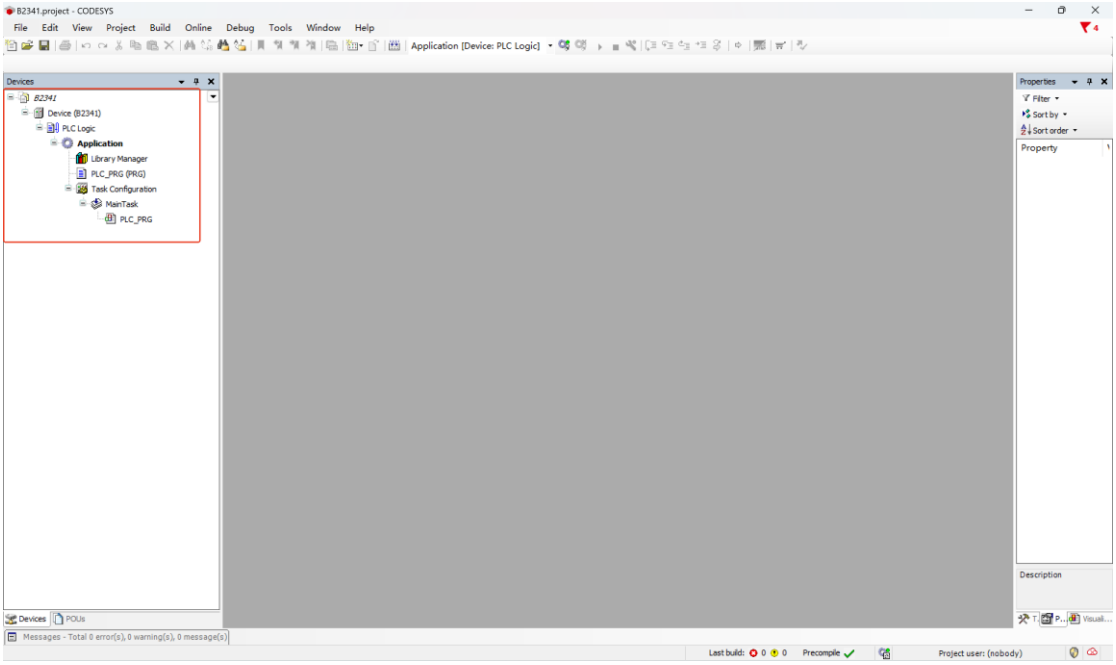
In the menu bar, select File - New Project, select the standard project in the pop-up window, set the project name and location, and click OK.



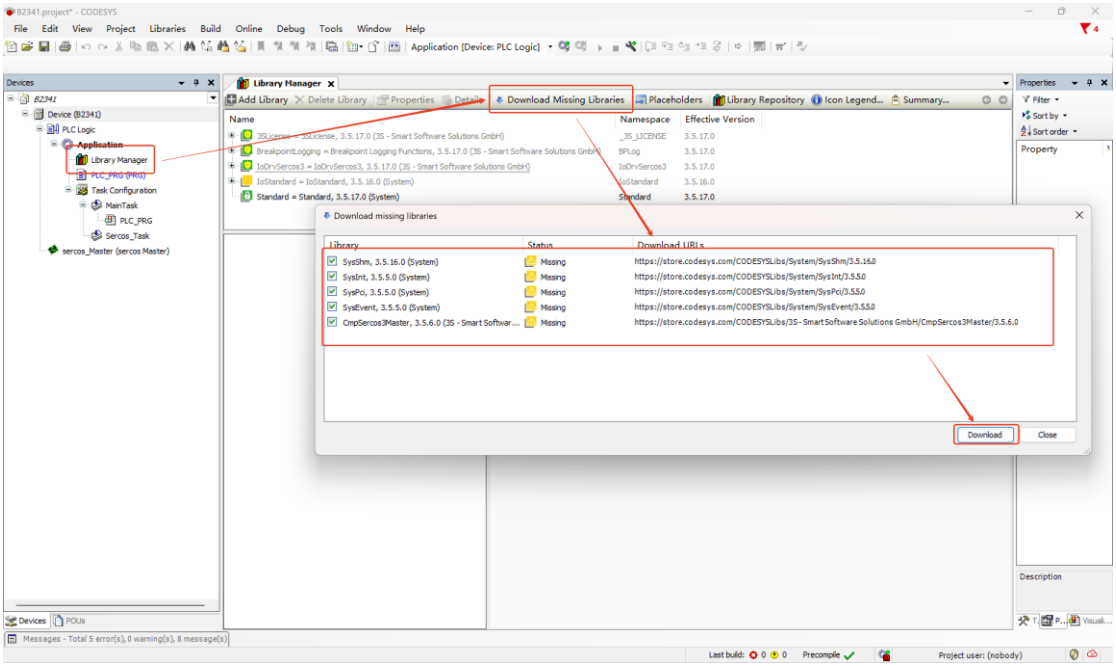
In the pop-up window, select B2341 as the device and click OK.



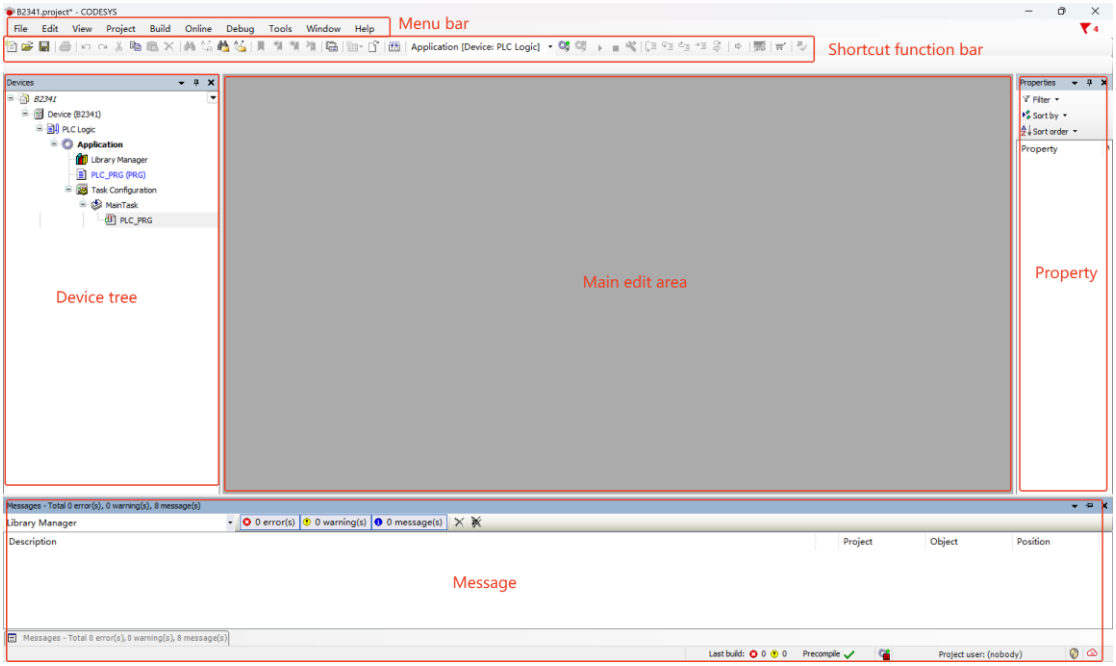
At this point, the project was established.



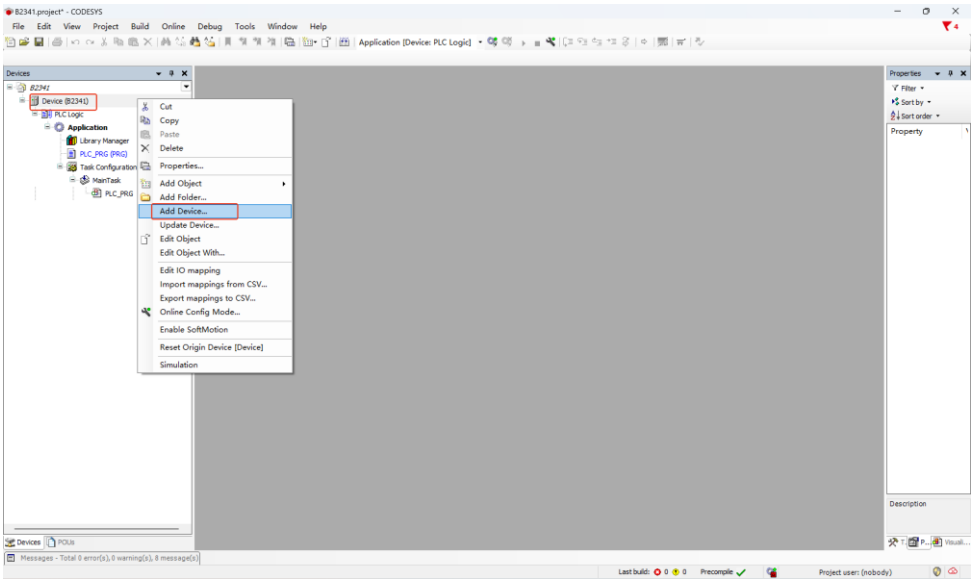
The first time install Codesys and create a project for compilation, it will find a lot of missing items, the solution is to open the library manager, click "Download Missing Libraries - Select All - Download", wait for the download to complete, and compile again.



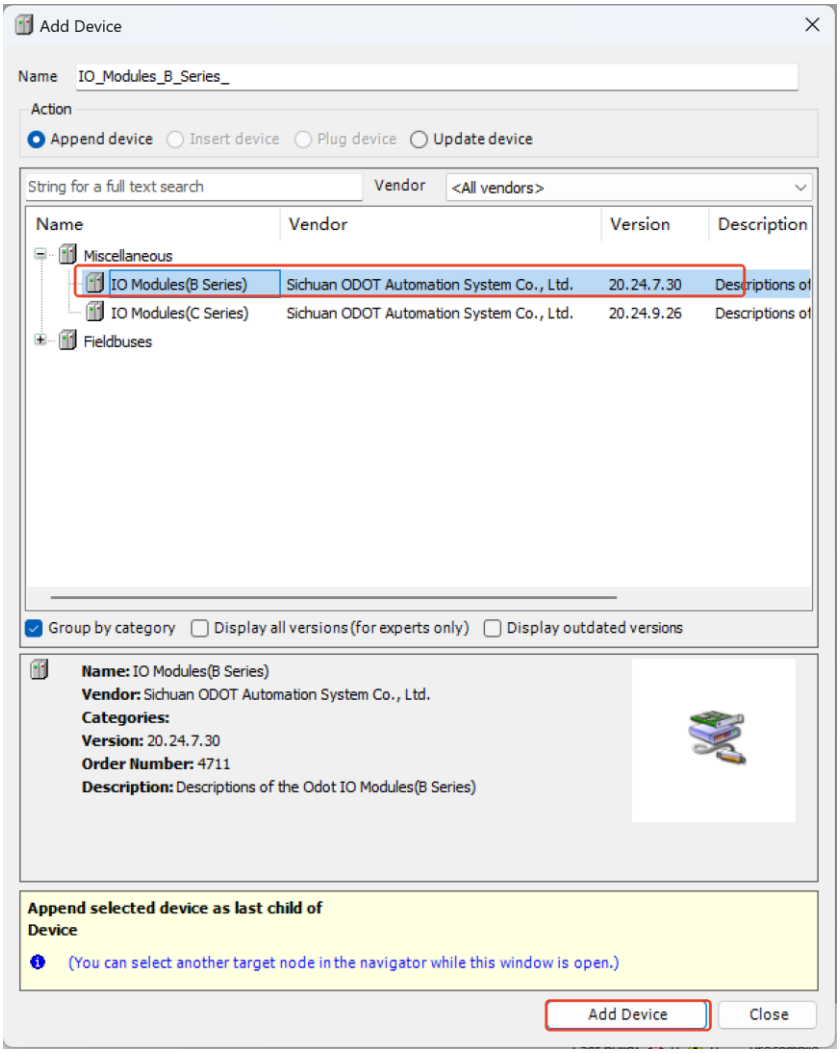
The introduction of the Codesys software interface is shown in the figure below, and the function introduction is detailed in the "PLC Comprehensive Development Tool - CODESYS Basic Programming and Application Guide".



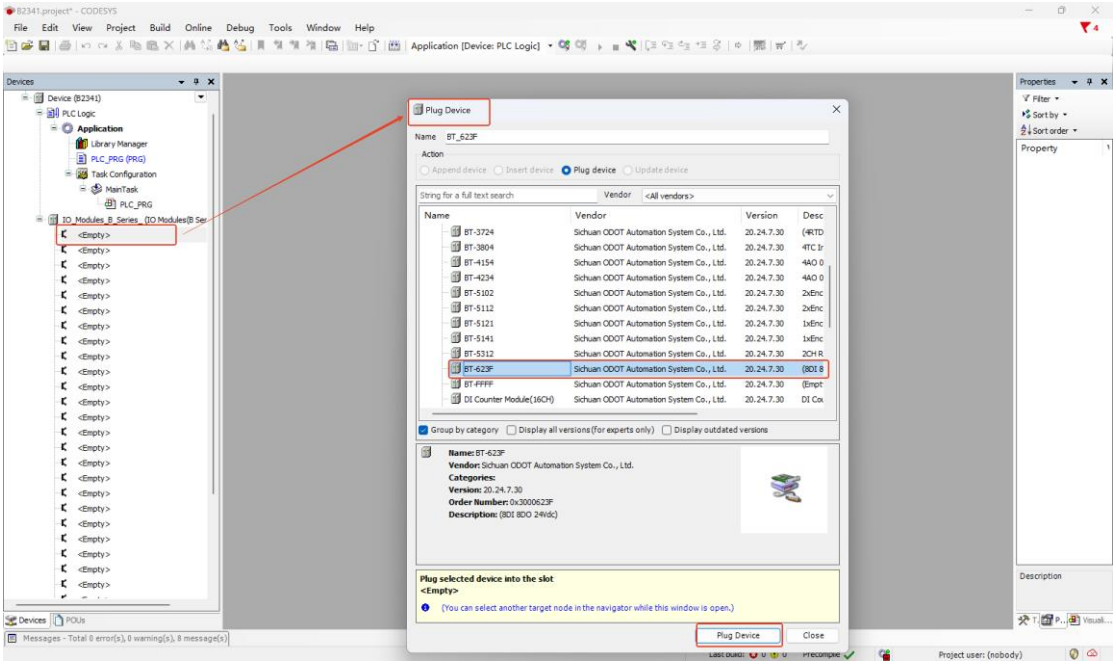
After the project is created, right-click B2341 and select Add Device.



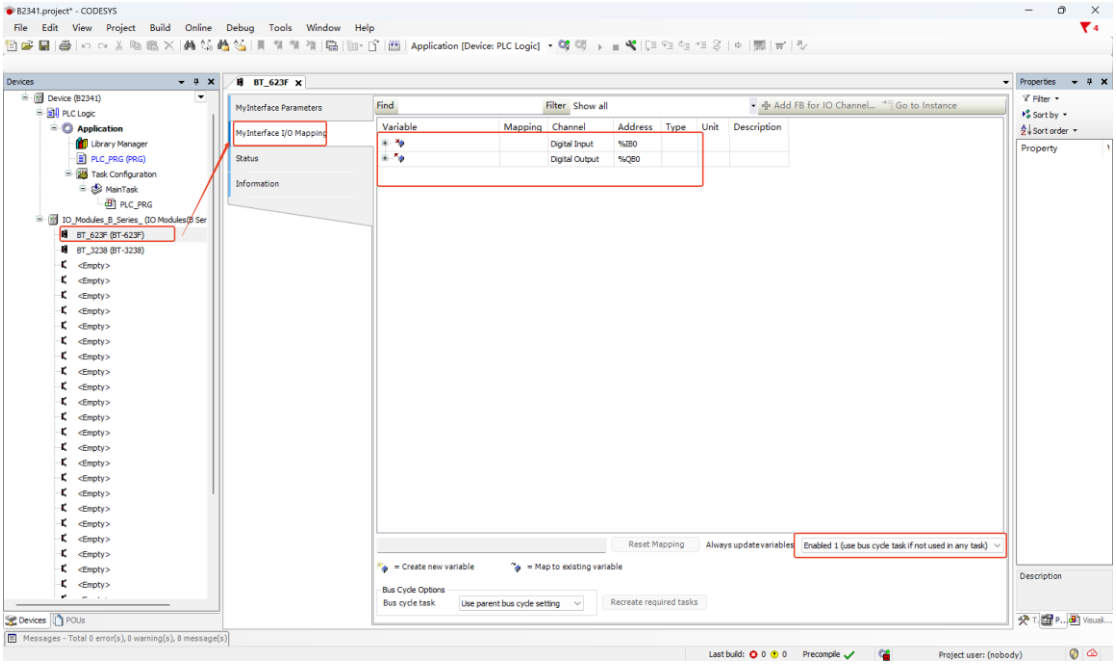
Find "IO Modules" in the pop-up window, select it, click Add Device, and don't need to close this page after adding.



Select the "empty" slot, and insert the corresponding module according to the hardware configuration, and the functions of the module are listed in the selection table.

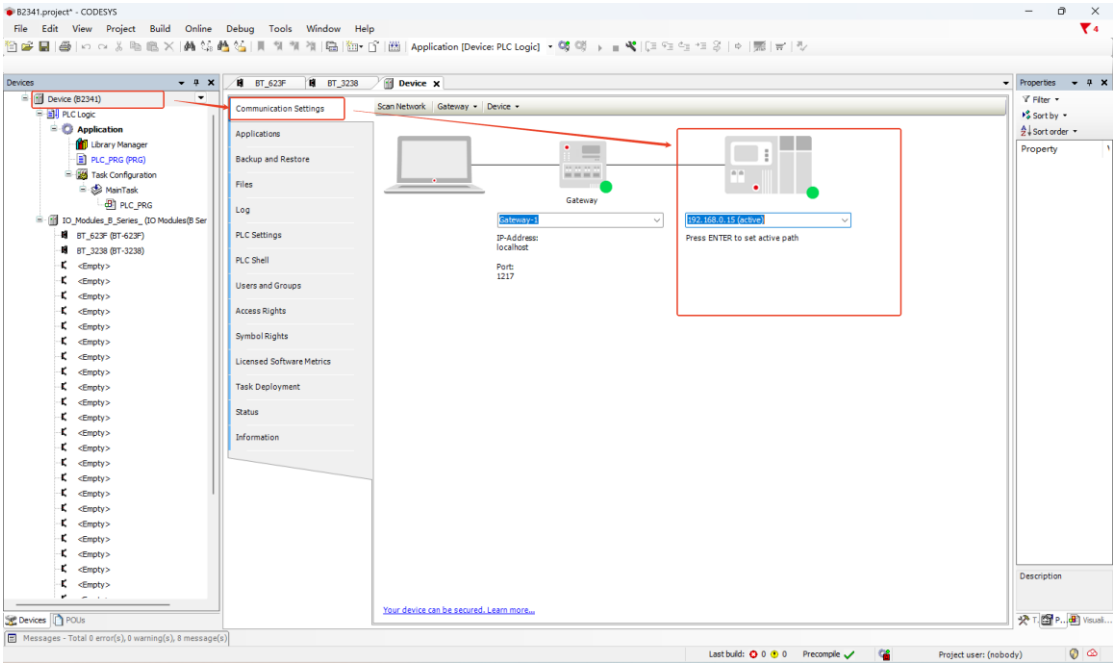


Double-click the module and select I/O Mapping to view the corresponding I/O address and set the mapping relationship.

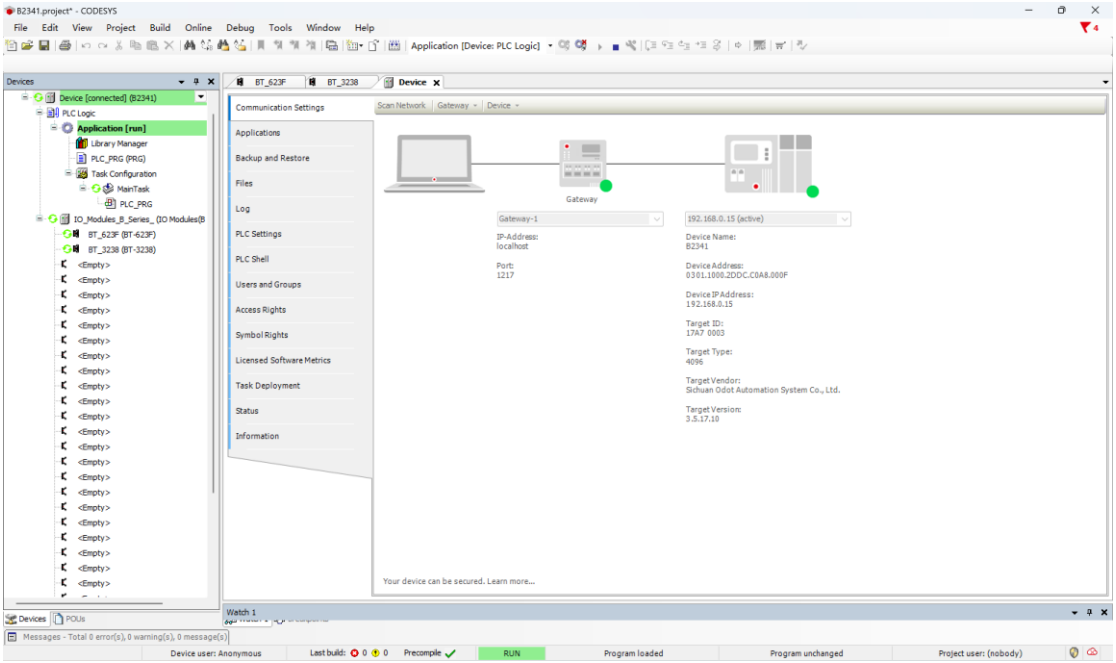


4.3 Download & Monitor

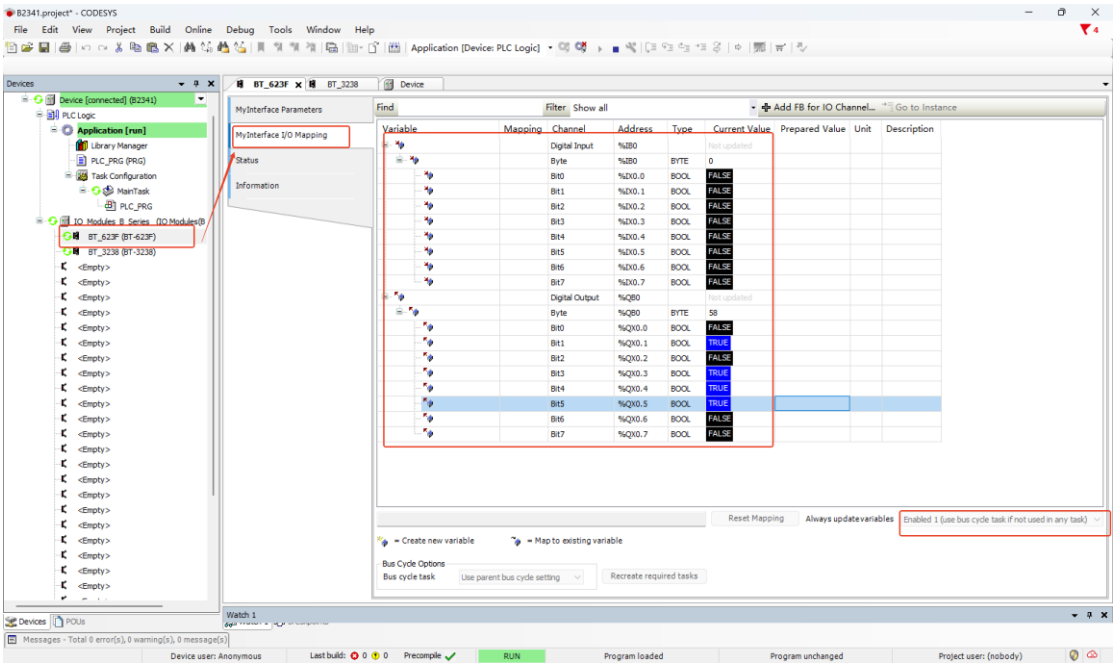
Double-click Device (B2341), select communication settings, enter the IP address of the B2341 module (the IP address of the module can be viewed by the LCD display or IO Config software), and press Enter to activate the device.



After the device is activated, compile, download, and run the program.

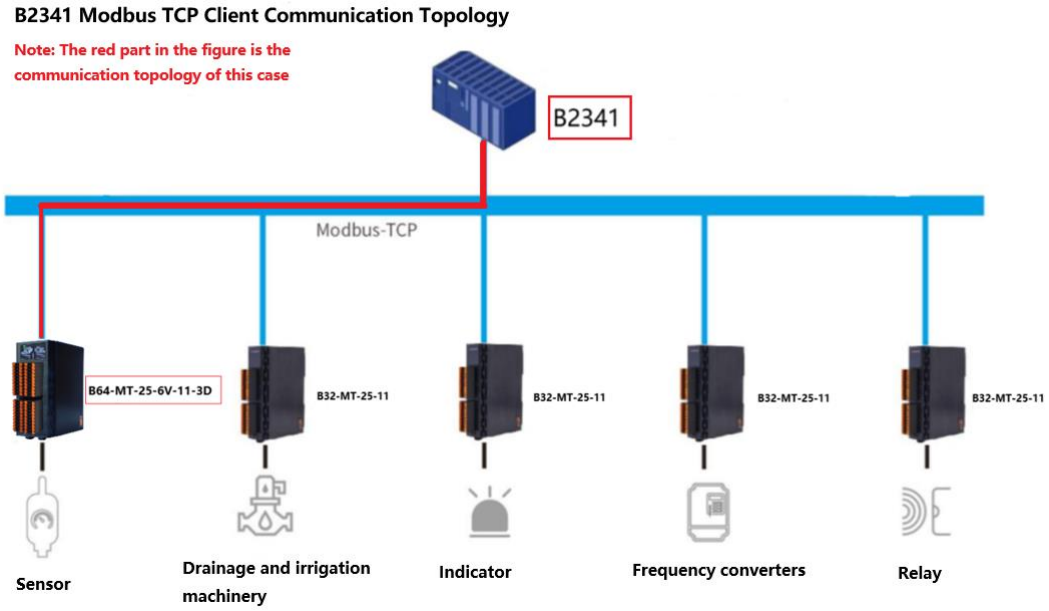


Select the module and click I/O Mapping to view the corresponding module parameters and set the Always Update variable to Enable 1.


B2341.project* - CODESYS
File Edit View Project Build Online Debug Tools Window Help
Application [Device: PLC Logic]
Devices
Device [connected] (B2341)
PLC Logic
Application [run]
Library Manager
PLC_PRG (PRG)
Task Configuration
MainTask
PLC_PRG
IO_Modules_B_Series_(IO Modules(B
BT_623F (BT-623F)
BT_3238 (BT-3238)
<Empty>
BT_623F
BT_3238
Device
MyInterface Parameters
MyInterface I/O Mapping
Status
Information
Find
Filter Show all
Add FB for IO Channel...
Go to Instance
Variable Mapping Channel Address Type Current Value Prepared Value Unit Description
Digital Input %IB0
Byte %IB0 BYTE 0
Bit0 %IX0.0 BOOL FALSE
Bit1 %IX0.1 BOOL FALSE
Bit2 %IX0.2 BOOL FALSE
Bit3 %IX0.3 BOOL FALSE
Bit4 %IX0.4 BOOL FALSE
Bit5 %IX0.5 BOOL FALSE
Bit6 %IX0.6 BOOL FALSE
Bit7 %IX0.7 BOOL FALSE
Digital Output %QB0
Byte %QB0 BYTE 58
Bit0 %QX0.0 BOOL FALSE
Bit1 %QX0.1 BOOL TRUE
Bit2 %QX0.2 BOOL FALSE
Bit3 %QX0.3 BOOL TRUE
Bit4 %QX0.4 BOOL TRUE
Bit5 %QX0.5 BOOL TRUE
Bit6 %QX0.6 BOOL FALSE
Bit7 %QX0.7 BOOL FALSE
Reset Mapping
Always update variables
Enabled 1 (use bus cycle task if not used in any task)
= Create new variable
= Map to existing variable
Bus Cycle Options
Bus cycle task
Use parent bus cycle setting
Recreate required tasks
Watch 1
Devices
POUs
Messages - Total 0 error(s), 0 warning(s), 0 message(s)
Device user: Anonymous
Last build: 0 0
Precompile
RUN
Program loaded
Program unchanged
Project user: (nobody)

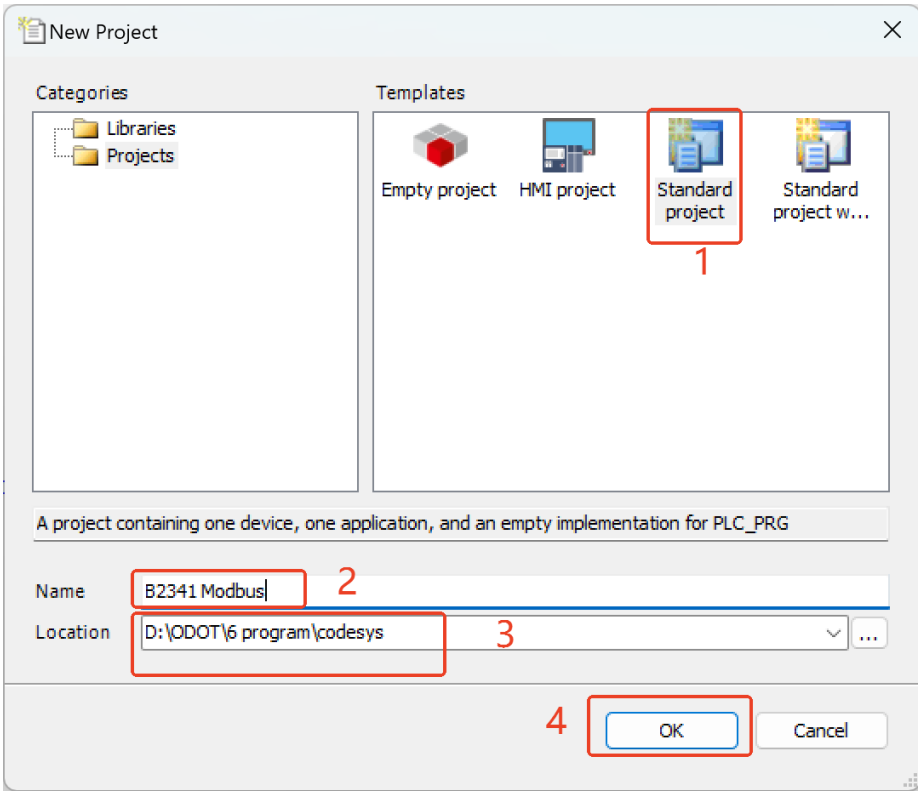
4.4 Modbus TCP Client

Topology

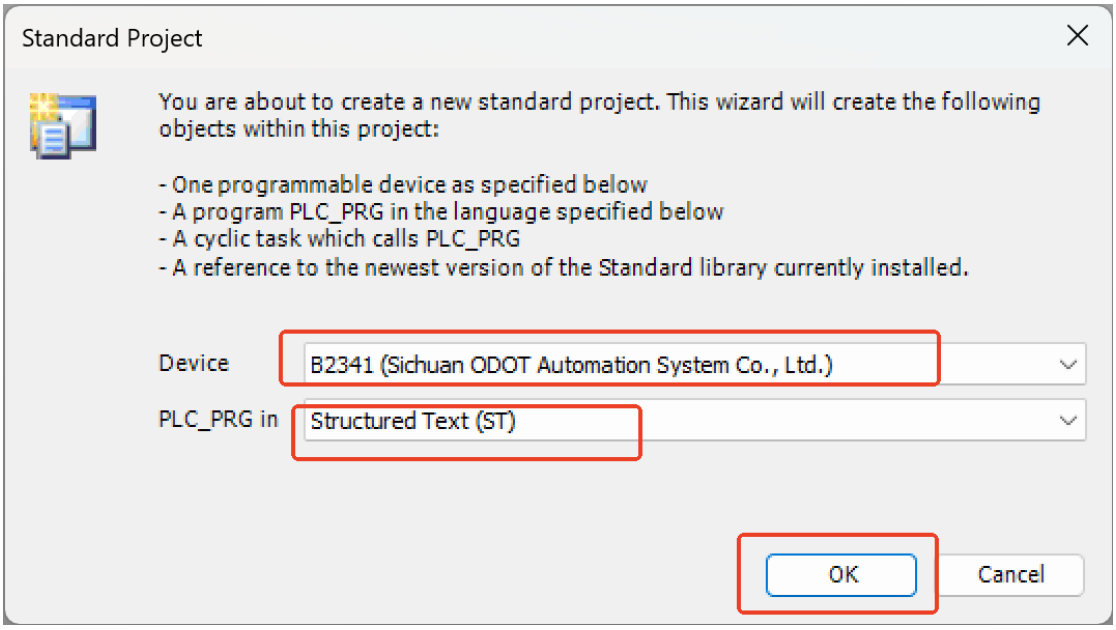


Hardware configuration: B2341+BT-623F+BT-3238; BN-8031+BT-221F+BT-623F+BT-124F+BT-3714;

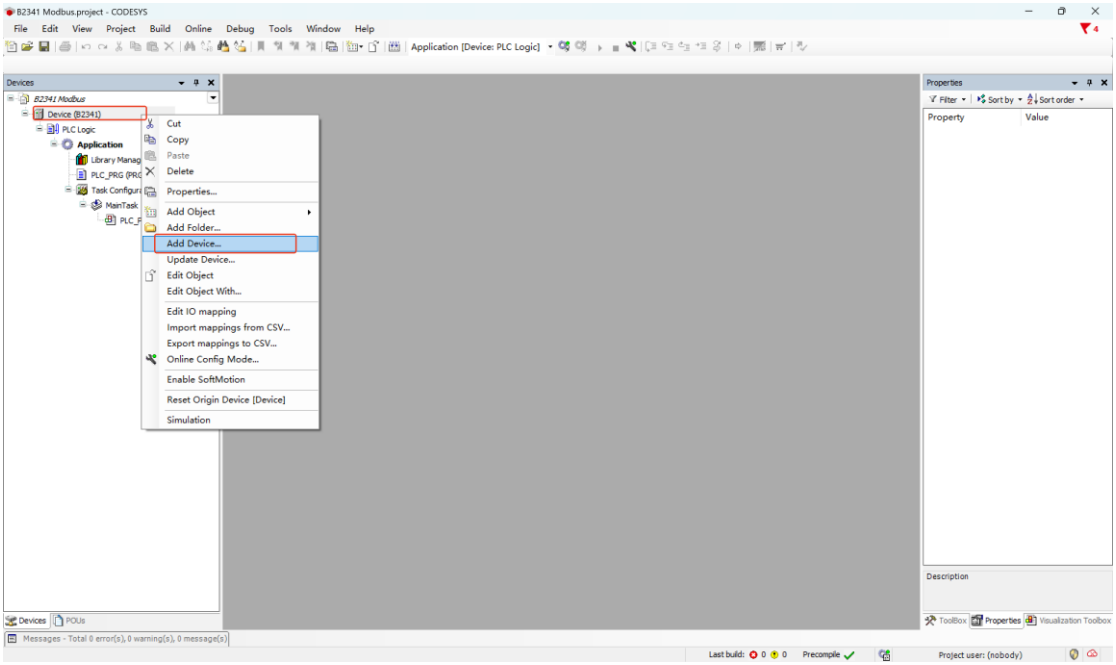
First, open the Codesys software and click New Project.



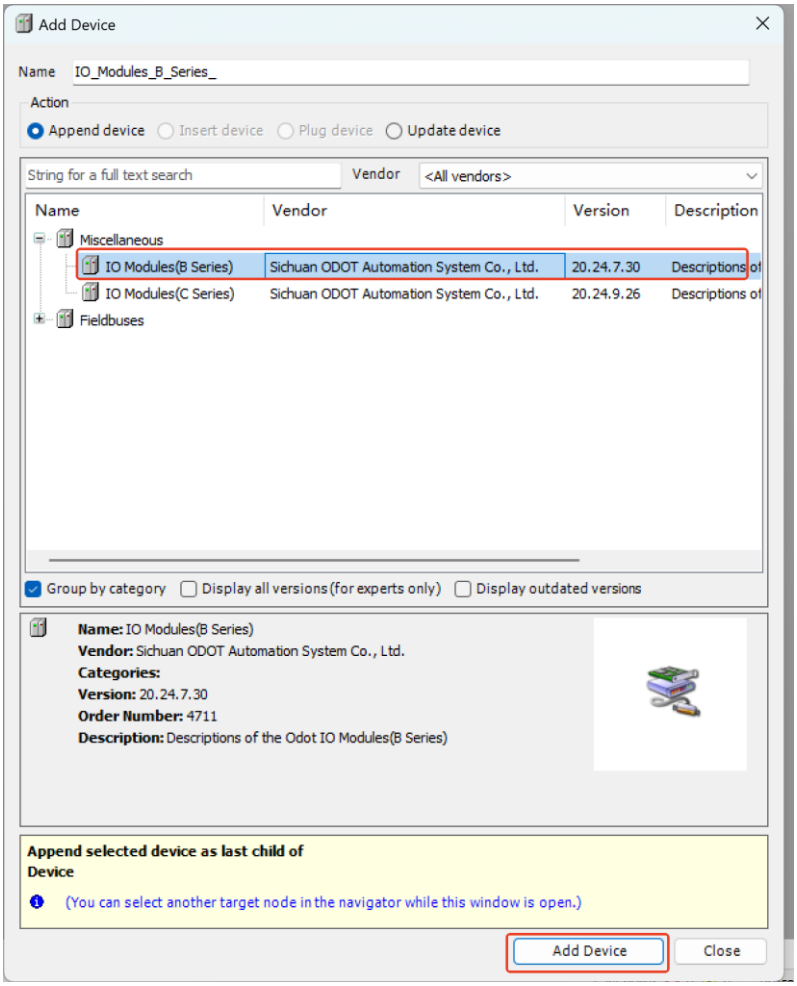
Then select the B2341 device, if can't find the device, refer to the installation device description file, and click OK.



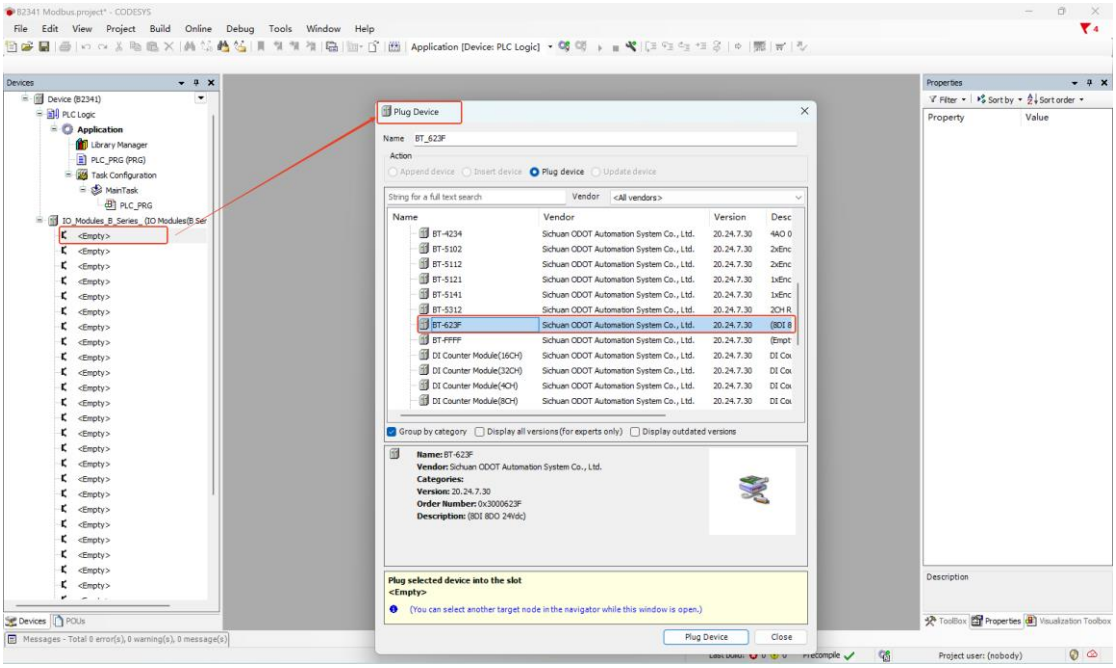
After the project is created, right-click B2341 and select Add Device.



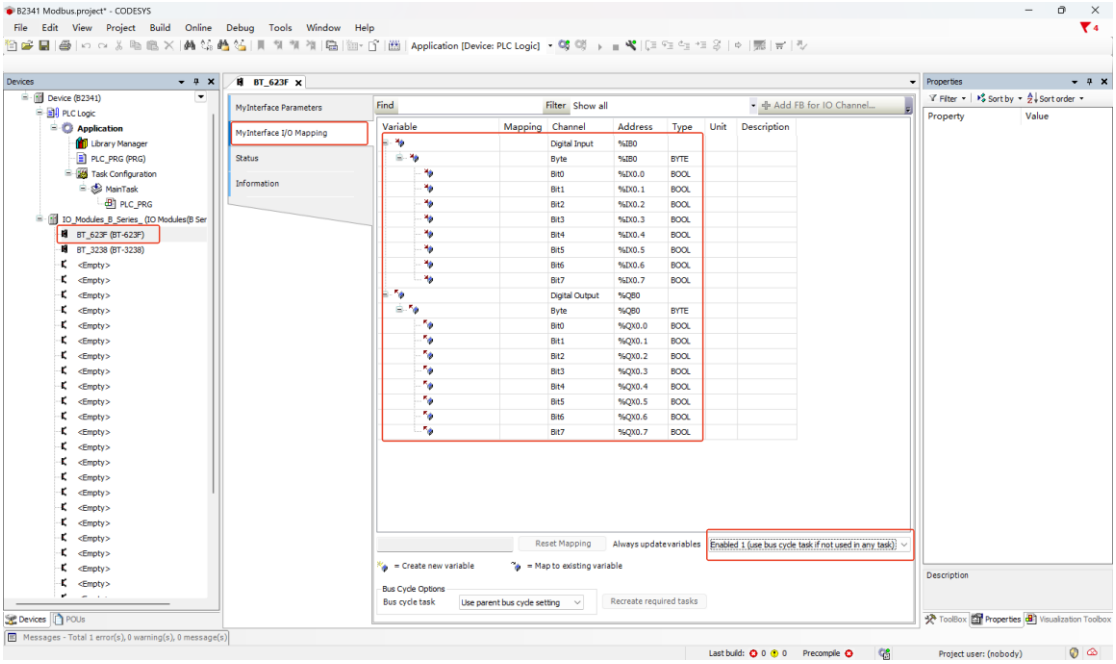
In the pop-up window, find "IO Modules (B Series)", select it, click Add Device, and you don't need to close this page after adding.



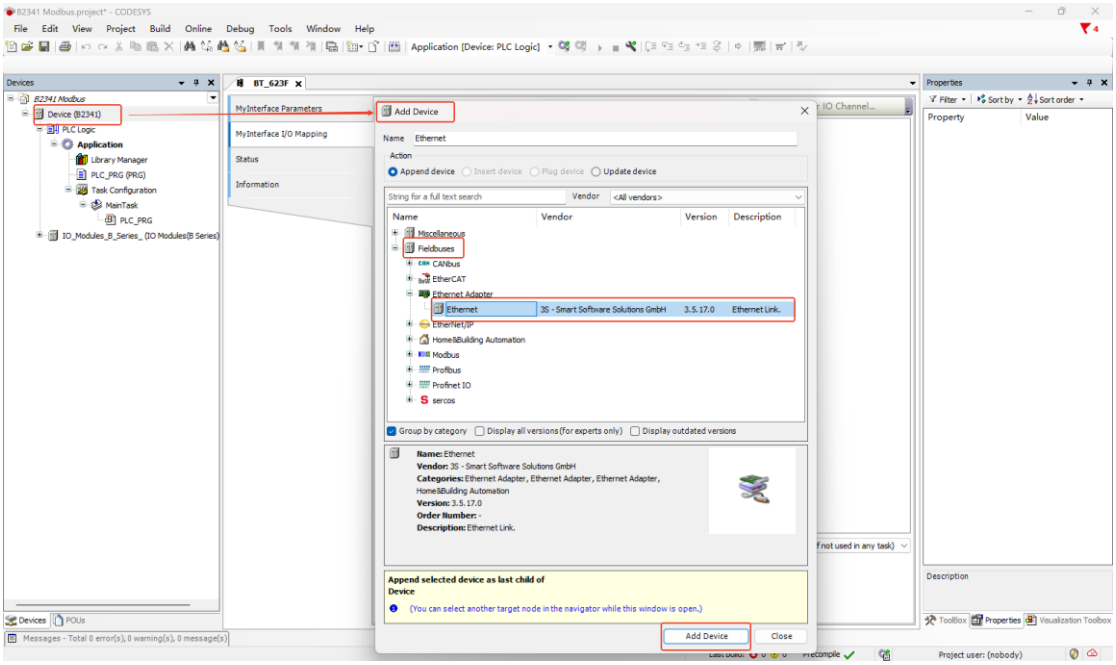
Select the "empty" slot, and insert the corresponding module according to the hardware configuration, and the functions of the module are listed in the selection table.



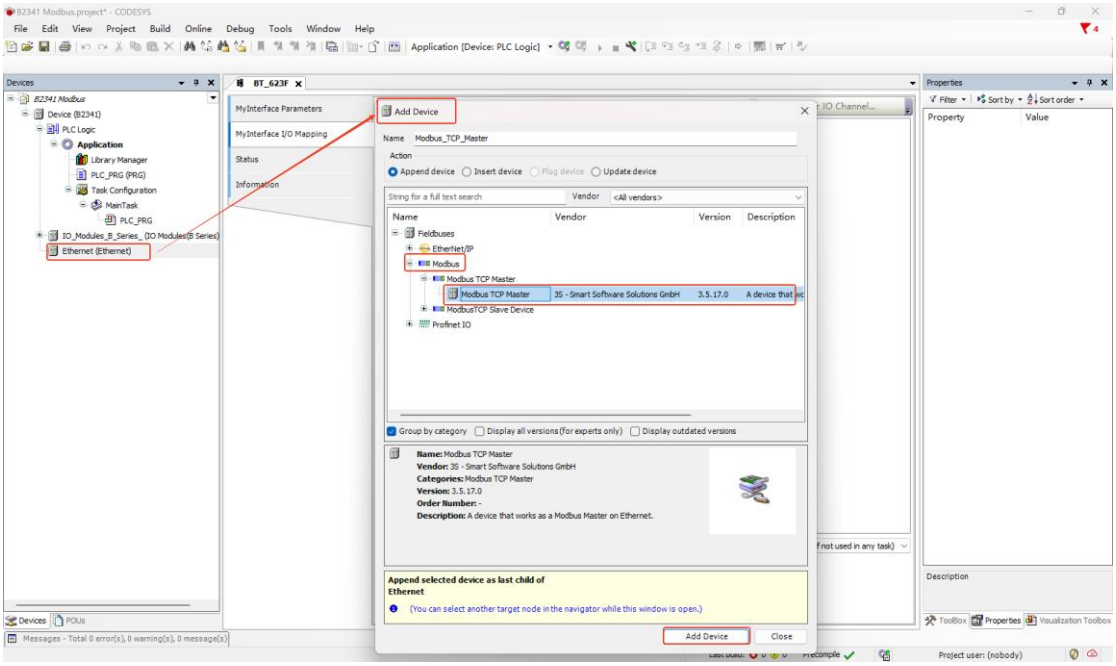
Double-click the module and select I/O Mapping to view the corresponding I/O address, set the mapping, and set the Always Update variable to enable 1 (if not used in any task, use the bus periodic task).



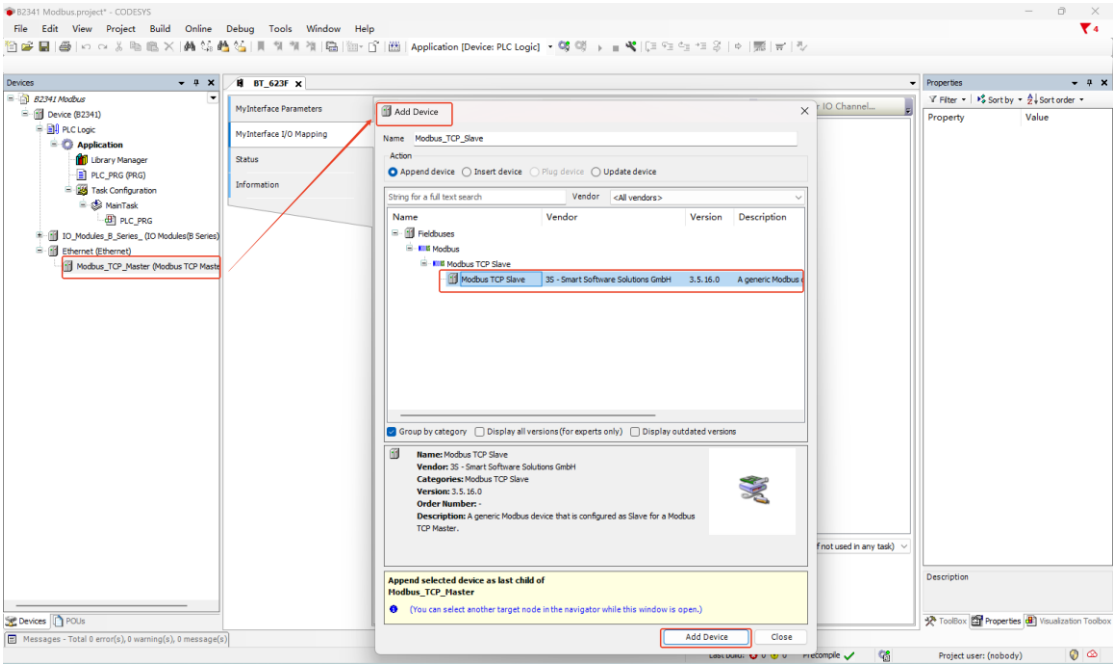
Right-click B2341, select Add Device, select “Ethernet Adapter—Ethernet”, and click Add Device.



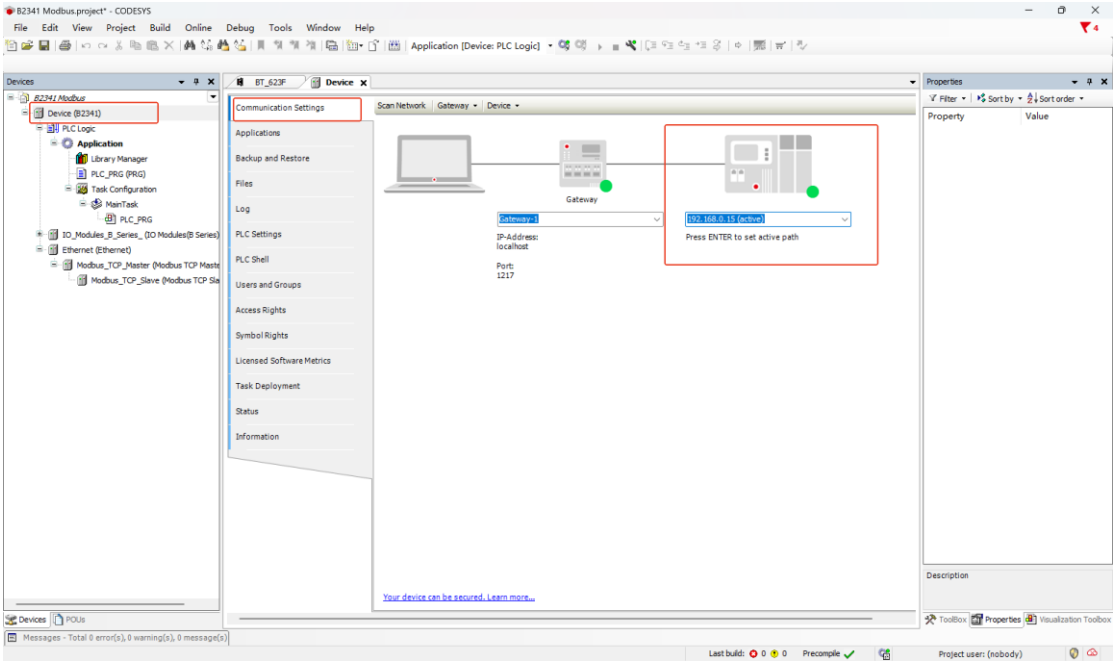
Right-click Ethernet, select Add device, select “Modbus TCP Master—Modbus TCP Master”, click Add device.



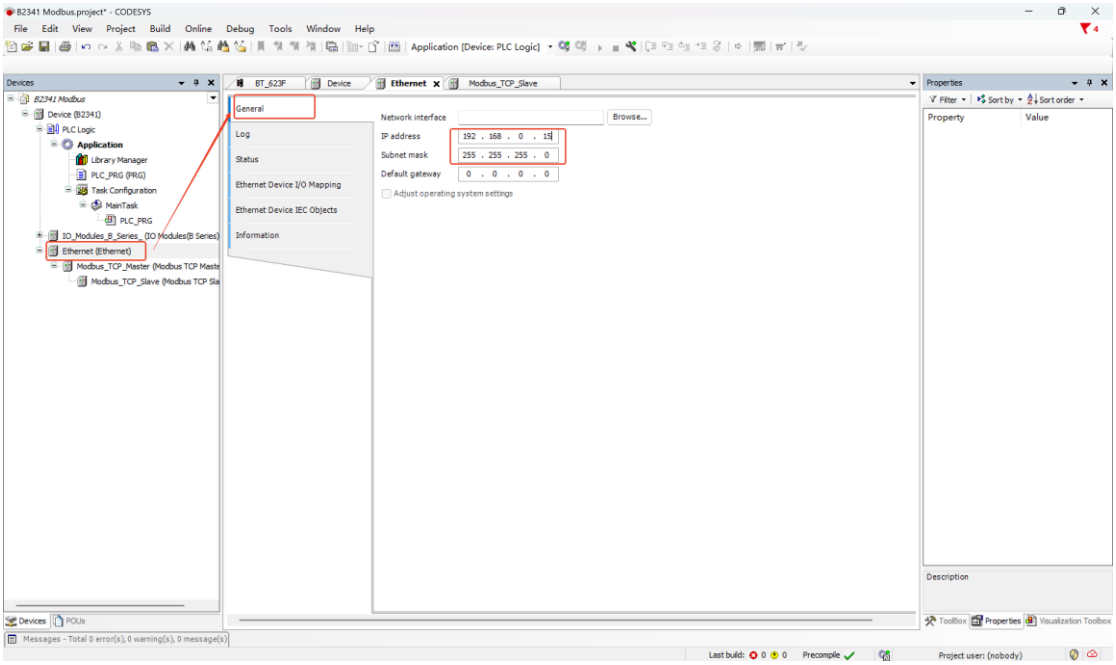
Right-click Modbus TCP Master, select Add Device, select “Modbus TCP Slave—Modbus TCP Slave”, click Add device.



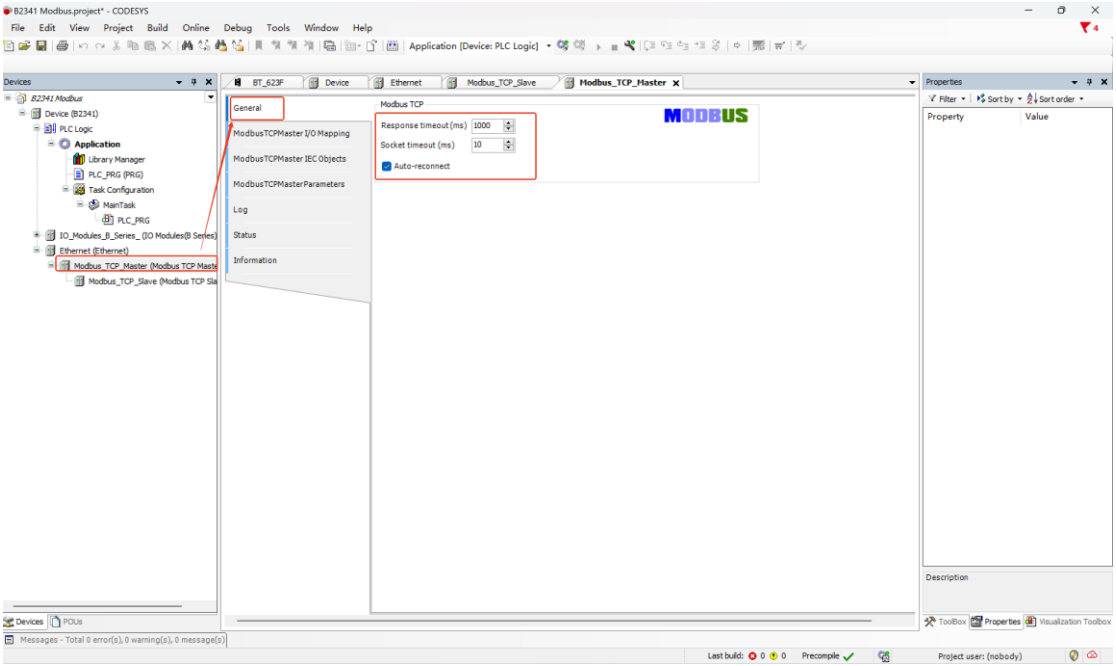
After the device is added, double-click Device(B2341), select "General" on the main interface on the right, enter the IP address of the B2341 module. Press Enter to activate the device.



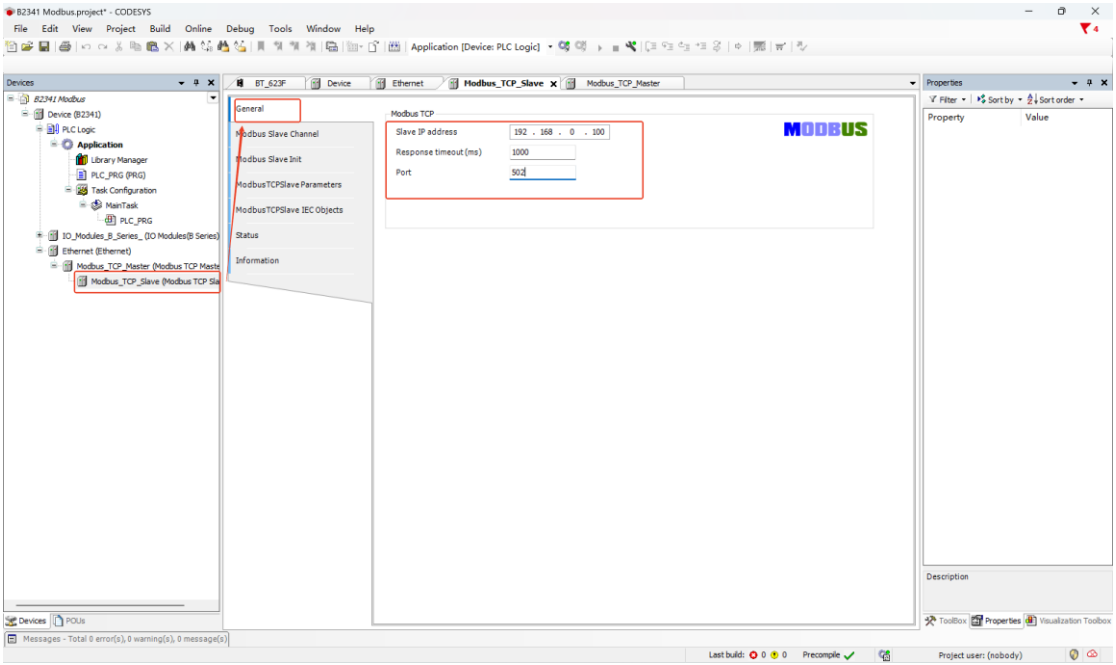
Double-click Ethernet, select General, and set the IP address of the module, The IP address of the module can be viewed by the IO Config software or on the LCD display.



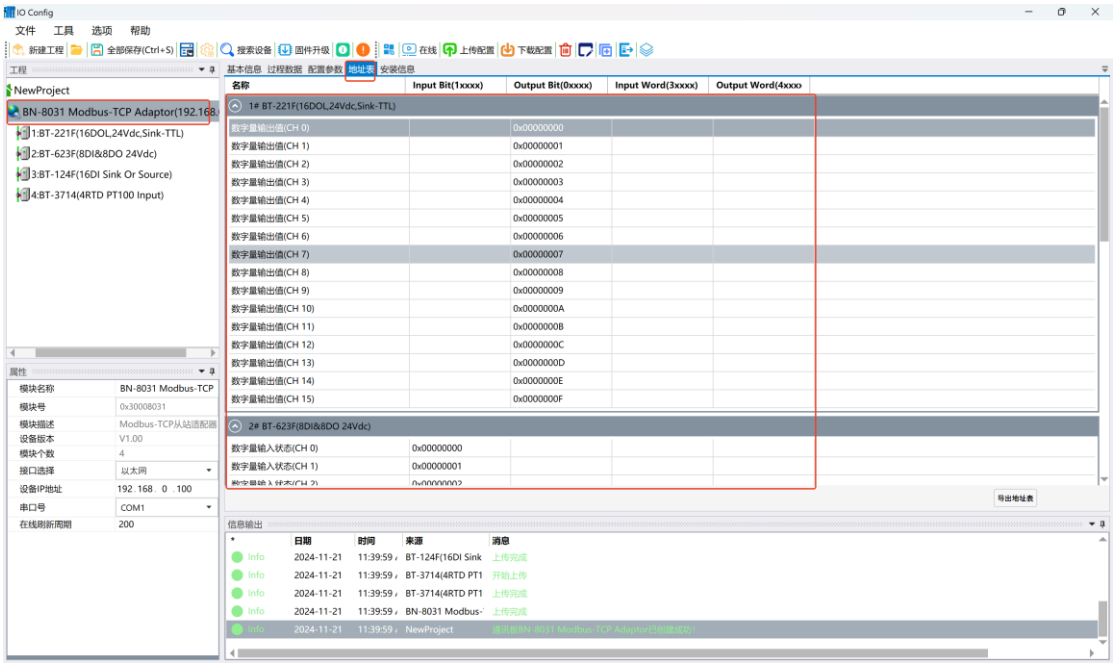
Double click the Modbus TCP Master, select General, set the Modbus TCP response timeout period, socket timeout period, and select the automatic reconnection function.



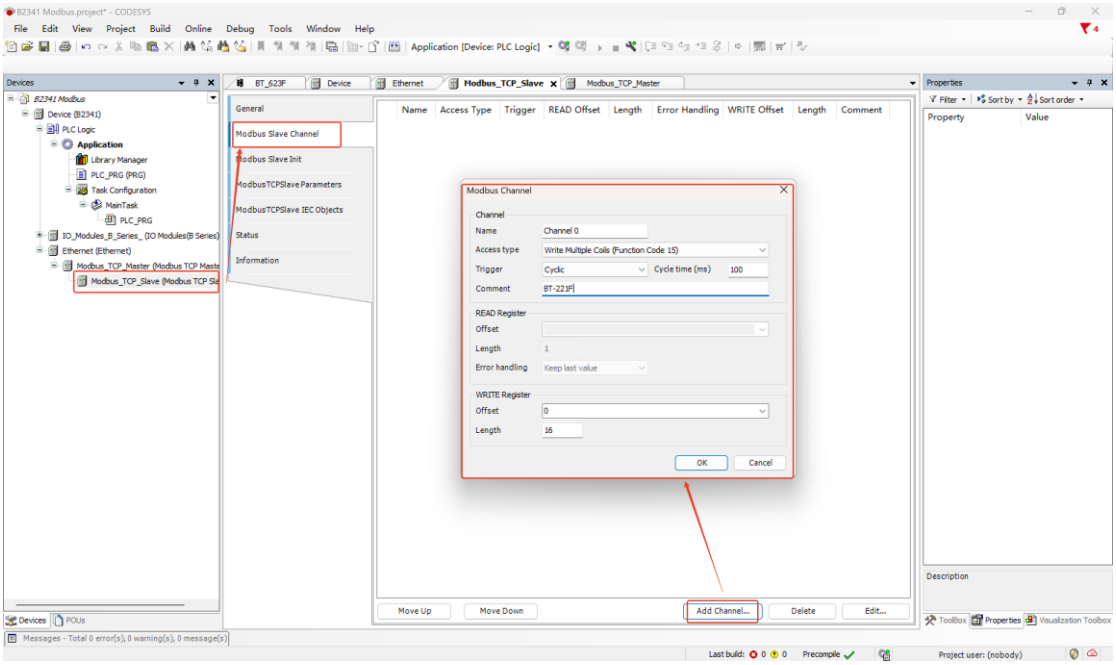
Double click Modbus TCP Slave, select General, set the IP address of the slave BN-8031 module 192.168.0.100, response time, and port number.

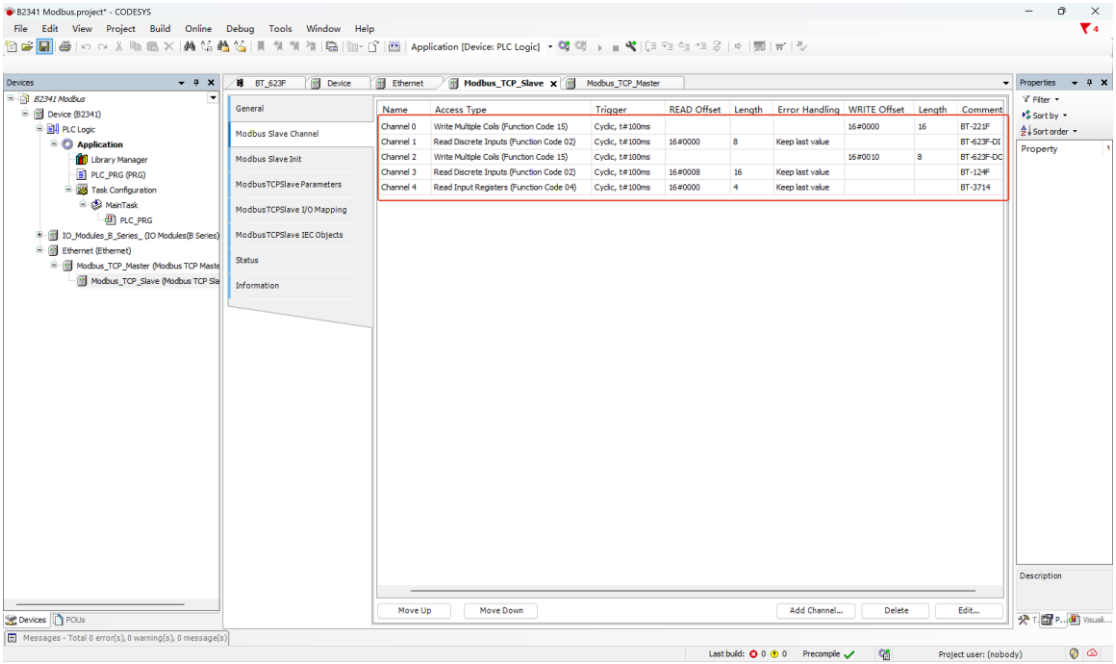


The parameters of the slave device BN-8031 module can be viewed in the IO Config software. Select BN-8031 and click the address table to view the address mapping relationship of the I/O module mounted later.

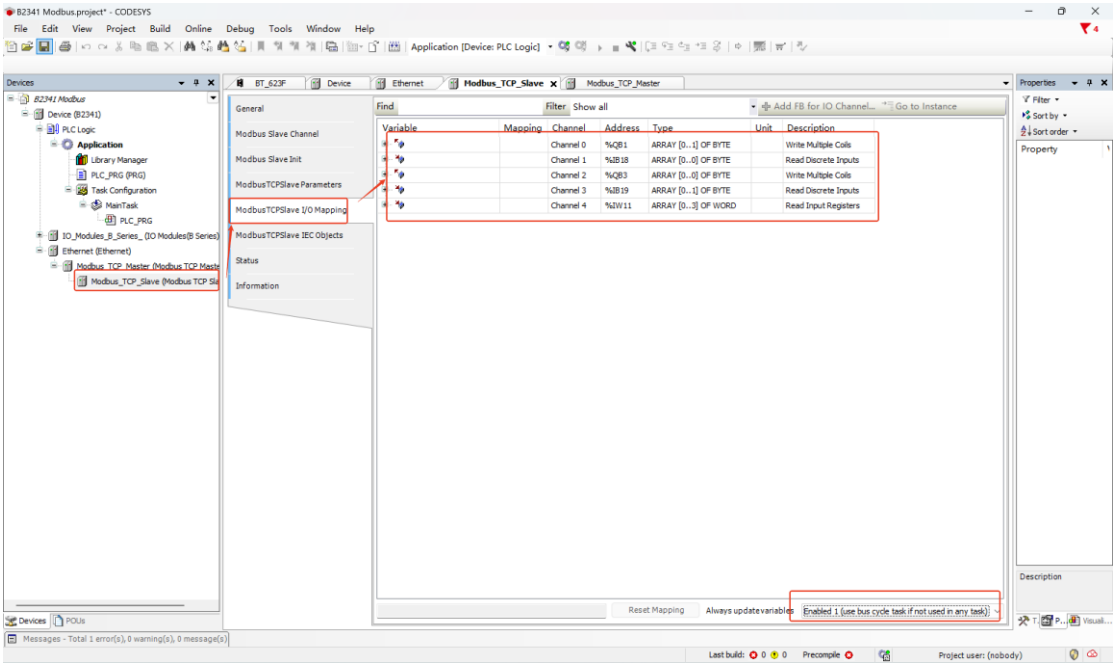


Double click Modbus TCP Slave, select Modbus slave channel, click Add Channel, set parameters such as the channel access type and length, and click OK after the configuration is complete.

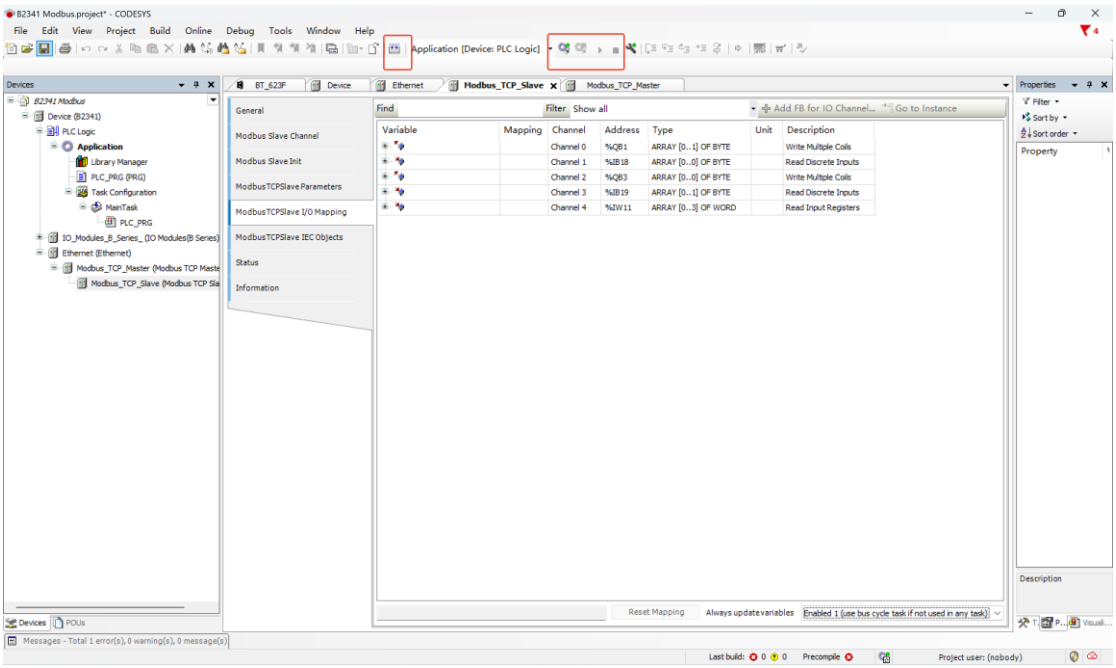




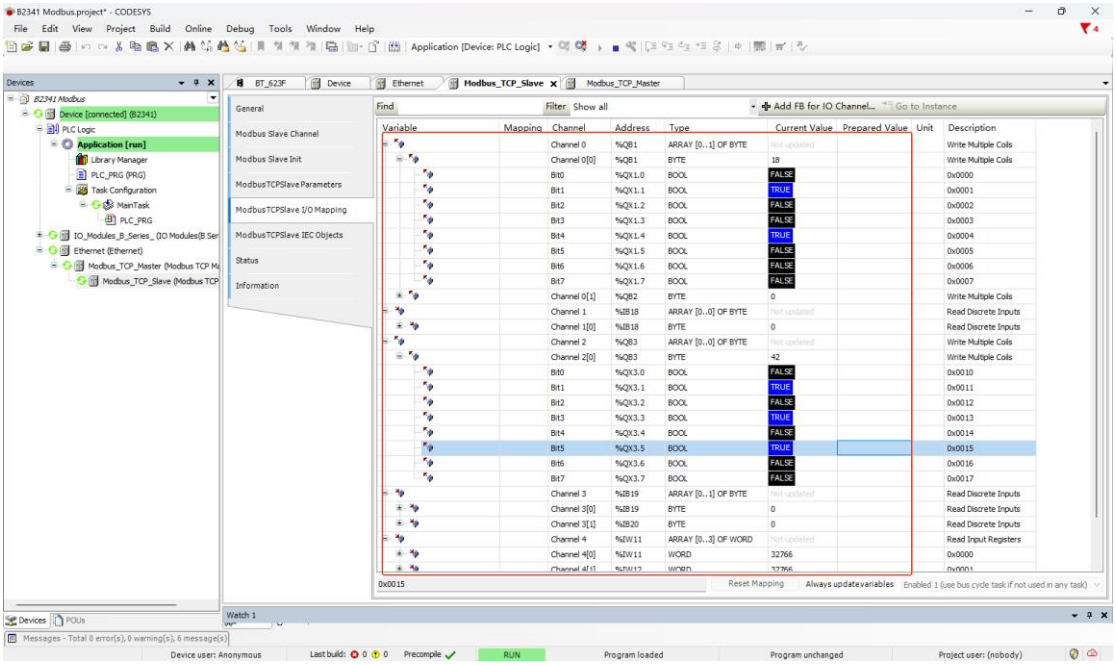
Select “Modbus TCP Slave IO Mapping”, view the mapped address of the established channel in the B2341 device and set the Always Update variable to "Enable 1".



After the parameters are configured, compile and download the program.



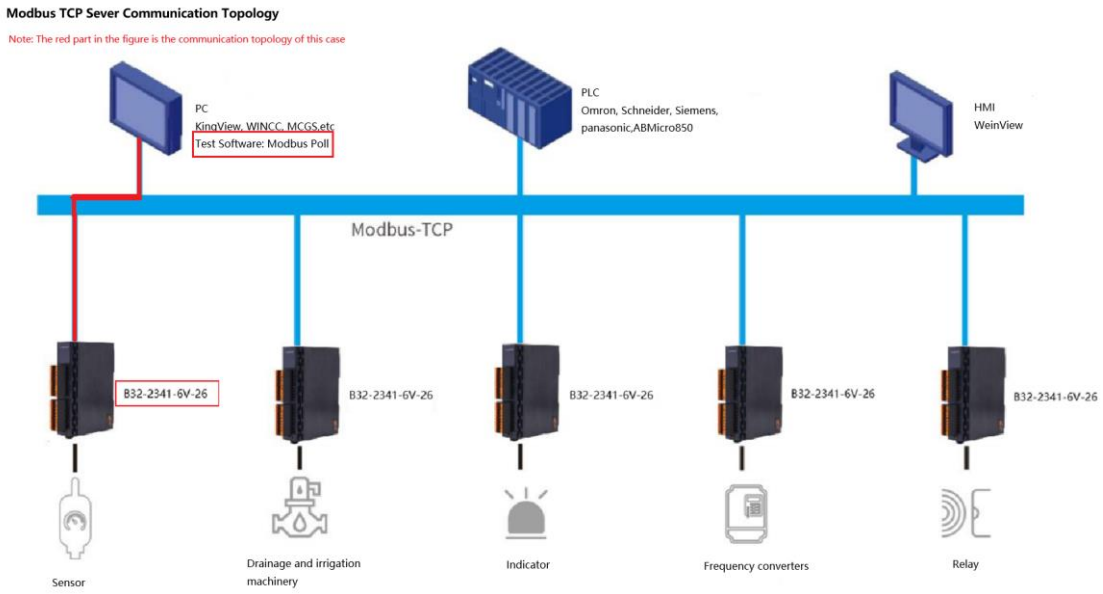
After the configuration is downloaded, monitor the status of the slave device online.


B2341 Modbus.project* - CODESYS
File Edit View Project Build Online Debug Tools Window Help
Devices
B2341 Modbus
Device [connected] (B2341)
PLC Logic
Application [run]
Library Manager
PLC_PRG (PRG)
Task Configuration
MainTask
PLC_PRG
IO_Modules_B_Series_ (IO Modules(B Ser
Ethernet (Ethernet)
Modbus_TCP_Master (Modbus TCP M
Modbus_TCP_Slave (Modbus TCP
BT_623F
Device
Ethernet
Modbus_TCP_Slave
Modbus_TCP_Master
General
Modbus Slave Channel
Modbus Slave Init
ModbusTCPSlave Parameters
ModbusTCPSlave I/O Mapping
ModbusTCPSlave IEC Objects
Status
Information
Find
Filter Show all
Add FB for IO Channel...
Go to Instance
Variable Mapping Channel Address Type Current Value Prepared Value Unit Description
Channel 0 %QB1 ARRAY [0..1] OF BYTE Write Multiple Coils
Channel 0[0] %QB1 BYTE 18 Write Multiple Coils
Bit0 %QX1.0 BOOL FALSE 0x0000
Bit1 %QX1.1 BOOL TRUE 0x0001
Bit2 %QX1.2 BOOL FALSE 0x0002
Bit3 %QX1.3 BOOL FALSE 0x0003
Bit4 %QX1.4 BOOL TRUE 0x0004
Bit5 %QX1.5 BOOL FALSE 0x0005
Bit6 %QX1.6 BOOL FALSE 0x0006
Bit7 %QX1.7 BOOL FALSE 0x0007
Channel 0[1] %QB2 BYTE 0 Write Multiple Coils
Channel 1 %IB18 ARRAY [0..0] OF BYTE Read Discrete Inputs
Channel 1[0] %IB18 BYTE 0 Read Discrete Inputs
Channel 2 %QB3 ARRAY [0..0] OF BYTE Write Multiple Coils
Channel 2[0] %QB3 BYTE 42 Write Multiple Coils
Bit0 %QX3.0 BOOL FALSE 0x0010
Bit1 %QX3.1 BOOL TRUE 0x0011
Bit2 %QX3.2 BOOL FALSE 0x0012
Bit3 %QX3.3 BOOL TRUE 0x0013
Bit4 %QX3.4 BOOL FALSE 0x0014
Bit5 %QX3.5 BOOL TRUE 0x0015
Bit6 %QX3.6 BOOL FALSE 0x0016
Bit7 %QX3.7 BOOL FALSE 0x0017
Channel 3 %IB19 ARRAY [0..1] OF BYTE Read Discrete Inputs
Channel 3[0] %IB19 BYTE 0 Read Discrete Inputs
Channel 3[1] %IB20 BYTE 0 Read Discrete Inputs
Channel 4 %IW11 ARRAY [0..3] OF WORD Read Input Registers
Channel 4[0] %IW11 WORD 32766 0x0000
0x0015
Reset Mapping
Always update variables
Enabled 1 (use bus cycle task if not used in any task)
Watch 1
Messages - Total 0 error(s), 0 warning(s), 6 message(s)
Device user: Anonymous
Last build: 0 0
Precompile
RUN
Program loaded
Program unchanged
Project user: (nobody)


PWR
RUN
ERR
IER
BN-8031
1BT-221F
2BT-623F
FEDCBA98
ModbusTCP
3BT-124F
4BT-3714
76543210
1
2
3
4

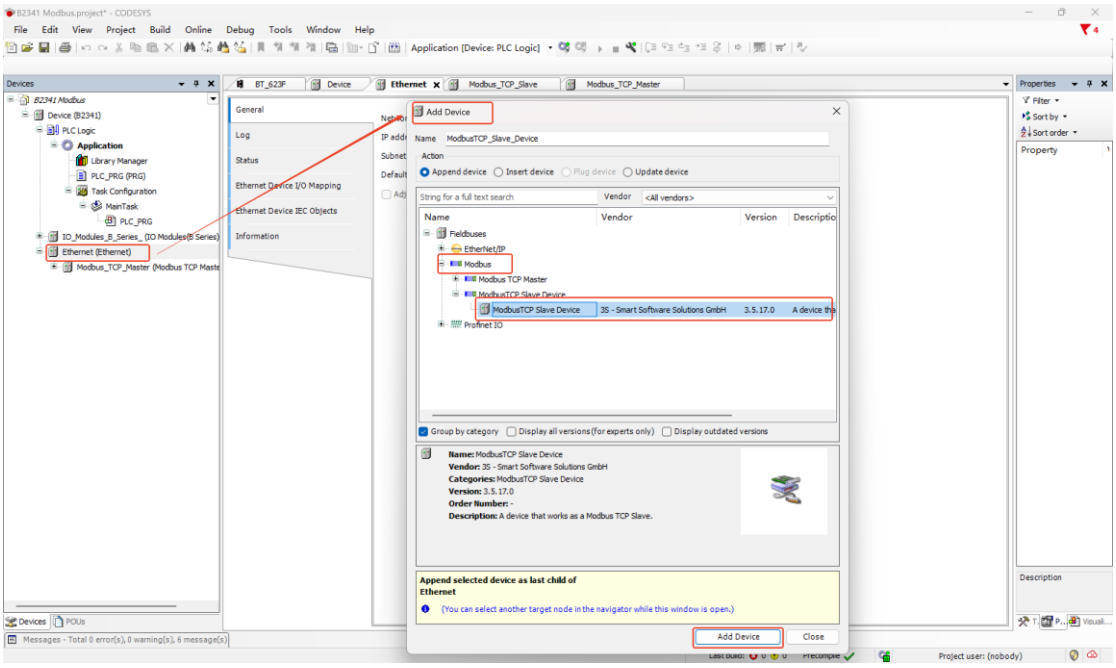
4.5 Modbus TCP Server

Topology



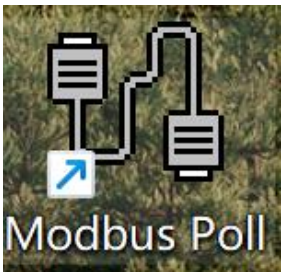
Hardware configuration: B2341+BT-623F+BT-3238；BN-8031+BT-221F+BT-623F+BT-124F+BT-3714;

When B2341 is considered a Modbus server, on the basis of the project of the Modbus TCP client, right click “Ethernet”, select Add Device, add a "fieldbus—Modbus—Modbus TCP Slave Device—Modbus TCP Slave Device”.

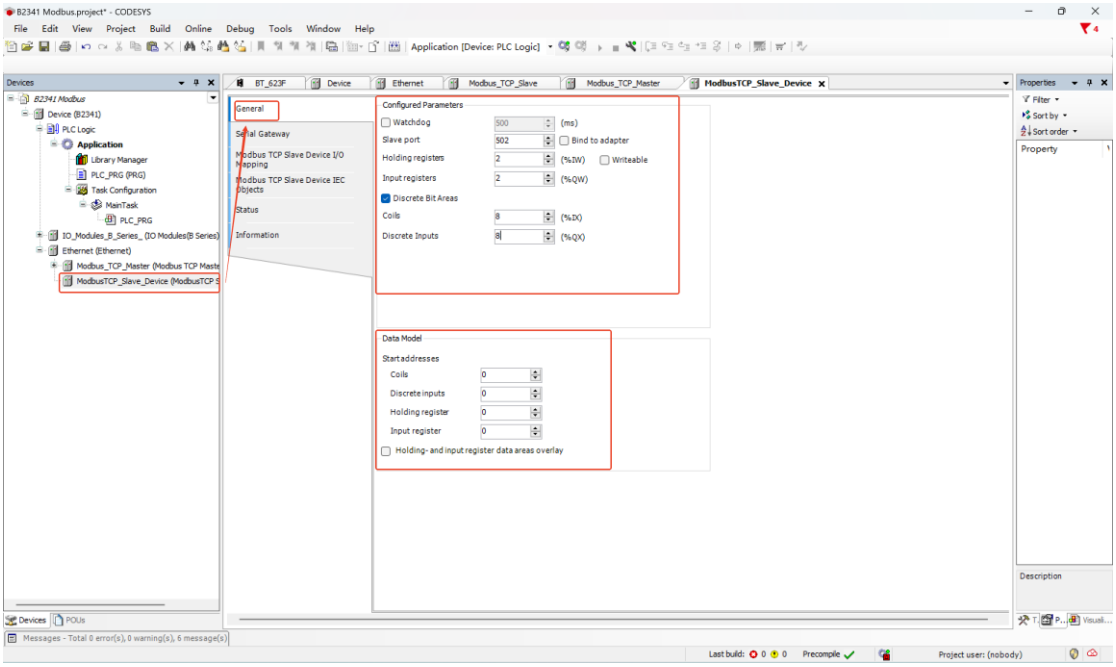


Next, the server is parameterized with a third-party client, which is simulated using

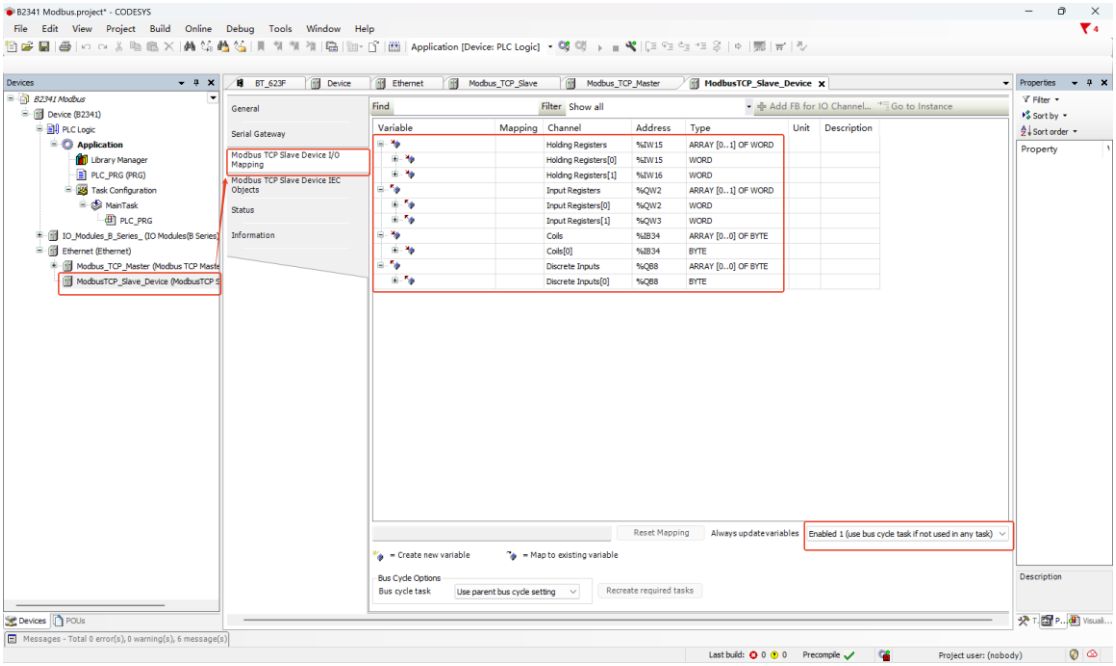
the "Modbus Poll" software.



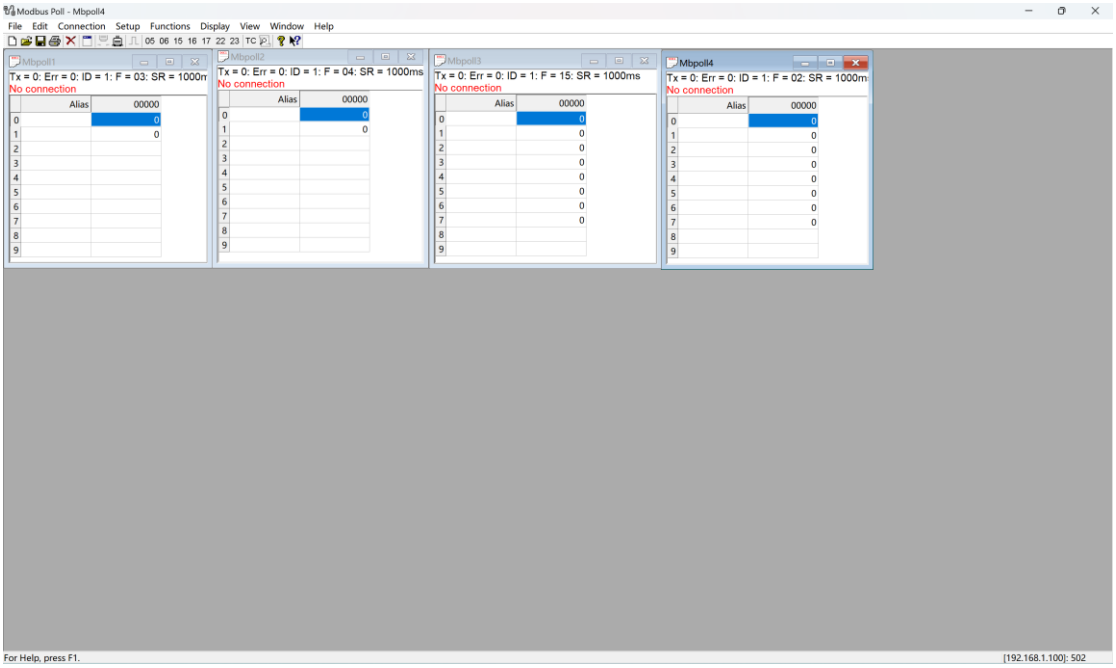
Double-click "Modbus TCP Slave Device", select "General" on the main interface on the right, set the slave port number in the configuration parameters, set the length of the holding register, input register, coil, and discrete input parameters, and modify the start address of the parameter in the data type.



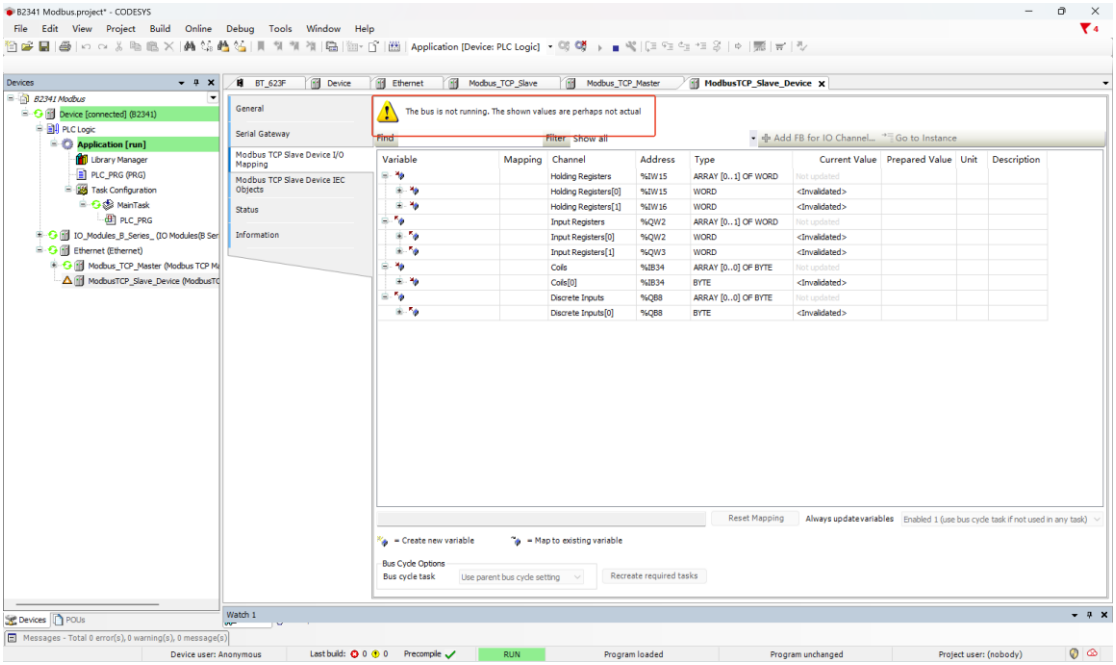
After the parameters are configured, select “Modbus TCP Slave Device I/O Mapping”, the mapped addresses of just-established slave devices in the B2341 device could be viewed, set Always Update Variable to Enable 1 (Use Bus Cycle Task if not used in any task).



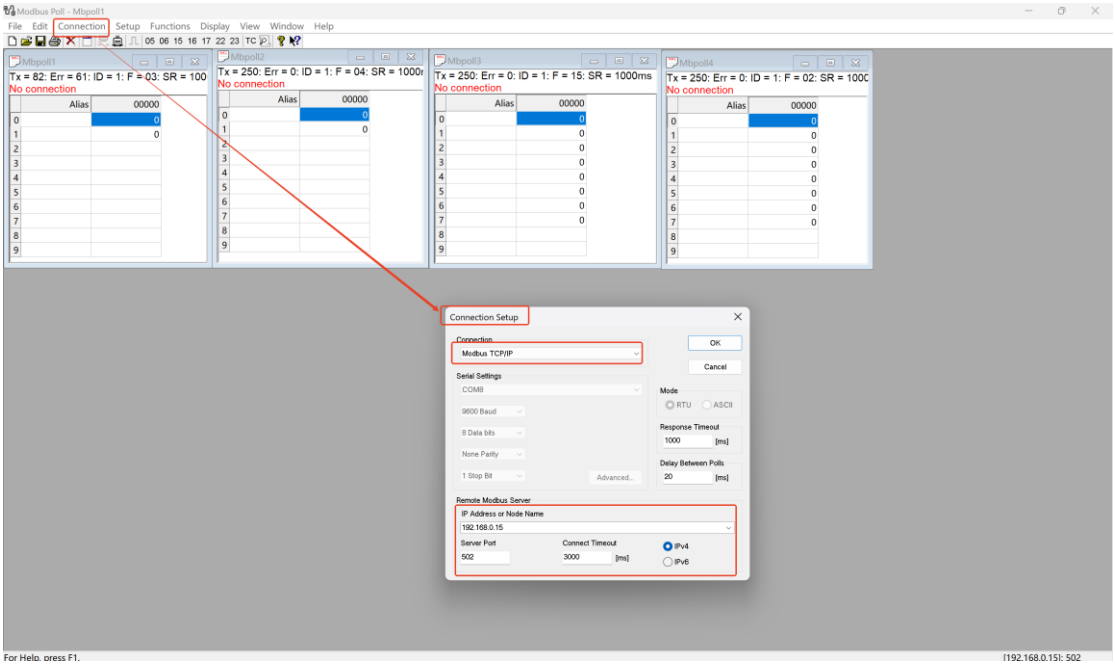
Next, open the client emulation software “Modbus Poll”， “Ctrl+N” create two Mbpoll windows, right-click in the blank spaces of each of the two windows—select “Read/Write Definition” setting, the first window Function is selected “03 Read Holding Registers（4x）”，“Quantity” set to the length of the hold register set in Codesys; The second window is Function selection “04 Read Input Register（3x）”，“Quantity” set to the length of the input register set in Codesys; The third window is Function selection “15 Write Multiple Coils（0x）”，“Quantity” set to the coil length set in Codesys; The fourth window is Function selection “02 Read Discrete Input Register（1x）”，“Quantity” set to the discrete input length set in Codesys.



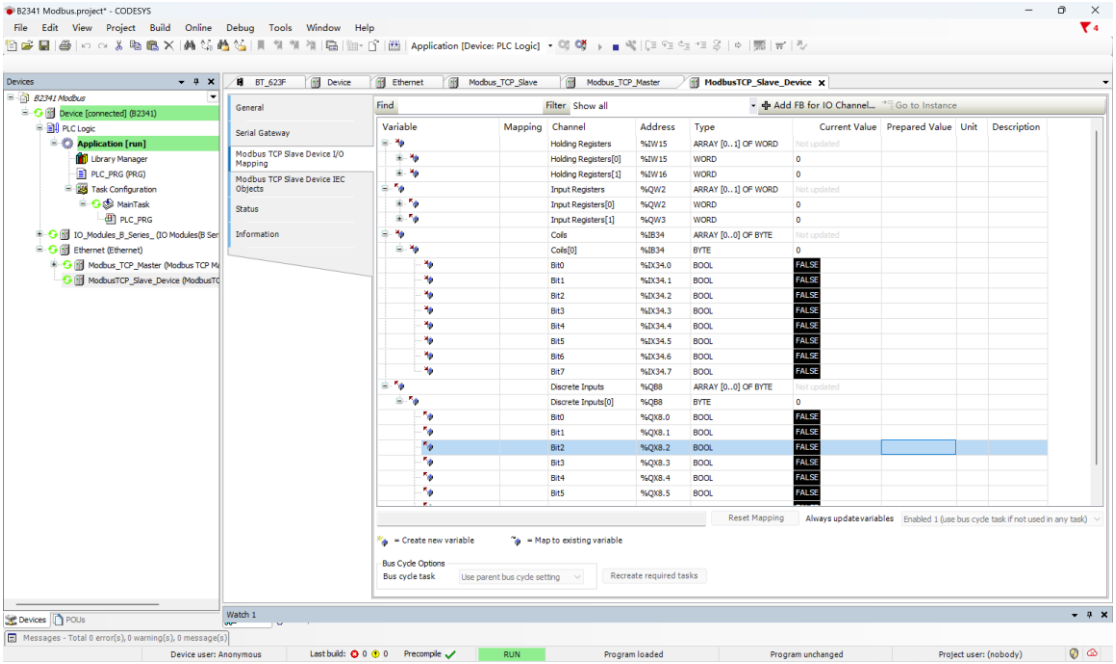
After completion, go back to the Codesys software, download and log in to the B2341 device again, and the error will disappear after the bus is not running and the TCP client is connected.



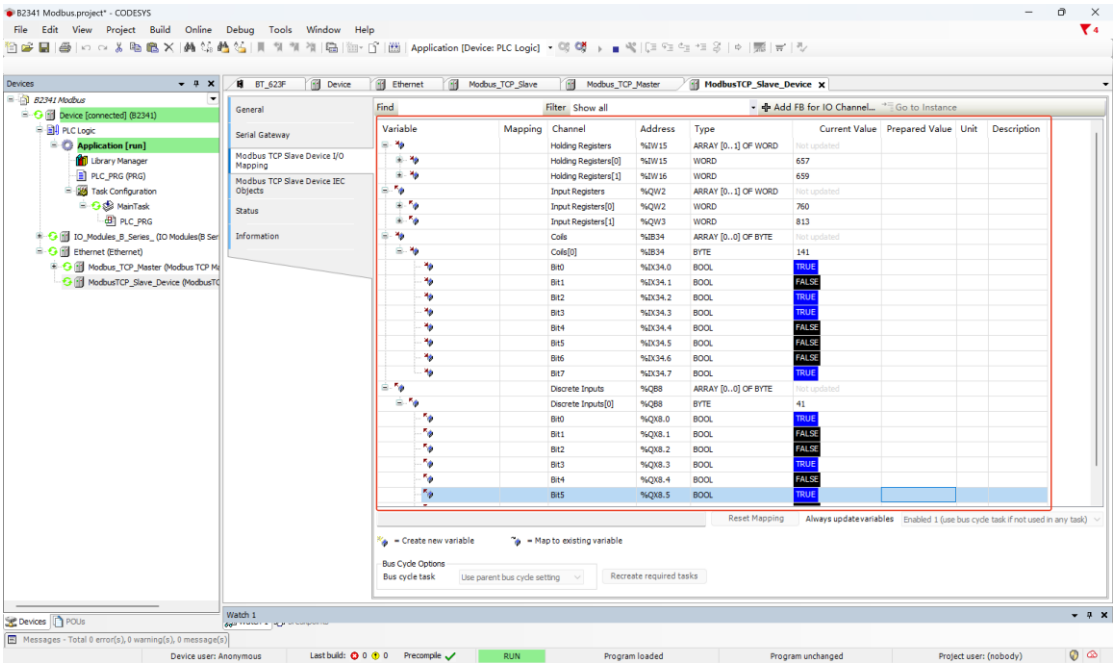
Back to Modbus Poll software, click “Connection--Connect” or use shortcut keys F3,to connect, in the pop-up interface set the “Connection” as “Modbus TCP/IP”, enter the IP address and port number, and click OK after the configuration is complete.

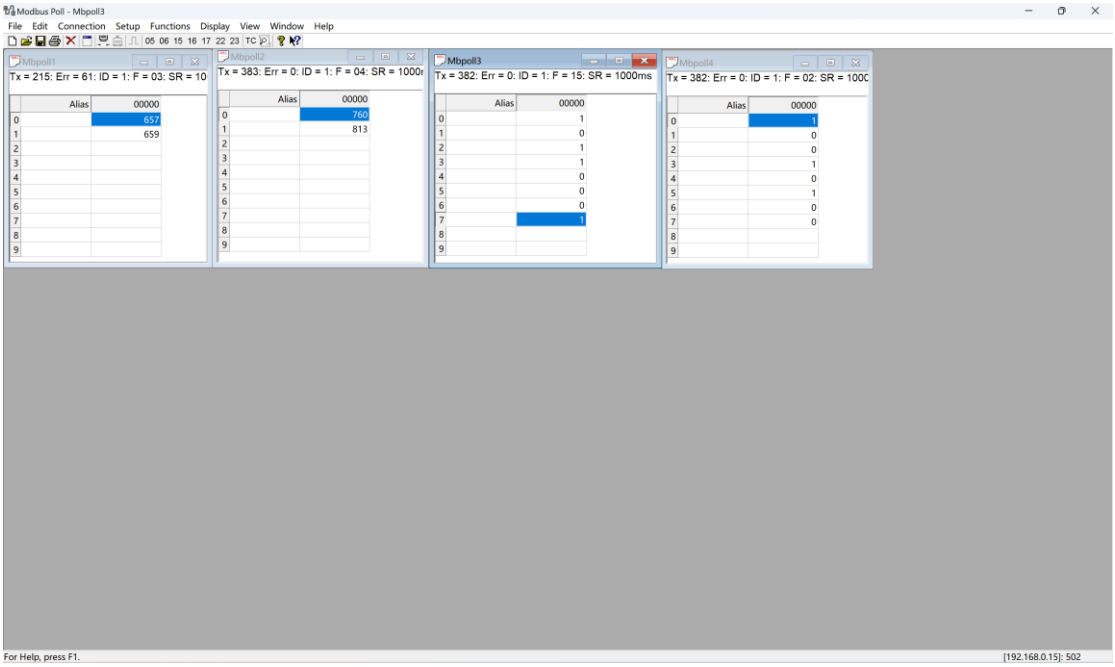


Go back to the Codesys software and it will see that all the devices are working fine.



Set the prepared values in the Codesys software and select "Debug - Write Values", or use shortcut keys “Ctrl+F7” to write, changes in values can also be monitored in the Modbus Poll software;Values from the Modbus Poll software can also be read in the Codesys software.


B2341 Modbus.project* - CODESYS
File Edit View Project Build Online Debug Tools Window Help
Devices
B2341 Modbus
Device [connected] (B2341)
PLC Logic
Application [run]
Library Manager
PLC_PRG (PRG)
Task Configuration
MainTask
PLC_PRG
IO_Modules_B_Series_ (IO Modules(B Ser
Ethernet (Ethernet)
Modbus_TCP_Master (Modbus TCP M
ModbusTCP_Slave_Device (ModbusTC
BT_623F
Device
Ethernet
Modbus_TCP_Slave
Modbus_TCP_Master
ModbusTCP_Slave_Device
General
Serial Gateway
Modbus TCP Slave Device I/O Mapping
Modbus TCP Slave Device IEC Objects
Status
Information
Find
Filter Show all
Add FB for IO Channel...
Go to Instance
Variable Mapping Channel Address Type Current Value Prepared Value Unit Description
Holding Registers %IW15 ARRAY [0..1] OF WORD
Holding Registers[0] %IW15 WORD 657
Holding Registers[1] %IW16 WORD 659
Input Registers %QW2 ARRAY [0..1] OF WORD
Input Registers[0] %QW2 WORD 760
Input Registers[1] %QW3 WORD 813
Coils %IB34 ARRAY [0..0] OF BYTE
Coils[0] %IB34 BYTE 141
Bit0 %IX34.0 BOOL TRUE
Bit1 %IX34.1 BOOL FALSE
Bit2 %IX34.2 BOOL TRUE
Bit3 %IX34.3 BOOL TRUE
Bit4 %IX34.4 BOOL FALSE
Bit5 %IX34.5 BOOL FALSE
Bit6 %IX34.6 BOOL FALSE
Bit7 %IX34.7 BOOL TRUE
Discrete Inputs %QB8 ARRAY [0..0] OF BYTE
Discrete Inputs[0] %QB8 BYTE 41
Bit0 %QX8.0 BOOL TRUE
Bit1 %QX8.1 BOOL FALSE
Bit2 %QX8.2 BOOL FALSE
Bit3 %QX8.3 BOOL TRUE
Bit4 %QX8.4 BOOL FALSE
Bit5 %QX8.5 BOOL TRUE
Reset Mapping
Always update variables
Enabled 1 (use bus cycle task if not used in any task)
= Create new variable
= Map to existing variable
Bus Cycle Options
Bus cycle task
Use parent bus cycle setting
Recreate required tasks
Watch 1
Messages - Total 0 error(s), 0 warning(s), 0 message(s)
Device user: Anonymous
Last build: 0 0
Precompile
RUN
Program loaded
Program unchanged
Project user: (nobody)


Modbus Poll - Mbpoll3
File Edit Connection Setup Functions Display View Window Help
Mbpoll1
Tx = 215: Err = 61: ID = 1: F = 03: SR = 10
Alias 00000
0 657
1 659
Mbpoll2
Tx = 383: Err = 0: ID = 1: F = 04: SR = 1000
Alias 00000
0 760
1 813
Mbpoll3
Tx = 382: Err = 0: ID = 1: F = 15: SR = 1000ms
Alias 00000
0 1
1 0
2 1
3 1
4 0
5 0
6 0
7 1
Mbpoll4
Tx = 382: Err = 0: ID = 1: F = 02: SR = 1000
Alias 00000
0 1
1 0
2 0
3 1
4 0
5 1
6 0
7 0
For Help, press F1.
[192.168.0.15]: 502

5 Example Demonstration

5.1 Control Demand

Project Name: Part of the process of sewage treatment plant (sump to regulating tank);

Project function: The external sewage is automatically replenished to the sump tank, and the water in the sump is sent to the regulating tank through the pumping pump for further sewage treatment.

Project requirements: The start and stop of the pump is jointly determined by the level switch of the regulating tank and the collecting basin, and a level gauge is installed in the collecting tank and the regulating basin respectively, which can detect the liquid level value of the pool. Sound and light alarms are installed in the collecting tank and the regulating tank to alarm the liquid level, and the yellow indicator light is on when the pump is faulty, and the green indicator light is on when it is running.

5.2 Preparation

Pump control conditions

Starting conditions: If the level of the regulating tank is low and the level of the sump is not low, start the pump.

Stop condition: Stop the pump when the level of the regulating tank is high or the level of the sump is low.

Alarm conditions: When the level of the sump is higher than 4.5 meters or the level of the regulating tank is higher than 3.5 meters, the audible and visual alarm will be triggered.

Point statistics

DI: 2 sets of liquid level switches with high level and low liquid level, and 6 DI signals for pump operation and fault signals

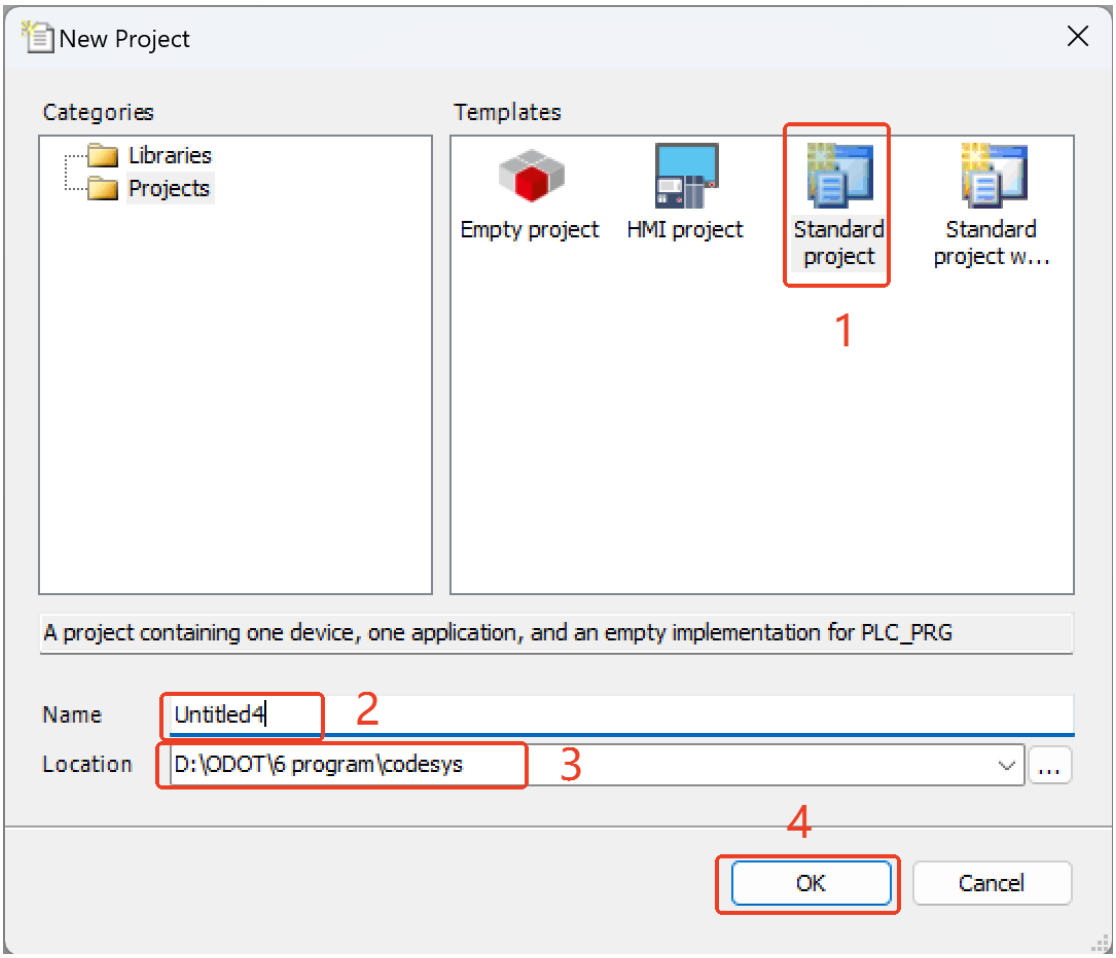
DO: pump drive, 2 sound and light alarms drive, 2 LEDs for a total of 5 DO signals

AI: The analog signals of the 2 sets of level gauges have a total of 2 AI signals

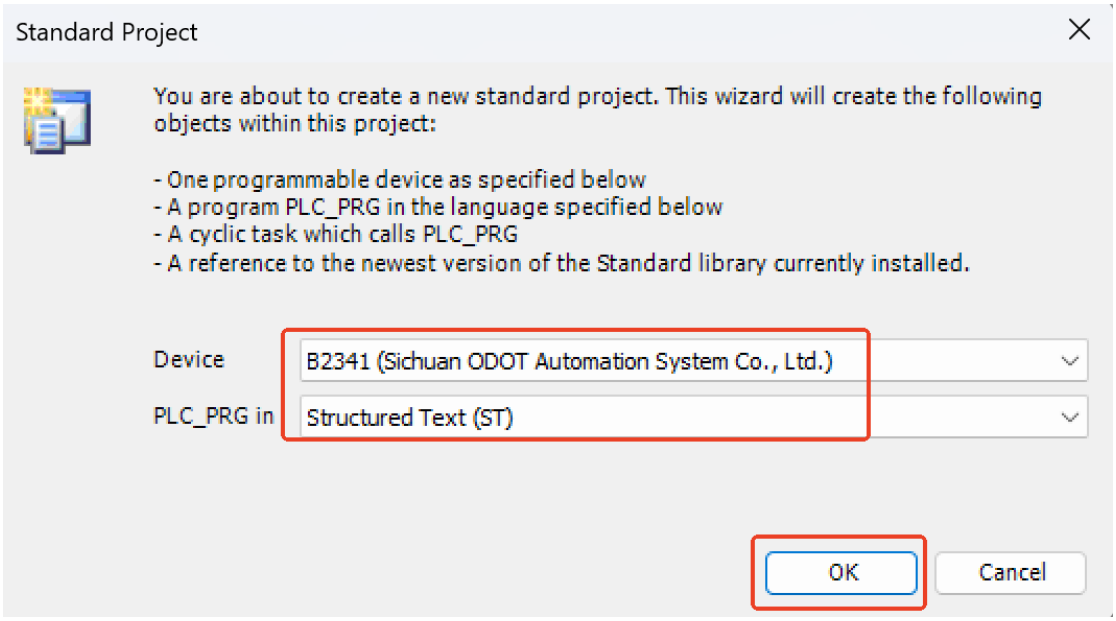
Project analysis: combined with the actual situation of B2341, and according to the selection table: select BT-623F module to receive DI signal (high level signal) and output DO signal (high level signal); Select the BT-3238 module to receive the analog signal.

5.3 Project Establishment

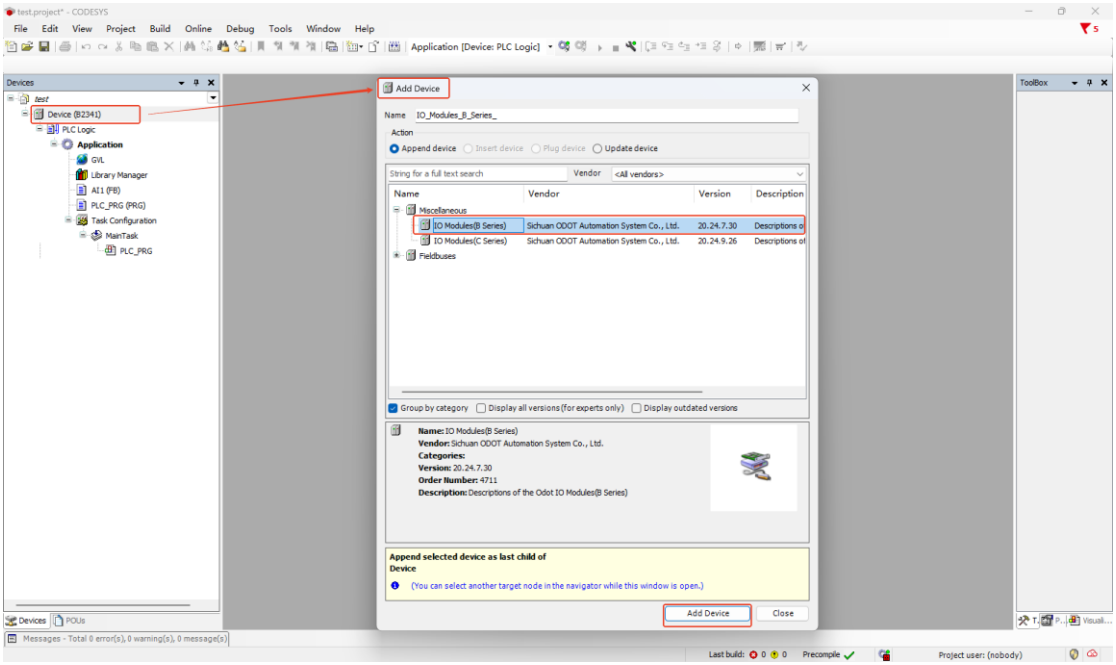
In the menu bar, select File - New Project, select the standard project in the pop-up window, set the project name and location, and click OK.



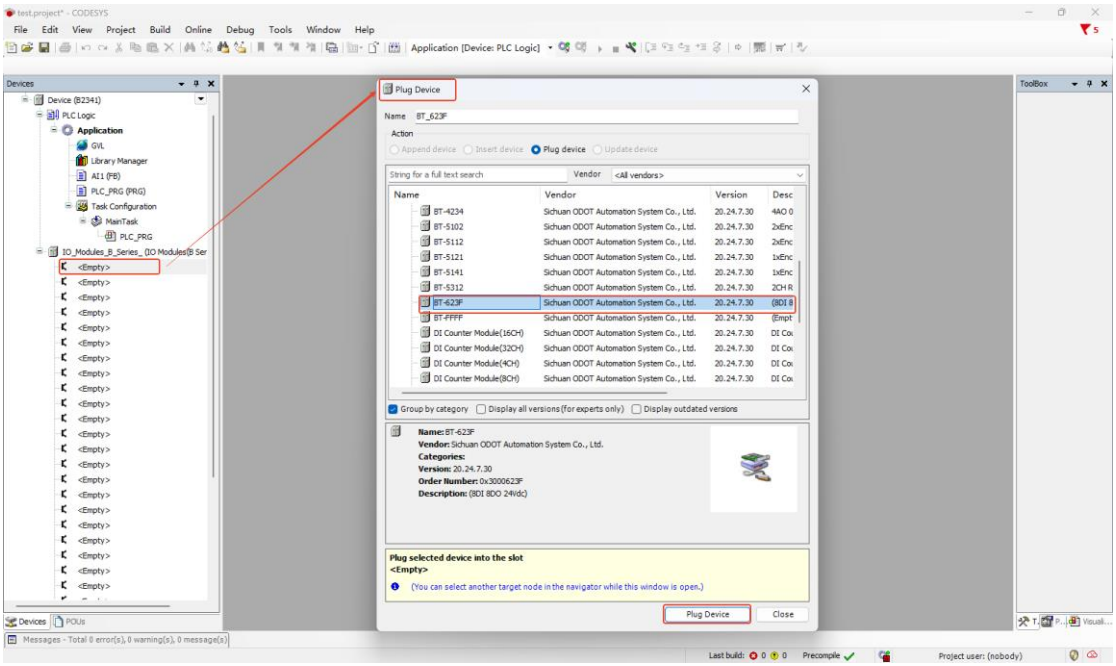
In the pop-up window, select B2341 as the device and click OK.



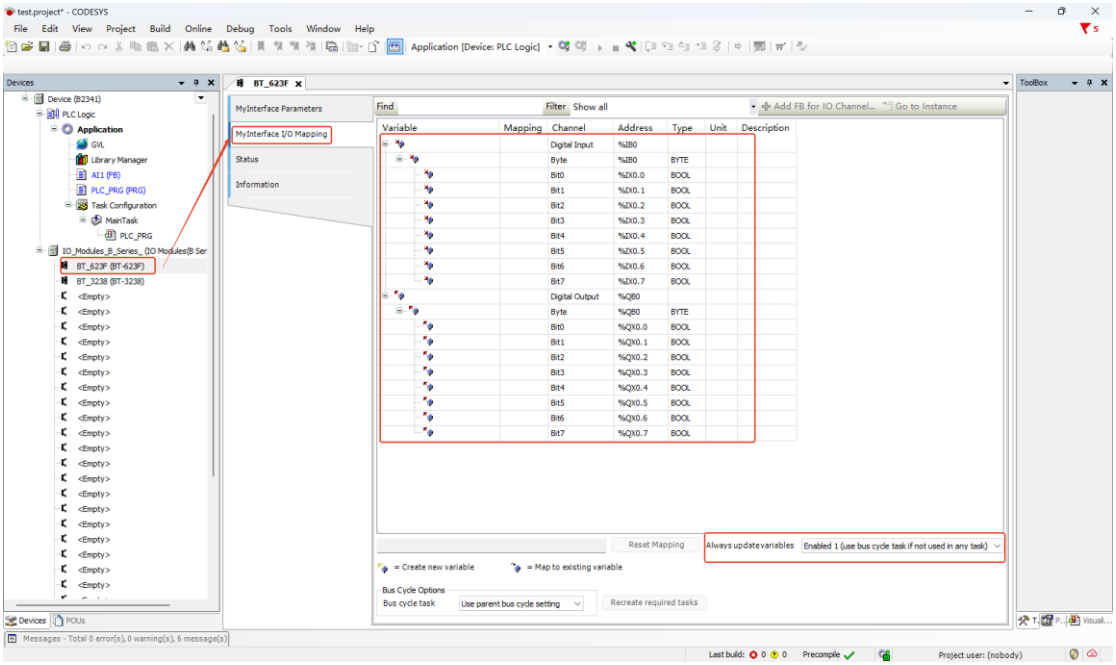
After the project is created, right-click B2341 and select Add Device. Find "IO Modules" in the pop-up window, select it, click Add Device, and you don't need to close this page after adding.



Select the "empty" slot and insert the corresponding modules BT-623F and BT-3238 according to the hardware configuration.



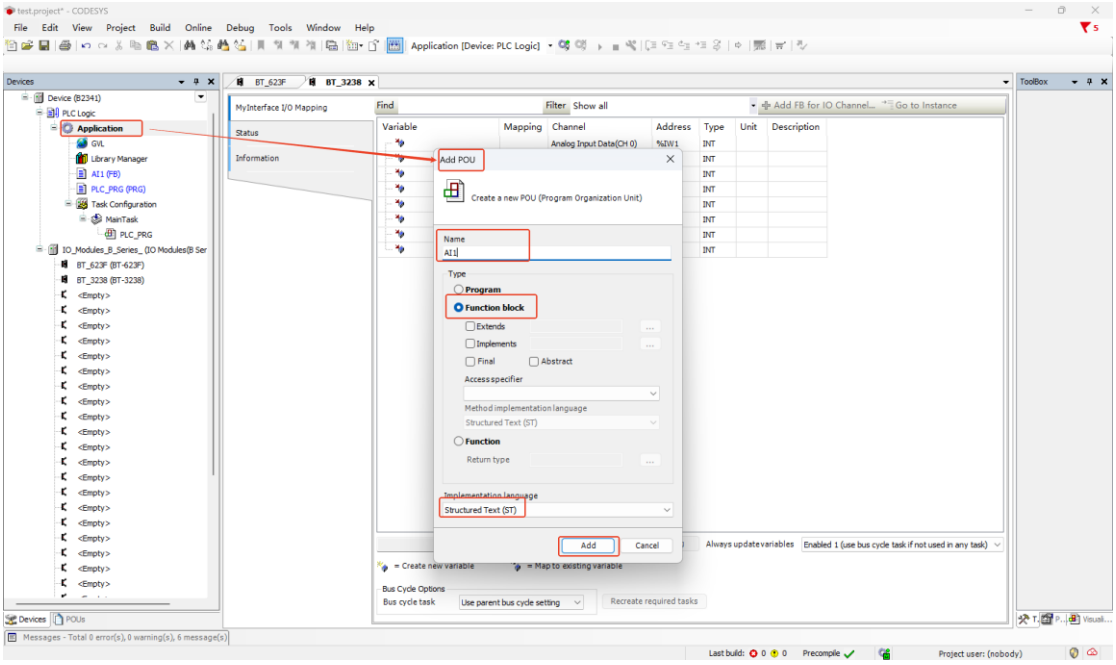
Double-click the module and select I/O Mapping to view the corresponding I/O address, set the mapping relationship, and set the Always Update variable to Enable 1.

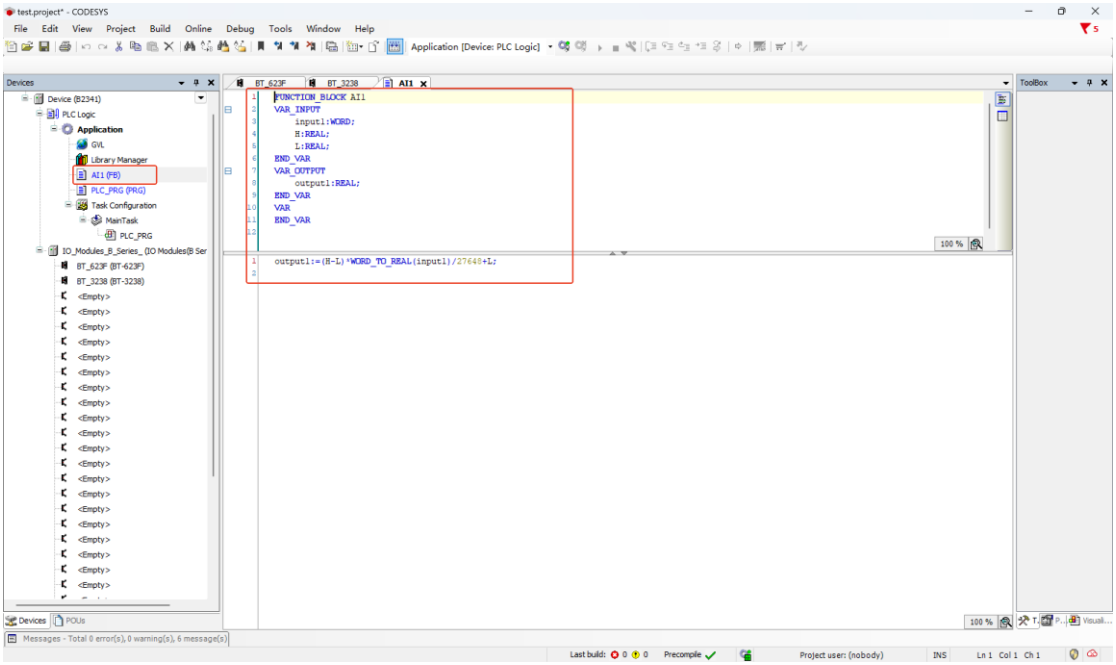


Considering the user's usage habits, FB blocks are often called in the process of program writing, and this time the analog input is used to build the block and the ST language is used to write.

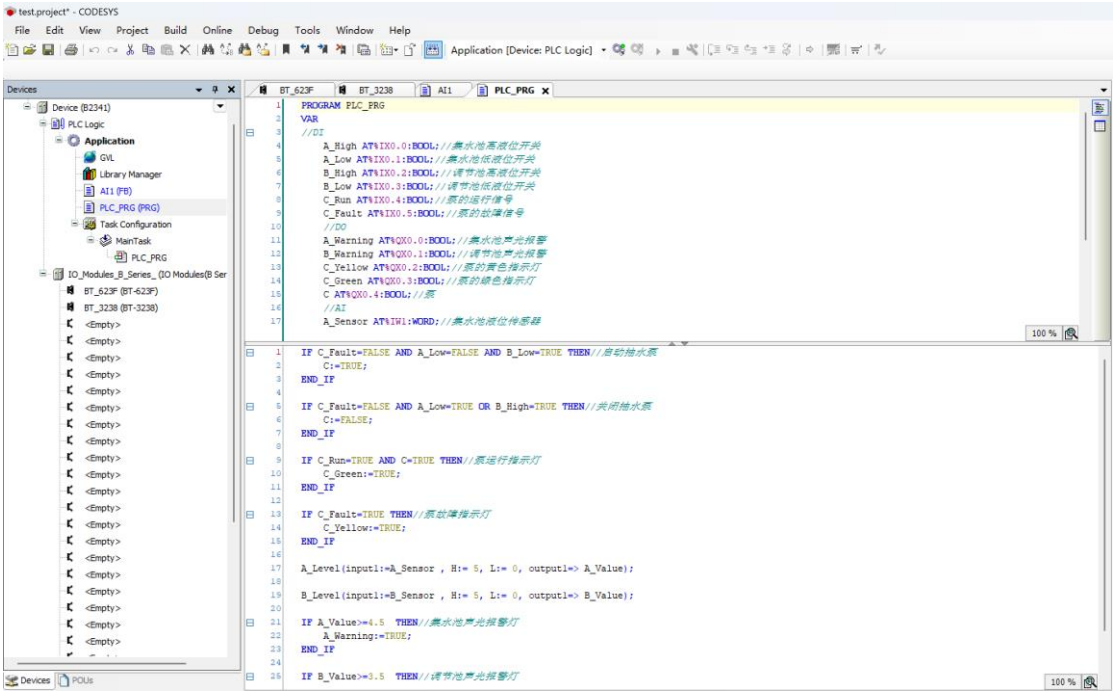
Right-click Application, select "Add Object--POU", set the name of the function block, select the type as "Function Block B", select "Structured Text (ST)" as the

language, and click Add after the setting is complete.



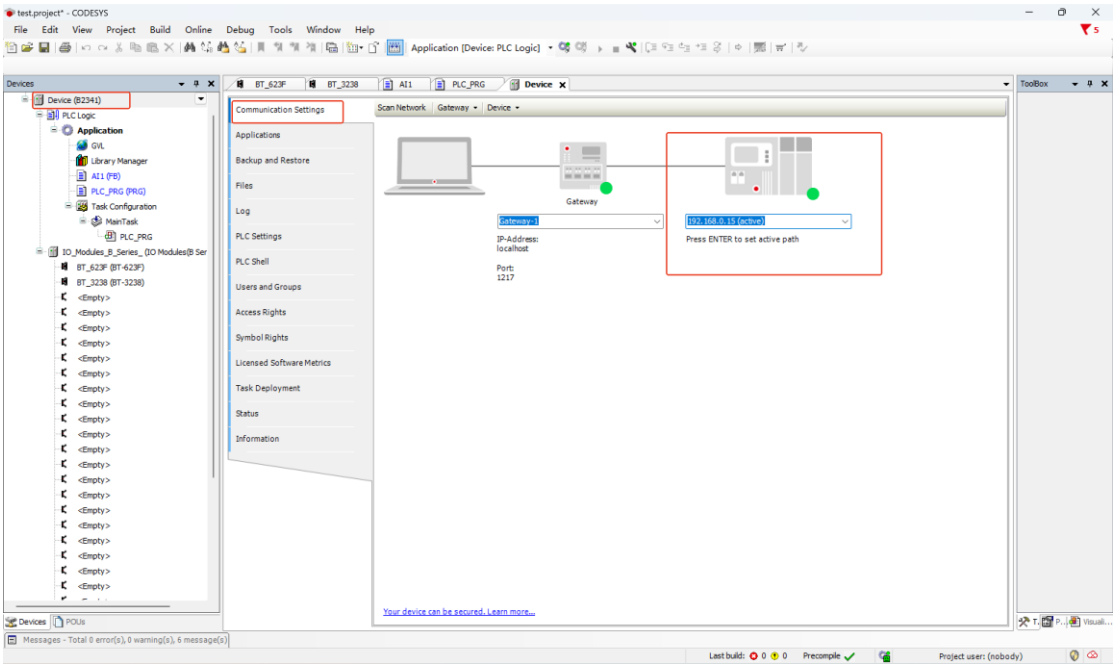


Next, the main program is written according to the control requirements.

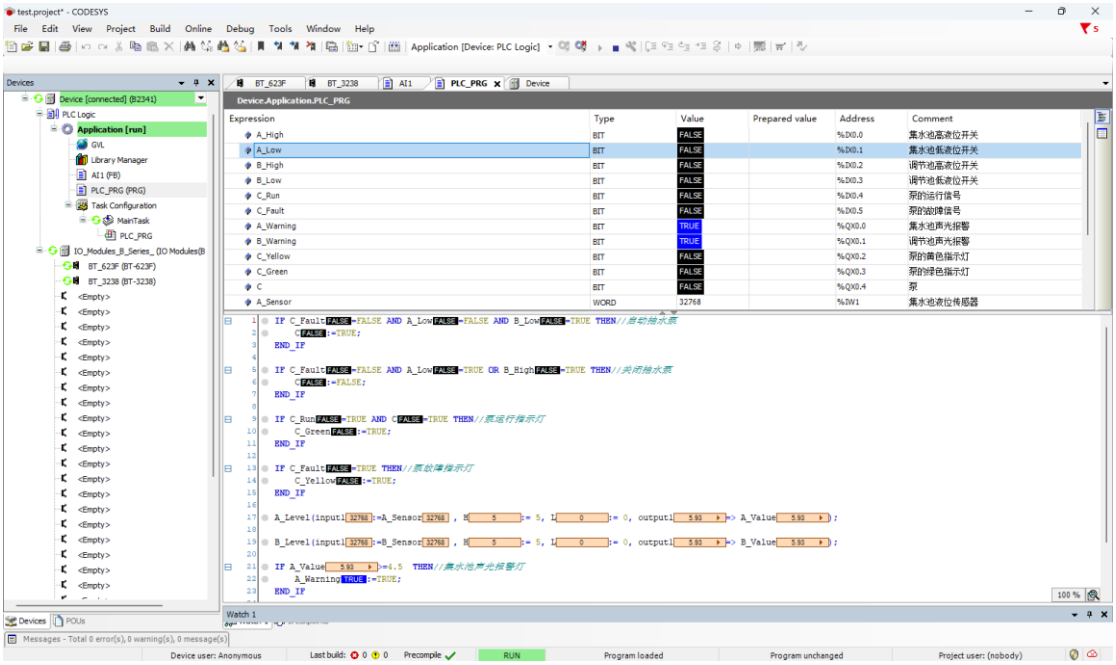


5.5 Program Downloads and Monitoring

Double-click Device (B2341), select communication settings, enter the IP address of the B2341 module (the IP address of the module can be viewed by the LCD display or IO Config software), and press Enter to activate the device.



After the device is activated, compile, download, and run the program, it can be monitored online.


test.project* - CODESYS
File Edit View Project Build Online Debug Tools Window Help
Application [Device: PLC Logic]
Devices
Device [connected] (B2341)
PLC Logic
Application [run]
GVL
Library Manager
AI1 (PB)
PLC_PRG (PRG)
Task Configuration
MainTask
PLC_PRG
IO_Modules_B_Series_ (IO Modules(B
BT_623F (BT-623F)
BT_3238 (BT-3238)
BT_623F
BT_3238
AI1
PLC_PRG
Device
Device.Application.PLC_PRG
Expression
Type
Value
Prepared value
Address
Comment
A_High BIT FALSE %IX0.0 集水池高液位开关
A_Low BIT FALSE %IX0.1 集水池低液位开关
B_High BIT FALSE %IX0.2 调节池高液位开关
B_Low BIT FALSE %IX0.3 调节池低液位开关
C_Run BIT FALSE %IX0.4 泵的运行信号
C_Fault BIT FALSE %IX0.5 泵的故障信号
A_Warning BIT TRUE %QX0.0 集水池声光报警
B_Warning BIT TRUE %QX0.1 调节池声光报警
C_Yellow BIT FALSE %QX0.2 泵的黄色指示灯
C_Green BIT FALSE %QX0.3 泵的绿色指示灯
C BIT FALSE %QX0.4 泵
A_Sensor WORD 32768 %IW1 集水池液位传感器
IF C_Fault=FALSE AND A_Low=FALSE AND B_Low=TRUE THEN//启动抽水泵
C:=TRUE;
END_IF
IF C_Fault=FALSE AND A_Low=TRUE OR B_High=TRUE THEN//关闭抽水泵
C:=FALSE;
END_IF
IF C_Run=TRUE AND C=TRUE THEN//泵运行指示灯
C_Green:=TRUE;
END_IF
IF C_Fault=TRUE THEN//泵故障指示灯
C_Yellow:=TRUE;
END_IF
A_Level(input:=A_Sensor, H:= 5, L:= 0, output=> A_Value);
B_Level(input:=B_Sensor, H:= 5, L:= 0, output=> B_Value);
IF A_Value>=4.5 THEN//集水池声光报警灯
A_Warning:=TRUE;
END_IF
100 %
Watch 1
Messages - Total 0 error(s), 0 warning(s), 0 message(s)
Device user: Anonymous
Last build: 0 0
Precompile
RUN
Program loaded
Program unchanged
Project user: (nobody)

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