# **ODOT C3351 PLC**

# **User Manual**

03/2024





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# **Security Information**

### **Important Information**

Before attempting to install, operate, service, or maintain the equipment, please read the following instructions carefully and look to familiarize yourself with the equipment. Specific information described below may appear elsewhere in the text or on the device to alert the user to potential hazards, or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a DANGER or WARNING label indicates the presence of an electric shock hazard which, if instructions are not followed, will result in personal injury.



This is a symbol to remind you to be safe. Remind users of the possible danger of personal injury. Please follow all safety precautions with this symbol to avoid possible personal injury or even death.

# **A** DANGER

**DANGER** INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN SERIOUS INJURY OR DEATH.

# **A**WARNING

**WARNING** INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN SERIOUS INJURY OR DEATH.

# **A**CAUTION

**CAUTION** INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY OR DEATH.

# NOTICE

NOTICE INDICATES A HAZARD NOT RELATED TO PERSONAL INJURY.

#### Attention

Installation, operation, repair and maintenance of electrical equipment is restricted to qualified personnel only. Sichuan ODOT Automation System Co., Ltd. shall not be responsible for any consequences arising from the use of this user manual.

Qualified personnel are those who have the skills and knowledge related to the manufacturing and operation of electrical equipment and its installation, and who have been trained in safety to be able to detect and avoid related hazards.

#### **Personnel Qualification**

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

Qualified personnel must be able to detect possible hazards arising from setting parameters and modifying parameter values, usually from mechanical, electrical or electronic equipment. Qualified personnel must be familiar with the various standards, rules and regulations aimed at preventing industrial accidents and must comply with them when designing and building systems.

### **Expected Usage**

The products described 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, guide, examples and safety instructions in this document and other supporting documents.

This product must be used in compliance with all applicable safety laws and regulations, specified requirements and technical parameters. Due to planned application, you must perform a risk assessment before using this product. Appropriate safety-related measures must be taken based on the results of the evaluation.

Since this product should be used as an integral part of the entire machine or process, the safety of personnel 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 spare parts and original replacement parts.

Any use other than that expressly permitted is prohibited as unintended hazards may result.

### **Network Safety Tips**

A. Use controllers and devices only in protected environments to minimize network exposure and ensure inaccessibility from the outside.

B. Use a firewall to protect the control system network and separate it from other networks.

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

D. Restrict access to development and control systems by 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 introduces the hardware implementation of C3351 programmable controller and CODESYS programming cases. It provides descriptions, characteristics, wiring diagrams and installation details for Modbus TCP and Modbus COM network adapters and Digital Input, Digital Output, Analog Input, Analog Output, and special modules.

#### **Validity Statement**

In accordance with our policy of continuous improvement, we will continue to revise the content of this manual to make it clearer and more accurate.

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

### **Product Information**

# A DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

•Disconnect power from all equipment (including connected equipment) before removing any covers, or installing or removing any accessories, hardware, cables, or wires, unless otherwise specified in the corresponding hardware guide for this equipment.

•As directed, at the appropriate place and time, it is important to always use a properly rated voltage sensing devices to detect if the power is off.

•Replace and secure all covers, accessories, hardware, cables and wires, and verify proper ground connection 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 or serious injury.

# **A** DANGER

#### POSSIBLE EXPLOSION HAZARD

•Do not connect or disconnect equipment unless it is unplugged or the location is known to be non-hazardous.

·Use the USB port (if equipped) only if the work area is known to be non-hazardous.

Failure to follow the instructions will result in serious consequences such as personal injury or death.

# **A** WARNING

#### OUT OF CONTROL

• The designer of any control scheme must account for the possible failure of the control path and provide a means for certain critical control functions could be restored to a safe state during and after path failure. These critical control functions include emergency stop, over-travel stop, power-off restart, and similar safety measures.

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

•System control paths may include communication links. Consideration must be given to the implications of unforeseen transmission delays or link failures.

·Comply with all accident prevention regulations and local safety guidelines.

•To guarantee proper operation, each implementation of the device must be fully tested individually before being placed into service.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

Only use software approved by Sichuan ODOT Automation System Co., Ltd. for use with this equipment.

Please update the application after every change to the physical hardware configuration.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•Your risk assessment should include the possibility of a communication failure between the logic controller and any I/O expansion modules.

·If the I/O module output signal "maintain current value" does not meet your application requirements when the I/O expansion Bus error occurs, other solutions should be used to ensure that the application can cope with Bus error events.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

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# **1 Product Overview**

### **1.1 Introduction**

The C3351 is the second edition PLC of Sichuan ODOT Automation System Co., Ltd. And the programming environment is CODESYS. It is a programmable system that follows the IEC61131-3 international standard. It supports five programming languages such as ladder diagram (LD), instruction list (IL), structured text (ST), function block diagram (CFC/FBD) and Sequential Function Chart (SFC). The PLC supports to mount 32 modules and user program storage supports 1Mbytes, and data storage supports 1Mbytes. With built-in standard serial communication RS485 interface and RJ45 interfaces, it makes C3351 to be a small PLC with rich functions.

The C3351 is the core component of the entire C series remote I/O system. Its main job is not only to execute the user's logic program, but also to send and receive all I/O data and process communication data. It has rich instructions, reliable functions, good adaptability, compact structure, easy expansion, cost-effective, strong versatility, and is very convenient for programming, monitoring, debugging, and on-site operation. The C3351 could be applied to a variety of automation systems.

The Ethernet interface on the CPU supports the Modbus TCP client function, supports the third-party Modbus TCP servers to access data, supports the Modbus TCP server function, and supports access to the data of the third-party Modbus TCP clients. And the RS485 interface of the CPU supports the Modbus RTU master and Modbus RTU slave function, and it supports third-party equipment to exchange data with PLC through the serial port.

The 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 Version Information**

The document has been modified as follows:

Date	Version No.	Modify Content	Author
2023/7/26	V1.00	Initial Version of the Sample PLC	YS
		Manual	
2023/11/17	V2.00	Official User Manual	YS/DFL

### **1.3 Ownership Information**

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### **1.4 Disclaimer**

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### **1.5 Revision Notes**

2023/6/30 Initial version is completed.2023/11/17 Update the image and modify it to the official version

### **1.6 Software Download**

Please log in to the official website of Sichuan ODOT Automation System Co., Ltd.: <u>https://www.odotautomation.com</u>, and click to download on the corresponding product page.

# **1.7 Selection Table**

Serial No.	Model	Functional Description	Status
1	CT-1218	8 channels digital input PNP/24V Valid	Published
2	CT-1228	8 channels digital input / 24VDC/NPN	Published
3	CT-121F	16 channels digital input PNP/24V Valid / Sink	Published
4	CT-122F	16 channels digital input, NPN /0V Valid/ Source	Published
5	CT-124H	32 channels digital input, PNP/24V valid / Sink, NPN/0V valid/ Source	Published
6	CT-124D	32-channel digital input/24VDC/PNP or NPN	Published
7	CT-1314	CT-1314 4 channels digital input/220VAC	Published
8	CT-2218	8 channels digital output/24VDC/NPN	Published
9	CT-221F	16 channels digital output 0.5A/NPN/0V valid/Source	Published
10	CT-222F	16 channels digital output 0.5A/PNP/24V valid/Source	Published
11	CT-221H	32 channels digital output /24VDC/NPN	Published
12	СТ-222Н	32 channels digital output 0.5A/PNP/24V valid/Source	Published
13	CT-222D	32 channels digital output/24VDC/PNP	Published
14	CT-2224	4 channels digital output 2A/PNP/24V valid/Source	Published
15	CT-2228	8 channels digital output 0.5A/PNP/24V valid/Source	Published
16	CT-2718	8 channels relay output 1A/30VDC/30W	Published
17	CT-2738	8 channels relay output 1A/30VDC/30W	Published
18	CT-2754	4 channels relay output,3A/30VDC/90W	Published
19	CT-2794	4 channel relay output,2A/250VAC/500VA	Published
20	CT-3168	8 channels voltage input 0~5VDC/0~10VDC /±5VDC/±10VDC,15 bits	Published
21	CT-3234	4 channels analog input /0&4~20mA/ 15 bits, single-ended	Published
22	CT-3238	8 channels analog input /0&4~20mA/ 15 bits, single-ended	Published
23	CT-3258	8 channels analog input 0~ 20mA /-20~0mA /±20mA 12 bits, single-ended bipolar	Published
24	CT-3268	8 channels analog input /0 ~ 20mA or -20~0mA or ±20mA / 15 bits, single-ended bipolar	Published
25	CT-3713	3 channels thermal resistance input RTD-PT100	Published
26	CT-3734	4 channels thermal resistance RTD -PT100 temperature acquisition module, with isolation	Published
27	CT-3804	4 channels thermocouple input TC-J/K/ E/T/S/R/B/N type	Published

28	CT-3808	8 channels thermocouple input TC-J/K/ E/T/S/R/B/N type	Published
29	CT-3844	4 channels thermocouple input TC-J/K/ E/T/S/R/B/N type (filter adjustable)	Published
30	CT-3848	8 channels thermocouple input TC-J/K/ E/T/S/R/B/N type (filter adjustable)	Published
31	CT-4154	4 channels voltage output 0~5VDC/0~10VDC /±5VDC/±10VDC, 16 bits	Published
32	CT-4158	8 channels voltage output 0~5VDC/0~10VDC/±5VDC/±10VDC, 16 bits	Published
33	CT-4234	4 channels analog output 0&4~20mA/16 bits, single-ended	Published
34	CT-5102	2 channels encoder input 5VDC	Published
35	CT-5112	2 channels encoder input 24VDC	Published
36	CT-5122	2 channels encoder SSI input	Published
37	CT-5142	2 channels encoder differential input	Published
38	CT-5321	1 channel serial port module Modbus Master/Modbus Slave /Free Protocol	Published
39	CT-5331	CANopen Master module	Published
40	CT-5341	Profibus DP Master module	Published
41	CT-5711	Bus extension master module	Published
42	CT-5721	Bus extension slave module	Published
43	CT-5801	terminal module	Published
44	CT-623F	8 channels digital input PNP/24V valid/Sink, NPN/0V valid/Source 8 channels digital output 0.5A/PNP/24V valid/Source	Published
45	CT-7100	field Power Expansion Module 8A (no configuration required)	Published
46	CT-7220	power expansion module 5V/2A (no configuration required)	Published
47	CT-7221	Power Supply Extension Module 5V/2A	Published
48	CT-730F	18 channels field power distribution module (0Vdc)	Published
49	CT-731F	18 channels field power distribution module (24Vdc)	Published
50	CT-732F	18 channels field power distribution module (PE)	Published
51	CT-7339	18 channels field power distribution module (24Vdc/0Vdc)	Published
52	CT-7346	18 channels field power distribution module (24Vdc/0Vdc/PE)	Published

# **2 Module description**

# **2.1 Device Preview**



**Reset Button:** press and hold for 5s so it could to reset the C3351 to its initial state, including device configuration parameters, user program storage area, power-down storage area, etc. will be cleared or reset.

**STOP/RUN DIP switch:** Dial up and it will turn to RUN mode, then the RUN indicator will be green on, and it means the program is running; Dial down to STOP mode, then the RUN indicator will be off, and it means the program stops running. In addition, the indicator above the dip switch will be green on when it is dialed up, and the indicator below the DIP switch will be red on when it is dialed down.

**Type-C serial port:** This serial port is a device debugging port for development engineers only.



### **2.2 LED indicator**

The user can easily check the power status, running status, Bus status, and I/O module status of C3351 through the LED status indicators.

PWR STA RUN NET IRN IRR	C3351 Modbus
	FP 🗖

#### PWR — Power Status Indicator (Green): The system power supply is normal. On: Off: The system power supply is abnormal. FP——Power Status Indicator (Green): On: The field power supply is normal. Off: The field power supply is abnormal. STAT—— Module status indicator (Red/Green): Red flashes twice: The module is abnormal and has been softly restarted. Green on: Operating mode Green single flash: Stop mode Red and Green alternately flashing (slow): The current status is upgrade mode. Red and Green alternately flashing (fast): Firmware upgrade in progress **RUN** —— Device running indicator (Green): On: The PLC is running. Off: The PLC is not running. NET —— Network Status Indicator (Green/Red): Green on: The current module is consistent with the PLC configuration. Red flash: The current module and PLC configuration are inconsisten. Off: No error IRN ——IO Running indicator (Green): IO initialization is normal. On: Off: IO initialization error IER ——IO Error indicator (Red): Off: IO communication is normal. Flash twice: IO communication error

# **2.3 Interface introduction**

### **2.3.1 Ethernet interface**

Port1/Port2 support switch cascading function, 10Mbps/100Mbps adaptive rate.

Speed			
Speed 1	Network speed indicator (Green)		
On:	00Mbps		
Off:	10Mbps		
Link/Act I	Link status indicator / Active indicator (orange)		
On: O	Connected		
Off: Not connected			
Flashing: Active link			
SHIELD RJ45 crystal head shield interface			
RJ45 interface pin definition			
Pin	Definition	Description	
1	TD+	Transmitting	

1	TD+	Transmitting +
2	TD-	Transmitting -
3	RD+	Receiving +
6	RD-	Receiving -

### 2.3.2 485 interface

RS485 terminal adopts the top 4 pins of the terminal, which are defined as follows:

Pin	Definition	Description
1	В-	RS485 B-
2	A+	RS485 A+
3	GND	Signal ground
4	PE	Protective Earth





#### UNEXPECTED EQUIPMENT OPERATION

·Connecting the RS485 interface to a voltage exceeding the rated voltage will cause permanent damage, and the rated voltage is DC  $\pm$ 5V.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **2.3.3 Power interface**

The CP-PW03 module is used for power supply, and the module pins are defined as follows:

Pin	Definition	Description
1	SV+	System power supply positive
2	SV+	System power supply positive
3	SV-	System power supply negative
4	SV-	System power supply negative
5	FV+	Field power supply positive
6	FV+	Field power supply positive
7	FV-	Field power supply negative
8	FV-	Field power supply negative
9	PE	Protective Earth



### 2.4 C3351 Installation

#### 2.4.1 Installation and maintenance requirements

The use and application of the information contained in this chapter requires expertise in the design and programming of automatic control systems. Only the user, machine builder or integrator can clearly understand the various situations and factors that may arise during installation and set-up, operation and maintenance, and therefore can determine the effective and correct use of automation and associated equipment, related safety devices and interlocks equipment. When selecting automation and control equipment and any other related equipment or software for a particular application, all applicable local, regional or national standards and/or regulations must also be considered.

In particular, observe any safety information, different electrical requirements and regulatory standards applicable to the machine or the use of the equipment.

#### 2.4.2 Power cut off

Before installing the control system on the DIN Rail, mounting plate or panel, all options and modules should be assembled; when disassembling, first remove the control system from the DIN Rail, mounting plate or panel, and then remove the equipment.

# A DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

•Disconnect power from all equipment (including connected equipment) before removing any covers, or installing or removing any accessories, hardware, cables, or wires, unless otherwise specified in the corresponding hardware guide for this equipment.

As directed, at the appropriate place and time, it is important to always use a properly rated voltage sensing devices to detect if the power is off.

•Replace and secure all covers, accessories, hardware, cables and wires, and verify proper ground connection before powering on the device. When operating this equipment and related products, the specified voltage must be used.

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

Failure to follow the instructions will result in serious consequences such as personal injury or death.

#### 2.4.3 Environmental Specification

All expansion module components must be electrically isolated between the internal circuitry and the input/output channels, and the device is intended for use in a pollution degree 2 industrial environment.

# **A**WARNING

Unexpected equipment operation

•Do not exceed any ratings specified in the Environmental and Electrical Characteristics Table.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **2.4.4 Programming Notes**

# **A**WARNING

#### UNINTENDED EQUIPMENT OPERATION

Only use software approved by Sichuan ODOT Automation System Co., Ltd. for use with this equipment.

Please update the application after every change to the physical hardware configuration.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### 2.4.5 Operating Environment

In addition to the environmental characteristics, please refer to the product-related information at the beginning of this document for important information about installing this specific equipment in hazardous locations.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•The modules are not suitable for use in harsh environments, such as environments with corrosive gases or salt spray.

·Install and operate this equipment in accordance with the conditions described in "Environmental Characteristics".

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **2.4.6 Installation Precautions**



#### UNINTENDED EQUIPMENT OPERATION

·Use appropriate safety interlocks in situations where there may be a risk of personal injury and/or equipment damage.

·Install and operate the equipment in an enclosure that is locked by a key locking device and complies with the level of the environment in which the equipment operates.

 $\cdot$ Use the sensor and actuator power supply only for powering the sensors or actuators connected to the module.

•Wiring and output circuits must be wired and fused in accordance with local and national regulations for specific equipment rated amperage and voltage.

•Do not use this device in a safety-critical machine environment unless it is designated as a functional safety device and complies with applicable regulations and standards.

·Do not disassemble, repair or modify this equipment.

·Do not connect any lines to reserved unused connection points, or connection points indicated as No Connection (NC).

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **2.4.7 Installation Guide**

The remote I/O module can be mounted on a 35mm DIN rail.

The C3351 device is installed on the far left, followed by the other I/O modules (including digital input/output modules, analog input/output modules, and special function modules), and the terminal module is installed on the far right.

PORTI		PWR STA RUN NET IRN IER	C3351 Modbus	C1 P 0 1 2 3 4 4 5 6 6 7	F-121F W STA 9 10 11 12 12 13 14 15	CT-121F PW STA 0 8 1 9 2 10 3 11 4 12 5 13 6 14 7 15	CT-121F PW 0 8 1 0 8 1 0 2 10 3 11 4 12 5 13 6 14 7 15	CT-121F PW \$51A 1 9 2 10 3 11 4 12 5 13 6 14 7 15	CT-121F PW \$17A 9 2 100 3 11 4 12 5 13 6 14 7 15	CT-121F PW STA 0 8 1 9 2 100 3 11 4 12 5 13 6 14 7 15	CT-121F PW STA 0 8 1 9 2 10 3 11 5 13 6 14 7 15 C	-5801 L L L L
	B- A* NC NC NC		51+ 52+ 52+ 52+ 52+ 52+ 52+ 52+ 52+ 52+ 52						ा स्थिति के किन्द्र के बाह्य विद्याद्य विद्याद्य विद्याद्य के बिन्द्र के किन्द्र के किन्द्र के किन्द्र के किन्द्र के किन्द्र के किन्द्र किन्द्र के बाह्य किन्द्र के किन्द्			

# NOTICE

#### **DEVICE INOPERABLE**

•The installation position of the I/O module in the middle is not fixed. According to the layout position needed by customer, after the actual project confirms the installation position, it is not allowed to move the position of the I/O module.

·Each station needs to add terminal modules.

Failure to follow the above instructions could result in damage to the equipment.

Power modules need to be added according to the actual number of I/O modules. The power modules are placed between the I/O modules, and the specific slots are not fixed. The drawing designer needs to consider the installation position of the power modules in advance.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

·If the total current of the I/O modules installed at the rear of the C3351 device exceeds the provided current, but no power module is added, the I/O module channels will work abnormally.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

#### 2.4.8 Correct Installation Position

All modules should be installed horizontally on a vertical surface as much as possible, as shown in the following figure:



After the module is installed vertically, press the lock on the top of the module to ensure that the module is installed in place, and the distance between the module and the upper and lower contact surfaces of the 35mm Din rail is less than 1mm. Press the lock on the left side of the C3351 device counterclockwise to lock the Din rail.



# **A**WARNING

#### OUT OF CONTROL

•The lock of the I/O module must be pressed firmly; otherwise, the communication of the I/O module may be disconnected.

The lock of the I/O module must be pressed firmly, otherwise the module may fall off.

•When installing the I/O module, no gap should be left between the modules. Otherwise, the I/O channel may not work properly.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **2.4.9 Incorrect Installation Location**

A. The lock on the left side of the C3351 device is not pressed firmly to the Din rail.

B. After the installation is completed, the lock on the upper side of the module is not pressed to lock the Din rail, or the pressed position is not in place.

C. After the installation is completed, the lower part of the side of the module is not installed in place, and the module is not installed vertically, but is inclined to the backplane.

D. There are gaps between modules.





### 2.4.10 Minimum Clearance

# **A**WARNING

#### UNINTENDED EQUIPMENT OPERATION

•Install the equipment that dissipates the most heat at the top of the cabinet to ensure proper ventilation.

·Please do not place this device near or above equipment that may cause overheating.

•Install the equipment so that it maintains the minimum clearances stated in this document to all nearby structures and equipment.

·Install all equipment according to the specifications in the relevant documentation.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

The figure below shows the minimum clearances for all C-Series module models (mm) :





# 2.5 Install I/O modules for C3351

This section describes how to assemble the expansion I/O module to the C3351 programmable controller.

# AA DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

•Disconnect power from all equipment (including connected equipment) before removing any covers, or installing or removing any accessories, hardware, cables, or wires, unless otherwise specified in the corresponding hardware guide for this equipment.

•As directed, at the appropriate place and time, it is important to always use a properly rated voltage sensing devices to detect if the power is off.

•Replace and secure all covers, accessories, hardware, cables and wires, and verify proper ground connection before powering on the device.

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

Failure to follow the instructions will result in serious consequences such as personal injury or death.

After connecting the new module to the C3351 programmable controller Bus network, it needs to update the application program before putting the system into use. If the application program could not be updated and reflects the new modules, and the I/O on the expansion Bus may not function correctly.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•Only use software approved by Sichuan ODOT Automation System Co., Ltd. for use with this equipment.

Please update the application after every change to the physical hardware configuration.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **Installation Steps**

The following describes how to assemble the C3351 device and I/O modules:

Unlock the buckles on the left and upper sides of the C3351 device, and install it vertically on a 35mm Din rail.

Steps	Operations
1	Take all modules out of the box.
2	Open the lock on the left and upper sides of the C3351 device, and install it vertically on a 35mm Din rail.
3	Rotate the lock on the left side of the C3351 device counterclockwise to clamp the Din rail.

4	Press the lock on the upper side of the C3351 device (there will be a 'click' sound to indicate that the lock is in place), so that the C3351 device is firmly fixed on the Din rail.
5	Open the lock on the upper side of the I/O module, move the module from top to bottom along the slot of the C3351 shell, and make the I/O module flush with the C3351 device, then press the lock on the upper side of the module, and it will be clamped with a 'click' sound.
6	Then install the next I/O module until all I/O modules are installed.
7	After the I/O module is installed, please install the terminal module as the last module.



# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•The module model on the physical slot needs to correspond one-to-one with the module model on the configuration software slot, and please save it after the configuration is completed.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# 2.6 Removing the I/O Module from the C3351

# A DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

•Disconnect power from all equipment (including connected equipment) before removing any covers, or installing or removing any accessories, hardware, cables, or wires, unless otherwise specified in the corresponding hardware guide for this equipment.

•As directed, at the appropriate place and time, it is important to always use a properly rated voltage sensing devices to detect if the power is off.

•Replace and secure all covers, accessories, hardware, cables and wires, and verify proper ground connection before powering on the device.

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

Failure to follow the instructions will result in serious consequences such as personal injury or death.

The following describes how to remove the C3351 programmable controller and I/O modules:

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•The module does not support the hot swap function. When removing or replacing a module, it is necessary to power off before removing or replacing the module.

•When replacing I/O modules in later maintenance, please note that the model and slot number should be replaced correspondingly. It is not allowed to replace with the wrong module model or move the sequence of I/O modules at will, otherwise there will be a risk of burning out the module or damaging the field equipment.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

Steps	Operations
1	Disconnect all power to the control system.
2	Open the lock of the module to be removed to release it from the Din rail.
3	Remove the wires from the channel of the module that needs to be removed.
4	Pull out the module to be removed in a vertical direction to the Din rail.

# 2.7 Wiring

### 2.7.1 Wiring Guidelines

When wiring the system, the following rules must be followed:

 $\cdot$ I/O and communication wiring must be done separately from power wiring. These two types of cables cannot be laid in the same cable duct.

•Please check that the operating conditions and environment are within the range allowed by the specification values.

•The specifications of the cables used must meet the voltage and current requirements.

·Please use copper wire.

Please use shielded twisted pair cables for analog and/or fast I/O.

Network and fieldbus should use shielded twisted pair cables.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•Please use shielded cables for all fast I/O, analog I/O, and communication signals.

•Please use shielded cables for single point grounding for all fast I/O, analog I/O, and communication signals. [1]

Please wire power cables separately from communication cables and I/O cables.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

[1] Multi-point grounding is permitted (and in some cases unavoidable) if connected to the equipotential grounding plane to avoid damage to the cable shield in the event of a power system short-circuit current. **NOTE:** Surface temperatures may exceed 60°C (140°F).

To comply with IEC-61010, the primary wiring (wires connected to the main power supply) should be arranged separately and separated from the secondary wiring (extra low voltage wiring from the intermediate power supply). If separate wiring is not possible, double insulation must be provided, such as conduit or cable gain.

Copper interconnects are required.

# **A**DANGER

#### FIRE HAZARD

•Only use the correct wire rules for the maximum current capacity of the I/O channels and power supplies.

·For relay output (2A) wiring, please use conductors with a cross-sectional area of at least 0.5 mm<sup>2</sup> (AWG20) and a temperature rating of at least 80°C (176°F).

Failure to follow the instructions will result in serious consequences such as personal injury or death.

### 2.7.2 Push-in Terminal

All module terminals adopt push-in terminals. Use the push-in connection method to connect single wires or crimp terminal (ferrule) wires without any additional tools to ensure fast wiring. Users can save wiring and disconnection time.

When the push-in terminals are disconnected, the pressing force should be 15 Newtons, and the maximum mechanical bearing pressure of the push-in terminals is 20 Newtons. Using a larger pressing force will affect the spring back of the terminal, and if the tool used for pressing is too sharp and it will damage the push-in terminals.



The module has a cable harness fixing end, which is used to fix the cable when the I/O module is connected to multiple cables.

### NOTICE

#### **DEVICE INOPERABLE**

•When removing wires from the channel, please do not press the push-in terminals with more than the maximum pressing force specified for this terminal, otherwise it may damage the push-in terminals spring back force and affect the terminal spring back.

•When removing wires from the channel, please do not use sharp tools to press the push-in terminals, otherwise the push-in terminals will be damaged.

Failure to follow the above instructions could result in damage to the equipment.

### 2.7.3 Cold-pressed Terminal

It is recommended to use a cable with a core less than 1mm<sup>2</sup>, and the parameters of the cold-pressed terminal are as follows:





#### UNINTENDED EQUIPMENT OPERATION

•The length of stripping off the insulation layer of the wire should be greater than 10mm to ensure the reliable connection of the signal.

•It is recommended to use a wire with a wire core greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1mm<sup>2</sup> to ensure reliable signal connection.

•When the cold-press terminal is terminated, it should be terminated and inspected in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node number.

·It is forbidden to power on the cold-press terminal before it is correctly connected or completely locked.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **AA** DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

•Disconnect power from all equipment (including connected equipment) before removing any covers, or installing or removing any accessories, hardware, cables, or wires, unless otherwise specified in the corresponding hardware guide for this equipment.

•As directed, at the appropriate place and time, it is important to always use a properly rated voltage sensing devices to detect if the power is off.

•Replace and secure all covers, accessories, hardware, cables and wires, and verify proper ground connection before powering on the device.

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

Failure to follow the instructions will result in serious consequences such as personal injury or death.



#### OUT OF CONTROL

•The designer of any control scheme must account for the possible failure of the control path and provide a means for certain critical control functions could be restored to a safe state during and after path failure. These critical control functions include emergency stop, over-travel stop, power-off restart, and similar safety measures.

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

•System control paths may include communication links. Consideration must be given to the implications of unforeseen transmission delays or link failures.

·Comply with all accident prevention regulations and local safety guidelines.

•To guarantee proper operation, each implementation of the device must be fully tested individually before being placed into service.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### **2.8 Protects Outputs from Inductive Load Damage**

Depending on the load, the outputs of the controller and specific modules may require protection circuits. Inductive loads using DC voltages can create voltage reflections that cause overshoots that can damage or shorten the life of the output device.

# **A** CAUTIOUS

#### DAMAGE TO OUTPUT CIRCUITS DUE TO INDUCTIVE LOADS

·Use appropriate external protective circuits or devices to reduce the risk of damage to inductive loads.

Failure to follow the instructions may result in personal injury or equipment damage.

If the controller or module contains relay outputs, and these types of outputs can support up to 30 Vdc. Inductive damage to these types of outputs can result in fused contacts and loss of control. Every inductive load must be equipped with protective devices, such as RC circuits or freewheeling diodes. These relays do not support capacitive loads.



#### **RELAY OUTPUT FUSION CLOSURE**

·Always use appropriate external protective circuits or devices to protect relay outputs from inductive load damage.

Please do not connect relay outputs to capacitive loads.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **A** WARNING

#### THERE ARE CONSQUENCES OUT OF CONTROL

•Please install an RC surge suppressor or freewheeling diode on each relay output when connecting to a contactor or other form of inductive load.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **2.9 Power Supply**

### 2.9.1 Features and Wiring

# **A** DANGER

#### FIRE HAZARD

·Use only the correct wire specifications for the maximum current capacity of the power supply.

Failure to follow the instructions may result in serious consequences such as personal injury or death.

# **A** WARNING

#### UNINTENDED EQUIPMENT OPERATION

•Please do not exceed any ratings specified in the Environmental and Electrical Characteristics table.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### 2.9.2 DC Power Requirements

The C3351 device and associated expansion modules require a power supply rated at 24 Vdc. According to IEC 61140, the 24 Vdc power supply must be rated safety extra-low voltage (SELV) or protective extra-low voltage (PELV). These power supplies are isolated between its electrical input and output circuit.



#### **OVERHEATING AND FIRE HAZARD**

Never connect the device directly to the line voltage.

Please use only insulated SELV or PELV power supply to power the device. [1]

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

[1] To comply with UL (Underwriters Laboratories) requirements, the power supply must meet the various standards of NEC Class 2 and inherently limit the current to less than the maximum usable power output of 100 VA (approximately 4 A at nominal voltage), or not be affected by intrinsic limits, but limited by additional protective devices (such as circuit breakers or fuses meeting the requirements of UL 61010-1 Clause 9.4, "Energy-Limited Circuits"). In no case shall the current limit exceed that of the electrical characteristics and wiring diagrams of the equipment described in this document. In all cases, the power supply must be grounded, and the user must isolate Class 2 circuits from other circuits. Multiple Class 2 power supplies could be used if the ratings indicated in the electrical characteristics or wiring diagrams are greater than the specified current limit.

# **2.10 Grounding**

### 2.10.1 Functional grounding on the DIN rail

The system DIN rail is the common functional grounding plane and must always be mounted on a conductive backplane.



#### UNINTENDED EQUIPMENT OPERATION

·Connect the DIN rail to the functional grounding of the installed equipment.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

### 2.10.2 System Grounding

Due to the influence of electromagnetic interference, cables carrying fast I/O, analog I/O and fieldbus communication signals must be shielded cables.



#### UNINTENDED EQUIPMENT OPERATION

Please use shielded cables for all fast I/O, analog I/O, and communication signals.

·Please use shielded cables for single point connection for all fast I/O, analog I/O and

communication signals. [1]

·Arrange power cables separately from communication and I/O cables.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

[1] Multi-point grounding is permitted (and in some cases unavoidable) if it is connected to the equipotential grounding plane to avoid damage to the cable shield in the event of a power system short-circuit current. When using shielded cables, the following wiring rules need to be followed:

•For the protective earthing (PE), metal pipes or wires can be used as part of the shield length, the premise is it should provide the entire earthing connection continuously without interruption. For functional grounding, shielding is used to reduce electromagnetic interference and the shielding must be continuous throughout the cable without interruption. If for both functional and protective purposes (This is usually the case for communication cables), the shielding of the cable must be continuous without interruption.

·Cables carrying different types of signals or power should be separated whenever possible

### **2.10.3 Protective Earthing on the backplane (PE)**

The protective earthing (PE) is connected to the conductive backplane by a heavy-duty conductor (usually a braided copper cable with the largest allowable cable cross-section). There is a metal spring plate on the back of the module, which is used for effective grounding with the Din rail, and the metal spring plate is connected to the inside of the terminal PE of the adapter module.

### 2.10.4 Shielded Cable Connection

Cables carrying fast I/O, analog I/O and fieldbus communication signals must be shielded. The shielded cable must be firmly grounded. The fast I/O and analog I/O shields can be connected to the functional grounding or protective earthing (PE) of the C3351 expansion module. The fieldbus communication cable shields must be connected to protective earthing (PE) via using connection clamps fastened to the conductive backplane installed.

### **2.11 Dimensions**




# **3 Module Parameters**

# **3.1 General Parameters**

System power supply:	22-28VDC (Nominal 24VDC)
Protection:	Anti-reverse connection protection
Module consumption:	110mA@24Vdc
Internal Bus supply current:	Max: 2.0A@5VDC
Isolation:	system to site power isolation
Field power supply:	22-28V (Nominal 24V)
Field supply current:	Max. DC 8A
Number of supported I/O mo	dules: 32 pcs
Wiring diameter:	Max.1.5mm <sup>2</sup> (AWG 16)
Way to install:	35mm DIN rail
Dimension:	115 * 65.5 * 75mm
Weight:	170g
TT (1 ' (	

Unexpected equipment operation



#### UNINTENDED EQUIPMENT OPERATION

·Devices exceeding the above requirements may be damaged or malfunction.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **3.2 Environmental Parameter**

Operating Temperature of Horizontal Installation -35°C~70°C Operating Temperature of Vertical Installation -35°C~60°C Relative Humidity < 95%RH (No Condensation) Storage Temperature -40°C~85°C Storage Humidity < 95%RH (No Condensation) Manufacturing Test Temperature -40°C~75°C Ingress Protection Rating IP20



#### UNINTENDED EQUIPMENT OPERATION

Devices exceeding the above requirements may be damaged or malfunction.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **3.3 Programming Specification**

Programming Software:	CODESYS SP17		
Programming language:	IEC 61131-3 (LD, IL, S	ST, CFC/FBD, SFC)	
Maximum State Task:	5		
Bit Instruction Cycle:	0.0738us		
Word Transfer Cycle:	0.33us		
Floating Point Operation Cycle:	0.38us		
Program Memory:	1MBytes		
Data Storage:	1MBytes		
Power-down Protection Area:	3KBytes		
RTC:	Not Supporte	ed	
Maximum Expansion Module:	32		
Modbus Master Max Channel Nur	mbers: 10		
Modbus Master Command Max Length:			
Function Code 1(Read Coils)	:	2000/1 channel	
Function Code 2(Read Discre	ete Inputs):	2000/1 channel	
Function Code 3(Read Holding	ng Registers):	125/1 channel	
Function Code 4(Read Input	Registers):	125/1 channel	
Function Code 15(Write Mul	tiple Coils):	440/1 channel	
Function Code 16(Write Mul	tiple Registers):	27/1 channel	
Function Code 23(Read/Writ	e Multiple Registers):	25+25/1 channel	

# **3.4 Interface Parameters**

Interface:	2 * RJ45,1 * RS485	
Network Port Baud Rate:	10/100Mbps, Adaptive and full duplex	
Network Protocol:	Modbus TCP, the default IP of the device is 192.168.0.15	
Serial Port Configuration (RS485) : Supports Modbus RTU/ASCII, the baud rate is		
2400~115200bps, and supports the parameter configuration of parity code and stop bit		
LED indicator:	6 LEDs PWR STAT RUN NET IRN IER	

# **3.5 Link Parameter**

Modbus TCP Client:	Max supports for connecting 6 Modbus TCP servers
Modbus TCP Server:	Max supports for 6 Modbus TCP clients connected
Modbus RTU Master:	Max supports for connecting 5 slave devices
Modbus RTU Slave:	Max supports for connecting 1 master device

# NOTICE

#### **DEVICE INOPERABLE**

•The maximum number of TCP connections is 6

Failure to follow the above instructions may result in abnormal device communication.

# 3.6 Electromagnetic Compatibility

Electrostatic Discharge Immunity:

Air discharge  $\pm 8kV$ ; contact discharge  $\pm 6kV$  (network port and power supply)

Electrical fast transient group pulse immunity:

±2kV, 5KHz/100KHz (system power port and network cable)

Surge immunity:

±2kV common mode/differential mode (system power port and network cable)



#### UNINTENDED EQUIPMENT OPERATION

Devices exceeding the above requirements may be damaged or malfunction.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

# **4 IO-Config Software**

# 4.1 IO-Config Configure software installation

ODOT Automation provides IO Config software for customers. Once receiving the software, customers just double click the software and select language English and click to confirm it, the default language is Chinese.

	Select Setup Language	
	Select the language to use during the installation:	
IO Config		
V1.0.1.6(Full	English	$\sim$
y with		
.NET4.0).exe		

Confirm the installation directory and click "Next" when the window pops out, select and create "Desktop logo", then click "next", click "install". Once installation is finished, then IO Config logo will be created on the desktop.

🔣 Setup - IO Config — 🗆 🗙	🗱 Setup - IO Config — 🗆 🗙
Select Destination Location Where should IO Config be installed?	Select Additional Tasks Which additional tasks should be performed?
Setup will install IO Config into the following folder.	Select the additional tasks you would like Setup to perform while installing IO Config, then click Next.
To continue, click Next. If you would like to select a different folder, click Browse.	Additional shortcuts:
DiProgram Files/pdot[[0] Browse	Create a desktop shortcut
At least 38.1 MB of free disk space is required.	
Next > Cancel	Next > Cancel
🔣 Setup - IO Config — 🗌 🗙	🔢 Setup - IO Config — 🗌 🗙
Ready to Install Setup is now ready to begin installing IO Config on your computer. Click Install to continue with the installation, or click Back if you want to review or change any settings. Additional abors: Create a desktop shortcut	Completing the IO Config on your computer. The application may be launched by selecting the installed solutions.           City. Finish to exit Setup.
<back cancel<="" instal="" th=""><th>Einsh</th></back>	Einsh

# 4.2 Software Interface

IO Config					- 0	×
File Tool Option Help						
📔 🐟 New Project 📄 🔚 Save All(Ctrl+S) 层 🔯	C Searcl	h Device 🚺 Device l	Jpdate 🚺 🦲			
Project 🔻 🕈	Module Ir	nformation Process D	ata Config Para	ms Address N	lap Installation Information	Ŧ
	Name	Project Value			Online Value	
Durantin - 0						
Properties • 4						
	Logs 200					о <del>т</del> ф
	*	DATE	TIME	SOURCE	MESSAGE	
	🔵 Info	2023-07-06	4:58:43 PM	Main	Load:GSD\DIST-IO-CONFIG-HSP-20230315.c	ml
	🔵 Info	2023-07-06	4:58:44 PM	Main	IO ConfigStarted! current version:1.0.1.6	
						▶

Menu: IO-Config software

Tool: Common user menu

Project Window: projects set down are showed.

Property Window: Current projects' main specific parameters are showed.

#### **Major Window:**

Basic Information: it could view module name, module number, hardware version, software version, module description, electrical current consumption and manufacturer name.

Process Data: it could be used for online monitoring of channel data.

Configured parameters: modifiable module parameters.

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

Installation Information: it could view module description, current consumption, module size, residual current, and product images.

Message Window: It could output the operation log of the current operation.

## 4.2.1 Menu

File

Menu	Sub-Menu	Description
Project	New project	Create new project
	Open project	Open saved project
	Save all	Save current project
	Save as	Save current project as new project
Exit		Exit Software

Tool	
Menu	Description
Search devices	Pop up a new window to search devices through network or serial
	communication
Upgrade	Pop up a new window to upgrade hardware for C3351and IO Module
hardware	

Options

Menu	Description	
Configuration	The displayed language and color and device described file path can be	
	modified	

Help

Menu	Description	
About	Company information and software version information can be checked.	
Help for	A new window pops up with an abnormal exit reminder. For Windows 7	
abnormal issue	Sp1/XP systems below, please install Microsoft patches.	

# 4.2.2 Tool

Menu general shortcut logo.

🛛 🐟 New Project 📄 🔚 Save All(Ctrl+S) 层 🎕 🔍 Search Device 🔛 Device Update 🚺 🌖

Logo	Name	Menu	Description
	New project	File-Project-New project	Create New project
	Open project	File-Project-Open project	Open saved project
8	Save all	File-Project-Save all	Save current project
Ы	Save as	File-Project-Save as	Save current project as new project
<u>(</u>	Config	Options - Configuration	Modify language, color, device described file.
	Search Device	Tool-search device	Pop-up new window and search device
	Upgrade hardware	Tool-hardware upgrade	Pop-up new window for module hardware upgrade
0	About	Help-about	Configuration software version can be checked.
	Help for abnormal issue	Help for abnormal issue	A new window pops up with an abnormal exit reminder. For Windows 7 Sp1/XP systems below, please install Microsoft patches.

# 4.2.3 Project Window

Display the currently created projects.

IO Config								- 🗆 X
File Tool Option	n Help ) Save All(Ctrl+S)	<u>≥</u>  ©	Search Devic	e 🕢	Device L	Ipdate 🚺	🚺 🔡 💽 Online	e 🕞 Upload Params 🕑 Download Params 💼 🦵
Project		L N	lodule Informat	tion Pr	ocess Da	ita Config Pa	rams Address Map In	nstallation Information 🗮
NewProject			Name		Project	t Value		Online Value
C3351-A00 Programmable IO(192.168.0.1)			Vame		C3351-	A00 Program	nable IO	
1:CT-3238(8AI 0~20ma Input)			Nodule ID		0x200C	3351		
2:CT-4154(4AQ =10~10/( Output)			/endor Name		Sichuar	Odot Autom	ation System Co.,Ltd.	
			Description		Program	nmable IO		
• 3:CI-4158(8AO - 10~ 10V Output)			Current Consum	-2500mA				
5:CT-4234(4AO 0~2)	0ma Output)							
Name	C3351-A00 Programm							
Module ID	0x200C3351	b	ogs					- ų
Description	Programmable IO	•	•	DATE		TIME	SOURCE	MESSAGE
Device version	V1.00		🔵 Info	2023-	07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
Module Number	9		🔵 Info	2023-	07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading
Interface	Ethernet 🔻		🔵 Info	2023-	07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
Device IP	192.168.0.15		🔵 Info	2023-	07-06	5:02:33 PN	C3351-A00 Program	Upload completed
СОМ	COM1 (通信端口 🔻		🕘 Info	2023-	07-06	5:02:34 PN	NewProject	Commboard C3351-A00 Programmable IO has been c
Refresh Period	200		(					

# 4.2.4 Property Window

Property window shows current specific parameter.

IO Adapters, PLC (Module name, module number, module description, device version, modules quantity, interface option, device IP address, serial port number, online refreshing period)

IO Config							- 🗆 X
File Tool Opt	ion Help						
🐟 New Project 📄	💾 Save All(Ctrl+S) 📑 🏫	🔾 Search Dev	rice 🔱	Device l	Jpdate 🚺	🚺 🔡 💽 Online	🛛 🖓 Upload Params 🔂 Download Params 🛍 🦵
Project	<b>▼</b> ‡	Module Inform	nation Pr	ocess Da	ata Config Pa	rams Address Map Ir	stallation Information
NewProject	A	Name		Projec	t Value		Online Value
C3351-A00 Progr	Name		C3351-	A00 Program	mable IO		
1-CT-2228/8AL 0-	Module ID		0x200C	3351			
2:CT-4154(4AO -	Vendor Name		Sichuar	n Odot Autom	ation System Co.,Ltd.		
TU2:C1-4154(4A0 -	Description		Program	mmable IO			
4 3.CT-4136(8AU -	Current Consu	-2500mA					
Properties	∼zoma Output) →						
Name	C3351-A00 Programm						
Module ID	0x200C3351	Logs concerned					· · · · · · · · · · · · · · · · · · ·
Description	Programmable IO		DATE		TIME	SOURCE	MESSAGE
Device version	V1.00	lnfo	2023-	07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
Module Number	9	🔵 Info	2023-	07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading
Interface	Ethernet 🔻	🔵 Info	2023-	07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
Device IP	192.168. 0 . 15	🔵 Info	2023-	07-06	5:02:33 PN	C3351-A00 Program	Upload completed
COM	COM1 (通信端口 🔻	🔵 Info	<b>20</b> 23-	07-06	5:02:34 PN	NewProject	Commboard C3351-A00 Programmable IO has been c
Refresh Period	200	4					

IO Module (module name, module number, module description, extended module numbers)

IO Config						>	<
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🐟 New Project 🥃 🖫	Save All(Ctrl+S)	Search Devic	e 🚺 Devi	ce Update 🚺	o i 📰 🏛 🗖		
Project	✓ 1	Module Informa	tion Proces	s Data Config Pa	rams Address Map Ir	Installation Information	Ŧ
NewProject	<u> </u>	Name	Pr	oject Value		Online Value	
C2251 400 Brogrammable 10(102 168 0 1)		Name	CT-	4158(8AO - 10~1	0V Output)		
CSSST-AUU Program	Module ID	0x2	0004158				
1:CT-3238(8AI 0~20	Description	8 A	nalog Output 0~	5Vdc -5~5Vdc 0~10	/dc		
2:CT-4154(4AO -10-	~10V Output)	Current Concur	untion 500	mA	5100, 5 5400, 0-10		
3:CT-4158(8AO -10-	~10V Output)	Current Consun	iption 500	ma			
4:CT-3238(8AI 0~20	Ima Input)						
5:CT-4234(4AO 0~2	0ma Output) 🚽						
4	•						
Properties	<b>~</b> ₽						
Name	CT-4158(8AO -10~10V O						_
Module ID	0x20004158	Logs	DATE	TINAT	COURCE	WERE ACT	#
Description	8 Analog Output ,0~5V		DATE		SOURCE	MESSAGE	
Submodule Number	0	Into	2023-07-0	0 0:02:33 PN	C1-4234(4AO U~20h		
		Info	2023-07-0	6 5:02:33 PN	CI-4234(4AO 0~20n	Start uploading	
		Info	2023-07-0	6 5:02:33 PN	CT-4234(4AO 0~20n	Upload completed	
		Info	2023-07-0	6 5:02:33 PN	C3351-A00 Program	Upload completed	
		🕘 Info	2023-07-0	6 5:02:34 PN	NewProject	Commboard C3351-A00 Programmable IO has been of	
		•				•	~

# 4.2.5 Major Window

Basic information: IO Adapter module, PLC and IO Module name, module number, hardware version, software version, module description, electrical consumption and manufacturer can be showed.

IO Config					- 🗆 X
File Tool Optio	n Help				
🐟 New Project 📄 🖁	Save All(Ctrl+S) 📰 🔯	🔾 Search Device 🚺	Device Update 🚺	0 🛯 🛤 💼 🗖 🗖	
Project		Module Information	Process Data Config Pa	rams Address Map Ins	tallation Information 🗧
NewProject		Name	Project Value		Online Value
C3351-400 Programmable IO(192 168 0 1)		Name	CT-4158(8AO -10~1	0V Output)	
	ma lanut)	Module ID	0x20004158		
10-ct-3238(8AL0~20	All Output	Description	8 Analog Output ,0~	5Vdc , -5~5Vdc , 0~10Vd	lc ,
2:C1-4154(4AO -10	~ IOV Output)	Current Consumption	500mA		
3:CT-4158(8AO -10	~10V Output)		1		
4:CT-3238(8AI 0~20	Oma Input)				
5:CT-4234(4AO 0~2	20ma Output) 🗸 🗸				
Descention	- 1				
Name	CT-4158(840 -10~10V 0				
Module ID	0x20004158	Logs			
Description	8 Analog Output ,0~5V	* DATI	TIME	SOURCE	MESSAGE
Submodule Number	0	Info 2023	-07-06 5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
		Info 2023	-07-06 5:02:33 PN	CT-4234(4AO 0~20n	Start uploading
		Info 2023	-07-06 5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
		Info 2023	-07-06 5:02:33 PN	C3351-A00 Program	Upload completed
		<b>Info</b> 2023	-07-06 5:02:34 PN	NewProject	Commboard C3351-A00 Programmable IO has been c
		•			

Process data: The channel information of IO Modules can be showed, which is used for online monitoring the channel data.

III 0 Config       -       -       ×         File       Tool       Option       Help         IVex       Project       IVex       IVex       IVex       IVex         Project       IVex       IVex       IVex       IVex       IVex       IVex         IVex       IVex       IVex       IVex       IVex       IVex       IVex       IVex         IVex	r										 -
File       Tool       Option       Help         Image: Seve All(Ctrl+S)       Image: Seve All(Seve All(S	IO Config									-	$\times$
Image: New Project       Image: Save All(Ctrl-s)	File Tool Optic	on Help									
Project       ▼ 1       Module Information       Process Data       Config Params       Address Map       Installation Information         NewProject       C3351-A00       Programmable IO(192.168.0.1       Installation       Installation       Info         C3351-A00       Programmable IO(192.168.0.1       Installation       Installation       Installation       Info         Walk       TYPE       ONLINE VALUE       Installation       Installation       Installation         Walk       TYPE       ONLINE VALUE       Installation       Installation       Installation         Walk       TYPE       ONLINE VALUE       PROJECT VALUE       Installation       Installation         Walk       TYPE       ONLINE VALUE       PROJECT VALUE       Installation       Installation         Walk       TYPE       ONLINE VALUE       PROJECT VALUE       Installation       Installation <td>🔍 😋 New Project 📄</td> <td>🖞 Save All(Ctrl+S) 📷 🔯</td> <th>📿 Search Dev</th> <td>ice 🚺 Device Up</td> <td>date 🚺</td> <td>🚺 🛛 🕄 🗍</td> <td>ê 🗖</td> <td>⊡⊘⊘</td> <td>Þ</td> <td></td> <td></td>	🔍 😋 New Project 📄	🖞 Save All(Ctrl+S) 📷 🔯	📿 Search Dev	ice 🚺 Device Up	date 🚺	🚺 🛛 🕄 🗍	ê 🗖	⊡⊘⊘	Þ		
NewProject       Io Input:         C C3351-A00 Programmable IO(192.168.0.1*       NAME       TYPE       ONLINE VALUE         MAME       TYPE       ONLINE VALUE       Image: Calculation of the state of the stat	Project	<b>4</b>	Module Inform	ation Process Data	Config Pa	rams Addre	ess Map Ir	nstallation Inform	ation		Ŧ
C3351-A00 Programmable IQ(192.168.0.1*       NAME       TYPE       ONLINE VALUE         I::CT-3238(8AI 0-20ma Input)       I::CT-3238(8AI 0-20ma Input)       I::CT-3238(8AI 0-20ma Input)       I::CT-3238(8AI 0-20ma Input)         I::SCT-4234(4AO 0-10V Output)       I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)         I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)         Properties       I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)       I::SCT-4234(4AO 0-20ma Output)         Name       CT-4158(8AO -10-10V O       I::SCT-4234(4AO 0-20ma Output, 0-5V-S)       I::SCT-	NewProject		IO Input:								
International input)       Image: CT-43238(8AI 0-20ma Input)         Image: CT-4158(8AO -10-10V Output)       NAME       TYPE       ONLINE VALUE       PROJECT VALUE         Image: CT-4158(8AO -20ma Input)       Analog Output Data(CH 0)       Integer16	C3351-A00 Program	NAME		TYPE		ONLINE V	ALUE				
IO Output:         IO Suppose         Inter-sessional or construction         Into 2023-07-06		0	<ul> <li>Analog</li> </ul>	Diagnostic Input D	at Unsig	ned8					
MAME       TYPE       ONLINE VALUE       PROJECT VALUE         Analog Output Data(CH 0)       Integer16            Analog Output Data(CH 1)       Integer16            Analog Output Data(CH 2)       Integer16            Analog Output Data(CH 2)       Integer16            Analog Output Data(CH 2)       Integer16            Analog Output Data(CH 3)       Integer16            Module ID       0x20004158       Output, 0-5V       DATE       TIME       SOURCE       MESSAGE         Description       8 Analog Output, 0-5V       Info       2023-07-06       5x0233 Pk       CT-3238(8AI 0-20m.       Start uploading         Info       2023-07-06       5x0233 Pk       CT-4234(4AO 0-20m.       Upload completed          Info       2023-07-06       5x0233 Pk       CT-4234(4AO 0-20m.       Upload completed          Info       2023-07-06       5x0233 Pk       CT-4234(4AO 0-20m.       Upload completed          Info       2023-07-06       5x0233 Pk       CT-4234(4AO 0-20m.       Upload completed </td <td>r∭1.01-3238(8AF0~2</td> <td>ona nputy</td> <th>IO Output:</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	r∭1.01-3238(8AF0~2	ona nputy	IO Output:								
Image: 13cT-4188(8AO -10-10V Output)       Analog Output Data(CH 0)       Integer16           Image: 15cT-4238(8AI 0-20ma Output)       Analog Output Data(CH 1)       Integer16           Analog Output Data(CH 2)       Integer16            Analog Output Data(CH 2)       Integer16            Analog Output Data(CH 3)       Integer16            Analog Output Data(CH 4)       Integer16            Module ID       0x20004158             Description       8 Analog Output ,0-5V       DATE       TIME       SOURCE       MESSAGE          Info       2023-07-06       5:02:33 Pk       CT-4238(8AI 0-20m.       Start uploading          Info       2023-07-06       5:02:33 Pk       CT-4234(4AO 0-20n.       Start uploading          Info       2023-07-06       5:02:33 Pk       CT-4234(4AO 0-20n.       Start uploading          Info       2023-07-06       5:02:33 Pk       CT-4234(4AO 0-20n.       Start uploading          Info       2023-07-06       5:02:33 Pk       CT-4234(4AO 0-20n. <td>P[]]2:C1-4154(4AO -10</td> <td>0~10V Output)</td> <th>NAME</th> <td></td> <td>TYPE</td> <td></td> <td>ONLINE V</td> <td>ALUE</td> <td>PROJECT VALUE</td> <td></td> <td></td>	P[]]2:C1-4154(4AO -10	0~10V Output)	NAME		TYPE		ONLINE V	ALUE	PROJECT VALUE		
Image: CT-3238(8A) 0~20ma Output)       Analog Output Data(CH 1)       Integer16            Properties       up       Analog Output Data(CH 2)       Integer16            Name       CT-4158(8A0 -10-10V 0)       Module ID       0x20004158             Description       8 Analog Output ,0-5V       Submodule Number       0       DATE       TIME       SOURCE       MESSAGE         Info       2023-07-06       5:02:33 Pk       CT-4238(8A1 0~20m.       Start uploading           Info       2023-07-06       5:02:33 Pk       CT-4234(4A0 0~20n.       Start uploading           Info       2023-07-06       5:02:33 Pk       CT-4234(4A0 0~20n.       Start uploading           Info       2023-07-06       5:02:33 Pk       CT-4234(4A0 0~20n.       Start uploading            Info       2023-07-06       5:02:33 Pk       CT-4234(4A0 0~20n.             Info       2023-07-06       5:02:33 Pk       CT-4234(4A0 0~20n.              Info       2023-07-	3:CT-4158(8AO -10	0~10V Output)	Analog	Output Data(CH 0)	Integ	er16					
Mane       CT-4138(8A0 - 10-100 V         Mane       CT-4158(8A0 - 10-100 V         Module ID       0x2004158         Description       8 Analog Output, 0-5V         Submodule Number       0         Info       2023-07-06       50233 PN         CT-3128(8A0 - 20m       Start uploading         Info       2023-07-06       50233 PN         CT-3128(8A0 - 20m       Start uploading         Info       2023-07-06       50233 PN         CT-3238(8A0 - 20m       Start uploading         Info       2023-07-06       50233 PN	4:CT-3238(8AI 0~2	0ma Input)	Analog	Output Data(CH 1)	Integ	er16					
Properties         Image         CT-4158(8AD -10-10V C)           Madule ID         0x20004158         Analog Output Data(CH 3)         Integer16	5:CT-4234(4AO 0~	20ma Output) 🚽	Analog	Output Data(CH 2)	Integ	er16					
Properties         V 0           Name         CT-4158(BAO -10-10V O           Module ID         0x20004158           Description         8 Analog Output ,0-5V           Submodule Number         0           Info         2023-07-06           5:0233 PN         CT-3238(BAI 0-20m.           Upload completed         Info           Info         2023-07-06           5:02:33 PN         CT-3238(BAI 0-20m.           Upload completed         Info           Info         2023-07-06           5:02:33 PN         CT-4234(4A0 0-20m.           Upload completed         Info           Info         2023-07-06           5:02:33 PN         CT-4234(4A0 0-20m.           Info         2023-07-06           5:02:33 PN         CT-4234(4A0 0-20m.           Upload completed         Info           Info         2023-07-06           5:02:33 PN         CT-4234(4A0 0-20m.           Upload completed         Info           Info         2023-07-06           5:02:33 PN         CT-4234(4A0 0-20m.           Info         2023-07-06           5:02:33 PN         CT-4234(4A0 0-20m.           Info         2023-07-06	•	•	Analog	Output Data(CH 3)	Integ	er16					
Name         CI-41s8(pA0-10-10V O         Index style	Properties	<b>▼ </b>	Analog	Output Data(CH 4)	Integ	er16					-
Module ID         0x2000 135         Cogs	Name	CI-4158(8AO -10~10V O	Logs	,,,							 - I
Description         a stratage output (x)-x-x-           Submodule Number         0           Info         2022-07-06           5:02:33 Pk         CT-3238(8AI 0-20m.           Start uploading         Info           0         Info           0         5:02:33 Pk           0         Submodule Number           0         Info           0         5:02:33 Pk           0         Info           0         5:02:33 Pk           0         Submodule Number           0         Info           0         2023-07-06           5:02:33 Pk         CT-4234(4A0 0-20n           0         Info           0         Submodule Number           0         Info           0         Submodule Number	Module ID	0x20004158	*	DATE	TIME	SOURCE		MESSAGE			 - · · · ·
Info         2023-07-06         5:02:33 PN         CT-3238(8A) 0-20m.         Upload completed           Info         2023-07-06         5:02:33 PN         CT-4234(4AO O-20m         Start uploading           Info         2023-07-06         5:02:33 PN         CT-4234(4AO O-20m         Upload completed           Info         2023-07-06         5:02:33 PN         CT-4234(4AO O-20m         Upload completed           Info         2023-07-06         5:02:33 PN         CT-4234(4AO O-20m         Upload completed           Info         2023-07-06         5:02:33 PN         CT-4234(4AO O-20m         Start uploading           Info         2023-07-06         5:02:33 PN         CT-4234(4AO O-20m         Start uploading	Submodule Number	0	Info	2023-07-06	5:02:33 PN	CT-3238(8)	Al 0~20m	Start uploading			
Info         2023-07-06         5:02:33 PL         CT-4234(4A0 0-20n         Start uploading           Info         2023-07-06         5:02:33 PL         CT-4234(4A0 0-20n         Upload completed           Info         2023-07-06         5:02:33 PL         CT-4234(4A0 0-20n         Upload completed           Info         2023-07-06         5:02:33 PL         CT-4234(4A0 0-20n         Start uploading			Info	2023-07-06	5:02:33 PN	CT-3238(8/	Al 0~20m	Upload comple	ted		
Info         2023-07-06         5:02:33 Pk         CT-4234(4A0 0-20n         Upload completed           Info         2023-07-06         5:02:33 Pk         CT-4234(4A0 0-20n         Start uploading           Info         2023-07-06         5:02:33 Pk         CT-4234(4A0 0-20n         Start uploading			Info	2023-07-06	5:02:33 PN	CT-4234(4	AO 0~20n	Start uploading			
Info 2023-07-06 5:02:33 PK CT-4234(4A0 0-20n Start uploading			Info	2023-07-06	5:02:33 PN	CT-4234(4)	AO 0~20n	Upload comple	ted		
			Info	2023-07-06	5:02:33 PN	CT-4234(4	AO 0~20n	Start uploading			
				2022 07 06	5.00.00 04	CT 4334/4	AO 0 20-				•

Configured parameter: The module parameter information can be showed and modified, such as IO adapter module, PLC and I/O modules

IO Config							_		×		
File Tool Optic	on Help										
🔤 😋 New Project 📄	🖁 Save All(Ctrl+S) 🗮 🔯	📿 Search Devic	e 🕖 Device U	Ipdate 🕕	0 🗄 🛍 🗖						
Project	• <b>p</b>	Module Informat	ion Process Da	ita Config Pa	arams Address Map Ir	nstallation Information			Ŧ		
NewProject	<b>A</b>	Module Config Parameters									
C3351-A00 Program	nmable IO(192.168.0.1!	Name	Param Va	lue							
1:CT-3238(8A) 0~2	0ma Input)	16Bit Data Form	at A_B	-							
2:CT-4154(4AO -10	~10V Output)	Range Mode	Standard	-							
3:CT-4158(8AO -10~10V Output)		Voltage Type(Cl	H 0) 0~10Vdc	-							
4:CT-3238(84) 0~2	Voltage Type(Cl	H 1) 0~10Vdc	-								
SICT-4224(4AO 0=20ma Output)		Voltage Type(Cl	H 2) 0~10Vdc	-							
		Voltage Type(Cl	H 3) 0~10Vdc	-							
Properties	·····	Voltage Type(Cl	H 4) 0~10Vdc	-							
Name	CT-4158(8AO -10~10V O								-		
Module ID	0x20004158	Logs							- џ		
Description	8 Analog Output ,0~5V	*	DATE	TIME	SOURCE	MESSAGE			-		
Submodule Number	0	Info	2023-07-06	5:02:33 PN	CT-3238(8AI 0~20m	Start uploading					
		Info	2023-07-06	5:02:33 PN	CT-3238(8AI 0~20m	Upload completed					
		Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading					
		🔵 Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed			- 11		
		Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading					
		1-f-	2022 07 06	5.00.00 DA	CT 4334/440 0 30-	11-1			▶		

Address sheet: The storage area of I/O Module input and output channel can be displayed.

😭 10 Carlig						- 0 ×
File Tool Option Help						
🖹 🐑 New Project 🔛 🔀 Save AU(Col+S) 🚼 🛞	🔾 Search Device 🕀 Device Update 🚺 🌢	0 🗖 🗑 🌄 🖸	⊙⊙₽			
Pojet * 8	Module Information: Process Data: Config Part	rama Address Map Install	ation Information			
NewProject	Name	Input BR(hoos)	Output BR(Docc)	Input Word(Looo)	Output Word(Acco)	
C3351-A00 Programmable IO(192.168.0.15)	<ul> <li>3# CT-&amp;158(840 -10-10V Output)</li> </ul>		1			
101 CT-1216040 0-20ma Input	Overlengisture					
HELECT-ATTACADO -10-30V Overage	Analog Output Data(CH 0)				0+00000004	
Albert and the state of the	Analog Output Data(CH 1)				0x80000025	
12	Analog Output Data(CH 2)				0.00000006	
MillerC1-3238(ski 0-23ma input)	Analog Output Date(CH 3)				040000057	
10 S.CT-4254(4AD 0-20Ha Output)	Analog Dutput Date(CH 4)				0-0000008	
SCT-4234(4AD 0-20HA Output)	Analog Output Data(CH 5)				040000009	
TCT-3236(5AV 0-20ma Input)	Analog Output Data(CH 6)				0-00000054	
BRCT-4234(4AD 0-20ma Output)	wareg output bate(CH /)				0.0000004	
HIDOT 42549440 0-20ma Output						
I I						

Installation information: The below information can be showed, such as IO Adapter modules, PLC, IO module including module description, current consumption, modules dimension, residual current and product picture.



## 4.2.6 Message Window

The timely operation information can be showed, such as new project, uploading, downloading, configured parameter modification, copy, paste and etc. all operation details.

IO Config							-		×
File Tool Option	n Help								
🐟 New Project 📄 🖀	Save All(Ctrl+S) 📷 🔯	🔍 Search Devie	e 🕖 Device U	pdate 🚺 (	🚺 🔡 💽 Online	🕐 Upload Params 🛃 D	ownload Parar	ms 💼	
Project		Module Informa	tion Process Da	ta Config Pa	rams Address Map Ir	stallation Information			₹
NewProject	<b>^</b>	C3351-A0	0 Programm	able IO					
😪 C3351-A00 Program	mable IO(192.168.0.1)	Description:Pr	ogrammable IO						
1:CT-3238(84) 0~20	ma (nput)	Current Outpo	ut:2500 mA						
2:CT-4154(4AO -10-	-10\/ Output)	Module Size:L	*W*H=115*52*7	5 (mm)					- 1
P 2:C1-4154(4AO - 10-	- Tov Output)	Total Residual	Current:1205 m	A					
3:CT-4158(8AO -10-	-10V Output)	Total Size:L*W	/*H=115*178*75	(mm)					
4:CT-3238(8AI 0~20	ma Input)	NAME AND ADDRESS	Tanad Manad Manad M	at 1995 yes					
5:CT-4234(4AO 0~2	0ma Output) 🚽 🚽								
4	• •								•
Properties	····· 🕈 🎝	Logs concentration		000000000000000000000000000000000000000	20010000000000000000000000000000000000				₹ ņ
Name	C3351-A00 Programm		DATE	TIME	SOURCE	MESSAGE			-
Module ID	0x200C3351	Info	2023-07-06	5:02:33 PN	CT-3238(8AI 0~20m	Start uploading			
Description	Programmable IO	Info	2023-07-06	5:02:33 PN	CT-3238(8AI 0~20m	Upload completed			
Device version	V1.00	Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading			
Module Number	9	Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed			
Interface	Ethernet 🔻	🔵 Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading			
Device IP	192.168. 0 . 15	Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed			
COM	COM1 (通信端口 🔹	Info	2023-07-06	5:02:33 PN	C3351-A00 Program	Upload completed			
Refresh Period	200 👻		0000 07 0C	5 00 0 1 00		a 1 100301 100.0			•••

Shortcut keys	Menu	Description
Ctrl + C	Project/PLC, IO Adapter	Copy project, PLC, IO Adapter and IO Module
	-Copy	
Ctrl + V	Project/PLC, IO Adapter	Paste project, PLC, IO Adapter and IO Module
	-Paste	
Delete	Project/PLC, IO Adapter	Delete project, PLC, IO Adapter and IO Module
	-Delete	
Ctrl + S	File-Project-Save all	Save configured project
Ctrl + M	PLC, IO Adapter-Output	Output project, PLC, IO Adapter and the address of
	address sheet	IO Module

# 4.2.7 Shortcut keys

# **4.3 Software Function**

## 4.3.1 Function

A. Module selection.

- B. Check the module configuration parameters and the data address of the module.
- C. Modify module configuration parameters.
- D. Online debugging module.
- E. Search for devices.
- F. Firmware upgrade

## **4.3.2 Communication Interface**

The PLC program upload and download of the C3351 device, the upload and download of the I/O module, the modification of the mounted I/O module parameters, the online test, and the firmware upgrade all use the Ethernet interface as the communication interface.

## 4.3.3 Module Selection

The customer could use the IO-Config software to select the I/O module offline, the main purpose is to determine whether the selected I/O module needs to add an additional power module. Of course, the user can also calculate whether to add a power module according to the internal bus power supply current of the adapter module and the power consumption of the I/O module itself. Export the corresponding files of adapter modules, PLC and I/O modules could be convenient for purchasing, drawing, etc.

Double-click the IO-Config shortcut icon to pop up the initial interface of the configuration software, and click the right button in the project directory bar  $\rightarrow$ 'Project'  $\rightarrow$  'New Project' or click the shortcut key of 'New Project' or the menu bar 'File'  $\rightarrow$  'Project'  $\rightarrow$  'New Project', then enter the project name manually, and create a new project.

IO Config						- 🗆 X
File Tool Opt	ion Help 🖺 Save All(Ctrl+S) 🗮 🎼	🔋 📿 Search De	vice 🕕 Device	Update 🚺	0	
Project	- <b>Q</b>	Module Inform	nation Process D w Project roject Name	ata Config Pa	vrams Address Map 1	stallation Information
Properties	······ 🕈 🕇	Logs			000000	
Upload Interface	Ethernet •		DATE	TIME	SOURCE	MESSAGE
COM	COM1 (通信端口 (C *	Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
Device IP	192.168. 0 . 15	Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Start uploading
		🔵 Info	2023-07-06	5:02:33 PN	CT-4234(4AO 0~20n	Upload completed
		🔵 Info	2023-07-06	5:02:33 PN	C3351-A00 Program	Upload completed
		🔵 Info	2023-07-06	5:02:34 PN	NewProject	Commboard C3351-A00 Programmable IO has been c
		🔵 Info	2023-07-06	5:14:23 PN	NewProject	Project NewProject deleted!
		🕒 Info				Offline!

III IO Config	_	$\times$
File Tool Option Help		
🛛 😋 New Project 😇 🔀 Save All(Ctrl+S) 📰 🕸 🔍 Search Device 🖶 Device Update 🚺 🌖		
Project Module Information Process Data Config Params Address Map Installation Information		Ŧ
Properties		 · • 4
Upload Interface Ethernet		-

Right-click the newly created project in the project directory bar  $\rightarrow$  'New Adapter'.

IO Config				-	×
File Tool Option He	elp				
🕴 🖏 New Project 📄 🛗 Save A	lll(Ctrl+S) 🔣 🔯 🔾 Search	i Device ⊍ Device Update 🛄			
Project	👻 🕴 Module In	formation Process Data Config Params Address Map I	nstallation Information		=
NewProject	Nigma .	Project Value	Online Value		
<b>NewFloject</b>	👪 New Adapter				
	🗎 Delete Project				
	Upload Modules				
	🔽 Rename				

Select 'C3351 Programmable I/O' in the pop-up interface, select 'Ethernet' for the interface, and click 'OK'.

New Adapter			×
Project Name			
NewProject			
Name			
CN-8033 Ether	CAT		<b></b>
CN-8033-P Eth	erCAT		
CN-8034 Ether	Net/IP		_
CP-9131 Progra	ammable IO		
CT-5331(CANo	pen Master)		
C3351 Program	mable IO		<b>-</b>
Description			
Programma	ole IO		
Communication Setti	ng		
Interface	Ethernet 🔻		
СОМ	<b>COM1</b> (通信端 [ ▼		
Device IP	192.168. 1 .100		
		ок	Cancel

Right-click the 'C3351 Programmable I/O' device generated in the project bar, and

IO Config										-		×
File Tool Option	Help											
🔍 New Project 🥃 🔀 Sa	ave All(Ct	trl+S) 式 😥	C Searc	h Device 🔱	Device Update		D 🛛 🔡 💽 d	Online 🝙	Upload Params  Downi	oad Para	ms 💼	
Project		<b>- - -</b>	Module I	nformation Pr	rocess Data Co	onfig Par	ams Address Ma	ap Installati	ion Information			=
NewProject			Name		Project Value				Online Value			
- NewProject			Name		C3351 Progra	mmable	10					
C3351 Programmal	ble 🔣	Module Mana	ager		0v200C3351							
	•	Online	-	ľ	0.20003331							
				lame	Sichuan Odot	Automa	ation System Co.,	Ltd.				
	(f)	Upload Paran	15	on	Programmable IO							
	🕑 Download Par		rams	onsumption	-2500mA							
	ŵ	Delete										
4		Rename										
Properties		C(Ch-1+C)										
Name	225	Copy(Ctrl+C)										
Madula ID 0	200	Paste(Ctrl+V)										<b>–</b> n
Description 00		Up		DATE	TIM	F	SOURCE	MESS	SAGE			
Device version V		Down		2023-	07-14 10:0	- 4:45 A	Main					
Module Number 0		5		2023-	07-14 10:0	4:45 A	Main			:1.0.1.6		
Interface Et	ther 🗈	Export Map		2023-	07-14 10:0	5:40 A	NewProject	Comr	nboard C3351 Programmat	sle IO ha		eated
Device IP 19	2.1	Export docun	nent				,					
сом с	<b>OM1</b> (通	信端口 🔻										
Refresh Period 20	00											

click 'Module Manager'.

In the pop-up dialog box, please select the I/O module required by the user, and double-click the I/O module or select the module and click the two-way right arrow



The power consumption of the selected I/O module will be displayed in the lower left corner. After configuration to the rear side, the total remaining current will be displayed on the lower right side. When the current is exhausted, the font will be displayed in red. At this time, a power module needs to be added.



In this example, it is indicated that the power module should be inserted into slot 11. After the power module is added, the total remaining current displayed on the lower side of the selected module will change to a black font, and other I/O modules can be added behind it.



When actually installing the module, it needs to add a power module (CT-7220) to slot 11. The CT-7220 power module does not require configuration and does not occupy any slot. So, it is grayed out in the screenshot.

# **A** WARNING

#### ABNORMAL WORKING STATUS OF THE MODULE

•In the configuration software, there is a configuration function to calculate the power consumption value and prompt the customer whether to add a power module.

·Insufficient current will cause the module channel to operate abnormally.

•The power module does not require configuration and does not occupy a slot. Just add it to the corresponding slot as needed.

Failure to follow the instructions may result in serious consequences such as personal injury or death or equipment damage.

Continue to configure I/O modules for the C3351 device. When the number of modules exceeds 32, and the following window will pop up. It prompts that the C3351 device only supports slots 1-32. If the customer needs to use more I/O modules, and the customer can add another C3351 device or Modbus adapter to add a new station.



After the I/O module is added, it could click the OK button to automatically generate the I/O module in the project bar.

On the installation information interface on the right, it can see that the 'output current' of the C3351 device is 2500mA, and the current 'remaining total current' is 1900mA after adding the module.



It could click a single I/O module icon to pop up the hardware information of the corresponding module.

IO Config		-	×
File Tool Option Help			
📗 🔩 New Project 📄 🔚 Save All(Ctrl+S) 📷 🔯 🔾	🔪 Search Device 🕕 Device Update 🚺 🕕 🔡 🛗 🧊 🖵 💽 🕑 🗈		
Project 👻 🖡 M	Iodule Information Process Data Config Params Address Map Installation Information		Ŧ
A NewProject	CT-121F (16DI 24Vdc)Sink		
🖌 隆 C3351 Programmable IO(192.168.1.100)	Description:16 Digital Input ,DC 24V,Sink Type		
1:CT-121F (16DI 24Vdc)Sink	Current Consumption:60 mA		
2:CT-121F (16DI 24Vdc)Sink	Module Size:L*W*H=115*14*/5 (mm)		
3:CT-121F (16DI 24Vdc)Sink			
4:CT-121F (16DI 24Vdc)Sink	58 58		
5:CT-121F (16DI 24Vdc)Sink			

## **4.3.4 View Configuration Parameters**

For C3351 devices and different I/O modules, it could click Configuration Parameters to view the default configuration parameters of the modules.

# NOTICE

#### **DEVICE INOPERABLE**

·It can only communicate with the IO-Config software in the PC through the Ethernet interface and view the parameters.

Failure to follow the above instructions could result in damage to the equipment.

## **C3351**

#### Default parameter interface.

🚻 IO Config								-		$\times$
File Tool Optio	n Help									
🐟 New Project 📄	Save All(Ctrl+S)	🔍 Search Devi	ce 🚺 Device	Update 🚺	0   👪	•	Online 🕞 Upload Params ⊍ Downl	oad Par	ams 💼	
Project	• <b>p</b>	Module Inform	ation Process E	ata Config F	arams Addre	ess N	lap Installation Information			Ŧ
<b>A</b> NewProject	<b>^</b>	Adaptor Config	Parameters							<b>^</b>
🖌 😪 C3351 Programma	able IO(192.168.1.100)	Name		Param Valu	e					
1:CT-121F (16D) 2	24Vdc)Sink	Source of Con	figuration Data	Configuratio	on Software	*				
2:CT-121F (16D) 2	24Vdc)Sink	Fault Action fo	r Input	Hold Last In	put Value	•				
3:CT-121F (16D) 2	24Vdc)Sink	Fault Action fo	r Output	Hold Last O	utput Value	•				
4:CT-121F (16D) 2	24Vdc)Sink	FieldBus Config	Parameters							
5:CT-121F (16D) 2	24Vdc)Sink	Name	Param Value							
4	•	MAC Address	00:00:00:	00 : 00 : 00						_
Properties	····· 🕈 🗸	IP Address	0.0.0.	0						
Name	C3351 Programmable 🚔	NUL MALL	0 0 0	^						-
Module ID	0x200C3351	Logs ::::::::::::::::::::::::::::::::::::	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			000000				• <b>• </b>

## I/O Module

Taking the 16DI module (CT-121F) as an example, the default parameter interface is as follows, and the configuration parameters of other I/O modules are checked in the same way. And the module default parameter will not be explained one by one.

IO Config							-		×
File Tool Optio	n Help								
🔍 New Project 🧰 🗜	Save All(Ctrl+S) 📻 🙆	C Search Devi	ice Ų De	vice Update 🚺	0 🖩 🛍 🗖				
Project	<b>~</b> ‡	Module Inform	ation Proce	ess Data Config Pa	rams Address Map In	stallation Information			Ŧ
NewProject	<u>^</u>	Module Config							
C3351 Programm	able IO(192 168 1 100)	Name		Param Value					
	24//dc/Sink	Input Filtering	Time(ms)	10					
	24VUC/Sink	Input Holding	Time(ms)	Disable	•				
2:CI-121F (16DI	24vac)Sink								
3:CT-121F (16DI	24Vdc)Sink								
4:CT-121F (16DI	24Vdc)Sink								
5:CT-121F (16DI	24Vdc)Sink 🚽								
4	•								
Properties	<b>- 1</b>								
Name	CT-121F (16DI 24Vdc)Sinl								
Module ID	0x2000121F	Logs concentration	00000000000000000	**********************					÷џ
Description	16 Digital Input ,DC 24V	*	DATE	TIME	SOURCE	MESSAGE			
Submodule Number	0	lnfo	2023-07-	14 10:05:40 A	NewProject	Commboard C3351 Program	mable IO ha	s been cr	eate
		Info	2023-07-	14 10:10:02 A	C3351 Programmabl	Module Manager			
		🔵 Info	2023-07-	14 10:10:44 A	C3351 Programmabl	Module Manager			- 1
		🔵 Info	2023-07-	14 10:11:24 A	C3351 Programmabl	Module Manager			
		🕘 Info	2023-07-	14 10:12:22 A	C3351 Programmabl				
		•							• <sup>•</sup>

# **4.3.5 Modify Configuration Parameters**

The configuration parameters of C3351 and I/O module can be modified in the IO-Config software. After the modification of the I/O module parameters is completed, it needs to right-click the adapter module  $\rightarrow$  download configuration. C3351 must use IO-Config software to modify parameters.

# NOTICE

#### **DEVICE INOPERABLE**

·For the time being, C3351 can only modify parameters through the Ethernet interface.

Failure to follow the above instructions could result in damage to the equipment.

Take C3351 PLC and CT-222F, CT-1228, CT-2718 and other modules as examples to demonstrate module parameter configuration.

C3351 uses the Ethernet configuration interface, and uploads the device according to the steps in the figure below.

IO Config											—		×
File Tool	Option	Help		1			- 1						
🐘 穴 New Project	📄  🖀 Sa	ave All(Ctrl+S) 📑 🔯	🔍 Searc	ch Device	Device Upd	ate 🚺	0   👪   🛍	JC	7,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Project		🗸 🗸	Module I	Information	Process Data	Config Pa	rams Address	Map	Installation Info	rmation			₹
A NewProject			Module	Config Param	eters		1						
Search								3	5		-		×
Network Card:	以太网:Rea	altek PCIe GbE Family C	Controller	192.168.0.88	<b>-</b> 2		Searc	ı	Upload	Update	Ca	incel	
Device								Me	essage				
Alia	5	Device Type	e	Device ID	Hardware	Version	Software V		2023-07-14 10:	15:31 584 192.1	68.0.88		
C3351-A00 Prog			mable IO				V1.00		2023-07-14 10:	15:31 584 Exec	uting		
					4				2023-07-14 10:	15:33 085 No d	evice was f	ound	

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

IO Config						- 0	×
File Tool Opti	on Help 🌄 Save All(Ctrl+S) 📑 🎼	🔾 Search Devi	ice 🕕 Device U	pdate 🕕	0		
Project	<b>~</b> ₽	Module Inform	ation Process Da	ta Config Pa	rams Address Map Ir	nstallation Information	Ŧ
🗥 NewProject							
🗸 😪 C3351-A00 Prog	rammable IO(192.168.0.15						
1:CT-222F(16DC	),24Vdc,Source-TTL)						
2:CT-1228(8DI 2	4Vdc Source)						
3:CT-2718(8DO	Relay Output)						
		1					
•	•						
Properties	····· 🕈 🗘						
Upload Interface	Ethernet 🔹						
COM	COM1 (通信端口 (C 🔹	Logs	DATE	TINAT	COURCE	hereare	
Device IP	192.168. 0 . 15	- Info	2023-07-14	10:23:18 A	CT-2718/8DO Relavi	Unload completed	
		Info	2023-07-14	10:23:18 A	C3351-A00 Program	Upload completed	
			2023-07-14	10:23:18 A	NewProject		een c
		Info	2023-07-14	10:23:23 A	NewProject	Project NewProject deleted!	
		🛑 Info	2023-07-14	10:23:23 A	C3351 Programmabl	Offine!	
		<					•

#### Then modify the parameters of the module.

IO Config							- 0	$\times$
File Tool Optic	on Help							
🔍 New Project 🥃	🖥 Save All(Ctrl+S) 📷 🔯	C Search Devi	ice Ų D	evice Upd	ate 🚺	0 🗄 📰 🗖		
Project	<b>- 1</b>	Module Inform	ation Pro	cess Data	Config Pa	rams Address Map In	nstallation Information	Ŧ
NewProject		Module Config						
4 A C22E1 A00 Broad	rammable 10/102 169 0 16	Name		Param \	/alue			
AUD FIOG	Tammable 10(192.100.0.1.	Input Filtering	Time(ms)	10				
1:CT-222F(16DO	0,24Vdc,Source-TTL)	Input Holding	Time(mc)	Disable		•		
2:CT-1228(8DI 2	4Vdc Source)	Input Holding	inite(ina)	Disable				
3:CT-2718(8DO	Relay Output)							
4	•							
Properties	<b>ņ</b>							
Name	CT-1228(8DI 24Vdc Sourc							
Module ID	0x20001228	Logs concentration	000000000000000000000000000000000000000				1	× ņ
Description	8 Digital Input ,DC 24V,	1	DATE	Т	IME	SOURCE	MESSAGE	<b></b>
Submodule Number	0	Info	2023-07	7-14 1	0:23:18 A	CT-2718(8DO Relay I	Upload completed	
		Info	2023-07	7-14 1	0:23:18 A	C3351-A00 Program	Upload completed	
			2023-07	/-14 1	0:23:18 A	NewProject	Commboard C3351-A00 Programmable IO has be	en c
			2023-07	/-14 1	0:23:23 A	NewProject	Project NewProject deleted!	
		into into	2023-07	/-14 1	0:23:23 A	C3351 Programmabl	CARDON CONTRACTOR	-
L								<u> </u>
File Tool Optic	on Help 🖺 Save All(Ctrl+S) 📻 🏠	Search Dev Module Inform	ice 🕖 D ation Prod	evice Upd	ate	🚺 🔡 💼 🏹 rams Address Map II	Image: Image	Ŧ
		Module Config	Paramete	rs				
		Name		Param \	/alue			
a CSSST-AUU Progr	rammable IO(192.166.0.1:	Input Filtering	Time(ms)	10				_
1:CT-222F(16DO	0,24Vdc,Source-TTL)	Input Holding	Time(mc)	200ms		•		
2:CT-1228(8DI 2	4Vdc Source)	Input noiding	nine(ins)	2001115				
3:CT-2718(8DO	Relay Output)							
4	•							
Properties	<b>1</b>							
Name	CT-1228(8DI 24Vdc Sourc							
Module ID	0x20001228	Logs	DATE		IME	SOURCE	MESSAGE	• <b>q</b>
Description Submodule Number	8 Digital Input ,DC 24V,		2023-07	י 7-14 1	0:23:18 4	CT-2718(8DO Relavi	Upload completed	_
Submodule Number	v		2023-07	7-14 1	0:23:18 4	C3351-A00 Program		
			2023-07	7-14 1	0:23:18 A	NewProject		
		Info	2023-07	7-14 1	0:23:23 A	NewProject	Project NewProject deleted!	
		🕒 Info	2023-07	7-14 1	0:23:23 A	C3351 Programmabl	Offline	
		4						× -
		1						P

After the setting is complete, right click on the C3351 device in the project directory bar  $\rightarrow$  'Download Params'. It can realize the modification of configuration parameters of C3351 equipment and I/O modules.

File Tool Option Help   File Tool Option Help   File Tool Option Help   File Tool Option File   File Tool Tool File   File Tool Tool   File Tool <td< th=""><th>IN Config</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>	IN Config								
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New Project       Image: Search Device       Image: S	File Tool Option	h Help	p						
Project <ul> <li>Module Information Process Data Config Params</li> <li>Addptor Config Parameters</li> </ul> NewProject <ul> <li>Adaptor Config Parameters</li> <li>C3351-A00 Programmat</li> <li>Module Manager</li> <li>Online</li> <li>Online&lt;</li></ul>	🐟 New Project 📄 🖺	Save All(	(Ctrl+S) 式 🏫	📿 Sea	rch Dev	ice  Device	Update 🚺	🕕 🛛 👪 💽 Onlir	ne 🝙 Upload Params 🕑 Download Params 🛍 厚
NewProject       Adaptor Config Parameters         Name       Param Value         Online       Online         Online       Online         Output       Hold Last Input Value         Description       Progenties         Description       Progenties         Description       Progenties         Output       Param Value         Date       Param Value         Description       Progenties         Output       Param Value         Description       Progenties         Output       Down         Date       Time       Source         Module ID       Output       Output         Description       Progenties       Output         Output       Source       Message         Output       Down       Config Parameters         Description       Progenties       Progenties       Param Value         Output       Param Value       Message         Description       Progenties       Progenties       Param Value         Description       Progenties       Progenties       Progenties         Output       Param Value       Param Value       Param Value         Descri	Project		<b>4</b>	Module	Inform	ation Process [	Data Config Pa	arams Address Map	Installation Information
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Image: Sector Action of the sector of the	C3351-A00 Program	mał		Nam	9		Param Value		
Image: Section 24Vdc Sectio			Module Mana	ger	of Con	figuration Data	Configuration	n Software 🔻	
Image: Sector 1228(8DI 24Vdc So       Upload Params       Image: Sector 10 model         Image: Sector 1278(8DO Relay O       Image: Sector 10 model       Image: Sector 10 model         Image: Sector 1278(8DO Relay O       Image: Sector 10 model       Image: Sector 10 model         Image: Sector 1278(8DO Relay O       Image: Sector 10 model       Image: Sector 10 model         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O       Image: Sector 1278(8DO Relay O         Image: Sector 1278(8DO Relay O	MIT:CT-222F(16D0,24	vac,s	Online		rtion fo	- Input	Hold Last Inc	ut Value 🔻	
Iden bio Guput       Produ Last Output       Produ Last Output       Produ Last Output         Iden bio Guput       Produ Last Output       Produ Last Output       Produ Last Output         Image: Config Parameters       Image: Config Parameters       Param Value       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Param Value       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Param Value       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Param Value       Image: Config Parameters       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Parameters         Image: Config Parameters       Image: Config Parameters       Image: Config Parameters       Image: Config Param	2:CT-1228(8DI 24Vd	ic So	Upload Param	5			Used Last Ou	taut)(elus =	
Image: Config Parameters       Image: Config P	3:CT-2718(8DO Rela	ay Ot	D 1 10		ction to	or Output	Hold Last Ou	tput value 🔹	
Image: Delete         Param Value           Image: Delete         Param Value           Image: Delete         Image: Delete           Im		Download I			Confi	g Parameters			
Image: Constraint of the second sec		Ŵ	Delete			Param Value			
Properties         IE         Copy(Ctrl+C)         ess         192.168.0.15           Name         C33         IP Paste(Ctrl+V)         Image: sec accession         Image: sec a	•		Rename		ddress	AC : 1D : DF :	83 : 00 : A8		
Name         C33         IP Paste(Ctrl+V)           Module ID         0x2         IP Paste(Ctrl+V)           Description         Prop         O           Device version         V1.0         ODown           Oddue Number         3	Properties		Copy(Ctrl+C)		ess	192.168.0.	15		
Module ID         0x2         Obscient (V)         VI           Description         Pro         Up         DATE         TIME         SOURCE         MESSAGE         A           Device version         V1.0         Down         2023-07-14         10.23:18 A         CT-2718(8DO Relay)         Upload completed           Module Number         3         2023-07-14         10.23:18 A         CT-2718(8DO Relay)         Upload completed	Name	C33	Pasto(Ctrl+V)			nee nee nee	^		
Description         Pro         O Up         DATE         TIME         SOURCE         MESSAGE         4           Device version         V1.0         Down         2 2023-07-14         10:23:18 A CT-2718(8DO Relay)         Upload completed         4           Module Number         3         2 2023-07.14         10:23:18 A CT-2718(8DO Relay)         Upload completed         4	Module ID	0x2	ruste(ettrivy)						· · · · · · · · · · · · · · · · · · ·
Device version         V1.1         O         Down         2023-07-14         10:23:18 A         CT-2718(8DO Relay+         Upload completed           Module Number         3         2022 07.14         10:23:18 A         CT-2718(8DO Relay+         Upload completed	Description	Prog	Up			DATE	TIME	SOURCE	MESSAGE
Module Number 3 2022.07.14 10:22:18 A C2251 A00 Brogram Upload completed	Device version	V1.0 🕑	Down		þ	2023-07-14	10:23:18 A	CT-2718(8DO Relay	Upload completed
Export Map	Module Number	3	Export Map		o	2023-07-14	10:23:18 A	C3351-A00 Program	Upload completed
Interface Eth 2023-07-14 10:23:18 A NewProject Commboard C3351-A00 Programmable IO has been c	Interface	Eth	Evport docurr	+	o	2023-07-14	10:23:18 A	NewProject	Commboard C3351-A00 Programmable IO has been c
Device IP 192 LXport Goddment 2023-07-14 10:23:23 A NewProject Project NewProject deleted!	Device IP	192.	Export docum	2111	b	2023-07-14	10:23:23 A	NewProject	Project NewProject deleted!
COM COM1 (通信端口 Y 2023-07-14 10:23:23 A C3351 Programmabl Citilical	COM	COM1 (	通信端口 🔻	🕒 In					I Offline!
Refresh Period 200	Refresh Period	200	-						*

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

IO Config			- 🗆 🗙
File Tool Opt	Select project file	×	
Rew Project Project	← → ∨ ↑ 🕒 > Desktop > devXml > V C Search devXml ,	D	🕑 Download Params 💼 🕞 🖡
NewProject	Organize  Vew folder	2	<u>^</u>
C3351-A00 Progr	A Home Name		
1:CT-222F(16DO	OneDrive     TCP		
2:CT-1228(8DI 2	Desktop		
3:CT-2718(8DO	U Downloads		
	🔤 Documents 🖈		
	🔀 Pictures 🖈		
•	🕖 Music 🖈		
Properties	🛂 Videos 🖈 🖡		
Name	🔁 C3351说明书 🖈		
Module ID			••••• <b>‡</b>
Description			A
Device version		_	
Module Number	File name: NewProject.apj	~	
Interface	Save as type: apj(*.apj)	~	A00 Programmable IO has been c
Device IP			leleted!
СОМ	Hide Folders     Save     Cancel		
Refresh Period	200 🗸		• • •

## **4.3.6 Online Debugging**

Refer to chapter <u>4.3.5 Modify Configuration Parameters</u>, please search device and upload the project, then right click C3351 device and select Online. The real-time data of I/O modules can be monitored on the "Process Data" interface of the main window.

Example: The CT-1228 module in slot 2, as shown in the figure below, it can view the real-time changes of IO points.

IO Config						-	×
File Tool O	ption Help						
🔍 🐟 New Project 🧮	) 🖁 Save All(Ctrl+S) 📰 🔯	🔍 Search Device  Device Upda	te 🚺 🕕 🛙	i 🗗			
Project	• <b>q</b>	Module Information Process Data	Config Params Ad	Idress Map Installation Inform	ation		Ŧ
NewProject		IO Input:					<b>a</b>
Online 1 2251	1 A00 Programmable IO(103	NAME	TYPE	ONLINE VALUE			
	-AOU Frogrammable IO(132.	<ul> <li>Digital Input Data(CH 0-7)</li> </ul>	Unsigned8	0x00			
P 1:C1-222F(16L	DO,24Vdc,Source-TTL)	Digital Input Data(CH 0)	Bit	0			
2:CT-1228(8D	I 24Vdc Source)	Digital Input Data(CH 1)	Bit	0			
3:CT-2718(8D	O Relay Output)	Digital Input Data(CH 2)	Bit	0			
		Digital Input Data(CH 3)	Bit	0			
4		Digital Input Data(CH 4)	Bit	0			
Properties	- 1	Digital Input Data(CH 5)	Bit	0			
Name	CT-1228(8DI 24Vdc Sourc	Digital Input Data(CH 6)	Bit	0			-
Module ID	0x20001228	Logs					• <b>4</b>

Note: For digital input modules, it could right-click the module and manually add a 'counting sub-module'. After the addition is complete, the configuration must be downloaded again.

# 4.3.7 Device Firmware Upgrade

Open the IO-Config configuration software and follow the steps in the figure below

001010.							
IO Config						- 🗆	×
File Tool Option Help	1						
🔍 New Project 📄 🖺 Save All(Ctrl+S)	🔜 🏫 🔾 Search Device ↓	Device Update 🚺	0 🖪 🗗				
Project	👓 🔻 🖡 Module Information	Process Data Config P	arams Address	Map Installation Inf	formation		Ŧ
NewProject	IO Input:						
	NAME	TVDE	~			-	
Search			3		5	- 0	×
Network Card: 以太网:Realtek PCIe Gb	E Family Controller 192.168.0.88	3 - 2	Search	Upload	Update	Cancel	
Device				Message			
Alias De	vice Type Device ID	Hardware Version	Software Ve	2023-07-14 1	0:29:48 678 192.16	8.0.88	
C3351-A00 Programmable IO C3351-A00	I V1.00-В	V1.00	2023-07-14 10:29:48 678 Executing				
			2023-07-14 10:29:49 180 Search completed, found 1 d				

In the pop-up interface, it needs to set the upgrade file, and select the interface to set 'Ethernet', then 'Read Info', and selects the device to be upgraded, and sets 'Automatic Skip (to APP) ', then click 'Start ' and wait for the upgrade to complete.

				Device Info	,										
			<u> </u>	Slot Num	Name	Module ID	Hardware Num	Hardware Version	Software Version	Software Date	IAP Version	IAP Date	MAC	Update	
Firmware:			• 🖃												1
Interface	Ethernet 4		•	01	CT-222F(16DO,24Vdc,Source	e-TTL) 0x2000222F	LDBLD202303V600-T222F	V6.00	T3.02	2023/05/08	V1.00	2023.06.08	Null		
COM	COM7 (通信端口 (COM1))		•	02	CT-1228(8DI 24Vdc Sour	ce) 0x20001228	LDBLD202207V200-T1228	V2.00	V2.04	2023/04/13	V3.00	2022.05.04	Null		
Device IP	192 168 0 15			03	CT-2718(8DO Relay Outp	out) 0x20002718	LDBLD202205V220-T2718	V2.20	V2.02	2023/04/11	V3.00	2022.05.04	Null		
Automatic skip(t															
Read Info	Export Info Start	Stop Run APP	Advanced												
6	8														
					Select Updated File					×					
						· Declara · decl	(m)	Canada das Van							
					e	/ Desktop / Dev	um ~ ()	Search devinin		<i>p</i>					
					Organize 👻 New folder				≣ • □	0					
					<ul> <li>OneDrive</li> </ul>	Name			<u>^</u>						
						TCP									
					Desktop #	C3351-(HW1.0	0-B)-APP-V1.00-20230713.	ofd		_					
					Uownioads #	C3351-400-V1	.00-20230625-01.ofd	ora 2							
					Ricturer #	C3351-A00-V1	.00-20230626-01.ofd								
					Music #	C3351-APP-V	1.00-20230613.ofd								
					Videos 📌	() C3351-APP-V	1.00-20230704.ofd								
					C3351说明书 ≠										
					= 中文										
					<u>二 共享</u>										
					💼 新的测试										
					<b>1</b> 3										
						-									
					File nan	me: C3351-(HW1.0	D-B)-APP-V1.00-20230714.4	✓ ofd(*.ofd)	_	<u>~</u>					
								Open	Cancel						
								3							

The above is the firmware upgrade process. Similarly, it can use this method to upgrade the equipped I/O module.

# 4.3.8 Data Export

# **Export Address Table**

After the project is established, pls right-click on 'C3351 Device' and select 'Export Map'.

IO Config								-		>
File Tool Opt	ion Help 🖺 Save All(Ctrl+S) 🗮 🛙	<u>≥</u>  Q	Search Device  I	Device Update	D   🕕   🖿	🛛 💽 Online 🦳 Up	oload Params 🕑 Down	nload Par	rams 🛍	i   C.
Project 🝷 🕴 Module Information Process Data Config Params Address Map Installation Information 📿										
A 🗥 New Project			Name			Input Bit(1xxxx)	Output Bit(0xxxx)	)	Input Wo	ord(
1 C 12 C 22 E 15 DO 24 Vd Source-TTL)										
C2551-X00 Plogrammable IO(122-IN     R     Mc     M1:CT-222F(16D0,24Vdc,Source-TLL)     M1:CT-2228(8DI 24Vdc Source)     M1:CT-2718(8DO Relay Output)     Do     D     D			Nodule Manager	(CH O)						
			Online	(CH 1)			0×00000001			
			Upload Params (CH				0x0000002	0x00000002		
			pioau rarams	(CH 3)			0×00000002			
			Download Params	(CH 4)			0×00000003			
			Delete	(CH 5)			0,00000004			
			Rename				0.00000005			
operties		E (	onv(Ctrl+C)							
Name	C3351-A00 Programma		Contraction (Contraction)				Expor	rt Map		
Module ID	0x200C3351		'aste(Ctrl+V)							
Description	Programmable IO	ા	dr	TE	TIME	SOURCE	MESSAGE			
Device version	V1.00	⊙ (	Down	23-07-14	10:48:19 A	CT-1228(8DI 24Vdc 5	Start uploading			
Module Number	3	🗈 (	xport Map	23-07-14	10:48:19 A	CT-1228(8DI 24Vdc 5	Upload completed			
Interface	Ethernet		vport document	23-07-14	10:48:19 A	CT-2718(8DO Relay	Start uploading			
Device IP	192.168.0.15	<u> </u>	xport document	23-07-14	10:48:19 A	CT-2718(8DO Relay I	Upload completed			
СОМ	COM1 (通信端口 (COM	1)) 🔻	🔵 Info	2023-07-14	10:48:19 A	C3351-A00 Program	Upload completed			
Refresh Period	200		-			MaurDaniant		n n		-

In the pop-up window, it could select the file format, output Folder

Path, and File Name, and then click OK.

IO Config						_	
File Tool (	Option He   🔀 Save All	lp I(Ctrl+S)   📻   🏠   🤇	Search Device  Device Update	🖸 🕕 🎚 腸 <u>  💽</u> Online 🕼	D Upload	Params 🕑 Download i	Params 💼 🌄 1
Project			Adule Information Process Da	ta Config Params Address Ma	ap Installa	tion Information	
A 😤 NewProject	t		Name	Input Bit(1xxx	x)	Output Bit(0xxxx)	Input Word(3
4 😪 C3351-A	.00 Programm	able IO(192.168.0.1	5) 1# CT-222F(16DO,24Vdc,So	ource-TTL)			<u>^</u>
1:CT-22	22F(16DO,24Vd	Config	Digital Output Data/CU 0)	-		× 00000	
2:CT-12	228(8DI 24Vdc 5	Format Config				00002	
3:CT-27	718(8DO Relay	🖌 .txt file	✓ View .txt file .xl	s file View .xls f	file	00003	
		Path Config				00004	
		Folder Path:				00005	
Properties		File Name: C33	51-A00_Programmable_IO(192.16	8.0.15)_Address_Map_2023	3-07-14_1	049	•
Name	C3351-			OK	Can	Export Map	
Module ID	0x200C			OK		,	т

An example of the generated file is as follows:

C3351-A00_Programmable_IO(192. × +			- 0 ×
File Edit View			۲
1# CT-222F(16D0,24Vdc,Source-TTL)			
Data Name:Digital Output Data(CH 0)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000000(Hex)	0(Bin)
Data Name:Digital Output Data(CH 1)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000001(Hex)	1(Bin)
Data Name:Digital Output Data(CH 2)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000002(Hex)	2(Bin)
Data Name:Digital Output Data(CH 3)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000003(Hex)	3(Bin)
Data Name:Digital Output Data(CH 4)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000004(Hex)	4(Bin)
Data Name:Digital Output Data(CH 5)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000005(Hex)	5(Bin)
Data Name:Digital Output Data(CH 6)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000006(Hex)	6(Bin)
Data Name:Digital Output Data(CH 7)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000007(Hex)	7(Bin)
Data Name:Digital Output Data(CH 8)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000008(Hex)	8(Bin)
Data Name:Digital Output Data(CH 9)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000009(Hex)	9(Bin)
Data Name:Digital Output Data(CH 10)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000000A(Hex)	10(Bin)
Data Name:Digital Output Data(CH 11)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000008(Hex)	11(Bin)
Data Name:Digital Output Data(CH 12)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000000C(Hex)	12(Bin)
Data Name:Digital Output Data(CH 13)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000000(Hex)	13(Bin)
Data Name:Digital Output Data(CH 14)	RegisterArea:Coil Status(0x)	数据起始地址:0x0000000E(Hex)	14(Bin)
Data Name:Digital Output Data(CH 15)	RegisterArea:Coil Status(0x)	数据起始地址:0x000000F(Hex)	15(Bin)
2# CT-1228(8DI 24Vdc Source)			
Data Name:Digital Input Data(CH 0)	RegisterArea:Input Status(1x)	数据起始地址:0x00000000(Hex)	0(Bin)
Data Name:Digital Input Data(CH 1)	RegisterArea:Input Status(1x)	数据起始地址:0x00000001(Hex)	1(Bin)
Data Name:Digital Input Data(CH 2)	RegisterArea:Input Status(1x)	数据起始地址:0x00000002(Hex)	2(Bin)
Data Name:Digital Input Data(CH 3)	RegisterArea:Input Status(1x)	数据起始地址:0x00000003(Hex)	3(Bin)
Data Name:Digital Input Data(CH 4)	RegisterArea:Input Status(1x)	数据起始地址:0x00000004(Hex)	4(Bin)
Data Name:Digital Input Data(CH 5)	RegisterArea:Input Status(1x)	数据起始地址:0x00000005(Hex)	5(Bin)
Data Name:Digital Input Data(CH 6)	RegisterArea:Input Status(1x)	数据起始地址:0x0000006(Hex)	6(Bin)
Data Name:Digital Input Data(CH 7)	RegisterArea:Input Status(1x)	数据起始地址:0x00000007(Hex)	7(Bin)
3# CT-2718(8D0 Relay Output)			
Data Name:Digital Output Data(CH 0)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000010(Hex)	16(Bin)
Data Name:Digital Output Data(CH 1)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000011(Hex)	17(Bin)
Data Name:Digital Output Data(CH 2)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000012(Hex)	18(Bin)
Data Name:Digital Output Data(CH 3)	RegisterArea:Coil Status(0x)	数据起始地址:0x00000013(Hex)	19(Bin)
Dies Hans-Dielest Diese Dies/(01.4)	Bandahan Part Part Phank-10.1	#http:://www.nonnons.a///	20/02-1
Ln 1, Col 1		100% Windows (CRLF)	UTF-8

## **Export Document**

After the project is established, please right click on the C3351 device and select Export Document.

-											
🚻 IO Config								-		×	
File Tool Optic	n He	lp									
🐟 New Project 📄 🗜	🐟 New Project 📄 🖫 Save All(Ctrl+S) 📻 🕸 🔾 Search Device 🖶 Device Update 💽 🌒 🎚 😻 🖭 Online 📭 Upload Params 🔂 Download Params 💼 🖵 🎼										
Project		<b>~</b> ‡	Module Inform	ation Process Da	ita Config Pa	rams Address Map In	stallation Information			Ŧ	
A 🗥 NewProject			Name			Input Bit(1xxxx)	Output Bit(0xxxx)		Input Wo	ord(3	
C3351-A00 Pr	ogramm	able IO(192,168,0,15)	1# CT-222F(16DO,24Vdc,Source-TTL)							Â	
1.CT-222F(16	002	Module Manager	Digital Output	Data(CH 0)			0x00000000				
10 1.CT 2221(10	24	Online	Digital Output	Data(CH 1)			0x0000001				
P 2:C1=1220(0L	Lipload Params		Digital Output	Data(CH 2)			0x0000002				
3:CT-2718(8DO Re			Digital Output	Data(CH 3)			0x0000003				
	🕑 Download Params		Digital Output Data(CH 4)				0x00000004				
	l	Delete	Digital Output	Digital Output Data(CH 5)			0x0000005				
	- 0	Rename	Distant Distant Distance I en								
Properties		Copy(Ctrl+C)					Expor	t Map			
Name Modula ID	0x2	Paste(Ctrl+V)	Logs							- ņ	
Description	Pro C	) Up	*	DATE	TIME	SOURCE	MESSAGE				
Device version	V1.	Davia	🔵 Info	2023-07-14	10:48:19 A	CT-2718(8DO Relay	Start uploading				
Module Number	3	Down	Info	2023-07-14	10:48:19 A	CT-2718(8DO Relay	Upload completed				
Interface	Eth 🕒	<ul> <li>Export Map</li> </ul>	🔵 Info	2023-07-14	10:48:19 A	C3351-A00 Program	Upload completed				
Device IP	192 🤤	Export document	Info	2023-07-14	10:48:19 A	NewProject	Commboard C3351-A0	) Progra	mmable I	O ha	
			-								

In the pop-up window, please select the file format, output Folder Path, and File Name, and then click OK.

IO Config							-	
File Tool	Option Hel D Save All	p (Ctrl+S)   📷   🏠   📿 Set	arch Device  Device Upda	te 🕕 🕕 🗄 📖 座	Online 🕞 Uple	oad Param	s 🕑 Download P	arams 🛍 🌄
Project		🗢 ĝ	Module Information Proces	s Data Config Params A	ddress Map Inst	allation In	formation	Ŧ
▲ 🗥 NewProjec	ct		Name	Inpu	t Bit(1xxxx)	Outp	out Bit(0xxxx)	Input Word(3
▲ 😪 C3351-A	A00 Programma	ble IO(192.168.0.15)	1# CT-222F(16DO,24Ve)	dc,Source-TTL)				<u> </u>
1:CT-22	22F(16DO,24Vd	Config	Digital Output Data(CU A)		- n	X	200000	
2:CT-12	228(8DI 24Vdc \$	Format Config			_		00001	
	718(8DO Relavi	ronnat coning	A Manu ula fila	a de Gila 🗌 Mi			00002	
1 John L		<ul> <li>.xis file</li> </ul>	View .xis file		w.parme		D0003	
		Path Config					00004	
	[	Folder Path: D:\Desk	Тор				00005	
		File Name: C3351-/	00_Programmable_IO(19)	2.168.0.15)_Document	Info_2023-07-	14_1051	20006	• • •
Name	C3351-				ок	Cancel	Export Map	

The example of the generated file is as follows, and a total of 5 aspects of information are generated, including the overview of the submodules, the statistics of the number of submodules, the schematic diagram of the submodules, the address table, and the parameter settings of the submodules:

1	A	В	С	D	E	
1			1 Node (	Overview		
2	Node name:C3351-A00 Pr	ogrammable IO				
3	Adapter	Module	Submodu	le rder Numb	Slot	Desc
4	51-A00 Programmable IO(192.168	.0.15)		C3351	0-0	Program
5		CT-222F(16DO,24Vdc,Source-TTL)		CT-222F	1-0	16 Digital Output,
6		CT-1228(8DI 24Vdc Source)		CT-1228	2-0	8 Digital Input ,D
7		CT-2718(8DO Relay Output)		CT-2718	3-0	8 Digital Output ,R
8						
9	2					
10						
11						
12						
13						
14						
15						
16						
17						
10	1 Node Overview	2 Inquiry 3 Image View	4 Address 1 🕀			

# **5 Programming Software (CODESYS)**

# 5.1 Programming software installation

Please go to CODESYS official website to download the latest version or install it according to the software installation package provided by our company. Here, the SP19 version is used as an example to install and demonstrate.

Please log in <u>https://www.codesys.com/</u>, then find the download area and click:

# Attention

#### **Device inoperable**

This website is not the website of our company, and our company has nothing to do with the loss caused by visiting this website.

Failure to follow the above instructions could result in damage to the equipment.



Then enter the download page, <u>https://store.codesys.com/de/</u>, then select the appropriate installation package to download according to the configuration of the computer:



http: // www.odotautomation.com 60 / 109

TEL: +86-0816-2538289

Double-click after getting the installation package, and follow the steps in the pop-up window:





TEL: +86-0816-2538289

CODESYS 64 3.5.19.0 - InstallShiel	d Wizard		×						
License Agreement       Image: Comparison of C									
License Agreement for the usage of a CODE Software Package General Terms Agreement) for this Software Us the supplied Soft the Software package	of License (E the supplied ser Agreemer ftware. Down	ware or CC and User Licer Software. Plea It carefully be loading or inst	DESYS						
I accept the terms in the license agreem     I do not accept the terms in the license a      InstallShield	ent agreement		Print						
	< 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 Manage instead.	I
InstallShield  Back Next >	Print



CODESYS 64 3.5.19.0 - InstallShield Wiza	rd X
Setup Type Choose the setup type that best suits your need	s. CODESYS
Please select a setup type	
Complete All program features will be insta space.)	lled. (Requires the most disk
Choose which program features will be installed. Recommended f	you want installed and where they or advanced users.
InstallShield < B	ack 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, dick Back. Click Ca exit the wizard.	ncel to
L	
InstallShield	
< Back Install	Cancel

Just wait for the installation to be completed.

# **5.2 CODESYS Software Using**

Find CODESYS.exe in the installation location, right-click to create a new desktop shortcut, and double-click on the desktop to run the CODESYS programming software.



## 5.2.1 Create a project

Firstly, open the CODESYS software and select 'Tools' - 'Device Storage Library' in the menu bar.

🐞 cod	DESYS					×.		_		
File	Edit	View	Project	Build	Online	Debug	Tool	s Window	Help	
1		<b>6</b>   10	α χ Ι	• <b>i</b> :	×∣₩ 3	s 🗛 😘	Ø	Package Man	ager	
						-	1	Library Reposi	itory	
Devices				<b>→</b> ₽	× 📝	Start P	1	Device Reposi	tory	
					•	1	•	Visual Elemen	t Reposit	ory

Select Install on the pop-up page.

ocation System Repository   (C:\ProgramData\CODESYS\Devices)   Installed Device Descriptions   String for a full text search   Vendor   Vendor   Vendor Version Description   Uninstall   Point   Install   Uninstall   Export   Pics SoftMotion drives   Image: SoftMotion drives							
(C:\ProgramData\CODESYS\Devices)  Installed Device Descriptions  String for a full text search Vendor <all vendors=""> ✓ Install Name Vendor Version Description  Miscellaneous  FileHMI devices  FilePLCs  For SoftMotion drives  FilePLCs  FilePLCS</all>	ocation.	System Repository	/			$\sim$	Edit Locations.
nstalled Device Descriptions String for a full text search Vendor Vendor Version Description Uninstall  Triedbuses Fieldbuses Field		(C:\ProgramData\	CODESYS\E	Devices)			×
String for a full text search Vendor <all vendors=""> Install     Name Vendor Version Description     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor     Image: String for a full text search Vendor Vendor   Image: String for a full text search Vendor Vendor   Image: String for a full text search Vendor Vendor   Image: String for a full text search Vendor Vendor   Image: String for a full text search Vendor Vendor   Image: String for a full text search Vendor Vendor   Image: String for a full text search Vendor Vendor   Im</all>	nstalled D	evice Descriptions					X
Name       Vendor       Version       Description         Image: Second state of the second state of	String for	a full text search		Vendor	<all vendors=""></all>	$\sim$	Install
Provide the second	Name		Vendor	Version	Description		Uninstall
Fieldbuses  Fieldbuses Fieldbuses Fieldbuses  Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldbuses Fieldb	• • • • • •	liscellaneous					Export
HMI devices     PLCs     SoftMotion drives	🗏 – 🔟 F	ieldbuses					
SoftMotion drives	E I	MI devices					
		oftMotion drives					
	-						

Select Automatically detect file types in the pop-up page.

n				×
> This PC > ODOT-YS (D:) > Desktop > devXml	~	C Search devXml		P
er			≣ - □	•
Name ^	Date modified	Туре	Size	
ТСР	7/13/2023 10:29 AM	File folder		
C C3351-A00.devdesc.xml	5/11/2023 3:35 PM	Microsoft Edge H	45 KB	
C3351-A00.devdesc2.xml	6/13/2023 1:54 PM	Microsoft Edge H	45 KB	
C3351-A00-20230705.devdesc.xml	7/5/2023 6:26 PM	Microsoft Edge H	45 KB	
C GSDML-V2.33-ODOT-BLADEIO-TEST-20230606.xml	6/13/2023 1:53 PM	Microsoft Edge H	1,557 KB	
C PicloDrv.devdesc.xml	5/18/2023 3:23 PM	Microsoft Edge H	134 KB	
PlcloDrv.devdesc2.xml	6/13/2023 5:12 PM	Microsoft Edge H	116 KB	
C PicloDrv.devdesc-YS改.xml	6/14/2023 9:27 AM	Microsoft Edge H	122 KB	
C PicioDrv20230705.devdesc.xml	7/5/2023 6:26 PM	Microsoft Edge H	135 KB	
name:		Automatic dete	ection (*.xml;*.e	ι ~
		Automatic dete Device descript EDS, DCF (*.eds	ction (*.xml;*.e ions (*.devdesc. ;, *.dcf)	ds;*.dct xml)

Select (multiple choice) the xml file provided by our company (including C3351 device and IO module) and open it

> This PC > ODOT-YS (D:) > Desktop > devXml	$\checkmark$	C Search devXml	
r			≣ • □
Name ^	Date modified	Туре	Size
🛅 ТСР	7/13/2023 10:29 AM	File folder	
C3351-A00.devdesc.xml	5/11/2023 3:35 PM	Microsoft Edge H	45 K
C3351-A00.devdesc2.xml	6/13/2023 1:54 PM	Microsoft Edge H	45 K
C3351-A00-20230705.devdesc.xml	7/5/2023 6:26 PM	Microsoft Edge H	45 K
C GSDML-V2.33-ODOT-BLADEIO-TEST-20230606.xml	6/13/2023 1:53 PM	Microsoft Edge H	1,557 K
C PicloDrv.devdesc.xml	5/18/2023 3:23 PM	Microsoft Edge H	134 K
PicloDrv.devdesc2.xml	6/13/2023 5:12 PM	Microsoft Edge H	116 K
💽 PicloDrv.devdesc-YS改.xml	6/14/2023 9:27 AM	Microsoft Edge H	122 K
PicloDrv20230705.devdesc.xml	7/5/2023 6:26 PM	Microsoft Edge H	135 K
	developer une ll		action (* vml

Close the device repository interface when done.

tring for a full text search	Vendor	<all vendors=""></all>	~	Install
Name	Vendor			Uninstall
IO Modules	Sichuan Ol	OOT Automation System	n Co., Ltd.	Export
D:\DeskTop\devXml\C3351-     Device "C3351-A00" ins     D:\DeskTop\devXml\PlcIoDr	A00-20230705.devde talled to device reposi v20230705.devdesc.x	sc.xm tory ml		

CODESYS File Edit View Project Build Online Debug New Project... Ctrl+N Open Project... Ctrl+O Close Project Save Project Ctrl+S Save Project as... **Project Archive** ۲

Select Standard Project in the pop-up menu, name it and select a storage location, and then click OK.

管 New Pro	ject				1	×
Categories		г	Templates			
	raries		Tempty project	HMI project	Standard project	Standard project w
A project co	ontaining one device, o	one applic	cation, and an e	empty implement	tation for PLC_	PRG
Name	Untitled2 2					
Location	D:\DeskTop\Test	3			4	~
					4 ОК	Cancel

Then the device creation page will pop up automatically, select the C3351 device and confirm.

Standard	Project	×
	You are about to create a new standard project. This wizard will create the following objects within this project:	
	<ul> <li>One programmable device as specified below</li> <li>A program PLC_PRG in the language specified below</li> <li>A cyclic task which calls PLC_PRG</li> <li>A reference to the newest version of the Standard library currently installed.</li> </ul>	
	Device C3351-A00 (Sichuan ODOT Automation System Co., Ltd.)	~
	PLC_PRG in Structured Text (ST)	~
	OK Cancel	
	Cancel	

Select 'File'  $\rightarrow$  'New Project' from the menu bar.

Wait for a while, and the software will automatically create a standard project file tree for the user.



So far, the project has been established.

# Attention

#### **DEVICE INOPERABLE**

The first time when install CODESYS and build a project to compile, it will find many missing items. The solution is to open the library manager, then click Download the missing library-select all-start download, wait for the download to complete, and compile again.

Failure to follow the above instructions could result in damage to the equipment.



# 

## **5.2.2 CODESYS Software Interface**

For detailed function introduction, please refer to "The BOOK of CODESYS"., <u>https://us.store.codesys.com/the-book-of-codesys.html</u>.

# NOTICE

#### **DEVICE INOPERABLE**

This basic programming and application guide are not written by our company.

Failure to follow the above instructions could result in damage to the equipment.

# **5.2.3** Configure the IO module

Firstly, after the project is established, right-click the C3351 device icon  $\rightarrow$  'Add Device'.

🐞 Unti	tled1.p	roject - C	ODESYS			
File	Edit	View	Project	Build	Online	Debug
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/		- <b>"</b>	Prope	ties		
		***	Add O	bject		•
		<b></b>	Add F	older		
			Add D	evice		
	1		Updat	e Device.		
		- Dî	Edit O	bject		
	/		Edit O	bject Wit	h	

Find the IO-Modules device provided by our company in the pop-up window, select it and click 'Add Device', you don't need to close this page after adding.

Name IO Modules						~
Action						_
• Append device • Ins	ert device 🔵 Plug d	levice 🔿 U	pdate device			
String for a full text search		Vendor	<all td="" vendors<=""><td>&gt;</td><td></td><td><math>\sim</math></td></all>	>		$\sim$
Name	Vendor			Version	Description	
Miscellaneous						
IO Modules	Sichuan ODOT Autom	nation System	n Co., Ltd.	20.23.7.5	Descriptions of the O	dot 1
Group by category	Display all versions (f	for experts o		alay outdated	versions	
Group by category	Display all versions (f	for experts o	nly) 🗌 Disp	olay outdated	versions	
Group by category  Name: IO Modules Vendor: Sichuan O Categories: Version: 20.23.7; Order Number: 43	Display all versions (f DOT Automation Syster ; 711	for experts o	nly) 🗌 Disp	olay outdated	versions	
Group by category     Name: IO Modules     Vendor: Sichuan O     Categories:     Version: 20.23.7.5     Order Number: 4:      Append selected device     Device	Display all versions (f DOT Automation Syster ; 711 as last child of	for experts o	nly) Disp	olay outdated	versions	
Group by category     Name: IO Modules     Vendor: Sichuan O     Categories:     Version: 20.23.7.7     Order Number: 47      Append selected device     Device     (You can select anot	Display all versions (f DOT Automation Syster ; 711 <b>as last child of</b> her target node in the	navigator w	nly) Disp	ow is open.)	versions	

Then select the 'empty' slot, right-click and select 'Insert Device', and insert the required module. For the function of the module, refer to the <u>1.7Selection Table</u>.



- 0 × 1.project\* - CODESY - Ministry Regist Build Online Debug Tools Window Help 資産量量ののでよる物面×米品信ML通信具常常准備回行のApplication (Device PLCLogic)・等等)→重化注注注意中で注意(単調)が下や **→** ∓ × . ice (C3351-A00) - 🗊 D 0 Library Ma æ (B) PLC PR CT\_1228 (CT-1228) CT\_1228 (CT-1228) CT\_122F (CT-122F) CT\_124H (CT-124H CT\_124H\_1 (CT-12 <Empty> <Empty> <Empty> <Empty> <Empty> <Empty> <Empty> <Empty> <Empty> - 4 X ages - Total 1 error(s), 0 O error(s) • 0 warning(s) • 6 message(s) × × Build enerate code... enerate global i enerate code in <Empty> <Empty> <Empty> <Empty> wrate microsoftam... of global data: 6120 bytes of global data: 6120 bytes all aclocatel energy zero food and data: 6120 bytes and aclocatel energy zero food and data: 6120 bytes howy are to contam. Data: pupel, clobal and howry: are: 10803% bytes, hybertus energy area 3 contams. Persistent data: see: 1528 bytes, hohertus and dates: 6, largest Latata budg. 0 0 0 0 = 1 ie 🧹 🗯 Project user: (nobody) 0

The figure below is the view after inserting the module:

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



# **5.3 Programming**

This chapter is recommended to try after referring to "The BOOK of CODESYS"., <u>https://us.store.codesys.com/the-book-of-codesys.html</u>. ODOT-C3351 supports five programming languages including Instruction List (IL), Ladder Diagram (LD), Structured Text (ST), Function Block Diagram (CFC/FBD), and Sequential Function Chart (SFC).

In the project management tree, double-click the PLC\_PRG (PRG) program under the program organization unit.





It could make a simple output variable assignment program, and observe the changes of the indicator lights of the C3351 physical equipment. Connect QX0.0 and QX0.1 of BT-221F to the variables test1 and test2 in two ways. The first way is the way marked in green in the above picture, and the second way is the way marked in red in the picture above. Two ways can associate channels with variables.
# 5.4 Download, Monitor

Double-click the device icon, enter the IP address of the C3351 device in the "Communication Settings" and press Enter, wait for the device to be activated successfully. For the IP address, refer to <u>4.3.4 view the configuration parameters</u> the IP address of the C3351 device obtained from.



After activation, log in to the device and run the program. At this point, you can observe the change of the indicator light of the IO device. You can see that the indicator light of the first and second channels of BT-221F is lit, indicating that the program is successfully written.

# NOTICE

#### **DEVICE INOPERABLE**

•To observe the current value of the I/O map in real time, it must set 'always update variables' to enable 1 in the PLC settings of the C3351 device.

•To run the PLC program as soon as the power is turned on, create an implicit start application in the Application-properties.

Failure to follow the above instructions could result in damage to the equipment.



Common	Information	Boot Application	Encryption	Application Build Options	Target mei
-		51 - 25 - 74			
Cre	ate implicit b	ootapplication or	n download		
Cre	ate implicit b	oot application o	n online chan	ge	
-			t classa		

# 5.5 Modbus TCP client/server functionality

It is recommended to read <u>Annex 7</u> before performing operations in this section. The first step is to establish the project, as follows:

CODESYS		- 🗆 ×
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1		
	New Project X	
	Categories Templates	
	Empty project HRI project Standard project	
	A project containing one device, one application, and an empty implementation for PLC_PRG	
	Name Underdi 3 Location (0:pedropitet) 4 Cancel	

Then select the C3351 device. If the device cannot be found, please refer to 5.2.1<u>Create a project installation device description file.</u>

Standard F	Project	×							
67	You are about to create a new standard project. This wizard will create the following objects within this project:								
	<ul> <li>One programmable device as specified below</li> <li>A program PLC_PRG in the language specified below</li> <li>A cyclic task which calls PLC_PRG</li> <li>A reference to the newest version of the Standard library currently installed.</li> </ul>								
	Device C3351-A00 (Sichuan ODOT Automation System Co., Ltd.)	~							
	PLC_PRG in Structured Text (ST)	~							
	OK Cancel								

The project file tree will be created automatically, right click on the C3351 device  $\rightarrow$  'Add Device':

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1		Update	e Device				
	D°	Edit Ol	oject				
		E 12 01					

Add an 'IO Modules device' to the project in the pop-up interface. If this device is not found, refer to 5.2.1 to create a project and install device description file.

Action Append device	⊖ Inse	t device 🔵 Plug	device Ou	Ipdate device	2	
itring for a full text	search		Vendor	<all th="" vendor<=""><th>s&gt;</th><th></th></all>	s>	
Name		Vendor			Version	Description
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	ules	Sichuan ODOT Auto	omation Syster	n Co., Lta.	20.23.7.5	Descriptions of the Odot
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Group by catego	ory D	isplay all versions	(for experts a	nly) 🗌 Dis	play outdated	versions
Group by catego Name: IO I Vendor: Si	ory D Modules chuan ODC	isplay all versions	(for experts o	nly) 🗌 Dis	play outdated	versions
Group by catego Name: IO I Vendor: Si Categorie Version: 21	Pory C Modules chuan ODO s: 2,23,7,5	isplay all versions	(for experts a	nly) 🗍 Dis	iplay outdated	versions
Group by catego Name: IO 1 Vendor: Sk Categorie Version: 2 Order Nun	Dry D Modules chuan OD s: 0.23.7.5 aber: 471	isplay all versions DT Automation Syst 1	(for experts o	nly) 🗌 Dis	play outdated	versions



Similarly, find 'Ethernet Device' and add it to the project:

The next step is to create a TCP client and server:

When treating C3351 as a client, right click on the Ethernet device in the project - 'Add Device' - add a device named 'Modbus TCP Master', the supplier is 3S – Smart Software Solutions GmbH.



Similarly, right-click the 'Modbus TCP Master Device' just added to the project  $\rightarrow$  'Add Device'  $\rightarrow$  add a device named 'Modbus TCP Slave', the supplier is 3S – Smart Software Solutions GmbH.

Untitled1.project* - CODESY	s											-	o ×
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Devices		- 4 X	- IR	dd Da	ico.				~				
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Device (C3351-A00)			Name	Mo	dbus_TCP_Slave								
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E M Task Config	uratio	on and a second s	Strin	ig for a	full text search	Vendor	<all vendors=""></all>		~				
🖻 🥩 MainTa	sk		Na	me		Vendor		Version	Description				
-@) PL	_PRG		8	11 Fi	ldbuses								
IO_Modules (IO Mo	dules)			8.0	8 Modbus								
Ethernet (Ethernet)		Alashua TCD Master			Modbus TCP Slave								
Modbus_TCP_N	V V	Cut			Modbus TCP Slave	3S - Smart Softwar	e Solutions GmbH	4.1.0.0	A generic Modbus de				
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POUs 🗶 Devices		Update Device											
	Ű,	Edit Object			ndor: 3S - Smart Software So	lutions GmbH		1					
Messages - Total 1 error(s), 0 warn		Edit Object With			tegories: Modbus TCP Slave				<u> </u>				• + ×
Library Manager		Edit IO mapping			rsion: 4.1.0.0				2				
Description		Import mappings from CS	v		der Number: - scription: A generic Modbus	device that is configure	d as Slave for a		-	t	Object	Position	
Could not open library '#Break;		Export mappings to CSV								31	Library Manager [De		
	_		App	end s	elected device as last chil	d of							
			Mod	ibus_	ICP_Master								
			•	(You	can select another target no	de in the navigator wh	ile this window is o	open.)					
								Add Device	e Close				
									- Close				
							Last b	xuid: 🟮 0 🤙	0 Precompile 🧹	6	Project user: (nobe	dy)	0 🙆

Next, let's set the parameters of the master station and the third-party slave station. Here, the third-party simulation software Modbus Slave is used to simulate the connection of the slave station device:



Double-click 'Ethernet Device' in the CODESYS interface - select 'General' in the main interface on the right, and we will see the settings of the network interface. For the IP address here, refer to 4.3.4 to view the configuration parameters the IP address of the C3351 device scanned by IO-Config, and fill it in:

Untitled 1.project* - CODESYS			-		×	
File Edit View Project Build Online Debu	g Tools Window Help				₹4	
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😑 👘 Device (C3351-A00)	General	Network interface Browse				
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Generation Generation	Ethernet Device I/O Mapping	IP address 192 . 168 . 0 . 21				
- 🎁 Library Manager	Ethernet Device IEC Objects	Subnet mask 255 . 255 . 0				
PLC_PRG (PRG)	Ethemet Device IEC Objects	Default esterior				
Task Configuration	Log	Default gateway				
🖹 🍪 MainTask		Adjuct operating system cettings				
PLC_PRG	Status					
IO Modules (IO Modules)						
B file Ethernet (Ethernet)	Information					
Modbus_TCP_Master (Modbus TCP Master)						
Modbus_TCP_Slave (Modbus TCP Slave)						
1						

Similarly, double-click 'Modbus TCP Master Device' in the CODESYS interface  $\rightarrow$  select the general setting of Modbus TCP's 'Response Timeout' time and 'Socket Timeout' time in the main interface on the right, and it is recommended to click the Auto-reconnect function:

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Constant     Constant	General ModbusTCPMaster (/O Mapping ModbusTCPMaster /E Objects ModbusTCPMaster /EC Objects ModbusTCPMaster Parameters Log Status Information	Modas TOP Response timeout (ms) 1000 Octet timeout (ms) 10 Auto-reconnect						

Similarly, double-click the 'Modbus TCP Slave device' in the CODESYS interface select the general settings of Modbus TCP's 'slave station IP address', 'response timeout' time and 'port number' in the main interface on the right. This IP address is the IP address of the third-party slave station simulation software, that is, the IP address set by the local PC, press the Win+R key, enter CMD and press Enter:

💷 Run	×
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	cmd ~
	OK Cancel Browse

- · ·		~	· .1				• •	1		<b>D</b> .
Hnfer 1	ncont	10	in fl	he r	nnr	111r	window	and	nrecc	Hnter
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C\Windows\system32\cmd.e X + ~		
Microsoft Windows [Version 10.0.22621.1992] (c) Microsoft Corporation. All rights reserved.		
C:\Users\13521>ipconfig		
Windows IP Configuration		
Wireless LAN adapter 本地连接* 1:		
Media State Media disconnected Connection-specific DNS Suffix . :		
Wireless LAN adapter 本地连接* 2:		
Media State		
Ethernet adapter 以太网:		
Connection-specific DNS Suffix .: Link-Local IPv6 Address : fe80::88eb:abab:3182:e187%9 IPv4 Address : 192.168.0.88 Subnet Mask : 255.285.255.6 Default Gateway :		
Ethernet adapter VMware Network Adapter VMnet1:		
Connection-specific DNS Suffix .: Link-local IPv6 Address : fe80::46e:10ce:dc76:eea6%8		

It can be seen that the IPv4 address used here is 192.168.0.88, so the IP address of the slave station it should enter in the CODESYS interface is 192.168.0.88, and the port can be consistent with the port set by the third-party slave station. The setting here is 502.



Next, continue to set the Modbus slave station channel of the "Modbus TCP Slave device" →the step "Add Channel" as shown in the figure below, here a channel type of "Read Holding Registers" is added, and its length is 10 WORD:

Untitled1.project* - CODESYS		- • ×
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🎦 🚔 🗐 🛤 🖂 🖄 🖻 🛍 🗙 🖓 🍪	5    1 1 1 1 1 <b> </b>   <b> </b>   1    1	월   Application [Device: PLC Logic] - 약 약 : 🙀 🖌 📳 🕾 [ 그 약을 약을 약을 양   수   🧱   국   주
Devices - 7 X	Ethernet Modbus_TCP	Master / Modbus_TCP_Slave x
Ontred1     Ontred1     Ontred1     Ontred1     Ontred1	General	Name Access Type Trigger READ Offset Length Error Handling WRITE Offset Length Comment
PLC Logic     Application     Minute Manager	Modbus Slave Channel 2	Modbus Channel X
PLC_PRG (PRG)	Modbus Slave Init	Channel
⊟- 🗱 Task Configuration ⊟- 🌚 MainTask	ModbusTCPSIave Parameters	Name Channel 0 4 Access type Read Holding Registers (Function Code 3) 5 ~
E PLC_PRG	ModbusTCPSlave IEC Objects	Trigger Cyclic v Cycle time (ms) 100
Holdies (10 Modules)     Ethernet (Ethernet)	Status	Comment
Modbus_TCP_Master (Modbus TCP Master)	Information	READ Register
1	-	Offset 0x0000 6 ~
1		Length 10
		Error handling Keep last value V
		WRITE Register
		Offset 0x0000
		Length 1
		OK Cancel 3
POUs 🕱 Devices		Move Up Move Down Add Channel Delete Edit

After the addition is complete, we can find that there is an option of 'Modbus TCP Slave I/O Mapping' in the menu on the right. Click this option to view the address mapped in the C3351 device by the channel just established.

### NOTICE

#### **DEVICE INOPERABLE**

•The channel length is limited, please refer to 3.3 Programming Specifications.

Failure to follow the above instructions could result in damage to the equipment.

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le Edit View Project Build Online Deb	ug Tools Window Help							
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ices 👻 🕈 🗙	Ethernet Modbus	_TCP_Master	odbus_TCP_Slave 🗙	1				
Unbiled1	Consul	Find		Filter Show all			lle Add Fl	8 for IO Channel
Device (C3351-A00)	General			Show an				
E EII PLC Logic	Modbus Slave Channel	Variable	Mapping	Channel	Address	Туре	Unit	Description
= Q Application		8-19		Channel 0	%EW0	ARRAY [09] OF WORD		Read Holding Registers
Library Manager	Modbus Slave Init	i≣-*≱		Channel 0[0]	%IW0	WORD		0x0000
PLC_PRG (PRG)		🕮 - 🏘		Channel 0[1]	%IW1	WORD		0x0001
Task Configuration	ModbusTCPSlave Parameters	iii - ₩a		Channel 0[2]	%IW2	WORD		0x0002
🗏 🐯 MainTask		N		Channel 0[3]	%IW3	WORD		0x0003
de PLC_PRG	ModbusTCPSlave I/O Mapping	18 - No		Channel 0[4]	%IW4	WORD		0x0004
IO_Modules (IO Modules)		8-19		Channel 0[5]	%IW5	WORD		0x0005
Ethernet (Ethernet)	ModbusTCPSlave IEC Objects	B- 🎭		Channel 0[6]	%IW6	WORD		0x0006
Modbus_TCP_Master (Modbus TCP Master)		8-10		Channel 0[7]	%IW7	WORD		0x0007
Modbus_TCP_Slave (Modbus TCP Slave	Status	8-19		Channel 0[8]	%IW8	WORD		0x0008
	Information	8-19		Channel 0[9]	%IW9	WORD		0x0009
	an on a don							

Next, we open the third-party slave station simulation software 'Modbus Slave', and press 'Ctrl+N' to create a new Mbslave1 window, and press 'F3' to connect, and then set the following settings on the pop-up page. The 'IP Address' should be filled in the 192.168.0.88 just checked through CMD:



Right-click on the blank space of the Mbslave1 window - select 'Slave Definition', and set as follows in the pop-up window. The specific parameters should correspond to the channel parameters set by the 'Modbus TCP Slave device' in CODESYS. If the parameters do not correspond, it may cause errors and Communication exception:

3 Modbus Slave - [Mbslave1]	-		×
📅 File Edit Connection Setup Display View Window Help		-	8 ×
ID = 1: F = 03			
Altar       00000         0       Gave Diffinition         1       0         2       0         3       0         4       0         4       0         6       0         7       0         8       0         9       0         Hdde Alasi Columns       PLC Addresses (Base 1)         Em Sinulation       Stop reporte         Stop reporte       Invite rescription (CARC)         0       multi Alasi Columns         0       multi Alasi Columns         0       multi Alasi Columns         Bit oppone       Invite rescription (S. Burg)			

After completion, return to the CODESYS interface, download and log in to the C3351 device. For the method, refer to <u>5.4 download, monitor:</u>

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File Edit View Project Build Online Debug	Tools Window Help						₹4
◎ ☞ ■  ●   い べ よ № 池 ×   ぬ 結 ぬ 結	위 위 개 🛱 🛅 - 더 🖽	Application [Device: PLC Lo	gic] - 🕸 🗱 , 🖬 🖣	E (E 93 43 43	양   호   號   로   장		
Devices 👻 🕈 🗙	Ethernet Modbus_TCF	P_Master Modbus_T	CP_Slave I Device	×			•
E Dittled1	A sector front sec						
= 😔 👔 Device [connected] (C3351-A00)	Applications						
E I PLC Logic	Backup and Restore		i –				
Application [run]							
Library Manager	Files	•			• •		
PLC_PRG (PRG)			Gateway				
Task Configuration	Log		Cotourou.1		102 168 0 21 (active)		
= S MainTask	DI C Sallinga		dateway-1		192,100,0,21 (dcove)		
	Fice becongs		IP-Address: localbost		C3351-A00		
G III IO Modules (IO Modules)	PLC Shell						
Good and a construction of the ster (Modeus TCP Master)			Port: 1217		Device Address: 0301.1000.2DDC.C0A8.0015		
G fill Mothus TCP Slave (Mothus TCP Slave)	Users and Groups						
• • • • • • • • • • • • • • • • • • • •					192 168 0 21		

All devices are in the running state, indicating that the connection is successful. Now click on the 'ModbusTCPSlaveI/O Mapping' menu of the 'Modbus TCP Slave Device' to monitor the current value of the channel mapping:

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File Edit View Project Build Online Debug	g Tools Window Help							₹4
🗎 🛎 🖬 😹 🗠 여 종 🖻 🖻 🗙 🛤 僑	🍒 🔲 왜 왜 왜 🖼 🔤 💼	🕮   Application [Device	e: PLC Logic] 🔹 😂 🤇	× • *	Ç≣ ⊊∃ d <sub>∃</sub>	*= 8   +   第   =*	37	
Devices 👻 🗭 🗄	K 🕤 Ethernet 🕤 Modbus,	_TCP_Master	odbus_TCP_Slave 🗙	Device				
■ ☐ Untitled1	-						1.4.11504	
🖹 😏 👘 Device [connected] (C3351-A00)	General	Find		Filter Show all		•	·P Add FB for IO Channe	El
B I PLC Logic	Modhus Slave Changel	Variable	Mapping	Channel	Address	Туре	Current Value	Prepar
Application [run]	Ploubus slave channel	B-¥≱		Channel 0	%EWO	ARRAY [09] OF WORD	Not updated	
👘 Library Manager	Modbus Slave Init	÷-*		Channel 0[0]	%IW0	WORD	0	
PLC_PRG (PRG)		B- 🍫		Channel 0[1]	%IW1	WORD	0	
Task Configuration	ModbusTCPSlave Parameters	18 - Ma		Channel 0[2]	%IW2	WORD	0	
🖃 😏 😂 MainTask		<b>*</b>		Channel 0[3]	%EW3	WORD	0	
DI PLC_PRG	ModbusTCPSlave I/O Mapping	🕸 - 🏘		Channel 0[4]	%EW4	WORD	0	
I C Modules (IO Modules)	11 11 TODA 150 01 1	🖷 - 🍫		Channel 0[5]	%IW5	WORD	0	
Comparison (Ethernet)	Modbus ICPSiave IEC Objects	🕸 - 🍫		Channel 0[6]	%IW6	WORD	0	
Modpus TCP Master (Modbus TCP Master	Statue	B- 🏘		Channel 0[7]	%IW7	WORD	0	
I I Modbus_TCP_Slave (Modbus TCP Slav	e) Status	10 - M		Channel 0[8]	%IW8	WORD	0	
	Information	B- 🏘		Channel 0[9]	%IW9	WORD	0	

Go back to the third-party slave station simulation software Modbus Slave,

double-click the first data, a modification window will pop up, modify the value of 'Value' to 55 and click 'OK':

23 Modbus Slave - [Mbslave1]	-		×
📅 File Edit Connection Setup Display View Window Help		-	8 ×
ID = 1: F = 03			
Alias 00000 Edit Register			
0 59			
1 0 Value: 22 DK			
3 0 Auto increment Caliber			
4 0			
5 0			
6 0			
7 0			
8 0			
0			

Back to the CODESYS page, we can find that the current value of the WORD type data with the address %IW0 has been changed to 55, indicating that the communication is normal and the master station function is successfully

#### implemented: 斜 26 🐴 🖾 | 🏠 08 1 Add FB for IO Chan Curren ARRAY WORD WORD WORD %IW1 %IW2 %IW3 %IW3 %IW5 %IW5 %IW6 0 Byte 0 WORD WORD WORD WORD WORD dbusTCPSlave I/O M Status WORE Always update variables Reset Mapping

When C3351 is regarded as a server, on the previous basis, right-click 'Ethernet Device' in the project  $\rightarrow$  'Add Device'  $\rightarrow$  add a device named 'Modbus TCP Slave Device', the supplier is 3S – Smart Software Solutions GmbH.

) 🛎 🖬   🎯   い つ 🌡 🕾 🛍 🗙   🏘 🍇 💆	Tools Window Hep , 특 및 웹 책 책 (읍 ) 등· 다 (편   Application [Device PLC Logic] - 야 야 야 > = 색 [ 문 약: 속	*38 0	r I V	
evices 👻 🖛 🗙 🖉	Add Davice			
Untitled I	a and pevice	`		
🖻 🕤 Device (C3351-A00)	Name ModpusTCP Slave Device		Add FB for I	O Channel
Reference PLC Logic	2	pe	Unit Des	cription
Generation		RAY [0.,9] OF WORD	Rea	d Holding Registers
- 💼 Library Manager	Append device      Insert device      Plug device      Update device	)RD	0x0	000
PLC_PRG (PRG)	String for a full text search Vendor <all td="" wanderes<=""><td>)RD</td><td>0x0</td><td>001</td></all>	)RD	0x0	001
🖹 🌃 Task Configuration	Televi Careloisz	)RD	0x0	002
🖹 😂 MainTask	Name Vendor Version Description	)RD	0x0	003
PLC_PRG	B- 🗊 Fieldbuses	)RD	0x0	004
IO Modules (IO Modules)	=	)RD	0x0	005
Ethernet (E	E Mill Modbus	3RD	0x0	006
- 11 Modbus	Modbus TCP Master	)RD	0x0	007
Mo Bata	Modbus TCP Master 4 3S - Smart Software Solutions GmbH 4.2.0.0 A device that	)RD	0x0	008
In Poste	Mit ModbustCP Slave Device	)RD	0x0	009
× Delete	ModbusTCP Slave Device 3S - Smart Software Solutions GmbH 4.2.0.0 A device that			
Refactoring	Profinet IO			
Properties				
ropertes				
Add Object				
Add Folder				
Add Device				
Insert Device 2				
Disable Device				
Undate Device				
CP Edit Okinet	Group by category Display all versions (for experts only) Display outdated versions	triables Use narent d	evice setting	
POUs S Devices	Name: ModbusTCP Slave Device			
Edit Object With	Vendor: 3S - Smart Software Solutions GmbH			_
Edit IO mapping	Categories: ModbusTCP Slave Device			•
Id Import mappings from CSV	Version: 4.2.0.0			
scription Export mappings to CSV	Order Number: -	t Obje	ct	Position
Build started: Application: Device.Application	Describuoli: A device that works as a modulus for stave.			
	Append selected device as last child of			
Typify code	Ethernet			
Typify code Generate code				
Typify code Generate code Generate global initializations	(You can select another target node in the navigator while this window is open.) -			
Typify code Generate code Generate global initializations Generate code initialization	• (You can select another target node in the navigator while this window is open.) 5			
Typify code Generate code Generate global initializations Generate code initialization Generate relocations	(You can select another target node in the navigator while this window is open.) 5  Add Device Close			
Typfr orde Generate global initializations Generate code initializations Generate relocations Size of generated code: 157652 bytes	(You can select another target node in the navigator while this window is open).      Add Device     Close			
Tynfry code Generate code Generate code initializations Generate code initialization Size of generate code: 157652 bytes Size of global data: 21235 bytes	(You can select another target node in the navigator while this window is open.) 5     Add Device     Close			
Tripfir code Generate code Generate global intializations Generate relocations Generate relocations Sare of generatesia: 2235 hytes Sare of global disat: 2235 hytes Total allocated memory size for code and data: 159396 bytes	(You can select another target node in the navigator while this window is open.) 5     Add Device     Close			
Tripfir code Generate code Generate code institutations Generate reforcations Ser of generate code 15/952 bytes Ser of generate code 15/952 bytes Total allocated memory gas for code and data: 159396 bytes Internor y area 0 custans. Code: ser: 1048376 bytes, highest us	(You can select another target node in the navigator while this window is open.) 5      Add Device Close  ef addresse: 56440, largest contiguous memory gap: 883736 bytes (84 %)			

Next, let's set the parameters of the server and the third-party client. Here, the third-party client simulation software 'Modbus Poll' is used to simulate the connection of the server device:



Double-click 'Modbus TCP Slave Device', select 'General' in the main interface on the right, and set the length of 'Slave port', 'Holding registers', 'Input registers', 'Coils', 'Discrete inputs' in the configuration parameters:



After the setting is complete, we click the option of 'ModbusTCPSlaveDeviceI/O Mapping' to view the address mapped in the C3351 device by the newly established slave device.

# Notice

#### **DEVICE INOPERABLE**

•The channel length is limited, please refer to 3.3 Programming Specifications.

Failure to follow the above instructions could result in damage to the equipment

Untitled 1.project* - CODESYS								- 0	1
ile Edit View Project Build Online Debu	g Tools Window Help								
🚔 🖬 🙈 loo o 🕹 🖻 🕲 🗙 🖓 🖄 🗛	54   11 19 19 19 104 104 104 - 1	1 Application (Dev	ce: PLC Logic1 - S	8 08 L = 42 IC	= ⊊:: dia +3	요			
			carrie cogre,	9 -9 F = 919					
vices 👻 🕈 🛪 🗙	Ethernet Modbus	s_TCP_Master 🛛 🚮 M	dbus_TCP_Slave	Device /	ModbusTCP	Slave_Device X			
DibledI	General	Find		Filter Show all		- 🕪 Add	FB for IC	O Channel →	Goto
Device (C3351-A00)     Device (C3351-A00)	- Concrui	Madable	Manufac	Channel	A 44	Tar	11-24	Description	_
Application	Serial Gateway	variable	mapping	Channel	Address	ivpe	Unit	Description	а.
Library Manager	Modbus TCP Slave Device I/O			Holding Registers	%IW10	ARRAY [09] OF WORD			4
PLC PRG (PRG)	Mapping			Holding Registers[U]	%1W10	WORD			-
- 144 Task Configuration	Modbus TCP Slave Device IEC			Holding Registers[1]	%IW11	WORD			-
🖹 🕄 MainTask	Objects			Holding Registers[2]	%IW12	WORD			-
B) PIC PRG	Chature			Holding Registers[3]	%IW13	WORD			-
1 mil IO Modules (IO Modules)	0.0.00			Holding Registers[4]	%elW/14	WORD			-
Ethernet (Ethernet)	Information			Holding Registers[5]	%IW15	WORD			-
- fill Modbus TCP Master (Modbus TCP Master)				Holding Registers[6]	%IW16	WORD			-
Modbus TCP Slave (Modbus TCP Slave)				Holding Registers[/]	%IW1/	WORD			-
ModbusTCP Slave Device (ModbusTCP Slave				Holding Registers[8]	%IW18	WORD			-
·	1			Holding Registers[9]	%IW19	WORD			-
		0 V		Input Registers	%QW0	ARRAY [09] OF WORD			-
				Input Registers[0]	SEQWO	WORD			-
				Input Registers[1]	%QW1	WORD			-1-
				Input Registers[2]	%QW2	WORD			-1-
		L		Input Redisters[3]	%OW3	WORD			_

Next, open the third-party master station simulation software 'Modbus Poll', and press 'Ctrl+N' to create two Modbus Poll windows, right-click on the blank space of the two windows respectively - select the 'Read/Write Definition' setting. Click the 'Function' of the 1<sup>st</sup> window and select '03 Read Holding Registers (4x)', and 'Quantity' could be set to the holding register length configured in CODESYS. Click the 'Function' of the 2<sup>nd</sup> window and select '04 Read Input Registers (3x)', and 'Quantity' could be set to the input register length configured in CODESYS:

Modbus Poll - Mbpoll2		-	$\times$
File Edit Connection Setup Functions Display View Window Help			
🗅 📽 🖬 🎒 🗙 🛅 🙁 🚊 💷 05 06 15 16 17 22 23   TC 🗵	<b>8 ⊮</b> ?		
Alternoit         Connection           1         0         0           2         0         3           3         0         3           4         0         5           6         0         6	Read/White Definition X Slove ID: II DK Function DE Read Input Registers (3x) Cancel Addess: 0 Protocol addess. E.g. 30011 > 10 Gunnhy 10 Scan Rate: 1000 [ms] Apply		

After the completion, return to the CODESYS interface, re-download and log in to the C3351 device. For the method, refer to <u>5.4 download, Monitor</u>. At this time, it will prompt that the Bus is not running. This is a normal situation:

Devices - 7 ×	Ethernet	Modbus TCP Master	Modbus T	CP Slave	Mod	busTCP Slave Device	×		
(insted 1     (connected] (C3351-A00)	The bus is not run	ning. The shown va	lues are perhaps not act	ual	• 🕂 Add	FB for IO Channel →=	Go to Instance		_
Comparison of the second	Variable           ***         **           **         *           **         *           **         *           **         *           *	Ic Appendix Control of the second sec	Channel Holding Registers Registers Registers Holding Registers Registers Holding R	Address %IW10 %IW10 %IW11 %IW12 %IW12 %IW12 %IW15 %IW15 %IW15 %IW15 %IW15 %IW18 %IW19 Reset Mapp	Type         ARRAY (0, -8) GF WORD           WORD         WORD	Current Value Inst content dimaldated> dimaldated> dimaldated> dimaldated> dimaldated> dimaldated> 0 0 0 0 0 0	Prepared Value	Unit	

Go back to the 'Modbus Poll' software, and press 'F3' to connect, and set the 'Connection Setup' type, IP address and port number in the pop-up interface:

🖓 Modbus Poll - Mbpoll2			– 🗆 X
File Edit Connection Setup Functions Display View Window	Help		
🗅 🚅 🖬 🎒 🗙 🗂 🗏 🊊 🕕 05 06 15 16 17 22 2	3 TC 🖻 💡 📢		
Mappell         Image: Control of the second se	F = C4: SR 00000 Connection Setup Connection Connection Connection Connection Connection Connection Connection Setup Setup Set	X Carcel Mode ORTU ASCII Regiones Timicot 20 [ms] Deby Between Pols 20 [ms] OIFM OIFM OIFM	

Back to CODESYS, it could find that all devices are running normally:

		<pre>#odbus_TCP_Master</pre>	Modbus_T	DP_Slave	Device Mod	busTCP_Slave_Device	×			
Untitled1     Vice (connected) (C3351-A00)	Find		Filter Show all		- 🖶 Add	<ul> <li>Add FB for IO Channel</li></ul>				
Bill PC Loge     Coge     Coge	Winkble           Winkble <td< th=""><th>Μαρρίηg           Παρρίηg           <t< th=""><th>Channel Halding Registers Halding Registers[0] Halding Registers[1] Halding Registers[1] Halding Registers[1] Halding Registers[2] Halding Registers[2] Halding Registers[3] Halding Registers[3] Halding Registers[3] Input R</th><th>Address 96W 10 96W 10 96W 11 96W 12 96W 13 96W 13 96W 14 96W 15 96W 16 96W 16 96W 18 96W 18 96W 19 96Q 00 Reset Mapp</th><th>Type           ARRAY [0, a] OF WORD           Base</th><th>Current Volue Hot costand dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; 0 0 0 0 0 0 0 0 0 0 0 0 0</th><th>Prepared Volue</th><th>Unit</th></t<></th></td<>	Μαρρίηg           Παρρίηg           Παρρίηg <t< th=""><th>Channel Halding Registers Halding Registers[0] Halding Registers[1] Halding Registers[1] Halding Registers[1] Halding Registers[2] Halding Registers[2] Halding Registers[3] Halding Registers[3] Halding Registers[3] Input R</th><th>Address 96W 10 96W 10 96W 11 96W 12 96W 13 96W 13 96W 14 96W 15 96W 16 96W 16 96W 18 96W 18 96W 19 96Q 00 Reset Mapp</th><th>Type           ARRAY [0, a] OF WORD           Base</th><th>Current Volue Hot costand dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; dimalated &gt; 0 0 0 0 0 0 0 0 0 0 0 0 0</th><th>Prepared Volue</th><th>Unit</th></t<>	Channel Halding Registers Halding Registers[0] Halding Registers[1] Halding Registers[1] Halding Registers[1] Halding Registers[2] Halding Registers[2] Halding Registers[3] Halding Registers[3] Halding Registers[3] Input R	Address 96W 10 96W 10 96W 11 96W 12 96W 13 96W 13 96W 14 96W 15 96W 16 96W 16 96W 18 96W 18 96W 19 96Q 00 Reset Mapp	Type           ARRAY [0, a] OF WORD           Base	Current Volue Hot costand dimalated > dimalated > dimalated > dimalated > dimalated > dimalated > dimalated > dimalated > dimalated > 0 0 0 0 0 0 0 0 0 0 0 0 0	Prepared Volue	Unit		
	Watch 1 Expression	Applicatio	n Type	Valu	re Prepared	value Execution point	1	- 1		

The following is the verification of the communication. The first step is to double-click to modify the input register Prepared Value to 1111 in the 'ModbusTCPSlaveDeviceI/O Mapping' of the 'Modbus TCP Slave Device', and press 'Ctrl+F7' to write:

Untitled1.project* - CODESYS								-	×
File Edit View Project Build Online Debug	Tools Wine	dow	Help						₹4
🛅 🚅 🖬 🚳 🗠 🗠 🐰 🗞 🋍 🗙 🖊 🌿	11 11 11	省	🖷 i 🔤 - 🕤 i 🕮 i	Application	[Device: PLC Logic] 🔹 🎯	🗳 🕞 🖬 %   CH 9	6 6 6 8   ¢   🛒	1 T	
Devices 👻 🕈 🗙	Modb	usTC	P_Slave_Device 🗙						-
Ohttled1     Onected] (C3351-A00)	Find			Filter Sh	ow all	- dp A	dd FB for IO Channel 🔶	Go to Instance	
PLC Logic	Variable	М	Channel	Address	Туре	Current Value	Prepared Value Unit	Description	
Application [run]	🖃 🍫		Holding Registers	%IW10	ARRAY [09] OF WORD				
Library Manager	B- 🏘		Holding Registers[0]	%IW10	WORD	0			
PLC_PRG (PRG)	🛞 🏘		Holding Registers[1]	%IW11	WORD	0			
Task Configuration	🛞 - 🍫		Holding Registers[2]	%IW12	WORD	0			
🖃 🍤 😂 MainTask	· · · · · ·		Holding Registers[3]	%IW13	WORD	0			
- @ PLC_PRG	8- 🐲		Holding Registers[4]	%IW14	WORD	0			
O Modules (IO Modules)	B- 🍫		Holding Registers[5]	%IW15	WORD	0			
Ethernet (Ethernet)	· · · •		Holding Registers[6]	%IW16	WORD	0			
Modbus_TCP_Master (Modbus TCP Master)	B- 🐪		Holding Registers[7]	%IW17	WORD	0			
Modbus_TCP_Slave (Modbus TCP Slave)	i 🖲 🏘		Holding Registers[8]	%IW18	WORD	0			
ModbusTCP_Slave_Device (ModbusTCP Slave	🗷 🐪		Holding Registers[9]	%IW19	WORD	0 Cui+r/	<b>V</b>		
	8-50		Input Registers	%QW0	ARRAY [09] OF WORD	Not updated			
	8-10		Input Registers[0]	%QW0	WORD	1111	1111		
	B- 🌘		Input Registers[1]	%QW1	WORD	0			

Back to the 'Modbus Poll' software, you will find that the value of Mbpoll2 has been modified successfully, now double-click the first data of Mbpoll1, and modify the 'Value' to 55:



Back to the CODESYS software, we will find that the first data value of the holding register has been modified to 55, this indicating that the communication function is normal:

Untitled1.project* - CODESYS										-	×
File Edit View Project Build Online Debug	Tools Wind	low	Help								₹4
🛅 🚅 🖬 🚳 🗠 🗠 🖁 🛍 🗙 🖬 🍇 📥 🌿	11 11 11	省日	🖷 i 🛅 - 🗗 i 🕮 i	Application	[Device: PLC Logic] 🔹 🎯	Q∰ →	■ %   (= 9	is is is \$   €		1 T 1 T	
Devices - # X	Modb	USTCP	_Slave_Device X								
Untitled 1     Unit led 1     Off Device [connected] (C3351-A00)	Find			Filter Sh	ow all		- ф A	dd FB for IO Chann	el →	Go to Instance	
B I PLC Logic	Variable	М	Channel	Address	Туре		Current Value	Prepared Value	Unit	Description	
Application [run]	8- <b>%</b>		Holding Registers[0]	%IW10	WORD	55					
Library Manager	🛞 - 🎲		Holding Registers[1]	%IW11	WORD	0					
PLC_PRG (PRG)	🛞 🏘		Holding Registers[2]	%IW12	WORD	0					
Task Configuration	🛞 - 🦄		Holding Registers[3]	%IW13	WORD	0	(12 D 4+ 4 )				
🗏 🍤 🐼 MainTask	🛞 👋		Holding Registers[4]	%IW14	WORD	0	52 byte 4				
- C The second	🛞 - 🏘		Holding Registers[5]	%IW15	WORD	0					
IO_Modules (IO Modules)	🗷 👋		Holding Registers[6]	%IW16	WORD	0					
O O O O O O O O O O O O O O O O O	🛞 - 🏘		Holding Registers[7]	%IW17	WORD	0					
Modbus_ICP_Master (Modbus ICP Master)	B- 🐐		Holding Registers[8]	%IW18	WORD	0					
Modbus_TCP_slave (Modbus TCP slave)	🖻 - 🏘		Holding Registers[9]	%IW19	WORD	0					
	8- 0		Input Registers	%QW0	ARRAY [09] OF WORD						
	B- 🖗		Input Registers[0]	%QW0	WORD	1111		1111			
	8- 9		Input Registers[1]	%QW1	WORD	0					
	🗐 - 🌘		Input Registers[2]	%QW2	WORD	0					

So far, the Modbus TCP client/server function test of the C3351 device is completed.

# **5.6 Modbus RTU Master function**

# NOTICE

#### **DEVICE INOPERABLE**

•This section involves the use of USB to 485 converter equipment. It is recommended to read <u>Annex 7.2.3</u> in advance and purchase relevant equipment to connect to the 485 interface of the C3351 device before performing operations in this section. Refer to <u>2.3.2 485 interface</u>.

#### Failure to follow the above instructions could result in damage to the equipment.

Next, we continue to demonstrate the Modbus RTU master function. Continue to use the project in the previous section, right-click the C3351 device  $\rightarrow$  'Add Device', and select Modbus-Modbus serial port 'Modbus COM' in the pop-up page, the supplier is 3S – Smart Software Solutions GmbH.



Right-click the 'Modbus\_COM' just created in the project tree, select 'Add Device'  $\rightarrow$  add a device named 'Modbus Master, COM Port'.



Right-click the 'Modbus Master, COM Port device' just created in the project tree, select 'Add Device'  $\rightarrow$  add a device named 'Modbus Slave, COM Port'.

File Edit View Project Build Online Debug   Add Device     Image: Module State COM Port     Image: Module State Comparison     Image: Module Comparison     Image: Module State Comparison     Image: Module Sta	Untitled1.project* - CODESYS		×
Image: Solution Control       Image: Solution Control         Image: Solution Control       Image: Solution Control <td>File Edit View Project Build Online Debug</td> <td>Add Device</td> <td>× <b>₹</b>4</td>	File Edit View Project Build Online Debug	Add Device	× <b>₹</b> 4
Devices          • • • • • • • • • • • • • • •	≌≌∎⊜⊳∝Հ⊾≋≍⊭‱≝⊴∣,	Name Modbus_Slave_COM_Port	응   ㅎ   题   쿡   캇
Control of the set of the se	Devices - 7 X	Action Append device Insert device Plug device Update device	•
Bit R C Loge       Version       Version       Description         Bit R C PGR PRO       Image: Module Save, COM Port       35 - Snart Software Solutions GebH       4.1.0.0       A genetic device         Bit D Prodets (C DM solution)       Image: Module Save, COM Port       35 - Snart Software Solutions GebH       4.1.0.0       A genetic device         Bit D Prodets (C DM solution)       Image: Module Save, COM Port       35 - Snart Software Solutions GebH       4.1.0.0       A genetic device         Bit Module Save, COM Port       Bit Module Save, COM Port       35 - Snart Software Solutions GebH       4.1.0.0       A genetic device         Bit Module Save, COM Port       Bit Module Save, COM Port       35 - Snart Software Solutions GebH       4.1.0.0       A genetic device         Bit Module Save, COM Port       Bit Module Save, COM Port       Bit Module Save, COM Port       Image: Snart Software Solutions GebH       Image:	Gil Unbled I     F	String for a full text search Vendor <all vendors=""></all>	Channel * Go to Instance
Application     Applicati	🖷 🛐 PLC Logic		Description
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Image: Martak       Image: Martak         Image: Martak	PLC_PRG (PRG)	in this Modbus	
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Poix 2 Devices     Update Device     Order Number -       Description     Description       Build     Edit ID mapping       Description     Import mappings for CSV       Description     Epidemic SV	Disable Device	Version: 4.1.0.0	
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nice opproductions by two Export mappings to CSV	The application is up to	(You can select another target node in the navigator while this window is open.)	Position
Add Device Close	Build complete 0 errors yo warrings - ready for download	Add Device Close	
		Lasthuide O 0 0 December 4	Desiret www. (esheath.)

The required equipment has been created. Next, we configure the parameters of the master station and the third-party slave station simulation software Modbus Slave. Double-click the 'Modbus COM device' in the project tree-select 'General' in the main interface on the right, and then configure the serial port according to the actual situation:

<ul> <li>Untitled1.project* - CODESYS</li> <li>File Edit View Project Build Online Debug</li> </ul>	Tools Window Help				- 0 ×	
管 📽 🔜   🚳   오 으 ※ 👒 噫 🗙   🏘 🍇 🐴 🍇	🛓 📕 🎕 🎕 🦄 🐘 🔛 🕤 🕮 🛛 Application [De	wice: PLC Logic] 🝷 😋 👀 📦 🔳 🕯	(1) E F2 42 42 1	3   o   露   국   킹	/	
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Constant     Constant	General Serial Port Configure Serial Port Configure Status Information Data bits Stop bits	ation				
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VICE INOPERABLE						
e COM port here must be set to 2						

Failure to follow the above instructions could result in damage to the equipment.

Next, double-click 'Modbus Master COM Port Device'  $\rightarrow$  select 'General' on the main interface on the right, and set the transmission mode to RTU, and set the response timeout time, frame interval time. It is recommended to click 'Auto-restart communication':

Untitled1.project* - CODESYS				- 0 ×
File Edit View Project Build Online Debu	ig Tools Window Help 缢 員気気機()[臨 箇+音	遡   Application [Device: PLC Logic] 🔹 😋 🕻	छ → = ≪।(व •व •ेव •ेव \$   ♦  ∰।च ।	₹4 ₹
Devices	Modxus_COM I Hodi	Modbus RTU/ASCII Transmission mode RTU/ASCII Transmission mode RTU Response timeout (ms) 1000 Time between frames (ms) 10 Auto-restart communication	ASCH MODBUS	

Next, double-click 'Modbus Slave COM Port Device'  $\rightarrow$  select 'General' on the main interface on the right, and set the slave station address and response timeout time:



Then select 'Modbus Slave Channel' - 'New Channel', and set various parameters in the pop-up window:

File Edit View Project Build Online Debu	g Tools Window Help	囲   Application [Device PLC Legic] - 야 역 → 표 약 [대 앱 앱 앱 전 위 후   종   수   종   국   장	<b>*</b> 4
Borker (13351.400)     Borker (13511.400)     Borker (13511.400)     Borker (13511.400)     Borker (13511.400)     Borker (13511.400)     Borker (13511.400	General General Modbus Save Channel Q Modbus Save Juit Modbus CenericGenalSave IEC Objects Status Information	Modbus Channel     X       Charnel     X       Charnel     X       Charnel     X       Access type     Read Holding Registers (Function Code 3)       Comment     X       Comment     X       READ Register     Condition       Offset     10000       Length     1       Error handling     Keep last value       VRUE Register     Offset       0fset     0       Concel     0K	nment
POUs Z Devices Messages - Total 1 error(s), 0 warring(s), 0 message(s)		Move Up Move Down Add Channel. Delete Edit	ф. ж
Build -	🗘 0 error(s) 😗 0 warning(s) 😲 0 i	i message(s) 🛛 🗙 💸	

After the addition is complete, we can find that there is an option of 'ModbusGenericSerialSlaveI/O Mapping' in the menu. Click this option to view the address mapped in the C3351 device by the channel just established.

# NOTICE

#### **DEVICE INOPERABLE**

•The channel length is limited, please refer to 3.3 Programming Specification

Failure to follow the above instructions could result in damage to the equipment.

				OPI_POR X			
Childen (Casta App)	General	Find	Filter	show all	-	🕆 Add FB	for IO Channel
PLC Logic		Variable	Mapping Chan	nel Address	Туре	Unit	Description
🖹 🚫 Application	Modbus Slave Channel	- 10	Chan	vel 0 %IW20	ARRAY [0,.9] OF WORD		Read Holding Regis
- 📶 Library Manager	Modbus Slave Init	8.49	Chann	el 0[0] %IW20	WORD		0x0000
PLC_PRG (PRG)	Product State Line		Chanr	vel 0[1] %IW21	WORD		0x0001
🖹 🎆 Task Configuration	ModbusGenericSerialSlave I/O	8-10	Chann	el 0[2] %IW22	WORD		0x0002
🖹 🆃 MainTask	Mapping	- + ×	Chann	vel 0[3] %IW23	WORD		0x0003
- 셴 PLC_PRG	ModbusGenericSerialSlave IEC Objects	B- 30	Chann	vel 0[4] %IW24	WORD		0x0004
IO_Modules (IO Modules)	objecto	B-*9	Chann	vel 0[5] %IW25	WORD		0x0005
Ethernet (Ethernet)	Status	B- No.	Chann	vel 0[6] %IW26	WORD		0x0006
Modbus_TCP_Master (Modbus TCP Master)	ster)	- <b>1</b>	Chann	nel 0[7] %IW27	WORD		0x0007
Modbus_TCP_Slave (Modbus TCP Slave)	Slave) Information	H- No	Chann	vel 0[8] %IW28	WORD		0x0008
ModbusTCP_Slave_Device (ModbusTC)	Slaw	<u> </u>	Chann	vel 0[9] %IW29	WORD		0x0009
		Read Holding Registers	Reset Mapping	Always update va	riables Use parent device s	etting	
POUs Devices		Read Holding Registers	Reset Mapping	Always up date va	riables Use parent device s	etting	
POUs 🗶 Devices Sages - Total 1 error(s), 0 warring(s), 0 message(s)		Read Holding Registers	Reset Mapping	Always up date va	riables Use parent device s	etting	•
POUs S Devices Sasages - Total 1 error(s), 0 warring(s), 0 message(s) id	O error(s)     O warning(s)	Read Holding Registers	Reset Mapping	Always up date va	riables Use parent device s	etting	·
POUS Se Devices Sector Devices Sector Devices (0, 0 warning(s), 0 message(s) id	- O error(s) 🕈 0 warning(s)	Read Holding Registers	Reset Mapping	Always update va	riables Use parent device s Object	etting	- Position

Now it needs to open the 'Modbus Slave' third-party slave station simulation software. And press 'F3' to open the connection setting page, then set 'Connection' to 'Serial Port'. The Serial Settings include COM port selection, baud rate selection, data bit selection, parity check, stop bit selection and mode selection, which should match the parameters of the Modbus COM device in CODESYS:

Modbus Slave - Mbslave1		-	×
File Edit Connection Setup Display View Window Help			
D 📽 🖬 🚭 🛅 🗒 🚊 🔋 😢			
Mbslave1			
ID = 1: F = 03			
No connection			
Alias 00000			
0 0			
1 0	Connection Setup X		
2 0			
3 0	Connection OK		
	Setial Pott		
4 0	Serial Settings		
5 0	USB Serial Port (COM14)		
6 0	Mode		
7 0	SOU Baud V ORTU OASCII		
8 0	8 Data bits V		
9 0	None Parity DSR CTS RTS Toggle		
	1 feel DTC disable dolay		
	1 Stop Bk V I I I I I I I I I I I I I I I I I I		

After completion, return to the CODESYS interface, it could download and log in to the C3351 device. For the method, please refer to <u>5.4 download, Monitor</u>. Then it could find all devices are in the running status, which indicates that the connection is successful. Now click on the 'ModbusGenericSerialSlaveI/O Mapping' option of the 'Modbus Slave COM Port Device', it can monitor the current value of the channel map:

s 🕶 #	X Modbus_Slave_COM	_Port X						
Ontified I On the Internet of Connected (C3351-A00)	eral	Find		Filter Show all		- 4	Add FB for IO Cha	nnel
PLC Logic	ibus Claus Channel	Variable	Mapping	Channel	Address	Туре	Current Value	Prepar
🖹 🔘 Application [run]	IDUS Slave Channel	B- <b>%</b>		Channel 0	%IW20	ARRAY [09] OF WORD		
Library Manager	Ibus Slave Init	iii - ¥≱		Channel 0[0]	%IW20	WORD	0	
PLC_PRG (PRG)		B- 🍫		Channel 0[1]	%IW21	WORD	0	
Task Configuration	IbusGenericSerialSlave I/O	B- 🍫		Channel 0[2]	%IW22	WORD	0	
🖹 😏 😻 MainTask	iping .	B- 🍫		Channel 0[3]	%IW23	WORD	0	
PLC_PRG	tous Generic Serial Slave LEC	18 · 🍫		Channel 0[4]	%IW24	WORD	0	
IO_Modules (IO Modules)		B-*9		Channel 0[5]	%IW25	WORD	0	
Contract (Ethernet)	us	18 - Ng		Channel 0[6]	%IW26	WORD	0	
G Modbus_COM (Modbus COM)	and the second se	B-*>		Channel 0[7]	%IW27	WORD	0	
G Modbus_Master_COM_Port (Modbus Mast	er, mation	18 - Ng		Channel 0[8]	%IW28	WORD	0	
🧐 🔟 Modbus_Slave_COM_Port (Modbus Slave_COM_Port (Modbus Slave)	ave	B- 🍫		Channel 0[9]	%IW29	WORD	0	

Go back to the third-party slave station simulation software 'Modbus Slave',

double-click the first data, and a modification window will pop up, then modify the value of the first data to 55:



Going back to the CODESYS page, we can find that the current value of the WORD type data with the address %IW20 has been changed to 55, indicating that the communication is normal and the master station function is successfully implemented:

Unbled1  Gild Device [connected] (C3351-A00)  Gild Device [connected] (C3351-A00)  Gild Device [connected] (C3351-A00)  Gild Device [connected]  Gild Device [connected]	eral	Find			e			
PLC Logic     Application [run]				Filter Show all		-	🗣 Add FB for IO Cha	nnel
Application [run]	11 01 01 1	Variable	Mapping	Channel	Address	Type	Current Value	Prepare
All there there are	Ibus Slave Channel	8-39		Channel 0	%IW20	ARRAY [09] OF WORD	and a later	
Library Manager	thus Slave Init	÷ *2		Channel 0[0]	%IW20	WORD	55	
- 💼 PLC_PRG (PRG)	1005 Store Inc			Channel 0[1]	%IW21	WORD	0	
Task Configuration	ibusGenericSerialSlave I	0 🛞 🦄		Channel 0[2]	%IW22	WORD	0	
🖹 😏 🆃 MainTask	iping	÷ *		Channel 0[3]	%IW23	WORD	0	
BI PLC_PRG	ibusGenericSerialSlave II	C 😐 🧤		Channel 0[4]	%IW24	WORD	0	
🖲 😏 🔝 IO_Modules (IO Modules)		· · · · · · · · · · · · · · · · · · ·		Channel 0[5]	%IW25	WORD	0	
🖲 🚱 🔟 Ethernet (Ethernet)	us	🛞 - 🍫		Channel 0[6]	%IW26	WORD	0	
😑 😏 🎬 Modbus_COM (Modbus COM)		· · · · · · · · · · · · · · · · · · ·		Channel 0[7]	%IW27	WORD	0	
🖻 😏 📊 Modbus_Master_COM_Port (Modbus Mas	ter, rmation	· · · · ·		Channel 0[8]	%IW28	WORD	0	
😔 🚮 Modbus_Slave_COM_Port (Modbus S	lave	· · · · · · · · · · · · · · · · · · ·		Channel 0[9]	%IW29	WORD	0	
		Read Holding Registers	Reset M	apping Alw	ays update var able	iables Use parent device s	– etting	
	Watch 1							- 0
	Expression	Application	Type	Value	Prep	ared value Execution po	int	• •
	Watch 1 Expression	Application	Туре	Value	Prep	ared value Execution po	int	

So far, the Modbus RTU master function test of the C3351 device is completed.

## **5.7 Modbus RTU Slave Station Function**

We continue to demonstrate the Modbus RTU master functionality. Continue to use the project in the previous section, right-click on the C3351 device  $\rightarrow$  'Add Device', and select Modbus-Modbus Serial Port $\rightarrow$ 'Modbus COM' in the pop-up page. The supplier is 3S – Smart Software Solutions GmbH.

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File Ec	lit	View Project Build Online	Debug	To	Add Device	×			₹4
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					ame Modbus_COM_1	_			
Devices		<b>→</b> 4	×	1	Artion				-
= ) Unt	tled 1		T		Append device () Insert device () Plug device () Update device		-		
ė- 🚮	Device	(C3351-400)	1	Gen	Stripp for a full text search Vendor call verdore >			Add Fl	B for IO Channel
8	å	Cut		Moc	Name Vendor Version Description	-		Unit	Description
	93	Сору			The Manalassa in		[09] OF WORD		Read Holding Register
		Paste		Mod	B- M Eieldhuses				0x0000
	$\mathbf{x}$	Delete		Moc	R- CAN CANDUS				0x0001
	i 🔒	Properties		Мар	* Brote EtherCAT				0x0002
	80	Add Object		Moc	🛞 - 🎬 Ethernet Adapter		-		0x0003
		Add Folder		UBJ	🛞 😔 EtherNet/IP				0x0005
	Ē	Add Device		Stat	🕮 🖆 Home8Building Automation				0x0006
8-		Had beneen			m - Kill Modbus				0x0007
	2	Edit Object	ster,	TULO	🖃 💶 🖉 Modbus Serial Port				0x0008
		Edit Object	Slaw	_	Modbus COM 3S - Smart Software Solutions GmbH 4.1.0.0 A serial COM Por	toni			0x0009
	*	Edit IO mapping Import mappings from CSV Export mappings to CSV Online Config Mode			# ■ Profinet ID ★ S sercos				
		Enable SoftMotion			Group by category 🗌 Display all versions (for experts only) 📄 Display outdated versions				
		Reset Origin Device [Device]			Name: Modbus COM		Jse parent device se	tting	
		Simulation			Vendor: 35 - Smart Software Solutions GmbH Categories: Modbus Serial Port				
POUs S	e De	vices	_	-	Version: 4.1.0.0				
E				_	Description: A serial COM Port on a Windows PC.		-		
Messages -	lotal	1 error(s), 0 warning(s), 6 message(s)				-			* 4 ×
Build			•	<b>O</b> 0	Append selected device as last child of				
Descriptio	n						Object	P	osition
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Typify o	ode				Add Davice Close				
Genera	te cod	e			Add Device	-			
Conner	to alab	ad lakasankana		-	Last huid: 🙆 0, 🕐 0 Precomple 🏒 📴		Project user: (	(vhody	0 0
	-			-			rioject obeir (		v -

The difference is that we need to disable the Modbus COM device added in the previous section, and it needs to right click on the device and select Disable Device.

P X     Modbus Slave COM_      Device (C353:4:00)     Perice (C	Port X Find Variable = -10 = -10 = -10 = -10 = -10 = -10 = -10	Mapping	Filter Show all Channel Channel 0	Address	• s	P Add F	for IO Channel
electr (2331-A00) Bit Rc Logic Charles (2331-A00) Bit Rc Logic Charles (2331-A00) Bit Rc Roper(2) Bit	Find Variable ⊕-*3¢ ⊕-*4¢ ⊕-*4¢	Mapping	Filter Show all Channel Channel 0	Address	• Type	Add F	3 for IO Channel
Device (C333:400)         General           PLCLogic         Modbus Slave Channel           Modbus Slave	Variable	Mapping	Channel Channel 0	Address	Type	Unit	
III RL Cage Modbus Slave Channel	Variable           ⇒	Mapping	Channel Channel 0	Address	Type	Unit	
Application     Mothers y lanager     Act proc (PRG)     Mothers Save Ent     Modbus GenericSenalSave El     Modbus GenericSenalSave El     Modbus GenericSenalSave El     Modbus GenericSenalSave El			Channel 0			onin	Description
Lotary Manager     Modbus Slave Init     Garce Grading State Configuration     Garce Manager     Modbus CentricSet al Slave I/     Garce Manager     Modbus CentricSet al Slave I/     Direct All Slave I/     Dir	● <del>● *</del> ● ● <del>● *</del> ●			%IW20	ARRAY [09] OF WORD		Read Holding Regis
In C_Proc (HKo)     ModbusGenericSerialSlave I/     Mapping     ManTask     ModbusGenericSerialSlave IE     ModbusGenericSerialSlave IE     Objects	0 B-10		Channel 0[0]	%IW20	WORD		0x0000
Mapping Pask Comparation Mobility Comment Serial Slave In Mobility Comment Serial Slave In Mapping Decision Comment Serial Slave IE Objects	×   ⊕-*≱		Channel 0[1]	%IW21	WORD		0x0001
PLC_PRG Objects			Channel 0[2]	%IW22	WORD		0x0002
Objects	c 🕀 - 🍫		Channel 0[3]	%IW23	WORD		0x0003
1 Mill TO Manhalan (TO Manhalan)	· · · · ·		Channel 0[4]	%IW24	WORD		0x0004
The sector (Ethermone)	8-*		Channel 0[5]	%IW25	WORD		0x0005
(if the hus control to the control	B- 19		Channel 0[6]	%IW26	WORD		0x0006
Toformation	B- 🍫		Channel 0[7]	%IW27	WORD		0x0007
Bb. Conv	B- 🍫		Channel 0[8]	%IW28	WORD		0x0008
	B- 🍫		Channel 0[9]	%IW29	WORD		0x0009
UEN Paste							
× Delete							
Properties							
Add Object							
Add Folder							
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Disable Device							
Under Device	Read Holding Registers	Reset M	apping Alw	ays update va	riables Use parent device se	tting	
Update Device	× Create conversio	hia 2a - Ma	a ta aviatia a una	inhla			
Edit Object	a Create new varia	Die 🧔 = Mit	ip to existing var	lable			
Edit Object With	C						
- Te Edit IO mapping							<b>•</b> 0
Import mappings from CSV	C f manager (s) X X						
Export mappings to CSV	) o message(s) <						
on				Project	Object	P	asition
Build started: Application: Device.Application							
code							

Right-click the newly created Modbus COM 1 in the project tree, select Add Device  $\rightarrow$  add a device named 'Modbus Serial Device'.

2000 Strategy Constant		
<ul> <li>Ontitled i.project - CODESYS</li> </ul>		- 0 ×
File Edit View Project Build Online Deb	19 To 🗃 Add Device >	₹4
🎦 📽 🔛 🚳 🗠 🗠 🏷 🖓 🍪 🖄	54 Mar 1997	\$   ¢   ∰   <b>च</b>   ∛
	Name modbus_senal_bevice	
Devices - 4 X	Action	-
= 🗿 Untitled1	Append device () Insert device () Plug device () Update device	
🖹 - 🚮 Device (C3351-A00)	Gen String for a full text search Vendor call vendores	
E I PLC Logic		
Application	Sen Name Vendor Version Description	
🛗 Library Manager	Stat	
Tack Configuration	The second secon	
A MainTask	Into	
● PLC_PRG	R- III Modbus Serial Master	
IO_Modules (IO Modules)		
Ethernet (Ethernet)		
-      Modbus_COM (Modbus COM)		
Modbus COM 1 (Modbus COM)		
R Conv		
Paste		
× Delete		
Properties		
Add Object		
add Folder	Group by category Display all versions (for experts only) Display outdated versions	
Add Device	Name: Modbus Serial Device	
Insert Device	Vendor: 3S - Smart Software Solutions GmbH	
Disable Device	Categories: Modbus Serial Device	
POUs Se Dev Update Device	Order Number: -	
Edit Object	Description: A device that works as a Modbus Serial standalone slave.	
Edit Object With		• 4 X
Edit IO mapping	Append selected device as last child of Modhus COM 1	
Description Import mappings from CSV	(You can select appther target gode in the pavigator while this window is open.)	Object Position
Build sta Export mappings to CSV		1
rypity code	Add Device Close	
Conserts alabal initializations		
	Last build: 🥥 0 😗 0 Precomple 🗸 🚰	Project user: (nobody) 🛛 🖗 🗠

Next, it could set the parameters of the slave station and the third-party master station. Here, the third-party master station simulation software Modbus Poll is used to simulate the connection of the slave station device. Similarly, double-click the Modbus COM 1 device just added to the project  $\rightarrow$  select 'General' option and configure the serial port.

### NOTICE

#### **DEVICE INOPERABLE**

•Here the COM port must be set to 2.

Failure to follow the above instructions could result in damage to the equipment.

Untitled1.project* - CODESYS					-	×
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🗎 📽 📓   🥔   🗠 兴 🐚 🎼 🗙   🏘 🌿 🎂 1	🌜 🔲 🧃 🦄 🛍 🛅 🗂	Application [Device: PLC L	ogic] 🔹 👒 🕬 🕞 🔳 🔦	(≣ 9≣ 4 <u>≣</u> 9≣   ♦   ∭	₩   %	
Devices - 4 ×	Modbus_Slave_COM_Port	Modbus_COM_1 X	Modbus_Serial_Device			•
Elimination     Eliminat	SenialTort Parameters Setus Information	Serial Port Configuration COM port Baud rate Parity Data bits Stop bits	2 0 5600 V NONE V 8 1			

Double-click 'Modbus Serial Device', and select 'General' in the main interface on the right, and set the unit ID, holding register length, and input register length in the configuration parameters:

#### ● Unbitled Jproject - CODESYS File Edit View Project Build Online Debug Tools Window Help 答 當 圖 圖 (> < > ※ 職 職 × ) 為 低 遇 通 [用 別 別 酒 酒 []] (\* ① []] Application [Device PLC Logic] - 第 第 ④ → ■ ※ [耳 雪 雪 雪 雪 雪 雪 声 《 | 頁 雪 雪 雪 雪 声 》 – 🗆 🗙 - # X Modbus\_Slave\_COM\_Port Modbus\_COM\_1 Modbus\_Serial\_Device X General 1 D ice (C3351-A00) 1 🔹 Unit ID Modbus Serial Device I/O Mappin 0 -onlication Watchdog 500 👘 Library Ma Modbus Serial Device IEC Objects Holding registers 10 🗧 (%IW) 🗌 Writeable LC PRG (P Status Input registers 🔹 (%QW) Information Discrete Bit Area Coils 0 ‡ (%D() 0 ‡ (%QX) Discrete Inputs vice (Modbus Serial Dev StartAdd Coils • Discrete inputs Holding registe Input registe \$ 🗋 POUs 🧝 Devices Messages - Total 1 error(s), 0 warning(s), 6 n • # X - O error(s) 🕚 0 warning(s) 🜖 6 message(s) 🗙 💥 Build escript -- Build started: App Typify code... Generate code Last build: 😋 0 🕐 0 Precompile 🗸 😭 Project user: (nobody) ۵۵ 🚯

#### od•t Sichuan Odot Automation System Co., Ltd

After the setting is complete, we click the option of 'Modbus Serial Device I/O Mapping' to view the address mapped in the C3351 device by the newly established slave device.

# NOTICE

#### **DEVICE INOPERABLE**

•The channel length is limited, please refer to 3.3 Programming Specification.

Failure to follow the above instructions could result in damage to the equipment.

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🗣 - 🚮 Modbus_COM (Modbus COM)		1.4		Holding Registers[7]	%IW37	WORD		
Modbus_COM_1 (Modbus COM)		1.4		Holding Registers[8]	941W/38	WORD		
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		8.50		Input Registers	%OW10	ARRAY [0, 9] OF WORD		
		8-50		Input Registers[0]	%OW10	WORD		
		8.50		Input Registers[1]	%OW11	WORD		
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uild escription Buld started: Application: Device.Application Typify code				Pro	jett	object	- Californ	

Next, please open the third-party master station simulation software 'Modbus Poll', and press 'Ctrl+N' to create two Mbpoll windows, and right-click on the blank space of the two windows respectively - select the 'Read/Write Definition' setting. Click the 'Function' of the 1<sup>st</sup> window and select '03 Read Holding Registers (4x)' and 'Quantity' could be set to the holding register length configured in CODESYS. Click the 'Function' of the 2<sup>nd</sup> window and select '04 Read Input Registers (3x)', and 'Quantity' could be set to the input register length configured in CODESYS:

핵심 Modbus Poll - Mbpoll1	- 🗆 🗙
File Edit Connection Setup Functions Display View Window Help	
🗅 🗃 🖬 🚭 🗙 🛅 🙁 🏥 📖 05 06 15 16 17 22 23   TC 🗵 🤶 🦹	
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i or neiky kreas i n	processories and a second seco

After the completion, please return to the CODESYS interface, re-download and log in to the C3351 device. For the method, pls refer to <u>5.4 Download, monitor</u>. At this time, it will prompt that the Bus is not running. This is a normal situation:

				penal penal A			
Unbited1     Device [connected] (C3351-A00)	General	The bus is n	ot running. The shown va	lues are perhaps not ac	tual		
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- 1 Library Manager	Modbus Serial Device IEC Objects	Variable	Mapping	Channel	Address	Туре	Current V
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ask Conliguration	Status	(B) 🐪		Holding Registers[0]	%IW30	WORD	<invalidated></invalidated>
- All pic ppc	. formation	8 N		Holding Registers[1]	%IW31	WORD	<invalidated></invalidated>
TO Madride (TO Madrides)	information	B- 🏘		Holding Registers[2]	%IW32	WORD	<invalidated></invalidated>
Conduces (comoduces)		🛞 🦄		Holding Registers[3]	%IW33	WORD	<invalidated></invalidated>
a call stations cost draders cost		🛞 - Mp		Holding Registers[4]	%IW34	WORD	<invalidated></invalidated>
Com (Madbus COM)     Gail Madbus COM)     Gail Madbus COM (Madbus COM)     Madbus Serial Device (Madbus Serial Device)		8.4		Holding Registers[5]	%IW35	WORD	<invalidated></invalidated>
		🛞 - 🍫		Holding Registers[6]	%IW36	WORD	<invalidated></invalidated>
	ice,	· · · · · ·		Holding Registers[7]	%IW37	WORD	<invalidated></invalidated>
		10 - Ma		Holding Registers[8]	%IW38	WORD	<invalidated></invalidated>
		1 B- N		Holdina Reaisters[9]	%IW39	WORD	<invalidated></invalidated>
		Bus Cycle Options - Bus cycle task	Reset I ariable 🍾 = M Use parent bus cycle s	Always up ap to existing variable etting V Recr	datevariables eate required ta	Use parent device setting	
	Watch 1						- 1
	Expression	Application	Туре	/alue F	Prepared value	Execution point	

Go back to the Modbus Poll software, press 'F3' to connect. And it could set the type of 'Connection Setup' to Serial Port in the pop-up interface, and select the correct COM port, baud rate and other parameters are consistent with the parameters configured in the CODESYS software:



Back to CODESYS, it could find that all devices are running normally:

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🎦 🚅 🗑 🗠 🤉 🖻 🛍 🗙 🛤 🌿 🍓 🌿	別別別    陆	Application (Device: PLC Le	gic] • 08 (	💐 🕞 🖬 🔨 (CH 9	5 45 ×3 5	이 등 등 것		
Devices - 7 X	Modbus_Slave_COM_Port	Modbus_COM_1	Modbus_S	erial_Device 🗙				
- Dutitled I			-					
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Application [run]	Houbus Senar Device Do Happing	8-10		Holding Registers	%IW30	ARRAY [0.,9] OF WORD		
- 📶 Library Manager	Modbus Serial Device IEC Objects	1 - <b>X</b>		Holding Registers[0]	%IW30	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
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E 🔛 Task Configuration	Status	🛞 - 🍫		Holding Registers[2]	%IW32	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
🗏 😏 👹 MainTask		B-*		Holding Registers[3]	%IW33	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
PLC_PRG	Information	😐 - 🐐		Holding Registers[4]	%IW34	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
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Ethernet (Ethernet)		😐 - 🍫		Holding Registers[6]	%IW36	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
Modbus COM (Modbus COM)		B-*		Holding Registers[7]	%IW37	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
Hodbus_COM_1 (Modbus COM)		🗎 - 🍫		Holding Registers[8]	%IW38	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
		B-*		Holding Registers[9]	%IW39	WORD	<invalidate< td=""><td>d&gt;</td></invalidate<>	d>
(		- K.						

The following is the verification of the communication. The first step is to double-click to modify the input register preparation value to 1111 in the 'ModbusSerialDeviceI/O Mapping' of the 'Modbus Serial Device device', and press 'Ctrl+F7' to write:

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× • (	X Madhus Slave COM P	ort (1911)	Modbus COM 1		dhus Seria	Device Y			
Untitled1	-			···					
S [] Device [connected] (C3351-A00)	eral	Find			Filter SH	iow all	- +	Add FB for IO	Channel
PLC Logic		Variable	Mappi	Channel	Address	Type	Current Value	Prepared	Value U
🖹 🔘 Application [run]	Ibus Serial Device I/O Mapping	a 19		Ioldina Reais	%IW30	ARRAY [09] OF WORD			
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PLC_PRG (PRG)		8-14	F	Holding Regis	%IW31	WORD	0		
□-) (編) Task Configuration □ - G (録) MainTask □	us	B 🍫	F	Iolding Regis	%IW32	WORD	0		
		😐 🦄	F	Holding Regis	%IW33	WORD	0		
	rmation	18 · 🍫	F	Iolding Regis	%IW34	WORD	0		
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* 🛀 🏥 Ethernet (Ethernet)		B- 🍫	F	Holding Regis	%IW36	WORD	0		
P-III Modbus_COM (Modbus COM)		- B- 🍫	E F	Iolding Regis	%IW37	WORD	0		
Modbus_COM_1 (Modbus COM)		H- 🍫	F	Iolding Regis	%IW38	WORD	0		
- 🧐 🔟 Modbus_Serial_Device (Modbus Serial I	Device]	B- 🍫	F	Holding Regis	%IW39	WORD	0	•	
		B- **	I	input Registers	%QW10	ARRAY [09] OF WORD	Not updated		
		B- 🍫	I	input Regist	%QW10	WORD	1111	1111	
		B 🗘	I	input Regist	%QW11	WORD	0		
		B- 🍫	I	input Regist	%QW12	WORD	0		
		B- 🔷	I	input Regist	%QW13	WORD	0		
		B- 🔶	I	input Regist	%QW14	WORD	0		
			I	input Regist	%QW15	WORD	0		
		- •	I	input Regist	%QW16	WORD	0		
			I	nput Regist	%QW17	WORD	0		

Back to the 'Modbus Poll' software, it could find that the value of Mbpoll2 has been modified successfully. Now we double-click the first line of Mbpoll1 to modify the value to 55:

R Modbus Poll - Mbpoll1	-	×
File Edit Connection Setup Functions Display View Window Help		
D 🗃 📾 😹 🗡 🛅 🖳 👶 1. 05 06 15 16 17 22 23 TC 🙉 🦹 😢		
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For Help, press F1. [192.168.0.16]: 502		

Back to the CODESYS software, it could find that the first WORD value of the holding register has been changed to 55, indicating that the communication function is normal:

ices - + >	Modbus_Slave_COM_Por	t 👔 🛚	fodbus_COM_1		odbus_Seria	l_Device X			
Untitled 1	eral	Find	Find			ow all	- 🖶 Add FB for IO Channel		
PLC Logic		Variable	Mappi C	hannel	Address	Type	Current Value	Prepared Value	U
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PLC_PRG	rmation	8.4	H	dina Reais	%IW34	WORD	0		
🕸 😏 📆 IO_Modules (IO Modules)		H 🎭	H	dina Reais	%IW35	WORD	0		
🗷 🚱 🏢 Ethernet (Ethernet)		8.49	H	dina Reais	%IW36	WORD	0		
Modus_COM (Modus COM)     Modus_COM (Modus COM)     Modus_COM 1 (Modus COM)     Modus_Serial_Device (Modus Serial Device		B 🎭	H	dina Reais	%IW37	WORD	0		
			н	dina Reais	%IW38	WORD	0		
	el	8- 🍫	H	ding Regis	%IW39	WORD	0		
		8.50	In	put Registers	%OW10	ARRAY [0.,9] OF WORD			
		8-50	In	put Regist	%OW10	WORD	1111	1111	
		8.5	In	put Regist	%QW11	WORD	0		
		B- <b>*</b> >	In	put Regist	%OW12	WORD	0		
		8.5	In	put Regist	%OW13	WORD	0		
		8.5	In	put Regist	%OW14	WORD	0		
		8.5	In	put Regist	%OW15	WORD	0		
		B- **	In	put Regist	%OW16	WORD	0		
		H . 🍫	In	out Regist	%OW17	WORD	0		
		8- 4	In	out Regist	%OW18	WORD	0		
		B - S - S - S - S - S - S - S - S - S -	new variable	put Regist put Regist Rese ?	%QW17 %QW18 t Mapping Map to exist	WORD WORD Always update variables	Use parent device sett	ing	

So far, the Modbus RTU slave function test of the C3351 device is completed.

# 6 Demo

## **6.1 Control requirement**

Project name: Water conservancy valve control system Project function: Controlling the opening of the drain valve according to the water level of the reservoir and water level growth rate.

# **6.2 Preparation**

Project Analysis: According to the actual situation of C3351 and the module selection table: selecting module CT-2228 to be used as alarm controller, the alarm accepts 24V high level alarm; selecting module CT-3238 to be as water level sensor signal input; selecting module CT-5112 as valve opening value reading, and get data from encoder; using Modbus TCP master function to control the steering and speed of the valve motor. It is assumed that the motor controller D CAC only needs these two parameters to control the motor.

### **6.3 Project creation**

Create the project as shown below



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Application	alarm_filag (800L)		1.1	wateriv_Temp(INT)	
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#### Programming and Setting parameters

The above program can realize simple water conservancy valve control, but the results are not 100% accurate.

### 6.4 Program download and monitoring

Activate the device, then log in to the device.







Above are all the demo, the relevant file can be found in the attached Demo.

# 7 Annex

# 7.1 Modbus-RTU Protocol Introduction

For user, it is important to understand that Modbus has 8 important function codes corresponding to 4 areas: 4 read, 2 write a single bit or register, and 2 write multiple bits or multiple registers (Address description adopts PLC address).

# 7.1.1 Modbus Storage Area

The storage area of the controller (or Modbus device) involved in Modbus is identified by 0XXXX, 1XXXX, 3XXXX and 4XXXX.

Storage ID	Name	Data Type	Read/Write	Storage Unit Address
0XXXX	Output Coil	Bit	Read/Write	00001~0XXXX, XXXX: related to the device
1XXXX	Discrete Input	Bit	Read Only	10001~1XXXX, XXXX: related to the device
3XXXX	Input Register	Word	Read Only	30001~3XXXX, XXXX: related to the device
4XXXX	Output/Holding Registers	Word	Read/Write	40001~4XXXX, XXXX: related to the device

### 7.1.2 Modbus Function Code

Modbus messages are relatively fixed, so it could know the structure after reading a few messages, and users can inquire about it when necessary.

(1) Read output coil status

Function Code: 01H

Master station inquiry message format:

Address	Function Code	Start Address High Byte	Start Address Low Byte	Number of coils High Byte	Number of coils Low Byte	CRC
0x11	0x01	0x00	0x13	0x00	0x25	XXXX

Function: Read slave station output coil 0XXXX status.

Note: Some device coil start address is 00000, which corresponds to address 00001 in the device, and the sequence is postponed.

In this example: read the output coil of the slave station No. 0x11, the register start address is 0x13=19, and the number of coils is 0x0025H=37.

Therefore, the function of this query message is: read the output coil 00019-00055 of the slave

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station No. 0x11 (17), A total of 37 coil status.

	Eumotion	Duto	Coil	Coil	Coil	Coil	Coil		
Address	Code	Count	Status	Status	Status	Status Status		CRC	
			19-26	27-34	35-42	43-50	51-55		
0x11	0x01	0x05	0xCD	0x6B	0xB2	0x0E	0x1B	XXXX	

Slave station response format:

Function: Slave returns to output coil 0XXXX status.

(2) Read discrete input status

Function Code: 02H

Master station query message format:

Address	Function Code	FunctionStart AddressStart AddressNumber of coilCodeHigh ByteLow ByteHigh Byte		Number of coils High Byte	Number of coils Low Byte	CRC
0x11	0x02	0x00	0xC4	0x00	0x16	xxxx

Function: Read the status of slave station input coil 1XXXX.

Note: Some equipment coil start address is 10000, which corresponds to the address of 10001 in the device, and the sequence is postponed.

In this example: read the input coil of the slave station No. 0x11, the starting address is 0x00C4=196, and the number of coils is 0x0016=22.

Therefore, the function of this query message is: read the input coil 10196-10217 of the slave station No. 0x11 (17), a total of 22 discrete input status.

Address	Function Code	Byte Count	DI 10196-10203	DI 10204-10211	DI 10212-10217	CRC
0x11	0x02	0x03	0xAC	0xDB	0x35	xxxx

#### Slave station response format:

Function: Slave returns to input coil 1 XXXX status.

#### (3) Read output/holding register

Function Code: 03H

Master station query message format:

Address	Function Code	Register Start Address High Byte	Register Start Address Low Byte	Number of Registers High Byte	Number of Registers Low Byte	CRC
0x11	0x03	0x00	0x6B	0x00	0x03	xxxx

Function: Read slave station holding register 4XXXX value.

Note: The starting address of some device registers is 40000, which corresponds to the address

40001 in the device, and the sequence is postponed.

In this example: read the holding register value of the slave station No. 0x11, the starting address is 0x006BH=107, and the number of registers is 0x0003.

Therefore, the function of this query message is: read the value of 3 holding registers

Address	Function Code	Byte Count	Register 40107 High Byte	Register 40107 Low Byte	Register 40108 High Byte	Register 40108 Low Byte	Register 40109 High Byte	Register 40109 Low Byte	CRC
0x11	0x03	0x06	0x02	0x2B	0x01	0x06	0x2A	0x64	XXXX

#### 40107-40109 of the slave station No. 0x11 (17H).

Function: The slave returns to the value of the holding register: (40107)=0x022B, (40108)=0x0106, (40109)=0x2A64

(40108)=0x0106, (40109)=0x2A6

(4) Read the input register

Function code: 04H

Master station query message format:

	Function	Register Start	Register Start Register Start		Number of	
Address Code		Address	Address	Registers	Registers	CRC
	Code	High Byte	Low Byte	High Byte	Low Byte	
0x11	0x04	0x00	0x08	0x00	0x01	xxxx

Function: Read slave station input register 3XXXX value.

Note: In some devices, the register start address is 30000, which corresponds to the address 30001 in the device, and the sequence is postponed.

In this example: read the input register value of the slave station No. 0x11, the start address is 0x0008H, and the register number is 0x0001.

Therefore, the function of this query message: read the value of 1 input register 30008 of slave station No. 0x11(17).

Slave station response format:

Address	Function Code	Byte Count	Input Register 30008 High Byte	Input Register 30008 Low Byte	CRC
0x11	0x04	0x02	0x01	0x01	XXXX

Function: The slave station returns to the value of the input register 30008; (30008) =0x0101

#### (5) Force a single coil

Function code: 05H

Master station query message format:

Address	Function	Coil Address	Coil Address	Dreat Flag	Break Flag	CRC
	Code	High Byte	Low Byte	Break Flag		

0x11 0x05 0x00 0xAC 0xFF 0x00 xxxx	0x11	0x05	0x00	0xAC	0xFF	0x00	xxxx
------------------------------------	------	------	------	------	------	------	------

Function: Force the 0XXXX value of slave station coil 0x01 (17). In some devices, the coil start address is 00000, which corresponds to the address 00001 in the device, and the sequence is postponed.

Break Flag = FF00, force the coil ON. Break Flag = 0000, force the coil OFF.

Example: The starting address is 0x00AC=172. Force No. 17 slave station coil 0172 to ON status. Response format: return to the original text

Address	Function Code	Coil Address High Byte	Coil Address Low Byte	Break Flag	Break Flag	CRC
0x11	0x05	0x00	0xAC	0xFF	0x00	XXXX

Function: Force No. 17 slave device coil 0172 ON and return to the original text

(6) Preset single holding register

Function Code: 06H

Master station query message format:

Address	Function Code	Register Start Address High Byte	Register Start Address Low Byte	Number of Registers High Byte	Number of Registers Low Byte	CRC
0x11	0x06	0x00	0x87	0x03	0x9E	XXXX

Function: Preset single holding register 4XXXX value. In some devices, the coil start address is 40000, which corresponds to the address 40001 in the device, and the sequence is postponed.

Example: Preset the value of the single holding register 40135 of No. 17 slave device to 0x039E; Response format: return to the original text

	E	Register Start	er Start Register Start		Number of		
Address	Code	Address	Address	Registers	Registers	CRC	
	Code	High Byte	Low Byte	High Byte	Low Byte		
0x11	0x06	0x00	0x87	0x03	0x9E	xxxx	

Function: Preset the No. 17 slave device single holding register 40135 value to 0x039E and return to the original text.

(7) Force Multi-coilFunction Code: 0FHMaster station query message format:

Address	Function Code	Coil Start Address High Byte	Coil Start Address Low Byte	Number of coils High Byte	Number of coils Low Byte	Byte Count	Coil Status 20-27	Coil Status 28-29	CRC
0x11	0x0F	0x00	0x13	0x00	0x0A	0x02	0xCD	0x00	xxxx

Function: Force multiple continuous coils 0XXXX to ON/OFF status.

Note: In some devices, the coil start address is 00000, which corresponds to the address 00001 in the device, and the sequence is postponed.

In this example: Force multiple continuous coils in slave station 0x11, the start address of the coil is 0x0013=19, and the number of coils is 0x000A=10.

Therefore, the function of this query message is: to force the value of 00019-00028 of the 10 coils of slave station No. 0x11(17); CDH $\rightarrow$ 00019-00026; 00H $\rightarrow$ 00027-00028.

Slave station response format:

Address	Function Code	Coil Start Address High Byte	Coil Start Address Low Byte	Number of coils High Byte	Number of coils Low Byte	CRC
0x11	0x0F	0x00	0x13	0x00	0x0A	xxxx

### (8) Preset multiple registers

#### Function Code: 10H

#### Master station query message format:

Address	Function Code	Start Register Address High Byte	Start Register Address Low Byte	Number of Registers High Byte	Number of Registers Low Byte	Byte Count	Data High Byte	Data Low Byte	Data High Byte	Data Low Byte	CRC
0x11	0x10	0x00	0x87	0x00	0x02	0x04	0x01	0x05	0x0A	0x10	XXXX

Function: Preset multiple holding register values 4XXXX of the slave station. Note: In some devices, the holding register start address is 40000, which corresponds to the address 40001 in the device, and the sequence is postponed.

In this example: Preset multiple holding register values of slave station 0x11, the register start address is 0x0087=135, and the number of coils is 0x0002=2.

Therefore, the function of this query message is: preset the value of 2 holding registers of slave station No. 0x11 (17);

0105H→40135; 0A10H→40136.

Address	Function Code	Start Register	Start Register	Number of	Number of	
		Address	Address	Registers	Registers	CRC
		High Byte	Low Byte	High Byte	Low Byte	
0x11	0x10	0x00	0x87	0x00	0x02	xxxx

# 7.2 Brief introduction of serial port network topology

# 7.2.1 RS232

RS232 is one of serial communication interfaces controlled by industry. It is widely used to connect computer serial interface with peripherals. RS232 using a signal and a signal transmission form, return lines were in the land of the three wire connection mode, can realize full-duplex communications, the transmission signals for single ended, the total transmission of easy to generate common-mode interference, so the noise resistance is weak, the transmission distance is limited, RS232 interface standards stipulated in the code element distortion maximum transmission distance is less than 4% under the condition of standard values of 50 feet (15 meters) (more than 15 m long distance communication, need to adopt modem), the maximum transmission distance is also associated with communication baud rate, in the process of practical application, if the transmission distance is far, Please reduce the baud rate. In order to reduce the electromagnetic interference from the outside during the signal transmission, please use the shielded cable as the communication cable.

RS232 interface standard specifies that TXD and RXD:

RS232 USES negative logic to transmit signals and takes the signal of  $-(3\sim15)$  V as logic "1". Take the signal of  $+(3\sim15)$  V as logical "0"; Voltages between -3 and +3V are meaningless, as are voltages lower than -15V or higher than +15V.

RS232 Interface Classification:

DB9 header interface



The top left corner is 1, the bottom right corner is 9

9-pin RS232 serial port (DB9)						
Pin	Name	Function				
1	CD	Carrier detect				
2	RXD	Receive data				
3	TXD	Send data				
4	DTR	Data terminal ready				
5	GND	Signal ground				
6	DSR	Data ready				
7	RTS	Request to send				
8	CTS	Clear to send				
9 RI Ring alert						

As the RS232 interface has the above electrical characteristics, it can only realize point-to-point communication.

RS232 communication wiring diagram is shown in the figure below:



### 7.2.2 RS422

The full name of RS422 interface standard is "Electrical Characteristics of Balanced Voltage Digital Interface Circuit", which defines the characteristics of the interface circuit. RS422 adopts four-wire plus ground wire (T+, T-, R+, R-, GND), full-duplex, differential transmission,

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multi-point communication data transmission protocol. It USES a balanced transmission line that is unidirectional/non-reversible, with or without an enabling end. Because the receiver USES a high input impedance and the sending driver is stronger than RS232, it is allowed to connect multiple receiving nodes on the same transmission line, up to 10 nodes. That is, one Master device (Master), the rest are slave devices (Salve), and the slave devices cannot communicate with each other, so RS-422 supports point-to-many two-way communications.

The RS-422 has a maximum transmission range of 4,000 feet and a maximum transmission rate of 10Mb/s. The length of the balanced twisted pair is inversely proportional to the transmission rate, and the maximum transmission distance can be reached only if the rate is below 100KB /s. The highest rate of transmission can be obtained only over very short distances. Generally, the maximum transmission rate obtained on 100 meters long twisted pair is only 1Mb/s.

The RS-422 requires a terminal resistance that is approximately equal to the characteristic impedance of the transmission cable. In short distance transmission, no final resistance is required, that is, no final resistance is generally required below 300 meters. The final resistance is connected to the farthest end of the transmission cable.

In a master multi-slave network connection, all the sending terminals of the slave connect to the receiving terminals of the master station by daisy-chain. All the receiving ends of the slave stations are connected by daisy-chain to the sending end which is finally connected to the master station.

RS4	422 (9 Pin)	Function	Remark	
3	R-	Receive negative	Must connect	
2	T-	Send negative	Must connect	
7	R+	Receiving positive	Must connect	
8	T+	Send positive	Must connect	

The RS422 pin definition:



The upper left corner is 1, the lower right corner is 9.



The RS422 communication wiring diagram is shown in the figure:

# 7.2.3 RS485

Since the RS-485 is developed from the RS-422, many electrical provisions of the RS-485 are similar to those of the RS-422. If they all adopt the balanced transmission mode, they all need to connect the final resistance on the transmission line, etc. The RS-485 can adopt two - wire and four - wire mode, and the two - wire system can realize real multi - point two - way communication.

RS485 is a standard for defining the electrical characteristics of drivers and receivers in a balanced digital multipoint system, using a combination of balanced drivers and differential receivers for enhanced common-mode dry resistance, i.e., good noise interference resistance. Because the semi-duplex network composed of RS485 interface generally adopts the wiring mode of two-wire system and adopts differential signal to transmit data, the voltage difference between the two lines is -(2-6)V to represent logic "0 ", and the voltage difference between the two lines is +(2-6)V to represent logic "1".

RS485 signal transmission distance is related to communication baud rate, the higher the baud rate, the shorter the transmission distance, under the condition of the baud rate is not higher than 100 KBPS, theory of the maximum communication distance is about 1200 meters, in the process of practical application, Due to electromagnetic interference and other factors, often cannot meet the maximum communication distance, if in a long-distance communication, please reduce the baud rate, to reduce the signal during transmission by external electromagnetic interference, please use twisted-pair shielded cable as a communication cable.

RS485 bus in the case of no trunk to support a maximum of 32 nodes, node and node between the "Daisy chain" connection mode, in the communication cable at both ends need to add terminal http://www.odotautomation.com 107 / 109 TEL: +86-0816-2538289

resistance, the resistance value is required to be approximately equal to the transmission cable characteristic impedance. In short distance transmission, no final resistance is required, that is, no final resistance is generally required below 300 meters. The final resistance is connected at the ends of the transmission cable.

RS485 9 pin definition:

Pi	Name	Functio	Rema
n		n	rk
1	Data-/B-/485-	Send	Must
		positive	connect
2	Data+/A+/485	Receivi	Must
	+	ng positive	connect
5	GND	Ground	
		wire	

The RS485 communication wiring diagram is shown in the figure:


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