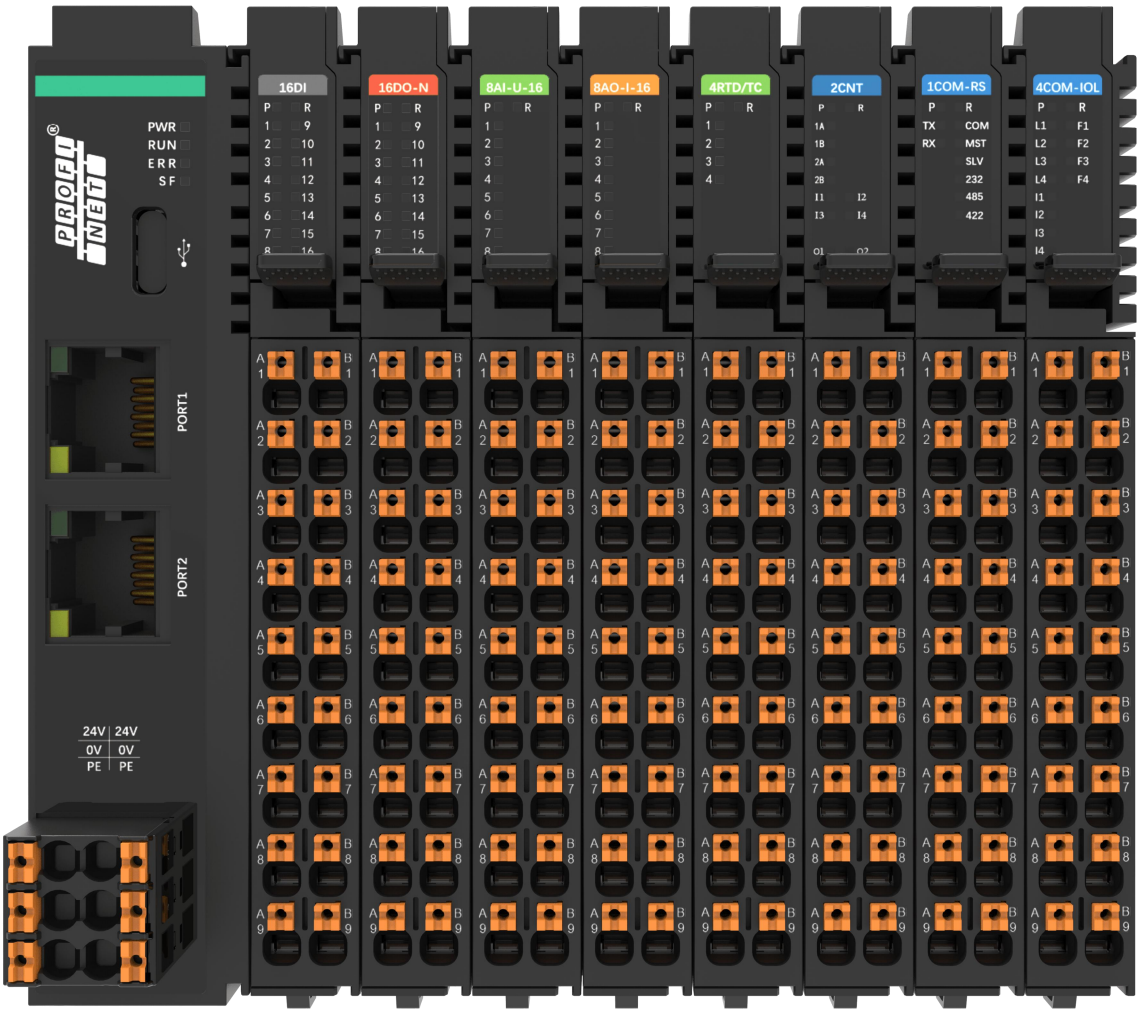
DF30-C-EC

User manual



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1 Preface

■ Introduction

➢ The DF30-C-EC communication interface module (hereinafter referred to as the module) is connected to the Ethercat network as an Ethercat slave station, and can be used to expand local modules such as digital, analog, temperature, pulse, and communication gateway.

This manual explains the basic information of the product, electrical installation, programming examples, mechanical installation, etc.

■ Meet the standards

Please refer to the table below for relevant certification categories, directives and standards.

Certification Name	Instruction Name		Meet the standards
CE certified	EMC directive	2014/30/EU	EN 61131-2
	LVD instructions	2014/35/EU	EN 61010-1 EN 61010-2-201
	RoHS Directive	2011/65/EU Amended by (EU) 2015/863	EN IEC 63000

■ Version change history

Revision date	Release version	Changes
2025-02-28	2025-02-28	The manual was published for the first time
2025-07-21	2025-7-21	Add parameters and operating instructions for 16DI, 32DI, 16DO, 32DO
2025-09-10	2025-09-10	Add AI, AO, RTD, TC, CNT, COM module parameters and operation instructions

■ About manual access

This manual does not ship with the product, and if you want to obtain an electronic PDF file, you can obtain it in the following ways:

■ Warranty Statement

Under normal use, if the product fails or is damaged, we will provide warranty service within the warranty period (please refer to the order form for details of the product warranty period). If the warranty period is exceeded, the repair fee will be charged.

During the warranty period, repair fees will be charged for product damage caused by the following situations.

- Failure to operate this product as specified in the manual results in product damage.
- Product damage caused by fire, water damage, abnormal voltage.
- Use this product for abnormal functions, causing product damage.
- Product damage caused by exceeding the scope of use specified by the product.
- Secondary damage to products caused by force majeure (natural disasters, earthquakes, lightning strikes).

The relevant service fees are calculated according to the manufacturer's unified standards, and if there is a contract, it will be dealt with on the principle of contract priority.

For detailed warranty descriptions, please refer to the Product Warranty Card.

2 Safety precautions

■ Safety Statement

➢ This chapter describes the safety precautions that need to be taken into account when using this product. Before using this product, please read the instruction manual and properly understand the relevant information on safety precautions. Failure to comply with the matters agreed in the safety precautions may result in death, serious injury, or damage to the equipment.

➢ The "hazards", "warnings" and "precautions" in the manual do not represent all safety matters to be observed and are only in addition to all safety precautions.

➢ This product should be used in an environment that meets the design specifications; otherwise, it may cause malfunctions. Functional abnormalities or component damage caused by failure to comply with relevant regulations are not covered by the product quality guarantee.

➢ Our company will not bear any legal responsibility for personal safety accidents or property losses caused by failure to comply with the contents of this book or improper operation of the product.

■ Security level definition

Danger: This indicates that failure to follow the regulations could result in death or serious bodily injury.

Warning: This indicates that failure to follow the instructions could result in death or serious bodily injury.

Attention: This indicates that failure to operate according to regulations may result in minor physical injury or equipment damage.

■ Safety Precautions

➢ In the product illustrations in this manual, the product may sometimes be shown with the outer cover or safety cover removed to demonstrate product details. When using this product, please be sure to install the outer cover or safety cover as specified and operate

according to the instructions in the user manual.

➢ The product illustrations in this manual are for illustrative purposes only and may differ slightly from the product you order. Please refer to the actual product you order.

➢ Workers must take mechanical safety precautions to protect their personal safety. Please wear necessary protective equipment, such as protective shoes, safety clothing, safety glasses, protective gloves, and sleeves.

Unpacking and inspection
Attention: ● If you find any damage, rust, or signs of use on the product or its accessories upon unpacking, please do not install it! ● Do not install the product if you find water inside, missing parts, or damaged parts when you open the box! ● Please carefully check the packing list. If the product name does not match the packing list, please do not install! ● Before opening the box, please check whether the outer packaging of the equipment is intact and whether there is any damage, wetness, dampness, deformation, etc. ● Please open the packaging in the correct order, and do not strike it violently! ● When unpacking, please check the surface of the equipment and accessories for any damage, rust, or dents. ● After unpacking, please carefully check the packing list to verify the quantity of equipment and accessories and whether the documents are complete.
Storage and transportation
Attention: ● When moving products, please lift and place them gently, and always pay attention to the objects under your feet to prevent tripping or falling, otherwise there is a risk of injury or product damage! ● When handling the product by hand, please be sure to hold the product casing firmly to prevent product parts from falling, otherwise there is a risk of injury! ● Please strictly follow the storage and transportation conditions required by the product

specifications for storage and transportation; otherwise, there is a risk of product damage.

● Avoid storing and transporting in places where water splashes, rain falls, direct sunlight is present, strong electric fields, strong magnetic fields, or strong vibrations are present.

● Avoid storing the product for more than 3 months. If the storage time is too long, please take more stringent precautions and conduct necessary inspections.

● Please pack the product carefully before transporting it by vehicle. For long-distance transport, a sealed container must be used.

● It is strictly forbidden to transport this product together with equipment or articles that may affect or damage this product.

During installation

Danger:

● Only qualified professionals with electrical training and knowledge are permitted to operate this equipment. Operation by unqualified personnel is strictly prohibited!

Warning:

● Please read the product instruction manual and safety precautions carefully before installation!

● Do not install this product in locations with strong electric fields or strong electromagnetic interference!

● Before installation, ensure that the mechanical strength of the installation location is sufficient to support the weight of the equipment; otherwise, it may lead to mechanical hazards.

● Do not wear loose clothing or jewelry when performing installation work, otherwise there may be a risk of electric shock!

● When installing the product in an enclosed environment (such as a cabinet or chassis), please use a cooling device (such as a cooling fan or air conditioner) to cool it thoroughly to meet the requirements of the installation environment. Otherwise, it may cause the product to overheat or catch fire.

● Modification of this product is strictly prohibited!

● When this product is installed in a cabinet or terminal equipment, the cabinet or terminal

equipment must be provided with appropriate fireproof enclosures, electrical protective enclosures, and mechanical protective enclosures, and the protection level should comply with relevant IEC standards and local laws and regulations.

● When installing equipment that is subject to strong electromagnetic interference, such as transformers, please install shielding protection devices to prevent this product from malfunctioning!

● Please install the product on flame-retardant objects such as metal. Do not allow flammable materials to come into contact with the product or attach flammable materials to the product, otherwise there may be a risk of fire.

Attention:

● When performing installation, please cover the top of the product with a cloth or paper to prevent metal shavings, oil, water, and other foreign objects from entering the product during drilling, which could cause product malfunction. After the installation is complete, please remove the cover to prevent it from blocking the ventilation holes and affecting heat dissipation, which could cause the product to overheat abnormally.

● Resonance may occur when a machine that operates at a constant speed is subjected to variable speed operation. In this case, installing anti-vibration rubber under the motor frame or using vibration damping functions can effectively reduce resonance.

When wiring

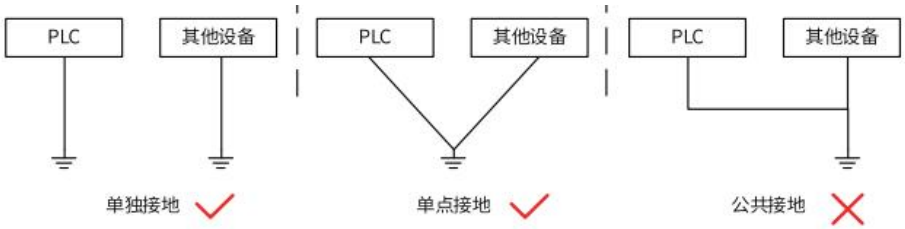
Danger:

● It is strictly forbidden for non-professionals to install, wire, maintain, inspect, or replace parts of the equipment!

● Before wiring, please disconnect the power supply to all devices. After disconnecting the power, residual voltage may remain in the internal capacitors of the devices. Please wait at least the time specified on the warning label on the product before performing any wiring operations. Measure the DC voltage of the main circuit to ensure it is below a safe voltage level; otherwise, there is a risk of electric shock.

● Do not perform wiring operations, remove product covers, or touch circuit boards while the power is off, otherwise there is a risk of electric shock.

● Please ensure that the equipment and products are properly grounded, otherwise there is a risk of electric shock. Grounding should preferably be done by separate grounding or single-point grounding, and common grounding should not be used.



Warning:

● It is strictly forbidden to connect the input power supply to the output terminal of the equipment or product, otherwise it will cause damage to the equipment or even cause a fire.

● When connecting the drive device to the motor, please ensure that the phase sequence of the product and the motor terminals is accurate and consistent to avoid causing the motor to rotate in the opposite direction.

● The cables used for wiring must meet the corresponding requirements for wire diameter and shielding. The shielding layer of shielded cables must be reliably grounded at one end!

● After wiring is complete, please ensure that all cables are connected correctly and that there are no loose screws, washers or exposed cables inside the product, otherwise there may be a risk of electric shock or damage to the product.

Attention:

● Please follow the procedures specified in the electrostatic discharge (ESD) prevention measures and wear an anti-static wrist strap when performing wiring operations to avoid damaging the internal circuitry of the equipment or product.

● When wiring the control circuit, please use a twisted shielded cable and connect the shield to the grounding terminal of the product for grounding. Otherwise, the product may malfunction.

When powered on

Danger:

● Before powering on, please ensure that the product is properly installed, the wiring is secure, and the motor is ready to restart.

● Before powering on, please ensure that the power supply meets the product requirements to avoid product damage or fire!

● Do not open the product cabinet door or product protective cover, touch any wiring terminals of the product, or disassemble any device or component of the product while it is powered on, otherwise there is a risk of electric shock!

Warning:

● After the wiring and parameter settings are completed, please conduct a test run of the machine to confirm that it can operate safely; otherwise, it may cause personal injury or equipment damage.

● Before powering on, ensure that the product's rated voltage matches the power supply voltage. Using an incorrect power supply voltage may cause a fire.

● Before powering on, ensure that there are no people around the product, motor, and machinery, otherwise it may result in injury or death.

Runtime

Danger:

● It is strictly forbidden for non-professionals to operate the product, otherwise there is a risk of injury or death!

● It is strictly forbidden to touch any terminals of the equipment, disassemble any device or component of the equipment or product while it is running, otherwise there is a risk of electric shock!

Warning:

● Do not touch the equipment casing, fan, or resistors to test the temperature, as this may cause burns!

● During operation, prevent other items or metal objects from falling into the equipment, otherwise it may cause a fire or product damage!

During maintenance

Danger:

● It is strictly forbidden for non-professionals to install, wire, maintain, inspect, or

replace parts of the equipment!

● Never perform equipment maintenance while the device is powered on, as this could result in electric shock!

● After disconnecting the power to all devices, please wait at least the time specified on the warning label on the product before performing any maintenance or other operations.

● When using the PM motor, even if the product's power is off, an induced voltage will be generated on the motor terminals during motor rotation. Do not touch the motor terminals, as this may result in an electric shock risk.

Warning:

● Please conduct daily and periodic inspections and maintenance of equipment and products in accordance with equipment maintenance and upkeep requirements, and keep maintenance records.

During maintenance

Danger:

● It is strictly forbidden for non-professionals to install, wire, maintain, inspect, or replace parts of the equipment!

● It is strictly forbidden to perform equipment maintenance while the power is on, otherwise there is a risk of electric shock!

● After disconnecting the power to all devices, please wait at least the time specified on the warning label on the product before performing any equipment inspections, maintenance, or other operations.

Warning:

● Please report the equipment for repair in accordance with the product warranty agreement.

● When a fuse blows, a circuit breaker trips, or an ELCB trips, please wait at least the time specified on the warning label on the product before turning on the power or operating the machine. Otherwise, it may result in personal injury or equipment damage.

● When equipment malfunctions or is damaged, it is essential that professional personnel troubleshoot and repair the equipment and products in accordance with the maintenance guidelines, and keep maintenance records.

● Please replace the parts according to the product's consumable parts replacement instructions. ● Do not continue to use a damaged machine, as this may cause personal injury or further damage to the product. ● After replacing the equipment, please be sure to check the equipment wiring and re-set the parameters.
When scrapped
Warning: ● Please scrap equipment and products in accordance with relevant national regulations and standards to avoid property damage or personal injury! ● Discarded equipment and products should be disposed of and recycled in accordance with industrial waste disposal standards to avoid environmental pollution.

■ Safety signs

To ensure safe operation, please always adhere to the safety labels affixed to the equipment and do not damage or remove them. The safety labels are explained below:

Safety signs	Content Description
	Please read the safety manual and instructions for use carefully before using the product, otherwise there may be a risk of personal injury or product damage!

3 Product Information

3.1 Model and Nameplate Description

■ Nameplate Description

3.2 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light: Normal communication status
		Green light off: System power failure		Green Extinction: In the initial state
	SF	Red indicator light: The device is in forced operation mode (reserved, BootLoad mode, etc.).		
		Flashing (red): Configuration error, coupler error, module error, new diagnostic information, etc.		

		Red off: Equipment is normal
	ERR	Bright red: This product is offline.
		Flashing (red): Inconsistent configuration of extended modules
		Redout: No communication failure

Terminal blocks	
Interface Name	Function definition
PORT1	EtherCAT Ethernet interface
PORT2	EtherCAT Ethernet interface
24V power supply	Module power input terminals
Type-C interface	Port for single-board software upgrade

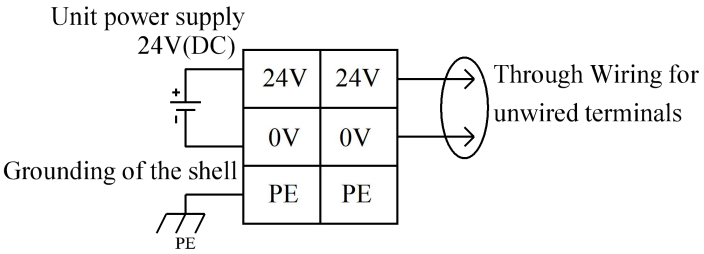
3.3 Specifications

Structural parameters	
Dimensions (width x height x depth)	24mm x 104mm x 80mm
weight	103.4g
Power parameters	
Terminal input power supply rated voltage	24V DC (20.4V DC~ 28.8V DC)
Terminal input power supply rated current	5A (typical value at 24V DC)
Usys backplane output power rated voltage	5V DC (4.75V DC～5.25V DC)
Usys backplane output power rated current	2A (typical value at 5V)
Uin backplane output power rated voltage	24V DC (20.4V DC～28.8V DC)
Uin backplane output power rated current	4A (typical value at 24V)
Functional parameters	
Specifications	EtherCAT bus, 2 RJ45 ports, expandable to 32 modules, 24VDC
Communication interface	Two RJ45 ports, integrating switch functionality
Communication Protocol	EtherCAT
Communication rate	10/100Mbps, adaptive, full-duplex
Bus address settings	EtherCAT Specification
Address Mapping	support
Transmission distance	100M
diagnosis	Diagnostic alarms, process alarms, module plug-in/plug-out alarms
Isolation methods	Electrical isolation from site

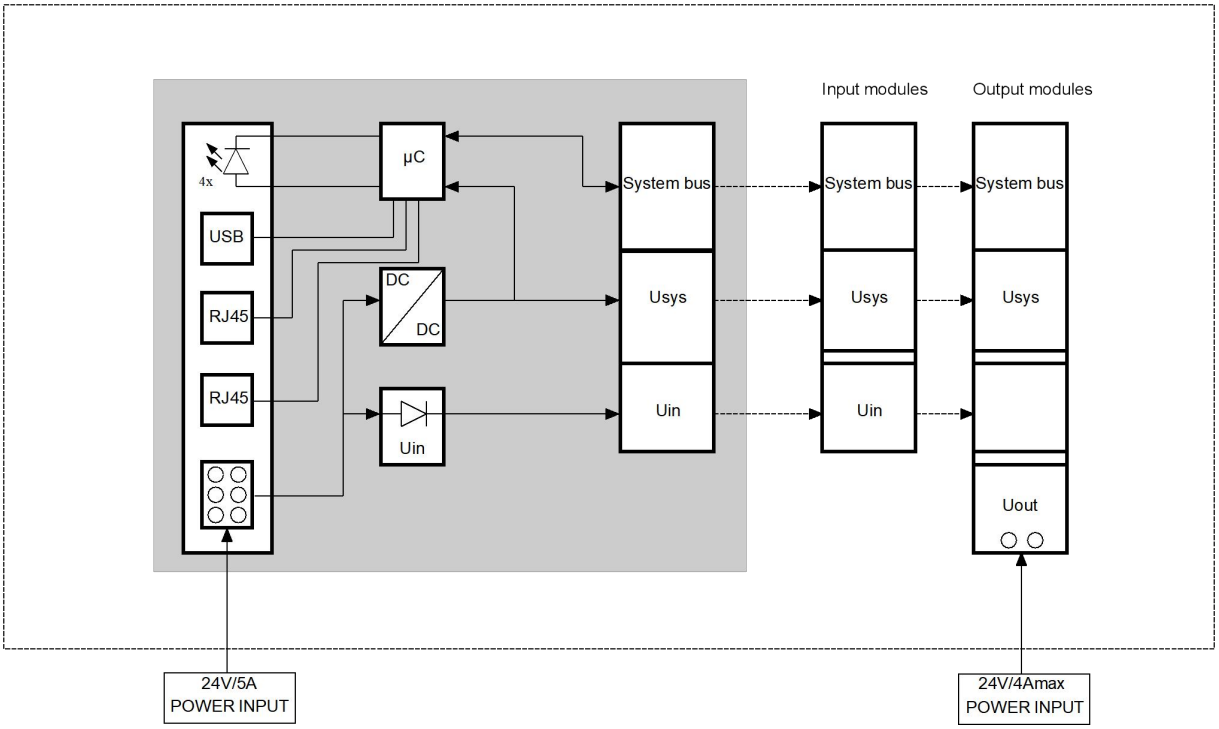
transmission medium	Category 5 twisted pair cable
Software parameters	
Minimum cycle time	1ms
Input PDO data volume	Maximum 512 bytes
Output PDO data volume	Maximum 512 bytes
Enter email size	Maximum 512 bytes
Output mailbox size	Maximum 512 bytes
Wiring parameters	
Connection technology: Communication/Fieldbus	EtherCAT IO: 2 x RJ-45
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm²
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity	5-95%RH

(non-condensing)	
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

3.4 Wiring schematic diagram



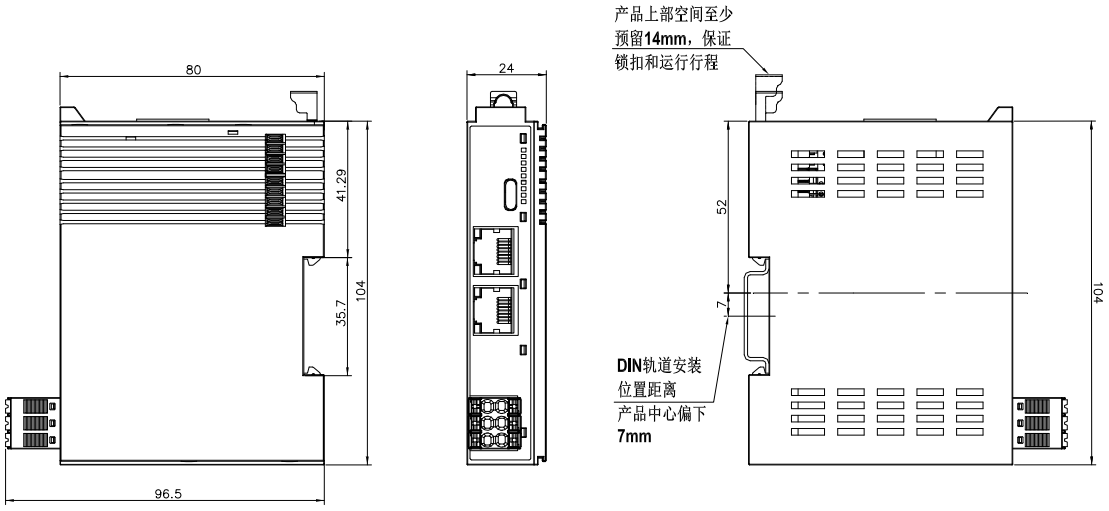
3.5 System block diagram



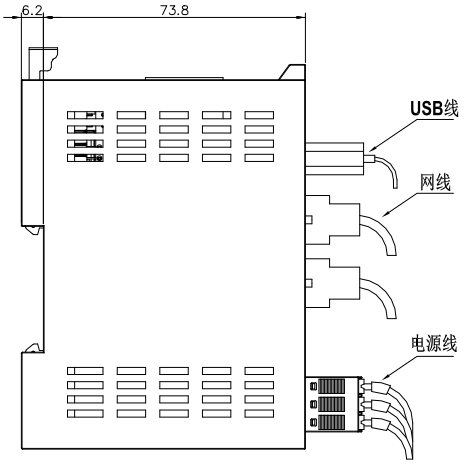
3.6 Installation and Removal

3.6.1 Installation Dimensions

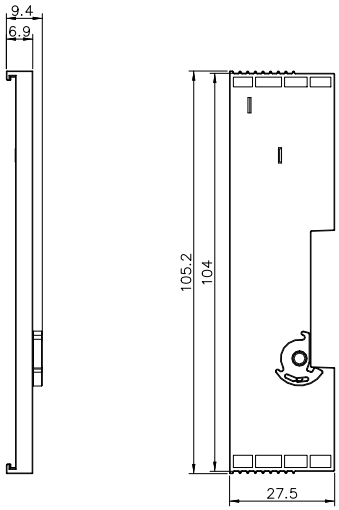
- The installation dimensions are shown in the figure below, in millimeters (mm).



- Connecting cables

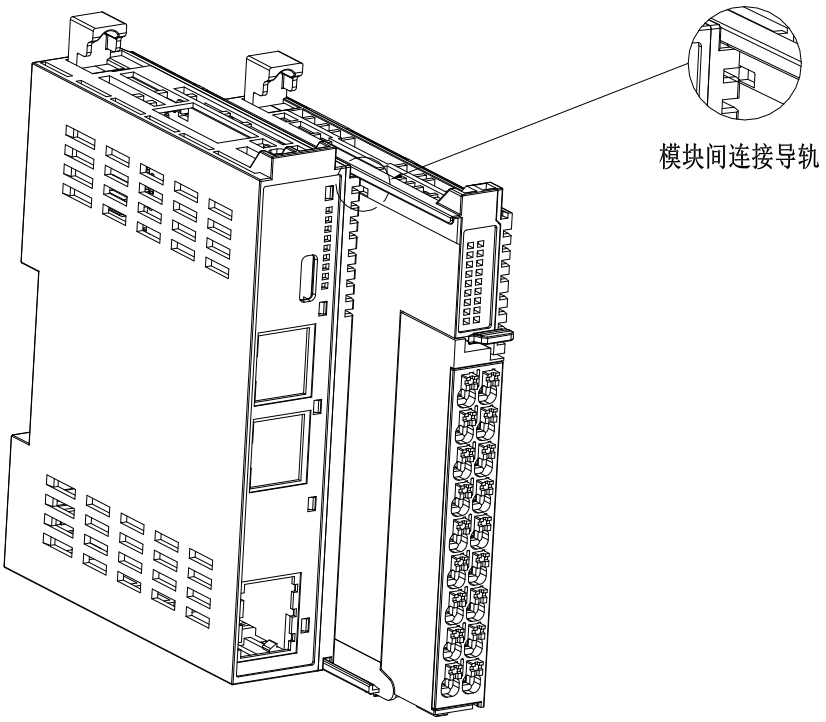


- Tail cover

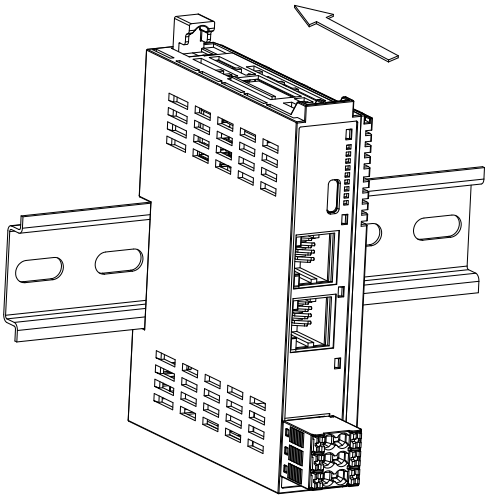


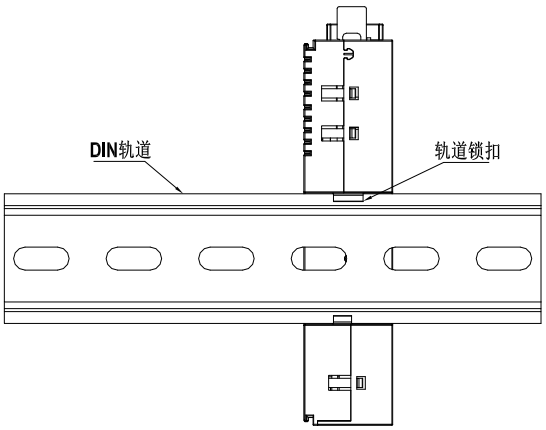
3.6.2 Installation Guide

➢ The modules are assembled by sliding on the top and bottom guide rails of the modules, as shown in the figure below.



➢ During installation, align the module with the DIN rail and press the module in the direction shown by the arrow. After installation, there will be a clear clicking sound, as shown in the picture below.





➢ Confirm that the DIN rail latch of the module is in the locked state. The locked and unlocked states of the rail latch are shown in the figure below.

If the DIN rail latch is at the bottom, it is in the locked state.

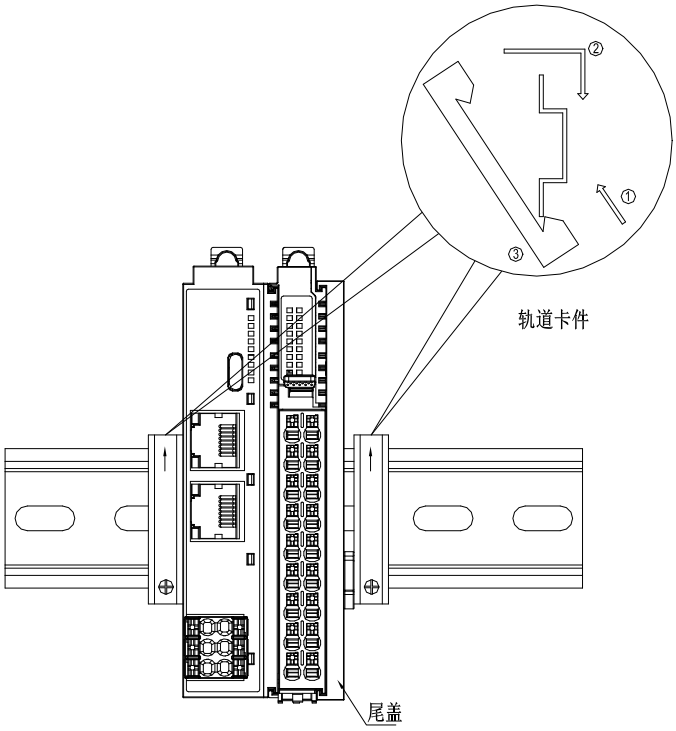
If the DIN rail latch is on top, it is in the unlocked state.

When in the unlocked state, press down on the DIN rail latch to lock it.

➢ The tail cap needs to be installed on the last module to prevent the metal pins from being exposed, and a DIN rail clip should be installed at both ends of the main unit or module to prevent the module from sliding left and right, as shown in the figure below.

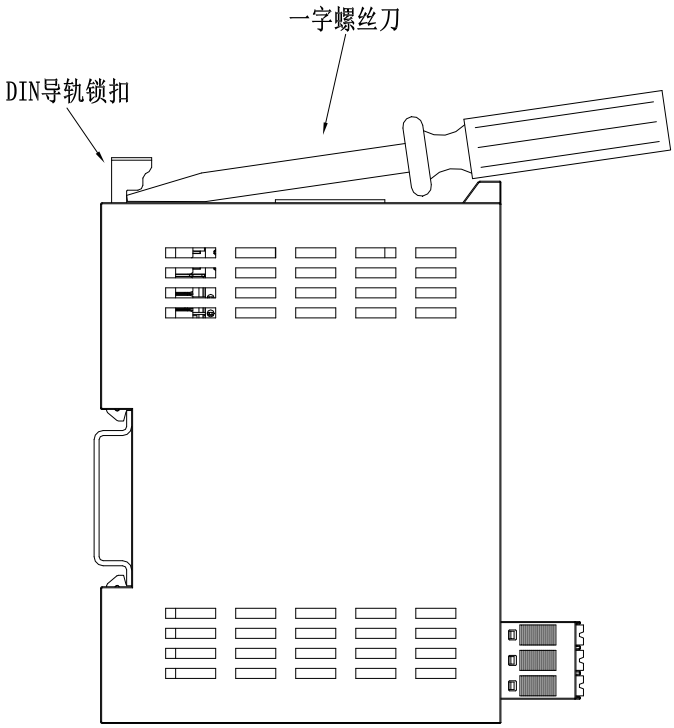
➢ When installing the guide rail clip, hook the bottom of the guide rail clip onto the bottom of the guide rail, then rotate the guide rail clip to make the guide rail clip...

➢ The upper end hooks onto the upper end of the guide rail, and finally the screws are tightened to lock the guide rail clip.



3.6.3 Disassembly Method

➢ Use a flathead screwdriver or similar tool to pry up the rail latch, then pull the module away from the DIN rail. After that, press down on the top of the latch.



3.6.4 Precautions

- Before installing or removing the module, ensure that the module is powered off.
- If you encounter a module that is difficult to install, do not use brute force to install it, as this may damage the current module or other modules. The module should be removed from the guide rail and checked for any abnormalities (such as foreign objects blocking the circuit). Only after confirming that there are no problems should you attempt to plug or unplug it.
- When this product is installed on a non-standard DIN rail (DIN rail thickness is 1.0mm), the DIN rail locking mechanism will fail, the product will not be able to be installed properly, and thus the product will not work properly.

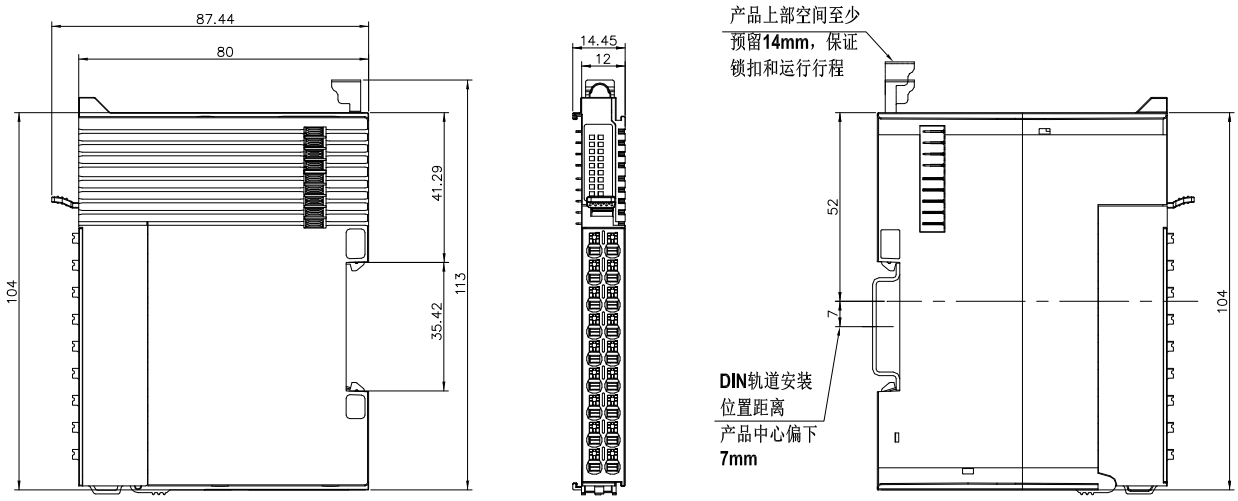
4 Module Description

Installation Instructions

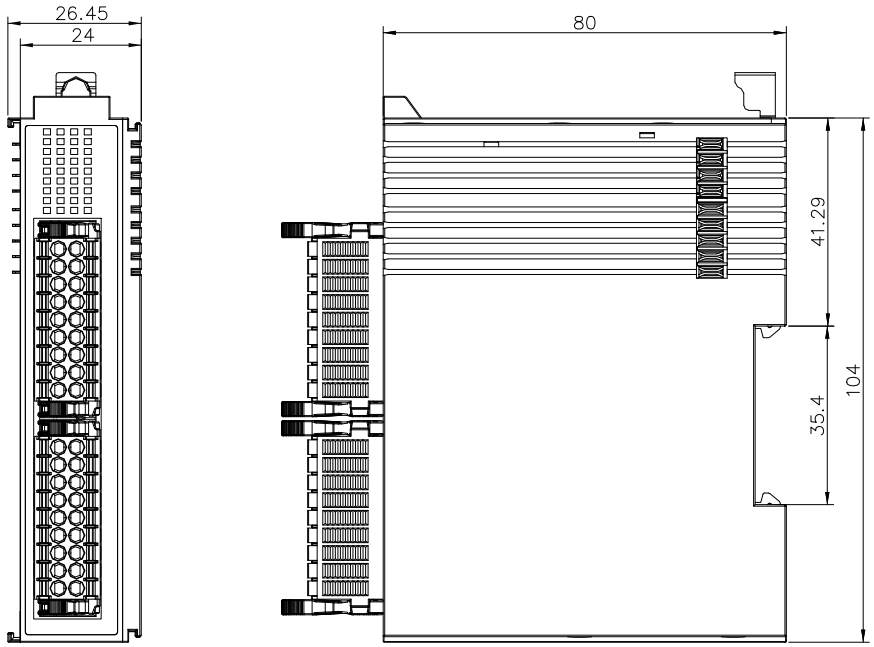
Size Specifications

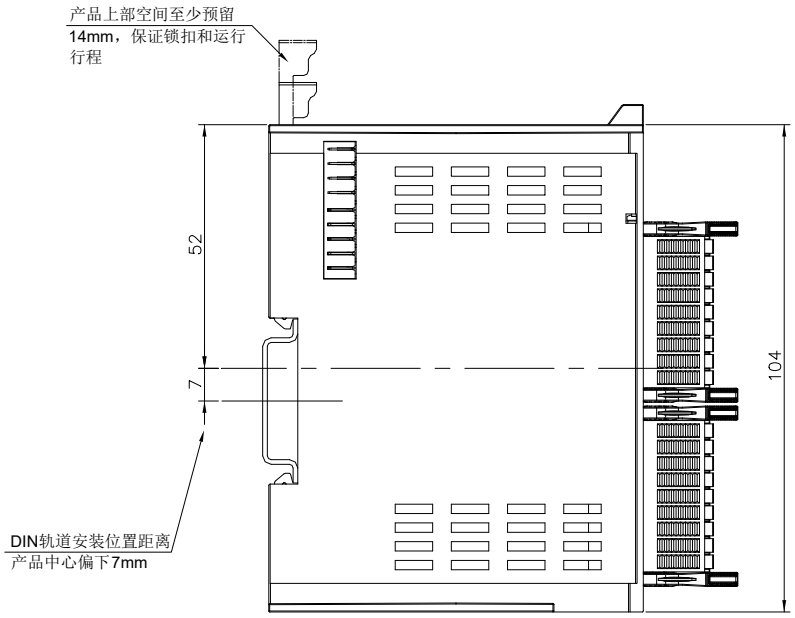
The installation dimensions are shown in the figure below, in millimeters (mm).

■ 16-bit module



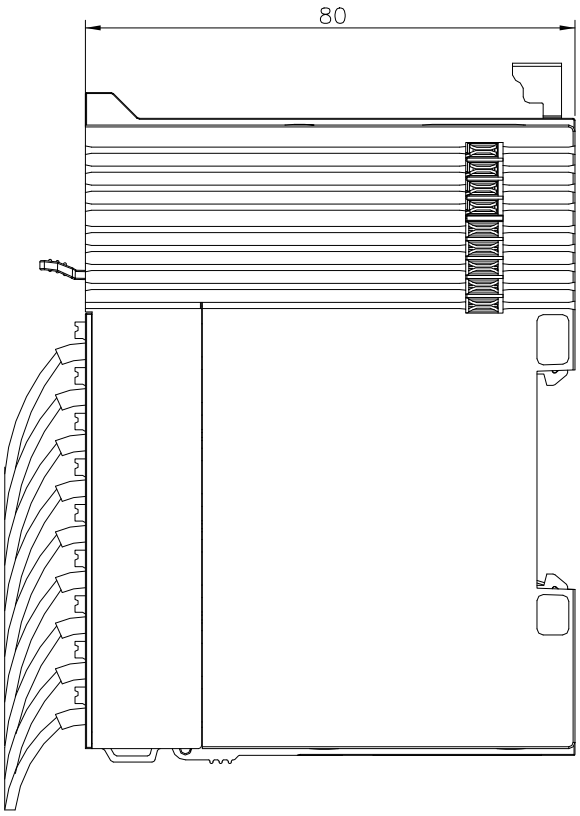
■ 32-bit module



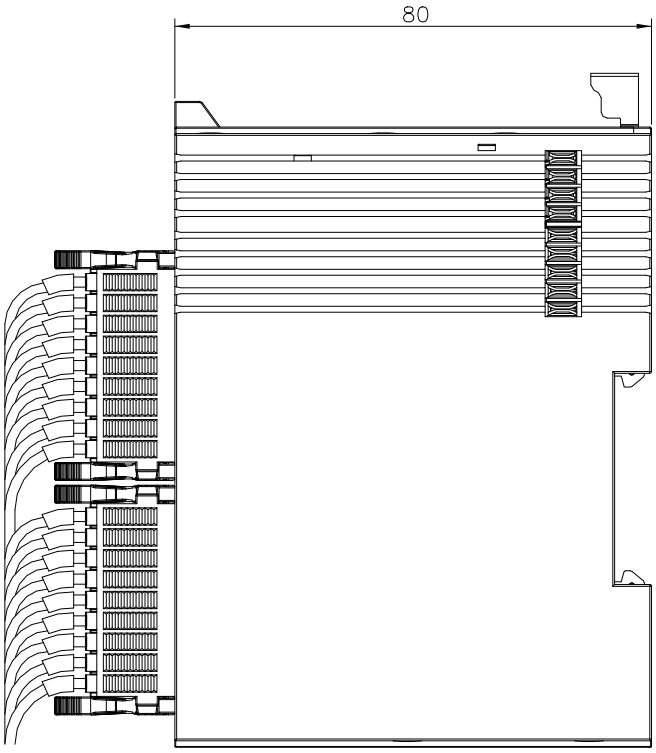


Connecting cables

- 16-bit module

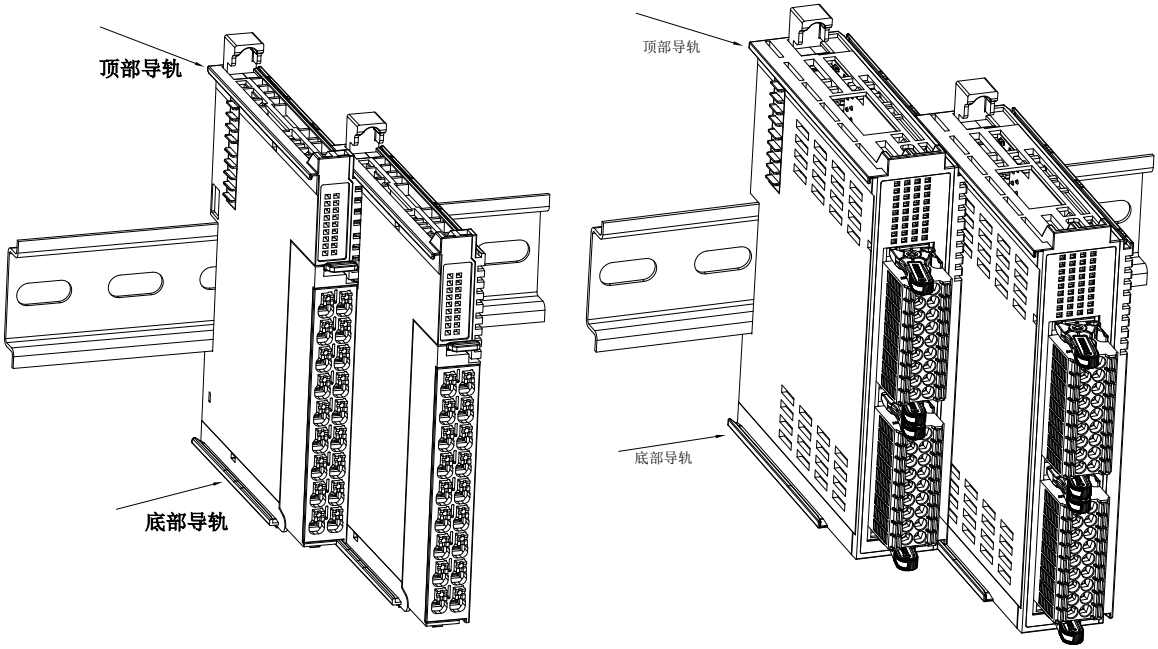


- 32-bit module

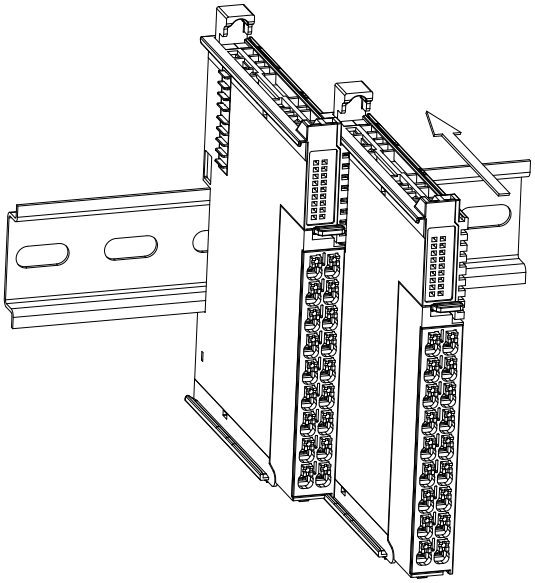


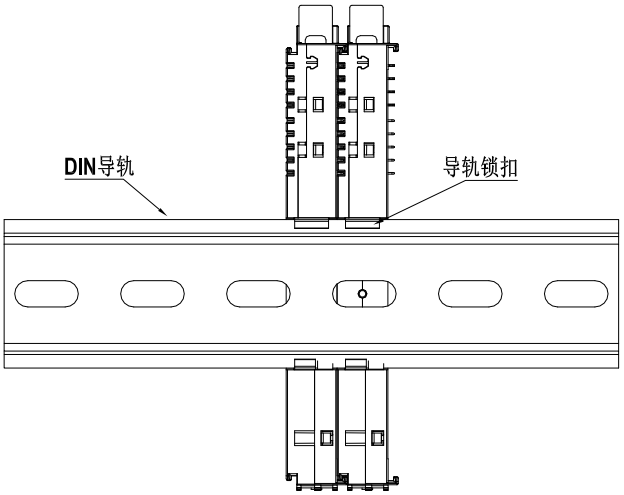
Installation Guide

The modules are slidably installed using the top and bottom guide rails of the modules, as shown in the figure below.

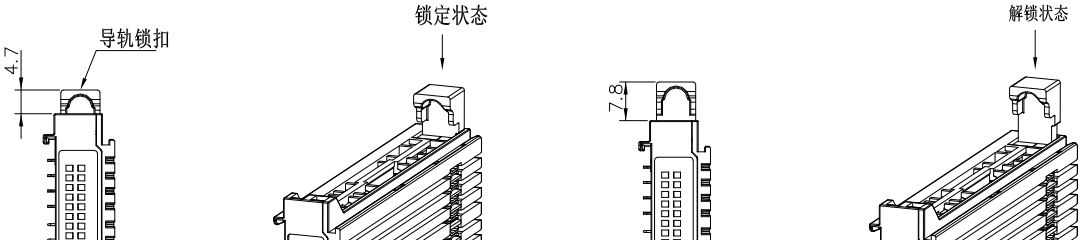


During installation, align the module with the DIN rail and press the module in the direction shown by the arrow. After installation, there will be a clear clicking sound, as shown in the picture below.





Confirm that the DIN rail latch of the module is in the locked state. The locked and unlocked states of the rail latch are shown in the figure below.

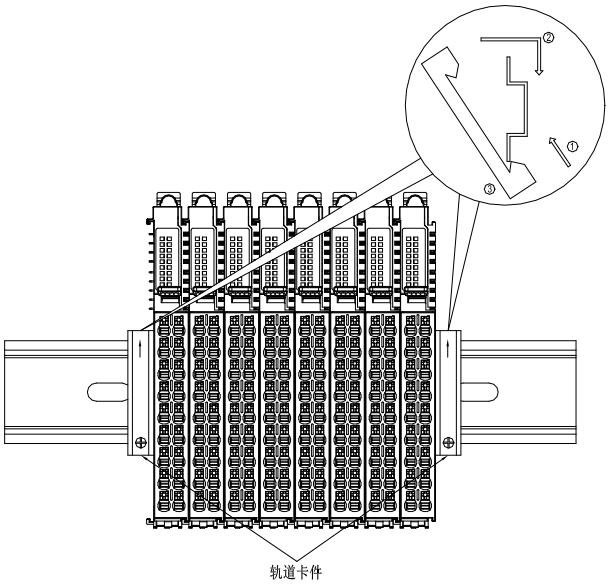


If the DIN rail latch is at the bottom, it is in the locked state.

If the DIN rail latch is on top, it is in the unlocked state.

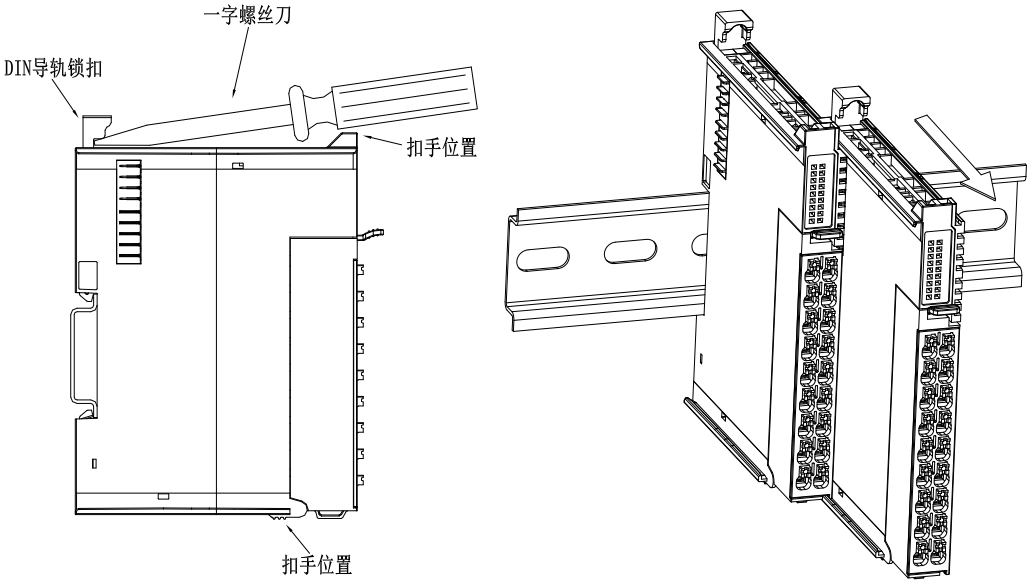
When in the unlocked state, press down on the DIN rail latch to lock it.

The tail cap needs to be installed on the last module to prevent the metal pins from being exposed, and a DIN rail clip should be installed at both ends of the main unit or module to prevent the module from sliding left and right, as shown in the figure below. When installing the guide rail clip, hook the bottom of the guide rail clip onto the bottom of the guide rail, then rotate the guide rail clip to make the guide rail clip... The upper end hooks onto the upper end of the guide rail, and finally the screws are tightened to lock the guide rail clip.



Disassembly method

Use a flathead screwdriver or similar tool to pry up the rail latch, then pull the module away from the DIN rail. After that, press down on the top of the latch.



Precautions

Before installing or removing the module, ensure that the module is powered off.

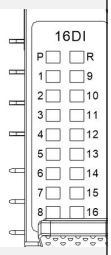
If you encounter a module that is difficult to install, do not use brute force to install

it, as this may damage the current module or other modules. The module should be removed from the guide rail and checked for any abnormalities (such as foreign objects blocking the circuit). Only after confirming that there are no problems should you attempt to plug or unplug it.

When this product is installed on a non-standard DIN rail (DIN rail thickness is 1.0mm), the DIN rail locking mechanism will fail, the product will not be able to be installed properly, and thus the product will not work properly.

4.1 DF30-M-16DI-P/N

4.1.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-16	Green light indicates that input signals for channels 1-16 are valid.		
		Green off: Channels 1-16 input signals are invalid		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	DI 1	Digital input channel 1	B1	DI 9	Digital input channel 9
A2	DI 2	Digital input channel 2	B2	DI 10	Digital input channel 10
A3	DI 3	Digital input channel 3	B3	DI 11	Digital input channel 11

A4	DI 4	Digital input channel 4	B4	DI 12	Digital input channel 12
A5	DI 5	Digital input channel 5	B5	DI 13	Digital input channel 13
A6	DI 6	Digital input channel 6	B6	DI 14	Digital input channel 14
A7	DI 7	Digital input channel 7	B7	DI 15	Digital input channel 15
A8	DI 8	Digital input channel 8	B8	DI 16	Digital input channel 16
A9	COM	common pin	B9	COM	common pin

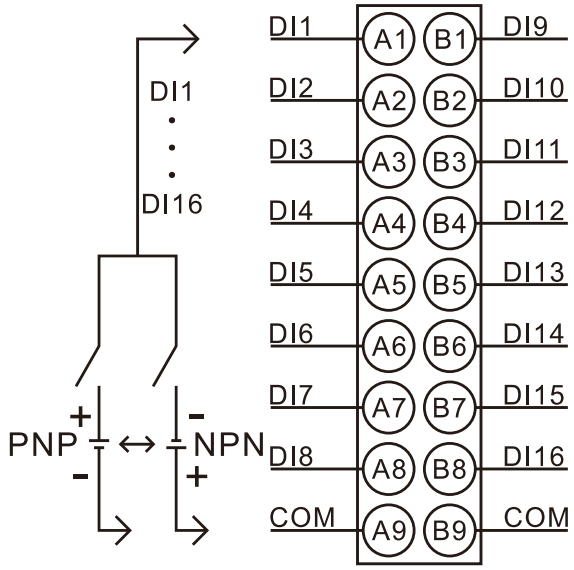
4.1.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA (typical value at 5V DC)
Uout power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current	4A (typical value at 24V DC)
Uout power input anti-reverse plugging protection	support
Module prevents power failure from spreading	support

Functional parameters		
Module type		Digital input
Number of channels		16
signal type		PNP & NPN
Connection type		1-wire system
signal type	"ON" signal voltage	Differential pressure > 11VDC (differential pressure from the common input terminal)
	"OFF" signal voltage	Differential pressure < 5VDC (differential pressure from common input terminal)
Input impedance		>7.5kΩ
Hardware response time		100us/100us
Whether to isolate		yes
Indicator light status		When the input is in drive mode, the input indicator light will illuminate (software controlled).
Software parameters		
Data size		2 Byte
Filtering time configuration		Supports independent configuration of single channel
Synchronous mode		Supports synchronization within the same coupler group
IO mapping		Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters		
Connectivity technology		PUSH-IN type terminal block
Connection type		System/Field Power Supply/Input
crimping area of the wire		0.34～1.5mm
Stripping length		10mm
Installation method		DIN-35 type guide rail
Material parameters		
color		Pantone 419C

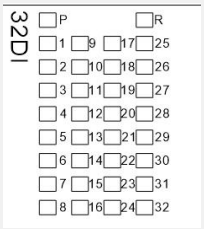
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.1.3 Wiring Diagram



4.2 DF30-M-32DI-P/N

4.2.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-32	Green light indicates that input signals for channels 1-32 are valid.		
		Green off: Channel 1-32 input signals are invalid		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	DI 1	Digital input channel 1	B1	DI 9	Digital input channel 9
A2	DI 2	Digital input channel 2	B2	DI 10	Digital input channel 10
A3	DI 3	Digital input channel 3	B3	DI 11	Digital input channel 11
A4	DI 4	Digital input channel 4	B4	DI 12	Digital input channel 12
A5	DI 5	Digital input channel 5	B5	DI 13	Digital input channel 13
A6	DI 6	Digital input channel 6	B6	DI 14	Digital input channel 14
A7	DI 7	Digital input channel 7	B7	DI 15	Digital input channel 15
A8	DI 8	Digital input channel 8	B8	DI 16	Digital input channel 16
A9	COM1	Common pin 1	B9	COM2	Common pin 2
C1	DI 17	Digital input channel 17	D1	DI 25	Digital input channel 25

C2	DI 18	Digital input channel 18	D2	DI 26	Digital input channel 26
C3	DI 19	Digital input channel 19	D3	DI 27	Digital input channel 27
C4	DI 20	Digital input channel 20	D4	DI 28	Digital input channel 28
C5	DI 21	Digital input channel 21	D5	DI 29	Digital input channel 29
C6	DI 22	Digital input channel 22	D6	DI 30	Digital input channel 30
C7	DI 23	Digital input channel 23	D7	DI 31	Digital input channel 31
C8	DI 24	Digital input channel 24	D8	DI 32	Digital input channel 32
C9	COM3	Common pin 3	D9	COM4	Common pin 4

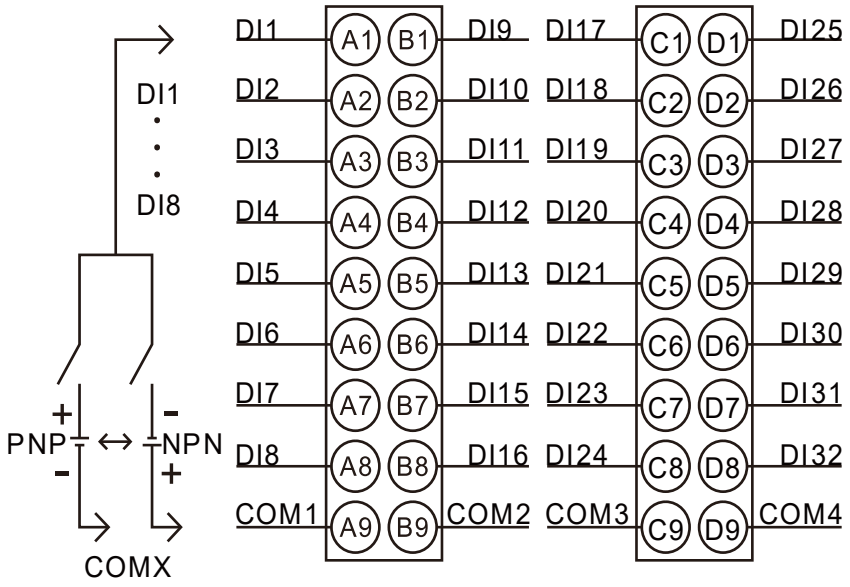
4.2.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	113.6g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA (typical value at 5V DC)
Uout power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current	4A (typical value at 24V DC)
Uout power input anti-reverse plugging protection	support
Module prevents power failure from spreading	support
Functional parameters	

Module type		Digital input
Number of channels		32
signal type		PNP & NPN
Connection type		1-wire system
signal type	"ON" signal voltage	Differential pressure > 11VDC (differential pressure from the common input terminal)
	"OFF" signal voltage	Differential pressure < 5VDC (differential pressure from common input terminal)
Input impedance		>7.5kΩ
Hardware response time		100us/100us
Whether to isolate		yes
Indicator light status		When the input is valid, the input indicator light will illuminate (software controlled).
Software parameters		
Data size		4 Byte
Error Diagnosis		Communication diagnostics
Filtering time configuration		Supports independent configuration of single channel
Synchronous mode		Supports synchronization within the same coupler group
IO mapping		Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters		
Connectivity technology		PUSH-IN type terminal block
Connection type		System/Field Power Supply/Input
crimping area of the wire		0.34～1.5mm
Stripping length		10mm
Installation method		DIN-35 type guide rail
Material parameters		
color		gy7042

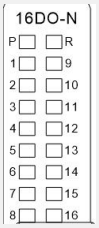
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.2.3 Wiring Diagram



4.3 DF30-M-16DO-N

4.3.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-16	Green light indicates that the output signals of channels 1-16 are valid.		
		Green off: Channels 1-16 output signals are invalid		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	DO 1	Digital output channel 1	B1	DO 9	Digital output channel 9
A2	DO 2	Digital output channel 2	B2	DO 10	Digital output channel 10
A3	DO 3	Digital output channel 3	B3	DO 11	Digital output channel 11
A4	DO 4	Digital output channel 4	B4	DO 12	Digital output channel 12
A5	DO 5	Digital output channel 5	B5	DO 13	Digital output channel 13
A6	DO 6	Digital output channel 6	B6	DO 14	Digital output channel 14
A7	DO 7	Digital output channel 7	B7	DO 15	Digital output channel 15
A8	DO 8	Digital output channels 8	B8	DO 16	Digital output channel 16
A9	24V	24V power input	B9	0V	0V input

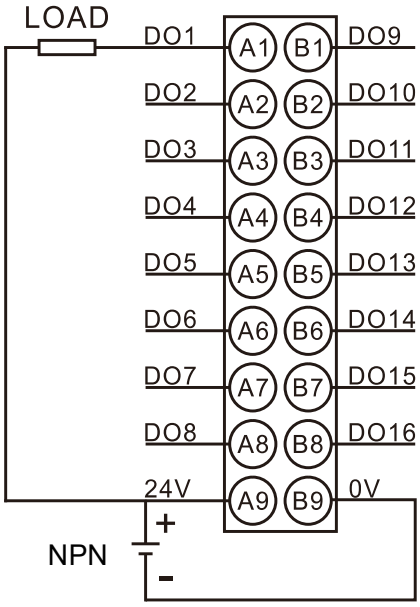
4.3.2 Specifications

Structural parameters		
Dimensions (width x height x depth)		12mm x 100mm x 80mm
weight		71.5g
Power parameters		
Usys bus input power rated voltage		5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current		<60mA (typical value at 5V DC)
Uout power input rated voltage		24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current		4A (typical value at 24V DC)
Uout power input anti-reverse plugging protection		support
Module prevents power failure from spreading		support
Functional parameters		
Module type		Digital output
Number of channels		16
signal type		NPN
Connection type		1-wire system
Power input Rated voltage	24V	24V power input
	0V	0V input
NPN signal type	"ON" signal voltage	0V DC
	"OFF" signal	In high-impedance state, leakage current <0.1mA

voltage	
Output load (resistive load)	0.5A/point, 4A/module
Output load (inductive load)	7.2W/point, 24W/module
Output load (lighting load)	5W/point, 18W/module
Switching frequency	Resistive load 100Hz, inductive load 0.5Hz, lamp load 10Hz
Hardware response time	100us/100us
Output derating	When operating at 55℃, the output current is derating by 50% (while the ON output current does not exceed 2A), or when all output points are ON, the output current is derating by 10℃.
Whether to isolate	yes
Protection function	Over-temperature shutdown: Minimum 150℃. Typical 175℃. Overcurrent protection: 3A Supports short circuit protection
Indicator light status	When the output is valid, the output indicator light will illuminate (software controlled).
Software parameters	
Data size	2 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel overcurrent diagnostics
Communication Failure Output Status Mode	Keep the current value and output the replacement value (configurable).
Overcurrent fault output status mode	Automatic retry, stop output (configurable)
Synchronous mode	Supports synchronization within the same coupler group
IO mapping	Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input

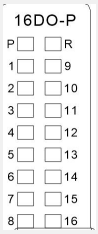
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.3.3 Wiring Diagram



4.4 DF30-M-16DO-P

4.4.1 Component Description

	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-16	Green light indicates that the output signals of channels 1-16 are valid.		
		Green off: Channels 1-16 output signals are invalid		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	DO 1	Digital output channel 1	B1	DO 9	Digital output channel 9
A2	DO 2	Digital output channel 2	B2	DO 10	Digital output channel 10
A3	DO 3	Digital output channel 3	B3	DO 11	Digital output channel 11
A4	DO 4	Digital output channel 4	B4	DO 12	Digital output channel 12
A5	DO 5	Digital output channel 5	B5	DO 13	Digital output channel 13
A6	DO 6	Digital output channel 6	B6	DO 14	Digital output channel 14
A7	DO 7	Digital output channel 7	B7	DO 15	Digital output channel 15
A8	DO 8	Digital output channels 8	B8	DO 16	Digital output channel 16
A9	24V	24V power input	B9	0V	0V input

4.4.2 Specifications

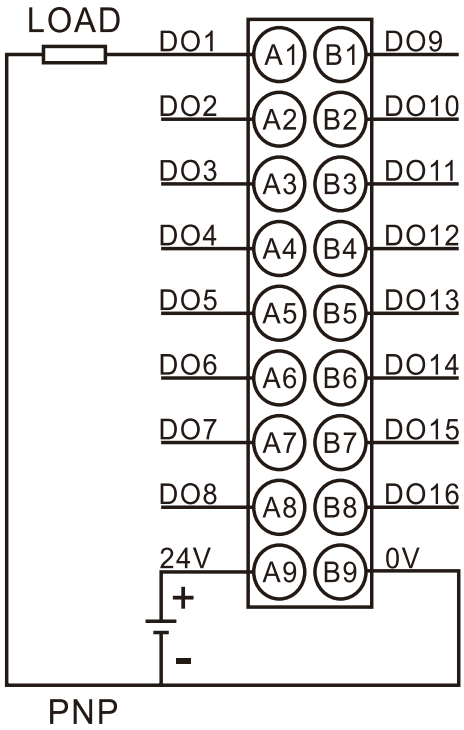
Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<60mA (typical value at 5V DC)
Uout power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current	4A (typical value at 24V DC)
Uout power input	support

anti-reverse plugging protection		
Module prevents power failure from spreading		support
Functional parameters		
Module type		Digital output
Number of channels		16
signal type		PNP
Connection type		1-wire system
Power input Rated voltage	24V	24V power input
	0V	0V input
PNP signal type	"ON" signal voltage	24V DC
	"OFF" signal voltage	In high-impedance state, leakage current <0.1mA
Output load (resistive load)		0.5A/point, 4A/module
Output load (inductive load)		7.2W/point, 24W/module
Output load (lighting load)		5W/point, 18W/module
Switching frequency		Resistive load 100Hz, inductive load 0.5Hz, lamp load 10Hz
Hardware response time		100us/100us
Output derating		When operating at 55℃, the output current is derating by 50% (while the ON output current does not exceed 2A), or when all output points are ON, the output current is derating by 10℃.
Whether to isolate		yes
Protection function		Over-temperature shutdown: Typical value 175℃ Overcurrent protection: 1A Supports short circuit protection

Indicator light status	When the output is valid, the output indicator light will illuminate (software controlled).
Software parameters	
Data size	2 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel overcurrent diagnostics
Communication Failure Output Status Mode	Keep the current value and output the replacement value (configurable).
Overcurrent fault output status mode	Automatic retry, stop output (configurable)
Synchronous mode	Supports synchronization within the same coupler group
IO mapping	Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20

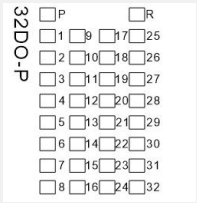
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.4.3 Wiring Diagram



4.5 DF30-M-32DO-P

4.5.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.

		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-32	Green light indicates that the output signal of channels 1-32 is valid.		
		Green off: Channels 1-32 output signals are invalid.		

Terminal blocks

Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	DO 1	Digital output channel 1	B1	DO 9	Digital output channel 9
A2	DO 2	Digital output channel 2	B2	DO 10	Digital output channel 10
A3	DO 3	Digital output channel 3	B3	DO 11	Digital output channel 11
A4	DO 4	Digital output channel 4	B4	DO 12	Digital output channel 12
A5	DO 5	Digital output channel 5	B5	DO 13	Digital output channel 13
A6	DO 6	Digital output channel 6	B6	DO 14	Digital output channel 14
A7	DO 7	Digital output channel 7	B7	DO 15	Digital output channel 15
A8	DO 8	Digital output channels 8	B8	DO 16	Digital output channel 16
A9	24V	24V power input	B9	0V	0V input
C1	DO 17	Digital output channel 17	D1	DO 25	Digital output channel 25
C2	DO 18	Digital output channel 18	D2	DO 26	Digital output channel 26
C3	DO 19	Digital output channel 19	D3	DO 27	Digital output channel 27
C4	DO 20	Digital output channel 20	D4	DO 28	Digital output channel 28
C5	DO 21	Digital output channel 21	D5	DO 29	Digital output channel 29
C6	DO 22	Digital output channel 22	D6	DO 30	Digital output channel 30
C7	DO 23	Digital output channel 23	D7	DO 31	Digital output channel 31
C8	DO 24	Digital output channel 24	D8	DO 32	Digital output channel 32
C9	24V	24V power input	D9	0V	0V input

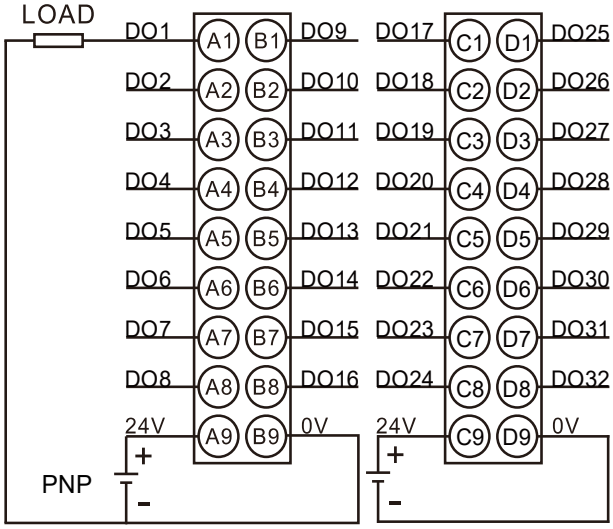
4.5.2 Specifications

Structural parameters		
Dimensions (width x height x depth)		12mm x 100mm x 80mm
weight		113.6g
Power parameters		
Usys bus input power rated voltage		5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current		<60mA (typical value at 5V DC)
Uout power input rated voltage		24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current		4A (typical value at 24V DC)
Uout power input anti-reverse plugging protection		support
Module prevents power failure from spreading		support
Functional parameters		
Module type		Digital output
Number of channels		32
signal type		PNP
Connection type		1-wire system
Power input Rated voltage	24V	24V power input
	0V	0V input
PNP signal	"ON" signal	24V DC

type	voltage	
	"OFF" signal voltage	High configuration, leakage current <0.1mA
Output load (resistive load)		0.5A/point, 8A/module
Output load (inductive load)		7.2W/point, 48W/module
Output load (lighting load)		5W/point, 36W/module
Switching frequency		Resistive load 100Hz, inductive load 0.5Hz, lamp load 10Hz
Hardware response time		100us/100us
Output derating		When operating at 55℃, derating by 50% (while the output current is ON, it does not exceed 4A), or derating by 10℃ when all output points are ON.
Whether to isolate		yes
Protection function		Over-temperature shutdown: Typical value 175℃ Overcurrent protection: 1A Supports short circuit protection
Indicator light status		When the output is valid, the output indicator light will illuminate (software controlled).
Software parameters		
Data size		4 Byte
Error Diagnosis		Communication diagnostics, power supply diagnostics, channel overcurrent diagnostics
Communication Failure Output Status Mode		Keep the current value and output according to the replacement value.
Overcurrent fault output status mode		Automatic retry, stop output (configurable)
Synchronous mode		Supports synchronization within the same coupler group
IO mapping		Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters		
Connectivity technology		PUSH-IN type terminal block

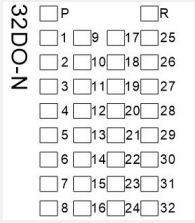
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	gy7042
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.5.3 Wiring Diagram



4.6 DF30-M-32DO-N

4.6.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1 -32	Green light indicates that the output signal of channels 1-32 is valid.		
		Green off: Channels 1-32 output signals are invalid.		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	DO 1	Digital output channel 1	B1	DO 9	Digital output channel 9
A2	DO 2	Digital output channel 2	B2	DO 10	Digital output channel 10
A3	DO 3	Digital output channel 3	B3	DO 11	Digital output channel 11
A4	DO 4	Digital output channel 4	B4	DO 12	Digital output channel 12
A5	DO 5	Digital output channel 5	B5	DO 13	Digital output channel 13
A6	DO 6	Digital output channel 6	B6	DO 14	Digital output channel 14
A7	DO 7	Digital output channel 7	B7	DO 15	Digital output channel 15
A8	DO 8	Digital output channels 8	B8	DO 16	Digital output channel 16
A9	24V	24V power input	B9	0V	0V input
C1	DO 17	Digital output channel 17	D1	DO 25	Digital output channel 25
C2	DO 18	Digital output channel 18	D2	DO 26	Digital output channel 26
C3	DO 19	Digital output channel 19	D3	DO 27	Digital output channel 27
C4	DO 20	Digital output channel 20	D4	DO 28	Digital output channel 28
C5	DO 21	Digital output channel 21	D5	DO 29	Digital output channel 29
C6	DO 22	Digital output channel 22	D6	DO 30	Digital output channel 30
C7	DO 23	Digital output channel 23	D7	DO 31	Digital output channel 31
C8	DO 24	Digital output channel 24	D8	DO 32	Digital output channel 32
C9	24V	24V power input	D9	0V	0V input

4.6.2 Specifications

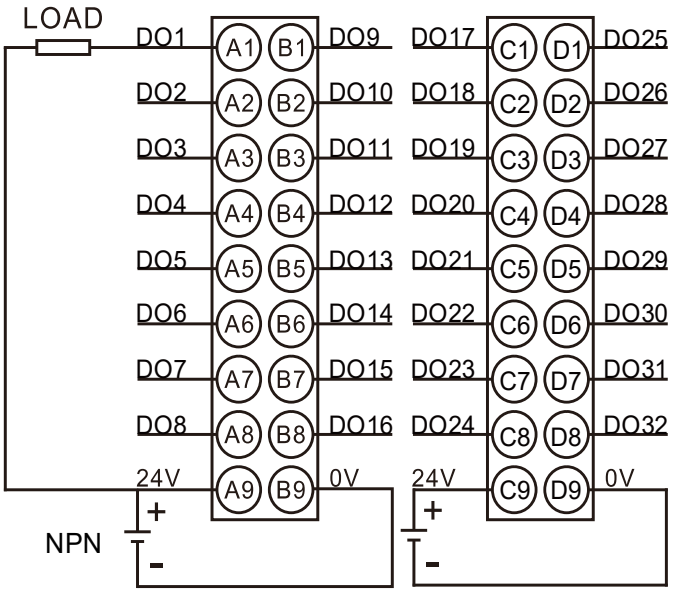
Structural parameters

Dimensions (width x height x depth)		12mm x 100mm x 80mm
weight		113.6g
Power parameters		
Usys bus input power rated voltage		5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current		<60mA (typical value at 5V DC)
Uout power input rated voltage		24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current		4A (typical value at 24V DC)
Uout power input anti-reverse plugging protection		support
Module prevents power failure from spreading		support
Functional parameters		
Module type		Digital output
Number of channels		32
signal type		NPN
Connection type		1-wire system
Power input Rated voltage	24V	24V power input
	0V	0V input
NPN signal type	"ON" signal voltage	24V DC
	"OFF" signal voltage	High configuration, leakage current <0.1mA
Output load (resistive load)		0.5A/point, 8A/module
Output load (inductive load)		7.2W/point, 48W/module
Output load (lighting load)		5W/point, 36W/module
Switching frequency		Resistive load 100Hz, inductive load 0.5Hz, lamp load

	10Hz
Hardware response time	100us/100us
Output derating	When operating at 55℃, derating by 50% (while the output current is ON, it does not exceed 4A), or derating by 10℃ when all output points are ON.
Whether to isolate	yes
Protection function	Over-temperature shutdown: Minimum 150℃. Typical 175℃. Overcurrent protection: 3A Supports short circuit protection
Indicator light status	When the output is valid, the output indicator light will illuminate (software controlled).
Software parameters	
Data size	4 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel overcurrent diagnostics
Communication Failure Output Status Mode	Keep the current value and output according to the replacement value.
Overcurrent fault output status mode	Automatic retry
Synchronous mode	Supports synchronization within the same coupler group
IO mapping	Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail

Material parameters	
color	gy7042
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.6.3 Wiring Diagram



4.7 DF30-M-4AI-UI

4.7.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-4	Green light indicates that input signals for channels 1-4 are valid.		
		Green off: Channels 1-4 input signals are invalid		
		Flashing green: When the diagnostic switches for channels 1-4 are on, the corresponding input channel is faulty.		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	U1+	Analog voltage input channel 1	B1	U1-	Analog voltage input channel 1
A2	U2+	Analog voltage input channel 2	B2	U2-	Analog voltage input channel 2
A3	U3+	Analog voltage input channel 3	B3	U3-	Analog voltage input channel 3
A4	U4+	Analog voltage input channel 4	B4	U4-	Analog voltage input channel 4
A5	I1+	Analog current input channel 1	B5	I1-	Analog current input channel 1

A6	I2+	Analog current input channel 2	B6	I2-	Analog current input channel 2
A7	I3+	Analog current input channel 3	B7	I3-	Analog current input channel 3
A8	I4+	Analog current input channel 4	B8	I4-	Analog current input channel 4
A9	24V	24V power output	B9	0V	0V output

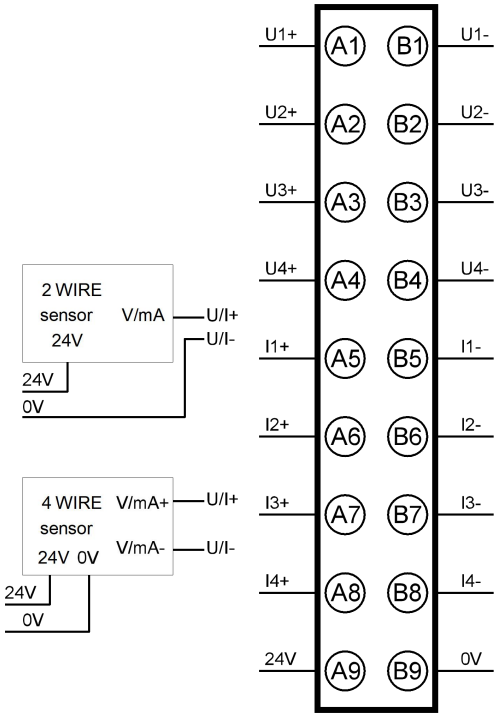
4.7.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA
Uin power input rated voltage	24V DC (20.4V DC~28.8V DC)
Uin power input rated current	<50mA Non-distribution
	<250mA power distribution
Uni power input reverse insertion protection	support
Functional parameters	
Module type	Analog voltage and current input module
Number of channels	4
signal type	Voltage/Current
Connection type	2-wire power distribution, 4-wire non-power distribution
Channel mode configuration	Disable, 0~10mA, 0~20mA, 4~20mA, ±10V, 0~10V, 2~10V, ±

	5V, 0~5V, 1~5V
Voltage input accuracy	±0.1% (±10V full range)
Voltage input impedance	>400KΩ
Voltage input limit	±15V
Voltage input diagnostics	Over-limit detection; supports wire breakage detection for 2~10V and 1~5V.
Current sampling impedance	≤250Ω
Current input accuracy	±0.1% (20mA full range)
Current input limit	30mA
Current input diagnostics	Over-limit detection, 4~20mA supports wire breakage detection
Whether to isolate	The interfaces are not isolated from each other, but the interfaces are isolated from the bus.
Input action display	When the input signal is valid, the input channel indicator light will remain on (software controlled).
Software parameters	
Sampling period	1ms (4 channels)
Filtering methods	Sliding window filtering, dejitter filtering, 50Hz/60Hz anti-power frequency.
Data size	8 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel over-limit diagnostics, channel disconnection diagnostics
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm

Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.7.3 Wiring Diagram

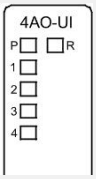


Note:

- If the sensor enumeration item for channel 1 is configured as 0~10mA to 4~20mA, then channel 1 is in current detection mode, and the sensor is connected to channels A5 to B5; if the sensor enumeration item for channel 1 is configured as -10V to +10V to 1V to 5V, then channel 1 is in voltage detection mode, and the sensor is connected to channels A1 to B1.
- If the sensor enumeration item for channel 2 is configured as 0~10mA or 4~20mA, channel 2 is in current detection mode, and the sensor is connected to channels A6~B6; if the sensor enumeration item for channel 2 is configured as -10V~+10V or 1V~5V, then channel 2 is in voltage detection mode, and the sensor is connected to channels A2~B2, and so on for other channels.

4.8 DF30-M-4AO-UI

4.8.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-4	Green light indicates that the output signals of channels 1-4 are valid.		
		Green off: Channels 1-4 output signals are invalid		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	U1+	Analog voltage output channel 1	B1	U1-	Analog voltage output channel 1
A2	U2+	Analog voltage output channel 2	B2	U2-	Analog voltage output channel 2
A3	U3+	Analog voltage output channel 3	B3	U3-	Analog voltage output channel 3
A4	U4+	Analog voltage output channel 4	B4	U4-	Analog voltage output channel 4
A5	I1+	Analog current output channel 1	B5	I1-	Analog current output channel 1
A6	I2+	Analog current output channel 2	B6	I2-	Analog current output channel 2

A7	I3+	Analog current output channel 3	B7	I3-	Analog current output channel 3
A8	I4+	Analog current output channel 4	B8	I4-	Analog current output channel 4

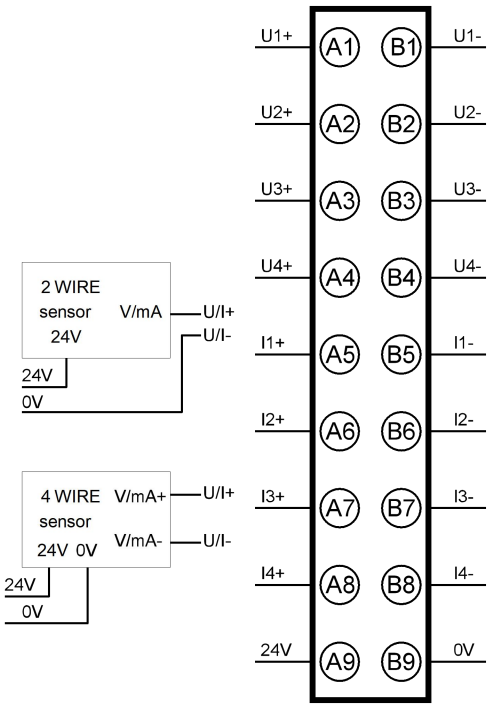
4.8.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA (typical value at 5V DC)
Uout power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current	<200mA
Uout power input anti-reverse plugging protection	support
Functional parameters	
Module type	Analog voltage and current output
Number of channels	4
signal type	Voltage/Current
Connection type	2-wire power distribution, 4-wire non-power distribution
Voltage output range	±10V, 0~10V, 2~10V, ±5V, 0~5V, 1~5V
Voltage output load	>1kΩ

Voltage output accuracy	±0.1%
Current output range	0~10mA, 0~20mA, 4~20mA
Current output load	0~10mA: <1.5kΩ Other: <600Ω
Current output accuracy	±0.1%
Whether to isolate	There is no isolation between interface channels; power supply is isolated from the interface; and the interface is isolated from the bus.
Output action display	When the output is valid, the output indicator light will illuminate (software controlled).
Software parameters	
Convert digital range	-20000~20000, -32000~32000, -27648~27648
IO process data size	16 bytes
Error Diagnosis	Communication diagnostics, power supply diagnostics, output open circuit (effective when current is outputting).
Synchronous mode	Supports synchronization within the same coupler group
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient	-20～55℃

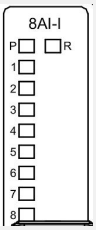
temperature (during operation)	
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.8.3 Wiring Diagram



4.9 DF30-M-8AI-I

4.9.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-8	Green light indicates that input signals for channels 1-8 are valid.		
		Green off: Channels 1-8 input signals are invalid		
		Flashing green: When the diagnostic switches for channels 1-8 are on, the corresponding input channel is faulty.		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	I1+	Current input channel 1	B1	I1-	Current input channel 1
A2	I2+	Current input channel 2	B2	I2-	Current input channel 2
A3	I3+	Current input channel 3	B3	I3-	Current input channel 3
A4	I4+	Current input channel 4	B4	I4-	Current input channel 4
A5	I5+	Current input channel 5	B5	I5-	Current input channel 5
A6	I6+	Current input channel 6	B6	I6-	Current input channel 6
A7	i7+	Current input channel 7	B7	I7-	Current input channel 7
A8	i8+	Current input channel 8	B8	I8-	Current input channel 8
A9	24V	24V power output	B9	0V	0V output

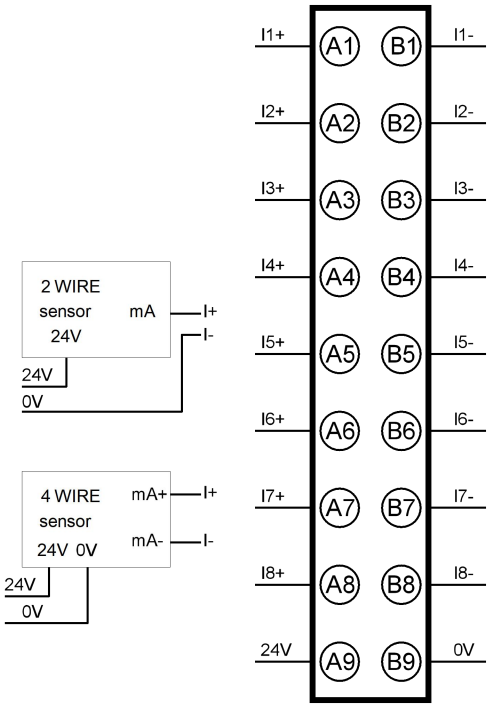
4.9.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA
Uin power input rated voltage	24V DC (20.4V DC~28.8V DC)
Uin power input rated current	<50mA Non-distribution
	<250mA power distribution
Uni power input reverse insertion protection	support
Module prevents power failure from spreading	support
Functional parameters	
Module type	Analog input module
Number of channels	8
signal type	Current
Connection type	2-wire power distribution, 4-wire non-power distribution
Maximum input current range	0~10mA: 0~12.5mA 0~20mA: 0~24mA 4~20mA: 1.19~24mA
Current acquisition impedance	≤250Ω
Current input accuracy	±0.1% (full range)
Temperature drift	±50ppm/K

Current protection	30mA
Current input diagnostics	Over-limit detection, 4~20mA supports wire breakage detection
Whether to isolate	There is no isolation between interface channels; power supply is isolated from the interface; and the interface is isolated from the bus.
Independent channel enable configuration	support
Diagnostic reporting function configuration	support
Channel mode configuration	Disable, 0~10mA, 0~20mA, 4~20mA
Input action display	When the input signal is valid, the input indicator light will remain on.
Channel reverse polarity protection	support
Channel protection against 24V misconnection	support
Software parameters	
Sampling period	1.6ms (8 channels)
Filtering methods	Sliding window filtering, dejitter filtering, 50Hz/60Hz anti-power frequency.
Data size	16 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel over-limit diagnostics, channel disconnection diagnostics
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input

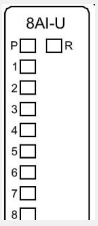
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.9.3 Wiring Diagram



4.10 DF30-M-8AO-I

4.10.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-8	Green light indicates that the output signals of channels 1-8 are valid.		
		Green light off: Channels 1-8 output signal abnormal.		

Terminal blocks					
Serial	Signal	illustrate	Serial	Signal	illustrate

Number			Number		
A1	I1+	Current output channel 1	B1	I1-	Current output channel 1
A2	I2+	Current output channel 2	B2	I2-	Current output channel 2
A3	I3+	Current output channel 3	B3	I3-	Current output channel 3
A4	I4+	Current output channel 4	B4	I4-	Current output channel 4
A5	I5+	Current output channel 5	B5	I5-	Current output channel 5
A6	I6+	Current output channel 6	B6	I6-	Current output channel 6
A7	i7+	Current output channel 7	B7	I7-	Current output channel 7
A8	i8+	Current output channel 8	B8	I8-	Current output channel 8
A9	24V	24V power input	B9	0V	0V input

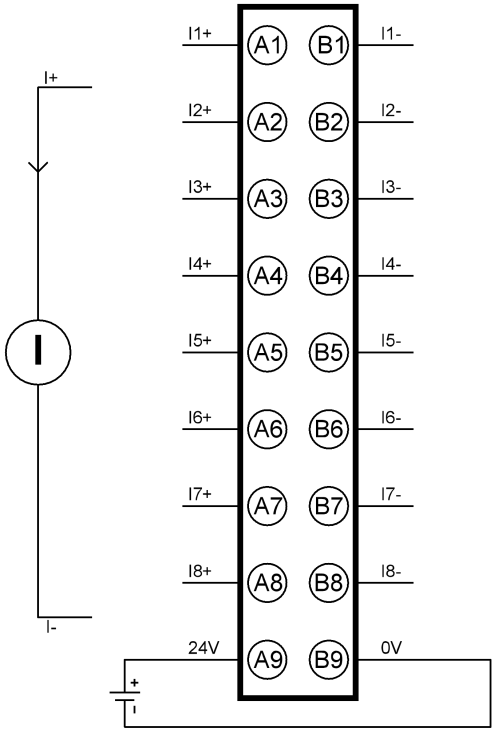
4.10.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA (typical value at 5V DC)
Uout power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current	<200mA
Uout power input anti-reverse plugging protection	support
Functional parameters	

Module type	Analog output
Number of channels	8
signal type	Current
Current output range	0~10ma: 0~12.5ma 0~20ma: 0~24ma 4~20ma: 1.19~24ma
Current output load	0~10mA: <1.5kΩ Other: <600Ω
Current output accuracy	±0.1% (full range)
Channel mode configuration	Disable, 0~10ma, 0~20ma, 4~20ma
Whether to isolate	Interface channels are not isolated, but the interface is isolated from the bus, 500VAC.
Temperature drift	±50ppm/k
Output response time	10%~90% step jump: <100ms
Diagnostic testing	Communication diagnostics, power supply diagnostics, output open circuit
Output status configuration after shutdown	Keep the current output or output preset value
Stop mode	In fault-stop mode, no further refresh.
Output action display	When the output signal is valid, the indicator light will remain on.
Software parameters	
Convert digital range	0~20000, 0~32000, 0~27648
IO process data size	16 bytes
Error Diagnosis	Communication diagnostics, power supply diagnostics, output open circuit
Synchronous mode	Supports synchronization within the same coupler group
IO mapping	Supports word mapping
Wiring parameters	

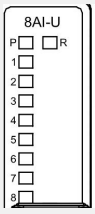
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.10.3 Wiring Diagram



4.11 DF30-M-8AI-U

4.11.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-8	Green light indicates that input signals for channels 1-8 are valid.		
		Green off: Channels 1-8 input signals are invalid		
		Flashing green: When the diagnostic switch for channels 1-8 is on, there is a fault in the corresponding channel input.		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	U1+	Voltage input channel 1	B1	U1-	Voltage input channel 1
A2	U2+	Voltage input channel 2	B2	U2-	Voltage input channel 2
A3	U3+	Voltage input channel 3	B3	U3-	Voltage input channel 3
A4	U4+	Voltage input channel 4	B4	U4-	Voltage input channel 4
A5	U5+	Voltage input channel 5	B5	U5-	Voltage input channel 5
A6	U6+	Voltage input channel 6	B6	U6-	Voltage input channel 6
A7	U7+	Voltage input channel 7	B7	U7-	Voltage input channel 7
A8	U8+	Voltage input channel 8	B8	U8-	Voltage input channel 8
A9	24V	24V power output	B9	0V	0V output

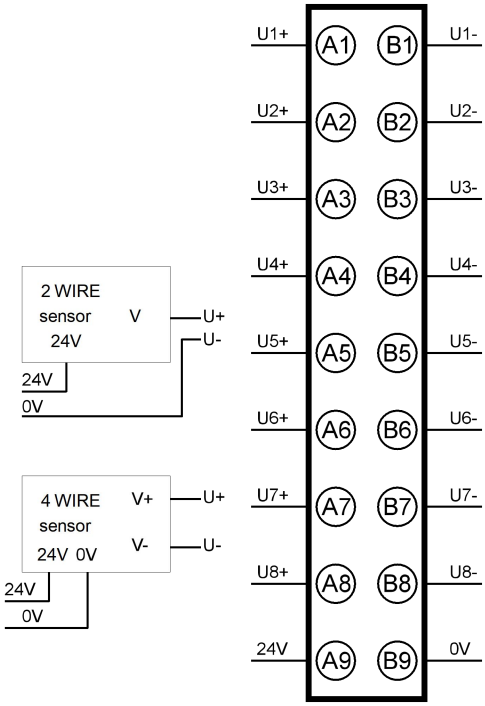
4.11.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50m
Uin power input rated voltage	24V DC (20.4V DC~28.8V DC)
Uin power input rated current	<50mA Non-distribution
	<250mA power distribution
Uni power input reverse insertion protection	support

Module prevents power failure from spreading	support
Functional parameters	
Module type	Analog input module
Number of channels	8
signal type	Voltage
Connection type	2-wire power distribution, 4-wire non-power distribution
Voltage input range	±10V, 0~10V, 2~10V, ±5V, 0~5V, 1~5V
Input impedance	>400KΩ
Voltage input accuracy	±0.1% (full range)
Temperature drift	±50ppm/K
Voltage protection	24V
Voltage input diagnostics	2~10V and 1~5V support wire breakage detection
Whether to isolate	The interfaces are not isolated from each other, but the interfaces are isolated from the bus.
Independent channel enable configuration	support
Diagnostic reporting function configuration	support
Channel mode configuration	Disable, ±10V, 0~10V, 2~10V, ±5V, 0~5V, 1~5V
Input action display	When the input signal is valid, the input indicator light will remain on.
Channel protection against 24V misconnection	support
Software parameters	
Sampling period	1.6ms (8 channels)
Filtering methods	Sliding window filtering, dejitter filtering, 50Hz/60Hz anti-power frequency.
Data size	16 Byte

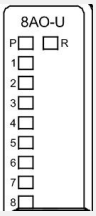
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel over-limit diagnostics, channel disconnection diagnostics
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.11.3 Wiring Diagram



4.12 DF30-M-8AO-U

4.12.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-8	Green light indicates that the output signals of channels 1-8 are valid.		
		Green off: Channels 1-8 output signals are invalid.		
Terminal blocks				

Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	U1+	Voltage output channel 1	B1	U1-	Voltage output channel 1
A2	U2+	Voltage output channel 2	B2	U2-	Voltage output channel 2
A3	U3+	Voltage output channel 3	B3	U3-	Voltage output channel 3
A4	U4+	Voltage output channel 4	B4	U4-	Voltage output channel 4
A5	U5+	Voltage output channel 5	B5	U5-	Voltage output channel 5
A6	U6+	Voltage output channel 6	B6	U6-	Voltage output channel 6
A7	U7+	Voltage output channel 7	B7	U7-	Voltage output channel 7
A8	U8+	Voltage output channel 8	B8	U8-	Voltage output channel 8
A9	24V	24V power input	B9	0V	0V input

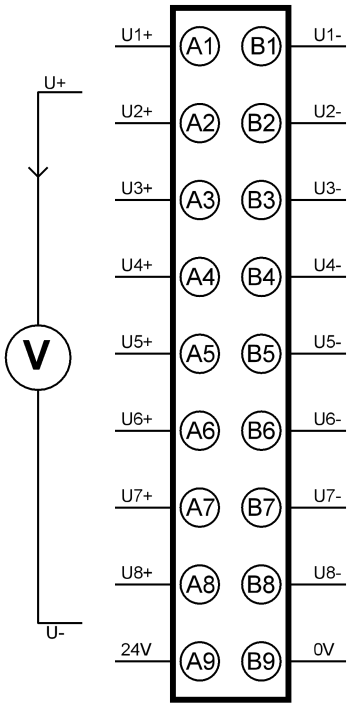
4.12.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA (typical value at 5V DC)
Uout power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uout power input rated current	<200mA
Uout power input anti-reverse plugging protection	support
Functional parameters	

Module type	Analog output
Number of channels	8
signal type	Voltage
Voltage output range	±10V, 0~10V, 2~10V, ±5V, 0~5V, 1~5V
Voltage output load	>1kΩ
Voltage output accuracy	±0.1% (full range)
Whether to isolate	Interface channels are not isolated, but the interface is isolated from the bus, 500VAC.
Temperature drift	±50ppm/k
Diagnostic reporting function configuration	support
Diagnostic testing	Communication diagnostics, power supply diagnostics
Channel mode settings	Disable, ±10V, 0~10V, 2~10V, ±5V, 0~5V, 1~5V
Output status configuration after shutdown	Keep the current output or output preset value
Stop mode	In fault-stop mode, no further refresh.
Output action display	When the output is valid, the output indicator light will illuminate.
Software parameters	
Convert digital range	-20000~20000, -32000~32000, -27648~27648
IO process data size	16 bytes
Error Diagnosis	Communication diagnostics, power supply diagnostics
Synchronous mode	Supports synchronization within the same coupler group
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm

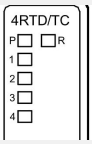
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.12.3 Wiring Diagram



4.13 DF30-M-4RTD/TC

4.13.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-4	Green light indicates that input signals for channels 1-4 are valid.		
		Green off: Channels 1-4 input signals are invalid		
		Flashing green: When the diagnostic switches for channels 1-4 are on,		

		there is an input fault in the corresponding channel.

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	RTD1+	First channel signal input	B1	RTD1-	First channel signal input
A2	Sense1+ (TC+)	First channel signal input	B2	Sense1- (TC-)	First channel signal input
A3	RTD2+	Second channel signal input	B3	RTD2-	Second channel signal input
A4	Sense2+ (TC+)	Second channel signal input	B4	Sense2- (TC-)	Second channel signal input
A5	RTD3+	Third channel signal input	B5	RTD3-	Third channel signal input
A6	Sense3+ (TC+)	Third channel signal input	B6	Sense3- (TC-)	Third channel signal input
A7	RTD4+	Fourth channel signal input	B7	RTD4-	Fourth channel signal input
A8	Sense4+ (TC+)	Fourth channel signal input	B8	Sense4- (TC-)	Fourth channel signal input
A9	/	Reserved for suspension	B9	/	Reserved for suspension

4.13.2 Specifications

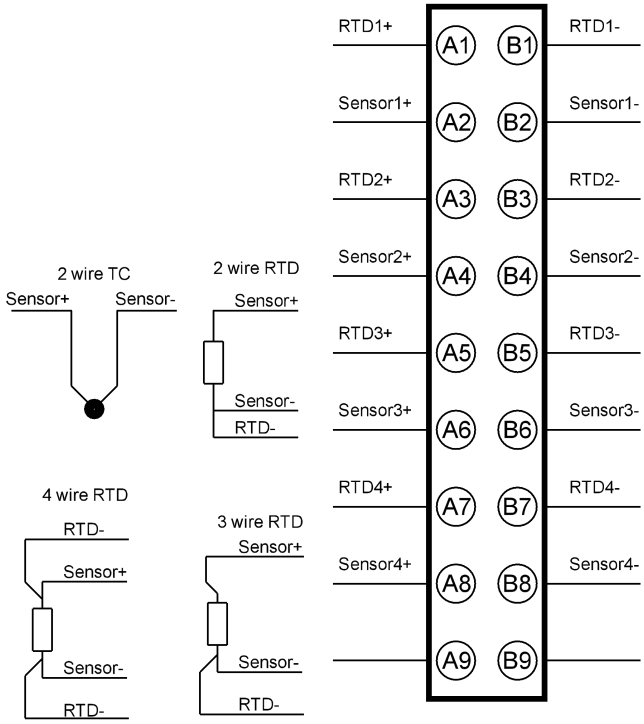
Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated	<60mA (typical value at 5V DC)

current	
Functional parameters	
Module type	Resistance temperature detector (RTD) and thermocouple measurement module
Number of channels	4
Sensor type	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu53, Cu100, KTY83-110, KTY83-120, KTY83-121, KTY83-122, KTY83-150, KTY83-151, KTY84-130,KTY84-150,KTY84-151,40 Ω,300 Ω, 500 Ω, 1 kΩ, 2 kΩ, K,E,T,J,B,S,R,N,C,L, ±15.625mV,±31.25mV,±62.5mV, ±125mV, ±250mV, ±500mV, ±1000mV, ±2000mV
Connection method	2-wire, 3-wire, 4-wire
Input precision (25° C)	Full scale* (±0.1%)
Temperature drift	±50ppm/K, ±0.375%
Connection method	Two-tier/Three-tier/Four-tier
Whether to isolate	Interfaces are isolated from the bus, terminals are isolated from the power supply, but channels are not isolated from each other.
Channel Diagnostics	Exceeding upper limit alarm, exceeding lower limit alarm, disconnection alarm, overflow error
Diagnostic reporting function configuration	support
Input action display	When the input signal is valid, the channel input indicator light stays on. When channel diagnostics are enabled, the channel input indicator light flashes when the input signal is invalid.
Software parameters	
Sampling period	RTD:250ms/TC:500ms, RTD:500ms/TC:1000ms, RTD:1000ms/TC:2000ms, RTD:320ms/TC:640ms (50Hz frequency

	suppression), RTD:266ms/TC:532ms (60Hz frequency suppression)
Filtering methods	Sliding window filtering, dejitter filtering, 50Hz/60Hz anti-power frequency.
Frequency interference suppression	Supports 50Hz | 60Hz suppression
Data size	8 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel over-limit diagnostics, channel disconnection diagnostics
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard

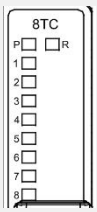
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.13.3 Wiring Diagram



4.14 DF30-M-8TC

4.14.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power		Green extinction: Module

		failure		hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	LED1-8	Green light indicates that input signals for channels 1-8 are valid.		
		Green off: Channels 1-8 input signals are invalid		
		Flashing green: When the diagnostic switch for channels 1-8 is on, there is a fault in the corresponding channel input.		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	TC1+	Thermocouple Input Channel 1	B1	TC1-	Thermocouple Input Channel 1
A2	TC2+	Thermocouple input channel 2	B2	TC2-	Thermocouple input channel 2
A3	TC3+	Thermocouple input channel 3	B3	TC3-	Thermocouple input channel 3
A4	TC4+	Thermocouple input channel 4	B4	TC4-	Thermocouple input channel 4
A5	TC5+	Thermocouple input channel 5	B5	TC5-	Thermocouple input channel 5
A6	TC6+	Thermocouple input channel 6	B6	TC6-	Thermocouple input channel 6
A7	TC7+	Thermocouple input channel 7	B7	TC7-	Thermocouple input channel 7
A8	TC8+	Thermocouple input channel 8	B8	TC8-	Thermocouple input channel 8
A9	\	\	B9	\	\

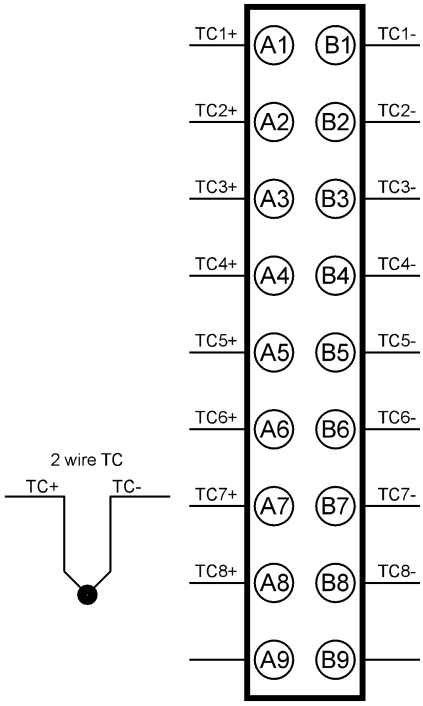
4.14.2 Specifications

Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<60mA
Functional parameters	
Module type	Analog input
Number of channels	8
signal type	thermocouple
Connection type	2-wire system
Display sensitivity	0.1℃
Input terminals	Thermocouple input; Thermocouple types: K, E, T, J, B, S, R, N, C, L; ±15.625mV, ±31.25mV, ±62.5mV, ±125mV, ±250mV, ±500mV, ±1000mV, ±2000mV
Compensation methods	Internal cold junction compensation
Accuracy (normal temperature 25℃)	Thermocouple measurement: (±0.1%) (±125mV full range) + cold junction compensation error Voltage measurement: (±0.1%) (±2000mV full range)
Accuracy (operating temperature -20℃~55℃)	Thermocouple measurement: (±0.3%) (±125mV full range) + cold junction compensation error Voltage measurement: (±0.3%) (±2000mV full range)
Whether to isolate	Interfaces are isolated from the bus, terminals are isolated from the power supply, but channels are not isolated from each other.

Input action display	When the output is valid, the output indicator light will illuminate (software controlled).
Software parameters	
Sampling period	500ms, 1000ms, 2000ms, 1280ms (50Hz frequency suppression), 1064ms (60Hz frequency suppression)
Filtering methods	Sliding window filtering, dejitter filtering, 50Hz/60Hz anti-power frequency.
Data size	16 Byte
Error Diagnosis	Communication diagnostics, power supply diagnostics, channel over-limit diagnostics, channel disconnection diagnostics
IO mapping	Supports word mapping
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20

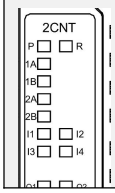
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.14.3 Wiring Diagram



4.15 DF30-M-2CNT

4.15.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning

				normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	1A/1B/2A/2B	Green indicator light: 1A/1B/2A/2B differential signal input indication, input is in drive state.		
		Green off: 1A/1B/2A/2B differential signal input indication, input is not in drive state.		
	DI1/DI2/DI3/DI4	Green indicator: DI1/DI2/DI3/DI4 digital input channel indicator, input is in drive state.		
		Green off: DI1/DI2/DI3/DI4 digital input channel indicator, the input is not in a driving state.		
	DO1/DO2	Green indicator: DO1/DO2 digital output channel indicator, output is in drive state.		
		Green off: DO1/DO2 digital output channel indicator, output is not in drive state.		

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	5V	5V power supply output positive terminal	B1	AGND	5V power supply output negative terminal
A2	1A+	Channel 1A phase differential input signal +	B2	1A-	Channel 1A phase differential input signal -
A3	1B+	Channel 1B phase differential input signal +	B3	1B-	Channel 1B phase differential input signal -

A4	2A+	Channel 2A phase differential input signal +	B4	2A-	Channel 2A phase differential input signal -
A5	2B+	Channel 2B phase differential input signal +	B5	2B-	Channel 2B phase differential input signal -
A6	DI 1	Digital input channel 1	B6	DI 2	Digital input channel 2
A7	DI 3	Digital input channel 3	B7	DI 4	Digital input channel 4
A8	COM	Public terminal	B8	PE	ground wire
A9	DO 1	Digital output channel 1	B9	DO 2	Digital output channel 2

4.15.2 Specifications

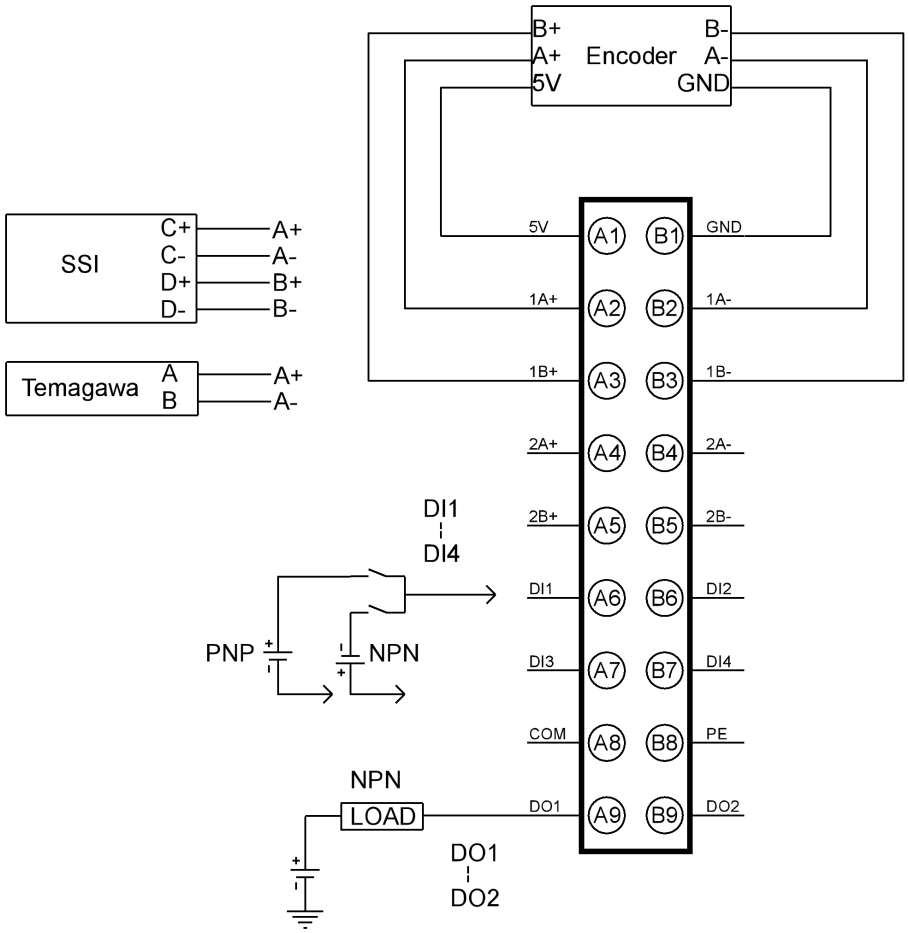
Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<50mA (typical value at 5V DC)
Terminal output power supply rated voltage	5V DC
Module prevents power failure from spreading	support
Functional parameters	
Differential Count Input Specifications	
Module type	Counter inputs (single-phase pulse plus direction, phase A, phase B, phase AB, SSI)

Input method	Differential input
Number of channels	2
Differential input voltage levels	RS422 level (logic 0 < 200 mA; logic 1 > 200 mA)
Maximum input frequency	4MHz
Counting range	32-bit
Frequency measurement range	0.04Hz~4MHz
Counting accuracy	100ppm
Whether to isolate	yes
Input action display	When the input is in drive mode, the input indicator light will illuminate (hardware controlled).
Single-ended input specifications	
Input type	Digital input
Input method	Single-ended input, NPN / PNP
Input Channel	4 (The counting channel is 2 channels, each channel has AB phase)
Frequency measurement range	0.04Hz~500kHz
Input voltage level	24V DC (20.4V DC~28.8V DC)
Input current (typical)	50 mA (24V typical)
ON voltage	>15V DC
OFF voltage	<5V DC
Whether to isolate	yes
Input action display	When the input is in drive mode, the input indicator light will illuminate (hardware controlled).
Output Specifications	
Output type	Digital output
Output method	NPN
Output Channel	2
Output voltage level	24V DC (20.4V DC ~28.8V DC)

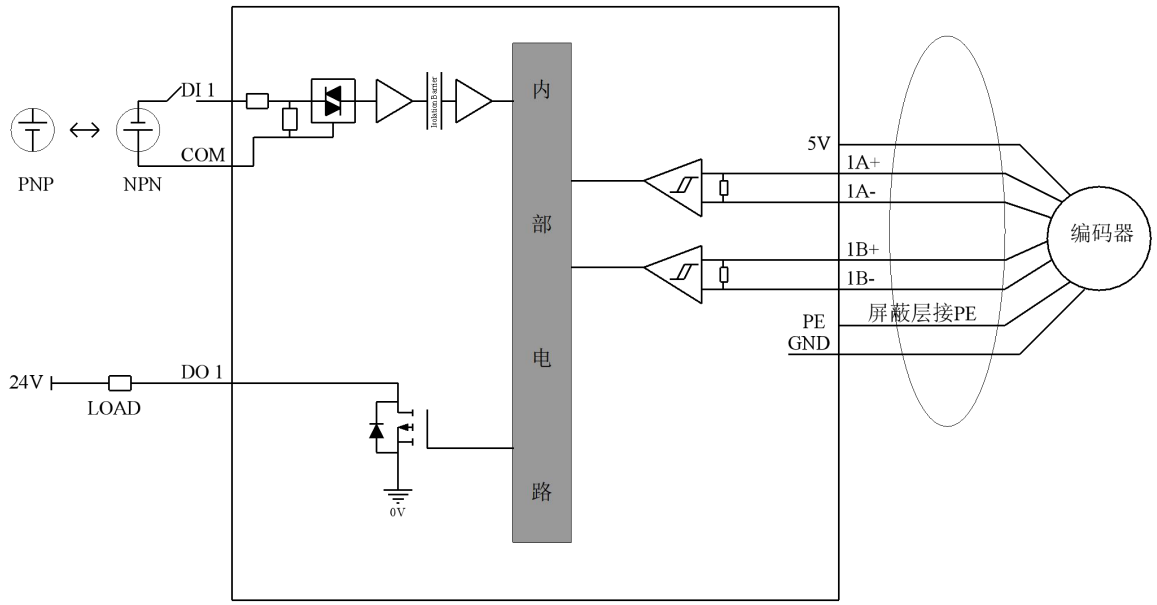
Output load (resistive load)	0.5A/point, 1A/module
Output load (inductive load)	7.2W/point, 1A/module
Output load (lighting load)	5W/point, 10W/module
Output action display	When the output is in drive mode, the input indicator light is on (hardware controlled).
Software parameters	
Data size	72 Byte
Error Diagnosis	Communication diagnostics, configuration parameter diagnostics
Communication Failure Counting Status Mode	Keep the current count value, reset the count value to zero, and continue counting.
Communication Failure Output Status Mode	Turn off output, enable output, and maintain current output.
IO mapping	Supports bitwise, bytewise, and wordwise mapping methods.
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm
Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient	-40～85℃

temperature (for storage)	
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.15.3 Wiring Diagram



➢ This is applicable to differential encoders with a 422 level output characteristic. The electrical wiring diagram of the differential encoder is shown in the figure below.

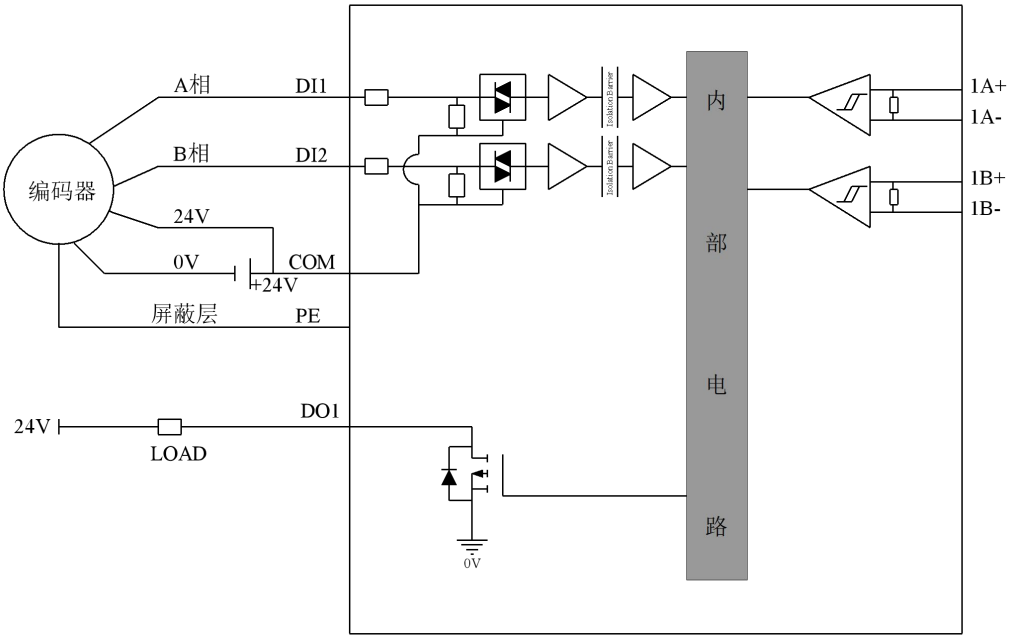


The module supports connecting a maximum of two differential encoders: 1A and 1B as one group, and 2A and 2B as another group (the illustration shows a connection of 1A and 1B as one group; if you need to connect 2A and 2B as one group, the connection method is the same).

The module supports a maximum of 4 DI digital inputs: DI1, DI2, DI3, and DI4 (the diagram shows DI1 as an example; the connection method is the same if DI2, DI3, and DI4 need to be connected).

The module supports a maximum of two DO digital outputs: DO1 and DO2 (the diagram shows DO1 as an example; the connection method is the same if DO2 needs to be connected).

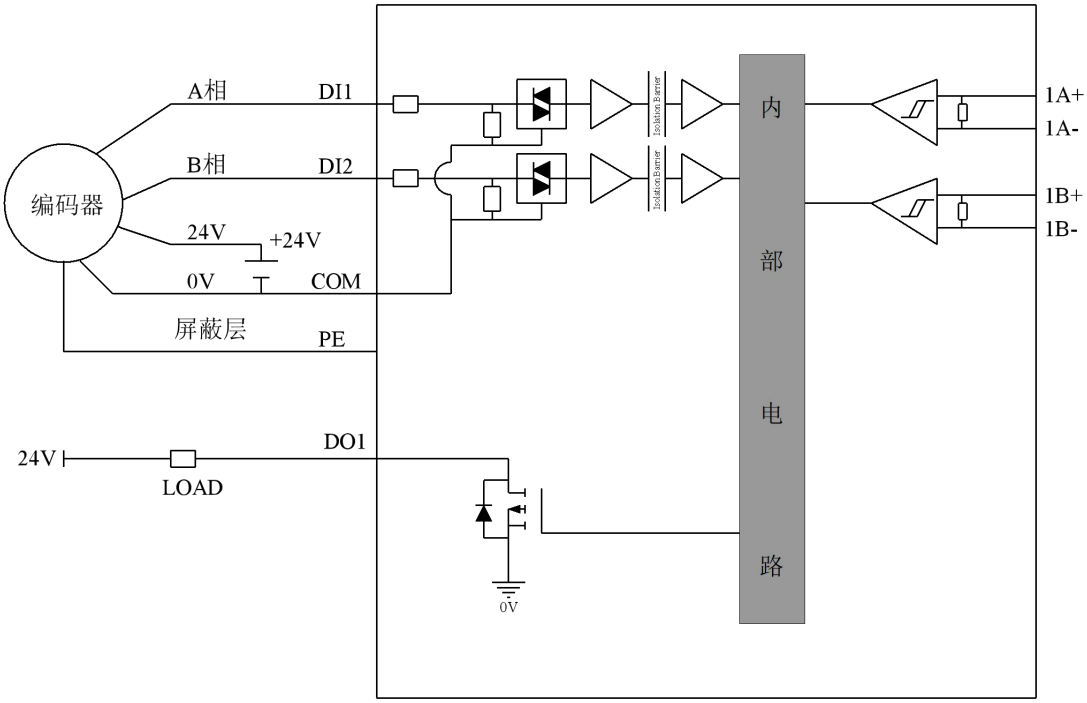
- This applies to single-ended encoders of the collector-output transistor NPN type. The electrical wiring diagram for a single-ended encoder (NPN type) is shown in the figure below.



The module supports a maximum of two single-ended encoders: DI1 and DI2 as one group, and DI3 and DI4 as another group (the illustration shows DI1 and DI2 as a group; if you need to connect DI3 and DI4 as a group, the connection method is the same).

The module supports a maximum of two DO digital outputs: DO1 and DO2 (the diagram shows DO1 as an example; the connection method is the same if DO2 needs to be connected).

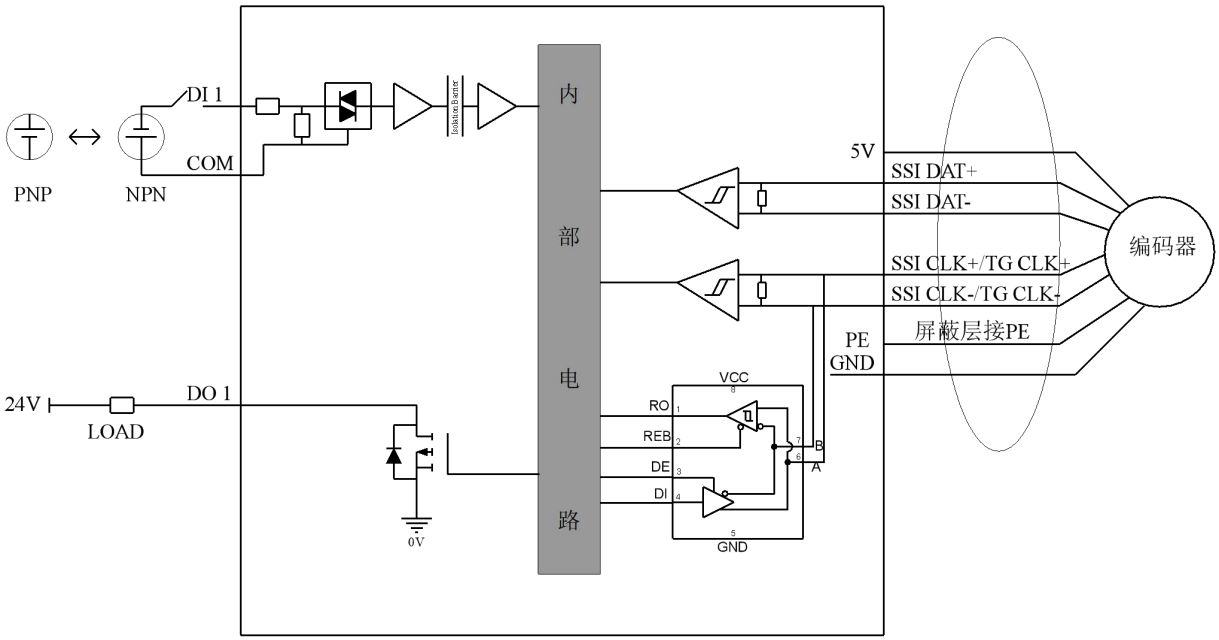
- This applies to single-ended encoders with collector output transistors (PNP type). The electrical wiring diagram for a single-ended encoder (NPN type) is shown below.



The module supports a maximum of two single-ended encoders: DI1 and DI2 as one group, and DI3 and DI4 as another group (the illustration shows DI1 and DI2 as a group; if you need to connect DI3 and DI4 as a group, the connection method is the same).

The module supports a maximum of two DO digital outputs: DO1 and DO2 (the diagram shows DO1 as an example; the connection method is the same if DO2 needs to be connected).

➢ The electrical wiring diagram for SSI and Tamagawa encoders is shown below:



The module supports a maximum of two SSI encoders/Tamagawa encoders: 1A and 1B as one group, and 2A and 2B as another group. (The illustration shows a connection of 1A and 1B as a group; the connection method is the same if you need to connect 2A and 2B as a group.)

Precautions:

➢ The DF30-M-2CNT module supports a maximum of two differential encoders: 1A and 1B are channel 1, and 2A and 2B are channel 2.

➢ The DF30-M-2CNT module supports a maximum of 2 SSI encoders/Tamagawa encoders: 1A and 1B are channel 1, and 2A and 2B are channel 2.

➢ The DF30-M-2CNT module supports a maximum of 4 DI digital inputs: DI1, DI2, DI3, and DI4.

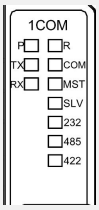
➢ The DF30-M-2CNT module supports a maximum of two DO digital outputs: DO1 and DO2.

➢ The DF30-M-2CNT module can be configured for either differential or single-ended

connection. When channel 1 is configured for single-ended connection, DI1 and DI2 correspond to phases A and B of channel 1, respectively. When channel 2 is configured for single-ended connection, DI3 and DI4 correspond to phases A and B of channel 2, respectively.

4.16 DF30-M-1COM-232/485/422

4.16.1 Component Description

indicator lights				
	LED No	Status and meaning	LED No	Status and meaning
	PWR	Green light indicates normal system power supply.	RUN	Green light indicates the module is functioning normally.
		Green light off: System power failure		Green extinction: Module hardware failure, communication failure
				Green flashing: Configuration fault/fail-safe mode
	TX	Green light: Data transmission	COM	Green highlight: Select this mode
		Green Extinction: No data sent		Green Extinction: This mode was not used.
	RX	Green light: Data reception	MST	Green highlight: Select MASTER mode
		Green Extinction: No data received		Green Extinction: This mode was not used.
			SLV	Green highlight: Select SLAVE mode
				Green Extinction: This mode was not used.

			232	Green light: Uses RS232 communication protocol
				Green Extinction: This communication protocol was not used.
			485	Green light: Uses RS485 communication protocol
				Green Extinction: This communication protocol was not used.
			422	Green light: Uses RS422 communication protocol
				Green Extinction: This communication protocol was not used.

Terminal blocks					
Serial Number	Signal	illustrate	Serial Number	Signal	illustrate
A1	24Vo	24V power output	B1	0Vo	Power output ground
A2	5Vo	5V power output	B2	0Vo	Power output ground
A3	TXD+	RS485 data positive terminal / RS422 transmit positive terminal	B3	TXD-	RS485 data negative terminal / RS422 transmit negative terminal
A4	Tres+	RS485 terminating resistor positive terminal / RS422 transmitting terminating resistor positive terminal	B4	Tres-	RS485 Termination Resistor Negative Terminal / RS422 Transmitter Termination Resistor Negative Terminal

A5	RXD+	RS422 receiver positive terminal	B5	RXD-	RS422 receiver negative terminal
A6	Rres+	RS422 receiver terminal resistor positive terminal	B6	Rres-	The negative terminal of the RS422 receiver terminal resistor
A7	CTS	RS232 Clear Send	B7	RTS	RS232 sends data request
A8	RXD	RS232 data reception	B8	TXD	RS232 data transmission
A9	GND	Reference	B9	GND	Reference

4.16.1 Specifications

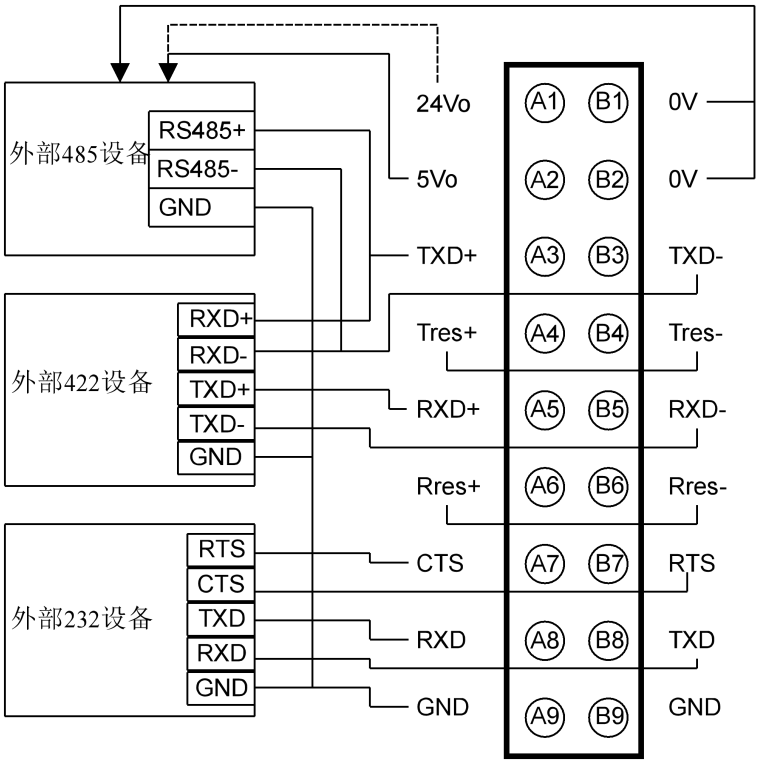
Structural parameters	
Dimensions (width x height x depth)	12mm x 100mm x 80mm
weight	71.5g
Power parameters	
Usys bus input power rated voltage	5V DC +20% /-15% (4.25V DC~ 6V DC)
Usys bus input power rated current	<60mA (typical value at 5V DC)
Uin power input rated voltage	24 V DC +20% /-15% (20.4V DC~28.8V DC)
Uin power input rated current	4A (typical value at 24V DC)
Uni power input reverse insertion protection	support
Module prevents power failure from spreading	support
Functional parameters	
Module type	Communication gateway module
Number of channels	Route 1

Communication interface type	The module only supports one serial communication port. 1 RS232 1 RS485 1 RS422
Communication distance	RS232: Maximum 15m RS422/RS485: Maximum 1200m
Whether to isolate	Yes, the passageway is isolated from the interior, but there is no isolation between passageways.
Termination matching resistor	By selecting the user's external wiring, short-circuit near the terminating resistor port.
Output load	Standard voltage: 24V; maximum current: 200mA. Standard voltage: 5V, maximum current: 500mA Two output loads can output simultaneously.
Software parameters	
Data size	Maximum 128 bytes per channel
Error Diagnosis	Actively report
Number of modules supported	A single coupler can support a maximum of 6 of these modules.
Number of channels	Supports up to 18 channels
Modbus protocol	RTU
Data transmission baud rate	1200 bps~4687500 bps (default 9600 bps)
Work mode	Modbus Master/Modbus Slave/Free Transmission (Default Modbus Master)
Communication interface	RS485/RS232/RS422 (RS485 is the default)
Data bits	7-bit/8-bit (default is 8-bit; a checksum needs to be added when configuring to 7-bit).
Check bit	No parity / Odd parity / Even parity
start bit	1 person
Stop bit	1 digit, 2 digits (default 1 digit)
Frame interval time	In master station mode, the interval between receiving a

	response message from a slave station and retransmitting it is 0 to 65535 milliseconds.
Response timeout	The timeout period for the master station to wait for the slave station's response, or the timeout period for waiting for a response in pass-through mode.
Polling time	The delay between the master station receiving the slave station's response message and sending the next command, ranging from 0 to 65535 milliseconds.
Read timeout handling	Keep last input value / Clear input value
Data output mode	Polling mode / Event triggered / Level triggered / Rising edge triggered. (Event triggered means data output occurs when the output data changes; Level triggered means communication is triggered when the master station channel control word is 1; Rising edge triggered means communication is triggered when the master station channel control word changes from 0 to 1.)
From station ID	The module's ID number is used when it is in slave mode.
Response delay	The working mode is that when the slave station receives a message from the master station, it responds to the master station with a delay of milliseconds.
byte order conversion	In the free pass-through mode, the data transmission and reception locations are swapped every two data transmission and reception locations.
Wiring parameters	
Connectivity technology	PUSH-IN type terminal block
Connection type	System/Field Power Supply/Input
crimping area of the wire	0.34～1.5mm
Stripping length	10mm

Installation method	DIN-35 type guide rail
Material parameters	
color	Pantone 419C
Shell material	PC plastic
Environmental requirements	
Permissible ambient temperature (during operation)	-20～55℃
Permissible ambient temperature (for storage)	-40～85℃
Protection type	IP20
Pollution level	2. Complies with IEC 61131-2 standard
Working altitude	0～2000m
Relative humidity (non-condensing)	5-95%RH
Vibration resistance	1g, conforming to IEC 60068-2-6 standard
Impact resistance	15g, conforming to IEC 60068-2-27 standard
EMC anti-interference level	Zone B, IEC61131-2
Corrosion resistance	Compliant with IEC 60068-2-42 and IEC 60068-2-43 standards

4.16.1 Wiring Diagram



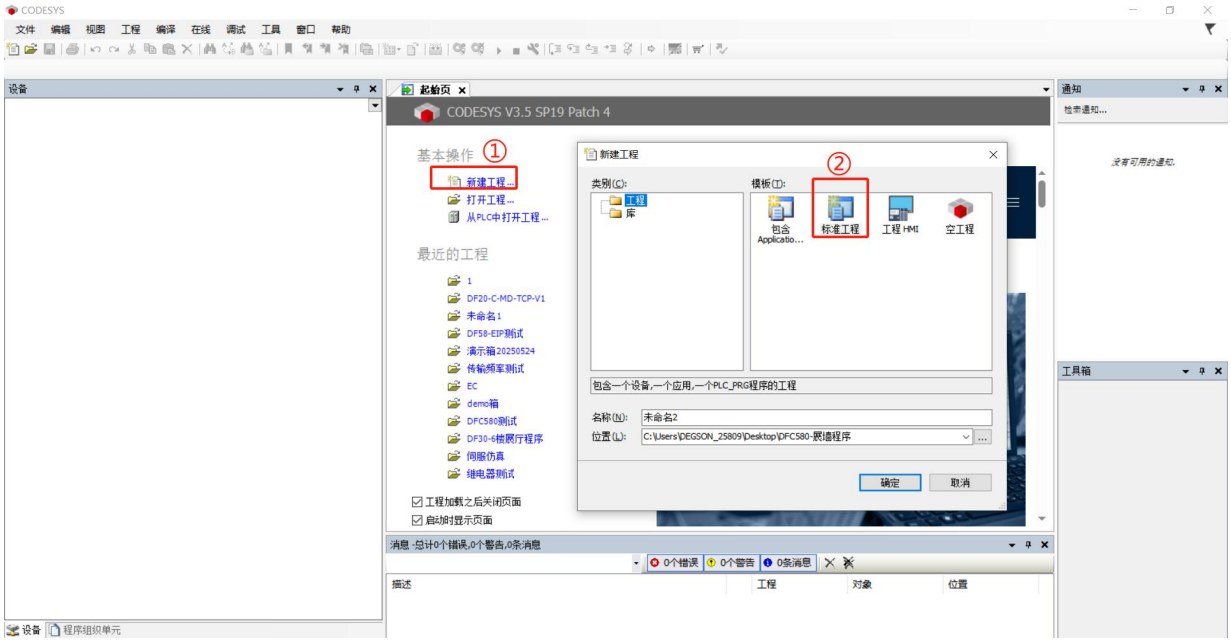
5 Configuration Example

Configuration routines in the Codesys software environment

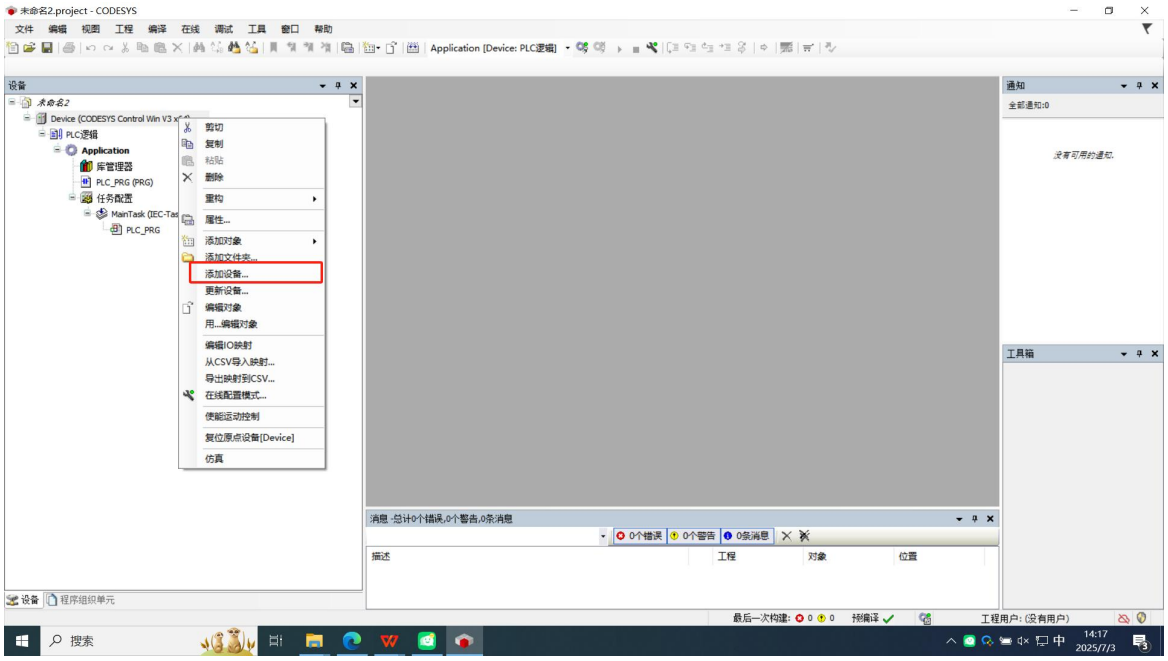
The simulation system included with the Codesys software is selected as the controller, and a configuration example is performed using the DF30-C-EC coupler.

Add controller

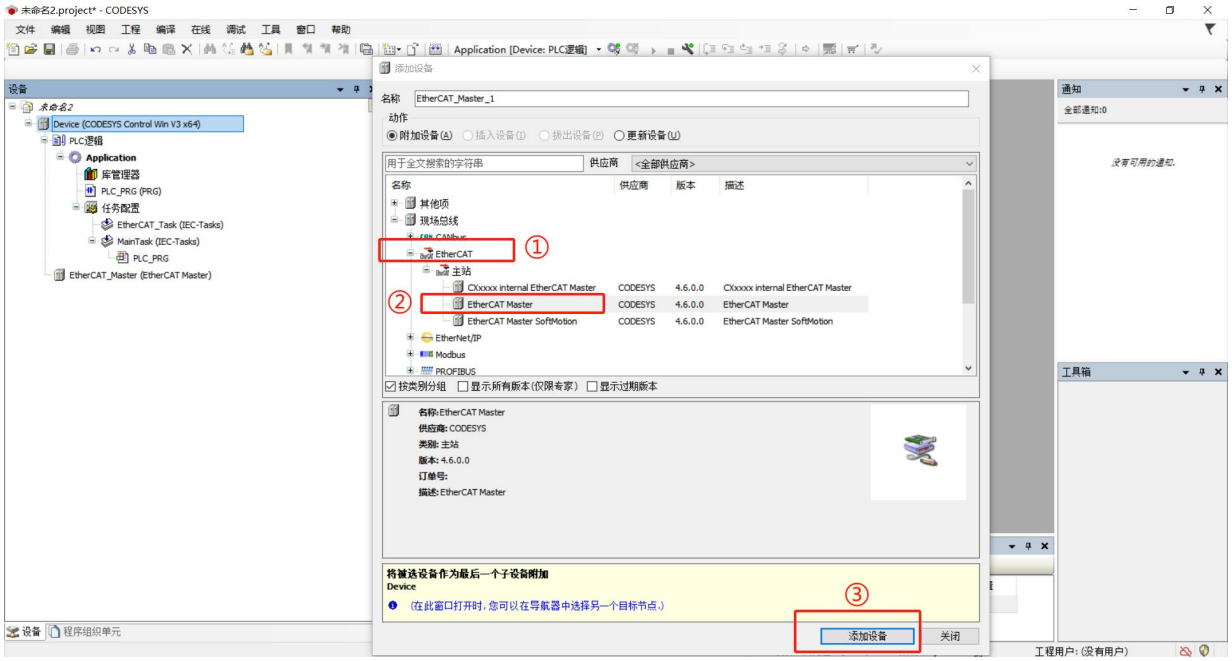
① Create a new project, select standard project, and then click OK.



② Click Add New Device, then select the corresponding controller and select Add Device.

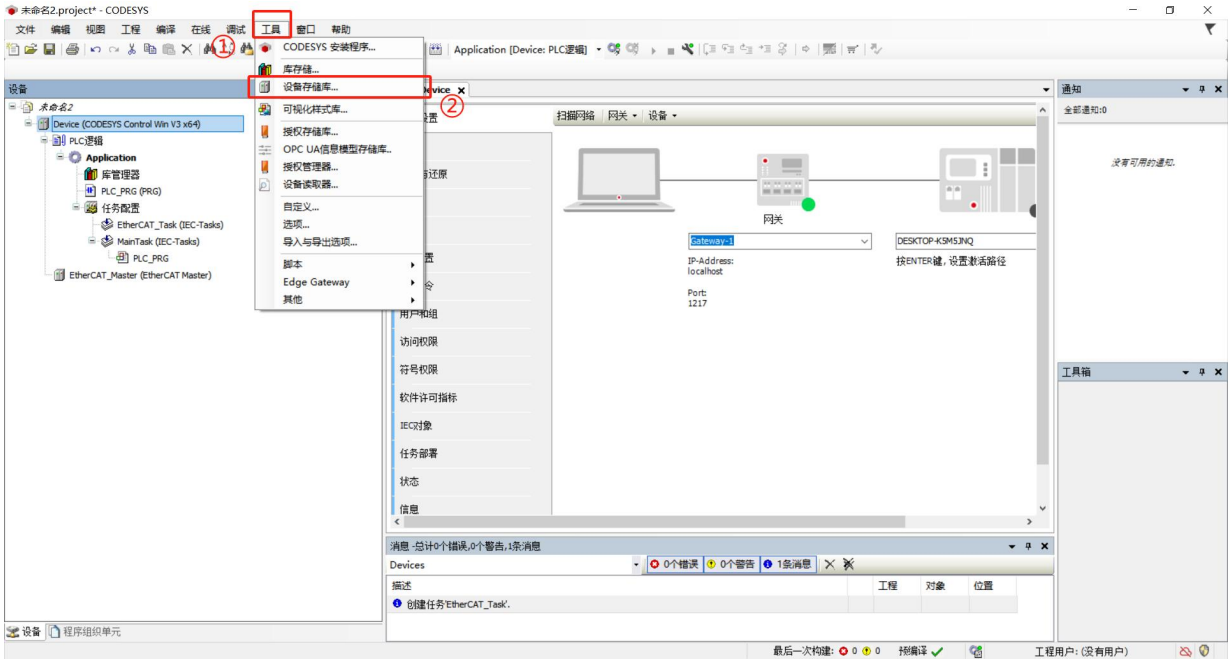


③ Select EtherCAT bus → Master → EtherCAT Master, and click Add Device.

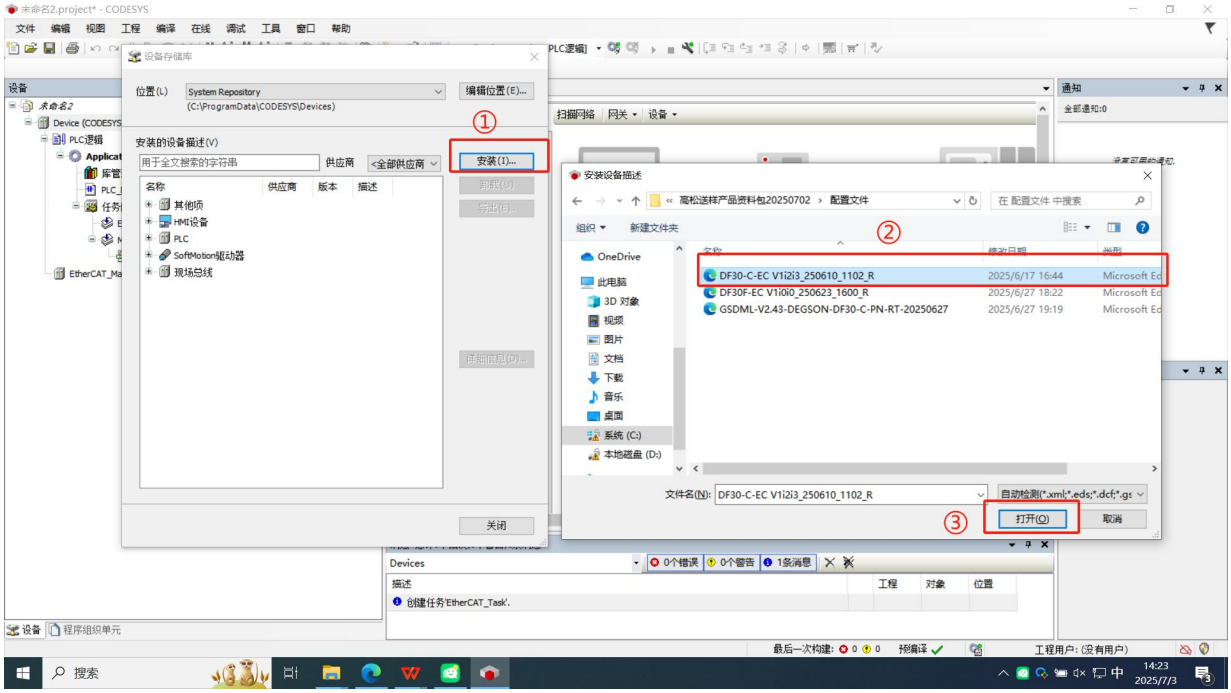


Import XML file

Click "Tools" above, then click "Device Storage".

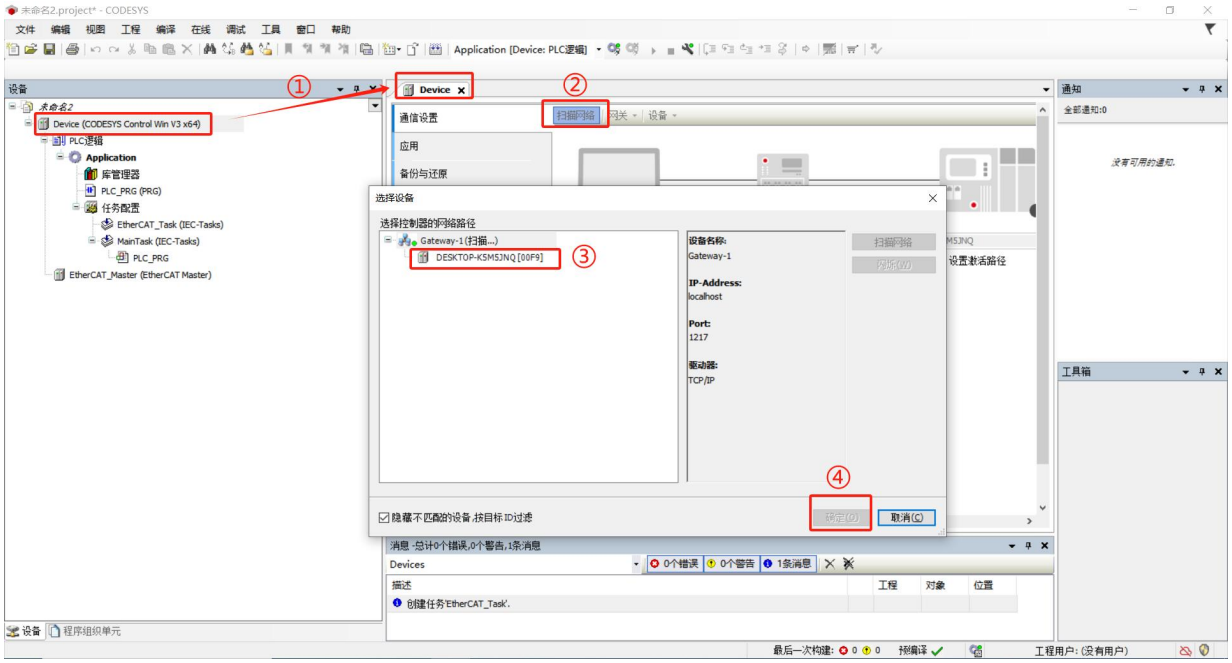


Click on the original path to select the file path, and then click Install.

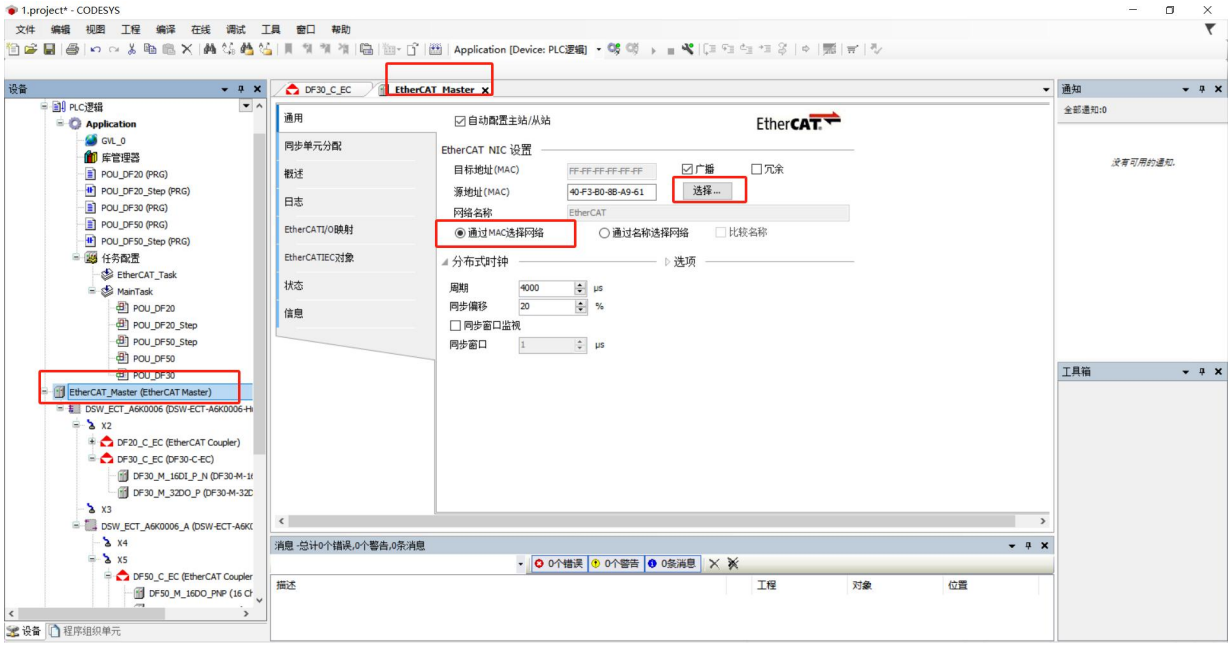


Add EtherCAT device

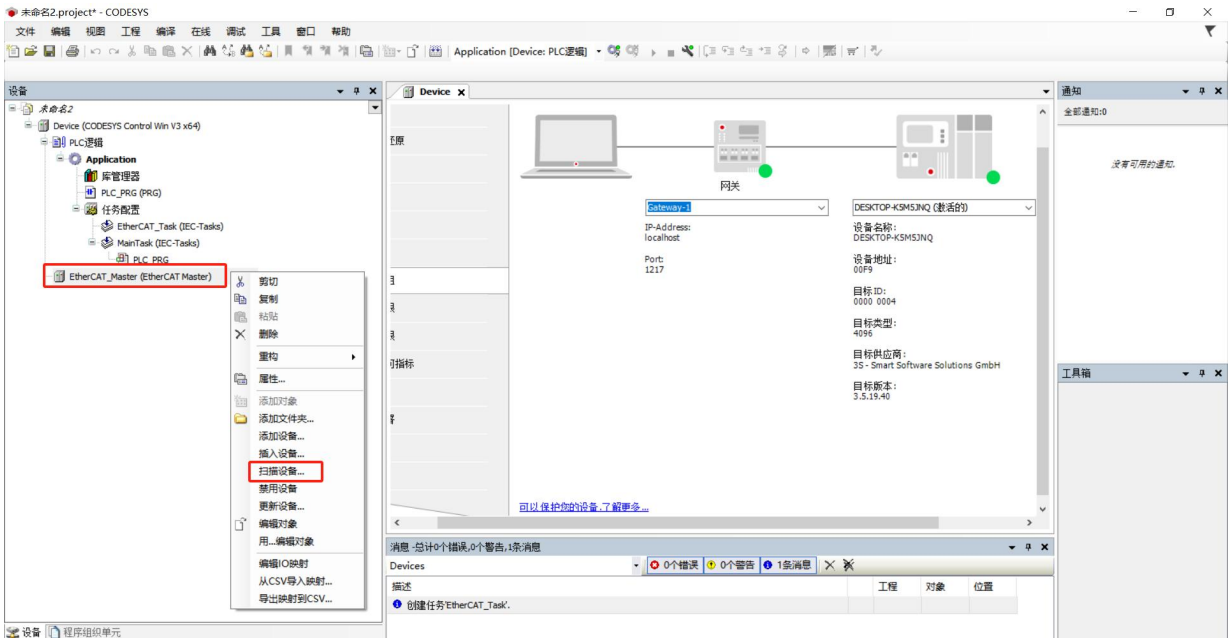
Double-click "Device" in the device list to enter the "Device" window, click "Scan Network", select the appropriate controller in the device window, and click OK.



Double-click EtherCAT_Master to enter the EtherCAT_Master window and select the EtherCAT communication port source address.

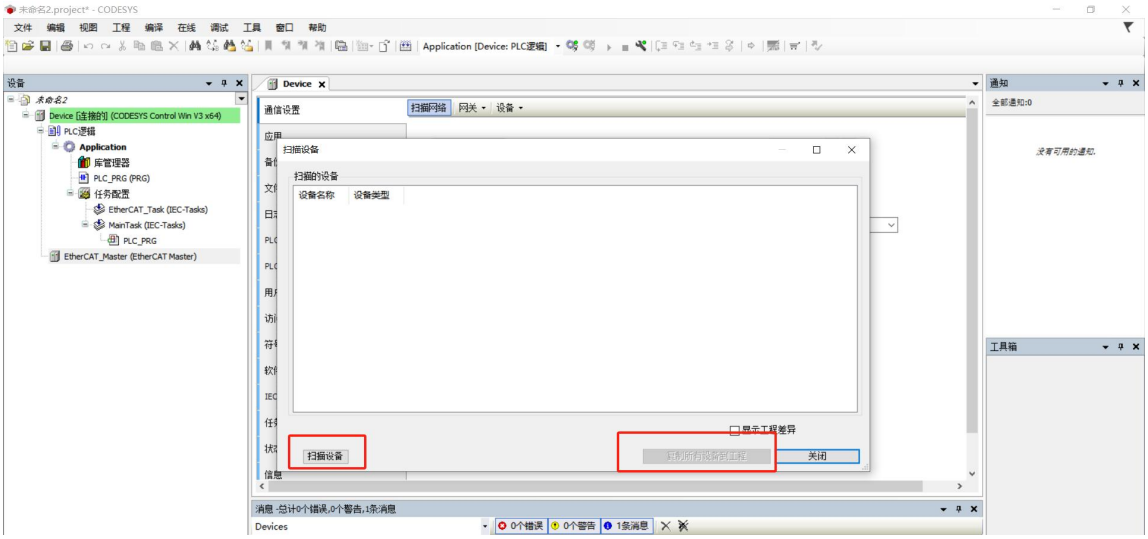


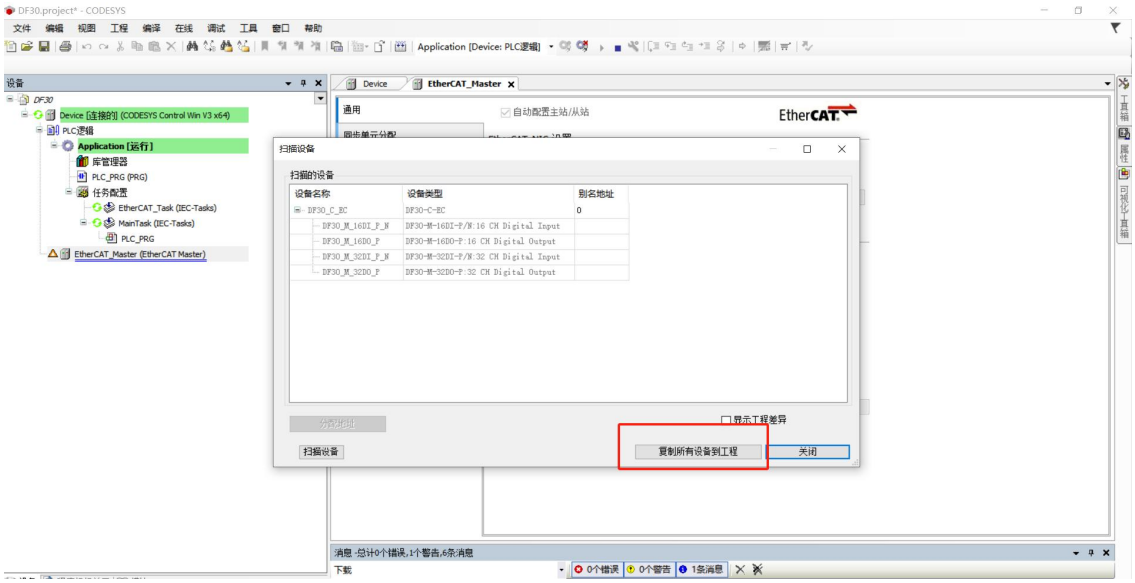
Then right-click EtherCAT_Master and select the scanning device.



Add IO module

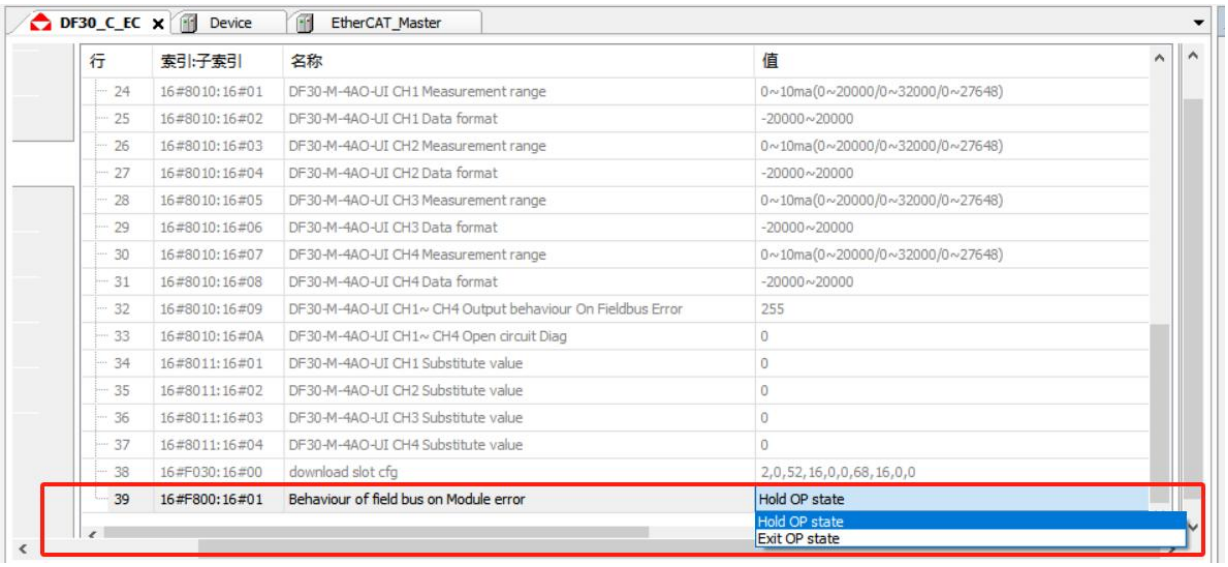
Select the scanning device, identify the DF30-C-EC coupler and functional modules, and then copy all devices to the project.





Parameter configuration

index	16#F800				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	Behavior of field bus on Module error	0: Hold OP state 1: Exit OP state (Exit OP state)	8	0	Configuration for whether the adapter remains in the OP state when the module goes offline.



After modifying the configuration data, click the login icon at the top of the interface.

After successfully logging in, click the start icon at the top of the interface.

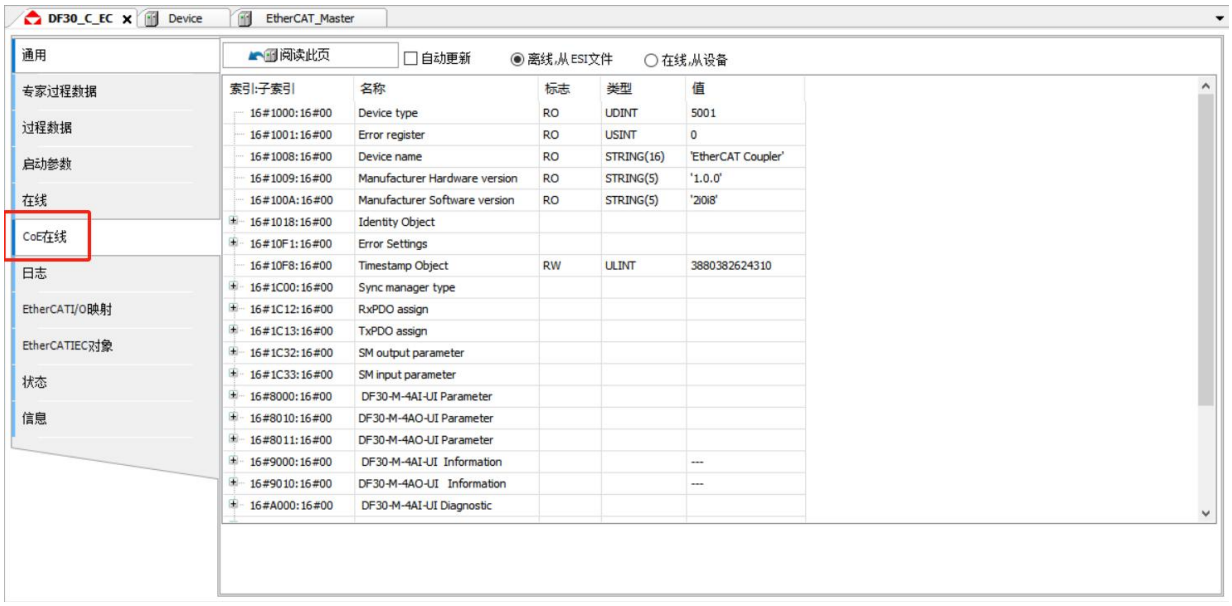
Process data

RXPDO				
index	name	type	size	meaning
16#F200:01	Device CtrlWord	UINT	16	reserve
TXPDO				
index	name	type	size	meaning
16#F100:01	Device StateWord	UINT	16	bit15~bit14: Reserved Bits 13-8: 0 indicates a coupler error; 1-32 indicate a module error in the corresponding card slot. bits 7-4: 0 indicates a module error, 1-8 indicate a module channel group error. Bits 3 through 0: Indicate fault codes

Coupler firmware version query

index	16#100A			
Sub-index	name	type	Bit length	meaning
1	Manufacturer Software Version	STRING(5)	40	Coupler firmware version information

Open expert settings and select CoE online.

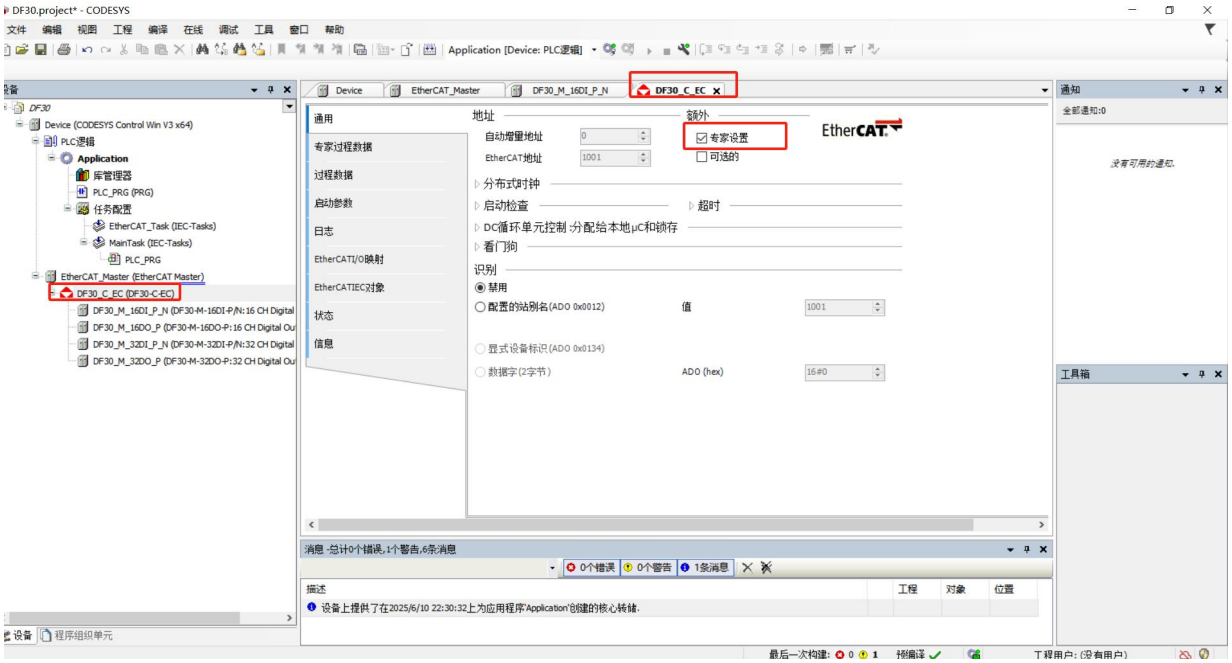


Module information query

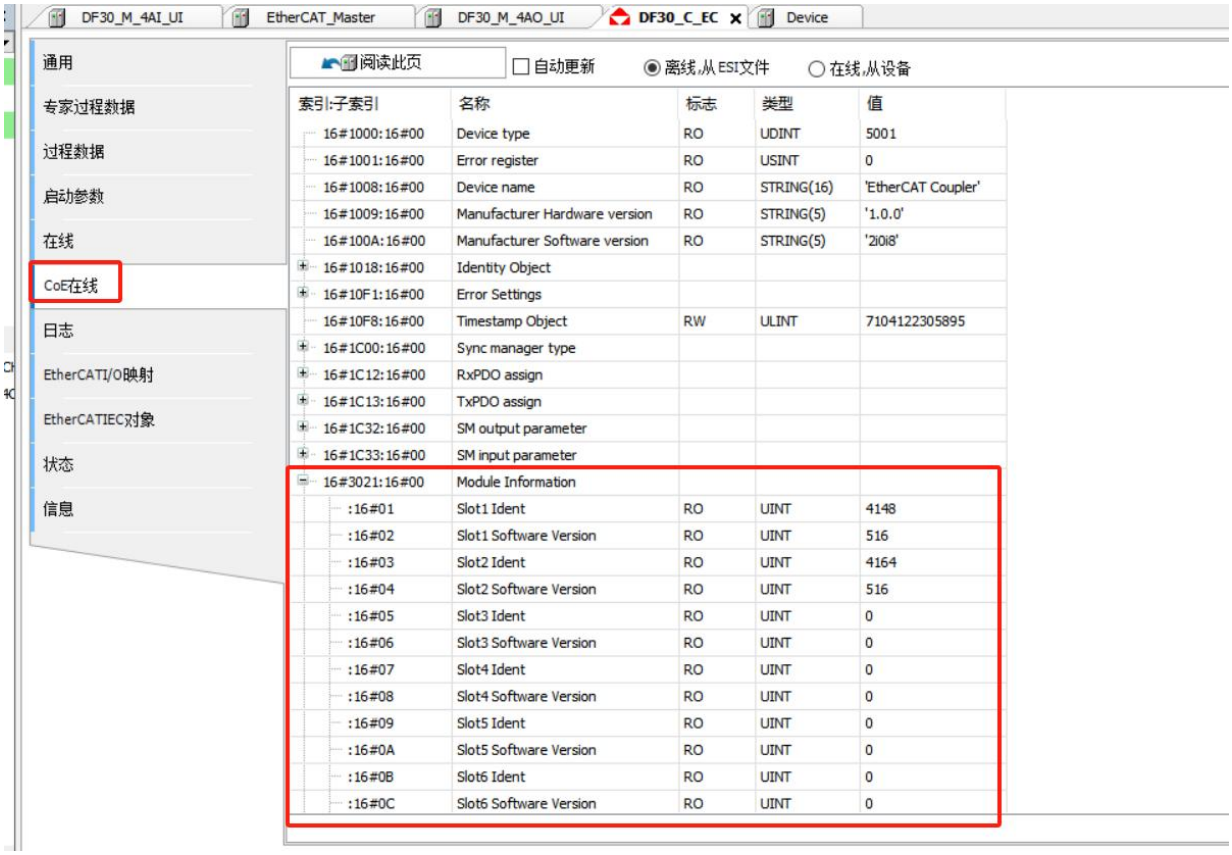
index	16#3021			
Sub-index	name	type	Bit length	meaning
1	Slot1 Ident	UINT	16	Slot 1 ID number
2	Slot1 Software Version	UINT	16	Slot 1 Software Version
3	Slot2 Ident	UINT	16	Slot 2 ID number
4	Slot2 Software Version	UINT	16	Slot 2 Software Version
...	...	UINT	16	Slot ID number
...	...	UINT	16	Slot n Software Version

63	Slot32 Ident	UINT	16	Slot 32 ID number
64	Slot32 Software Version	UINT	16	Slot 32 Software Version

Double-click the DF30-C-EC with the left mouse button, then click General, check Expert Settings, and click the PLC Online button.



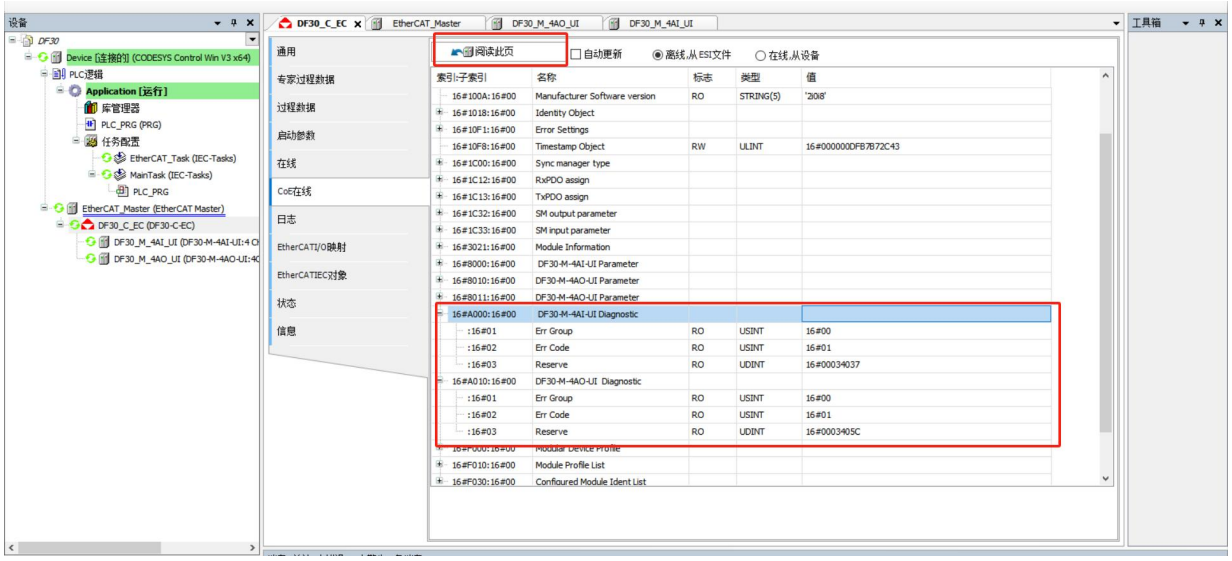
Then click on CoE Online, select the Information dropdown menu, and view the firmware version information.



Error Diagnosis

index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates no error in the module; 1-8: Indicates an error in the module channel.
2	Err Code	USINT	8	Error code

Click on CoE Online, then select the Diagnostic tab in the dropdown menu. Click to read this pageCheck the error diagnosis information.



Error code

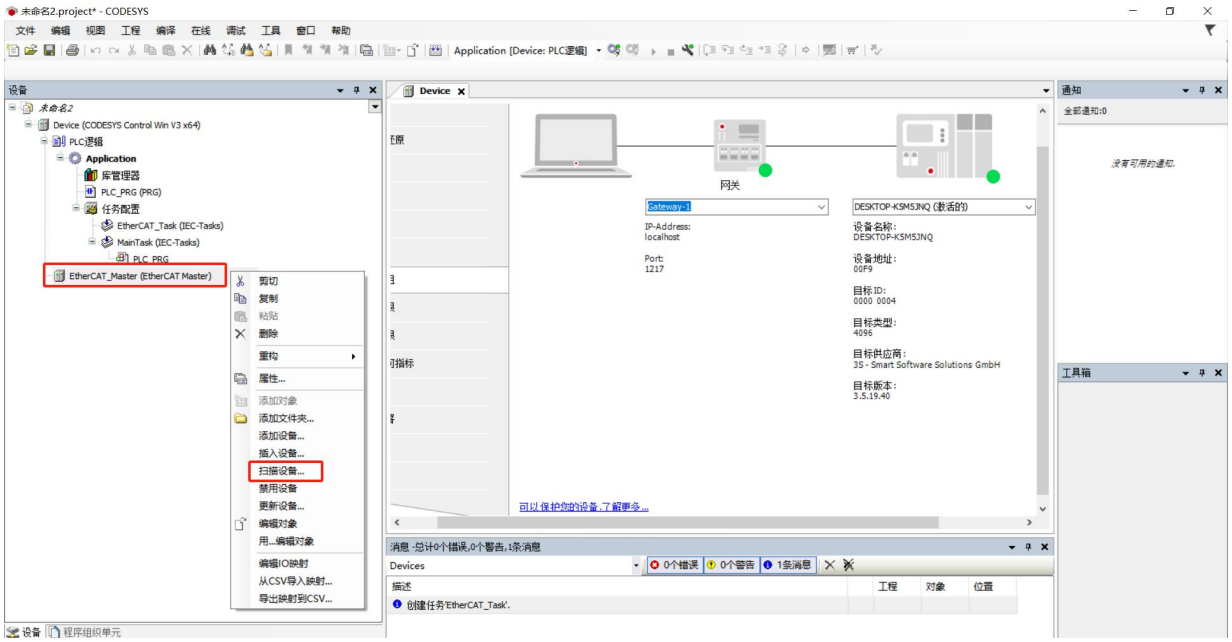
Fault location	Fault Name	Fault Codes	Solution/Cause
Coupler	The protocol stack did not scan the module.	1	Check if the module is inserted firmly and if the clips are fastened securely.
	Module quantity exceeded	2	Check the number of backplane modules
	The configured IO module does not match the actual card being scanned.	3	Check whether the configuration module model and sequence are consistent with the actual modules.
	Configuration list not downloaded	4	
	Hot-swap failed, module model incorrect.	5	Check if the signals of the newly plugged-in/unplugged module are consistent with the original signals.
Module	Backplane bus timeout	1	Check if the module is installed correctly.
	Flash read failure	3	Reconnect the power or contact

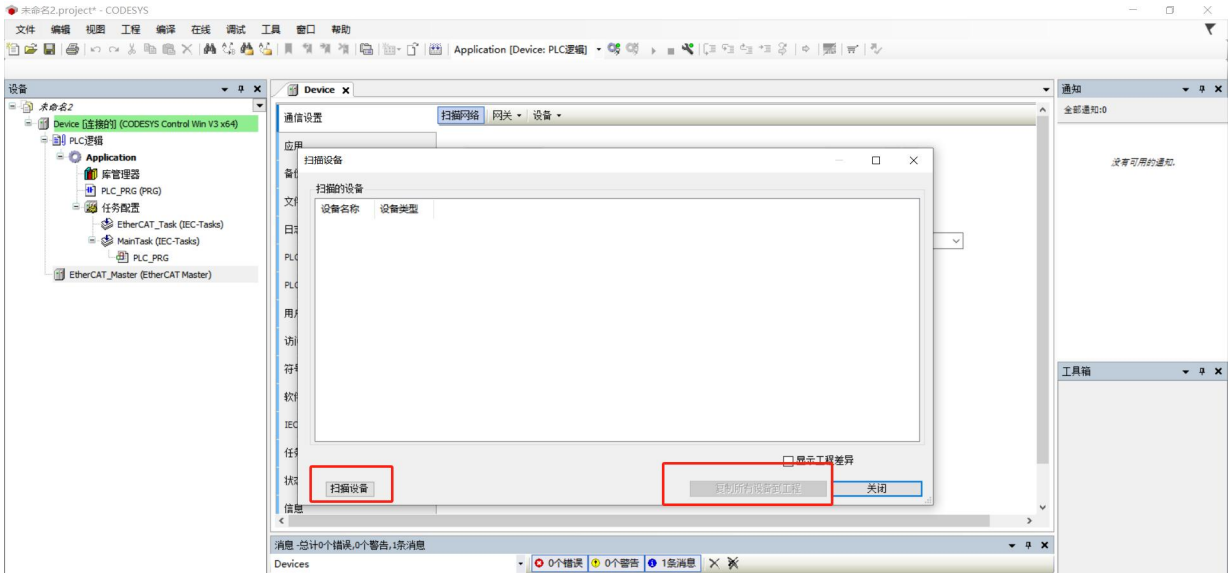
			the supplier.
	Configuration parameter error	4	Check if the configuration parameters are reasonable.
	Power supply failure	5	Check power supply
	ADC anomaly	6	Reconnect the power or contact the supplier.
	DAC error	7	Reconnect the power or contact the supplier.
	Synchronization signal timeout	8	Detection module installation
aisle	Overcurrent	1	Check if the load is too high.
	Overheating	2	Check external wiring and whether the load is too high.
	Short circuit	3	Check the external wiring of the channel
	Open circuit/disconnection	4	Check the external wiring of the channel
	overflow	5	Check if the external input signal is normal.
	overflow	6	Check if the external input signal is normal.
	Exceeding the limit	7	Check if the external input signal is normal.
	Below the lower limit	8	Check if the external input signal is normal.
	Sensor type error	9	Check if the connected sensors and configuration items match.

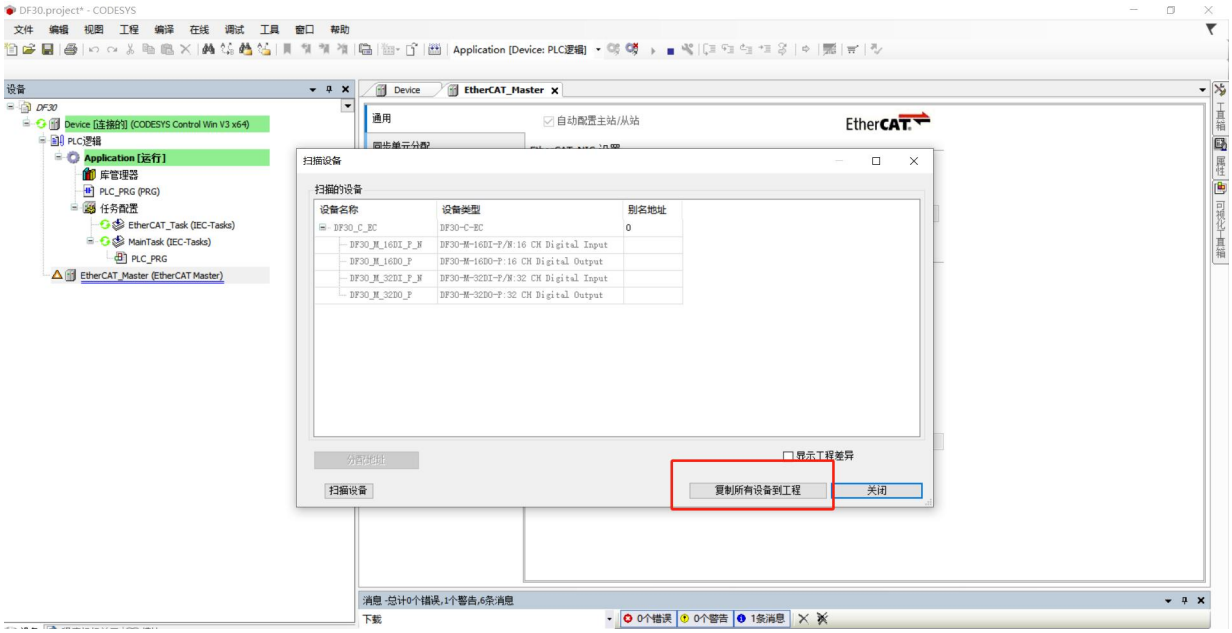
1 DF30-M-16DI-P/N

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO moduleScan the device, select "Copy all devices to project".

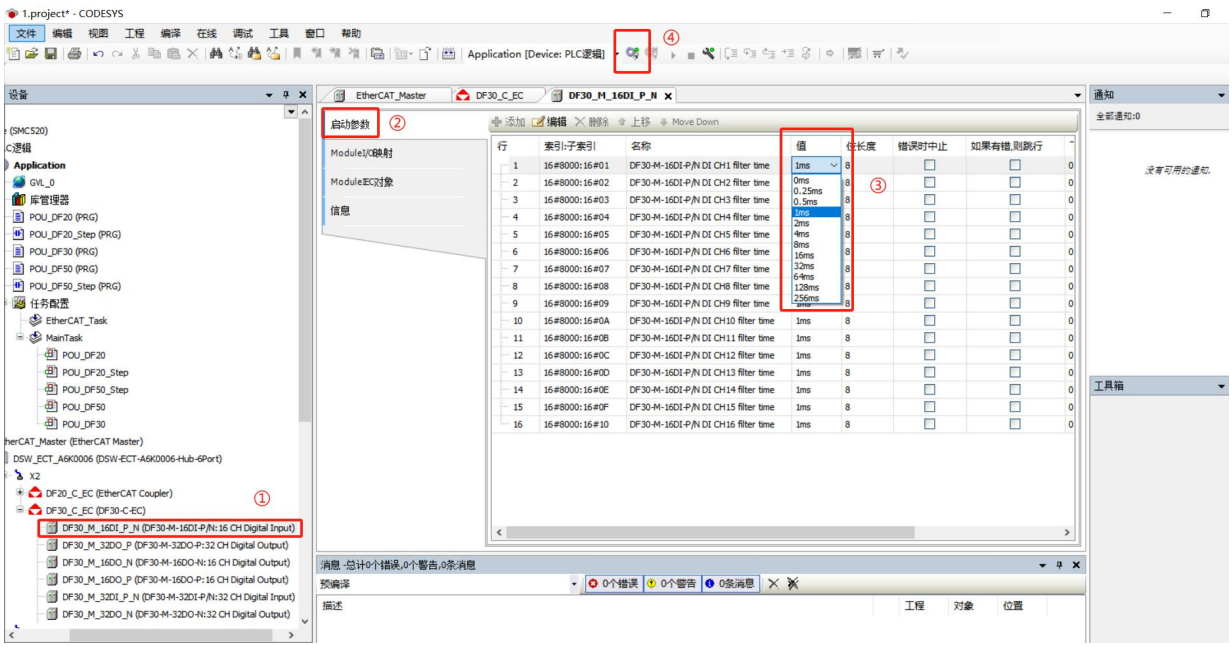






2 Parameter Configuration

Select the DF30-M-16DI-P/N module, start the parameter interface to set the filter, and after modifying the configuration data, click the login icon at the top of the interface. After successfully logging in, click the start icon at the top of the interface.



Filtering parameter description

index	16#8000+n*16#10(n=0~31)					
Sub-index	name	Data types	bitSize	bitOff	default value	meaning
1	DI CH1 filter time	See the filter configuration table	8	16	3	Channel 1 input filtering time
2	DI CH2 filter time	See the filter configuration table	8	twenty four	3	Channel 2 input filtering time
3	DI CH3 filter time	See the filter configuration table	8	32	3	Channel 3 Input Filtering Time
4	DI CH4 filter time	See the filter configuration table	8	40	3	Channel 4 input filtering time
5	DI CH5 filter time	See the filter configuration table	8	48	3	Channel 5 Input Filtering Time
6	DI CH6 filter time	See the filter configuration table	8	56	3	Channel 6 Input Filtering Time
7	DI CH7 filter time	See the filter	8	64	3	Channel 7 Input Filtering Time

		configuration table				
8	DI CH8 filter time	See the filter configuration table	8	72	3	Channel 8 Input Filtering Time
9	DI CH9 filter time	See the filter configuration table	8	80	3	Channel 9 Input Filtering Time
10	DI CH10 filter time	See the filter configuration table	8	88	3	Channel 10 Input Filtering Time
11	DI CH11 filter time	See the filter configuration table	8	96	3	Channel 11 Input Filtering Time
12	DI CH12 filter time	See the filter configuration table	8	104	3	Channel 12 Input Filtering Time
13	DI CH13 filter time	See the filter configuration table	8	112	3	Channel 13 Input Filtering Time
14	DI CH14 filter time	See the filter configuratio	8	120	3	Channel 14 Input Filtering Time

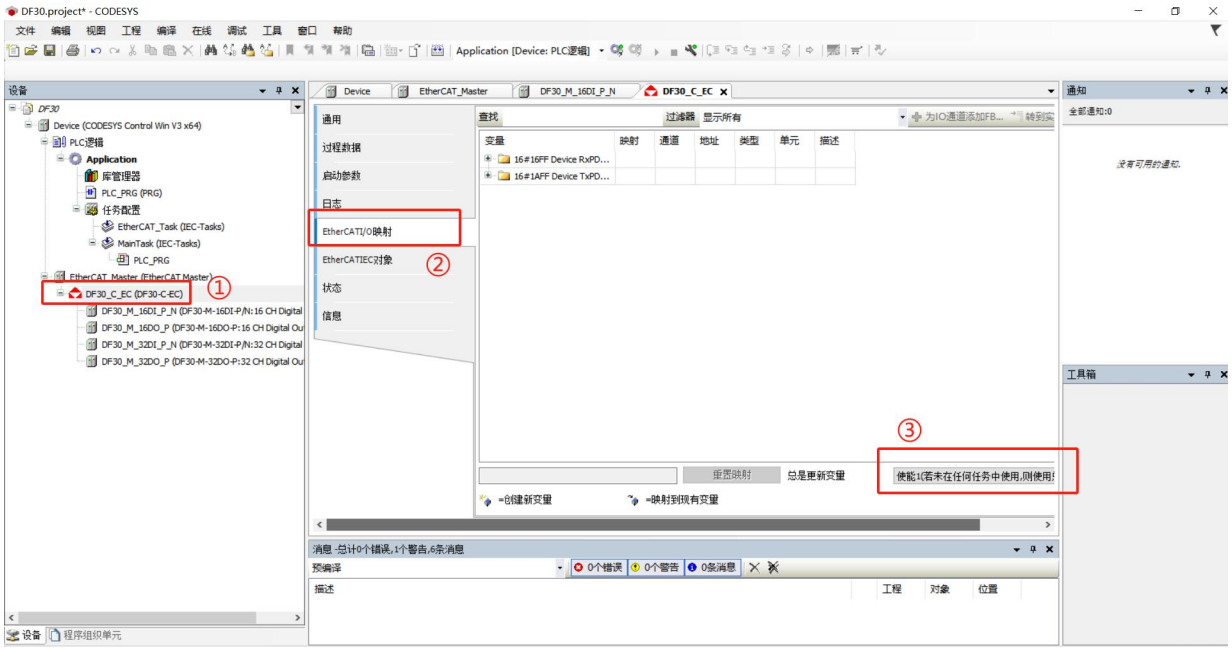
		n table				
15	DI CH15 filter time	See the filter configuration table	8	128	3	Channel 15 Input Filtering Time
16	DI CH16 filter time	See the filter configuration table	8	136	3	Channel 16 Input Filtering Time

surface1Filter parameter configuration

Sub-index object data	name	meaning
0	0ms	Software filtering 0ms
1	0.25ms	Software filtering 0.25ms
2	0.5ms	Software filtering 0.5ms
3	1ms	Software filtering 1ms
4	2ms	Software filtering 2ms
5	4ms	Software filtering 4ms
6	8ms	Software filtering 8ms
7	16ms	Software filtering 16ms
8	32ms	Software filtering 32ms
9	64ms	Software filtering 64ms
10	128ms	Software filtering 128ms
11	256ms	Software filtering 256ms

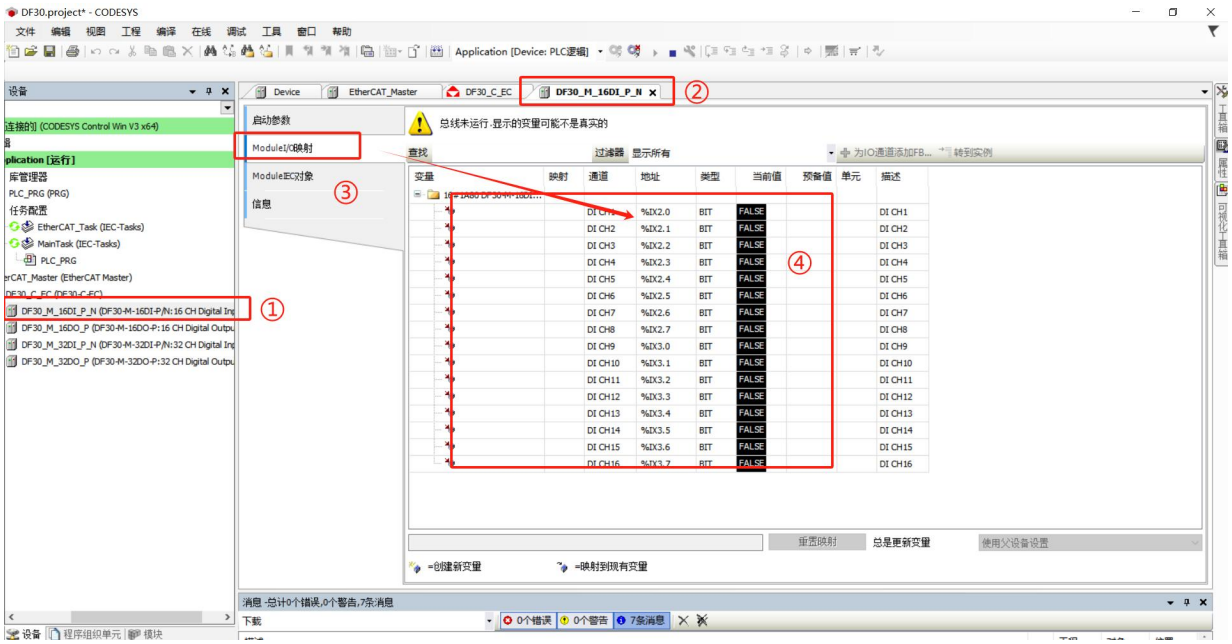
3. Data monitoring

Open the DF30-C-EC window, select EtehrCAT I/O mapping, and change "Always update variable" to "Enable 1".

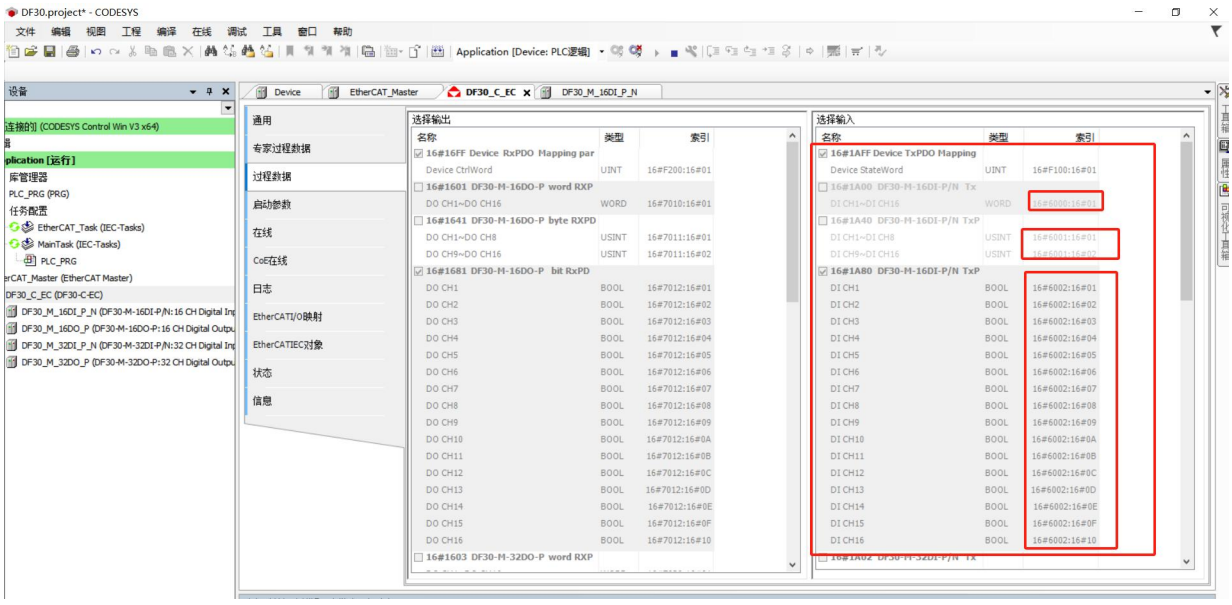


Open the DF30-M-16DI-P/N window, go to Module IO mapping, modify/view the input address, and monitor the current information.

FALSE indicates no signal, TRUE indicates a valid signal.



4 Process Data



TXPDO				
index	16#6000+n*16#10(n=0~31)			
Sub-index	name	type	size	meaning
1	DI CH1~DI CH16	UINT	16	Bits 0 to 15 correspond to the input states of channels 1 to 16.
index	16#6001+n*16#10(n=0~31)			
1	DI CH1~DI CH8	USINT	8	Bits 0 to 7 correspond to the input states of channels 1 to 8.
2	DI CH9~DI CH16	USINT	8	Bits 0 to 7 correspond to the input states of channels 9 to 16.
index	16#6002+n*16#10(n=0~31)			
1	DI CH1	BOOL	1	Channel 1 Input Status
2	DI CH2	BOOL	1	Channel 2 Input Status
3	DI CH3	BOOL	1	Channel 3 Input Status
4	DI CH4	BOOL	1	Channel 4 Input Status
5	DI CH5	BOOL	1	Channel 5 Input Status
6	DI CH6	BOOL	1	Channel 6 Input Status
7	DI CH7	BOOL	1	Channel 7 Input Status

8	DI CH8	BOOL	1	Channel 8 Input Status
9	DI CH9	BOOL	1	Channel 9 Input Status
10	DI CH10	BOOL	1	Channel 10 Input Status
11	DI CH11	BOOL	1	Channel 11 Input Status
12	DI CH12	BOOL	1	Channel 12 Input Status
13	DI CH13	BOOL	1	Channel 13 Input Status
14	DI CH14	BOOL	1	Channel 14 Input Status
15	DI CH15	BOOL	1	Channel 15 Input Status
16	DI CH16	BOOL	1	Channel 16 Input Status

Firmware version 5

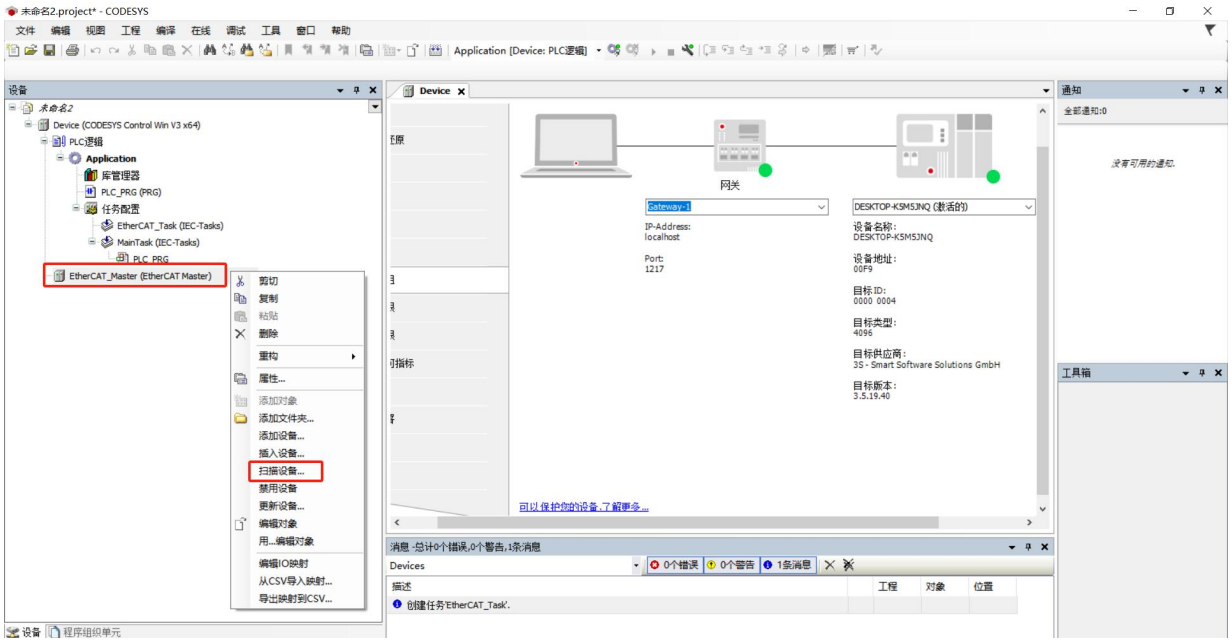
Same as firmware version 5.1 query (Configuration routines in the Codesys software environment).

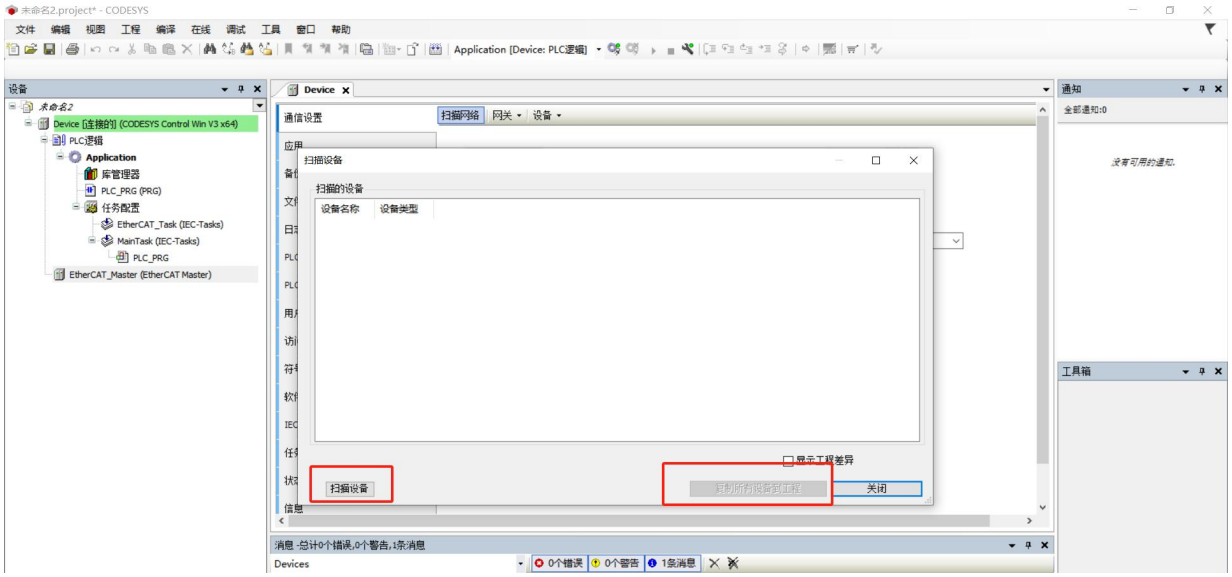
The firmware version query operation is omitted in subsequent modules.

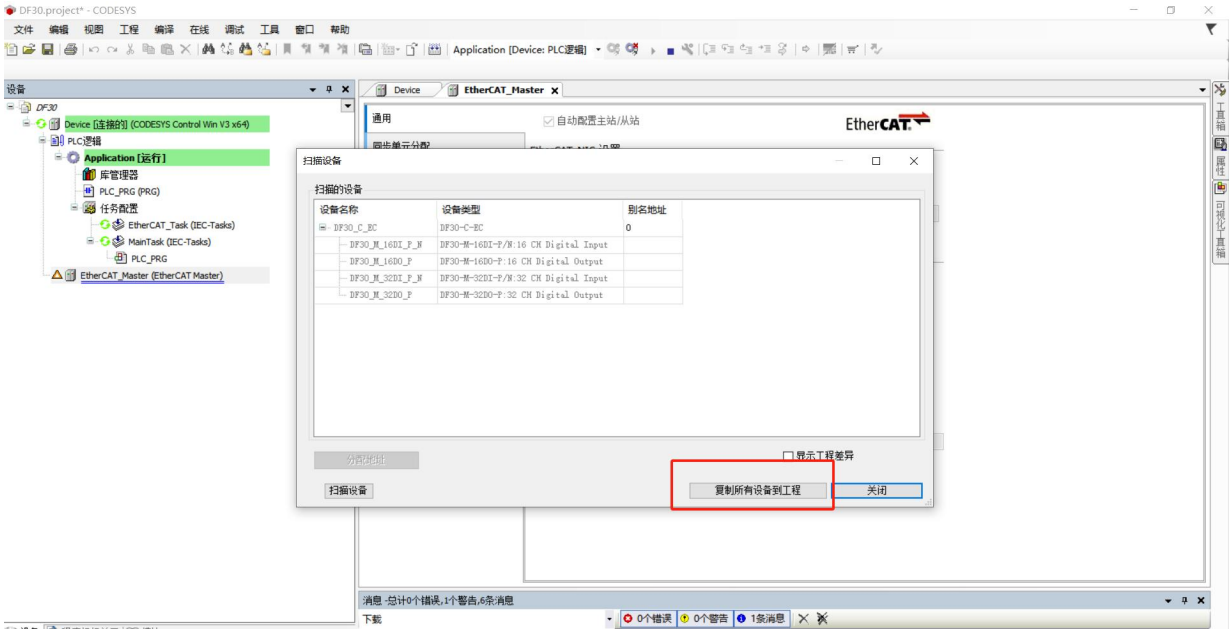
2 DF30-M-32DI-P/N

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO moduleScan the device, select "Copy all devices to project".

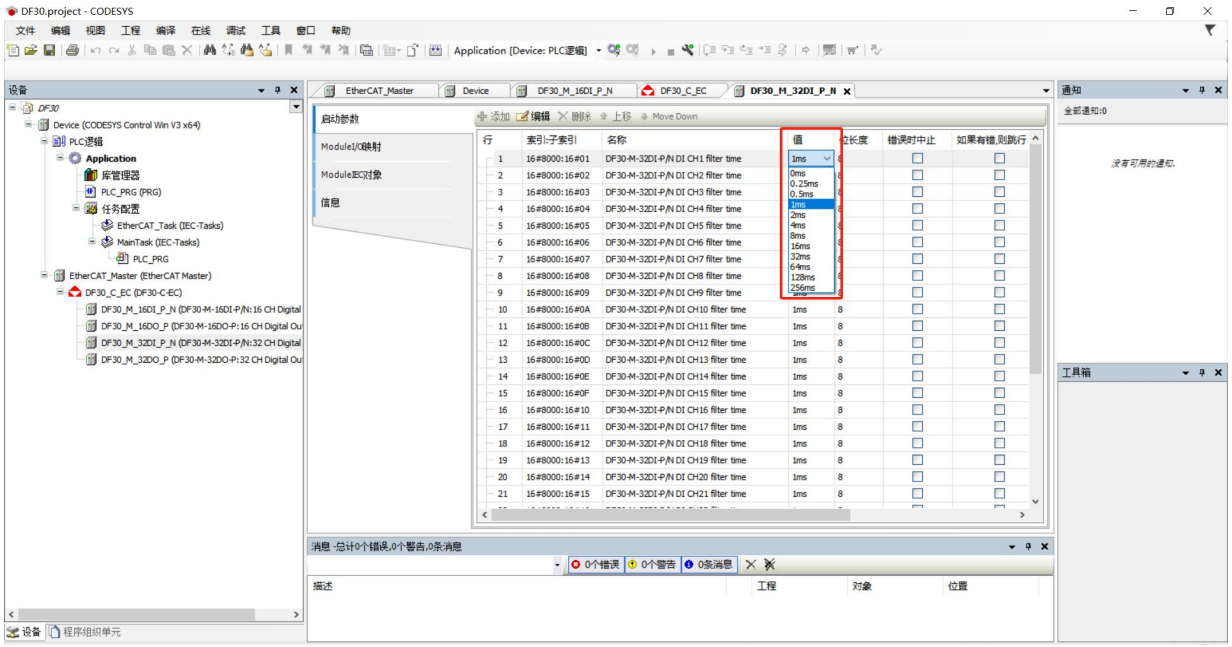

未命名2.project* - CODESYS
文件 编辑 视图 工程 编译 在线 调试 工具 窗口 帮助
Application [Device: PLC逻辑]
设备
未命名2
Device (CODESYS Control Win V3 x64)
PLC逻辑
Application
库管理器
PLC_PRG (PRG)
任务配置
EtherCAT_Task (IEC-Tasks)
MainTask (IEC-Tasks)
PLC_PRG
EtherCAT_Master (EtherCAT Master)
剪切
复制
粘贴
删除
重构
属性...
添加对象
添加文件夹...
添加设备...
插入设备...
扫描设备...
禁用设备
更新设备...
编辑对象
用...编辑对象
编辑IO映射
从CSV导入映射...
导出映射到CSV...
设备 程序组织单元
Device
网关
Gateway-1
IP-Address:
localhost
Port:
1217
DESKTOP-K5M5JNQ (激活的)
设备名称:
DESKTOP-K5M5JNQ
设备地址:
00F9
目标ID:
0000 0004
目标类型:
4096
目标供应商:
3S - Smart Software Solutions GmbH
目标版本:
3.5.19.40
可以保护你的设备,了解更多...
消息 -总计0个错误,0个警告,1条消息
Devices
0个错误 0个警告 1条消息
描述
工程
对象
位置
创建任务'EtherCAT_Task'.
通知
全部通知:0
没有可用的通知.
工具箱


未命名2.project* - CODESYS
文件 编辑 视图 工程 编译 在线 调试 工具 窗口 帮助
Application [Device: PLC逻辑]
设备
未命名2
Device [连接的] (CODESYS Control Win V3 x64)
PLC逻辑
Application
库管理器
PLC_PRG (PRG)
任务配置
EtherCAT_Task (IEC-Tasks)
MainTask (IEC-Tasks)
PLC_PRG
EtherCAT_Master (EtherCAT Master)
Device
通信设置
扫描网络
网关
设备
扫描设备
扫描的设备
设备名称
设备类型
显示工程差异
扫描设备
复制所有设备到工程
关闭
消息 -总计0个错误,0个警告,1条消息
Devices
0个错误 0个警告 1条消息
通知
全部通知:0
没有可用的通知.
工具箱



2 Parameter Configuration

Select the DF30-M-32DI-P/N module, start the parameter interface to set the filter, and after modifying the configuration data, click the login icon at the top of the interface. After successfully logging in, click the start icon at the top of the interface.



The module's SDO index offset is 16#0010

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	DI CH1 filter time	Filter input counting filter table	8	3	Channel 1 Filtering Time
2	DI CH2 filter time	Filter input counting filter table	8	3	Channel 2 Filtering Time
3	DI CH3 filter time	Filter input counting filter table	8	3	Channel 3 Filtering Time
4	DI CH4 filter time	Filter input counting filter table	8	3	Channel 4 Filtering Time
5	DI CH5 filter time	Filter input counting filter table	8	3	Channel 5 Filtering Time
6	DI CH6 filter time	Filter input counting filter table	8	3	Channel 6 Filtering Time
7	DI CH7 filter time	Filter input counting filter table	8	3	Channel 7 Filtering Time
8	DI CH8 filter time	Filter input counting filter table	8	3	Channel 8 Filtering Time
9	DI CH9 filter time	Filter input	8	3	Channel 9

		counting filter table			Filtering Time
10	DI CH10 filter time	Filter input counting filter table	8	3	Channel 10 Filtering Time
11	DI CH11 filter time	Filter input counting filter table	8	3	Channel 11 Filtering Time
12	DI CH12 filter time	Filter input counting filter table	8	3	Channel 12 Filtering Time
13	DI CH13 filter time	Filter input counting filter table	8	3	Channel 13 Filtering Time
14	DI CH14 filter time	Filter input counting filter table	8	3	Channel 14 Filtering Time
15	DI CH15 filter time	Filter input counting filter table	8	3	Channel 15 Filtering Time
16	DI CH16 filter time	Filter input counting filter table	8	3	Channel 16 Filtering Time
17	DI CH17 filter time	Filter input counting filter table	8	3	Channel 17 Filtering Time
18	DI CH18 filter time	Filter input counting filter table	8	3	Channel 18 Filtering Time

19	DI CH19 filter time	Filter input counting filter table	8	3	Channel 19 Filtering Time
20	DI CH20 filter time	Filter input counting filter table	8	3	Channel 20 Filtering Time
twenty one	DI CH21 filter time	Filter input counting filter table	8	3	Channel 21 Filtering Time
twenty two	DI CH22 filter time	Filter input counting filter table	8	3	Channel 22 Filtering Time
twenty three	DI CH23 filter time	Filter input counting filter table	8	3	Channel 23 Filtering Time
twenty four	DI CH24 filter time	Filter input counting filter table	8	3	Channel 24 Filtering Time
25	DI CH25 filter time	Filter input counting filter table	8	3	Channel 25 Filtering Time
26	DI CH26 filter time	Filter input counting filter table	8	3	Channel 26 Filtering Time
27	DI CH27 filter time	Filter input counting filter table	8	3	Channel 27 Filtering Time
28	DI CH28 filter time	Filter input counting filter	8	3	Channel 28 Filtering Time

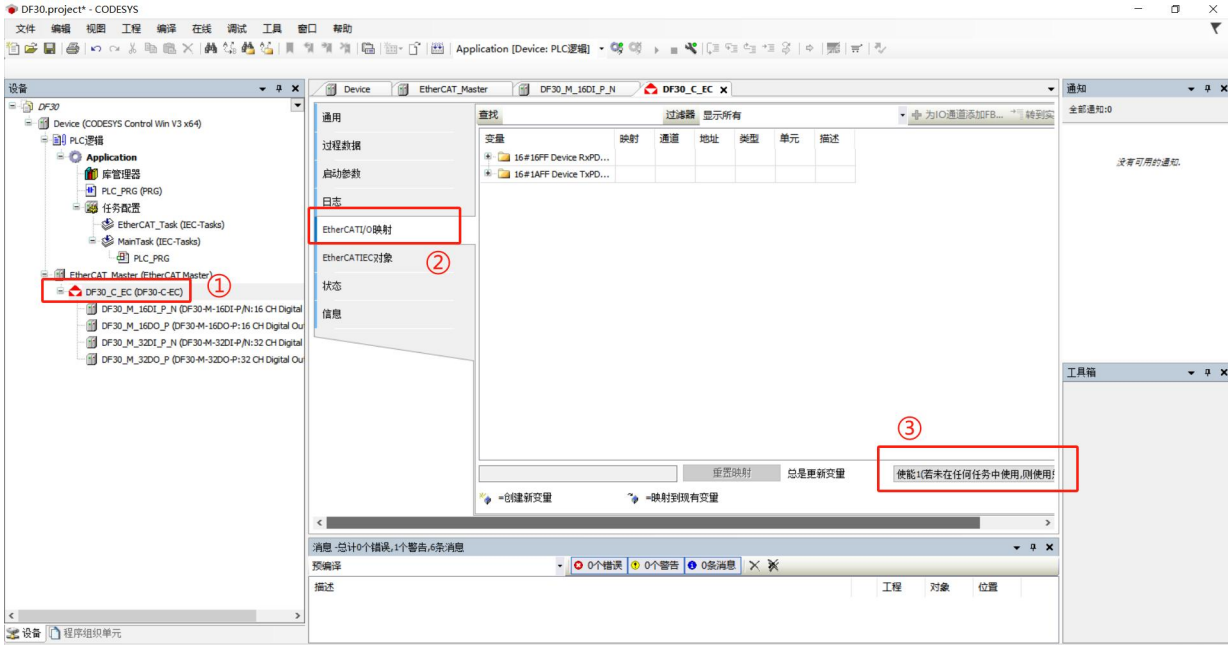
		table			
29	DI CH29 filter time	Filter input counting filter table	8	3	Channel 29 Filtering Time
30	DI CH30 filter time	Filter input counting filter table	8	3	Channel 30 Filtering Time
31	DI CH31 filter time	Filter input counting filter table	8	3	Channel 31 Filtering Time
32	DI CH32 filter time	Filter input counting filter table	8	3	Channel 32 Filtering Time

surface2Filter input counting filter table

Sub-index object data	name	meaning
0	0ms	Software filtering 0ms
1	0.25ms	Software filtering 0.25ms
2	0.5ms	Software filtering 0.5ms
3	1ms	Software filtering 1ms
4	2ms	Software filtering 2ms
5	4ms	Software filtering 4ms
6	8ms	Software filtering 8ms
7	16ms	Software filtering 16ms
8	32ms	Software filtering 32ms
9	64ms	Software filtering 64ms
10	128ms	Software filtering 128ms
11	256ms	Software filtering 256ms

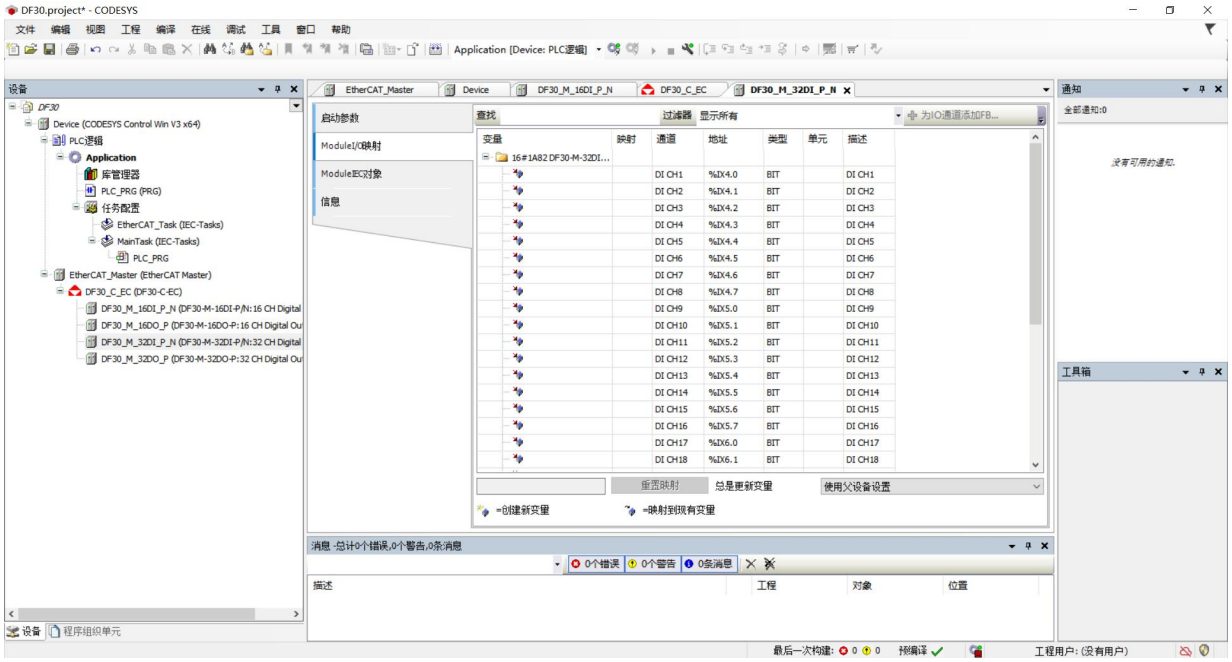
3. Data monitoring

Open the DF30-C-EC window, select EtehrCAT I/O mapping, and change "Always update variable" to "Enable 1".



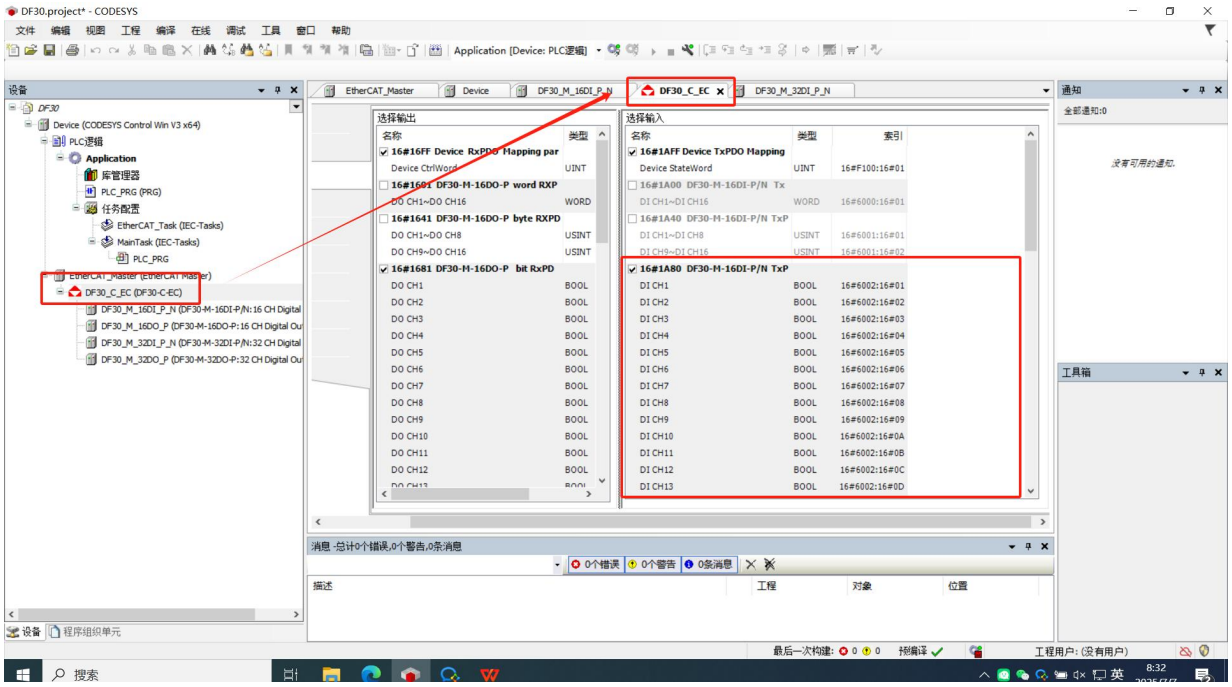
Open the DF30-M-32DI-P/N window, go to Module IO mapping, modify/view the input address, and monitor the current information.

FALSE indicates no signal, TRUE indicates a valid signal.



4 Process Data

After successful configuration, in online status, double-click the red area in the image to view the module firmware version.



The module's PDO index offset is 16#0010

Input data

Choose one of the three options: word mapping, byte access, and bit access. The default is bit access.

index	16#7000 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DI CH1~DI CH16	WORD	16	Bits 0 to 15 correspond to the input states of channels 1 to 16.
2	DI CH17~DI CH32	WORD	16	Bits 0 to 15 correspond to the input states of channels 17 to 32.
index	16#7001 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DI CH1~DI CH8	USINT	8	Bits 0 to 7 correspond to the input states

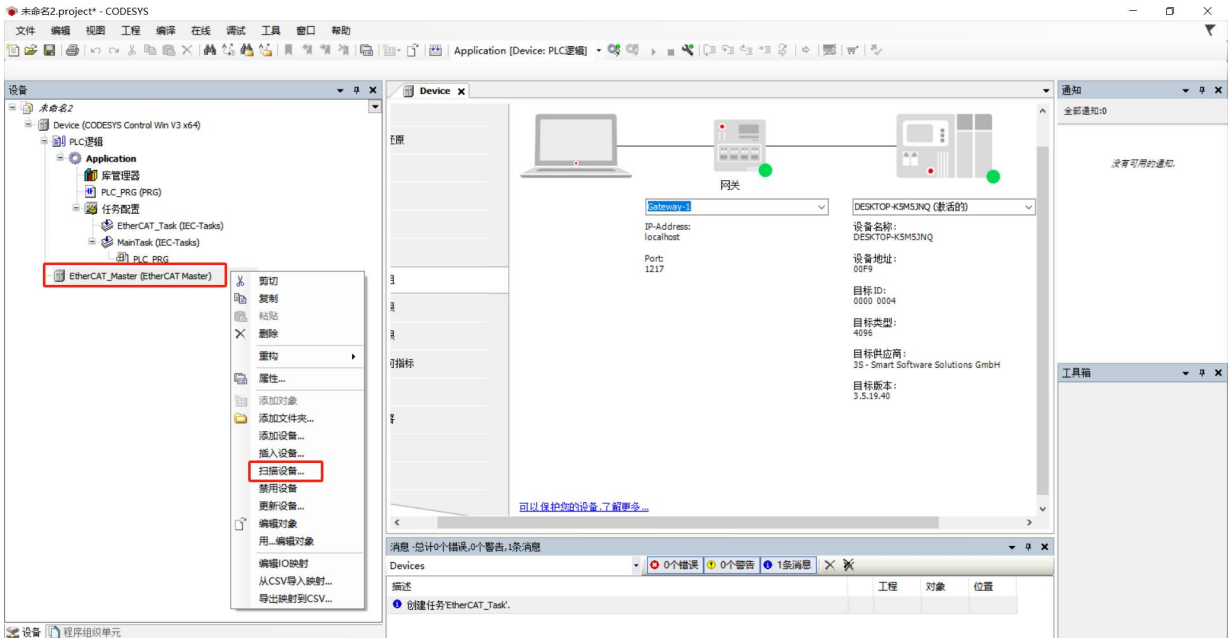
				of channels 1 to 8.
2	DI CH9~DI CH16	USINT	8	Bits 0 to 7 correspond to the input states of channels 9 to 16.
3	DI CH17~DI CH24	USINT	8	Bits 0 to 7 correspond to the input states of channels 17 to 24.
4	DI CH25~DI CH32	USINT	8	Bits 0 to 7 correspond to the input states of channels 25 to 32.
index	16#7002 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DI CH1	BOOL	1	Channel 1 Input Status
2	DI CH2	BOOL	1	Channel 2 Input Status
3	DI CH3	BOOL	1	Channel 3 Input Status
4	DI CH4	BOOL	1	Channel 4 Input Status
5	DI CH5	BOOL	1	Channel 5 Input Status
6	DI CH6	BOOL	1	Channel 6 Input Status
7	DI CH7	BOOL	1	Channel 7 Input Status
8	DI CH8	BOOL	1	Channel 8 Input Status
9	DI CH9	BOOL	1	Channel 9 Input Status
10	DI CH10	BOOL	1	Channel 10 Input Status
11	DI CH11	BOOL	1	Channel 11 Input Status
12	DI CH12	BOOL	1	Channel 12 Input Status
13	DI CH13	BOOL	1	Channel 13 Input Status
14	DI CH14	BOOL	1	Channel 14 Input Status
15	DI CH15	BOOL	1	Channel 15 Input Status
16	DI CH16	BOOL	1	Channel 16 Input Status
17	DI CH17	BOOL	1	Channel 17 Input Status
18	DI CH18	BOOL	1	Channel 18 Input Status
19	DI CH19	BOOL	1	Channel 19 Input Status

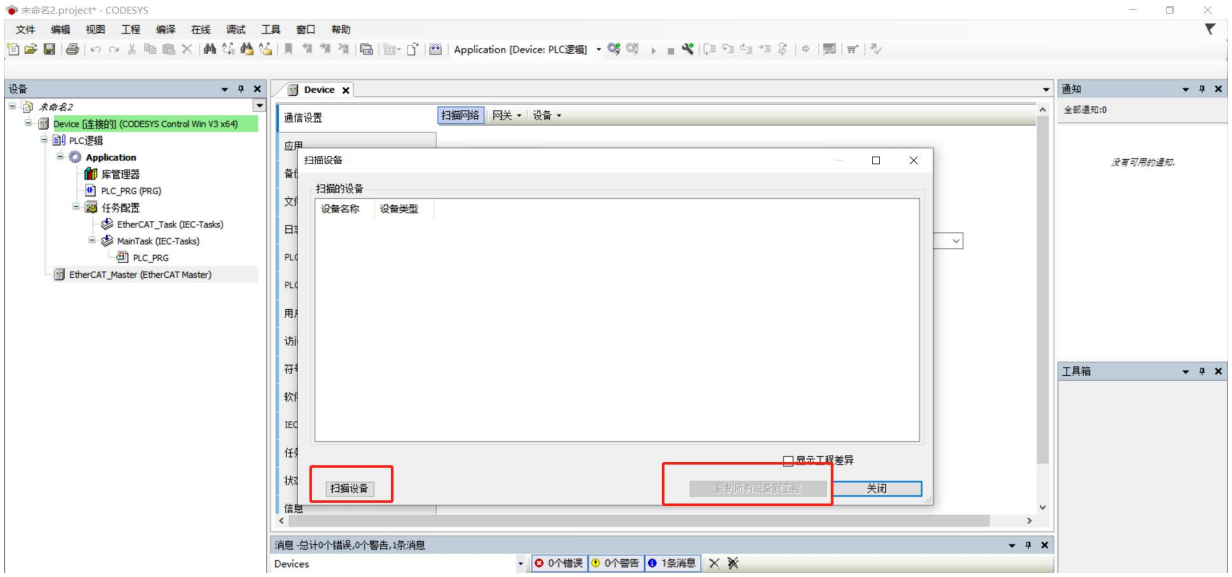
20	DI CH20	BOOL	1	Channel 20 Input Status
twenty one	DI CH21	BOOL	1	Channel 21 Input Status
twenty two	DI CH22	BOOL	1	Channel 22 Input Status
twenty three	DI CH23	BOOL	1	Channel 23 Input Status
twenty four	DI CH24	BOOL	1	Channel 24 Input Status
25	DI CH25	BOOL	1	Channel 25 Input Status
26	DI CH26	BOOL	1	Channel 26 Input Status
27	DI CH27	BOOL	1	Channel 27 Input Status
28	DI CH28	BOOL	1	Channel 28 Input Status
29	DI CH29	BOOL	1	Channel 29 Input Status
30	DI CH30	BOOL	1	Channel 30 Input Status
31	DI CH31	BOOL	1	Channel 31 Input Status
32	DI CH32	BOOL	1	Channel 32 Input Status

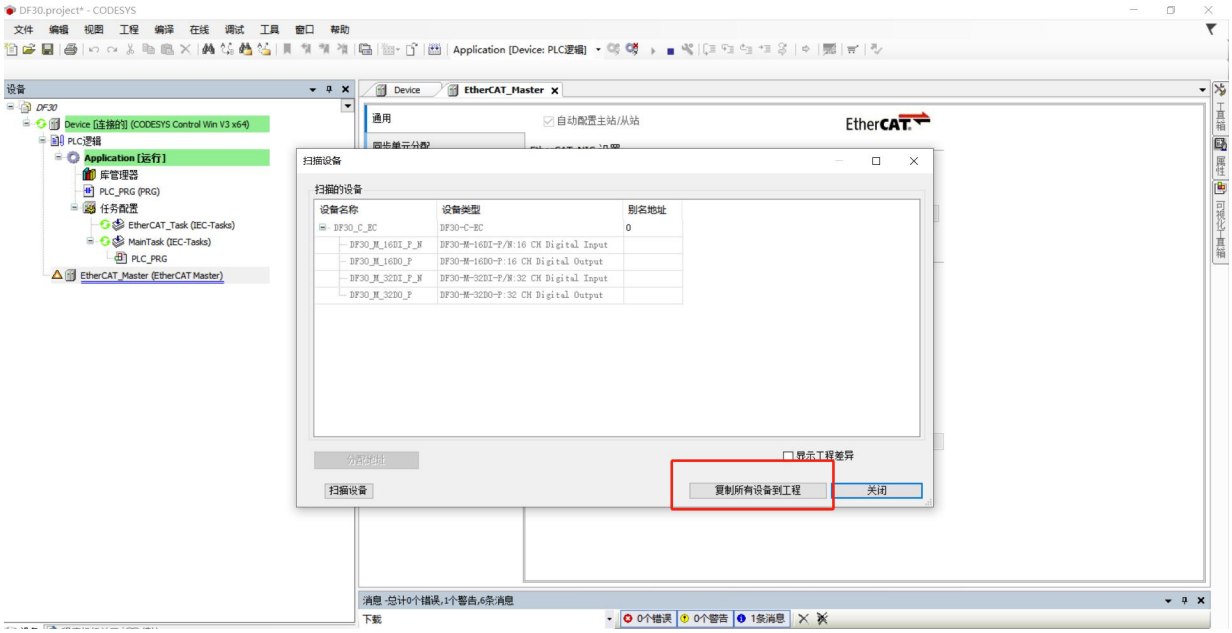
3 DF30-M-16DO-P

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO moduleScan the device, select "Copy all devices to project".

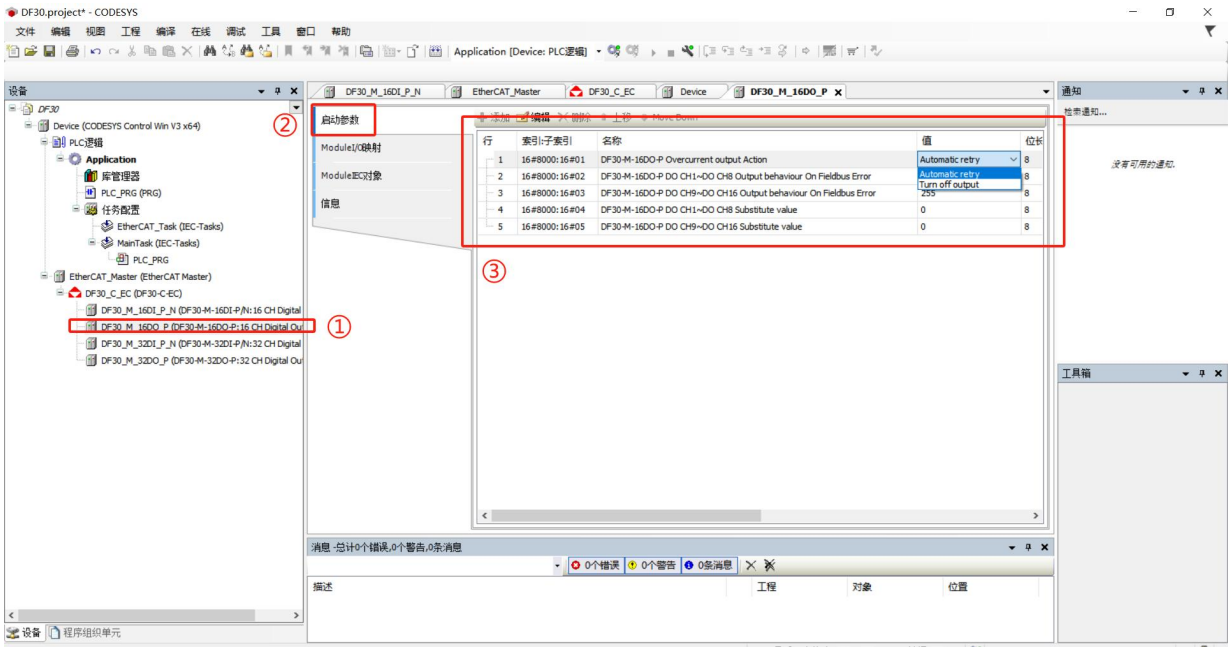

未命名2.project* - CODESYS
文件 编辑 视图 工程 编译 在线 调试 工具 窗口 帮助
Application [Device: PLC逻辑]
设备
未命名2
Device (CODESYS Control Win V3 x64)
PLC逻辑
Application
库管理器
PLC_PRG (PRG)
任务配置
EtherCAT_Task (IEC-Tasks)
MainTask (IEC-Tasks)
PLC_PRG
EtherCAT_Master (EtherCAT Master)
剪切
复制
粘贴
删除
重构
属性...
添加对象
添加文件夹...
添加设备...
插入设备...
扫描设备...
禁用设备
更新设备...
编辑对象
用...编辑对象
编辑IO映射
从CSV导入映射...
导出映射到CSV...
设备 程序组织单元
Device
网关
Gateway-1
IP-Address:
localhost
Port:
1217
DESKTOP-K5M5JNQ (激活的)
设备名称:
DESKTOP-K5M5JNQ
设备地址:
00F9
目标ID:
0000 0004
目标类型:
4096
目标供应商:
3S - Smart Software Solutions GmbH
目标版本:
3.5.19.40
可以保护你的设备,了解更多...
消息 -总计0个错误,0个警告,1条消息
Devices
0个错误 0个警告 1条消息
描述
工程
对象
位置
创建任务'EtherCAT_Task'.
通知
全部通知:0
没有可用的通知.
工具箱


未命名2.project* - CODESYS
文件 编辑 视图 工程 编译 在线 调试 工具 窗口 帮助
Application [Device: PLC逻辑]
设备
未命名2
Device [连接的] (CODESYS Control Win V3 x64)
PLC逻辑
Application
库管理器
PLC_PRG (PRG)
任务配置
EtherCAT_Task (IEC-Tasks)
MainTask (IEC-Tasks)
PLC_PRG
EtherCAT_Master (EtherCAT Master)
Device
通信设置
扫描网络
网关
设备
扫描设备
扫描的设备
设备名称
设备类型
显示工程差异
扫描设备
复制所有设备到工程
关闭
消息 -总计0个错误,0个警告,1条消息
Devices
0个错误 0个警告 1条消息
通知
全部通知:0
没有可用的通知.
工具箱



2 Parameter Configuration

Select the DF30-M-16DO-P module, start the parameter settings interface, modify the configuration data, and then click the login icon at the top of the interface. After successfully logging in, click the start icon at the top of the interface.

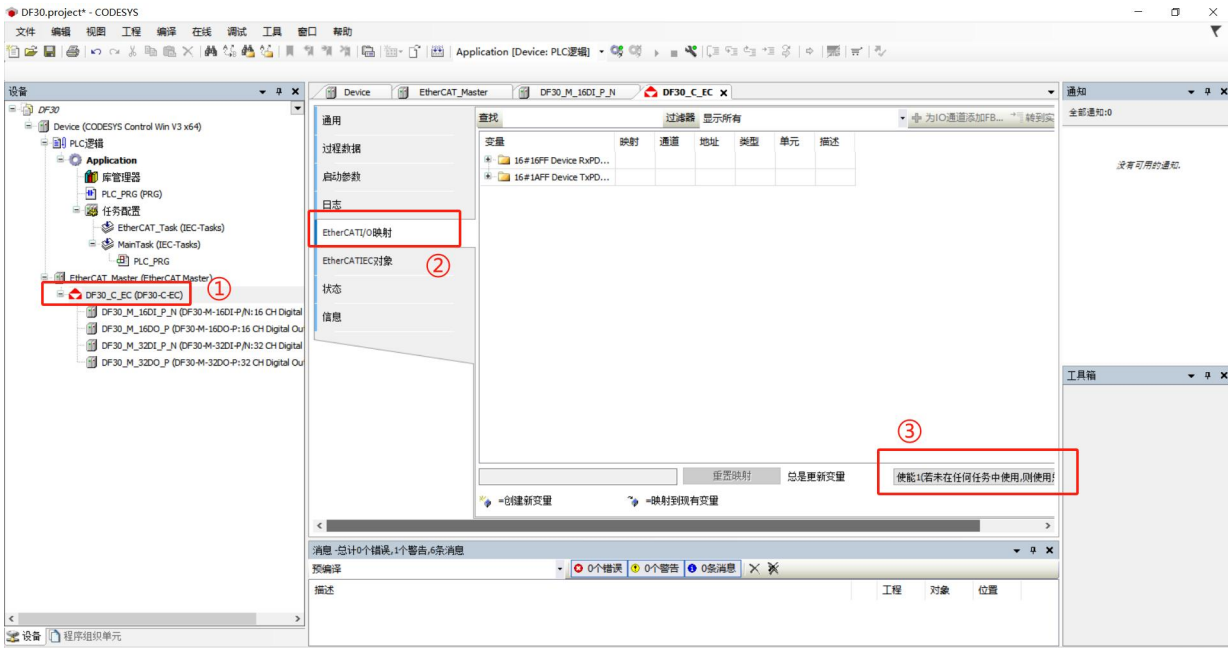


Parameter Description

index	16#8000+n*16#10(n=0~31)					
Sub-index	name	Data types	bitSize	bitOff	default value	meaning
1	Overcurrent output action	USINT	8	16	0	0: Automatic retry 1: Turn off output
2	DO CH1~DO CH8 Output behavior On Fieldbus Error	USINT	8	twenty four	255	Bits 0 to 7 correspond to output modes CH1 to CH8. 0: Keep the current output; 1: Output with replacement value.
3	DO CH9~DO CH16 Output behavior On Fieldbus Error	USINT	8	32	255	Bits 0 to 7 correspond to output modes CH9 to CH16. 0: Keep the current output; 1: Output with replacement value.
4	DO CH1~DO CH8 Substitute value	USINT	8	40	0	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on
5	DO CH9~DO CH16 Substitute value	USINT	8	48	0	Bits 0 to 7 correspond to the preset values output by CH9 to CH16. 0: Output off; 1: Output on

3. Data monitoring

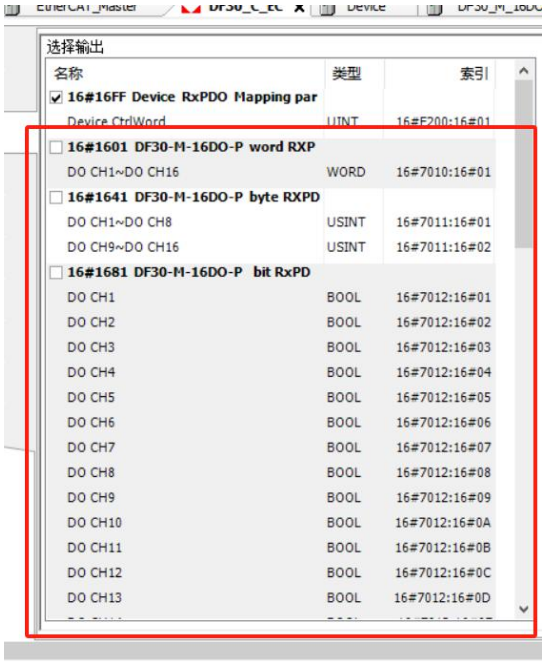
Open the DF30-C-EC window, select EtehrCAT I/O mapping, and change "Always update variable" to "Enable 1".



Open the DF30-M-16O-P window, go to Module IO mapping, modify/view the input address, and monitor the current information.

FALSE indicates no signal, TRUE indicates a valid signal.

4 Process Data



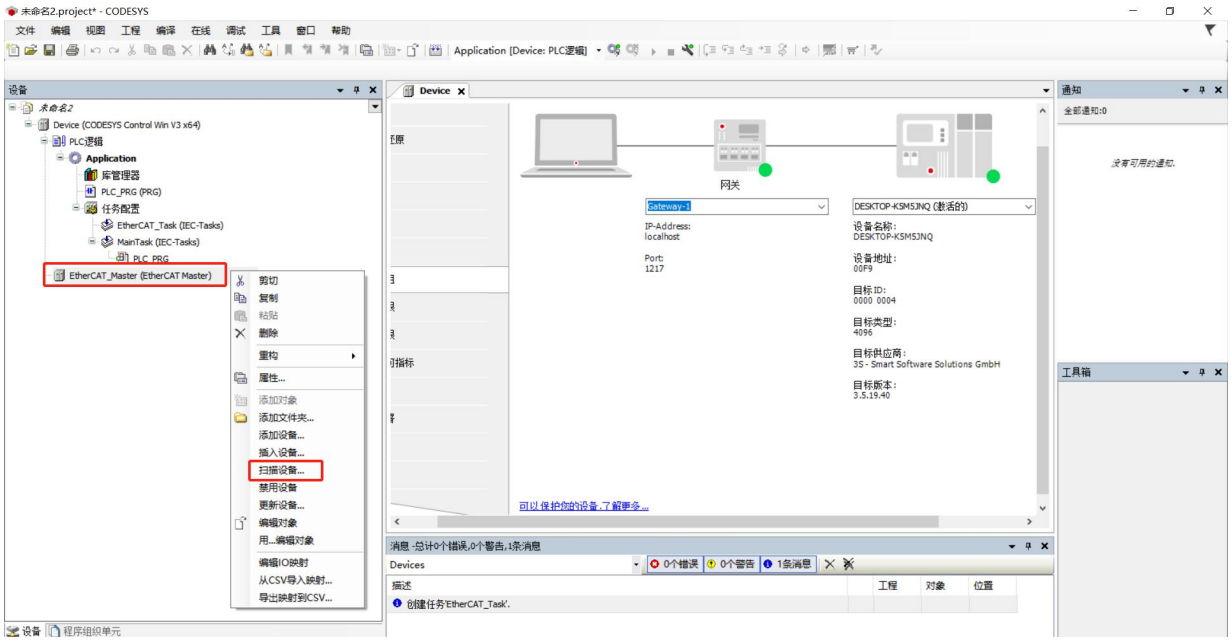
RXPDO				
index	16#7000+n*16#10(n=0~31)			
Sub-index	name	type	size	meaning
1	DO CH1~DO CH16	UINT	16	Channel 1 to Channel 16 Output Control
index	16#7001+n*16#10(n=0~31)			
1	DO CH1~DO CH8	USINT	8	Channel 1 to Channel 8 output control
2	DO CH9~DO CH16	USINT	8	Channel 9~Channel 16 Output Control
index	16#7002+n*16#10(n=0~31)			
1	DO CH1	BOOL	1	Channel 1 output control
2	DO CH2	BOOL	1	Channel 2 output control
3	DO CH3	BOOL	1	Channel 3 output control
4	DO CH4	BOOL	1	Channel 4 output control
5	DO CH5	BOOL	1	Channel 5 output control
6	DO CH6	BOOL	1	Channel 6 output control
7	DO CH7	BOOL	1	Channel 7 output control

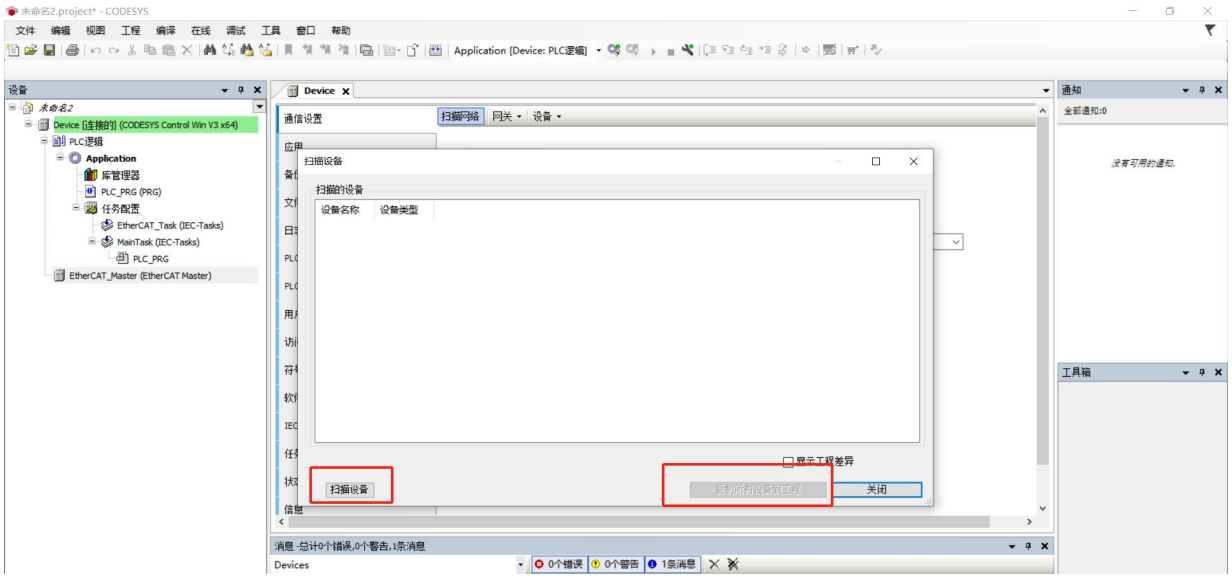
8	DO CH8	BOOL	1	Channel 8 output control
9	DO CH9	BOOL	1	Channel 9 output control
10	DO CH10	BOOL	1	Channel 10 output control
11	DO CH11	BOOL	1	Channel 11 output control
12	DO CH12	BOOL	1	Channel 12 output control
13	DO CH13	BOOL	1	Channel 13 output control
14	DO CH14	BOOL	1	Channel 14 Output Control
15	DO CH15	BOOL	1	Channel 15 output control
16	DO CH16	BOOL	1	Channel 16 Output Control

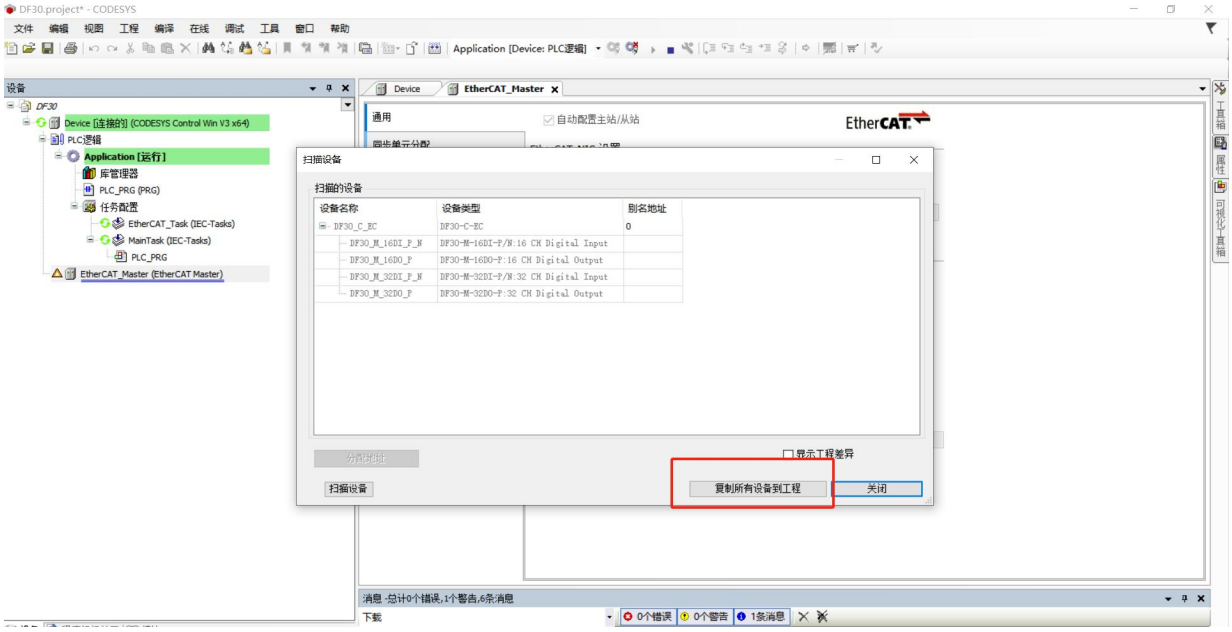
4 DF30-M-16DO-N

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO moduleScan the device, select "Copy all devices to project".

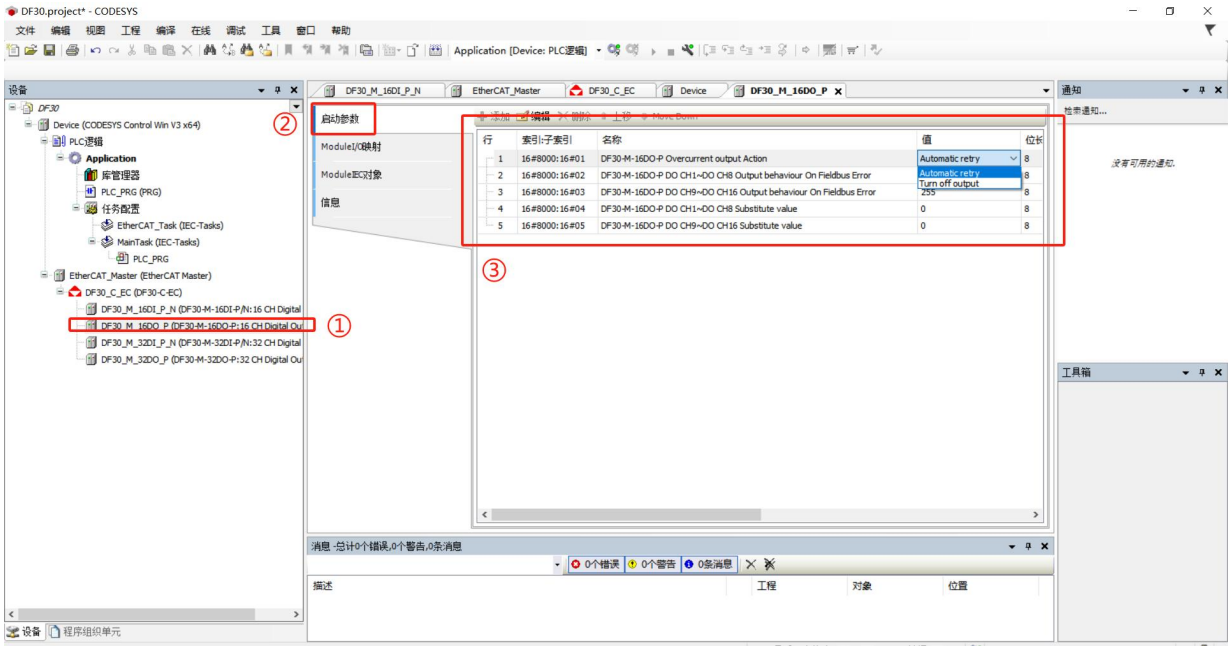






2 Parameter Configuration

Select the DF30-M-16DO-N module, start the parameter settings interface, modify the configuration data, and then click the login icon at the top of the interface. After successfully logging in, click the start icon at the top of the interface.



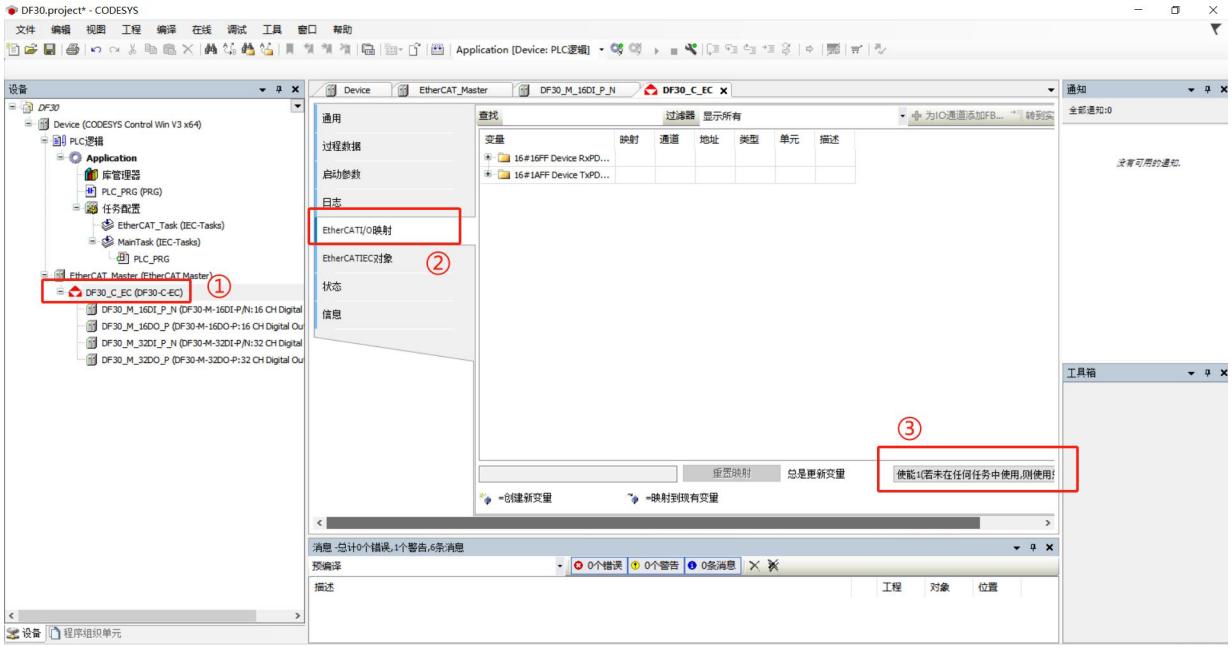
Parameter Description

index	16#8000+n*16#10(n=0~31)					
Sub-index	name	Data types	bitSize	bitOff	default value	meaning
1	Overcurrent output action	USINT	8	16	0	0: Automatic retry 1: Turn off output
2	DO CH1~DO CH8 Output behavior On Fieldbus Error	USINT	8	twenty four	255	Bits 0 to 7 correspond to output modes CH1 to CH8. 0: Keep the current output; 1: Output with replacement value.
3	DO CH9~DO CH16 Output behavior On Fieldbus Error	USINT	8	32	255	Bits 0 to 7 correspond to output modes CH9 to CH16. 0: Keep the current output; 1: Output with replacement value.
4	DO CH1~DO CH8 Substitute value	USINT	8	40	0	Bits 0 to 7 correspond to the preset values output by CH1 to CH8.

						0: Output off; 1: Output on
5	DO CH9~DO CH16 Substitute value	USINT	8	48	0	Bits 0 to 7 correspond to the preset values output by CH9 to CH16. 0: Output off; 1: Output on

3. Data monitoring

Open the DF30-C-EC window, select EtehrCAT I/O mapping, and change "Always update variable" to "Enable 1".



Open the DF30-M-16O-N window, go to Module IO mapping, modify/view the input address, and monitor the current information.

FALSE indicates no signal, TRUE indicates a valid signal.

4 Process Data

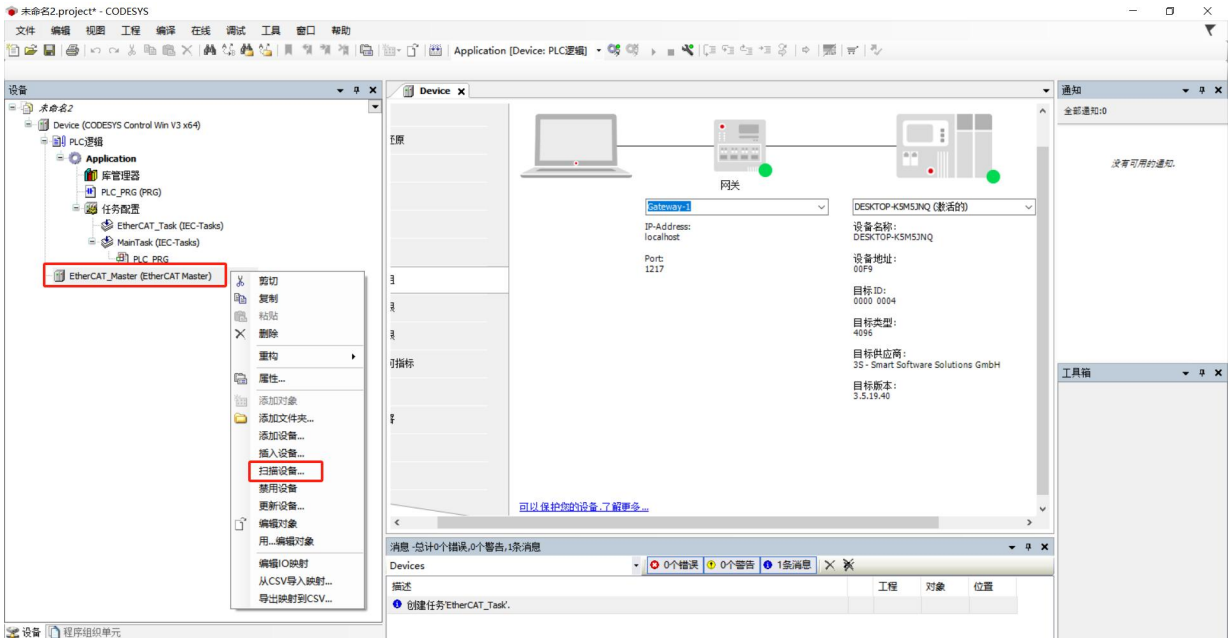
RXPDO				
index	16#7000+n*16#10(n=0~31)			
Sub-index	name	type	size	meaning
1	DO CH1~DO CH16	UINT	16	Channel 1 to Channel 16 Output Control
index	16#7001+n*16#10(n=0~31)			
1	DO CH1~DO CH8	USINT	8	Channel 1 to Channel 8 output control
2	DO CH9~DO CH16	USINT	8	Channel 9~Channel 16 Output Control
index	16#7002+n*16#10(n=0~31)			
1	DO CH1	BOOL	1	Channel 1 output control
2	DO CH2	BOOL	1	Channel 2 output control
3	DO CH3	BOOL	1	Channel 3 output control
4	DO CH4	BOOL	1	Channel 4 output control
5	DO CH5	BOOL	1	Channel 5 output control

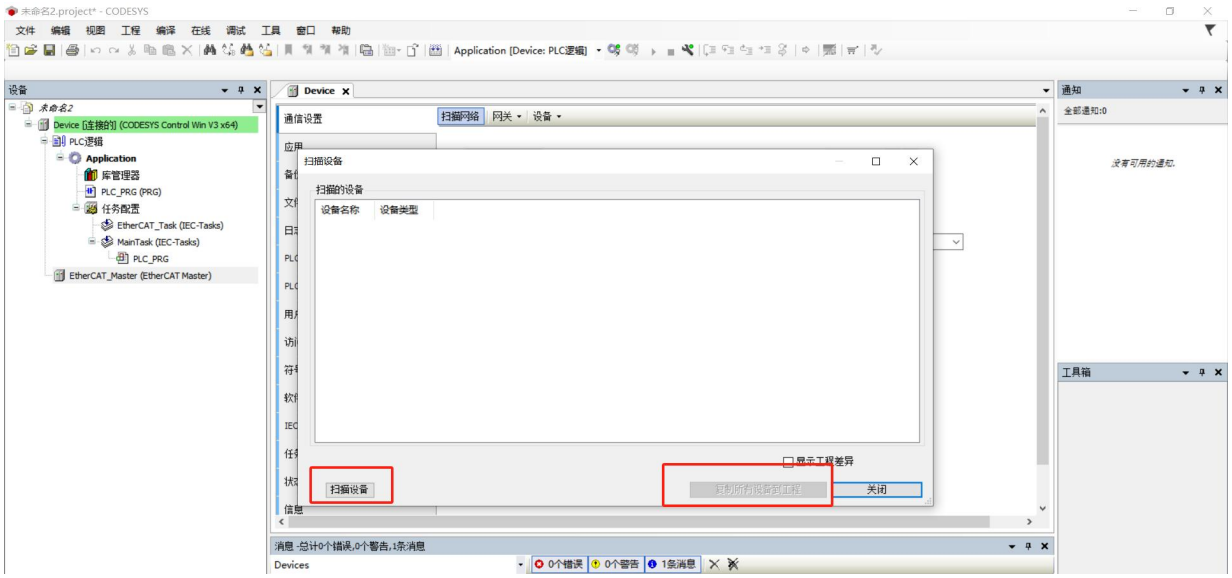
6	DO CH6	BOOL	1	Channel 6 output control
7	DO CH7	BOOL	1	Channel 7 output control
8	DO CH8	BOOL	1	Channel 8 output control
9	DO CH9	BOOL	1	Channel 9 output control
10	DO CH10	BOOL	1	Channel 10 output control
11	DO CH11	BOOL	1	Channel 11 output control
12	DO CH12	BOOL	1	Channel 12 output control
13	DO CH13	BOOL	1	Channel 13 output control
14	DO CH14	BOOL	1	Channel 14 Output Control
15	DO CH15	BOOL	1	Channel 15 output control
16	DO CH16	BOOL	1	Channel 16 Output Control

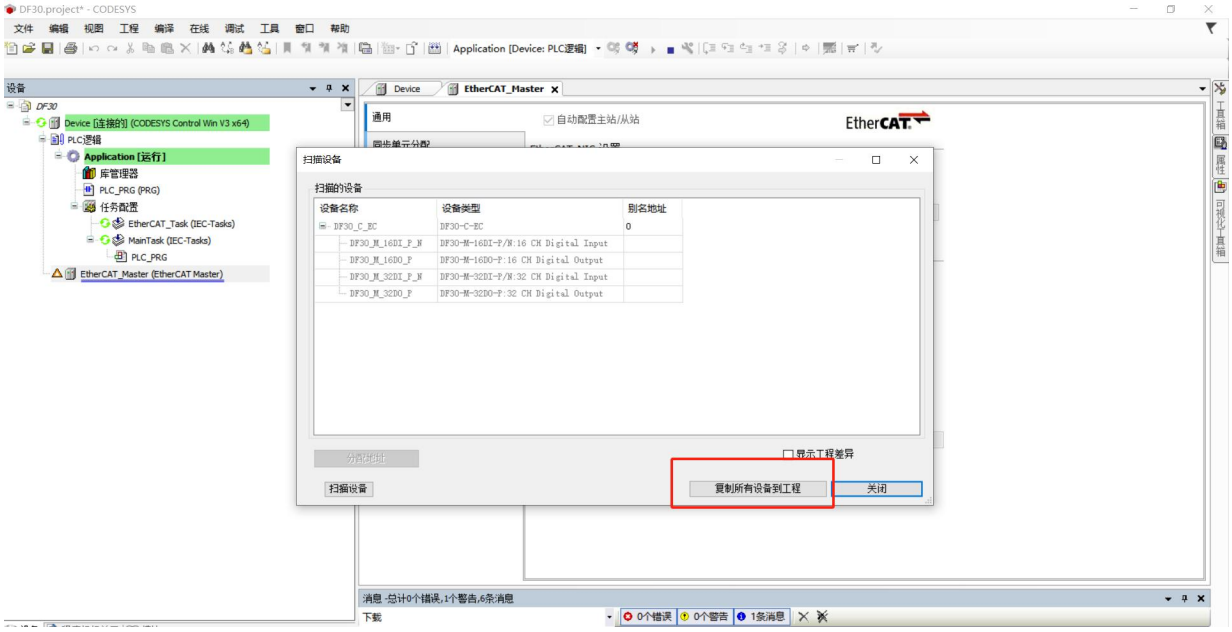
5 DF30-M-32DO-P

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO moduleScan the device, select "Copy all devices to project".

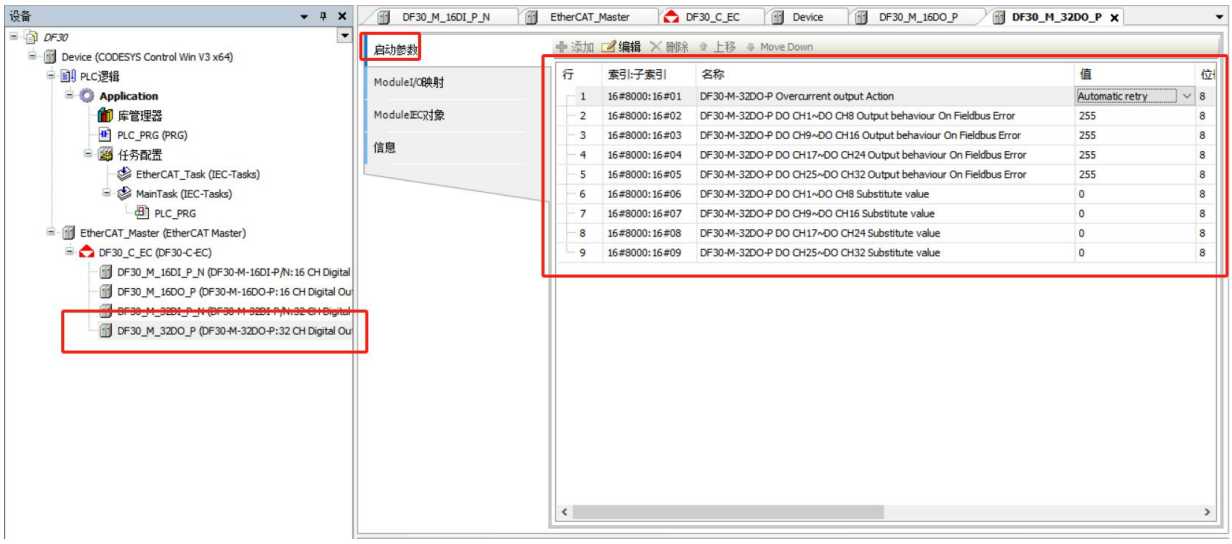






2 Parameter Configuration

Select the DF30-M-32DO-P module, start the parameter settings interface, modify the configuration data, and then click the login icon at the top of the interface. After successfully logging in, click the start icon at the top of the interface.



Parameter Description

The module's SDO index offset is 16#0010

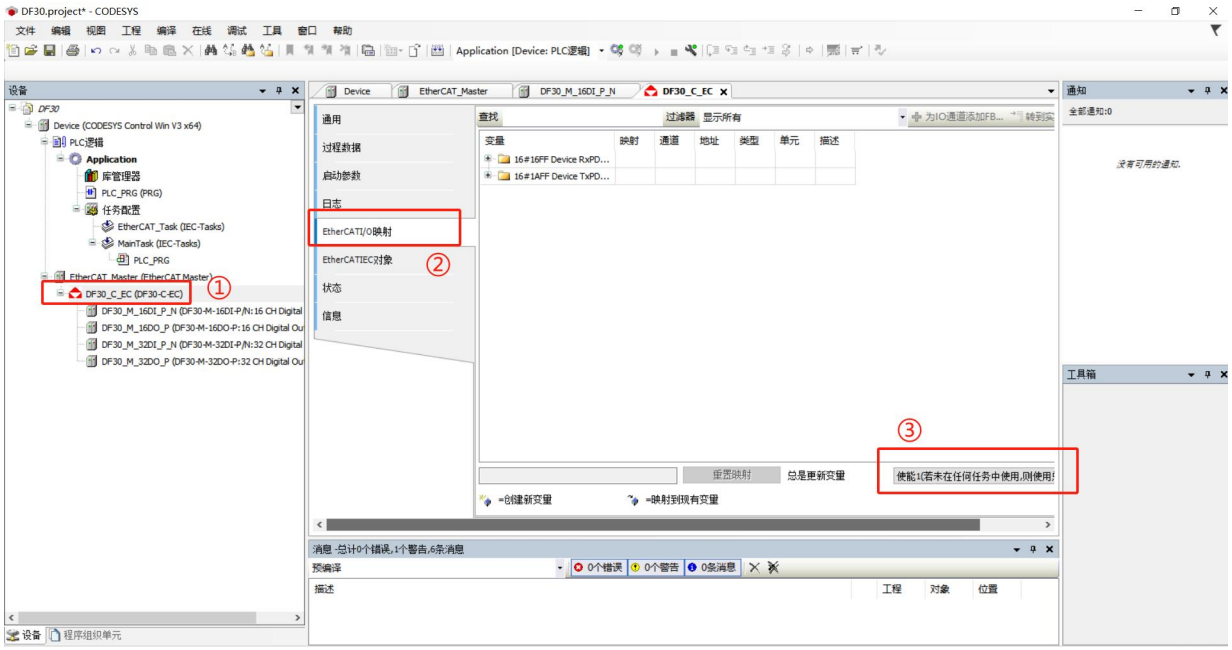
index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	Overcurrent output action	0: Automatic retry 1: Turn off output	8	0	Channel overcurrent output behavior
2	DO CH1~DO CH8 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH1 to CH8. 0: Keep the current output; 1: Output with replacement value.	8	255	Bus abnormal output behavior of channels 1 to 8
3	DO CH9~DO CH16 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH9 to CH16. 0: Keep the current	8	255	Bus abnormality output behavior of channels 9 to 16

		output; 1: Output with replacement value.			
4	DO CH17~DO CH24 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH1 to CH8. 0: Keep the current output; 1: Output with replacement value.	8	255	Bus abnormality output behavior of channels 17 to 24
5	DO CH25~DO CH32 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH9 to CH16. 0: Keep the current output; 1: Output with replacement value.	8	255	Channels 25 to 32 output replacement values
6	DO CH1~DO CH8 Substitute value	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on
7	DO CH9~DO CH16 Substitute value	Bits 0 to 7 correspond to the preset values	8	0	Bits 0 to 7 correspond to the preset

		output by CH9 to CH16. 0: Output off; 1: Output on			values output by CH9 to CH16. 0: Output off; 1: Output on
8	DO CH17~DO CH24 Substitute value	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values output by CH17 to CH24. 0: Output off; 1: Output on
9	DO CH25~DO CH32 Substitute value	Bits 0 to 7 correspond to the preset values output by CH9 to CH16. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values of CH25 to CH32 outputs. 0: Output off; 1: Output on

3. Data monitoring

Open the DF30-C-EC window, select EtehrCAT I/O mapping, and change "Always update variable" to "Enable 1".



Open the DF30-M-32O-P window, go to Module IO mapping, modify/view the input address, and monitor the current information.

FALSE indicates no signal, TRUE indicates a valid signal.

4 Process Data

The module's PDO index offset is 16#0010

➢ Output data

Choose one of three options: word mapping, byte access, and bit access. The default is bit access. A channel output control value of 1 indicates that the corresponding channel outputs a valid signal, while a channel output control value of 0 indicates that the corresponding channel outputs a disabled signal.

index	16#7000 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DO CH1~DO CH16	WORD	16	Bits 0 to 15 correspond to the output control of channels 1 to 16.
2	DO CH17~DO CH32	WORD	16	Bits 0 to 15 correspond to the output control of channels 17 to 32.
index	16#7001 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DO CH1~DO CH8	USINT	8	Bits 0 to 7 correspond to the output control of channels 1 to 8.
2	DO CH9~DO CH16	USINT	8	Bits 0 to 7 correspond to the output control of channels 9 to 16.
3	DO CH17~DO CH24	USINT	8	Bits 0 to 7 correspond to the output control of channels 17 to 24.
4	DO CH25~DO CH32	USINT	8	Bits 0 to 7 correspond to the output control of channels 25 to 32.
index	16#7002 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DO CH1	BOOL	1	Channel 1 output control
2	DO CH2	BOOL	1	Channel 2 output control
3	DO CH3	BOOL	1	Channel 3 output control
4	DO CH4	BOOL	1	Channel 4 output control

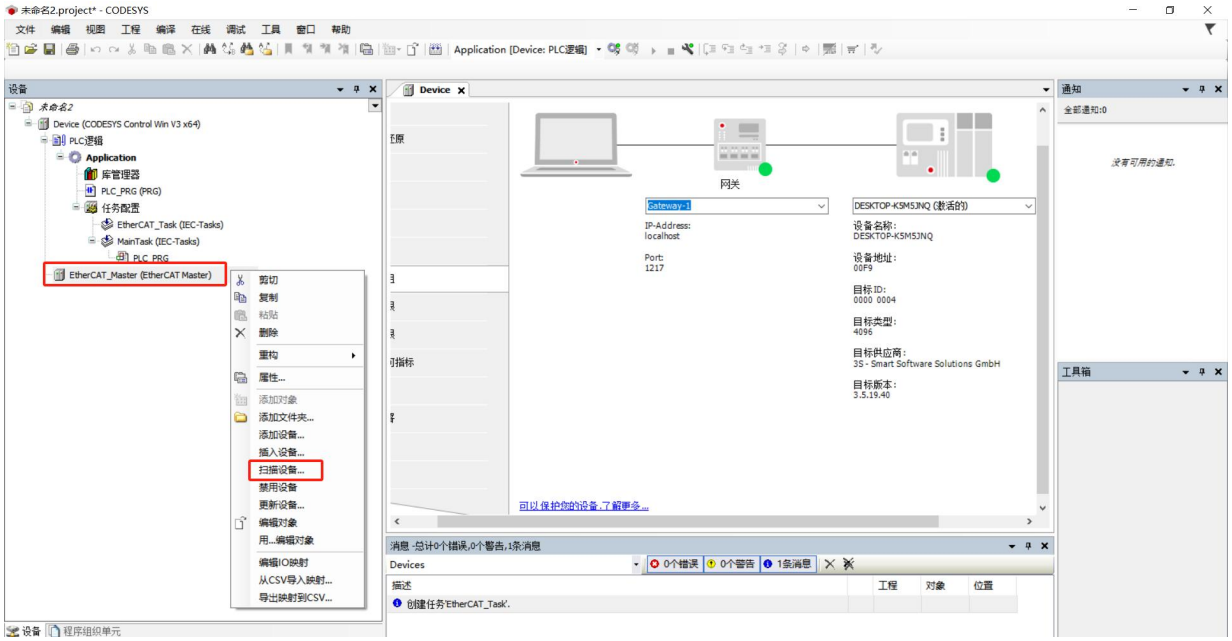
5	DO CH5	BOOL	1	Channel 5 output control
6	DO CH6	BOOL	1	Channel 6 output control
7	DO CH7	BOOL	1	Channel 7 output control
8	DO CH8	BOOL	1	Channel 8 output control
9	DO CH9	BOOL	1	Channel 9 output control
10	DO CH10	BOOL	1	Channel 10 output control
11	DO CH11	BOOL	1	Channel 11 output control
12	DO CH12	BOOL	1	Channel 12 output control
13	DO CH13	BOOL	1	Channel 13 output control
14	DO CH14	BOOL	1	Channel 14 Output Control
15	DO CH15	BOOL	1	Channel 15 output control
16	DO CH16	BOOL	1	Channel 16 Output Control
17	DO CH17	BOOL	1	Channel 17 Output Control
18	DO CH18	BOOL	1	Channel 18 output control
19	DO CH19	BOOL	1	Channel 19 output control
20	DO CH20	BOOL	1	Channel 20 output control
twenty one	DO CH21	BOOL	1	Channel 21 output control
twenty two	DO CH22	BOOL	1	Channel 22 output control
twenty three	DO CH23	BOOL	1	Channel 23 output control
twenty four	DO CH24	BOOL	1	Channel 24 output control
25	DO CH25	BOOL	1	Channel 25 output control
26	DO CH26	BOOL	1	Channel 26 output control
27	DO CH27	BOOL	1	Channel 27 Output Control
28	DO CH28	BOOL	1	Channel 28 output control
29	DO CH29	BOOL	1	Channel 29 output control

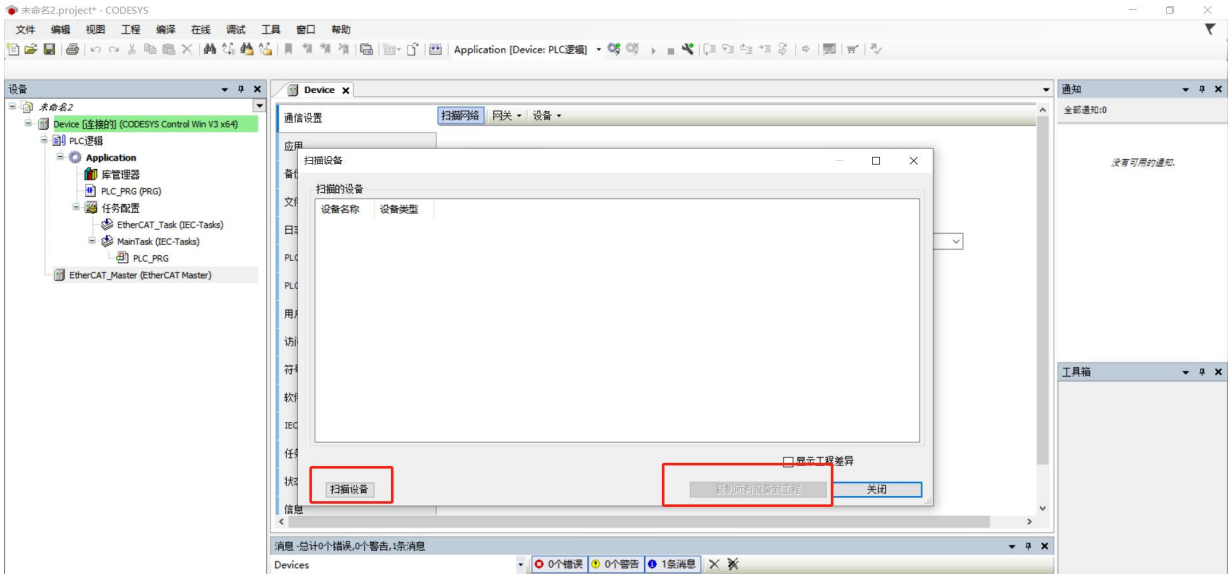
30	DO CH30	BOOL	1	Channel 30 output control
31	DO CH31	BOOL	1	Channel 31 output control
32	DO CH32	BOOL	1	Channel 32 output control

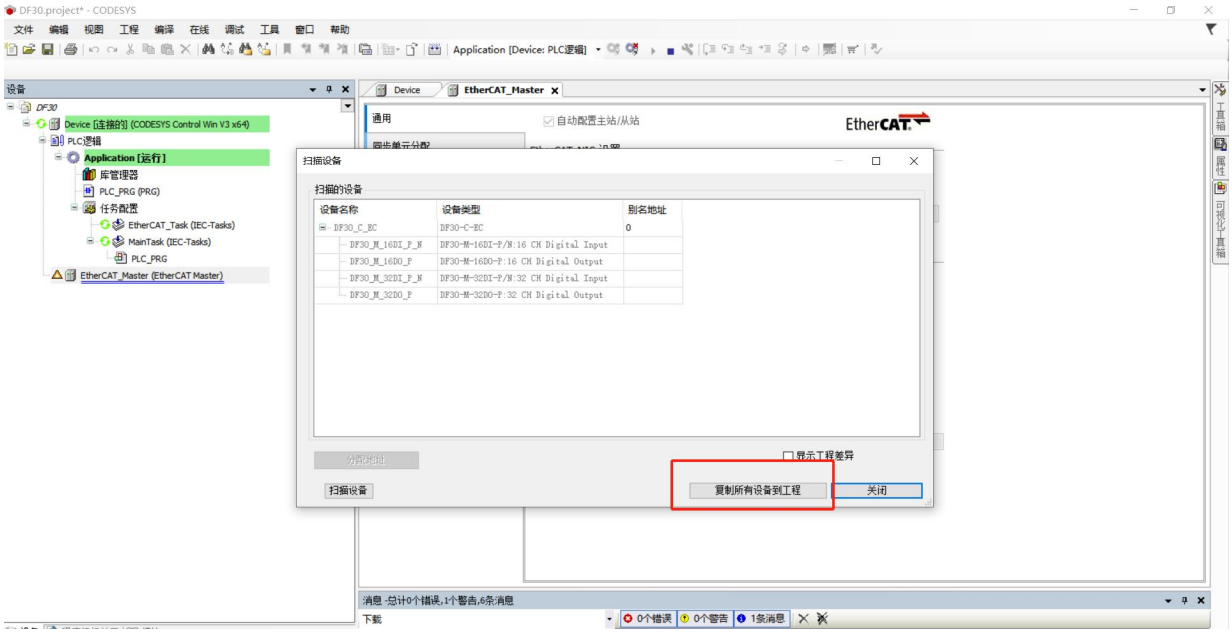
6 DF30-M-32DO-N

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO moduleScan the device, select "Copy all devices to project".

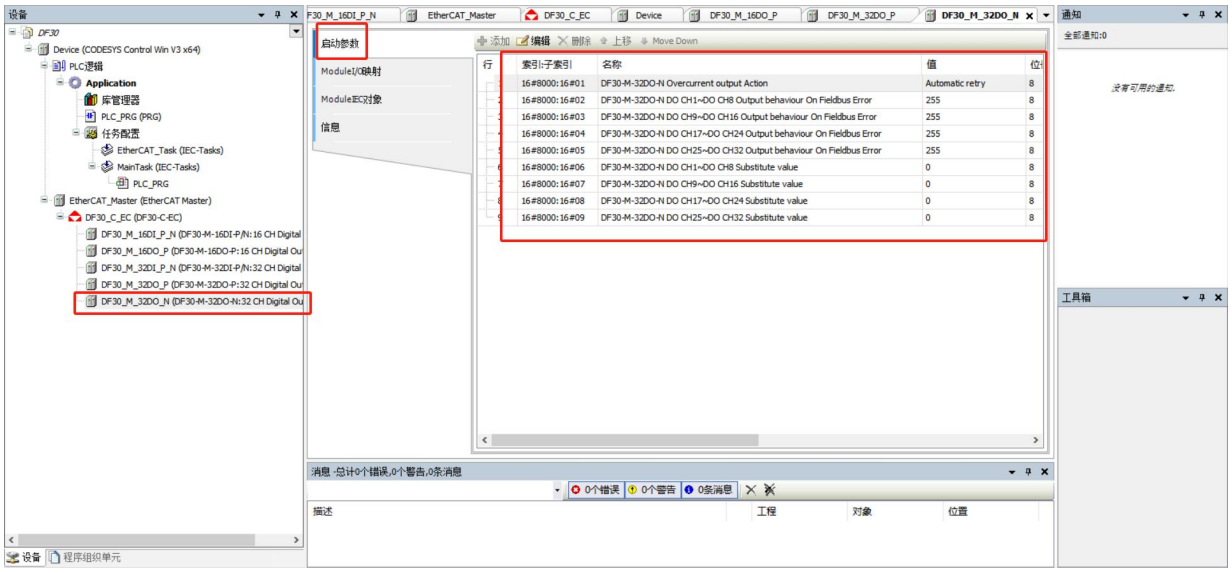






2 Parameter Configuration

Select the DF30-M-32DO-N module, start the parameter settings interface, modify the configuration data, and then click the login icon at the top of the interface. After successfully logging in, click the start icon at the top of the interface.



Parameter Description

The module's SDO index offset is 16#0010

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration	Bit	default	meaning

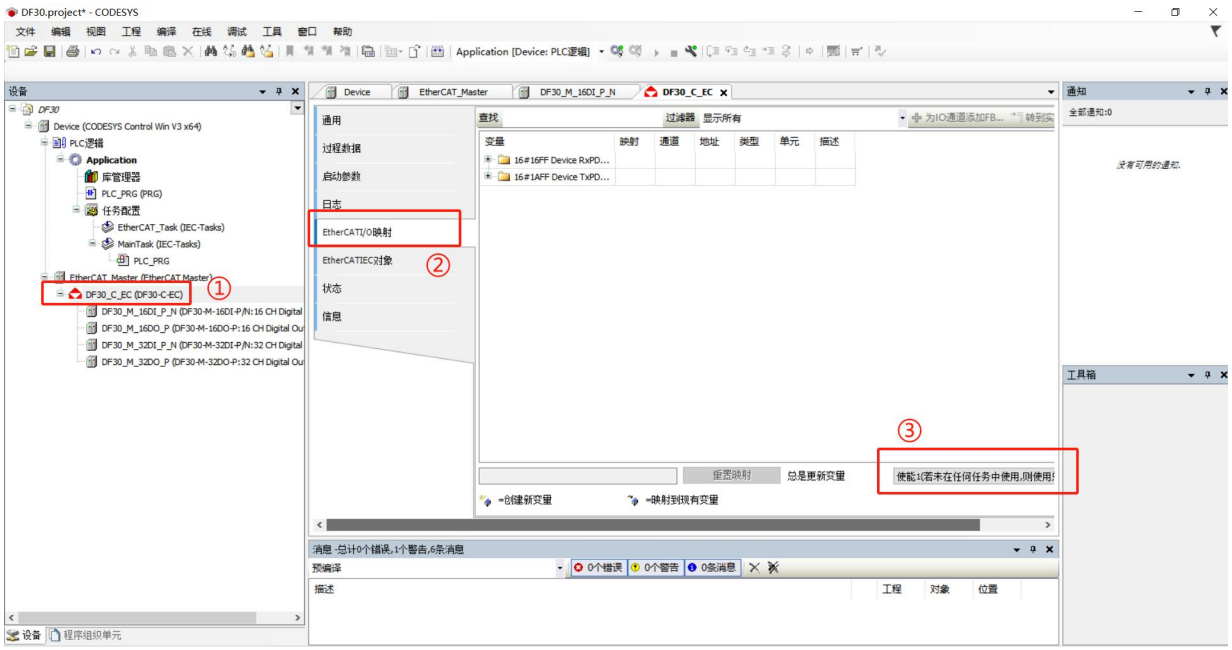
		parameters	length	value	
1	Overcurrent output action	0:Automatic retry (Automatic retry)	8	0	Channel overcurrent output behavior
2	DO CH1~DO CH8 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH1 to CH8. 0: Keep the current output; 1: Output with replacement value.	8	255	Bus abnormal output behavior of channels 1 to 8
3	DO CH9~DO CH16 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH9 to CH16. 0: Keep the current output; 1: Output with replacement value.	8	255	Bus abnormality output behavior of channels 9 to 16
4	DO CH17~DO CH24 Output behavior On Fieldbus Error	Bits 0 to 7 correspond to output modes CH1 to CH8. 0: Keep the current output; 1: Output with replacement value.	8	255	Bus abnormality output behavior of channels 17 to 24
5	DO CH25~DO CH32 Output behavior On Fieldbus	Bits 0 to 7 correspond to	8	255	Channels 25 to 32 output

	Error	output modes CH9 to CH16. 0: Keep the current output; 1: Output with replacement value.			replacement values
6	DO CH1~DO CH8 Substitute value	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on
7	DO CH9~DO CH16 Substitute value	Bits 0 to 7 correspond to the preset values output by CH9 to CH16. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values output by CH9 to CH16. 0: Output off; 1: Output on
8	DO CH17~DO CH24 Substitute value	Bits 0 to 7 correspond to the preset values output by CH1 to CH8. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values output by CH17 to CH24. 0: Output off; 1: Output on

9	DO CH25~DO CH32 Substitute value	Bits 0 to 7 correspond to the preset values output by CH9 to CH16. 0: Output off; 1: Output on	8	0	Bits 0 to 7 correspond to the preset values of CH25 to CH32 outputs. 0: Output off; 1: Output on

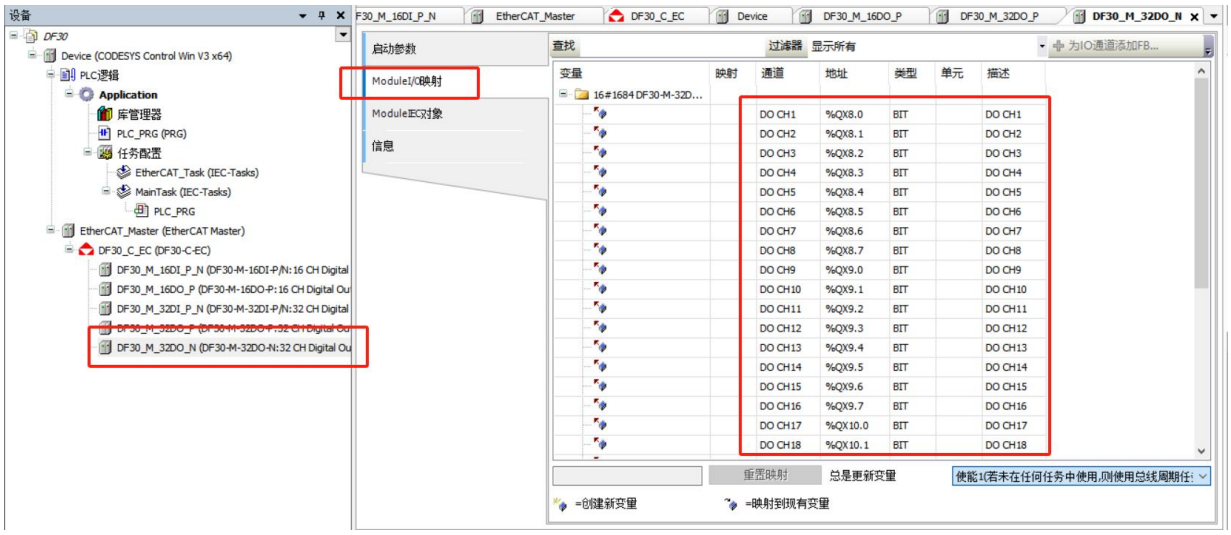
3. Data monitoring

Open the DF30-C-EC window, select EtehrCAT I/O mapping, and change "Always update variable" to "Enable 1".



Open the DF30-M-32O-N window, go to Module IO mapping, modify/view the input address, and monitor the current information.

FALSE indicates no signal, TRUE indicates a valid signal.



4 Process Data

The module's PDO index offset is 16#0010

➢ Output data

Choose one of three options: word mapping, byte access, and bit access. The default is bit access. A channel output control value of 1 indicates that the corresponding channel outputs a valid signal, while a channel output control value of 0 indicates that the corresponding channel outputs a disabled signal.

index	16#7000 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DO CH1~DO CH16	WORD	16	Bits 0 to 15 correspond to the output control of channels 1 to 16.
2	DO CH17~DO CH32	WORD	16	Bits 0 to 15 correspond to the output control of channels 17 to 32.
index	16#7001 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DO CH1~DO CH8	USINT	8	Bits 0 to 7 correspond to the output control of channels 1 to 8.

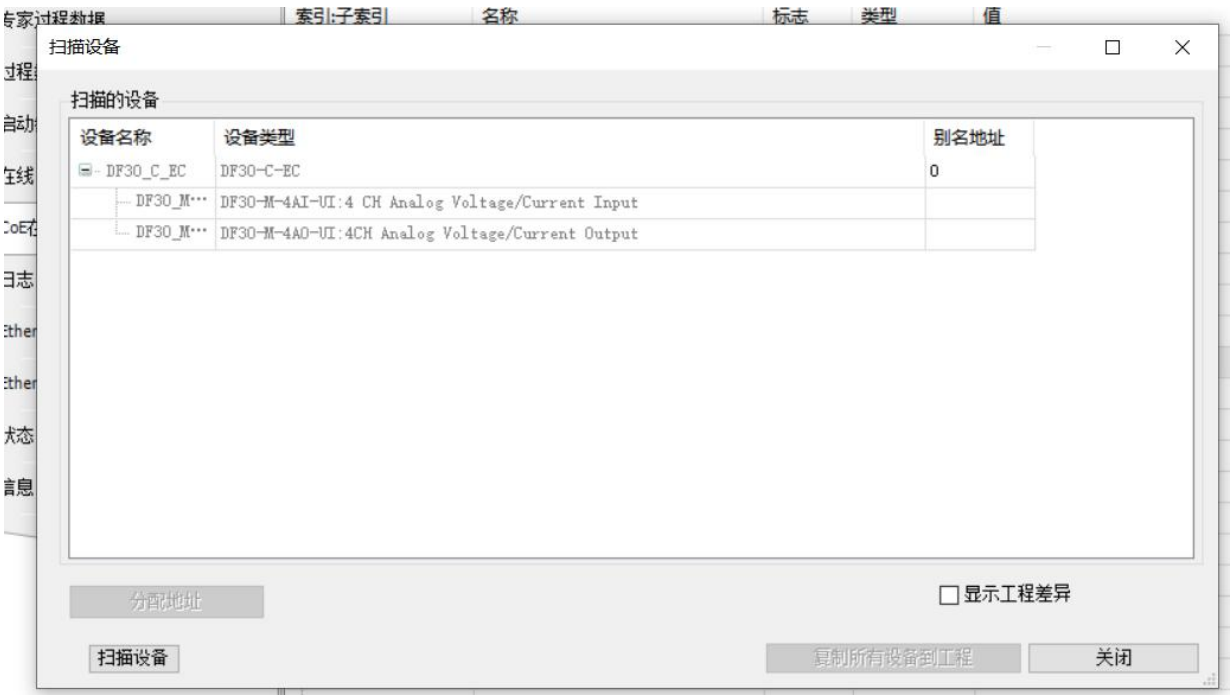
2	DO CH9~DO CH16	USINT	8	Bits 0 to 7 correspond to the output control of channels 9 to 16.
3	DO CH17~DO CH24	USINT	8	Bits 0 to 7 correspond to the output control of channels 17 to 24.
4	DO CH25~DO CH32	USINT	8	Bits 0 to 7 correspond to the output control of channels 25 to 32.
index	16#7002 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	DO CH1	BOOL	1	Channel 1 output control
2	DO CH2	BOOL	1	Channel 2 output control
3	DO CH3	BOOL	1	Channel 3 output control
4	DO CH4	BOOL	1	Channel 4 output control
5	DO CH5	BOOL	1	Channel 5 output control
6	DO CH6	BOOL	1	Channel 6 output control
7	DO CH7	BOOL	1	Channel 7 output control
8	DO CH8	BOOL	1	Channel 8 output control
9	DO CH9	BOOL	1	Channel 9 output control
10	DO CH10	BOOL	1	Channel 10 output control
11	DO CH11	BOOL	1	Channel 11 output control
12	DO CH12	BOOL	1	Channel 12 output control
13	DO CH13	BOOL	1	Channel 13 output control
14	DO CH14	BOOL	1	Channel 14 Output Control
15	DO CH15	BOOL	1	Channel 15 output control
16	DO CH16	BOOL	1	Channel 16 Output Control
17	DO CH17	BOOL	1	Channel 17 Output Control
18	DO CH18	BOOL	1	Channel 18 output control
19	DO CH19	BOOL	1	Channel 19 output control
20	DO CH20	BOOL	1	Channel 20 output control

twenty one	DO CH21	BOOL	1	Channel 21 output control
twenty two	DO CH22	BOOL	1	Channel 22 output control
twenty three	DO CH23	BOOL	1	Channel 23 output control
twenty four	DO CH24	BOOL	1	Channel 24 output control
25	DO CH25	BOOL	1	Channel 25 output control
26	DO CH26	BOOL	1	Channel 26 output control
27	DO CH27	BOOL	1	Channel 27 Output Control
28	DO CH28	BOOL	1	Channel 28 output control
29	DO CH29	BOOL	1	Channel 29 output control
30	DO CH30	BOOL	1	Channel 30 output control
31	DO CH31	BOOL	1	Channel 31 output control
32	DO CH32	BOOL	1	Channel 32 output control

7 DF30-M-4AI-UI

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration

The module's SDO index offset is 16#0010

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	AI_UI CH1 Measurement range	0:disable	8	4	Channel 1 Closed Input
		1:0~10ma 2:0~20ma 3:4~20ma			Channel 1 Current Measurement Range
		4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V			Channel 1 voltage measurement range

		9:1V~5V			
2	AI_UI CH1 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 1 data code value range
3	AI_UI CH1 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 1 frequency suppression
4	AI_UI CH1 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 1 debounce level
5	AI_UI CH1 Filter	0~255	8	50	Channel 1 filter coefficients
6	AI_UI CH2 Measurement range	0:disable	8	4	Channel 2 Closed Input
		1:0~10ma 2:0~20ma 3:4~20ma 4: -10V to +10V			Channel 2 Current Measurement Range
		5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V 9:1V~5V			Channel 2 voltage measurement range
7	AI_UI CH2 Data	0:-20000~20000	8	0	Channel 2 data

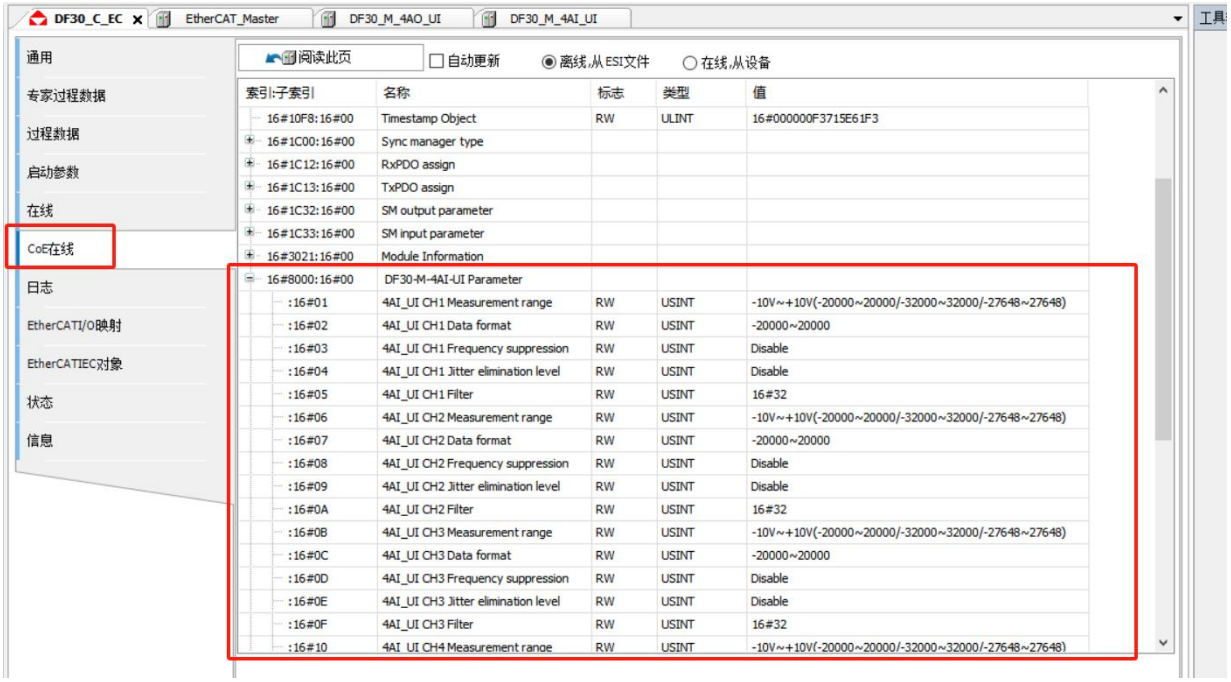
	format	1:-32000~32000 2:-27648~27648			code value range
8	AI_UI CH2 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 2 frequency suppression
9	AI_UI CH3 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 2 anti-shake level
10	AI_UI CH2 Filter	0~255	8	50	Channel 2 filter coefficients
11	AI_UI CH3 Measurement range	0:disable	8	4	Channel 3 Closed Input
		1:0~10ma 2:0~20ma 3:4~20ma			Channel 3 Current Measurement Range
		4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V 9:1V~5V			Channel 3 voltage measurement range
12	AI_UI CH3 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 3 data code value range
13	AI_UI CH3 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 3 frequency suppression
14	AI_UI CH3	0:Disable	8	0	Channel 3

	Jitter elimination level	1:Weak 2:Medium 3:Strong			anti-shake level
15	AI_UI CH3 Filter	0~255	8	50	Channel 3 filter coefficients
16	AI_UI CH4 Measurement range	0:disable	8	4	Channel 4 Closed Input
		1:0~10ma 2:0~20ma 3:4~20ma			Channel 4 Current Measurement Range
		4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V 9:1V~5V			Channel 4 voltage measurement range
17	AI_UI CH4 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 4 data code value range
18	AI_UI CH4 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 4 frequency suppression
19	AI_UI CH4 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 4 anti-shake level
20	AI_UI CH4 Filter	0~255	8	50	Channel 4 filter coefficients
twenty	AI_UI CH1~CH4	Bits 0-3 correspond to	8	0	Overflow

one	Overflow Diag	the overflow diagnostic switches for channels 1-4: 0: diagnostics off, 1: diagnostics on.			diagnostic switches for channels 1 to 4
twenty two	AI_UI CH1~CH4 Overlimit Diag	Bits 0-3 correspond to the over-limit diagnostic switches for channels 1-4: 0: Diagnostics off, 1: Diagnostics on.	8	0	Channel 1 to Channel 4 Over-limit Diagnostic Switch
twenty three	AI_UI CH1~CH4 Breaking Diag	Bits 0-3 correspond to the disconnection diagnostic switches for channels 1-4: 0: diagnostics off, 1: diagnostics on.	8	0	Channel 1 to Channel 4 Disconnection Diagnostic Switch

- Double-click the module and select startup parameters to configure them.

Users can configure the parameters of each channel of the module individually. The configurable parameters are as follows: measurement range (Disable, 0mA~10mA, 0mA~20mA, 4mA~20mA, -10V~10V, 0~10V, 2V~10V, -5V~5V, 0V~5V, 1V~5V), data code value range (-20000~20000, -32000~32000, -27648~27648), frequency suppression (Disable, 50HZ/60HZ), debouncing level (Disable, weak, medium, strong), filter coefficient (0~255), over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.



3. Data monitoring

The module's PDO index offset is 16#0010

➢ Input data

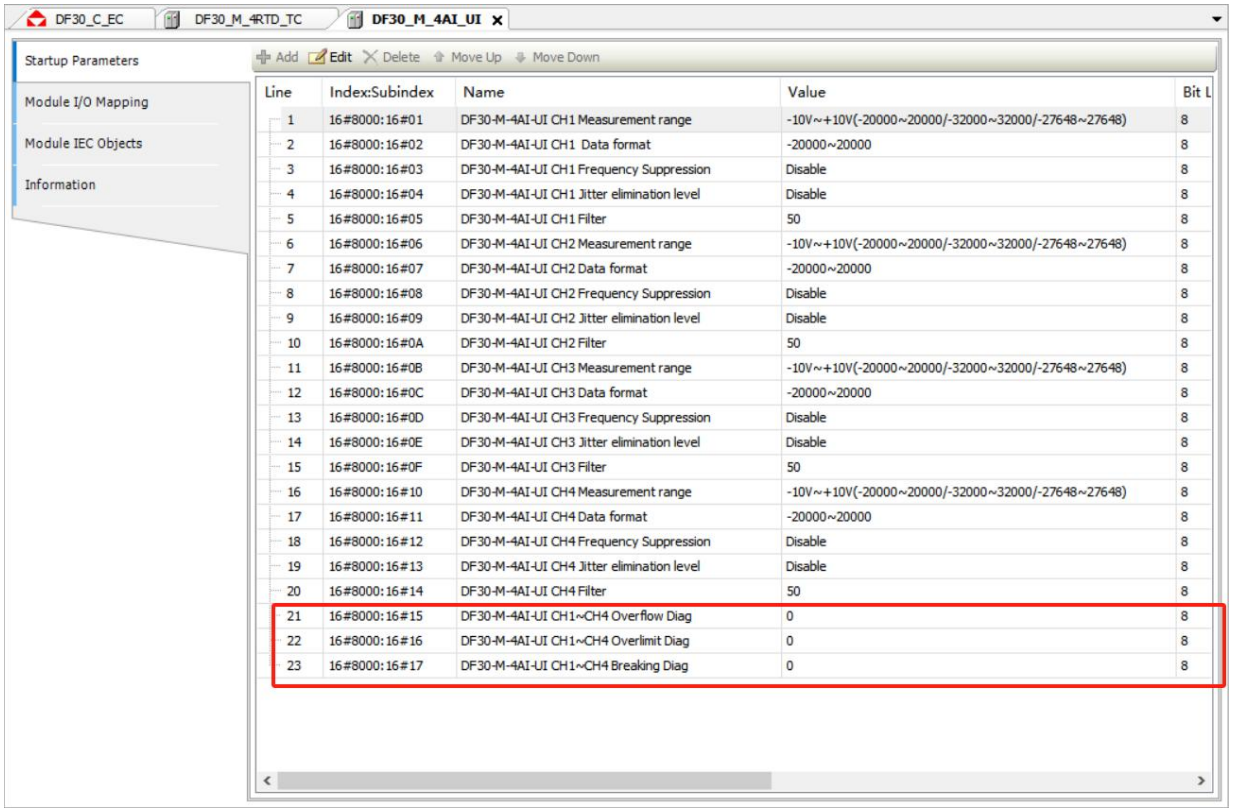
index	16#6000 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	AI CH1	INT	16	Channel 1 input data
2	AI CH2	INT	16	Channel 2 input data
3	AI CH3	INT	16	Channel 3 input data
4	AI CH4	INT	16	Channel 4 input data

Channel 1 input valid signal:

Channel 1's measurement range is configured to -10V to 10V, and its data code value range is configured to -20000 to 20000. The input signal for Channel 1 is +10V, and the code value is 20001. Other code value definitions are provided below. 6.2 Correspondence between code value and voltage or current.

4. Error Diagnosis

Enter the corresponding values in the configuration parameter interface to turn on the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.



name	Data and their meanings
Overlimit Diag	Exceeding limits diagnosis: Channel 1----1
	Exceeding limits diagnosis: Channel 2----2
	Exceeding limits diagnosis: Channel 3----4
	Exceeding limits diagnosis: Channel 4----8
Breaking Diag	Disconnection diagnosis: Channel 1----1

	Disconnection diagnosis: Channel 2----2
	Disconnection diagnosis: Channel 3----4
	Disconnection diagnosis: Channel 4----8
Overloading Diag	Overflow diagnosis: Channel 1----1
	Overflow diagnosis: Channel 2----2
	Overflow diagnosis: Channel 3----4
	Overflow diagnosis: Channel 4----8

View module error messages in the COE online window.

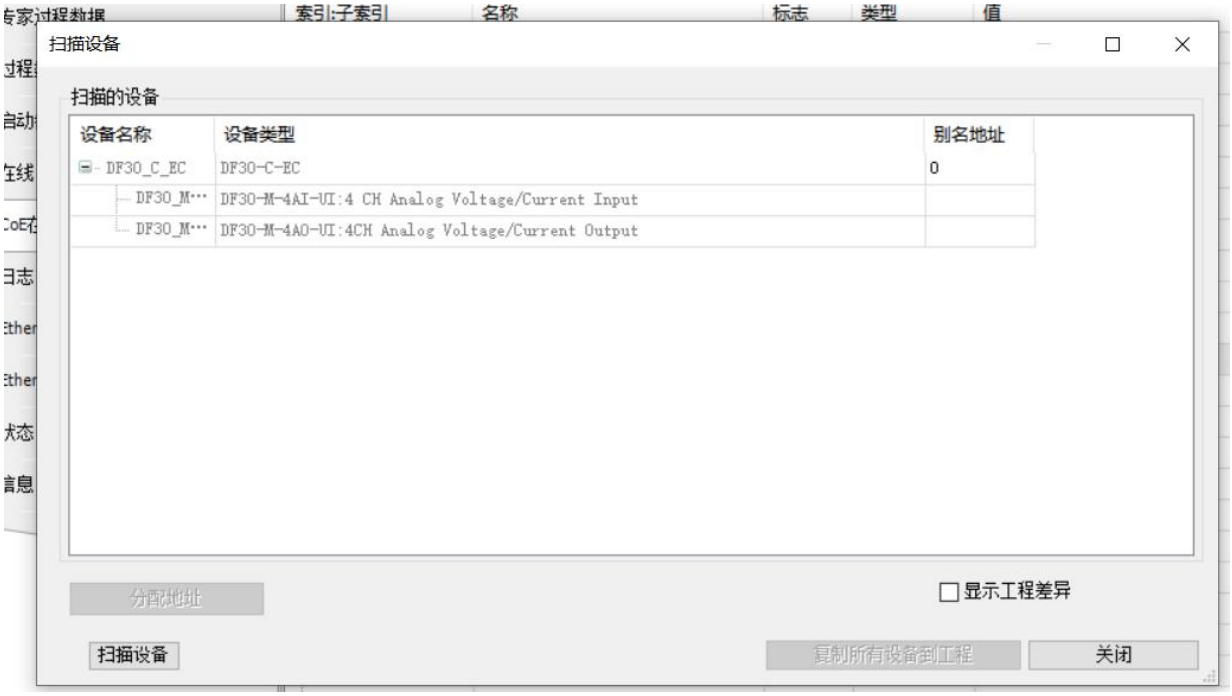
index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-4: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Module Lost Count	UDINT	32	Module loss count

Definition Reference6.1 Fault Code Description

8 DF30-M-4AO-UI

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



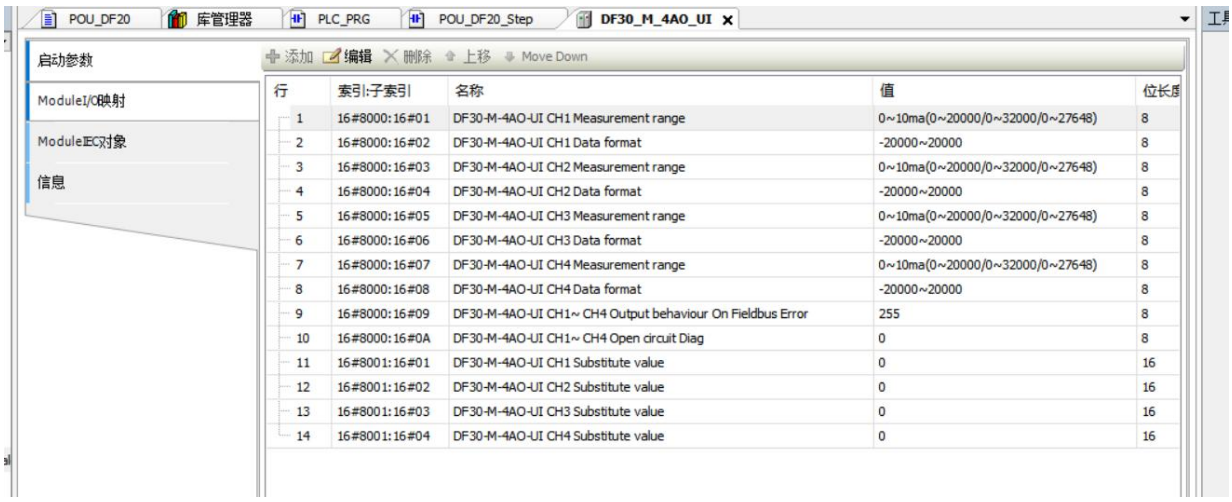
2 Parameter Configuration

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	4AO-UI CH1 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma 4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V	8	1	Channel 1 output range configuration

		8:0V~5V 9:1V~5V			
2	4AO-UI CH1 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 1 data code value range configuration
3	4AO-UI CH2 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma 4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V 9:1V~5V	8	1	Channel 2 output range configuration
4	4AO-UI CH2 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 2 data code value range configuration
5	4AO-UI CH3 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma 4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V 9:1V~5V	8	1	Channel 3 output range configuration
6	4AO-UI CH3 Data format	0:-20000~20000 1:-32000~32000	8	0	Channel 3 data code value range

		2:-27648~27648			configuration
7	4AO-UI CH4 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma 4: -10V to +10V 5:0V~10V 6:2V~10V 7: -5V~+5V 8:0V~5V 9:1V~5V	8	1	Channel 4 output range configuration
8	4AO-UI CH4 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 4 data code value range configuration
9	4AO-UI CH1~CH4 Output behavior On Fieldbus Error	0~255	8	255	Bits 0-3 correspond to the output mode when there is a fieldbus error in channels 1-4. 0: Maintain output 1: Preset value output
10	4AO-UI CH1~CH8 Open circuit Diag	0~255	8	0	Bits 0-4 correspond to the open circuit diagnostic switches for channels 1-4. 0: Turn off diagnostics 1: Enable diagnostics

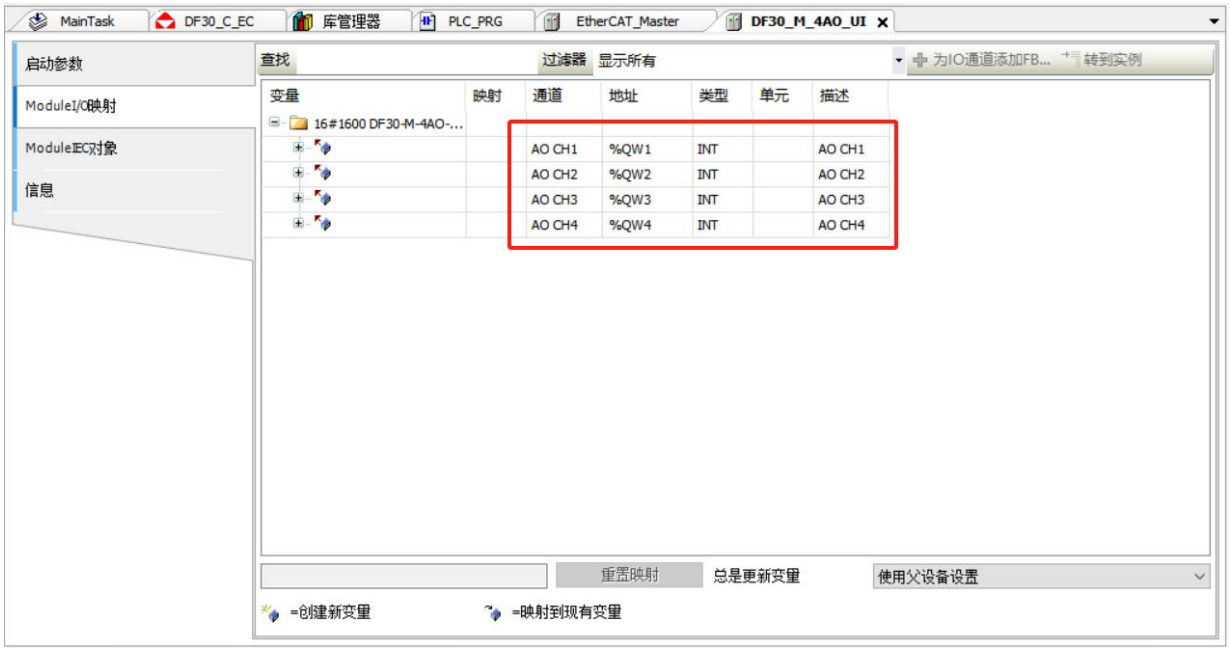
11	4AO-UI CH1 Substitute value	-32768~32767	16	0	Channel 1 output preset value
12	4AO-UI CH2 Substitute value	-32768~32767	16	0	Channel 2 output preset value
13	4AO-UI CH3 Substitute value	-32768~32767	16	0	Channel 3 output preset value
14	4AO-UI CH4 Substitute value	-32768~32767	16	0	Channel 4 output preset value



➢ Double-click the module and select startup parameters to configure channel behavior in case of bus errors.

Users can configure the parameters of each channel of the module individually. The configurable parameters are as follows: Measurement range (disable, 0~10mA (0~20000/0~32000/0~27648), 0~20mA (0~20000/0~32000/0~27648), 4~20mA (0~0000/0~32000/0~27648), -10V~+10V, 0V~10V (0~20000/0~32000/0~27648) 8) 2V~10V (0~20000/0~32000/0~27648), -5V~+5V, 0V~5V (0~20000/0~32000/0~27648), 1V~5V (0~20000/0~32000/0~27648)), data code value range (-20000~20000, -27648~27648, -32000~32000), output mode when fieldbus error occurs, open circuit detection, output preset value.

3. Data monitoring

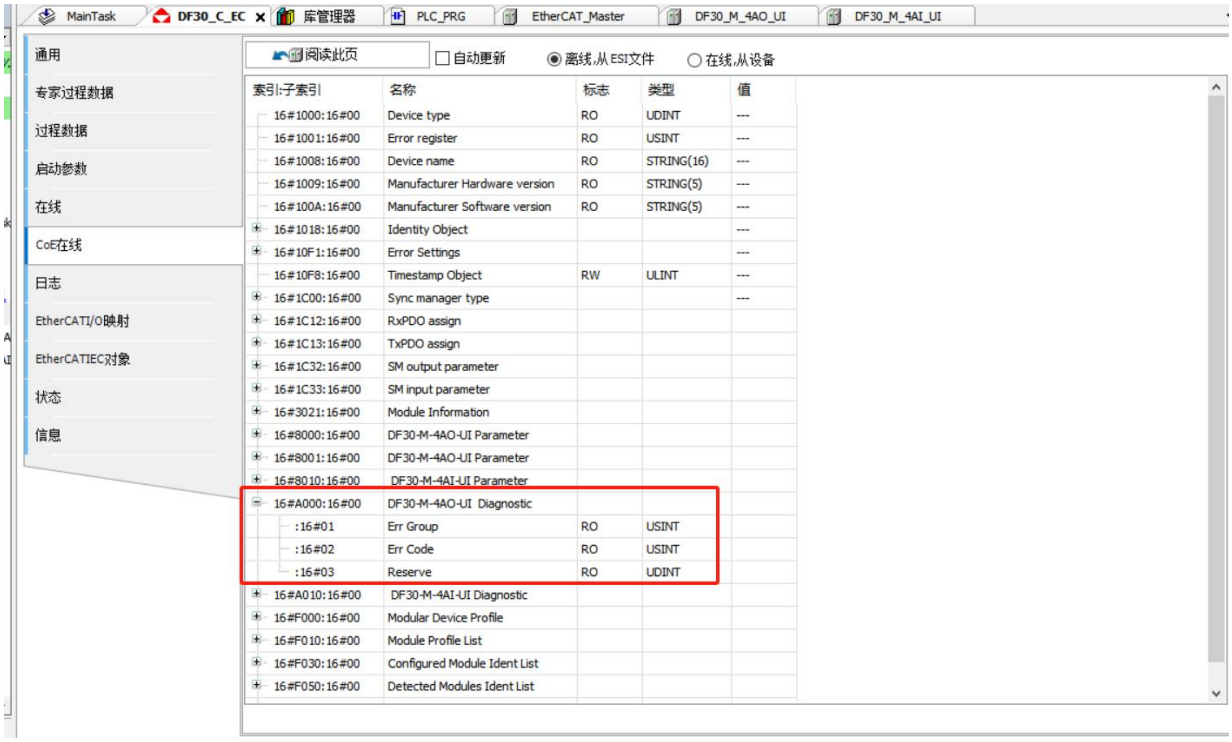


➢ Output data

index	16#7000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	AO CH1	INT	16	Channel 1 output data
2	AO CH2	INT	16	Channel 2 output data
3	AO CH3	INT	16	Channel 3 output data
4	AO CH4	INT	16	Channel 4 output data

Definition Reference6.2 Correspondence between code value and voltage or current

4 Error Diagnosis



index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Module Lost Count	UDINT	32	Module loss count

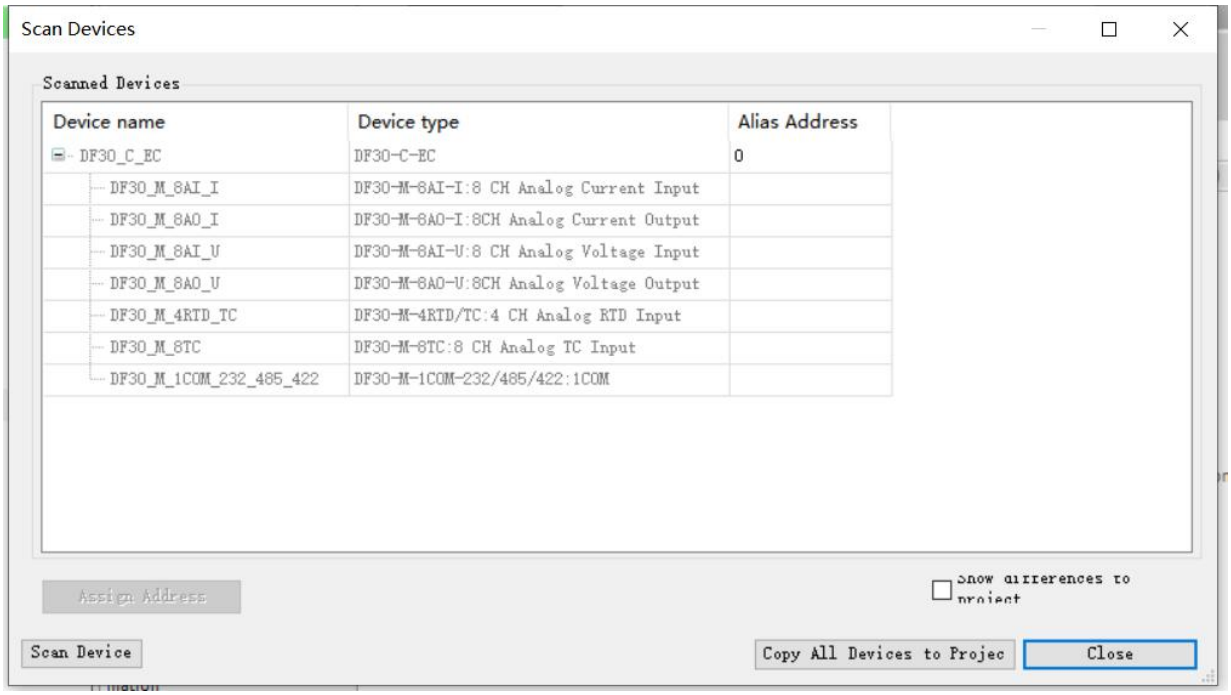
Click on CoE online. The module's diagnostic information is displayed in sub-index 16#01 of index 16#A000. An error code of 0 indicates that the current module is normal.

Definition Reference6.1 Fault Code Description

9 DF30-M-8AI-I

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration

The module's SDO index offset is 16#0010

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	AI_I CH1 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 1 Measurement Range Configuration
2	AI_I CH1 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 1 data code value range

3	AI_I CH1 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 1 frequency suppression
4	AI_I CH1 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 1 debounce level
5	AI_I CH1 Filter	0~255	8	50	Channel 1 filter coefficients
6	AI_I CH2 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 2 Measurement Range Configuration
7	AI_I CH2 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 2 data code value range
8	AI_I CH2 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 2 frequency suppression
9	AI_I CH2 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 2 anti-shake level
10	AI_I CH2 Filter	0~255	8	50	Channel 2 filter coefficients
11	AI_I CH3 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 3 Measurement Range Configuration

12	AI_I CH3 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 3 data code value range
13	AI_I CH3 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 3 frequency suppression
14	AI_I CH3 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 3 anti-shake level
15	AI_I CH3 Filter	0~255	8	50	Channel 3 filter coefficients
16	AI_I CH4 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 4 Measurement Range Configuration
17	AI_I CH4 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 4 data code value range
18	AI_I CH4 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 4 frequency suppression
19	AI_I CH4 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 4 anti-shake level
20	AI_I CH4 Filter	0~255	8	50	Channel 4 filter coefficients
twenty	AI_I CH5 Measurement	0:disable	8	3	Channel 5

one	Range	1:0~10ma 2:0~20ma 3:4~20ma			Measurement Range Configuration
twenty two	AI_I CH5 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 5 data code value range
twenty three	AI_I CH5 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 5 frequency suppression
twenty four	AI_I CH5 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 5 anti-shake level
25	AI_I CH5 Filter	0~255	8	50	Channel 5 filter coefficients
26	AI_I CH6 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 6 Measurement Range Configuration
27	AI_I CH6 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 6 data code value range
28	AI_I CH6 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 6 frequency suppression
29	AI_I CH6 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 6 anti-shake level

30	AI_I CH6 Filter	0~255	8	50	Channel 6 filter coefficients
31	AI_I CH7 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 7 Measurement Range Configuration
32	AI_I CH7 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 7 data code value range
33	AI_I CH7 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 7 frequency suppression
34	AI_I CH7 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 7 anti-shake level
35	AI_I CH7 Filter	0~255	8	50	Channel 7 filter coefficients
36	AI_I CH8 Measurement Range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 8 Measurement Range Configuration
37	AI_I CH8 Data format	0:0~20000 1:0~32000 2:0~27648	8	0	Channel 8 data code value range
38	AI_I CH8 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 8 frequency suppression
39	AI_I CH8 Jitter	0:Disable	8	0	Channel 8

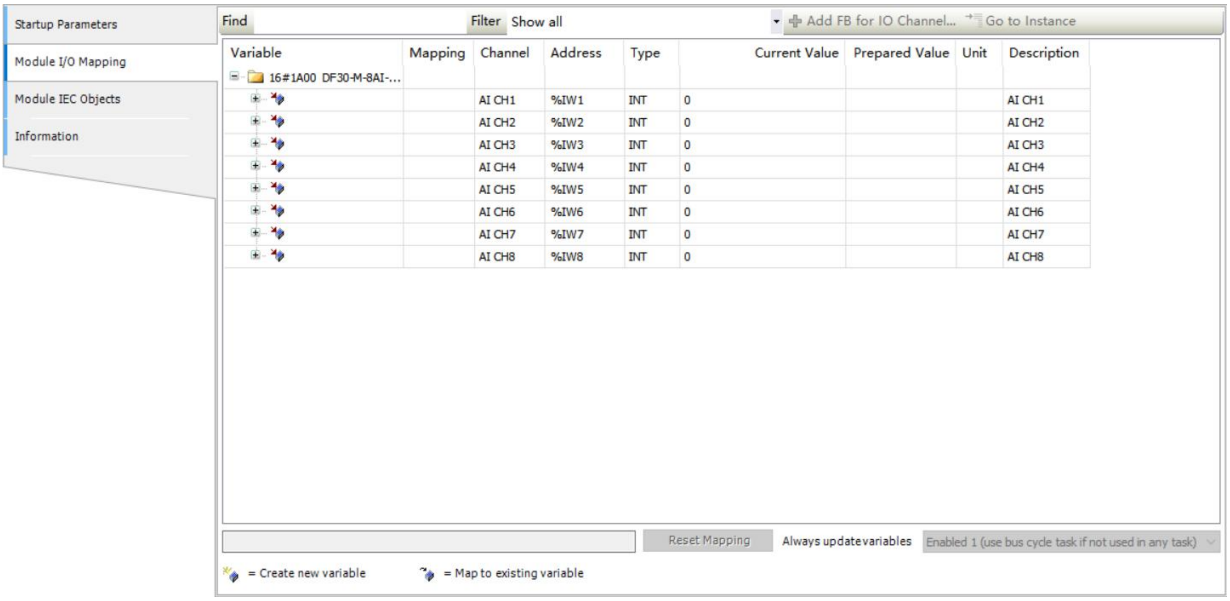
	elimination level	1:Weak 2:Medium 3:Strong			anti-shake level
40	AI_I CH8 Filter	0~255	8	50	Channel 8 filter coefficients
41	AI_I CH1~CH8 Overflow Diag	Bits 0 through 7 correspond to the overflow diagnostic switches for channels 1 through 8: 0: diagnostics off, 1: diagnostics on.	8	0	Overflow diagnostic switches for channels 1 to 8
42	AI_I CH1~CH8 Overlimit Diag	Bits 0-7 correspond to the disconnection diagnostic switches for channels 1-8: 0: diagnostics off, 1: diagnostics on.	8	0	Channel 1 to Channel 8 Over-limit Diagnostic Switches
43	AI_I CH1~CH8 Breaking Diag	Bits 0-7 correspond to the disconnection diagnostic switches for channels 1-8: 0: diagnostics off, 1: diagnostics on.	8	0	Channel 1 to Channel 8 Disconnection Diagnostic Switch

行	索引:子索引	名称	值	位长度	错误时中止
1	16#8000:16#01	DF30-M-8AI-I CH1 Measurement range	4~20ma	8	☐
2	16#8000:16#02	DF30-M-8AI-I CH1 Data format	0~20000	8	☐
3	16#8000:16#03	DF30-M-8AI-I CH1 Frequency Suppression	Disable	8	☐
4	16#8000:16#04	DF30-M-8AI-I CH1 Jitter elimination level	Disable	8	☐
5	16#8000:16#05	DF30-M-8AI-I CH1 Filter	50	8	☐
6	16#8000:16#06	DF30-M-8AI-I CH2 Measurement range	4~20ma	8	☐
7	16#8000:16#07	DF30-M-8AI-I CH2 Data format	0~20000	8	☐
8	16#8000:16#08	DF30-M-8AI-I CH2 Frequency Suppression	Disable	8	☐
9	16#8000:16#09	DF30-M-8AI-I CH2 Jitter elimination level	Disable	8	☐
10	16#8000:16#0A	DF30-M-8AI-I CH2 Filter	50	8	☐
11	16#8000:16#0B	DF30-M-8AI-I CH3 Measurement range	4~20ma	8	☐
12	16#8000:16#0C	DF30-M-8AI-I CH3 Data format	0~20000	8	☐
13	16#8000:16#0D	DF30-M-8AI-I CH3 Frequency Suppression	Disable	8	☐
14	16#8000:16#0E	DF30-M-8AI-I CH3 Jitter elimination level	Disable	8	☐
15	16#8000:16#0F	DF30-M-8AI-I CH3 Filter	50	8	☐
16	16#8000:16#10	DF30-M-8AI-I CH4 Measurement range	4~20ma	8	☐
17	16#8000:16#11	DF30-M-8AI-I CH4 Data format	0~20000	8	☐
18	16#8000:16#12	DF30-M-8AI-I CH4 Frequency Suppression	Disable	8	☐
19	16#8000:16#13	DF30-M-8AI-I CH4 Jitter elimination level	Disable	8	☐
20	16#8000:16#14	DF30-M-8AI-I CH4 Filter	50	8	☐
21	16#8000:16#15	DF30-M-8AI-I CH5 Measurement range	4~20ma	8	☐
22	16#8000:16#16	DF30-M-8AI-I CH5 Data format	0~20000	8	☐
23	16#8000:16#17	DF30-M-8AI-I CH5 Frequency Suppression	Disable	8	☐
24	16#8000:16#18	DF30-M-8AI-I CH5 Jitter elimination level	Disable	8	☐
25	16#8000:16#19	DF30-M-8AI-I CH5 Filter	50	8	☐
26	16#8000:16#1A	DF30-M-8AI-I CH6 Measurement range	4~20ma	8	☐

- Double-click the module and select startup parameters to configure them.

Users can configure the parameters of each channel of the module individually. The configurable parameters are as follows: measurement range (Disable, 0mA~10mA, 0mA~20mA, 4mA~20mA), data code value range (0~20000, 0~27648, 0~32000), frequency suppression (Disable, 50Hz/60Hz), debouncing level (Disable, weak, medium, strong), filter coefficient (0~255), over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.

3. Data monitoring



The module's PDO index offset is 16#0010

➢ Input data

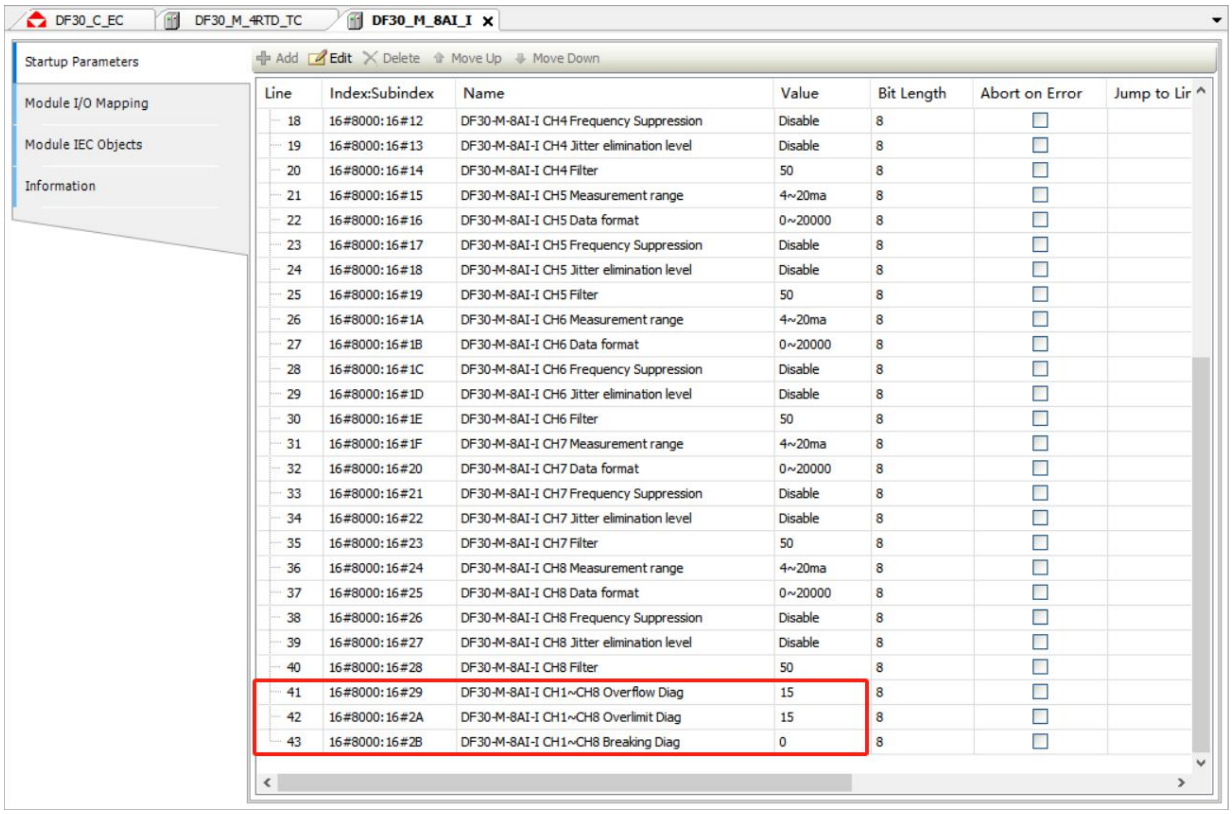
index	16#6000 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	AI CH1	INT	16	Channel 1 input data
2	AI CH2	INT	16	Channel 2 input data
3	AI CH3	INT	16	Channel 3 input data
4	AI CH4	INT	16	Channel 4 input data
5	AI CH5	INT	16	Channel 5 input data
6	AI CH6	INT	16	Channel 6 input data
7	AI CH7	INT	16	Channel 7 Input Data
8	AI CH8	INT	16	Channel 8 input data

Definition Reference6.2 Correspondence between code value and voltage or current

4 Error Diagnosis

Enter the corresponding values in the configuration parameter interface to turn on the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection

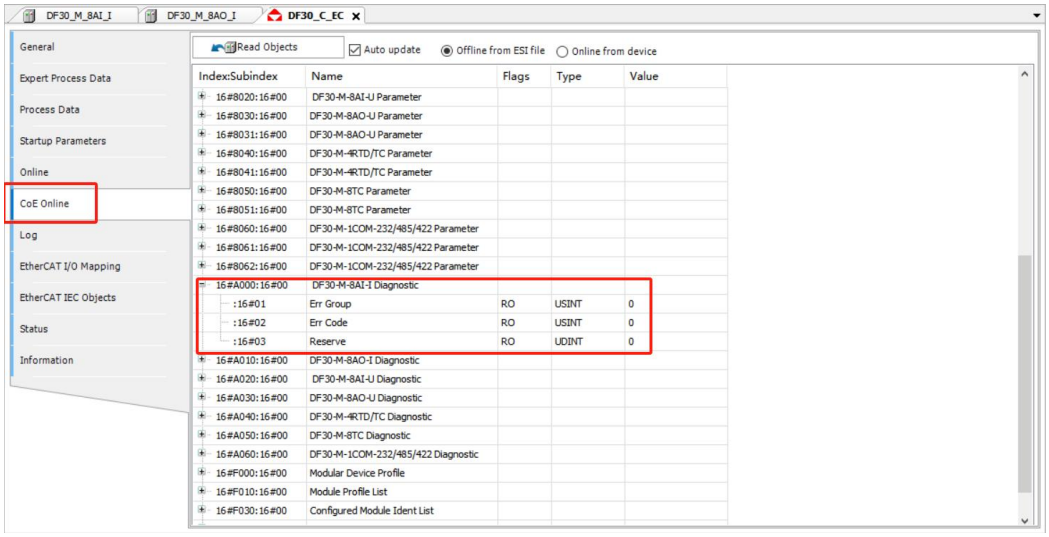
diagnostic switch.



Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Lir
18	16#8000:16#12	DF30-M-8AI-I CH4 Frequency Suppression	Disable	8	☐	
19	16#8000:16#13	DF30-M-8AI-I CH4 Jitter elimination level	Disable	8	☐	
20	16#8000:16#14	DF30-M-8AI-I CH4 Filter	50	8	☐	
21	16#8000:16#15	DF30-M-8AI-I CH5 Measurement range	4~20ma	8	☐	
22	16#8000:16#16	DF30-M-8AI-I CH5 Data format	0~20000	8	☐	
23	16#8000:16#17	DF30-M-8AI-I CH5 Frequency Suppression	Disable	8	☐	
24	16#8000:16#18	DF30-M-8AI-I CH5 Jitter elimination level	Disable	8	☐	
25	16#8000:16#19	DF30-M-8AI-I CH5 Filter	50	8	☐	
26	16#8000:16#1A	DF30-M-8AI-I CH6 Measurement range	4~20ma	8	☐	
27	16#8000:16#1B	DF30-M-8AI-I CH6 Data format	0~20000	8	☐	
28	16#8000:16#1C	DF30-M-8AI-I CH6 Frequency Suppression	Disable	8	☐	
29	16#8000:16#1D	DF30-M-8AI-I CH6 Jitter elimination level	Disable	8	☐	
30	16#8000:16#1E	DF30-M-8AI-I CH6 Filter	50	8	☐	
31	16#8000:16#1F	DF30-M-8AI-I CH7 Measurement range	4~20ma	8	☐	
32	16#8000:16#20	DF30-M-8AI-I CH7 Data format	0~20000	8	☐	
33	16#8000:16#21	DF30-M-8AI-I CH7 Frequency Suppression	Disable	8	☐	
34	16#8000:16#22	DF30-M-8AI-I CH7 Jitter elimination level	Disable	8	☐	
35	16#8000:16#23	DF30-M-8AI-I CH7 Filter	50	8	☐	
36	16#8000:16#24	DF30-M-8AI-I CH8 Measurement range	4~20ma	8	☐	
37	16#8000:16#25	DF30-M-8AI-I CH8 Data format	0~20000	8	☐	
38	16#8000:16#26	DF30-M-8AI-I CH8 Frequency Suppression	Disable	8	☐	
39	16#8000:16#27	DF30-M-8AI-I CH8 Jitter elimination level	Disable	8	☐	
40	16#8000:16#28	DF30-M-8AI-I CH8 Filter	50	8	☐	
41	16#8000:16#29	DF30-M-8AI-I CH1~CH8 Overflow Diag	15	8	☐	
42	16#8000:16#2A	DF30-M-8AI-I CH1~CH8 Overlimit Diag	15	8	☐	
43	16#8000:16#2B	DF30-M-8AI-I CH1~CH8 Breaking Diag	0	8	☐	

name	Data and their meanings
Overlimit Diag	Exceeding limits diagnosis: Channel 1----1
	Exceeding limits diagnosis: Channel 2----2
	Exceeding limits diagnosis: Channel 3----4
	Exceeding limits diagnosis: Channel 4----8
Breaking Diag	Disconnection diagnosis: Channel 1----1
	Disconnection diagnosis: Channel 2----2
	Disconnection diagnosis: Channel 3----4
	Disconnection diagnosis: Channel 4----8
Overloading Diag	Overflow diagnosis: Channel 1----1
	Overflow diagnosis: Channel 2----2
	Overflow diagnosis: Channel 3----4
	Overflow diagnosis: Channel 4----8

View module error messages in the COE online window.



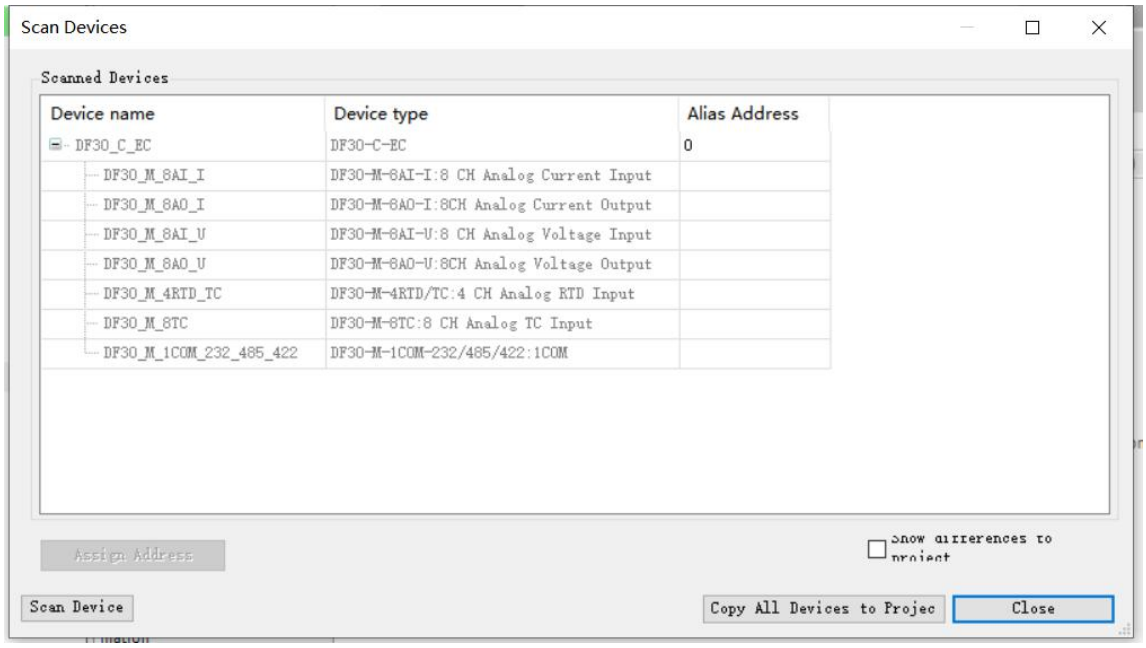
index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Reserve	USINT	32	reserve

Definition Reference6.1 Fault Code Description

10 DF30-M-8AI-U

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration

The module's SDO index offset is 16#0010

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	AI_U CH1 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 1 Measurement Range Configuration
2	AI_U CH1 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 1 data code value range
3	AI_U CH1 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 1 frequency suppression

4	AI_U CH1 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 1 debounce level
5	AI_U CH1 Filter	0~255	8	50	Channel 1 filter coefficients
6	AI_U CH2 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 2 Measurement Range Configuration
7	AI_U CH2 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 2 data code value range
8	AI_U CH2 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 2 frequency suppression
9	AI_U CH2 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 2 anti-shake level
10	AI_U CH2 Filter	0~255	8	50	Channel 2 filter coefficients
11	AI_U CH3 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V	8	1	Channel 3 Measurement Range Configuration

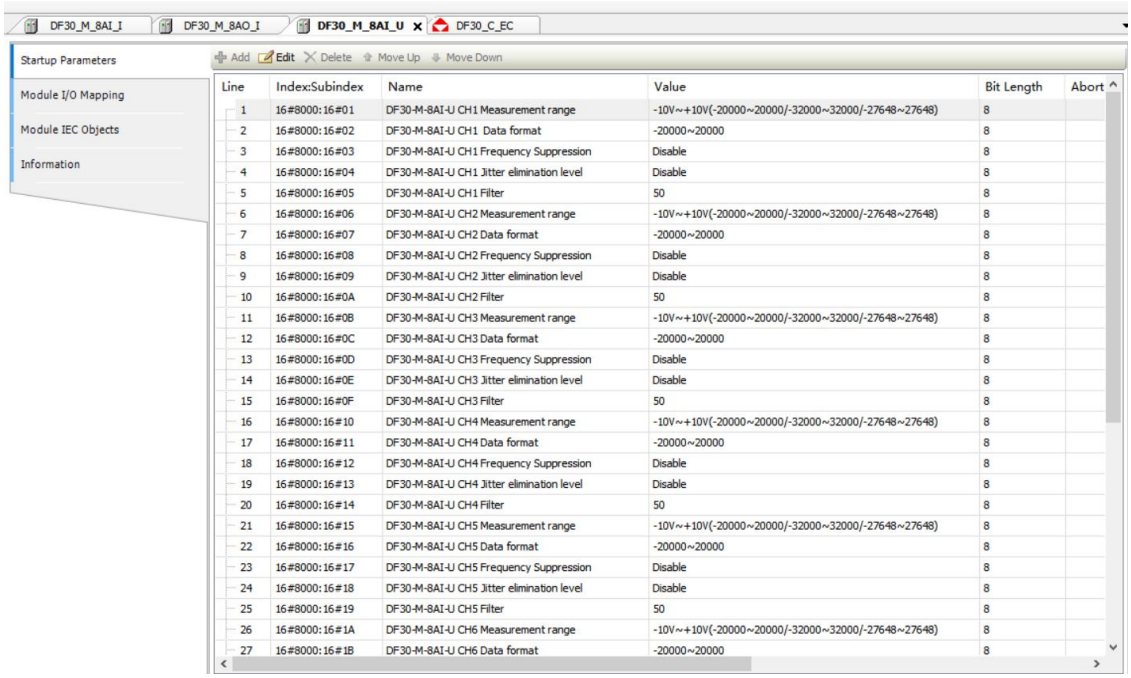
		4: -5V~+5V 5:0V~5V 6:1V~5V			
12	AI_U CH3 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 3 data code value range
13	AI_U CH3 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 3 frequency suppression
14	AI_U CH3 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 3 anti-shake level
15	AI_U CH3 Filter	0~255	8	50	Channel 3 filter coefficients
16	AI_U CH4 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 4 Measurement Range Configuration
17	AI_U CH4 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 4 data code value range
18	AI_U CH4 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 4 frequency suppression
19	AI_U CH4 Jitter	0:Disable	8	0	Channel 4

	elimination level	1:Weak 2:Medium 3:Strong			anti-shake level
20	AI_U CH4 Filter	0~255	8	50	Channel 4 filter coefficients
twenty one	AI_U CH5 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 5 Measurement Range Configuration
twenty two	AI_U CH5 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 5 data code value range
twenty three	AI_U CH5 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 5 frequency suppression
twenty four	AI_U CH5 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 5 anti-shake level
25	AI_U CH5 Filter	0~255	8	50	Channel 5 filter coefficients
26	AI_U CH6 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V	8	1	Channel 6 Measurement Range Configuration

		5:0V~5V 6:1V~5V			
27	AI_U CH6 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 6 data code value range
28	AI_U CH6 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 6 frequency suppression
29	AI_U CH6 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 6 anti-shake level
30	AI_U CH6 Filter	0~255	8	50	Channel 6 filter coefficients
31	AI_U CH7 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 7 Measurement Range Configuration
32	AI_U CH7 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 7 data code value range
33	AI_U CH7 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 7 frequency suppression
34	AI_U CH7 Jitter elimination level	0:Disable 1:Weak	8	0	Channel 7 anti-shake

		2:Medium 3:Strong			level
35	AI_U CH7 Filter	0~255	8	50	Channel 7 filter coefficients
36	AI_U CH8 Measurement range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 8 Measurement Range Configuration
37	AI_U CH8 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 8 data code value range
38	AI_U CH8 Frequency suppression	0:Disable 1:50Hz/60Hz	8	0	Channel 8 frequency suppression
39	AI_U CH8 Jitter elimination level	0:Disable 1:Weak 2:Medium 3:Strong	8	0	Channel 8 anti-shake level
40	AI_U CH8 Filter	0~255	8	50	Channel 8 filter coefficients
41	AI_U CH1~CH8 Overflow Diag	Bits 0 through 7 correspond to the overflow diagnostic switches for channels 1 through	8	0	Overflow diagnostic switches for channels 1 to 8

		8: 0: diagnostics off, 1: diagnostics on.			
42	AI_U CH1~CH8 Overlimit Diag	Bits 0-7 correspond to the disconnection diagnostic switches for channels 1-8: 0: diagnostics off, 1: diagnostics on.	8	0	Channel 1 to Channel 8 Over-limit Diagnostic Switches
43	AI_U CH1~CH8 Breaking Diag	Bits 0-7 correspond to the disconnection diagnostic switches for channels 1-8: 0: diagnostics off, 1: diagnostics on.	8	0	Channel 1 to Channel 8 Disconnection Diagnostic Switch

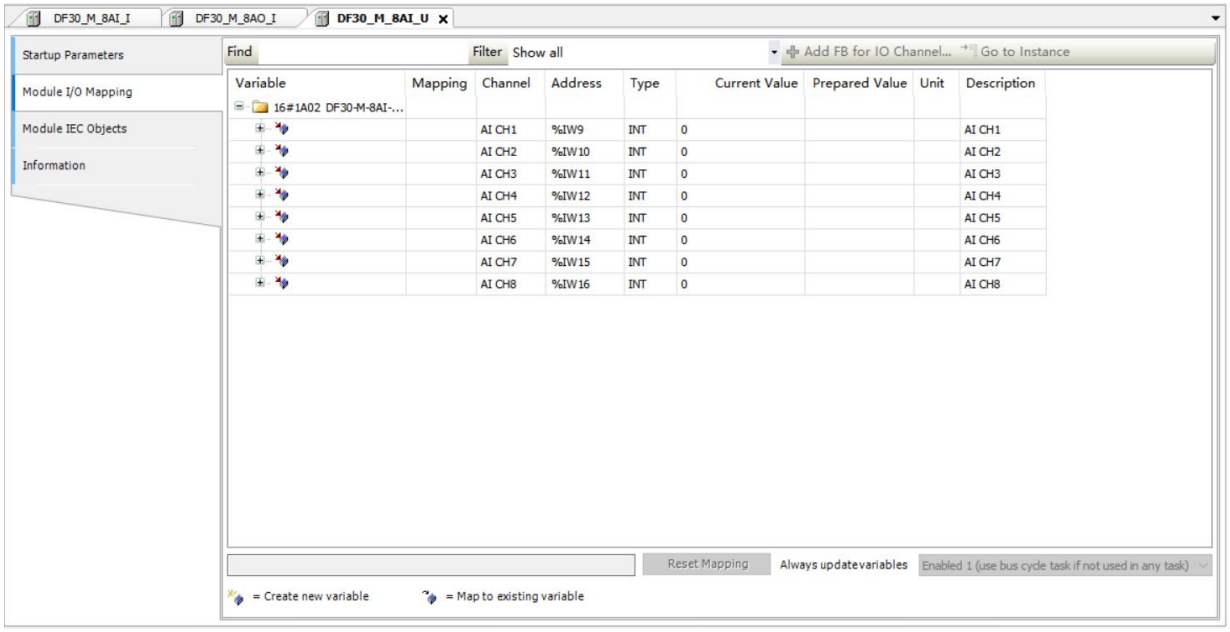


Line	Index:Subindex	Name	Value	Bit Length	Abort
1	16#8000:16#01	DF30-M-8AI-U CH1 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8	
2	16#8000:16#02	DF30-M-8AI-U CH1 Data format	-20000~20000	8	
3	16#8000:16#03	DF30-M-8AI-U CH1 Frequency Suppression	Disable	8	
4	16#8000:16#04	DF30-M-8AI-U CH1 Jitter elimination level	Disable	8	
5	16#8000:16#05	DF30-M-8AI-U CH1 Filter	50	8	
6	16#8000:16#06	DF30-M-8AI-U CH2 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8	
7	16#8000:16#07	DF30-M-8AI-U CH2 Data format	-20000~20000	8	
8	16#8000:16#08	DF30-M-8AI-U CH2 Frequency Suppression	Disable	8	
9	16#8000:16#09	DF30-M-8AI-U CH2 Jitter elimination level	Disable	8	
10	16#8000:16#0A	DF30-M-8AI-U CH2 Filter	50	8	
11	16#8000:16#0B	DF30-M-8AI-U CH3 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8	
12	16#8000:16#0C	DF30-M-8AI-U CH3 Data format	-20000~20000	8	
13	16#8000:16#0D	DF30-M-8AI-U CH3 Frequency Suppression	Disable	8	
14	16#8000:16#0E	DF30-M-8AI-U CH3 Jitter elimination level	Disable	8	
15	16#8000:16#0F	DF30-M-8AI-U CH3 Filter	50	8	
16	16#8000:16#10	DF30-M-8AI-U CH4 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8	
17	16#8000:16#11	DF30-M-8AI-U CH4 Data format	-20000~20000	8	
18	16#8000:16#12	DF30-M-8AI-U CH4 Frequency Suppression	Disable	8	
19	16#8000:16#13	DF30-M-8AI-U CH4 Jitter elimination level	Disable	8	
20	16#8000:16#14	DF30-M-8AI-U CH4 Filter	50	8	
21	16#8000:16#15	DF30-M-8AI-U CH5 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8	
22	16#8000:16#16	DF30-M-8AI-U CH5 Data format	-20000~20000	8	
23	16#8000:16#17	DF30-M-8AI-U CH5 Frequency Suppression	Disable	8	
24	16#8000:16#18	DF30-M-8AI-U CH5 Jitter elimination level	Disable	8	
25	16#8000:16#19	DF30-M-8AI-U CH5 Filter	50	8	
26	16#8000:16#1A	DF30-M-8AI-U CH6 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8	
27	16#8000:16#1B	DF30-M-8AI-U CH6 Data format	-20000~20000	8	

➢ Double-click the module and select startup parameters to configure them.

Users can configure parameters for each channel of the module. The configurable parameters are as follows: measurement range (Disable, -10V~10V, 0~10V, 2V~10V, -5V~5V, 0V~5V, 1V~5V), data code value range (-20000~20000, -32000~32000, -27648~27648), frequency suppression (Disable, 50HZ/60HZ), debouncing level (Disable, weak, medium, strong), filter coefficient (0~255), over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.

3. Data monitoring



The module's PDO index offset is 16#0010

➢ Input data

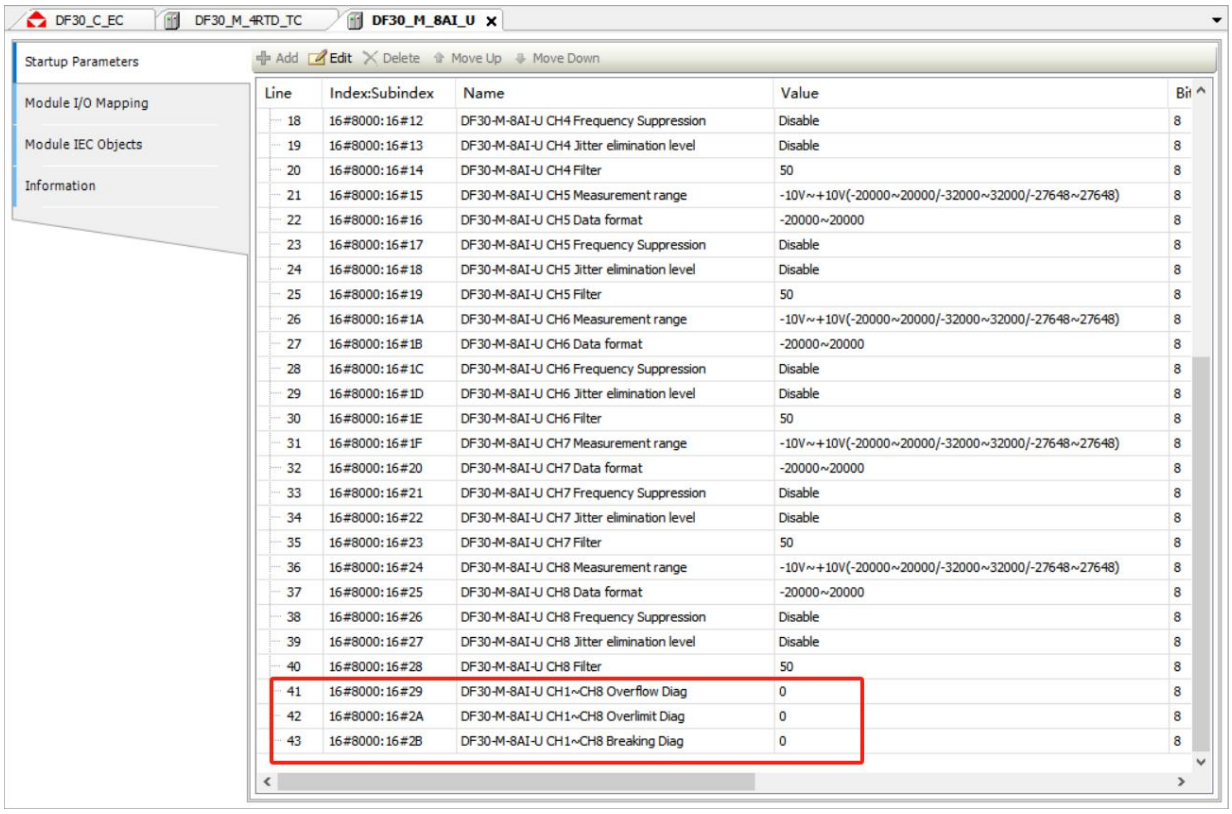
index	16#6000 + n*16#10 (n=0~31)			
Sub-index	name	type	Bit length	meaning
1	AI CH1	INT	16	Channel 1 input data
2	AI CH2	INT	16	Channel 2 input data
3	AI CH3	INT	16	Channel 3 input data
4	AI CH4	INT	16	Channel 4 input data
5	AI CH5	INT	16	Channel 5 input data

6	AI CH6	INT	16	Channel 6 input data
7	AI CH7	INT	16	Channel 7 Input Data
8	AI CH8	INT	16	Channel 8 input data

Definition Reference6.2 Correspondence between code value and voltage or current

4 Error Diagnosis

Enter the corresponding values in the configuration parameter interface to turn on the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.

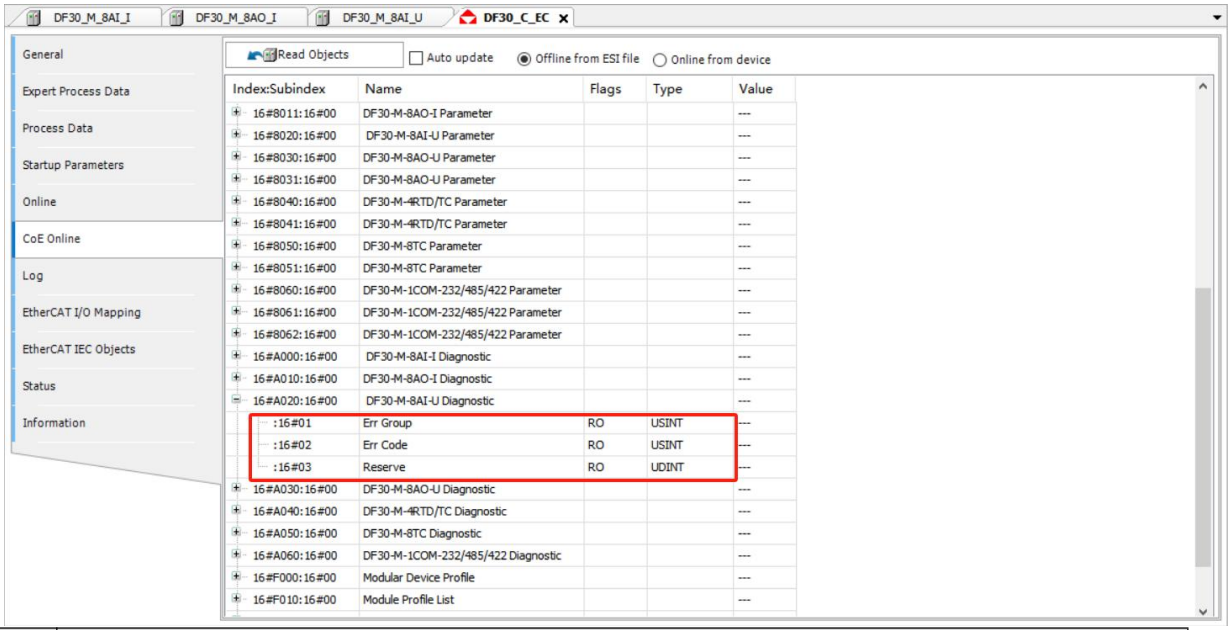


Line	Index:Subindex	Name	Value	Bit
18	16#8000:16#12	DF30-M-8AI-U CH4 Frequency Suppression	Disable	8
19	16#8000:16#13	DF30-M-8AI-U CH4 Jitter elimination level	Disable	8
20	16#8000:16#14	DF30-M-8AI-U CH4 Filter	50	8
21	16#8000:16#15	DF30-M-8AI-U CH5 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
22	16#8000:16#16	DF30-M-8AI-U CH5 Data format	-20000~20000	8
23	16#8000:16#17	DF30-M-8AI-U CH5 Frequency Suppression	Disable	8
24	16#8000:16#18	DF30-M-8AI-U CH5 Jitter elimination level	Disable	8
25	16#8000:16#19	DF30-M-8AI-U CH5 Filter	50	8
26	16#8000:16#1A	DF30-M-8AI-U CH6 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
27	16#8000:16#1B	DF30-M-8AI-U CH6 Data format	-20000~20000	8
28	16#8000:16#1C	DF30-M-8AI-U CH6 Frequency Suppression	Disable	8
29	16#8000:16#1D	DF30-M-8AI-U CH6 Jitter elimination level	Disable	8
30	16#8000:16#1E	DF30-M-8AI-U CH6 Filter	50	8
31	16#8000:16#1F	DF30-M-8AI-U CH7 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
32	16#8000:16#20	DF30-M-8AI-U CH7 Data format	-20000~20000	8
33	16#8000:16#21	DF30-M-8AI-U CH7 Frequency Suppression	Disable	8
34	16#8000:16#22	DF30-M-8AI-U CH7 Jitter elimination level	Disable	8
35	16#8000:16#23	DF30-M-8AI-U CH7 Filter	50	8
36	16#8000:16#24	DF30-M-8AI-U CH8 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
37	16#8000:16#25	DF30-M-8AI-U CH8 Data format	-20000~20000	8
38	16#8000:16#26	DF30-M-8AI-U CH8 Frequency Suppression	Disable	8
39	16#8000:16#27	DF30-M-8AI-U CH8 Jitter elimination level	Disable	8
40	16#8000:16#28	DF30-M-8AI-U CH8 Filter	50	8
41	16#8000:16#29	DF30-M-8AI-U CH1~CH8 Overflow Diag	0	8
42	16#8000:16#2A	DF30-M-8AI-U CH1~CH8 Overlimit Diag	0	8
43	16#8000:16#2B	DF30-M-8AI-U CH1~CH8 Breaking Diag	0	8

name	Data and their meanings
Overlimit Diag	Exceeding limits diagnosis: Channel 1----1
	Exceeding limits diagnosis: Channel 2----2
	Exceeding limits diagnosis: Channel 3----4
	Exceeding limits diagnosis: Channel 4----8
Breaking Diag	Disconnection diagnosis: Channel 1----1
	Disconnection diagnosis: Channel 2----2

	Disconnection diagnosis: Channel 3----4
	Disconnection diagnosis: Channel 4----8
Overloading Diag	Overflow diagnosis: Channel 1----1
	Overflow diagnosis: Channel 2----2
	Overflow diagnosis: Channel 3----4
	Overflow diagnosis: Channel 4----8

View module error messages in the COE online window.



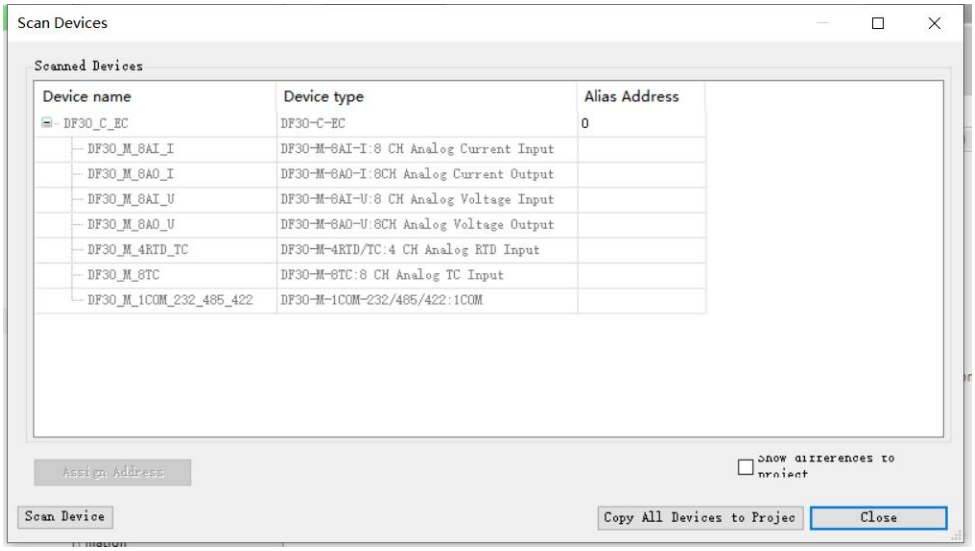
index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Rseerve	UDINT	32	reserve

Definition Reference6.1 Fault Code Description

11 DF30-M-8AO-I

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration

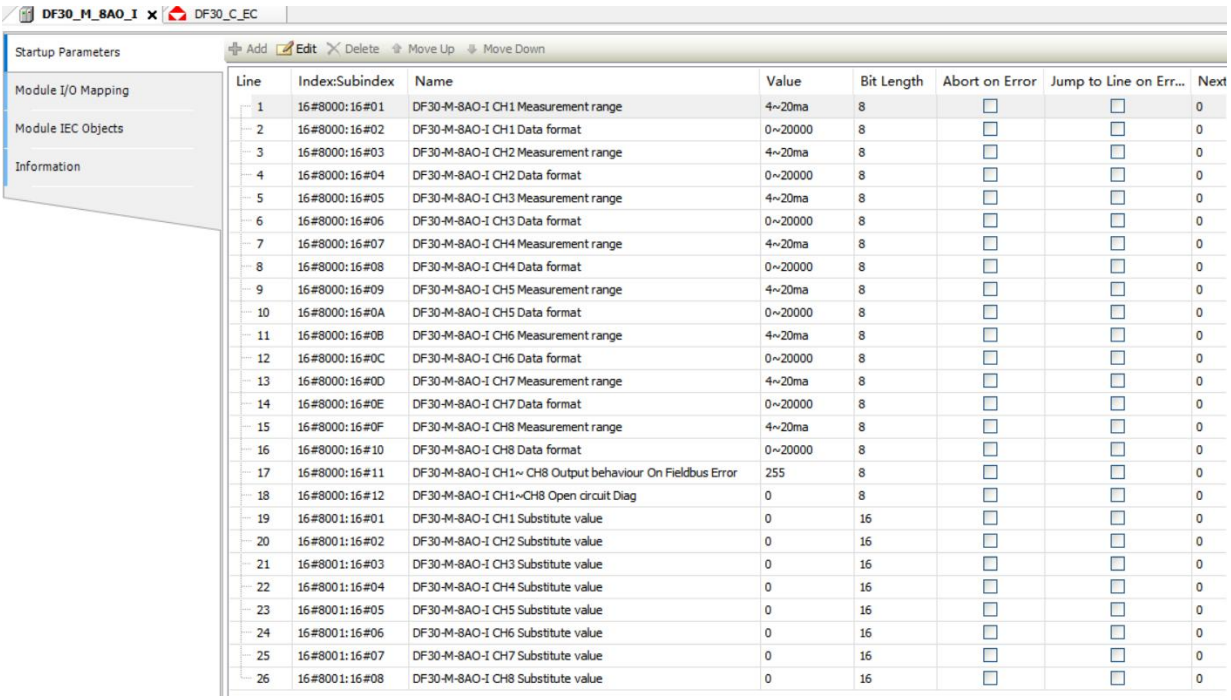
index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	8AO-I CH1 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 1 output range configuration
2	8AO-I CH1 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 1 data code value range configuration
3	8AO-I CH2 Measurement	0:disable 1:0~10ma	8	3	Channel 2 output range

	range	2:0~20ma 3:4~20ma			configuration
4	8AO-I CH2 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 2 data code value range configuration
5	8AO-I CH3 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 3 output range configuration
6	8AO-I CH3 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 3 data code value range configuration
7	8AO-I CH4 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 4 output range configuration
8	8AO-I CH4 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 4 data code value range configuration
9	8AO-I CH5 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 5 output range configuration
10	8AO-I CH5 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 5 data code value range

					configuration
11	8AO-I CH6 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 6 output range configuration
12	8AO-I CH6 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 6 data code value range configuration
13	8AO-I CH7 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 7 output range configuration
14	8AO-I CH7 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 7 data code value range configuration
15	8AO-I CH8 Measurement range	0:disable 1:0~10ma 2:0~20ma 3:4~20ma	8	3	Channel 8 output range configuration
16	8AO-I CH8 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 8 data code value range configuration
17	8AO-I CH1~CH8 Output behavior On Fieldbus Error	0~255	8	255	Bits 0-7 correspond to the output mode when a fieldbus

					error occurs in channels 1-8. 0: Maintain output 1: Preset value output
18	8AO-I CH1~CH8 Open circuit Diag	0~255	8	0	Bits 0 to 7 correspond to the open-circuit diagnostic switches for channels 1 to 8. 0: Turn off diagnostics 1: Enable diagnostics
index	16#8001+n*16#10(n=0~31)				
19	8AO-I CH1 Substitute value	-32768~32767	16	0	Channel 1 output preset value
20	8AO-I CH2 Substitute value	-32768~32767	16	0	Channel 2 output preset value
twenty one	8AO-I CH3 Substitute value	-32768~32767	16	0	Channel 3 output preset value
twenty two	8AO-I CH4 Substitute	-32768~32767	16	0	Channel 4 output preset

	value				value
twenty three	8AO-I CH5 Substitute value	-32768~32767	16	0	Channel 5 output preset value
twenty four	8AO-I CH6 Substitute value	-32768~32767	16	0	Channel 6 output preset value
25	8AO-I CH7 Substitute value	-32768~32767	16	0	Channel 7 output preset value
26	8AO-I CH8 Substitute value	-32768~32767	16	0	Channel 8 output preset value



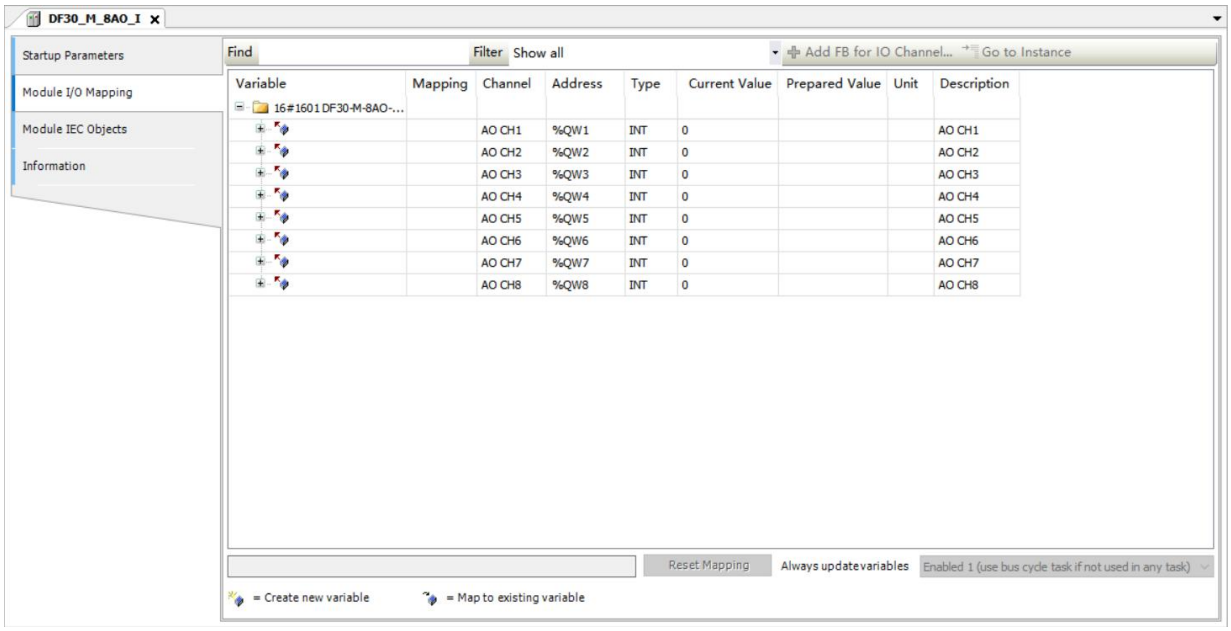
Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Line on Err...	Next
1	16#8000:16#01	DF30-M-8AO-I CH1 Measurement range	4~20ma	8	☐	☐	0
2	16#8000:16#02	DF30-M-8AO-I CH1 Data format	0~20000	8	☐	☐	0
3	16#8000:16#03	DF30-M-8AO-I CH2 Measurement range	4~20ma	8	☐	☐	0
4	16#8000:16#04	DF30-M-8AO-I CH2 Data format	0~20000	8	☐	☐	0
5	16#8000:16#05	DF30-M-8AO-I CH3 Measurement range	4~20ma	8	☐	☐	0
6	16#8000:16#06	DF30-M-8AO-I CH3 Data format	0~20000	8	☐	☐	0
7	16#8000:16#07	DF30-M-8AO-I CH4 Measurement range	4~20ma	8	☐	☐	0
8	16#8000:16#08	DF30-M-8AO-I CH4 Data format	0~20000	8	☐	☐	0
9	16#8000:16#09	DF30-M-8AO-I CH5 Measurement range	4~20ma	8	☐	☐	0
10	16#8000:16#0A	DF30-M-8AO-I CH5 Data format	0~20000	8	☐	☐	0
11	16#8000:16#0B	DF30-M-8AO-I CH6 Measurement range	4~20ma	8	☐	☐	0
12	16#8000:16#0C	DF30-M-8AO-I CH6 Data format	0~20000	8	☐	☐	0
13	16#8000:16#0D	DF30-M-8AO-I CH7 Measurement range	4~20ma	8	☐	☐	0
14	16#8000:16#0E	DF30-M-8AO-I CH7 Data format	0~20000	8	☐	☐	0
15	16#8000:16#0F	DF30-M-8AO-I CH8 Measurement range	4~20ma	8	☐	☐	0
16	16#8000:16#10	DF30-M-8AO-I CH8 Data format	0~20000	8	☐	☐	0
17	16#8000:16#11	DF30-M-8AO-I CH1~ CH8 Output behaviour On Fieldbus Error	255	8	☐	☐	0
18	16#8000:16#12	DF30-M-8AO-I CH1~CH8 Open circuit Diag	0	8	☐	☐	0
19	16#8001:16#01	DF30-M-8AO-I CH1 Substitute value	0	16	☐	☐	0
20	16#8001:16#02	DF30-M-8AO-I CH2 Substitute value	0	16	☐	☐	0
21	16#8001:16#03	DF30-M-8AO-I CH3 Substitute value	0	16	☐	☐	0
22	16#8001:16#04	DF30-M-8AO-I CH4 Substitute value	0	16	☐	☐	0
23	16#8001:16#05	DF30-M-8AO-I CH5 Substitute value	0	16	☐	☐	0
24	16#8001:16#06	DF30-M-8AO-I CH6 Substitute value	0	16	☐	☐	0
25	16#8001:16#07	DF30-M-8AO-I CH7 Substitute value	0	16	☐	☐	0
26	16#8001:16#08	DF30-M-8AO-I CH8 Substitute value	0	16	☐	☐	0

➢ Double-click the module and select startup parameters to configure channel behavior in case of bus errors.

Users can configure the parameters of each channel of the module individually. The configurable parameters are as follows: measurement range (Disable, 0~10mA, 0~20mA, 4~20mA), data code value range (0~20000, 0~27648, 0~32000), output mode when fieldbus error occurs,

open circuit detection, and output preset value.

3. Data monitoring

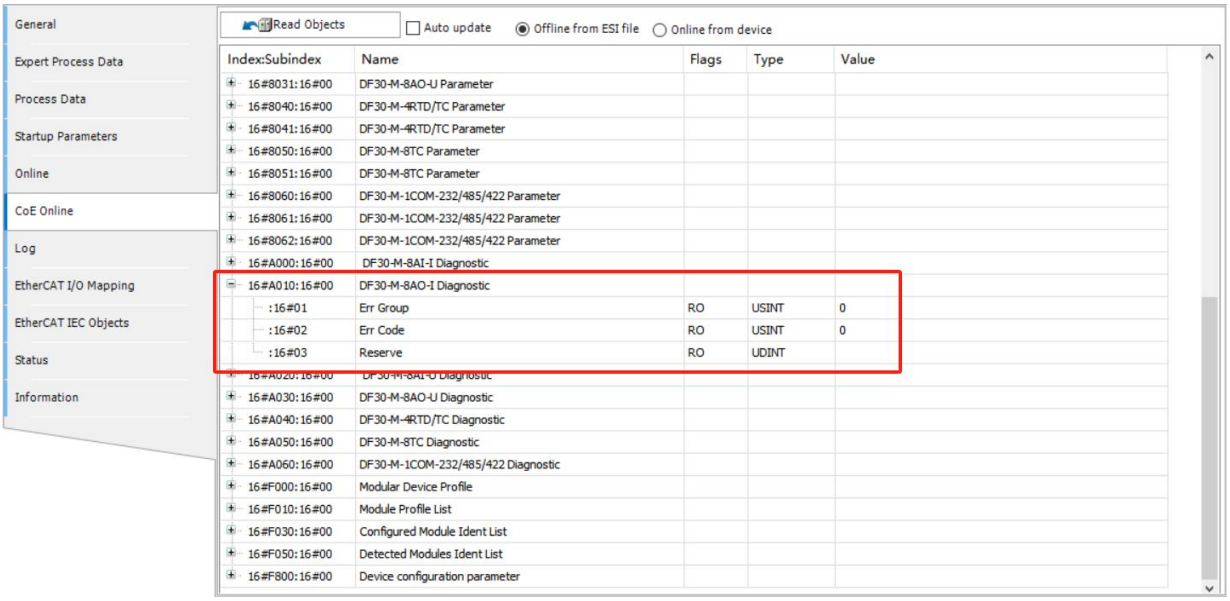


➢ Output data

index	16#7000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	AO CH1	INT	16	Channel 1 output data
2	AO CH2	INT	16	Channel 2 output data
3	AO CH3	INT	16	Channel 3 output data
4	AO CH4	INT	16	Channel 4 output data
5	AO CH5	INT	16	Channel 5 output data
6	AO CH6	INT	16	Channel 6 output data
7	AO CH7	INT	16	Channel 7 output data
8	AO CH8	INT	16	Channel 8 output data

Definition Reference6.2 Correspondence between code value and voltage or current

4 Error Diagnosis



index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Reserve	UDINT	32	reserve

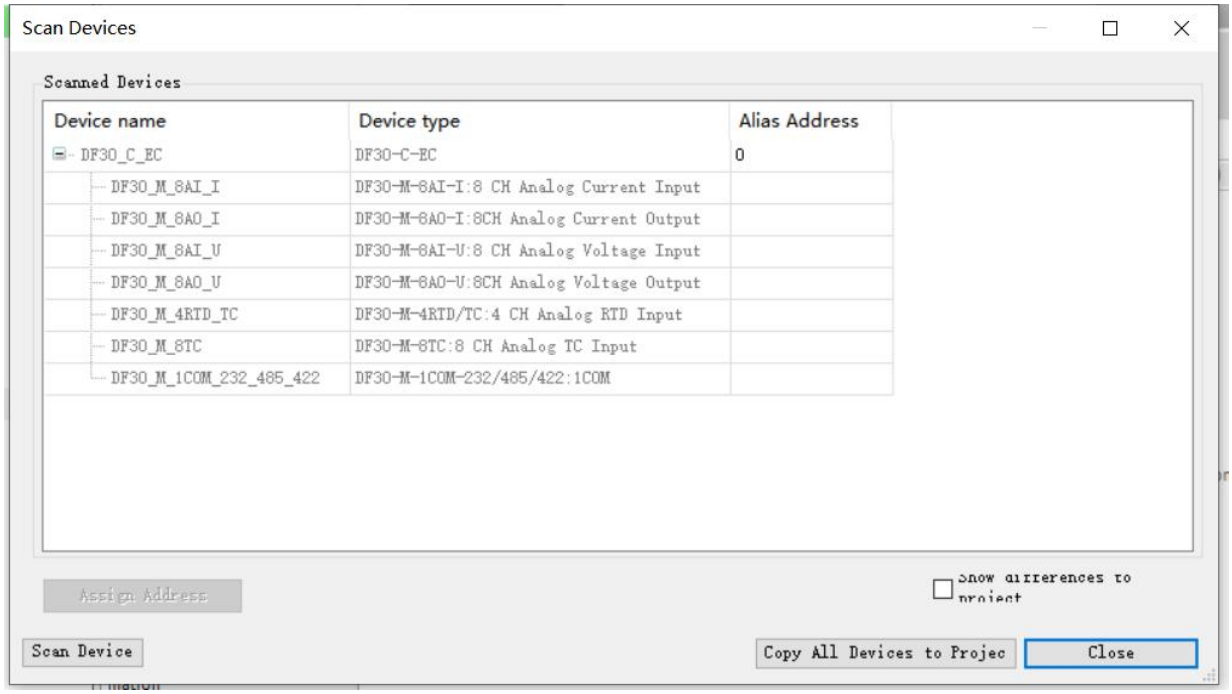
Entering 0x0F in the configuration parameter interface will enable the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.

Definition Reference6.1 Fault Code Description

12 DF30-M-8AO-U

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration

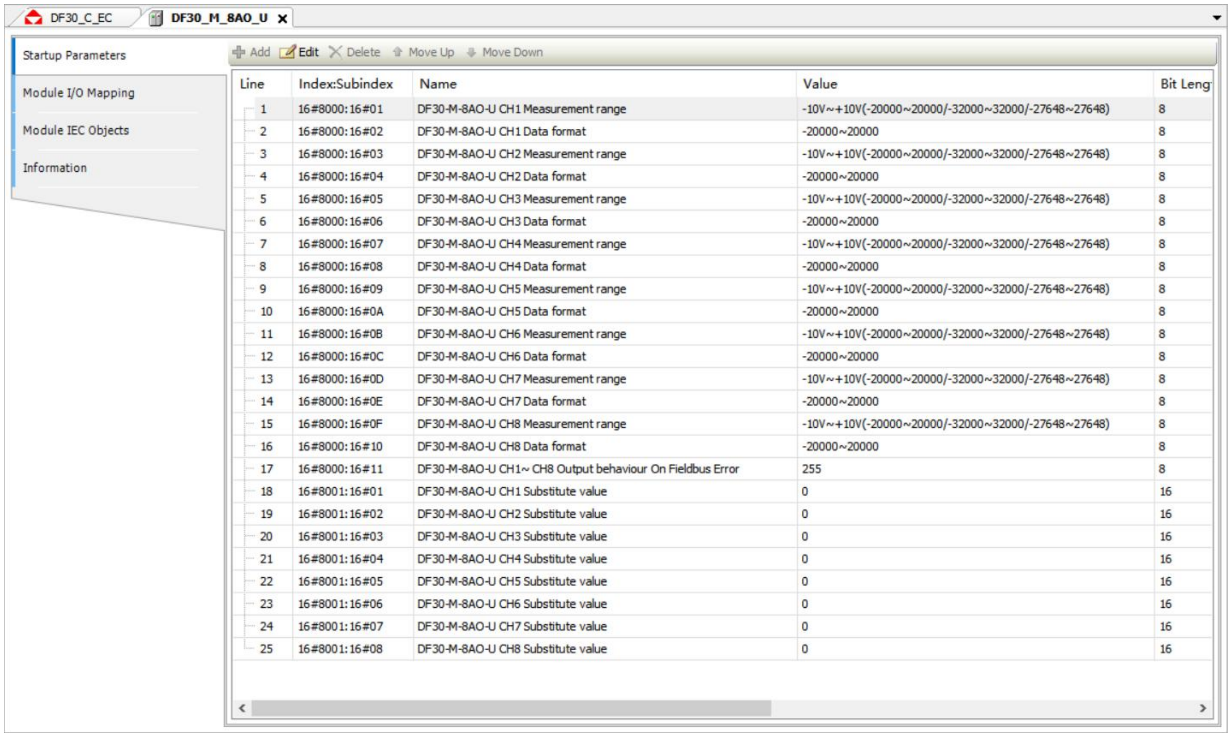
index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	8AO-U CH1 Measurement Range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 1 output range configuration
2	8AO-U CH1 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 1 data code value range configuration
3	8AO-U CH2 Measurement Range	0:disable 1: -10V to +10V 2:0V~10V	8	1	Channel 2 output range configuration

		3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V			
4	8AO-U CH2 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 2 data code value range configuration
5	8AO-U CH3 Measurement Range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 3 output range configuration
6	8AO-U CH3 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 3 data code value range configuration
7	8AO-U CH4 Measurement Range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 4 output range configuration
8	8AO-U CH4 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 4 data code value range configuration
9	8AO-U CH5 Measurement Range	0:disable 1: -10V to +10V	8	1	Channel 5 output range configuration

		2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V			
10	8AO-U CH5 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 5 data code value range configuration
11	8AO-U CH6 Measurement Range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 6 output range configuration
12	8AO-U CH6 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 6 data code value range configuration
13	8AO-U CH7 Measurement Range	0:disable 1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V	8	1	Channel 7 output range configuration
14	8AO-U CH7 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 7 data code value range configuration
15	8AO-U CH8 Measurement	0:disable	8	1	Channel 8 output

	Range	1: -10V to +10V 2:0V~10V 3:2V~10V 4: -5V~+5V 5:0V~5V 6:1V~5V			range configuration
16	8AO-U CH8 Data format	0:-20000~20000 1:-32000~32000 2:-27648~27648	8	0	Channel 8 data code value range configuration
17	8AO-U CH1~CH8 Output behavior On Fieldbus Error	0~255	8	255	Bits 0-7 correspond to the output mode when a fieldbus error occurs in channels 1-8. 0: Maintain output 1: Preset value output
18	8AO-U CH1 Substitute value	-32768~32767	16	0	Channel 1 output preset value
19	8AO-U CH2 Substitute value	-32768~32767	16	0	Channel 2 output preset value
20	8AO-U CH3 Substitute value	-32768~32767	16	0	Channel 3 output preset value
twenty one	8AO-U CH4 Substitute value	-32768~32767	16	0	Channel 4 output preset value
twenty two	8AO-U CH5 Substitute value	-32768~32767	16	0	Channel 5 output preset value
twenty three	8AO-U CH6 Substitute value	-32768~32767	16	0	Channel 6 output preset value

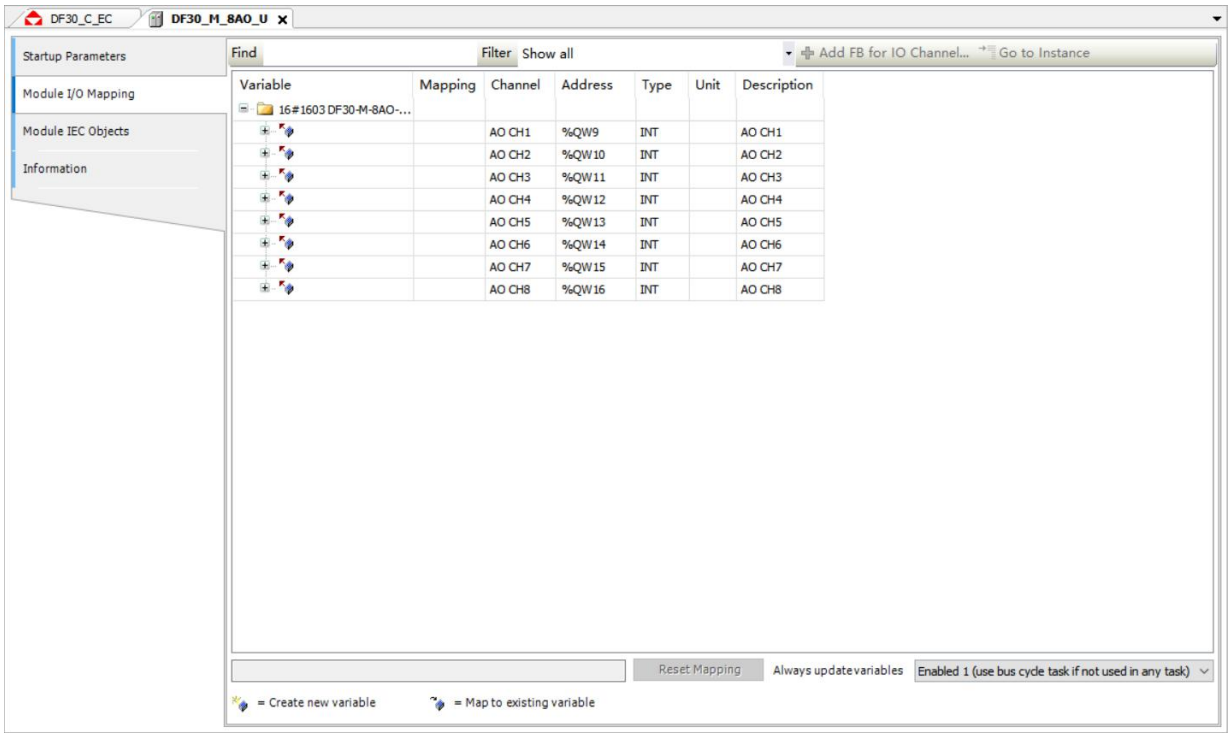
twenty four	8AO-U CH7 Substitute value	-32768~32767	16	0	Channel 7 output preset value
25	8AO-U CH8 Substitute value	-32768~32767	16	0	Channel 8 output preset value



Line	Index:Subindex	Name	Value	Bit Leng
1	16#8000:16#01	DF30-M-8AO-U CH1 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
2	16#8000:16#02	DF30-M-8AO-U CH1 Data format	-20000~20000	8
3	16#8000:16#03	DF30-M-8AO-U CH2 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
4	16#8000:16#04	DF30-M-8AO-U CH2 Data format	-20000~20000	8
5	16#8000:16#05	DF30-M-8AO-U CH3 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
6	16#8000:16#06	DF30-M-8AO-U CH3 Data format	-20000~20000	8
7	16#8000:16#07	DF30-M-8AO-U CH4 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
8	16#8000:16#08	DF30-M-8AO-U CH4 Data format	-20000~20000	8
9	16#8000:16#09	DF30-M-8AO-U CH5 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
10	16#8000:16#0A	DF30-M-8AO-U CH5 Data format	-20000~20000	8
11	16#8000:16#0B	DF30-M-8AO-U CH6 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
12	16#8000:16#0C	DF30-M-8AO-U CH6 Data format	-20000~20000	8
13	16#8000:16#0D	DF30-M-8AO-U CH7 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
14	16#8000:16#0E	DF30-M-8AO-U CH7 Data format	-20000~20000	8
15	16#8000:16#0F	DF30-M-8AO-U CH8 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
16	16#8000:16#10	DF30-M-8AO-U CH8 Data format	-20000~20000	8
17	16#8000:16#11	DF30-M-8AO-U CH1~ CH8 Output behaviour On Fieldbus Error	255	8
18	16#8001:16#01	DF30-M-8AO-U CH1 Substitute value	0	16
19	16#8001:16#02	DF30-M-8AO-U CH2 Substitute value	0	16
20	16#8001:16#03	DF30-M-8AO-U CH3 Substitute value	0	16
21	16#8001:16#04	DF30-M-8AO-U CH4 Substitute value	0	16
22	16#8001:16#05	DF30-M-8AO-U CH5 Substitute value	0	16
23	16#8001:16#06	DF30-M-8AO-U CH6 Substitute value	0	16
24	16#8001:16#07	DF30-M-8AO-U CH7 Substitute value	0	16
25	16#8001:16#08	DF30-M-8AO-U CH8 Substitute value	0	16

Users can configure the parameters of each channel of the module individually. Configurable parameters include: measurement range (disable, -10V to +10V, ...). 0V~10V(0~20000/0~32000/0~27648), 2V~10V(0~20000/0~32000/0~27648), -5V~+5V 0V~5V (0~20000/0~32000/0~27648), 1V~5V (0~20000/0~32000/0~27648), data code value range (0~20000, 0~27648, 0~32000), output mode when fieldbus error occurs, output preset value.

3. Data monitoring

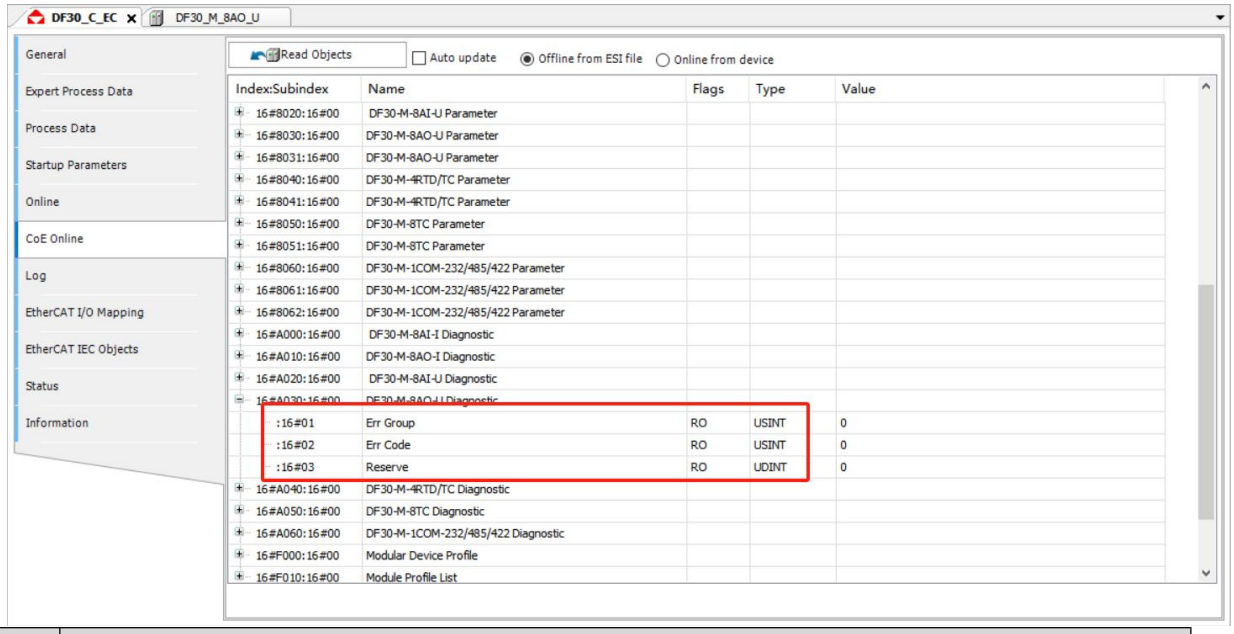


➢ Output data

index	16#7000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	AO CH1	INT	16	Channel 1 output data
2	AO CH2	INT	16	Channel 2 output data
3	AO CH3	INT	16	Channel 3 output data
4	AO CH4	INT	16	Channel 4 output data
5	AO CH5	INT	16	Channel 5 output data
6	AO CH6	INT	16	Channel 6 output data
7	AO CH7	INT	16	Channel 7 output data
8	AO CH8	INT	16	Channel 8 output data

Definition Reference6.2 Correspondence between code value and voltage or current

4 Error Diagnosis



index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Reserve	UDINT	32	reserve

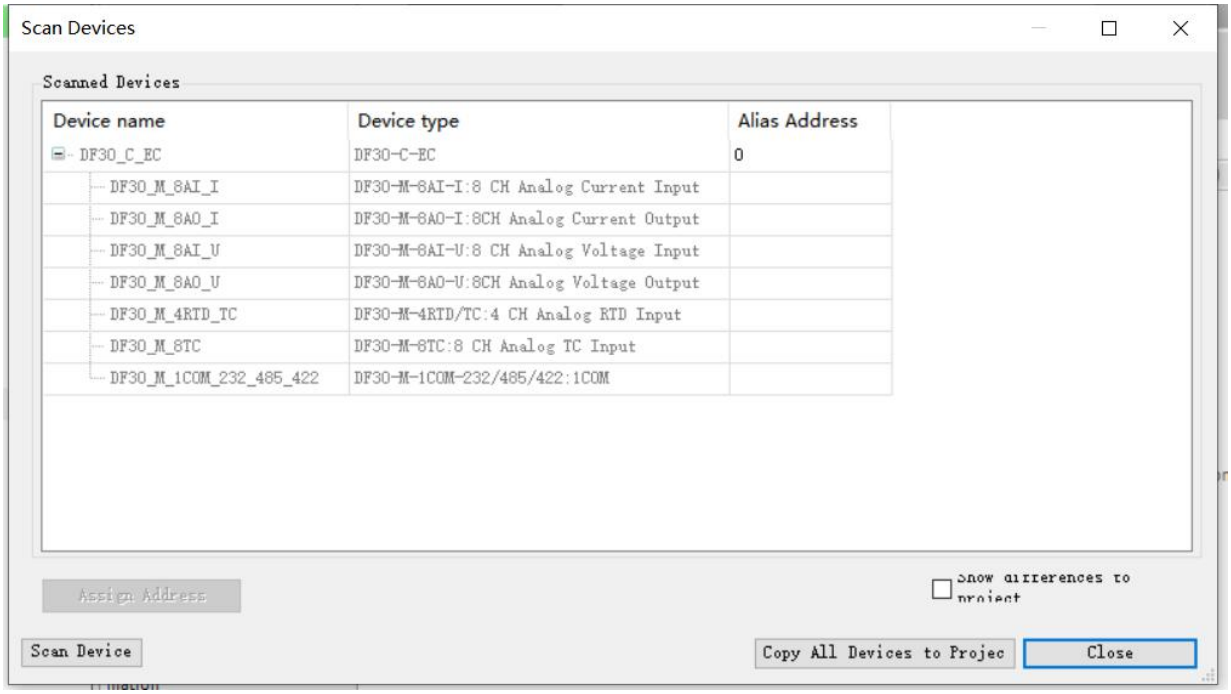
Entering 0x0F in the configuration parameter interface will enable the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.

Definition Reference6.1 Fault Code Description

13 DF30-M-4RTD/TC

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration

The module's SDO index offset is 16#0010

Parameter Configuration Table1

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	4RTD Sampling Time	0:RTD:250ms/TC:500ms/4 channels 1: RTD: 500ms / TC: 1000ms / 4 channels 2: RTD: 1000ms / TC: 2000ms / 4 channels 3: RTD: 320ms / TC: 640ms (50Hz Fre Suppre) / 4 channels 4: RTD: 266ms / TC: 532ms (60Hz Fre Suppre) / 4 channels	8	1	4RTD module sampling period
2	Temperature	0:Degree Celsius	8	0	temperature

	unit	1: Degree Fahrenheit 2:Kelvin			unit
3	4RTD CH1 Sensor Type	SeeSensor Type Table1	8	1	Channel 1 sensor type
4	4RTD CH1 Connection Type	0:2-wire 1:3-wire 2:4-wire	8	1	Channel 1 wiring method
5	4RTD CH1 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 1 debounce level
6	4RTD CH1 Filter	0~255	8	0	Channel 1 filter coefficients
7	4RTD CH2 Sensor Type	SeeSensor Type Table1	8	1	Channel 2 sensor type
8	4RTD CH2 Connection Type	0:2-wire 1:3-wire 2:4-wire	8	1	Channel 2 wiring method
9	4RTD CH2 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 2 anti-shake level
10	4RTD CH2 Filter	0~255	8	0	Channel 2 filter coefficients
11	4RTD CH3 Sensor Type	SeeSensor Type Table1	8	1	Channel 3 sensor type
12	4RTD CH3	0:2-wire	8	1	Channel 3

	Connection Type	1:3-wire 2:4-wire			wiring method
13	4RTD CH3 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 3 anti-shake level
14	4RTD CH3 Filter	0~255	8	0	Channel 3 filter coefficients
15	4RTD CH4 Sensor Type	SeeSensor Type Table1	8	1	Channel 4 sensor type
16	4RTD CH4 Connection Type	0:2-wire 1:3-wire 2:4-wire	8	1	Channel 4 wiring method
17	4RTD CH4 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 4 anti-shake level
18	4RTD CH4 Filter	0~255	8	0	Channel 4 filter coefficients
19	4RTD CH1~CH4 Overlimit Diag	Bits 0-3 correspond to the over-limit detection diagnostic switch for channels 1-4: 0: Diagnostics off; 1: Diagnostics on.	8	0	Channel 1 to Channel 4 Over-limit Diagnostic Switch
20	4RTD CH1~CH4 Breaking Diag	Bits 0-3 correspond to channels 1-4 for disconnection detection and diagnostics.	8	0	Channel 1 to Channel 4 Disconnection

		Switch 0: Diagnostics off; Switch 1: Diagnostics on.			Diagnostic Switch
twenty one	4RTD CH1~CH4 Overflow Diag	Bits 0-3 correspond to channels 1-4. Overflow detection diagnostic switch: 0: Diagnostics off; 1: Diagnostics on.	8	0	Overflow diagnostic switches for channels 1 to 4
index	**16#8001+n*16#10(n=0~31)**				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	4RTD CH1 Temp Offset value	-32768~32767	16	0	Channel 1 temperature offset value (graduation value 0.1℃)
2	4RTD CH2 Temp Offset value	-32768~32767	16	0	Channel 2 temperature offset value (graduation value 0.1℃)
3	4RTD CH3 Temp Offset value	-32768~32767	16	0	Channel 3 temperature offset value (graduation value 0.1℃)
4	4RTD CH4 Temp Offset value	-32768~32767	16	0	Channel 4 temperature offset value (graduation

					value 0.1℃)

Note:

When the sensor enumeration item is configured as K-type ~ 2000mV, it is in TC detection mode. This function has channel independence and can configure a channel for TC detection individually.

In TC detection mode, the sampling rate is reduced to half of RTD. For example, if the sampling period is configured as RTD:250ms/TC:500ms, it means that the sampling rate of the TC detection channel is 2Hz, and the sampling rate of other RTD detection channels is 4Hz.

The wiring configuration is invalid in TC detection mode;

In TC detection mode, the temperature offset value configuration is invalid when the sensor type is ±15.625mV to ±2000mV.

Sensor Type Table1

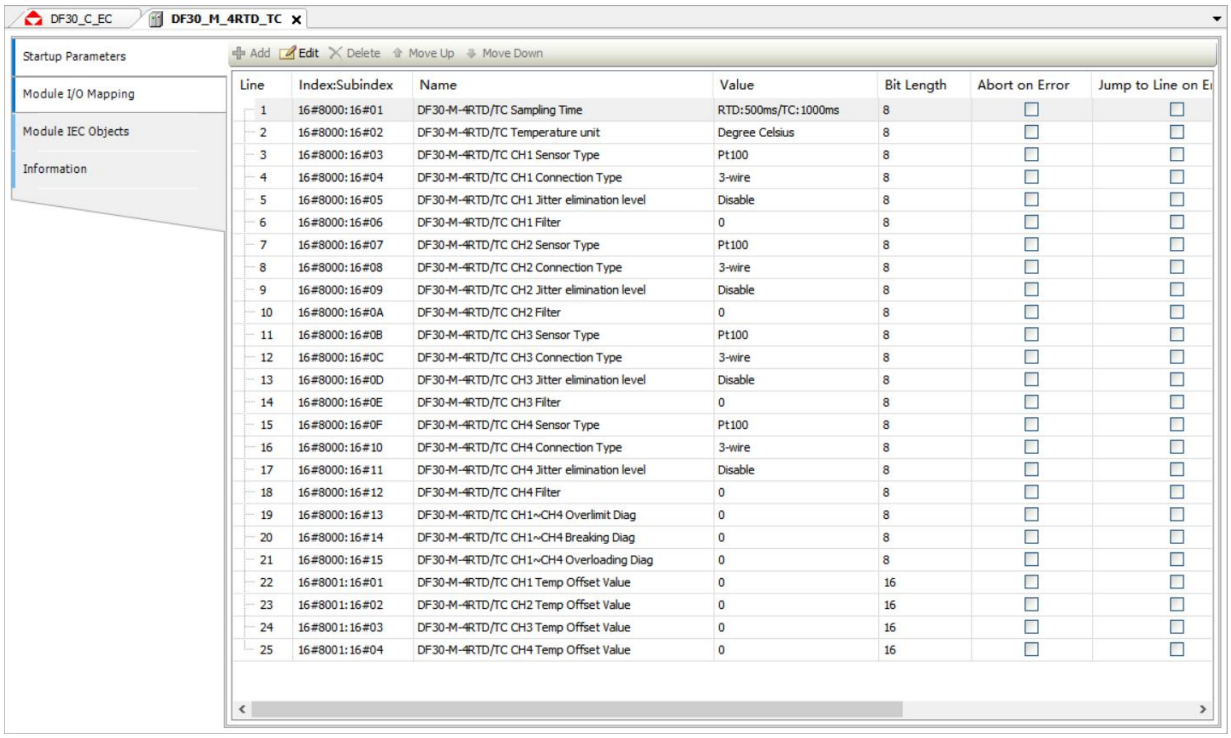
Sub-index 1 object	Sensor type	Sub-index 1 object	Sensor type
0	disable	32	Resistor 80 Ohm
1	PT100	33	Resistor 150 Ohm
2	PT200	34	Resistor 300 Ohm
3	PT500	35	Resistor 500 Ohm
4	PT1000	36	Resistor 1000 Ohm
5	Ni100	37	Resistor 2000 Ohm
6	Ni120	40	K
7	Ni200	41	E
8	Ni500	42	T
9	Ni1000	43	J
10	Cu10	44	B
11	Cu50	45	S
12	Cu53	46	R
13	Cu100	47	N
14	KTY83_110	48	C
15	KTY83_120	49	L
16	KTY83_121	50	±15.625mV
17	KTY83_122	51	±31.25mV
18	KTY83_150	52	±62.5mV
19	KTY83_151	53	±125mV

20	KTY84-130	54	±250mV
twenty one	KTY84-150	55	±500mV
twenty two	KTY84-151	56	±1000mV
31	Resistor 40 Ohm	57	±2000mV

➢ Double-click the module and select startup parameters to configure them.

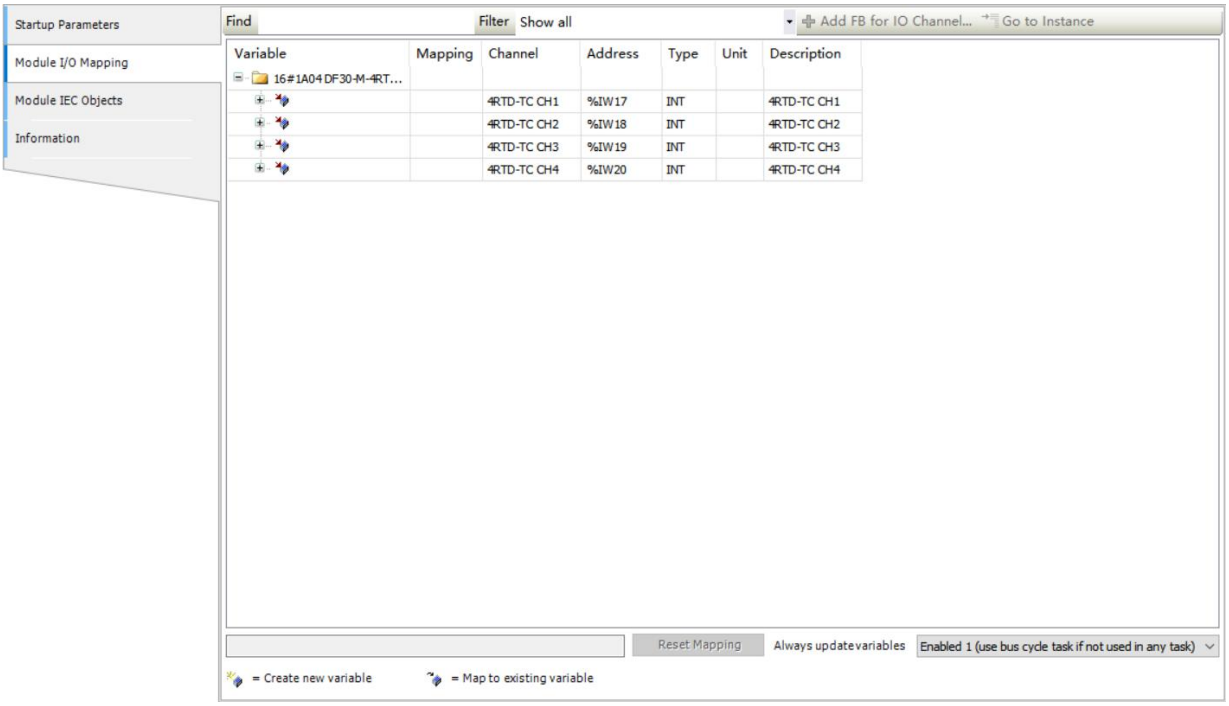
Users can configure the sampling period for all channels (RTD: 250ms/TC: 500ms, RTD: 500ms/TC: 1000ms, RTD: 1000ms/TC: 2000ms, RTD: 320ms/TC: 640ms, RTD: 266ms/TC: 532ms), the temperature display unit (Celsius, Fahrenheit, Kelvin), and the sensor type (Pt100, Pt2) for each channel can be configured individually.

00, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu53, Cu100, KTY83-110, KTY83-120, KTY83-121, KTY83-122, KTY83-150, KTY83-151, KTY84-130, KTY84-150, KTY84-151, 40Ω, 300Ω, 500Ω, 1 kΩ, 2 kΩ, K, E, T, J, B, S, R, N, C, L, ±15.625mV, ±31.25mV, ±62.5mV, ±125mV, ±250mV, ±500mV, ±1000mV, ±2000mV), wiring method (2-wire, 3-wire, 4-wire), debouncing level (off, weak, medium, strong), filtering coefficient (0~255), over-limit detection diagnostic switch, overflow detection diagnostic switch, open wire detection diagnostic switch, temperature offset value (-32768~32767).



Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Line on Er
1	16#8000:16#01	DF30-M-4RTD/TC Sampling Time	RTD:500ms/TC:1000ms	8	☐	☐
2	16#8000:16#02	DF30-M-4RTD/TC Temperature unit	Degree Celsius	8	☐	☐
3	16#8000:16#03	DF30-M-4RTD/TC CH1 Sensor Type	Pt100	8	☐	☐
4	16#8000:16#04	DF30-M-4RTD/TC CH1 Connection Type	3-wire	8	☐	☐
5	16#8000:16#05	DF30-M-4RTD/TC CH1 Jitter elimination level	Disable	8	☐	☐
6	16#8000:16#06	DF30-M-4RTD/TC CH1 Filter	0	8	☐	☐
7	16#8000:16#07	DF30-M-4RTD/TC CH2 Sensor Type	Pt100	8	☐	☐
8	16#8000:16#08	DF30-M-4RTD/TC CH2 Connection Type	3-wire	8	☐	☐
9	16#8000:16#09	DF30-M-4RTD/TC CH2 Jitter elimination level	Disable	8	☐	☐
10	16#8000:16#0A	DF30-M-4RTD/TC CH2 Filter	0	8	☐	☐
11	16#8000:16#0B	DF30-M-4RTD/TC CH3 Sensor Type	Pt100	8	☐	☐
12	16#8000:16#0C	DF30-M-4RTD/TC CH3 Connection Type	3-wire	8	☐	☐
13	16#8000:16#0D	DF30-M-4RTD/TC CH3 Jitter elimination level	Disable	8	☐	☐
14	16#8000:16#0E	DF30-M-4RTD/TC CH3 Filter	0	8	☐	☐
15	16#8000:16#0F	DF30-M-4RTD/TC CH4 Sensor Type	Pt100	8	☐	☐
16	16#8000:16#10	DF30-M-4RTD/TC CH4 Connection Type	3-wire	8	☐	☐
17	16#8000:16#11	DF30-M-4RTD/TC CH4 Jitter elimination level	Disable	8	☐	☐
18	16#8000:16#12	DF30-M-4RTD/TC CH4 Filter	0	8	☐	☐
19	16#8000:16#13	DF30-M-4RTD/TC CH1~CH4 Overlimit Diag	0	8	☐	☐
20	16#8000:16#14	DF30-M-4RTD/TC CH1~CH4 Breaking Diag	0	8	☐	☐
21	16#8000:16#15	DF30-M-4RTD/TC CH1~CH4 Overloading Diag	0	8	☐	☐
22	16#8001:16#01	DF30-M-4RTD/TC CH1 Temp Offset Value	0	16	☐	☐
23	16#8001:16#02	DF30-M-4RTD/TC CH2 Temp Offset Value	0	16	☐	☐
24	16#8001:16#03	DF30-M-4RTD/TC CH3 Temp Offset Value	0	16	☐	☐
25	16#8001:16#04	DF30-M-4RTD/TC CH4 Temp Offset Value	0	16	☐	☐

3. Data monitoring



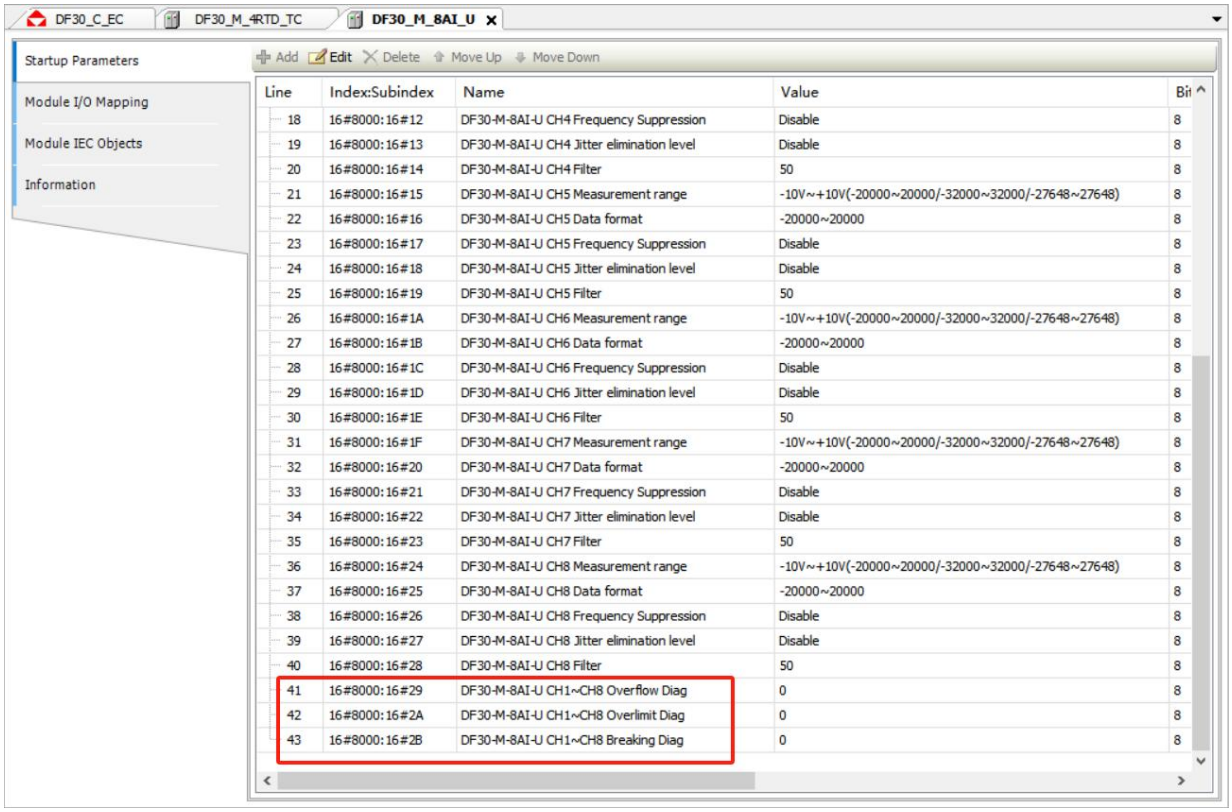
The module's PDO index offset is 16#0010

➢ Input data

index	16#6000+n*16#10(n=0~31)			
1	4RTD CH1	INT	2.0	Channel 1 input data
2	4RTD CH2	INT	2.0	Channel 2 input data
3	4RTD CH3	INT	2.0	Channel 3 input data
4	4RTD CH4	INT	2.0	Channel 4 input data

4 Error Diagnosis

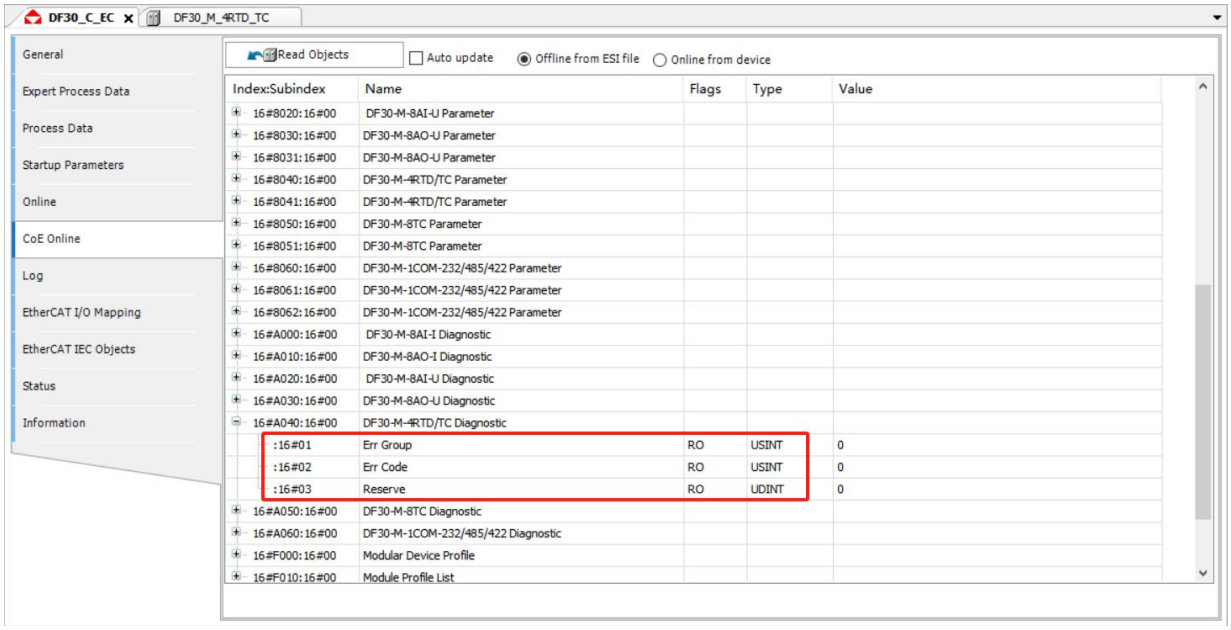
Enter the corresponding values in the configuration parameter interface to turn on the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.



Line	Index:Subindex	Name	Value	Bit
18	16#8000:16#12	DF30-M-8AI-U CH4 Frequency Suppression	Disable	8
19	16#8000:16#13	DF30-M-8AI-U CH4 Jitter elimination level	Disable	8
20	16#8000:16#14	DF30-M-8AI-U CH4 Filter	50	8
21	16#8000:16#15	DF30-M-8AI-U CH5 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
22	16#8000:16#16	DF30-M-8AI-U CH5 Data format	-20000~20000	8
23	16#8000:16#17	DF30-M-8AI-U CH5 Frequency Suppression	Disable	8
24	16#8000:16#18	DF30-M-8AI-U CH5 Jitter elimination level	Disable	8
25	16#8000:16#19	DF30-M-8AI-U CH5 Filter	50	8
26	16#8000:16#1A	DF30-M-8AI-U CH6 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
27	16#8000:16#1B	DF30-M-8AI-U CH6 Data format	-20000~20000	8
28	16#8000:16#1C	DF30-M-8AI-U CH6 Frequency Suppression	Disable	8
29	16#8000:16#1D	DF30-M-8AI-U CH6 Jitter elimination level	Disable	8
30	16#8000:16#1E	DF30-M-8AI-U CH6 Filter	50	8
31	16#8000:16#1F	DF30-M-8AI-U CH7 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
32	16#8000:16#20	DF30-M-8AI-U CH7 Data format	-20000~20000	8
33	16#8000:16#21	DF30-M-8AI-U CH7 Frequency Suppression	Disable	8
34	16#8000:16#22	DF30-M-8AI-U CH7 Jitter elimination level	Disable	8
35	16#8000:16#23	DF30-M-8AI-U CH7 Filter	50	8
36	16#8000:16#24	DF30-M-8AI-U CH8 Measurement range	-10V~+10V(-20000~20000/-32000~32000/-27648~27648)	8
37	16#8000:16#25	DF30-M-8AI-U CH8 Data format	-20000~20000	8
38	16#8000:16#26	DF30-M-8AI-U CH8 Frequency Suppression	Disable	8
39	16#8000:16#27	DF30-M-8AI-U CH8 Jitter elimination level	Disable	8
40	16#8000:16#28	DF30-M-8AI-U CH8 Filter	50	8
41	16#8000:16#29	DF30-M-8AI-U CH1~CH8 Overflow Diag	0	8
42	16#8000:16#2A	DF30-M-8AI-U CH1~CH8 Overlimit Diag	0	8
43	16#8000:16#2B	DF30-M-8AI-U CH1~CH8 Breaking Diag	0	8

name	Data and their meanings
Overlimit Diag	Exceeding limits diagnosis: Channel 1----1
	Exceeding limits diagnosis: Channel 2----2
	Exceeding limits diagnosis: Channel 3----4
	Exceeding limits diagnosis: Channel 4----8
Breaking Diag	Disconnection diagnosis: Channel 1----1
	Disconnection diagnosis: Channel 2----2
	Disconnection diagnosis: Channel 3----4
	Disconnection diagnosis: Channel 4----8
Overloading Diag	Overflow diagnosis: Channel 1----1
	Overflow diagnosis: Channel 2----2
	Overflow diagnosis: Channel 3----4
	Overflow diagnosis: Channel 4----8

View module error messages in the COE online window.



■ Error Diagnosis

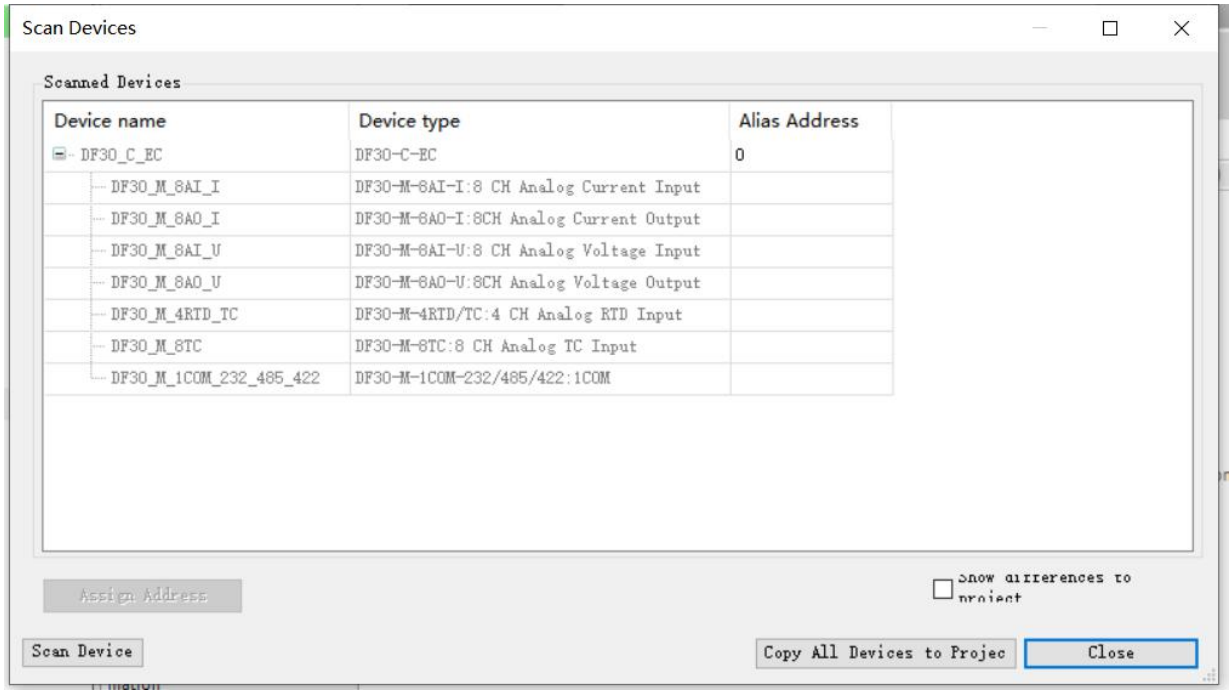
index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Reserve	UDINT	32	reserve

Definition Reference6.1 Fault Code Description

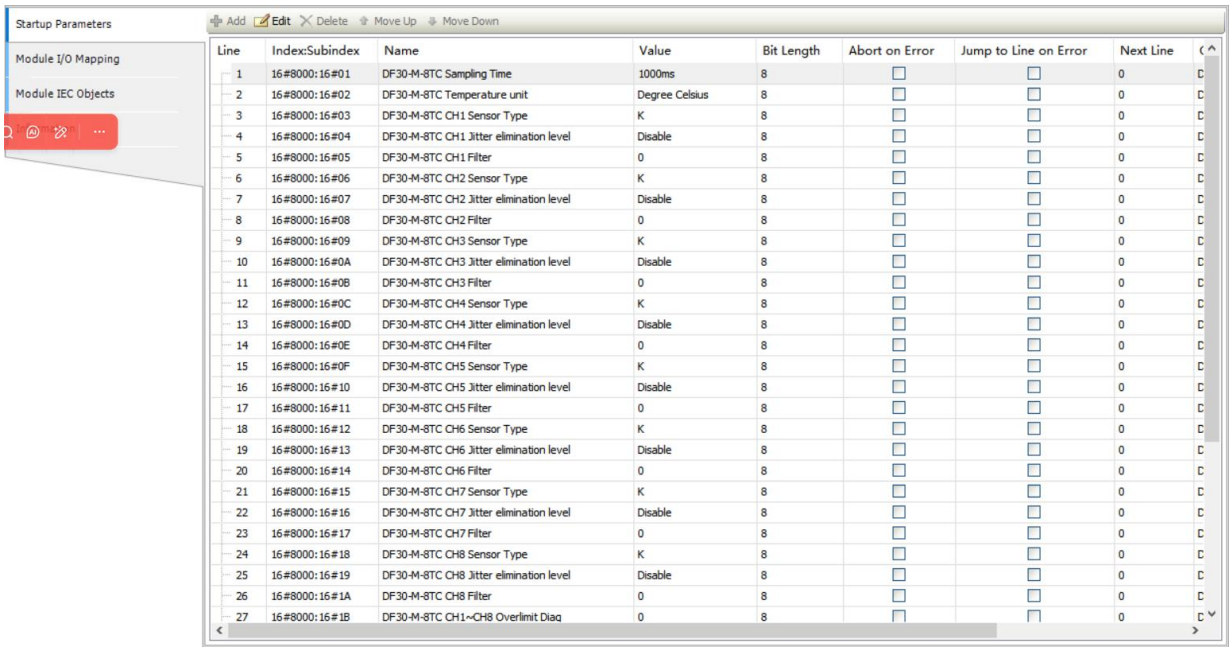
14 DF30-M-8TC

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration



➢ The module's SDO index offset is 16#0010

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning

1	8TC Sampling Time	0:500ms/8 channels 1:1000ms/8 channels 2:2000ms/8 channels 3:1280ms (50Hz Fre Suppre)/8 channels 4:1064ms (60Hz Fre Suppre)/8 channels	8	2	8TC module sampling period
2	Temperature unit	0:Degree Celsius 1: Degree Fahrenheit 2:Kelvin	8	0	temperature unit
3	8TC CH1 Sensor Type	SeeSensor Type Table2	8	40	Channel 1 sensor type
4	8TC CH1 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 1 debounce level
5	8TC CH1 Filter	0~255	8	20	Channel 1 filter coefficients
6	8TC CH2 Sensor Type	SeeSensor Type Table2	8	40	Channel 2 sensor type
7	8TC CH2 Jitter elimination level	0:disable 1:Weak 2:Medium	8	0	Channel 2 anti-shake level

		3:Strong			
8	8TC CH2 Filter	0~255	8	0	Channel 2 filter coefficients
9	8TC CH3 Sensor Type	SeeSensor Type Table2	8	40	Channel 3 sensor type
10	8TC CH3 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 3 anti-shake level
11	8TC CH3 Filter	0~255	8	0	Channel 3 filter coefficients
12	8TC CH4 Sensor Type	SeeSensor Type Table2	8	40	Channel 4 sensor type
13	8TC CH4 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 4 anti-shake level
14	8TC CH4 Filter	0~255	8	0	Channel 4 filter coefficients
15	8TC CH5 Sensor Type	SeeSensor Type Table2	8	40	Channel 5 sensor type
16	8TC CH5 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 5 anti-shake level
17	8TC CH5 Filter	0~255	8	0	Channel 5 filter coefficients
18	8TC CH6 Sensor Type	SeeSensor Type Table2	8	40	Channel 6 sensor type

19	8TC CH6 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 6 anti-shake level
20	8TC CH6 Filter	0~255	8	0	Channel 6 filter coefficients
twenty one	8TC CH7 Sensor Type	SeeSensor Type Table2Sensor Type Table1	8	40	Channel 7 sensor type
twenty two	8TC CH7 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 7 anti-shake level
twenty three	8TC CH7 Filter	0~255	8	0	Channel 7 filter coefficients
twenty four	8TC CH8 Sensor Type	SeeSensor Type Table2	8	40	Channel 8 sensor type
25	8TC CH8 Jitter elimination level	0:disable 1:Weak 2:Medium 3:Strong	8	0	Channel 8 anti-shake level
26	8TC CH8 Filter	0~255	8	0	Channel 8 filter coefficients
27	8TC CH1~CH8 Overlimit Diag	Bits 0 to 7 correspond to the over-limit detection and diagnostic switches for	8	0	Channel 1 to Channel 8 Over-limit Diagnostic Switches

		channels 1 to 8. 0: Disable diagnostics 1: Enable diagnostics			
28	8TC CH1~CH8 Breaking Diag	Bits 0-7 correspond to the disconnection detection and diagnostic switches for channels 1-8. 0: Disable diagnostics 1: Enable diagnostics	8	0	Channel 1 to Channel 8 Disconnection Diagnostic Switch
29	8TC CH1~CH8 Overflow Diag	Bits 0-7 correspond to overflow detection and diagnostic switches for channels 1-8. 0: Disable diagnostics 1: Enable diagnostics	8	0	Overflow diagnostic switches for channels 1 to 8
index	16#8001+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning

1	8TC CH1 Temp Offset value	-32768~32767	16	0	Channel 1 temperature offset value (graduation value 0.1℃)
2	8TC CH2 Temp Offset value	-32768~32767	16	0	Channel 2 temperature offset value (graduation value 0.1℃)
3	8TC CH3 Temp Offset value	-32768~32767	16	0	Channel 3 temperature offset value (graduation value 0.1℃)
4	8TC CH4 Temp Offset value	-32768~32767	16	0	Channel 4 temperature offset value (graduation value 0.1℃)
5	8TC CH5 Temp Offset value	-32768~32767	16	0	Channel 5 temperature offset value (graduation value 0.1℃)
6	8TC CH6 Temp Offset value	-32768~32767	16	0	Channel 6 temperature offset value (graduation value 0.1℃)
7	8TC CH7 Temp Offset value	-32768~32767	16	0	Channel 7 temperature offset value (graduation value 0.1℃)
8	8TC CH8 Temp	-32768~32767	16	0	Channel 8 temperature

	Offset value				offset value (graduation value 0.1℃)

Note:

When the sensor type is K-type to L-type, the temperature offset value configuration is valid;

When the sensor type is ±15.625mV to ±2000mV, the temperature offset value configuration is invalid;

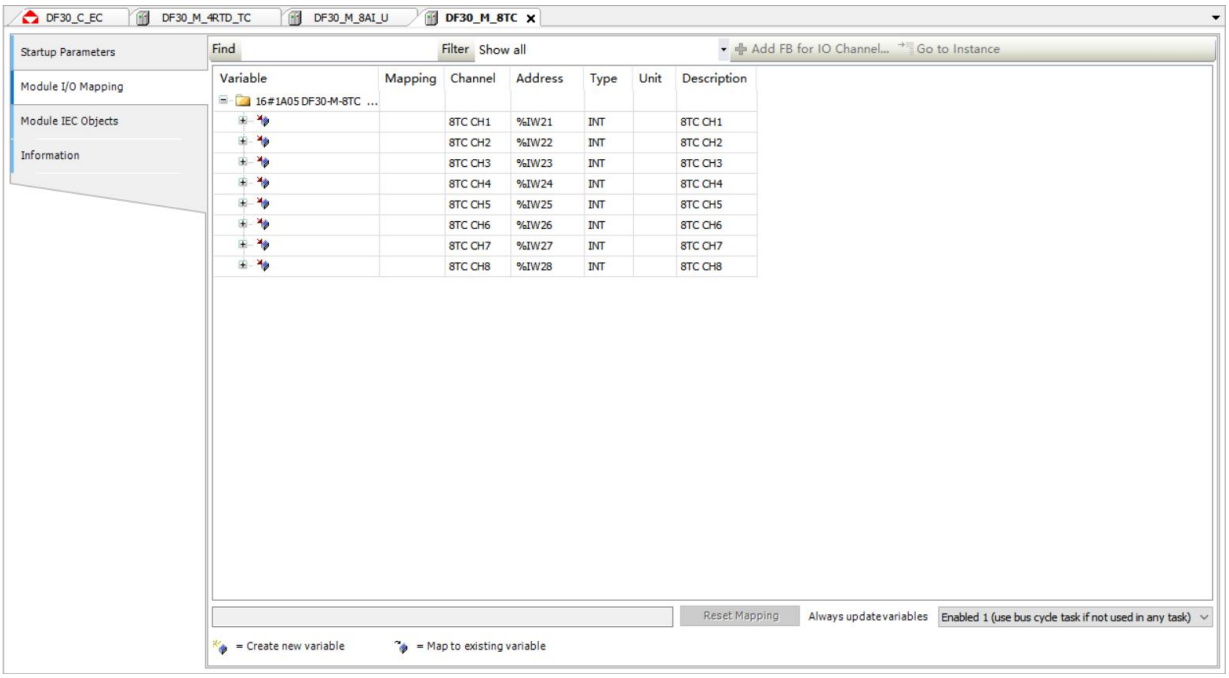
Sensor Type Table2

Sub-index 1 object	Sensor type	Sub-index 1 object	Sensor type
0	disable	50	±15.625mV
40	K	51	±31.25mV
41	E	52	±62.5mV
42	T	53	±125mV
43	J	54	±250mV
44	B	55	±500mV
45	S	56	±1000mV
46	R	57	±2000mV
47	N		
48	C		
49	L		

- Double-click the module and select startup parameters to configure them.

Users can configure the sampling period for all channels (500ms, 1000ms, 2000ms, 1280ms, 1064ms), the temperature display unit (Celsius, Fahrenheit, Kelvin), and individually configure the sensor type (K, E, T, J, B, S, R, N, C, L, ±15.625mV, ±31.25mV, ±62.5mV, ±125mV, ±250mV, ±500mV, ±1000mV, ±2000mV), debouncing level (off, weak, medium, strong), filter coefficient (0~255), over-limit detection diagnostic switch, overflow detection diagnostic switch, disconnection detection diagnostic switch, and temperature offset value (-32768~32767).

3. Data monitoring



The module's PDO index offset is 16#0010

➢ Input data

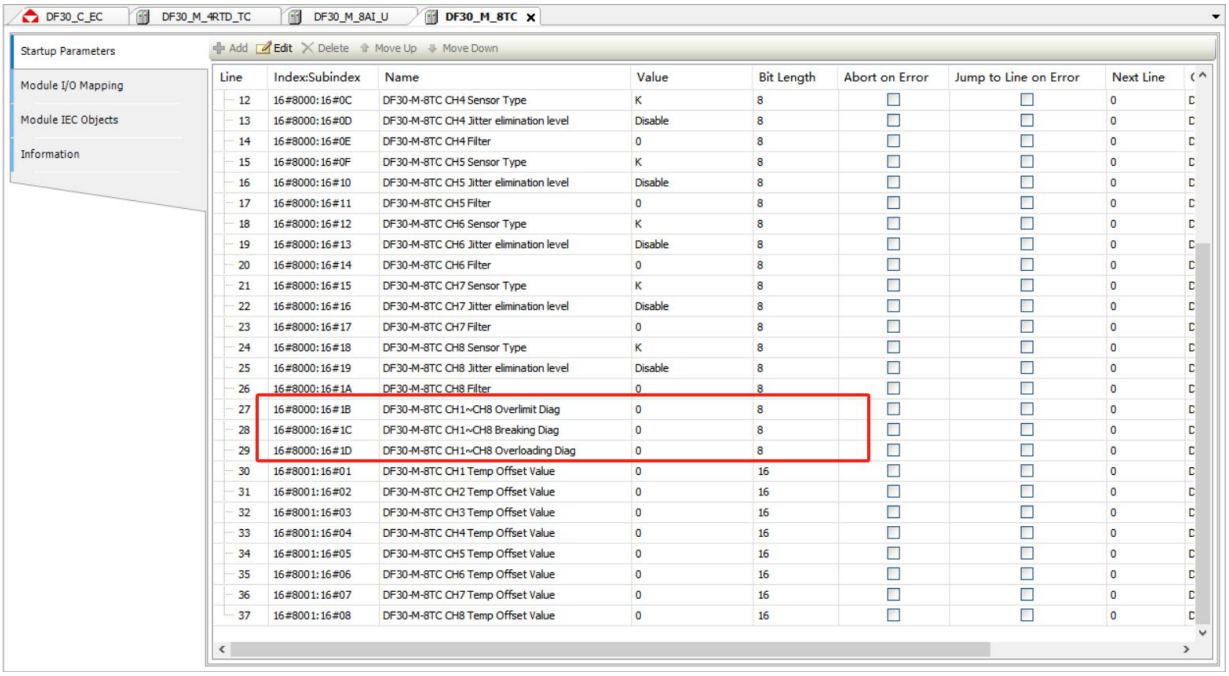
index	16#6000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	8TC CH1	INT	2.0	Channel 1 input data
2	8TC CH2	INT	2.0	Channel 2 input data
3	8TC CH3	INT	2.0	Channel 3 input data
4	8TC CH4	INT	2.0	Channel 4 input data
5	8TC CH5	INT	2.0	Channel 5 input data
6	8TC CH6	INT	2.0	Channel 6 input data
7	8TC CH7	INT	2.0	Channel 7 Input Data
8	8TC CH8	INT	2.0	Channel 8 input data

➢ Channel 1 input valid signal:

The sensor type is set to ±125mV, the input is 5mV, and the code value is 1307. The code value-temperature correspondence definition is provided in the appendix. **错误!未找到引用源。错误!未找到引用源。**.

4 Error Diagnosis

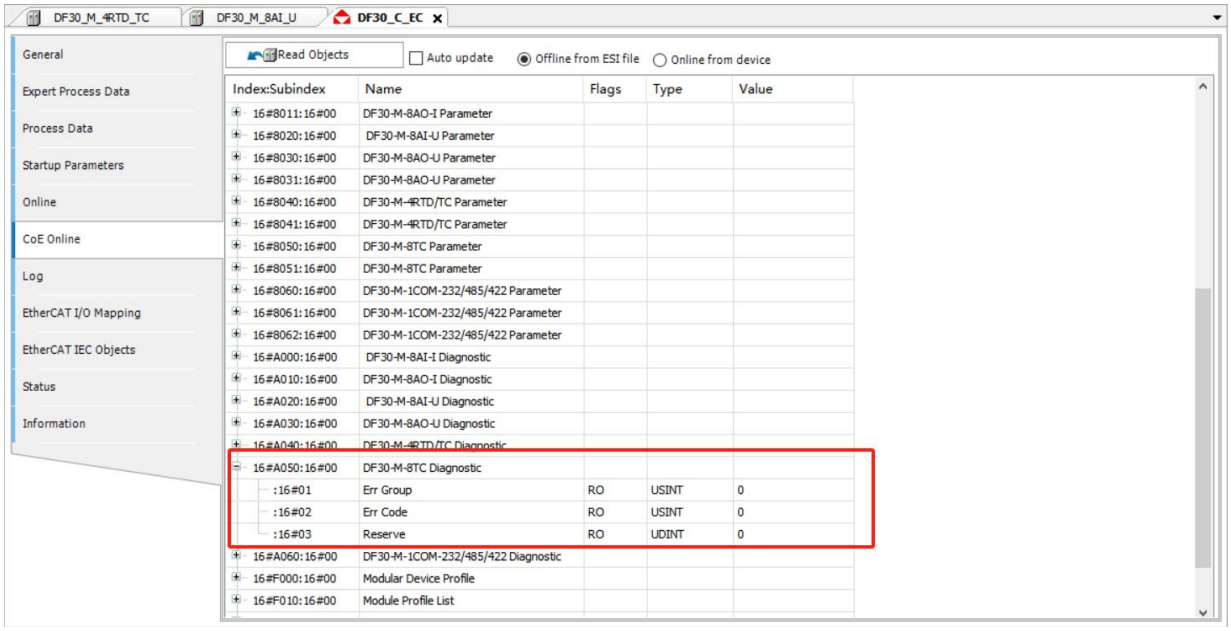
Enter the corresponding values in the configuration parameter interface to turn on the module's over-limit diagnostic switch, overflow diagnostic switch, and disconnection diagnostic switch.



Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Line on Error	Next Line
12	16#8000:16#0C	DF30-M-8TC CH4 Sensor Type	K	8			0
13	16#8000:16#0D	DF30-M-8TC CH4 Jitter elimination level	Disable	8			0
14	16#8000:16#0E	DF30-M-8TC CH4 Filter	0	8			0
15	16#8000:16#0F	DF30-M-8TC CH5 Sensor Type	K	8			0
16	16#8000:16#10	DF30-M-8TC CH5 Jitter elimination level	Disable	8			0
17	16#8000:16#11	DF30-M-8TC CH5 Filter	0	8			0
18	16#8000:16#12	DF30-M-8TC CH6 Sensor Type	K	8			0
19	16#8000:16#13	DF30-M-8TC CH6 Jitter elimination level	Disable	8			0
20	16#8000:16#14	DF30-M-8TC CH6 Filter	0	8			0
21	16#8000:16#15	DF30-M-8TC CH7 Sensor Type	K	8			0
22	16#8000:16#16	DF30-M-8TC CH7 Jitter elimination level	Disable	8			0
23	16#8000:16#17	DF30-M-8TC CH7 Filter	0	8			0
24	16#8000:16#18	DF30-M-8TC CH8 Sensor Type	K	8			0
25	16#8000:16#19	DF30-M-8TC CH8 Jitter elimination level	Disable	8			0
26	16#8000:16#1A	DF30-M-8TC CH8 Filter	0	8			0
27	16#8000:16#1B	DF30-M-8TC CH1~CH8 Overlimit Diag	0	8			0
28	16#8000:16#1C	DF30-M-8TC CH1~CH8 Breaking Diag	0	8			0
29	16#8000:16#1D	DF30-M-8TC CH1~CH8 Overloading Diag	0	8			0
30	16#8001:16#01	DF30-M-8TC CH1 Temp Offset Value	0	16			0
31	16#8001:16#02	DF30-M-8TC CH2 Temp Offset Value	0	16			0
32	16#8001:16#03	DF30-M-8TC CH3 Temp Offset Value	0	16			0
33	16#8001:16#04	DF30-M-8TC CH4 Temp Offset Value	0	16			0
34	16#8001:16#05	DF30-M-8TC CH5 Temp Offset Value	0	16			0
35	16#8001:16#06	DF30-M-8TC CH6 Temp Offset Value	0	16			0
36	16#8001:16#07	DF30-M-8TC CH7 Temp Offset Value	0	16			0
37	16#8001:16#08	DF30-M-8TC CH8 Temp Offset Value	0	16			0

name	Data and their meanings
Overlimit Diag	Exceeding limits diagnosis: Channel 1----1
	Exceeding limits diagnosis: Channel 2----2
	Exceeding limits diagnosis: Channel 3----4
	Exceeding limits diagnosis: Channel 4----8
Breaking Diag	Disconnection diagnosis: Channel 1----1
	Disconnection diagnosis: Channel 2----2
	Disconnection diagnosis: Channel 3----4
	Disconnection diagnosis: Channel 4----8
Overloading Diag	Overflow diagnosis: Channel 1----1
	Overflow diagnosis: Channel 2----2
	Overflow diagnosis: Channel 3----4
	Overflow diagnosis: Channel 4----8

View module error messages in the COE online window.



■ Error Diagnosis

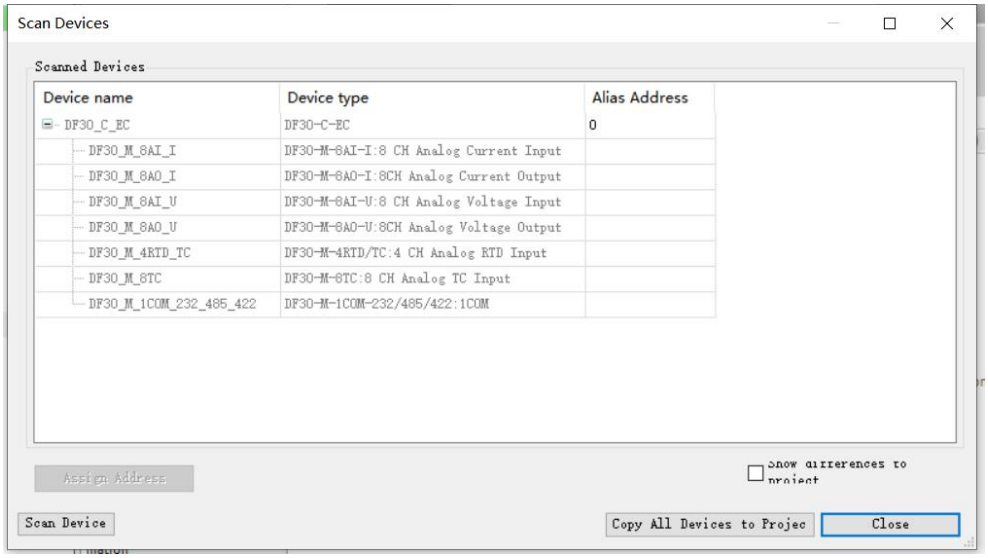
index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Reserve	UDINT	32	reserve

Definition Reference6.1 Fault Code Description

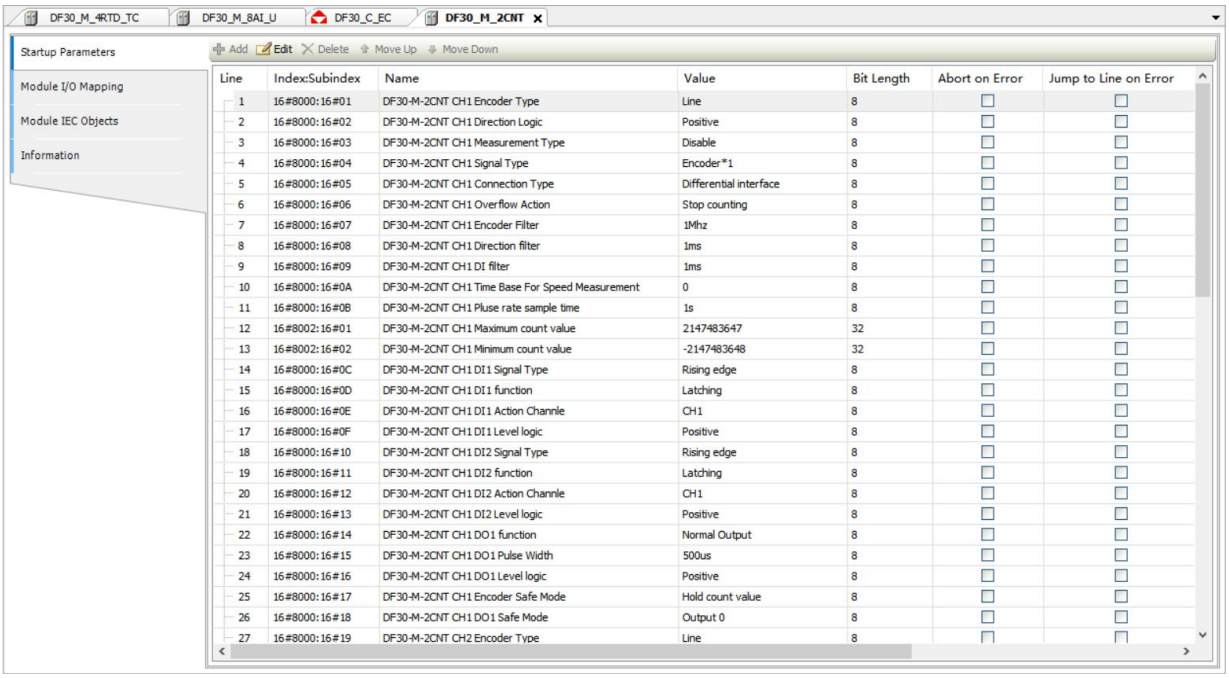
15 DF30-M-2CNT

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration



■ Parameter configuration

index	16#8000+n*16#10(n=0~31)			
Sub-index	Configuration items	Configuration parameters	Bit length	default value
1	CH1 Encoder Type (Channel 1 Count Type)	0: Line (linear counting) 1: Annular (circular counting)	8	0

2	CH1 Direction Logic (Channel 1 counting direction logic)	0: Positive (positive logic) 1: Negative logic	8	0
3	CH1 Measurement Type (Channel 1 Measurement Type)	0: Disable (Measurement turned off) 1: Frequency (Hz) (measured frequency) 2: Cycle (ms) (measurement period) 3: Rotary speed (Not Supported)	8	0
4	CH1 Signal Type (Channel 1 signal type)	0: Encoder*1 (orthogonal encoding, frequency multiplication by 1) 1: Encoder*2 (orthogonal encoding, frequency multiplied by 2) 2: Encoder*4 (orthogonal encoding, frequency multiplied by 4) 3: Pulse direction 4: SSI 5: Single-phase counting (A) 6: Single-phase counting (B)	8	0
5	CH1 Connection Type (Channel 1 connection type)	0: Differential interface (differential input) 1: Single-ended interface	8	0
6	CH1 Overflow Action (Channel 1 counter value overflow action)	0: Stop counting 1: Continue counting	8	0
7	CH1 Encoder Filter	See the counting filter table	8	6

	(Channel 1 counting filter)	below.		
8	CH1 Direction filter (Channel 1 counting direction filtering, effective in pulse plus direction mode)	See the counting direction filter table below.	8	
9	CH1 DI filter (Channel 1 DI input filter, applied to DI1 and DI2)	See the DI input filter table below.	8	
10	CH1 Time Base For Speed Measurement (Channel 1 speed measurement time base)	Not supported at present	8	0
11	CH1 Pluse rate sample time (Channel 1 frequency sampling period)	See the frequency measurement sampling period table below.	8	9
12	CH1 DI1 Signal Type (DI1 signal input type)	0: Rising edge 1: Falling edge 2: Double edge	8	0
13	CH1 DI1 function (DI1 function)	0: Normal input (ordinary numeric input) 1: Locking 2: Counting 3: Clear (reset) 4: Gating (Not Supported)	8	1
14	DI1 Action Channel	0: CH1 (Channel 1)	8	0

	(DI1 is the active channel, and it is active under latching and clearing functions.)	1: CH2 (Channel 2)		
15	DI1 Level Logic (DI1 level logic)	0: Positive (positive logic) 1: Negative logic	8	0
16	CH1 DI2 Signal Type (DI2 signal input type)	0: Rising edge 1: Falling edge 2: Double edge	8	0
17	CH1 DI2 function (DI2 function)	0: Normal input (ordinary numeric input) 1: Locking 2: Counting 3: Clear (reset) 4: Gating (Not Supported)	8	1
18	CH1 DI2 Action Channel (DI2 is the active channel, and it takes effect under latching and clearing functions.)	0: CH1 (Channel 1) 1: CH2 (Channel 2)	8	0
19	CH1 DI2 Level logic (DI2 level logic)	0: Positive (positive logic) 1: Negative logic	8	0
20	CH1 DO1 function (DO1 function)	0: Normal Output (Digital Normal Output) 1: Compare Output	8	0
twenty one	CH1 DO1 Pulse Width (DO1 output pulse	See the DO output pulse width table below.	8	4

	width)			
twenty two	CH1 DO1 Level Logic (DO1 level logic)	0: Positive (positive logic) 1: Negative logic	8	0
twenty three	CH1 Encoder Safe Mode (Channel 1 counting safety mode, effective upon fieldbus disconnection)	0: Hold count value 1: Clear count value 2: Continue counting	8	0
twenty four	CH1 DO1 Safe Mode (DO1 safety mode, effective when fieldbus disconnection)	0: Output 0 (output logic 0) 1: Output 1 (Output logic 1) 2: Hold (Keep the current output)	8	0
25	CH2 Encoder Type (Channel 2 Count Type)	0: Line (linear counting) 1: Annular (circular counting)	8	0
26	CH2 Direction Logic (Channel 2 counting direction logic)	0: Positive (positive logic) 1: Negative logic	8	0
27	CH2 Measurement Type (Channel 2 Measurement Type)	0: Disable (Measurement turned off) 1: Frequency (Hz) (measured frequency) 2: Cycle (ms) (measurement period) 3: Rotary speed (Not Supported)	8	0
28	CH2 Signal Type (Channel 2 signal type)	0: Encoder*1 (orthogonal encoding, frequency multiplication by 1) 1: Encoder*2 (orthogonal	8	0

		encoding, frequency multiplied by 2) 2: Encoder*4 (orthogonal encoding, frequency multiplied by 4) 3: Pulse direction 4: SSI 5: Single-phase counting (A) 6: Single-phase counting (B)		
29	CH2 Connection Type (Channel 2 connection type)	0: Differential interface (differential input) 1: Single-ended interface	8	0
30	CH2 Overflow Action (Channel 2 counter value overflow action)	0: Stop counting 1: Continue counting	8	0
31	CH2 Encoder Filter (Channel 2 counting filter)	See the counting filter table below.	8	6
32	CH2 Direction filter (Channel 2 counting direction filtering, effective in pulse plus direction mode)	See the counting direction filter table below.	8	
33	CH2 DI filter (Channel 2DI input filter, applied to DI3 and DI4)	See the DI input filter table below.	8	
34	CH2 Time Base For Speed Measurement	Not supported at present	8	0

	(Channel 2 speed measurement time base)			
35	CH2 Pluse rate sample time (Channel 2 frequency sampling period)	See the frequency measurement sampling period table below.	8	9
36	CH2 DI3 Signal Type (DI3 signal input type)	0: Rising edge 1: Falling edge 2: Double edge	8	0
37	CH2 DI3 function (DI3 function)	0: Normal input (ordinary numeric input) 1: Locking 2: Counting 3: Clear (reset) 4: Gating (Not Supported)	8	1
38	CH2 DI3 Action Channel (DI3 is the active channel, and it takes effect under latch and clear functions.)	0: CH1 (Channel 1) 1: CH2 (Channel 2)	8	1
39	CH2 DI3 Level Logic (DI3 level logic)	0: Positive (positive logic) 1: Negative logic	8	0
40	CH2 DI4 Signal Type (DI4 signal input type)	0: Rising edge 1: Falling edge 2: Double edge	8	0
41	CH2 DI4 function (DI4 function)	0: Normal input (ordinary numeric input) 1: Locking 2: Counting	8	1

		3: Clear (reset) 4: Gating (Not Supported)		
42	CH3 DI4 Action Channel (DI4 is the active channel, and it takes effect under latch and clear functions.)	0: CH1 (Channel 1) 1: CH2 (Channel 2)	8	0
43	CH2 DI4 Level Logic (DI4 level logic)	0: Positive (positive logic) 1: Negative logic	8	0
44	CH2 DO2 function (DO2 function)	0: Normal Output (Digital Normal Output) 1: Compare Output	8	0
45	CH2 DO2 Pulse Width (DO2 output pulse width)	See the DO output pulse width table below.	8	4
46	CH2 DO2 Level logic (DO2 level logic)	0: Positive (positive logic) 1: Negative logic	8	0
47	CH2 Encoder Safe Mode (Channel 2 counting safety mode, effective when fieldbus disconnection)	0: Hold count value 1: Clear count value 2: Continue counting	8	0
48	CH2 DO2 Safe Mode (DO2 safety mode, effective when fieldbus disconnection)	0: Output 0 (output logic 0) 1: Output 1 (Output logic 1) 2: Hold (Keep the current output)	8	0
index	16#8002+n*16#10(n=0~31)			
Sub-index	Configuration items	Configuration parameters	Bit	default

			length	value
1	CH1 Maximum count value (Channel 1 count limit)	-2147483648~2147483647	32	2147483647
2	CH1 Minimum count value (Lower limit of channel 1 count)	-2147483648~2147483647	32	-2147483648
3	CH2 Maximum count value (Channel 2 count limit)	-2147483648~2147483647	32	2147483647
4	CH2 Minimum count value (Channel 2 count limit)	-2147483648~2147483647	32	-2147483648
index	16#8003+n*16#10(n=0~31)			
Sub-index	Configuration items	Configuration parameters	Bit length	default value
1	SSI CH1 Gray Conversion (SSI Channel 1 Gray Code Conversion)	0:Disable 1: Enable	8	0
2	SSI CH1 Parity (SSI Channel 1 Verification)	0:None 1:Odd 2:Even	8	0
3	SSI CH1 Clock Frequency (SSI Channel 1 Baud Rate)	0:105khz 1:210.9khz 2:421.8khz 3:843.75khz 4:1688khz 5:3375khz	8	3
4	SSI CH1 Interval Time(unit:100us) (SSI Channel 1 sampling interval)	0~255 (unit: 100μs)	8	10

5	SSI CH1 Frame Bit Length (SSI channel 1 frame length)	8~32	8	25
6	SSI CH1 LSB Bit of Position (SSI Channel 1 LSB tag number)	0~31	8	0
7	SSI CH1 MSB Bit of Position (SSI Channel 1 MSB Number)	0~31	8	twenty four
8	SSI CH1 Reserve		8	0
9	SSI CH2 Gray Conversion (SSI Channel 2 Gray Code Conversion)	0:Disable 1: Enable	8	0
10	SSI CH2 Parity (SSI Channel 2 verification)	0:None 1:Odd 2:Even	8	0
11	SSI CH2 Clock Frequency (SSI Channel 2 Baud Rate)	0:105khz 1:210.9khz 2:421.8khz 3:843.75khz 4:1688khz 5:3375khz	8	3
12	SSI CH2 Interval Time(unit:100us) (SSI Channel 2 sampling interval)	0~255 (unit: 100μs)	8	10

13	SSI CH2 Frame Bit Length (SSI channel 2-frame length)	8~32	8	25
14	SSI CH2 LSB Bit of Position (SSI Channel 2 LSB tag number)	0~31	8	0
15	SSI CH2 MSB Bit of Position (SSI Channel 2 MSB Number)	0~31	8	twenty four
16	SSI CH2 Reserve		8	0

Counting filter table

Parameter value	Parameters	meaning
1	50MHz	Filtering frequency 50MHz
2	25MHz	Filtering frequency 25MHz
3	12MHz	Filtering frequency 12MHz
4	2.1MHz	Filtering frequency 2.1MHz
5	1.6MHz	Filtering frequency 1.6MHz
6	1MHz	Filtering frequency 1MHz
7	900kHz	Filtering frequency 900kHz
8	550kHz	Filter frequency 550kHz
9	410kHz	Filter frequency 410kHz
10	330kHz	Filtering frequency 330kHz
11	280kHz	Filtering frequency 280kHz
12	210kHz	Filter frequency 210kHz
13	160kHz	Filtering frequency 160kHz

14	140kHz	Filtering frequency 140kHz
15	105kHz	Filtering frequency 105kHz

Counting Direction Filter Table

Parameter value	Parameters	meaning
4	500us	Filtering time 500μs
5	1ms	Filtering time 1ms
6	2ms	Filtering time 2ms
7	4ms	Filtering time 4ms
8	8ms	Filtering time 8ms
9	16ms	Filtering time 16ms
10	32ms	Filtering time 32ms
11	64ms	Filtering time 64ms

DI Input Filter Table

Parameter value	Parameters	meaning
0	Disable	No filtering
1	50us	Filtering time 50μs
2	100us	Filtering time 100μs
3	250us	Filtering time 250μs
4	500us	Filtering time 500μs
5	1ms	Filtering time 1ms
6	2ms	Filtering time 2ms
7	4ms	Filtering time 4ms
8	8ms	Filtering time 8ms
9	16ms	Filtering time 16ms
10	32ms	Filtering time 32ms
11	64ms	Filtering time 64ms

Frequency measurement sampling period table

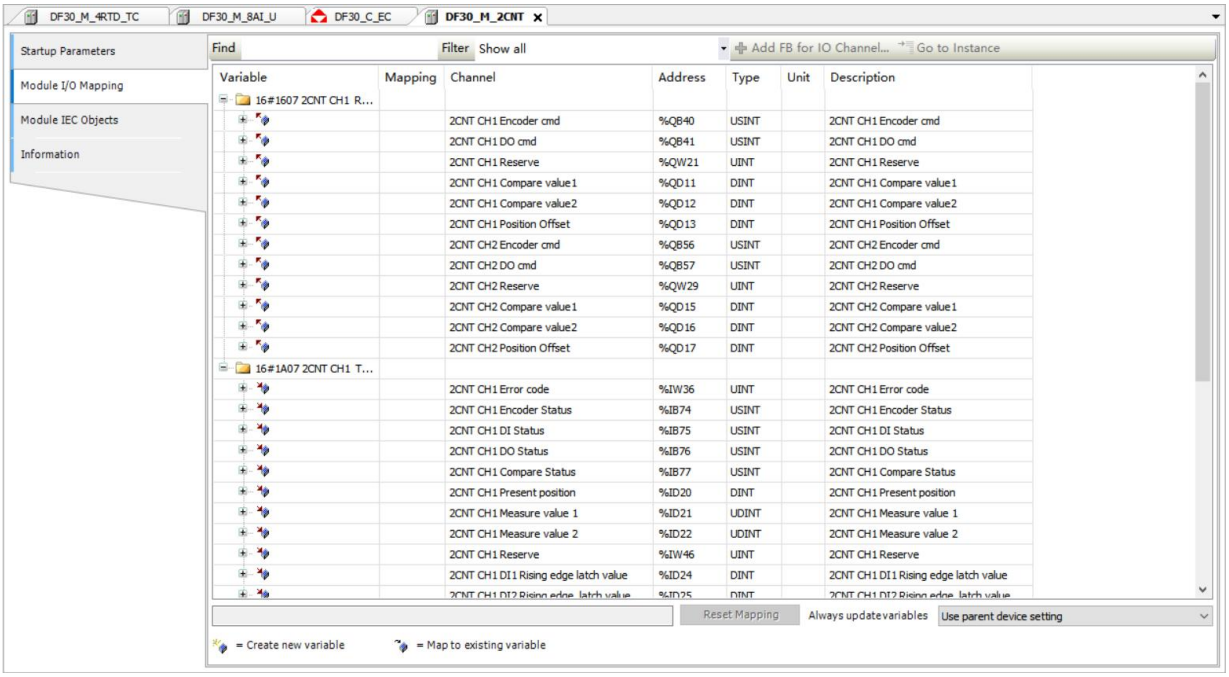
Parameter value	Parameters	meaning
0	1ms	Frequency sampling period 1ms
1	2ms	Frequency sampling period 2ms
2	5ms	Frequency sampling period 5ms
3	10ms	Frequency sampling period 10ms
4	20ms	Frequency sampling period 20ms
5	50ms	Frequency sampling period 50ms
6	100ms	Frequency sampling period 100ms
7	200ms	Frequency sampling period 200ms
8	500ms	Frequency sampling period 500ms
9	1s	Frequency sampling period 1s
10	2s	Frequency sampling period 2s
11	5s	Frequency sampling period 5s
12	10s	Frequency sampling period 10s
13	20s	Frequency sampling period 20s
14	25s	Frequency sampling period 25s

DO Output Pulse Width Table

Parameter value	Parameters	meaning
0	<20us	DO output pulse width <20us
1	50us	DO output pulse width 50us
2	100us	DO output pulse width 100us

3	250us	DO output pulse width 250us
4	500us	DO output pulse width 500us
5	1ms	DO output pulse width 1ms
6	2ms	DO output pulse width 2ms
7	4ms	DO output pulse width 4ms
8	8ms	DO output pulse width 8ms
9	16ms	DO output pulse width 16ms
10	32ms	DO output pulse width 32ms
11	64ms	DO output pulse width 64ms

3. Data monitoring



■ Process data

➢ Output data

index	16#7000 + n*16#10 (n=0~31)			
Sub-index	name	Value Description	type	Bit length
1	CH1 Encoder cmd	0: Reset to zero and stop counting.	USINT	8

	(Channel 1 counting command)	1: Enable counter 2: Stop counting		
2	DO1 cmd (DO1 control command)	0: Turn off output 1: Enable output	USINT	8
3	CH1 Reserve (Reserved word for Channel 1)	reserve	UINT	16
4	CH1 Compare value1 (Channel 1 comparison value 1)	-2147483648~2147483647	DINT	32
5	CH1 Compare value2 (Channel 1 comparison value 2)	-2147483648~2147483647	DINT	32
6	CH1 Position Offset (Channel 1 position offset value)	-2147483648~2147483647	DINT	32
7	CH2 Encoder cmd (Channel 2 counting command)	0: Reset to zero and stop counting. 1: Enable counter 2: Stop counting	USINT	8
8	DO2 cmd (DO2 control command)	0: Turn off output 1: Enable output	USINT	8
9	CH2 Reserve (Reserved words in Channel 2)	reserve	UINT	16
10	CH2 Compare value1 (Channel 2 comparison value 1)	-2147483648~2147483647	DINT	32
11	CH2 Compare value2 (Channel 2 comparison	-2147483648~2147483647	DINT	32

	value 2)			
12	CH2 Position Offset (Channel 2 position offset value)	-2147483648~2147483647	DINT	32

➢ Input data

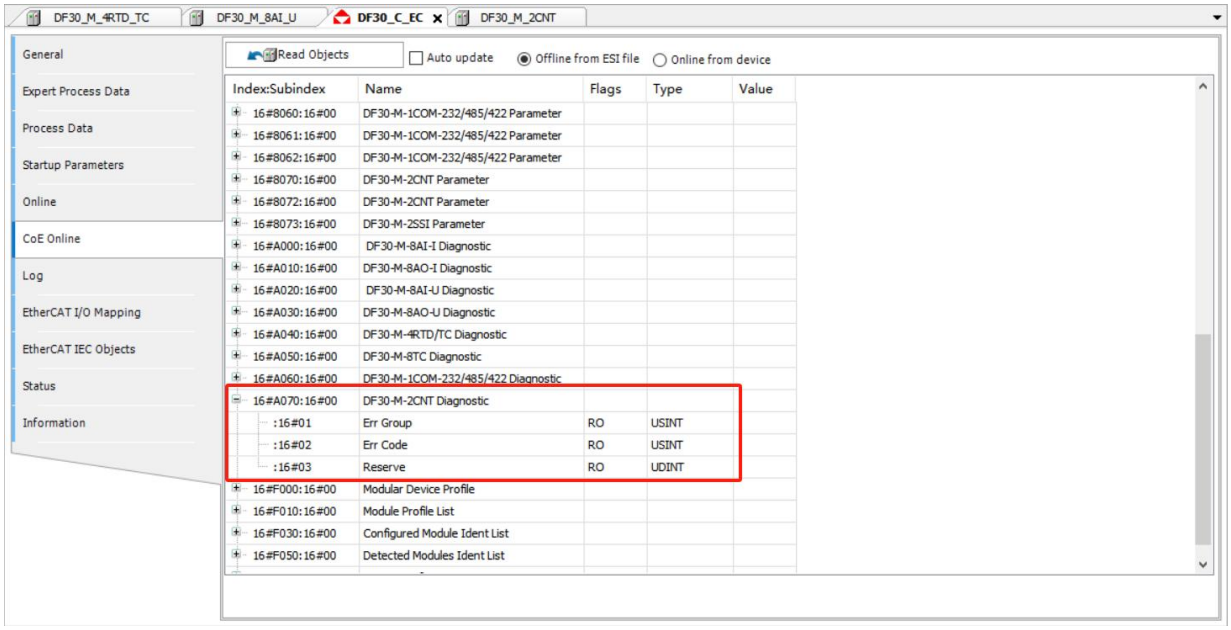
index	16#6000 + n*16#10 (n=0~31)			
Sub-index	name	Value Description	type	Bit length
1	CH1 Error code (Channel 1 error value)	See the ErrCode table in the appendix.	UINT	16
2	CH1 Encoder Status (Channel 1 counting status)	Bit0: 0 (counting disabled), 1 (counting enabled) Bit1: 0 (forward), 1 (reverse) Bit2: 0 (less than the upper limit), 1 (greater than or equal to the upper limit) Bit3: 0 (greater than the lower limit), 1 (less than or equal to the lower limit)	USINT	8
3	CH1 DI Status (DI input signal status)	Bit0: DI1 signal input status Bit1: DI2 signal input status	USINT	8
4	DO1 Status (DO1 output status)	0: DO1 disables output. 1: DO1 enables output mode	USINT	8
5	CH1 Compare Status	Bit0~Bit1: 0 (less than comparison value 1), 1 (equal to comparison value 1), 2 (greater than comparison value 1) Bit2~Bit3: 0 (less than comparison	USINT	8

		value 2), 1 (equal to comparison value 2), 2 (greater than comparison value 2)		
6	CH1 Present position (Channel 1 counter position value)	-2147483648~2147483647	DINT	32
7	CH1 Measure value 1 (Measurement value of Channel 1)	The integer part of the measurement value for channel 1 is in Hz when measuring frequency and in ms when measuring period.	UDINT	32
8	CH1 Measure value 2 (Measurement value of Channel 1)	The decimal part of the measurement value for Channel 1 needs to be divided by 100000000	UDINT	32
9	CH1 Reserve	reserve	UINT	16
10	CH1 DI1 Rising edge latch value (DI1 rising edge latch value)	-2147483648~2147483647	DINT	32
11	CH1 DI2 Rising edge latch value (DI2 rising edge latch value)	-2147483648~2147483647	DINT	32
12	CH1 DI1 Falling edge latch value (DI1 falling edge latch value)	-2147483648~2147483647	DINT	32
13	CH1 DI2 Falling edge latch value (DI2 falling edge latch value)	-2147483648~2147483647	DINT	32

14	CH2 Error code (Channel 2 error value)	See the ErrCode table in the appendix.	UINT	16
15	CH2 Encoder Status (Channel 2 counting status)	Bit0: 0 (counting disabled), 1 (counting enabled) Bit1: 0 (forward), 1 (reverse) Bit2: 0 (less than the upper limit), 1 (greater than or equal to the upper limit) Bit3: 0 (greater than the lower limit), 1 (less than or equal to the lower limit)	USINT	8
16	CH2 DI Status (DI signal input status)	Bit0: DI3 signal input status Bit1: DI4 signal input status	USINT	8
17	DO2 Status (DO2 output status)	0: DO2 disables output. 1: DO2 enables output mode	USINT	8
18	CH2 Compare Status (Channel 2 comparison status)	Bit0~Bit1: 0 (less than comparison value 1), 1 (equal to comparison value 1), 2 (greater than comparison value 1) Bit2~Bit3: 0 (less than comparison value 2), 1 (equal to comparison value 2), 2 (greater than comparison value 2)	USINT	8
19	CH2 Present position (Channel 2 counter position value)	-2147483648~2147483647	DINT	32
20	CH2 Measure value 1 (Measurement value from channel 2)	The integer part of the measurement value for channel 2 is in Hz when measuring frequency and in ms when	UDINT	32

		measuring period.		
twenty one	CH2 Measure value 2 (Measurement value from channel 2)	The decimal part of the channel 2 measurement value is converted to a decimal by dividing by 100000000.	UDINT	32
twenty two	CH2 Reserve	reserve	UINT	16
twenty three	CH2 DI3 Rising edge latch value (DI3 rising edge latch value)	-2147483648~2147483647	DINT	32
twenty four	CH2 DI4 Rising edge latch value (DI4 rising edge latch value)	-2147483648~2147483647	DINT	32
25	CH2 DI3 Falling edge latch value (DI3 falling edge latch value)	-2147483648~2147483647	DINT	32
26	CH2 DI4 Falling edge latch value (DI4 falling edge latch value)	-2147483648~2147483647	DINT	32

4 Error Diagnosis



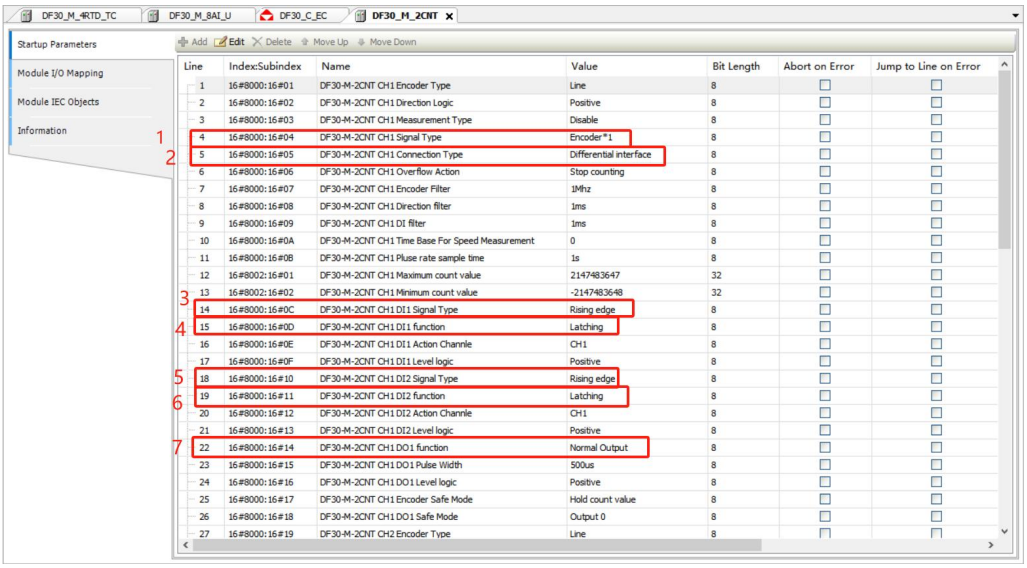
View module error messages in the COE online window.

index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.
2	Err Code	USINT	8	Error code
3	Reserve	UDINT	32	reserve

Definition Reference6.1 Fault Code Description

5 Application Cases: Differential Input Quadrature Encoder with 1x Frequency Counting, Two-Probe Double-Edge Triggering, One-DO Comparison Output.

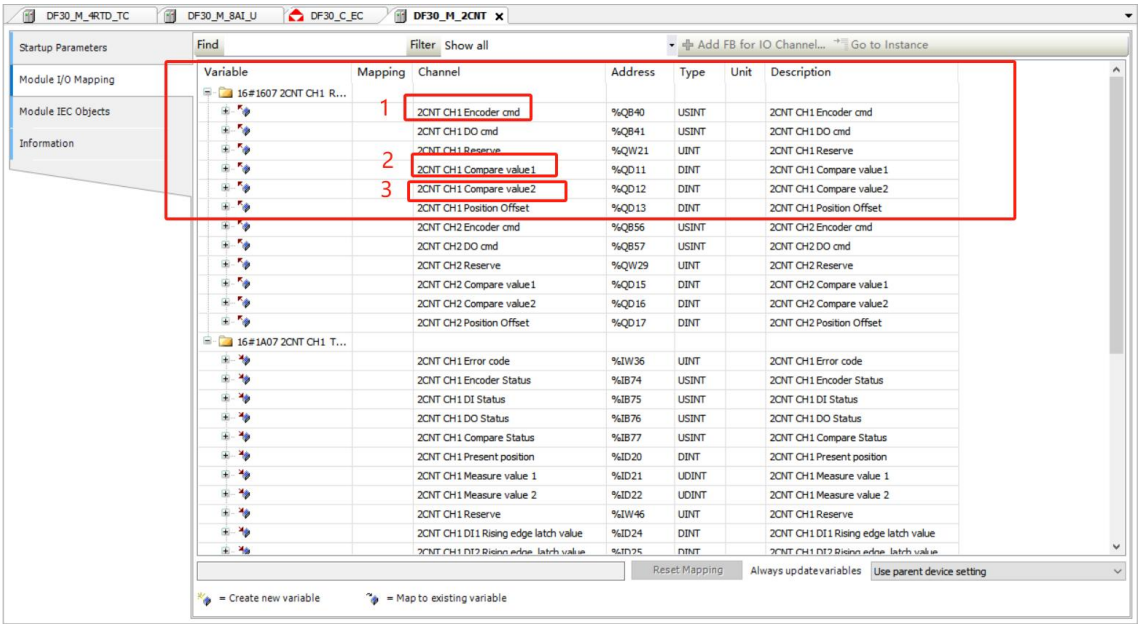
- Parameter configuration:



Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Line on Error
1	16#8000:16#01	DF30-M-2CNT CH1 Encoder Type	Line	8	☐	☐
2	16#8000:16#02	DF30-M-2CNT CH1 Direction Logic	Positive	8	☐	☐
3	16#8000:16#03	DF30-M-2CNT CH1 Measurement Type	Disable	8	☐	☐
4	16#8000:16#04	DF30-M-2CNT CH1 Signal Type	Encoder*1	8	☐	☐
5	16#8000:16#05	DF30-M-2CNT CH1 Connection Type	Differential interface	8	☐	☐
6	16#8000:16#06	DF30-M-2CNT CH1 Overflow Action	Stop counting	8	☐	☐
7	16#8000:16#07	DF30-M-2CNT CH1 Encoder Filter	1Mhz	8	☐	☐
8	16#8000:16#08	DF30-M-2CNT CH1 Direction filter	1ms	8	☐	☐
9	16#8000:16#09	DF30-M-2CNT CH1 DI filter	1ms	8	☐	☐
10	16#8000:16#0A	DF30-M-2CNT CH1 Time Base For Speed Measurement	0	8	☐	☐
11	16#8000:16#0B	DF30-M-2CNT CH1 Pluse rate sample time	1s	8	☐	☐
12	16#8002:16#01	DF30-M-2CNT CH1 Maximum count value	2147483647	32	☐	☐
13	16#8002:16#02	DF30-M-2CNT CH1 Minimum count value	-2147483648	32	☐	☐
14	16#8000:16#0C	DF30-M-2CNT CH1 DI1 Signal Type	Rising edge	8	☐	☐
15	16#8000:16#0D	DF30-M-2CNT CH1 DI1 function	Latching	8	☐	☐
16	16#8000:16#0E	DF30-M-2CNT CH1 DI1 Action Channle	CH1	8	☐	☐
17	16#8000:16#0F	DF30-M-2CNT CH1 DI1 Level logic	Positive	8	☐	☐
18	16#8000:16#10	DF30-M-2CNT CH1 DI2 Signal Type	Rising edge	8	☐	☐
19	16#8000:16#11	DF30-M-2CNT CH1 DI2 function	Latching	8	☐	☐
20	16#8000:16#12	DF30-M-2CNT CH1 DI2 Action Channle	CH1	8	☐	☐
21	16#8000:16#13	DF30-M-2CNT CH1 DI2 Level logic	Positive	8	☐	☐
22	16#8000:16#14	DF30-M-2CNT CH1 DO1 function	Normal Output	8	☐	☐
23	16#8000:16#15	DF30-M-2CNT CH1 DO1 Pulse Width	500us	8	☐	☐
24	16#8000:16#16	DF30-M-2CNT CH1 DO1 Level logic	Positive	8	☐	☐
25	16#8000:16#17	DF30-M-2CNT CH1 Encoder Safe Mode	Hold count value	8	☐	☐
26	16#8000:16#18	DF30-M-2CNT CH1 DO1 Safe Mode	Output 0	8	☐	☐
27	16#8000:16#19	DF30-M-2CNT CH2 Encoder Type	Line	8	☐	☐

1. Configured as orthogonal encoding, frequency multiplication factor 1.
2. Configure as differential input
3. The first DL channel is configured as a dual-edge triggered channel.
4. The DI function of the first channel is configured as latch.
5. The second DI channel is configured as a dual-edge triggered channel.
6. The second DI function is configured as latching.
7. The DO function is configured for comparison output.

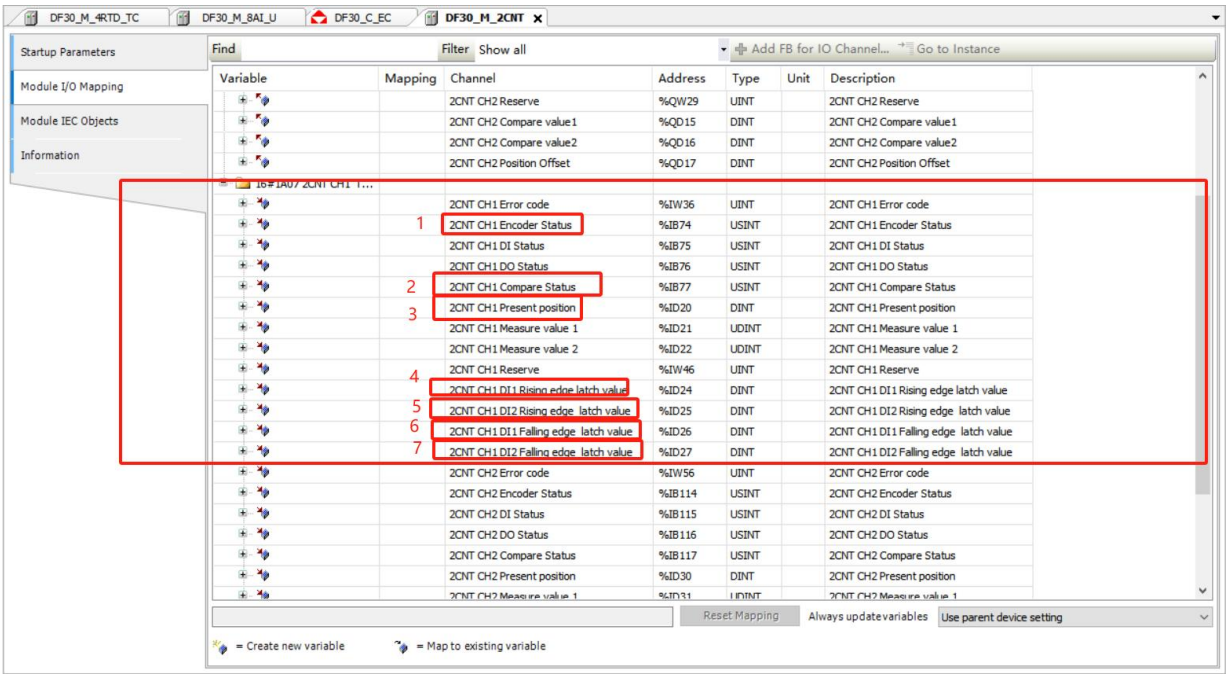
- Process data manipulation:



1. Write 1 to start counting

2. Set comparison value 1 to 10000

3. Set comparison value 2 to 20000



1. A count state of 1 indicates that the current state is counting.

2. Comparison status: Larger than comparison value 1; greater than comparison value 2.

3. Current count value

4. Latch value on the rising edge of probe 1

5. Latch value on the rising edge of probe 2

6. Latch value on the rising edge of probe 1

7. Latch value on the rising edge of probe 2

6 Application Cases: SSI encoder input, 2-channel DI general input, 1-channel DO output, taking Wuxi Banghe multi-turn encoder M1213-25bit as an example.

Wiring procedure: Connect the encoder's Clock+ and Clock- to 1A+ and 1A- respectively, and connect the encoder's Data+ and Data- to 1B+ and 1B- respectively.

- Parameter configuration:

According to the encoder's manual rate requirements, our SSI clock frequency is configured to 843.75kHz, and the data read interval is 1ms.

The following is the encoder data:

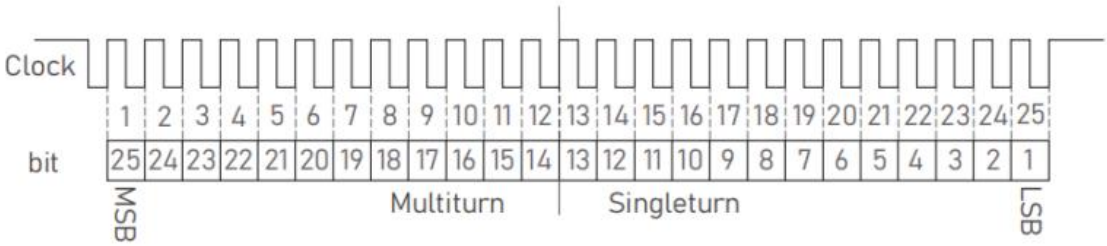
1. The number of SSI master clocks depends on the number of bits in the encoder's position data.

2. Clock frequency supports 100-1000kHz

3. Data read interval greater than 300μs

According to the encoding manual's data format, the total frame length is 25, consisting of the lower 12 bits of the single-loop position value and the higher 13 bits of the loop value. Here, we will take obtaining the single-loop position value as an example and convert the Gray code to a decimal number.

1. Multi-turn encoder SS1 data format (M1213-25bit as an example)

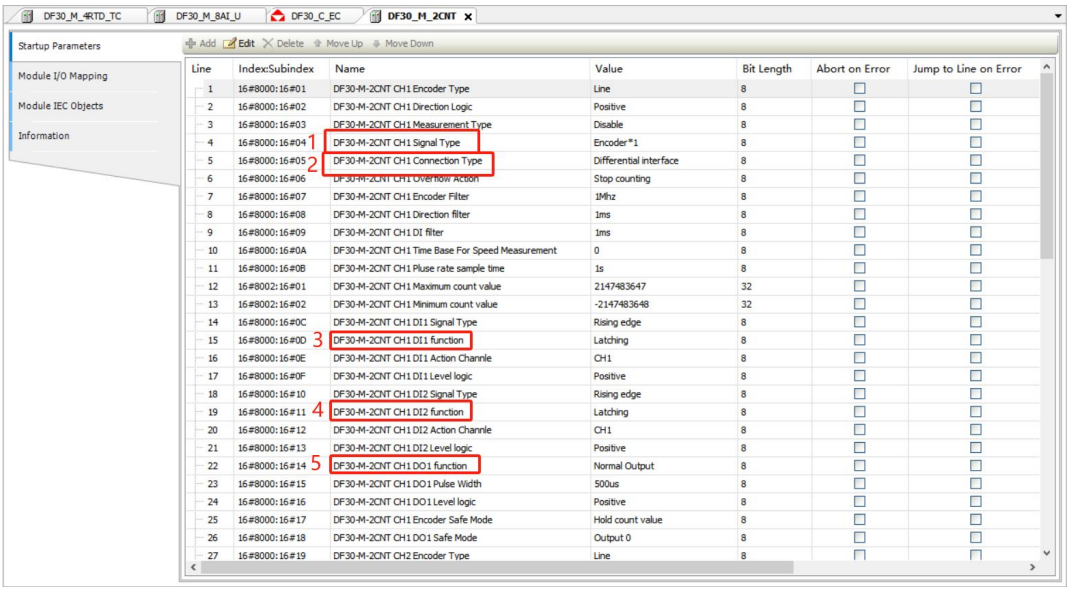


Clock 1-12: Clock position

Clock 13-25: Single-lap position

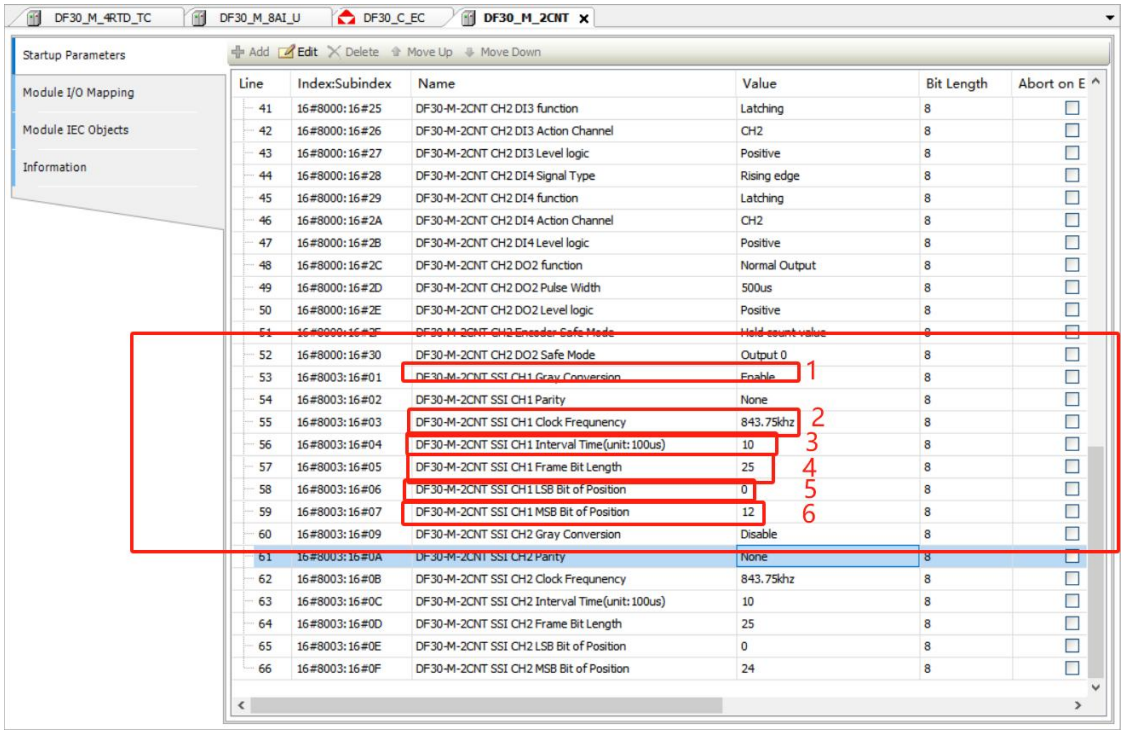
LSB: Least Significant Bit

MSB: Most significant bit



Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Line on Error
1	16#8000:16#01	DF30-M-2CNT CH1 Encoder Type	Line	8	☐	☐
2	16#8000:16#02	DF30-M-2CNT CH1 Direction Logic	Positive	8	☐	☐
3	16#8000:16#03	DF30-M-2CNT CH1 Measurement Type	Disable	8	☐	☐
4	16#8000:16#04	DF30-M-2CNT CH1 Signal Type	Encoder*1	8	☐	☐
5	16#8000:16#05	DF30-M-2CNT CH1 Connection Type	Differential interface	8	☐	☐
6	16#8000:16#06	DF30-M-2CNT CH1 Overflow Action	Stop counting	8	☐	☐
7	16#8000:16#07	DF30-M-2CNT CH1 Encoder Filter	1Mhz	8	☐	☐
8	16#8000:16#08	DF30-M-2CNT CH1 Direction filter	1ms	8	☐	☐
9	16#8000:16#09	DF30-M-2CNT CH1 DI filter	1ms	8	☐	☐
10	16#8000:16#0A	DF30-M-2CNT CH1 Time Base For Speed Measurement	0	8	☐	☐
11	16#8000:16#0B	DF30-M-2CNT CH1 Pluse rate sample time	1s	8	☐	☐
12	16#8002:16#01	DF30-M-2CNT CH1 Maximum count value	2147483647	32	☐	☐
13	16#8002:16#02	DF30-M-2CNT CH1 Minimum count value	-2147483648	32	☐	☐
14	16#8000:16#0C	DF30-M-2CNT CH1 DI1 Signal Type	Rising edge	8	☐	☐
15	16#8000:16#0D	DF30-M-2CNT CH1 DI1 function	Latching	8	☐	☐
16	16#8000:16#0E	DF30-M-2CNT CH1 DI1 Action Channle	CH1	8	☐	☐
17	16#8000:16#0F	DF30-M-2CNT CH1 DI1 Level logic	Positive	8	☐	☐
18	16#8000:16#10	DF30-M-2CNT CH1 DI2 Signal Type	Rising edge	8	☐	☐
19	16#8000:16#11	DF30-M-2CNT CH1 DI2 function	Latching	8	☐	☐
20	16#8000:16#12	DF30-M-2CNT CH1 DI2 Action Channle	CH1	8	☐	☐
21	16#8000:16#13	DF30-M-2CNT CH1 DI2 Level logic	Positive	8	☐	☐
22	16#8000:16#14	DF30-M-2CNT CH1 DO1 function	Normal Output	8	☐	☐
23	16#8000:16#15	DF30-M-2CNT CH1 DO1 Pulse Width	500us	8	☐	☐
24	16#8000:16#16	DF30-M-2CNT CH1 DO1 Level logic	Positive	8	☐	☐
25	16#8000:16#17	DF30-M-2CNT CH1 Encoder Safe Mode	Hold count value	8	☐	☐
26	16#8000:16#18	DF30-M-2CNT CH1 DO1 Safe Mode	Output 0	8	☐	☐
27	16#8000:16#19	DF30-M-2CNT CH2 Encoder Type	Line	8	☐	☐

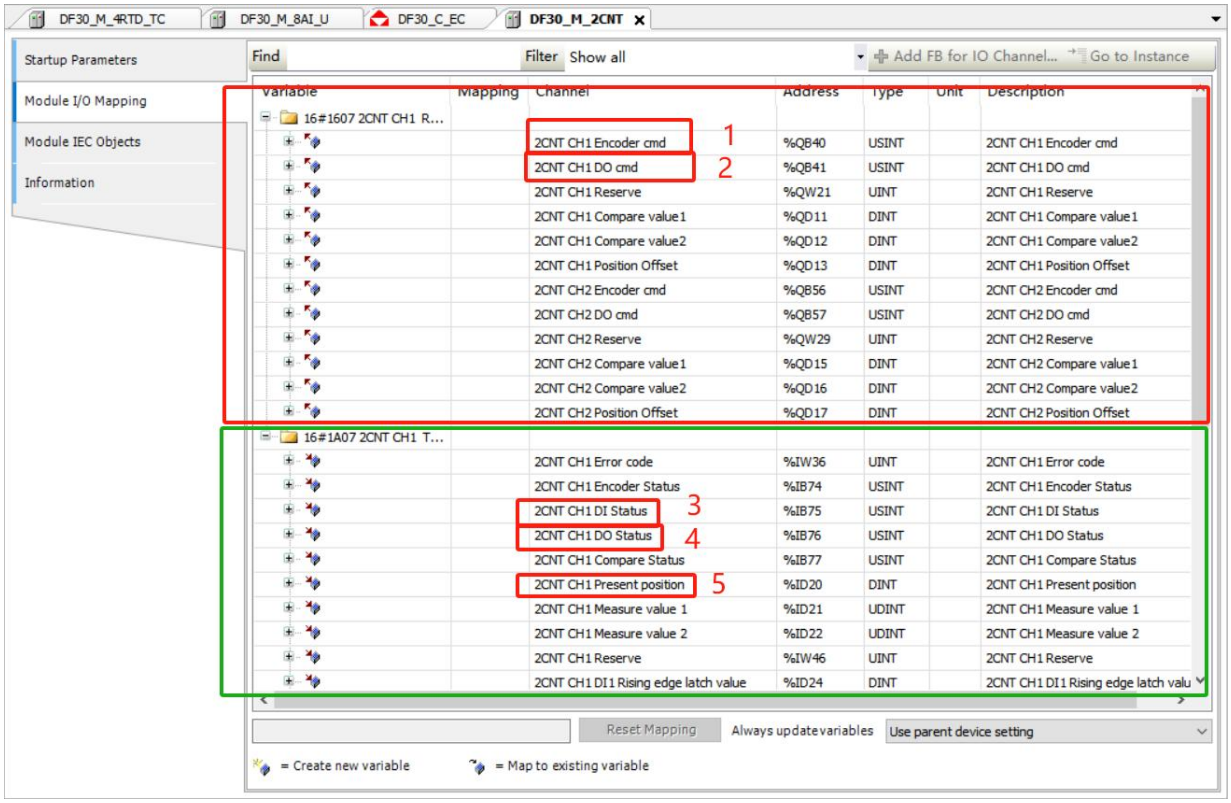
1. Configure the signal type as "SSI"
2. Configure the connection method as "Differential Input"
3. Channel 1 DI, configured as "Normal Input"
4. DI Channel 2, configured as "Normal Input"
5. DO, configured as "Normal Output"



Line	Index:Subindex	Name	Value	Bit Length	Abort on E
41	16#8000:16#25	DF30-M-2CNT CH2 DI3 function	Latching	8	☐
42	16#8000:16#26	DF30-M-2CNT CH2 DI3 Action Channel	CH2	8	☐
43	16#8000:16#27	DF30-M-2CNT CH2 DI3 Level logic	Positive	8	☐
44	16#8000:16#28	DF30-M-2CNT CH2 DI4 Signal Type	Rising edge	8	☐
45	16#8000:16#29	DF30-M-2CNT CH2 DI4 function	Latching	8	☐
46	16#8000:16#2A	DF30-M-2CNT CH2 DI4 Action Channel	CH2	8	☐
47	16#8000:16#2B	DF30-M-2CNT CH2 DI4 Level logic	Positive	8	☐
48	16#8000:16#2C	DF30-M-2CNT CH2 DO2 function	Normal Output	8	☐
49	16#8000:16#2D	DF30-M-2CNT CH2 DO2 Pulse Width	500us	8	☐
50	16#8000:16#2E	DF30-M-2CNT CH2 DO2 Level logic	Positive	8	☐
51	16#8000:16#2F	DF30-M-2CNT CH2 Encoder Safe Mode	Hold count value	8	☐
52	16#8000:16#30	DF30-M-2CNT CH2 DO2 Safe Mode	Output 0	8	☐
53	16#8003:16#01	DF30-M-2CNT SSI CH1 Gray Conversion	Enable	8	☐
54	16#8003:16#02	DF30-M-2CNT SSI CH1 Parity	None	8	☐
55	16#8003:16#03	DF30-M-2CNT SSI CH1 Clock Frequency	843.75khz	8	☐
56	16#8003:16#04	DF30-M-2CNT SSI CH1 Interval Time(unit:100us)	10	8	☐
57	16#8003:16#05	DF30-M-2CNT SSI CH1 Frame Bit Length	25	8	☐
58	16#8003:16#06	DF30-M-2CNT SSI CH1 LSB Bit of Position	0	8	☐
59	16#8003:16#07	DF30-M-2CNT SSI CH1 MSB Bit of Position	12	8	☐
60	16#8003:16#09	DF30-M-2CNT SSI CH2 Gray Conversion	Disable	8	☐
61	16#8003:16#0A	DF30-M-2CNT SSI CH2 Parity	None	8	☐
62	16#8003:16#0B	DF30-M-2CNT SSI CH2 Clock Frequency	843.75khz	8	☐
63	16#8003:16#0C	DF30-M-2CNT SSI CH2 Interval Time(unit:100us)	10	8	☐
64	16#8003:16#0D	DF30-M-2CNT SSI CH2 Frame Bit Length	25	8	☐
65	16#8003:16#0E	DF30-M-2CNT SSI CH2 LSB Bit of Position	0	8	☐
66	16#8003:16#0F	DF30-M-2CNT SSI CH2 MSB Bit of Position	24	8	☐

1. Gray code to decimal conversion: Enable
2. Data transmission frequency configuration
3. Data retrieval time: 1ms
4. The data frame length is configured to 25.
5. Read the data LSB position
6. Read the MSB location of the data.

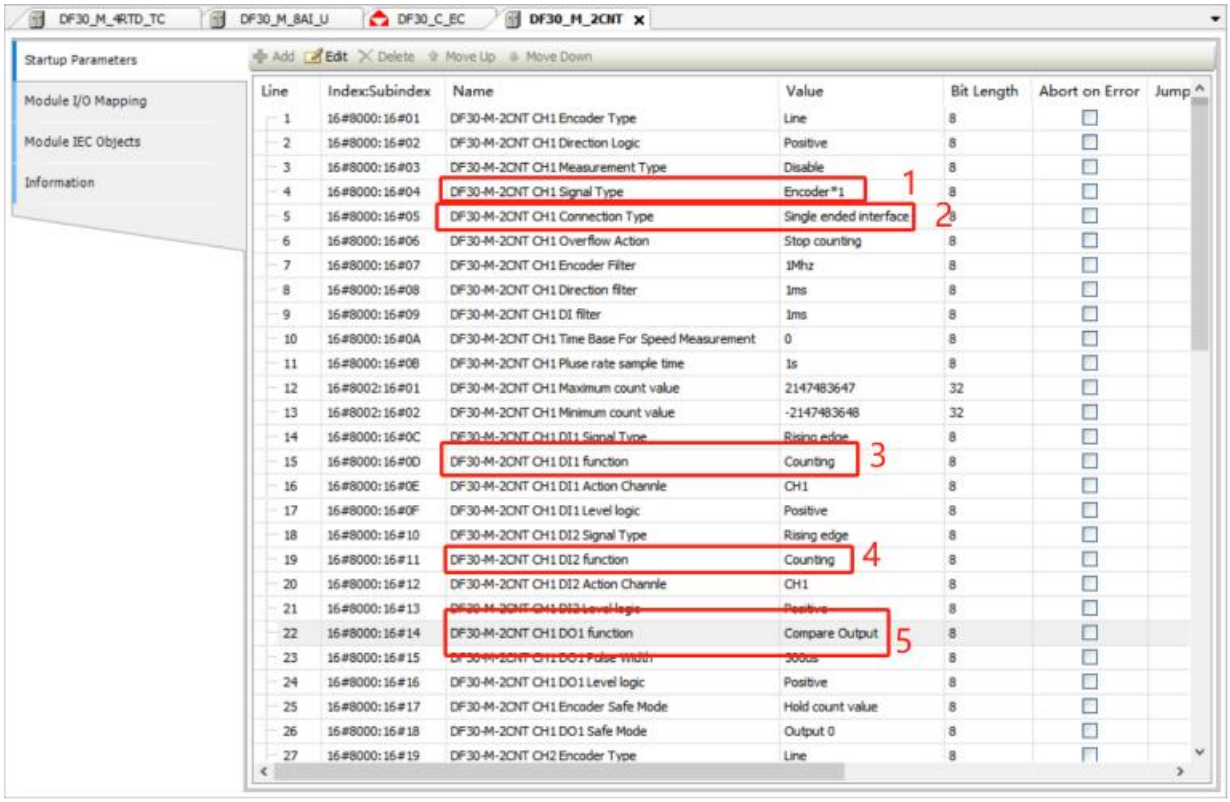
- Process data manipulation:



1. Enable counter
2. Enable DO output
3. DI signal input status
4. DO signal input status
5. Convert the read Gray code to decimal and determine the single-loop position value.

7 Application Case: Single-ended input quadrature encoder with 1x frequency counting and 1-channel DO comparison output.

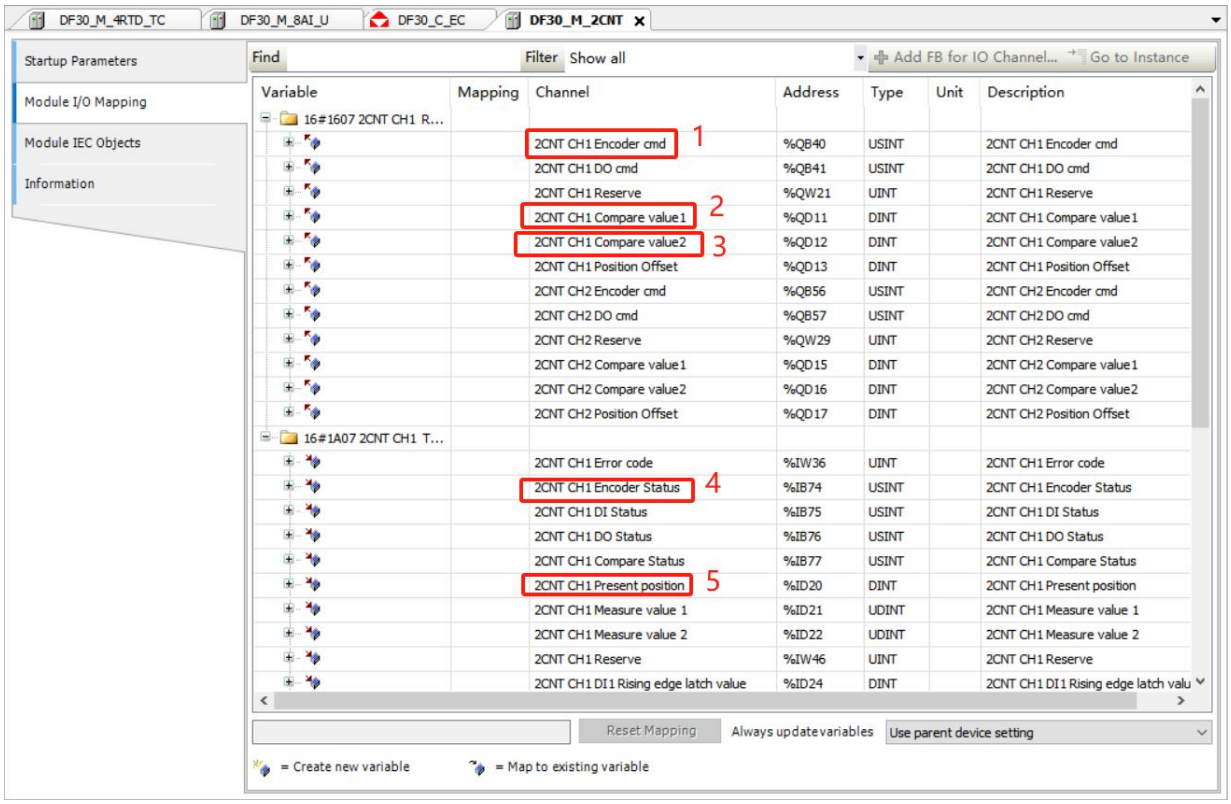
- Wiring instructions: Connect the encoder's 0V to the COM port, and connect phase A and phase B to DI1 and DI2 respectively.
- Parameter configuration:



Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump
1	16#8000:16#01	DF30-M-2CNT CH1 Encoder Type	Line	8	☐	
2	16#8000:16#02	DF30-M-2CNT CH1 Direction Logic	Positive	8	☐	
3	16#8000:16#03	DF30-M-2CNT CH1 Measurement Type	Disable	8	☐	
4	16#8000:16#04	DF30-M-2CNT CH1 Signal Type	Encoder*1	8	☐	
5	16#8000:16#05	DF30-M-2CNT CH1 Connection Type	Single ended interface	8	☐	
6	16#8000:16#06	DF30-M-2CNT CH1 Overflow Action	Stop counting	8	☐	
7	16#8000:16#07	DF30-M-2CNT CH1 Encoder Filter	1Mhz	8	☐	
8	16#8000:16#08	DF30-M-2CNT CH1 Direction filter	1ms	8	☐	
9	16#8000:16#09	DF30-M-2CNT CH1 DI filter	1ms	8	☐	
10	16#8000:16#0A	DF30-M-2CNT CH1 Time Base For Speed Measurement	0	8	☐	
11	16#8000:16#0B	DF30-M-2CNT CH1 Pluse rate sample time	1s	8	☐	
12	16#8002:16#01	DF30-M-2CNT CH1 Maximum count value	2147483647	32	☐	
13	16#8002:16#02	DF30-M-2CNT CH1 Minimum count value	-2147483648	32	☐	
14	16#8000:16#0C	DF30-M-2CNT CH1 DI1 Signal Type	Rising edge	8	☐	
15	16#8000:16#0D	DF30-M-2CNT CH1 DI1 function	Counting	8	☐	
16	16#8000:16#0E	DF30-M-2CNT CH1 DI1 Action Channle	CH1	8	☐	
17	16#8000:16#0F	DF30-M-2CNT CH1 DI1 Level logic	Positive	8	☐	
18	16#8000:16#10	DF30-M-2CNT CH1 DI2 Signal Type	Rising edge	8	☐	
19	16#8000:16#11	DF30-M-2CNT CH1 DI2 function	Counting	8	☐	
20	16#8000:16#12	DF30-M-2CNT CH1 DI2 Action Channle	CH1	8	☐	
21	16#8000:16#13	DF30-M-2CNT CH1 DI2 Level logic	Positive	8	☐	
22	16#8000:16#14	DF30-M-2CNT CH1 DO1 function	Compare Output	8	☐	
23	16#8000:16#15	DF30-M-2CNT CH1 DO1 Pulse Width	300us	8	☐	
24	16#8000:16#16	DF30-M-2CNT CH1 DO1 Level logic	Positive	8	☐	
25	16#8000:16#17	DF30-M-2CNT CH1 Encoder Safe Mode	Hold count value	8	☐	
26	16#8000:16#18	DF30-M-2CNT CH1 DO1 Safe Mode	Output 0	8	☐	
27	16#8000:16#19	DF30-M-2CNT CH2 Encoder Type	Line	8	☐	

1. Signal type configured as quadrature 1x frequency.
2. The connection method is configured as single-ended input.
3. DI1 function is configured for counting.
4. DI2 function is configured for counting.
5. The DO function is configured to output comparison.

- Process data manipulation:

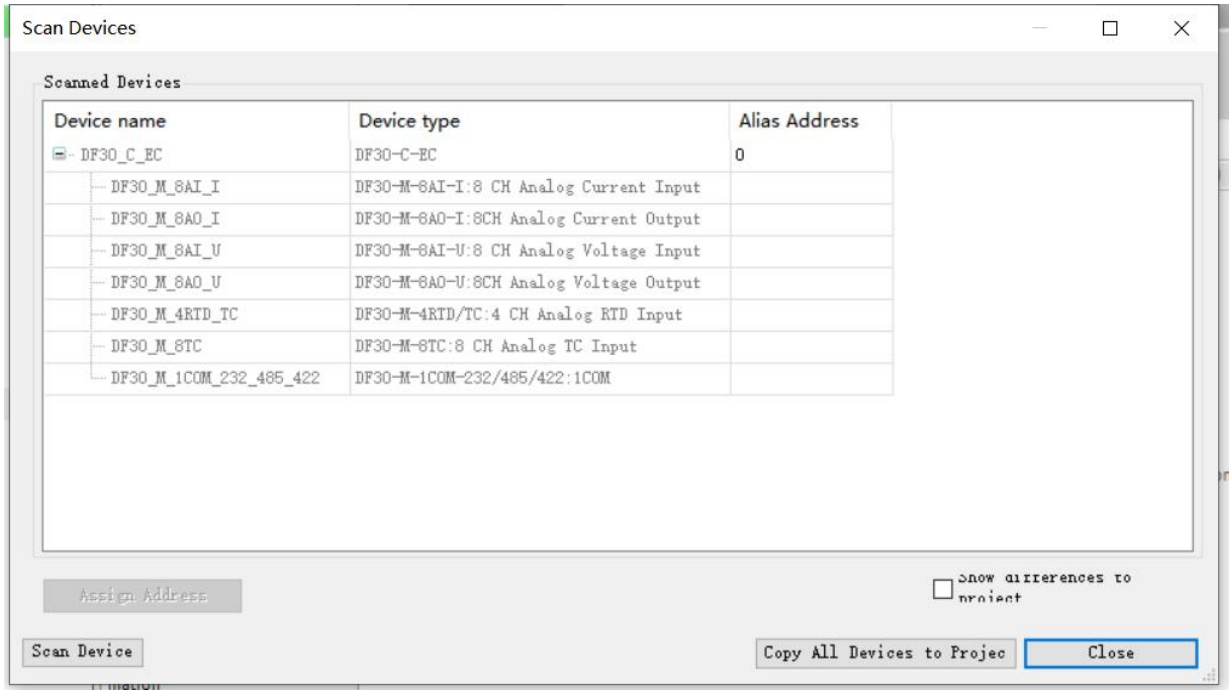


1. Enable counter
2. Set the comparison value to 1
3. Set the comparison value to 2
4. Currently in counting mode.
5. Current count value

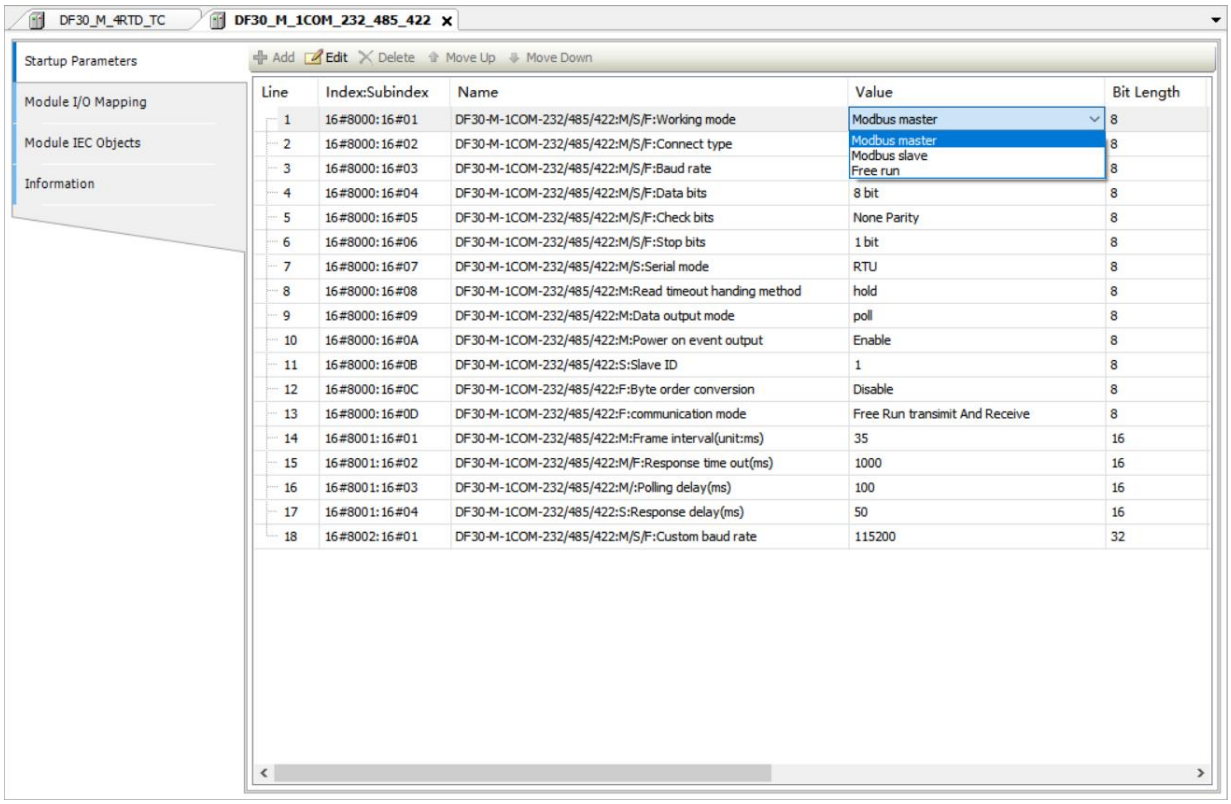
16 DF30-M-1COM-232/485/422

1 Scanning Module

After adding the EtehrCAT device (see "[link to instructions]")Add IO module"), Scan the device, and select to copy all devices to the project.



2 Parameter Configuration



Note: M: Master mode is enabled; S: Slave mode is enabled; F: Transmit mode is enabled.

index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration	Bit	default	meaning

		parameters	length	value	
1	M/S/F: Working mode	0: Modbus master (Modbus master station mode) 1: Modbus slave (Modbus slave mode) 2: Free run (Pass-through mode)	8	0	Working mode settings
2	M/S/F:Connect type	0: RS232 1: RS232 Flow (RS232 flow control) 2: RS485 3: RS422	8	2	Port connection type
3	M/S/F: Baud rate	Filter input counting filter table	8	2	Port baud rate configuration
4	M/S/F: Data bits	0: 7 bits 1: 8bit	8	1	Port data bits
5	M/S/F: Check bits	0: None Parity (No verification) 1: Odd Parity (Odd check) 2: Even Parity (Even check)	8	0	Data Validation
6	M/S/F: Stop bits	0: 1 bit 1:2bit	8	0	Data stop bits
7	M/S: Serial mode	0: RTU	8	0	Modbus protocol
8	M: Read timeout	0: hold	8	0	Master station

	handing method	(Keep) 1: clear (Reset)			mode read slave station response timeout data processing behavior
9	M: Data output mode	0: poll (Polling triggers the main site to output data) 1: event (The main station output is triggered when the output data changes) 2: Level triggered (The master station outputs data when the level is high) 3: Rising edge (The rising edge triggers the main station to output data)	8	0	Main site data output mode
10	M: Power on event output	0: Disable 1: Enable	8	1	Master station mode power-on event output
11	S:Slave ID	1~247	8	1	Slave mode address ID
12	F: Byte order conversion	0: Disable 1: Enable	8	0	Byte order conversion in

					pass-through mode
13	F: Communication mode	0: Free Run transit And Receive (Free to send and receive) 2: Request-Response (Request-Response)	8	0	Transparent transmission mode transmit/receive configuration
index	16#8001+n*16#10(n=0~31)				
1	M:Frame interval(unit:ms)	0~65535	16	35	Master station mode access to slave station channel interval time
2	M/F: Response time out (ms)	0~65535	16	1000	Master station mode or slave station mode response timeout
3	M: Polling delay (ms)	0~65535	16	100	Main site polling channel time
4	S: Response delay (ms)	0~65535	16	50	Slave mode response to master station delay time
index	16#8002+n*16#10(n=0~31)				
1	M/S/F: Custom baud rate	1200~4687500	32	115200	Custom baud rate

surface3Baud Rate Parameter Table

Sub-index object data	name	meaning
0	2400 bps	
1	4800 bps	
2	9600 bps	
3	14400 bps	
4	19200 bps	
5	38400 bps	
6	56000 bps	
7	115200 bps	
8	128000 bps	
9	230400 bps	
10	256000 bps	
11	custom	After configuring the custom baud rate to this setting, the baud rate is determined by the M/S/F:Custom baud rate configuration item.

■ **CHxx submodule parameter configuration**

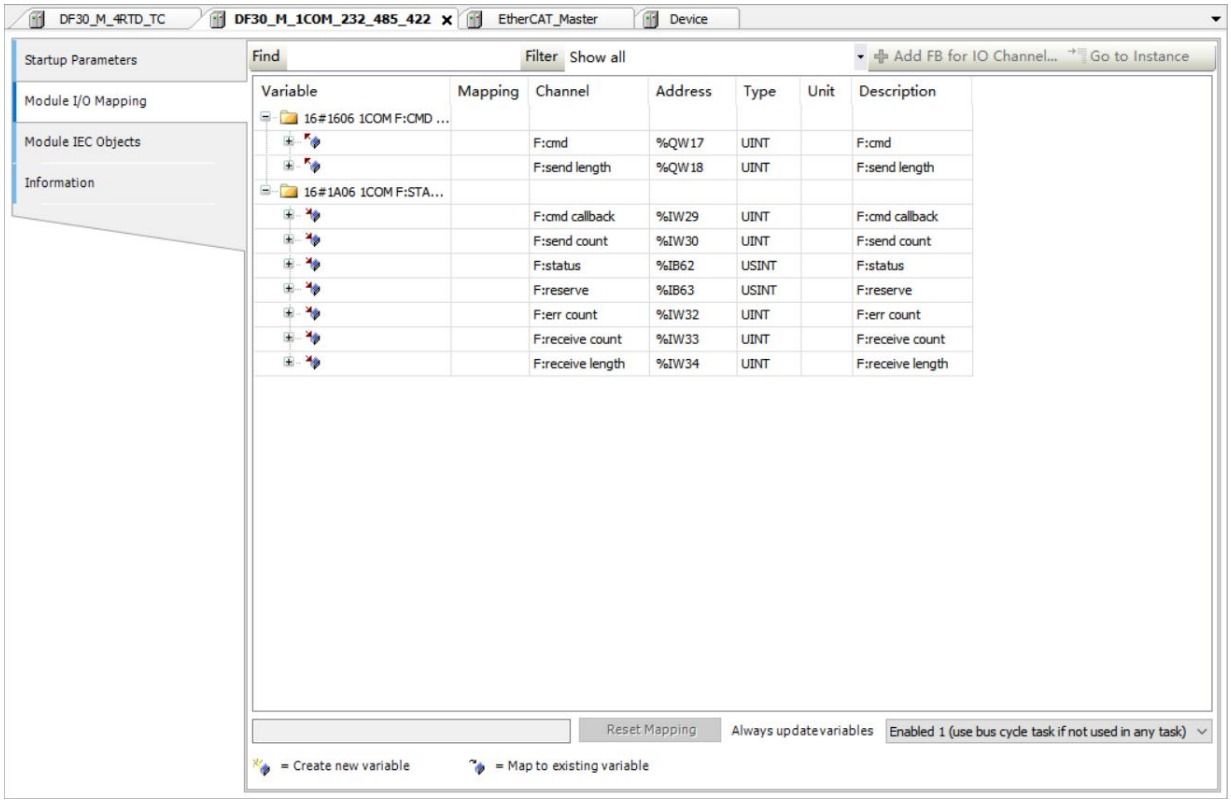
index	16#8000+n*16#10(n=0~31)				
Sub-index	Configuration items	Configuration parameters	Bit length	default value	meaning
1	Port Group	1~6	8	0	Which serial port module does the submodule belong to?
2	M:Slave ID	1~247	8	1	The slave ID that the submodule connects to when

					the master station is active.
3	M: Function Code	1: M:Read Coils (Reading coil) 2: M: Read Discrete Inputs (Reading discrete variables) 5: M: Write Single Coils (Write a single coil) 15: M: Write Multiple Coils (Write multiple coils) 3: M: Read Hold Registers (Read holding register) 4: M: Read Input Registers (Read input register) 6: M:Write Single Hold Register (Write a single holding register) 16: M:Write	8	3	Main site function code

		Multiple Registers (Write to multiple holding registers) 17: M:PDO Settings (Set in PDO)			
4	S: Function Code	0:S:Read Coils (Reading coil) 1: S: Read Hold Registers (Read holding register) 2: S: Write Coils (Write the coil) 3: S: Write Multiple Discrete (Write discrete variables) 4: S: Write Input Registers (Write to input register) 5: S: Write Hold Registers (Write to holding register)	8	1	Slave function code
5	M: 16-bit Data Format	0: A_B 1: B_A	8	0	Main site byte order configuration
index	16#8001+n*16#10(n=0~31)				

1	M/S: Start Address	0~65535	16	0	Register start address
2	M/S: Number of Registers	0~65535	16	0	Register operation count

3. Data monitoring



➢ Output data

index	16#7000 +n*16#10 (n=0~31) (Free mode control word)			
Sub-index	name	type	Bit length	meaning
1	F:cmd	UINT	16	Free mode control output commands Bit0: Send trigger (0->1 takes effect) Bit1: Reset upon completion of operation (0->1 takes effect) Bit2: Check error reset (effective from 0 to

				1) Bit3: Timeout error reset (0->1 takes effect) Bit4: Reset error count (effective from 0 to 1) Bit 5: Reset the number of receive attempts (effective from 0 to 1) Bit 6: Clear received data (0->1 takes effect) Bit7: Reset transmission count (0->1 takes effect) Bits 8-15: Reserved
2	F:send length	UINT	16	Free mode output data length
index	16#7001 + n*16#10 (n=0~31) (8 bytes of data sent in free mode)			
Sub-index	name	type	Bit length	meaning
1	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
8	TX8	USINT	8	Send data 8
index	16#7002 +n*16#10 (n=0~31) (Send 16 bytes of data in free mode)			
Sub-index	name	type	Bit length	meaning
1	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
16	TX16	USINT	8	Send data 16
index	16#7003 +n*16#10 (n=0~31) (32 bytes of data sent in free mode)			
Sub-index	name	type	Bit length	meaning
1	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
32	TX32	USINT	8	Send data 32

index	16#7004 + n*16#10 (n=0~31) (64 bytes of data sent in free mode)			
Sub-index	name	type	Bit length	meaning
1	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
64	TX64	USINT	8	Send data 64
index	16#7005 + n*16#10 (n=0~31) (Sends 128 bytes of data in free mode)			
Sub-index	name	type	Bit length	meaning
1	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
128	TX128	USINT	8	Send data 128

➢ Input data

index	16#6000 + n*16#10 (n=0~31) (Free mode status word)			
Sub-index	name	type	Bit length	meaning
1	F:cmd callback	UINT	16	Read back the free mode control word
2	F:send count	UINT	16	Free mode data transmission count
3	F:status	USINT	8	Free mode status word Bit0: Busy sending status Bit1: Operation completed status Bit2: Verification error status Bit3: Timeout error status Bits 4-7: Reserved
4	F:reserve	USINT	8	reserve
5	F:err count	UINT	16	Free mode error count
6	F:receive count	UINT	16	Free mode receive count
7	F: Receive length	UINT	16	Free mode received data length

index	16#6001 + n*16#10 (n=0~31) (Receives 8 bytes of data in free mode)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
8	RX8	USINT	8	Received data 8
index	16#6002 +n*16#10 (n=0~31) (Receives 16 bytes of data in free mode)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
16	RX16	USINT	8	Received data 16
index	16#6003 +n*16#10 (n=0~31) (Receives 32 bytes of data in free mode)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
32	RX32	USINT	8	Received data 32
index	16#6004 + n*16#10 (n=0~31) (64 bytes of data are received in free mode)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
64	RX64	USINT	8	Received data 64
index	16#6005 + n*16#10 (n=0~31) (Receives 128 bytes of data in free mode)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...

128	RX128	USINT	8	Received data 128

■ **CHxx submodule process data**

➢ Output data

index	16#7000 +n*16#10 (n=0~31) (Channel control word)			
Sub-index	name	type	Bit length	meaning
1	M:cmd	USINT	8	PDO settings for master station channel parameter control words (0->1 takes effect)
2	M:function code	USINT	8	Main site channel function code
3	M:start address	UINT	16	Main station channel starting address
4	M:register num	UINT	16	Number of master station channel registers
index	16#7001 + n*16#10 (n=0~31) (8 bytes of data to be sent via the channel)			
Sub-index	name	type	Bit length	meaning
1	Level	USINT	8	Master station channel data output trigger level
2	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
9	TX8	USINT	8	Send data 8
index	16#7002 +n*16#10 (n=0~31) (Channel sends 16 bytes of data)			
Sub-index	name	type	Bit length	meaning
1	Level	USINT	8	Master station channel data output trigger level
2	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
17	TX16	USINT	8	Send data 16
index	16#7003 + n*16#10 (n=0~31) (Channel sends 32 bytes of data)			
Sub-index	name	type	Bit	meaning

			length	
1	Level	USINT	8	Master station channel data output trigger level
2	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
33	TX32	USINT	8	Send data 32
index	16#7004 + n*16#10 (n=0~31) (64 bytes of data to be sent through the channel)			
Sub-index	name	type	Bit length	meaning
1	Level	USINT	8	Master station channel data output trigger level
2	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
65	TX64	USINT	8	Send data 64
index	16#7005 + n*16#10 (n=0~31) (Channel sends 128 bytes of data)			
Sub-index	name	type	Bit length	meaning
1	Level	USINT	8	Master station channel data output trigger level
2	TX1	USINT	8	Send data 1
...	TX...	USINT	8	Send data...
129	TX128	USINT	8	Send data 128

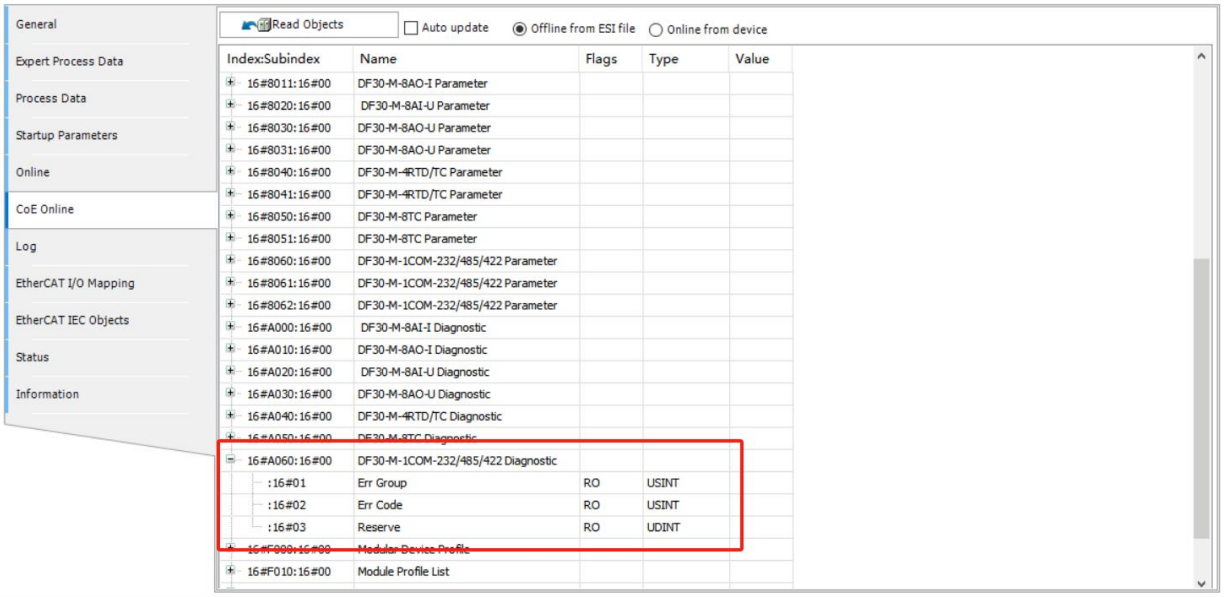
➢ Input data

index	16#6000 +n*16#10 (n=0~31) (Channel status word)			
Sub-index	name	type	Bit length	meaning
1	status	USINT	8	Channel status word 0x00: No errors 0x01: Illegal function code

				0x02: Illegal data address 0x03: Invalid data value 0x04: Internal device failure 0x05: Device delay response 0x06: Device busy 0x08: Memory parity error 0x0C: Communication CRC error 0x0D: Device disconnected
2	reserve	USINT	8	reserve
index	16#6001 + n*16#10 (n=0~31) (Channel receives 8 bytes of data)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
8	RX8	USINT	8	Received data 8
index	16#6002 + n*16#10 (n=0~31) (Channel receives 16 bytes of data)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
16	RX16	USINT	8	Received data 16
index	16#6003 + n*16#10 (n=0~31) (Channel receives 32 bytes of data)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
32	RX32	USINT	8	Received data 32
index	16#6004 + n*16#10 (n=0~31) (Channel receives 64 bytes of data)			
Sub-index	name	type	Bit	meaning

			length	
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
64	RX64	USINT	8	Received data 64
index	16#6005 + n*16#10 (n=0~31) (Channel receives 128 bytes of data)			
Sub-index	name	type	Bit length	meaning
1	RX1	USINT	8	Received data 1
...	RX...	USINT	8	Receive data...
128	RX128	USINT	8	Received data 128

4 Error Diagnosis



View module error messages in the COE online window.

index	16#A000+n*16#10(n=0~31)			
Sub-index	name	type	Bit length	meaning
1	Err Group	USINT	8	0: Indicates a module error; 1-8: Indicates a module channel error.

2	Err Code	USINT	8	Error code
3	Reserve	UDINT	32	reserve

Definition Reference6.1 Fault Code Description

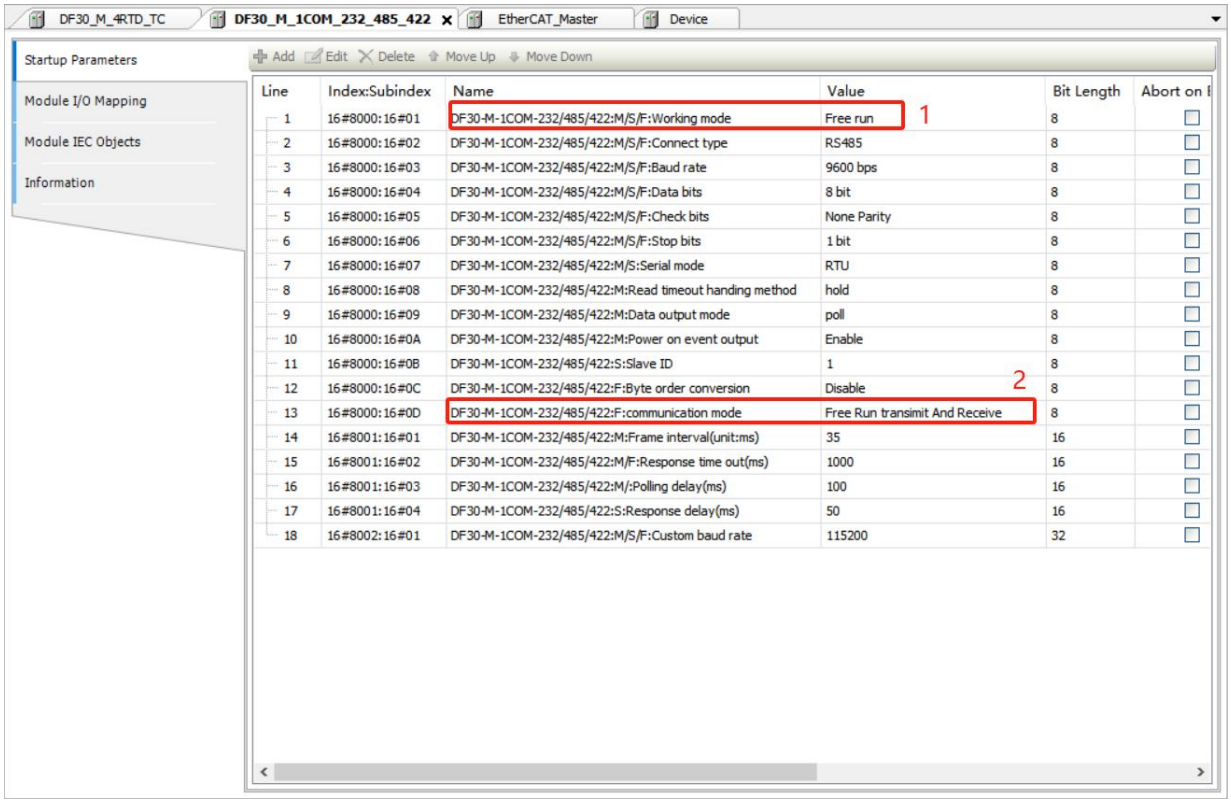
5 Application Cases: Free Mode

Free mode has two data transmission and reception methods: free transmission and reception, and request-response. This article uses RS485 and a baud rate of 115200 bps as an example for testing.

Free to send and receive

(1) Set configuration parameters

Configure the working mode to free mode, configure the corresponding serial port parameters, and set it to free transmit and receive.

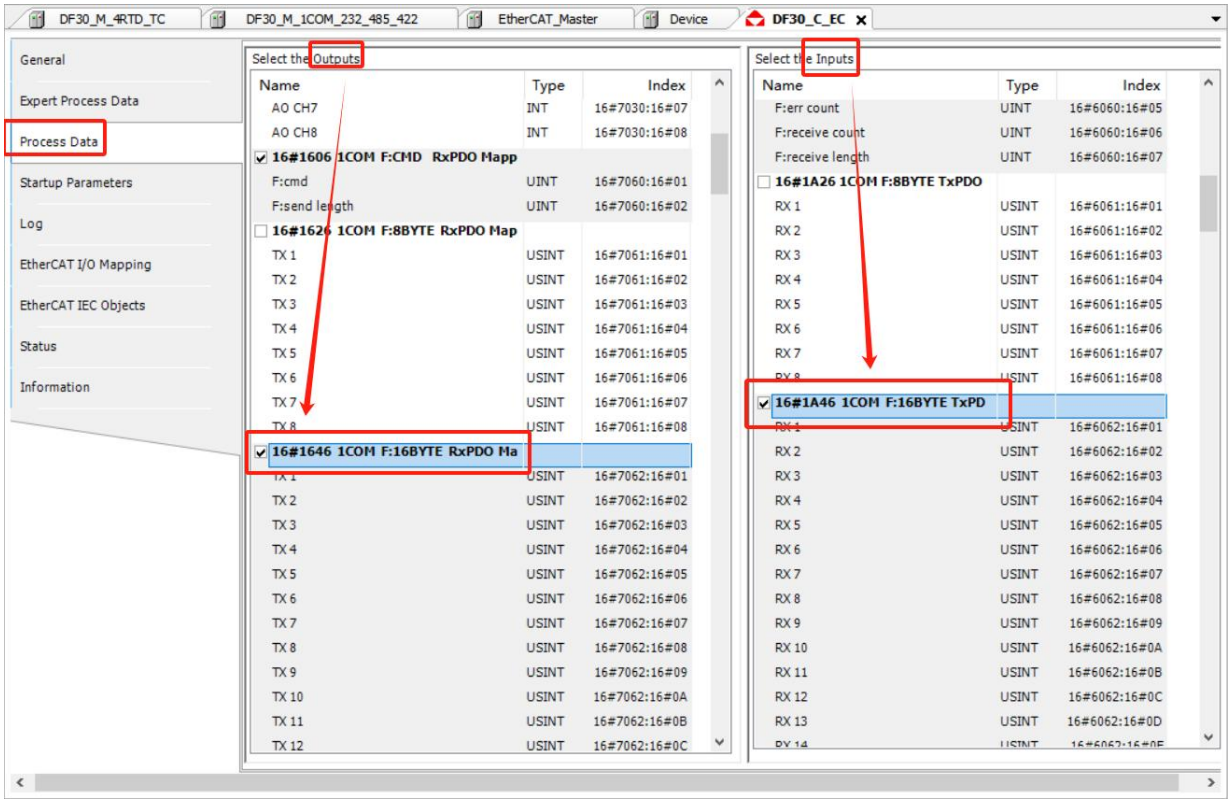


Line	Index:Subindex	Name	Value	Bit Length	Abort on I
1	16#8000:16#01	DF30-M-1COM-232/485/422:M/S/F:Working mode	Free run	8	☐
2	16#8000:16#02	DF30-M-1COM-232/485/422:M/S/F:Connect type	RS485	8	☐
3	16#8000:16#03	DF30-M-1COM-232/485/422:M/S/F:Baud rate	9600 bps	8	☐
4	16#8000:16#04	DF30-M-1COM-232/485/422:M/S/F:Data bits	8 bit	8	☐
5	16#8000:16#05	DF30-M-1COM-232/485/422:M/S/F:Check bits	None Parity	8	☐
6	16#8000:16#06	DF30-M-1COM-232/485/422:M/S/F:Stop bits	1 bit	8	☐
7	16#8000:16#07	DF30-M-1COM-232/485/422:M/S:Serial mode	RTU	8	☐
8	16#8000:16#08	DF30-M-1COM-232/485/422:M:Read timeout handing method	hold	8	☐
9	16#8000:16#09	DF30-M-1COM-232/485/422:M:Data output mode	poll	8	☐
10	16#8000:16#0A	DF30-M-1COM-232/485/422:M:Power on event output	Enable	8	☐
11	16#8000:16#0B	DF30-M-1COM-232/485/422:S:Slave ID	1	8	☐
12	16#8000:16#0C	DF30-M-1COM-232/485/422:F:Byte order conversion	Disable	8	☐
13	16#8000:16#0D	DF30-M-1COM-232/485/422:F:communication mode	Free Run transimit And Receive	8	☐
14	16#8001:16#01	DF30-M-1COM-232/485/422:M:Frame interval(unit:ms)	35	16	☐
15	16#8001:16#02	DF30-M-1COM-232/485/422:M/F:Response time out(ms)	1000	16	☐
16	16#8001:16#03	DF30-M-1COM-232/485/422:M/:Polling delay(ms)	100	16	☐
17	16#8001:16#04	DF30-M-1COM-232/485/422:S:Response delay(ms)	50	16	☐
18	16#8002:16#01	DF30-M-1COM-232/485/422:M/S/F:Custom baud rate	115200	32	☐

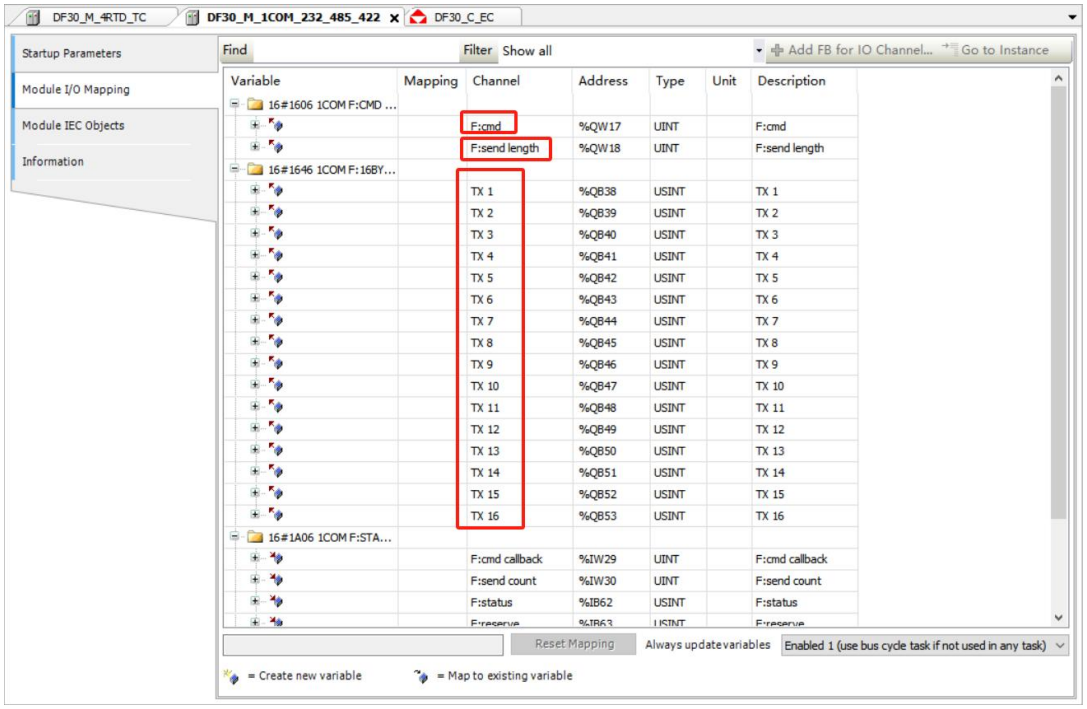
1. Set to: Free Run
2. Set to: Free Run Transmit And Receive

(2) Select the length of data to send and receive.

The PDO length for sending and receiving data can be selected as 8 bytes, 16 bytes, 32 bytes, 64 bytes, or 128 bytes respectively. Choose the appropriate PDO according to the actual amount of data to be sent and received. Here, we take 16 bytes for both sending and receiving as an example.



(3) Data transmission and reception test



F: cmd is triggered by changing from 0 to 1.

F: Send length. Input 1 to send TX1; input 2 to send TX1, TX2, and so on.

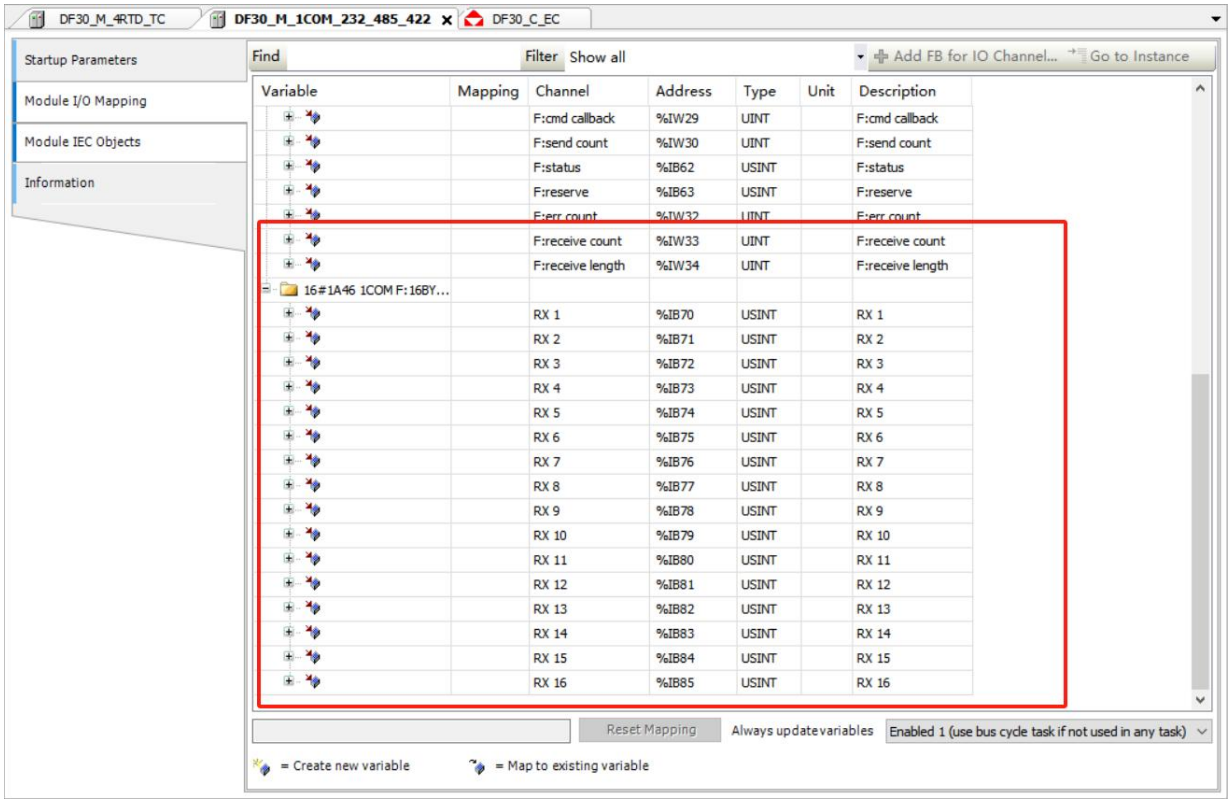
TX1-16 Data Area

	TX 16	%QB53	USINT		TX 16
16#1A06 1COM F:STA...					
	F:cmd callback	%IW29	UINT		F:cmd callback
	F:send count	%IW30	UINT		F:send count
	F:status	%IB62	USINT		F:status
	F:reserve	%IB63	USINT		F:reserve
	F:err count	%IW32	UINT		F:err count
	F:receive count	%IW33	UINT		F:receive count
	F:receive length	%IW34	UINT		F:receive length
16#1A46 1COM F:16BY...					

F:cmd callback provides feedback on the current control word.

The F:status setting sets the busy send flag; it is cleared after sending is complete.

F: send count value

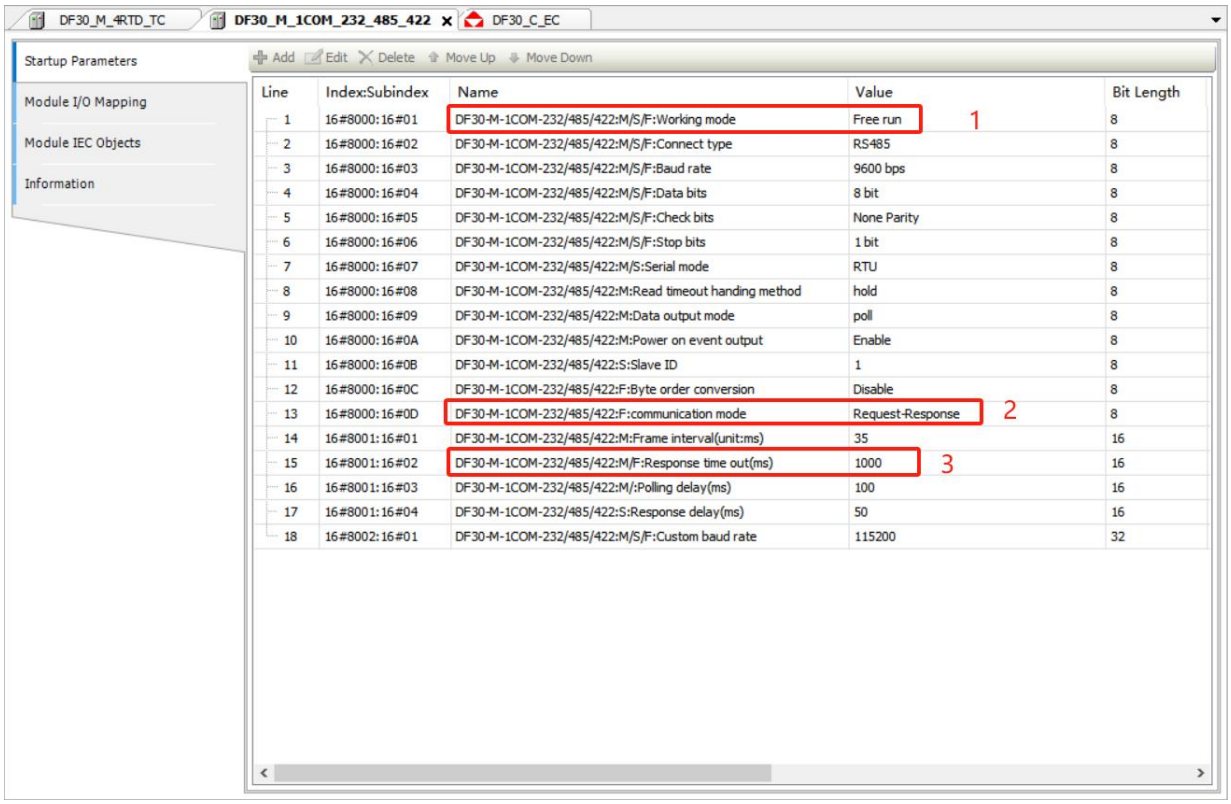


F: Receive count increments by 1 when data is received.

F: Receive Length updates the length of the received data. Value 1 corresponds to RX1; value 2 corresponds to RX1 and RX2; and so on.

Request-Response

The communication method in free mode is configured as request-response, and a response timeout is set.



Line	Index:Subindex	Name	Value	Bit Length
1	16#8000:16#01	DF30-M-1COM-232/485/422:M/S/F:Working mode	Free run	8
2	16#8000:16#02	DF30-M-1COM-232/485/422:M/S/F:Connect type	RS485	8
3	16#8000:16#03	DF30-M-1COM-232/485/422:M/S/F:Baud rate	9600 bps	8
4	16#8000:16#04	DF30-M-1COM-232/485/422:M/S/F:Data bits	8 bit	8
5	16#8000:16#05	DF30-M-1COM-232/485/422:M/S/F:Check bits	None Parity	8
6	16#8000:16#06	DF30-M-1COM-232/485/422:M/S/F:Stop bits	1 bit	8
7	16#8000:16#07	DF30-M-1COM-232/485/422:M/S:Serial mode	RTU	8
8	16#8000:16#08	DF30-M-1COM-232/485/422:M:Read timeout handing method	hold	8
9	16#8000:16#09	DF30-M-1COM-232/485/422:M:Data output mode	poll	8
10	16#8000:16#0A	DF30-M-1COM-232/485/422:M:Power on event output	Enable	8
11	16#8000:16#0B	DF30-M-1COM-232/485/422:S:Slave ID	1	8
12	16#8000:16#0C	DF30-M-1COM-232/485/422:F:Byte order conversion	Disable	8
13	16#8000:16#0D	DF30-M-1COM-232/485/422:F:communication mode	Request-Response	8
14	16#8001:16#01	DF30-M-1COM-232/485/422:M:Frame interval(unit:ms)	35	16
15	16#8001:16#02	DF30-M-1COM-232/485/422:M/F:Response time out(ms)	1000	16
16	16#8001:16#03	DF30-M-1COM-232/485/422:M/:Polling delay(ms)	100	16
17	16#8001:16#04	DF30-M-1COM-232/485/422:S:Response delay(ms)	50	16
18	16#8002:16#01	DF30-M-1COM-232/485/422:M/S/F:Custom baud rate	115200	32

1. Set to Free Run
2. Set as Request Response
3. Timeout setting: 1000ms

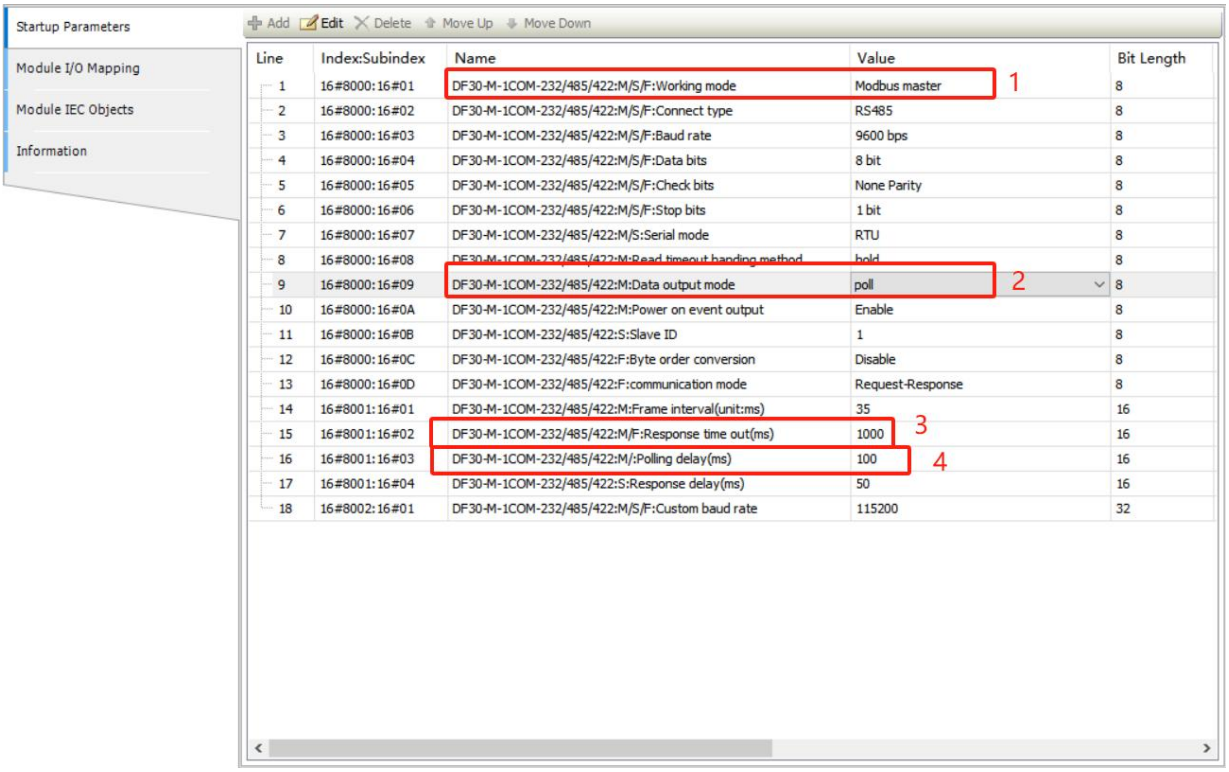
6 Application Cases: Main Site Mode

In master station mode, channel data output methods include polling, event triggering, level triggering, and rising edge triggering.

Polling: Outputs data according to the configured polling time. Event triggering: Outputs data when the output data changes. Level triggering: Outputs data when the Level value in the submodule RXpdo is 1. Rising edge triggering: Outputs data once when the Level value in the submodule RXpdo changes from 0 to 1.

This example demonstrates the use of one serial port module and one 16DI.

(1) Set configuration parameters



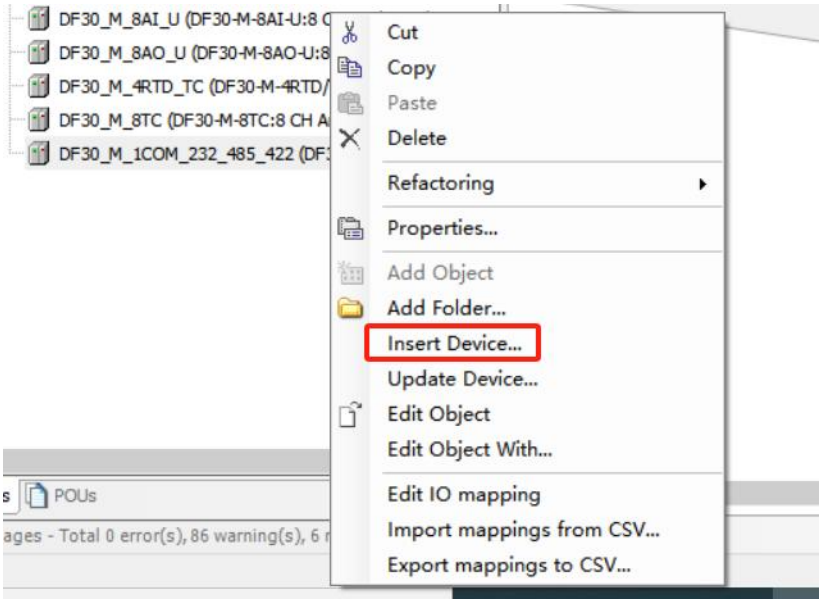
Line	Index:Subindex	Name	Value	Bit Length
1	16#8000:16#01	DF30-M-1COM-232/485/422:M/S/F:Working mode	Modbus master	8
2	16#8000:16#02	DF30-M-1COM-232/485/422:M/S/F:Connect type	RS485	8
3	16#8000:16#03	DF30-M-1COM-232/485/422:M/S/F:Baud rate	9600 bps	8
4	16#8000:16#04	DF30-M-1COM-232/485/422:M/S/F:Data bits	8 bit	8
5	16#8000:16#05	DF30-M-1COM-232/485/422:M/S/F:Check bits	None Parity	8
6	16#8000:16#06	DF30-M-1COM-232/485/422:M/S/F:Stop bits	1 bit	8
7	16#8000:16#07	DF30-M-1COM-232/485/422:M/S:Serial mode	RTU	8
8	16#8000:16#08	DF30-M-1COM-232/485/422:M:Read timeout handing method	hold	8
9	16#8000:16#09	DF30-M-1COM-232/485/422:M:Data output mode	poll	8
10	16#8000:16#0A	DF30-M-1COM-232/485/422:M:Power on event output	Enable	8
11	16#8000:16#0B	DF30-M-1COM-232/485/422:S:Slave ID	1	8
12	16#8000:16#0C	DF30-M-1COM-232/485/422:F:Byte order conversion	Disable	8
13	16#8000:16#0D	DF30-M-1COM-232/485/422:F:communication mode	Request-Response	8
14	16#8001:16#01	DF30-M-1COM-232/485/422:M:Frame interval(unit:ms)	35	16
15	16#8001:16#02	DF30-M-1COM-232/485/422:M/F:Response time out(ms)	1000	16
16	16#8001:16#03	DF30-M-1COM-232/485/422:M/:Polling delay(ms)	100	16
17	16#8001:16#04	DF30-M-1COM-232/485/422:S:Response delay(ms)	50	16
18	16#8002:16#01	DF30-M-1COM-232/485/422:M/S/F:Custom baud rate	115200	32

1. Mode setting: Modbus master
2. Data output settings: Polling
3. Timeout for waiting for slave response: 1000ms
4. Output polling time: 100ms

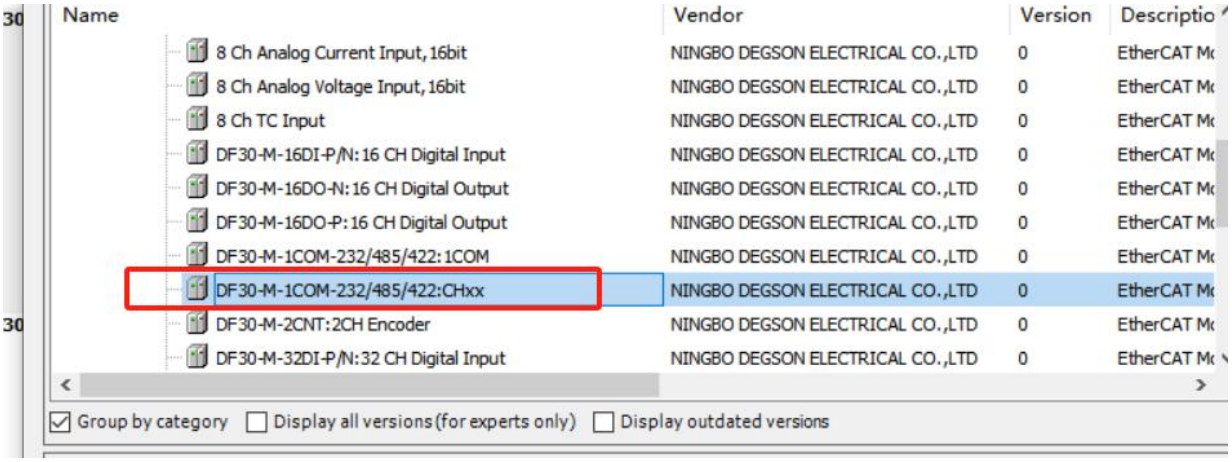
(2) Add submodule

A single serial port module supports a maximum of 18 sub-modules. Sub-modules must be manually added after all physically mounted modules scanned in, and can only be added at the very end; they cannot be added elsewhere. This article uses adding two sub-modules as

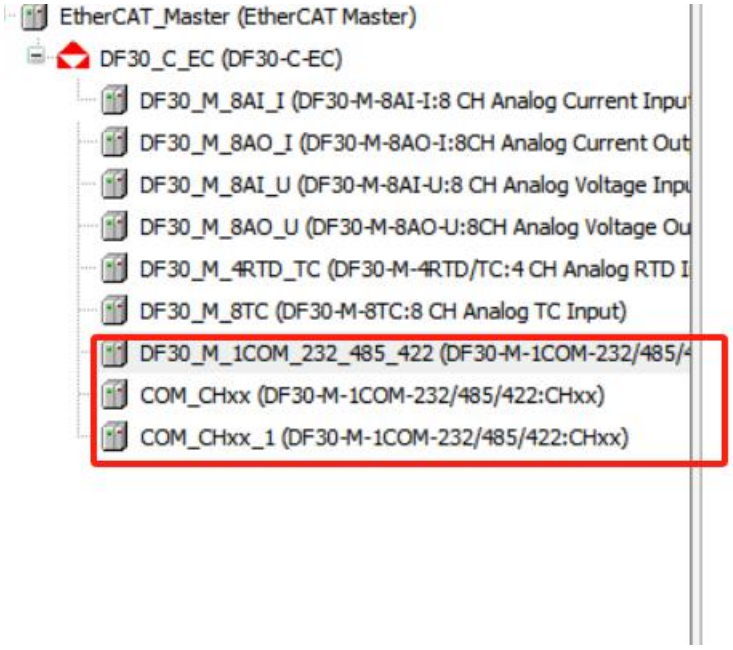
an example. One sub-module writes to four holding registers, and the other reads from four holding registers, with the slave ID set to 1 for both.



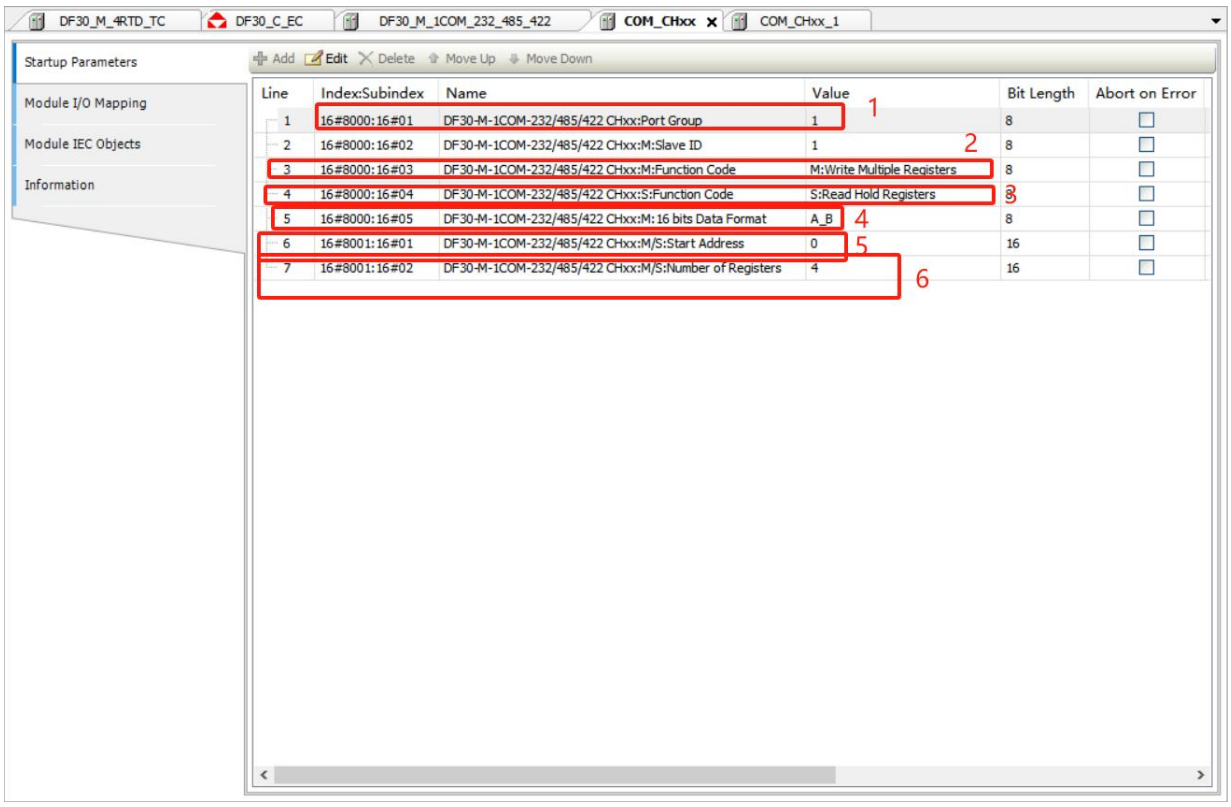
Select DF30-M-1COM-232/485/422:CHxx



After adding, it will look like this.



Parameter settings for the first submodule:The submodule writes to four holding registers, so the output data is selected as 8 bytes.

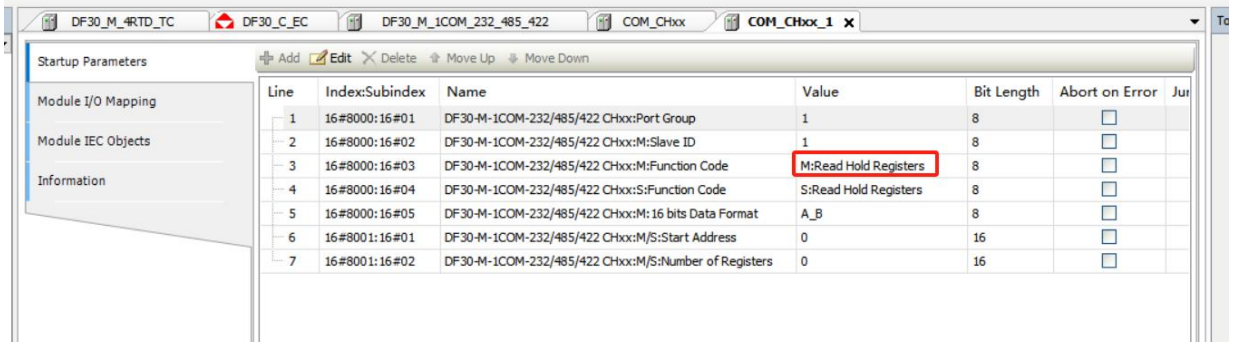


1. Which serial port module does the submodule belong to?
2. Master station mode: Configured as a write register
3. Slave mode: Configured for reading the register (not set here)
4. Submodule data byte order setting

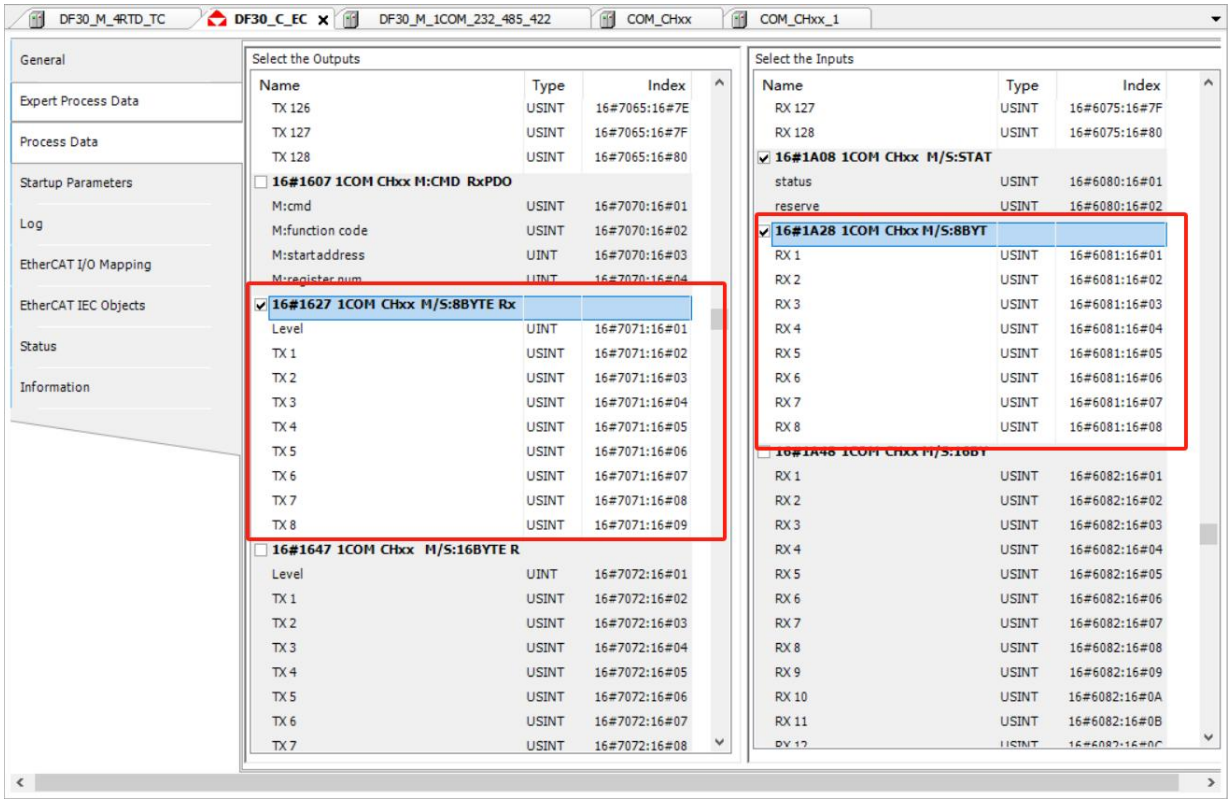
5. Starting address

6. Number of registers

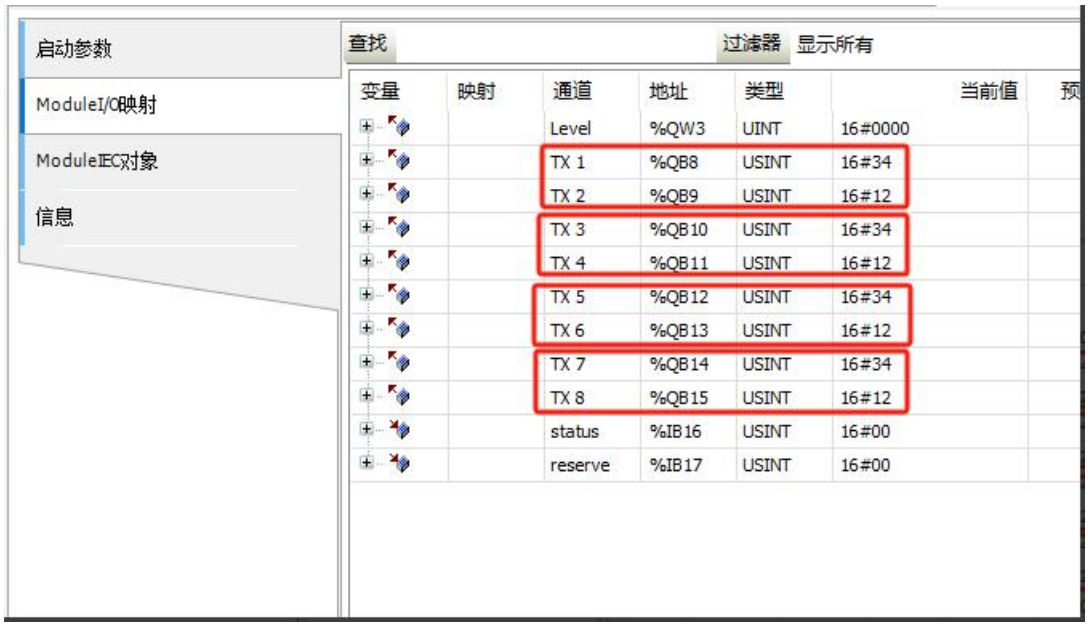
Parameter settings for the second submodule:The submodule reads four holding registers, so the input data is selected as 8 bytes.

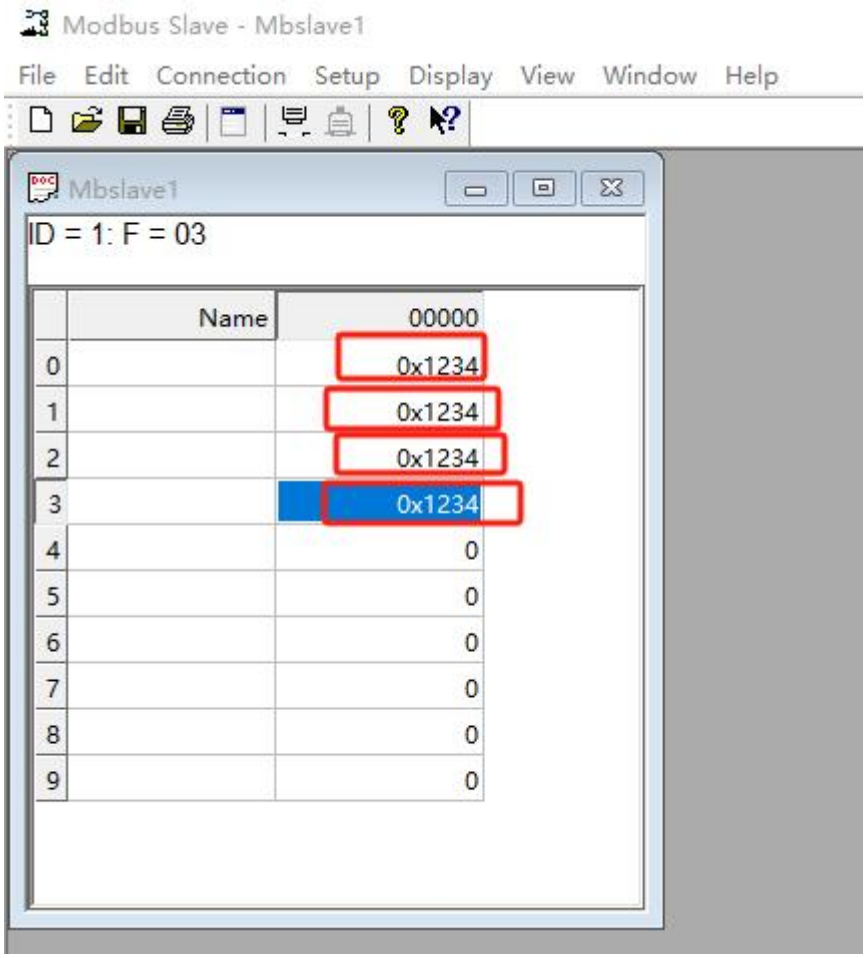


Submodule functionality set asRead function code

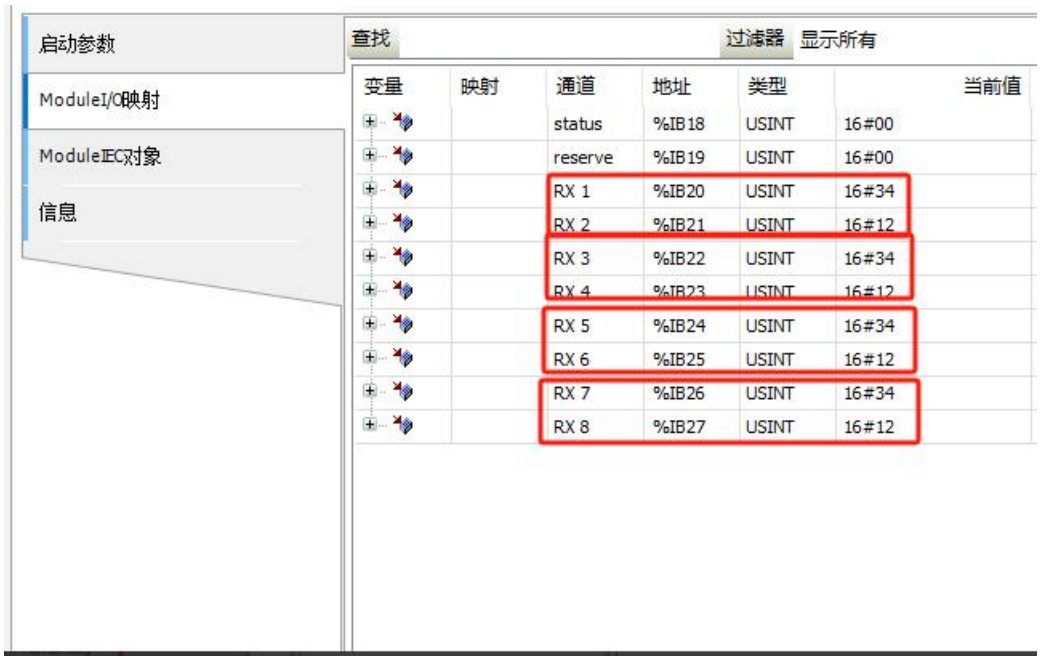


After the slave station is connected, the submodule status is restored to 0x00, and 0x1234 is written to all four holding registers of the slave station through the first submodule.



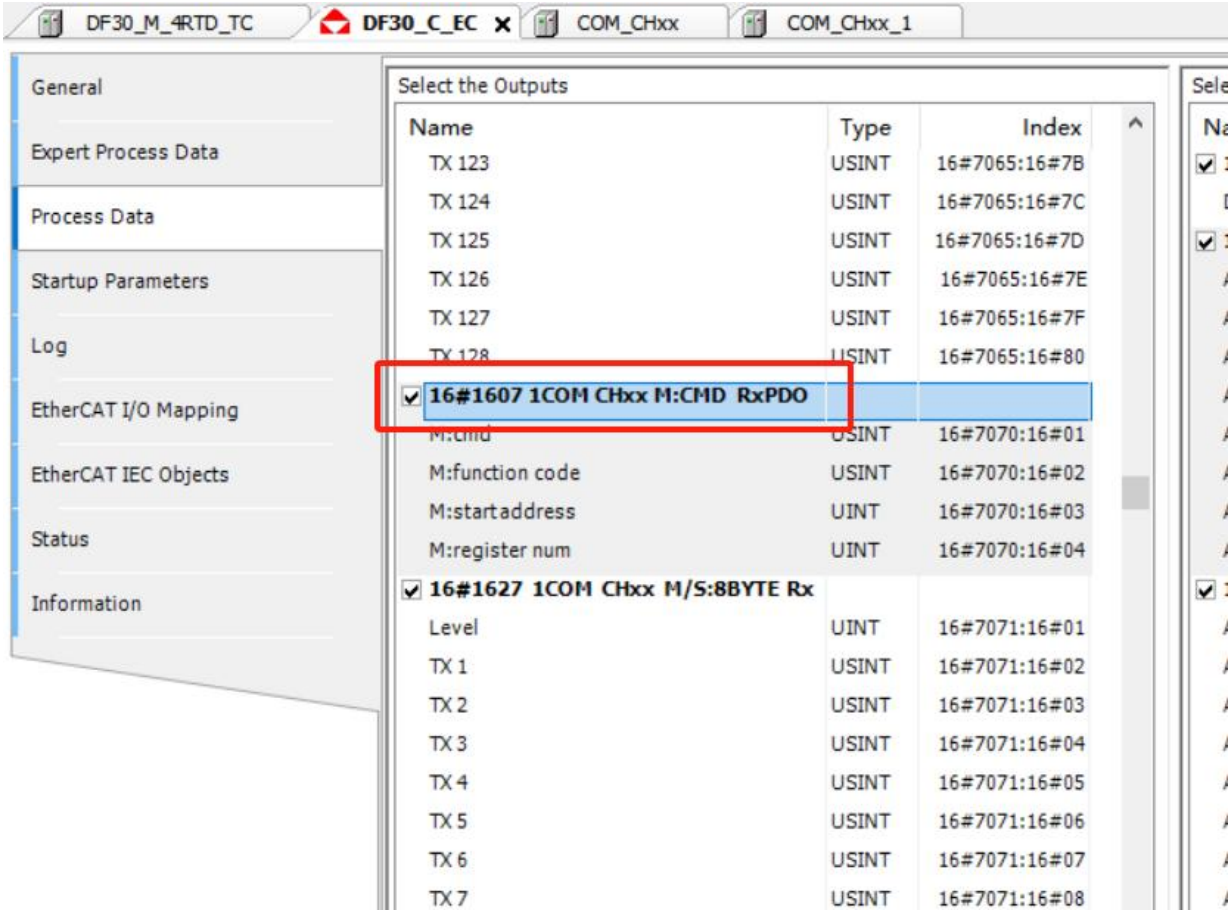


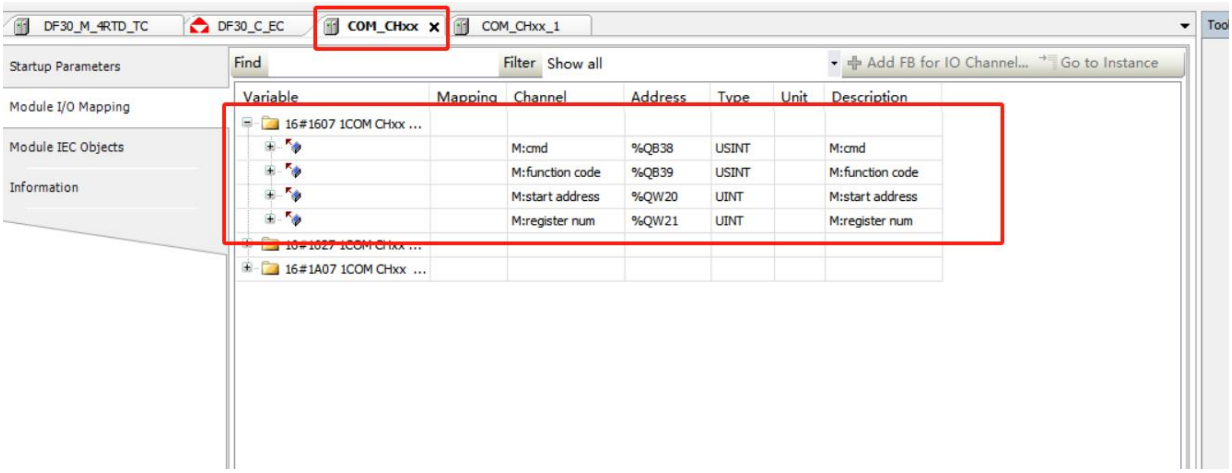
The four holding register values read from the second submodule were all 0x1234.



Submodule PDO settings

In the submodule's configuration options, the master mode function code is configured as: M:PDO. After setting, it is possible to configure the submodule function code, starting address, and number of registers in PDO.





Change M:cmd from 0 to 1 to make the settings take effect.

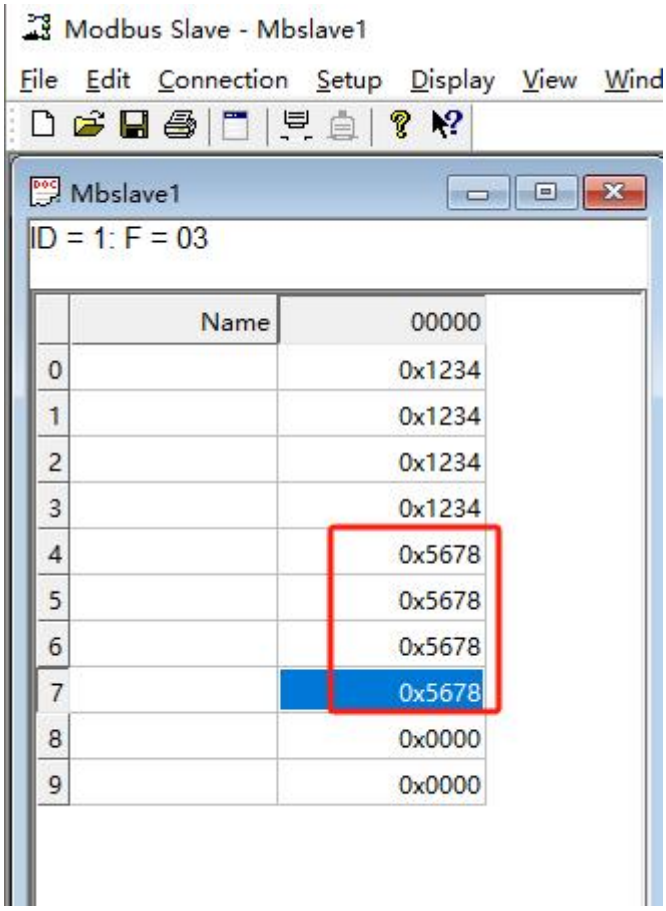
M: Function code 16 (write multiple holding registers) of the data area setting submodule.

M:start address (4)

M:register num Number of registers 4

The slave station's holding registers 4, 5, 6, and 7 were all written to 0x5678.

All data read from the station became 0x5678.

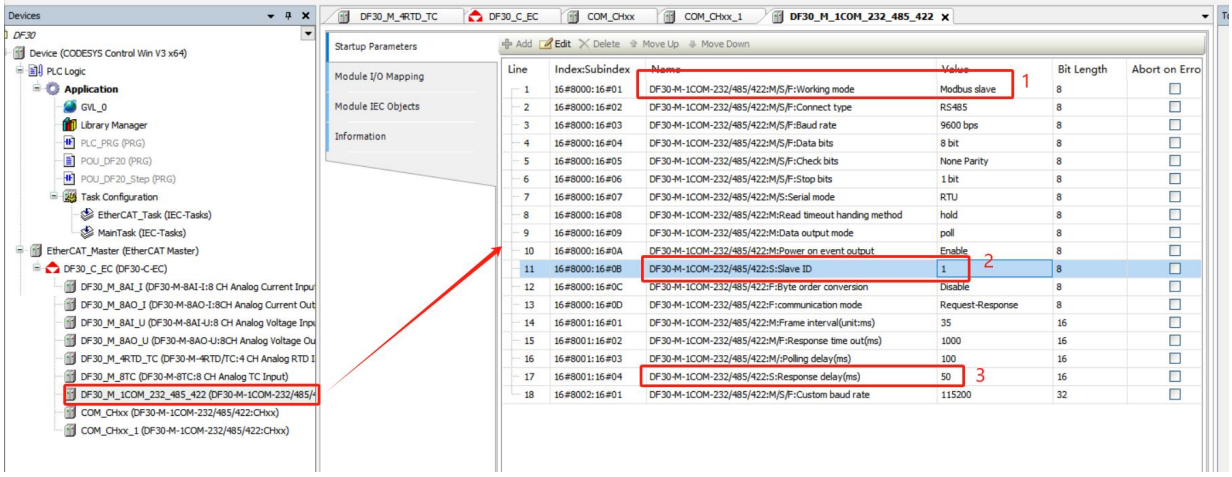


7 Application Case: Slave Mode

The operand addresses and sizes of each register when acting as a slave are shown in the table below:

Register Name	Starting address	End address	Number of registers
coil	0	1023	1024
Discrete variables	0	1023	1024
Input register	0	127	128
Holding register	0	127	128

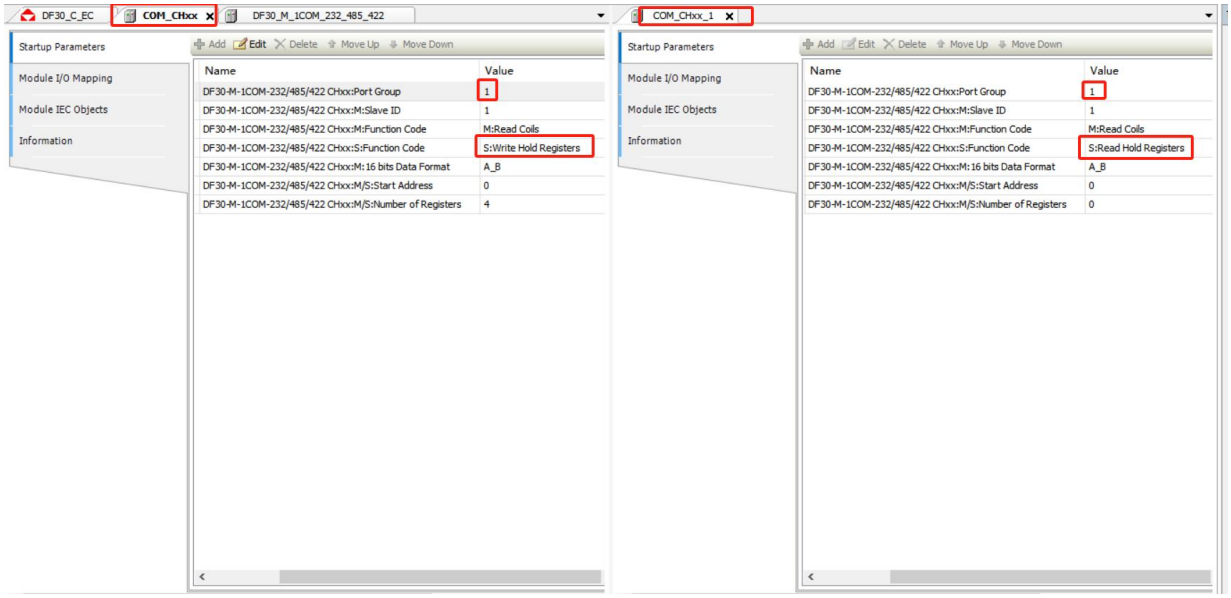
(1) Set configuration parameters



1. Set as Modbus slaves
2. Set Slave ID to 1
3. Set the response delay to 50ms

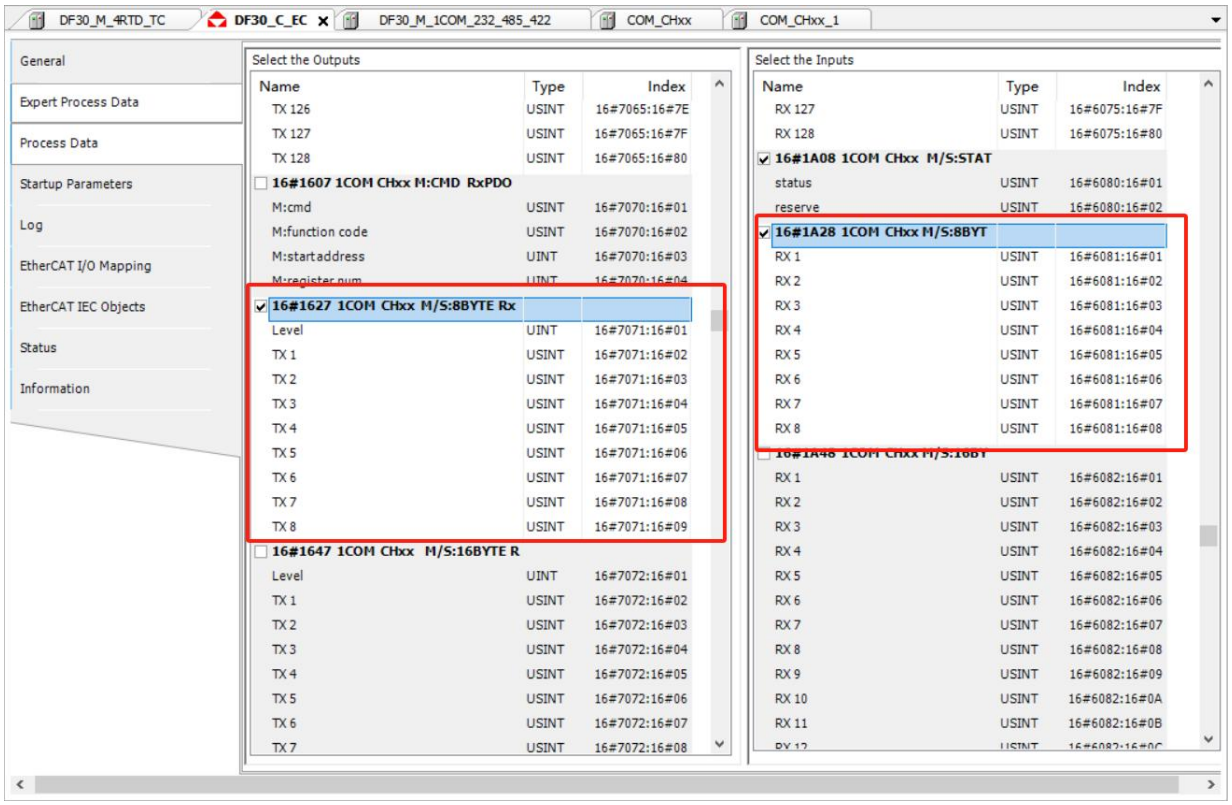
(2) Add submodule

A single serial port module supports a maximum of 18 sub-modules. Sub-modules must be manually added after all physically mounted modules scanned in, and can only be added at the very end; they cannot be added elsewhere. This article uses adding two sub-modules as an example. One sub-module writes to four holding registers, and the other sub-module reads from four holding registers.



The submodules have input and output data lengths of 8 bytes, 16 bytes, 32 bytes, 64 bytes, and 128 bytes respectively. The first submodule writes to 4 holding registers, so the output

data is 8 bytes. The second submodule reads from 4 holding registers, so the input data is 8 bytes.



The first submodule writes 0x1234 to all four holding registers.

The four holding register values read from the second submodule are all 0x1234.

6 Appendix

6.1 Fault Code Description

Fault location	Fault Name	Fault Codes	Solution/Cause
Coupler	The protocol stack did not scan the module.	1	Check if the module is inserted firmly and if the clips are fastened securely.
	Module quantity exceeded	2	Check the number of backplane modules
	The configured IO module does not match the actual card being scanned.	3	Check whether the configuration module model and sequence are consistent with the actual modules.
	Configuration list not downloaded	4	
	Hot-swap failed, module model incorrect.	5	Check if the signals of the newly plugged-in/unplugged module are consistent with the original signals.
Module	Backplane bus timeout	1	Check if the module is installed correctly.
	Flash read failure	3	Reconnect the power or contact the supplier.
	Configuration parameter error	4	Check if the configuration parameters are reasonable.
	Power supply failure	5	Check power supply
	ADC anomaly	6	Reconnect the power or contact the supplier.

	DAC error	7	Reconnect the power or contact the supplier.
aisle	Overcurrent	1	Check if the load is too high.
	Overheating	2	Check external wiring and whether the load is too high.
	Short circuit	3	Check the external wiring of the channel
	Open circuit/disconnection	4	Check the external wiring of the channel
	overflow	5	Check if the external input signal is normal.
	overflow	6	Check if the external input signal is normal.
	Exceeding the limit	7	Check if the external input signal is normal.
	Below the lower limit	8	Check if the external input signal is normal.
	Sensor type error	9	Check if the connected sensors and configuration items match.

6.2 Correspondence between code value and voltage or current

Code value -20000~20000				
signal range	Current value (I)	Decimal data	Scope Description	Transformation Relationship
0~20ma	>24ma	32767	overflow	D = 20000 x I / 20 I = D x 20 / 20000
	20mA~24mA	20,000 ~ 24,000	Exceeding the limit	
	0ma~20ma	0 ~ 20000	Normal range	
	<0ma	0	/	

0~10mA	>12.5ma	32767	overflow	D = 20000 x I / 10 I = D x 10 / 20000
	10ma~12.5ma	20,000 ~ 25,000	Exceeding the limit	
	0~10mA	0 ~ 20000	Normal range	
	<0ma	0	/	
4~20ma	>24ma	32767	overflow	D = 20000 x (I - 4) / 16 I = D x 16 / 20000 + 4
	20mA~24mA	20,000 ~ 25,000	Exceeding the limit	
	4ma~20ma	0 ~ 20000	Normal range	
	2ma~4ma	-2500 ~ 0	Below the lower limit	
	<2ma	-32768	Broken wire	
signal range	Voltage value (U)	Decimal data	Scope Description	Transformation Relationship
±10V	>12V	32767	overflow	D = 20000 x U / 10 U = D x 10 / 20000
	10~12V	20000~24000	Exceeding the upper limit range	
	-10V~+10V	-20000~20000	Normal range	
	-12~-10V	-24000~-0000	Beyond the lower limit range	
	<-12V	-32767	overflow	
0~10V	>12V	32767	overflow	D = 20000 x U / 10 U = D x 10 / 20000
	10~12V	20000~24000	Exceeding the upper limit range	

	0~10V	0~20000	Normal range	
	<0V	0		
2~10V	>11.6V	32767	overflow	D = 20000 x (U - 2) / 8 U = D x 8 / 20000 + 2
	10~11.6V	20000~24000	Exceeding the upper limit range	
	2~10V	0~20000	Normal range	
	0.4~2V	-4000~0	Below the lower limit	
	<0.4V	-32768	Broken wire	
±5V	>6V	32767	overflow	D = 20000 x U / 5 U = D x 5 / 20000
	5~6V	20000~24000	Exceeding the limit	
	-5V~5V	-20000~20000	Normal range	
	-6-5V	-24000~-0000	Below the lower limit	
	<-6V	-32767	overflow	
0~5V	>6V	32767	overflow	D = 20000 x U / 5 U = D x 5 / 20000
	5~6V	20000~24000	Exceeding the upper limit range	
	0~5V	0~20000	Normal range	
	<0V	0		
1~5V	>5.8V	32767	overflow	D = 20000 x (U-1) / 4 U = D x 4 / 20000 + 1
	5~5.8V	20000~24000	Exceeding the upper limit range	

	1~5V	0~20000	Normal range	
	0.2~1V	-4000~0	Below the lower limit	
	<0.2V	-32768	Broken wire	
Code value -32000~32000				
signal range	Current value (I)	Decimal data	Scope Description	Transformation Relationship
0~20ma	>20.4ma	32767	overflow	D = 32000 x I / 20 I = D x 20 / 32000
	20ma~20.4ma	32000 ~ 32640	Exceeding the limit	
	0ma~20ma	0 ~ 32000	Normal range	
	<0ma	0	/	
0~10mA	>10.2ma	32767	overflow	D = 32000 x I / 10 I = D x 10 / 32000
	10ma~10.2ma	32000 ~ 32640	Exceeding the limit	
	0~10mA	0 ~ 32000	Normal range	
	<0ma	0	/	
4~20ma	>20.32ma	32767	overflow	D = 32000 x (I - 4) / 16 I = D x 16 / 32000 + 4
	20ma~20.32ma	32000 ~ 32640	Exceeding the limit	
	4ma~20ma	0 ~ 32000	Normal range	
	3.2mA~4mA	-1600 ~ 0	Below the lower limit	
	<3.2ma	-32768	Broken wire	
signal range	Voltage value (U)	Decimal data	Scope Description	Transformation Relationship
±10V	>10.2V	32767	overflow	D = 32000 x U / 10

	10~10.2V	32000~32640	Exceeding the upper limit range	U = D x 10 / 32000
	-10V~+10V	-32000~32000	Normal range	
	-10.2~-10V	-32640~-32000	Exceeding the upper limit range	
	<-10.2V	-32767	overflow	
	>10.2V	32767	overflow	
0~10V	>10.2V	32767	overflow	D = 32000 x U / 10 U = D x 10 / 32000
	10~10.2V	32000~32640	Exceeding the upper limit range	
	0~10V	0~32000	Normal range	
	<0V	0		
2~10V	>10.16V	32767	overflow	D = 32000 x (U - 2) / 8 U = D x 8 / 32000 + 2
	10~10.16V	32000~32640	Exceeding the upper limit range	
	2~10V	0~32000	Normal range	
	1.6~2V	-1600~0	Below the lower limit	
	<1.6V	-32768	Broken wire	
±5V	>5.1V	32767	overflow	D = 32000 x U / 5 U = D x 5 / 32000
	5~5.1V	32000~32640	Exceeding the limit	
	-5V~5V	-32000~32000	Normal range	

	-5.1~-5V	-32640~-32000	Below the lower limit	
	<-5.1V	-32767	overflow	
0~5V	>5.1V	32767	overflow	D = 32000 x U / 5 U = D x 5 / 32000
	5~5.1V	32000~32640	Exceeding the upper limit range	
	0~5V	0~32000	Normal range	
	<0V	0		
1~5V	>5.08V	32767	overflow	D = 32000 x (U-1) / 4 U = D x 4 / 32000 + 1
	5~5.08V	32000~32640	Exceeding the upper limit range	
	1~5V	0~32000	Normal range	
	0.8~1V	-1600~0	Below the lower limit	
	<0.8V	-32768	Broken wire	
Code value -27648~27648				
signal range	Current value (I)	Decimal data	Scope Description	Transformation Relationship
0~20ma	>23.52ma	32767	overflow	D = 27648 x I / 20 I = D x 20 / 27648
	20ma~23.52ma	27648 ~ 32511	Exceeding the limit	
	0ma~20ma	0 ~ 27648	Normal range	
	<0ma	0	/	
0~10mA	>11.76ma	32767	overflow	D = 27648 x I / 10

	10ma~11.76ma	27648 ~ 32511	Exceeding the limit	I = D x 10 / 27648
	0~10mA	0 ~ 27648	Normal range	
	<0ma	0	/	
4~20ma	>22.81ma	32767	overflow	D = 27648 x (I - 4) / 16 I = D x 16 / 27648 + 4
	20ma~22.81ma	27648 ~ 32511	Exceeding the limit	
	4ma~20ma	0 ~ 27648	Normal range	
	1.19ma~4ma	-4864~ 0	Below the lower limit	
	<1.19ma	-32768	Broken wire	
signal range	Voltage value (U)	Decimal data	Scope Description	Transformation Relationship
±10V	>11.76V	32767	overflow	D = 27648 x U / 10 U = D x 10 / 27648
	10~11.76V	27648~32511	Exceeding the upper limit range	
	-10V~+10V	-27648~27648	Normal range	
	-11.76~-10V	-32511~-27648	Beyond the lower limit range	
	<-11.7V	-32767	overflow	
0~10V	>11.76V	32767	overflow	D = 27648 x U / 10 U = D x 10 / 27648
	10~11.76V	27648~32511	Exceeding the upper limit range	
	0~10V	0~27648	Normal range	

	<0V	0		
2~10V	>11.41V	32767	overflow	D = 27648 x (U - 2) / 8 U = D x 8 / 27648 + 2
	10~11.41V	27648~32511	Exceeding the upper limit range	
	2~10V	0~27648	Normal range	
	0.59V~2V	-4864~0	Below the lower limit	
	<0.59V	-32768	Broken wire	
±5V	>5.88V	32767	overflow	D = 27648 x U / 5 U = D x 5 / 27648
	5~5.88V	27648~32511	Exceeding the limit	
	-5V~5V	-27648~27648	Normal range	
	-5.88~-5V	-32511~-27648	Below the lower limit	
	<-5.88V	-32767	overflow	
0~5V	>5.88V	32767	overflow	D = 27648 x U / 5 U = D x 5 / 27648
	5~5.88V	27648~32511	Exceeding the upper limit range	
	0~5V	0~27648	Normal range	
	<0V	0		
1~5V	>5.7V	32767	overflow	D = 27648 x (U-1) / 4 U = D x 4 / 27648 + 1
	5~5.7V	27648~32511	Exceeding the upper limit range	
	1~5V	0~27648	Normal range	

	0.3~1V	-4864~0	Below the lower limit	
	<0.3V	-32768	Broken wire	