DF20-C-EN-IP
Adapter
User Manual

V2.0.2

2024.9.29

Version History

date	Version	describe
2024/7/26	v1.0.0	Release version
2024/8/20	v2.0.0	Add DF20-M-1COM-232/485/422 module parameters and check other parameters
2024/9/23	v2.0.1	Added DF20-M-2CNT-EL-5, DF20-M-2CNT-EL-4, DF20-M-2PWM module parameters
2024/9/29	v2.0.2	Improve the wiring diagram of DF20-M-2CNT-EL-5 and DF20-M-2CNT-EL-4

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1 Product Overview

- Distributed RemoteIOThe system consists of network adapter modules and expansion IO Module composition.
- The network adapter module is responsible for fieldbus communication and realizes communication connection with the master station controller.
- Select the corresponding bus module according to the communication interface of the system. The mainstream industrial communication protocols include EtherCAT 、 EtherNetIP 、 Profibus-DP 、 Modbus/TCP、EtherNet/IPwait.
- ExtensionsIOThe module is responsible for connecting to the on-site input and output sensors.IOThe module collects various signals on site and transmits them through internal

The controller reads the data from the adapter through the field bus and processes it, then writes the output data to the network adapter, which then writes the output data to the output through the internal bus.IOModules to achieve device control.IOModules are divided into9Major categories: digital input module, digital output module, digital input and output mixed module, analog input module, analog output module, temperature input module, pressure sensor input module, pulse counting module, auxiliary module, etc.

- Network adapters and extensionsIOModules can be freely combined according to site requirements. DistributedIOModules can achieve lower cost requirements.
- This manual is mainly aimed atEtherNet/IPSeries of distributedIOThe usage of is explained.

1.1 Product Features

- Occupies fewer nodes, one node has oneEtherNet/IPadapter,1~32indivualIOmodule and an end baffle.
- Flexible configuration, multiple typesIOModules can be combined in any way.
- Easy to use, eachIOEach module has independent function modules, which can be directly loaded into the configuration system according to the actual topology structure, making configuration convenient.

Easy to get started.

- ExtensionsIOThe module is rich in functions.IOThe modules include digital quantity, analog quantity, temperature, pressure, pulse and other types, which can be flexibly combined and expanded.

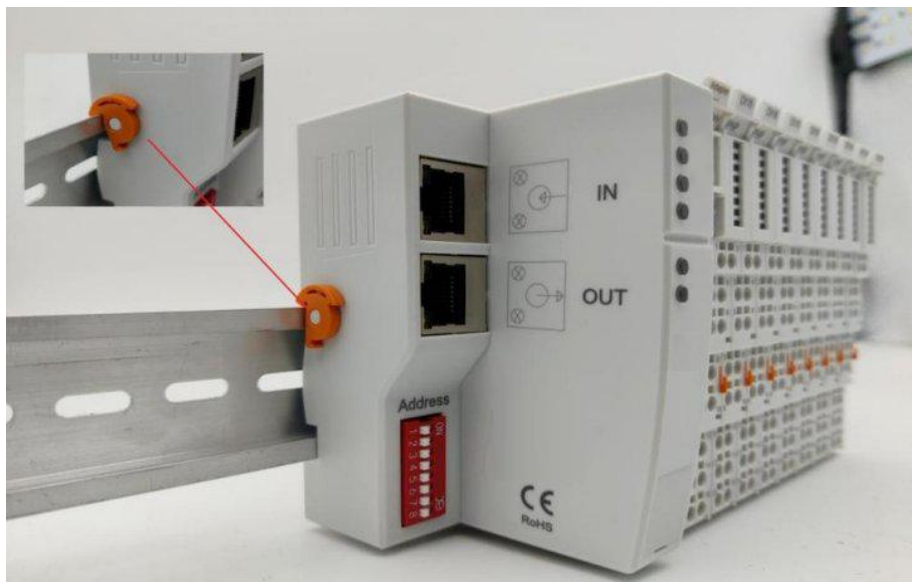
Can be used in different occasions. Strong compatibility, the adapter communication interface complies withEtherNet/IPCommunication standards, support KEYENCE, OMRON, Schneider and other mainstreamEtherNet/IPMain StationPLC.

- Support module parameter configuration.
- Supports error diagnosis, the adapter is marked with an error indicator light, and each module also supports a fault alarm function, making detection and maintenance simple and convenient.

1.2 Product Installation and Removal

- When the module is installed,DINThe rail lock can be safely and securely installed on35 mm DINOn the rail, there is also a

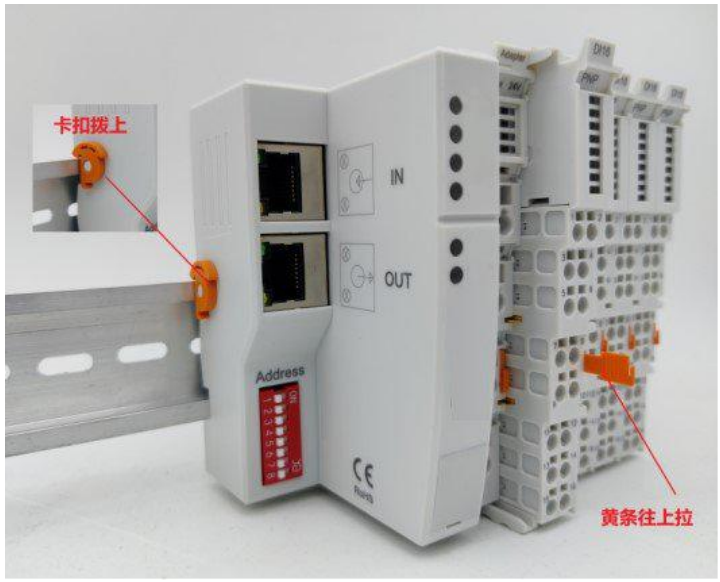
A manual buckle is used to lock the guide rail. When installing the module, you need to align it with the notch and push the module in the direction of the arrow.DINThe module is placed on theDINOn the rail.



picture1-1

- When disassembling a module, first remove all signal cables or power cables from the module, then pull the latch in the direction of the arrow (the yellow part in the figure below).

When removing the adapter module, you also need to open the rail lock counterclockwise.



picture1-2

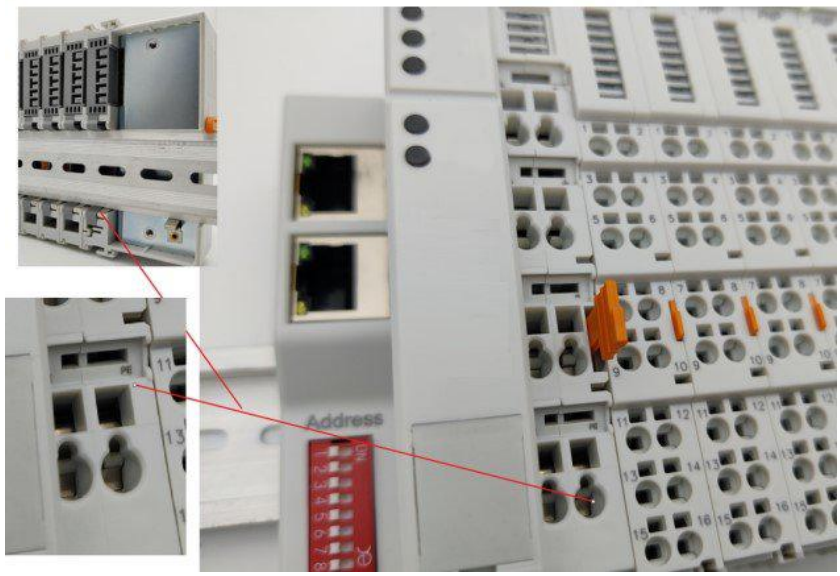
1.3 Product installation dimensions

- Adapter module installation dimensions:100mm × 48mm × 69mm
- IOModule installation dimensions:100mm × 12mm × 67mm

1.4 Grounding protection

- There is a metal spring on the back of the module, which is used to effectively ground the rail. The metal spring and the adapter module

Grounding PEThe interior is connected.



picture1-3

2 Network adapters

- DF20-C-EN-IPNetwork adapters support standardEtherNet/IP IO DeviceDevice communication. The adapter has twoEtherNet/IPbus

Interface. Can be adapted to most of Keyence, Omron, Schneider, etc.EtherNet/IPMaster station. Small footprint, fast speed, easy wiring, and simple configuration.

2.1 Adapter Technical Parameters

Adapter technical parameters		
Product Model	DF20-C-EN-IP	
Bus protocol	EtherNet/IP	
Number of slaves	According to the master station settings	
Data transmission	Category 5 twisted pair	
Transmission	100m(Distance between stations)	
Bus speed	100Mbps	
Bus interface	2*RJ45	
System Power	Power Input	24V DC (18~36V)
	Power Output	5V DC/2A
Common power	24V DC (±20%)/8A	
Slave Error	support	
Vibration Testing	1g,conform toIEC 60068-2-6standard	
Shock Test	15g,conform toIEC 60068-2-27standard	
Electromagnetic	conform toEN 61000-4standard	
Protection level	IP20	
Operating	-25~75℃	
Storage temperature	-40℃~+85℃	
Relative humidity	5~95%RH(No condensation)	
Dimensions	100mm × 48mm × 69mm	
Pollution degree	2Level, in line withIEC 61131-2standard	
Corrosion resistance	conform toIEC 60068-2-42andIEC 60068-	
Operating altitude	0~2000m	

2.2 Adapter Wiring Diagram

- As shown in the figure is the adapter wiring diagram, the user needs to isolate the two groups according to the wiring diagram.24VPower access system power transmission

Ingress Port(SYS_24VPorts andSYS_0Vport)With the common power input port (Filed_24VPorts andFiled_0VThere are two groups of common power input ports, and it is recommended that users connect all of them. In addition, a group of safety ground wires and network communication cables need to be connected.

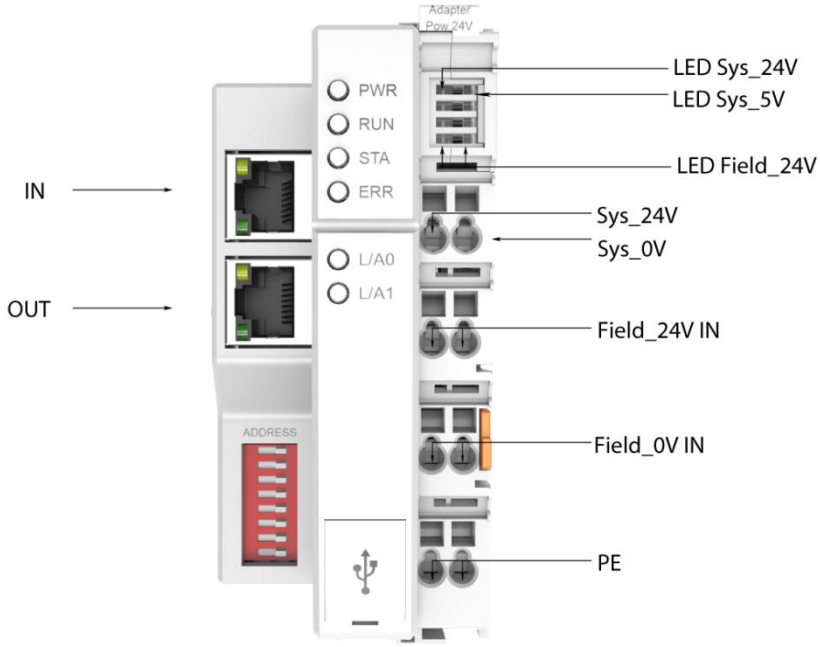
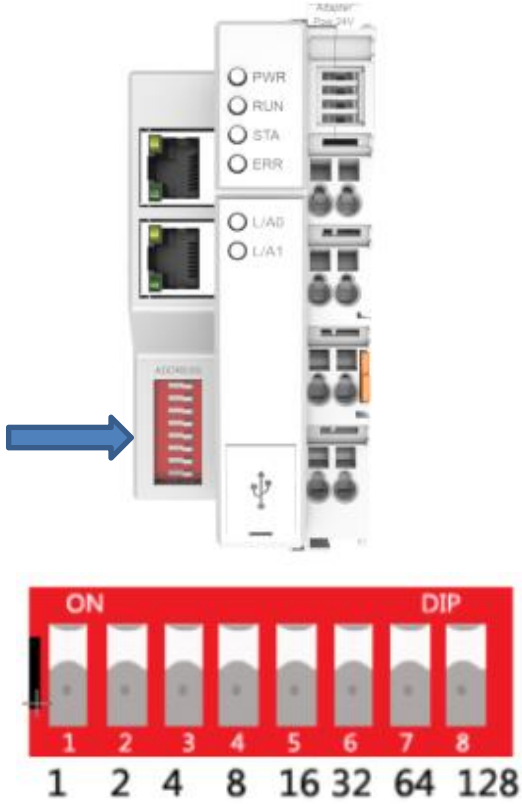


Figure 2-1

2.3 Adapter LED Indicator

serial number	Indicator Lights	illustrate	color	state	meaning
1	PWR	Control power supply	green	Bright	Control power supply is normal
				Destroy	Control power supply is not connected or is faulty
2	RUN	Bus Status	green	Bright	Bus configuration successful
				Destroy	Bus configuration failed
3	STA	Module communication	green	Flash	Module communication is normal
				Destroy/ Always on	Module has no communication
4	ERR	Module failure	red	Bright	Module failure (specific failure informationPLCAvailable for query)
				Destroy	The module works fine
5	L/A0	Network port1Links and Status	green	Bright	Network connection is normal
				Flash	Network communication work
				Destroy	Network link abnormality
6	L/A1	Network port2Links and Status	green	Bright	Network connection is normal
				Flash	Network communication work
				Destroy	Network link abnormality

2.4 Adapter DIP Switch



picture2-2

- As shown in the figure, the EtherNET/IP adapter module has a set of dip switches, which have a total of 8 positions, position 1, position 2, position 3,

Bit 4, bit 5, bit 6, bit 7, bit 8, each bit represents a value. Pushing them to the ON position represents 1, 2, 4, 8, 16, 32, 64, 128 respectively. The sum of the values represented by the bits turned to ON is the address code of the machine.

- Address 11 is: 1(bit 1) + 2(bit 2) + 8(bit 4) = 11, and address 30 is: 2(bit 2) + 4(bit 3) + 8(bit 4) + 16(bit 5) = 30;

All the dials are turned down to represent 0.

- The dip switch can be used to set the last byte of the IP address of the adapter module, that is, the D segment of the IP address A:B:C:D.

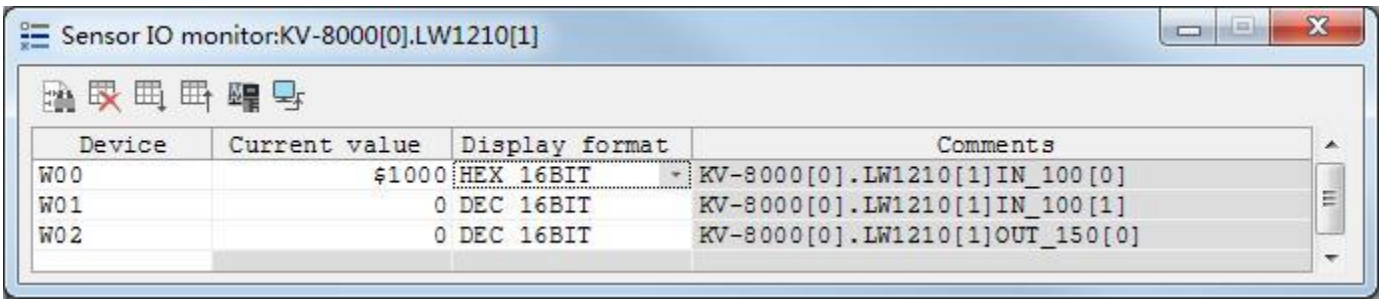
The ABC segment can be set through the "IP Setting Tool" Configuration Tool. In particular, when the DIP switch is set to 0 or 255, the ABCD segments of the adapter IP address are all configured using the "IP Setting Tool" When the DIP switch is set to 254, the adapter IP address is fixed to 192.168.0.254. Therefore, when the IP address is lost, forgotten or in other abnormal situations, you can set the DIP switch to 254 and use the 192.168.0.254 address to enter the "IP Setting Tool" Configure reconfigures the network information of the adapter.

- **When shipped from the factory, the DIP switch is set to 0 and the IP address is configured to 192.168.0.1.**

2.5 Adapter Process Data Description

- The DF20-C-EN-IP adapter comes with two bytes of diagnostic data to display the module operating status. As shown in Figure 2-3, when the diagnostic data

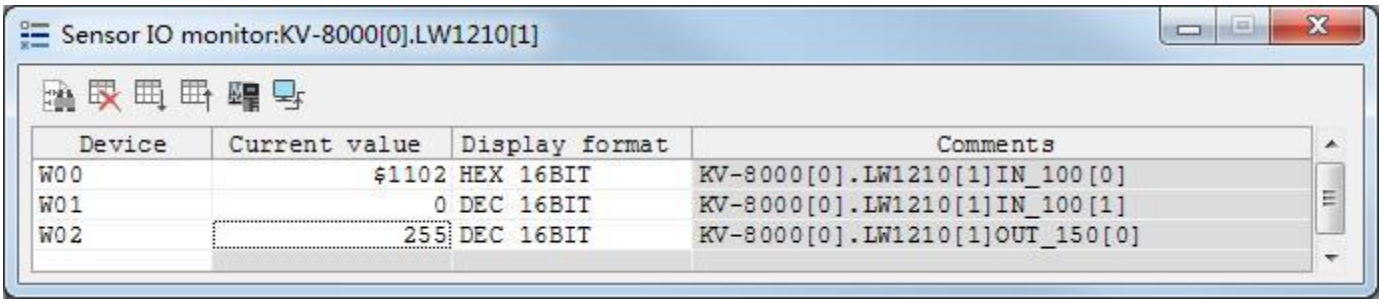
When it is 0x1000, it indicates that the connection between PLC and adapter is normal.



picture2-3

- When the adapter DF20-C-EN-IP is When an IO module fails or data is lost, The ERR light is on and the error message will

exist In normal use, the 2 The IO module fails or data is lost. The diagnostic data is shown in the figure The data shown in 2-4 is 0x1102, low 3-bit data 0x102 represents the 2 modules have errors. Similarly, if an error occurs in the first module, the diagnostic input data is $1101, and so on.



picture2-4

3 Expansion IO Module

- ExtensionsIOModules are divided into9Major categories: digital input module, digital output module, digital input and output mixed module, analog

Input module, analog output module, temperature input module, pressure sensor input module, encoder/Pulse counting module, etc., multiple typesIOModules can be combined in any way.

3.1 List of commonly used IO modules

model	Product Description
DF20-M-8DI-N	8Channel digital input module,NPN
DF20-M-8DI-P	8Channel digital input module,PNP
DF20-M-16DI-N	16Channel digital input module,NPN
DF20-M-16DI-P	16Channel digital input module,PNP
DF20-M-32DI-N	32Channel digital input module,NPN
DF20-M-32DI-P	32Channel digital input module,PNP
DF20-M-4DO-R	4Channel relay output module
DF20-M-8DO-N	8Channel digital output module,NPN
DF20-M-8DO-P	8Channel digital output module,PNP
DF20-M-16DO-N	16Channel digital output module,NPN
DF20-M-16DO-P	16Channel digital output module,PNP
DF20-M-32DO-N	32Channel digital output module,NPN
DF20-M-32DO-P	32Channel digital output module,PNP
DF20-M-8DIO-N	8Channel digital output and8Channel input mixing module,NPN
DF20-M-8DIO-P	8Channel digital output and8Channel input mixing module,PNP
DF20-M-4AI-U-0	4Channel analog input module,-10V~+10V
DF20-M-4AI-U-1	4Channel analog input module,0~+10V
DF20-M-4AI-I-2	4Channel analog input module,0~20mA
DF20-M-4AI-I-3	4Channel analog input module,4~20mA
DF20-M-4AI-U-4	4Channel analog input module,±10V/0~10V/2~10V/±5V/0~5V/1~5V
DF20-M-8AI-U-4	8Channel analog input module,±10V/0~10V/2~10V/±5V/0~5V/1~5V
DF20-M-4AI-I-5	4Channel analog input module,0~20mA/4~20mA
DF20-M-8AI-I-5	8Channel analog input module,0~20mA/4~20mA
DF20-M-2LC-S-5	2Channel Pressure Sensor Input Module
DF20-M-2RTD-PT	2Channel RTD Sensor Input Module
DF20-M-4RTD-PT	4Channel RTD Sensor Input Module
DF20-M-4TC-KETJ	4Channel Thermocouple Sensor Input Module
DF20-M-8TC-KETJ	8Channel Thermocouple Sensor Input Module
DF20-M-4AO-U-0	4Channel analog output module,-10V~+10V
DF20-M-4AO-U-1	4Channel analog output module,0~+10V
DF20-M-4AO-I-2	4Channel analog output module,0~20mA
DF20-M-4AO-I-3	4Channel analog output module,4~20mA

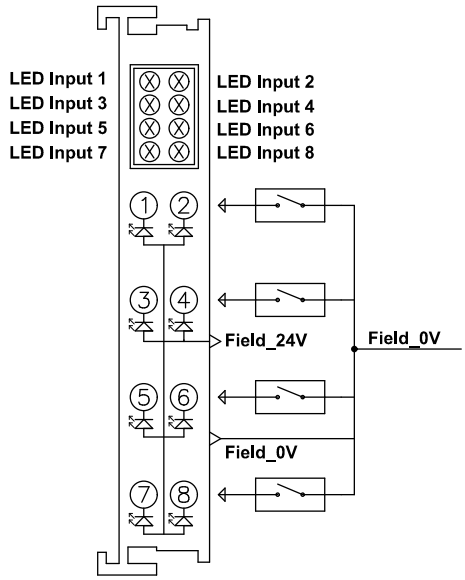
DF20-M-4AO-U-4	4Channel analog output module,±10V/0~10V/2~10V/±5V/0~5V/1~5V
DF20-M-8AO-U-4	8Channel analog output module,±10V/0~10V/2~10V/±5V/0~5V/1~5V
DF20-M-4AO-I-5	4Channel analog output module,0~20mA/4~20mA
DF20-M-8AO-I-5	8Channel analog output module,0~20mA/4~20mA
DF20-M-1CNT-EL-5	Single channel encoder counting module,5V
DF20-M-1CNT-EL-4	Single channel encoder counting module,24V
DF20-M-2CNT-PIL-5	2Channel pulse counting module,5V
DF20-M-2CNT-PIL-4	2Channel pulse counting module,24V
DF20-M-2CNT-EL-5	2Channel Encoder/Pulse counting module,5V
DF20-M-2CNT-EL-4	2Channel Encoder/Pulse counting module,24V
DF20-M-2PWM	2Channel pulse output module,5V
DF20-M-1COM-232/485/422	1-channel serial communication module
DF20-M-DC-U-5	Power Module

3.2 DF20-M-8DI-N: 8-channel digital input module NPN type

3.2.1 Technical parameters

Electrical parameters	
Number of input channels	8
Input signal type	NPN
Input rated voltage	0V DC
logic"0" signal voltage	>11VDC
logic"1" signal voltage	<5V DC
Typical input current	3mA
System side current	15mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.2.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED Input No	Status and meaning	LED Input No	Status and meaning
LED Input1	On: Channel 1 input signal is valid	LED Input2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED Input3	On: Channel 3 input signal is valid	LED Input4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED Input5	On: Channel 5 input signal is valid	LED Input6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED Input7	On: Channel 7 input signal is valid	LED Input8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid

3.2.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8DI-N	2	1	/	/

Data description:

CH1~CH8：When the corresponding channel input signal is valid, this position 1, when the input is invalid 0.

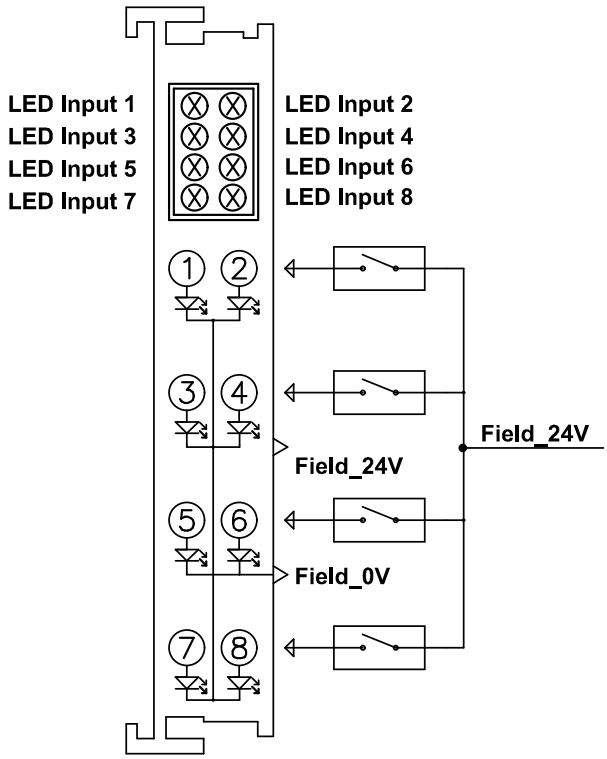
0: Input signal is invalid 1：Input signal is valid

3.3 DF20-M-8DI-P: 8-channel digital input module PNP type

3.3.1 Technical parameters

Electrical parameters	
Number of input channels	8
Input signal type	PNP
Input rated voltage	twenty fourV DC
logic"0" signal voltage	<5VDC
logic"1" signal voltage	>11VDC
Typical input current	3mA
System side current	15mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.3.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED Input No	Status and meaning	LED Input No	Status and meaning
LED Input1	On: Channel 1 input signal is valid	LED Input2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED Input3	On: Channel 3 input signal is valid	LED Input4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED Input5	On: Channel 5 input signal is valid	LED Input6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED Input7	On: Channel 7 input signal is valid	LED Input8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid

3.3.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8DI-P	2	1	/	/

Data description:

CH1~CH8：When the corresponding channel input signal is valid, this position 1, when the input is invalid 0.

0: Input signal is invalid

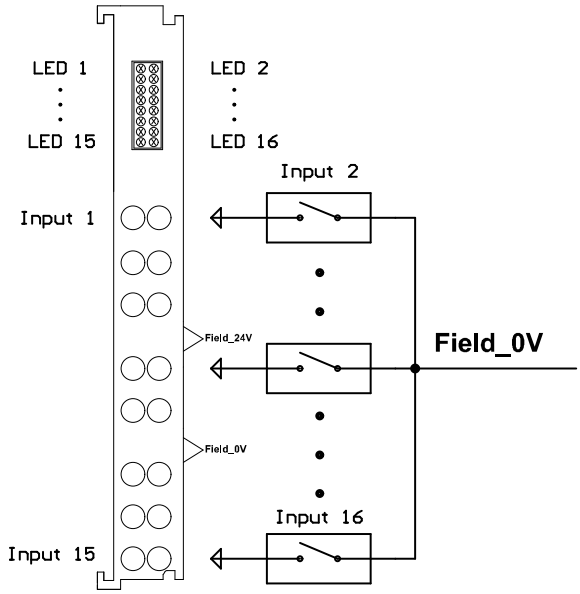
1：Input signal is valid

3.4 DF20-M-16DI-N: 16-channel digital input module NPN type

3.4.1 Technical parameters

Electrical parameters	
Number of input channels	16
Input signal type	NPN
Input rated voltage	0V DC
logic“0”Signal voltage	>11VDC
logic“1”Signal voltage	<5V DC
Typical input current	3mA
System side current	30mA
Input filtering	Default 3ms, 0.2-40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.4.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 input signal is valid	LED2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED3	On: Channel 3 input signal is valid	LED4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED5	On: Channel 5 input signal is valid	LED6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED7	On: Channel 7 input signal is valid	LED8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid
LED9	On: Channel 9 input signal is valid	LED10	On: Channel 10 input signal is valid
	Off: Channel 9 input signal is invalid		Off: Channel 10 input signal is invalid
LED11	On: Channel 11 input signal is valid	LED12	On: Channel 12 input signal is valid
	Off: Channel 11 input signal is		Off: Channel 12 input signal

	invalid		is invalid
LED13	On: Channel 13 input signal is valid	LED14	On: Channel 14 input signal is valid
	Off: Channel 13 input signal is invalid		Off: Channel 14 input signal is invalid
LED15	On: Channel 15 input signal is valid	LED16	On: Channel 16 input signal is valid
	Off: Channel 15 input signal is invalid		Off: Channel 16 input signal is invalid

3.4.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-16DI-N	2	2	/	/

Data description:

CH1~CH16： When the corresponding channel input signal is valid, this position 1, when the input is invalid 0.

0: Input signal is invalid

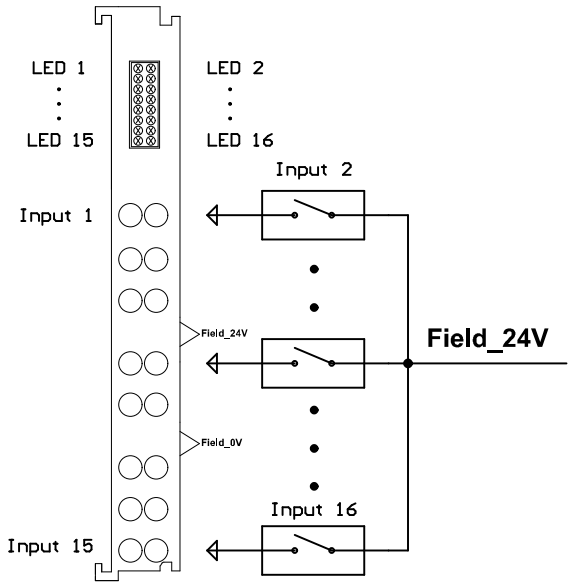
1：Input signal is valid

3.5 DF20-M-16DI-P: 16-channel digital input module PNP type

3.5.1 Technical parameters

Electrical parameters	
Number of input channels	16
Input signal type	PNP
Input rated voltage	twenty fourV DC
logic“0”Signal voltage	<5VDC
logic“1”Signal voltage	>11VDC
Typical input current	3mA
System side current	30mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.5.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 input signal is valid	LED2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED3	On: Channel 3 input signal is valid	LED4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED5	On: Channel 5 input signal is valid	LED6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED7	On: Channel 7 input signal is valid	LED8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid
LED9	On: Channel 9 input signal is valid	LED10	On: Channel 10 input signal is valid
	Off: Channel 9 input signal is invalid		Off: Channel 10 input signal is invalid
LED11	On: Channel 11 input signal is valid	LED12	On: Channel 12 input signal is valid

	Off: Channel 11 input signal is invalid		Off: Channel 12 input signal is invalid
LED13	On: Channel 13 input signal is valid	LED14	On: Channel 14 input signal is valid
	Off: Channel 13 input signal is invalid		Off: Channel 14 input signal is invalid
LED15	On: Channel 15 input signal is valid	LED16	On: Channel 16 input signal is valid
	Off: Channel 15 input signal is invalid		Off: Channel 16 input signal is invalid

3.5.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-16DI-P	2	2	/	/

Data description:

CH1~CH16： When the corresponding channel input signal is valid, this position 1, when the input is invalid 0.

0: Input signal is invalid

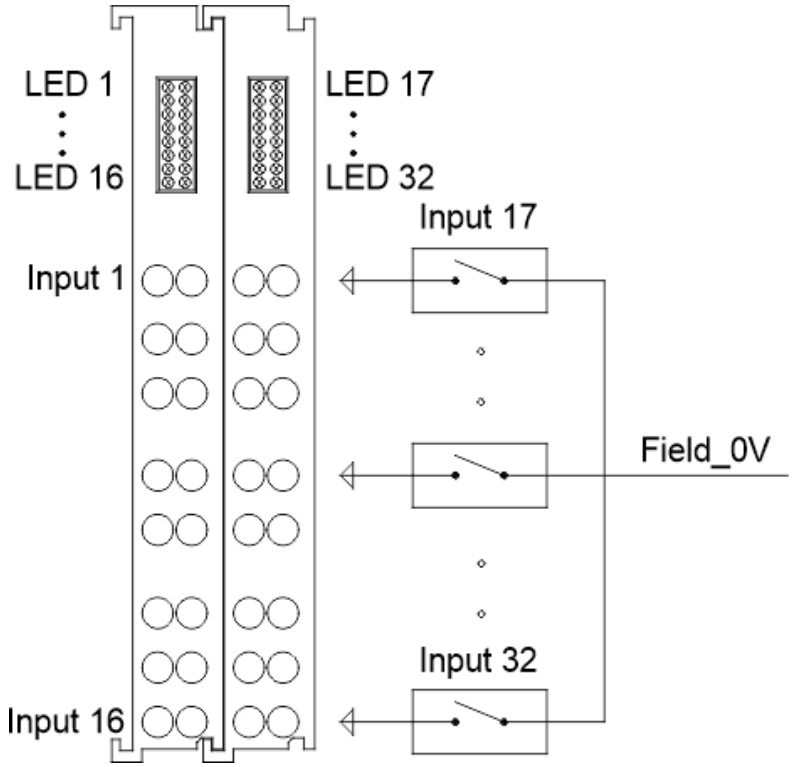
1：Input signal is valid

3.6 DF20-M-32DI-N: 32-channel digital input module NPN type

3.6.1 Technical parameters

Electrical parameters	
Number of input channels	32
Input signal type	NPN
Input rated voltage	0V DC
logic"0" signal voltage	>11VDC
logic"1" signal voltage	<5V DC
Typical input current	3mA
System side current	65mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85 °C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.6.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 input signal is valid	LED2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED3	On: Channel 3 input signal is valid	LED4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED5	On: Channel 5 input signal is valid	LED6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED7	On: Channel 7 input signal is valid	LED8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid
LED9	On: Channel 9 input signal is valid	LED10	On: Channel 10 input signal is valid
	Off: Channel 9 input signal is invalid		Off: Channel 10 input signal is invalid

LED11	On: Channel 11 input signal is valid	LED12	On: Channel 12 input signal is valid
	Off: Channel 11 input signal is invalid		Off: Channel 12 input signal is invalid
LED13	On: Channel 13 input signal is valid	LED14	On: Channel 14 input signal is valid
	Off: Channel 13 input signal is invalid		Off: Channel 14 input signal is invalid
LED15	On: Channel 15 input signal is valid	LED16	On: Channel 16 input signal is valid
	Off: Channel 15 input signal is invalid		Off: Channel 16 input signal is invalid
LED17	On: Channel 17 input signal is valid	LED18	On: Channel 18 input signal is valid
	Off: Channel 17 input signal is invalid		Off: Channel 18 input signal is invalid
LED19	On: Channel 19 input signal is valid	LED20	On: Channel 20 input signal is valid
	Off: Channel 19 input signal is invalid		Off: Channel 20 input signal is invalid
LED21	On: Channel 21 input signal is valid	LED22	On: Channel 22 input signal is valid
	Off: Channel 21 input signal is invalid		Off: Channel 22 input signal is invalid
LED23	On: Channel 23 input signal is valid	LED24	On: Channel 24 input signal is valid
	Off: Channel 23 input signal is invalid		Off: Channel 24 input signal is invalid
LED25	On: Channel 25 input signal is valid	LED26	On: Channel 26 input signal is valid
	Off: Channel 25 input signal is invalid		Off: Channel 26 input signal is invalid
LED27	On: Channel 27 input signal is valid	LED28	On: Channel 28 input signal is valid
	Off: Channel 27 input signal is invalid		Off: Channel 28 input signal is invalid
LED29	On: Channel 29 input signal is valid	LED30	On: Channel 30 input signal is valid
	Off: Channel 29 input signal is invalid		Off: Channel 30 input signal is invalid

LED31	On: Channel 31 input signal is valid	LED32	On: Channel 32 input signal is valid
	Off: Channel 31 input signal is invalid		Off: Channel 32 input signal is invalid

3.6.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-32DI-N	4	4	/	/

Data description:

CH1~CH32： When the corresponding channel input signal is valid, this position 1, when the input is invalid 0.

0: Input signal is invalid

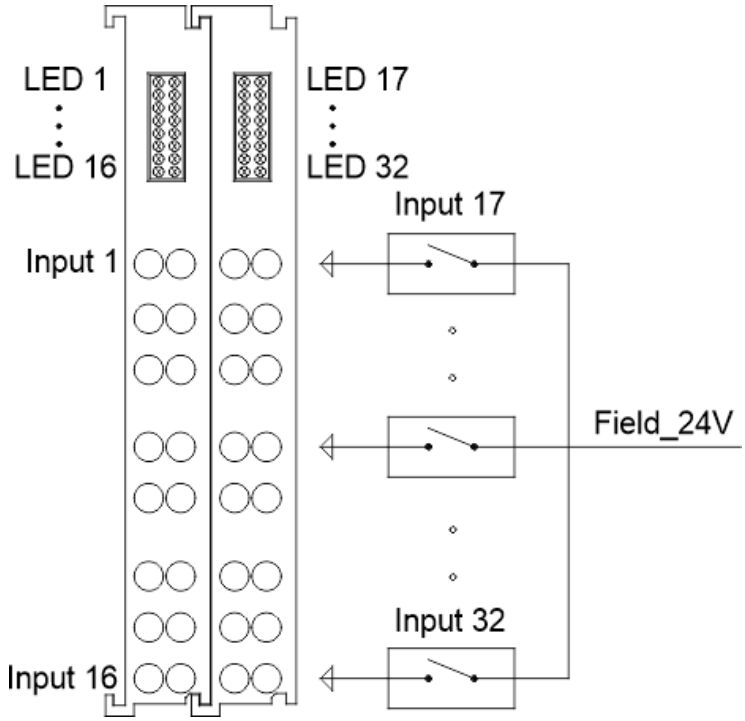
1：Input signal is valid

3.7 DF20-M-32DI-P: 32-channel digital input module PNP type

3.7.1 Technical parameters

Electrical parameters	
Number of input channels	32
Input signal type	PNP
Input rated voltage	twenty fourV DC
logic"0" signal voltage	<5VDC
logic"1" signal voltage	>11VDC
Typical input current	3mA
System side current	65mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.7.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 input signal is valid	LED2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED3	On: Channel 3 input signal is valid	LED4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED5	On: Channel 5 input signal is valid	LED6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED7	On: Channel 7 input signal is valid	LED8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid
LED9	On: Channel 9 input signal is valid	LED10	On: Channel 10 input signal is valid
	Off: Channel 9 input signal is invalid		Off: Channel 10 input signal is invalid
LED11	On: Channel 11 input signal is	LED12	On: Channel 12 input signal

	valid		is valid
	Off: Channel 11 input signal is invalid		Off: Channel 12 input signal is invalid
LED13	On: Channel 13 input signal is valid	LED14	On: Channel 14 input signal is valid
	Off: Channel 13 input signal is invalid		Off: Channel 14 input signal is invalid
LED15	On: Channel 15 input signal is valid	LED16	On: Channel 16 input signal is valid
	Off: Channel 15 input signal is invalid		Off: Channel 16 input signal is invalid
LED17	On: Channel 17 input signal is valid	LED18	On: Channel 18 input signal is valid
	Off: Channel 17 input signal is invalid		Off: Channel 18 input signal is invalid
LED19	On: Channel 19 input signal is valid	LED20	On: Channel 20 input signal is valid
	Off: Channel 19 input signal is invalid		Off: Channel 20 input signal is invalid
LED21	On: Channel 21 input signal is valid	LED22	On: Channel 22 input signal is valid
	Off: Channel 21 input signal is invalid		Off: Channel 22 input signal is invalid
LED23	On: Channel 23 input signal is valid	LED24	On: Channel 24 input signal is valid
	Off: Channel 23 input signal is invalid		Off: Channel 24 input signal is invalid
LED25	On: Channel 25 input signal is valid	LED26	On: Channel 26 input signal is valid
	Off: Channel 25 input signal is invalid		Off: Channel 26 input signal is invalid
LED27	On: Channel 27 input signal is valid	LED28	On: Channel 28 input signal is valid
	Off: Channel 27 input signal is invalid		Off: Channel 28 input signal is invalid
LED29	On: Channel 29 input signal is valid	LED30	On: Channel 30 input signal is valid
	Off: Channel 29 input signal is invalid		Off: Channel 30 input signal is invalid
LED31	On: Channel 31 input signal is	LED32	On: Channel 32 input signal

	valid		is valid
	Off: Channel 31 input signal is invalid		Off: Channel 32 input signal is invalid

3.7.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-32DI-P	4	4	/	/

Data description:

CH1~CH32： When the corresponding channel input signal is valid, this position 1, when the input is invalid 0.

0: Input signal is invalid

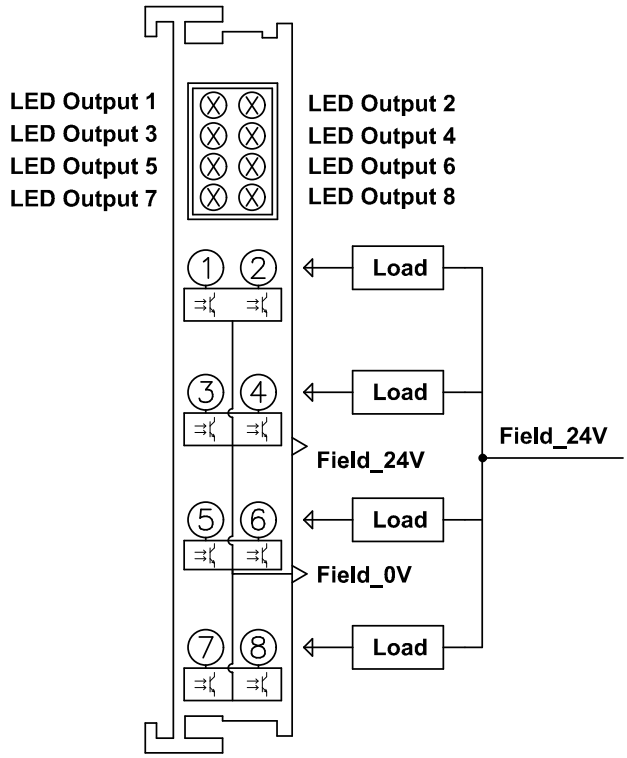
1：Input signal is valid

3.8 DF20-M-8DO-N: 8-channel digital output module NPN type

3.8.1 Technical parameters

Electrical parameters	
Number of output channels	8
Output signal type	NPN
logic"0" signal voltage	High impedance
logic"1" signal voltage	0V DC
Maximum output current	0.5A/channel, 3A/module
System side current	50mA
Maximum short circuit	2A
Load Type	Inductive load, resistive load, lamp load
Reverse voltage protection	support
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.8.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED 1	On: Channel 1 output is valid	LED 2	On: Channel 2 output is valid
	Off: Channel 1 output is invalid		Off: Channel 2 output is invalid
LED 3	On: Channel 3 output is valid	LED 4	On: Channel 4 output is valid
	Off: Channel 3 output is invalid		Off: Channel 4 output is invalid
LED 5	On: Channel 5 output is valid	LED 6	On: Channel 6 output is valid
	Off: Channel 3 output is invalid		Off: Channel 6 output is invalid
LED 7	On: Channel 7 output is valid	LED 8	On: Channel 8 output is valid
	Off: Channel 7 output is invalid		Off: Channel 8 output is invalid

3.8.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8DO-N	0	0	2	1

Data description:

CH1~CH8： When the position 1, the corresponding channel output signal is valid, and the output voltage is0V,for0The output is invalid and the output voltage is in high impedance state.

0: The output signal is invalid.

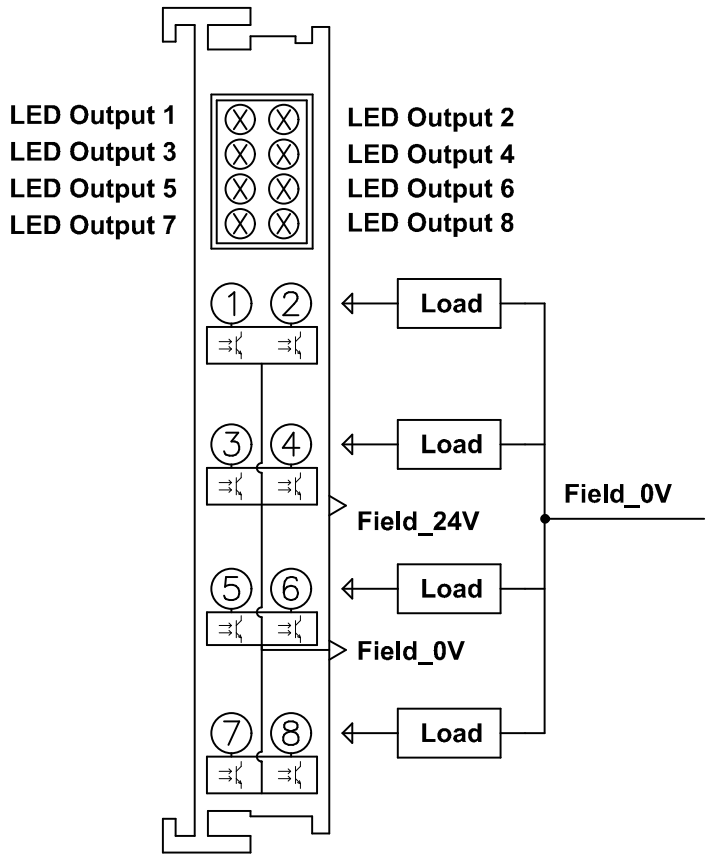
1: The output signal is valid.

3.9 DF20-M-8DO-P: 8-channel digital output module PNP Type

3.9.1 Technical parameters

Electrical parameters	
Number of output channels	8
Output signal type	PNP
logic"0" signal voltage	High impedance
logic"1" signal voltage	twenty fourV DC
Maximum output current	0.5A/channel, 3A/module
System side current	50mA
Maximum short circuit	2A
Load Type	Inductive load, resistive load, lamp load
Reverse voltage protection	support
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.9.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	LED No	Status and meaning
LED 1	On: Channel 1 output is valid	LED 2	On: Channel 2 output is valid
	Off: Channel 1 output is invalid		Off: Channel 2 output is invalid
LED 3	On: Channel 3 output is valid	LED 4	On: Channel 4 output is valid
	Off: Channel 3 output is invalid		Off: Channel 4 output is invalid
LED 5	On: Channel 5 output is valid	LED 6	On: Channel 6 output is valid
	Off: Channel 3 output is invalid		Off: Channel 6 output is invalid
LED 7	On: Channel 7 output is valid	LED 8	On: Channel 8 output is valid
	Off: Channel 7 output is invalid		Off: Channel 8 output is invalid

3.9.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8DO-P	0	0	2	1

Data description:

CH1~CH8： When the position 1, the corresponding channel output signal is valid, and the output voltage is24V,for0The output is invalid and the output voltage is in high impedance state.

0: The output signal is invalid.

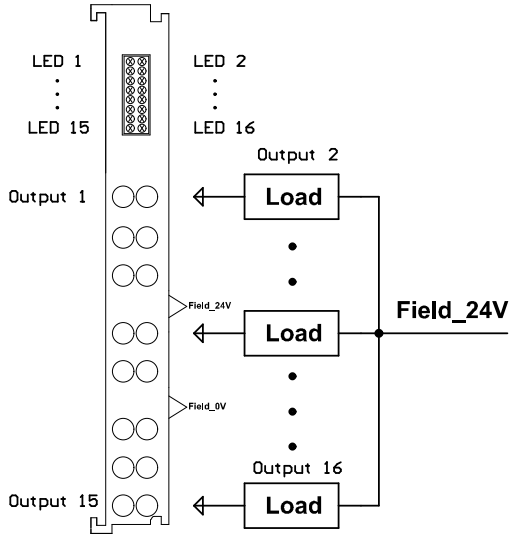
1: The output signal is valid.

3.10 DF20-M-16DO-N: 16-channel digital output module NPN type

3.10.1 Technical parameters

Electrical parameters	
Number of output channels	16
Output signal type	NPN
logic“0”Signal voltage	High impedance
logic“1”Signal voltage	0V DC
Maximum output current	0.5A/channel, 6A/module
System side current	75mA
Maximum short circuit	2A
Load Type	Inductive load, resistive load, lamp load
Reverse voltage protection	support
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.10.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 output is valid	LED2	On: Channel 2 output is valid
	Off: Channel 1 output is invalid		Off: Channel 2 output is invalid
LED3	On: Channel 3 output is valid	LED4	On: Channel 4 output is valid
	Off: Channel 3 output is invalid		Off: Channel 4 output is invalid
LED5	On: Channel 5 output is valid	LED6	On: Channel 6 output is valid
	Off: Channel 5 output is invalid		Off: Channel 6 output is invalid
LED7	On: Channel 7 output is valid	LED8	On: Channel 8 output is valid
	Off: Channel 7 output is invalid		Off: Channel 8 output is invalid
LED9	On: Channel 9 output is valid	LED10	On: Channel 10 output is valid
	Off: Channel 9 output is invalid		Off: Channel 10 output is invalid
LED11	On: Channel 11 output is valid	LED12	On: Channel 12 output is valid
	Off: Channel 11 output is invalid		Off: Channel 12 output is invalid
LED13	On: Channel 13 output is valid	LED14	On: Channel 14 output is valid
	Off: Channel 13 output is		Off: Channel 14 output is

	invalid		invalid
LED15	On: Channel 15 output is valid	LED16	On: Channel 16 output is valid
	Off: Channel 15 output is invalid		Off: Channel 16 output is invalid

3.10.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-16DO-N	0	0	2	2

Data description:

CH1~CH16：When the position 1, the corresponding channel output signal is valid, and the output voltage is0V,for0The output is invalid and the output voltage is in high impedance state.

0: The output signal is invalid.

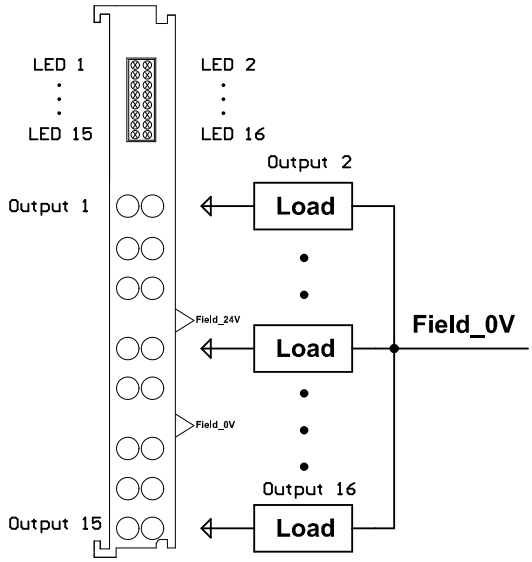
1: The output signal is valid.

3.11 DF20-M-16DO-P: 16-channel digital output module PNP type

3.11.1 Technical parameters

Electrical parameters	
Number of output channels	16
Output signal type	PNP
logic“0”Signal voltage	High impedance
logic“1”Signal voltage	twenty fourV DC
Maximum output current	0.5A/channel, 6A/module
System side current	75mA
Maximum short circuit	2A
Load Type	Inductive load, resistive load, lamp load
Reverse voltage protection	support
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85 °C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.11.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 output is valid	LED2	On: Channel 2 output is valid
	Off: Channel 1 output is invalid		Off: Channel 2 output is invalid
LED3	On: Channel 3 output is valid	LED4	On: Channel 4 output is valid
	Off: Channel 3 output is invalid		Off: Channel 4 output is invalid
LED5	On: Channel 5 output is valid	LED6	On: Channel 6 output is valid
	Off: Channel 5 output is invalid		Off: Channel 6 output is invalid
LED7	On: Channel 7 output is valid	LED8	On: Channel 8 output is valid
	Off: Channel 7 output is invalid		Off: Channel 8 output is invalid
LED9	On: Channel 9 output is valid	LED10	On: Channel 10 output is valid
	Off: Channel 9 output is invalid		Off: Channel 10 output is invalid
LED11	On: Channel 11 output is valid	LED12	On: Channel 12 output is valid
	Off: Channel 11 output is invalid		Off: Channel 12 output is invalid
LED13	On: Channel 13 output is valid	LED14	On: Channel 14 output is valid
	Off: Channel 13 output is		Off: Channel 14 output is

	invalid		invalid
LED15	On: Channel 15 output is valid	LED16	On: Channel 16 output is valid
	Off: Channel 15 output is invalid		Off: Channel 16 output is invalid

3.11.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-16DO-P	0	0	2	2

Data description:

CH1~CH16：When the position 1, the corresponding channel output signal is valid, and the output voltage is24V,for0The output is invalid and the output voltage is in high impedance state.

0: The output signal is invalid.

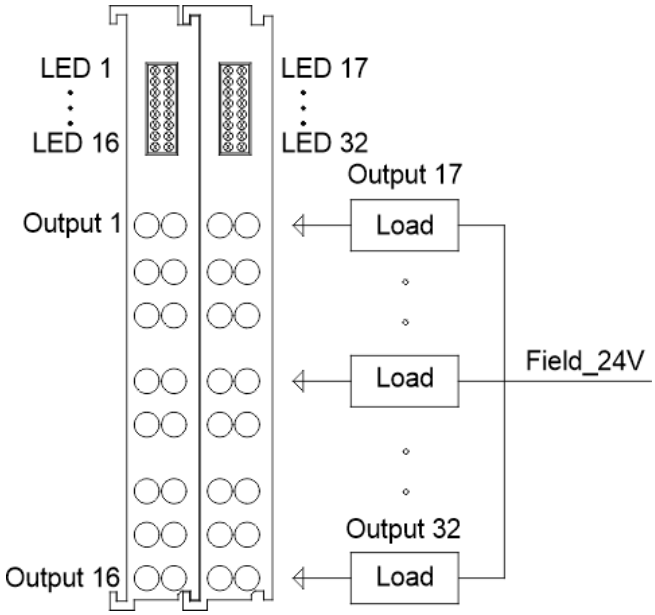
1: The output signal is valid.

3.12 DF20-M-32DO-N: 32-channel digital output module NPN type

3.12.1 Technical parameters

Electrical parameters	
Number of output channels	32
Output signal type	NPN
logic“0”Signal voltage	High impedance
logic“1”Signal voltage	0V DC
Maximum output current	0.5A/channel, 12A/module
System side current	130mA
Maximum short circuit	2A
Load Type	Inductive load, resistive load, lamp load
Reverse voltage protection	support
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.12.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 output is valid	LED2	On: Channel 2 output is valid
	Off: Channel 1 output is invalid		Off: Channel 2 output is invalid
LED3	On: Channel 3 output is valid	LED4	On: Channel 4 output is valid
	Off: Channel 3 output is invalid		Off: Channel 4 output is invalid
LED5	On: Channel 5 output is valid	LED6	On: Channel 6 output is valid
	Off: Channel 5 output is invalid		Off: Channel 6 output is invalid
LED7	On: Channel 7 output is valid	LED8	On: Channel 8 output is valid
	Off: Channel 7 output is invalid		Off: Channel 8 output is invalid
LED9	On: Channel 9 output is valid	LED10	On: Channel 10 output is valid
	Off: Channel 9 output is invalid		Off: Channel 10 output is invalid
LED11	On: Channel 11 output is valid	LED12	On: Channel 12 output is valid
	Off: Channel 11 output is invalid		Off: Channel 12 output is invalid
LED13	On: Channel 13 output is valid	LED14	On: Channel 14 output is valid
	Off: Channel 13 output is		Off: Channel 14 output is

	invalid		invalid
LED15	On: Channel 15 output is valid Off: Channel 15 output is invalid	LED16	On: Channel 16 output is valid Off: Channel 16 output is invalid
LED17	On: Channel 17 output is valid Off: Channel 17 output is invalid	LED18	On: Channel 18 output is valid Off: Channel 18 output is invalid
LED19	On: Channel 19 output is valid Off: Channel 19 output is invalid	LED20	On: Channel 20 output is valid Off: Channel 20 output is invalid
LED21	On: Channel 21 output is valid Off: Channel 21 output is invalid	LED22	On: Channel 22 output is valid Off: Channel 22 output is invalid
LED23	On: Channel 23 output is valid Off: Channel 23 output is invalid	LED24	On: Channel 24 output is valid Off: Channel 24 output is invalid
LED25	On: Channel 25 output is valid Off: Channel 25 output is invalid	LED26	On: Channel 26 output is valid Off: Channel 26 output is invalid
LED27	On: Channel 27 output is valid Off: Channel 27 output is invalid	LED28	On: Channel 28 output is valid Off: Channel 28 output is invalid
LED29	On: Channel 29 output is valid Off: Channel 29 output is invalid	LED30	On: Channel 30 output is valid Off: Channel 30 output is invalid
LED31	On: Channel 31 output is valid Off: Channel 31 output is invalid	LED32	On: Channel 32 output is valid Off: Channel 32 output is invalid

3.12.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-32DO-N	0	0	4	4

Data description:

CH1~CH32： When the position 1, the corresponding channel output signal is valid, and the output voltage is0V,for0The output is invalid and the output voltage is in high impedance state.

0: The output signal is invalid.

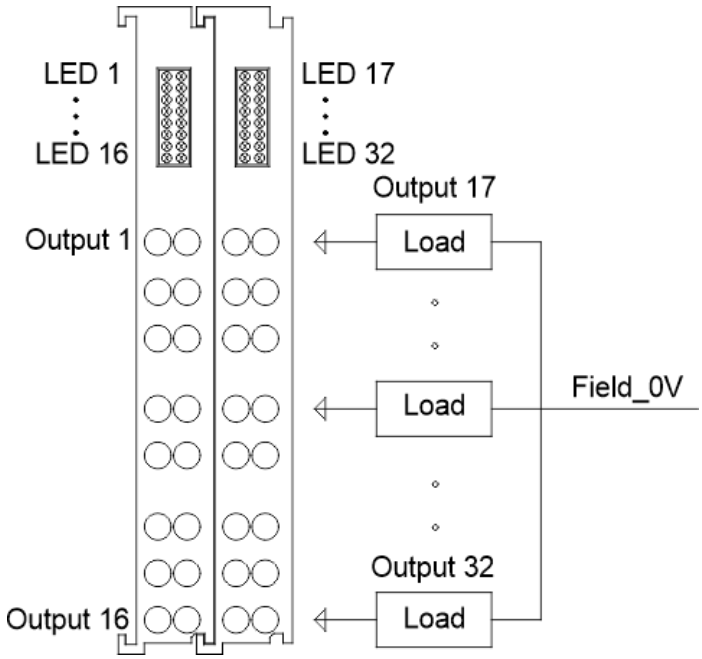
1: The output signal is valid.

3.13 DF20-M-32DO-P: 32-channel digital output module PNP type

3.13.1 Technical parameters

Electrical parameters	
Number of output channels	32
Output signal type	PNP
logic“0”Signal voltage	High impedance
logic“1”Signal voltage	twenty fourV DC
Maximum output current	0.5A/channel, 12A/module
System side current	130mA
Maximum short circuit	2A
Load Type	Inductive load, resistive load, lamp load
Reverse voltage protection	support
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.13.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 output is valid	LED2	On: Channel 2 output is valid
	Off: Channel 1 output is invalid		Off: Channel 2 output is invalid
LED3	On: Channel 3 output is valid	LED4	On: Channel 4 output is valid
	Off: Channel 3 output is invalid		Off: Channel 4 output is invalid
LED5	On: Channel 5 output is valid	LED6	On: Channel 6 output is valid
	Off: Channel 5 output is invalid		Off: Channel 6 output is invalid
LED7	On: Channel 7 output is valid	LED8	On: Channel 8 output is valid
	Off: Channel 7 output is invalid		Off: Channel 8 output is invalid
LED9	On: Channel 9 output is valid	LED10	On: Channel 10 output is valid
	Off: Channel 9 output is invalid		Off: Channel 10 output is invalid
LED11	On: Channel 11 output is valid	LED12	On: Channel 12 output is valid
	Off: Channel 11 output is invalid		Off: Channel 12 output is invalid
LED13	On: Channel 13 output is valid	LED14	On: Channel 14 output is valid

	Off: Channel 13 output is invalid		Off: Channel 14 output is invalid
LED15	On: Channel 15 output is valid	LED16	On: Channel 16 output is valid
	Off: Channel 15 output is invalid		Off: Channel 16 output is invalid
LED17	On: Channel 17 output is valid	LED18	On: Channel 18 output is valid
	Off: Channel 17 output is invalid		Off: Channel 18 output is invalid
LED19	On: Channel 19 output is valid	LED20	On: Channel 20 output is valid
	Off: Channel 19 output is invalid		Off: Channel 20 output is invalid
LED21	On: Channel 21 output is valid	LED22	On: Channel 22 output is valid
	Off: Channel 21 output is invalid		Off: Channel 22 output is invalid
LED23	On: Channel 23 output is valid	LED24	On: Channel 24 output is valid
	Off: Channel 23 output is invalid		Off: Channel 24 output is invalid
LED25	On: Channel 25 output is valid	LED26	On: Channel 26 output is valid
	Off: Channel 25 output is invalid		Off: Channel 26 output is invalid
LED27	On: Channel 27 output is valid	LED28	On: Channel 28 output is valid
	Off: Channel 27 output is invalid		Off: Channel 28 output is invalid
LED29	On: Channel 29 output is valid	LED30	On: Channel 30 output is valid
	Off: Channel 29 output is invalid		Off: Channel 30 output is invalid
LED31	On: Channel 31 output is valid	LED32	On: Channel 32 output is valid
	Off: Channel 31 output is invalid		Off: Channel 32 output is invalid

3.13.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-32DO-P	0	0	4	4

Data description:

CH1~CH32：When the position 1, the corresponding channel output signal is valid, and the output voltage is24V,for0The output is invalid and the output voltage is in high impedance state.

0: The output signal is invalid.

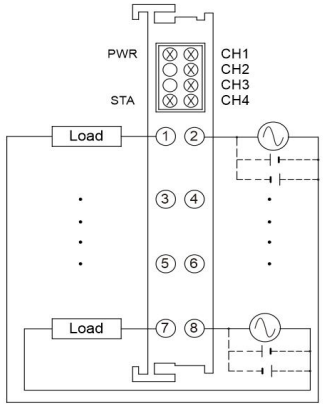
1: The output signal is valid.

3.14 DF20-M-4DO-R: 4-channel relay output module

3.14.1 Technical parameters

Electrical parameters	
Number of channels	4
Contact Type	NOcontact
Maximum output current	5A/aisle,20A/Modules
System side current	20mA
Maximum switching voltage	250VAC/30VDC
Output Impedance	<200mΩ
Action time	≤15ms
Release time	≤15ms
Reverse circuit protection	support
Communication error diagnosis	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Stripping length	8...9mm

3.14.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
PWR	Power light: When the power supply is normal, it will be green.
CH1	No.1Channel relay indicator light, off when circuit is open, always on when circuit is closed
CH2	No.2Channel relay indicator light, off when circuit is open, always on when circuit is closed
CH3	No.3Channel relay indicator light, off when circuit is open, always on when circuit is closed
CH4	No.4Channel relay indicator light, off when circuit is open, always on when circuit is closed
STA	Status LED: Power-on stage;Green when powered on; Turns off after the internal bus initialization is completed.
	Operation phase: When the module is operating normally, it flashes green; When the module operates abnormally, the green light goes out.

3.14.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
LW2064	0	0	2	1

Data description:

CH1~CH4：When the position1When the corresponding channel output signal is valid, the channel relay is energized.0When the corresponding channel output signal is invalid, the relay is disconnected

0: Output signal is invalid

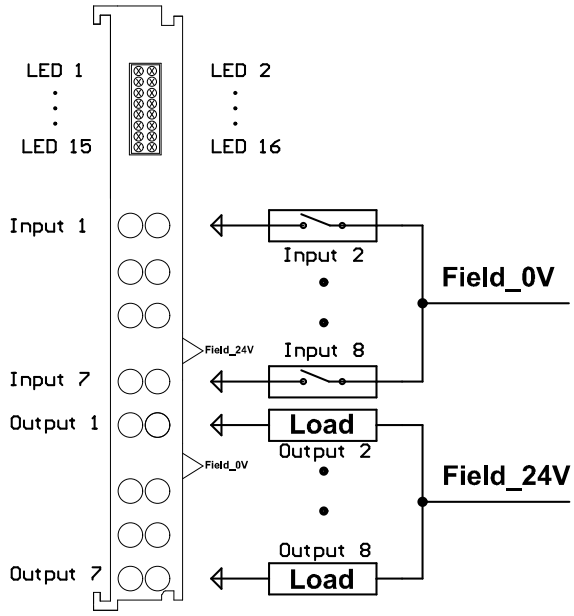
1: Output signal is valid

3.15 DF20-M-8DIO-N: 8-channel digital input 8-channel digital output module NPN

3.15.1 Technical parameters

Electrical parameters	
Number of input channels	8
Number of output channels	8
Input signal type	NPN
Output signal type	NPN
Input Logic“0”Signal voltage	>11VDC
logic“1”Signal voltage	<5V DC
Output Logic“0”Signal voltage	High impedance
Output Logic“1”Signal voltage	0V
System side current	50mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.15.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 input signal is valid	LED2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED3	On: Channel 3 input signal is valid	LED4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED5	On: Channel 5 input signal is valid	LED6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED7	On: Channel 7 input signal is valid	LED8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid
LED9	On: Channel 9 output signal is valid	LED10	On: Channel 10 output signal is valid
	Off: Channel 9 output signal is invalid		Off: Channel 10 output signal is invalid
LED11	On: Channel 11 output signal is valid	LED12	On: Channel 12 output signal is valid

	Off: Channel 11 output signal is invalid		Off: Channel 12 output signal is invalid
LED13	On: Channel 13 output signal is valid	LED14	On: Channel 14 output signal is valid
	Off: Channel 13 output signal is invalid		Off: Channel 14 output signal is invalid
LED15	On: Channel 15 output signal is valid	LED16	On: Channel 16 output signal is valid
	Off: Channel 15 output signal is invalid		Off: Channel 16 output signal is invalid

3.15.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8DIO-N	2	1	2	1

Data description:

CH1~CH16：When the corresponding channel input and output signals are valid, this position 1, when the input and output are invalid 0.

0: Input signal is invalid

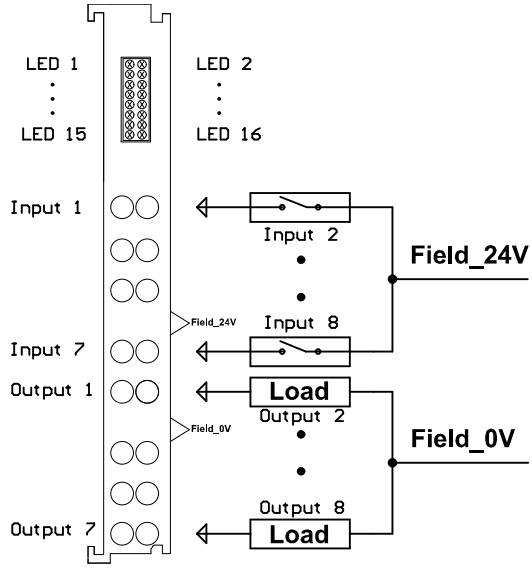
1：Input signal is valid

3.16 DF20-M-8DIO-P: 8-channel digital input 8-channel digital output module PNP

3.16.1 Technical parameters

Electrical parameters	
Number of input channels	8
Number of output channels	8
Input signal type	PNP
Output signal type	PNP
Input Logic“0”Signal voltage	<5VDC
Input Logic“1”Signal voltage	>11VDC
Output Logic“0”Signal voltage	High impedance
Output Logic“1”Signal voltage	24V
System side current	50mA
Input filtering	Default 3ms, 0.2~40ms configurable
Input Impedance	>7.5kΩ
Module failure alarm	support
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	1.5mm²
Maximum crimping area of	AWG16
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28

3.16.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

led No	Status and meaning	led No	Status and meaning
LED1	On: Channel 1 input signal is valid	LED2	On: Channel 2 input signal is valid
	Off: Channel 1 input signal is invalid		Off: Channel 2 input signal is invalid
LED3	On: Channel 3 input signal is valid	LED4	On: Channel 4 input signal is valid
	Off: Channel 3 input signal is invalid		Off: Channel 4 input signal is invalid
LED5	On: Channel 5 input signal is valid	LED6	On: Channel 6 input signal is valid
	Off: Channel 5 input signal is invalid		Off: Channel 6 input signal is invalid
LED7	On: Channel 7 input signal is valid	LED8	On: Channel 8 input signal is valid
	Off: Channel 7 input signal is invalid		Off: Channel 8 input signal is invalid
LED9	On: Channel 9 output signal is valid	LED10	On: Channel 10 output signal is valid
	Off: Channel 9 output signal is invalid		Off: Channel 10 output signal is invalid
LED11	On: Channel 11 output signal is valid	LED12	On: Channel 12 output signal is valid
	Off: Channel 11 output signal is invalid		Off: Channel 12 output signal is invalid

LED13	On: Channel 13 output signal is valid	LED14	On: Channel 14 output signal is valid
	Off: Channel 13 output signal is invalid		Off: Channel 14 output signal is invalid
LED15	On: Channel 15 output signal is valid	LED16	On: Channel 16 output signal is valid
	Off: Channel 15 output signal is invalid		Off: Channel 16 output signal is invalid

3.16.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8DIO-P	2	1	2	1

Data description:

CH1~CH16：When the corresponding channel input and output signals are valid, this position 1, when the input and output are invalid 0.

0: Input signal is invalid

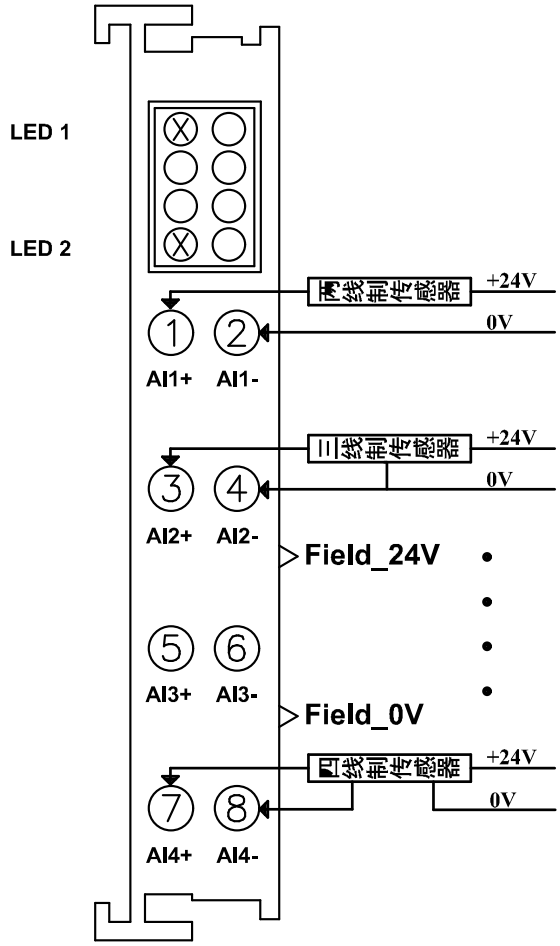
1：Input signal is valid

3.17 DF20-M-4AI-U-0: 4-channel voltage input module

3.17.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	±10V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	>500KΩ
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable, default 20Hz
System side current	120mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.17.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Operation process	Flashing: The module is working in normal sampling state

3.17.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AI-U-0	8	8	0	0

- **Data description:**

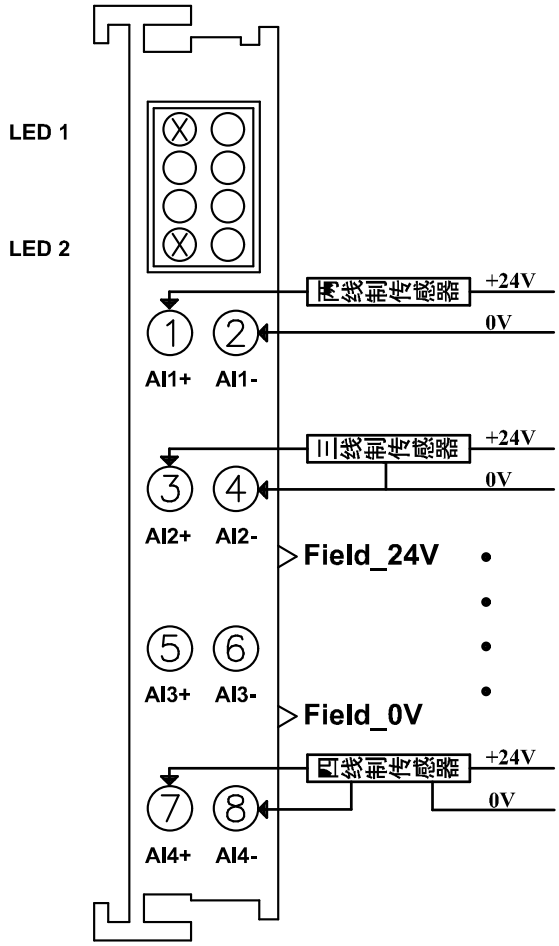
Signal range	Voltage value (U)	Decimal data	Hexadecimal data	Scope	Conversion relationship
±10V	10V	27648	0x6C00	Normal range	D = 27648x U / 10 U = D x 10 / 27648
	0V	0	0		
	-10V	-27648	0x9400		

3.18 DF20-M-4AI-U-1: 4-channel voltage input module

3.18.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	0~10V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	>500KΩ
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable, default 20Hz
System side current	120mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.18.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	On: Module initialization error
	Off: Module initialization is normal
	Flashing: The module is working in normal sampling state

3.18.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AI-U-1	8	8	0	0

- **Data description:**

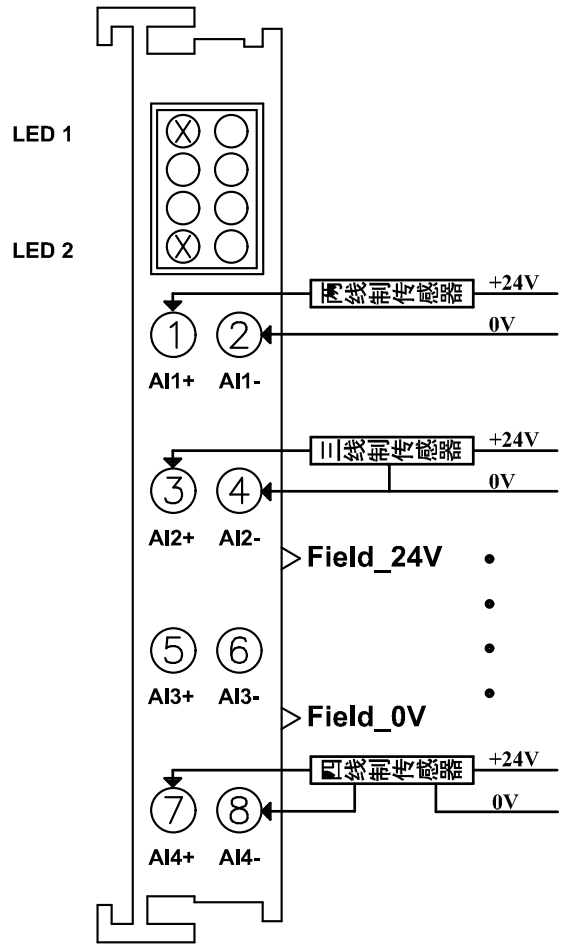
Signal range	Voltage value (U)	Decimal data	Hexadecimal data	Scope	Conversion relationship
0~10V	10V	27648	0x6C00	Normal range	D = 27648x U / 10 U = D x 10 / 27648
	5V	13824	0x3600		
	0V	0	0		

3.19 DF20-M-4AI-I-2: 4-channel current input module

3.19.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	0~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	100Ω
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable, default 20Hz
System side current	120mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.19.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Operation process	Flashing: The module is working in normal sampling state

3.19.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AI-I-2	8	8	0	0

- **Data description:**

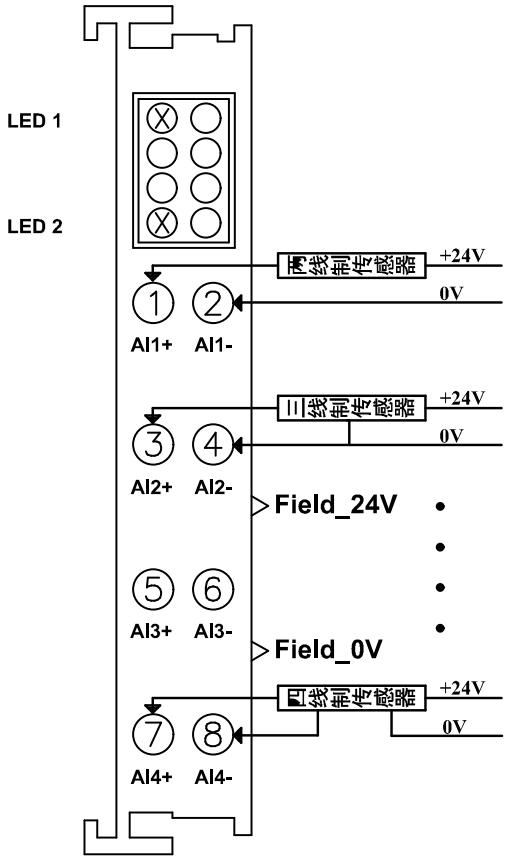
Signal range	Current value (I)	Decimal data	Hexadecimal data	scope	Conversion relationship
0~20 mA	20mA	27648	0x6C00	Normal range	D = 27648x I / 20 I = D x 20 / 27648
	10mA	13824	0x3600		
	0	0	0		

3.20 DF20-M-4AI-I-3: 4-channel current input module

3.20.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	4~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	100Ω
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable, default 20Hz
System side current	120mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.20.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Operation process	Flashing: The module is working in normal sampling state

3.20.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AI-I-3	8	8	0	0

- **Data description:**

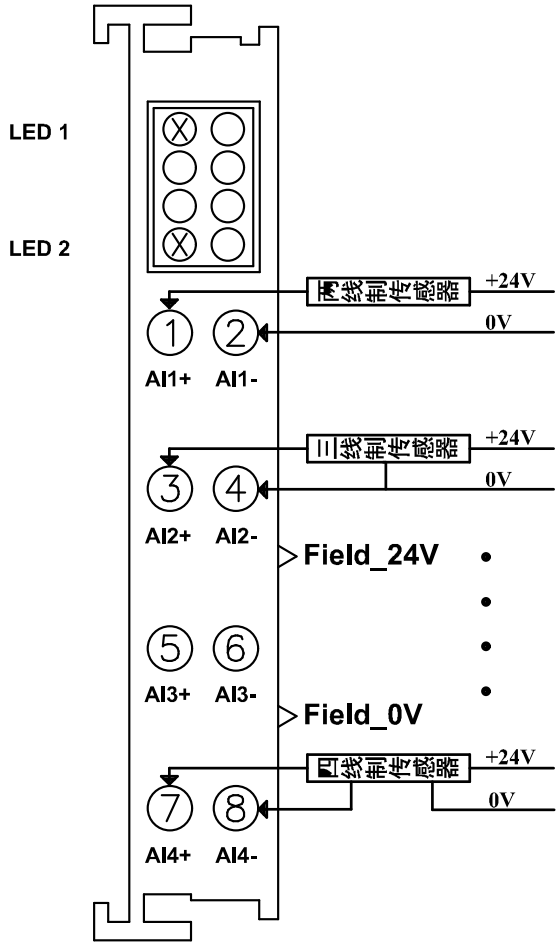
Signal range	Current value (I)	Decimal data	Hexadecimal data	scope	Conversion relationship
4 ~ 20 mA	20mA	27648	0x6C00	Normal range	D = 27648x (I – 4) / 16 I = D x 16 / 27648 + 4
	12mA	13824	0x3600		
	4mA	0	0		

3.21 DF20-M-4AI-U-4: 4-channel voltage input module

3.21.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	±10V/0~10V/2~10V/±5V/0~5V/1~5V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	>500KΩ
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable, default 20Hz
System side current	120mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.21.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Operation process	Flashing: The module is working in normal sampling state

3.21.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AI-U-4	8	8	0	0

➢ Process Data Definition

Signal range	Voltage value	Decimal data	Hexadecimal	Scope	Conversion
±10V（-27648~27648）	>11.76V	32767	0x7FFF	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	11.76V	32511	0x7EFF	Upper limit	
	10V	27648	0x6C00	Normal range	
	5V	13824	0x3600		
	0V	0	0x0000		
	-5V	-13824	0xCA00		
	-10V	-27648	0x9400		
	-11.76V	-32511	0x8100	Lower limit	
	<-11.76V	-32768	0x8000	Underflow	
0~10V（0~27648）	>11.76V	32767	0x7FFF	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	11.76V	32511	0x7EFF	Upper limit	
	10V	27648	0x6C00	Normal range	
	5V	13824	0x3600		
	0V	0	0x0000		
2~10V（0~27648）	>11.41V	32767	0x7FFF	Overflow	D = 27648 x (U – 2) / 8 U = D x 8 / 27648 + 2
	11.41V	32511	0x7EFF	Upper limit	
	10V	27648	0x6C00	Normal range	
	6V	13824	0x3600		
	2V	0	0x0000		
	0.59 V	-4864	0xED00	Lower limit	
	<0.59 V	-32768	0x8000	Underflow	
±5V（-27648~27648）	>5.88V	32767	0x7FFF	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	5.88V	32511	0x7EFF	Upper limit	
	5V	27648	0x6C00	Normal range	
	2.5V	13824	0x3600		
	0V	0	0x0000		
	-2.5V	-13824	0xCA00		
	-5V	-27648	0x9400		
	-5.88V	-32511	0x8100	Lower limit	
	<-5.88V	-32768	0x8000	Underflow	
0~5V（0~27648）	>5.88V	32767	0x7FFF	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	5.88V	32511	0x7EFF	Upper limit	
	5V	27648	0x6C00	Normal range	
	2.5V	13824	0x3600		
	0V	0	0x0000		
1~5V	>5.7V	32767	0x7FFF	Overflow	D = 27648 x (U – 1) /

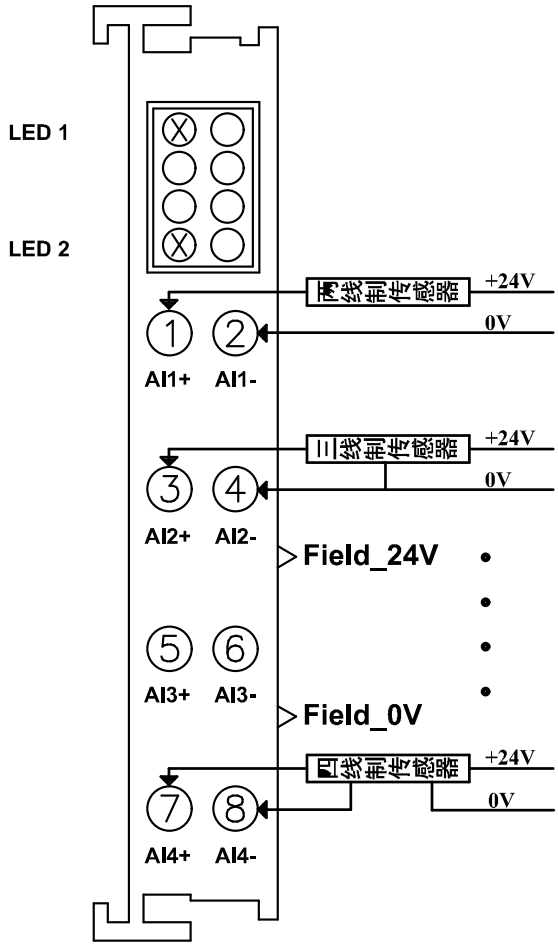
5.7V	32511	0x7EFF	Upper limit
5V	27648	0x6C00	Normal range
3V	13824	0x3600	
1V	0	0x0000	
0.3V	-4864	0xED00	Lower limit
<0.3V	-32768	0x8000	Underflow

3.22 DF20-M-4AI-I-5: 4-channel current input module

3.22.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	0~20mA/4~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	100Ω
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable, default 20Hz
System side current	120mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.22.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Operation process	Flashing: The module is working in normal sampling state

3.22.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AI-I-5	8	8	0	0

➢ Process Data Definition

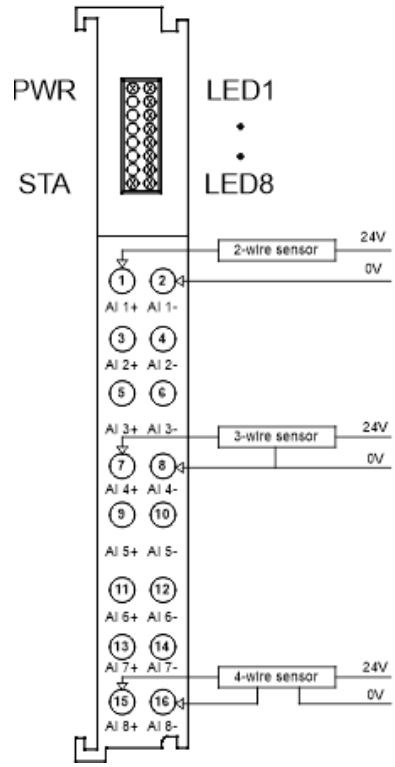
Signal range	Current value (I)	Decimal data	Hexadecimal data	scope	Conversion relationship
0 ~ 20 mA (0~27648)	>23.52 mA	32767	0x7FFF	Overflow	D = 27648 x I / 20 I = D x 20 / 27648
	23.52 mA	32511	0x7EFF	Upper limit	
	20 mA	27648	0x6C00	Normal range	
	10 mA	13824	0x3600		
	0 mA	0	0		
4 ~ 20 mA (0~27648)	>22.81 mA	32767	0x7FFF	Overflow	D = 27648 x (I – 4) / 16 I = D x 16 / 27648 + 4
	22.81 mA	32511	0x7EFF	Upper limit	
	20 mA	27648	0x6C00	Normal range	
	12 mA	13824	0x3600		
	4 mA	0	0		
	1.19 mA	-4864	0xED00	Lower limit	
	<1.19 mA	-32768	0x8000	Underflow	

3.23 DF20-M-8AI-U-4: 8-channel voltage input module

3.23.1 Technical parameters

Electrical parameters	
Number of channels	8
Signal range	±10V/0~10V/2~10V/±5V/0~5V/1~5V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	>500KΩ
Resolution/Accuracy	16bit/0.2%
Sampling frequency	50Hz~1000Hz configurable, default 100Hz
System side current	20mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.23.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
PWR	On: The module is powered normally	
	Off: Module power supply is abnormal	
STA	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal sampling state
LED1	Off: No signal input to the module	
	Flashing: The module has signal input	
LED2	Off: No signal input to the module	
	Flashing: The module has signal input	
LED3	Off: No signal input to the module	
	Flashing: The module has signal input	
LED4	Off: No signal input to the module	
	Flashing: The module has signal input	
LED5	Off: No signal input to the module	
	Flashing: The module has signal input	
LED6	Off: No signal input to the module	
	Flashing: The module has signal input	
LED7	Off: No signal input to the module	
	Flashing: The module has signal input	
LED8	Off: No signal input to the module	
	Flashing: The module has signal input	

3.23.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8AI-U-4	16	16	0	0

➢ Process Data Definition

Signal range	Voltage value	Decimal data	Hexadecimal	Scope	Conversion relationship
±10V （-27648~27648）	>11.76V	32767	0x7FFF	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	11.76V	32511	0x7EFF	Upper limit	
	10V	27648	0x6C00	Normal range	
	5V	13824	0x3600		
	0V	0	0x0000		
	-5V	-13824	0xCA00		
	-10V	-27648	0x9400		
	-11.76V	-32511	0x8100	Lower limit	
	<-11.76V	-32768	0x8000	Underflow	
0~10V （0~27648）	>11.76V	32767	0x7FFF	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	11.76V	32511	0x7EFF	Upper limit	
	10V	27648	0x6C00	Normal range	
	5V	13824	0x3600		
	0V	0	0x0000		
2~10V （0~27648）	>11.41V	32767	0x7FFF	Overflow	D = 27648 x (U – 2) / 8 U = D x 8 / 27648 + 2
	11.41V	32511	0x7EFF	Upper limit	
	10V	27648	0x6C00	Normal range	
	6V	13824	0x3600		
	2V	0	0x0000		
	0.59 V	-4864	0xED00	Lower limit	
	<0.59 V	-32768	0x8000	Underflow	
±5V （-27648~27648）	>5.88V	32767	0x7FFF	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	5.88V	32511	0x7EFF	Upper limit	
	5V	27648	0x6C00	Normal range	
	2.5V	13824	0x3600		
	0V	0	0x0000		
	-2.5V	-13824	0xCA00		
	-5V	-27648	0x9400		
	-5.88V	-32511	0x8100	Lower limit	
	<-5.88V	-32768	0x8000	Underflow	
0~5V （0~27648）	>5.88V	32767	0x7FFF	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	5.88V	32511	0x7EFF	Upper limit	
	5V	27648	0x6C00	Normal range	
	2.5V	13824	0x3600		
	0V	0	0x0000		

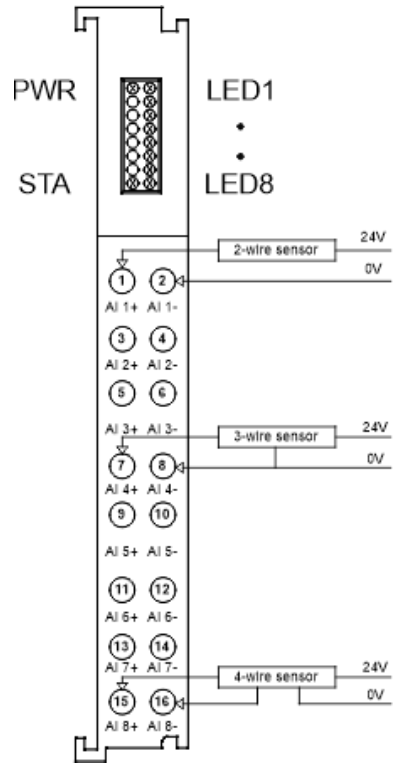
1~5V （0~27648）	>5.7V	32767	0x7FFF	Overflow	D = 27648 x (U – 1) / 4 U = D x 4 / 27648 + 1
	5.7V	32511	0x7EFF	Upper limit	
	5V	27648	0x6C00	Normal range	
	3V	13824	0x3600		
	1V	0	0x0000		
	0.3V	-4864	0xED00	Lower limit	
	<0.3V	-32768	0x8000	Underflow	

3.24 DF20-M-8AI-I-5: 8-channel current input module

3.24.1 Technical parameters

Electrical parameters	
Number of channels	8
Signal range	0~20mA/4~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Input Impedance	100Ω
Resolution/Accuracy	16bit/0.2%
Sampling frequency	50Hz~1000Hz configurable, default 100Hz
System side current	20mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.24.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
PWR	On: The module is powered normally	
	Off: Module power supply is abnormal	
STA	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal sampling state
LED1	Off: No signal input to the module	
	Flashing: The module has signal input	
LED2	Off: No signal input to the module	
	Flashing: The module has signal input	
LED3	Off: No signal input to the module	
	Flashing: The module has signal input	
LED4	Off: No signal input to the module	
	Flashing: The module has signal input	
LED5	Off: No signal input to the module	
	Flashing: The module has signal input	
LED6	Off: No signal input to the module	
	Flashing: The module has signal input	

LED7	Off: No signal input to the module
	Flashing: The module has signal input
LED8	Off: No signal input to the module
	Flashing: The module has signal input

3.24.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8AI-I-5	16	16	0	0

Process Data Definition

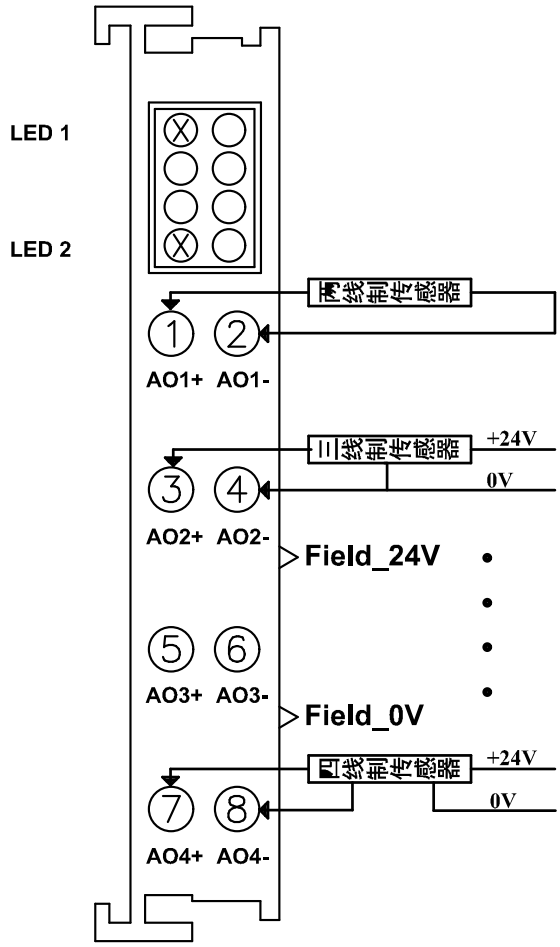
Signal range	Current value (I)	Decimal data	Hexadecimal data	scope	Conversion relationship
0 ~ 20 mA (0~27648)	>23.52 mA	32767	0x7FFF	Overflow	D = 27648 x I / 20 I = D x 20 / 27648
	23.52 mA	32511	0x7EFF	Upper limit	
	20 mA	27648	0x6C00	Normal range	
	10 mA	13824	0x3600		
	0 mA	0	0		
4 ~ 20 mA (0~27648)	>22.81 mA	32767	0x7FFF	Overflow	D = 27648 x (I – 4) / 16 I = D x 16 / 27648 + 4
	22.81 mA	32511	0x7EFF	Upper limit	
	20 mA	27648	0x6C00	Normal range	
	12 mA	13824	0x3600		
	4 mA	0	0		
	1.19 mA	-4864	0xED00	Lower limit	
	<1.19 mA	-32768	0x8000	Underflow	

3.25 DF20-M-4AO-U-0: 4-channel voltage output module

3.25.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	±10V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	>1KΩ
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	500mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.25.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal output state

3.25.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AO-U-0	0	0	8	8

- Process data definition description:

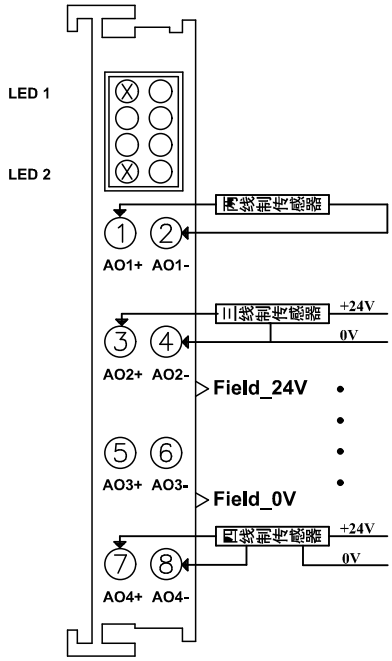
Signal range	Decimal data	Hexadecimal	Voltage	Scope	Conversion relationship
±10V	27648	0x6C00	10V	Normal range	D =27648x U / 10 U = D x 10 /27648
	0	0	0V		
	-27648	0x9400	-10V		

3.26 DF20-M-4AO-U-1: 4-channel voltage output module

3.26.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	0~10V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	>1KΩ
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	500mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.26.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal output state

3.26.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AO-U-1	0	0	8	8

➢ Process data definition description:

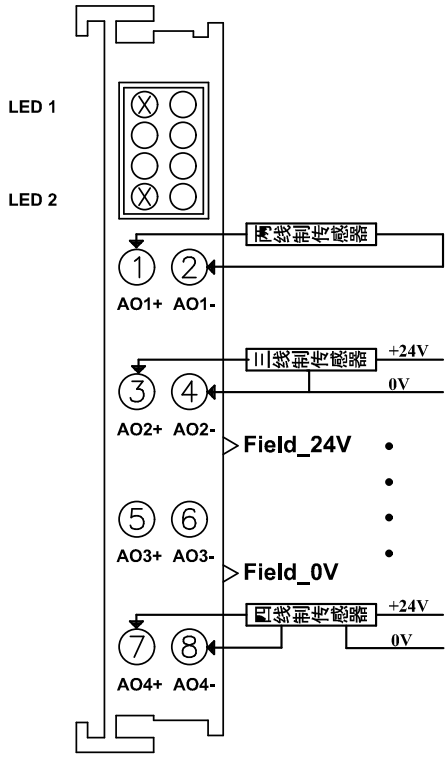
Signal range	Decimal data	Hexadecimal data	Voltage value (U)	Scope	Conversion relationship
0~10V	27648	0x6C00	10V	Normal range	D =27648x U / 10 U = D x 10 /27648
	13824	0x3600	5V		
	0	0	0V		

3.27 DF20-M-4AO-I-2: 4-channel current output module

3.27.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	0~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	<500Ω
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	600mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.27.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal output state

3.27.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AO-I-2	0	0	8	8

- Process Data Definition

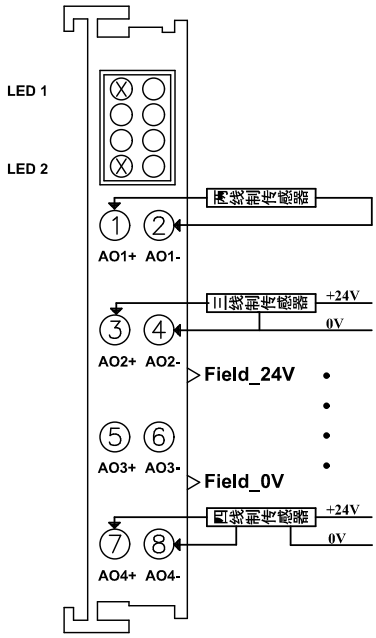
Signal range	Decimal data	Hexadecimal data	Current value (I)	scope	Conversion relationship
0 ~ 20 mA	27648	0x6C00	20mA	Normal range	D =27648x I / 20 I = D x 20 /27648
	13824	0x3600	10mA		
	0	0	0		

3.28 DF20-M-4AO-I-3: 4-channel current output module

3.28.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	4~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	<500Ω
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	600mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.28.2Status indicator and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal output state

3.28.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AO-I-3	0	0	8	8

➢ Process Data Definition

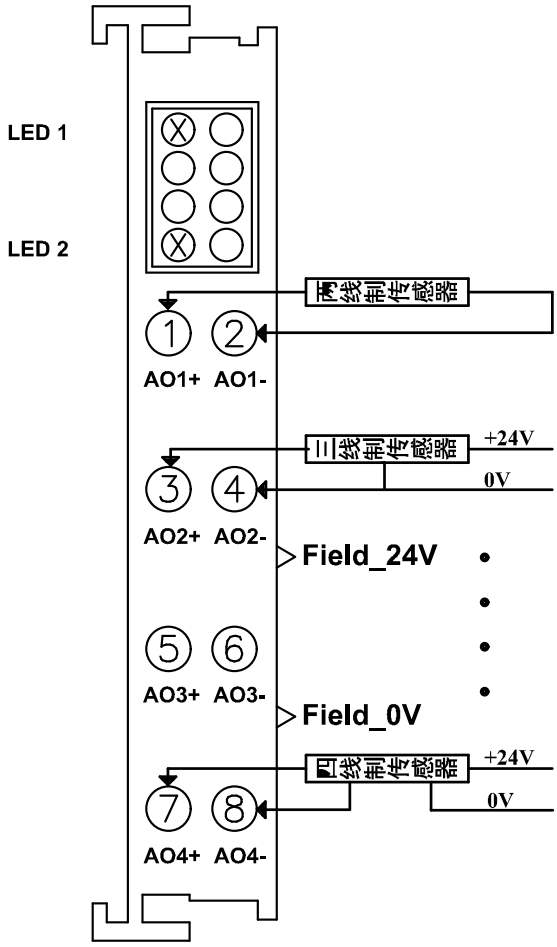
Signal range	Decimal data	Hexadecimal data	Current value (I）	scope	Conversion relationship
4～20 mA	27648	0x6C00	20mA	Normal range	D =27648x (I – 4) / 16 I = D x 16 /27648+ 4
	13824	0x3600	12mA		
	0	0	4mA		

3.29 DF20-M-4AO-U-4: 4-channel voltage output module

3.29.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	±10V/0~10V/2~10V/±5V/0~5V/1~5V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	>1KΩ
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	500mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.29.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal output state

3.29.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AO-U-4	0	0	8	8

➢ Process Data Definition

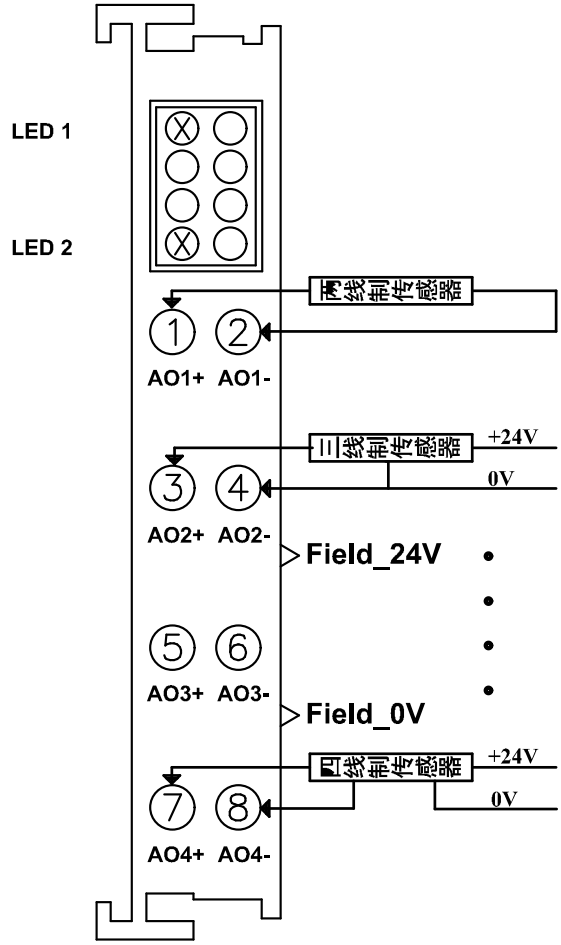
Signal range	Decimal data	Hexadecimal	Voltage	Scope	Conversion relationship
±10V（-27648~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	32511	0x7EFF	11.76V	Upper limit	
	27648	0x6C00	10V	Normal range	
	13824	0x3600	5V		
	0	0x0000	0V		
	-13824	0xCA00	-5V		
	-27648	0x9400	-10V		
	-32511	0x8100	-11.76V	Lower limit	
	<-32511	<0x8100	0V	Underflow	
0~10V（0~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	32511	0x7EFF	11.76V	Upper limit	
	27648	0x6C00	10V	Normal range	
	13824	0x3600	5V		
	0	0x0000	0V		
2~10V（0~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x (U – 2) / 8 U = D x 8 / 27648 + 2
	32511	0x7EFF	11.41V	Upper limit	
	27648	0x6C00	10V	Normal range	
	13824	0x3600	6V		
	0	0x0000	2V		
	-4864	0xED00	0.59 V	Lower limit	
	<-4864	<0xED00	0V	Underflow	
±5V（-27648~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	32511	0x7EFF	5.88V	Upper limit	
	27648	0x6C00	5V	Normal range	
	13824	0x3600	2.5V		
	0	0x0000	0V		
	-13824	0xCA00	-2.5V		
	-27648	0x9400	-5V		
	-32511	0x8100	-5.88V	Lower limit	
	<-32511	<0x8100	0V	Underflow	
0-5V（0~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	32511	0x7EFF	5.88V	Upper limit	
	27648	0x6C00	5V	Normal range	
	13824	0x3600	2.5V		
	0	0x0000	0V		
1~5V（0~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x (U – 1) / 4 U = D x 4 / 27648 + 1
	32511	0x7EFF	5.7V	Upper limit	
	27648	0x6C00	5V	Normal range	
	13824	0x3600	3V		
	0	0x0000	1V		
	-4864	0xED00	0.3V	Lower limit	
	<-4864	<0xED00	0V	Underflow	

3.30 DF20-M-4AO-I-5: 4-channel current output module

3.30.1 Technical parameters

Electrical parameters	
Number of channels	4
Signal range	0~20mA/4~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	<500Ω
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	600mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.30.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal output state

3.30.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4AO-I-5	0	0	8	8

➢ Process Data Definition

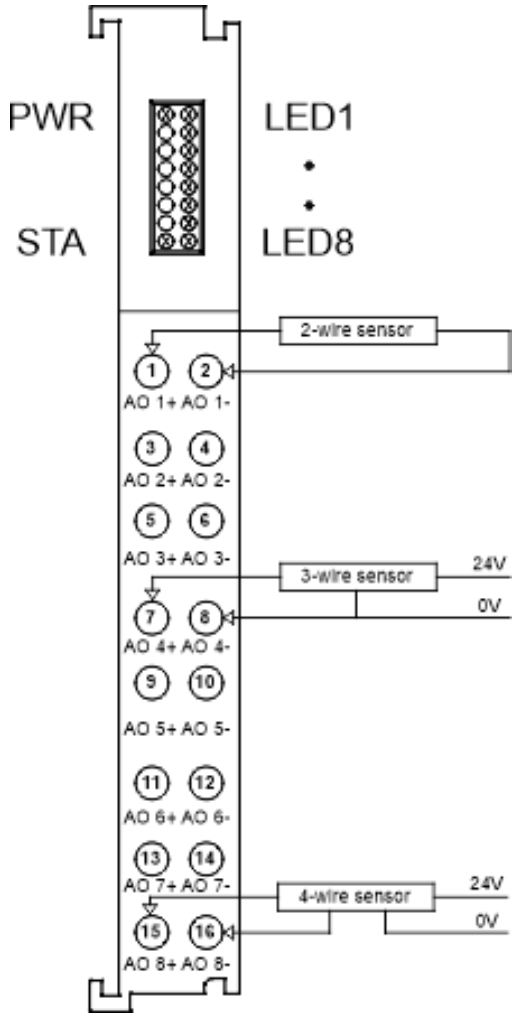
Signal range	Decimal data	Hexadecimal data	Current value (I）	scope	Conversion relationship
0～20 mA（0~27648）	>32511	>0x7EFF	0mA	Overflow	D = 27648 x I / 20 I = D x 20 / 27648
	32511	0x7EFF	23.52 mA	Upper limit	
	27648	0x6C00	20 mA	Normal range	
	13824	0x3600	10 mA		
	0	0	0 mA		
4～20 mA（0~27648）	>32511	>0x7EFF	0mA	Overflow	D = 27648 x (I – 4) / 16 I = D x 16 / 27648 + 4
	32511	0x7EFF	22.81 mA	Upper limit	
	27648	0x6C00	20 mA	Normal range	
	13824	0x3600	12 mA		
	0	0	4 mA		
	-4864	0xED00	1.19 mA	Lower limit	
	<-4864	<0xED00	0mA	Underflow	

3.31 DF20-M-8AO-U-4: 8-channel voltage output module

3.31.1 Technical parameters

Electrical parameters	
Number of channels	8
Signal range	±10V/0~10V/2~10V/±5V/0~5V/1~5V
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	>1KΩ
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	35mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.31.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
PWR	On: The module is powered normally	
	Off: Module power supply is abnormal	
STA	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Output stage	Flashing: The module is working in normal output state
LED1	Off: The module has no signal output	
	Flashing: The module has signal output	
LED2	Off: The module has no signal output	
	Flashing: The module has signal output	
LED3	Off: The module has no signal output	
	Flashing: The module has signal output	
LED4	Off: The module has no signal output	
	Flashing: The module has signal output	

LED5	Off: The module has no signal output
	Flashing: The module has signal output
LED6	Off: The module has no signal output
	Flashing: The module has signal output
LED7	Off: The module has no signal output
	Flashing: The module has signal output
LED8	Off: The module has no signal output
	Flashing: The module has signal output

3.31.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8AO-U-4	0	0	16	16

- Process Data Definition

Signal range	Decimal data	Hexadecimal	Voltage	Scope	Conversion relationship
±10V (-27648~27648)	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	32511	0x7EFF	11.76V	Upper limit	
	27648	0x6C00	10V	Normal range	
	13824	0x3600	5V		
	0	0x0000	0V		
	-13824	0xCA00	-5V		
	-27648	0x9400	-10V		
	-32511	0x8100	-11.76V	Lower limit	
	<-32511	<0x8100	0V	Underflow	
0~10V (0~27648)	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 10 U = D x 10 / 27648
	32511	0x7EFF	11.76V	Upper limit	
	27648	0x6C00	10V	Normal range	
	13824	0x3600	5V		
	0	0x0000	0V		
2~10V (0~27648)	>32511	>0x7EFF	0V	Overflow	D = 27648 x (U – 2) / 8 U = D x 8 / 27648 + 2
	32511	0x7EFF	11.41V	Upper limit	
	27648	0x6C00	10V	Normal range	
	13824	0x3600	6V		
	0	0x0000	2V		
	-4864	0xED00	0.59 V	Lower limit	
	<-4864	<0xED00	0V	Underflow	
±5V (-27648~27648)	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	32511	0x7EFF	5.88V	Upper limit	

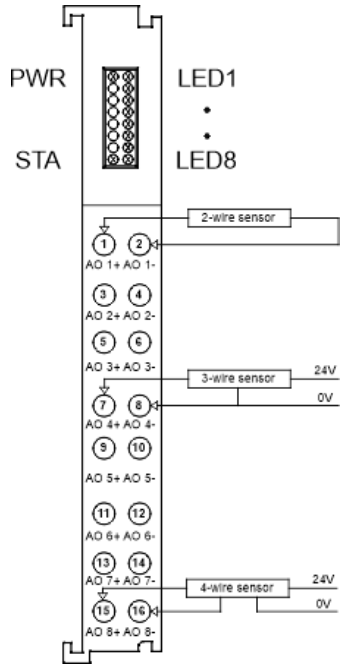
	27648	0x6C00	5V	Normal range	
	13824	0x3600	2.5V		
	0	0x0000	0V		
	-13824	0xCA00	-2.5V		
	-27648	0x9400	-5V		
	-32511	0x8100	-5.88V	Lower limit	
	<-32511	<0x8100	0V	Underflow	
0~5V （0~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x U / 5 U = D x 5 / 27648
	32511	0x7EFF	5.88V	Upper limit	
	27648	0x6C00	5V	Normal range	
	13824	0x3600	2.5V		
	0	0x0000	0V		
1~5V （0~27648）	>32511	>0x7EFF	0V	Overflow	D = 27648 x (U – 1) / 4 U = D x 4 / 27648 + 1
	32511	0x7EFF	5.7V	Upper limit	
	27648	0x6C00	5V	Normal range	
	13824	0x3600	3V		
	0	0x0000	1V		
	-4864	0xED00	0.3V	Lower limit	
	<-4864	<0xED00	0V	Underflow	

3.32 DF20-M-8AO-I-5: 8-channel current output module

3.32.1 Technical parameters

Electrical parameters	
Number of channels	8
Signal range	0~20mA/4~20mA
Signal Type	Differential/Single-ended
Connection Type	2-wire
Load Capacity	<500Ω
Resolution/Accuracy	16bit/0.1%
Load Type	Resistive load/capacitive load
System side current	35mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.32.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
PWR	On: The module is powered normally	
	Off: Module power supply is abnormal	
STA	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Output stage	Flashing: The module is working in normal output state
LED1	Off: The module has no signal output	
	Flashing: The module has signal output	
LED2	Off: The module has no signal output	
	Flashing: The module has signal output	
LED3	Off: The module has no signal output	
	Flashing: The module has signal output	
LED4	Off: The module has no signal output	
	Flashing: The module has signal output	
LED5	Off: The module has no signal output	
	Flashing: The module has signal output	
LED6	Off: The module has no signal output	
	Flashing: The module has signal output	
LED7	Off: The module has no signal output	
	Flashing: The module has signal output	
LED8	Off: The module has no signal output	
	Flashing: The module has signal output	

3.32.3 Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8AO-I-5	0	0	16	16

➢ Process Data Definition

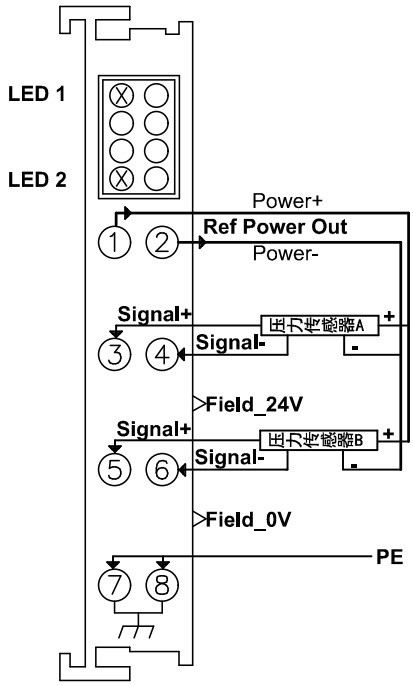
Signal range	Decimal data	Hexadecimal data	Current value (I)	scope	Conversion relationship
0 ~ 20 mA (0~27648)	>32511	>0x7EFF	0mA	Overflow	D = 27648 x I / 20 I = D x 20 / 27648
	32511	0x7EFF	23.52 mA	Upper limit	
	27648	0x6C00	20 mA	Normal range	
	13824	0x3600	10 mA		
	0	0	0 mA		
4~ 20 mA (0~27648)	>32511	>0x7EFF	0mA	Overflow	D = 27648 x (I – 4) / 16 I = D x 16 / 27648 + 4
	32511	0x7EFF	22.81 mA	Upper limit	
	27648	0x6C00	20 mA	Normal range	
	13824	0x3600	12 mA		
	0	0	4 mA		
	-4864	0xED00	1.19 mA	Lower limit	
	<-4864	<0xED00	0mA	Underflow	

3.33 DF20-M-2LC-S-5:2Channel Pressure Sensor Input Module

3.33.1 Technical parameters

Electrical parameters	
Number of channels	2
Signal range	0~10mv
Signal Type	Differential/Single-ended
Connection Type	3-wire/4-wire
Excitation power output	5V DC
Resolution/Accuracy	16bit/0.2%
Sampling frequency	20Hz~300Hz configurable
System side current consumption	210mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of wire	2.5mm²
Maximum crimping area of wire(AWG)	AWG14
Minimum crimping area of wire	0.2mm²
Minimum crimping area of wire(AWG)	AWG28
Line length	8...9mm

3.33.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning	
LED1	On: The module is powered normally	
	Off: Module power supply is abnormal	
LED2	Initialization phase	On: Module initialization error
		Off: Module initialization is normal
	Sampling stage	Flashing: The module is working in normal input state

3.33.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2LC-S-5	4	4	0	0

➢ Process Data Definition

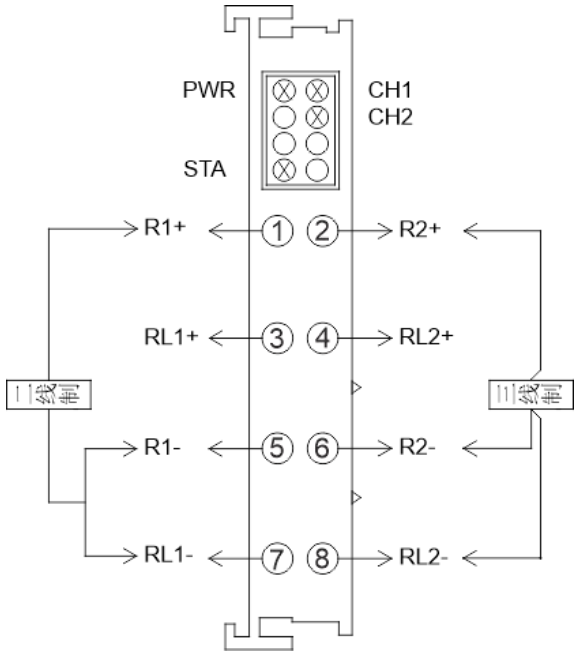
Signal range	Decimal data	Hexadecimal data	Voltage value (U)	Conversion relationship
0~10mV	32767	0x7FFF	10 mV	D = 32767x U / 10 U = D x 10 / 32767
	16383	0x3FFF	5 mV	
	0	0x0000	0 mV	

3.34 DF20-M-2RTD-PT: 2-channel RTD sensor input module

3.34.1 Technical parameters

Electrical parameters	
Number of channels	2
Connection Type	2-Wire system/3-Wire system
Temperature resolution	Temperature value:0.1℃/Each digit
Resistance value conversion formula (measurement resistance value)	$R_{Reality}$ =D/27648*$R_{Forehead}$ in:R_{It} is the current resistance value;R_{Rated} is the rated range value of resistance.
Sampling frequency	Configurable
Sensor Type	PT100,PT200,PT500,PT1000,Ni100,Ni120,Ni200,Ni500,Ni1000,Cu10,Cu50,Cu53,Cu100,KTY84-130,KTY84-150,KTY84-151,40 Ohm,80 Ohm,150 Ohm,300 Ohm,500 Ohm,1000 Ohm,2000 Ohm,4000 Ohm,KTY83-110,KTY83-120,KTY83-121,KTY83-122,KTY83-150,KTY83-151,NTC-5K,NTC-10K
Disconnection detection	support
System side current	70mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.34.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
PWR	On: The module is powered normally
	Off: Module power supply is abnormal
STA	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off
CH1~CH2	Green off: disconnected
	Green flash: normal collection
	Green: Over limit

3.34.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2RTD-PT	4	4	0	0

- Definition of various sensor process data

PT100type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

PT200type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

PT500type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

PT1000type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow

850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni100type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni120type			
temperature	Decimal	hexadecimal	Scope
>309	32767	0x7FFF	Overflow
309	3090	0x0C12	Normal range
-79	-790	0xFCEA	
<-79	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

NI200type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni500type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	

<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni1000type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu10type			
temperature	Decimal	hexadecimal	Scope
>159	32767	0x7FFF	Overflow
159	1590	0x0636	Normal range
-59	-590	0xFDB2	
<-59	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu50type			
temperature	Decimal	hexadecimal	Scope
>159	32767	0x7FFF	Overflow
159	1590	0x0636	Normal range
-59	-590	0xFDB2	
<-59	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu53type			
temperature	Decimal	hexadecimal	Scope
>150	32767	0x7FFF	Overflow
150	1500	0x05DC	Normal range
-50	-500	0xFE0C	
<-50	-32767	0x8001	Underflow
Sensor not	-32768	0x8000	Disconnection

connected			detection

Cu100type			
temperature	Decimal	hexadecimal	Scope
>159	32767	0x7FFF	Overflow
159	1590	0x0636	Normal range
-59	-590	0xFDB2	
<-59	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY84_130type			
temperature	Decimal	hexadecimal	Scope
>280	32767	0x7FFF	Overflow
280	2800	0x0AF0	Normal range
-40	-400	0xFE70	
<-40	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY84_150type			
temperature	Decimal	hexadecimal	Scope
>280	32767	0x7FFF	Overflow
280	2800	0x0AF0	Normal range
-40	-400	0xFE70	
<-40	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY84_151type			
temperature	Decimal	hexadecimal	Scope
>280	32767	0x7FFF	Overflow
280	2800	0x0AF0	Normal range
-40	-400	0xFE70	
<-40	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

0-40ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>319.25ohm	-32768	0x8000	Beyond the limit
>47.03ohm	32767	0x7FFF	Upper limit
47.03ohm	32511	0x7EFF	Overflow
40ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-150ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>319.25ohm	-32768	0x8000	Beyond the limit
>176.38ohm	32767	0x7FFF	Upper limit
176.38ohm	32511	0x7EFF	Overflow
150ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-300ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>638.5ohm	-32768	0x8000	Beyond the limit
>352.77ohm	32767	0x7FFF	Upper limit
352.77ohm	32511	0x7EFF	Overflow
300ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-500ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>638.5ohm	-32768	0x8000	Beyond the limit
>587.94ohm	32767	0x7FFF	Upper limit
587.94ohm	32511	0x7EFF	Overflow
500ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-1000ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>1277ohm	-32768	0x8000	Beyond the limit
>1175.89ohm	32767	0x7FFF	Upper limit
1175.89ohm	32511	0x7EFF	Overflow
1000ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-2000ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>2554ohm	-32768	0x8000	Beyond the limit
>2351.78ohm	32767	0x7FFF	Upper limit
2351.78ohm	32511	0x7EFF	Overflow
2000ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-4000ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>5108ohm	-32768	0x8000	Beyond the limit
>4703.56ohm	32767	0x7FFF	Upper limit
4703.56ohm	32511	0x7EFF	Overflow
4000ohm	27648	0x6C00	Normal range
0ohm	0	0	
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-110type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-120type			
temperature	Decimal	hexadecimal	Scope

>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-121type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-122type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-150type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-151type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

NTC-5Ktype			
temperature	Decimal	hexadecimal	Scope
>90	32767	0x7FFF	Overflow
90	900	0x0384	Normal range
-30	-300	0xFED4	
<-30	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

NTC-10Ktype

temperature	Decimal	hexadecimal	Scope
>150	32767	0x7FFF	Overflow
150	1500	0x05DC	Normal range
25	250	0x00FA	
<25	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

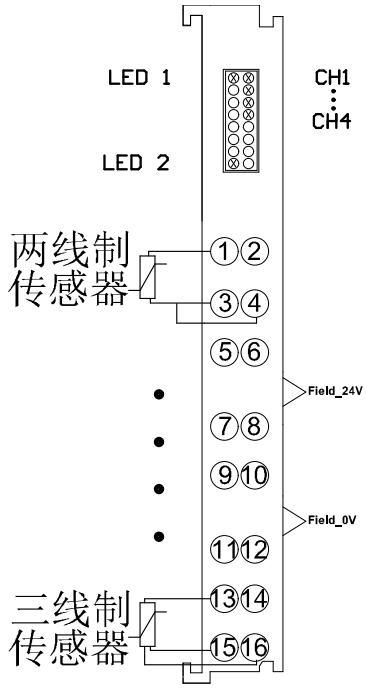
3.35 DF20-M-4RTD-PT: 4-channel thermal resistor sensor input module

3.35.1 Technical parameters

Electrical parameters	
Number of channels	4
Connection Type	2-wire/3-wire
Temperature resolution	Temperature value:0.1℃/Each digit
Resistance value conversion formula (measurement resistance value)	$R = D/27648 * R_{Forehead}$ in:R is the current resistance value; R is the rated range value of the resistance.
Sampling frequency	Configurable
Sensor Type	PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu53, Cu100, KTY84-130, KTY84-150, KTY84-151, 40 Ohm, 80 Ohm, 150 Ohm, 300 Ohm, 500 Ohm, 1000 Ohm, 2000 Ohm, 4000 Ohm,KTY83-110,KTY83-120,KTY83-121,KTY83-122,KTY83-150,KTY83-151,NTC-5K,NTC-10K
Disconnection detection	support
System side current	70mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40℃~+85℃
Relative humidity	5~95%RH(No condensation)

Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²

3.35.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off
CH1~CH4	Green off: disconnected
	Green flash: normal collection
	Green: Over limit

3.35.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4RTD-PT	8	8	0	0

➢ Definition of various sensor process data

PT100type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

PT200type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

PT500type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	
<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

PT1000type			
temperature	Decimal	hexadecimal	Scope
>850	32767	0x7FFF	Overflow
850	8500	0x2134	Normal range
-200	-2000	0xF830	

<-200	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni100type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni120type			
temperature	Decimal	hexadecimal	Scope
>309	32767	0x7FFF	Overflow
309	3090	0x0C12	Normal range
-79	-790	0xFCEA	
<-79	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

NI200type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Ni500type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not	-32768	0x8000	Disconnection

connected			detection

Ni1000type			
temperature	Decimal	hexadecimal	Scope
>250	32767	0x7FFF	Overflow
250	2500	0x09C4	Normal range
-60	-600	0xFDA8	
<-60	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu10type			
temperature	Decimal	hexadecimal	Scope
>159	32767	0x7FFF	Overflow
159	1590	0x0636	Normal range
-59	-590	0xFDB2	
<-59	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu50type			
temperature	Decimal	hexadecimal	Scope
>159	32767	0x7FFF	Overflow
159	1590	0x0636	Normal range
-59	-590	0xFDB2	
<-59	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu53type			
temperature	Decimal	hexadecimal	Scope
>150	32767	0x7FFF	Overflow
150	1500	0x05DC	Normal range
-50	-500	0xFE0C	
<-50	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

Cu100type			
temperature	Decimal	hexadecimal	Scope
>159	32767	0x7FFF	Overflow
159	1590	0x0636	Normal range
-59	-590	0xFDB2	
<-59	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY84_130type			
temperature	Decimal	hexadecimal	Scope
>280	32767	0x7FFF	Overflow
280	2800	0x0AF0	Normal range
-40	-400	0xFE70	
<-40	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY84_150type			
temperature	Decimal	hexadecimal	Scope
>280	32767	0x7FFF	Overflow
280	2800	0x0AF0	Normal range
-40	-400	0xFE70	
<-40	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY84_151type			
temperature	Decimal	hexadecimal	Scope
>280	32767	0x7FFF	Overflow
280	2800	0x0AF0	Normal range
-40	-400	0xFE70	
<-40	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

0-40ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>319.25ohm	-32768	0x8000	Beyond the limit
>47.03ohm	32767	0x7FFF	Upper limit
47.03ohm	32511	0x7EFF	Overflow
40ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not	-32768	0x8000	Disconnection

0-150ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>319.25ohm	-32768	0x8000	Beyond the limit
>176.38ohm	32767	0x7FFF	Upper limit
176.38ohm	32511	0x7EFF	Overflow
150ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-300ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>638.5ohm	-32768	0x8000	Beyond the limit
>352.77ohm	32767	0x7FFF	Upper limit
352.77ohm	32511	0x7EFF	Overflow
300ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-500ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>638.5ohm	-32768	0x8000	Beyond the limit
>587.94ohm	32767	0x7FFF	Upper limit
587.94ohm	32511	0x7EFF	Overflow
500ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-1000ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>1277ohm	-32768	0x8000	Beyond the limit
>1175.89ohm	32767	0x7FFF	Upper limit
1175.89ohm	32511	0x7EFF	Overflow
1000ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-2000ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>2554ohm	-32768	0x8000	Beyond the limit
>2351.78ohm	32767	0x7FFF	Upper limit
2351.78ohm	32511	0x7EFF	Overflow
2000ohm	27648	0x6C00	Normal range
0ohm	0	0x0000	
Sensor not connected	-32768	0x8000	Disconnection detection

0-4000ohmtype			
ohmvalue	Decimal	hexadecimal	Scope
>5108ohm	-32768	0x8000	Beyond the limit
>4703.56ohm	32767	0x7FFF	Upper limit
4703.56ohm	32511	0x7EFF	Overflow
4000ohm	27648	0x6C00	Normal range
0ohm	0	0	
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-110type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-120type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range

-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-121type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-122type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-150type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

KTY83-151type			
temperature	Decimal	hexadecimal	Scope
>175	32767	0x7FFF	Overflow
175	1750	0x06D6	Normal range
-55	-550	0xFDDA	
<-55	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

NTC-5Ktype			
temperature	Decimal	hexadecimal	Scope
>90	32767	0x7FFF	Overflow
90	900	0x0384	Normal range
-30	-300	0xFED4	
<-30	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

NTC-10Ktype			
temperature	Decimal	hexadecimal	Scope
>150	32767	0x7FFF	Overflow

150	1500	0x05DC	Normal range
25	250	0x00FA	
<25	-32767	0x8001	Underflow
Sensor not connected	-32768	0x8000	Disconnection detection

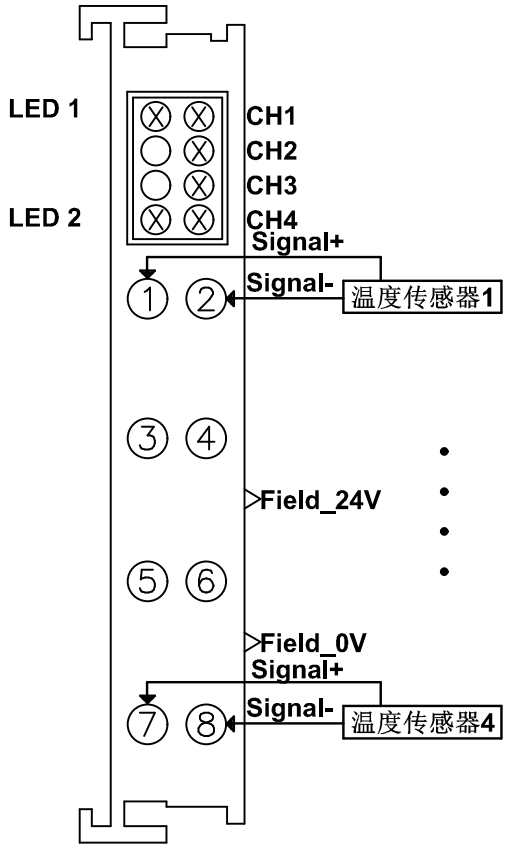
3.36 DF20-M-4TC-KETJ: 4-channel thermocouple sensor input module

3.36.1 Technical parameters

Electrical parameters	
Number of channels	4
Connection Type	2-wire
Temperature resolution	Temperature value:0.1℃/Each digit
Voltage conversion formula (measure mV voltage value)	$V = D/32767 * V_{Forehead}$ in:V is the current voltage value; V is the rated range value of the sensor.
Sampling frequency	Configurable, default 4Hz
Sensor type/signal range	K, E, T, J, B, S, R, N, C, L, 15.625mV, 31.25mV, 62.5mV, 125mV, 250mV, 500mV, 1000mV, 2000mV
Disconnection detection	support
System side current	70mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14

Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.36.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off
CH1~CH4	Green off: disconnected
	Green flash: normal collection
	Green: Over limit

3.36.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-4TC-KETJ	8	8	8	8

- Process Data Definition

Ktype			
temperature	Decimal	hexadecimal	Scope
>1370	32767	7FFF	Overflow
1370	13700	3584	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Etype			
temperature	Decimal	hexadecimal	Scope
>1000	32767	7FFF	Overflow
1000	10000	2710	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ttype			
temperature	Decimal	hexadecimal	Scope
>400	32767	7FFF	Overflow
400	4000	FA0	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection
Jtype			
temperature	Decimal	hexadecimal	Scope
>1200	32767	7FFF	Overflow
1200	12000	2EE0	Normal range

-210	-2100	F7CC	
<-210	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Btype			
temperature	Decimal	hexadecimal	Scope
>1820	32767	7FFF	Overflow
1820	18200	4718	Normal range
50	500	1F4	
<50	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Stype			
temperature	Decimal	hexadecimal	Scope
>1760	32767	7FFF	Overflow
1760	17600	44C0	Normal range
-50	-500	FE0C	
<-50	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Rtype			
temperature	Decimal	hexadecimal	Scope
>1770	32767	7FFF	Overflow
1770	17700	4524	Normal range
-50	-500	FE0C	
<-50	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ntype			
temperature	Decimal	hexadecimal	Scope
>1300	32767	7FFF	Overflow
1300	13000	32C8	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow

Sensor not connected	-32768	8000	Disconnection detection

Ctype			
temperature	Decimal	hexadecimal	Scope
>2320	32767	7FFF	Overflow
2320	23200	5AA0	Normal range
0	0	0	
<0	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ltype			
temperature	Decimal	hexadecimal	Scope
>900	32767	7FFF	Overflow
900	9000	2328	Normal range
-200	-2000	F830	
<-200	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

±15.625mV			
mvvalue	Decimal	hexadecimal	Scope
15.625mV	32767	7FFF	Normal range
-15.625mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±62.5mV			
mvvalue	Decimal	hexadecimal	Scope
62.5mV	32767	7FFF	Normal range
-62.5mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±125mV			
mvvalue	Decimal	hexadecimal	Scope
125mV	32767	7FFF	Normal range

-125mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±250mV			
mvvalue	Decimal	hexadecimal	Scope
250mV	32767	7FFF	Normal range
-250mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±500mV			
mvvalue	Decimal	hexadecimal	Scope
500mV	32767	7FFF	Normal range
-500mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±1000mV			
mvvalue	Decimal	hexadecimal	Scope
1V	32767	7FFF	Normal range
-1V	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

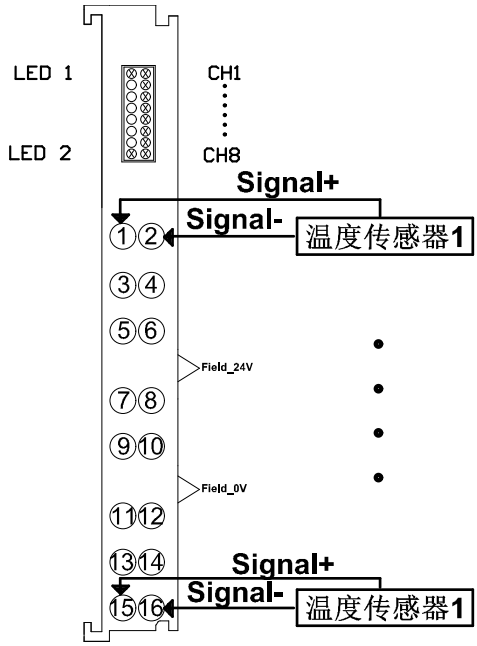
±2000mV			
mvvalue	Decimal	hexadecimal	Scope
2V	32767	7FFF	Normal range
-2V	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

3.37 DF20-M-8TC-KETJ: 8-channel thermocouple sensor input module

3.37.1 Technical parameters

Electrical parameters	
Number of channels	8
Connection Type	2-wire
Temperature resolution	Temperature value:0.1℃/Each digit
Voltage conversion formula (measure mV voltage value)	$V = D/32767 * V_{Forehead}$ in:V is the current voltage value; V is the rated range value of the sensor.
Filter time	Configurable, default 1800ms
Sensor type/signal range	K, E, T, J, B, S, R, N, C, L, 15.625mV, 31.25mV, 62.5mV, 125mV, 250mV, 500mV, 1000mV, 2000mV
Disconnection detection	support
System side current	80mA
Reverse circuit protection	support
Module failure alarm	support
General parameters	
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40℃~+85℃
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²
Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.37.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off
CH1~CH8	Green off: disconnected
	Green flash: normal collection
	Green: Over limit

3.37.3 Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-8TC-KETJ	16	16	16	16

➢ Process Data Definition

Ktype			
temperature	Decimal	hexadecimal	Scope
>1370	32767	7FFF	Overflow
1370	13700	3584	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Etype			
temperature	Decimal	hexadecimal	Scope
>1000	32767	7FFF	Overflow
1000	10000	2710	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ttype			
temperature	Decimal	hexadecimal	Scope
>400	32767	7FFF	Overflow
400	4000	FA0	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Jtype			
temperature	Decimal	hexadecimal	Scope
>1200	32767	7FFF	Overflow
1200	12000	2EE0	Normal range
-210	-2100	F7CC	
<-210	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Btype			
temperature	Decimal	hexadecimal	Scope
>1820	32767	7FFF	Overflow
1820	18200	4718	Normal range
50	500	1F4	
<50	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Stype			
temperature	Decimal	hexadecimal	Scope
>1760	32767	7FFF	Overflow
1760	17600	44C0	Normal range
-50	-500	FE0C	
<-50	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Rtype			
temperature	Decimal	hexadecimal	Scope
>1770	32767	7FFF	Overflow
1770	17700	4524	Normal range
-50	-500	FE0C	
<-50	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ntype			
temperature	Decimal	hexadecimal	Scope
>1300	32767	7FFF	Overflow
1300	13000	32C8	Normal range
-270	-2700	F574	
<-270	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ctype			
temperature	Decimal	hexadecimal	Scope

>2320	32767	7FFF	Overflow
2320	23200	5AA0	Normal range
0	0	0	
<0	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

Ltype			
temperature	Decimal	hexadecimal	Scope
>900	32767	7FFF	Overflow
900	9000	2328	Normal range
-200	-2000	F830	
<-200	-32767	8001	Underflow
Sensor not connected	-32768	8000	Disconnection detection

±15.625mV			
mvvalue	Decimal	hexadecimal	Scope
15.625mV	32767	7FFF	Normal range
-15.625mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±62.5mV			
mvvalue	Decimal	hexadecimal	Scope
62.5mV	32767	7FFF	Normal range
-62.5mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±125mV			
mvvalue	Decimal	hexadecimal	Scope
125mV	32767	7FFF	Normal range
-125mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±250mV

mvvalue	Decimal	hexadecimal	Scope
250mV	32767	7FFF	Normal range
-250mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±500mV			
mvvalue	Decimal	hexadecimal	Scope
500mV	32767	7FFF	Normal range
-500mV	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

±1000mV			
mvvalue	Decimal	hexadecimal	Scope
1V	32767	7FFF	Normal range
-1V	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

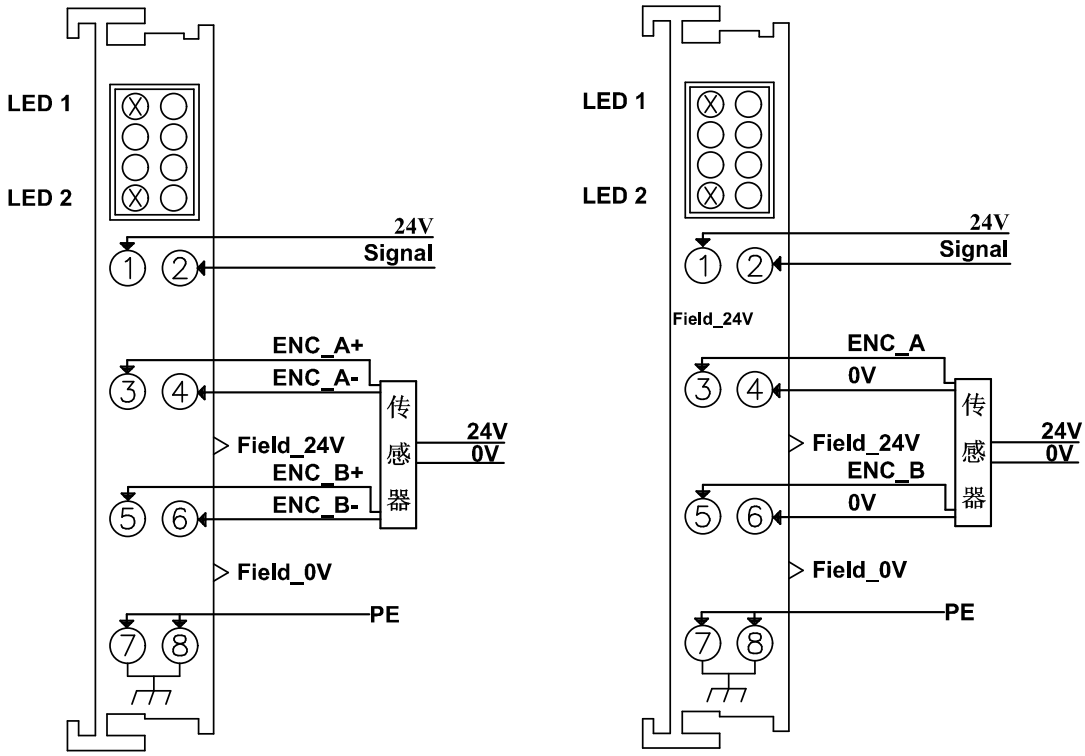
±2000mV			
mvvalue	Decimal	hexadecimal	Scope
2V	32767	7FFF	Normal range
-2V	-32767	8001	
Sensor not connected	-32768	8000	Disconnection detection

3.38 DF20-M-1CNT-EL-5: 1-channel encoder input module 5V signal

3.38.1 Technical parameters

Electrical parameters		
Input Channels	1 incremental encoder input	
	1 electronic probe input	
Input signal voltage	Encoder signal	5V
	Electron probe	24V
Encoder input parameters		
Signal Type	A+A-/B+B- differential signal or A/B signal	
Connection Type	2-wire/4-wire	
Counting range	–2147483648~2147483647	
Signal frequency	4x	
Maximum input frequency	1MHz	
Resolution/Accuracy	32bit/±1pulse	
Input Impedance	>500KΩ	
System side current	30mA	
Module failure alarm	support	
General parameters		
Vibration Testing	1g,conform toIEC 60068-2-6standard	
Shock Test	15g,conform toIEC 60068-2-27standard	
Electromagnetic	conform toEN 61000-4standard	
Protection level	IP20	
Operating temperature	-25~75℃	
Storage temperature	-40°C~+85°C	
Relative humidity	5~95%RH(No condensation)	
Installation	35mmRail installation	
Dimensions	100mm × 12mm × 67mm	
Maximum crimping area of	2.5mm²	
Maximum crimping area of	AWG14	
Minimum crimping area of	0.2mm²	
Minimum crimping area of	AWG28	
Line length	8...9mm	

3.38.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off

3.38.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-1CNT-EL-5	10	10	2	2

- Process data description:

Output data meaning	
The first channel output data	
Byte0~Byte1	Output 0x012B means start counting, 0x012C means clear current counting
Second channel output data	
Byte2~Byte3	Output 0x012B means start counting, 0x012C means clear current counting

Input data meaning	
First channel input data	
Byte0~Byte1	0x010BRepresentative channel1In counting state
	0x010CRepresentative channel1In cleared state
	0x0109Representative channel1In idle state
	0x010ERepresentative channel1In error state
Byte2~Byte3	aisle1Pulse input value low16Bit
Byte4~Byte5	aisle1Pulse input value high16Bit
Byte6~Byte7	aisle1Pulse input latch value low16Bit
Byte8~Byte9	aisle1Pulse input latch value high16Bit
Second channel input data	
Byte10~Byte11	0x010BIndicates that channel 2 is in counting state
	0x010CIndicates that channel 2 is in clear state
	0x0109Indicates that channel 2 is idle
	0x010EIndicates that channel 2 is in an error state
Byte12~Byte13	Channel 2 pulse input value low16Bit

Byte14~Byte15	Channel 2 pulse input value high16Bit
Byte16~Byte17	Channel 2 pulse input latch value low16Bit
Byte18~Byte19	Channel 2 pulse input latch value high16Bit

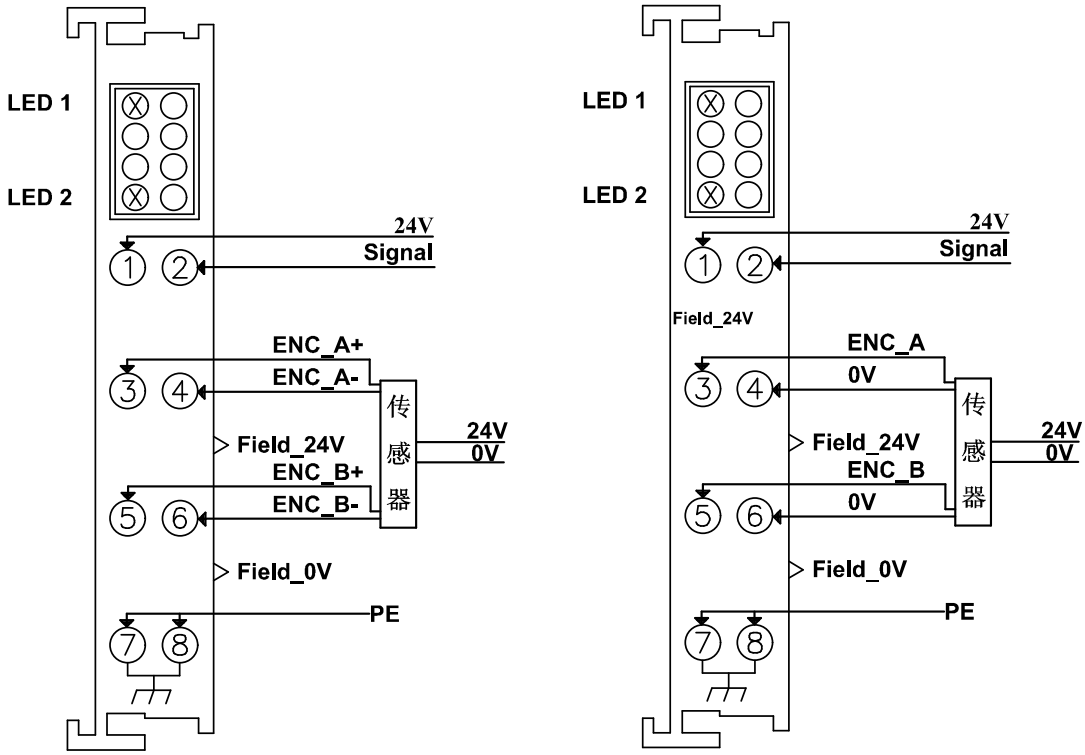
3.39 DF20-M-1CNT-EL-4: 1-channel encoder input module 24V signal

3.39.1 Technical parameters

Electrical parameters		
Input Channels	1 incremental encoder input	
	1 electronic probe input	
Input signal voltage	Encoder signal	24V
	Electron probe	24V
Encoder input parameters		
Signal Type	A+A-/B+B- differential signal or A/B signal	
Connection Type	2-wire/4-wire	
Counting range	–2147483648~2147483647	
Signal frequency	4x	
Maximum input frequency	1MHz	
Resolution/Accuracy	32bit/±1pulse	
Input Impedance	>500KΩ	
System side current	30mA	
Module failure alarm	support	
General parameters		
Vibration Testing	1g,conform toIEC 60068-2-6standard	
Shock Test	15g,conform toIEC 60068-2-27standard	
Electromagnetic	conform toEN 61000-4standard	
Protection level	IP20	
Operating temperature	-25~75℃	
Storage temperature	-40℃~+85℃	
Relative humidity	5~95%RH(No condensation)	
Installation	35mmRail installation	
Dimensions	100mm × 12mm × 67mm	
Maximum crimping area of	2.5mm²	

Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area of	AWG28
Line length	8...9mm

3.39.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off

3.39.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-1CNT-EL-4	10	10	2	2

- Process data description:

Output data meaning	
The first channel output data	
Byte0~Byte1	Output 0x012B means start counting, 0x012C means clear current counting
Second channel output data	
Byte2~Byte3	Output 0x012B means start counting, 0x012C means clear current counting

Input data meaning	
First channel input data	
Byte0~Byte1	0x010BRepresentative channel1In counting state
	0x010CRepresentative channel1In cleared state
	0x0109Representative channel1In idle state
	0x010ERepresentative channel1In error state
Byte2~Byte3	aisle1Pulse input value low16Bit
Byte4~Byte5	aisle1Pulse input value high16Bit
Byte6~Byte7	aisle1Pulse input latch value low16Bit
Byte8~Byte9	aisle1Pulse input latch value high16Bit
Second channel input data	
Byte10~Byte11	0x010BIndicates that channel 2 is in counting state
	0x010CIndicates that channel 2 is in clear state
	0x0109Indicates that channel 2 is idle
	0x010EIndicates that channel 2 is in an error state
Byte12~Byte13	Channel 2 pulse input value low16Bit
Byte14~Byte15	Channel 2 pulse input value high16Bit

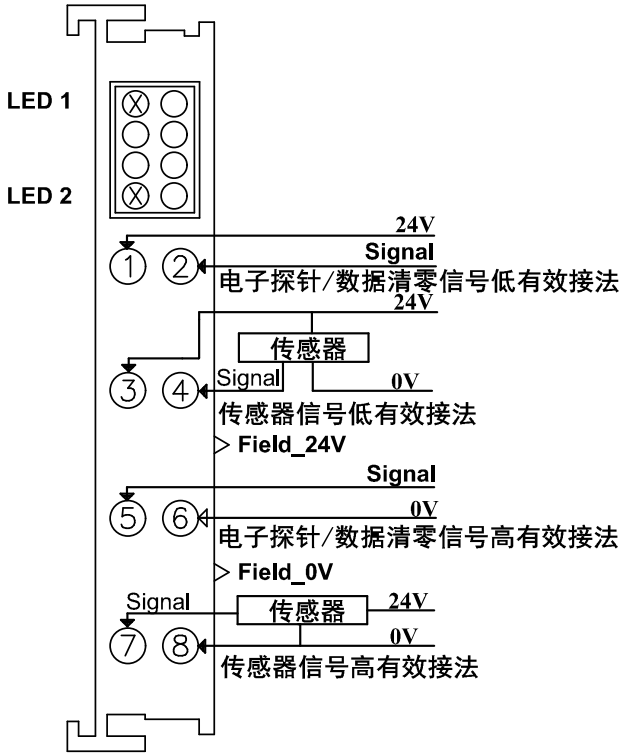
Byte16~Byte17	Channel 2 pulse input latch value low16Bit
Byte18~Byte19	Channel 2 pulse input latch value high16Bit

3.40 DF20-M-2CNT-PIL-5: 2-channel pulse input module 5V signal

3.40.1 Technical parameters

Electrical parameters		
Input Channels	2 pulse inputs	
	2 electronic probe inputs	
Input signal voltage	Pulse signal	5V
	Electron probe	24V
Encoder input parameters		
Signal Type	Differential signal or single-ended signal	
Connection Type	2-wire	
Counting range	0~4294967295	
Maximum input frequency	500KHz	
Resolution/Accuracy	32bit/±1pulse	
Input Impedance	>500KΩ	
System side current	30mA	
Module failure alarm	support	
General parameters		
Vibration Testing	1g,conform toIEC 60068-2-6standard	
Shock Test	15g,conform toIEC 60068-2-27standard	
Electromagnetic	conform toEN 61000-4standard	
Protection level	IP20	
Operating temperature	-25~75℃	
Storage temperature	-40℃~+85℃	
Relative humidity	5~95%RH(No condensation)	
Installation	35mmRail installation	
Dimensions	100mm × 12mm × 67mm	
Maximum crimping area of	2.5mm²	
Maximum crimping area of	AWG14	
Minimum crimping area of	0.2mm²	
Minimum crimping area of	AWG28	
Line length	8...9mm	

3.40.2 Status indicator light and wiring diagram



➢ The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off

3.40.3Process data description

- Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2CNT-PIL-5	20	20	12	12

- Process data description:

Output data meaning		
The first channel output data		
Byte0~Byte1	Bit15~bit3	reserve
	Bit2	0: Disable channel 1 comparison value; 1: Enable channel 1 comparison value
	Bit1	0: Enable the electronic probe function of channel 1; 1: Enable the count clear function triggered by the external signal of channel 1
	bit0	0: Channel 1 stops counting and the original count is reset to zero; 1: Channel 1 starts counting
Byte2~Byte3		Channel 1 comparison value lower 16 bits
Byte4~Byte5		Channel 1 comparison value high 16 bits
Second channel output data		
Byte6~Byte7	Bit15~bit3	reserve
	Bit2	0: Disable channel 1 comparison value; 1: Enable channel 1 comparison value
	Bit1	0: Enable the electronic probe function of channel 2; 1: Enable the count clear function triggered by the external signal of channel 2
	bit0	0: Channel 2 stops counting and the original count is reset; 1: Channel 2 starts counting
Byte8~Byte9		Channel 2 comparison value lower 16 bits
Byte10~Byte11		Channel 2 comparison value high 16 bits

Input data meaning		
First channel input data		
Byte0~Byte1	Bit15~bit3	reserve
	bit2	0: The count value of channel 1 is less than the comparison value; 1: The count value of channel 1 is greater than the comparison value.
	bit1	0: No electronic probe/first channel count reset signal; 1: Electronic probe/first channel count reset signal
	bit0	0: Channel 1 counting stop state, the original count is cleared; 1: Channel 1 counting state
Byte2~Byte3		Channel 1 pulse input value lower 16 bits

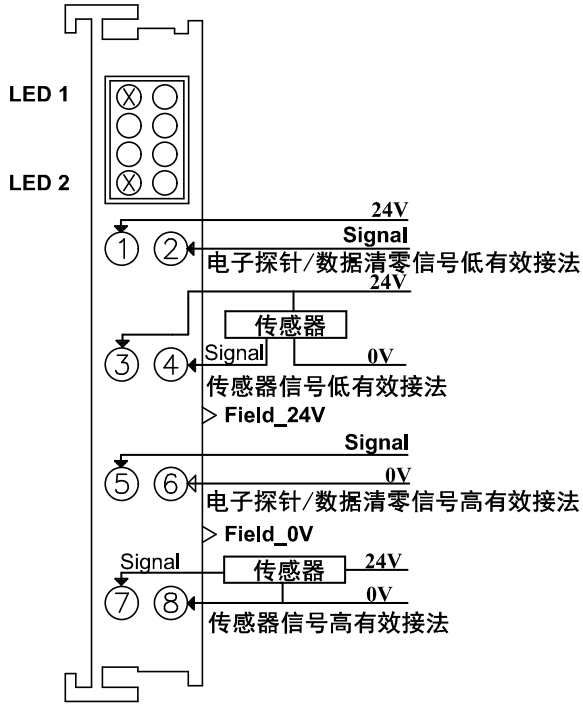
Byte4~Byte5		Channel 1 pulse input value high 16 bits
Byte6~Byte7		Channel 1 pulse input latch value lower 16 bits
Byte8~Byte9		Channel 1 pulse input latch value high 16 bits
Second channel input data		
Byte10~Byte11	Bit15~bit3	reserve
	bit2	0: The count value of channel 2 is less than the comparison value; 1: The count value of channel 2 is greater than the comparison value.
	bit1	0: No electronic probe/first channel count reset signal; 1: Electronic probe/first channel count reset signal
	bit0	0: Channel 2 counting stop state, the original count is cleared; 1: Channel 2 counting state
Byte12~Byte13		Channel 2 pulse input value lower 16 bits
Byte14~Byte15		Channel 2 pulse input value high 16 bits
Byte16~Byte17		Channel 2 pulse input latch value lower 16 bits
Byte18~Byte19		Channel 2 pulse input latch value high 16 bits

3.41DF20-M-2CNT-PIL-4:2Channel pulse input module 24VSignal

3.41.1 Technical parameters

Electrical parameters		
Input Channels	2 pulse inputs	
	2 electronic probe inputs	
Input signal voltage	Pulse signal	24V
	Electron probe	24V
Encoder input parameters		
Signal Type	Differential signal or single-ended signal	
Connection Type	2-wire	
Counting range	0~4294967295	
Maximum input frequency	500KHz	
Resolution/Accuracy	32bit/±1pulse	
Input Impedance	>500KΩ	
System side current	30mA	
Module failure alarm	support	
General parameters		
Vibration Testing	1g,conform toIEC 60068-2-6standard	
Shock Test	15g,conform toIEC 60068-2-27standard	
Electromagnetic	conform toEN 61000-4standard	
Protection level	IP20	
Operating temperature	-25~75℃	
Storage temperature	-40°C~+85°C	
Relative humidity	5~95%RH(No condensation)	
Installation	35mmRail installation	
Dimensions	100mm × 12mm × 67mm	
Maximum crimping area of	2.5mm²	
Maximum crimping area of	AWG14	
Minimum crimping area of	0.2mm²	
Minimum crimping area of	AWG28	
Line length	8...9mm	

3.41.2 Status indicator light and wiring diagram



- The status indicator lights are shown in the table below:

LED No	Status and meaning
LED1	On: The module is powered normally
	Off: Module power supply is abnormal
LED2	Power-on stage: always on when powered on; Turns off after the internal bus initialization is completed.
	Running stage: flashes when the module is running normally; When the module is running abnormally, it is always on or off

3.41.3Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte）		Downlink process data length (Byte）	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2CNT-PIL-4	20	20	12	12

➢ Process data description:

Output data meaning		
The first channel output data		
Byte0~Byte1	Bit15~bit3	reserve
	Bit2	0: Disable channel 1 comparison value; 1: Enable channel 1 comparison value
	Bit1	0: Enable the electronic probe function of channel 1; 1: Enable the count clear function triggered by the external signal of channel 1
	bit0	0: Channel 1 stops counting and the original count is reset to zero; 1: Channel 1 starts counting
Byte2~Byte3		Channel 1 comparison value lower 16 bits
Byte4~Byte5		Channel 1 comparison value high 16 bits
Second channel output data		
Byte6~Byte7	Bit15~bit3	reserve
	Bit2	0: Disable channel 1 comparison value; 1: Enable channel 1 comparison value
	Bit1	0: Enable the electronic probe function of channel 2; 1: Enable the count clear function triggered by the external signal of channel 2
	bit0	0: Channel 2 stops counting and the original count is reset; 1: Channel 2 starts counting
Byte8~Byte9		Channel 2 comparison value lower 16 bits
Byte10~Byte11		Channel 2 comparison value high 16 bits

Input data meaning		
First channel input data		
Byte0~Byte1	Bit15~bit3	reserve
	bit2	0: The count value of channel 1 is less than the comparison value; 1: The count value of channel 1 is greater than the comparison value.
	bit1	0: No electronic probe/first channel count reset signal; 1: Electronic probe/first channel count reset signal
	bit0	0: Channel 1 counting stop state, the original count is cleared; 1: Channel 1 counting state
Byte2~Byte3		Channel 1 pulse input value lower 16 bits

Byte4~Byte5		Channel 1 pulse input value high 16 bits
Byte6~Byte7		Channel 1 pulse input latch value lower 16 bits
Byte8~Byte9		Channel 1 pulse input latch value high 16 bits
Second channel input data		
Byte10~Byte11	Bit15~bit3	reserve
	bit2	0: The count value of channel 2 is less than the comparison value; 1: The count value of channel 2 is greater than the comparison value.
	bit1	0: No electronic probe/first channel count reset signal; 1: Electronic probe/first channel count reset signal
	bit0	0: Channel 2 counting stop state, the original count is cleared; 1: Channel 2 counting state
Byte12~Byte13		Channel 2 pulse input value lower 16 bits
Byte14~Byte15		Channel 2 pulse input value high 16 bits
Byte16~Byte17		Channel 2 pulse input latch value lower 16 bits
Byte18~Byte19		Channel 2 pulse input latch value high 16 bits

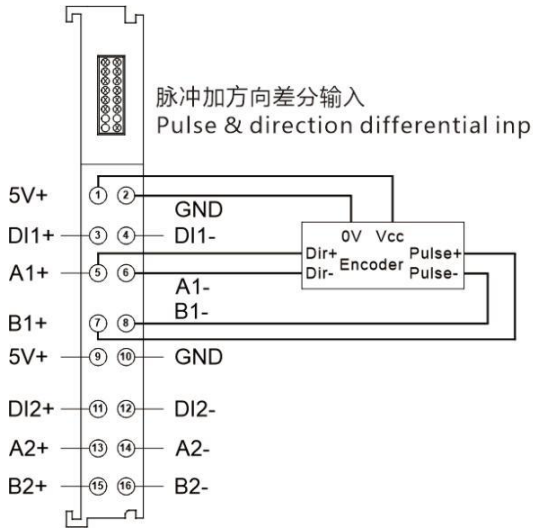
3.42DF20-M-2CNT-EL-5:2Channel Encoder Input Module 5VSignal

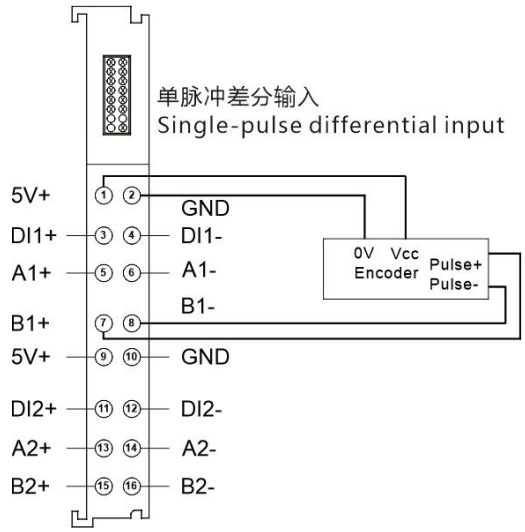
3.42.1Technical Parameters

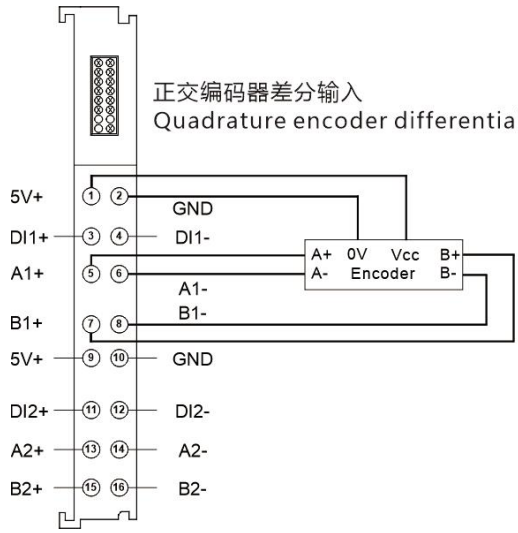
Electrical parameters	
Bus input power rated voltage	DC5V
Bus input power rated current	65mA
Terminal output rated voltage	DC5V
Terminal output rated current	500mA
Input connection type	2-Wire system / 4-Wire system
Number of input channels	2
Input signal type	ABOrthogonal/pulse+direction
Input signal voltage	5V
DIChannel input signal type	Single-ended/difference
DIChannel input voltage	DC24V
Maximum input frequency	1MHz
Orthogonal coded signal frequency multiplication	4Frequency doubling/2Frequency doubling/1Frequency multiplier, configurable
Accuracy	±1 pulse
Hardware filtering	Support, configurable
Channel Configuration	support
Error diagnosis	support
Counting Mode	Linear counter form, ring counter form, configurable
Count latch/Reset function	Support, configurable
Counting range	–2147483648~2147483647
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g,conform toIEC 60068-2-6standard
Shock Test	15g,conform toIEC 60068-2-27standard
Electromagnetic compatibility testing	conform toEN 61000-4standard
Protection level	IP20
Operating temperature	-25~75℃
Storage temperature	-40°C~+85°C
Relative humidity	5~95%RH(No condensation)
Installation	35mmRail installation
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of wire	2.5mm²
Maximum crimping area of wire(AWG)	AWG14
Minimum crimping area of wire	0.2mm²
Minimum crimping area of wire(AWG)	AWG28

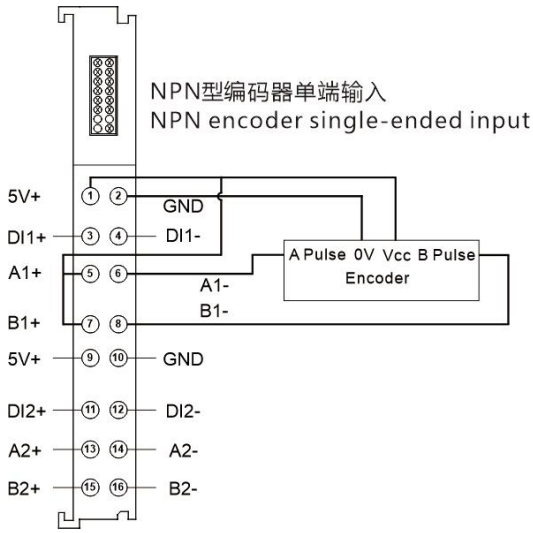
Line length	8...9mm

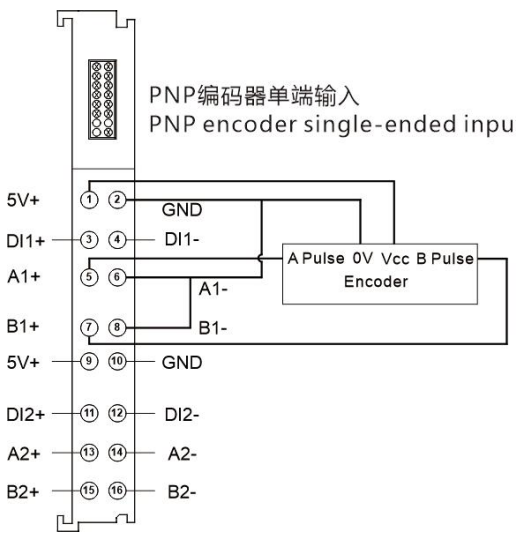
3.42.2Status indicator and wiring diagram











The status indicator lights are shown in the table below:

name	Status description
PWRPower indicator	On: The internal bus power supply is normal Off: Internal bus power supply is abnormal
STAStatus indicator	Power-on stage: Green: Module initialization abnormality
	Power-on stage: Green off: Module initialization is normal
	Running stage: Green flash: The internal bus of the module is working normally
	Running stage: Green off: The internal bus of the module is working abnormally
TP1/TP2Trigger signal indicator	On: Input signal is valid Off: Input signal is invalid
A1/A2Encoder signal indicator	On: Input signal is valid Off: Input signal is invalid
B1/B2Encoder signal indicator	On: Input signal is valid Off: Input signal is invalid
UP1/UP2Indicator Lights	On: Encoder is rotating in the positive direction Off: Encoder is stationary or rotating in the opposite direction
DN1/DN2Indicator Lights	On: Encoder is rotating in the opposite direction Off: Encoder is stationary or rotating in the positive direction
FP 5VIndicator Lights	On: The module power is normal Off: Module power is abnormal

3.42.3Module process data definition

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2CNT-EL-5	20	20	12	12

The first channel output data		
PulseCtrl CH1	bit3~bit15	reserve
	bit2	0: Close the channel1Position comparison function;1: Enable channel1Location Comparison
	bit1	0: Enable channel1Electronic probe latch function;1: Enable channel1Electronic probe count reset function
	bit0	0:aisle1Stop counting and reset the original count to zero;1:aisle1Start counting
PulseCompare CH1		aisle1Pulse comparison value, range:–2147483648~2147483647
Second channel output data		
PulseCtrl CH2	bit3~bit15	reserve
	bit2	0: Close the channel2Position comparison function;1: Enable channel2Location Comparison

	bit1	0: Enable channel2Electronic probe latch function;1: Enable channel2Electronic probe count reset function
	bit0	0:aisle2Stop counting and reset the original count to zero;1:aisle2Start counting
PulseCompare CH2		aisle2Pulse comparison value, range:–2147483648~2147483647
First channel input data		
PulseState CH1	bit3~bit15	reserve
	bit2	0:aisle 1The count value is less than the comparison value; 1:aisle 1The count value is greater than or equal to the comparison value.
	bit1	0:aisle1No electron probe; 1:aisle1With electron probe
	bit0	0:aisle 1Counting stop state; 1:aisle 1Counting status
PulseCount CH1		aisle1Pulse input value, range:–2147483648~2147483647
LatchCount CH1		aisle1Pulse input latch value, range:–2147483648~2147483647
Second channel input data		
PulseState CH2	bit3~bit15	reserve
	bit2	0:aisle 2The count value is less than the comparison value; 1:aisle 2The count value is greater than or equal to the comparison value.
	bit1	0:aisle2No electron probe; 1:aisle2With electron probe
	bit0	0:aisle 2Counting stop state; 1:aisle 2Counting status
PulseCount CH2		aisle2Pulse input value, range:–2147483648~2147483647
LatchCount CH2		aisle2Pulse input latch value, range:–2147483648~2147483647

3.42.4Configuration parameter definition

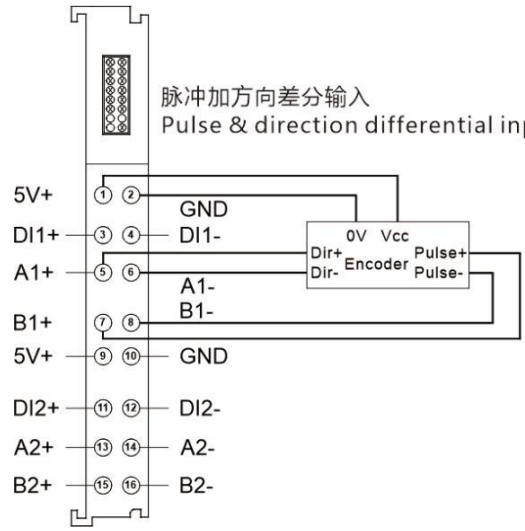
Configuration items	Parameter meaning
Counter Type (Count type)	0:Line Counter(Linear Counting) 1:Ring Counter(Ring count)
Pulse Input Method (Input signal type)	0:Phase Differential x4 (Orthogonal Coding4Frequency doubling) 1:Phase Differential x2(Orthogonal coding2Frequency multiplication) 2:Phase Differential x1(Orthogonal coding1Frequency multiplication) 3: Pulse and Directions(Pulse plus direction)
Encoder Count Direction (Signal input direction logic)	0:Position Direaction of Phase A(Positive Logic) 1:Position Direaction of Phase B(Negative logic) Positive logic: quadrature coded input,AAhead of the timesBMutually90The degree is forward rotation, pulse plus direction input, and the direction input high effective signal is forward rotation. Negative logic: quadrature coded input,BAhead of the timesAMutually90Forward rotation, pulse plus direction input, direction input low effective signal or hanging for forward rotation.
Counter Filter A (Input pulse signal filtering configuration)	3:4MHZ 4:1.5MHZ 5:1MHZ 6:800KHZ 7:600KHZ 8:420KHZ 9:315KHZ 10:250KHZ 11:200KHZ 12:160KHZ 13:120KHZ 14:100KHZ 15:75KHZ
Maximum Counter Value(Ring count upper limit)	-2147483648~ 2147483647
Minimum Counter Value(Ring count lower limit)	-2147483648~ 2147483647 For example, in the cycle mode, the upper and lower limits are set to 5and-5Then count up to -5,-4,-3,-2,-1,0,1,2,3,4,-5,-4..... Count down to-5,4,3,2,1,0,-1,-2,-3,-4,-5,4.....

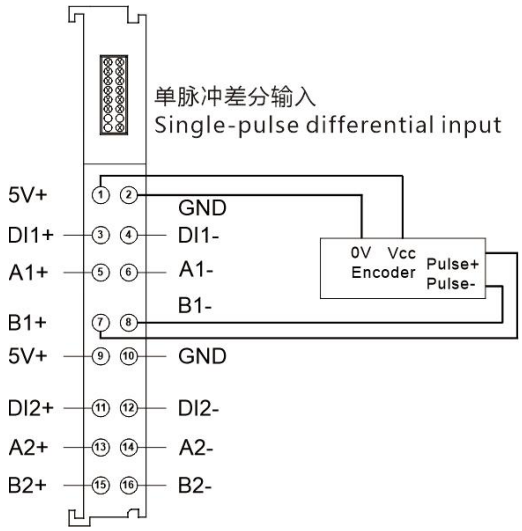
3.43 DF20-M-2CNT-EL-4: 2-channel encoder input module 24V signal

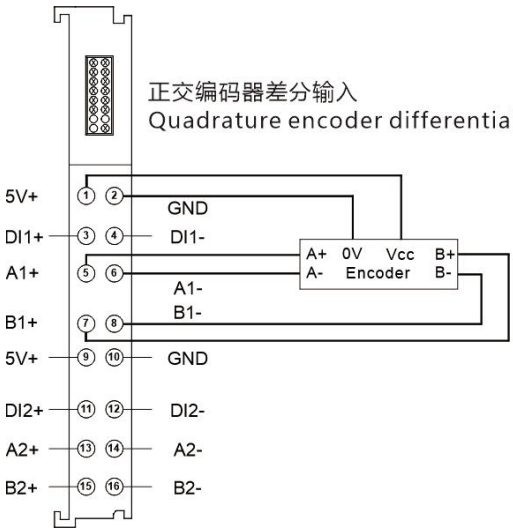
3.43.1 Technical parameters

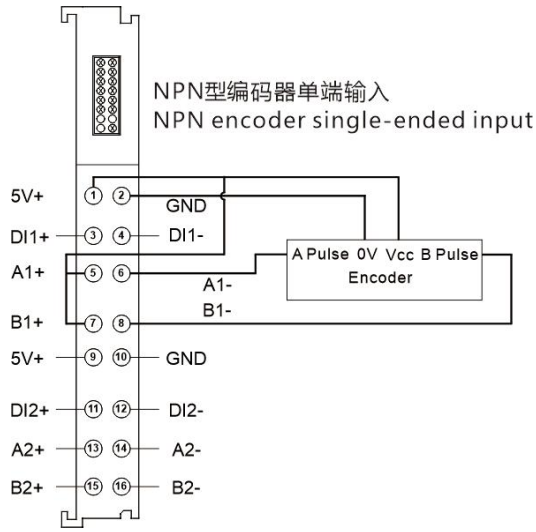
Electrical parameters	
Bus input power rated voltage	DC5V
Bus input power rated current	65mA
Terminal output rated voltage	DC24V
Terminal output rated current	500mA
Input connection type	2-wire / 4-wire
Number of input channels	2
Input signal type	AB quadrature/pulse+direction
Input signal voltage	24V
DI channel input signal type	Single-ended/differential
DI channel input voltage	DC24V
Maximum input frequency	1MHz
Orthogonal coded signal frequency multiplication	4x/2x/1x, configurable
Accuracy	±1 pulse
Hardware filtering	Support, configurable
Channel Configuration	support
Error diagnosis	support
Counting Mode	Linear counter form, ring counter form, configurable
Count latch/reset function	Support, configurable
Counting range	–2147483648~2147483647
General parameters	
Isolation withstand voltage	500V
Vibration Testing	1g, in accordance with IEC 60068-2-6
Shock Test	15g, compliant with IEC 60068-2-27
Electromagnetic compatibility testing	Complies with EN 61000-4
Protection level	IP20
Operating temperature	-25～75℃
Storage temperature	-40°C~+85°C
Relative humidity	5～95%RH (no condensation)
Installation	35mm rail mounting
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of wire	2.5mm²
Maximum crimping area of wire (AWG)	AWG14
Minimum crimping area of wire	0.2mm²
Minimum crimping area for wire (AWG)	AWG28
Line length	8...9mm

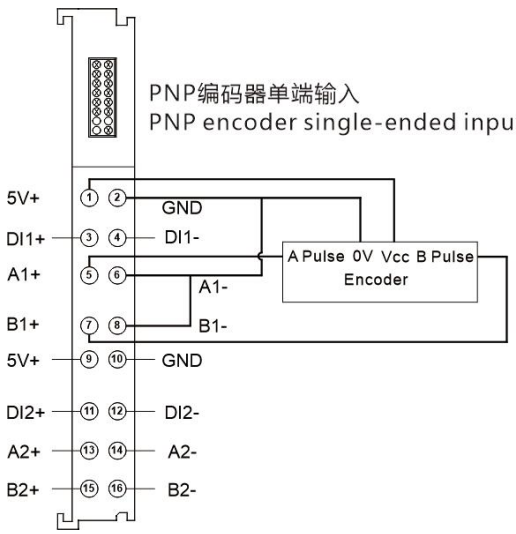
3.43.2 Status indicator light and wiring diagram











The status indicator lights are shown in the table below:

name	Status description
PWR power indicator	On: Internal bus power supply is normal Off: Internal bus power supply is abnormal
STA status indicator	Power-on stage: Green: Module initialization abnormality
	Power-on stage: Green off: Module initialization is normal
	Running stage: Green flash: The internal bus of the module is working normally
	Running stage: Green off: The internal bus of the module is working abnormally
TP1/TP2 trigger signal indicator	On: Input signal is valid Off: Input signal is invalid
A1/A2 encoder signal indicator	On: Input signal is valid Off: Input signal is invalid
B1/B2 encoder signal indicator	On: Input signal is valid Off: Input signal is invalid
UP1/UP2 indicator	On: Encoder is rotating forward Off: Encoder is stationary or rotating reverse
DN1/DN2 indicator light	On: Encoder is rotating in the reverse direction Off: Encoder is stationary or rotating in the forward direction
FP 24V indicator light	On: The module power is normal Off: The module power is abnormal

3.43.3 Module process data definition

- Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2CNT-EL-4	20	20	12	12

The first channel output data		
PulseCtrl CH1	bit3~bit15	reserve
	bit2	0: Disable the position comparison function of channel 1; 1: Enable the position comparison function of channel 1
	bit1	0: Enable the electronic probe latch function of channel 1; 1: Enable the electronic probe count clear function of channel 1
	bit0	0: Channel 1 stops counting and the original count is reset to zero; 1: Channel 1 starts counting
PulseCompare CH1		Channel 1 pulse comparison value, range: –2147483648~2147483647

Second channel output data		
PulseCtrl CH2	bit3~bit15	reserve
	bit2	0: Disable the position comparison function of channel 2; 1: Enable the position comparison function of channel 2
	bit1	0: Enable the electronic probe latch function of channel 2; 1: Enable the electronic probe count clear function of channel 2
	bit0	0: Channel 2 stops counting and the original count is reset; 1: Channel 2 starts counting
PulseCompare CH2		Channel 2 pulse comparison value, range: –2147483648~2147483647
First channel input data		
PulseState CH1	bit3~bit15	reserve
	bit2	0: Channel 1 count value is less than the comparison value; 1: Channel 1 count value is greater than or equal to the comparison value.
	bit1	0: Channel 1 has no electronic probe; 1: Channel 1 has an electronic probe
	bit0	0: Channel 1 counting stop state; 1: Channel 1 counting state
PulseCount CH1		Channel 1 pulse input value, range: –2147483648~2147483647
LatchCount CH1		Channel 1 pulse input latch value, range: –2147483648~2147483647
Second channel input data		
PulseState CH2	bit3~bit15	reserve
	bit2	0: Channel 2 count value is less than the comparison value; 1: Channel 2 count value is greater than or equal to the comparison value.
	bit1	0: Channel 2 has no electronic probe; 1: Channel 2 has an electronic probe
	bit0	0: Channel 2 counting stop state; 1: Channel 2 counting state
PulseCount CH2		Channel 2 pulse input value, range: –2147483648~2147483647
LatchCount CH2		Channel 2 pulse input latch value, range: –2147483648~2147483647

3.43.4 Configuration parameter definition

Configuration items	Parameter meaning
Counter Type	0: Line Counter (Linear Count) 1: Ring Counter
Pulse Input Method (input signal type)	0: Phase Differential x4 (quadrature encoding 4 times frequency) 1: Phase Differential x2 (orthogonal encoding 2 times frequency) 2: Phase Differential x1 (orthogonal encoding 1 times frequency) 3: Pulse and Directions
Encoder Count Direction (signal input direction logic)	0:Position Direaction of Phase A (positive logic) 1:Position Direaction of Phase B (negative logic) Positive logic: Orthogonal encoding input, phase A leads phase B by 90 degrees for forward rotation, pulse plus direction input, direction input high effective signal for forward rotation. Negative logic: Orthogonal encoding input, B phase leads A phase by 90 degrees for forward rotation, pulse plus direction input, direction input low effective signal or floating for forward rotation.
Counter Filter A (Input pulse signal filtering	3:4MHZ 4:1.5MHZ 5:1MHZ 6:800KHZ 7:600KHZ 8:420KHZ 9:315KHZ 10:250KHZ 11:200KHZ 12:160KHZ 13:120KHZ 14:100KHZ 15:75KHZ

configuration)	
Maximum Counter Value (ring count upper limit)	-2147483648~ 2147483647
Minimum Counter Value (Ring Count Lower Limit)	-2147483648~ 2147483647 For example, if the upper and lower limits are set to 5 and -5 respectively in loop mode, the upward count is -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, -5, -4.... The downward count is -5, 4, 3, 2, 1, 0, -1, -2, -3, -4, -5, 4....

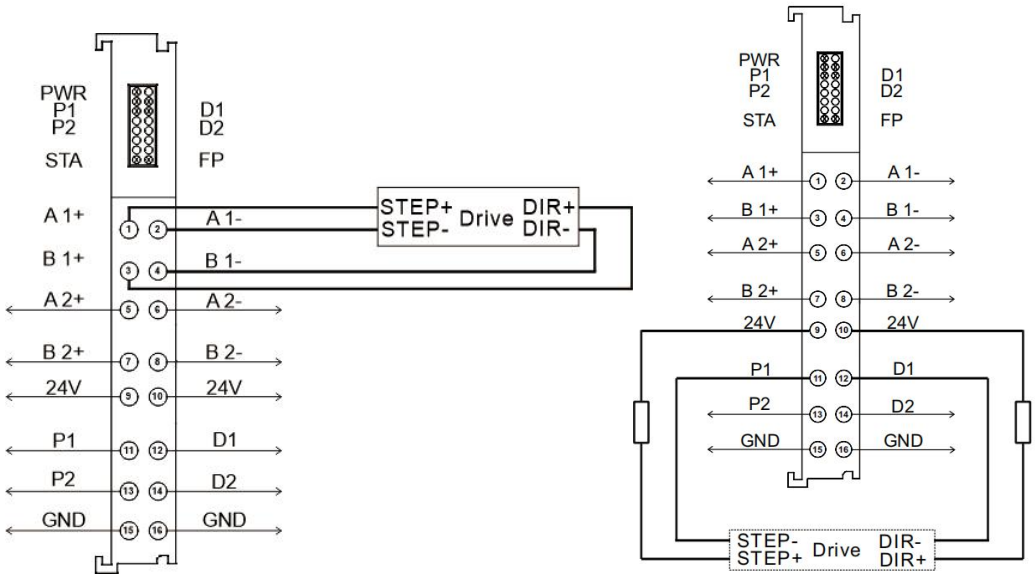
3.44 DF20-M-2PWM: 2-channel pulse output module 5V signal

3.44.1 Technical parameters

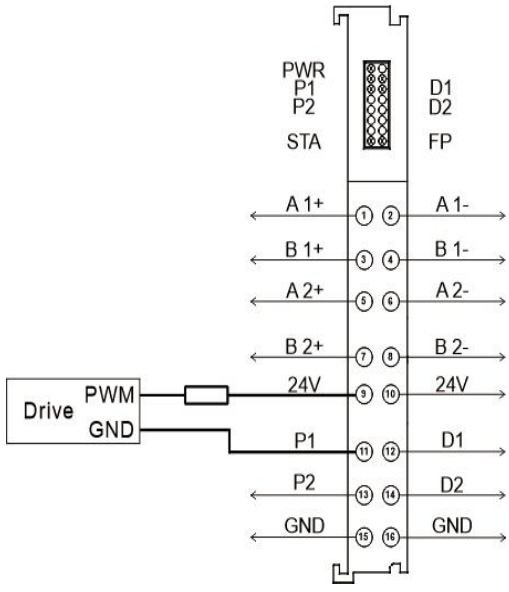
Electrical parameters	
Bus input power rated	DC5V
Bus input power rated	40mA
Terminal output rated	DC24V
Terminal output rated	500mA
Output connection type	2-wire / 4-wire
Number of output channels	2
Output signal type	Pulse+direction/PWM, configurable
Output signal voltage	DC5V
Differential signal output	800HZ~4MHZ
Open drain signal output	800HZ~500KHZ
PWM signal output	20HZ~12KHZ
Open drain output	30mA
Open drain output maximum pull-up voltage	28V
Accuracy	±1 pulse
General parameters	
Vibration Testing	1g, in accordance with IEC 60068-2-6
Shock Test	15g, compliant with IEC 60068-2-27
Electromagnetic	Compliant with EN 61000-4standard
Protection level	IP20
Operating temperature	-25～75℃
Storage temperature	-40°C~+85°C
Relative humidity	5～95%RH (no condensation)
Installation	35mm rail mounting
Dimensions	100mm × 12mm × 67mm
Maximum crimping area of	2.5mm²

Maximum crimping area of	AWG14
Minimum crimping area of	0.2mm²
Minimum crimping area for	AWG28
Line length	8...9mm

3.44.2 Status indicator light and wiring diagram



Pulse plus direction differential output Pulse plus direction open drain output



PWM open-drain output

The status indicator lights are shown in the table below:

LED No	Status and meaning
PWR	On: The module is powered normally
	Off: Module power supply is abnormal

STA	Power-on stage: Green: initialization abnormality; Green off: Initialization is normal
	Running stage: Green flashing: the internal bus is working normally Green off: Internal bus working abnormally
P1~P2	Green flash: Pulse/PWM signal output
	Green off: No signal output
D1~D2	Green: Output forward direction signal
	Green off: Output reverse direction signal or stop
FP	Green: Power input is normal
	Green off: Power input abnormality

3.44.3 Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-2PWM	12	12	16	16

RXPD0			
Name	Type	Size	meaning
Stop bit CH1	BOOL	0.1	1: Channel 1 emergency stop 0: Channel 1 does not stop suddenly
Jog Enable bit CH1	BOOL	0.1	0->1: Channel 1 starts jog motion 1->0: Channel 1 stops jog motion
Jog Direction bit CH1	BOOL	0.1	0: Channel 1 jog direction forward 1: Channel 1 jog direction reverse
Position Enable bit CH1	BOOL	0.1	0->1: Channel 1 starts positioning motion 1->0: Channel 1 stops positioning motion
Position Clear bit CH1	BOOL	0.1	1: Clear the current position of channel 1 0: Channel 1 position counts normally
Target Duty Cycle CH1	UINT	2.0	Channel 1 duty cycle setting, 1/1000 resolution.
Target Position or frequency CH1	DINT	4.0	Channel 1 pulse plus direction positioning mode target position setting, or PWM mode frequency setting.
Stop bit CH2	BOOL	0.1	1: Channel 2 emergency stop 0: Channel 2 does not stop suddenly
Jog Enable bit CH2	BOOL	0.1	0->1: Channel 2 starts jog motion 1->0: Channel 2 stops jog motion
Jog Direction bit CH2	BOOL	0.1	0: Channel 2 jog direction forward 1: Channel 2 jog direction reverse
Position Enable bit CH2	BOOL	0.1	0->1: Channel 2 starts positioning motion 1->0: Channel 2 stops positioning motion

Position Clear bit CH2	BOOL	0.1	1: Clear the current position of channel 2 0: Channel 2 position counts normally
Target Duty Cycle CH2	UINT	2.0	Channel 2 duty cycle setting, 1/1000 resolution.
Target Position or frequency CH2	DINT	4.0	Channel 2 pulse plus direction positioning mode target position setting, or PWM mode frequency setting.
TXPD0			
Name	Type	Size	meaning
Pulse Fault bit CH1	BOOL	0.1	0: Channel 1 is normal 1: Channel 1 fault
CtrlWord Fault bit CH1	BOOL	0.1	0: Channel 1 process data is normal 1: Channel 1 process data is abnormal
Positioning Complete bit CH1	BOOL	0.1	0: Channel 1 is in signal output state 1: Channel 1 has no signal output status
Config Fault bit CH1	BOOL	0.1	0: Channel 1 configuration data is normal 1: Channel 1 configuration data is abnormal
ActualPosition CH1	DINT	4.0	Actual position or number of PWM outputs of channel 1.
Pulse Fault bit CH2	BOOL	0.1	0: Channel 2 is normal 1: Channel 2 fault
CtrlWord Fault bit CH2	BOOL	0.1	0: Channel 2 process data is normal 1: Channel 2 process data is abnormal
Positioning Complete bit CH2	BOOL	0.1	0: Channel 2 is in signal output state 1: Channel 2 has no signal output status
Config Fault bit CH2	BOOL	0.1	0: Channel 2 configuration data is normal 1: Channel 2 configuration data is abnormal
ActualPosition CH2	DINT	4.0	Actual position or number of PWM outputs of channel 2.

3.44.4 Configuration parameter definition

index	Sub-index	name	Size	Value range	default value	meaning
16#40A0	1	Pulse Mode CH1	2.0	See DTA41A0: Table	0	Channel 1 signal type.
	2	Motion Mode CH1	2.0	See DTB41A0: Table	0	Channel 1 pulse control mode.
	3	Ramp Mode CH1	2.0	See DTC41A0: Table	0	Channel 1 pulse ramp enable.
	4	Direction Mode CH1	2.0	See DTD41A0: Table	0	Channel 1 direction logic.
	5	Signal Type CH1	2.0	See DTE41A0: Table	0	Channel 1 pulse output mode.
	6	Duty Cycle CH1	2.0	See DTF41A0: Table	0	Channel 1 PWM signal duty cycle enable.
	7	PWM Freq Range CH1	2.0	See DTA41B0: Table	3	Channel 1 PWM frequency range.
	8	Startup Freq CH1	4.0	800~4000000	1000	Channel 1 pulse output starting

						frequency, unit: HZ.
	9	Target Freq CH1	4.0	800~4000000	10000	Channel 1 pulse output target frequency, unit: HZ.
	10	Ramp Up Time CH1	2.0	10~4096	100	Channel 1 pulse output ramp-up time, in ms.
	11	Ramp Dn Time CH1	2.0	10~4096	100	Channel 1 pulse output downslope time, in ms.
	12	Pulse Mode CH2	2.0	See DTA41A0: Table	0	Channel 2 signal type.
	13	Motion Mode CH2	2.0	See DTB41A0: Table	0	Channel 2 pulse control mode.
	14	Ramp Mode CH2	2.0	See DTC41A0: Table	0	Channel 2 pulse ramp enable.
	15	Direction Mode CH2	2.0	See DTD41A0: Table	0	Channel 2 direction logic.
	16	Signal Type CH2	2.0	See DTE41A0: Table	0	Channel 2 pulse output mode.
	17	Duty Cycle CH2	2.0	See DTF41A0: Table	0	Channel 2 PWM signal duty cycle enable.
	18	PWM Freq Range CH2	2.0	See DTA41B0: Table	3	Channel 1 PWM frequency range.
	19	Startup Freq CH2	4.0	800~4000000	1000	Channel 2 pulse output starting frequency, unit: HZ.
	20	Target Freq CH2	4.0	800~4000000	10000	Channel 2 pulse output target frequency, unit: HZ.
	twenty one	Ramp Up Time CH2	2.0	10~4096	100	Channel 2 pulse output ramp-up time, in ms.

	twenty two	Ramp Dn Time CH2	2.0	10~4096	100	Channel 2 pulse output downslope time, in ms.
Note: If the module is inserted in the first card slot after the coupler, the SDO index is 16#40A0. If it is inserted in the second card slot, the SDO index is 16#40A1 and the index offset is 16#01.						

Table DTA41A0:

Sub-index object data	name	meaning
0	Pulse/Dir	Pulse plus direction
1	CW/CCW (Not Supported)	Not supported yet
2	A/B (Not Supported)	Not supported yet
3	PWM	PWM

Table DTB41A0:

Sub-index object data	name	meaning
0	Jog	Jog control
1	RelativePosition	Relative position control
2	AbsolutePosition	Absolute position control

Table DTC41A0:

Sub-index object data	name	meaning
0	Ramp Enable	Open ramp
1	Ramp Disable	Close the ramp

Table DTD41A0:

Sub-index object data	name	meaning
0	Positive	Direction output positive logic
1	Negative	Direction output negative logic

Table DTE41A0:

Sub-index object data	name	meaning
0	OpenDrain	Open-drain output
1	Difference 5V	Differential output

Table DTF41A0:

Sub-index object data	name	meaning
0	Duty cycle enable	Duty cycle adjustment enable
1	Duty cycle disable	Duty cycle adjustment is off, default is 50%

Table DTA41B0:

Sub-index object data	name	meaning
0	20Hz~1.2kHz	
1	40Hz~2.4kHz	
2	50Hz~3kHz	
3	100Hz~6kHz	
4	140Hz~8.4kHz	
5	200Hz~12kHz	

3.45 DF20-M-1COM-232/485/422: 1-channel serial communication module

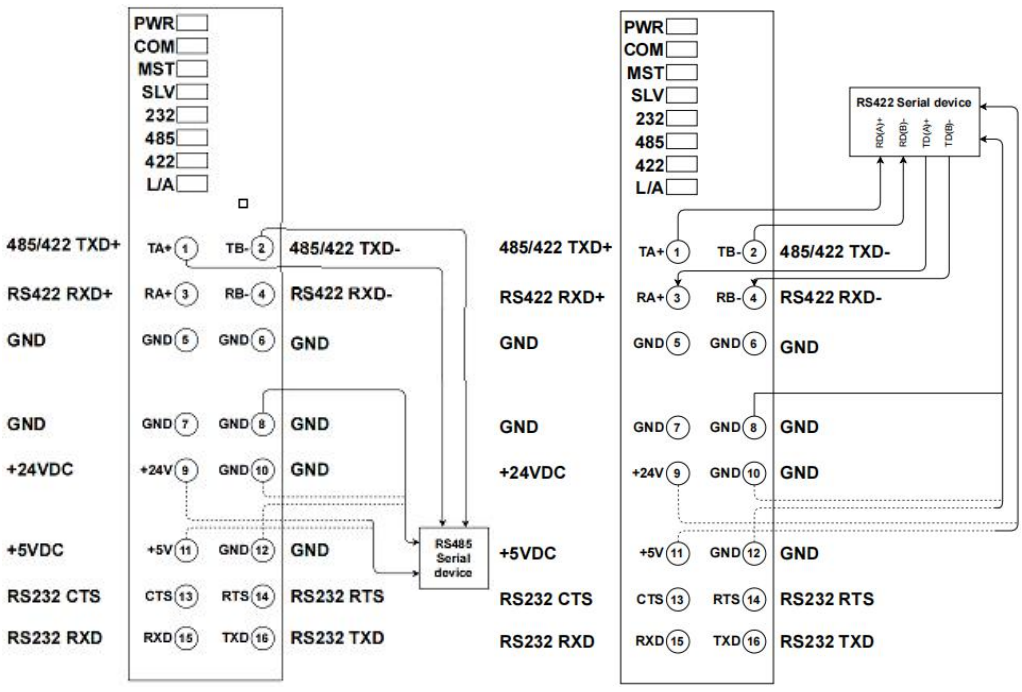
3.45.1 Technical parameters

Electrical parameters	
Bus input power rated	DC5V
Bus input power rated	75mA
interface	RS232/RS485/RS422
Number of channels	1 channel
protocol	Modbus RTU/ASCII master and slave modes; free protocol
Baud rate	2400bps - 512000bps
Data bits	7bit/8bit
Check digit	None/Even/Odd
Stop bits	1bit/2bit
Maximum data frame	40 bytes
Power supply for	5V/500mA
Power supply for	24V/500mA
General parameters	
Vibration Testing	1g, in accordance with IEC 60068-2-6
Shock Test	15g, compliant with IEC 60068-2-27
Electromagnetic	Compliant with EN 61000-4standard
Protection level	IP20
Operating temperature	-25～75℃
Storage temperature	-40℃~+85℃
Relative humidity	5～95%RH (no condensation)
Installation	35mm rail mounting
Dimensions	100mm × 12mm × 67mm
Maximum crimping	2.5mm²
Maximum crimping	AWG14
Minimum crimping	0.2mm²
Minimum crimping	AWG28
Line length	8...9mm

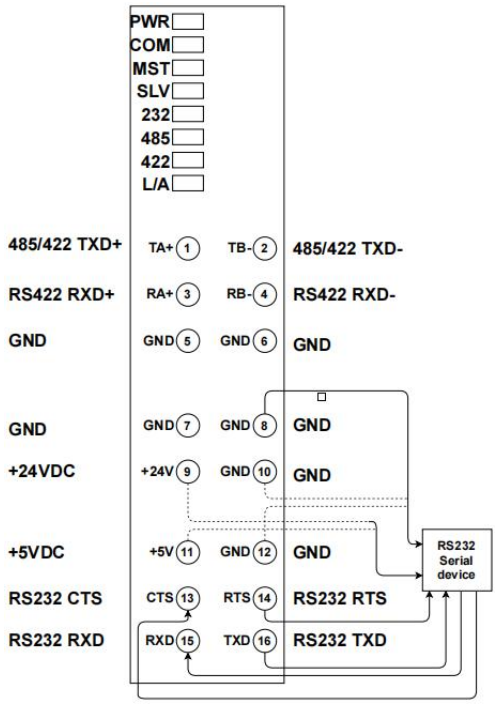
3.45.2 Status indicator light and wiring diagram

The status indicator lights are shown in the table below:

LED No	Status and meaning
PWR	When the power supply is normal, the green light is always on.
CUSTOM	In free protocol mode, green is always on
MASTER	In MASTER mode, green is always on
SLAVE	In SLAVE mode, green is always on
RS232	In RS232 mode, green is always on
RS485	In RS485 mode, green is always on
RS422	In RS422 mode, green is always on
L/A	Power-on stage: Green light is on when powered on; Turns off after the internal bus is initialized.
	Operation phase: When the module is operating normally, it flashes green; When the module operates abnormally, the green light goes out.
Tx	Flashing: sending data; Off: no data
Rx	Flashing: receiving data; Off: no data



RS485 wiring diagram RS422 wiring diagram



RS232 Wiring Diagram

3.45.3 Configuration Data Description

➢ Configuration data description:

name	Value range	default value	meaning
DF20-M-1COM-232/485/422 Port Operation Mode	Table A	0	Operation Mode
DF20-M-1COM-232/485/422 Interface	Table B	2	Interface Type
DF20-M-1COM-232/485/422 Parity	Table C	0	Check digit
DF20-M-1COM-232/485/422 Data bit	Table D	0	Data bits
DF20-M-1COM-232/485/422 Stop bit	Table E	0	Stop bits
DF20-M-1COM-232/485/422 Baudrate	Table F	11	Baud rate
DF20-M-1COM-232/485/422 FreeRUN Interval time	0~65535	1	Free mode data frame interval
DF20-M-1COM-232/485/422 Slave ID	0~127	1	Slave Mode Slave Mode Address
DF20-M-1COM-232/485/422 Slave Response Delay	0~65535	0	Slave mode slave response time
DF20-M-1COM-232/485/422 CH0: Slave ID	0~127	0	Channel 0 slave address configuration
DF20-M-1COM-232/485/422 CH0: Event Trigger	Table G	0	Channel 0 trigger mode configuration
DF20-M-1COM-232/485/422 CH0: Lost Action	Table H	0	Channel 0 offline action configuration
DF20-M-1COM-232/485/422 CH0: Operation Code	Table I	16	Channel 0 function code configuration
DF20-M-1COM-232/485/422 CH0: Reg Address	0~65535	0	Channel 0 register address configuration
DF20-M-1COM-232/485/422 CH0: Reg Num	Register: 0-20 (40 bytes) Number of coils: 0-320 (40	0	Channel 0 register quantity configuration

	bytes)		
DF20-M-1COM-232/485/422 CH0: Poll Time	100 - 5000ms	500	Channel 0 polling period configuration
DF20-M-1COM-232/485/422 CH0: Poll Delay	0-5000ms	0	Channel 0 interval time configuration
DF20-M-1COM-232/485/422 CH0: Response Timeout	100~5000ms	1000	Channel 0 slave timeout configuration
DF20-M-1COM-232/485/422 CH1: Slave ID	0~127	0	Channel 1 slave address configuration
:			
DF20-M-1COM-232/485/422 CH1: Response Timeout	100~5000ms	1000	Channel 1 slave timeout configuration
DF20-M-1COM-232/485/422 CH2: Slave ID	0~127	0	Channel 2 slave address configuration
:			
DF20-M-1COM-232/485/422 CH2: Response Timeout	100~5000ms	1000	Channel 2 slave timeout configuration
DF20-M-1COM-232/485/422 CH3: Slave ID	0~127	0	Channel 3 slave address configuration
:			
DF20-M-1COM-232/485/422 CH3: Response Timeout	100~5000ms	1000	Channel 3 slave timeout configuration
DF20-M-1COM-232/485/422 CH4: Slave ID	0~127	0	Channel 4 slave address configuration
:			
DF20-M-1COM-232/485/422 CH4: Response Timeout	100~5000ms	1000	Channel 4 slave timeout configuration
DF20-M-1COM-232/485/422 CH5: Slave ID	0~127	0	Channel 5 slave address configuration
:			
DF20-M-1COM-232/485/422 CH5: Response Timeout	100~5000ms	1000	Channel 5 slave timeout configuration
DF20-M-1COM-232/485/422 CH6: Slave ID	0~127	0	Channel 6 slave address configuration
:			
DF20-M-1COM-232/485/422 CH6: Response Timeout	100~5000ms	1000	Channel 6 slave timeout configuration
DF20-M-1COM-232/485/422 CH7: Slave ID	0~127	0	Channel 7 slave address configuration
:			
DF20-M-1COM-232/485/422 CH7: Response Timeout	100~5000ms	1000	Channel 7 slave timeout configuration

Table A

Serial number	name	meaning
0	FreeRUN	Free transparent transmission mode
1	Modbus RTU Master	Master mode
2	Modbus RTU Slave	Slave Mode

Table B

Serial number	name	meaning
0	RS232 Flow Off	RS232 mode flow control disabled
1	RS232 Flow On	RS232 mode flow control enabled
2	RS485	RS485 Mode
3	RS422	RS422 Mode

Table C

Serial number	name	meaning
0	None	No check digit
1	Odd	Odd Parity
2	Even	Even parity

Table D

Serial number	name	meaning
0	8bit	8 data bits
1	7bit	7 data bits

Table E

Serial number	name	meaning
0	1bit	1 stop bit
1	2bit	2 stop bits

Table F

Serial number	name	meaning
3	2400bps	2400 baud rate
4	4800bps	4800 baud rate
5	9600bps	9600 baud rate
6	14400bps	14400 baud rate
7	19200bps	19200 baud rate
8	38400bps	38400 baud rate
9	56000bps	56000 baud rate
10	57600bps	57600 baud rate
11	115200bps	115200 baud rate
12	128000bps	128000 baud rate
13	230400bps	230400 baud rate
14	256000bps	256000 baud rate
15	460800bps	460800 baud rate
16	500000bps	500000 baud rate
17	512000bps	512000 baud rate

Table G

Serial number	name	meaning
0	Poll mode	Polling Mode
1	Trigger	Trigger Mode

Table H

Serial number	name	meaning
0	Hold Data	Keep data
1	Clear Data	Clear data

Table I

Serial number	name	meaning
1	01 READ COILS	Reading coil
2	02 READ DISCRETE INPUTS	Read discrete quantity
3	03 READ HOLDING REGISTERS	Read Holding Registers
4	04 READ INPUT REGISTERS	Read Input Register
5	05 WRITE SINGLE COIL	Writing a single coil
6	06 WRITE SINGLE HOLDING REGISTER	Writing a single register
7	15 WRITE MULTIPLE COILS	Writing multiple coils
8	16 WRITE MULTIPLE HOLDING REGISTERS	Writing multiple holding registers

3.45.4 Process data description

➢ Process data structure definition:

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-M-1COM-232/485/422	46	46	46	46

➢ Description of process data in each mode:

Working mode: Modbus RTU Master					
Output Data			Input Data		
name	length	meaning	name	length	meaning
CtrlWord	2Byte	Control word (see part 1 in table b)	StateWord	2Byte	Status word (see table a)
Reserve	2Byte	reserve	ReadDataLength	2Byte	Receive data length

SelectChannel	2Byte	Channel operation selection	ActiveChannel	2Byte	Current active channels
DataOut0-19	40Byte	Send data content	DataIn0-19	40Byte	Receive data content
Working mode: Modbus RTU Slave					
Output Data			Input Data		
name	length	meaning	name	length	meaning
CtrlWord	2Byte	Control word (see part 2 in table b)	StateWord	2Byte	Status word (see table a)
SlaveCMD	1 Byte	Slave operation commands (see Table c)	ReadDataLength	1 Byte	Readback data length Byte
SlaveRegAddr	1 Byte	Slave register address	Reserve1	1 Byte	reserve
SlaveRegNum	2Byte	Number of slave registers	SlaveRegNum	2Byte	Readback register quantity
DataOut0-19	40Byte	Send data area	DataIn0-19	40Byte	Receive data area
Working mode: FreeRUN free transparent transmission					
Output Data			Input Data		
name	length	meaning	name	length	meaning
CtrlWord	2Byte	Control word (see part 3 in table b)	StateWord	2Byte	Status word (see table a)
OutputLength	2Byte	Send data length	InputLength	2Byte	Receive data length
OutputCount	2Byte	Send data sequence number	InputCount	2Byte	Receive data sequence number
DataOut0-39	40Byte	Send data content	DataIn0-39	40Byte	Receive data content

- The status word StateWord contains the following states:

Normal state value	Status Name	meaning
16#0000	OP_SUCCESS	Configuration or write operation successful
16#0001	DATA_FULL	Data has been updated and can be read
16#0002	WRITE_IDLE	Write idle, writable
16#0003	DATA_EMPTY	Read idle, receive data not updated
Error Status Value	Status Name	meaning
16#E0A1	WRITE_BUSY	Write busy, can't write
16#E0A2	DATA_LARGE	Data length exceeds limit
16#E0A3	CMD_ERR	Command Error
16#E0A4	PARA_ERR	Configuration parameter error
16#E0A5	CHECK_ERR	Verification Error
16#E0A6	SLAVE_NOEXIT	The slave device does not exist
16#E0A7	PACK_LOSS	Packet Loss
16#E0A8	OVER_FLOW	Data overflow

Table a

- Control word command values in each mode:

Table B-1:Modbus RTU Master mode control word		
Command Value	Command Name	meaning
16#00A1	CONFIGUREPORT	Port Configuration Commands
16#00B1	COMFIGUREMASTER	MASTER Mode Configuration Commands
16#00B2	OPERATIONMASTERMASTER	Mode Run Command
Table B-2:Modbus RTU Slave mode control word		
Command Value	Command Name	meaning
16#00A1	CONFIGUREPORT	Port Configuration

		Commands
16#00B3	OPERATIONMASTERMASTER	Mode Run Command
Table B-2:FreeRUN mode control word		
Command Value	Command Name	meaning
16#00A1	CONFIGUREPORT	Configuration Commands
16#00C1	WRITEFreeRUN	Free mode write data command
16#00C2	READFreeRUN	Free mode read data command

Table b

- Slave operation commands in Modbus RTU Slave mode:

SlaveCMDSlave operation commands		
value	**name**	**meaning**
1	ReadCoils	Read coil value
2	ReadHoldReg	Read Holding Registers
3	WriteCoils	Write coil value
4	WriteDiscrete	Write discrete quantity
5	WriteHoldReg	Writing Holding Registers
6	WriteInReg	Write input register

Table c

4 Software Configuration Instructions

4.1 IP settings for DF20-C-EN-IP coupler

4.1.1 Setting IP address via DIP switch

- **The dip switch is turned to OFF when leaving the factory, and the default IP address is configured as 192.168.0.1.**The dip switch can be used to set the adapter

The last byte of the IP address, that is, the D byte of the IP address ABCD, and the A/B/C bytes of the IP address can only be modified through configuration software or host computer software such as IP Setting Tool.

- When the DIP switch is set to 0 or 255, the adapter IP address uses the IP configured by the host computer; when the DIP value is greater than 0 and less than 254

At this time, the last byte D of the adapter's IP is the current dial value, and the first three bytes are A/B/C assigned by the host computer software.

- For example, if the IP address is set to 192.168.0.2 through the host computer, and then the setting of the dip switch is changed, the IP address will be 192.168.0.xxx.

Where xxx is the setting value of the DIP switch (1~253).

4.1.2 Setting IP address through configuration software

- **Turn all the DIP switches to OFF.**Power on the module, use the host computer to scan the module, and click the module IP address bar after scanning the module.

The IP address can be modified.

- **Taking KEYENCE KV-8000 and configuration software KV STUDIO Ver.11G as an example, the method and process of modifying the IP address are introduced.**
- The default IP address of the coupler is**192.168.0.1,**Therefore, the computer's gateway needs to be modified to 192.168.0.200 as shown in Figure 4-2 (the last byte address does not need to be repeated with the coupler and PLC).

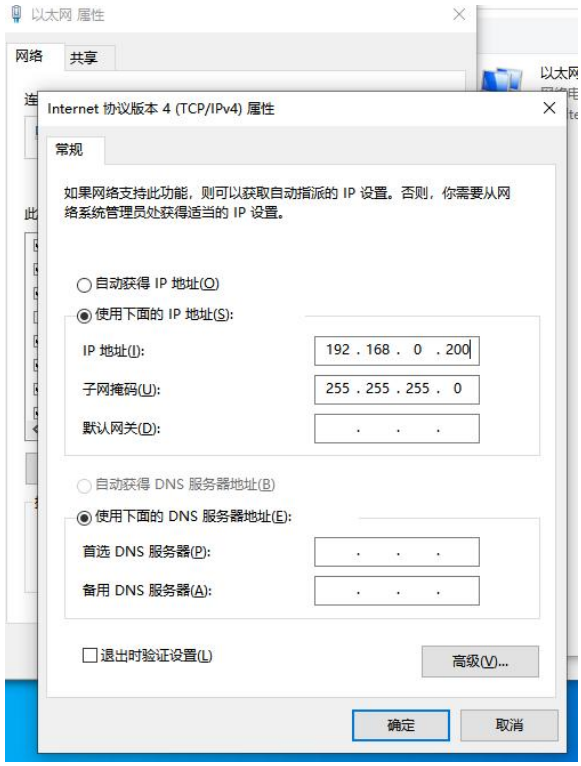


Figure 4-2

➢ Open KV STUDIO software, click "File" in the menu bar as shown in Figure 4-3, and click "New project":

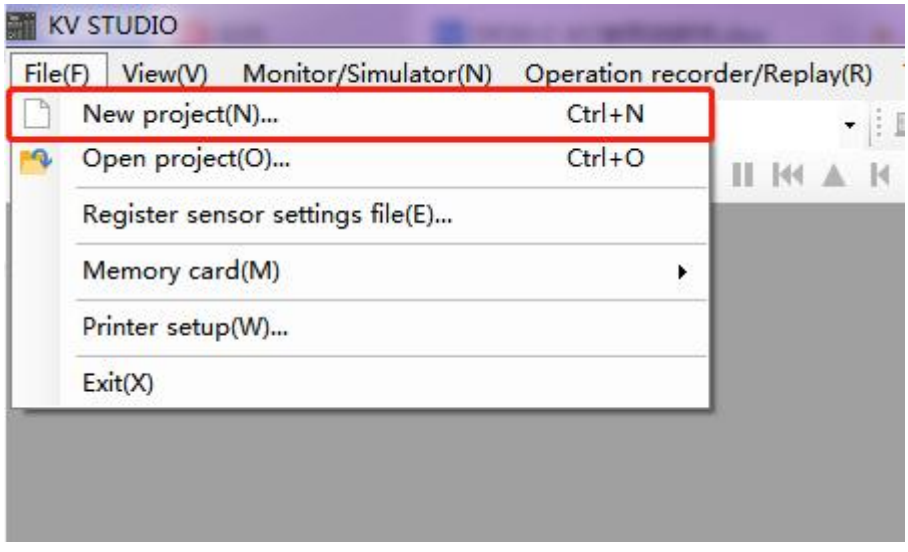


Figure 4-3

➢ As shown in Figure 4-4, the New Project dialog box pops up. Fill in the project name and storage path. Select the corresponding

PLC Type:

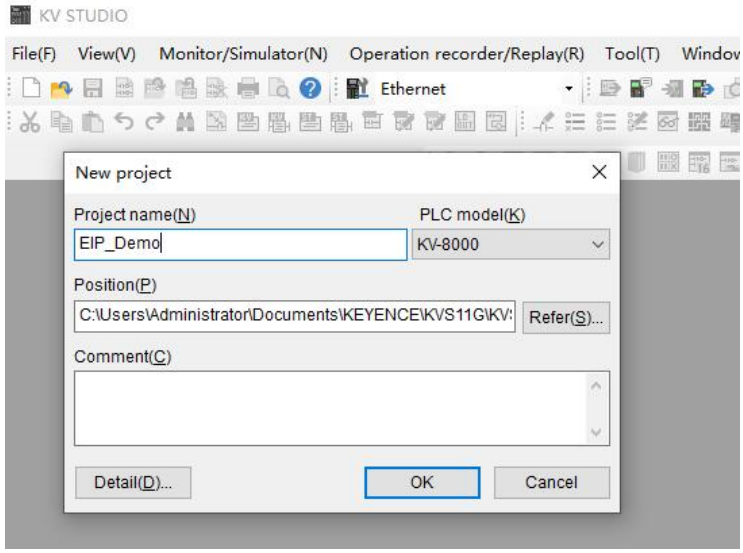


Figure 4-4

- As shown in Figure 4-5 (a) to Figure 4-5 (b), click "Yes (Y)" in sequence.

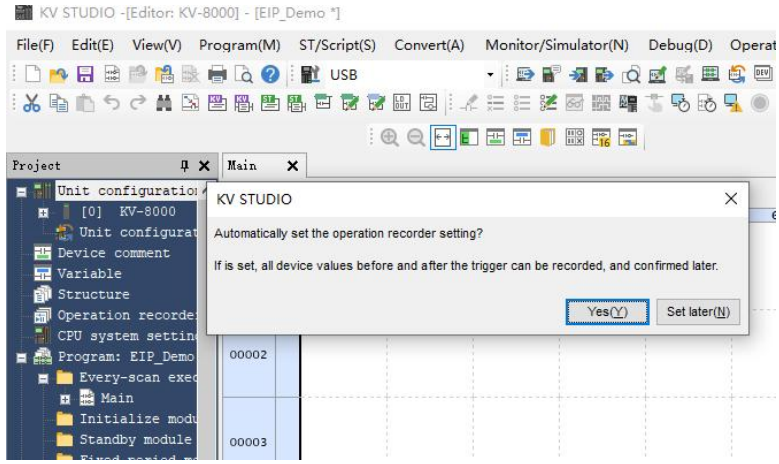


Figure 4-5 (a)

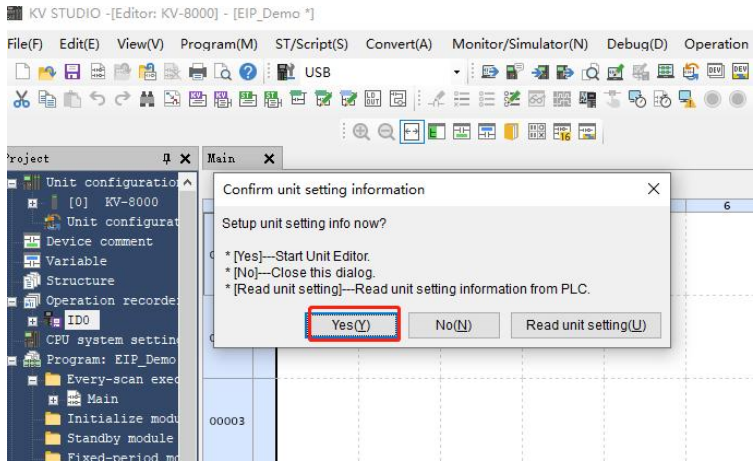


Figure 4-5 (b)

- As shown in Figure 4-6(a)~4-6(b), enter the “EtherNet/IP settings” interface.

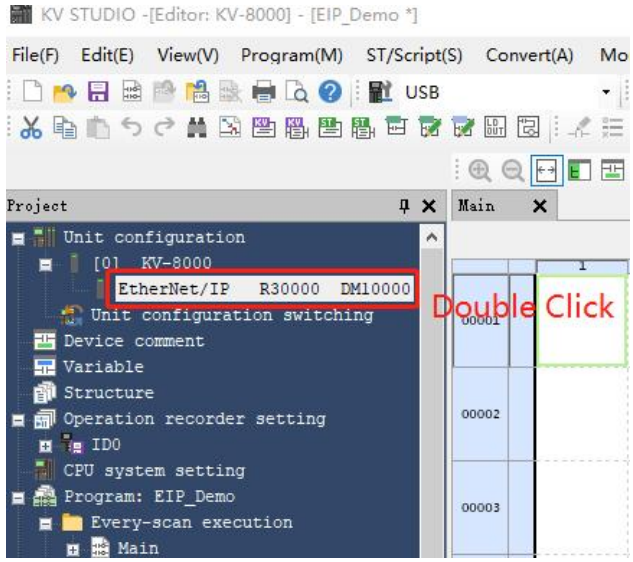


Figure 4-6(a)

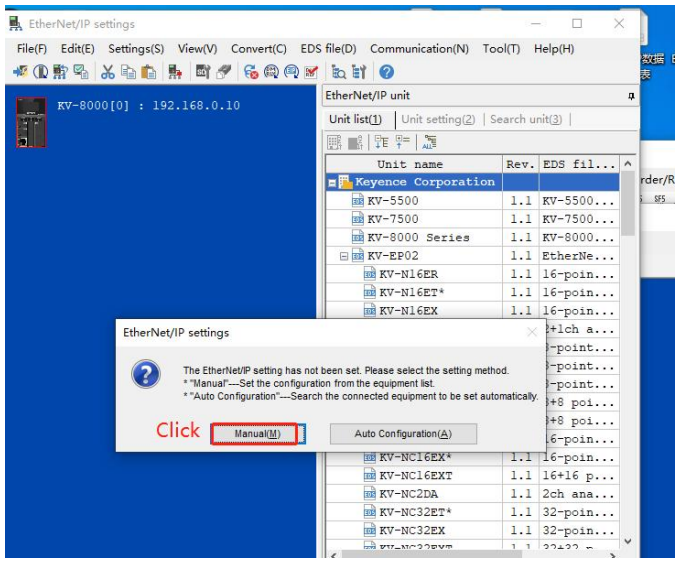


Figure 4-6(b)

➢ Install the EDS file as shown in Figure 4-7(a)~Figure 4-7(b): Click ESD file(D)->Reg(I), and then browse to the location where the EDS file is placed.

Set, select, open, and install the EDS file.

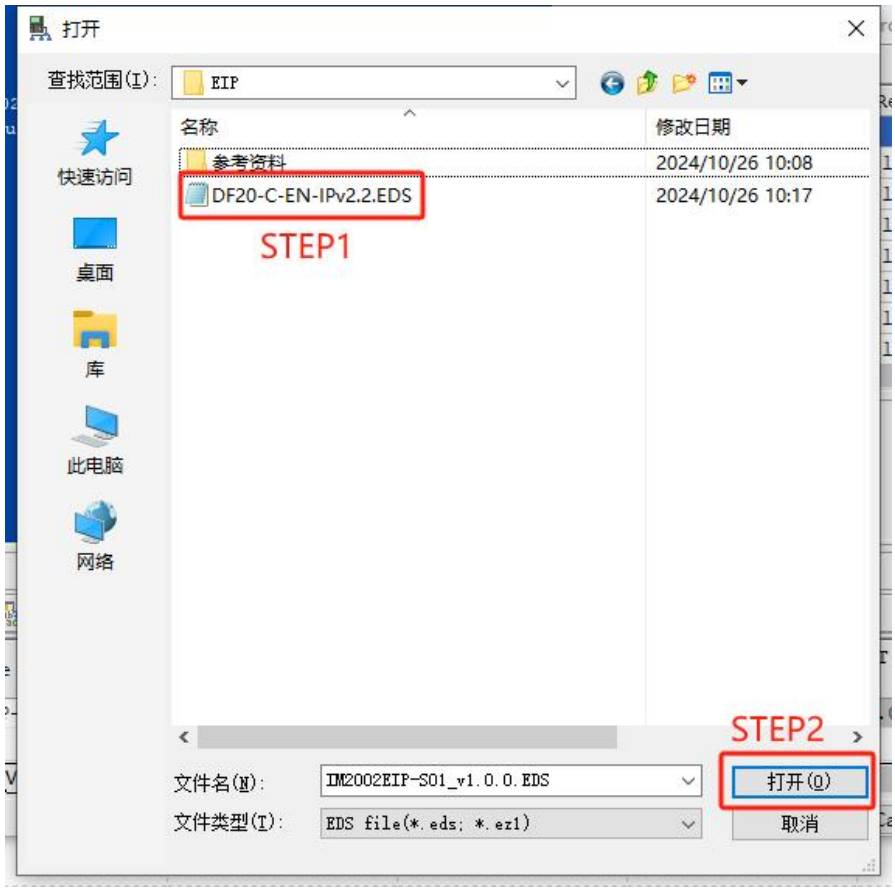


Figure 4-7(a)

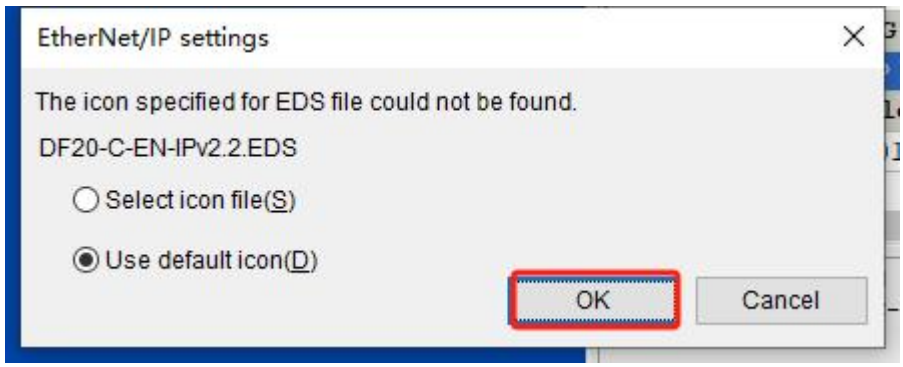


Figure 4-7(b)

➢ The EDS file installation is complete as shown in Figure 4-8.

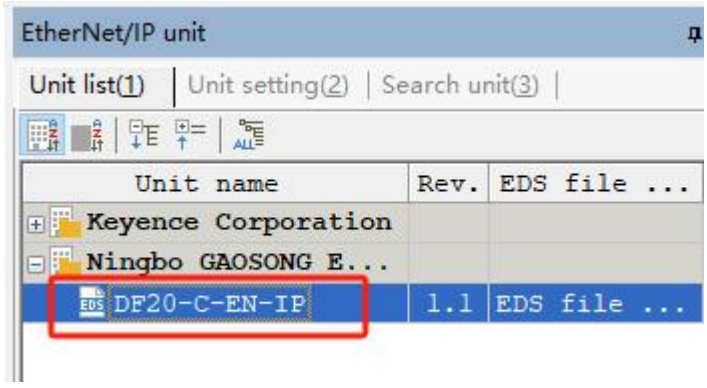


Figure 4-8

➢ As shown in Figure 4-9(a) to Figure 4-9(b), set the IP address of KV-8000 on the configuration software. In this example, the IP address of PLC is 192.168.0.10.

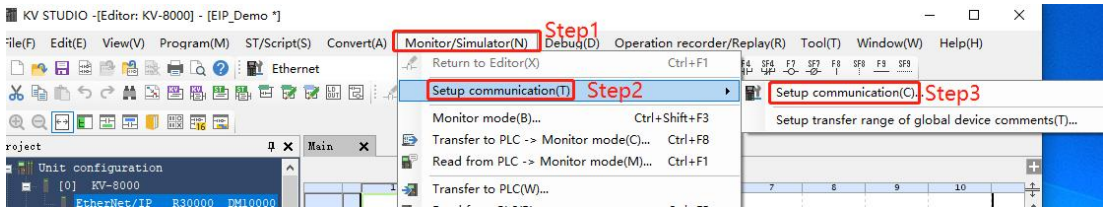


Figure 4-9(a)

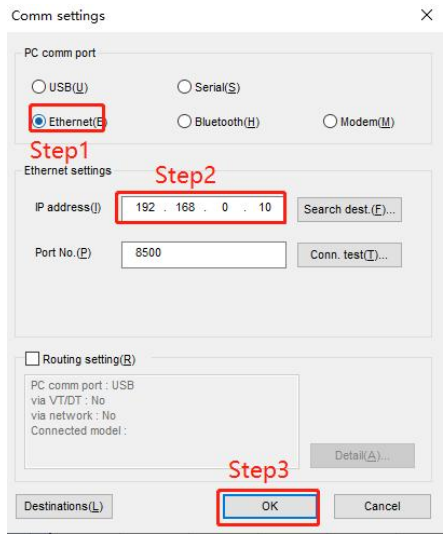


Figure 4-9(b)

➢ Search for the EIP coupler as shown in Figure 4-10(a) to Figure 4-10(e).

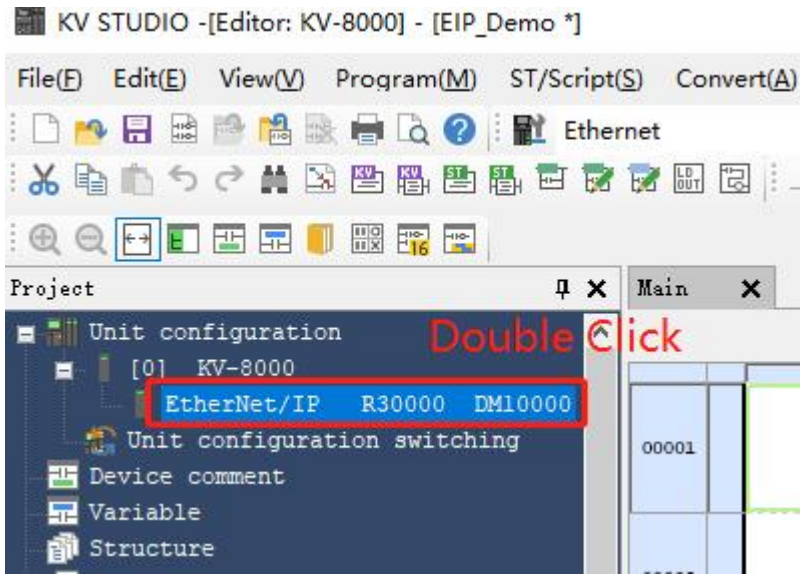


Figure 4-10(a)

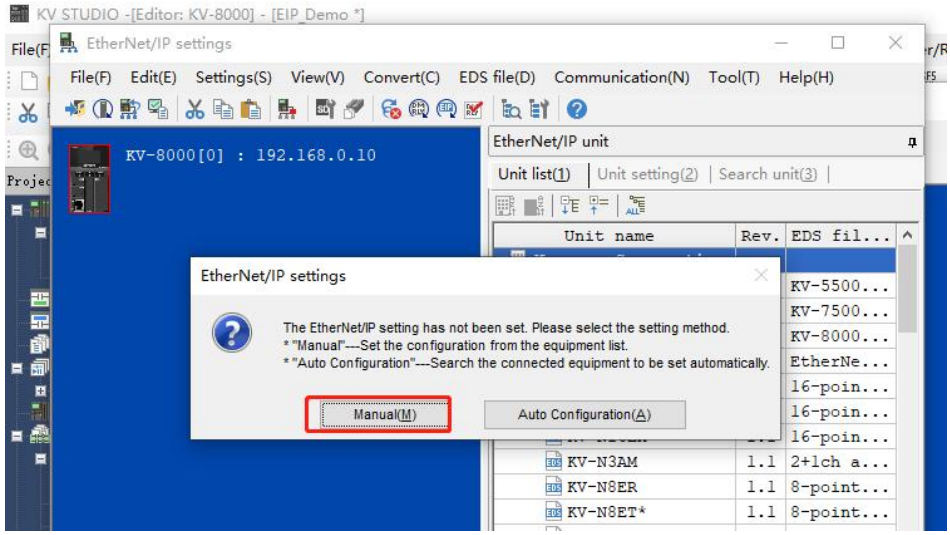


Figure 4-10(b)

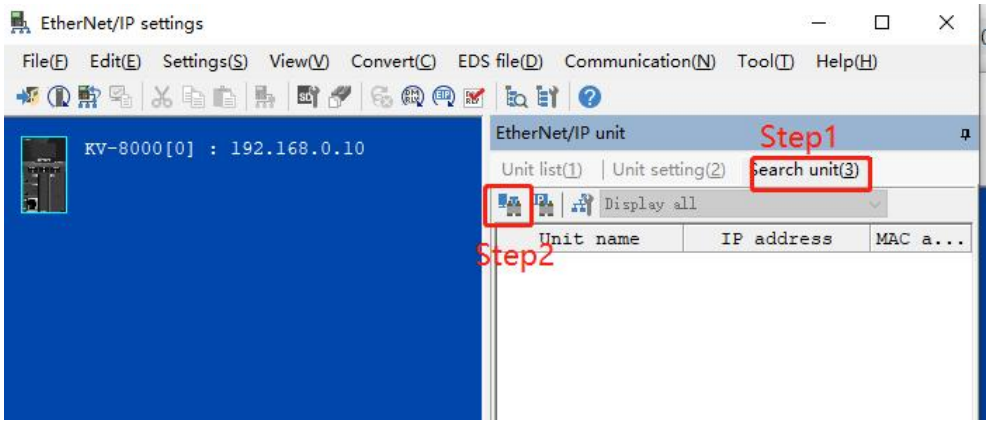


Figure 4-10(c)

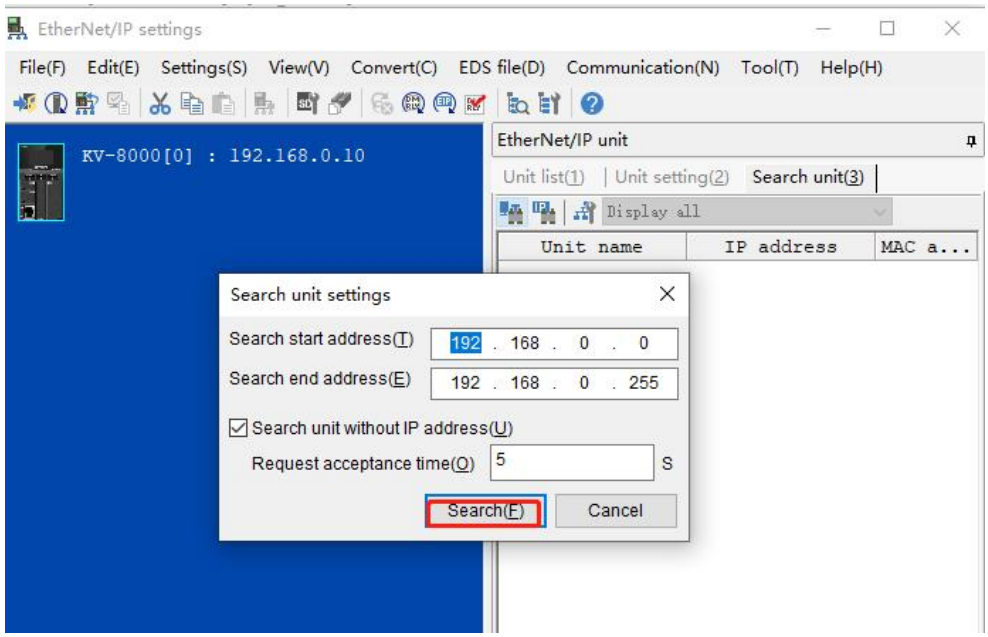


Figure 4-10(d)

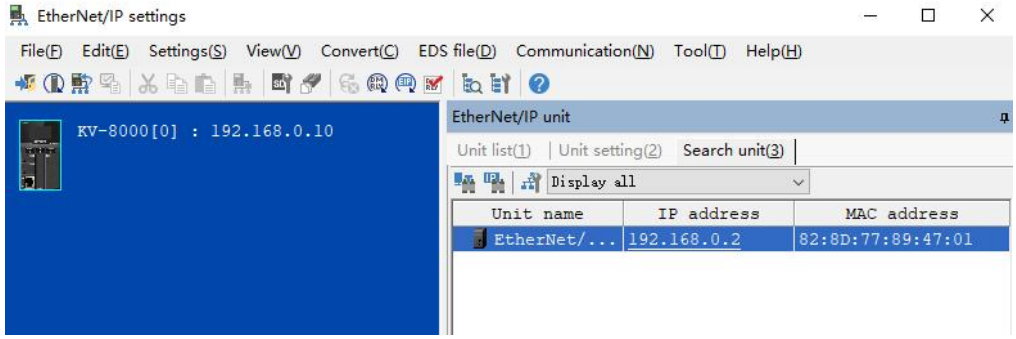


Figure 4-10(e)

➢ Modify the IP address of the coupler as shown in Figure 4-11(a) to Figure 4-11(c).

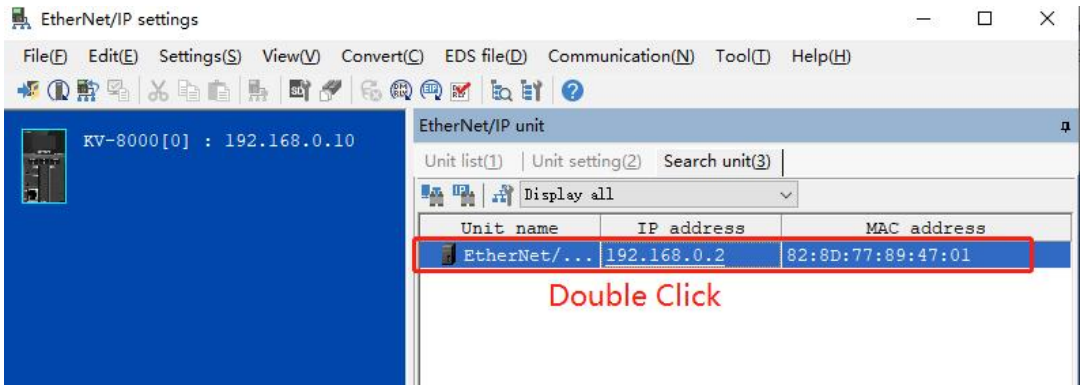


Figure 4-11(a)

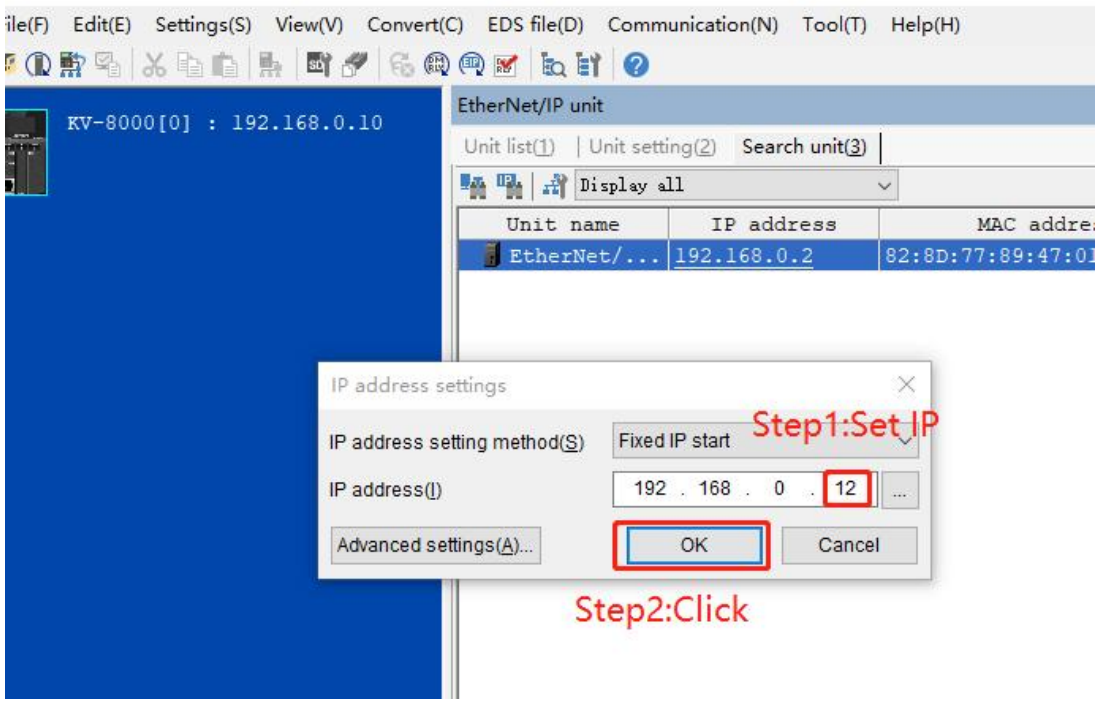


Figure 4-11(b)

Figure 4-11(c)

4.1.3 Setting the IP address using the IP Setting Tool

➢ **Turn all the DIP switches to OFF.**Power on the module, use the host computer to scan the module,

and click the module IP address bar after scanning the module.

The IP address can be modified.

- Install the "PSUpdate100" software provided by the supplier. After the installation is complete, the icon shown in Figure 4-12 will appear.

Figure 4-12

- As shown in Figure 4-13, open the "IP Setting Tool" software and select the network card currently in use.

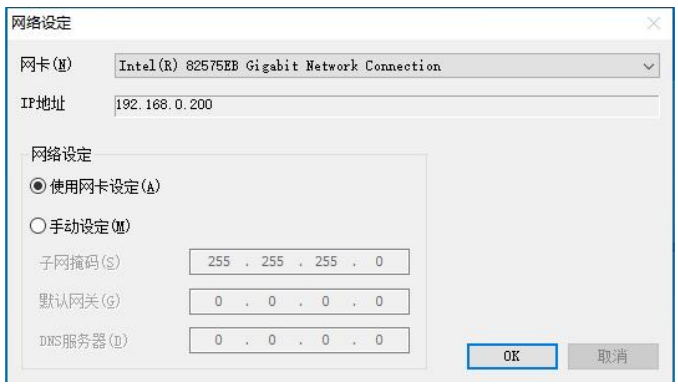


Figure 4-13

- As shown in Figure 4-14(a) to Figure 4-14(d), scan the coupler using the “IP Setting Tool” and set the IP address.

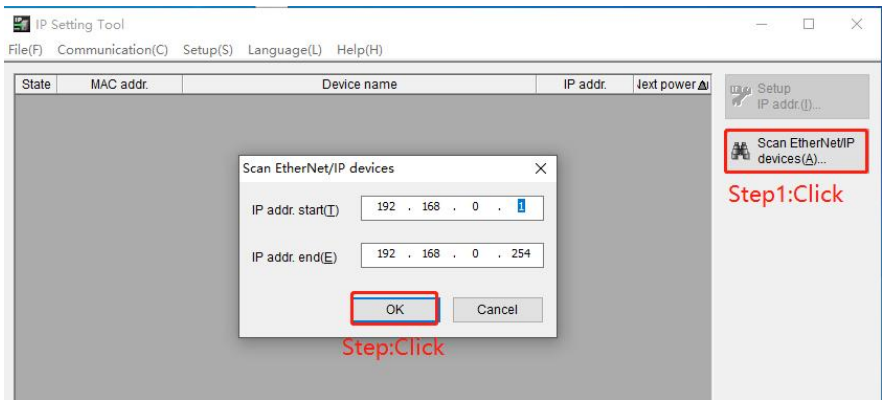


Figure 4-14(a)

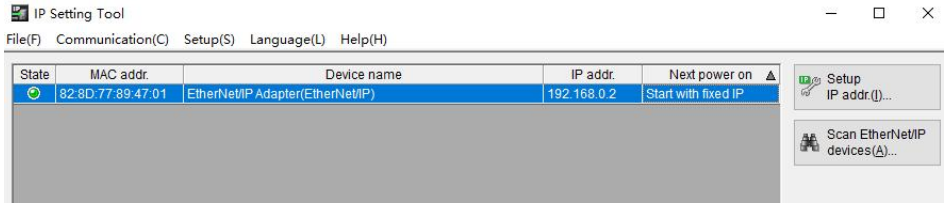


Figure 4-14(b)

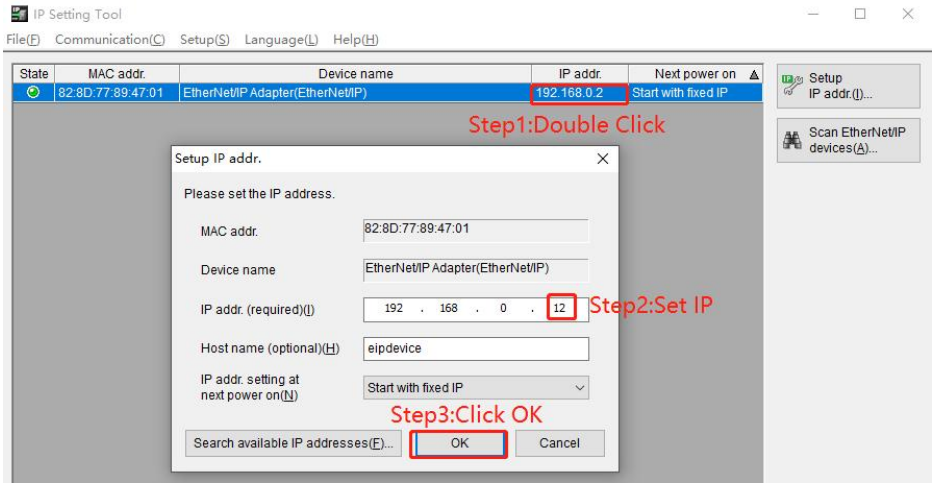


Figure 4-14(c)

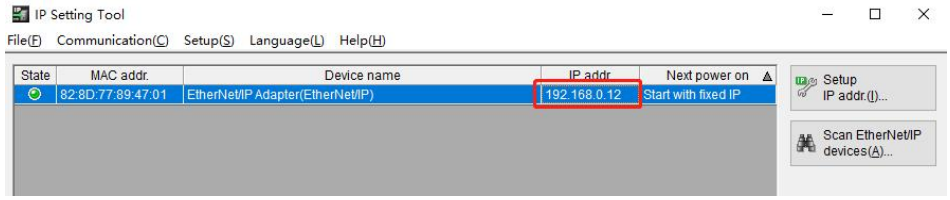


Figure 4-14(d)

- As shown in Figure 4-15(a) to Figure 4-15(d), the coupler network segment is modified through the "IP Setting Tool". As shown in Figure 4-15(b), after the network segment is modified, the software and the coupler cannot automatically reconnect, so the prompt "Failed" is displayed.

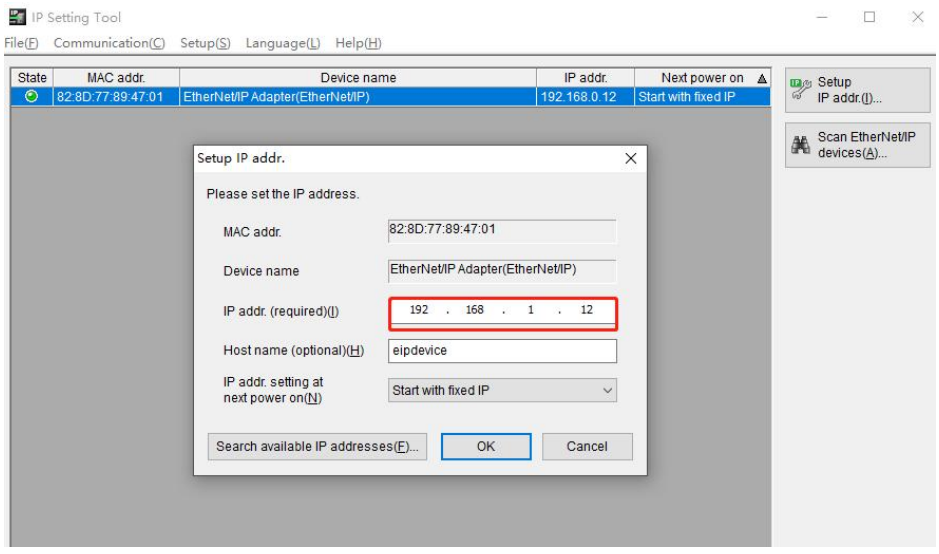


Figure 4-15(a)

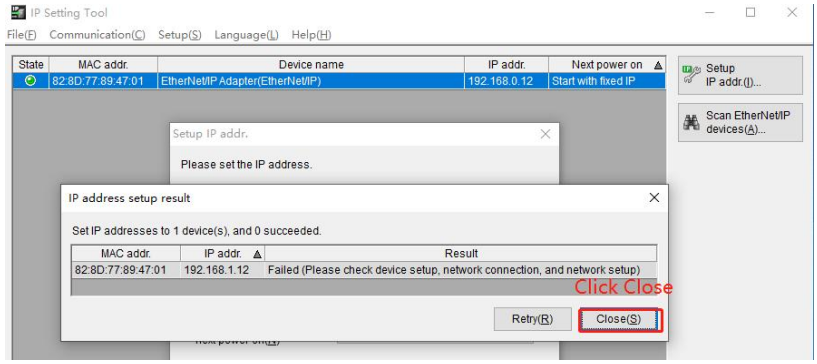


Figure 4-15(b)

➢ As shown in Figure 4-16 (a), modify the computer network segment, reopen the "IP Setting Tool", and scan the coupler as shown in Figure 4-16 (b).

The network segment was modified successfully.

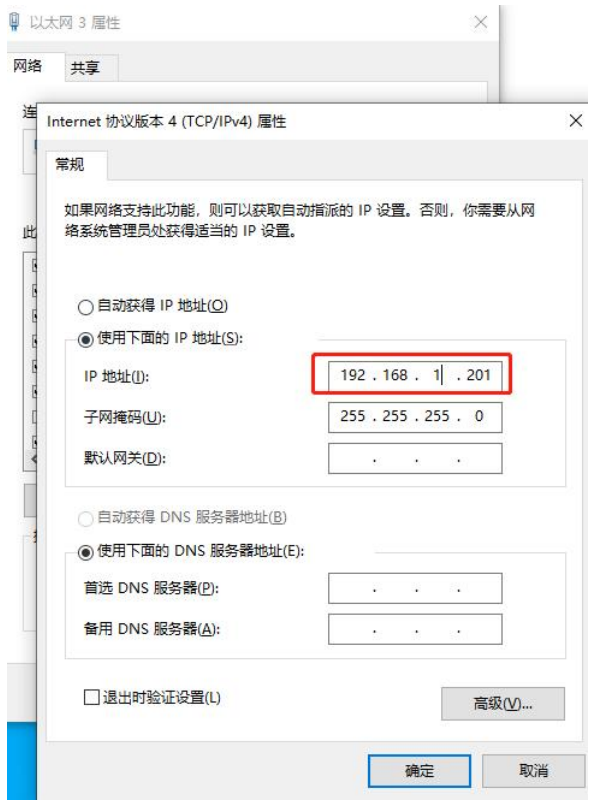


Figure 4-16(a)

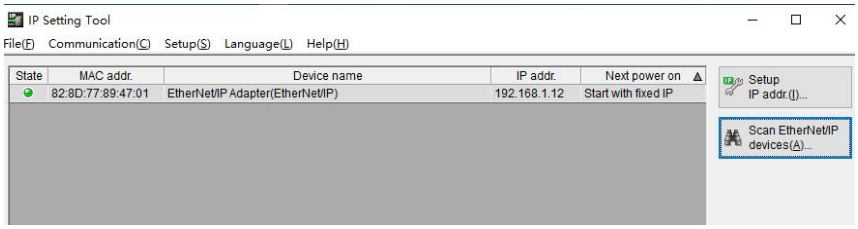


Figure 4-16(b)

4.1.4 Priority between IP setting by dial code and IP setting by host computer

➢ When the DIP switch is set to 0 or 255, the adapter IP address uses the IP configured by the host computer.

- When the dial value is greater than 0 and less than 254, the last byte of the adapter's IP is the current dial value, and the first three bytes are

Assigned by the host computer software.

4.1.5 Reset IP address

- If the IP address of the coupler is forgotten, lost or other abnormal situations occur during use, the coupler can reset the IP address through the IP address reset function.

The module is reset and the factory settings are restored through the special operation of the DIP switch. The specific operations are as follows:

(1) As shown in Figure 4-17(a), turn the DIP switch to 254 and power on the module. The module's default IP is: 192.168.0.254.

Figure 4-17(a)

(2) After the module is powered on, without disconnecting the power supply, turn the DIP switch to 0 as shown in Figure 4-17(b).

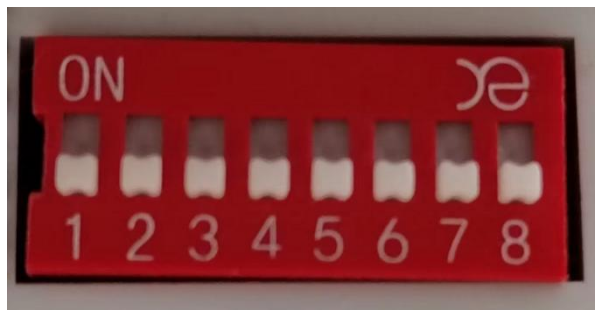


Figure 4-17(b)

(3) Then set the IP address of the coupler according to the method in Section 4.1.2 or Section 4.1.3.

4.2 IO module parameter configuration function

- **This manual uses the KV STUDIO Ver.11G software platform and KEYENCE PLC (model: KV-8000) as an example to introduce the module**

Parameters, functions and configuration methods.

- As shown in Figure 4-18, the module parameters can be configured through the "Setup parameter" interface. The configurable parameters are shown in Table 4.1.

Provide explanation.

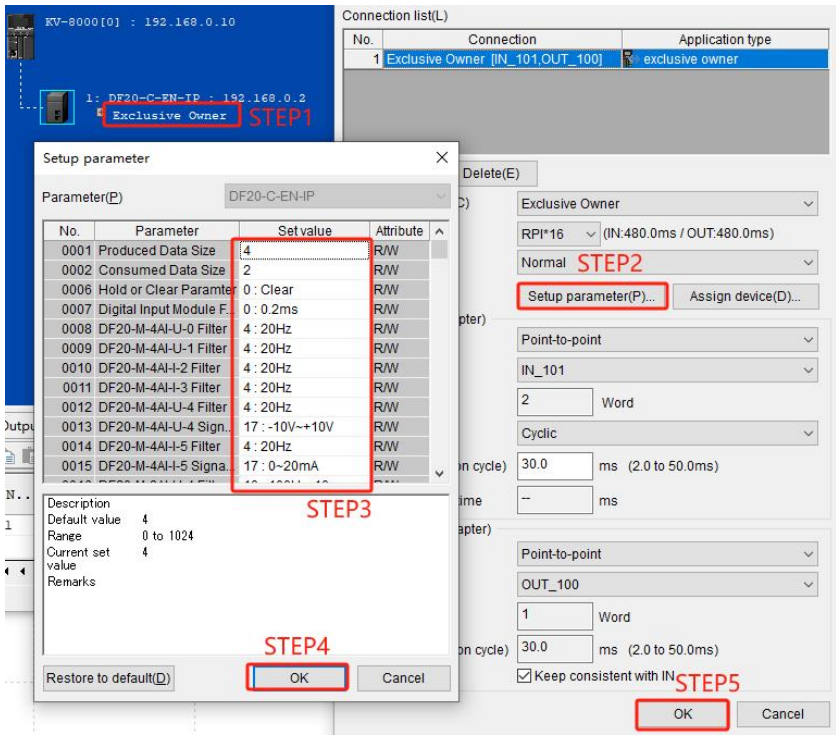


Figure 4-18

Table 4.1

Num	Module parameter object	Explanation of meaning	Configuration Values
0001	Produced Data Size	Uplink data length	2~1024
0002	Consumed Data Size	Downlink data length	0~1024
0006	Hold or Clear Parameter	Network disconnection output hold/clear configuration	Clear/Hold
0007	Digital Input Module Filter	Digital input module filter configuration	0.2ms~40ms optional
0008	DF20-M-4AI-U-0 Filter	DF20-M-4AI-U-0 filter configuration	20Hz~300Hz optional
0009	DF20-M-4AI-U-1 Filter	DF20-M-4AI-U-1 filter configuration	20Hz~300Hz optional
0010	DF20-M-4AI-I-2 Filter	DF20-M-4AI-I-2 filter configuration	20Hz~300Hz optional
0011	DF20-M-4AI-I-3 Filter	DF20-M-4AI-I-3 filter configuration	20Hz~300Hz optional
0012	DF20-M-4AI-U-4 Filter	DF20-M-4AI-U-4 filter configuration	20Hz~300Hz optional
0013	DF20-M-4AI-U-4 Signal Range	DF20-M-4AI-U-4 signal range selection	-10V~+10V/0~10V etc.
0014	DF20-M-4AI-I-5 Filter	DF20-M-4AI-I-5 filter configuration	20Hz~300Hz optional
0015	DF20-M-4AI-I-5 Signal Range	DF20-M-4AI-I-5 signal range selection	0~20ma/4~20ma
0016	DF20-M-8AI-U-4 Filter	DF20-M-8AI-U-4 filter configuration	50Hz~1000Hz optional
0017	DF20-M-8AI-U-4 Signal Range	DF20-M-8AI-U-4 signal range selection	-10V~+10V/0~10V etc.
0018	DF20-M-8AI-I-5 Filter	DF20-M-8AI-I-5 filter configuration	50Hz~1000Hz optional
0019	DF20-M-8AI-I-5 Signal Range	DF20-M-8AI-I-5 signal range selection	0~20ma/4~20ma

0020	DF20-M-4AO-U-4 Signal Range	DF20-M-4AO-U-4 signal range selection	-10V~+10V/0~10V etc.
0021	DF20-M-4AO-I-5 Signal Range	DF20-M-4AO-I-5 signal range selection	0~20ma/4~20ma
0022	DF20-M-8AO-U-4 Signal Range	DF20-M-8AO-U-4 signal range selection	-10V~+10V/0~10V etc.
0023	DF20-M-8AO-I-5 Signal Range	DF20-M-8AO-I-5 signal range selection	0~20ma/4~20ma
0024	DF20-M-2LC-S-5 Filter	DF20-M-2LC-S-5 filter configuration	20Hz~300Hz optional
0025	DF20-M-2RTD-PT Filter	DF20-M-2RTD-PT filter configuration	1.25Hz~7.5Hz optional
0026	DF20-M-2RTD-PT RTD Type	DF20-M-2RTD-PT sensor type selection	PT100/PT1000, etc.
0027	DF20-M-4RTD-PT Filter	DF20-M-4RTD-PT filter configuration	1.25Hz~5Hz optional
0028	DF20-M-4RTD-PT RTD Type	DF20-M-4RTD-PT sensor type selection	PT100/PT1000, etc.
0029	DF20-M-4TC-KETJ Filter	DF20-M-4TC-KETJ filter configuration	1Hz~8Hz optional
0030	DF20-M-4TC-KETJ TC Type	DF20-M-4TC-KETJ TC sensor type selection	K/E/T/J etc.
0031	DF20-M-8TC-KETJ Filter	DF20-M-8TC-KETJ filter configuration	61.25ms~7200ms
0032	DF20-M-8TC-KETJ TC Type	DF20-M-8TC-KETJ TC sensor type selection	K/E/T/J etc.
0033	DF20-M-2CNT-EL-5 CH1 Counter Type	DF20-M-2CNT-EL-5 CH1 counting type	Line Counter/ Ring Counter
0034	DF20-M-2CNT-EL-5 CH1 Pulse Input Method	DF20-M-2CNT-EL-5 CH1Input signal type	Phase Differential x4/ Phase Differential x2/ Phase Differential x1/ Pulse and Directions
0035	DF20-M-2CNT-EL-5 CH1 Encoder Count Direction	DF20-M-2CNT-EL-5 CH1Signal input direction logic	Positive logic/ Negative logic
0036	DF20-M-2CNT-EL-5 CH1 Counter Filter	DF20-M-2CNT-EL-5 CH1Input pulse signal filter configuration	75kHZ~4MHZ optional
0037	DF20-M-2CNT-EL-5 CH1 Maximum Counter Value	DF20-M-2CNT-EL-5 CH1Ring count upper limit	-2147483648~2147483647
0038	DF20-M-2CNT-EL-5 CH1 Minimum Counter Value	DF20-M-2CNT-EL-5 CH1Ring count lower limit	-2147483648~2147483647
0039	DF20-M-2CNT-EL-5 CH2 Counter Type	DF20-M-2CNT-EL-5 CH2 counting type	Line Counter/ Ring Counter
0040	DF20-M-2CNT-EL-5 CH2 Pulse Input Method	DF20-M-2CNT-EL-5 CH2Input signal type	Phase Differential x4/ Phase Differential x2/ Phase Differential x1/ Pulse and Directions
0041	DF20-M-2CNT-EL-5 CH2 Encoder Count Direction	DF20-M-2CNT-EL-5 CH2Signal input direction logic	Positive logic/ Negative logic
0042	DF20-M-2CNT-EL-5 CH2 Counter Filter	DF20-M-2CNT-EL-5 CH2Input pulse signal filter configuration	75kHZ~4MHZ optional
0043	DF20-M-2CNT-EL-5 CH2 Maximum Counter Value	DF20-M-2CNT-EL-5 CH2Ring count upper limit	-2147483648~2147483647
0044	DF20-M-2CNT-EL-5 CH2 Minimum Counter Value	DF20-M-2CNT-EL-5 CH2Ring count lower limit	-2147483648~2147483647
0045	DF20-M-2CNT-EL-4 CH1 Counter Type	DF20-M-2CNT-EL-4 CH1Count Type	Line Counter/ Ring Counter
0046	DF20-M-2CNT-EL-4 CH1 Pulse Input Method	DF20-M-2CNT-EL-4 CH1Input signal type	Phase Differential x4/ Phase Differential x2/ Phase Differential x1/ Pulse and Directions
0047	DF20-M-2CNT-EL-4 CH1 Encoder Count Direction	DF20-M-2CNT-EL-4 CH1Signal input direction logic	Positive logic/ Negative logic
0048	DF20-M-2CNT-EL-4 CH1 Counter Filter	DF20-M-2CNT-EL-4 CH1Input pulse signal filter configuration	75kHZ~4MHZ optional
0049	DF20-M-2CNT-EL-4 CH1 Maximum Counter Value	DF20-M-2CNT-EL-4 CH1Ring count upper limit	-2147483648~2147483647
0050	DF20-M-2CNT-EL-4 CH1 Minimum Counter Value	DF20-M-2CNT-EL-4 CH1Ring count lower limit	-2147483648~2147483647
0051	DF20-M-2CNT-EL-4 CH2 Counter Type	DF20-M-2CNT-EL-4 CH2Count Type	Line Counter/ Ring Counter
0052	DF20-M-2CNT-EL-4 CH2 Pulse Input Method	DF20-M-2CNT-EL-4 CH2Input signal type	Phase Differential x4/ Phase Differential x2/ Phase Differential x1/ Pulse and Directions
0053	DF20-M-2CNT-EL-4 CH2 Encoder Count Direction	DF20-M-2CNT-EL-4 CH2Signal input direction logic	Positive logic/ Negative logic
0054	DF20-M-2CNT-EL-4 CH2 Counter Filter	DF20-M-2CNT-EL-4 CH2Input pulse signal filter configuration	75kHZ~4MHZ optional

0055	DF20-M-2CNT-EL-4 CH2 Maximum Counter Value	DF20-M-2CNT-EL-4 CH2Ring count upper limit	-2147483648~2147483647
0056	DF20-M-2CNT-EL-4 CH2 Minimum Counter Value	DF20-M-2CNT-EL-4 CH2Ring count lower limit	-2147483648~2147483647
0057	DF20-M-1COM-232/485/422 Port Operation Mode	DF20-M-1COM-232/485/422 operation mode	FreeRUN/ Modbus RTU Master/ Modbus RTU Slave
0058	DF20-M-1COM-232/485/422 Interface	DF20-M-1COM-232/485/422 interface type	RS232 Flow Off/ RS232 Flow On/ RS485/ RS422
0059	DF20-M-1COM-232/485/422 Parity	DF20-M-1COM-232/485/422 check digit	None/Odd/Even
0060	DF20-M-1COM-232/485/422 Data bit	DF20-M-1COM-232/485/422 data bits	8bit/7bit
0061	DF20-M-1COM-232/485/422 Stop bit	DF20-M-1COM-232/485/422 stop bit	1bit/2bit
0062	DF20-M-1COM-232/485/422 Baudrate	DF20-M-1COM-232/485/422 baud rate	2400bps~512000bps optional
0063	DF20-M-1COM-232/485/422 FreeRUN Interval time	DF20-M-1COM-232/485/422Receive frame interval in transparent transmission mode	0~65535
0064	DF20-M-1COM-232/485/422 Slave ID	DF20-M-1COM-232/485/422Slave ID	0~127
0065	DF20-M-1COM-232/485/422 Slave Response Delay	DF20-M-1COM-232/485/422Slave station response delay time	0~65535
0066	DF20-M-1COM-232/485/422 CH0: Slave ID	DF20-M-1COM-232/485/422 CH0: Slave address	0~127
0067	DF20-M-1COM-232/485/422 CH0: Event Trigger	DF20-M-1COM-232/485/422 CH0: Trigger Mode	Poll mode/Trigger
0068	DF20-M-1COM-232/485/422 CH0: Lost Action	DF20-M-1COM-232/485/422 CH0: offline action	Hold Data/Clear Data
0069	DF20-M-1COM-232/485/422 CH0: Operation Code	DF20-M-1COM-232/485/422 CH0: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0070	DF20-M-1COM-232/485/422 CH0: Reg Address	DF20-M-1COM-232/485/422 CH0: Register address	0~65535
0071	DF20-M-1COM-232/485/422 CH0: Reg Num	DF20-M-1COM-232/485/422 CH0: Number of registers	0~320
0072	DF20-M-1COM-232/485/422 CH0: Poll Time	DF20-M-1COM-232/485/422 CH0: Polling cycle	100~500
0073	DF20-M-1COM-232/485/422 CH0: Poll Delay	DF20-M-1COM-232/485/422 CH0: Interval time	0~500
0074	DF20-M-1COM-232/485/422 CH0: Response Timeout	DF20-M-1COM-232/485/422 CH0: Slave timeout	100~5000
0075	DF20-M-1COM-232/485/422 CH1: Slave ID	DF20-M-1COM-232/485/422 CH1: Slave address	0~127
0076	DF20-M-1COM-232/485/422 CH1: Event Trigger	DF20-M-1COM-232/485/422 CH1: Trigger Mode	Poll mode/Trigger
0077	DF20-M-1COM-232/485/422 CH1: Lost Action	DF20-M-1COM-232/485/422 CH1: offline action	Hold Data/Clear Data
0078	DF20-M-1COM-232/485/422 CH1: Operation Code	DF20-M-1COM-232/485/422 CH1: Function Code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0079	DF20-M-1COM-232/485/422 CH1: Reg Address	DF20-M-1COM-232/485/422 CH1: Register address	0~65535
0080	DF20-M-1COM-232/485/422 CH1: Reg Num	DF20-M-1COM-232/485/422 CH1: Number of registers	0~320
0081	DF20-M-1COM-232/485/422 CH1: Poll Time	DF20-M-1COM-232/485/422 CH1: Polling cycle	100~500

0082	DF20-M-1COM-232/485/422 CH1: Poll Delay	DF20-M-1COM-232/485/422 CH1: Interval time	0~500
0083	DF20-M-1COM-232/485/422 CH1: Response Timeout	DF20-M-1COM-232/485/422 CH1: Slave timeout	100~5000
0084	DF20-M-1COM-232/485/422 CH2: Slave ID	DF20-M-1COM-232/485/422 CH2: Slave address	0~127
0085	DF20-M-1COM-232/485/422 CH2: Event Trigger	DF20-M-1COM-232/485/422 CH2: Trigger Mode	Poll mode/Trigger
0086	DF20-M-1COM-232/485/422 CH2: Lost Action	DF20-M-1COM-232/485/422 CH2: offline action	Hold Data/Clear Data
0087	DF20-M-1COM-232/485/422 CH2: Operation Code	DF20-M-1COM-232/485/422 CH2: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0088	DF20-M-1COM-232/485/422 CH2: Reg Address	DF20-M-1COM-232/485/422 CH2: Register address	0~65535
0089	DF20-M-1COM-232/485/422 CH2: Reg Num	DF20-M-1COM-232/485/422 CH2: Number of registers	0~320
0090	DF20-M-1COM-232/485/422 CH2: Poll Time	DF20-M-1COM-232/485/422 CH2: Polling cycle	100~500
0091	DF20-M-1COM-232/485/422 CH2: Poll Delay	DF20-M-1COM-232/485/422 CH2: Interval time	0~500
0092	DF20-M-1COM-232/485/422 CH2: Response Timeout	DF20-M-1COM-232/485/422 CH2: Slave timeout	100~5000
0093	DF20-M-1COM-232/485/422 CH3: Slave ID	DF20-M-1COM-232/485/422 CH3: Slave address	0~127
0094	DF20-M-1COM-232/485/422 CH3: Event Trigger	DF20-M-1COM-232/485/422 CH3: Trigger Mode	Poll mode/Trigger
0095	DF20-M-1COM-232/485/422 CH3: Lost Action	DF20-M-1COM-232/485/422 CH3: offline action	Hold Data/Clear Data
0096	DF20-M-1COM-232/485/422 CH3: Operation Code	DF20-M-1COM-232/485/422 CH3: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0097	DF20-M-1COM-232/485/422 CH3: Reg Address	DF20-M-1COM-232/485/422 CH3: Register address	0~65535
0098	DF20-M-1COM-232/485/422 CH3: Reg Num	DF20-M-1COM-232/485/422 CH3: Number of registers	0~320
0099	DF20-M-1COM-232/485/422 CH3: Poll Time	DF20-M-1COM-232/485/422 CH3: Polling cycle	100~500
0100	DF20-M-1COM-232/485/422 CH3: Poll Delay	DF20-M-1COM-232/485/422 CH3: Interval time	0~500
0101	DF20-M-1COM-232/485/422 CH3: Response Timeout	DF20-M-1COM-232/485/422 CH3: Slave timeout	100~5000
0102	DF20-M-1COM-232/485/422 CH4: Slave ID	DF20-M-1COM-232/485/422 CH4: Slave address	0~127
0103	DF20-M-1COM-232/485/422 CH4: Event Trigger	DF20-M-1COM-232/485/422 CH4: Trigger Mode	Poll mode/Trigger
0104	DF20-M-1COM-232/485/422 CH4: Lost Action	DF20-M-1COM-232/485/422 CH4: offline action	Hold Data/Clear Data
0105	DF20-M-1COM-232/485/422 CH4: Operation Code	DF20-M-1COM-232/485/422 CH4: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/

			16 WRITE MULTIPLE HOLDING REGISTERS
0106	DF20-M-1COM-232/485/422 CH4: Reg Address	DF20-M-1COM-232/485/422 CH4: Register address	0~65535
0107	DF20-M-1COM-232/485/422 CH4: Reg Num	DF20-M-1COM-232/485/422 CH4: Number of registers	0~320
0108	DF20-M-1COM-232/485/422 CH4: Poll Time	DF20-M-1COM-232/485/422 CH4: Polling cycle	100~500
0109	DF20-M-1COM-232/485/422 CH4: Poll Delay	DF20-M-1COM-232/485/422 CH4: Interval time	0~500
0110	DF20-M-1COM-232/485/422 CH4: Response Timeout	DF20-M-1COM-232/485/422 CH4: Slave timeout	100~5000
0111	DF20-M-1COM-232/485/422 CH5: Slave ID	DF20-M-1COM-232/485/422 CH5: Slave address	0~127
0112	DF20-M-1COM-232/485/422 CH5: Event Trigger	DF20-M-1COM-232/485/422 CH5: Trigger Mode	Poll mode/Trigger
0113	DF20-M-1COM-232/485/422 CH5: Lost Action	DF20-M-1COM-232/485/422 CH5: offline action	Hold Data/Clear Data
0114	DF20-M-1COM-232/485/422 CH5: Operation Code	DF20-M-1COM-232/485/422 CH5: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0115	DF20-M-1COM-232/485/422 CH5: Reg Address	DF20-M-1COM-232/485/422 CH5: Register address	0~65535
0116	DF20-M-1COM-232/485/422 CH5: Reg Num	DF20-M-1COM-232/485/422 CH5: Number of registers	0~320
0117	DF20-M-1COM-232/485/422 CH5: Poll Time	DF20-M-1COM-232/485/422 CH5: Polling cycle	100~500
0118	DF20-M-1COM-232/485/422 CH5: Poll Delay	DF20-M-1COM-232/485/422 CH5: Interval time	0~500
0119	DF20-M-1COM-232/485/422 CH5: Response Timeout	DF20-M-1COM-232/485/422 CH5: Slave timeout	100~5000
0120	DF20-M-1COM-232/485/422 CH6: Slave ID	DF20-M-1COM-232/485/422 CH6: Slave address	0~127
0121	DF20-M-1COM-232/485/422 CH6: Event Trigger	DF20-M-1COM-232/485/422 CH6: Trigger Mode	Poll mode/Trigger
0122	DF20-M-1COM-232/485/422 CH6: Lost Action	DF20-M-1COM-232/485/422 CH6: offline action	Hold Data/Clear Data
0123	DF20-M-1COM-232/485/422 CH6: Operation Code	DF20-M-1COM-232/485/422 CH6: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0124	DF20-M-1COM-232/485/422 CH6: Reg Address	DF20-M-1COM-232/485/422 CH6: Register address	0~65535
0125	DF20-M-1COM-232/485/422 CH6: Reg Num	DF20-M-1COM-232/485/422 CH6: Number of registers	0~320
0126	DF20-M-1COM-232/485/422 CH6: Poll Time	DF20-M-1COM-232/485/422 CH6: Polling cycle	100~500
0127	DF20-M-1COM-232/485/422 CH6: Poll Delay	DF20-M-1COM-232/485/422 CH6: Interval time	0~500
0128	DF20-M-1COM-232/485/422 CH6: Response Timeout	DF20-M-1COM-232/485/422 CH6: Slave timeout	100~5000
0129	DF20-M-1COM-232/485/422 CH7: Slave ID	DF20-M-1COM-232/485/422 CH7: Slave address	0~127
0130	DF20-M-1COM-232/485/422 CH7: Event Trigger	DF20-M-1COM-232/485/422 CH7: Trigger Mode	Poll mode/Trigger
0131	DF20-M-1COM-232/485/422 CH7: Lost Action	DF20-M-1COM-232/485/422 CH7: offline action	Hold Data/Clear Data

0132	DF20-M-1COM-232/485/422 CH7: Operation Code	DF20-M-1COM-232/485/422 CH7: Function code	01 READ COILS/ 02 READ DISCRETE INPUTS/ 03 READ HOLDING REGISTERS/ 04 READ INPUT REGISTERS/ 05 WRITE SINGLE COIL/ 06 WRITE SINGLE HOLDING REGISTER/ 15 WRITE MULTIPLE COILS/ 16 WRITE MULTIPLE HOLDING REGISTERS
0133	DF20-M-1COM-232/485/422 CH7: Reg Address	DF20-M-1COM-232/485/422 CH7: Register address	0~65535
0134	DF20-M-1COM-232/485/422 CH7: Reg Num	DF20-M-1COM-232/485/422 CH7: Number of registers	0~320
0135	DF20-M-1COM-232/485/422 CH7: Poll Time	DF20-M-1COM-232/485/422 CH7: Polling cycle	100~500
0136	DF20-M-1COM-232/485/422 CH7: Poll Delay	DF20-M-1COM-232/485/422 CH7: Interval time	0~500
0137	DF20-M-1COM-232/485/422 CH7: Response Timeout	DF20-M-1COM-232/485/422 CH7: Slave timeout	100~5000
0138	DF20-M-2PWM CH1 Pulse Mode	DF20-M-2PWM CH1Signal Type	Pulse/Dir/PWM
0139	DF20-M-2PWM CH1 Motion Mode	DF20-M-2PWM CH1Pulse control method	Jog/ Relative Position/ Absolute Position
0140	DF20-M-2PWM CH1 Ramp Mode	DF20-M-2PWM CH1Pulse ramp enable	Enable/Disable
0141	DF20-M-2PWM CH1 Direction Mode	DF20-M-2PWM CH1Direction Logic	Positive/Negative
0142	DF20-M-2PWM CH1 Signal Type	DF20-M-2PWM CH1Pulse output mode	OpenDrain/Difference 5V
0143	DF20-M-2PWM CH1 Duty Cycle	DF20-M-2PWM CH1PWM signal duty cycle enable	Disable/Enable
0144	DF20-M-2PWM CH1 PWM Freq Range	DF20-M-2PWM CH1PWM frequency range	20Hz-1.2kHz/ 40Hz-2.4kHz/ 50Hz-3kHz/ 100Hz-6kHz/ 140Hz-8.4kHz/ 200Hz-12kHz
0145	DF20-M-2PWM CH1 Startup Freq	DF20-M-2PWM CH1Pulse output starting frequency	800~4000000
0146	DF20-M-2PWM CH1 Target Freq	DF20-M-2PWM CH1Pulse output target frequency	800~4000000
0147	DF20-M-2PWM CH1 Ramp Up Time	DF20-M-2PWM CH1Pulse output ramp-up time	10~4096
0148	DF20-M-2PWM CH1 Ramp Dn Time	DF20-M-2PWM CH1Pulse output downslope time	10~4096
0149	DF20-M-2PWM CH2 Pulse Mode	DF20-M-2PWM CH2Signal Type	Pulse/Dir/PWM
0150	DF20-M-2PWM CH2 Motion Mode	DF20-M-2PWM CH2Pulse control method	Jog/ Relative Position/ Absolute Position
0151	DF20-M-2PWM CH2 Ramp Mode	DF20-M-2PWM CH2Pulse ramp enable	Enable/Disable
0152	DF20-M-2PWM CH2 Direction Mode	DF20-M-2PWM CH2Direction Logic	Positive/Negative
0153	DF20-M-2PWM CH2 Signal Type	DF20-M-2PWM CH2Pulse output mode	OpenDrain/Difference 5V
0154	DF20-M-2PWM CH2 Duty Cycle	DF20-M-2PWM CH2PWM signal duty cycle enable	Disable/Enable
0155	DF20-M-2PWM CH2 PWM Freq Range	DF20-M-2PWM CH2PWM frequency range	20Hz-1.2kHz/ 40Hz-2.4kHz/ 50Hz-3kHz/ 100Hz-6kHz/ 140Hz-8.4kHz/ 200Hz-12kHz
0156	DF20-M-2PWM CH2 Startup Freq	DF20-M-2PWM CH2Pulse output starting frequency	800~4000000
0157	DF20-M-2PWM CH2 Target Freq	DF20-M-2PWM CH2Pulse output target frequency	800~4000000
0158	DF20-M-2PWM CH2 Ramp Up Time	DF20-M-2PWM CH2Pulse output ramp-up time	10~4096
0159	DF20-M-2PWM CH2 Ramp Dn Time	DF20-M-2PWM CH2Pulse output downslope time	10~4096

4.2.1 Produced Data Size/Consumed Data Size configuration

- During the configuration process, the user must set the Produced Data Size (uplink data size) and the Consumed Data Size (downlink data size).

To configure, the size of the two configuration values is determined according to the topology of the IO module. Users can set the value in the "**EIP_DF20-C-EN-IP Configuration Table_V2.0**"Select the modules in order, the table can calculate the "Produced Data Size" and "Consumed Data Size"As shown in Table 4.1, the user can fill in the two values into the configuration objects of Num1 and Num2.

4.2.2 Digital output clear/hold function

- The clear/hold function is for modules with outputs. This function can configure the module output action when the bus is in abnormal state.

(1) Clear output: When communication is disconnected, the module output channel automatically clears the output.

(2) Maintain output: When communication is disconnected, the module output channel always maintains output.

- As shown in Table 4.1, the Num3 object is used to configure the output module to hold (Hold) or clear (Clear) the output after the network is disconnected.

4.2.3 General analog parameter configuration

- As shown in Table 4.1:Num7 is the filter configuration for all digital input modulesThere are configuration options ranging from 0.2ms to 40ms.
- As shown in Table 4.1:Num8~Num11 are the analog input filter configurations for the corresponding models, with 20Hz/Four frequencies are available: 80Hz/150Hz/300Hz.
- As shown in Table 4.1:Num12~Num13 are the configuration parameters of DF20-M-4AI-U-4, where Num12 is the input filter configuration and Num13 is the sampling signal range selection of the module, with optional ranges such as -10V~+10V/0~10V.
- As shown in Table 4.1:Num14~Num15 are the configuration parameters of DF20-M-4AI-I-5, where Num14 is the input filter configuration and Num15 is the sampling signal range selection of the module, with two ranges available: 0~20ma/4~20ma.
- As shown in Table 4.1:Num16~Num17 are the configuration parameters of DF20-M-8AI-U-4, where Num16 is the input filter configuration and Num17 is the sampling signal range selection of the module, with optional ranges such as -10V~+10V/0~10V.

➢ As shown in Table 4.1:Num18~Num19 are the configuration parameters of DF20-M-8AI-I-5, where Num18 is the input filter configuration and Num19 is the sampling signal range selection of the module, with two ranges of 0~20ma/4~20ma available.

➢ As shown in Table 4.1:Num20 is the configuration parameter of DF20-M-4AO-U-4, which is the output signal range selection of this module.-10V~+10V/0~10V and other ranges are available.

➢ As shown in Table 4.1:Num21 is the configuration parameter of DF20-M-4AO-I-5, which is the output signal range selection of this module.Two ranges are available: 0~20ma/4~20ma.

➢ As shown in Table 4.1:Num22 is the configuration parameter of DF20-M-8AO-U-4, which is the output signal range selection of this module.-10V~+10V/0~10V and other ranges are available.

➢ As shown in Table 4.1:Num23 is the configuration parameter of DF20-M-8AO-I-5, which is the output signal range selection of this module.Two ranges are available: 0~20ma/4~20ma.

➢ As shown in Table 4.1:Num24 is the configuration parameter of DF20-M-2LC-S-5, which is the input filter configuration of the module.

4.2.4 Temperature acquisition module parameter configuration

➢ As shown in Table 4.1:Num25~Num26 are the configuration parameters of DF20-M-2RTD-PT, where Num25 is the input filter configuration and Num26 is the sensor type selection.

➢ As shown in Table 4.1:Num27~Num28 are the configuration parameters of DF20-M-4RTD-PT, where Num27 is the input filter configuration and Num28 is the sensor type selection.

➢ As shown in Table 4.1:Num29~Num30 are the configuration parameters of DF20-M-4TC-KETJ, where Num29 is the input filter configuration and Num30 is the sensor type selection.

➢ As shown in Table 4.1:Num31~Num32 are the configuration parameters of DF20-M-8TC-KETJ, where Num31 is the input filter configuration and Num32 is the sensor type selection.

4.3 Process data

➢ Because each module has different functions and channels, the data length allocated will also be different. Table 4.2 shows the data length of the module.

According to the length allocation table.

Table 4.2

Module Model	Uplink process data length (Byte)		Downlink process data length (Byte)	
	Assigning Values	Actual usage value	Assigning Values	Actual usage value
DF20-C-EN-IP	2	2	0	0
DF20-M-8DI-N	2	1	0	0

DF20-M-8DI-P	2	1	0	0
DF20-M-16DI-N	2	2	0	0
DF20-M-16DI-P	2	2	0	0
DF20-M-32DI-N	4	4	0	0
DF20-M-32DI-P	4	4	0	0
DF20-M-4DO-R	0	0	2	1
DF20-M-8DO-N	0	0	2	1
DF20-M-8DO-P	0	0	2	1
DF20-M-16DO-N	0	0	2	2
DF20-M-16DO-P	0	0	2	2
DF20-M-32DO-N	0	0	4	4
DF20-M-32DO-P	0	0	4	4
DF20-M-8DIO-N	2	1	2	1
DF20-M-8DIO-P	2	1	2	1
DF20-M-4AI-U-0	8	8	0	0
DF20-M-4AI-U-1	8	8	0	0
DF20-M-4AI-I-2	8	8	0	0
DF20-M-4AI-I-3	8	8	0	0
DF20-M-4AI-U-4	8	8	0	0
DF20-M-8AI-U-4	16	16	0	0
DF20-M-4AI-I-5	8	8	0	0
DF20-M-8AI-I-5	16	16	0	0
DF20-M-2LC-S-5	4	4	0	0
DF20-M-2RTD-PT	4	4	0	0
DF20-M-4RTD-PT	8	8	0	0
DF20-M-4TC-KETJ	8	8	8	8
DF20-M-8TC-KETJ	16	16	16	16
DF20-M-4AO-U-0	0	0	8	8
DF20-M-4AO-U-1	0	0	8	8
DF20-M-4AO-I-2	0	0	8	8
DF20-M-4AO-I-3	0	0	8	8
DF20-M-4AO-U-4	0	0	8	8
DF20-M-8AO-U-4	0	0	16	16
DF20-M-4AO-I-5	0	0	8	8
DF20-M-8AO-I-5	0	0	16	16
DF20-M-1CNT-EL-5	10	10	2	2
DF20-M-1CNT-EL-4	10	10	2	2
DF20-M-2CNT-PIL-5	20	20	12	12
DF20-M-2CNT-PIL-4	20	20	12	12
DF20-M-2CNT-EL-5	20	20	12	12
DF20-M-2CNT-EL-4	20	20	12	12
DF20-M-2PWM	12	12	16	16
DF20-M-1COM-232/485/422	46	46	46	46

➢ Table 4.3 shows the input and output data structure, meaning and data allocation length of various modules.

Table 4.3

Module Model	Input/output data	Number of bytes

DF20-M-8DI-N(DF20-M-8DI-P)	Input Data	2
DF20-M-8DO-N(DF20-M-8DO-P/DF20-M-4DO-R)	Output Data	2
DF20-M-16DI-N(DF20-M-16DI-P)	Input Data	2
DF20-M-16DO-N(DF20-M-16DO-P)	Output Data	2
DF20-M-32DI-N(DF20-M-32DI-P)	Input Data	4
DF20-M-32DO-N(DF20-M-32DO-P)	Output Data	4
DF20-M-8DIO-N(DF20-M-8DIO-P)	Input Data	2
	Output Data	2
DF20-M-4AI-U-0 (DF20-M-4AI-U-1/DF20-M-4AI-U-4/DF20-M-4AI-I-2/ DF20-M-4AI-I-3/DF20-M-4AI-I-5)	Channel 1 input data	2
	Channel 2 input data	2
	Channel 3 input data	2
	Channel 4 input data	2
DF20-M-8AI-U-4(DF20-M-8AI-I-5)	Channel 1 input data	2
	Channel 2 input data	2
	Channel 3 input data	2
	Channel 4 input data	2
	Channel 5 input data	2
	Channel 6 input data	2
	Channel 7 input data	2
	Channel 8 input data	2
DF20-M-2LC-S-5	Channel 1 input data	2
	Channel 2 input data	2
DF20-M-2RTD-PT	Channel 1 input data	2
	Channel 2 input data	2
DF20-M-4RTD-PT	Channel 1 input data	2
	Channel 2 input data	2
	Channel 3 input data	2
	Channel 4 input data	2
DF20-M-4TC-KETJ	Channel 1 Compensation Output	2
	Channel 2 compensation output	2
	Channel 3 compensation output	2
	Channel 4 compensation output	2
	Channel 1 input data	2
	Channel 2 input data	2
	Channel 3 input data	2
	Channel 4 input data	2

DF20-M-8TC-KETJ	Channel 1 Compensation Output	2
	Channel 2 compensation output	2
	Channel 3 compensation output	2
	Channel 4 compensation output	2
	Channel 5 compensation output	2
	Channel 6 compensation output	2
	Channel 7 compensation output	2
	Channel 8 compensation output	2
	Channel 1 input data	2
	Channel 2 input data	2
	Channel 3 input data	2
	Channel 4 input data	2
	Channel 5 input data	2
	Channel 6 input data	2
	Channel 7 input data	2
	Channel 8 input data	2
DF20-M-4AO-U-0(DF20-M-4AO-U-1/DF20-M-4AO-U-4/DF20-M-4AO-I-2/ DF20-M-4AO-I-3/DF20-M-4AO-I-5)	Channel 1 output data	2
	Channel 2 output data	2
	Channel 3 output data	2
	Channel 4 output data	2
DF20-M-8AO-U-4(DF20-M-8AO-I-5)	Channel 1 output data	2
	Channel 2 output data	2
	Channel 3 output data	2
	Channel 4 output data	2
	Channel 5 output data	2
	Channel 6 output data	2
	Channel 7 output data	2
	Channel 8 output data	2
DF20-M-1CNT-EL-5(DF20-M-1CNT-EL-4)	Command output data	2
	Status input data	2
	Encoder sampling data	4
	Latching position data	4
DF20-M-2CNT-PIL-5(DF20-M-2CNT-PIL-4)	Channel 1 output command	2
	Channel 1 pulse comparison value output	4
	Channel 2 output command	2
	Channel 2 pulse comparison value output	4
	Channel 1 input status	2
	Channel 1 pulse input value	4
	Channel 1 pulse input latch value	4

	Channel 2 input status	2
	Channel 2 pulse input value	4
	Channel 2 pulse input latch value	4
DF20-M-2CNT-EL-5(DF20-M-2CNT-EL-4)	Channel 1 output command	2
	Channel 1 pulse comparison value output	4
	Channel 2 output command	2
	Channel 2 pulse comparison value output	4
	Channel 1 input status	2
	Channel 1 pulse input value	4
	Channel 1 pulse input latch value	4
	Channel 2 input status	2
	Channel 2 pulse input value	4
	Channel 2 pulse input latch value	4
DF20-M-2PWM	Channel 1 output command	2
	Channel 1 Duty Cycle Setting	2
	Channel 1 pulse plus direction positioning mode target position setting, or PWM mode frequency setting	4
	Channel 1 output command	2
	Channel 1 Duty Cycle Setting	2
	Channel 1 pulse plus direction positioning mode target position setting, or PWM mode frequency setting	4
	Channel 1 input status	2
	Channel 1 actual position or PWM output number	4
	Channel 1 input status	2
	Channel 1 actual position or PWM output number	4
DF20-M-1COM-232/485/422	Status word	2
	Accept data length	2
	Receive data sequence number	2
	Receiving Data	40
	Control Word	2
	Send data length	2
	Send data sequence number	2

	Sending Data	40

5 Bus module configuration instructions

5.1 Configuration process instructions in KV STUDIO environment

5.1.1 Preparation

- Module model and quantity

type	model	quantity
Coupler	DF20-C-EN-IP	1
IO Module	DF20-M-16DI-P	1
	DF20-M-16DO-P	1

- A computer with KV STUDIO Ver.11G software pre-installed
- KEYENCE PLC KV-8000
- Switching power supply
- EDS file: DF20-C-EN-IP_V1.01
- Module process data configuration table: EIP_DF20-C-EN-IP configuration table_V2.0

5.1.2 KV STUDIO Ver.11G Configuration

- IP setting and modification reference4.1.3
- New Construction
- Open KV STUDIO software, click "File" in the menu bar as shown in Figure 5-1-1, and click "New project":

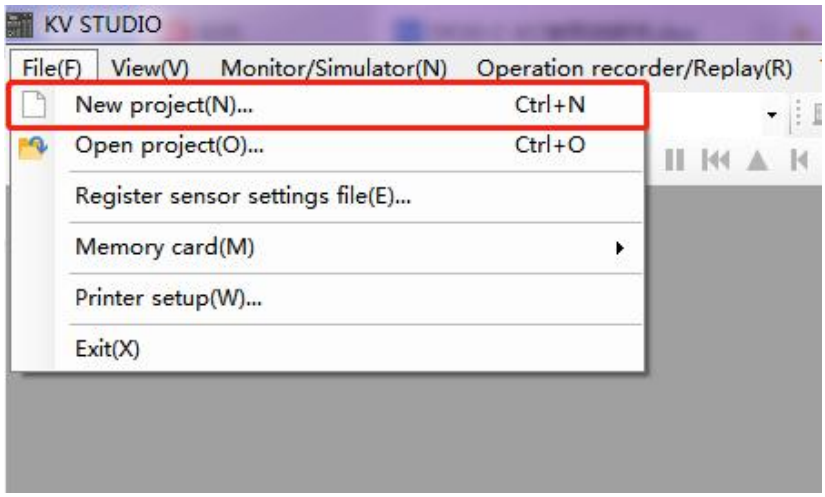


Figure 5-1-1

- As shown in Figure 5-1-2, a new project dialog box pops up. Fill in the project name and storage path,

and select the corresponding PLC type:

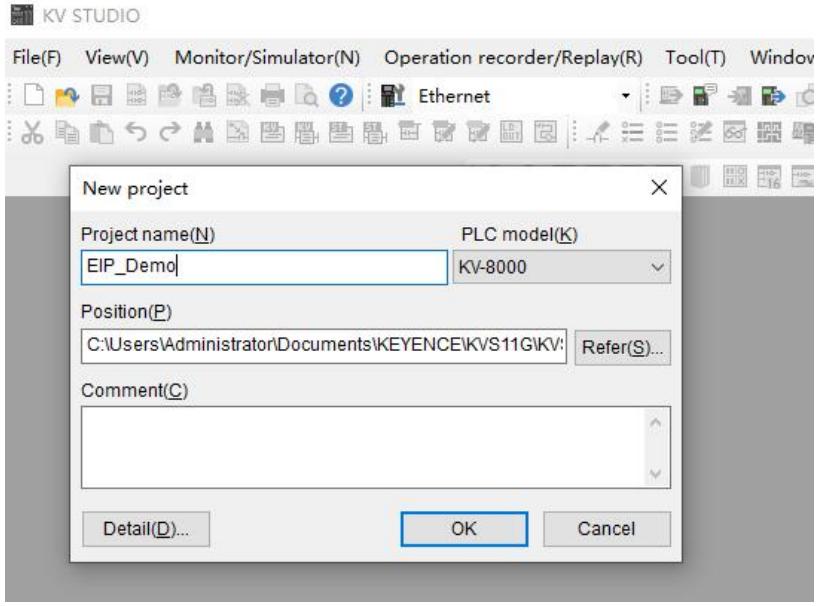


Figure 5-1-2

➢ As shown in Figure 5-1-3 and Figure 5-1-4, click “Yes(Y)” in sequence.

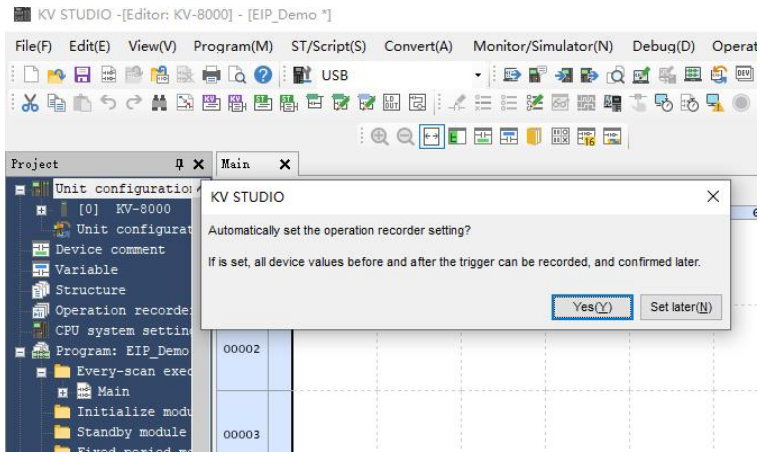


Figure 5-1-3

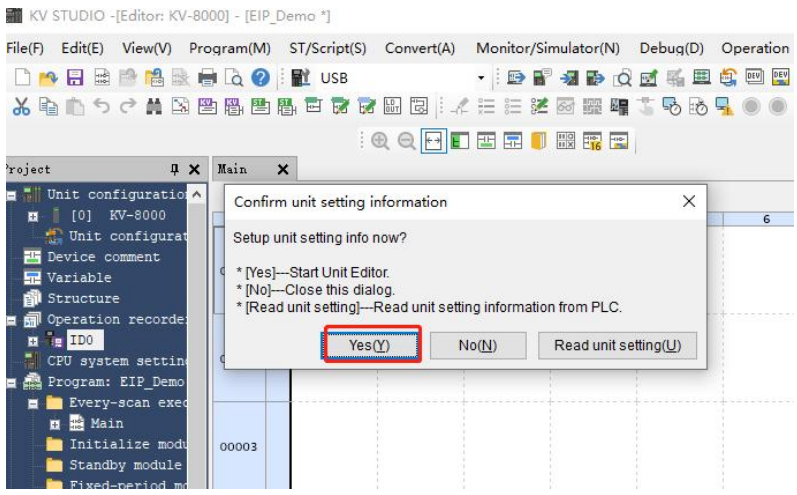


Figure 5-1-4

➢ As shown in Figure 5-1-5 to Figure 5-1-6, enter the "EtherNet/IP settings" interface.

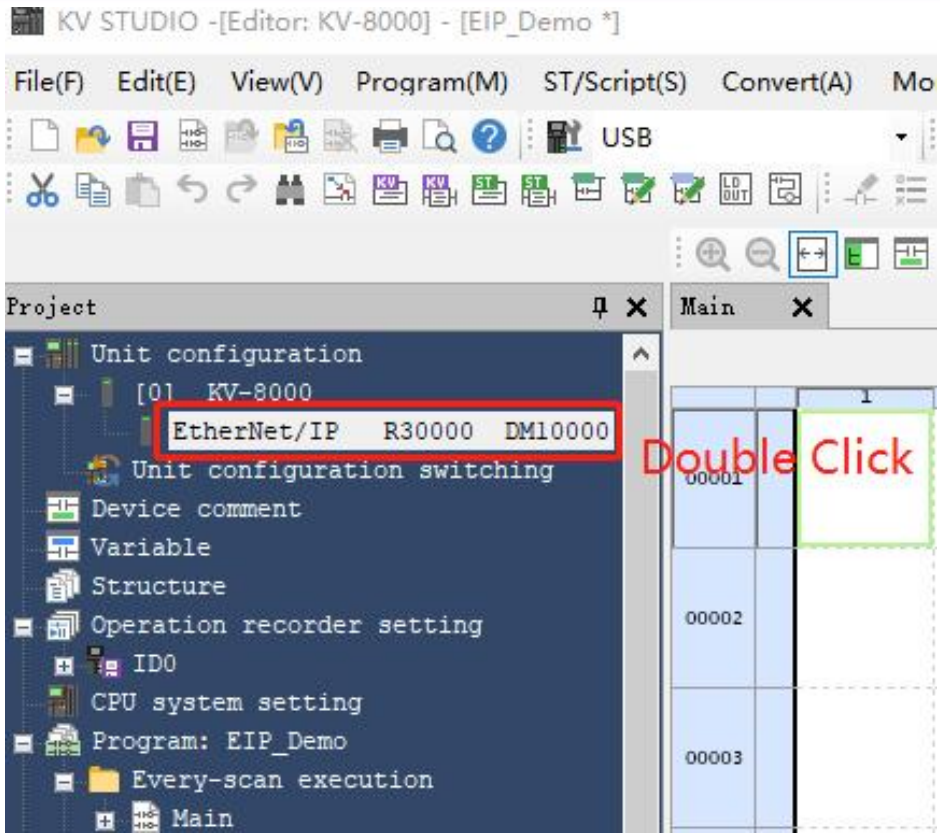


Figure 5-1-5

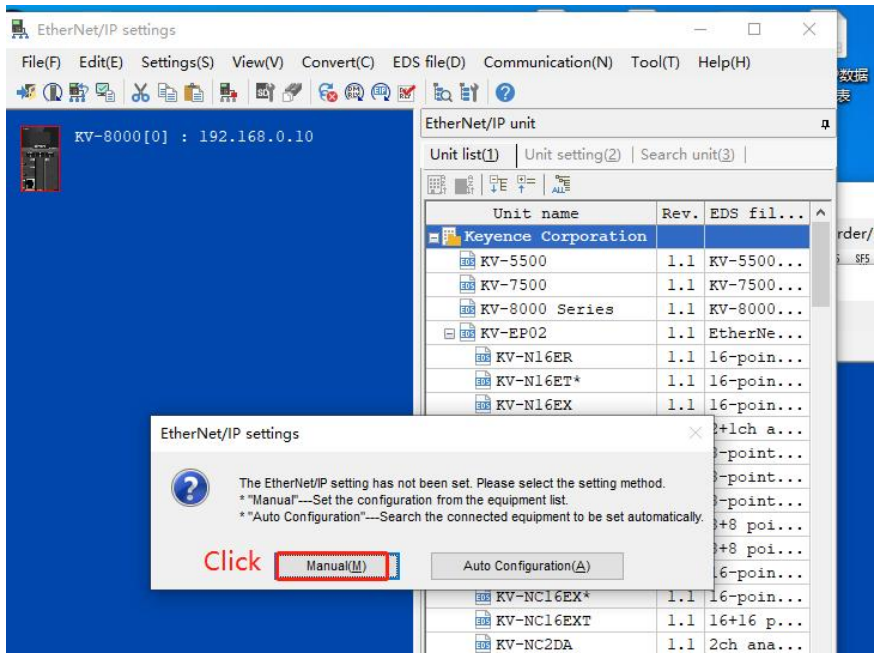


Figure 5-1-6

➢ Install the EDS file as shown in Figure 5-1-7~Figure 5-1-8: Click ESD file (D)->Reg (I), then browse to the location where the EDS file is placed.

Select, open, and install the EDS file.

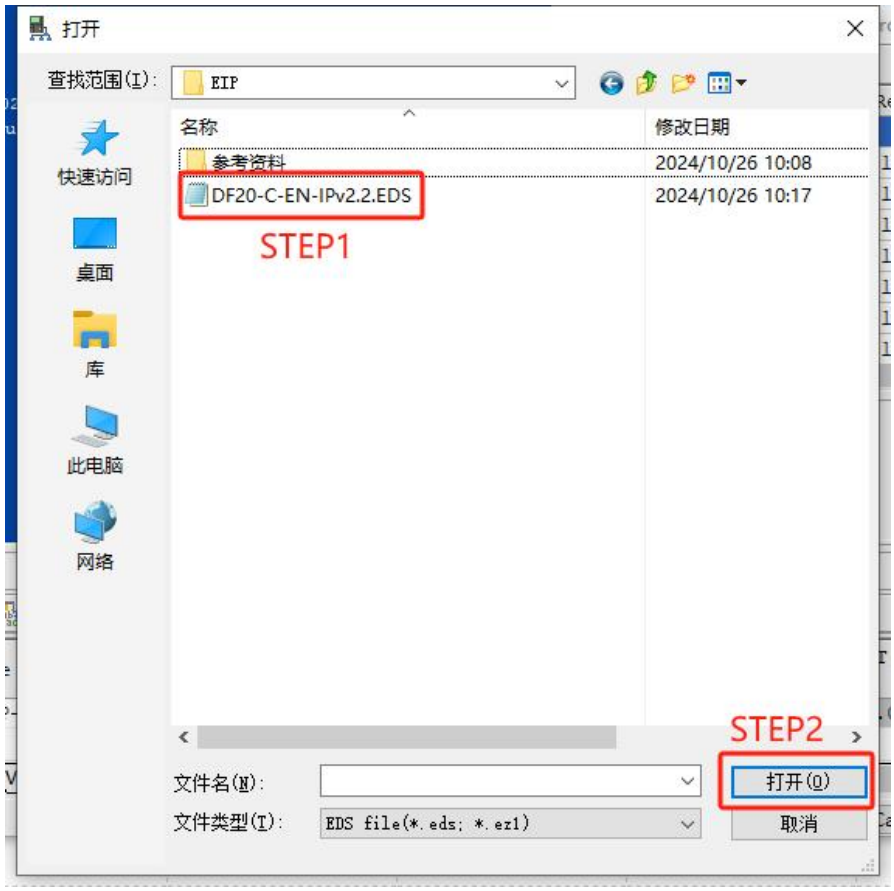


Figure 5-1-7

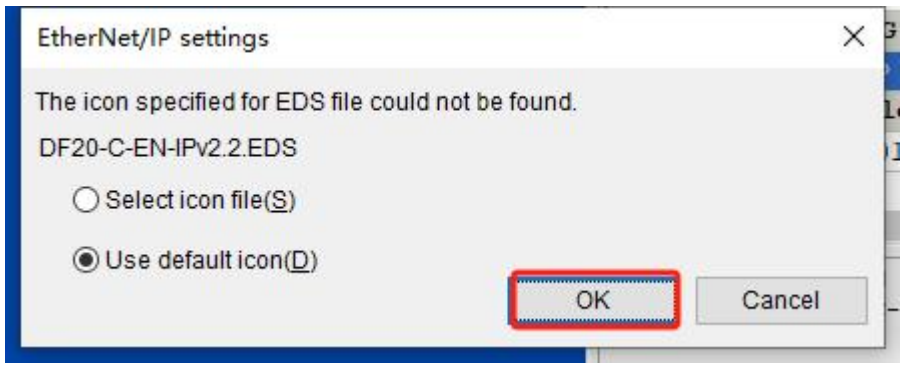


Figure 5-1-8

➢ The EDS file installation is completed as shown in Figure 5-1-9.

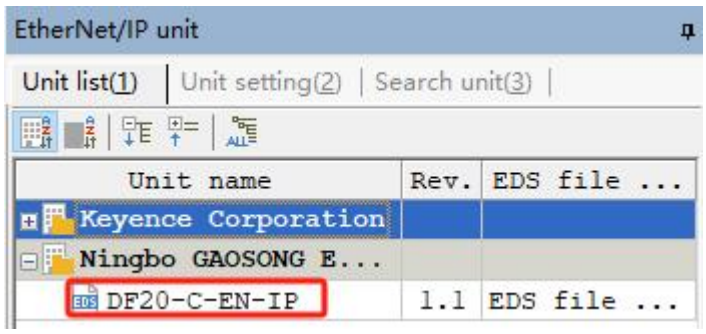


Figure 5-1-9

- As shown in Figure 5-1-10 to Figure 5-1-11, set the IP address of KV-8000 on the configuration software. In this example, the IP address of PLC is 192.168.0.10.

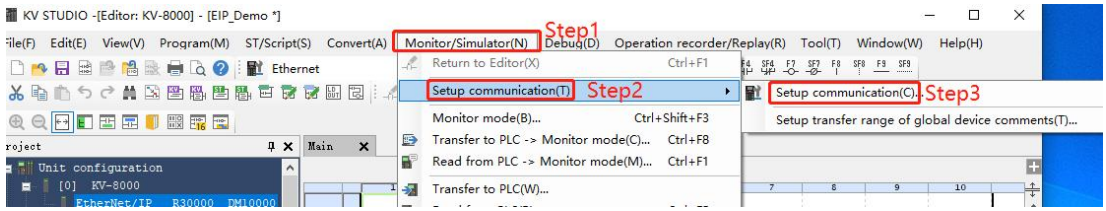


Figure 5-1-10

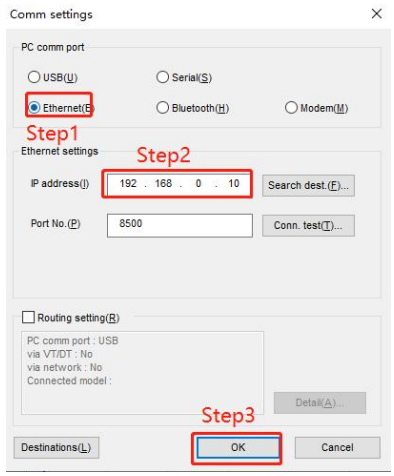


Figure 5-1-11

- Search for the EIP coupler as shown in Figure 5-1-12 to Figure 5-1-16.

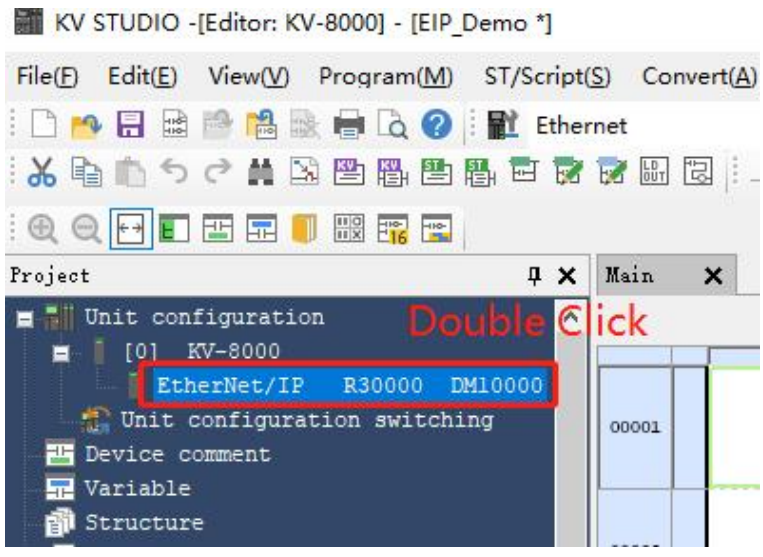


Figure 5-1-12

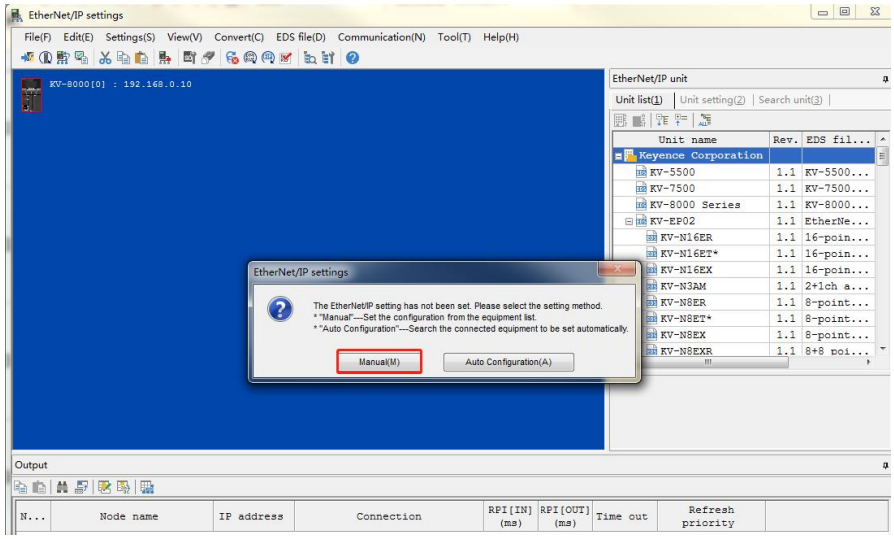


Figure 5-1-13

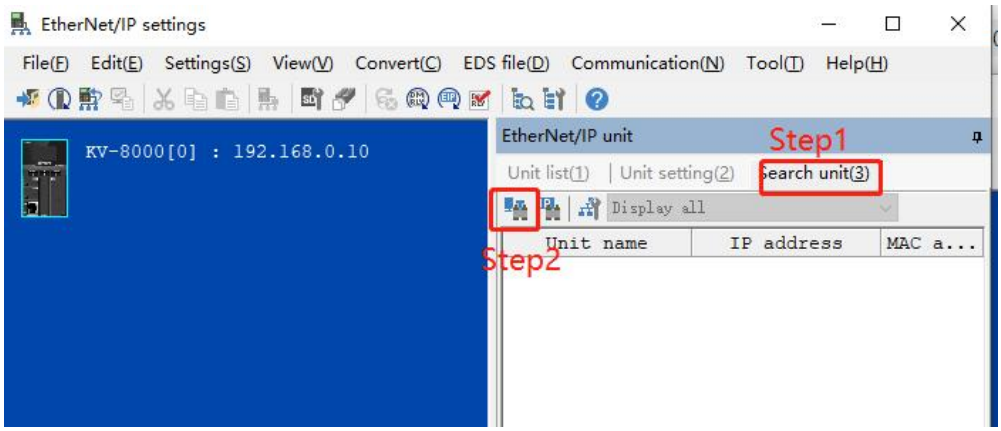


Figure 5-1-14

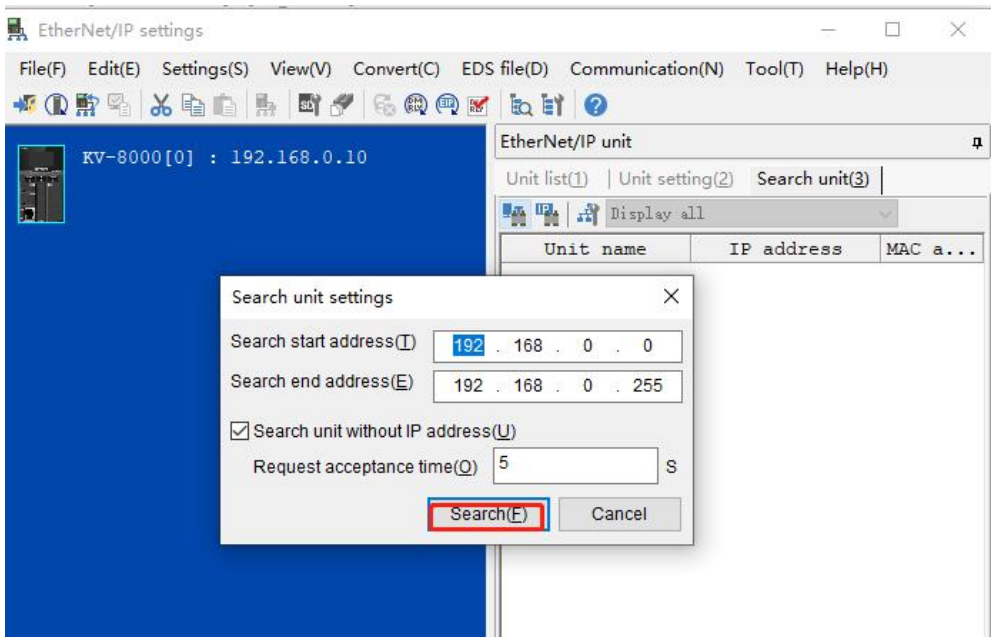


Figure 5-1-15

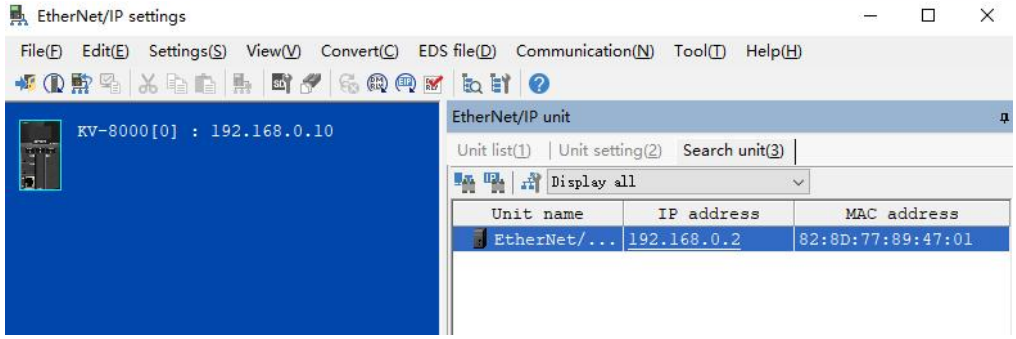


Figure 5-1-16

➢ Modify the IP address of the coupler as shown in Figure 5-1-17 to Figure 5-1-18.

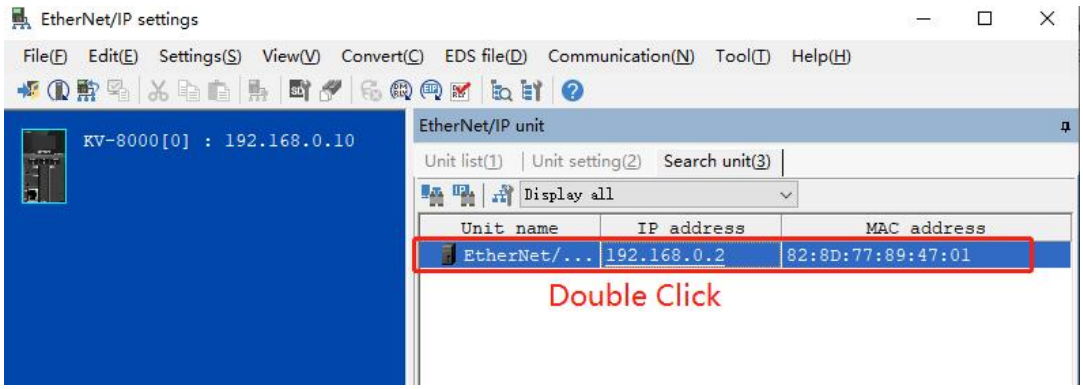


Figure 5-1-17

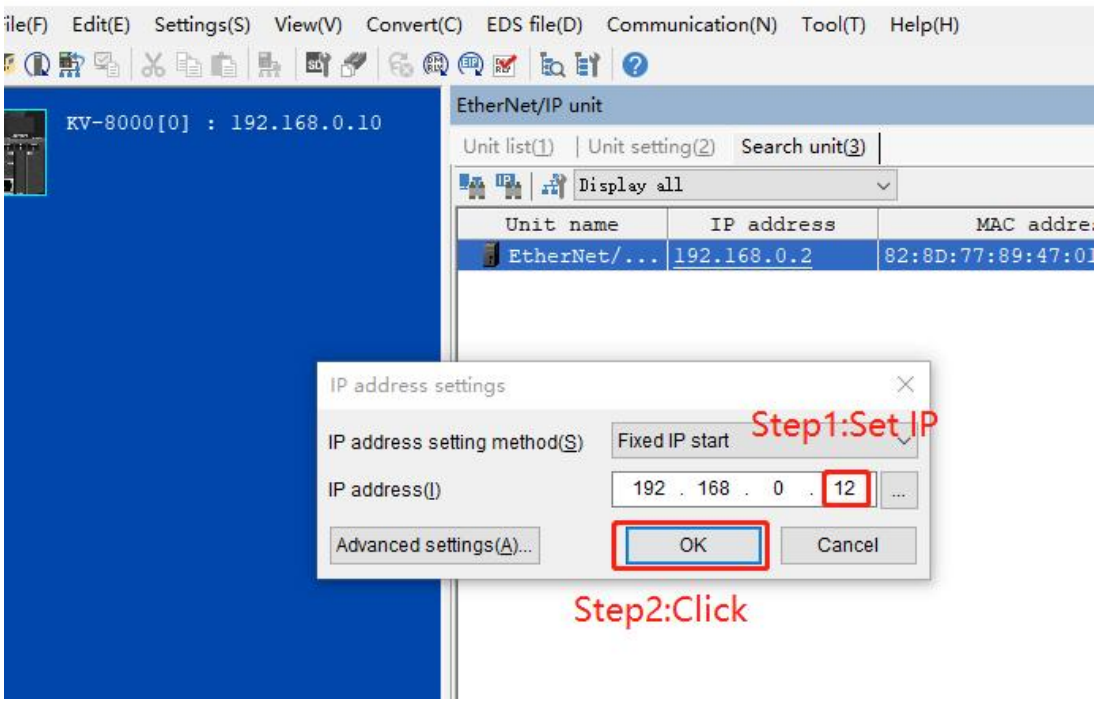


Figure 5-1-18

➢ Add EIP coupler as shown in Figure 5-1-19 to Figure 5-1-20.

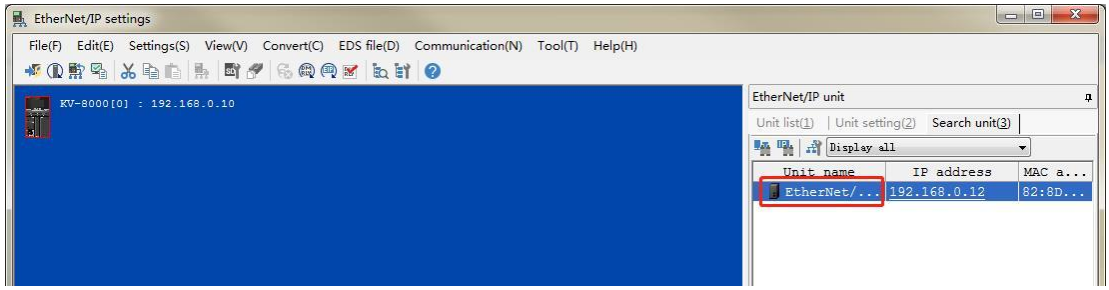


Figure 5-1-19

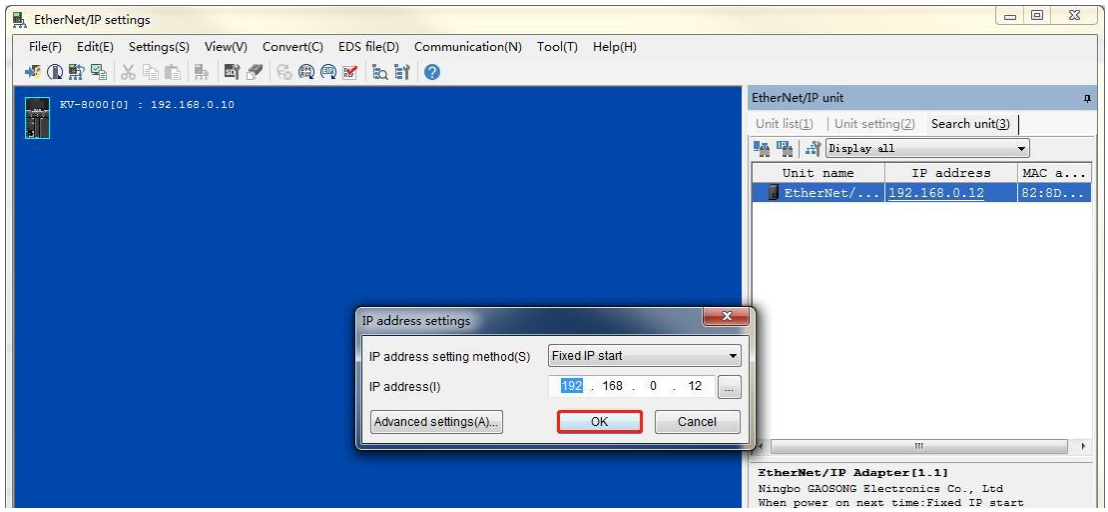


Figure 5-1-20

➢ Open the manufacturer's"EIP_DF20-C-EN-IP Configuration Table_V2.0",According to the actual module topology (DF20-M-16DI-P+DF20-M-16DO-P in this example), the configuration table is shown in Figure 5-1-21, where the coupler comes with 2 bytes of diagnostic data to display module diagnostic information. Then insert DF20-M-16DI-P and DF20-M-16DO-P in the second and third slots respectively, calculate the size of "Produced Data Size" and "Consumed Data Size", as shown in Figure 5-1-22, and fill these two data into the configuration table of the configuration software.

Produced Data Size	4	将该数据填入参数设定中的"Produced Data Size"对象中
Consumed Data Size	2	将该数据填入参数设定中的"Consumed Data Size"对象中

序号	IO卡片型号选择	上行数据（byte）	下行数据（byte）	数据含义解释说明
1	SystemDiagnostic	2	0	诊断模块过程数据
2	DF20-M-16DI-P	2	0	16通道数字量输入模块，PNP
3	DF20-M-16DO-P	0	2	16通道数字量输出模块，PNP

Figure 5-1-21

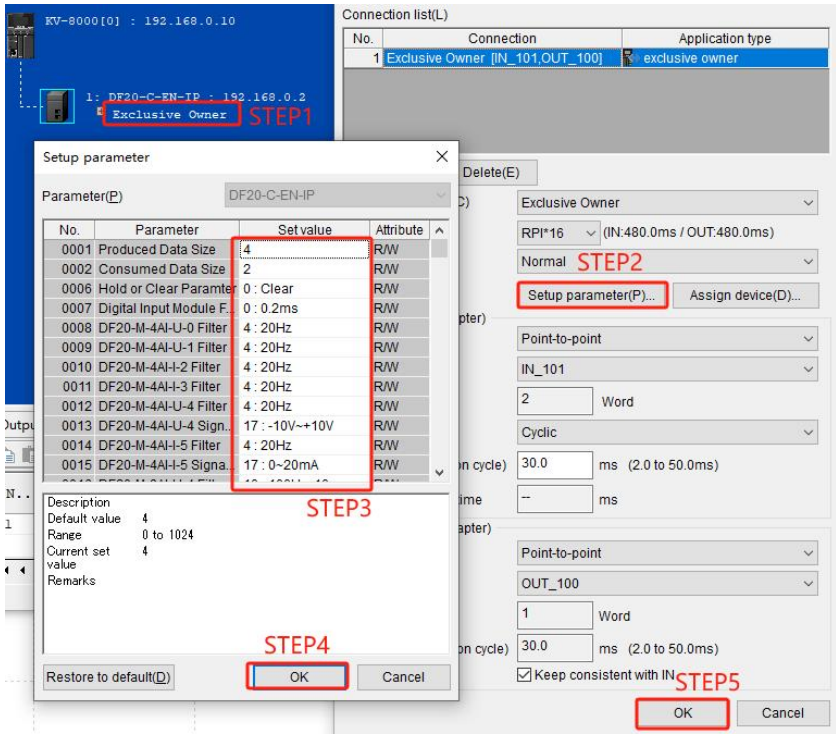


Figure 5-1-22

➢ As shown in Figure 5-1-23, PLC transmission download, click "Yes (Y)" in sequence.

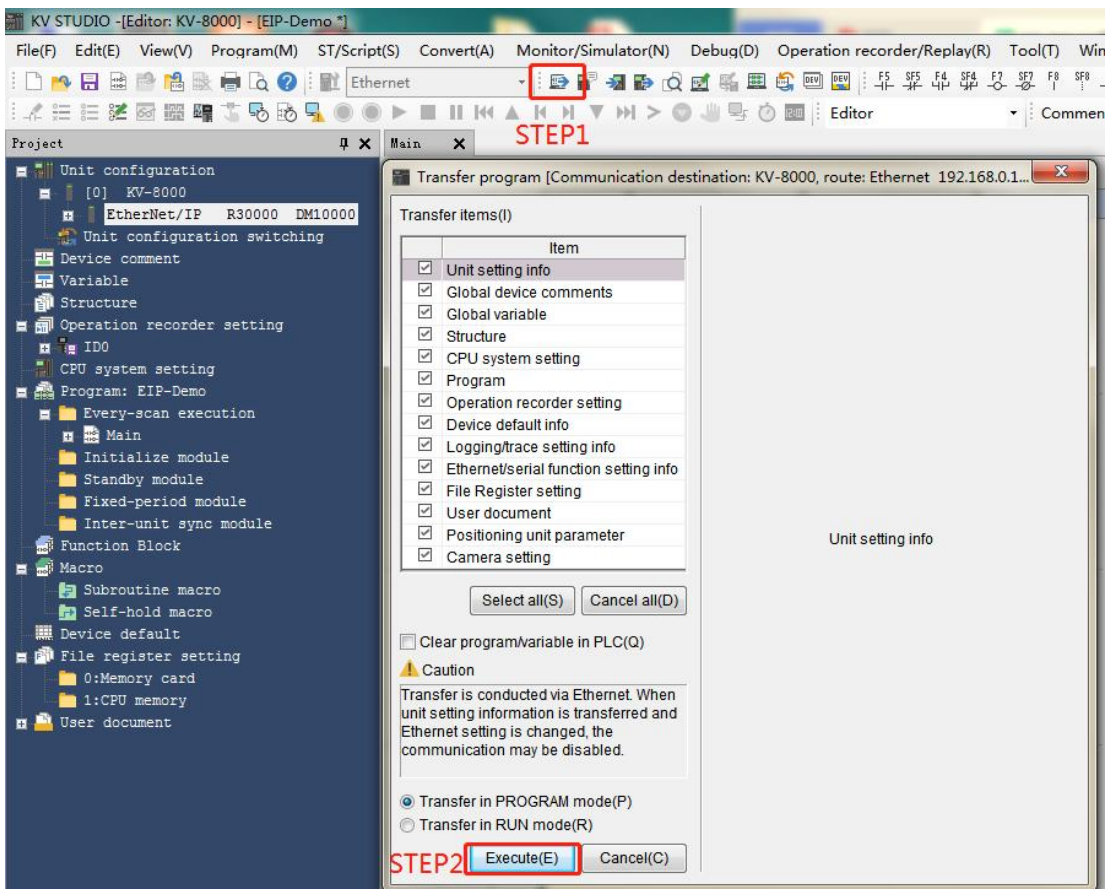


Figure 5-1-23

5.1.3 Diagnostic data description

➢ Open the data monitoring table, as shown in Figure 5-1-24.

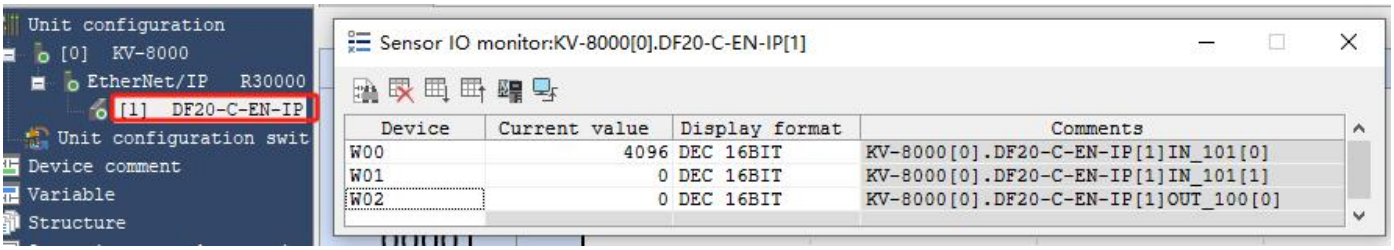


Figure 5-1-24

➢ W00 channel indicates module diagnostic data. When the data table is opened, 4096 indicates that the PLC is connected. In order to facilitate understanding of the meaning of module diagnostic data, it is adjusted to hexadecimal representation of $1000, where 1 indicates that the PLC is connected. See Figure 5-1-25 to Figure 5-1-26.

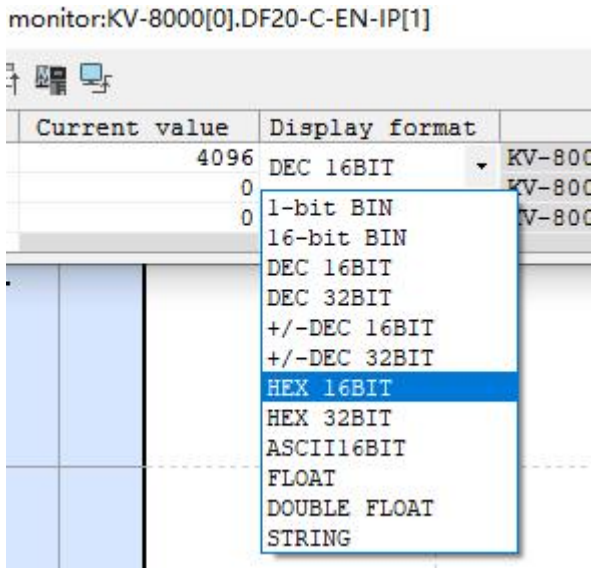


Figure 5-1-25

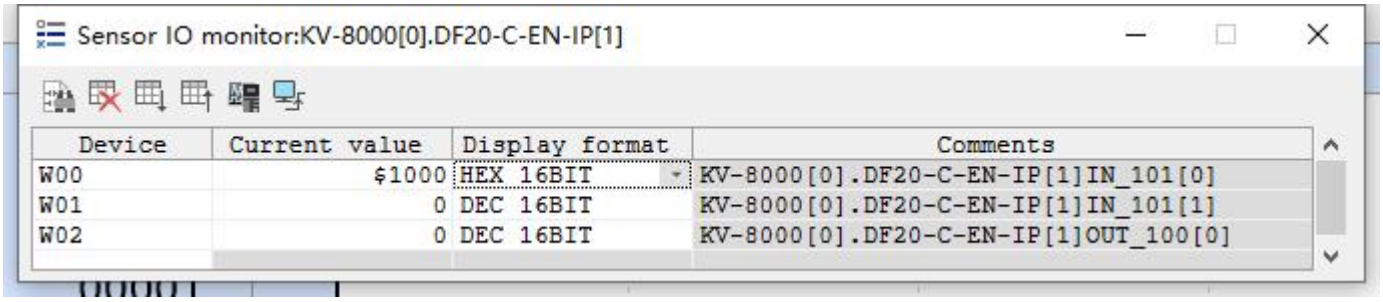
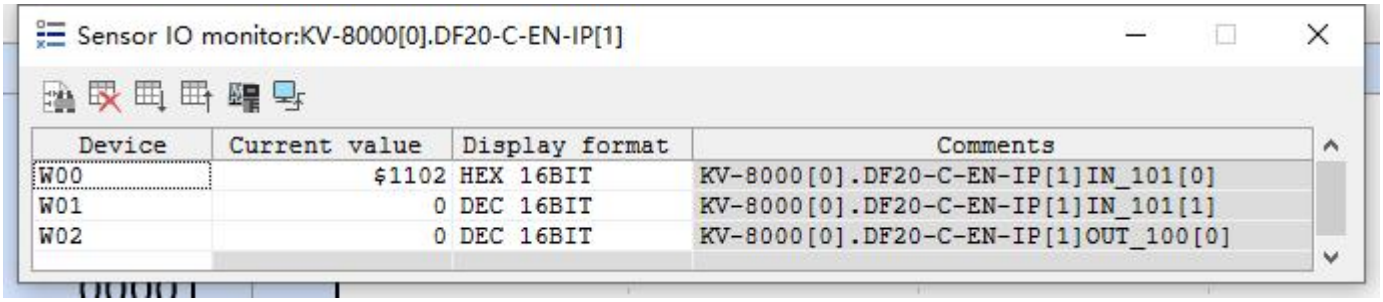


Figure 5-1-26

➢ When the IO module inserted behind the slave device DF20-C-EN-IP fails or data is lost, the ERR light is always on and the error information will be displayed in the diagnostic data. If the second IO module fails or data is lost during normal use, the diagnostic data is shown in Figure 5-1-27:



Device	Current value	Display format	Comments
W00	$1102	HEX 16BIT	KV-8000[0].DF20-C-EN-IP[1]IN_101[0]
W01	0	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]IN_101[1]
W02	0	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]OUT_100[0]

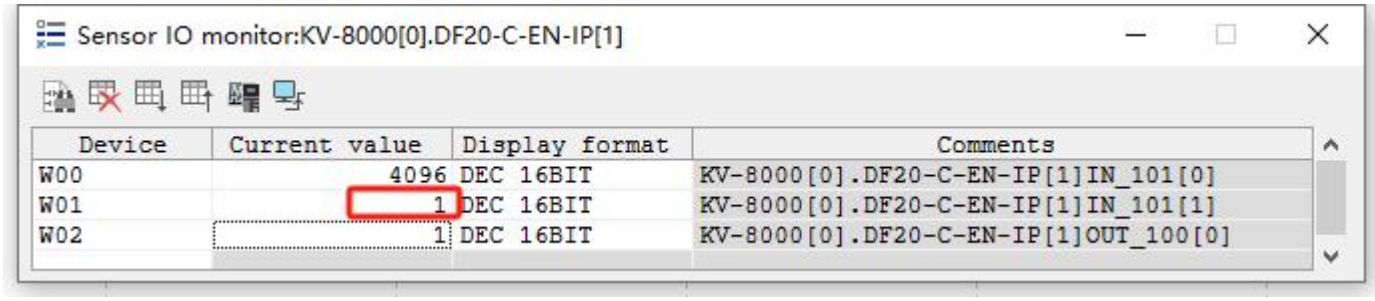
Figure 5-1-27

- As shown in the figure, the data is 0x1102. The lower 3 bits of data 0x102 represent that an error has occurred in the second module. Similarly, if an error occurs in the first module

If an error occurs, the diagnostic data is$1101.

5.1.4 IO data reading and writing

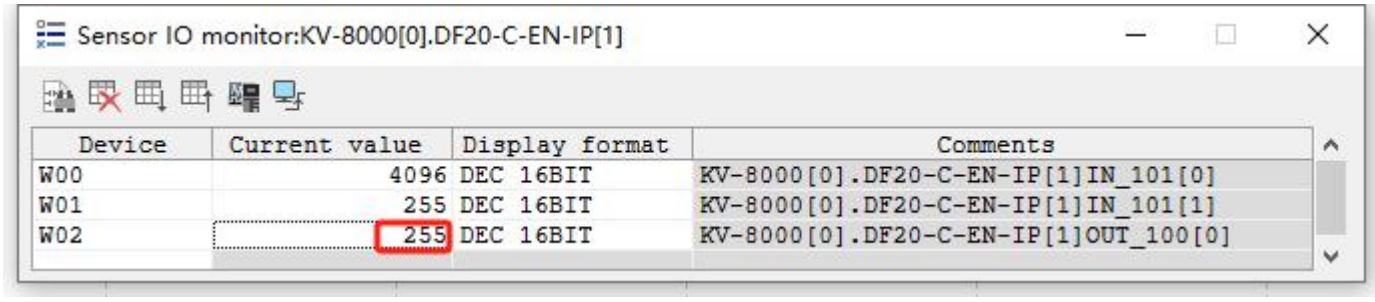
- W01 Channel DisplayDF20-M-16DI-P module, as shown in Figure 5-1-28, indicates that the first channel inputs a high level.



Device	Current value	Display format	Comments
W00	4096	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]IN_101[0]
W01	1	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]IN_101[1]
W02	1	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]OUT_100[0]

Figure 5-1-28

- The W02 channel represents the DF20-M-16DO-P module. As shown in Figure 5-1-29, write the output value according to the requirements.



Device	Current value	Display format	Comments
W00	4096	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]IN_101[0]
W01	255	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]IN_101[1]
W02	255	DEC 16BIT	KV-8000[0].DF20-C-EN-IP[1]OUT_100[0]

Figure 5-1-29

5.2 Configuration process instructions in Sysmac Studio environment

5.2.1 Preparation

- Module model and quantity

type	model	quantity
Coupler	DF20-C-EN-IP	1
IO Module	DF20-M-16DI-P	1
	DF20-M-16DO-P	1

- A computer with Sysmac Studio software pre-installed
- Omron PLC NX1P2-9024DT
- Switching power supply
- EDS file: DF20-C-EN-IP_V1.01
- Module process data configuration table: EIP_DF20-C-EN-IP configuration table_V2.0

5.2.2 Sysmac Studio Configuration

- IP setting and modification reference4.1.3In this processThe IP address of the Omron NX1P2 PLC is 192.168.250.1, and the network segment of the DF20-C-EN-IP adapter is 192.168.250.2.
- Open Sysmac Studio software, click “New project” as shown in Figure 5-2-1: Select the corresponding PLC model, and click Create

create.

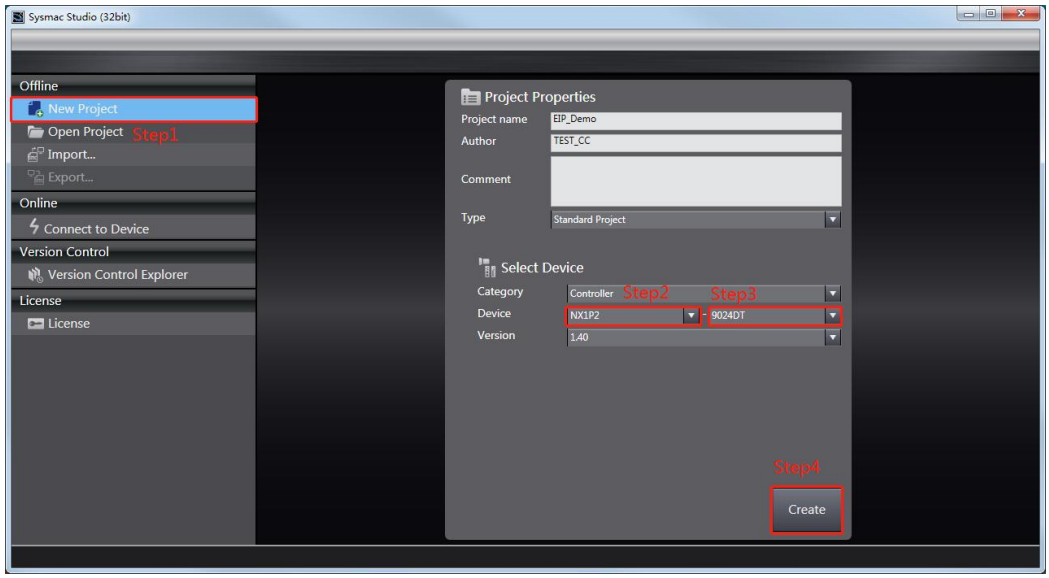


Figure 5-2-1

➢ Configure the EtherNet/IP port to a fixed IP address (consistent with the actual PLC port IP), as shown in Figure 5-2-2.

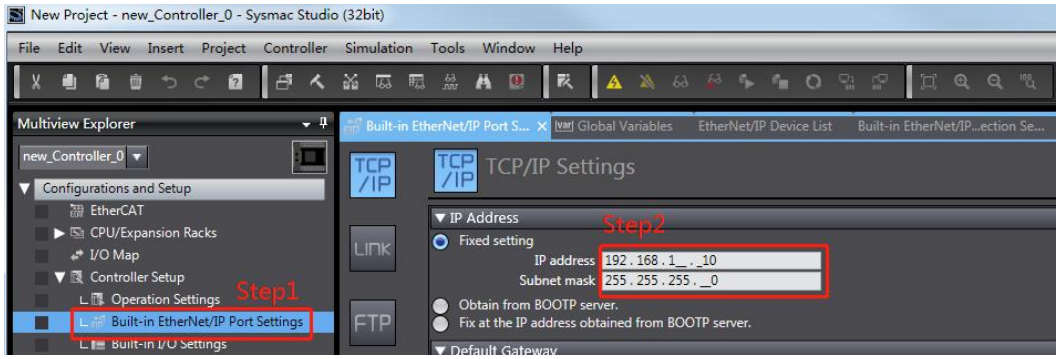


Figure 5-2-2

➢ The addition of global variables is shown in Figure 5-2-3 and Figure 5-2-4.

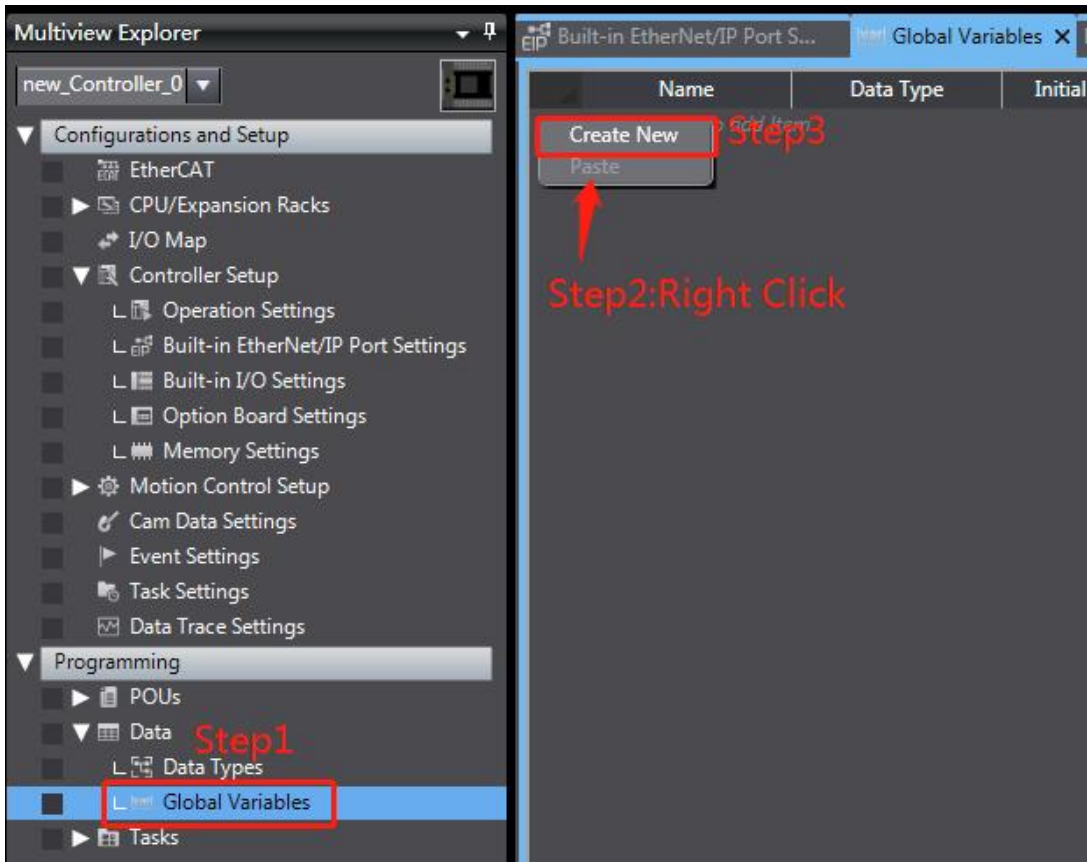


Figure 5-2-3

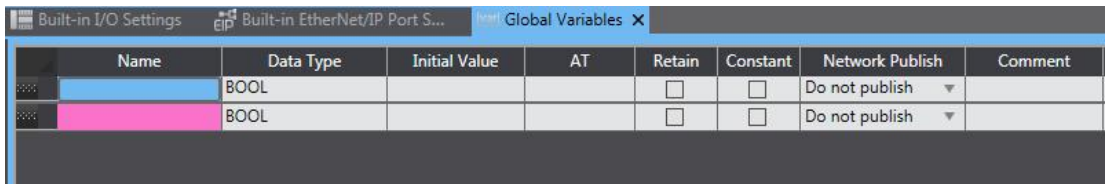


Figure 5-2-4

➢ Open the manufacturer's"EIP_DF20-C-EN-IP Configuration Table_V2.0",According to the actual

module topology (DF20-M-16DI-P+DF20-M-16DO-P in this example), the configuration table is shown in Figure 5-2-5, where the coupler comes with 2 bytes of diagnostic data to display module diagnostic information. Then insert DF20-M-16DI-P+DF20-M-16DO-P in the second and third slots respectively, and calculate the size of "Produced Data Size" and "Consumed Data Size" to be 4 and 2.

Produced Data Size	4	将该数据填入参数设定中的"Produced Data Size"对象中
Consumed Data Size	2	将该数据填入参数设定中的"Consumed Data Size"对象中

序号	IO卡片型号选择	上行数据（byte）	下行数据（byte）	数据含义解释说明
1	SystemDiagnostic	2	0	诊断模块过程数据
2	DF20-M-16DI-P	2	0	16通道数字量输入模块，PNP
3	DF20-M-16DO-P	0	2	16通道数字量输出模块，PNP

Figure 5-2-5

- Create input and output variables in the global variables. The length of the variables must be consistent with the input and output byte length in the actual module.

As shown in Figure 5-2-6, create an input variable input, enter ARRAY[0..3]OF byte in the data type, where [0..3] represents the number of bytes occupied by 0123, corresponding to the calculated byte size of 4; create an output variable output, similarly, enter ARRAY[0..1]OF byte in the data type, where [0..1] represents the number of bytes occupied by 01, corresponding to the calculated byte size of 2. Select the corresponding mode for the network public.

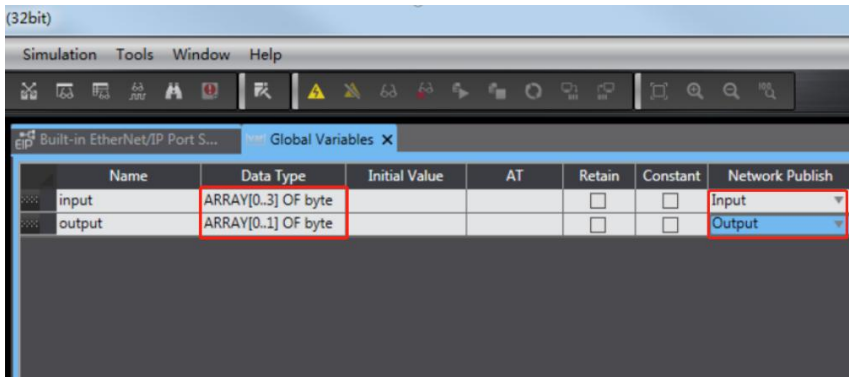


Figure 5-2-6

- Select "Tools" > "EtherNet/IP Connection Settings" from the menu bar, double-click the node address in the EtherNet/IP list window to open

The EtherNet/IP port setting connection setting window is shown in Figure 5-2-7.

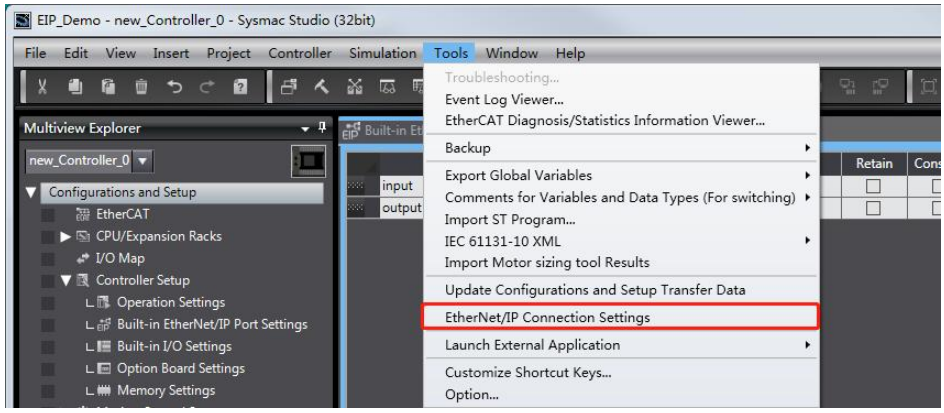


Figure 5-2-7

➢ As shown in Figure 5-2-8, double-click.

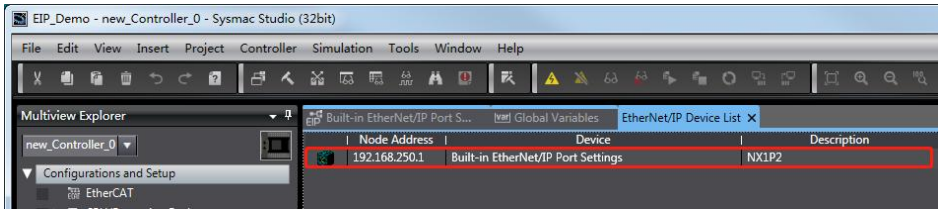


Figure 5-2-8

➢ Open the Built-in EtherNet/IP Port Setup Connection Settings window to register variables in the Built-in EtherNet/IP Port Setup Connection Settings window.

Select the "Tag Group" window in the window and click "Register All" to register the newly created global variables as shown in Figure 5-2-9.

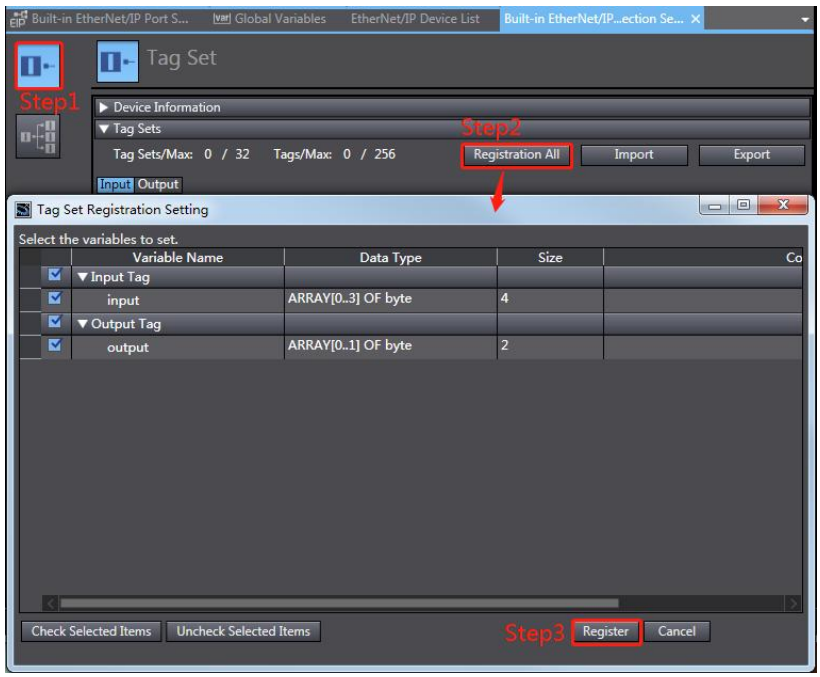


Figure 5-2-9

➢ Install the EDS file, right-click in the blank area of the toolbox on the right side of the opened built-in EtherNet/IP port settings connection settings window and select

Select “Show EDS Library”, as shown in Figure 5-2-10; in the EDS Library window, select “Install” and

open the EDS file to be installed, as shown in Figure 5-2-11.

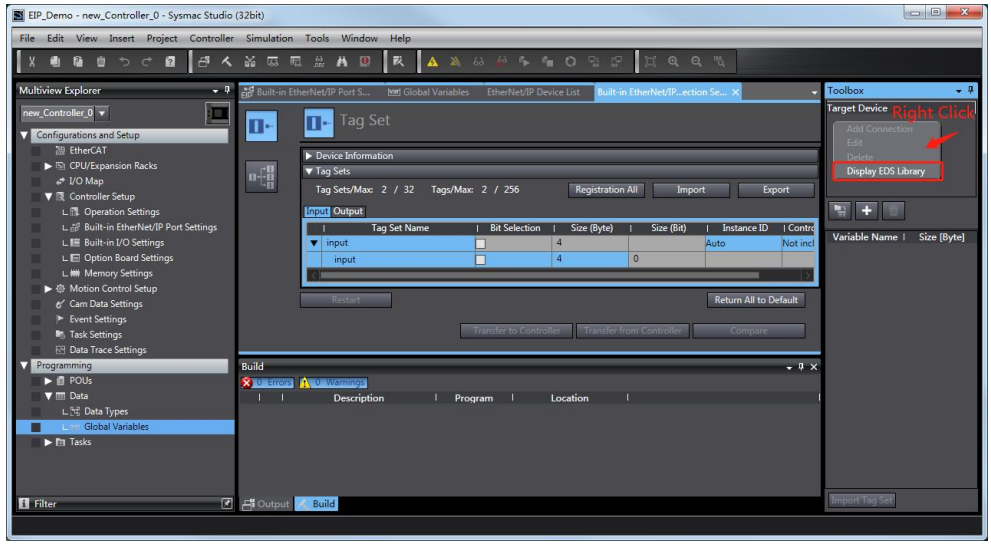


Figure 5-2-10

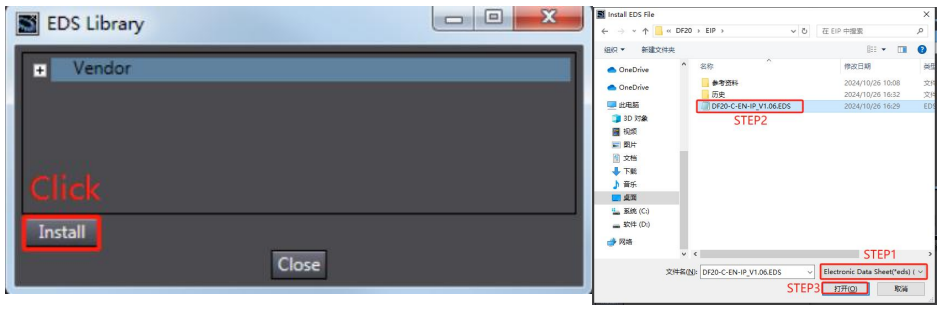


Figure 5-2-11

➢ Add the device that needs to communicate and the configuration parameters. Select "Add Target Device" in the toolbox. The user needs to fill in the EtherNet/IP

Slave IP address, slave model, revision, and click the "Add" button in the lower left corner of the motor after completion, as shown in Figure 5-2-12.

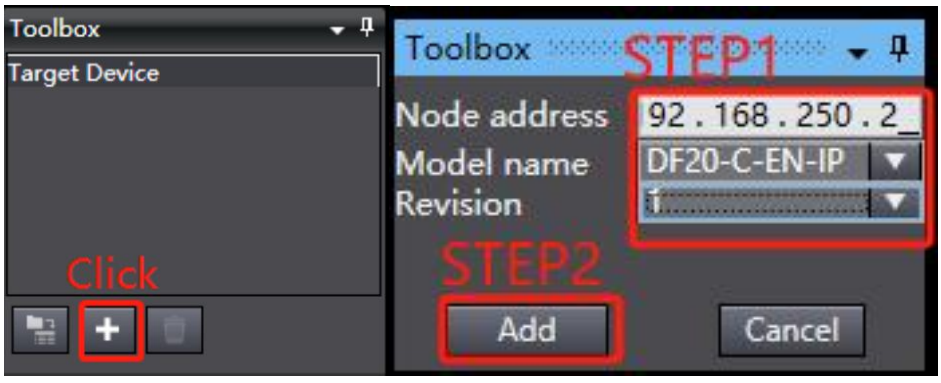


Figure 5-2-12

➢ Drag the target device "192.168.250.2 DF20-C-EN-IP Version 1" in the toolbox to the connection, as shown in Figure 5-2-13; configure the target device parameters, DF20-C-EN-IP input target variable is 100, output target variable is 101, input byte size is 4, output byte size is 2, and the start variable selects the

registered global variable; PLC goes online, and PLC goes to programming mode, and then select "Transfer to Controller", as shown in Figure 5-2-14; PLC goes online, and then downloads the program to PLC, and the IO module sequence corresponds to the actual address.

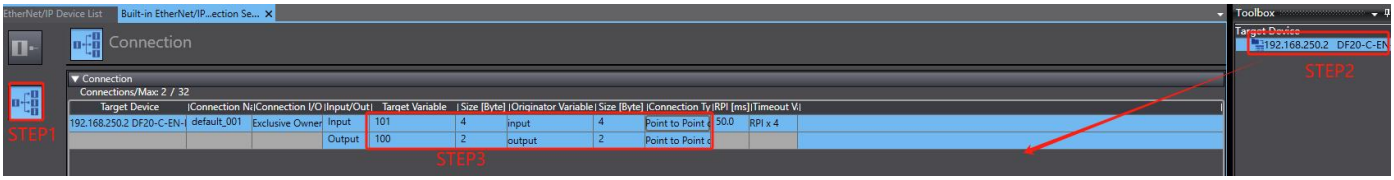


Figure 5-2-13

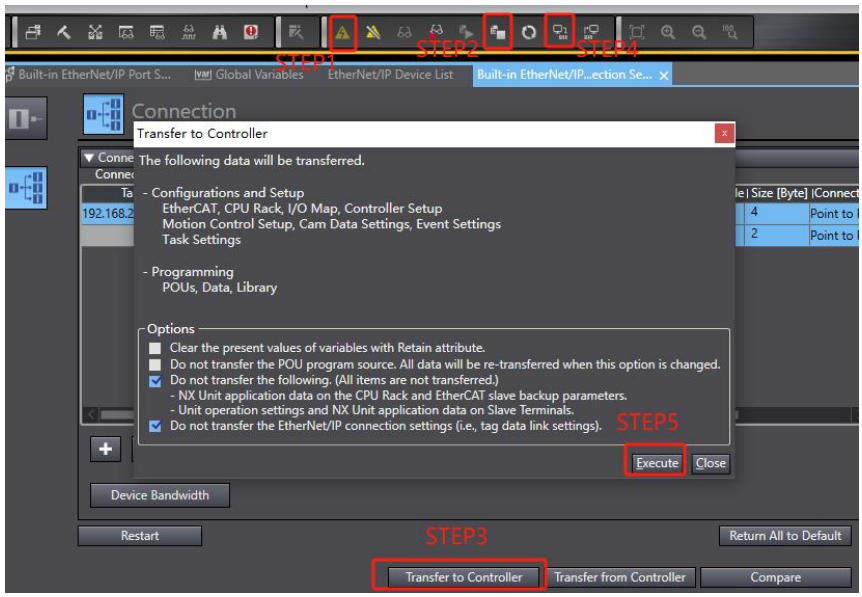


Figure 5-2-14

5.2.3 IO data reading and writing

➢ Open the Watch window.

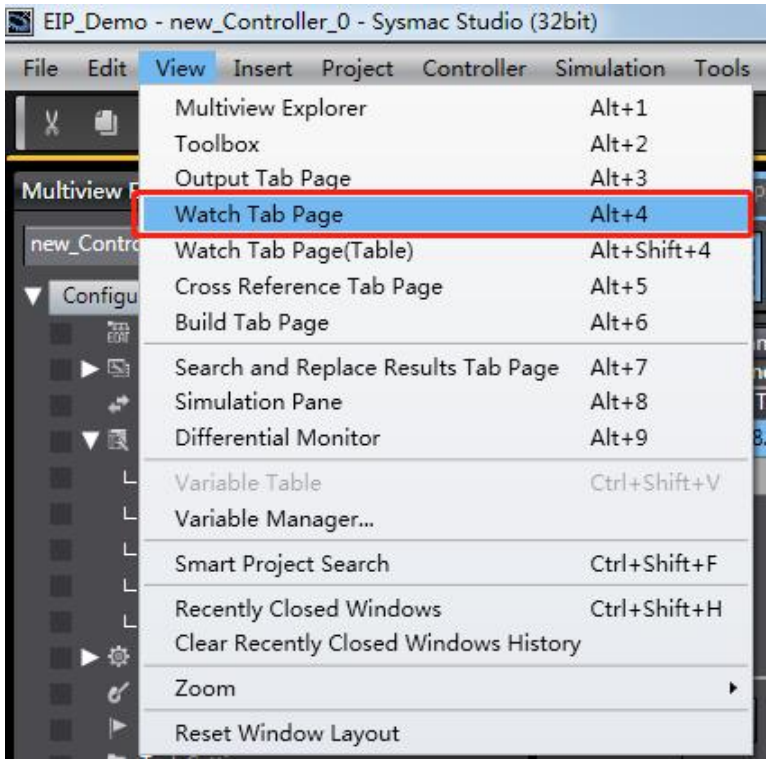


Figure 5-2-15

➢ Add the name created in the global variable in the monitoring window as shown in the figure, and modify the byte length in the brackets as shown in Figure 5-2-16 and Figure 5-2-17.

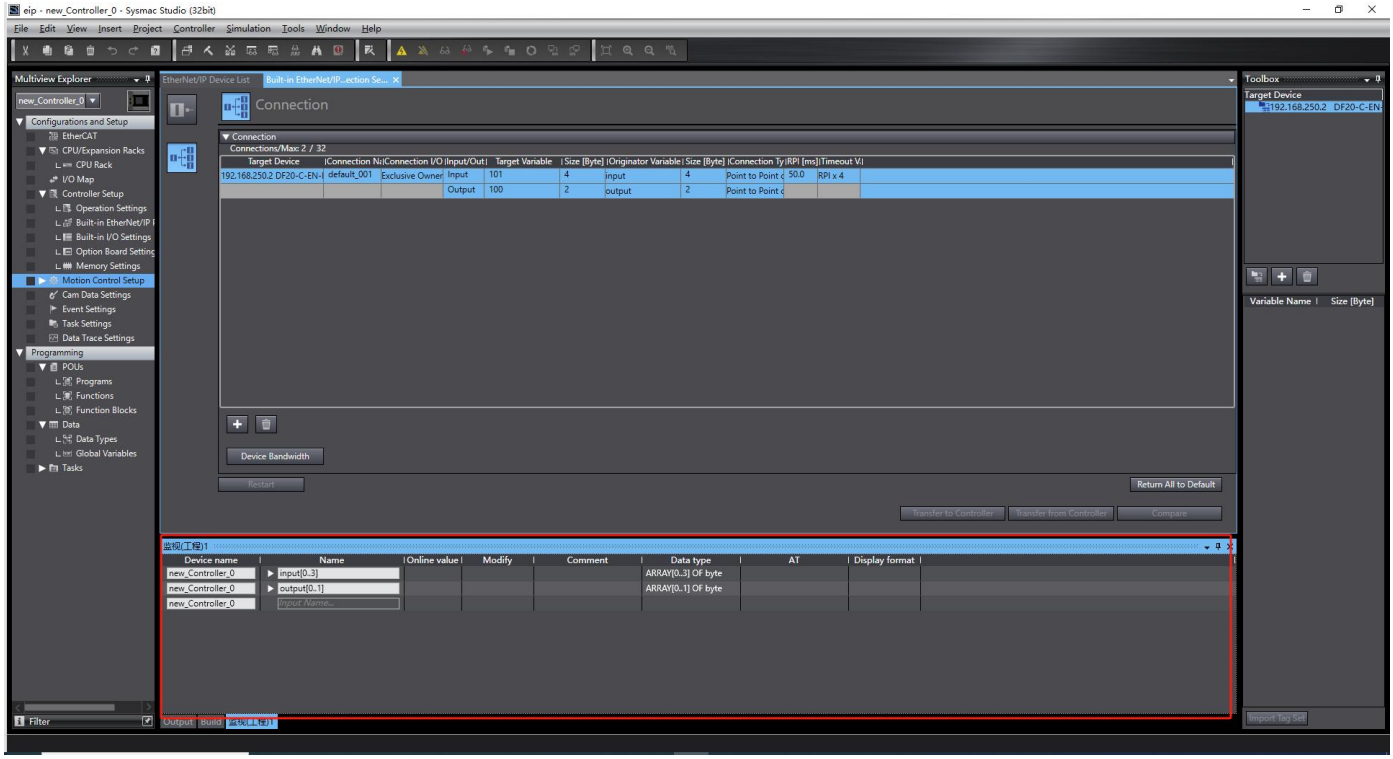


Figure 5-2-16

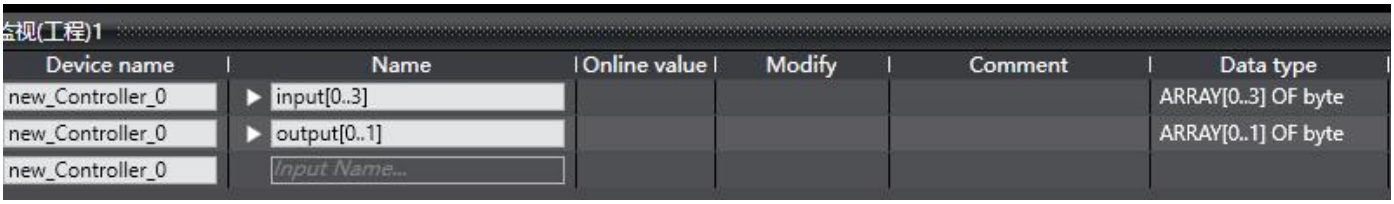


Figure 5-2-17

➢ After adding, start monitoring data, as shown in Figure 5-2-18.

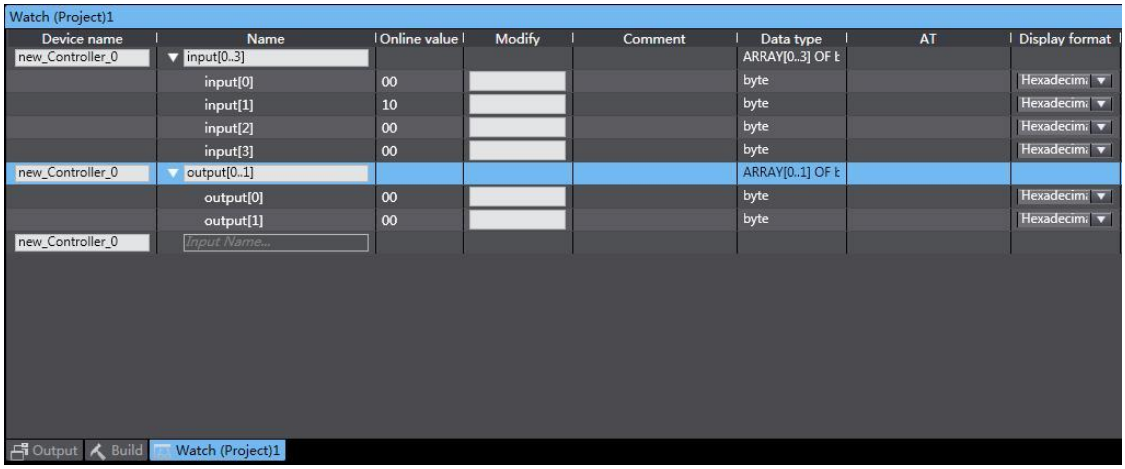


Figure 5-2-18

➢ As shown in Figure 5-2-19, 1 indicates the Alarm module, 2 indicates the DF20-M-16DI-P module, and 3 indicates the DF20-M-16DO-P module. 1 is the Alarm module, and the alarm information can be monitored in the table (in5.2.3Detailed description will be given in the table); 2 is the input module, and the input value can be monitored in the table; 3 is the output module, and the output value can be entered in the table.

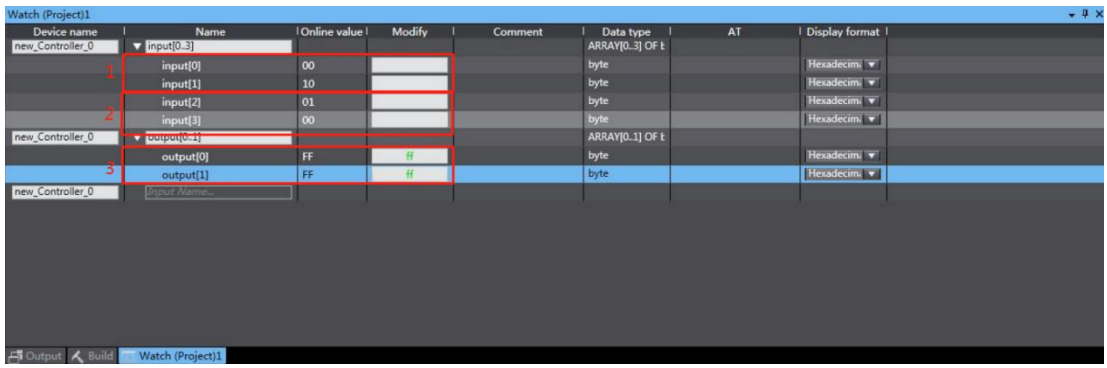


Figure 5-2-19

5.2.4 Diagnostic data description

➢ As shown in Figure 5-2-20, the input[o] and input[1] channels indicate the alarm module information. The input[1] channel displays 10, indicating that the PLC is connected.

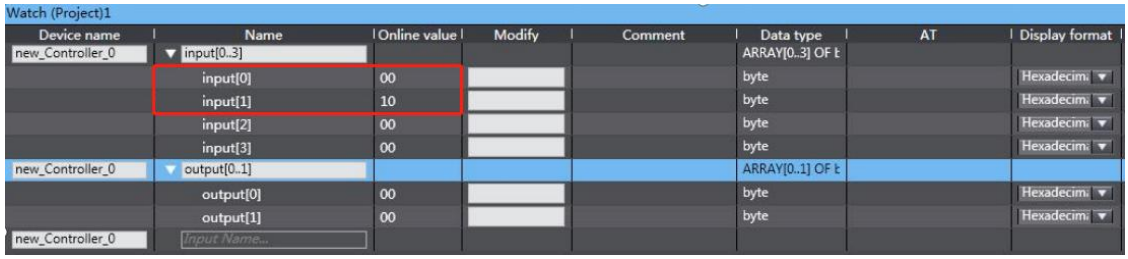


Figure 5-2-20

➢ When the IO module inserted behind the slave device DF20-C-EN-IP fails or data is lost, the ERR light is always on and the error information will be displayed in the Alarm module. If the second IO module fails or data is lost during normal use, the Alarm input information is as shown in Figure 5-2-21:

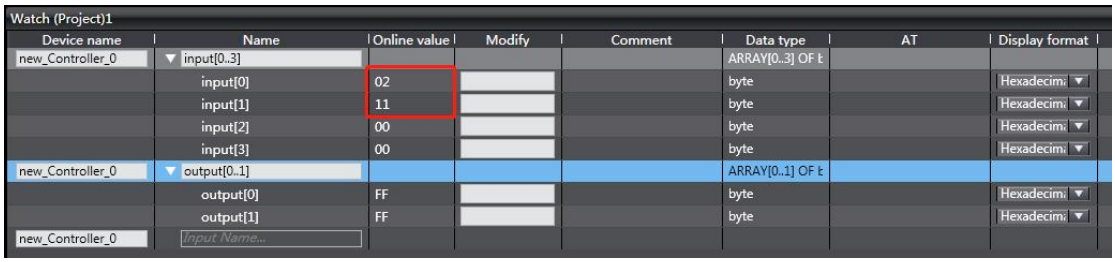


Figure 5-2-21

➢ As shown in the figure, the data is 0x1102. The lower 3 bits of data 0x102 represent that an error has occurred in the second module. Similarly, if an error occurs in the first module

If an error occurs, the input data of Alarm is$1101.

5.3 Configuration process instructions in SoMachine V4.3 environment

5.3.1 Preparation

- Module model and quantity

type	model	quantity
Coupler	DF20-C-EN-IP	1
IO Module	DF20-M-16DI-P	1
	DF20-M-16DO-P	1

- A computer with SoMachine V4.3 software pre-installed
- Schneider PLC TM241CE40R
- Switching power supply
- EDS file: DF20-C-EN-IP_V1.01
- Module process data configuration table: EIP_DF20-C-EN-IP configuration table_V2.0

5.3.2 SoMachine V4.3 Configuration

- IP setting and modification reference4.1.3
- In this process, the IP address of Schneider PLC is 192.168.0.13, and the network segment of DF20-C-EN-IP adapter is 192.168.0.2.
- New Construction
- Open SoMachine V4.3 software, click “New project” as shown in Figure 5-3-1, then click “Empty project”, fill in the project

Name, click “Create project” to create the project.

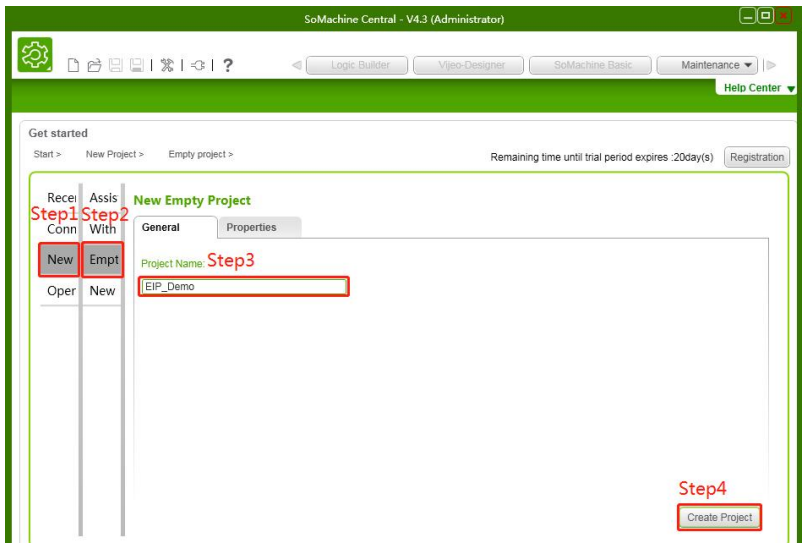


Figure 5-3-1

- Double-click "Controller" as shown in Figure 5-3-2.

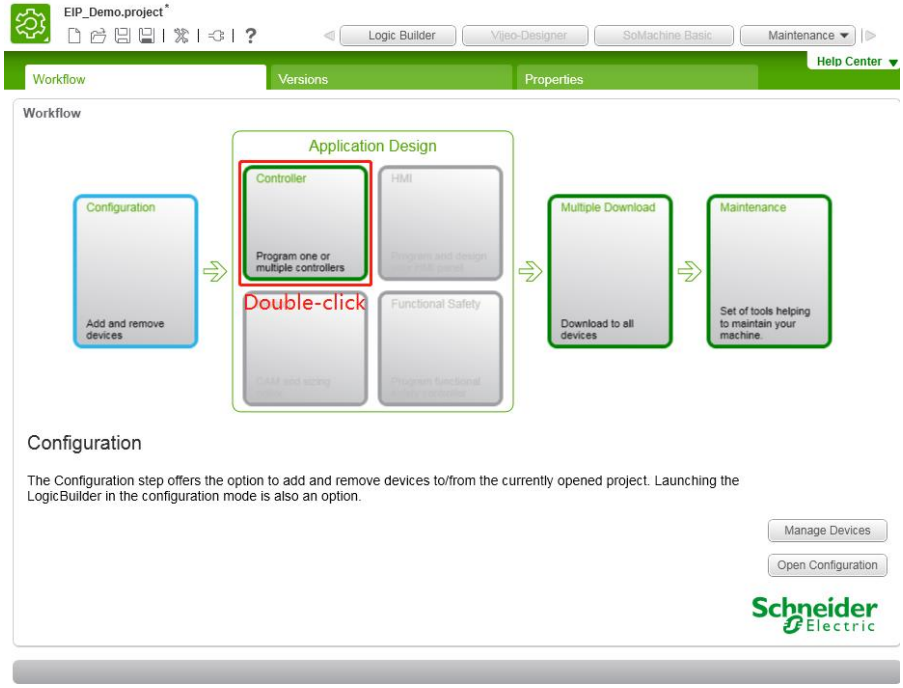


Figure 5-3-2

➢ Install the EDS file as shown in Figure 5-3-3 to Figure 5-3-5: Click Tools, then click Device Repository and then click Install to browse to the location where the EDS file is placed, select, open, and install the EDS file.

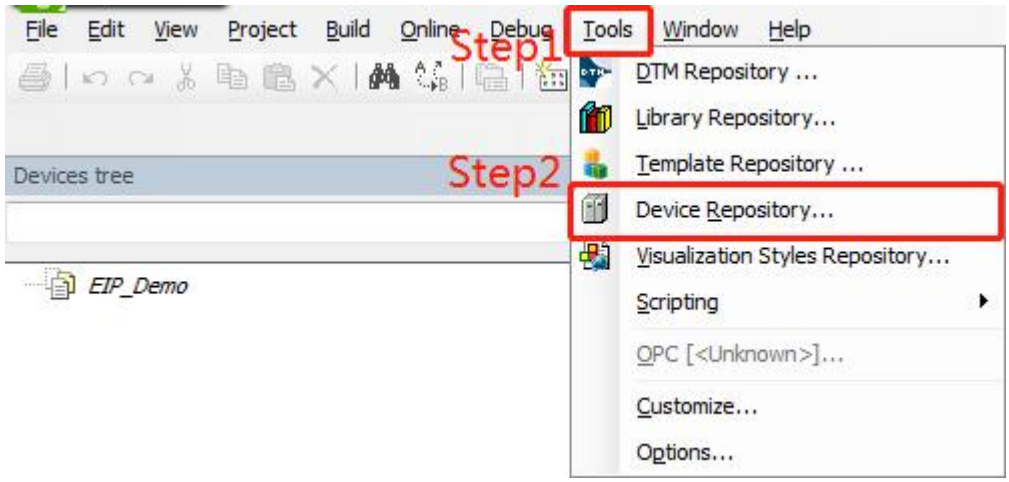


Figure 5-3-3

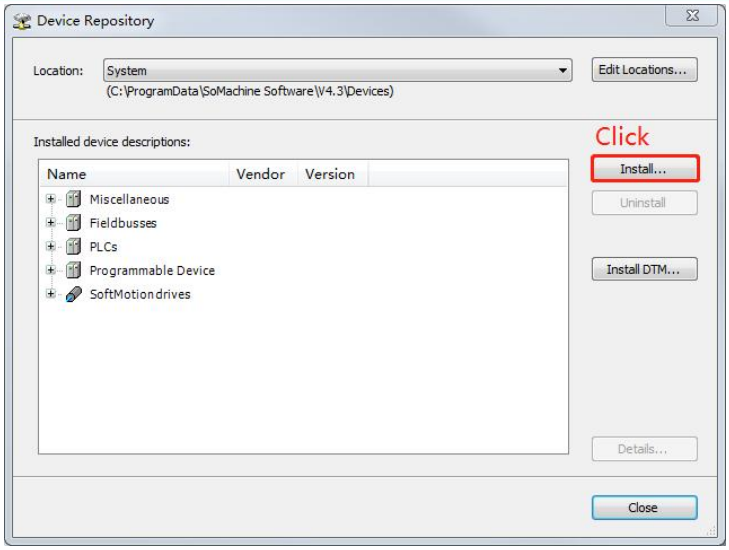


Figure 5-3-4

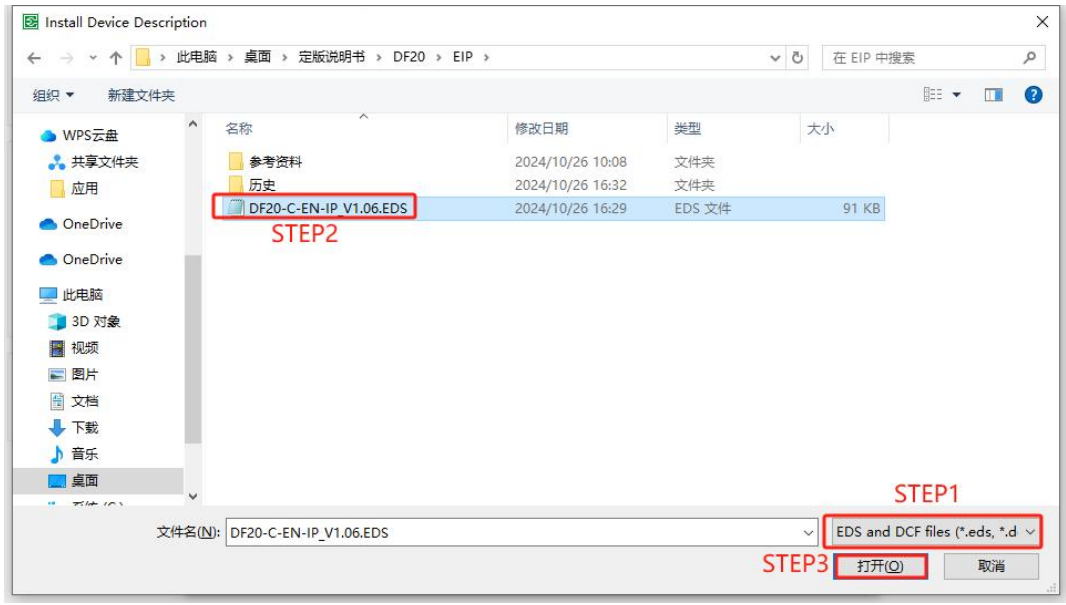


Figure 5-3-5

➢ As shown in Figure 5-3-6, right-click in the device tree to add a device.

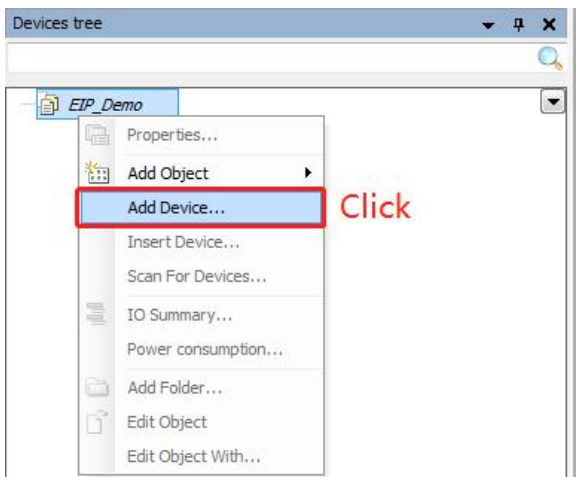


Figure 5-3-6

➢ As shown in Figure 5-3-7, select the corresponding PLC model and double-click to add.

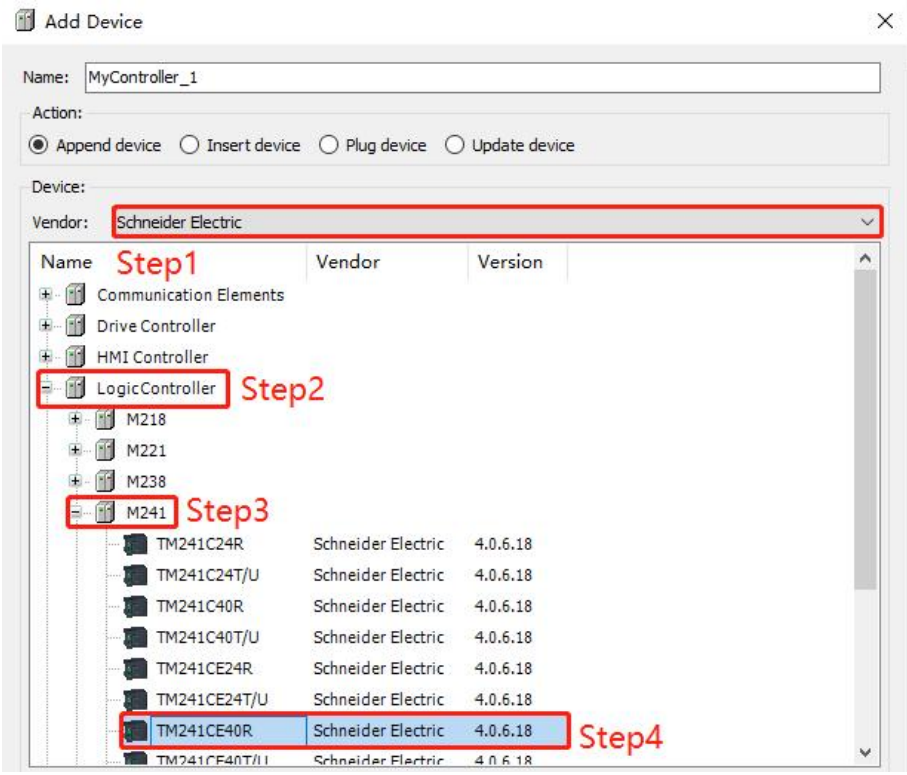


Figure 5-3-7

➢ As shown in Figure 5-3-8, right-click on Ethernet and click Add Device.

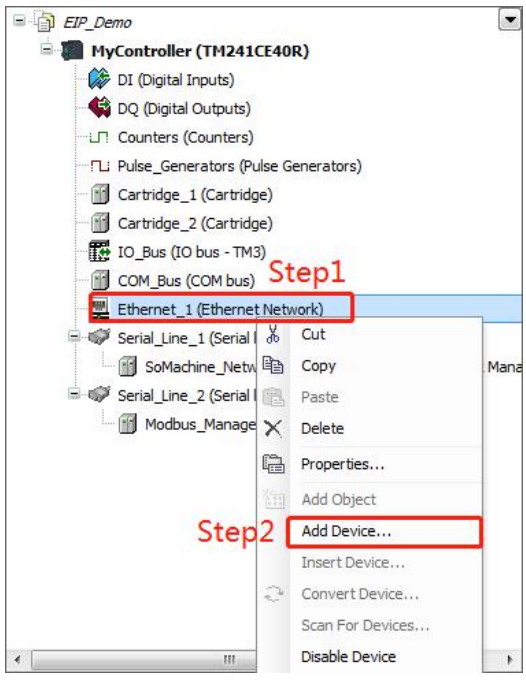


Figure 5-3-8

➢ As shown in Figure 5-3-9, double-click to add Industrial Ethernet Manager.

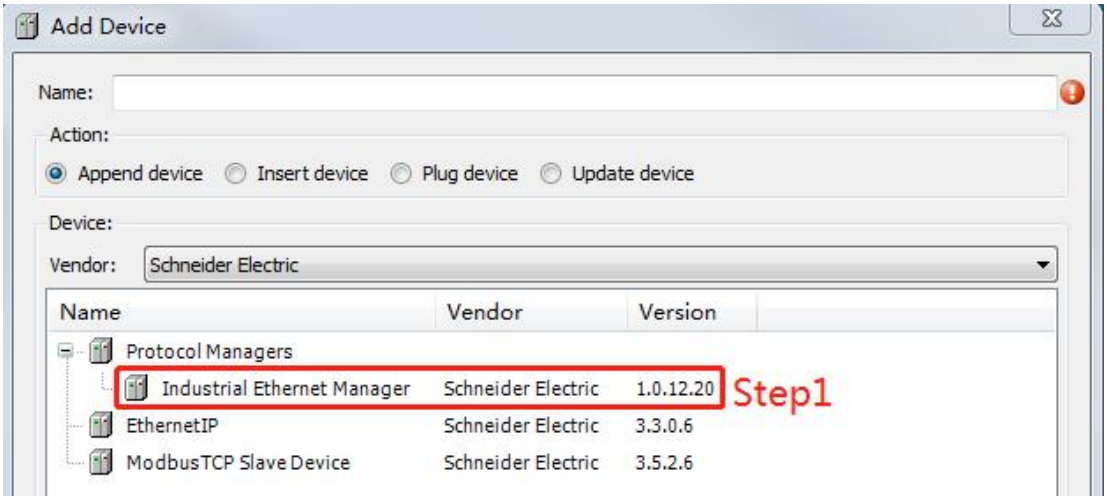


Figure 5-3-9

➢ As shown in Figure 5-3-10, right-click “Industrial Ethernet Manager” and click Add Device.

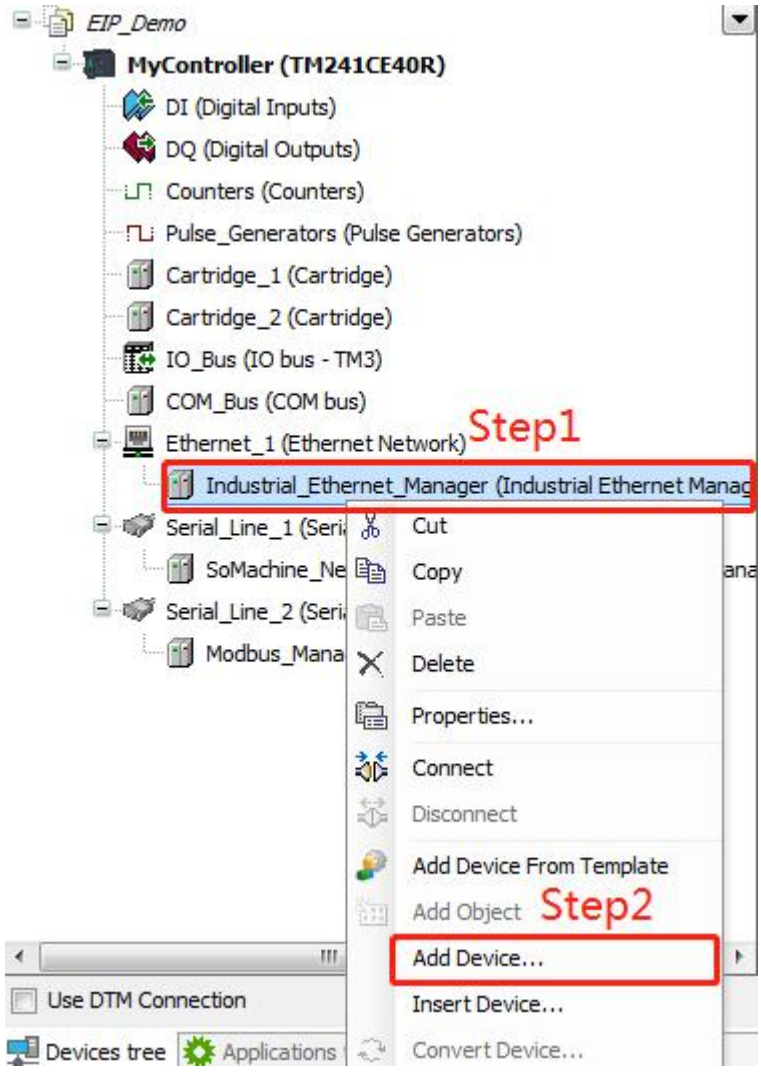


Figure 5-3-10

➢ As shown in Figure 5-3-11, browse to the device location and double-click to add the device.

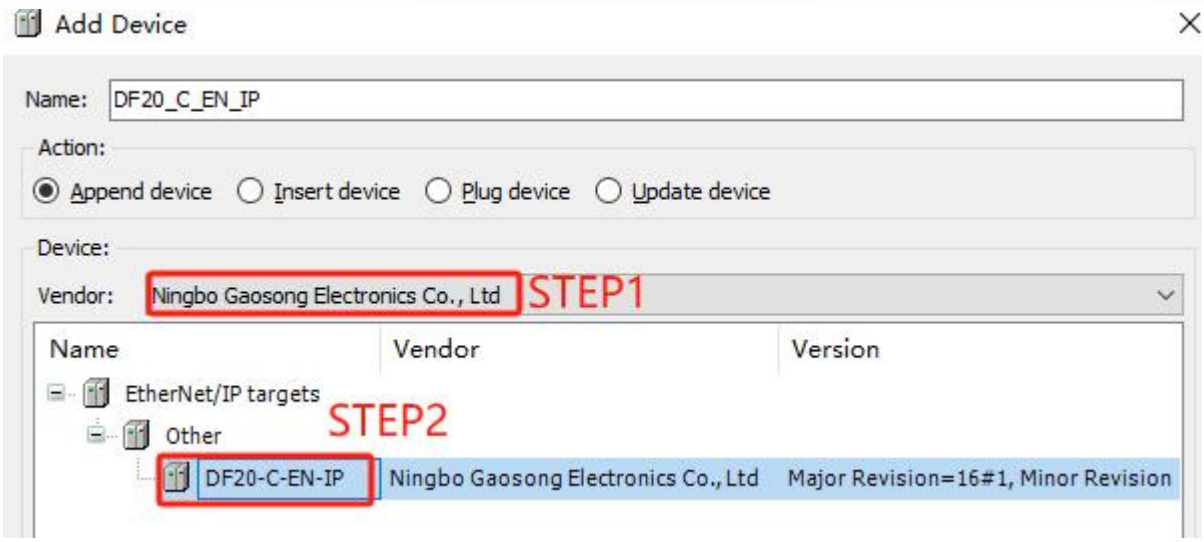


Figure 5-3-11

➢ As shown in Figure 5-3-12, click "Ethernet" to configure PLC parameters.

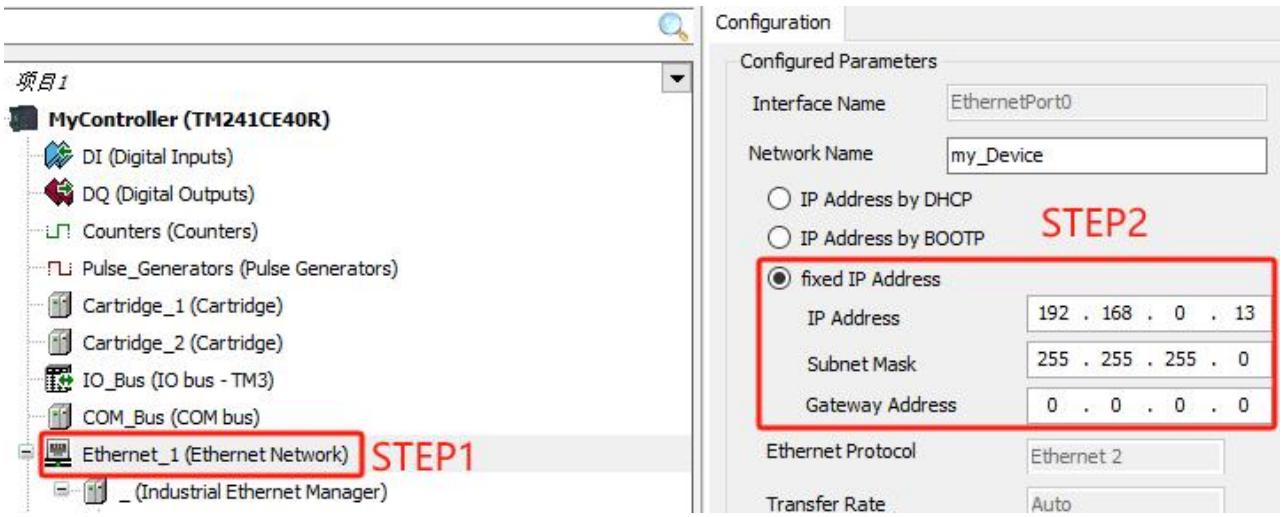


Figure 5-3-12

➢ As shown in Figure 5-3-13, click “DF20-C-EN-IP” to configure the coupler parameters.

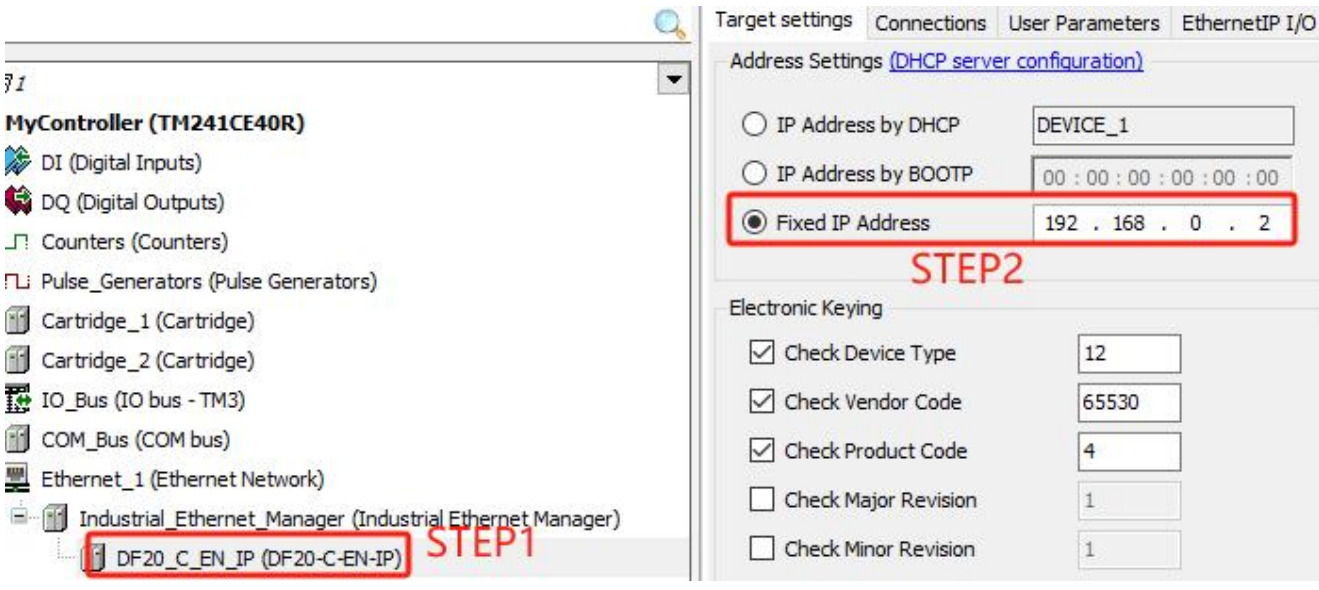


Figure 5-3-13

➢ After clicking Connect, a new connection is created as shown in Figure 5-3-14.

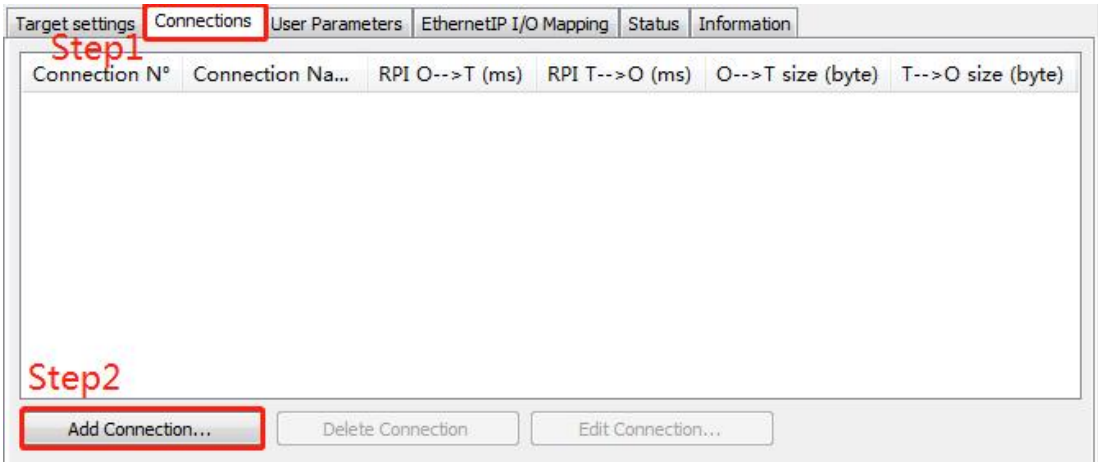


Figure 5-3-14

➢ As shown in Figure 5-3-15, create a new connection, edit the connection, and click "Show all parameters".

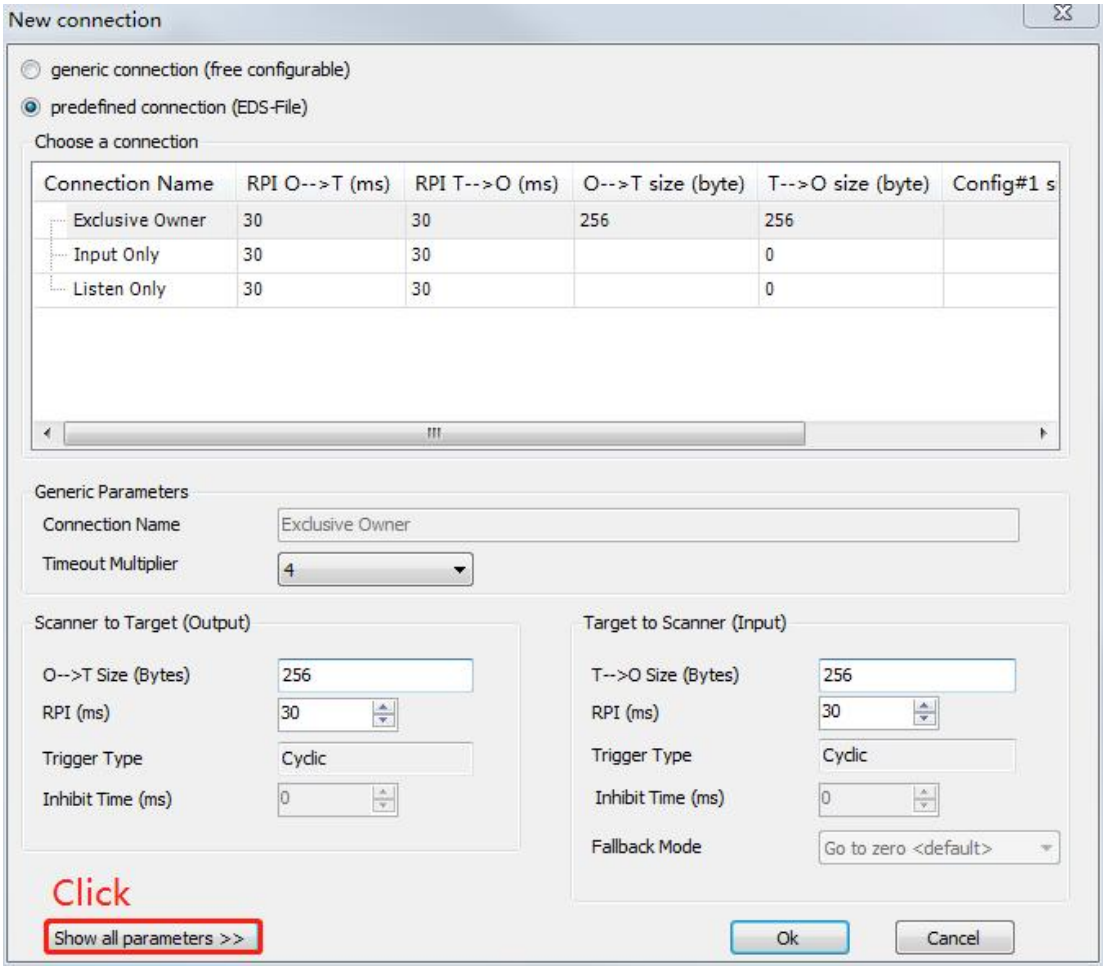


Figure 5-3-15

➢ Open the manufacturer's"EIP_DF20-C-EN-IP Configuration Table_V2.0",According to the actual module topology (DF20-M-16DI-P+DF20-M-16DO-P in this example), the configuration table is shown in Figure 5-3-16, where the coupler comes with 2 bytes of diagnostic data to display module diagnostic

information. Then insert DF20-M-16DI-P and DF20-M-16DO-P in the second and third slots respectively, calculate the size of "Produced Data Size" and "Consumed Data Size", as shown in Figure 5-3-17. These two data need to be filled in the parameter table for editing the connection, and the connection type is changed to "point to point".

Produced Data Size	4	将该数据填入参数设定中的"Produced Data Size"对象中
Consumed Data Size	2	将该数据填入参数设定中的"Consumed Data Size"对象中

序号	IO卡片型号选择	上行数据（byte）	下行数据（byte）	数据含义解释说明
1	SystemDiagnostic	2	0	诊断模块过程数据
2	DF20-M-16DI-P	2	0	16通道数字量输入模块，PNP
3	DF20-M-16DO-P	0	2	16通道数字量输出模块，PNP

Figure 5-3-16

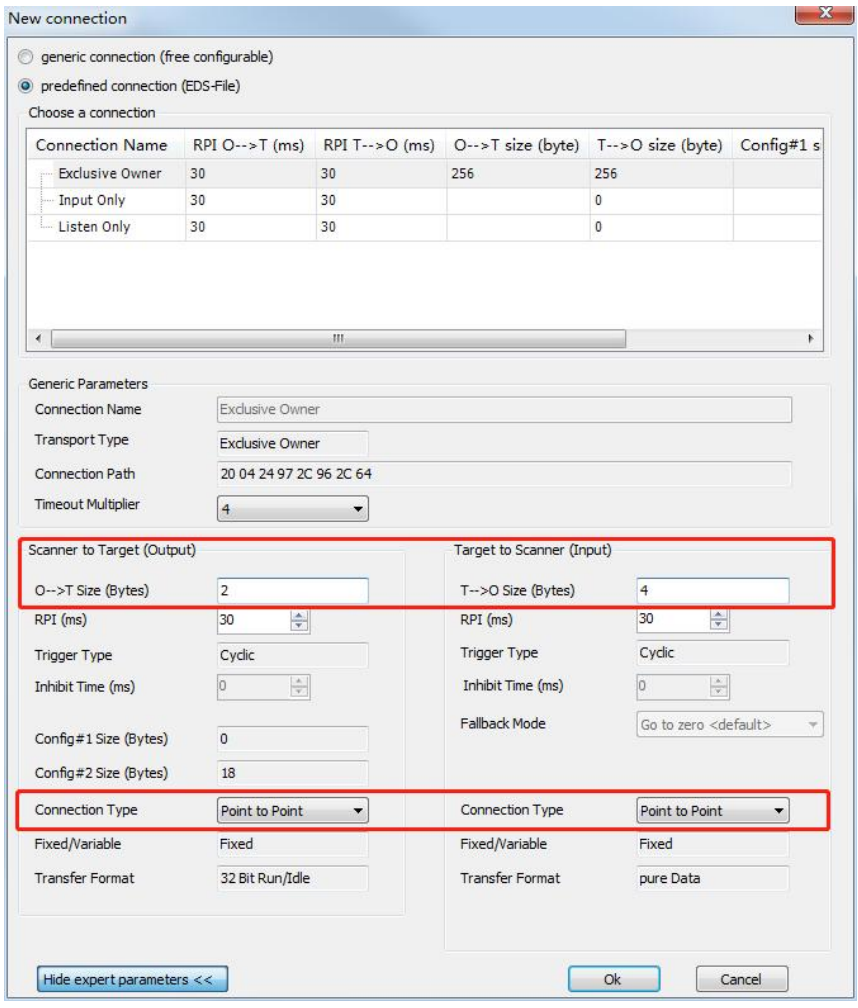


Figure 5-3-17

➢ As shown in Figure 5-3-18, first "compile", then "log in", and finally "start" to run.

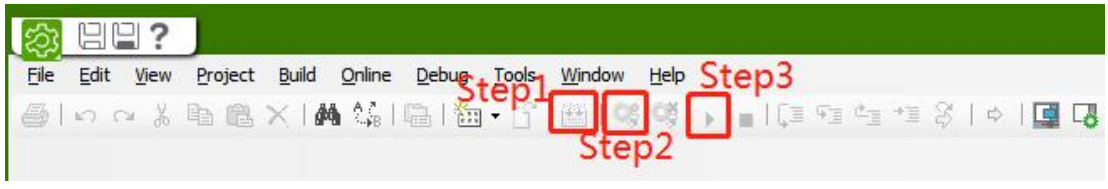


Figure 5-3-18

5.3.3 Diagnostic data description

➢ Open the EthernetIP I/O mapping table, as shown in Figure 5-3-19.

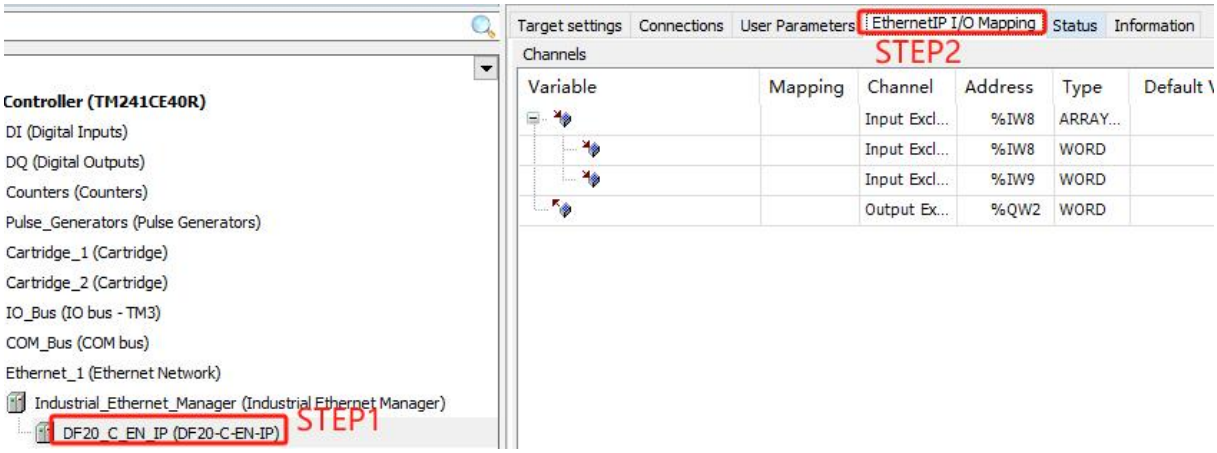


Figure 5-3-19

➢ Input Exclusive Owner[0] channel indicates alarm module information. When the EthernetIP I/O mapping table is opened, 4096 indicates that the

Connect to PLC. To facilitate understanding of the meaning of diagnostic data, adjust the hexadecimal representation to 16#1000, where 1 indicates that the PLC is connected. See Figure 5-3-20.

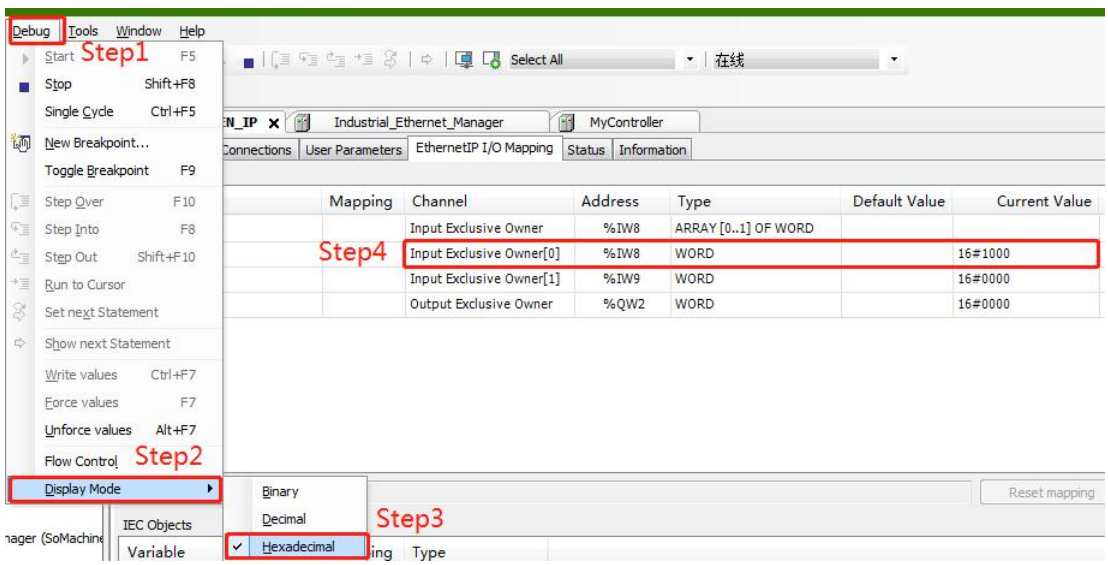


Figure 5-3-20

➢ When the IO module inserted behind the slave device DF20-C-EN-IP fails or data is lost, the ERR light is always on and the error information will be displayed in the diagnostic data. If the second IO module fails or data is lost during normal use, the diagnostic data is shown in Figure 5-3-21:

Channels

Variable	Mapping	Channel	Address	Type	Default Value	Current Value
		Input Exclusive Owner	%IW8	ARRAY [0..1] OF WORD		
		Input Exclusive Owner[0]	%IW8	WORD		16#1102
		Input Exclusive Owner[1]	%IW9	WORD		16#0000
		Output Exclusive Owner	%QW2	WORD		16#0000

Figure 5-3-21

➢ As shown in the figure, the data is 0x1102. The lower 3 bits of data 0x102 represent that an error has occurred in the second module. Similarly, if an error occurs in the first module

If an error occurs, the diagnostic data is16#1101.

5.3.4 IO data reading and writing

➢ Input Exclusive Owner[1] channel representationDF20-M-16DI-P module, as shown in Figure 5-3-22, indicates that the first channel inputs a high level.

Channels

Variable	Mapping	Channel	Address	Type	Default Value	Current Value	Prepared Value
		Input Exclusive Owner	%IW8	ARRAY [0..1] OF WORD			
		Input Exclusive Owner[0]	%IW8	WORD		16#1000	
		Input Exclusive Owner[1]	%IW9	WORD		16#0001	
		Output Exclusive Owner	%QW2	WORD		16#00FF	

Figure 5-3-22

➢ OutputExclusive OwnerThe channel represents the DF20-M-16DO-P module. As shown in Figure 5-3-23, write the output value according to the requirements. After entering the value, you need to click "Write values" to change the current value.

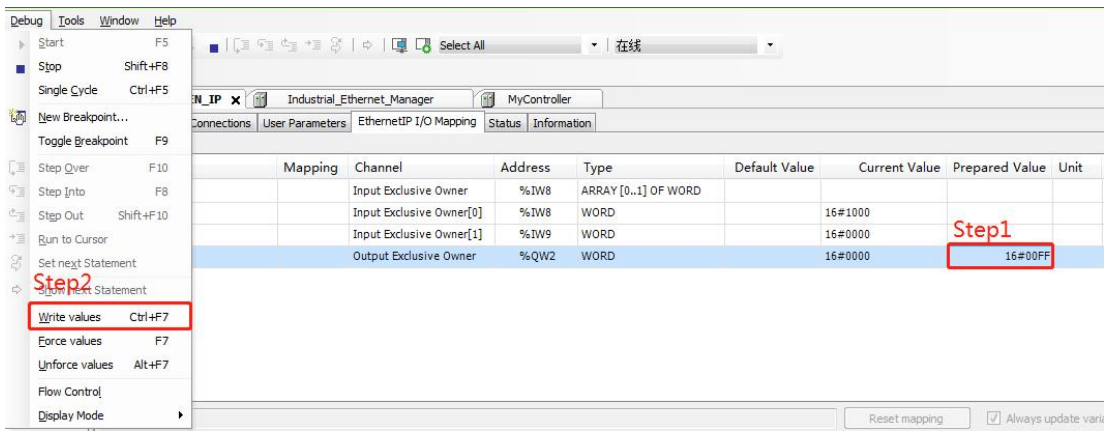


Figure 5-3-23

5.4 Configuration process instructions in CODESYS V3.5 SP16 environment

5.4.1 Preparation

- Module model and quantity

type	model	quantity
Coupler	DF20-C-EN-IP	1
IO Module	DF20-M-16DI-P	1
	DF20-M-16DO-P	1

- A computer with CODESYS V3.5 SP16 software pre-installed
- Switching power supply
- EDS file: DF20-C-EN-IP_V1.01
- Module process data configuration table: EIP_DF20-C-EN-IP configuration table_V2.0

5.4.2 Configuration with CODESYS V3.5 SP16

- IP setting and modification reference4.1.3
- In the processThe network segment of the DF20-C-EN-IP adapter is 192.168.0.2.
- Open CODESYS V3.5 SP16 software, click “New project” as shown in Figure 5-4-1: select the corresponding template, fill in the project

Name, and click OK to create.

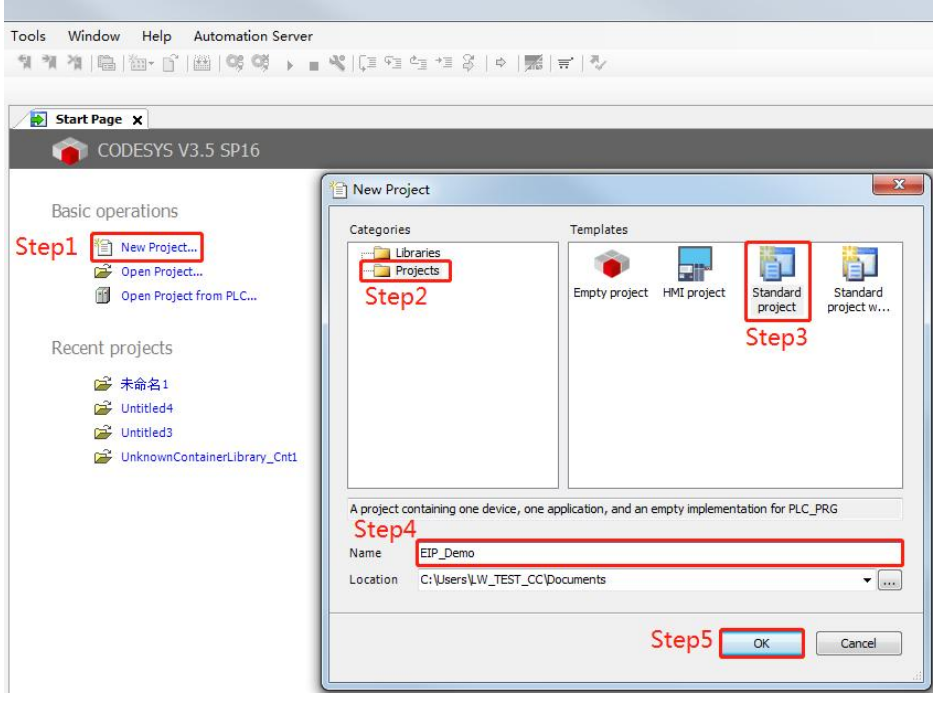


Figure 5-4-1

- As shown in Figure 5-4-2, select the corresponding device and the location of PLC_RPG.

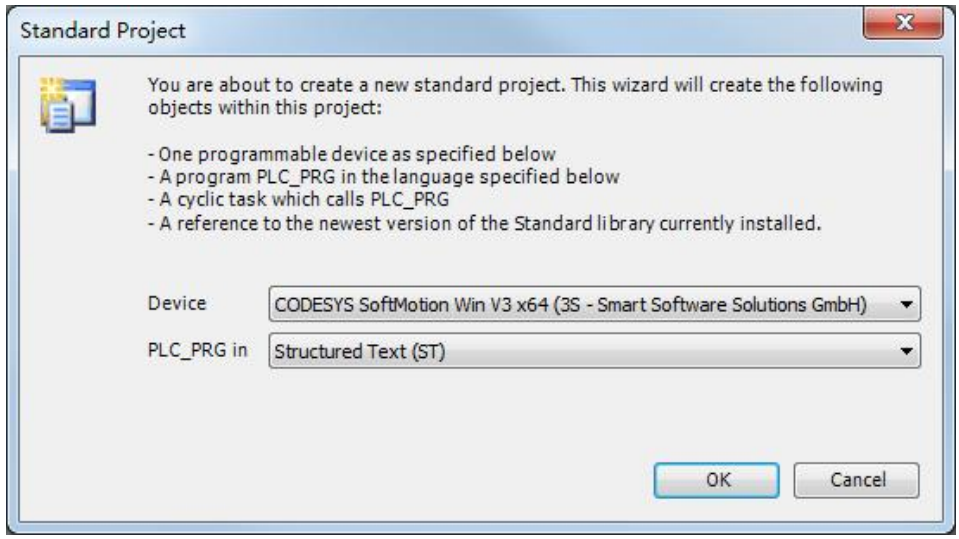


Figure 5-4-2

➢ As shown in Figure 5-4-3 to Figure 5-4-5, add the EIP slave.

Figure 5-4-3

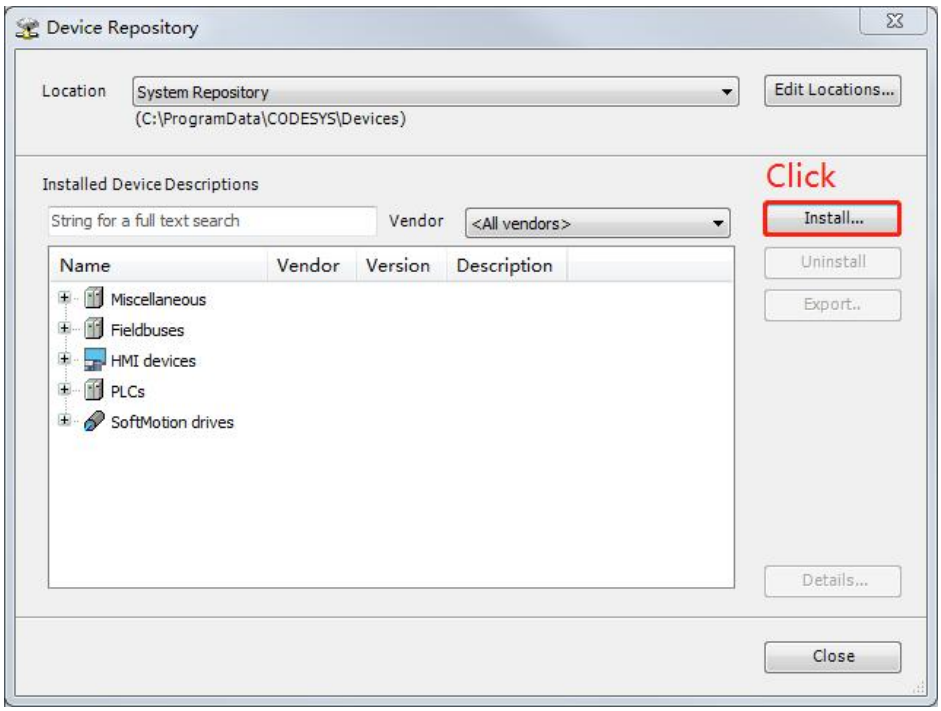


Figure 5-4-4

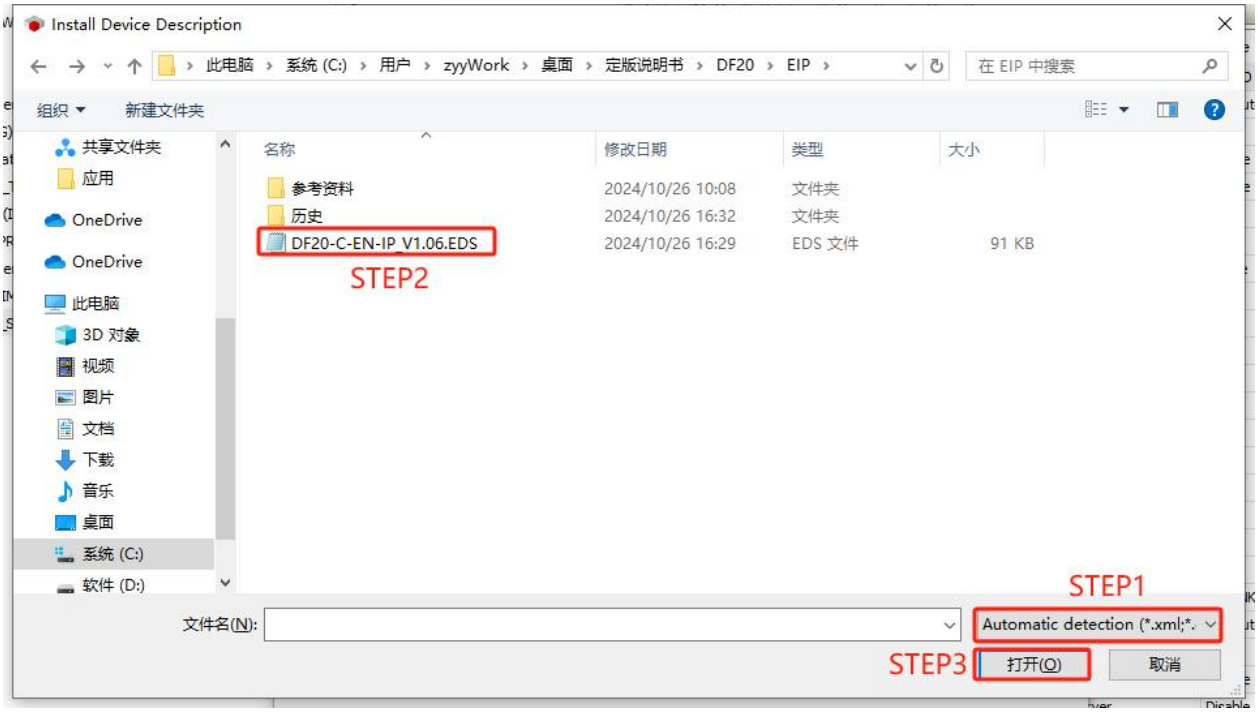


Figure 5-4-5

➢ As shown in Figure 5-4-6, in the device tree structure, right-click Device to add EtherNet.

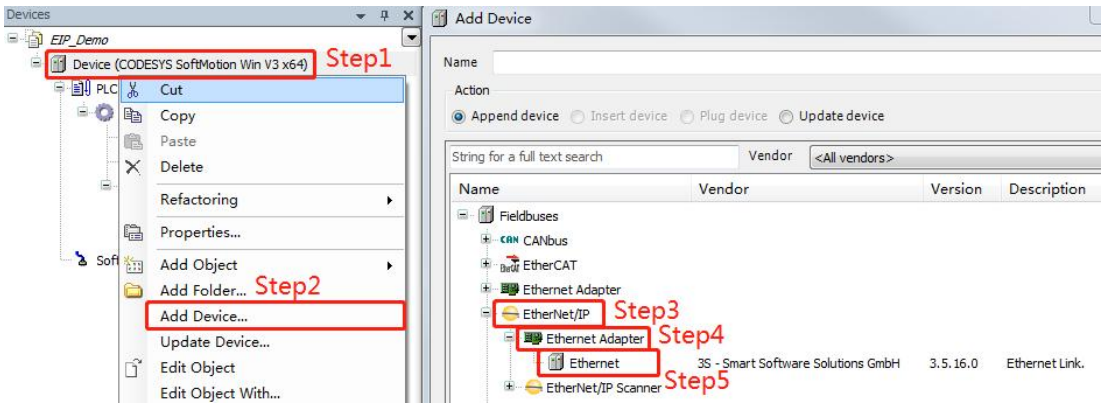


Figure 5-4-6

➢ As shown in Figure 5-4-7, select EtherNet/IP Scanner.

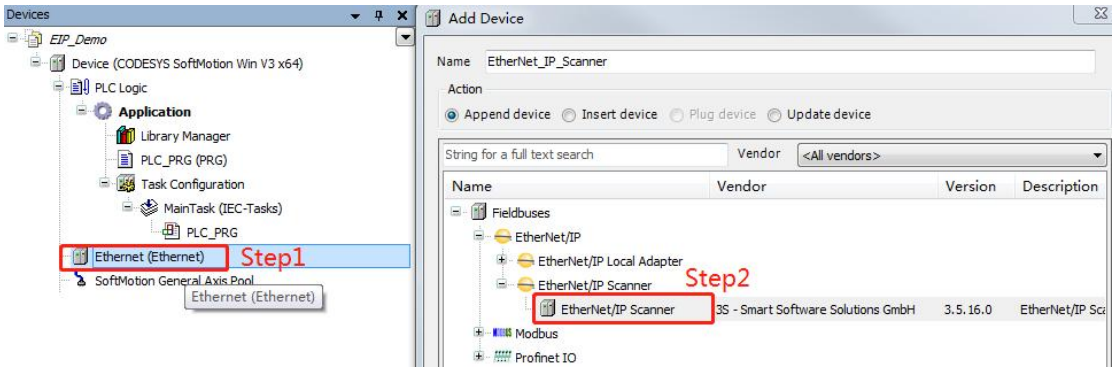


Figure 5-4-7

➢ As shown in Figure 5-4-8 and Figure 5-4-9, select the network port and use the same network segment as the EIP slave.

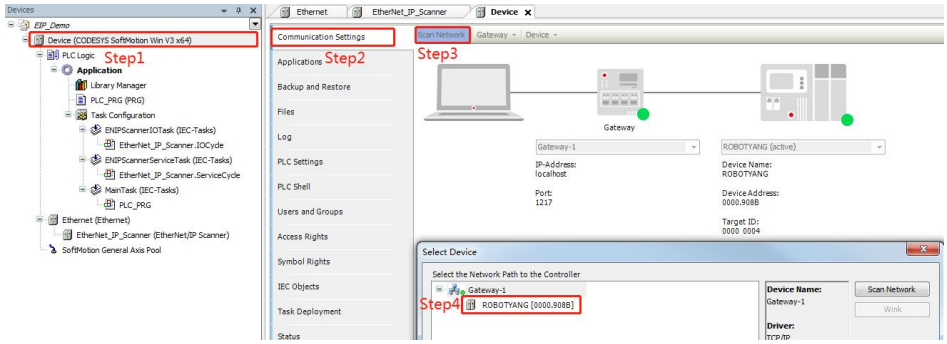


Figure 5-4-8

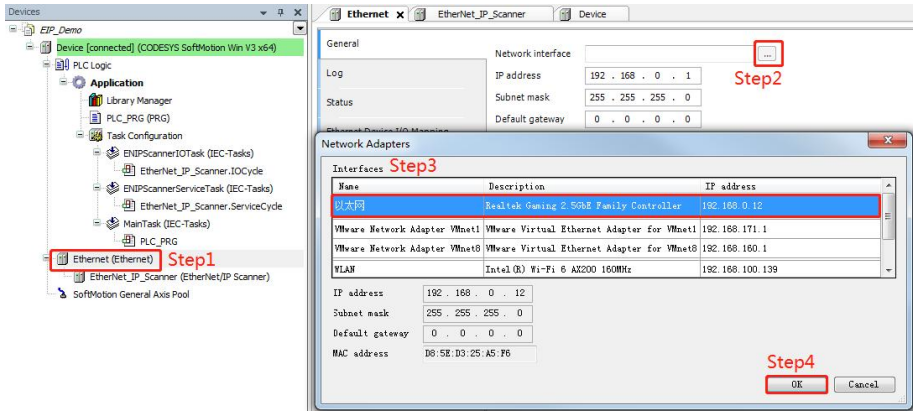


Figure 5-4-9

➢ Method 1 for adding devices: As shown in Figure 5-4-10~Figure 5-4-11, scan the EIP slave station (Note: you need to log in before scanning), click

Copy all devices to the project.

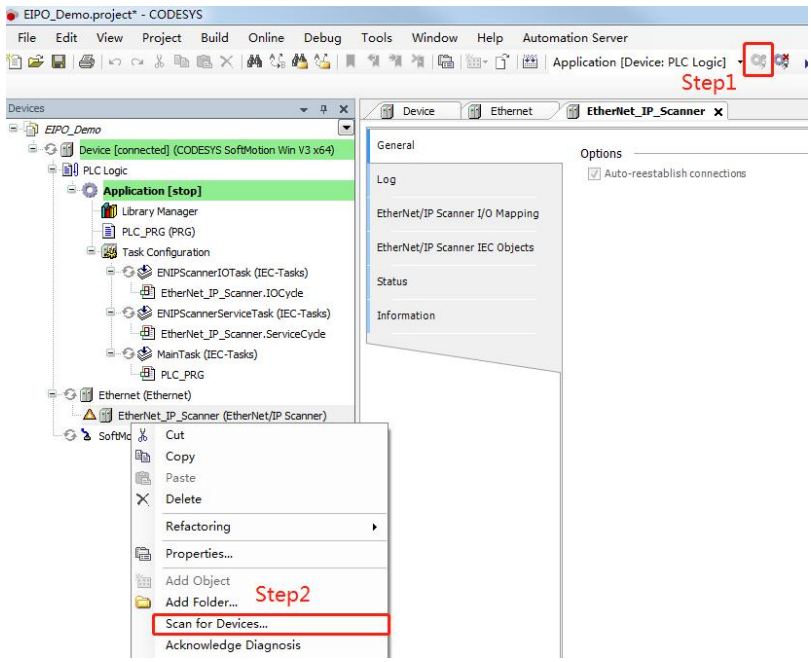


Figure 5-4-10

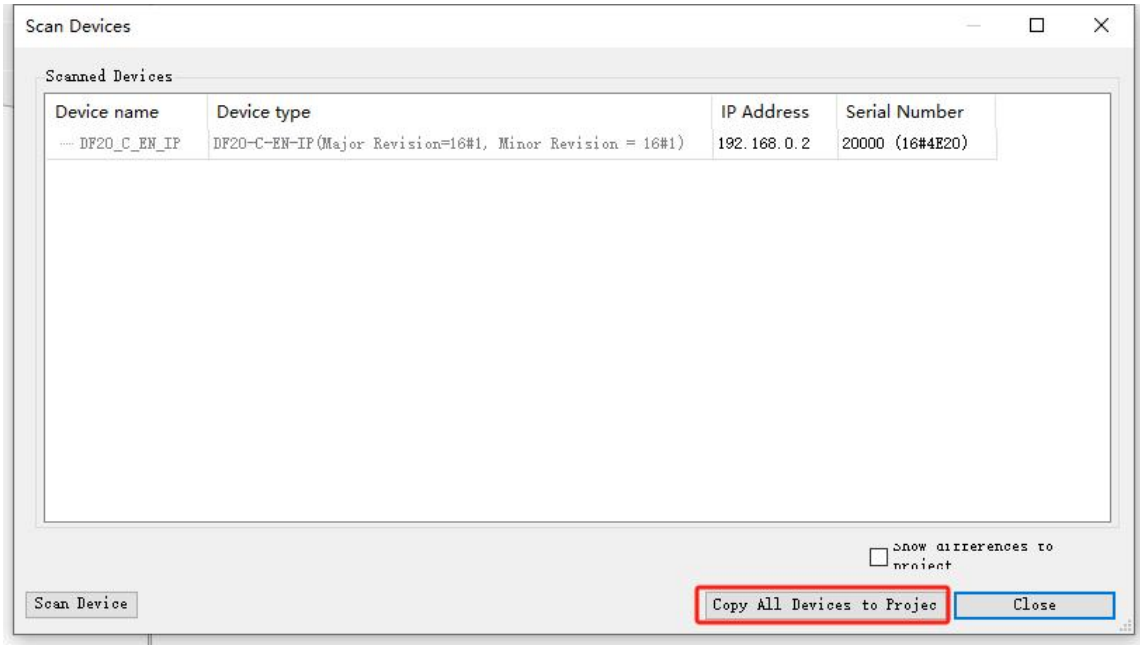


Figure 5-4-11

- Method 2: Manually add: As shown in step 5-4-12, right-click "EtherNet_IP_Scanner" and select Add Device. Select the corresponding device.

Modify the IP address as shown in Figure 5-4-13.

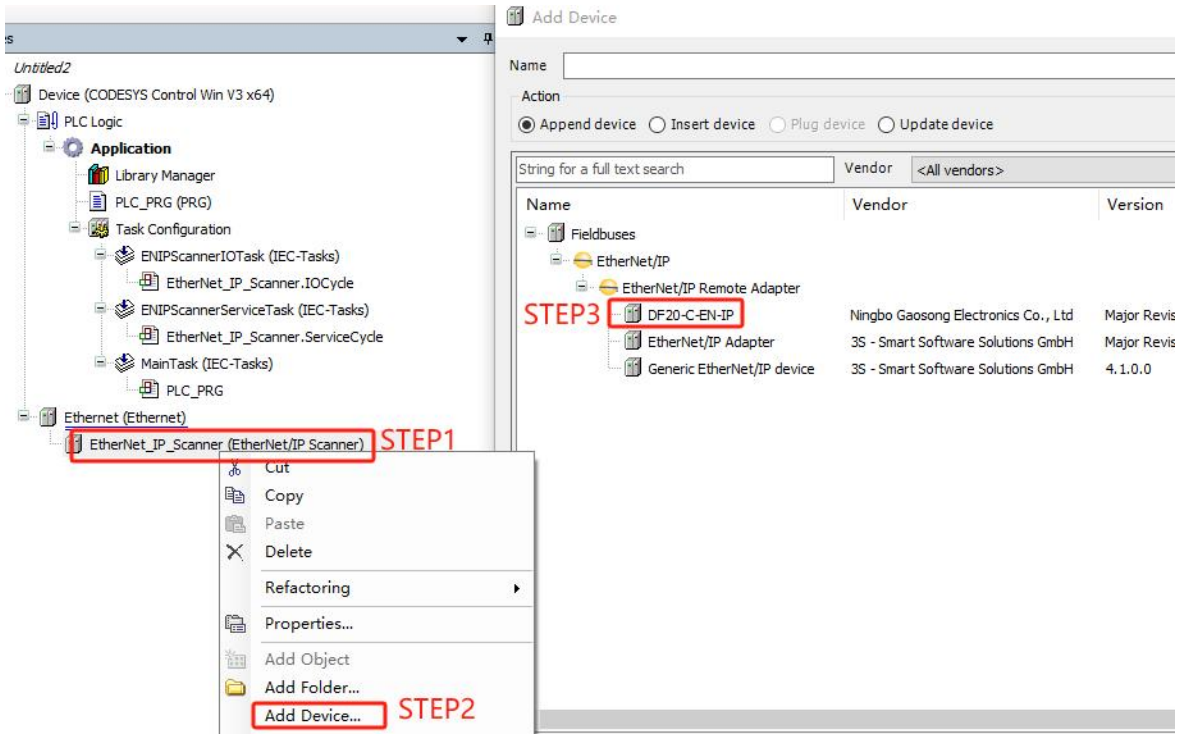


Figure 5-4-12

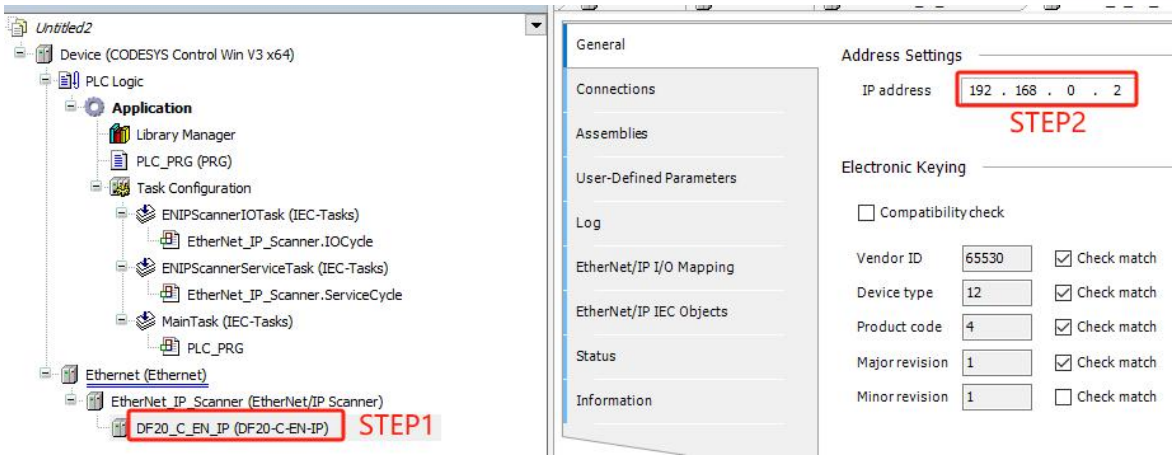


Figure 5-4-13

➢ Open the manufacturer's"EIP_EIP_DF20-C-EN-IP Configuration Table_V2.0",According to the actual module topology (DF20-M-16DI-P+DF20-M-16DO-P in this example), the configuration table is shown in Figure 5-4-14, where the coupler comes with 2 bytes of diagnostic data to display module diagnostic information. Then insert DF20-M-16DI-P+DF20-M-16DO-P in the second and third slots respectively, calculate the size of "Produced Data Size" and "Consumed Data Size", as shown in Figure 5-4-15, and fill these two data into the configuration table of the configuration software.

Produced Data Size	4	将该数据填入参数设定中的"Produced Data Size"对象中
Consumed Data Size	2	将该数据填入参数设定中的"Consumed Data Size"对象中

序号	IO卡片型号选择	上行数据（byte）	下行数据（byte）	数据含义解释说明
1	SystemDiagnostic	2	0	诊断模块过程数据
2	DF20-M-16DI-P	2	0	16通道数字量输入模块，PNP
3	DF20-M-16DO-P	0	2	16通道数字量输出模块，PNP

Figure 5-4-14

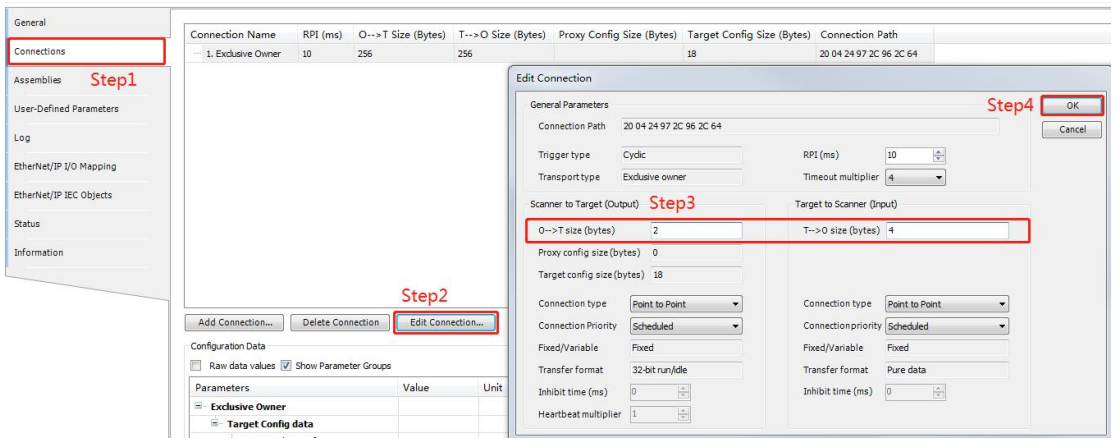


Figure 5-4-15

➢ Address mapping method 1:

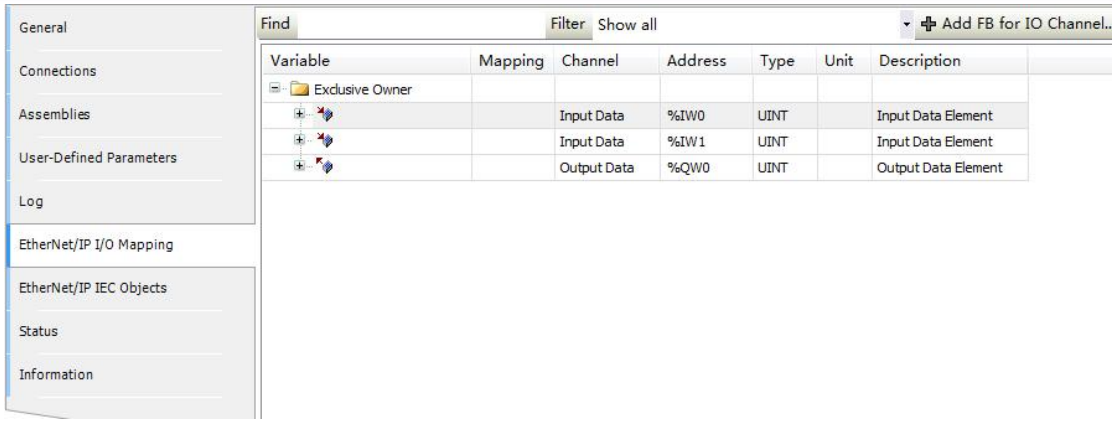


Figure 5-4-16

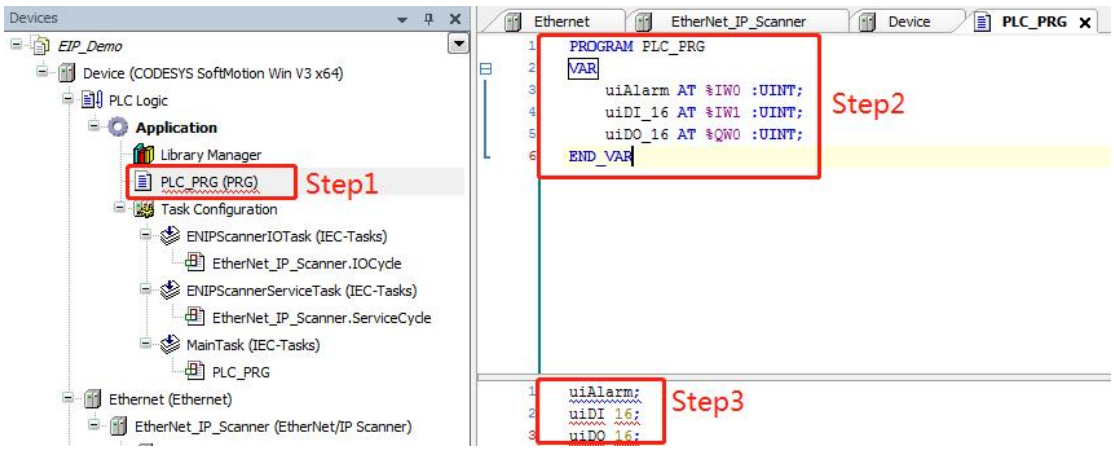


Figure 5-4-17

Address mapping method 2:

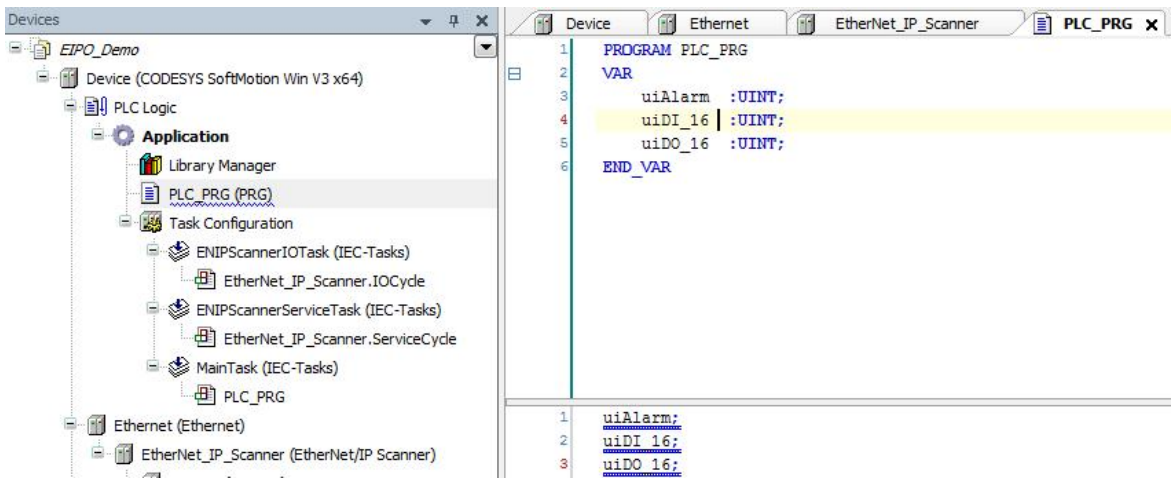


Figure 5-4-18

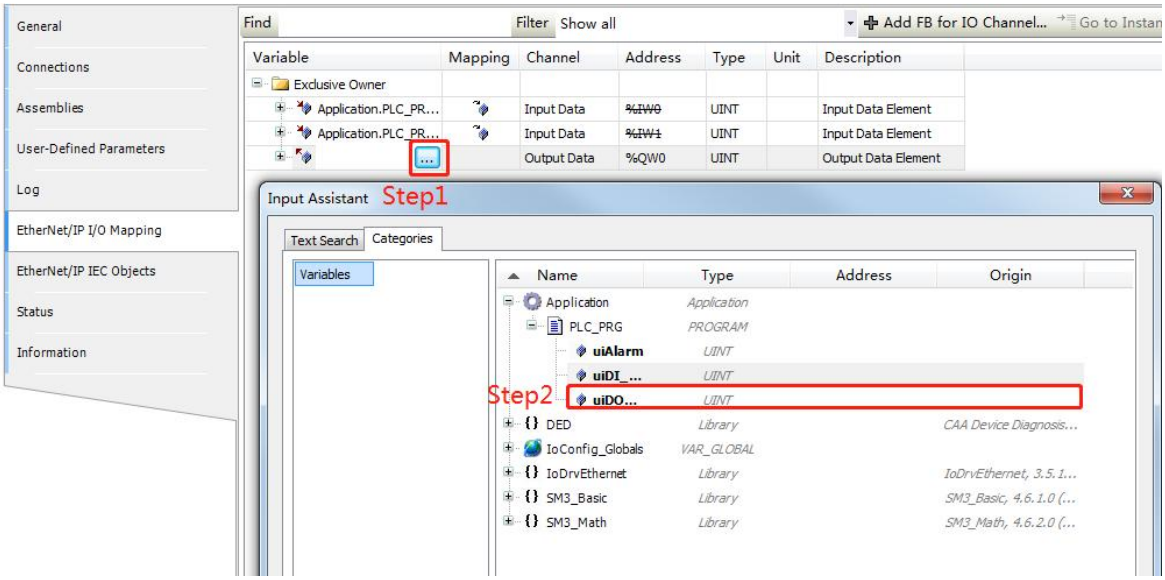


Figure 5-4-19

➢ As shown in Figure 5-4-20, log in and connect.

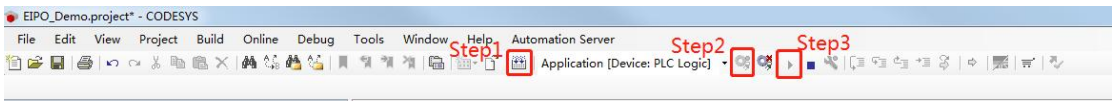


Figure 5-4-20

5.4.3 Diagnostic data description

➢ Open the EthernetIP I/O mapping table, as shown in Figure 5-4-21.

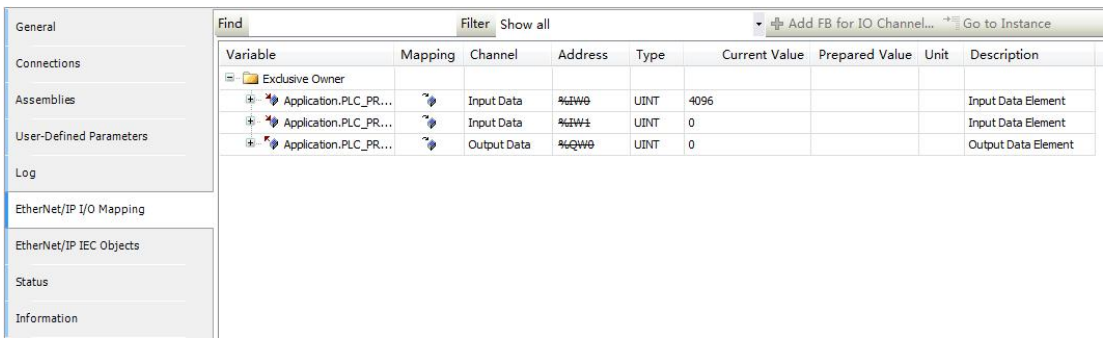


Figure 5-4-21

➢ IW0 channel indicates diagnostic data. When the EthernetIP I/O mapping table is opened, 4096 indicates that the PLC is connected.

Solution: The meaning of the diagnostic data is adjusted to hexadecimal 16#1000, where 1 means the PLC is connected, as shown in Figure 5-4-22.

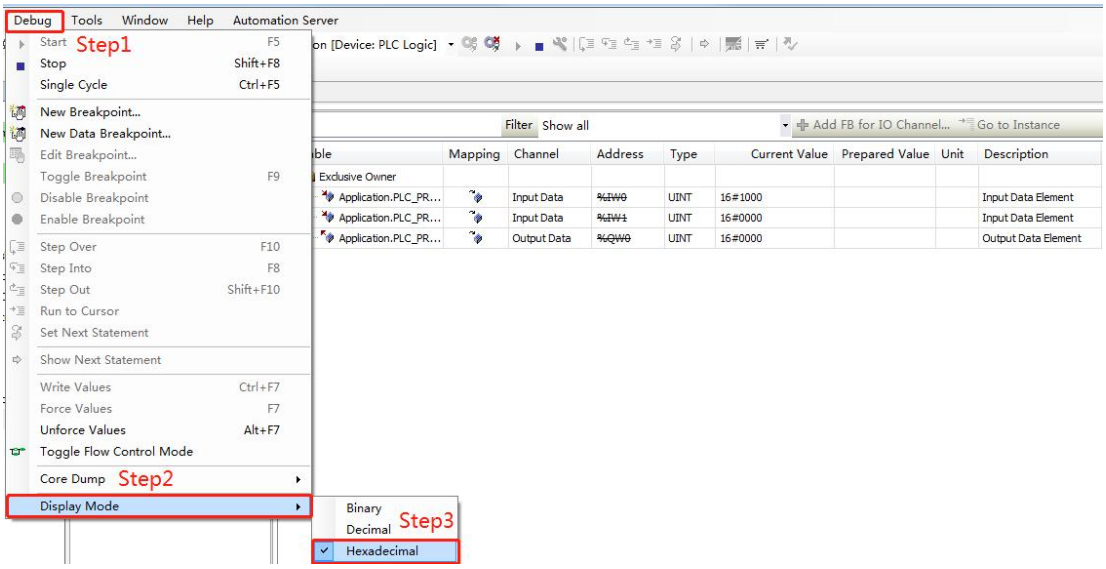


Figure 5-4-22

➢ When the IO module inserted behind the slave device DF20-C-EN-IP fails or data is lost, the ERR light is always on and the error information will be displayed in the diagnostic data. If the second IO module fails or data is lost during normal use, the diagnostic data is shown in Figure 5-4-23:

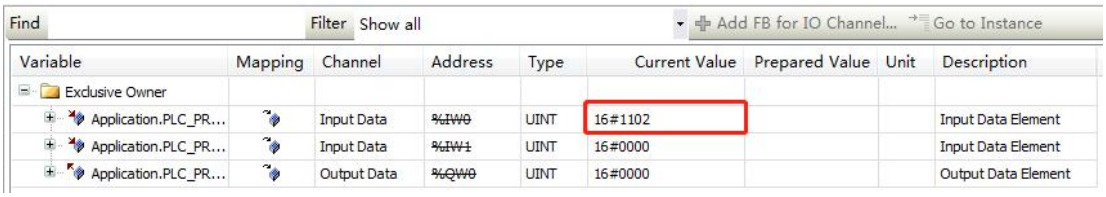


Figure 5-4-23

➢ As shown in the figure, the data is 0x1102. The lower 3 bits of data 0x102 represent that an error has occurred in the second module. Similarly, if an error has occurred in the first module, the diagnostic data is16#1101.

5.4.4 IO data reading and writing

➢ IW1 channel representationDF20-M-16DI-P module, as shown in Figure 5-4-24, indicates that the first channel inputs a high level.

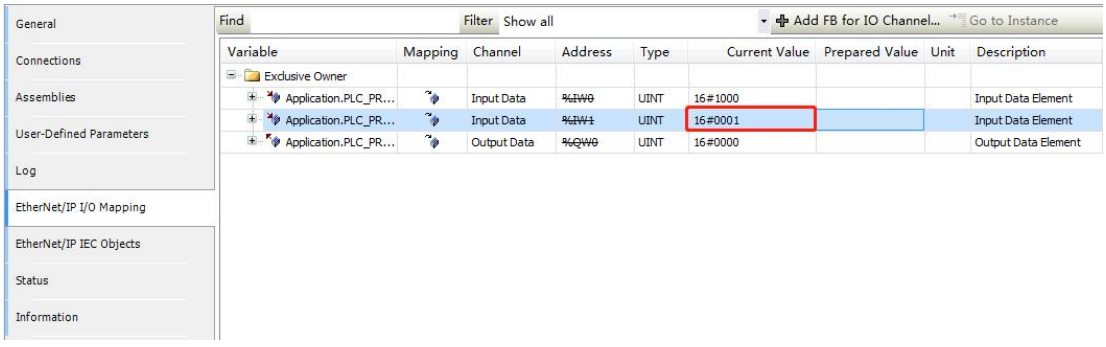


Figure 5-4-24

➢ QW0 channel represents DF20-M-16DO-P module. As shown in Figure 5-4-25, write the value to be output at the prepared value according to the requirements. After entering, click "Write values" to change the current value.

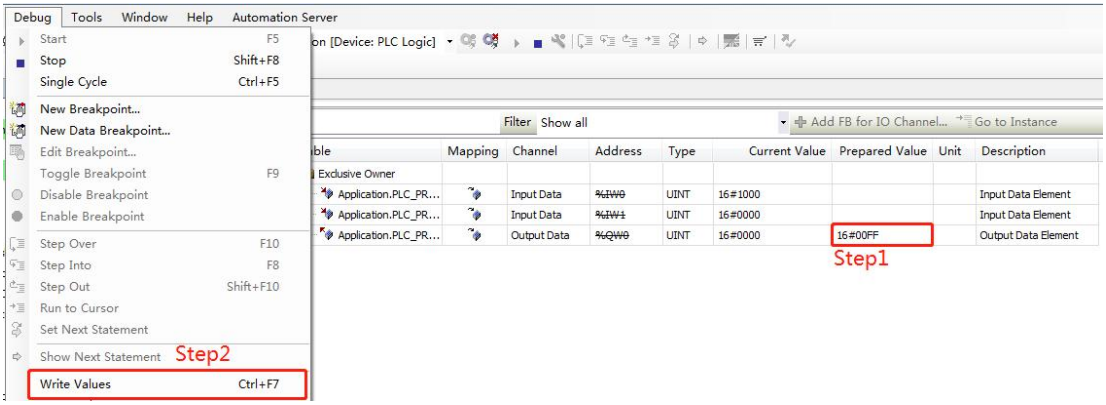


Figure 5-4-25