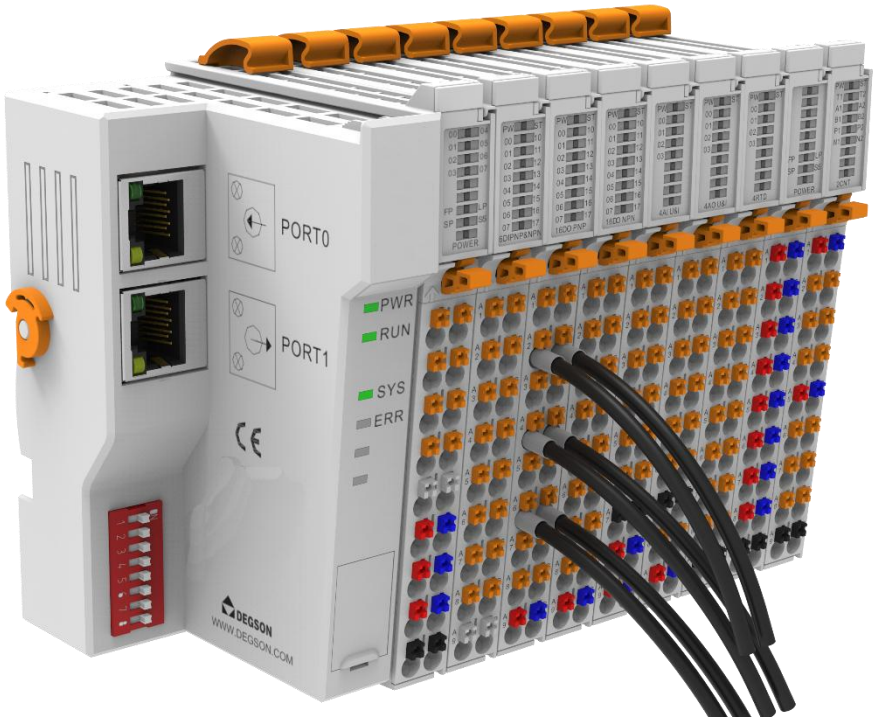
DF58-C-EC

User Manual



Directory

Preface

Scope of this document

This document applies to DF58 series remote IO systems

Introduction

This manual mainly introduces the technical specifications, installation, and debugging of DF58 series remote I/O modules.

Highlights include:

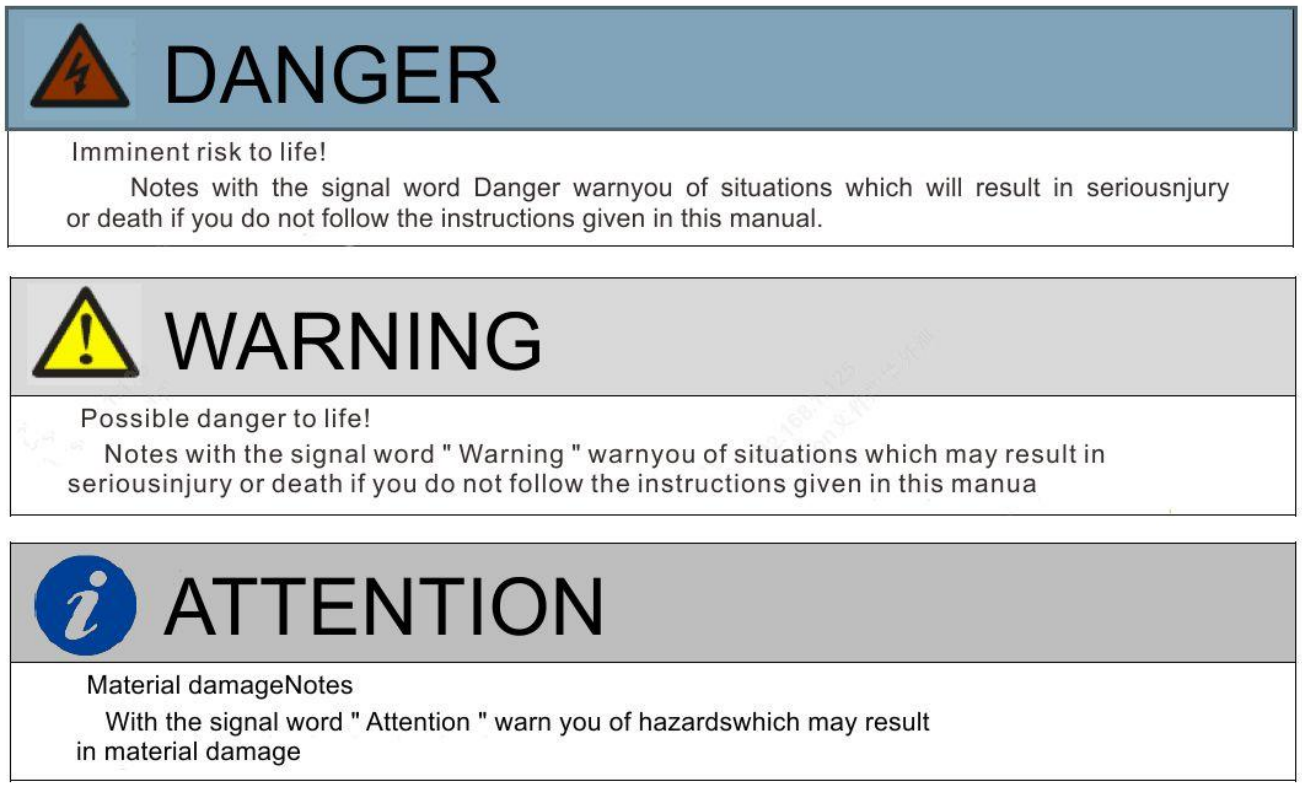
- System Overview: This paper mainly introduces the product ordering information of DF58 series remote I/O modules, product composition, system architecture, product transportation, storage environment, etc
- Product Description: Introduce the technical parameters of DF58 series remote I/O module
- Installation and Removal Instructions: Introduce the installation and removal of DF58 series remote I/O modules
- Mechanical and electrical diagrams: DF58 remote IO module dimensions and electrical wiring diagrams;
- User Guide: This section introduces the communication between DF58 series remote I/O modules and mainstream PLCs through examples.

Precautions

This document describes in detail how to use the DF58 series remote I/O modules, and is intended for

those with some engineering experience. DEGSON shall not be liable for any consequences arising from the use of this material.

Before attempting to use the equipment, please read the relevant precautions of the equipment carefully, and be sure to follow the safety precautions and operating procedures for installation and commissioning. The degree of harm and damage that may result from the incorrect use of the equipment is illustrated by the symbols below



Eligibility

This manual provides information on the installation and commissioning of the DF58 series remote I/O modules and is designed for engineers, installers, maintenance personnel, and electricians with a general understanding of automation.

Recycling and disposal

To ensure that the recycling of your old equipment meets environmental requirements, please contact a certified e-waste disposal facility.

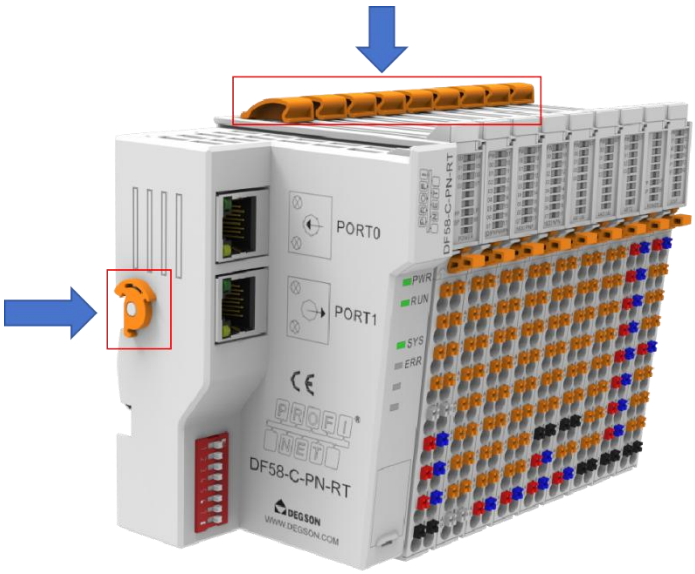
Precautions

If the module is difficult to install, do not use brute force to install, so as not to damage the current module or other modules, disassemble the module from the guide rail, check whether the module is abnormal (such as foreign body blockage, etc.), confirm that there is no problem, and then plug and unplug.

1. Product installation and disassembly

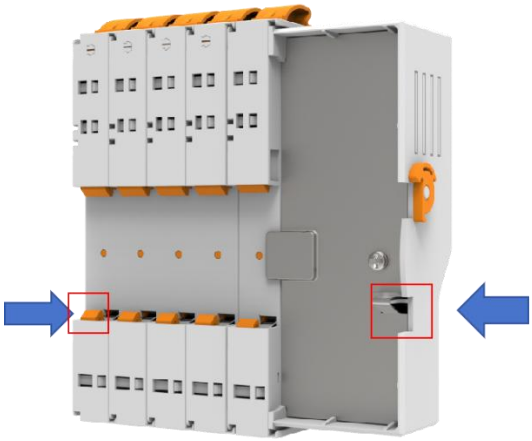
1.1 Installation

- The DIN rail lock at the bottom of the module can be safely and reliably mounted on a 35 mm DIN rail when the module is installed, and the module needs to be aligned with its notch, push the module towards the DIN bayonet, and place the module on the DIN rail.
- When installing the adapter, there is a manual snap above and on the left side for locking the rails.



1.2 Grounding protection

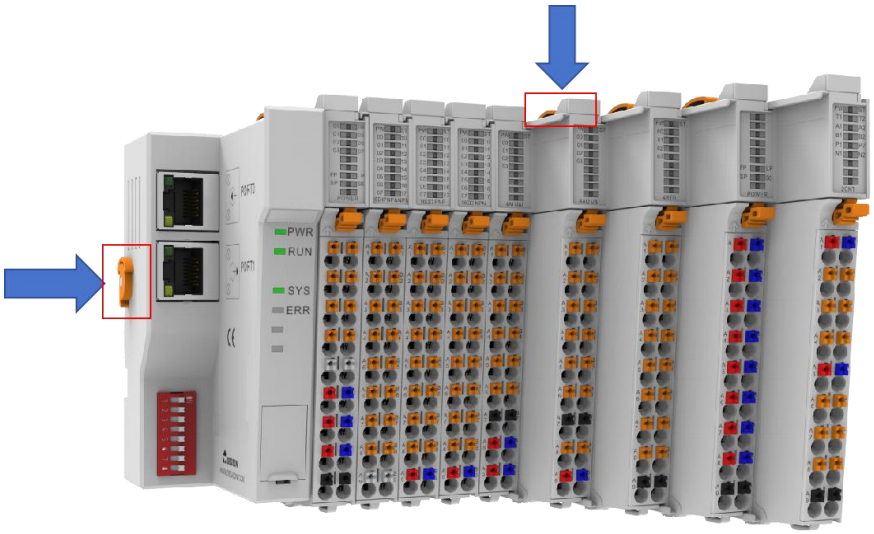
- There is a metal shrapnel on the back of the module for effective grounding with the guide rail, and the metal shrapnel is connected to the grounding PE of the adapter module.



1.3 Disassembly method

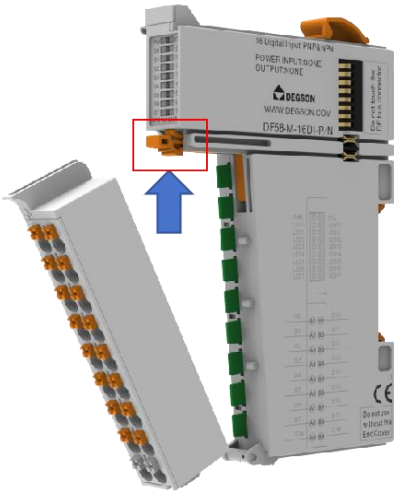
1.3.1 Module disassembly

When removing the adapter module, you should first remove all the signal cables or power cables of the module, then press the bayonet (the yellow part of the arrow at the top of the figure below), and when removing the adapter module, you also need to open the rail lock counterclockwise (the left arrow position).



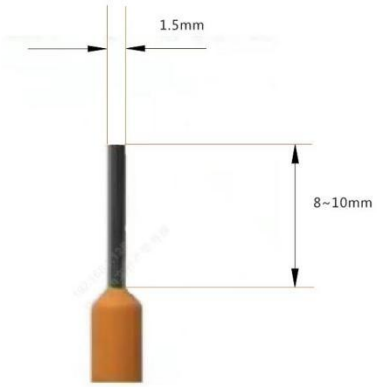
1.3.2 Terminal disassembly

The buckle can be removed separately by pressing the buckle in the direction of the arrow.

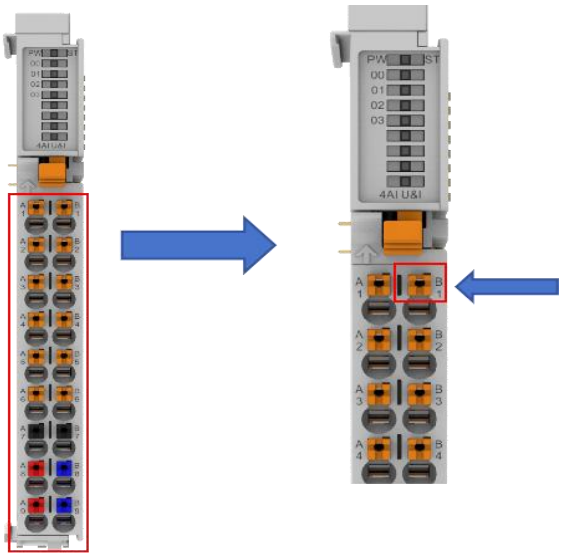


1.3.3 Cold-pressed terminals

It is recommended to use cables with a core of less than 1.5 mm², and the parameters of the crimp terminals are as follows



The terminal button is recommended to be used, and it is recommended to use a 0.4*2.5 screwdriver to press down.



1.4 Precautions

- If the module is difficult to install, do not use brute force to install, so as not to damage the current module or other modules, disassemble the module from the guide rail, check whether the module is abnormal (such as foreign body blockage, etc.), confirm that there is no problem, and then plug and unplug.

2. Fieldbus adapter

Fieldbus system	description	Model
EtherCAT	EtherCAT bus, 2 x RJ45, expandable with 32 modules, 24VDC	DF58-C-EC

2.1 EtherCAT fieldbus adapter (DF58-C-EC).

- The DF58-C-EC fieldbus adapter acts as a slave and is connected to EtherCAT IO, the open Industrial Ethernet standard in the field of automation. It automatically configures and generates local process images including analog, digital, and special function blocks. Analog modules and special function modules transmit data in the form of words or bytes, while digital modules transmit data in the form of bits.
- The fieldbus adapter can be integrated into the application as an EtherCAT IO device.
- It is also equipped with a dual-port switch that makes it easy to create a line structure without using any additional network components.
- Device names can be assigned through the DCP protocol.

2.1.1 Specifications

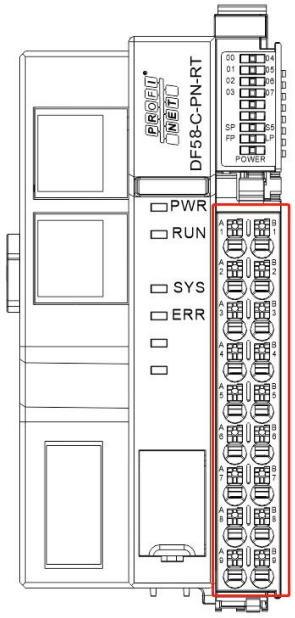
Technical parameters	
Product Description:	EtherCAT bus, 2 RJ45, expandable to 32 modules, 24VDC
Communication protocols	EtherCAT
Local I/O	Locally integrated 8-channel DI, support NPN/PNP input
Transmission rate	100Mbps, full-duplex

Transmission distance	100 meters
PDO data	512 bytes
Scalable number of modules	32
Address mapping	Yes
Bus address settings	EtherCAT specification
Transmission medium	Category 5 twisted pair
Isolation method	Electrically isolated from the field layer
characteristic	RT, Class C compliant, MRP, automatic addressing/topology detection
Alarm function	Diagnostic alarms, process alarms, plug-in and unplug connector alarms
Minimum cycle time	1ms
RT bridge delay	<3usec
Power supply parameters	
Connection	PUSH-IN terminal blocks
No-load current	<350mA
Provides internal system voltage	5VDC
Internal system current is supplied	Max.2A
The load voltage is provided	18V... 28VDC
The maximum current of the load is supplied	10A
Mechanical structure	
Ingress protection	IP20
Rail type Installation method	35mm DIN
Working environment	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
elevation	2000 meters below
Pollution level	Level 2
Immunity	Power cord 2Kv (IEC 61000-4-4)
Overvoltage category	I
EMC anti-interference level	Zone B,IEC61131-2
Vibration resistance	IEC 60068-2-65Hz~8.4Hz, amplitude 3.5 mm, 8.4Hz~150 Hz, acceleration 9.8 m/s2, 100 minutes each in X, Y, Z direction (10 times, 10 minutes each time, 100 minutes in total)

Impact resistance	IEC 60068-2-27, 9 .8m/s2, 11ms, X/Y/Z, 3 times each in 6 directions

2.1.2 Hardware interface

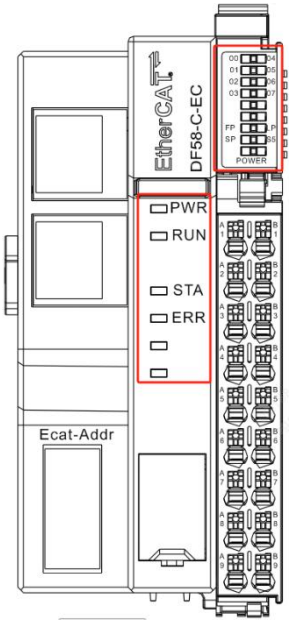
2.1.2.1 Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	DI0	B1	DI4	Digital signal input
A2	DI1	B2	DI5	
A3	DI2	B3	DI6	
A4	DI3	B4	DI7	
A5	COM	B5	COM	DI input on the public side
A6	Field_24V	B6	Field_0V	Load 24V power input
A7	Field_24V	B7	Field_0V	
A8	Sys_24V	B8	Sys_0V	24V power input of the system
A9	PE	B9	PE	Circuit grounding

Note: It is recommended to use two 24V power supplies isolated from each other to provide two power supplies for each coupler to achieve optimal anti-interference performance.

2.1.2.2 LED indicator definition

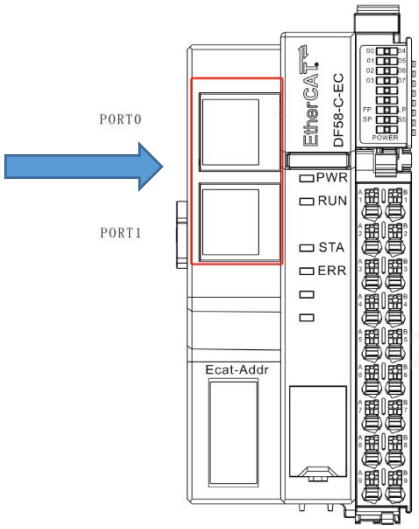


Light	meaning
PWR（green）	Power indicator, PWR indicator lights up when the module is powered normally
RUN (green)	Solid on: The coupler is functioning normally Off: Coupler operation abnormality Flickering: abnormal configuration;
SYS (green)	Illuminated: Communication between coupler and module is normal Off: Abnormal communication between coupler and module
ERR (red)	On: Communication between the coupler and module is abnormal, Off: Normal.
00~07 (green).	Channel input indicator
FP (green)	Green: The load power supply is running normally.
LP (green)	Green: The sensor power supply is operating normally.
SP (green)	Green: The internal system power supply is running normally.
S5 (green)	Green: The internal 5V power supply is running normally.

2.1.2.3RJ45 interface

Used to establish communication with the host computer, the dual RJ45 ports make it easy

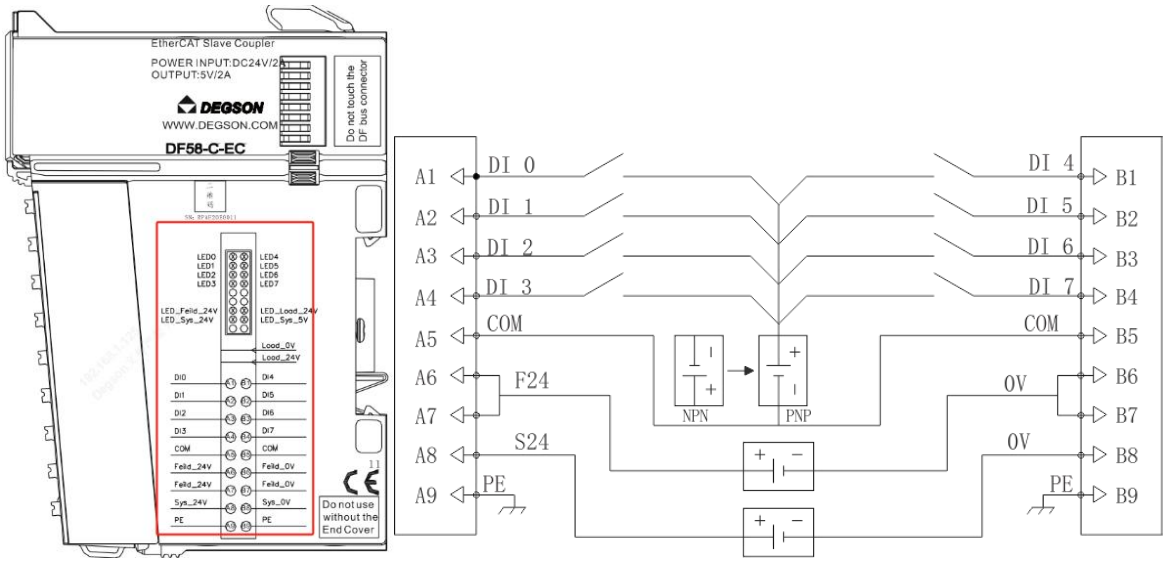
to create a line structure without the need for any additional network components.



2.1.2.4 DIP switch

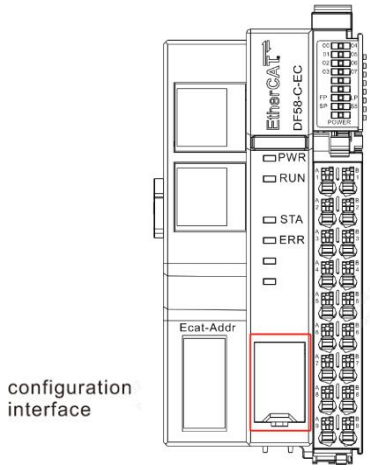
Currently, setting the adapter address is not supported.

2.1.2.5 Wiring diagram



Note: COM is the public side, and the external 24V is used to implement NPN, and the external 0V is connected to PNP.

2.1.2.6 Configure the interface



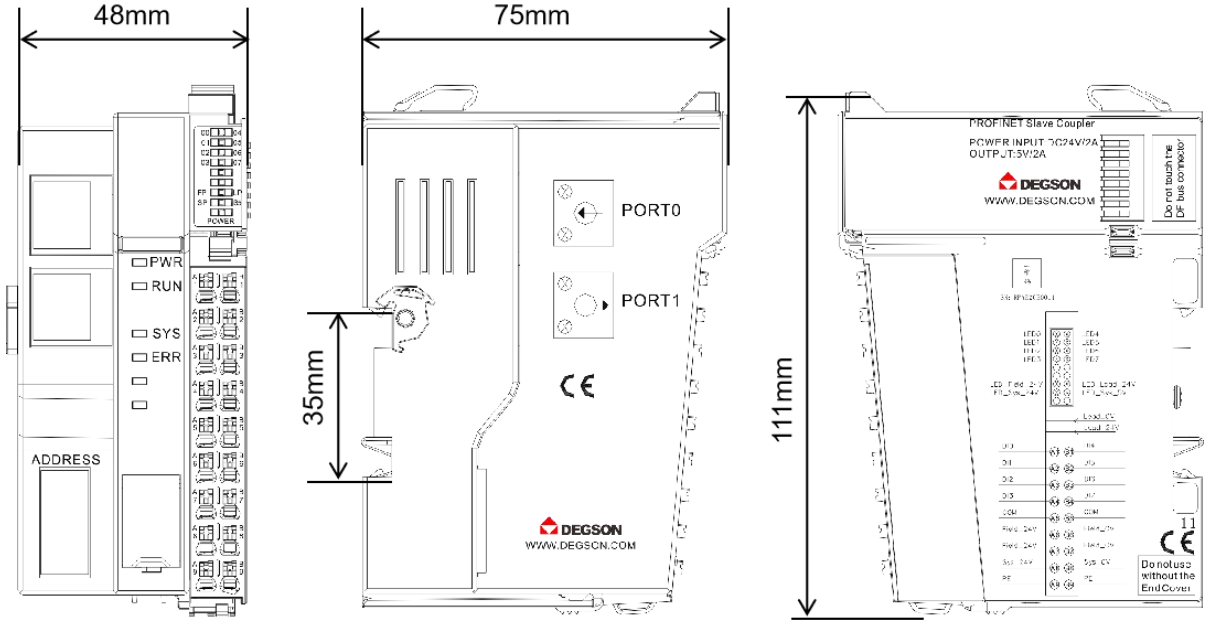
Set the configuration interface to facilitate the program upgrade of the adapter.

Note: Non-professionals and authorized personnel are not allowed to use this interface to avoid procedural problems.

2.1.3 Mechanical installation

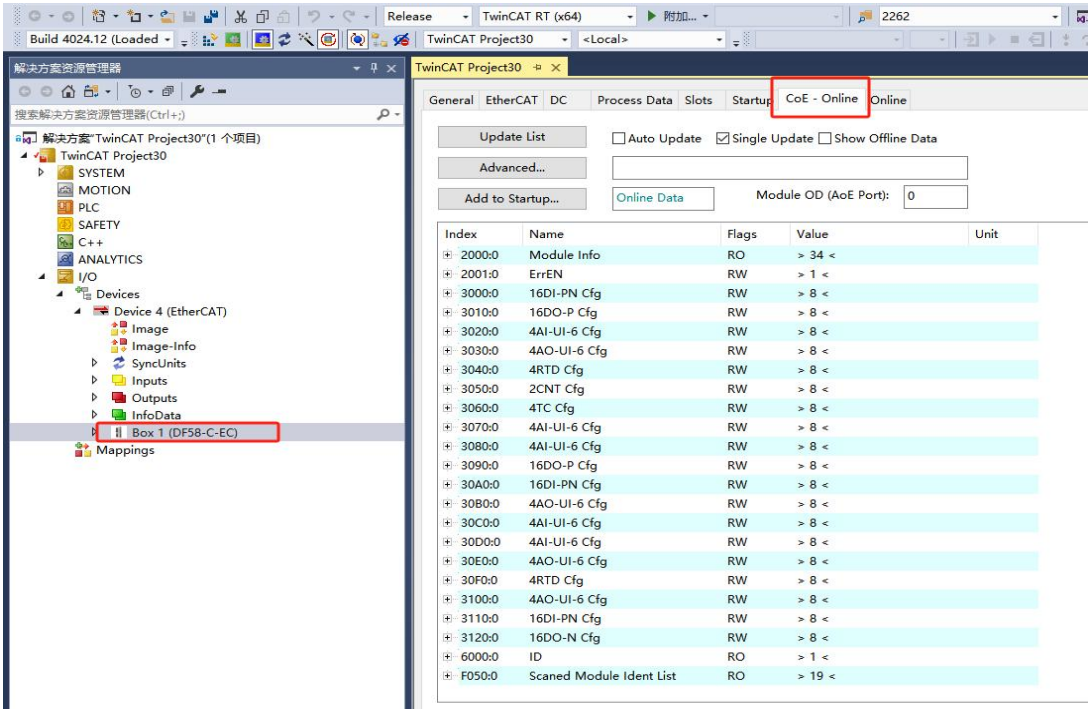
2.1.3.1 Installation dimensions

The installation size information is shown in the figure below, and the unit is (mm).



2.1.4 Module parameters

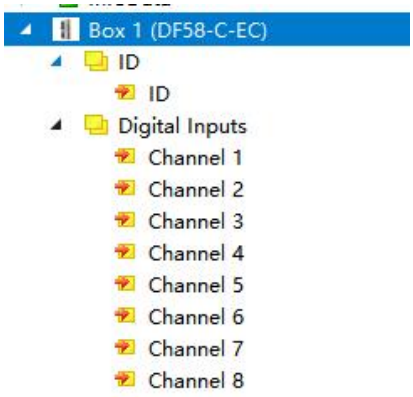
2.1.4.1 COE-Online parameters



index	Subindexes	The name of the parameter	Read and write type	illustrate
0x2000:0 (Modbule info)	0x2000:01	ExtNum	R	The number of expansion modules currently connected to the DF58-C-EC.
	0x2000:02	LcolErr	R	DF58-C-EC Local Fault Display: 0x00: DF58-C-EC is normal. 0x01: indicates that the DF58-C-EC is faulty.
	0x2000:03~0x2000:22	EM1Err~EM32Err	R	Expansion module (slot number 1~32) Fault display: 0x00: indicates that the module with the corresponding slot number is normal. 0x01: indicates the module bus fault of the corresponding slot;
0x2001:0 (Government)	0x2001:01	DO Reaction to ECT bus Err	R/W	The parameters are used to set the action settings of the output channels of

				the digital output module and the analog output module after the coupler EtherCAT communication is disconnected: keep last value: When ECT communication fails, the digital output retains the last output state. Substitute a value(OFF)： When there is an ECT communication fault, the digital output is reset to zero. Substitute a value(ON)：When there is an ECT communication fault, the digital output is set to 1.
0x3000：0 (xxx Cfg)	——	——	R/W	Parameter configuration for the first expansion module (slot 1).
0x3010：0 (xxx Cfg)	——	——	R/W	Parameter configuration for the second expansion module (slot 2).
—— (and so on, with each slot increasing by 0x10)	——	——	R/W	
0x31F0:0	——	——	R/W	Parameter configuration for the 32nd expansion module (slot 32).
6000:0(ID)	6000:01	ID	R	The station address of DF58-C-EC.

2.1.4.2 Address Description



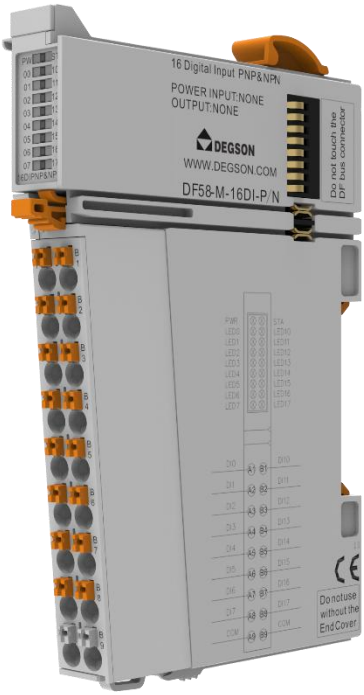
name	illustrate
ID	DF58-C-EC station address
Channel 1	DI0 TO ENTER THE ADDRESS
Channel 2	DI1 ENTER THE ADDRESS
....	....
Channel 8	DI7 ENTER THE ADDRESS

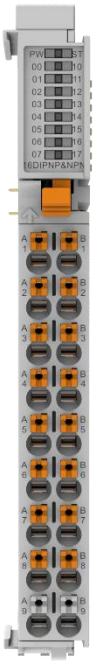
3. Expand the I/O module

function	description	Model
Digital modules	Digital inputs, 16 inputs, PNP/NPN	DF58-M-16DI-P/N
Digital modules	Digital output, 16 output, PNP	DF58-M-16DO-P
Digital modules	Digital outputs, 16 outputs, NPN	DF58-M-16DO-N
Digital modules	Analog input, 4 channels, voltage and current type	DF58-M-4AI-UI-6
Analog Module	Analog output, 4 channels, voltage and current type	DF58-M-4AO-UI-6
Temperature module	RTD measurement, 4 channels	DF58-M-4RTD-PT
Temperature module	Thermocouple measurement, 4 channels	DF58-M-4TC
Temperature module	Thermocouple measurement, 8 channels	DF58-M-8TC
Pulse Counting Module	Encoder input/pulse output, 2 channels	DF58-M-2CNT-PIL-24
Voltage distribution module	Voltage distribution/24VDC to 5VDC	DF58-M-DC-U-5

3.1. 16-channel digital input/24VDC/PNP&NPN (DF58-M-16DI-P/N).

- The digital input module receives control signals from field devices (e.g. sensors, etc.).
- 16 channels of digital input, PNP & NPN active. Public-side translation
- Each input module is equipped with an anti-interference filter.
- Each input module has an LED indicator.
- The field level and the system level are isolated by optocouplers.
- IP20 degree of protection.





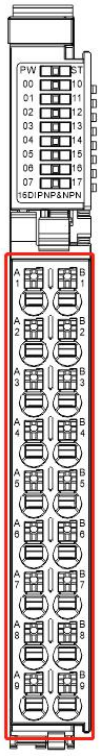
3.1.1. Specifications

Specifications	
Model	DF58-M-16DI-P/N
Product Description:	Digital input module, 16 inputs, NPN+PNP, 24VDC
Signal type	NPN &; PNP
"ON" signal voltage	>15V DC
"OFF" signal voltage	<5V DC
Hardware response time	100us/100us
Number of channels	16
Data size	2 Byte
Connection type	1-wire system, according to IEC 61131-2
Reverse circuit protection	Yes
Isolation method	Photoelectric isolation from the field layer
Error diagnosis	Yes
Signal (0) Input current per channel (typical)	0.678mA
Signal (1) Input current of each channel (typical)	4.07mA
Signal (1) The minimum input current of each channel	2.46mA
Signal (1) The maximum input current of each channel	4.7mA
Filtering time	No filtering, 0.25ms, 0.5ms, 1ms (factory setting), 2ms, 4ms, 8ms, 16ms, 32ms, you can set 2 groups of filtering parameters, a group of 8 channels, and a common filtering parameter within the group
Input impedance	5.6kΩ
Input action display	When the input is in the driving state, the input indicator lights up (the LED is controlled by the IO software of the microcontroller)
Enter the derating	Derating 75% at 55°C (no more than 12 ON input points at the same time) or 10°C at ON input points
IO mapping	Supports bit-by-bit access
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<15mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	

Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

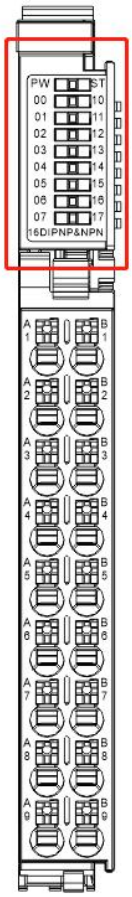
3.1.2. Hardware interface

3.1.2.1. Definition of terminal block



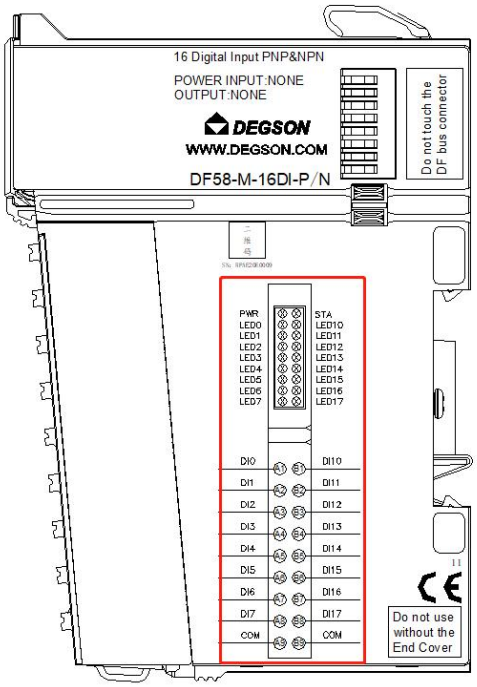
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	DI 0	B1	DI 10	DI signal input
A2	DI 1	B2	DI 11	
A3	DI 2	B3	DI 12	
A4	DI 3	B4	DI 13	
A5	DI 4	B5	DI 14	
A6	DI 5	B6	DI 15	
A7	DI 6	B7	DI 16	
A8	DI 7	B8	DI 17	
A9	COM	B9	COM	Common terminal of DI signal input

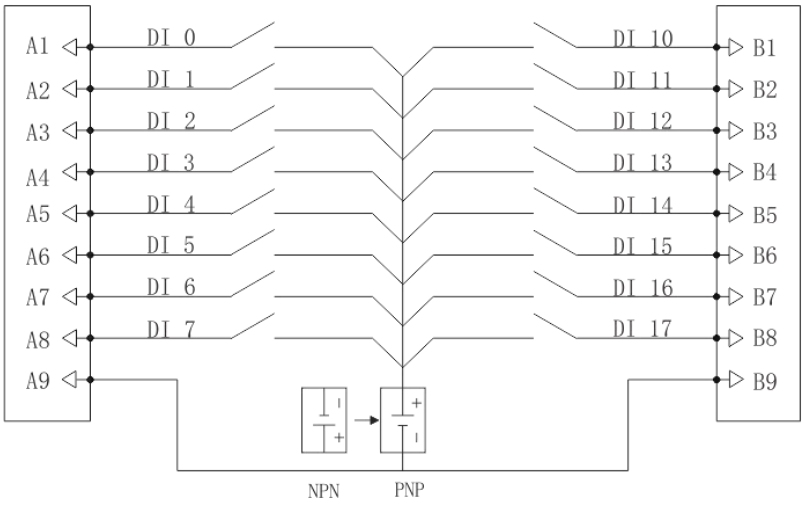
3.1.2.2. LED indicator definition



Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00~07(green)	Input indication of channels DI0~DI7.
10~17(green)	Input indication of channels DI10~DI17.

3.1.2.3. Wiring diagram



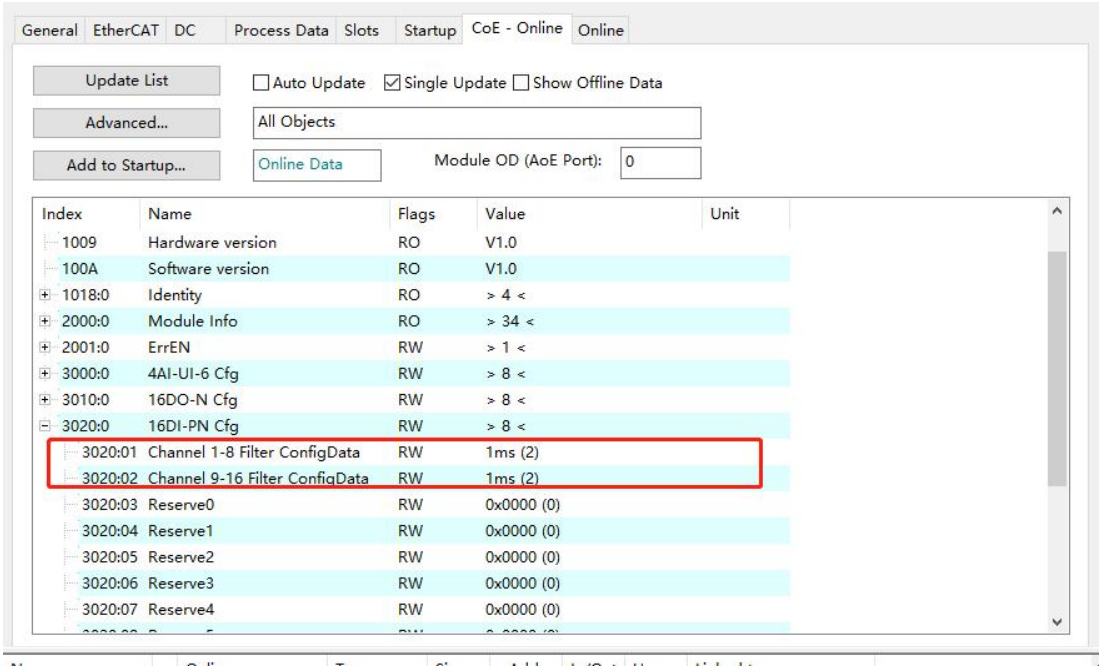


Note: COM is the public side, which is connected to 24V to implement NPN, and external 0V to implement PNP.

3.1.3. Parameter information

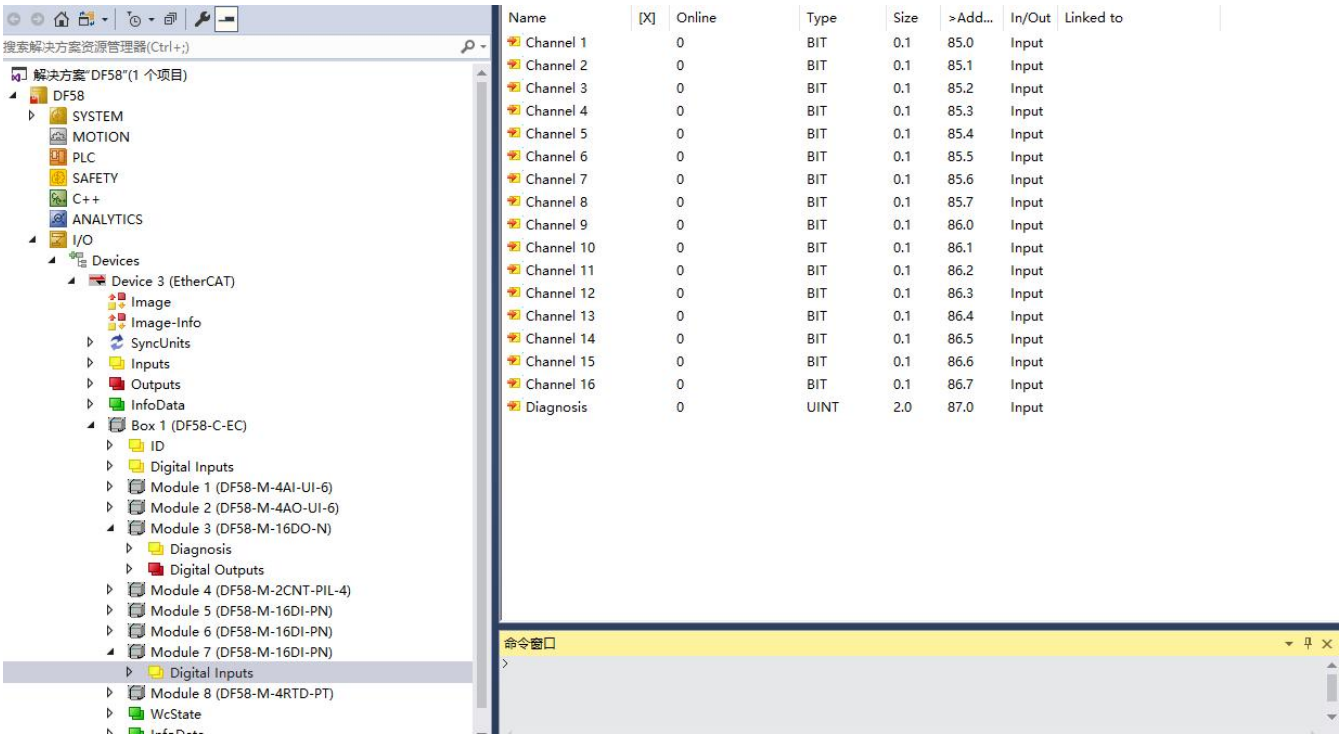
3.1.3.1. Module configuration parameters (COE-Online).

For example, DF58-M-16DI-P/N in the following figure is located in slot 3, the index value is 3020, and the name is 16DI-PN CFG.



The name of the parameter	definition
Channel 1-8 Filter ConfigData	Set channel 1~8 filter parameters: 0：0.25ms； 1：0.5ms； 2: 1ms (factory setting); 3：2ms； 4：4ms； 5：8ms； 6：16ms； 7：32ms。
Channel 9-16 Filter ConfigData	Set channel 9~16 filter parameters: 0：0.25ms； 1：0.5ms； 2: 1ms (factory setting); 3：2ms； 4：4ms； 5：8ms； 6：16ms； 7：32ms。

3.1.3.2. Address Description



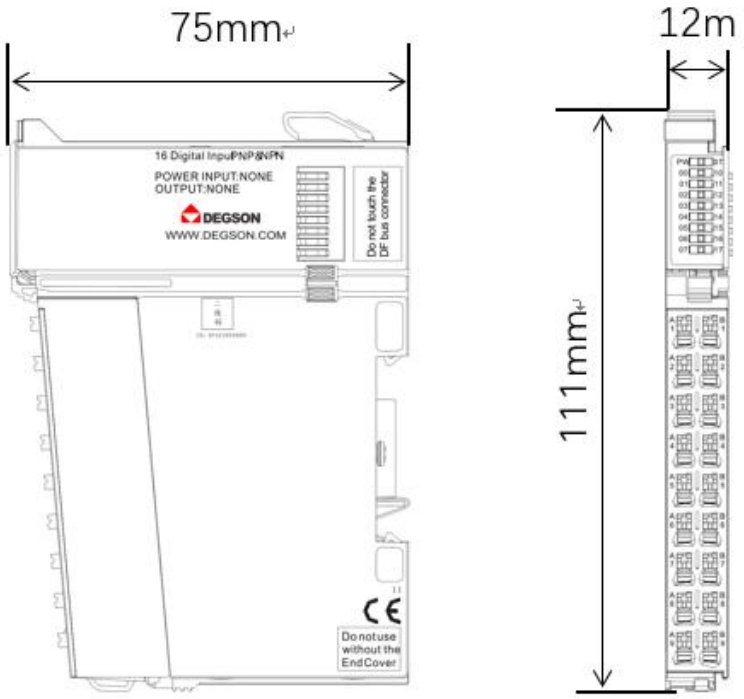
After configuring the DF58-M-16DI-P/N, the data of each address is shown in the following table:

name	illustrate
Channel 1	DI0 address
Channel 2	DI1 address
....	....
Channel 16	DI17 address
Diagnosis	Diagnostic information: 1: Prompts backplane bus fault; 0: normal;

3.1.4. Mechanical installation

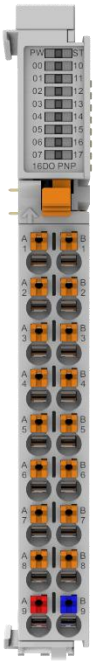
3.1.4.1. Installation dimensions

The installation size information is shown in the figure below, and the unit is (mm).



3.2. 16-channel digital output/24VDC/PNP (DF58-M-16DO-P).

- The digital output module transmits the binary signal of the automation equipment to the connected actuator (solenoid valve, etc.).
- 16 channels of digital output, PNP active high.
- Each output module is equipped with an anti-interference filter.
- Each output module has an LED indicator.
- The field level and the system level are isolated by optocouplers.
- IP20 degree of protection.



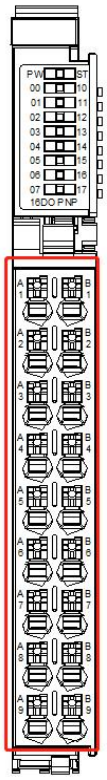
3.2.1. Specifications

Specifications	
Model	DF58-M-16DO-P
Product Description:	Digital output module, 16 outputs, PNP, 24VDC
Signal type	PNP
"OFF" signal voltage	High impedance state
"ON" signal voltage	24V DC
Number of channels	16
Data size	2 Byte
Connection type	1-wire system
Reverse circuit protection	Yes
Overcurrent protection	Yes
Short-circuit protection	Yes
Isolation method	Photoelectric isolation from the field layer
Error diagnosis	Yes
Switching Frequency (Resistive)	100Hz
Switching Frequency (Lamp)	10Hz
Switching Frequency (Inductive)	0.2Hz
The response time of the protection circuit	< 180μs
The maximum output current per channel	500 mA
Leakage current	Maximum: 10uA
Hardware response time	100us/100us
Output impedance	<200mΩ
Output delay	OFF to ON :Max.100us , ON to OFF :Max.150us
Protection features	Overcurrent protection: typical, 1.9A
The type of load	Inductive (7.2W/dot, 24W/module), Resistive (0.5A/dot, 4A/module), Lamp (5W/dot, 18W/module)
The output action is displayed	When the output is in the driving state, the indicator light is on (the LED is controlled by the IO software of the microcontroller)
Enter the derating	Derate by 50% at 55°C (while the output current of ON does not exceed 2A), or 10°C at full ON at the output point
IO mapping	Supports bit-by-bit access
Fault shutdown output state	Clear to zero, keep the current value, and output

mode	according to the preset value
Fault shutdown output preset	0 or 1
Shutdown mode	Output according to the fault shutdown state mode and preset value, no longer refreshed
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<75mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

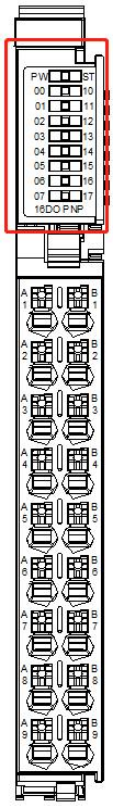
3.2.2. Hardware interface

3.2.2.1. Definition of terminal block



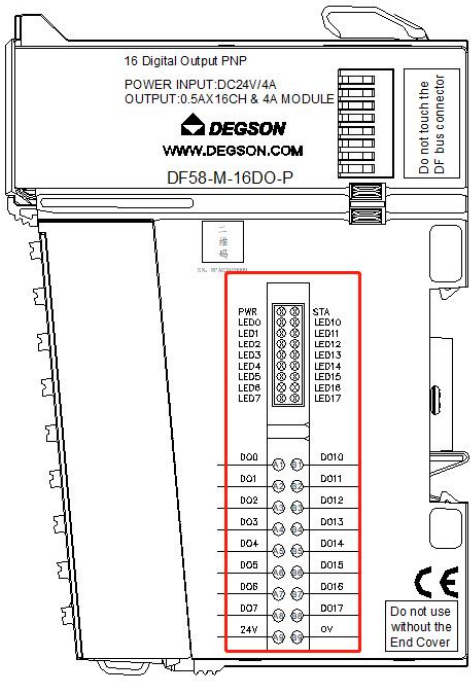
Pin ordinal	signal	Pin ordinal	signal	illustrate
A1	DO 0	B1	DO 10	DO signal output
A2	DO 1	B2	DO 11	
A3	DO 2	B3	DO 12	
A4	DO 3	B4	DO 13	
A5	DO 4	B5	DO 14	
A6	DO 5	B6	DO 15	
A7	DO 6	B7	DO 16	
A8	DO 7	B8	DO 17	
A9	24V	B9	0V	24V power input of the module

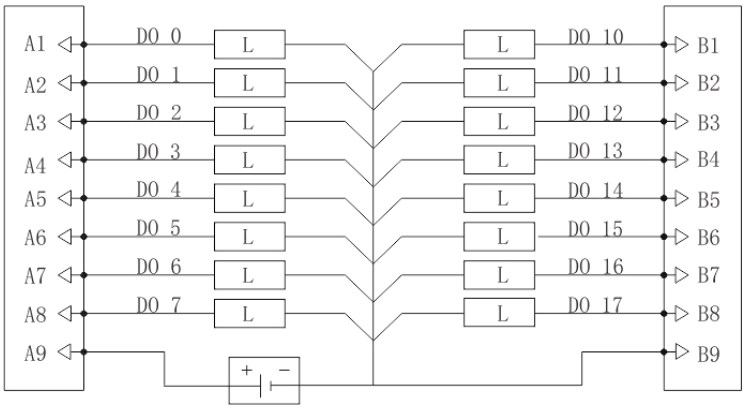
3.2.2.2. LED indicator definition



Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00~07(green)	Channel DO0~DO7 output indicator.
10~17(green)	Channel DO10~DO17 output indicator.

3.2.2.3. Wiring diagram



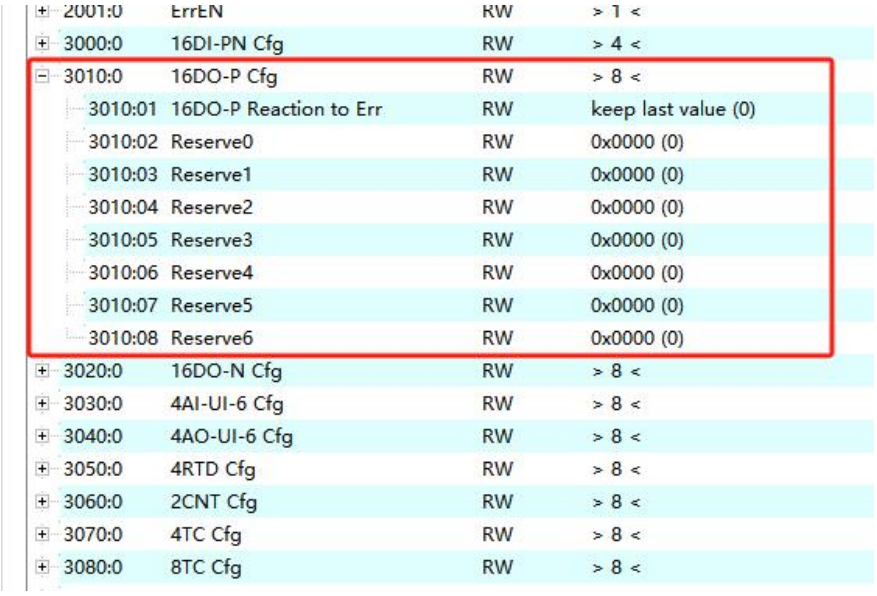


Note: A9 and B9 are connected to 0V power supply and are provided externally.

3.2.3. Module parameters

3.2.3.1. Module configuration parameters (COE-Online).

For example, DF58-M-16DO-P in the following figure is located in slot 2, the index value is "3010", and the name is 16DO-P Cfg:



2001:0	ErrEN	RW	> 1 <
3000:0	16DI-PN Cfg	RW	> 4 <
3010:0	16DO-P Cfg	RW	> 8 <
3010:01	16DO-P Reaction to Err	RW	keep last value (0)
3010:02	Reserve0	RW	0x0000 (0)
3010:03	Reserve1	RW	0x0000 (0)
3010:04	Reserve2	RW	0x0000 (0)
3010:05	Reserve3	RW	0x0000 (0)
3010:06	Reserve4	RW	0x0000 (0)
3010:07	Reserve5	RW	0x0000 (0)
3010:08	Reserve6	RW	0x0000 (0)
3020:0	16DO-N Cfg	RW	> 8 <
3030:0	4AI-UI-6 Cfg	RW	> 8 <
3040:0	4AO-UI-6 Cfg	RW	> 8 <
3050:0	4RTD Cfg	RW	> 8 <
3060:0	2CNT Cfg	RW	> 8 <
3070:0	4TC Cfg	RW	> 8 <
3080:0	8TC Cfg	RW	> 8 <

The name of the parameter	definition
16DO-P Reaction to Err	When the module is abnormal, the output status is as follows: 0：Keep last value, Output retention in case of module abnormality (factory setting) 1：Substitute a value(OFF), When the module is abnormal, the output is reset to zero 2：Substitute a value(ON), When the module is abnormal, output is set to 1

3.2.3.2. Address Description

After configuring the DF58-M-16DO-P, the module is divided into two parts: Diagnosis and Digital Outputs, which are defined as follows.

Diagnosis

name	illustrate
Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault 0: Normal Bit1: 1: Channel 24V is not connected 0: Normal Bit2: 1: There is a short circuit in one of the channels in channel 1~8; 0: Normal Bit3: 1: Channel 9~16 has a short circuit in one of the channels; 0: Normal Bit4~Bit15: Reserve

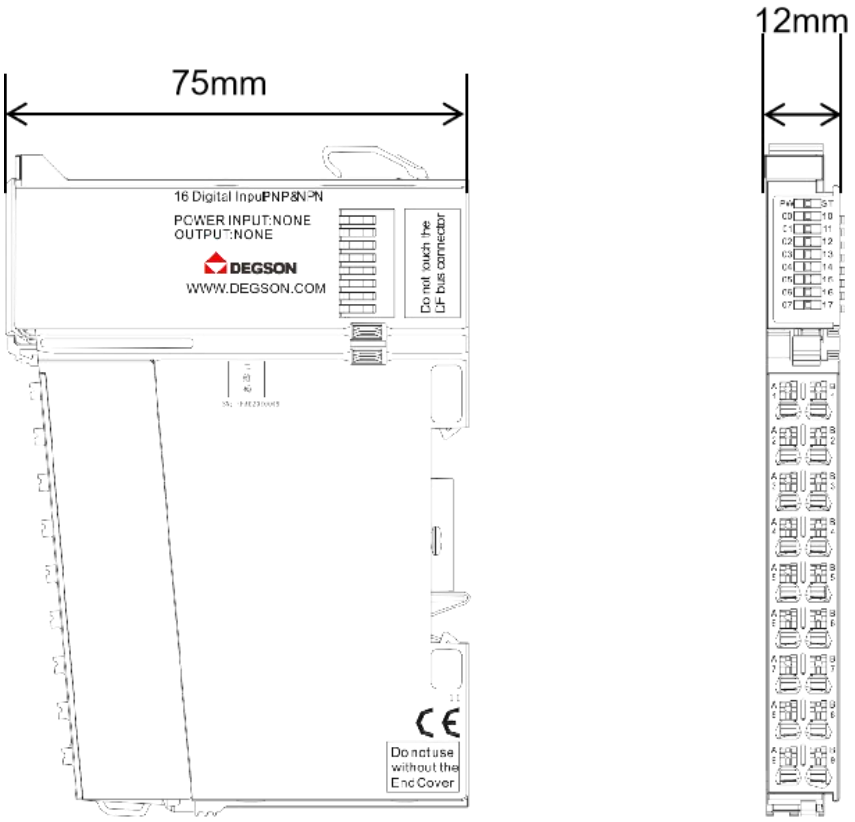
Digital Outputs

name	illustrate
Channel 1	DO0 output address
Channel 2	DO1 output address
....	....
Channel 16	DO17 output address

3.2.4. Mechanical installation

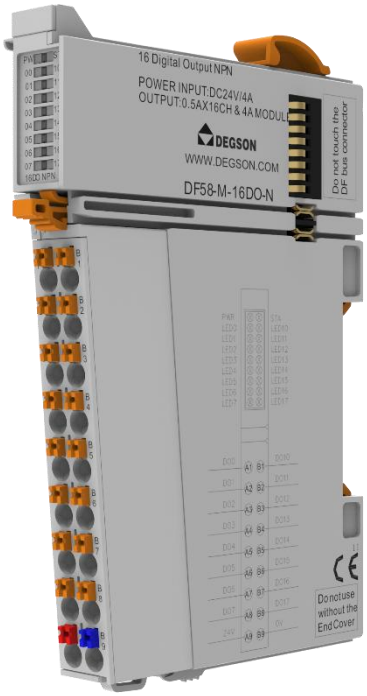
3.2.4.1. Installation dimensions

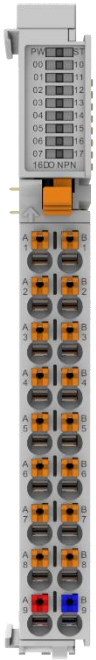
The installation size information is shown in the figure below, and the unit is (mm).



3.3. 16-channel digital output/24VDC/NPN(DF5-M-16DO-N)

- The digital output module transmits the binary signal of the automation equipment to the connected actuator (solenoid valve, etc.).
- 16 channels of digital output, NPN active-low.
- Each output module is equipped with an anti-interference filter.
- Each output module has an LED indicator.
- The field level and the system level are isolated by optocouplers.
- IP20 degree of protection.





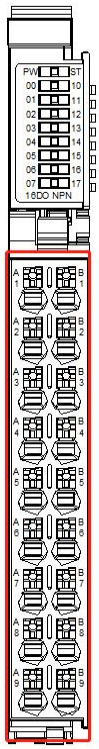
3.3.1. Specifications

Specifications	
Model	DF58-M-16DO-N
Product Description:	Digital output module, 16 outputs, NPN, 24VDC
Signal type	NPN
"OFF" signal voltage	High impedance state
"ON" signal voltage	0V DC
Number of channels	16
Data size	2 Byte
Connection type	1-wire system
Reverse circuit protection	Yes
Overcurrent protection	Yes
Short-circuit protection	Yes
Isolation method	Photoelectric isolation from the field layer
Error diagnosis	Yes
Switching Frequency (Resistive)	100Hz
Switching Frequency (Lamp)	10Hz
Switching Frequency (Inductive)	0.2Hz
The response time of the protection circuit	< 180μs
The maximum output current per channel	500 mA
Leakage current	Maximum: 10uA
Hardware response time	100us/100us
Output impedance	<200mΩ
Output delay	OFF to ON :Max.100us , ON to OFF :Max.150us
Protection features	Overcurrent protection: typical, 1.9A
The type of load	Inductive (7.2W/dot, 24W/module), Resistive (0.5A/dot, 4A/module), Lamp (5W/dot, 18W/module)
The output action is displayed	When the output is in the driving state, the indicator light is on (the LED is controlled by the IO software of the microcontroller)
Enter the derating	Derate by 50% at 55°C (while the output current of ON does not exceed 2A), or 10°C at full ON at the output point
IO mapping	Supports bit-by-bit access
Fault shutdown output state	Clear to zero, keep the current value, and output according to the

mode	preset value
Fault shutdown output preset	0 or 1
Shutdown mode	Output according to the fault shutdown state mode and preset value, no longer refreshed
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<75mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 … 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

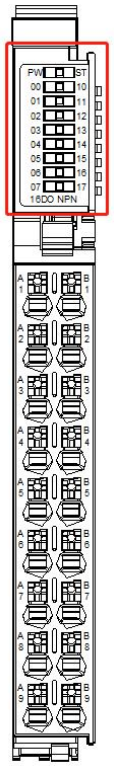
3.3.2. Hardware interface

3.3.2.1. Definition of terminal block



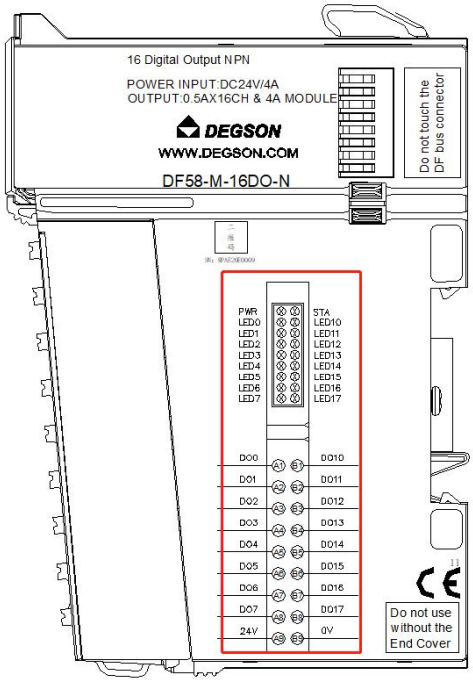
Pin ordinal	signal	Pin ordinal	signal	illustrate
A1	DO 0	B1	DO 10	DO signal output
A2	DO 1	B2	DO 11	
A3	DO 2	B3	DO 12	
A4	DO 3	B4	DO 13	
A5	DO 4	B5	DO 14	
A6	DO 5	B6	DO 15	
A7	DO 6	B7	DO 16	
A8	DO 7	B8	DO 17	
A9	24V	B9	0V	24V power input of the module

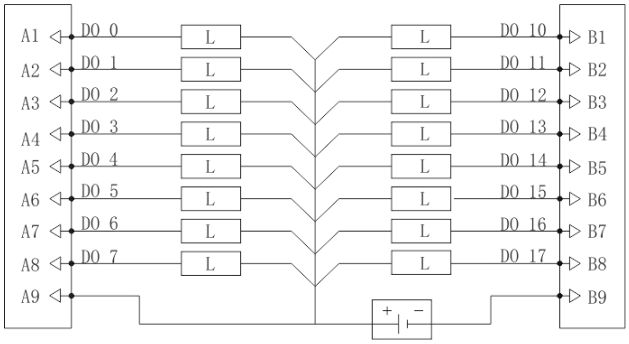
3.3.2.2. LED indicator definition



Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00~07(green)	Channel DO0~DO7 output indicator.
10~17(green)	Channel DO10~DO17 output indicator.

3.3.2.3. Wiring diagram





Note: A9 and B9 are connected to 24V power supply and are provided externally.

3.3.3. Module parameters

3.3.3.1. Module configuration parameters (COE-Online).

For example, DF58-M-16DO-N in the following figure is located in slot number 3, the index value is "3020", and the name is 16DO-N Cfg.

3020:0	16DO-N Cfg	RW	> 8 <
3020:01	16DO-N Reaction to Err	RW	keep last value (0)
3020:02	Reserve0	RW	0x0000 (0)
3020:03	Reserve1	RW	0x0000 (0)
3020:04	Reserve2	RW	0x0000 (0)
3020:05	Reserve3	RW	0x0000 (0)
3020:06	Reserve4	RW	0x0000 (0)
3020:07	Reserve5	RW	0x0000 (0)
3020:08	Reserve6	RW	0x0000 (0)

The name of the parameter	definition
16DO-N Reaction to Err	When the module is abnormal, the output status is as follows: 0：Keep last value, Output retention in case of module abnormality (factory setting) 1：Substitute a value(OFF), When the module is abnormal, the output is reset to zero 2：Substitute a value(ON), When the module is abnormal, output is set to 1

3.3.3.2. Address Description

After configuring the DF58-M-16DO-N, the module is divided into two parts: Diagnosis and Digital Outputs, which are defined as follows.

Diagnosis

name	illustrate
Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault 0: Normal Bit1: 1: Channel 24V is not connected 0: Normal Bit2: 1: Channel 1~4 has a short circuit in one of the channels; 0: Normal Bit3: 1: Channel 5~8 has a short circuit in one of the channels; 0: Normal Bit4: 1: There is a short circuit in one of the channels 9~12; 0: Normal Bit5: 1: Channel 13~16 has a short circuit in one of the channels; 0: Normal Bit6~Bit15: Reserve

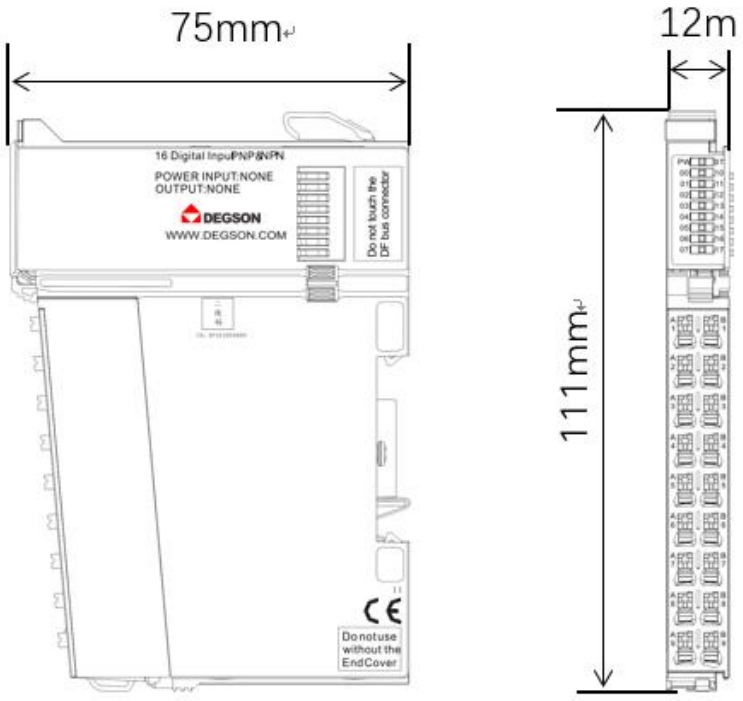
Digital Outputs

name	illustrate
Channel 1	DO0 output address
Channel 2	DO1 output address
....	....
Channel 16	DO17 output address

3.3.4. Mechanical installation

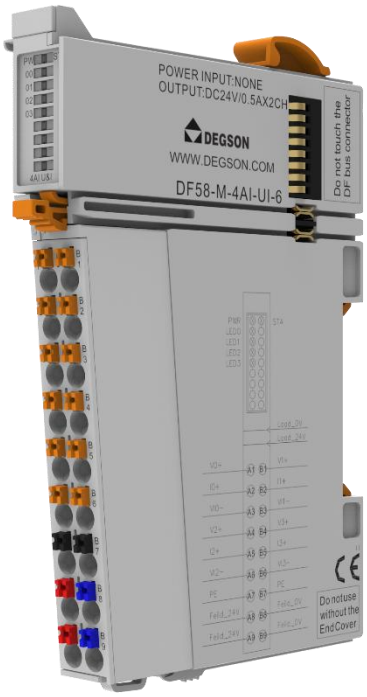
3.3.4.1. Installation dimensions

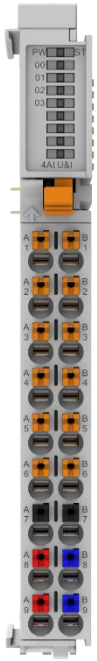
The installation size information is shown in the figure below, and the unit is (mm).



3.4. 4-channel analog input/voltage/current (DF58-M-4AI-UI-6).

- The analog input module receives voltage, current, and standard signals.
- 4-channel analog input, voltage type, current type.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Magnetic isolation between the field layer and the system layer.
- Transmitted in 16-bit resolution.
- IP20 degree of protection





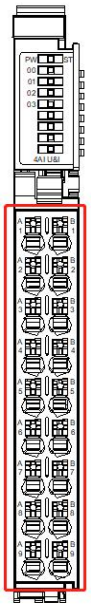
3.4.1. Specifications

Specifications	
Model	DF58-M-4AI-UI-6
Product Description:	Analog input module, 4 inputs, voltage type, current type
Input method	Voltage type, current type
Number of channels	4
Conversion time	400us/channel
Voltage input range	±10V、0-10V、2-10V、±5V、0-5V、1-5V
Voltage input impedance	>100KΩ
Voltage input accuracy (25°C)	±0.1% (full scale)
Voltage input accuracy (over full temperature range)	±0.2% (full scale)
Voltage input limit	±15V
Voltage input diagnostics	Yes
Current input range	±20mA、0-20mA、4-20mA
Current acquisition impedance	250Ω
Current Input Accuracy (25°C)	±0.1% (full scale)
Current Input Accuracy (Full Temperature Range)	±0.2% (full scale)
Current input limit	Instantaneous ± 30mA, average ± 24mA
Current input diagnostics	Disconnection detection is not supported
Whether or not to quarantine	There is no isolation between interface channels, the power supply is isolated from the interface, and the interface is isolated from the bus
Configure the diagnostic escalation function	Support input upper and lower overflow alarm diagnosis and reporting
Conversion mode configuration	±10V, 0-10V, 2-10V, ±5V, 0-5V, 1-5V, ±20mA, 0-20mA, 4-20mA
Filter parameter configuration	The software filtering time can be configured by the host computer, and the setting range is 0-65535, and the unit is the sampling period
Enable overrun detection	Yes
Peak Hold Enable configuration	Yes
Convert digital range configurations	The default configuration ± 32000
Sampling time	4 channels 4ms
Sample refresh	Asynchronous refresh according to the sampling time, and synchronous refresh by bus cycle is not required
Stop mode	Keeps the current value and does not refresh again

Signal type	difference
Data size	8 Byte
resolution	16 Bit
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<120mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

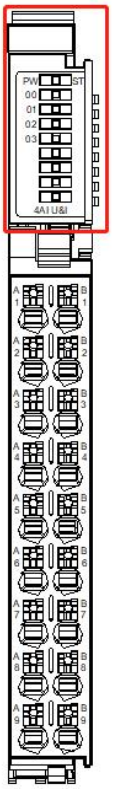
3.4.2. Hardware interface

3.4.2.1. Definition of terminal block



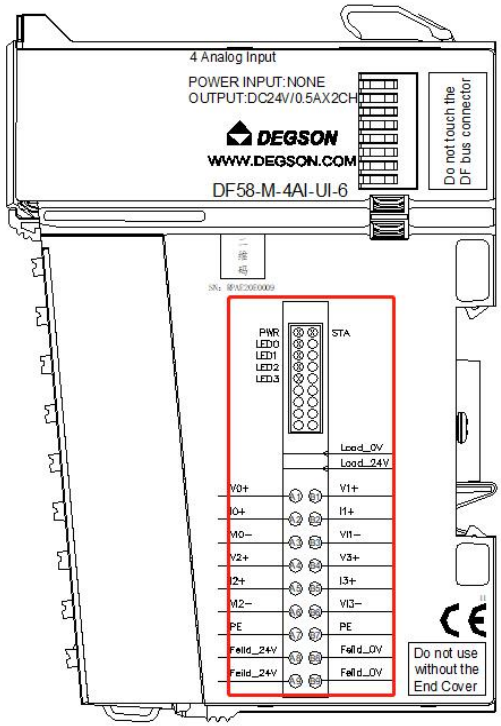
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	V0+	B1	V1+	Positive side of the voltage input channel
A2	I0+	B2	I1+	Current input channel positive
A3	V0-/I0-	B3	V1-/I1-	Negative terminal of voltage/current input
A4	V2+	B4	V3+	Positive side of the voltage input channel
A5	I2+	B5	I3+	Current input channel positive
A6	V2-/I2-	B6	V3-/I3-	Negative terminal of voltage/current input
A7	PE	B7	PE	Earth
A8	Load 24V	B8	Load 0V	24V power output
A9	Load 24V	B9	Load 0V	24V power output

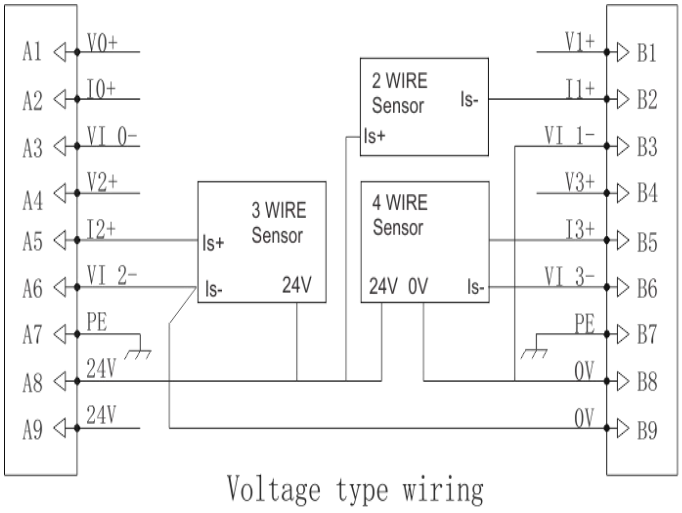
3.4.2.2. LED indicator definition



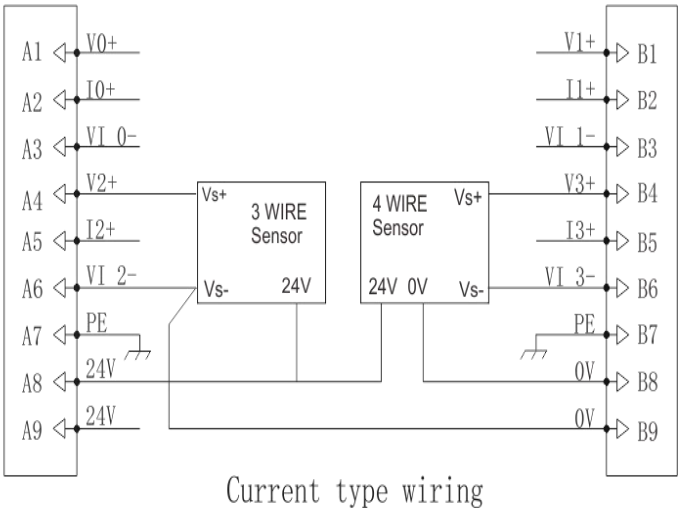
Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
LED0~LED3	No effect

3.4.2.3. Wiring diagram





Voltage type wiring



Current type wiring

3.4.3. Module parameters

3.4.3.1. Module Configuration Parameters (COE-Online)

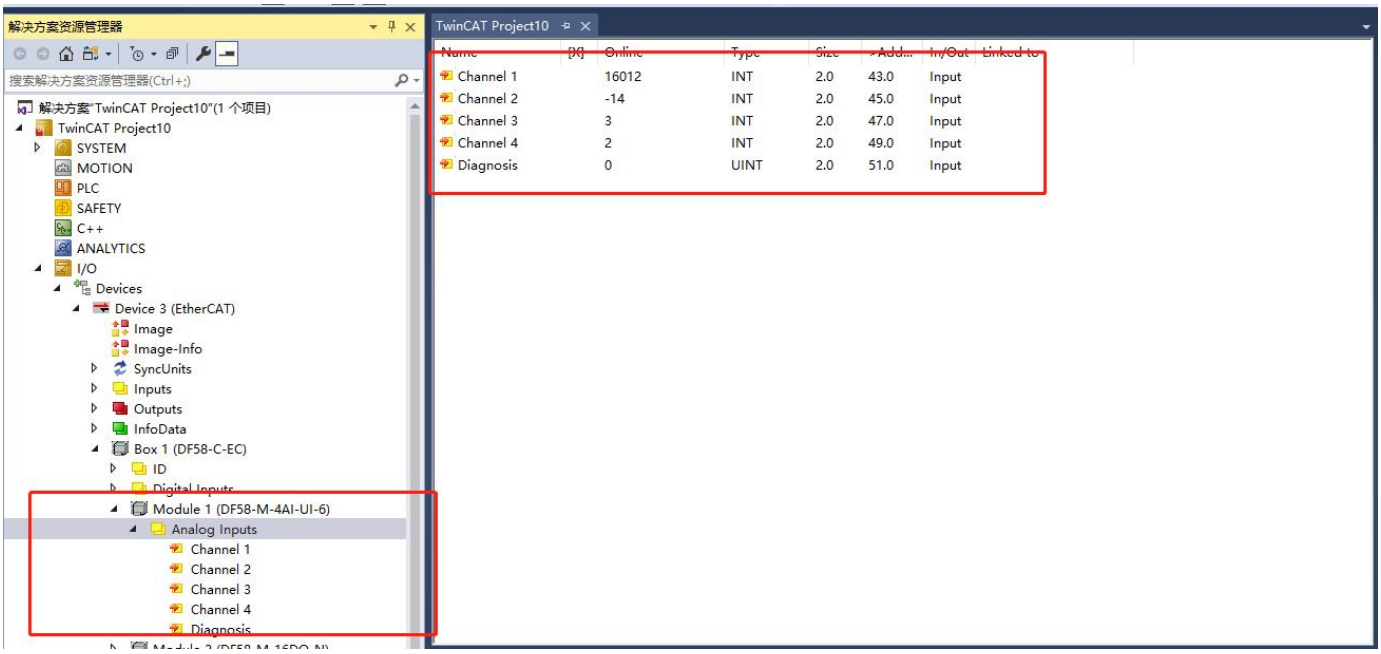
For example, DF58-M-4AI-UI-6 in the following figure is located in slot 1, the index value is 3000, and the name is 4AI-UI-6 Cfg.

3000:0	4AI-UI-6 Cfg	RW	> 8 <
3000:01	Reserve0	RW	0x0000 (0)
3000:02	4AI-UI-6 Range Type	RW	32000 (0)
3000:03	4AI-UI-6 Channel 0 ConfigData	RW	±10V (0)
3000:04	4AI-UI-6 Channel 1 ConfigData	RW	±10V (0)
3000:05	4AI-UI-6 Channel 2 ConfigData	RW	±10V (0)
3000:06	4AI-UI-6 Channel 3 ConfigData	RW	±10V (0)
3000:07	Reserve1	RW	0x0000 (0)
3000:08	Reserve2	RW	0x0000 (0)

The name of the parameter	definition
4AI-UI-6 Range Type	Set the range of range: fixed 32000 range;
4AI-UI-6 Channel 0 configData	Configure the input voltage/current range of channel 1 via the drop-down box: 0:-10-10VDC(Factory settings); 1:0-10VDC; 2:2-10VDC; 3:-5-5VDC; 4:0-5VDC; 5:1-5VDC; 6:-20-20ma; 7:0-20ma; 8:4-20ma;
4AI-UI-6 Channel 1 configData	Configure the input voltage/current range of channel 2 via the drop-down box: 0:-10-10VDC(Factory settings); 1:0-10VDC; 2:2-10VDC; 3:-5-5VDC; 4:0-5VDC; 5:1-5VDC; 6:-20-20ma; 7:0-20ma; 8:4-20ma;
4AI-UI-6 Channel 2 configData	Configure the input voltage/current range of channel 3 via the drop-down box: 0:-10-10VDC(Factory settings); 1:0-10VDC; 2:2-10VDC; 3:-5-5VDC; 4:0-5VDC; 5:1-5VDC; 6:-20-20ma; 7:0-20ma;

	8:4-20ma;
4AI-UI-6 Channel3 configData	Configure the input voltage/current range of channel 4 via the drop-down box: 0:-10-10VDC(Factory settings; 1:0-10VDC; 2:2-10VDC; 3:-5-5VDC; 4:0-5VDC; 5:1-5VDC; 6:-20-20ma; 7:0-20ma; 8:4-20ma;

3.4.3.2. Address Description



After the DF58-M-4AI-UI-6 is configured, the data of each address is shown in the following table:

Digital Inputs

name	illustrate
Channel 1	Channel 1 enters the address
Channel 2	Enter the address in channel 2
Channel 3	Enter the address for channel 3
Channel 4	Channel 14 input address
Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault;0: Normal; Bit1: reserved; Bit2: 1: overflow on channel 1;0: normal; Bit3: 1: overflow under channel 1;0: normal; Bit4: 1: overflow on channel 2;0: normal; Bit5: 1: overflow under channel 2;0: normal; Bit6: 1: overflow on channel 3;0: normal; Bit7: 1: overflow under channel 3;0: normal; Bit8: 1: overflow on channel 4;0: normal; Bit9: 1: overflow under channel 4;0: normal; Bit10~Bi0t15: Reserve;

3.4.3.3. Process data definition

Enter the voltage process parameters (Table 1) and use the voltage (±10V) range as an example to define the process data. Rated voltage range: The voltage of the input channel is -10V~10V, and the monitored channel value is -32000~32000.

Exceeding the upper limit: The voltage of the input channel is (10V+0.3617mV)~10.12V, and the

monitored channel value is 32001~32384. Overflow: The voltage of the input channel is greater than 10.12V, and the monitored channel value is 32767.

Exceeding the upper limit: The voltage of the input channel is (-10V-0.3617mV)~-10.12V, and the monitored channel value is -32001~-32384.

Overflow: The voltage of the input channel is less than -10.12V, and the monitored channel value is -32768.

Table 1 Process data definition (voltage type)

Process Data Definition (Voltage Type)								
Voltage (0-5V)	Voltage (1-5V)	Voltage (0-10V)	Voltage (2-10V)	voltage (±5V)	voltage (±10V)	decimal	hexadecimal	
>5.06	>5.06	>10.12	>10.12	>5.06	>10.12	32767	0x7FFF	Overflow
5.06	5.06	10.12	10.12	5.06	10.12	32384	0x7E80	Super Upper Limit
5V+0.15625mV	5V+0.15625mV	10V+0.3125mV	10V+0.3125mV	5V+0.15625mV	10V+0.3125mV	32001	0x7D01	
5	5	10	10	5	10	32000	0x7D00	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
2.5	3	5	6	2.5	5	16000	0x3600	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	Rated range
0	1	0	2	0	0	0	0x0000	
/	/	/	/	-	-	-	-	
/	/	/	/	-	-	-	-	
/	/	/	/	-2.5	-5	-16000	0xC180	
/	/	/	/	-	-	-	-	
/	/	/	/	-	-	-	-	
/	/	/	/	-5	-10	-320	0x8300	

						00		
/	/	/	/	-5V-0.15625mV	-10V-0.3125mV	-32001	0x82FF	Ultra-lower limit
/	/	/	/	-5.06	-10.12	-32384	0x8180	
/	<0.3	/	<0.59	<-5.06	<-10.12	-32768	0x8001	Hypolympation

Enter the current process parameters (Table 2) and take the current (4~20mA) as an example to define the process data. Rated voltage range: the current of the input channel is 4~20mA, and the monitored channel value is 0~32000. Exceeding the upper limit: When the current of the input channel is 20.005mA~22.81mA, the channel value is 32001~32511.

Overflow: The current of the input channel is greater than 22.81mA, and the monitored channel value is 32767.

Ultra-lower limit: the current of the input channel is 3.9995mA~1.1852mA, and the monitored channel value is -1~-4864;

Underflow: The current of the input channel is less than 1.1852mA, and the monitored channel value is -32768.

Table 2 Process data definition (current type)

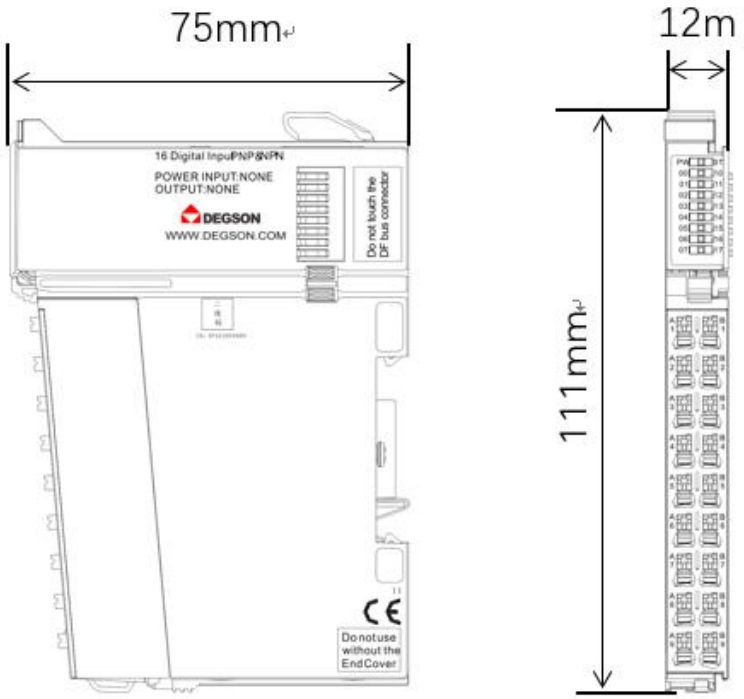
Process Data Definition (Current)					
Current (0-20mA)	Current (-20-20mA)	Current (4-20mA)	decimal	hexadecimal	
>20.32	>20.32	>20.32	32767	0x7FFF	Overflow
20.32	20.32	20.32	32511	0x7EFF	Super Upper Limit
-	-	-	-	-	
-	-	-	-	-	
20.0006	20.0006	20.0005	32001	0x7D01	

20	20	20	32000	0x7D00	Rated range
-	-	-	-	-	
-	-	-	-	-	
10	10	12	16000	0x3E80	
-	-	-	-	-	
-	-	-	-	-	
0	0	4	0	0x0000	
<0.0	<0.0	3.9995	-1	0xFFFF	Ultra-lower limit
-	-	-	-	-	
-	-	-	-	-	
-	-20.32	1.1852	-5630(4~20mA) -32511(-20~20 mA)	0xEA02(4~20mA) 0x8101(-20~20 mA)	
/	<-20.32	<1.1852	-32768	0x8001	Hypolympation

3.4.4. Mechanical installation

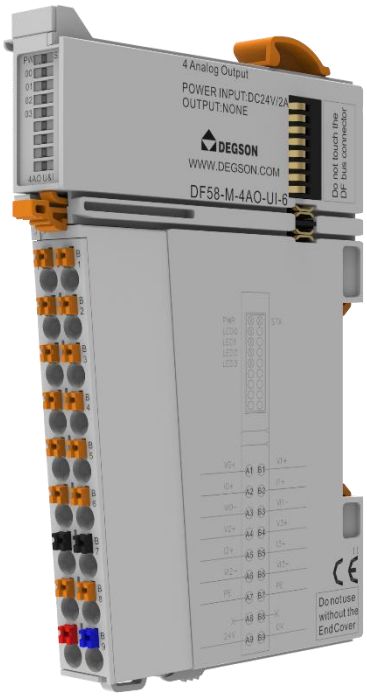
3.4.4.1. Installation dimensions

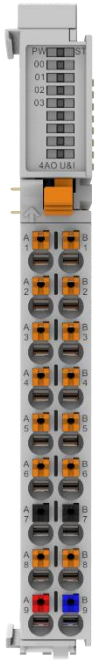
The installation size information is shown in the figure below, and the unit is (mm).



3.5. 4-channel analogue output/voltage/current (DF58-M-4AO-UI-6).

- The analog output module receives output voltage and current standard signals.
- 4-channel analog output, voltage and current type.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Magnetic isolation between the field layer and the system layer.
- Transmitted in 16 resolutions.
- IP20 degree of protection.





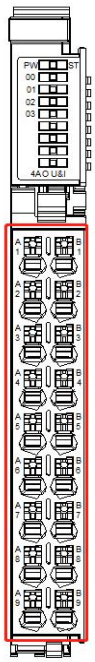
3.5.1. Specifications

Specifications	
Model	DF58-M-4AO-UI-6
type	Analog output
Measuring range	Voltage, current
Number of channels	4
resolution	16 Bit
Conversion time	3ms/channel
Voltage output range	±10V、0-10V、2-10V、±5V、0-5V、1-5V
Voltage output load	1KΩ
Voltage output accuracy (25°C)	±0.1% (full scale)
Voltage output accuracy (over full temperature range)	±0.5% (full scale)
Current output range	±20mA、0-20mA、4-20mA
Current output load	0-600Ω
Current Output Accuracy (25°C)	±0.1% (full scale)
Current Output Accuracy (Full Temperature Range)	±0.5% (full scale)
Whether or not to quarantine	There is no isolation between interface channels, the power supply is isolated from the interface, and the interface is isolated from the bus
Configure the diagnostic escalation function	Yes
Conversion mode configuration	±10V, 0-10V, 2-10V, ±5V, 0-5V, 1-5V, ±20mA, 0-20mA, 4-20mA
Output status configuration after shutdown	Clear, keep current output, output preset value
Output preset value configuration after shutdown	Yes
Convert digital range configurations	Fixed range ± 32000
Stop mode	Output according to the fault shutdown state mode and preset value, no longer refreshed
Signal type	difference
Data size	8 Byte
Error diagnosis	YES
The type of load	Sensual, resistive, capacitive
Protection current	20mA
Temperature coefficient	<20 ppm

Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<110mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 … 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

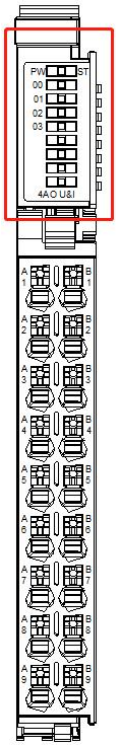
3.5.2. Hardware interface

3.5.2.1. Definition of terminal block



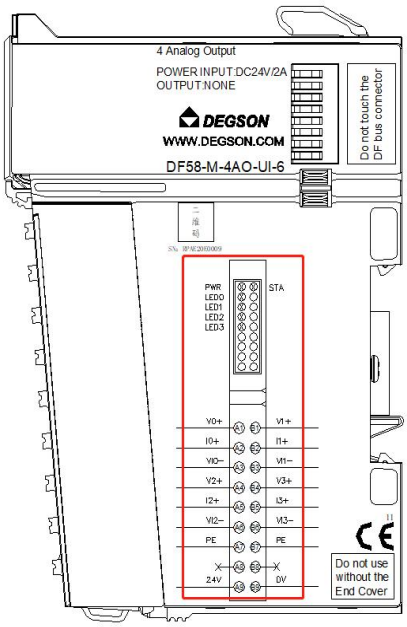
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	V0+	B1	V1+	The positive pole of the voltage output channel
A2	I0+	B2	I1+	The current output channel is positive
A3	V0-/I0-	B3	V1-/I1-	Negative terminal at voltage/current output
A4	V2+	B4	V3+	The positive pole of the voltage output channel
A5	I2+	B5	I3+	The current output channel is positive
A6	V2-/I2-	B6	V3-/I3-	Negative terminal of voltage/current input
A7	PE	B7	PE	Earth
A8	\	B8	\	\
A9	Load 24V	B9	Load 0V	24V power input of the module

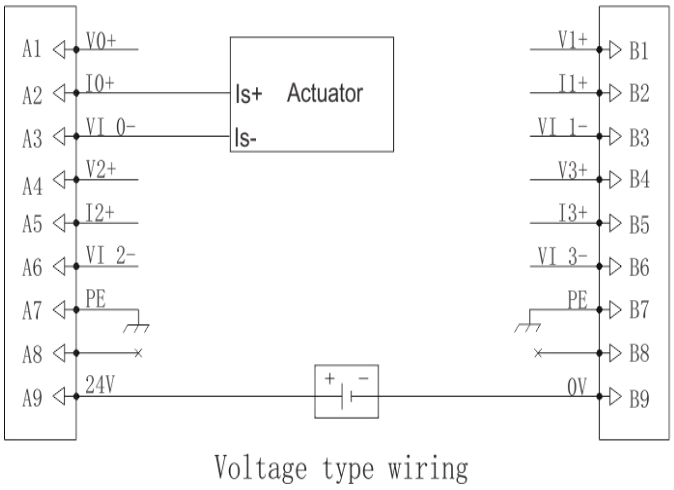
3.5.2.2. LED indicator definition



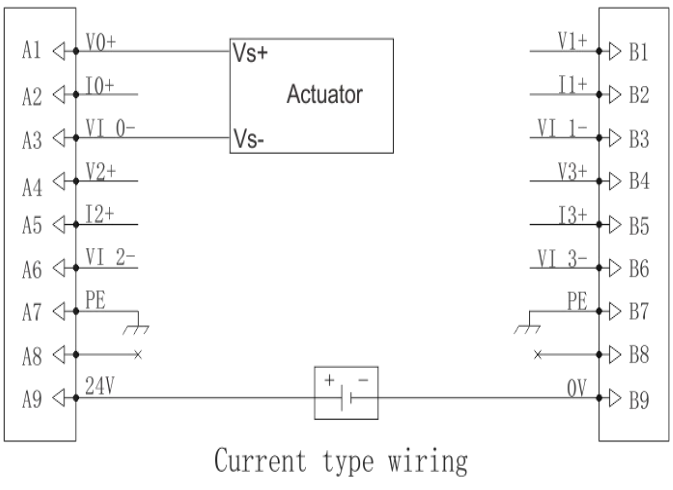
Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.

3.5.2.3. Wiring diagram





Voltage type wiring

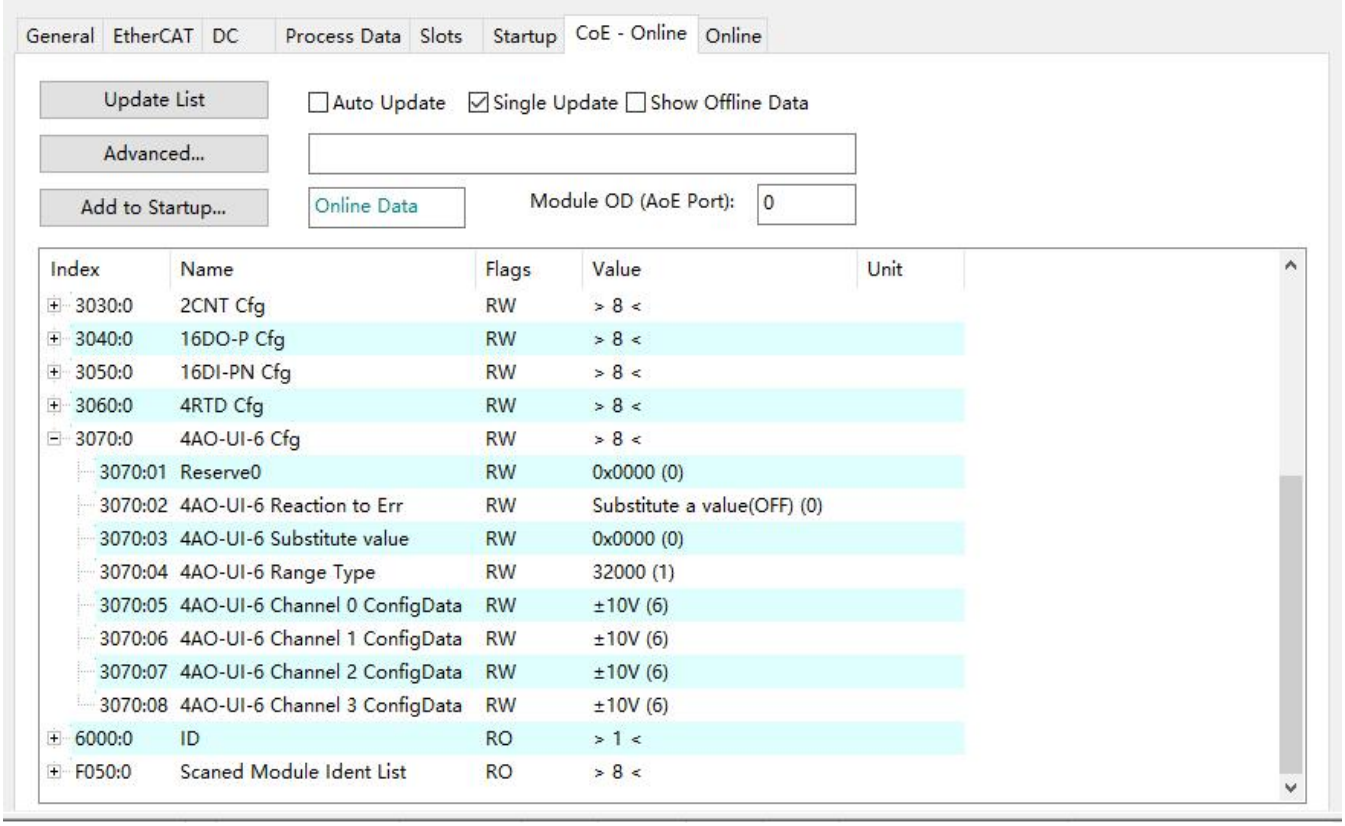


Current type wiring

3.5.3. Module parameters

3.5.3.1. Module Configuration Parameters (COE-Online)

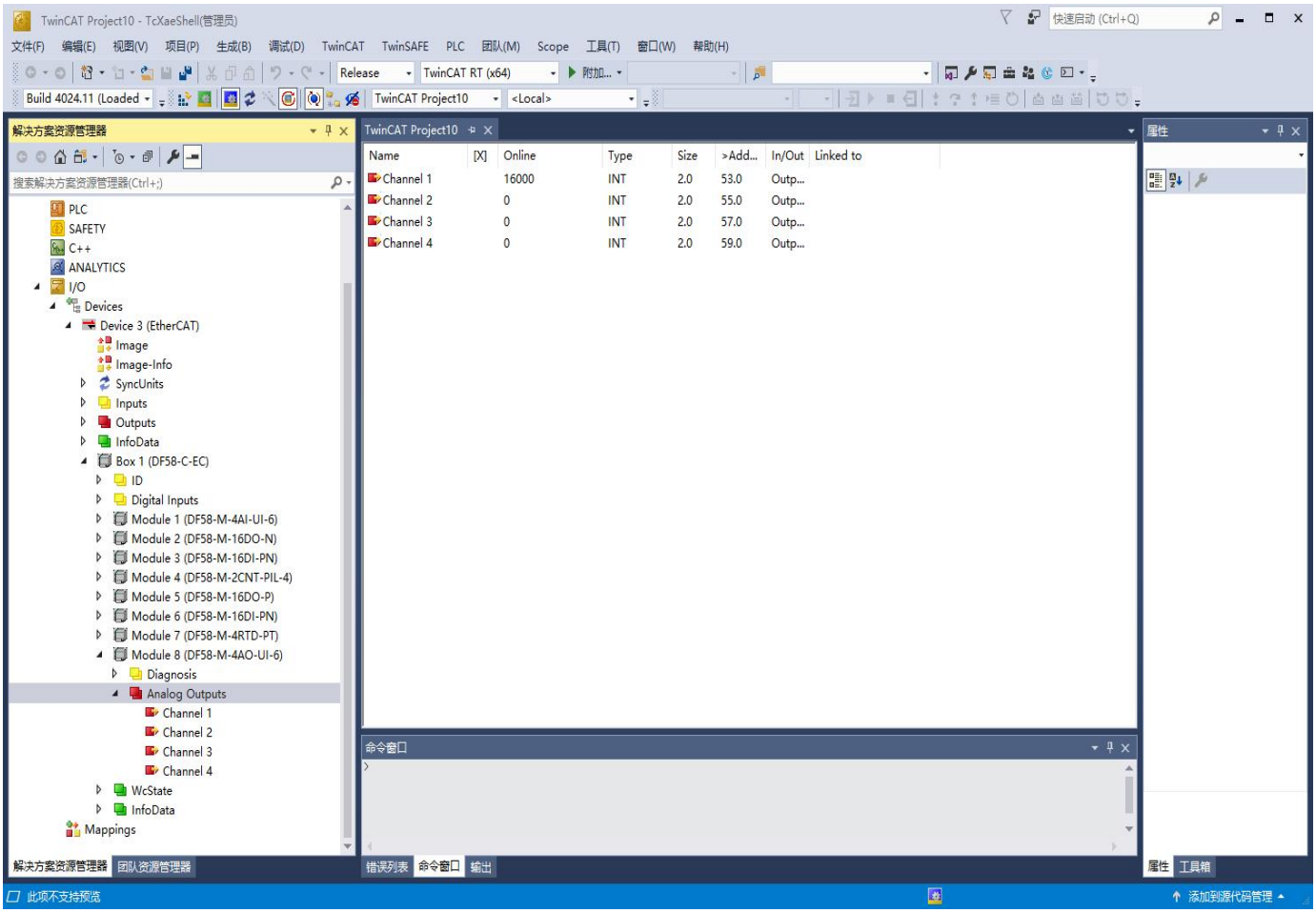
For example, DF58-M-4AO-UI-6 in the following figure is located in slot 8, the index value is 3070, and the name is 4AO-UI-6 Cfg.



The name of the parameter	definition
4AO-UI-6 Reaction to Err	0：Substitute a value(OFF)：When the module fails, the analog output is reset to zero. (Factory settings) 1: Keep last value: The analog output remains in the last output state when the module fails. 2：Substitute a value: When the module malfunctions, the analog output is preset.
4AO-UI-6 Substitute value	Output presets
4AO-UI-6 Range Type	The range of setting range is: fixed 32000 range;
4AO -UI - 6 Channel 0 ConfigData	Configure the output voltage/current range of channel 1: 0:DISABLE; 1:0-5VDC; 2:1-5VDC; 3:-5-5VDC; 4:0-10VDC; 5:2-10VDC; 6:-10-10VDC (Factory settings); 7:0-20mA; 8:4-20mA;
4AO-UI-6 Channel 1 ConfigData	Configure the output voltage/current range of channel 2: 0:DISABLE; 1:0-5VDC; 2:1-5VDC; 3:-5-5VDC; 4:0-10VDC; 5:2-10VDC; 6:-10-10VDC (Factory settings); 7:0-20mA; 8:4-20mA;
4AO -UI - 6 Channel 2 ConfigData	Configure the output voltage/current range of channel 3: 0:DISABLE; 1:0-5VDC; 2:1-5VDC;

The name of the parameter	definition
	3:-5-5VDC; 4:0-10VDC; 5:2-10VDC; 6:-10-10VDC (Factory settings); 7:0-20mA; 8:4-20mA;
4AO - UI - 6 Channel 3 ConfigData	Configure the output voltage/current range of channel 4: 0:DISABLE; 1:0-5VDC; 2:1-5VDC; 3:-5-5VDC; 4:0-10VDC; 5:2-10VDC; 6:-10-10VDC (Factory settings); 7:0-20mA; 8:4-20mA;

3.5.3.2. Address Description



After the DF58-M-4AO-UI-6 is configured, the module is divided into two parts: Diagnosis and Digital Outputs, which are defined as follows.

Diagnosis

name	illustrate

Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault; 0: Normal. Bit1： 1: 24V is not connected; 0: Normal. Bit3~Bit15：Reserved.

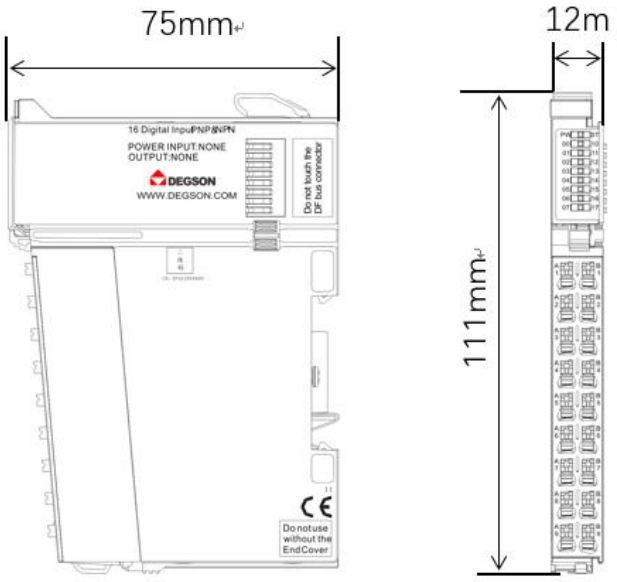
Digital Outputs

name	illustrate
Channel 1	Channel 1 output address
Channel 2	Channel 2 output address
Channel 3	Channel 3 output address
Channel 4	Channel 4 output address

3.5.4. Mechanical installation

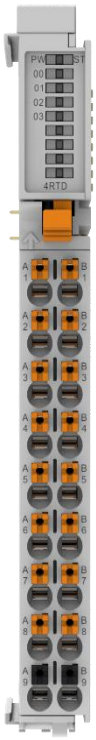
3.5.4.1. Installation dimensions

The installation size information is shown in the figure below, and the unit is (mm).



3.6. 4-channel RTD measurement (DF58-M-4RTD-PT).

- The module uses 4-channel RTD measurement and supports 13 conventional RTDs.
- Quad sensor support
- Support 2-wire, 3-wire, 4-wire sensors.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Each channel has an LED indicator.
- Magnetic isolation between the field layer and the system layer.
- Transmitted in 16 resolutions.
- IP20 degree of protection.



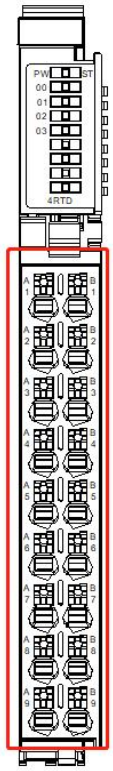
3.6.1. Specifications

Specifications	
Model	DF58-M-4RTD-PT
Product Description:	RTD measurement module, 16-bit resolution, 4 channels
Measuring range	RTD
Number of channels	4
Signal type	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni 200, Ni500, Ni1000, Cu10.40 Ω, 80 Ω, 150 Ω,300 Ω, 500 Ω.1kΩ, 2kΩ, 4kΩ
Temperature range	depending on the sensor type 0.1mA (Pt100, Ni100, Ni120, Cu10, 40 Ω, 80 Ω, 150 Ω, 300 Ω) or 0.1mA (Pt200, Pt500, Pt1000, Ni200, Ni500, Ni1000, 500 Ω,1kΩ, 2kΩ, 4kΩ)
precision	max. 0.2 % FSR / 0.3 % FSR for Ni sensors / 0.6 % FSR for Cu10
Sensor current	depending on the sensor type 0.1mA (Pt100, Ni100, Ni120, Cu10, 40 Ω, 80 Ω, 150 Ω, 300 Ω) or 0.1mA (Pt200, Pt500, Pt1000, Ni200, Ni500, Ni1000, 500 Ω, 1kΩ, 2kΩ, 4kΩ)
Connection type	2/3/4 wire
Temperature coefficient	±50 ppm/K max.
Reverse polarity protection	support
Module diagnostics	support
Single-channel diagnostics	support
Isolation method	Each channel is magnetically isolated from the field layer and isolated between channels
Data size	8 Byte
Internal resistance	>500KΩ
resolution	16bit, 0.1 ℃/16bit per digit
diagnosis	Disconnection / Parameter assignment error
Process alarms	Upper/lower limit per channel
Conversion time	s/4 channels
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<100mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Working environment	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃

relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

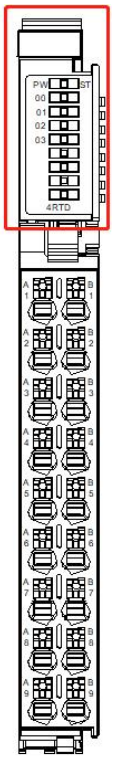
3.6.2. Hardware interface

3.6.2.1. Definition of terminal block



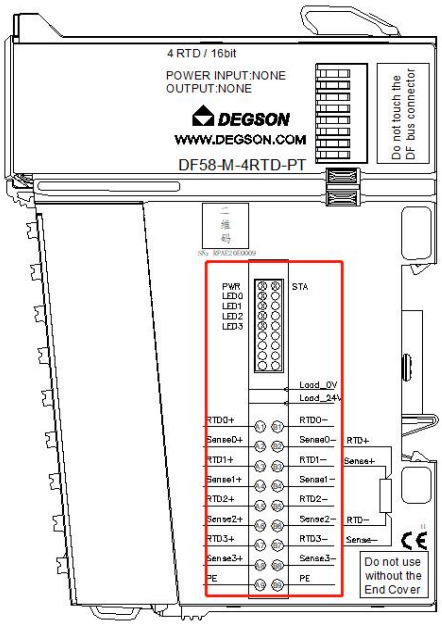
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	RTD0+	B1	RTD0-	RTD signal input channel 1
A2	Sense0+	B2	Sense0-	
A3	RTD1+	B3	RTD1-	RTD signal input channel 2
A4	Sense1+	B4	Sense1-	
A5	RTD2+	B5	RTD2-	RTD signal input channel 3
A6	Sense2+	B6	Sense2-	
A7	RTD3+	B7	RTD3-	RTD signal input channel 4
A8	Sense3+	B8	Sense3-	
A9	PE	B9	PE	Earth

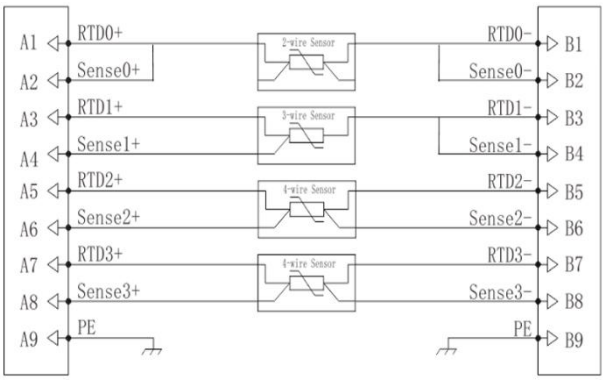
3.6.2.2. LED indicator definition



Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00 (green)	Channel 1 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
01 (green)	Channel 2 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
02 (green)	Channel 3 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
03 (green)	Channel 4 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;

3.6.2.3. Wiring diagram





3.6.3. Module parameters

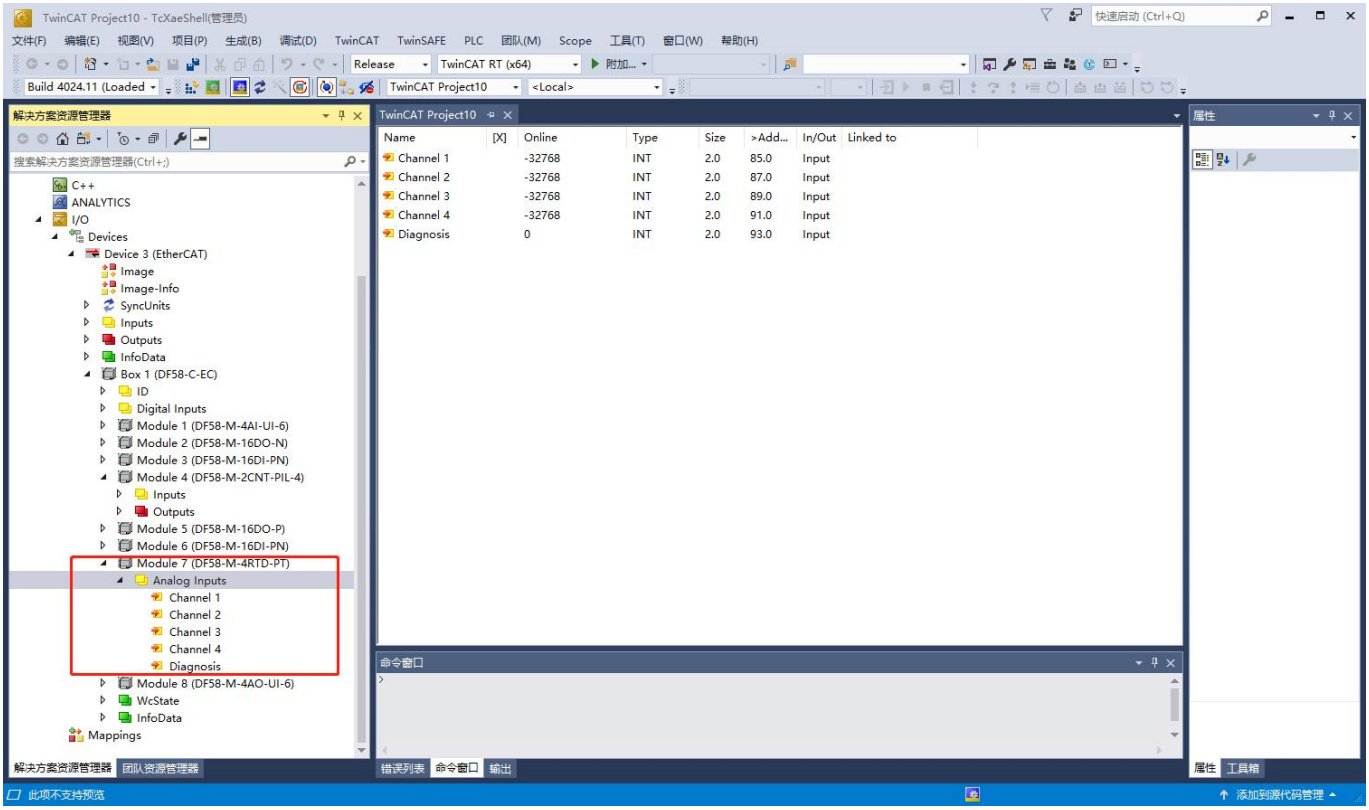
3.6.3.1. Module Configuration Parameters (COE-Online)

For example, DF58-M-4RTD-PT in the following figure is located in slot 7, the index value is "3060", and the name is 4RTD Cfg:

3000:0	4RTD Cfg	RW	> 8 <
3000:01	Reserve0	RW	0x0000 (0)
3000:02	4RTD ConfigData	RW	Pt 100 (0)
3000:03	Reserve1	RW	0x0000 (0)
3000:04	Reserve2	RW	0x0000 (0)
3000:05	Reserve3	RW	0x0000 (0)
3000:06	Reserve4	RW	0x0000 (0)
3000:07	Reserve5	RW	0x0000 (0)
3000:08	Reserve6	RW	0x0000 (0)

The name of the parameter	definition
4RTD ConfigData	0:Pt100(出厂设置); 1:Pt200:2:Pt500; 3:Pt1000; 4:Ni100; 5:Ni120; 6:Ni200; 7:Ni500; 8:Ni1000; 9:Cu10; 10:40Ω; 11:80 Ω; 12:150 Ω; 13:300 Ω; 14:500 Ω; 15:1kΩ; 16:2kΩ; 17: 4kΩ

3.6.3.2. Address Description



After the DF58-M-4RTD-PT is configured, the data of each address is shown in the following table:

Digital Inputs

name	illustrate
Channel 1	Channel 1 enters the address
Channel 2	Enter the address in channel 2
Channel 3	Enter the address for channel 3
Channel 4	Enter the address in channel 4
Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault; 0: normal; Bit1: Reserved

	Bit2: 1: Channel 1 is disconnected or exceeds the upper and lower limits; 0: normal; Bit3: 1: Channel 2 is disconnected or exceeds the upper and lower limits; 0: normal; Bit4: 1: Channel 3 is disconnected or exceeds the upper and lower limits; 0: normal; Bit5: 1: Channel 4 is disconnected or exceeds the upper and lower limits 0: Normal Bit6~Bit15: Reserved.

3.6.3.3. Process data definition

Pt100	Pt200	Pt500	Pt1000	Ni100	decimal	hexadecimal	
32767	32767	32767	32767	32767	32767	0x7FFF	Overflow
8500	8500	8500	8500	2500	32511	0x7EFF	rated range
-	-	-	-	-	27648	0x6C00	
-2000	-2000	-2000	-2000	-600	-	-	
-32767	-32767	-32767	-32767	-32767	0	0x0000	Hypolympation
-32768	-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

Ni200	Ni500	The 1000	Cu10	Ni200	decimal	hexadecimal	
32767	32767	32767	32767	32767	32767	0x7FFF	Overflow
2500	2500	2500	2600	2500	32511	0x7EFF	rated range
-	-	-	-	-	27648	0x6C00	
-600	-600	-600	-1000	-600	-	-	
-32767	-32767	-32767	-32767	-32767	0	0x0000	Hypolympation
-32768	-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

40Ω	80Ω	150Ω	300Ω	decimal	hexadecimal	
>47.04Ω	>94.07Ω	>176.4Ω	>352.77Ω	32767	0x7FFF	Overflow

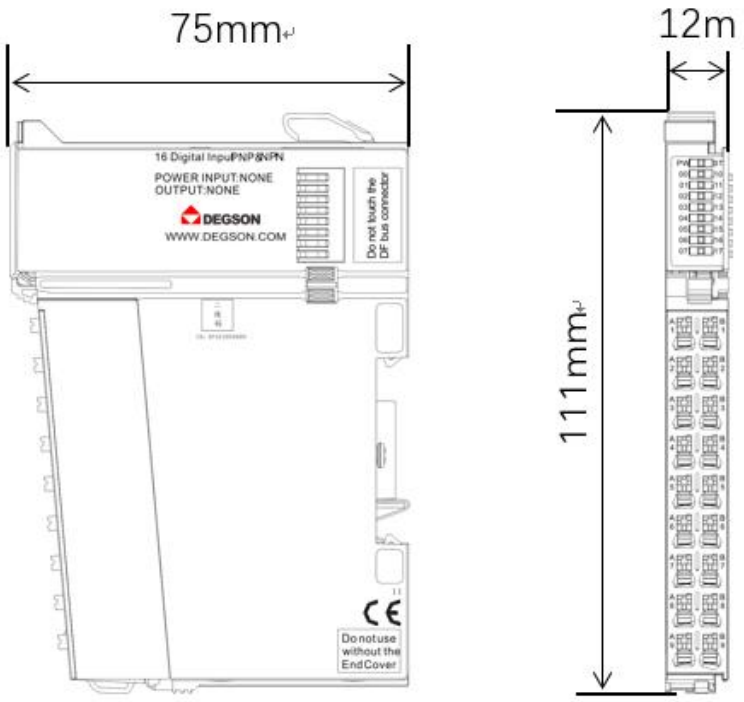
47.04Ω	94.07Ω	176.4Ω	352.77Ω	32511	0x7EFF	
40Ω	80Ω	150Ω	300Ω	27648	0x6C00	
-	-	-	-	-	-	rated
0Ω	0Ω	0Ω	0Ω	0	0x0000	range
-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

500Ω	1KΩ	2KΩ	4KΩ	decimal	hexadecimal	
>587.9Ω	>1.177KΩ	>2.352KΩ	>4.703KΩ	32767	0x7FFF	Overflow
587.9Ω	1.177KΩ	2.352KΩ	4.703KΩ	32511	0x7EFF	
500Ω	1.0KΩ	2.0KΩ	4.0KΩ	27648	0x6C00	
-	-	-	-	-	-	rated
0Ω	0Ω	0Ω	0Ω	0	0x0000	range
-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

3.6.4. Mechanical installation

3.6.4.1. Installation dimensions

The installation size information is shown in the figure below, and the unit is (mm).



3.7. 4-channel thermocouple measurement (DF58-M-4TC)

- The module uses 4-channel thermocouple measurements and supports K/E/T/J/B/S/R/N/L types.
- Supports 2/3/4 wire sensors.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Each channel has an LED indicator.
- Magnetic isolation between the field layer and the system layer.
- Transmitted in 16 resolutions.
- IP20 degree of protection.

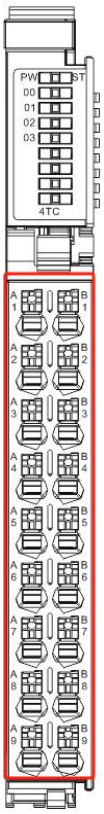
3.7.1. Specifications

Specifications		
Model	DF58-M-4TC	
Product Description:	Thermocouple module, 4 inputs, 16-bit resolution	
Measuring range	thermocouple	
Number of channels	4	
Signal type	E(-200 ~ 1000°C),S(-50 ~ 1,768°C),J(-210 ~ 1,200°C) T(-200~400°C),K(-200~1.372°C), N(-200 ~ 1300°C)， R(-50 ~ 1,768°C) ±15.625mV、±31.25mV、±62.5mV、±125mV、±250mV、±500mV、±1V	
Internal resistance	1 MΩ	
Cold junction compensation	Support internal and external NTC compensation	
Module diagnostics	be	
Temperature coefficient	≤ 50 ppm/K	
Connection type	2-wire system	
Reverse polarity protection	Yes	
Data size	8 Byte	
Error diagnosis	YES	
Single module diagnostics	YES	
Internal resistance	>500KΩ	
resolution	16bit, 0.1 ℃/per digit	
Frequency interference suppression	10Hz | 50Hz | 60Hz | 400Hz	
Margin of error	Operational errors	±0.5%
	Fundamental error	±0.5% @ 25°C
	Temperature error	±0.005%/K
	Linearity error	±0.05%/K
	The repeatability is in steady state	±0.05%/K
Data size	2 Byte	
Measuring range	-32768~32767	
precision	±0.2% FSR / 0.3% FSR for nickel sensors / 0.6% FSR for Cu10	
Power supply parameters		
Connection	PUSH-IN terminal blocks	
Operating voltage	24V DC +20%/ -15%	
System feed current	<100mA	

The maximum crimping area of the wire	1.5mm²
Maximum crimping area of conductor (AWG)	AWG16
The minimum crimping area of the wire	0.14mm²
Minimum crimp area (AWG) of conductor	AWG26
Dial length	8...9mm
The maximum crimping area of the wire	1.5mm²
Mechanical structure	
Ingress protection	IP20
Dimensions (H X W X D)	
Rail type	35mm DIN
Working environment	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)

3.7.2. Hardware interface

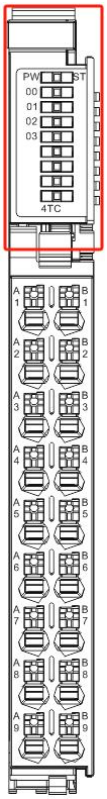
3.7.2.1. Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	TC0+	B1	TC0-	Channel 0 thermocouple terminals
A2	CJC0+	B2	CJC0-	Channel 0 external NTC compensation terminal
A3	TC1+	B3	TC1-	Channel 1 thermocouple terminals
A4	CJC1+	B4	CJC1-	Channel 1 external NTC compensation terminal
A5	TC2+	B5	TC2-	Channel 2 thermocouple terminals
A6	CJC2+	B6	CJC2-	Channel 2 external NTC compensation terminal
A7	TC3+	B7	TC3-	Channel 3 thermocouple terminals
A8	CJC3+	B8	CJC3-	Channel 3 external NTC

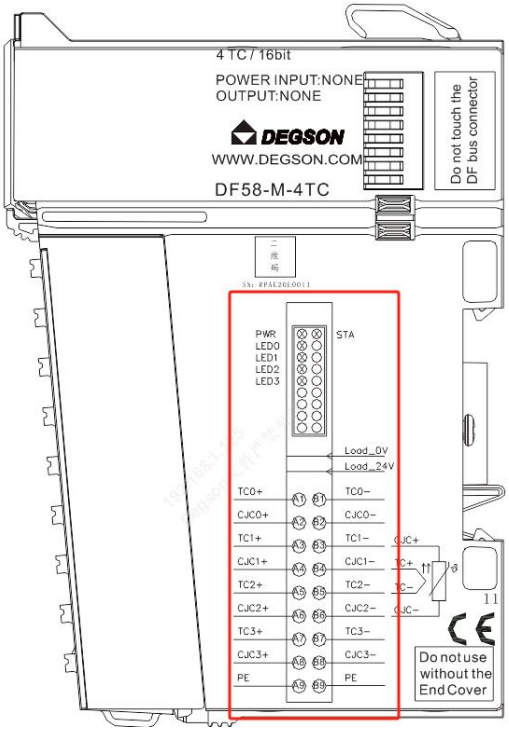
				compensation terminal
A9	PE	B9	PE	Earth

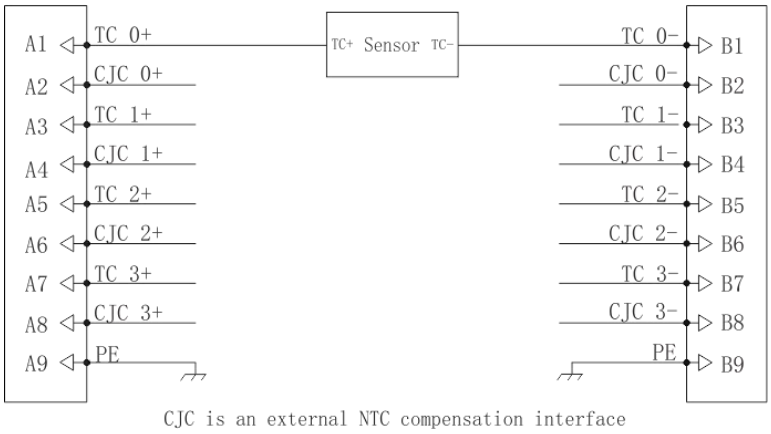
3.7.2.2. LED indicator definition



Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00 (green)	Channel 1 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
01 (green)	Channel 2 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
02 (green)	Channel 3 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
03 (green)	Channel 4 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;

3.7.2.3. Wiring diagram





3.7.3. Module parameters

3.7.3.1. Module Configuration Parameters (COE-Online)

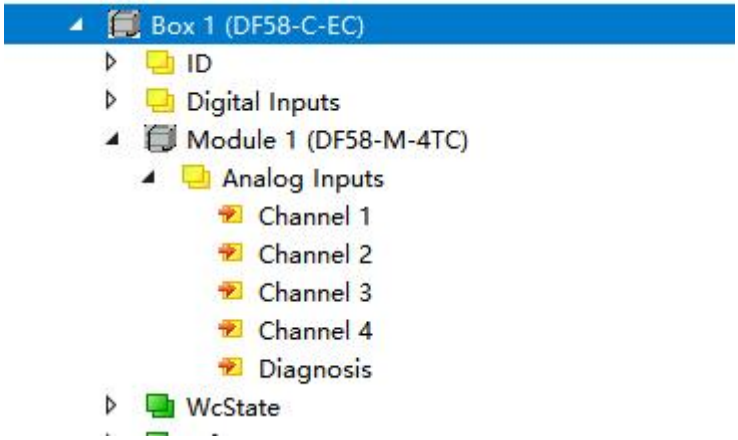
3.7.3.1.1. Output parameter definition

For example, DF58-M-4TC in the following figure is located in slot 1, the index value is "3000", and the name is 4TC Cfg:

3000:0	4TC Cfg	RW	> 8 <
3000:01	4TC Cold junction Compensati...	RW	ENABLE (0)
3000:02	4TC Method of Cold junction ...	RW	Internal (0)
3000:03	Reserve0	RW	0x0000 (0)
3000:04	4TC Open Circuit Monitoring	RW	ENABLE (0)
3000:05	Reserve1	RW	0x0000 (0)
3000:06	4TC Type	RW	J (0)
3000:07	Reserve2	RW	0x0000 (0)
3000:08	Reserve3	RW	0x0000 (0)

parameter	meaning
4TC Cold junction Compensation	Cold junction compensation ; 0: ENABLE: ON (factory setting); 1： DISABLE: close；
4TC Method of Cold junction Compensation	method of compensation; 0: Internal: Internal compensation; 1： External NTC： External NTC compensation
4TC Open Circuit Monitoring	Wire break detection; 0: ENABLE: ON (factory setting); 1： DISABLE: close；
4TC TYPE	Types of Thermocouple Measurements: 0: J type (factory setting); 1: Type K; 2: E type; 3: T-type; 4: S-type; 5: R-type; 6: Type B (not supported yet); 7: N-type; 8: Type C (not supported yet); 9: L-type (not supported yet); 10: U-shaped (not supported yet); 11： ±15.625mv； 12:±31.25mv; 13:±62.5mv; 14:±125mv; 15:±250mv; 16:±500mv; 17:±1000mv; 18:±2000mV (not supported yet);

3.7.3.1.2. Address description



After the DF58-M-4TC is well configured, it is defined as follows:

Digital Inputs

name	illustrate
Channel 1	Channel 1 enters the address
Channel 2	Enter the address in channel 2
Channel 3	Enter the address for channel 3
Channel 4	Enter the address in channel 4
Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault; 0: normal; Bit1: 1: Channel 1 is disconnected or exceeds the upper and lower limits; 0: normal; Bit2: 1: Channel 2 is disconnected or exceeds the upper and lower limits; 0: normal; Bit3: 1: Channel 3 is disconnected or exceeds the upper and lower limits; 0: normal; Bit4: 1: Channel 4 is disconnected or exceeds the upper and lower limits 0: Normal Bit5~Bit15: Reserve.

3.7.3.2. Process data definition

3.7.3.2.1. Process data definition J-type

Process Data Definition (Type J)			
temperature	decimal	hexadecimal	
>1450.0	32767	7FFF	Overflow
1450	14500	38A4	Super Upper Limit
-	-	-	
-	-	-	
1200.1	12001	2EE1	
1200	12000	2EE0	Rated range
-	-	-	
-	-	-	
-210	-2100	F7CC	
<-210	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.2. Process data definition K-type

Process Data Definition (Type K)			
temperature	decimal	hexadecimal	
>1622	32767	7FFF	Overflow
1622	16220	3F5C	Super Upper Limit
-	-	-	
-	-	-	
1372.1	13721	3599	
1372	13720	3598	Rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.3. Process data definition type E

Process Data Definition (Type E)

temperature	decimal	hexadecimal	
>1200	32767	7FFF	Overflow
1200	12000	2EE0	Super Upper Limit
-	-	-	
-	-	-	
1000.1	10001	2711	
1000	10000	2710	rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Breaking detect

3.7.3.2.4. Process data definition T-type

Process Data Definition (Type T)			
temperature	decimal	hexadecimal	
>540.0	32767	7FFF	Overflow
540	5400	1518	Super Upper Limit
-	-	-	
-	-	-	
400.1	4001	0FA1	
400	4000	0FA0	Rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.5. Process data definition S-type

Process Data Definition (Type S)			
temperature	decimal	hexadecimal	
>2019.0	32767	7FFF	Overflow
2019	20190	4EDE	Super Upper Limit
-	-	-	
-	-	-	
1769.1	17691	451B	

1769	17690	451A	Rated range
-	-	-	
-	-	-	
-50	-500	FE0C	
<-50.1	-501	FE0B	Ultra-lower limit
-	-	-	
-	-	-	
<-170.0	-1700	F95C	
<-170.0	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.6. Process data definition R type

Process Data Definition (Type R)			
temperature	decimal	hexadecimal	
>2019.0	32767	7FFF	Overflow
2019	20190	4EDE	Super Upper Limit
-	-	-	
-	-	-	
1769.1	17691	451B	
1769	17690	451A	Rated range
-	-	-	
-	-	-	
-50	-500	FE0C	
<-50.1	-501	FE0B	Ultra-lower limit
-	-	-	
-	-	-	
<-170.0	-1700	F95C	
<-170.0	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.7. Process data definition N-type

Process Data Definition (N-Type)			
temperature	decimal	hexadecimal	
>1550.0	32767	7FFF	Overflow
1550.0	15500	3C8C	Super Upper Limit
-	-	-	

-	-	-	
1300.1	13001	32C9	
1300.0	13000	32C8	rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Breaking detect

3.7.3.2.8. Process data definition± 15.625mV

Process Data Definition (±15.625mV)			
MV value	decimal	hexadecimal	
15.625mV	32767	7FFF	Rated range
-	-	-	
-15.625mV	-32767	8001	
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.9. Process data definition± 31.25mV

Process Data Definition (±31.25mV)			
MV value	decimal	hexadecimal	
62.5mV	32767	7FFF	Rated range
-	-	-	
-62.5mV	-32767	8001	
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.10. Process data definition ± 62.5mV

Process Data Definition (±62.5mV)			
MV value	decimal	hexadecimal	
62.5mV	32767	7FFF	Rated range
-	-	-	
-62.5mV	-32767	8001	
The sensor is not connected	-32768	8000	Wire break detection

3.7.3.2.11. Process data definition ± 125mV

Process Data Definition (±125mV)			
MV value	decimal	hexadecimal	
125mV	32767	7FFF	Rated range
-	-	-	
-125mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.7.3.2.12. Process data definition± 250mV

Process Data Definition (±250mV)			
MV value	decimal	hexadecimal	
250mV	32767	7FFF	Rated range
-	-	-	
-250mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.7.3.2.13. Process data definition± 500mV

Process Data Definition (±500mV)			
MV value	decimal	hexadecimal	
500mV	32767	7FFF	rated range
-	-	-	
-500mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

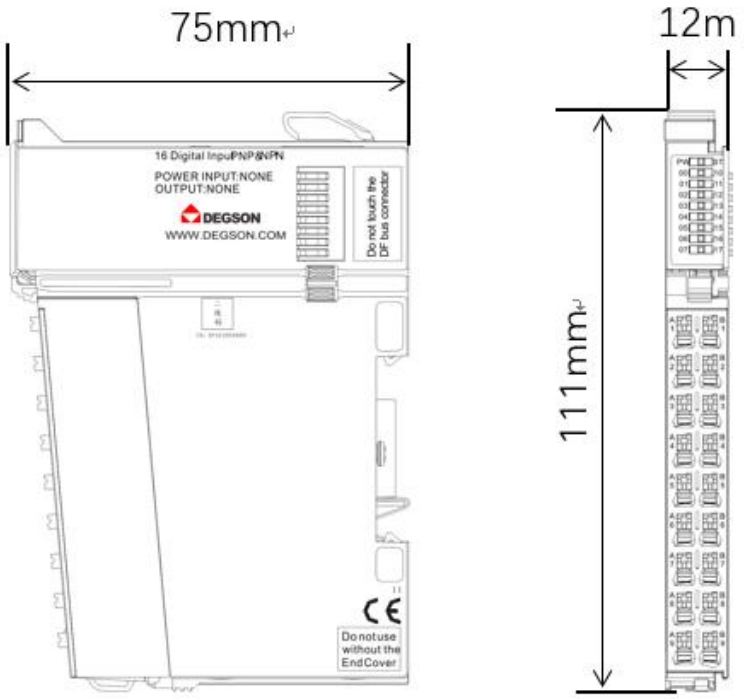
3.7.3.2.14. Process data definition± 1000mV

Process Data Definition (±1000mV)			
MV value	decimal	hexadecimal	
1V	32767	7FFF	Rated range
-	-	-	
-1V	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.7.4. Mechanical installation

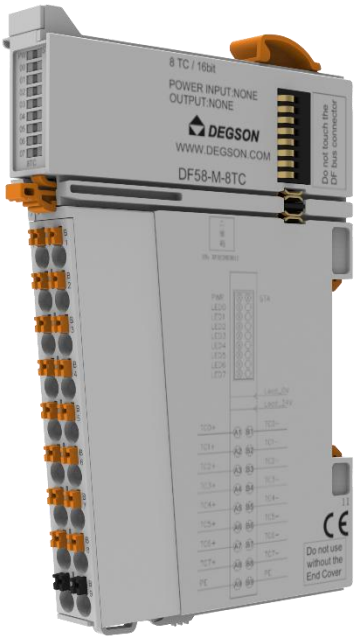
3.7.4.1. Installation dimensions

The installation size information is shown in the figure below, and the unit is (mm).



3.8. 8-channel thermocouple measurement (DF58-M-8TC)

- The module uses 4-channel thermocouple measurements and supports K/E/T/J/B/S/R/N/L types.
- Supports 2-wire sensors.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Each channel has an LED indicator.
- Magnetic isolation between the field layer and the system layer.
- Transmitted in 16 resolutions.
- IP20 degree of protection.



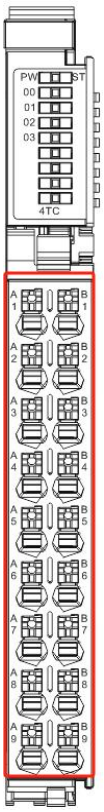
3.8.1. Specifications

Specifications		
Model	DF58-M-8TC	
Product Description:	Thermocouple module, 8 inputs, 16-bit resolution	
Measuring range	thermocouple	
Number of channels	8	
Signal type	E(-200 ~ 1000°C),S(-50 ~ 1,768°C),J(-210 ~ 1,200°C) T(-200~400°C),K(-200~1.372°C), N(-200 ~ 1300°C)，R(-50 ~ 1,768°C) ±15.625mV、±31.25mV、±62.5mV、±125mV、±250mV、±500mV、±1V	
Internal resistance	1 MΩ	
Cold junction compensation	Interior & Exterior (Interior Accuracy ≤ 3K)	
Module diagnostics	be	
Temperature coefficient	≤ 50 ppm/K	
Connection type	2-wire system	
Reverse polarity protection	Yes	
Isolation method	Magnetically isolated from the field layer	
Data size	16 Byte	
Error diagnosis	YES	
Single module diagnostics	YES	
Internal resistance	>500KΩ	
resolution	16bit, 0.1 ℃/per digit	
Margin of error	Operational errors	±0.5%
	Fundamental error	±0.5% @ 25°C
	Temperature error	±0.005%/K
	Linearity error	±0.05%/K
	The repeatability is in steady state	±0.05%/K
Data size	2 Byte	
Measuring range	-32768~32767	
precision	±0.2% FSR / 0.3% FSR for nickel sensors / 0.6% FSR for Cu10	
Power supply parameters		
Connection	PUSH-IN terminal blocks	
Operating voltage	24V DC +20%/ -15%	
System feed current	<150mA	
The maximum crimping area of	1.5mm²	

the wire	
Maximum crimping area of conductor (AWG)	AWG16
The minimum crimping area of the wire	0.14mm²
Minimum crimp area (AWG) of conductor	AWG26
Dial length	8...9mm
The maximum crimping area of the wire	1.5mm²
Mechanical structure	
Ingress protection	IP20
Dimensions (H X W X D)	
Rail type	35mm DIN
Working environment	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)

3.8.2. Hardware interface

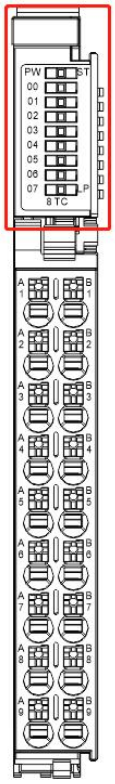
3.8.2.1. Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	TC0+	B1	TC0-	Channel 0 thermocouple terminals
A2	TC1+	B2	TC1-	Channel 1 thermocouple terminals
A3	TC2+	B3	TC2-	Channel 2 thermocouple terminals
A4	TC3+	B4	TC3-	Channel 3 thermocouple terminals
A5	TC4+	B5	TC4-	Channel 4 thermocouple terminals
A6	TC5+	B6	TC5-	Channel 5 thermocouple terminals
A7	TC6+	B7	TC6-	Channel 6 thermocouple terminals
A8	SS7+	B8	TC7-	Channel 7 thermocouple

				terminals
A9	ON	B9	ON	earth

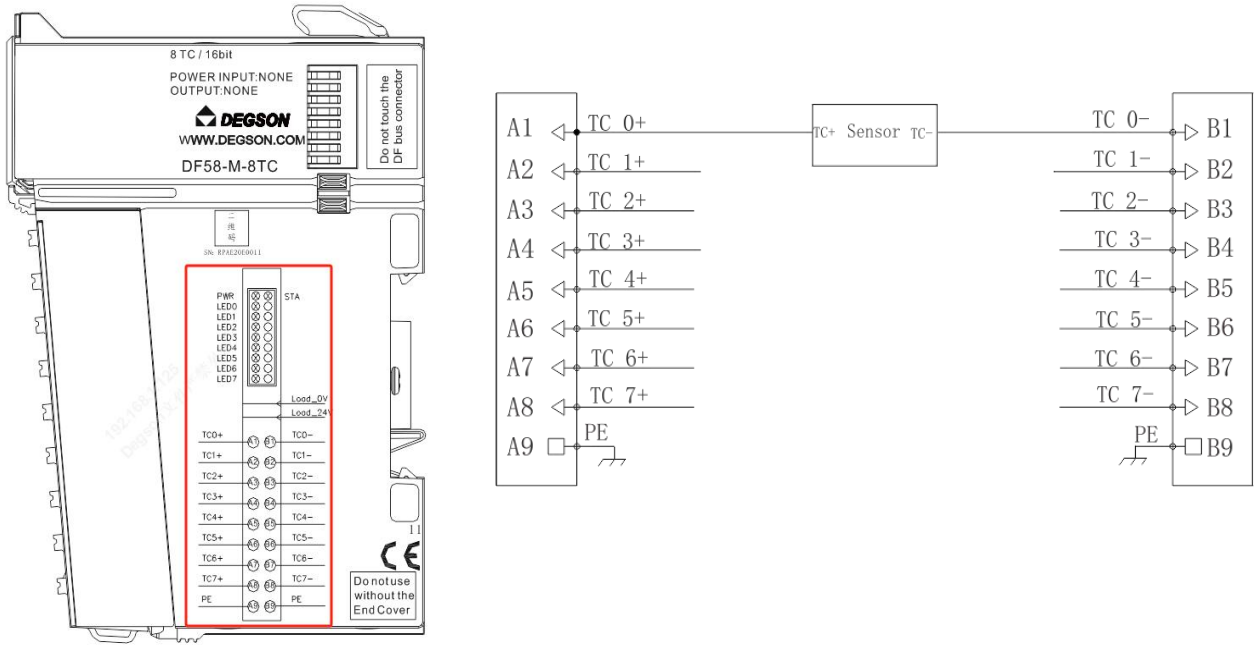
3.8.2.2. LED indicator definition



Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00 (green)	Channel 1 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
01 (green)	Channel 2 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
02 (green)	Channel 3 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
03 (green)	Channel 4 Indicator:

	Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
04 (green)	Channel 5 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
05 (green)	Channel 6 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
06 (green)	Channel 7 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
07 (green)	Channel 8 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;

3.8.2.3. Wiring diagram



3.8.3. Module parameters

3.8.3.1. Module Configuration Parameters (COE-Online)

For example, DF58-M-8TC in the following figure is located in slot 1, the index value is "3000", and the

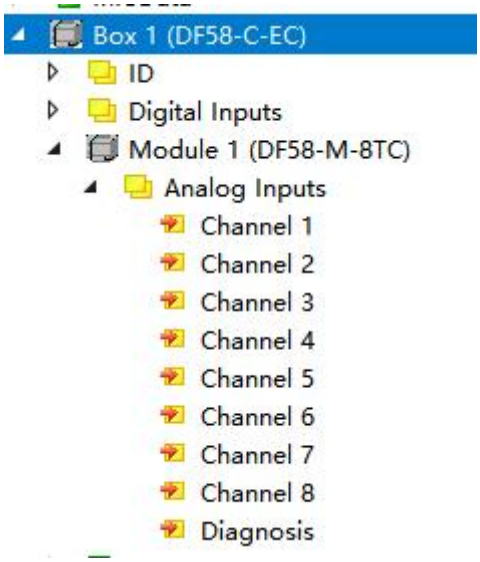
name is 8TC Cfg.

3000:0	8TC Cfg	RW	> 8 <
3000:01	8TC Cold junction Compensati...	RW	ENABLE (0)
3000:02	Reserve0	RW	0x0000 (0)
3000:03	Reserve1	RW	0x0000 (0)
3000:04	8TC Open Circuit Monitoring	RW	ENABLE (0)
3000:05	Reserve2	RW	0x0000 (0)
3000:06	8TC Type	RW	J (0)
3000:07	Reserve3	RW	0x0000 (0)
3000:08	Reserve4	RW	0x0000 (0)

parameter	meaning
8TC Cold junction Compensation	Cold junction compensation ; 0: ENABLE: ON (factory setting); 1： DISABLE:
Reserve0	obligate
8TC Open Circuit Monitoring	Wire break detection; 0: ENABLE: ON (factory setting); 1： DISABLE:
8TC TYPE	Types of Thermocouple Measurements: 0: J type (factory setting); 1: Type K; 2: E type; 3: T-type; 4: S-type; 5: R-type; 6: Type B (not supported yet); 7: N-type; 8: Type C (not supported yet); 9: L-type (not supported yet); 10: U-shaped (not supported yet); 11： ±15.625mv； 12:±31.25mv; 13:±62.5mv; 14:±125mv; 15:±250mv;

parameter	meaning
	16:±500mv; 17:±1000mv; 18:±2000mV (not supported yet);

3.8.3.2. Process data



After the DF58-M-8TC is well configured, it is defined as follows:

Digital Inputs

name	illustrate
Channel 1	Channel 1 enters the address
Channel 2	Enter the address in channel 2
Channel 3	Enter the address for channel 3
Channel 4	Enter the address in channel 4
Channel 5	Enter the address for channel 5
Channel 6	Channel 6 input address
Channel 7	Channel 7 enters the address
Channel 8	Channel 8 enters the address
Diagnosis	Module Diagnostic Information: Bit0: 1: Bus fault 0: Normal Bit1: 1: Channel 1 is disconnected or exceeds the upper and

name	illustrate
	lower limits 0: Normal Bit2: 1: Channel 2 is disconnected or exceeds the upper and lower limits 0: Normal Bit3: 1: Channel 3 is disconnected or exceeds the upper and lower limits 0: Normal Bit4: 1: Channel 4 is disconnected or exceeds the upper and lower limits 0: Normal Bit5: 1: Channel 5 is disconnected or exceeds the upper and lower limits 0: Normal Bit6: 1: Channel 6 is disconnected or exceeds the upper and lower limits 0: Normal Bit7: 1: Channel 7 is disconnected or exceeds the upper and lower limits 0: Normal Bit8: 1: Channel 8 is disconnected or exceeds the upper and lower limits 0: Normal BIt9~Bit15: Reserved.;

3.8.3.3. Process data definition

3.8.3.3.1. Process data definition J-type

Process Data Definition (Type J)			
temperature	decimal	hexadecimal	
>1450.0	32767	7FFF	Overflow

1450	14500	38A4	Super Upper Limit
-	-	-	
-	-	-	
1200.1	12001	2EE1	
1200	12000	2EE0	Rated range
-	-	-	
-	-	-	
-210	-2100	F7CC	
<-210	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.2. Process data definition K-type

Process Data Definition (Type K)			
temperature	decimal	hexadecimal	
>1622	32767	7FFF	Overflow
1622	16220	3F5C	Super Upper Limit
-	-	-	
-	-	-	
1372.1	13721	3599	
1372	13720	3598	Rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.3. Process data definition type E

Process Data Definition (Type E)			
temperature	decimal	hexadecimal	
>1200	32767	7FFF	Overflow
1200	12000	2EE0	Super Upper Limit
-	-	-	
-	-	-	
1000.1	10001	2711	
1000	10000	2710	rated range
-	-	-	

-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Breaking detect

3.8.3.3.4. Process data definition T-type

Process Data Definition (Type T)			
temperature	decimal	hexadecimal	
>540.0	32767	7FFF	Overflow
540	5400	1518	Super Upper Limit
-	-	-	
-	-	-	
400.1	4001	0FA1	
400	4000	0FA0	Rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.5. Process data definition S-type

Process Data Definition (Type S)			
temperature	decimal	hexadecimal	
>2019.0	32767	7FFF	Overflow
2019	20190	4EDE	Super Upper Limit
-	-	-	
-	-	-	
1769.1	17691	451B	
1769	17690	451A	Rated range
-	-	-	
-	-	-	
-50	-500	FE0C	
<-50.1	-501	FE0B	Ultra-lower limit
-	-	-	

-	-	-	
<-170.0	-1700	F95C	
<-170.0	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.6. Process data definition R type

Process Data Definition (Type R)			
temperature	decimal	hexadecimal	
>2019.0	32767	7FFF	Overflow
2019	20190	4EDE	Super Upper Limit
-	-	-	
-	-	-	
1769.1	17691	451B	
1769	17690	451A	Rated range
-	-	-	
-	-	-	
-50	-500	FE0C	
<-50.1	-501	FE0B	Ultra-lower limit
-	-	-	
-	-	-	
<-170.0	-1700	F95C	
<-170.0	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.7. Process data definition N-type

Process Data Definition (N-Type)			
temperature	decimal	hexadecimal	
>1550.0	32767	7FFF	Overflow
1550.0	15500	3C8C	Super Upper Limit
-	-	-	
-	-	-	

1300.1	13001	32C9	
1300.0	13000	32C8	rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Breaking detect

3.8.3.3.8. Process data definition± 15.625mV

Process Data Definition (±15.625mV)			
MV value	decimal	hexadecimal	
15.625mV	32767	7FFF	Rated range
-	-	-	
-15.625mV	-32767	8001	
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.9. Process data definition± 31.25mV

Process Data Definition (±31.25mV)			
MV value	decimal	hexadecimal	
62.5mV	32767	7FFF	Rated range
-	-	-	
-62.5mV	-32767	8001	
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.10. Process data definition ± 62.5mV

Process Data Definition (±62.5mV)			
MV value	decimal	hexadecimal	
62.5mV	32767	7FFF	Rated range
-	-	-	
-62.5mV	-32767	8001	
The sensor is not connected	-32768	8000	Wire break detection

3.8.3.3.11. Process data definition ± 125mV

Process Data Definition (±125mV)			
MV value	decimal	hexadecimal	
125mV	32767	7FFF	Rated range
-	-	-	
-125mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.8.3.3.12. Process data definition± 250mV

Process Data Definition (±250mV)			
MV value	decimal	hexadecimal	
250mV	32767	7FFF	Rated range
-	-	-	
-250mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.8.3.3.13. Process data definition± 500mV

Process Data Definition (±500mV)			
MV value	decimal	hexadecimal	
500mV	32767	7FFF	rated range
-	-	-	
-500mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

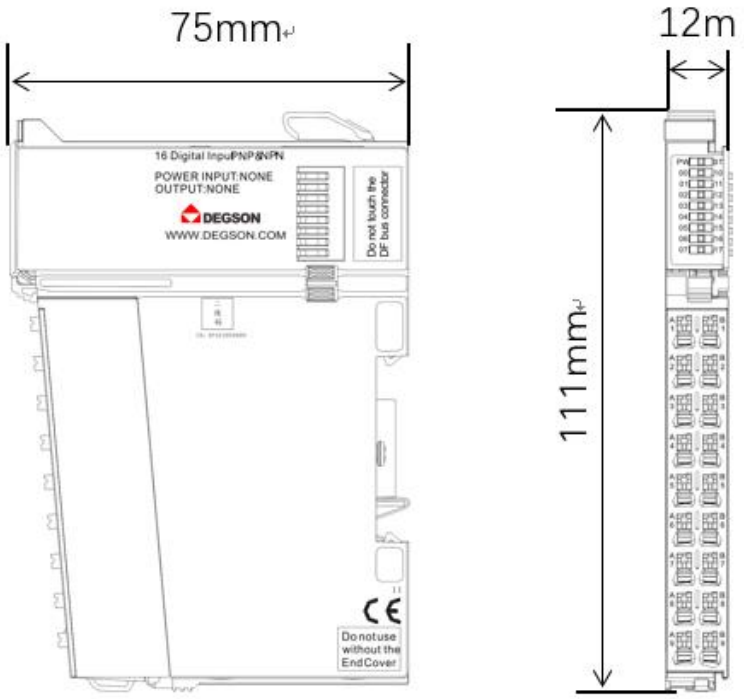
3.8.3.3.14. Process data definition± 1000mV

Process Data Definition (±1000mV)			
MV value	decimal	hexadecimal	
1V	32767	7FFF	Rated range
-	-	-	
-1V	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.8.4. Mechanical installation

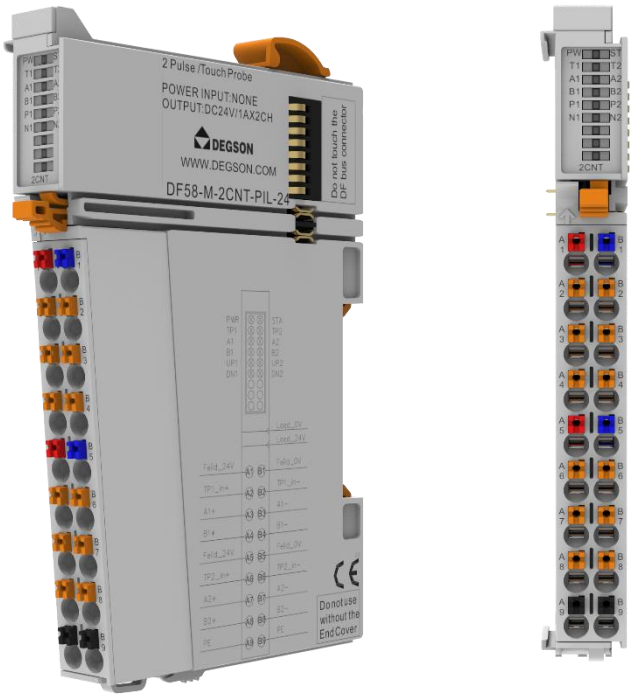
3.8.4.1. Installation dimensions

The installation size information is shown in the figure below, and the unit is (mm).



3.9. Encoder pulse count/24VDC (DF58-M-2CNT-PIL-24).

- The pulse counting module uses 2-channel pulse counting. The input signal voltage is 24VDC.
- Each input module is equipped with an anti-interference filter.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Magnetic isolation between the field layer and the system layer.
- IP20 degree of protection.



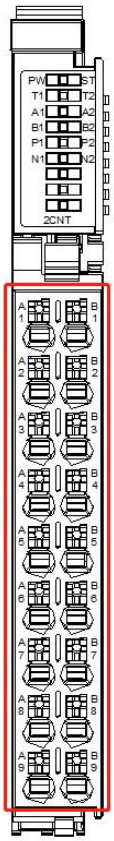
3.9.1. Specifications

Specifications	
Model	DF58-M-2CNT-PIL-24
Product Description:	Pulse counting module, 2 channels
Maximum count frequency	1Mhz
Number of channels	2
Input signal type	Incremental encoder AB or Pulse/Direction signal
Input signal voltage	24V DC
Enter the connection type	4-wire / 2-wire
Reverse circuit protection	Yes
Isolation method	Isolated from field layer optocouplers
Data size	20 Byte
Frequency multiplication mode	x1/x4
Filtering time	Configurable，0.01 to 1 ms
DI on voltage	Min.5Vdc to Max.28Vdc
DI off voltage	Max.2.7Vdc
DI turns on the current	Max.10mA/channel @28V
DI input impedance	=2.7k
Sensor powered	500mA@24V
Error diagnosis	Yes, us responds, and the error code can be queried by the upper computer
resolution	32 Bit
Measuring range	Encoder: –2147483648~2147483647
precision	±1 press
Power supply parameters	
System feed current	<100mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 … 2000 m

Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

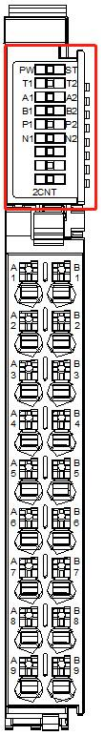
3.9.2. Hardware interface

3.9.2.1. Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	
A1	24V	B2	0V	24V power output
A2	TP1_in+	B3	TP1_in-	Channel 1 latched signal input (24V)
A3	A1+	B4	A1-	Channel 1 A signal input (24V)
A4	B1+	B5	B1-	Channel 1 B signal input (24V)
A5	24V	B6	0V	24V power output
A6	TP2_in+	B7	TP2_in-	Channel 2 latched signal input (24V)
A7	A2+	B8	A2-	Channel 2 A signal input (24V)
A8	B2+	B9	B2-	Channel 2 B signal input (24V)
A9	PE	B2	PE	Earth

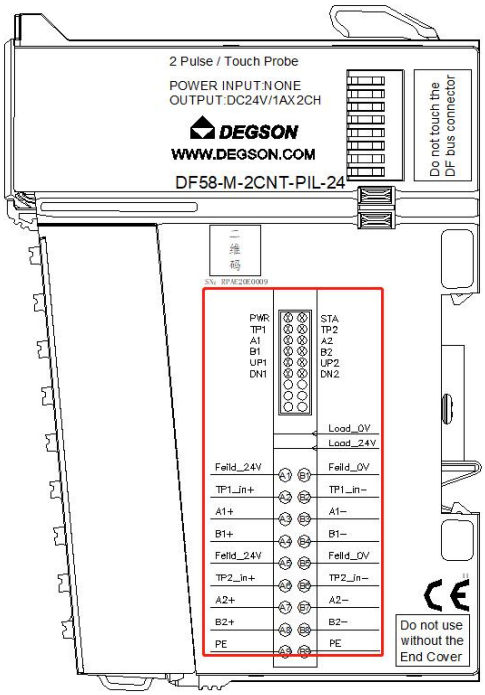
3.9.2.2. LED indicator definition

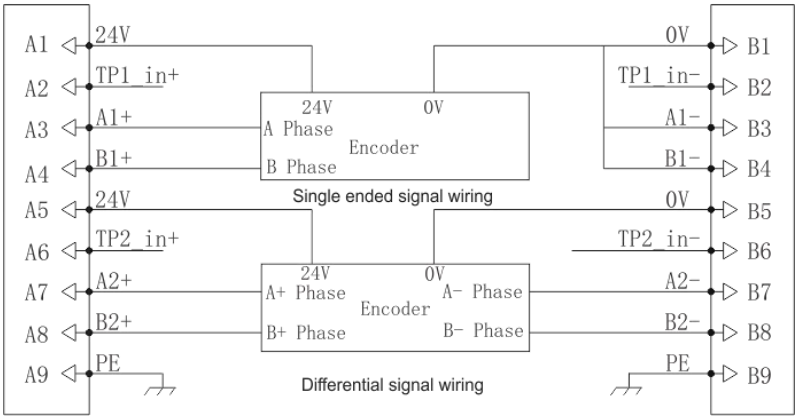


Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
T1 (green)	Channel 1 latches the signal indicator. Bright: The latch is successful. Off: No latching is performed.
T2 (green)	Channel 2 latches the signal indicator.

	Bright: The latch is successful. Off: No latching is performed.
A1 (green)	Channel 1 Encoder A Signal Indicator: On: The input signal is valid Off: The input signal is invalid
B1 (green)	Channel 1 Encoder B Signal Indicator: On: The input signal is valid Off: The input signal is invalid
A2 (green)	Channel 2 Encoder A Signal Indicator: On: The input signal is valid Off: The input signal is invalid
B2 (green)	Channel 2 Encoder B Signal Indicator: On: The input signal is valid Off: The input signal is invalid
P1 (green)	On: Encoder 1 rotates forward Off: Encoder 1 is stationary or rotates in the opposite direction
P2 (green)	On: Encoder 2 rotates forward Off: Encoder 2 is stationary or rotates in the opposite direction
N1 (green)	On: Encoder 1 rotates in reverse Off: Encoder 1 is stationary or rotates in a forward direction
N2 (green)	On: Encoder 2 rotates in reverse Off: Encoder 2 rotates stationary or forward
E1 (green)	Channel 1 Working Mode Indicator: On: The channel is in phase AB mode Off: The channel is in pulse/direction mode
E2 (green)	Channel 2 Working Mode Indicator: On: The channel is in phase AB mode Off: The channel is in pulse/direction mode

3.9.2.3. Wiring diagram





3.9.3. Module parameters

3.9.3.1. Module Configuration Parameters (COE-Online)

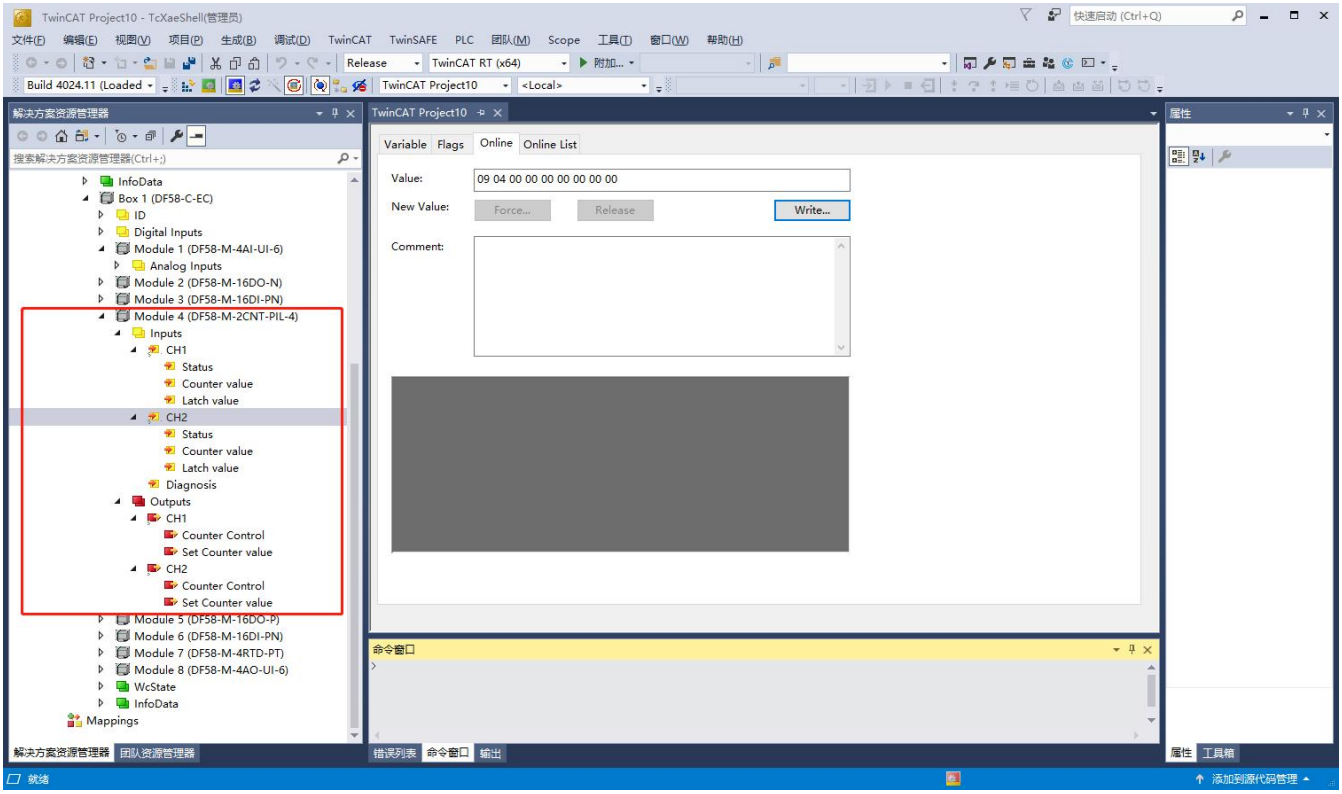
For example, DF58-M-2CNT-PIL-24 in the following figure is in the position of slot number 1, the index value is "3000", and the name is 2CNT Cfg:

3000:0	2CNT Cfg	RW	> 8 <
3000:01	2CNT Channel1 Mode	RW	A B x1 (0)
3000:02	2CNT Channel1 Direction	RW	UP (0)
3000:03	2CNT Channel1 Reaction to EC...	RW	Keep last value (0)
3000:04	2CNT Channel1 Filter Time	RW	NONE (0)
3000:05	2CNT Channel2 Mode	RW	A B x1 (0)
3000:06	2CNT Channel2 Direction	RW	UP (0)
3000:07	2CNT Channel2 Reaction to EC...	RW	Keep last value (0)
3000:08	2CNT Channel2 Filter Time	RW	NONE (0)

The name of the parameter	definition
2CNT Channel1 Mode	0: ABx1: AB phase 1 octave count;(factory setting) 1: ABx4: AB phase 4 octave counting; 2：Pulse+Dir: Pulse+direction counting；
2CNT Channel1 Direction	Set the counting direction of channel 1; 0:UP: Count upwards (factory setting) 1: Down: counts downward;
2CNT Channel1 Reaction to ECT Err	0: Keep last value: The counter stops counting during an error (such as a backplane bus failure or AB phase loss) and will continue to count from the previous value once it resumes normal work. (Factory setting) 1: Keep on: The counter continues to count during the error.
Filter Time CH1	Configure the filtering time for A, B, TP for channel 1: 0: NONE: No filtering, (factory setting) 1:0.01ms； 2:0.02ms； 3:0.03ms； 4:0.04ms； 5:0.05ms； 6:0.2ms； 7:0.4ms； 8:0.6ms； 9:0.8ms； 10:1.00ms；
2CNT Channel2 Mode	0: ABx1: AB phase 1 octave count;(factory setting) 1: ABx4: AB phase 4 octave counting; 2：Pulse+Dir: Pulse+direction counting；

2CNT Channel2 Direction	Set the counting direction of channel 2; 0:UP: Count upwards (factory setting) 1: Down: counts downward;
2CNT Channel2 Reaction to ECT Err	0: Keep last value keeps last value: The counter stops counting during an error (such as a backplane bus failure or AB phase loss) and will continue to count from the previous value once it resumes normal work. (Factory setting) 1: Keep on: The counter continues to count during the error.
Filter Time CH2	Configure the filtering time of A, B, TP for channel 2: 0: NONE: No filtering, (factory setting) 1:0.01ms; 2:0.02ms; 3:0.03ms; 4:0.04ms; 5:0.05ms; 6:0.2ms; 7:0.4ms; 8:0.6ms; 9:0.8ms; 10:1.00ms;

3.9.3.2. Process data



After the DF58-M-4AO-UI-6 is configured, the module is divided into two parts: Inputs and Outputs **,**

which are defined as follows.

Inputs

passage	parameter	meaning
CH1	Status of	BIT0: A phase input
		BIT1: B-phase input
		BIT2: Latch success flag.
		BIT3: Encoder Forward Indication
		BIT4: Encoder Reverse Indication
		BIT5:1: OVERFLOW ON THE CURRENT COUNT VALUE 0: After the count value is overflowed, the count value continues to exceed 5000.
		BIT6:1: OVERFLOW UNDER CURRENT COUNT VALUE 0: After the count value overflows, the count value continues down to exceed 5000.
		BIT7: The counter is preset successfully, and 1 is valid

	Counter value	The current count value
	Latch value	Depending on the configuration, the current count value is latched on the rising or falling edge of the TP signal.
CH2	Status	BIT0: A phase input
		BIT1: B-phase input
		BIT2: Latch success flag.
		BIT3: Encoder Forward Indication
		BIT4: Encoder Reverse Indication
		BIT5:1: OVERFLOW ON THE CURRENT COUNT VALUE 0: After the count value is overflowed, the count value continues to exceed 5000.
		BIT6:1: OVERFLOW UNDER CURRENT COUNT VALUE 0: After the count value overflows, the count value continues down to exceed 5000.
		BIT7: The counter is preset successfully, and 1 is valid
	Counter value	The current count value
	Latch value	Depending on the configuration, the current count value is latched on the rising or falling edge of the TP signal.
Diagnosis	Diagnosis	Module Diagnostic Information: Bit0： 1: Bus error; 0: normal; Bit1: reserved; Bit2： 1: Channel 1 is out of phase, and the AB phase is in orthogonal counting mode. 0: normal; Bit3： 1: Channel 2 is out of phase, and the AB phase is in quadrature counting mode. 0: normal; Bit4~Bit15： Reserve;

Outputs

passage	parameter	meaning
CH1	Counter Control	Counter 1 sets the control parameters: BIT0:0: INVALID; 1: Set the counter preset value to the current count value;

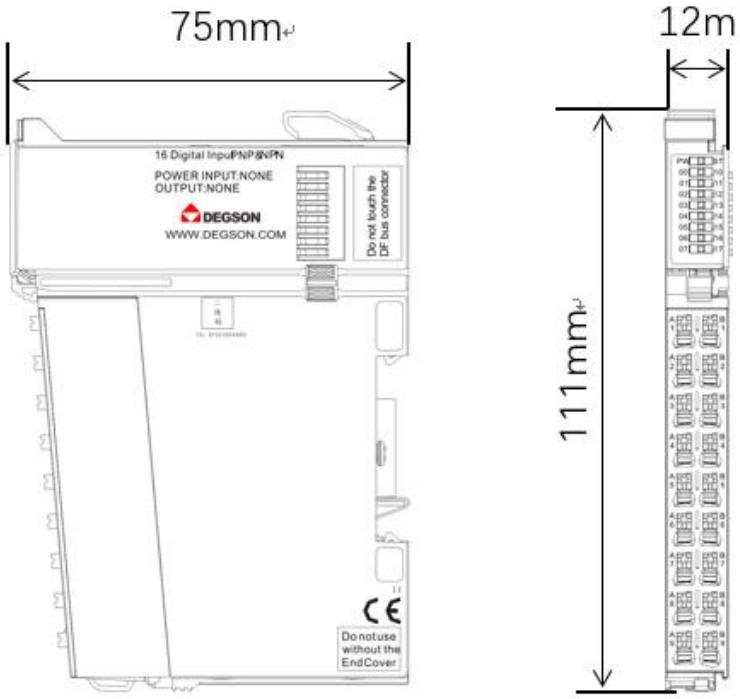
		BIT1:0: INVALID; 1: clears the counter value; BIT2:0: INVALID; 1: Clear the overflow mark; BIT3:0: INVALID; 1: Clear the overflow mark; BIT4:0: INVALID; 1: Latch the Counter value to the Latch value on the rising edge of the TP signal, note that the latch is only latched once, if you need to start the latch again, you need to set the parameter 0 and then reset it to 1. Bit5:0: Invalid; 1: Latch the Counter value to the Latch value on the descending edge of the TP signal, note that the latch is only latched once, if you need to start the latch again, you need to set the 0 parameter and then reset it to 1. Bit6~Bit7：Reserve;
	Set Counter value	Counter 1 preset value
CH2	Counter Control	Counter 2 sets the control parameters: BIT0: THE RISING EDGE IS 0→1, AND THE COUNTER PRESET VALUE IS SET TO THE CURRENT COUNTING VALUE BIT1: ZEROS THE COUNTER VALUE BIT2: Clear the overflow flag BIT3: Clear the under-zero overflow flag BIT4:0: INVALID 1：Lock Counter value to Latch value on the rising edge of TP signal Note that the latch is only used once, if you need to start the latch again, you need to set the parameter 0 and then reset it to 1 (to avoid invalid abnormal latch due to interference). BIT5:0: INVALID 1：Latch Counter value to Latch value at the falling edge of TP signal Note that the latch is only used once, if you need to start the latch again, you need to set the parameter 0 and then reset it to 1 (to avoid invalid abnormal latch

		due to interference).
	Set Counter value	Counter 2 preset value

3.9.4. Mechanical installation

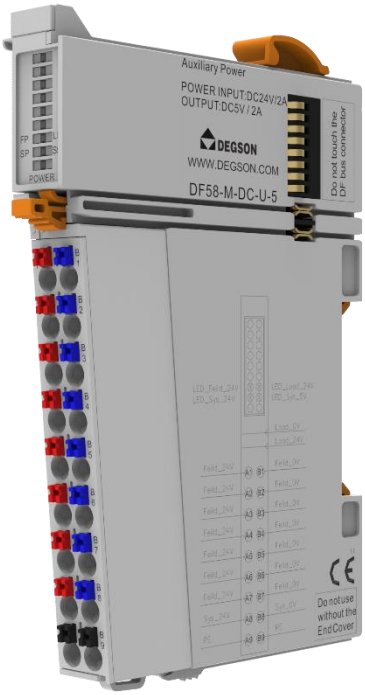
3.9.4.1. Installation dimensions

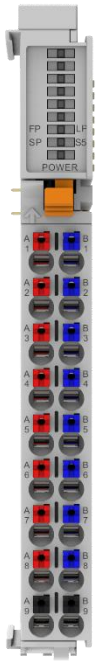
The installation size information is shown in the figure below, and the unit is (mm).



3.10. 24V to 5V Power isolation module (DF58-M-DC-U-5)

- The operating voltage of 5VDC for the I/O module is set by the internal bus of the module.
- Provides internal system current of 2A.
- 24VDC rated voltage for external sites.
- The two LED indicators indicate that the module is operating normally and the communication is normal, respectively.
- Galvanic isolation between the field layer and the system layer.
- IP20 degree of protection.





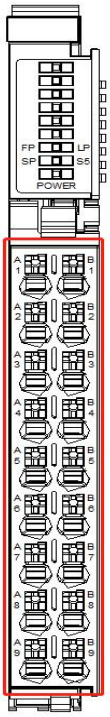
3.10.1. Specifications

Specifications	
Model	DF58-M-DC-U-5
Product Description:	24VDC to 5VDC
Number of channels	1
Isolation method	System power to field power: Isolation module
Power supply parameters	
Operating voltage	24V DC +20 %/ -15 % (IEC mode)
Anti-reverse polarity protection	YES
Over-temperature protection	YES
Overload protection	YES
Short-circuit protection	YES
Provides internal system voltage	5VDC
Internal system current is supplied	Max.2A@5V
The load voltage is provided	24V DC +20 %/ -15 % (IEC mode)
The maximum current of the load is supplied	10A
Load overvoltage protection	YES
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Working environment	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm

Firmware upgrades	Yes

3.10.2. Hardware interface

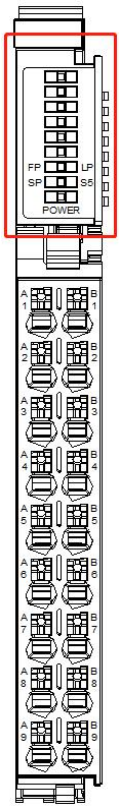
3.10.2.1. Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	
A1	24V	B2	0V	24V power output
A2	24V	B3	0V	24V power output
A3	24V	B4	0V	24V power output
A4	24V	B5	0V	24V power output
A5	24V	B6	0V	24V power output
A6	24V	B7	0V	24V power output
A7	24V	B8	0V	24V power output
A8	24V	B9	0V	24V power input of the module
A9	PE	B2	PE	Earth

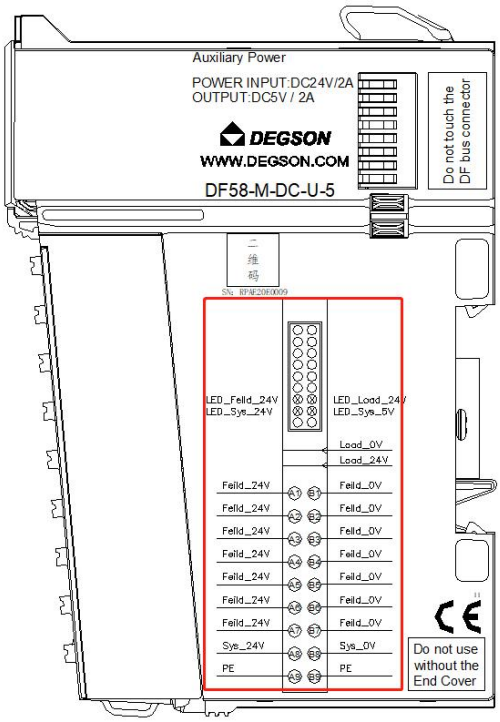
Note: It is recommended to use two 24V power supplies isolated from each other to provide 2 power supplies for the module to achieve optimal anti-interference performance.

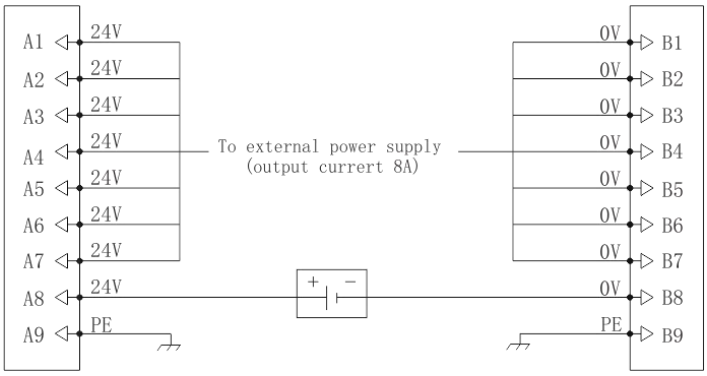
3.10.2.2. LED indicator definition



Light	meaning
FP (Green)	Green: The load power supply is running normally.
LP (Green)	Green: The sensor power supply is operating normally.
SP (green)	Green: The internal system power supply is running normally.
S5 (green)	Green: The internal 5V power supply is running normally.

3.10.2.3. Wiring diagram





As shown in the image:

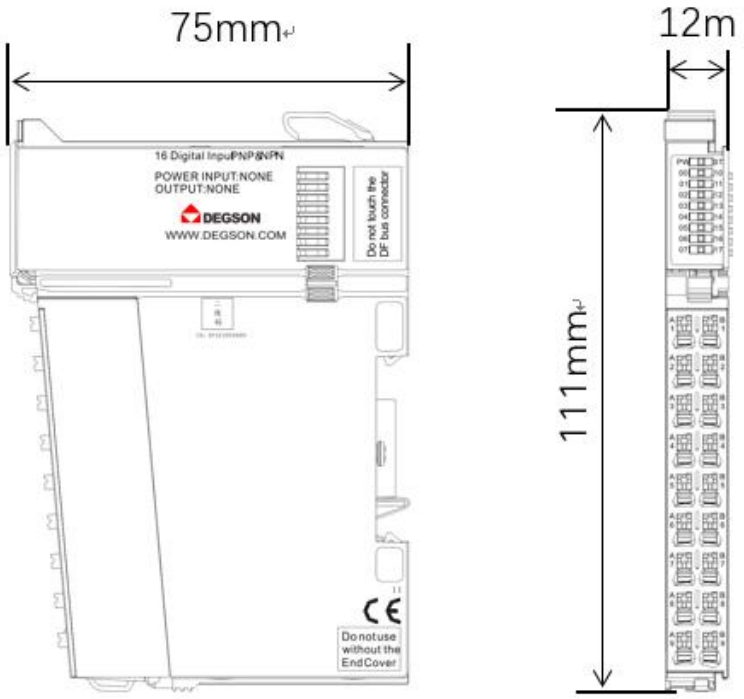
A8 external wiring 24v end, B8 external wiring 0v end, A9, B9 ground.

A1-B1 is one group of external power supply, and one group can support 7 groups of external 24V power supply.

3.10.3. Mechanical installation

3.10.3.1. Installation dimensions

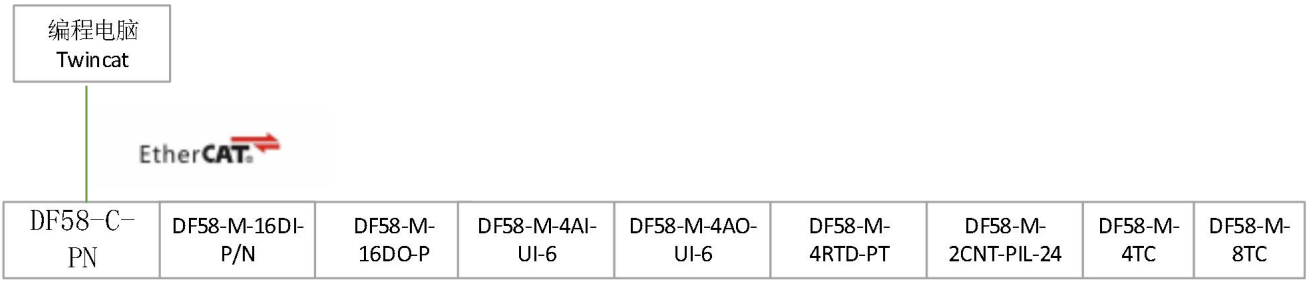
The installation size information is shown in the figure below, and the unit is (mm).



4. Example of use

4.1. TWINCAT3 software with DF58-C-EC usage example

4.1.1. Communication Connections



4.1.2. Hardware Configuration

hardware	quantity	remark
Programming a computer	1 unit	Install TWINCAT3 programming software
DF58-C-EC	1 pc	
DF58-M-16DI-P/N	1 pc	
DF58-M-16DO-P	1 pc	
DF58-M-4AI-UI-6	1 pc	
DF58-M-4AO-UI-6	1 pc	
DF58-M-4RTD-PT	1 pc	
DF58-M-2CNT-PIL-24	1 pc	
DF58-M-4TC	1 pc	
DF58-M-8TC	1 pc	
Cable	Several	

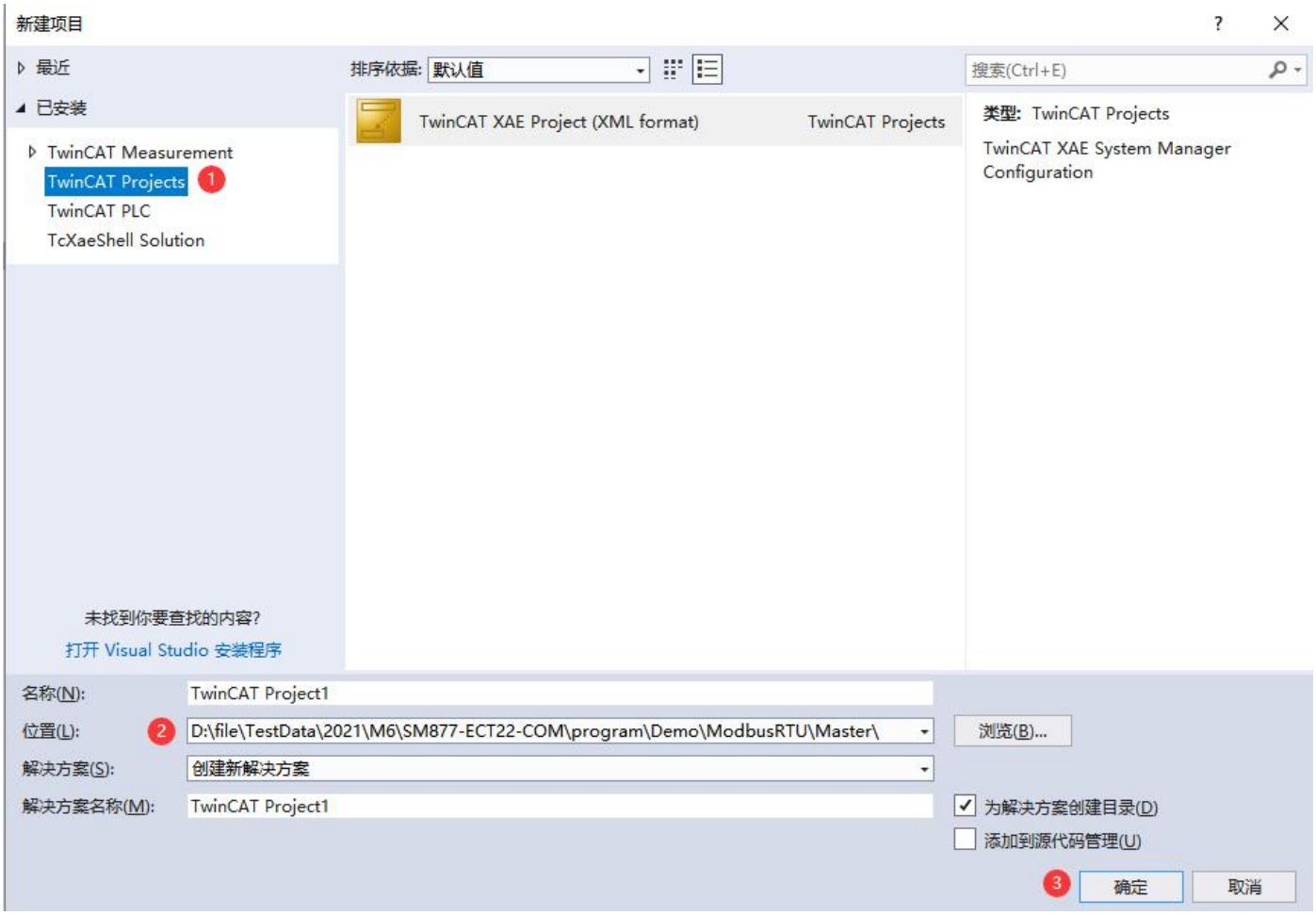
4.1.3. TwinCAT3 installs XML

Install the XML file into TwinCAT3 and the default folder in this example is

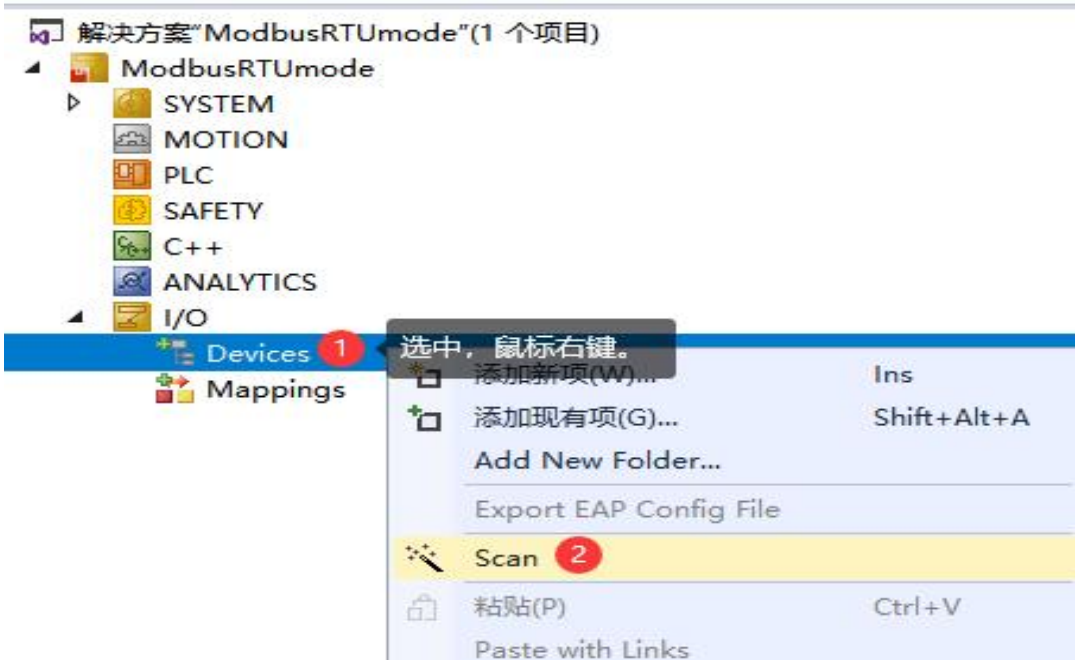
"C:\TwinCAT\3.1\Config\Io\EtherCAT", As shown in the following figure:

4.1.4. New construction and configuration of the TwinCAT3 platform

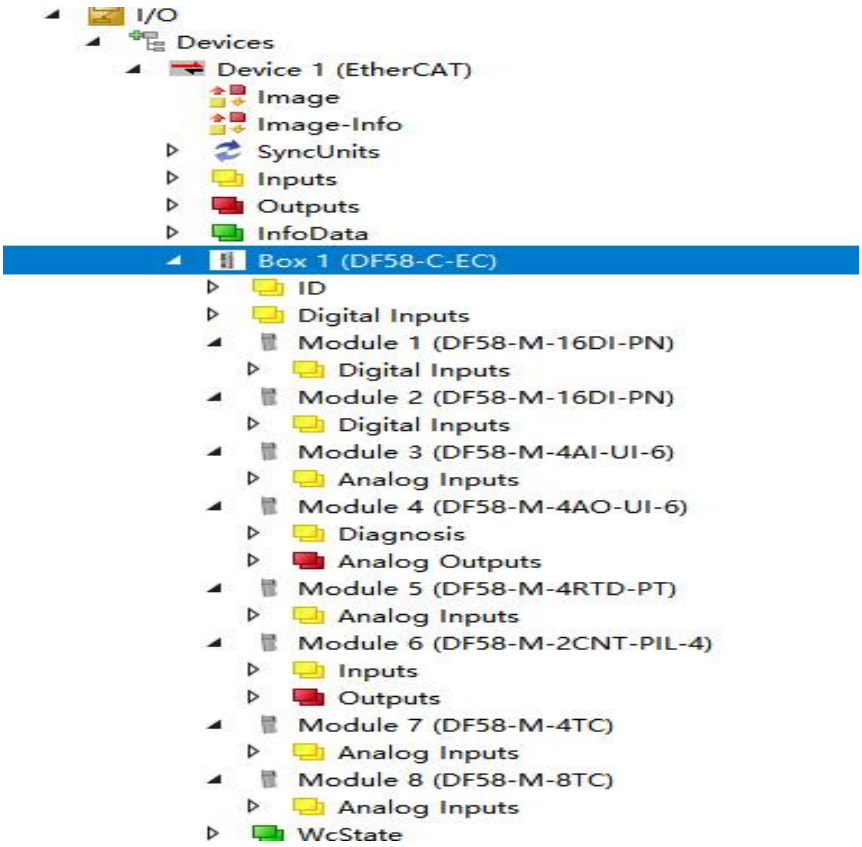
Open the TwinCAT3 software and create a new project project, as shown in the following figure:



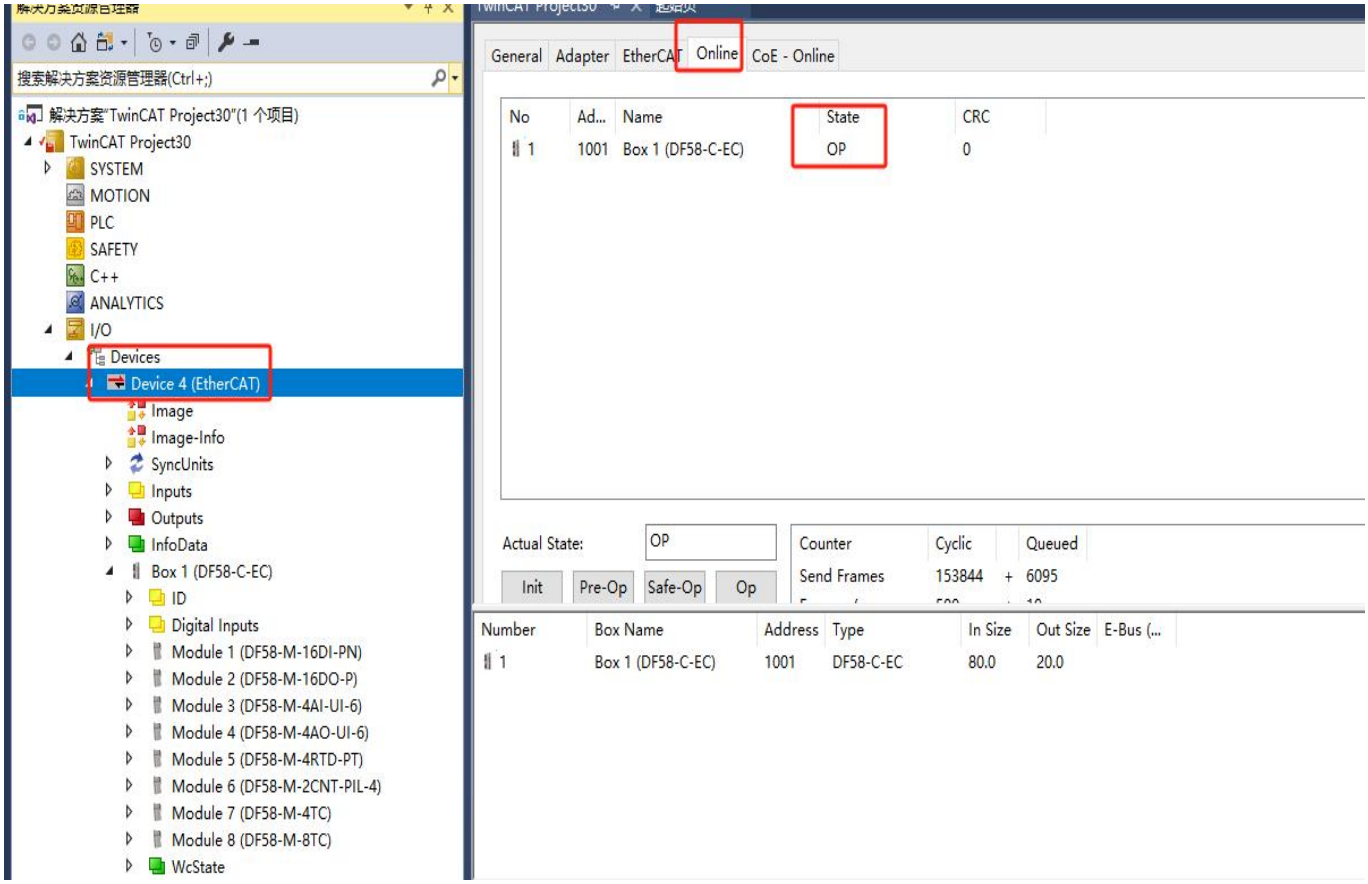
Scan the DF58-C-EC connected to the computer into the project, and click I/O>Devices>Scan, as shown in the following figure:



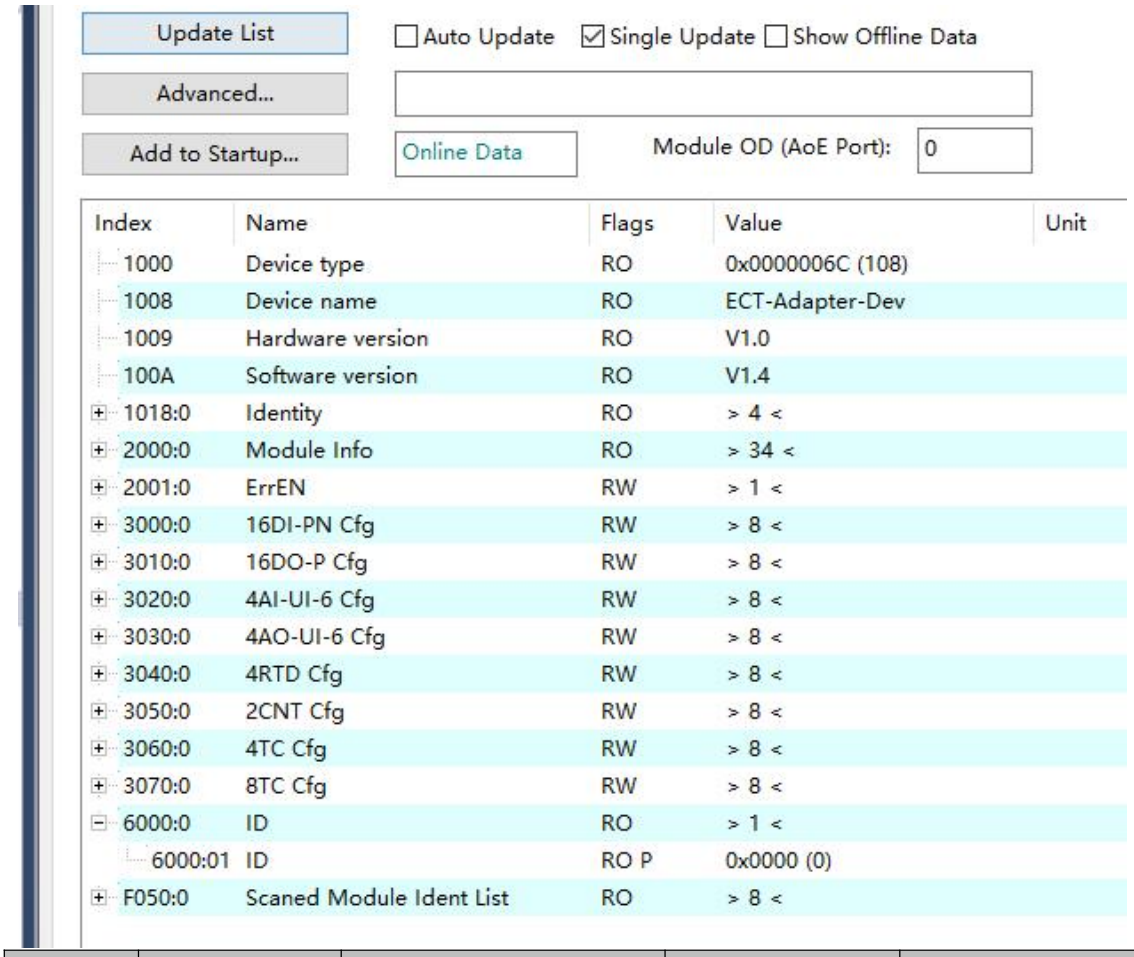
The modules that were successfully scanned are shown in the following figure:



If the status is displayed as "OP", the communication is normal.


搜索解决方案资源管理器(Ctrl+;)
解决方案"TwinCAT Project30"(1 个项目)
TwinCAT Project30
SYSTEM
MOTION
PLC
SAFETY
C++
ANALYTICS
I/O
Devices
Device 4 (EtherCAT)
Image
Image-Info
SyncUnits
Inputs
Outputs
InfoData
Box 1 (DF58-C-EC)
ID
Digital Inputs
Module 1 (DF58-M-16DI-PN)
Module 2 (DF58-M-16DO-P)
Module 3 (DF58-M-4AI-UI-6)
Module 4 (DF58-M-4AO-UI-6)
Module 5 (DF58-M-4RTD-PT)
Module 6 (DF58-M-2CNT-PIL-4)
Module 7 (DF58-M-4TC)
Module 8 (DF58-M-8TC)
WcState
General
Adapter
EtherCAT
Online
CoE - Online
No
Ad...
Name
State
CRC
1
1001
Box 1 (DF58-C-EC)
OP
0
Actual State:
OP
Init
Pre-Op
Safe-Op
Op
Counter
Cyclic
Queued
Send Frames
153844
6095
Number
Box Name
Address
Type
In Size
Out Size
E-Bus (...
1
Box 1 (DF58-C-EC)
1001
DF58-C-EC
80.0
20.0

4.1.5. Parameter configuration description

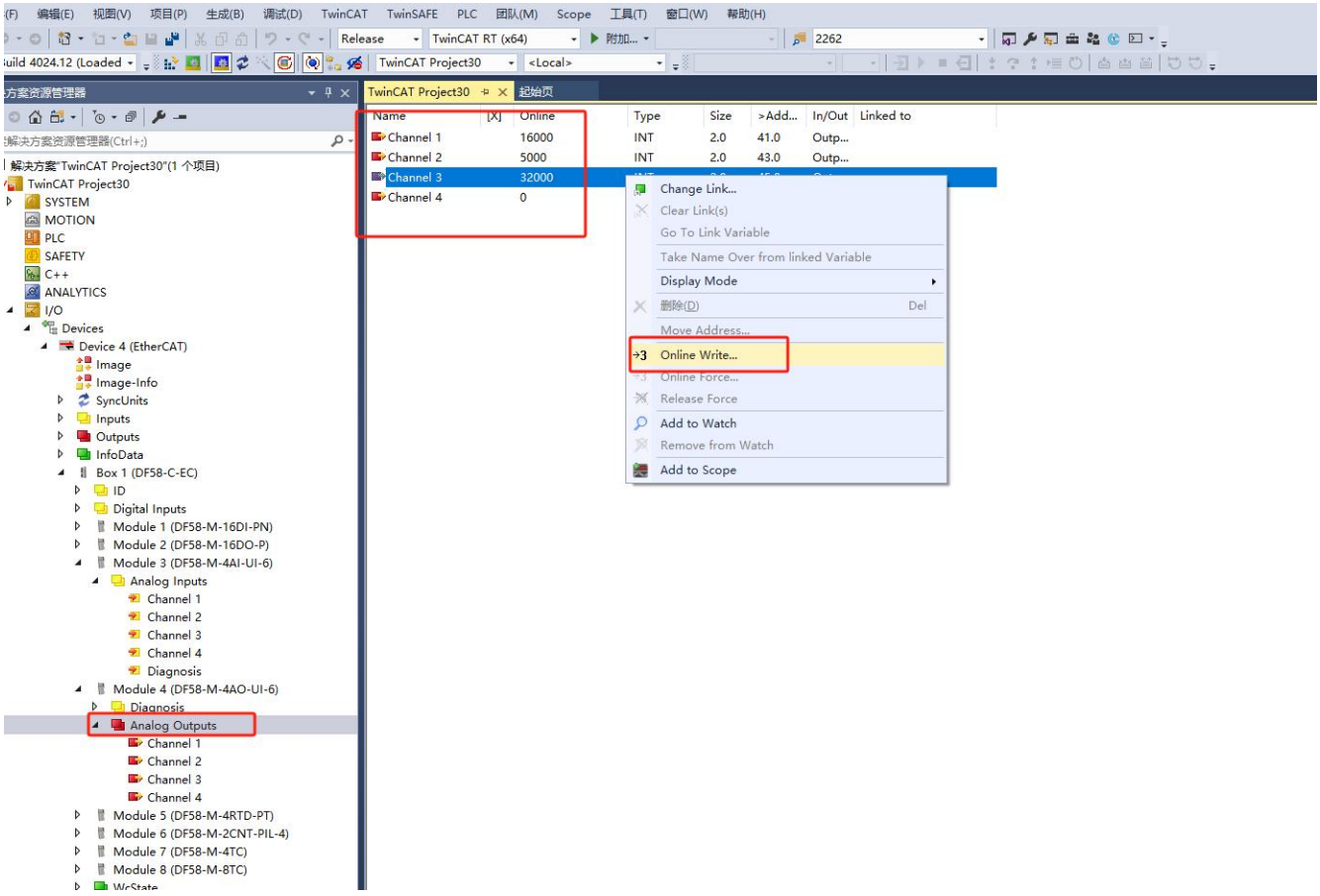


Slot number	index	Model	name	illustrate
	2000	----	Module Info	Coupler fault information, number of expansion modules, and fault information
	2001	----	ErrEN	It is used to set the action setting of the output channel of the digital output module and the analog output module after the coupler EtherCAT communication is disconnected
Slot number 1	3000	DF58-M-16DI-P/N	16DI-PN Cfg	Parameter configuration
Slot No. 2	3010	DF58-M-16DO-P	16DO-P Cfg	Parameter configuration
Slot No. 3	3020	DF58-M-4AI-UI-6	4AI-UI-6 Cfg	Parameter configuration

Slot No. 4	3030	DF58-M-4AO-UI-6	4AO-UI-6 Cfg	Parameter configuration
Slot No. 5	3040	DF58-M-4RTD-PT	4RTD Cfg	Parameter configuration
Slot No. 6	3050	DF58-M-2CNT-PIL-24	2CNT Cfg	Parameter configuration
Slot No. 7	3060	DF58-M-4TC	4TC Cfg	Parameter configuration
Groove No. 8	3070	DF58-M-8TC	8TC Cfg	Parameter configuration

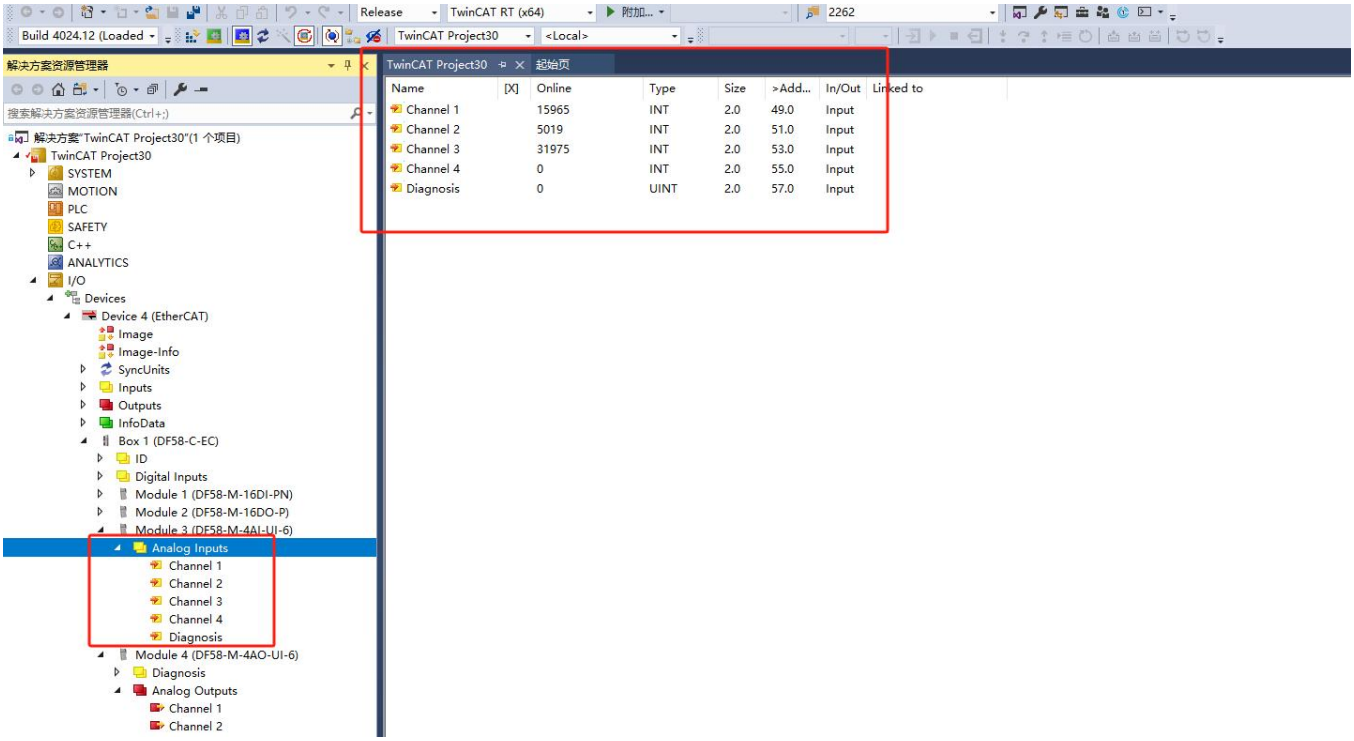
4.1.6. Data Monitoring

Select a value for the output channel to write, for example, DF58-M-4AO-UI-6 writes 16000 for channel 1, 5000 for channel 2, and 32000 for channel 3.



Actually, DF58-M-4AO-UI-6 module channels 1~4 and DF58-M-4AI-UI-6 module channels 1~4 are connected through signal cables. The values of DF58-M-4AI-UI-6 channels are shown in the figure

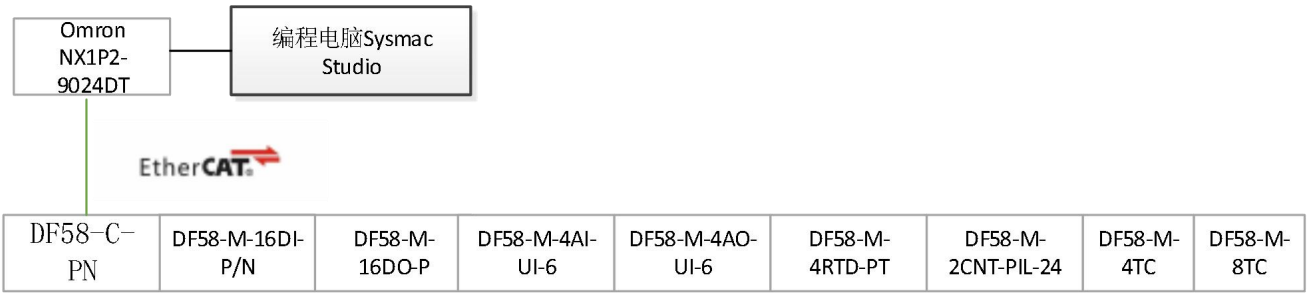
below, DF58-M-4AI-UI-6 channel 1 has a value of 15965, channel 2 has a value of 5019, and channel 3 has a value of 31975;



4.2. Example of connection with Omron NX1P2-9024DT

4.2.1. Communication Connections

Schematic diagram of the communication connection, as shown in the following figure:



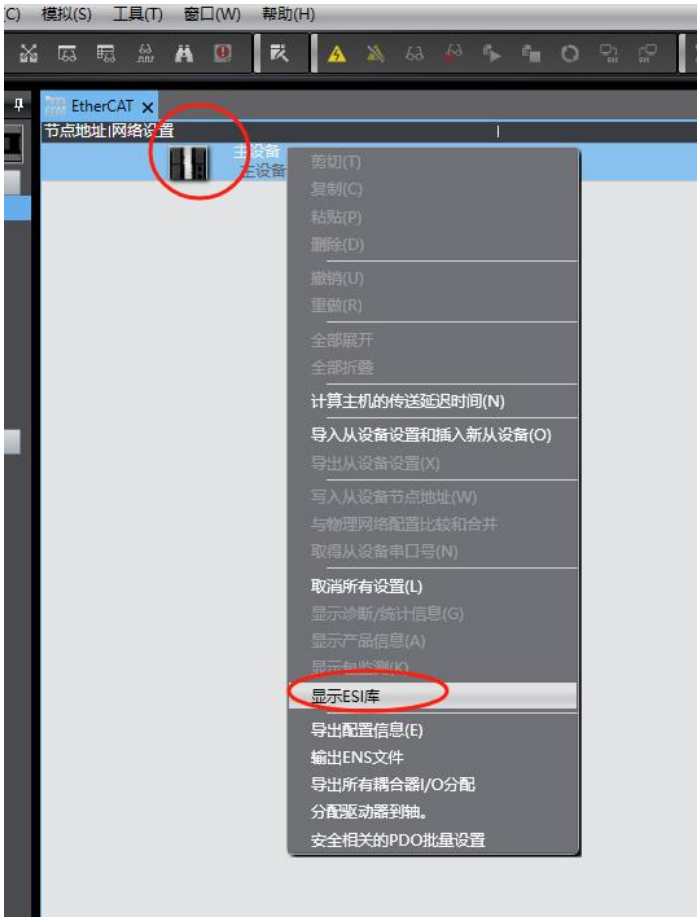
4.2.2. Hardware configuration

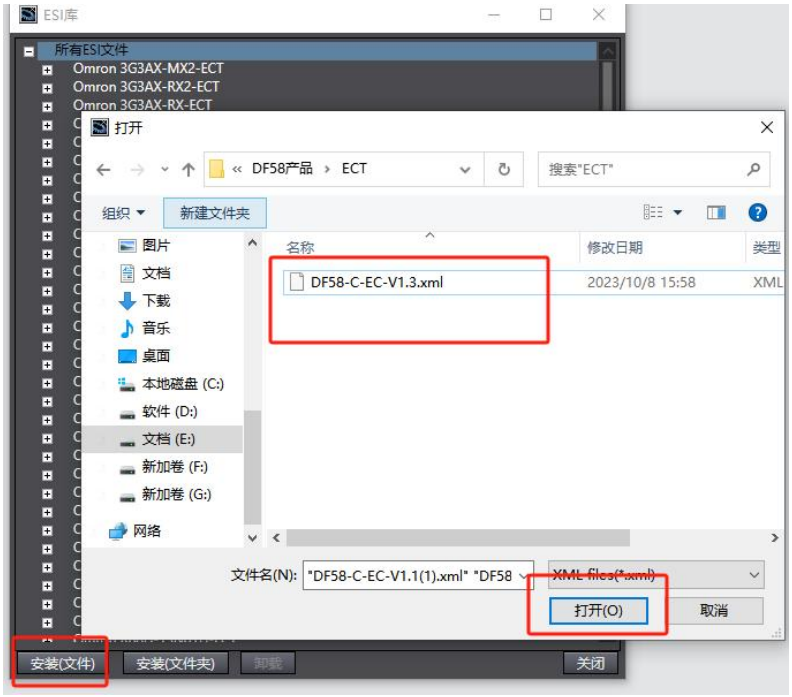
hardware	quantity	remark

Programming a computer	1 unit	Install Sysmac Studio v1.47
NX1P2-9024DT	1 pc	Omron PLC
DF58-C-EC	1 pc	
DF58-M-16DI-P/N	1 pc	
DF58-M-16DO-P	1 pc	
DF58-M-4AI-UI-6	1 pc	
DF58-M-4AO-UI-6	1 pc	
DF58-M-4RTD-PT	1 pc	
DF58-M-2CNT-PIL-24	1 pc	
DF58-M-4TC	1 pc	
DF58-M-8TC	1 pc	
Cable	Several	

4.2.3. Install the XML file

Open the Sysmac Studio programming software, create a project, select the main device, right-click, select "Show ESI Library", click Install, select the corresponding XML file, and then follow the steps shown below to install the XML file

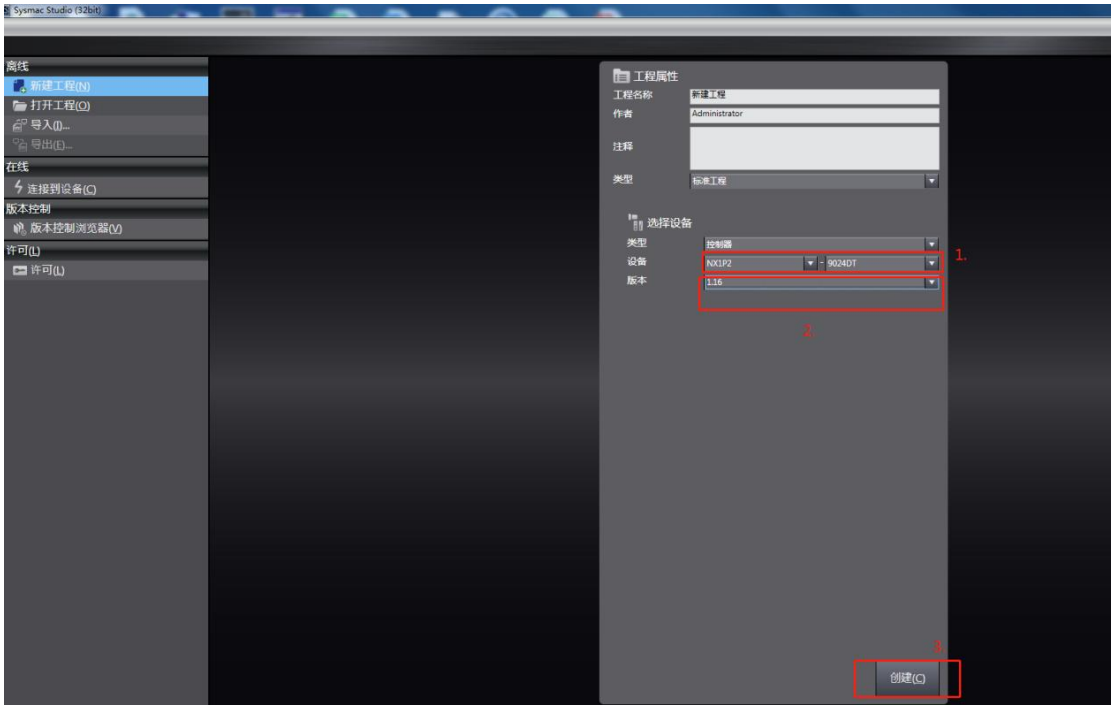




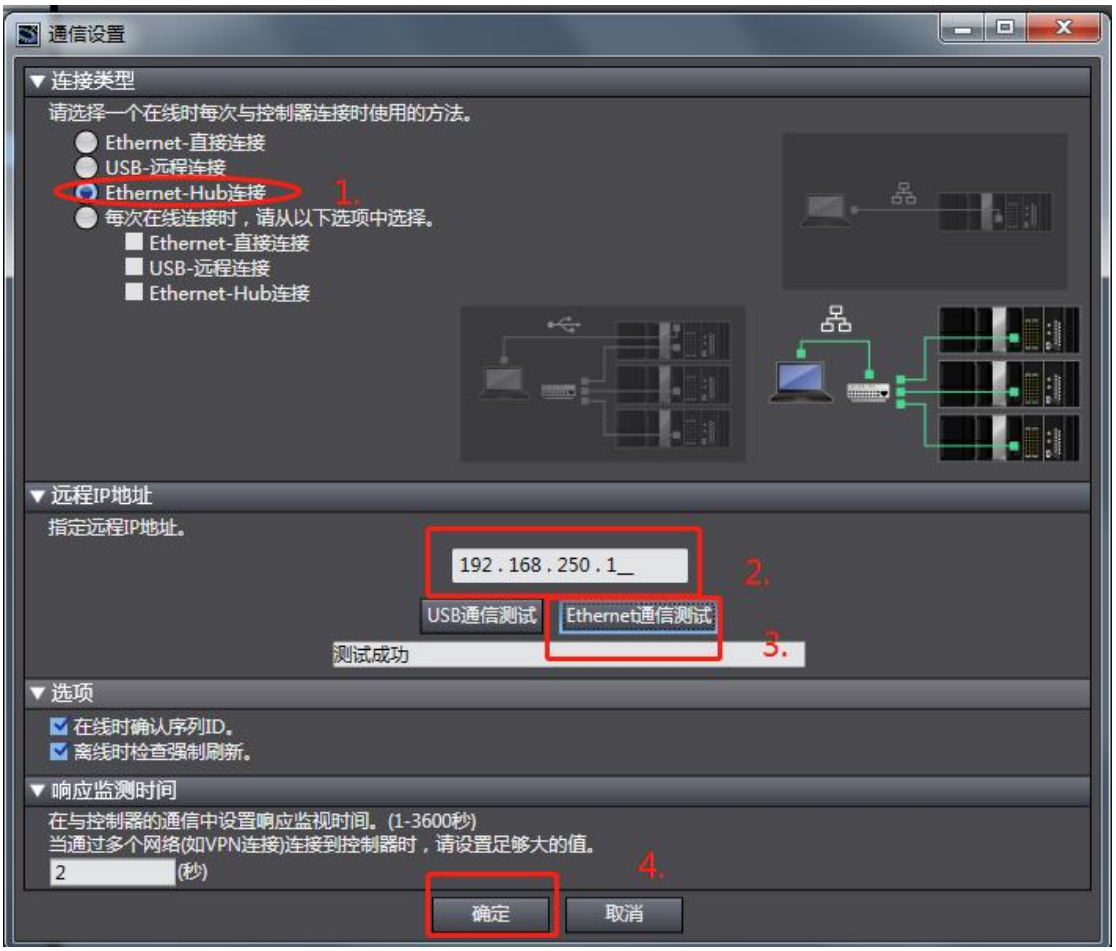
Once the installation is complete, you can find the installed XML file in the ESI Library.

4.2.4. New engineering and configuration

Open the Omron Sysmac Studio software, create a new project, and select the controller device model and version number, as shown in the following figure:

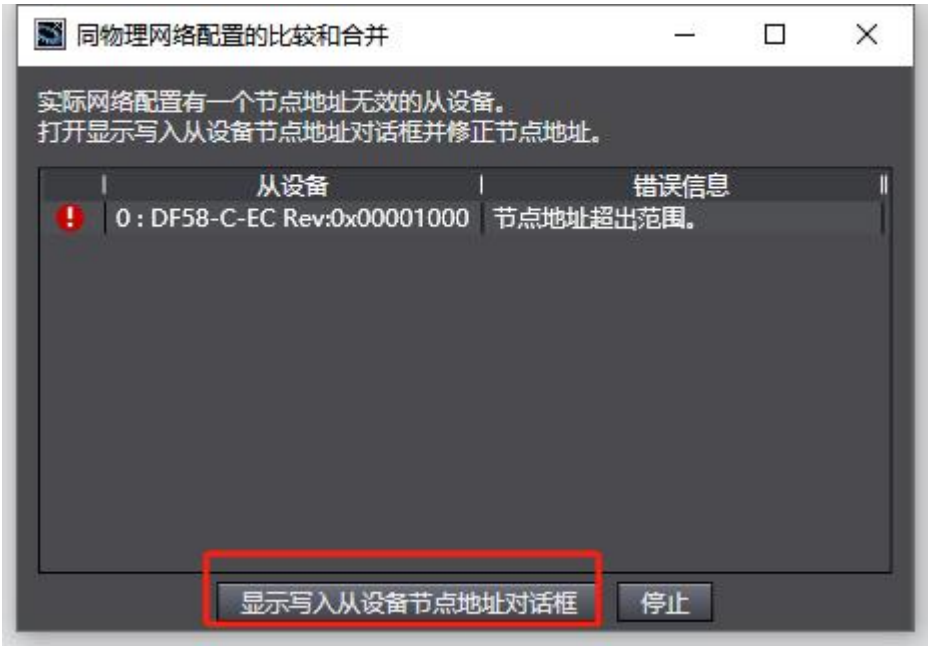


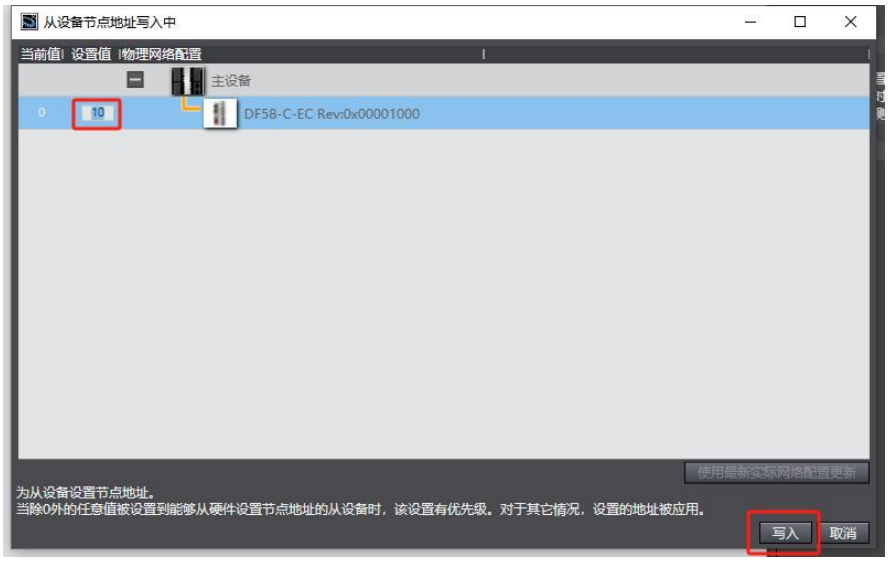
In this example, the IP address of the Omron controller is 192.168.250.1 and the IP address of the programming computer is 192.168.250.168. Test whether the programming computer and the Omron controller have communicated normally, as shown in the following figure:

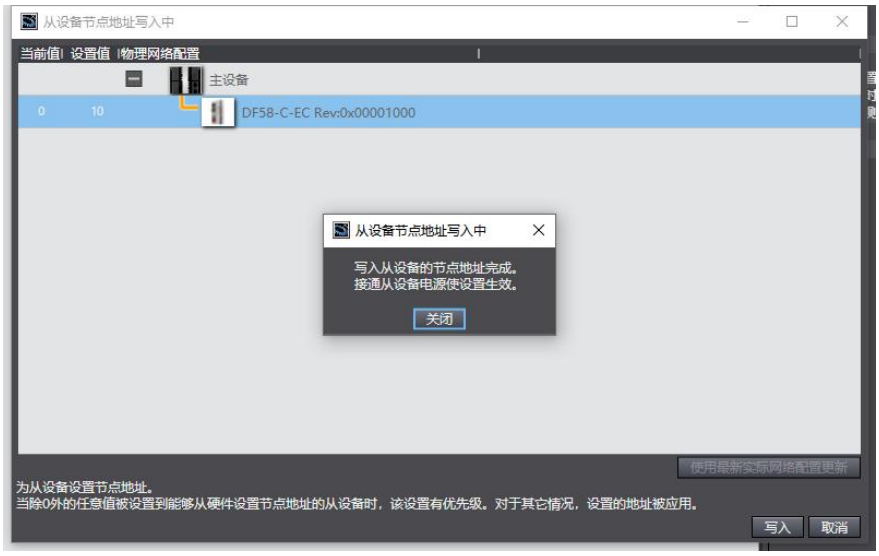


After the programming computer communicates with the controller normally, bring the controller online, and sweep the DF58-C-EC coupler and its extended IO to the Sysmac Studio, as shown in the following figure:

If the module dial address is 0 for the first use, you need to write to the station address, and after the write is successful, the station address will take effect after the module is powered off and restarted.

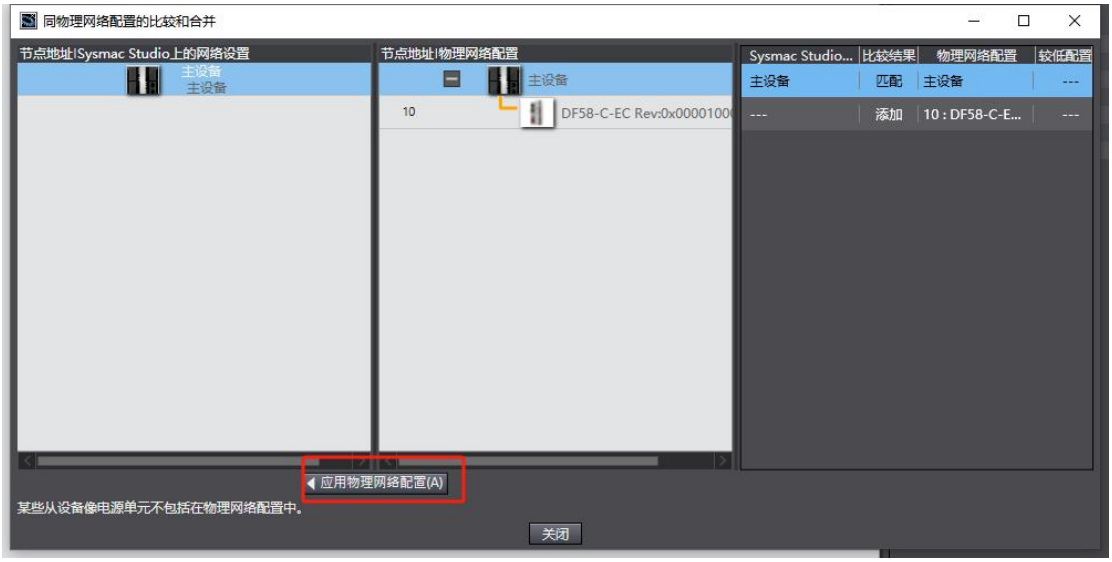






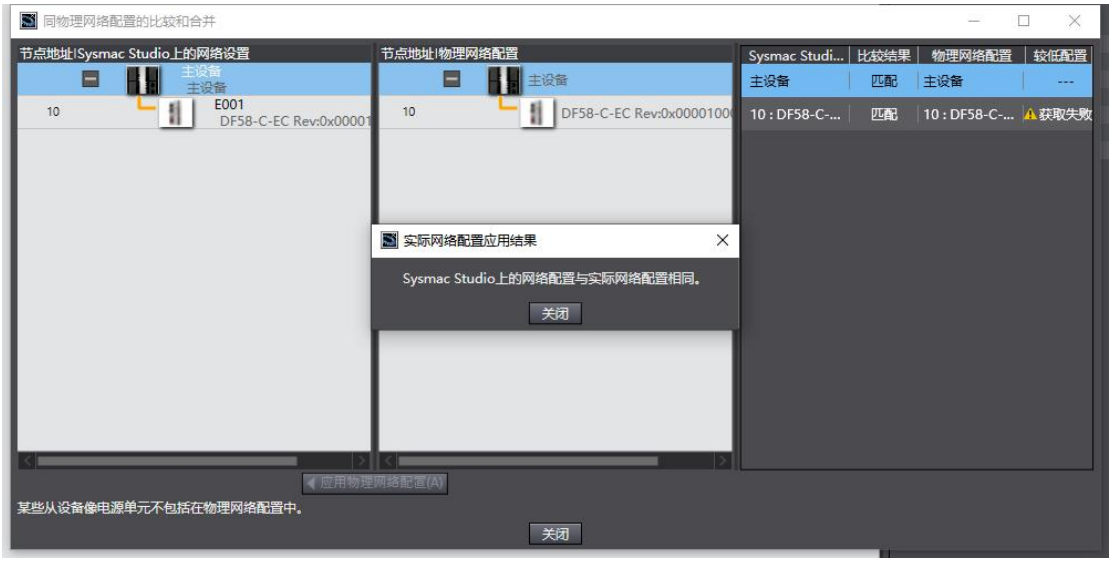
Once the write is successful, proceed with the following:


多视图浏览器
new_Controller_0
配置和设置
EtherCAT
CPU/扩展机架
I/O 映射
控制器设置
运动控制设置
Cam数据设置
事件设置
任务设置
数据跟踪设置
编程
POUs
程序
Program0
Section0
功能
EtherCAT
节点地址|网络设置
2
鼠标右键
主设备
剪切(T)
复制(C)
粘贴(P)
删除(D)
撤销(U)
重做(R)
全部展开
全部折叠
计算主机的传送延迟时间(N)
导入从设备设置和插入新从设备(O)
导出从设备设置(X)
写入从设备节点地址(W)
3
与物理网络配置比较和合并
取得从设备串口号(N)

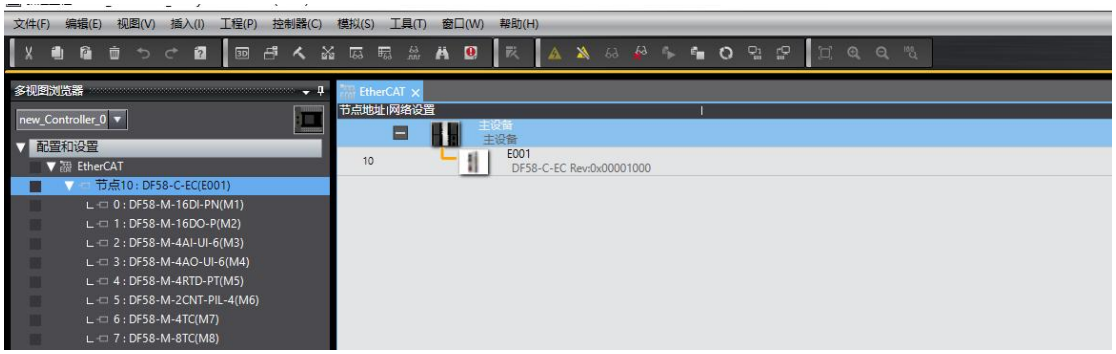

同物理网络配置的比较和合并
节点地址|Sysmac Studio上的网络设置
主设备
主设备
节点地址|物理网络配置
主设备
10
DF58-C-EC Rev:0x0000100
Sysmac Studio...
比较结果
物理网络配置
较低配置
主设备
匹配
主设备

添加
10 : DF58-C-E...

应用物理网络配置(A)
某些从设备像电源单元不包括在物理网络配置中。
关闭


同物理网络配置的比较和合并
节点地址|Sysmac Studio上的网络设置
主设备
主设备
10
E001
DF58-C-EC Rev:0x00001
节点地址|物理网络配置
主设备
10
DF58-C-EC Rev:0x0000100
Sysmac Studi...
比较结果
物理网络配置
较低配置
主设备
匹配
主设备
---
10 : DF58-C-...
匹配
10 : DF58-C-...
获取失败
实际网络配置应用结果
Sysmac Studio上的网络配置与实际网络配置相同。
关闭
应用物理网络配置(A)
某些从设备像电源单元不包括在物理网络配置中。
关闭

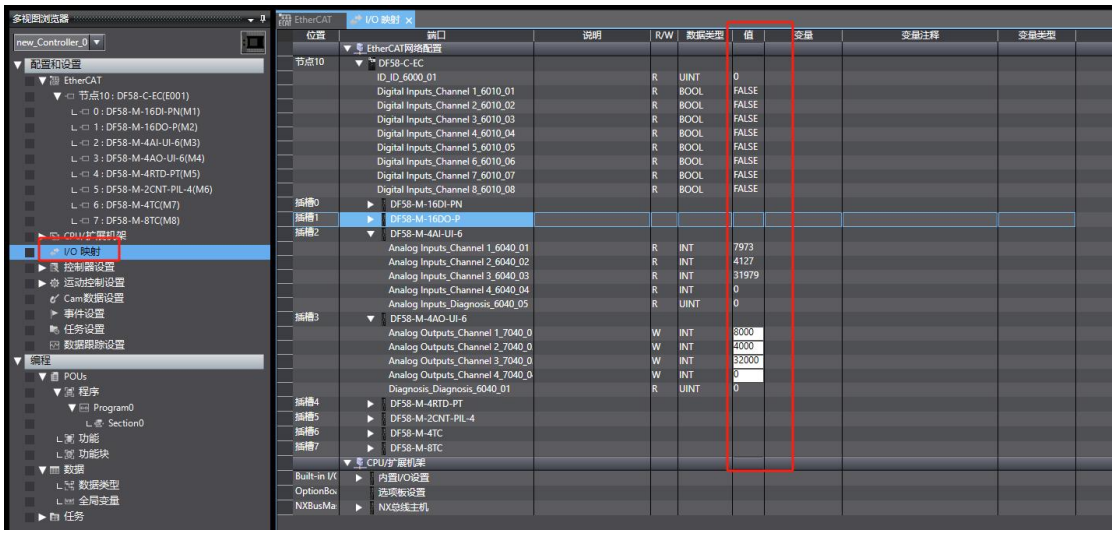
The result of a successful scan is shown in the following figure:



After the DF58-C-EC and its expansion modules are successfully scanned to Sysmac Studio, you need to download the configuration to the controller so that the controller can monitor the DF58-C-EC and its expansion modules, as shown in the following figure:

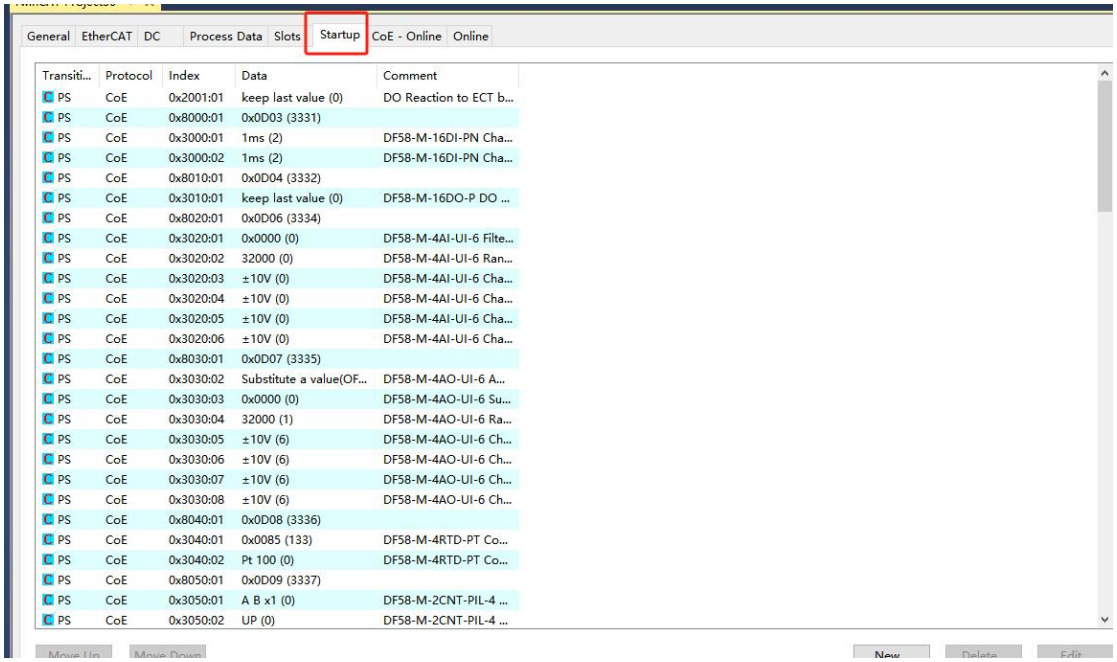
4.2.5. Data monitoring

After downloading the above configuration to the controller, keep the controller online, and monitor the IO in "Multi-View Browser→ "Configuration and Settings", → "IO Mapping" on the Sysmac Studio software, as shown in the following figure:

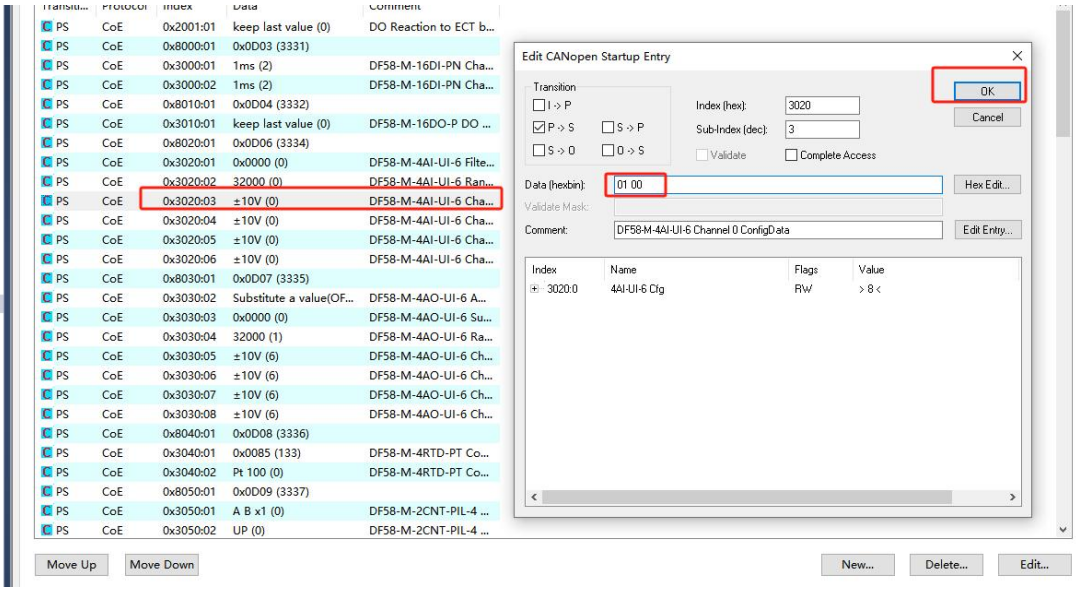


5. Appendix Module Configuration Parameters

The parameters of the DF58-C-EC expansion module are not saved, and the configuration of the expansion IO module is set to the factory every time the DF58-C-EC expansion module is scanned or powered on again. Set the parameters of the DF58-C-EC extension IO module in the startup item, write the parameters to the coupler every time you communicate, and keep the parameters of the expansion module unchanged in the same project.



For example, if the DF58-M-4AI-UI-6 channel 1 range is set to 1 (0~10V), write the corresponding parameter values, as shown in the following figure:



After the parameter configuration is complete, the configuration needs to be activated for the parameter to take effect.