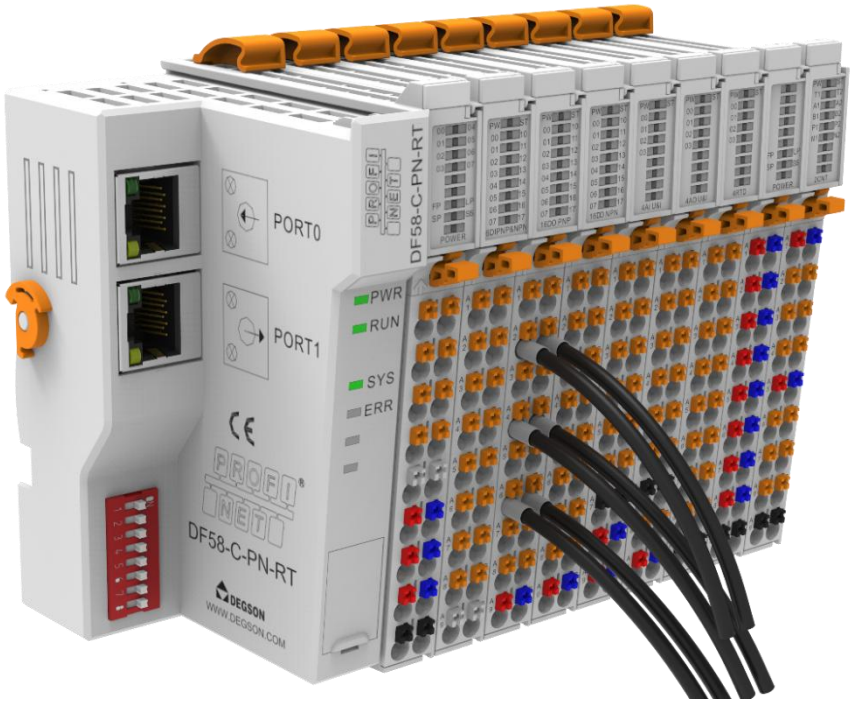
DF58-C-PN-RT

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

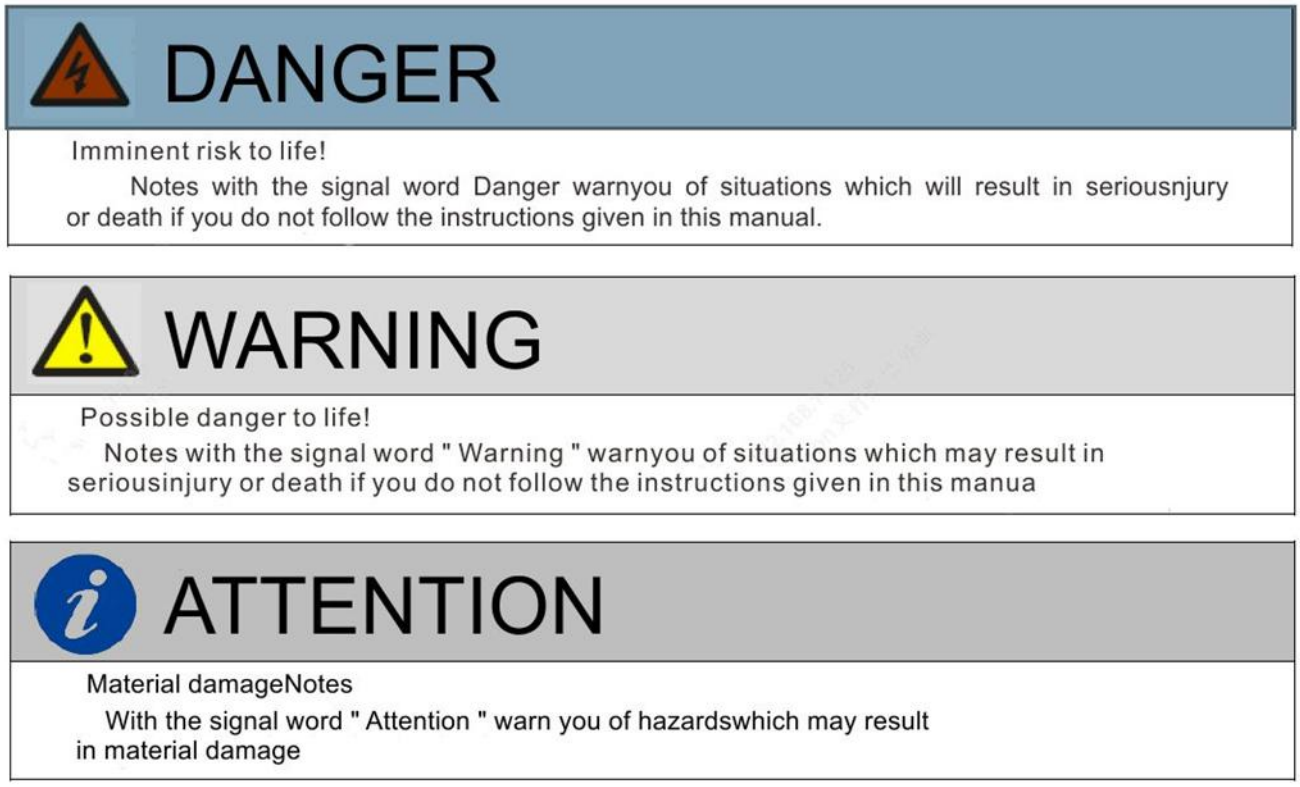
● Mechanical and electrical diagrams: DF58 remote IO module dimensions and electrical wiring diagrams;

● 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.

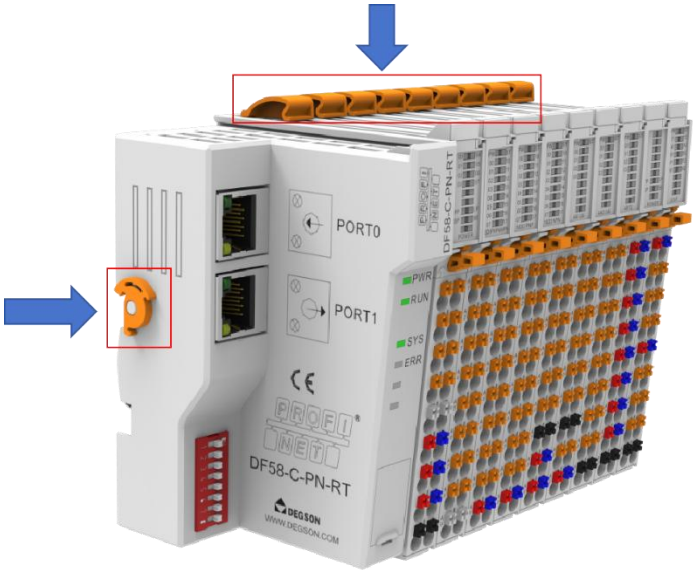
Recycling and disposal

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

1. Product installation and disassembly

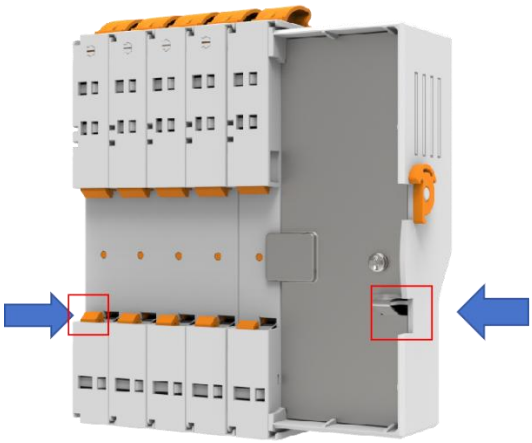
1.1 Installation

- 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

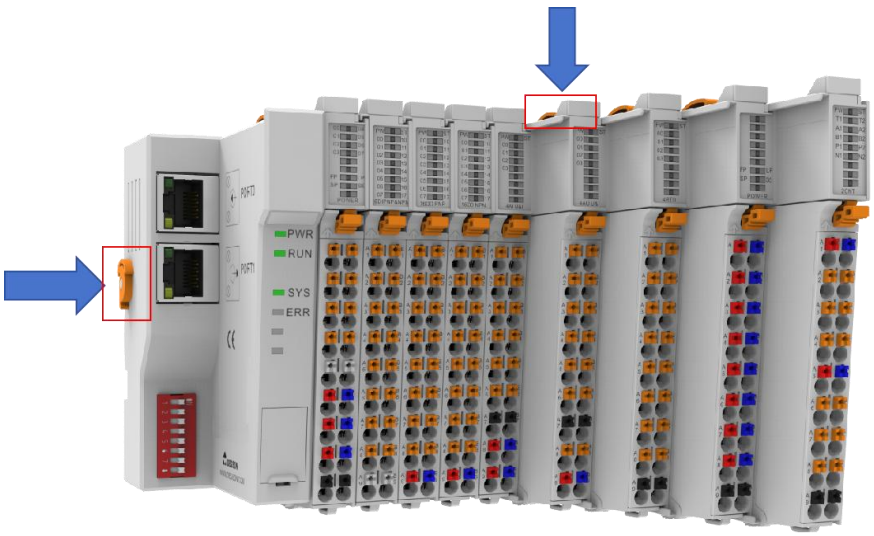
- There is a metal shrapnel on the back of the module for effective grounding with the guide rail, and the metal shrapnel is connected to the grounding PE of the adapter module.



1.3 Disassembly method

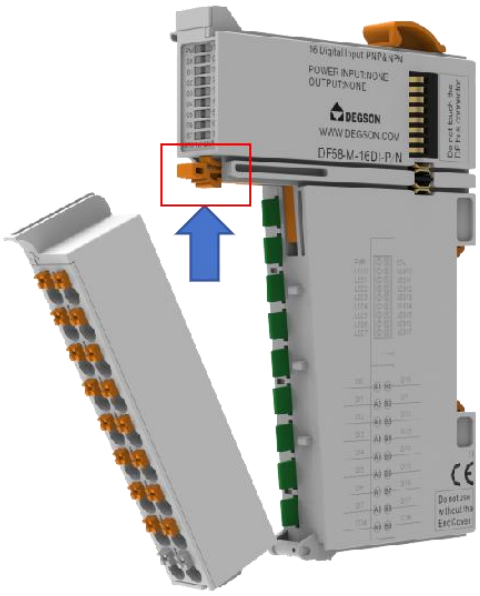
1.3.1 Module disassembly

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).



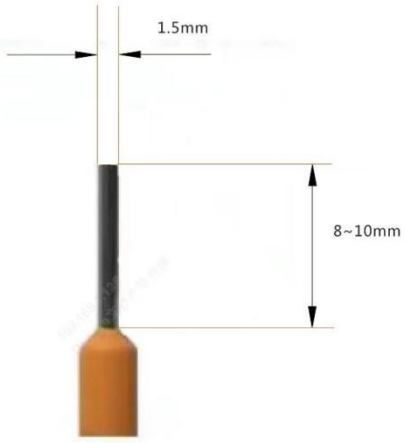
1.3.2 Terminal disassembly

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



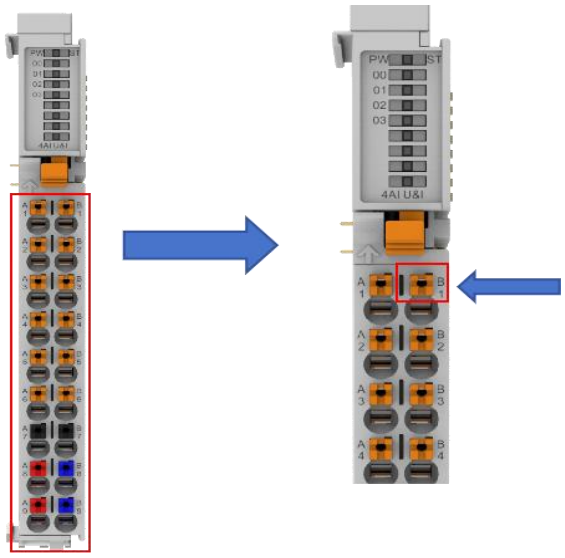
1.3.3 Cold-pressed terminals

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
PROFINET	PROFINET bus, 2 RJ45, expandable 32 modules, 24VDC	DF58-C-PN-RT

2.1 ProfiNet fieldbus adapter (DF58-C-PN-RT)

- The DF58-C-PN-RT fieldbus adapter acts as a slave to connect to PROFINET 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 a PROFINET 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.

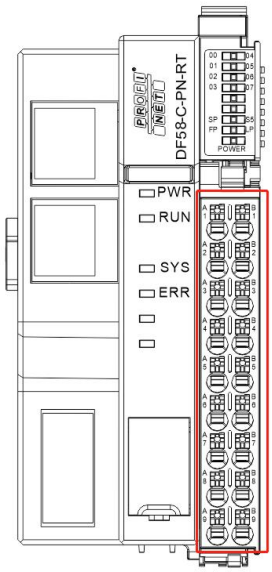
2.1.1 Specifications

Technical parameters	
Product Description:	PROFINET bus, 2 RJ45, expandable to 32 modules, 24VDC
Communication protocols	PROFINET
Local I/O	Locally integrated 8-channel DI, support NPN/PNP input
Connection	2 x RJ45 with integrated switch functionality
Transmission rate	100Mbps, full-duplex
Transmission distance	100 meters
PDO data	512 bytes
Scalable number of modules	32
Address mapping	Yes
Bus address settings	PROFINET 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	Max.2A

supplied	
The load voltage is provided	18V... 28VDC
The maximum current of the load is supplied	10A
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)
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

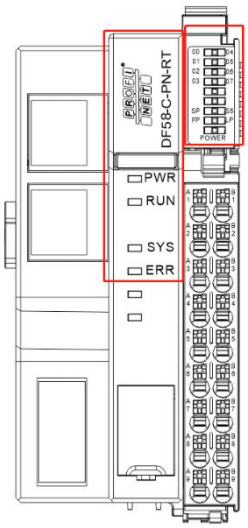


Terminal serial	Signal	Terminal serial number	Signal	illustrate

number				
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	earthing

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.

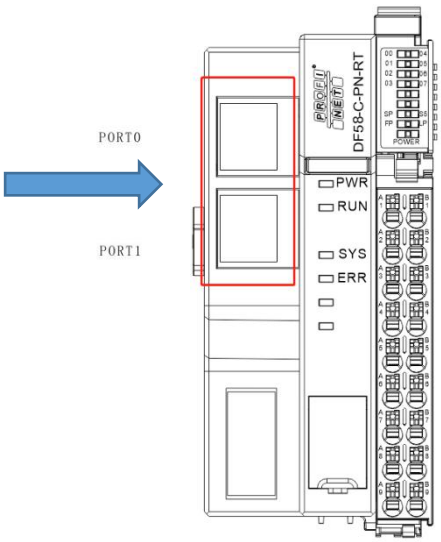
2.1.2.2 LED indicator definition



Light	meaning
PWR（green）	Power indicator, PWR indicator lights up when the module is powered normally
RUN (green)	On: The coupler is functioning normally Off: Coupler running abnormally Flickering: abnormal configuration;

SYS (green)	On: 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.

2.1.2.3 RJ45 interface

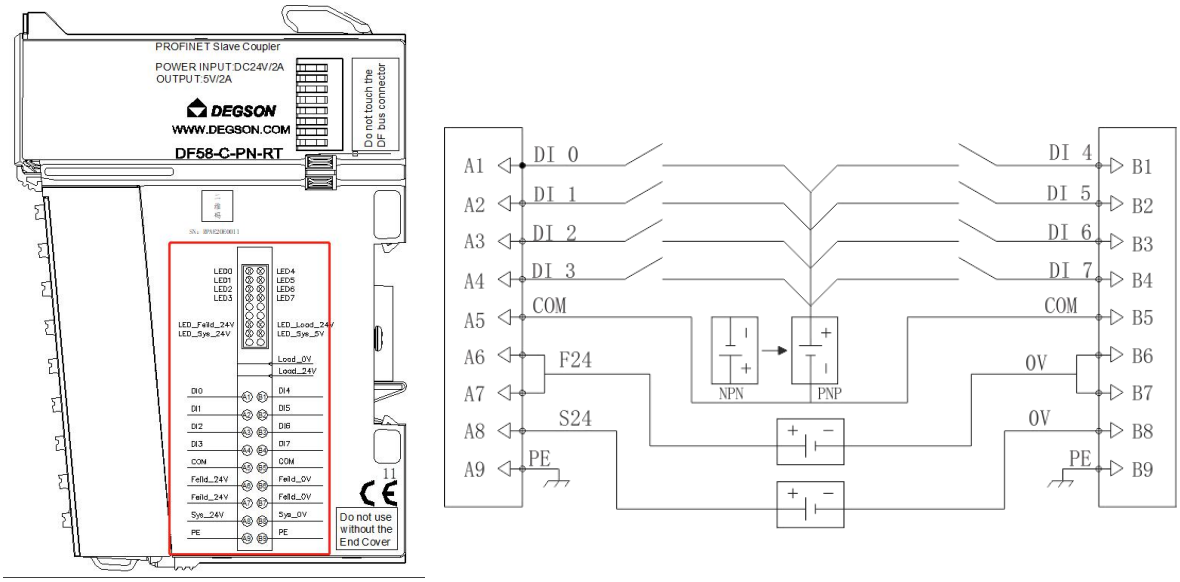


Used to establish communication with the host computer, the dual RJ45 ports make it easy to create a line structure without the need for any additional network components.

2.1.2.4 DIP switch

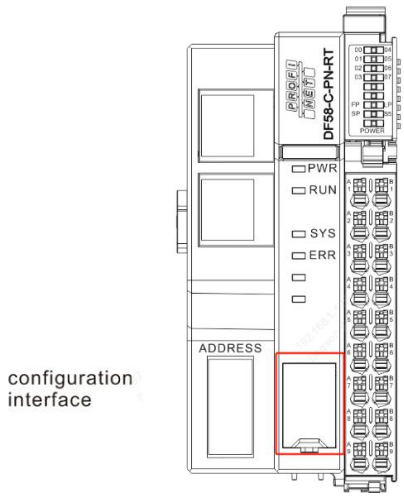
Currently, setting the adapter address is not supported.

2.1.2.5 Wiring diagram



Note: COM is the public side, and the external 24V implements NPN and 0V external implements PNP.

2.1.2.6 Configure the interface



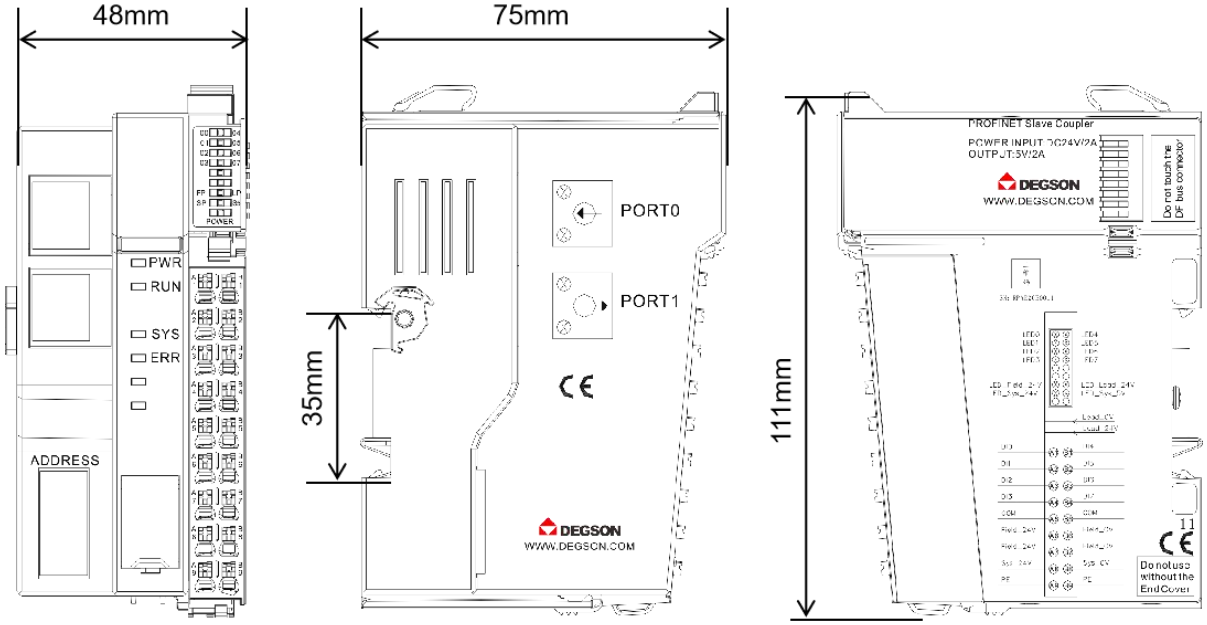
Set the configuration interface to facilitate the program upgrade of the adapter.

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

2.1.3 Mechanical installation

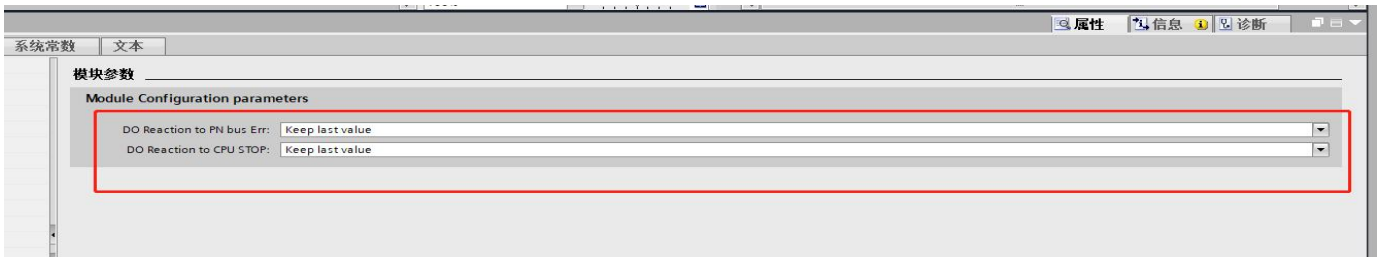
2.1.3.1 Installation dimensions

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



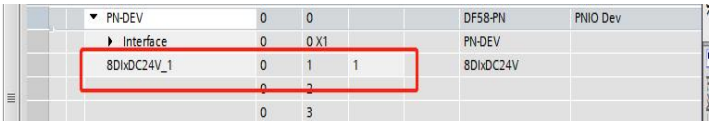
2.1.4 Parameter information

2.1.4.1 Module parameters



Module parameters	meaning
DO Reaction to PN bus Err	keep last value: When the PN communication fails, the digital output retains the last output state. Substitute a value(OFF)： Zero digital output during PN communication failure。 Substitute a value(ON)：When PN communication fails, digital output is set to 1
DO Reaction to CPU STOP	keep last value: When CPU stops, the digital output retains the last output state. Substitute a value(OFF)：Zero digital output during CPU STOP。 Substitute a value(ON)：When the CPU is stopped, the digital output is set to 1

2.1.4.2 Address Description



Add the corresponding data address of the module to the monitoring table, which can monitor the information of DF58-C-PN-RT8 digital input channels. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout

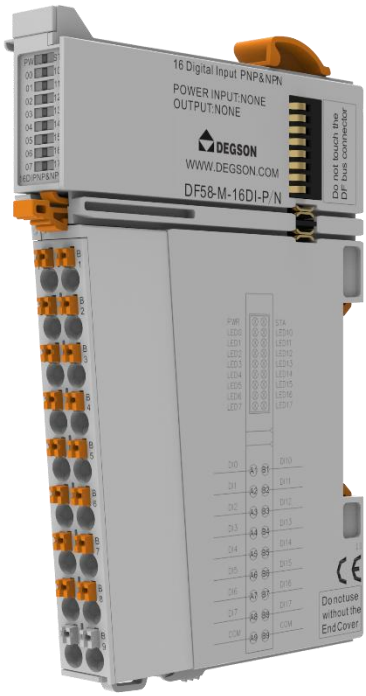
type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	1Byte	Enter the address/1Byte	%IB1	Supports 8 digital input channels
output	——	——	——	——

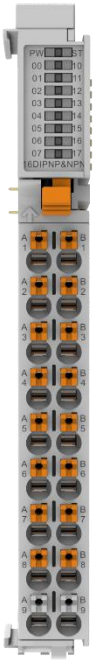
3. Expand the I/O module

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.





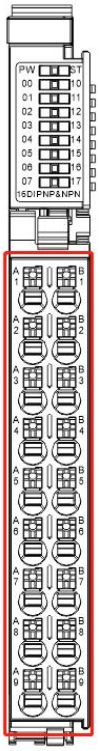
3.1.1 Specifications

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, byte-by-byte access, and word-by-word 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

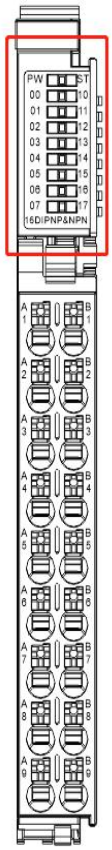
3.1.2 Hardware interface

3.1.2.1 Definition of terminal block



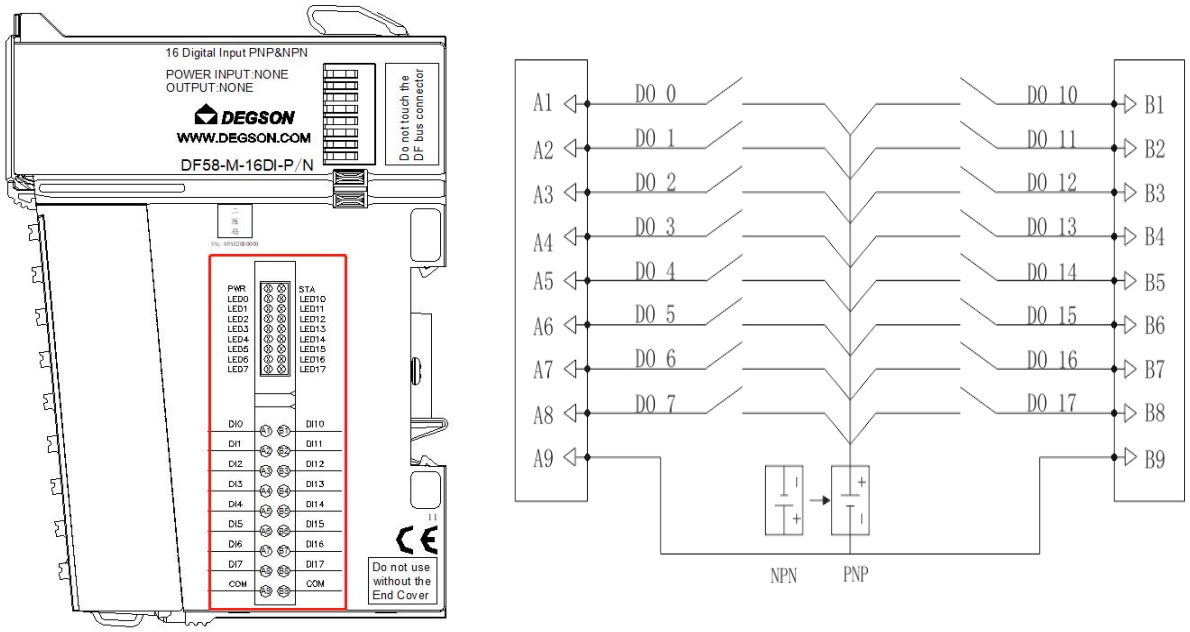
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	DI 0	B1	DI 10	DI signal input
A2	DI 1	B2	DI 11	
A3	DI 2	B3	DI 12	
A4	DI 3	B4	DI 13	
A5	DI 4	B5	DI 14	
A6	DI 5	B6	DI 15	
A7	DI 6	B7	DI 16	
A8	DI 7	B8	DI 17	
A9	COM	B9	COM	The DI signal is input to the common end

3.1.2.1 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.

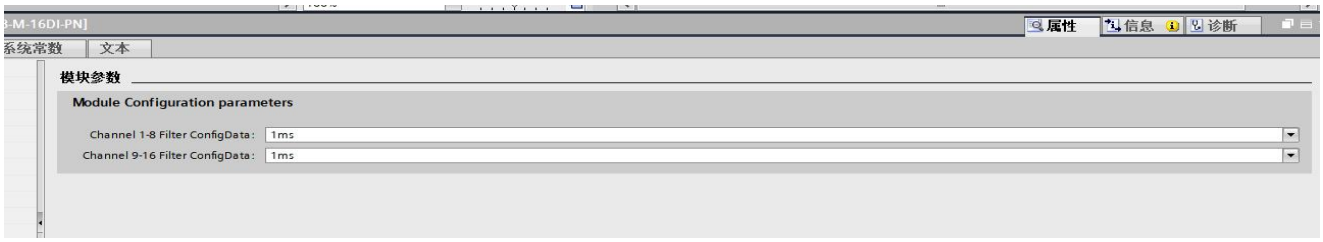
3.1.2.3 Wiring diagram



Note: COM is the public side, with an external 24V connection for NPN and an external 0V connection for PNP

3.1.3 Parameter information

3.1.3.1 Filter parameter configuration



Two sets of filtering parameters can be set, which are channel 1~8 filter parameters / channel 9~16 filter parameters

The filter parameters are selected in the form of drop-down boxes:

Module parameters	meaning
Channel 1-8 Filter ConfigData	Channel 1~8 filter parameters, no filter, 0.25ms, 0.5ms, 1ms (factory setting), 2ms, 4ms, 8ms, 16ms, 32ms.

Channel 9-16 Filter ConfigData	Channel 9~16 filter parameters, no filter, 0.25ms, 0.5ms, 1ms (factory setting), 2ms, 4ms, 8ms, 16ms, 32ms.

3.1.3.2 Address parameters

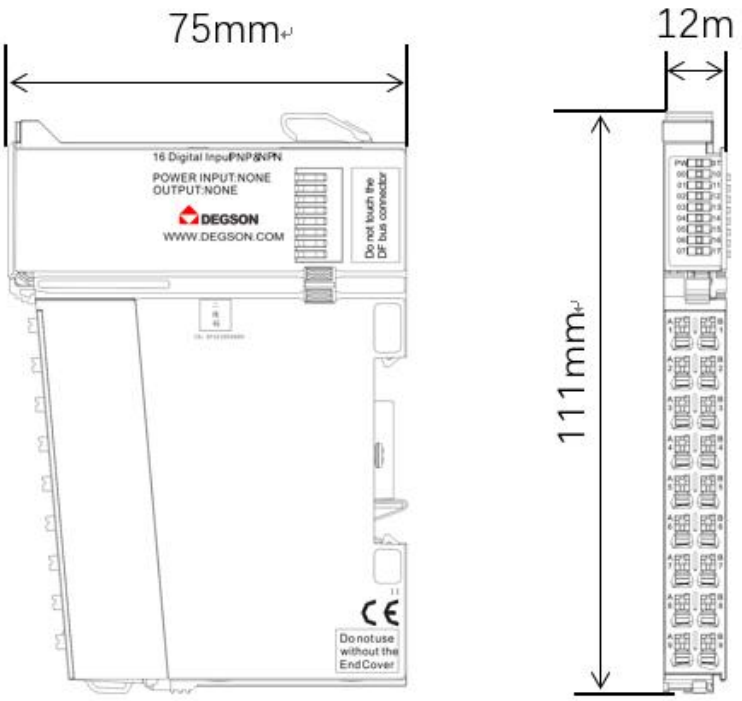
After configuring the DF58-M-16DI-P/N, add the corresponding data address to the monitoring table. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	4Byte	Enter the address/2Byte	%IW2	Supports 16 digital input channels
		Diagnostic information/2 bytes	%IW4	Bit0: 0: The bus is normal; 1: Bus fault; Bit1~Bit15: reserve
output	——	——	——	——

3.1.4 Mechanical installation

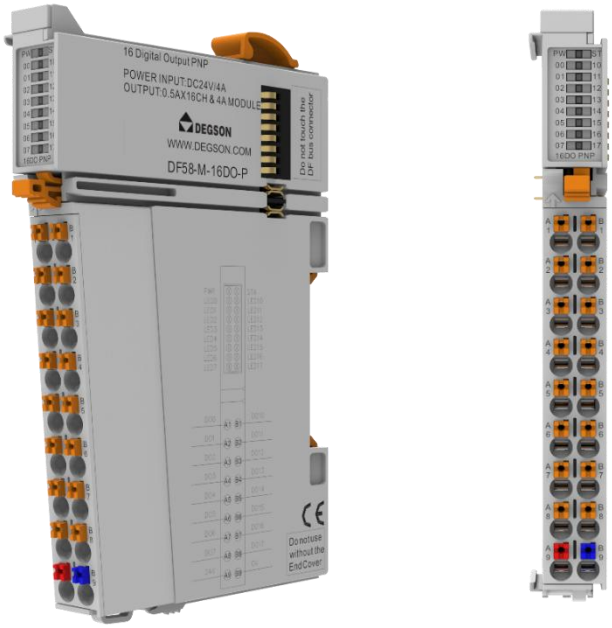
3.1.4.1 Installation dimensions

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.



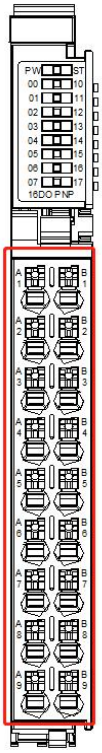
3.2.1. Specifications

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	＜180us
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 supports short-circuit protection
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, byte-by-byte access, and word-by-word 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

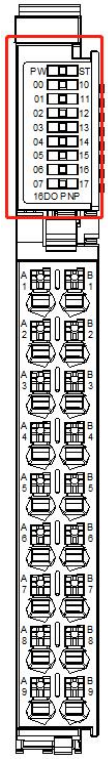
3.2.2 Hardware interface

3.2.2.1 Definition of terminal block



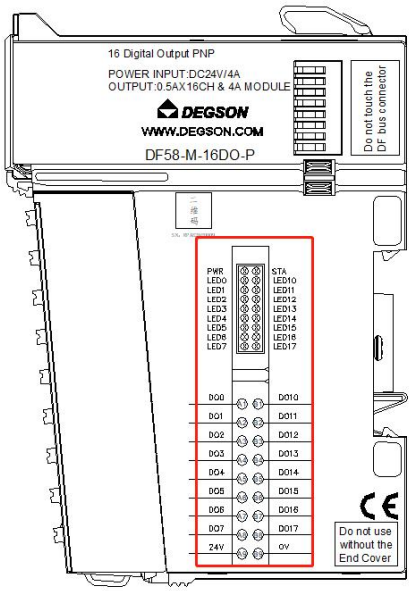
Pin ordinal	signal	Pin ordinal	signal	illustrate
A1	DO 0	B1	DO 10	DO signal output
A2	DO 1	B2	DO 11	
A3	DO 2	B3	DO 12	
A4	DO 3	B4	DO 13	
A5	DO 4	B5	DO 14	
A6	DO 5	B6	DO 15	
A7	DO 6	B7	DO 16	
A8	DO 7	B8	DO 17	
A9	24V	B9	0V	24V power input of the module

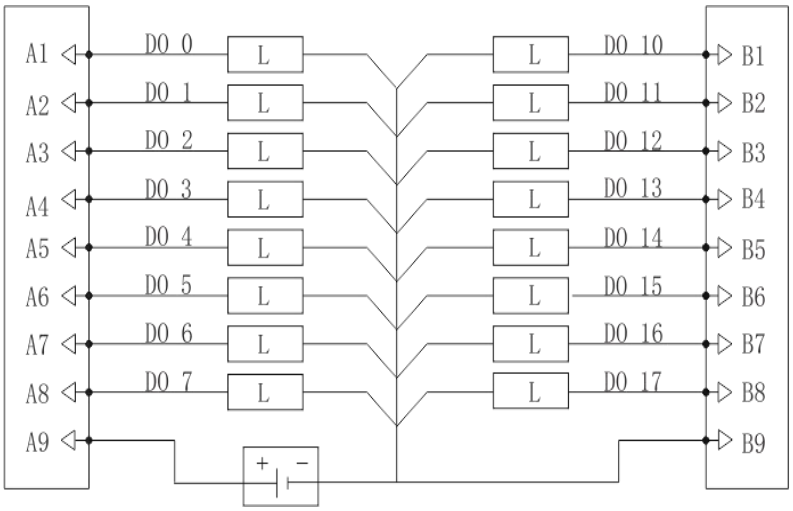
3.2.2.2 LED indicator definition



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

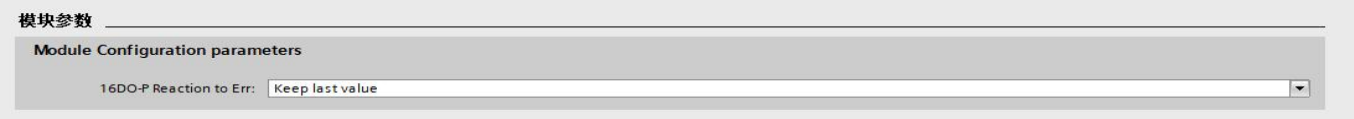




Note: The A9 and B924V power supplies are externally supplied.

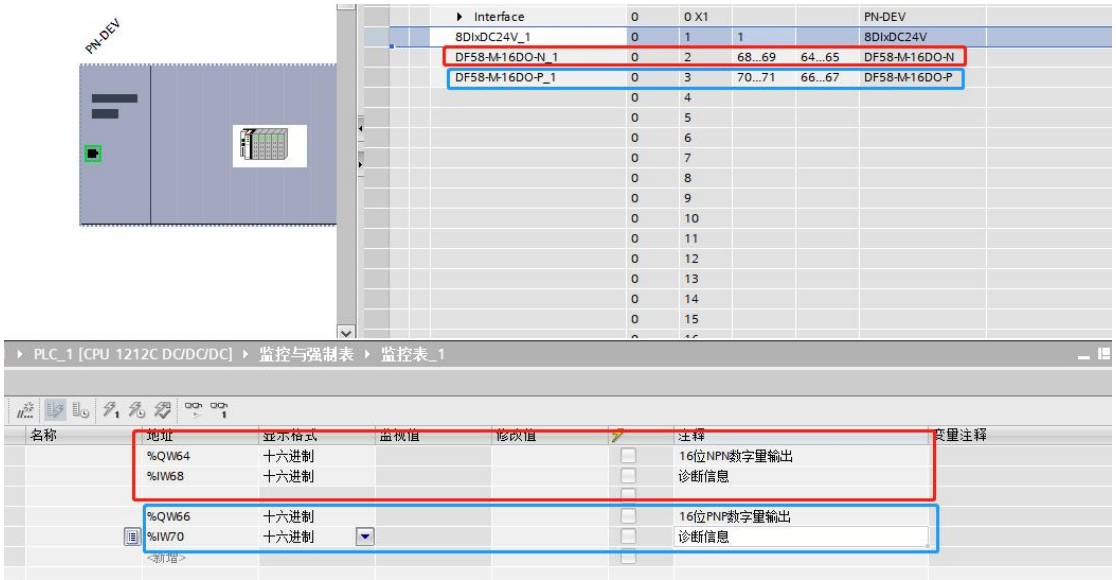
3.2.3 Parameter information

3.2.3.1 Module parameters



Module parameters	meaning
16DO-P Reaction to Err:	Keep last value：When the module is abnormal, the output remains unchanged； Substitute a value(OFF)：When the module is abnormal, output clear 0； Substitute a value(ON)：When the module is abnormal, set the output to 1；
Keep last value	When the module is abnormal, the output is maintained;
Substitute a value(OFF)	When the module is abnormal, the output is clear to 0;
Substitute a value(ON)	When the module is abnormal, the output is set to 1;

3.2.3.2 Address Description



After configuring the DF58-M-16DO-P, add the corresponding data address to the monitoring table to control the output of the DF58-M-16DO-P channel. Use the address in

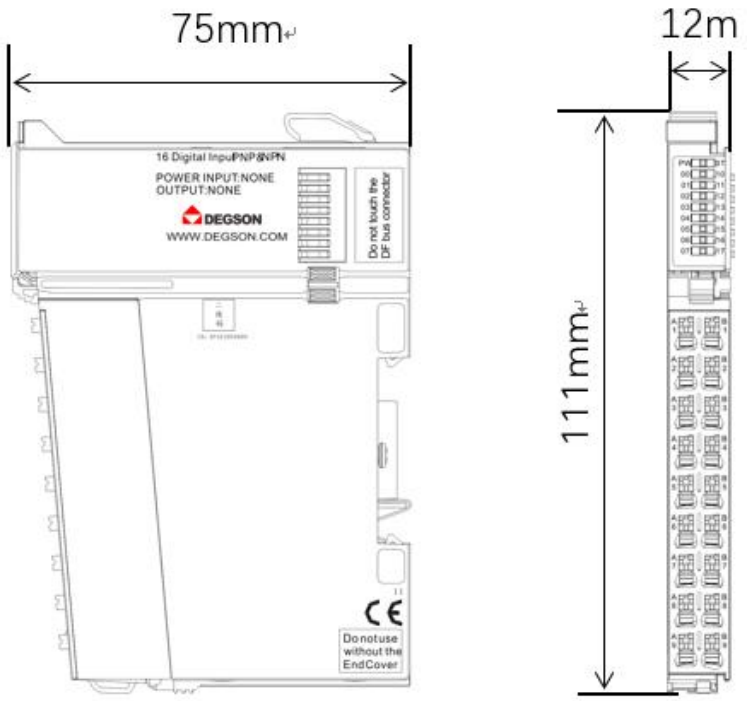
the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	2Byte	Diagnostic information/2 bytes	%IW70	Module Diagnostic Information: Bit0: 1: Bus fault; 0: The bus is normal; Bit1: 1: Channel 24V is not connected; 0: channel 24V access; Bit2: 1: Channel 1~8 has a short circuit in one of the channels; 0: The channel is normal Bit3: 1: Channel 9~16 has a short circuit in one of the channels; 0: The channel is normal Bit4~Bit15: reserve
output	2Byte	Output/2Byte	%QW66	Compatible with 16 digital output channels

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.

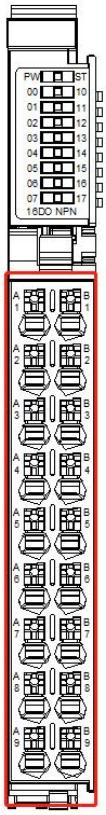
3.3.1 Specifications

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	< 100μs
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 supports short-circuit protection
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, byte-by-byte access, and word-by-word 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

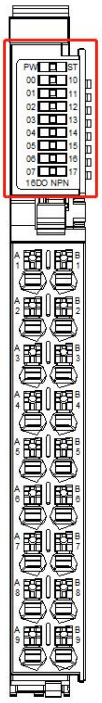
3.3.2 Hardware interface

3.3.2.1 Definition of terminal block



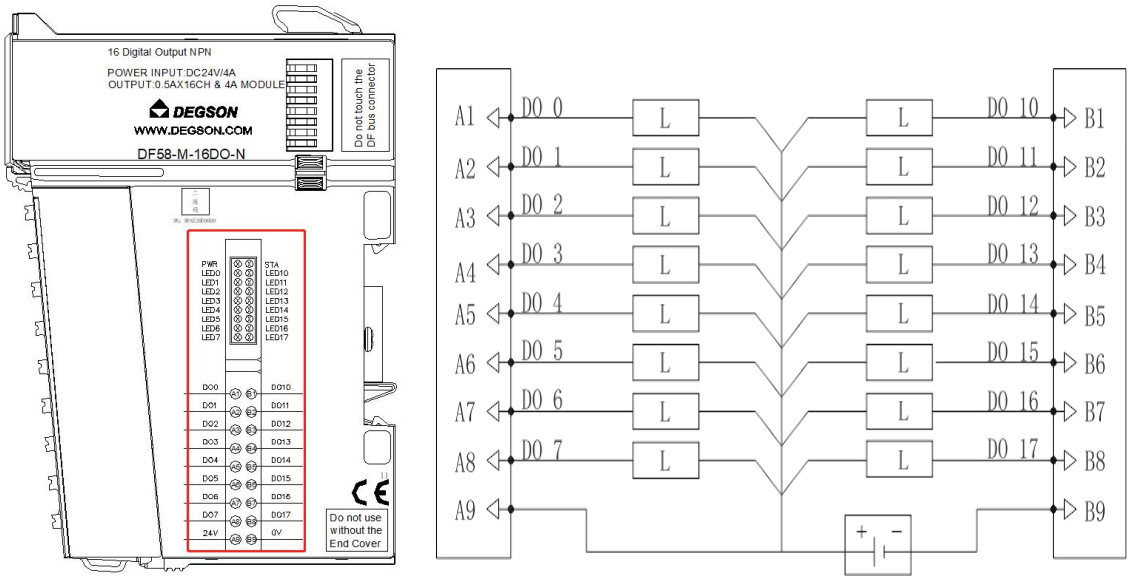
Pin ordinal	signal	Pin ordinal	signal	illustrate
A1	DO 0	B1	DO 10	DO signal output
A2	DO 1	B2	DO 11	
A3	DO 2	B3	DO 12	
A4	DO 3	B4	DO 13	
A5	DO 4	B5	DO 14	
A6	DO 5	B6	DO 15	
A7	DO 6	B7	DO 16	
A8	DO 7	B8	DO 17	
A9	24V	B9	0V	24V power input of the module

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.

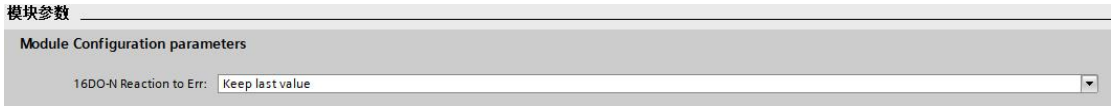
3.3.2.3 Wiring diagram



Note: The A9 and B924V power supplies are externally supplied.

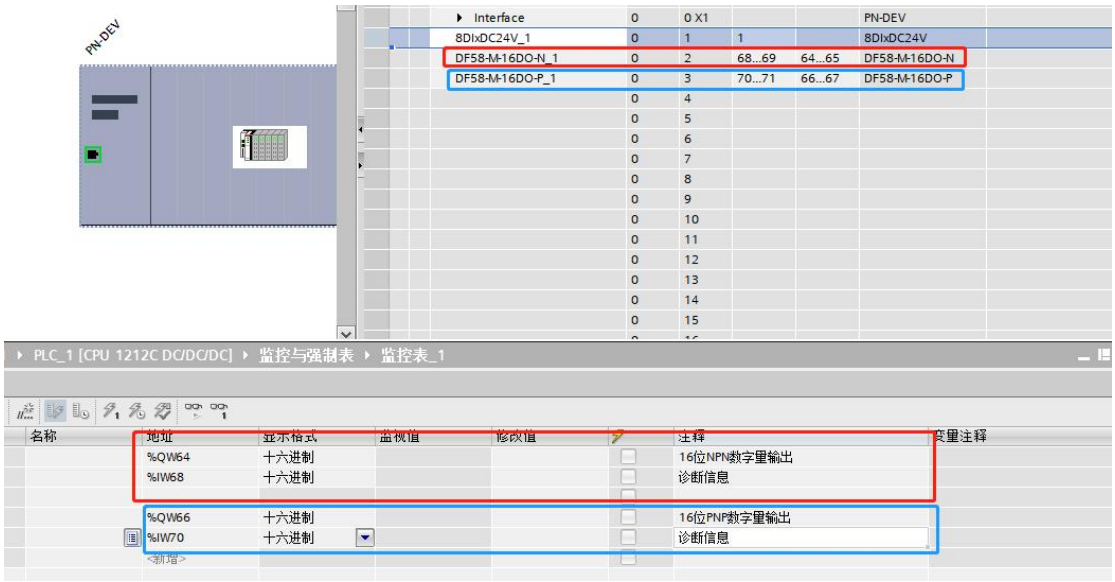
3.3.3 Parameter information

3.3.3.1 Module parameters



Module parameters	meaning
16DO-N Reaction to Err:	Keep last value：When the module is abnormal, the output remains unchanged； Substitute a value(OFF)：When the module is abnormal, output clear 0； Substitute a value(ON)：When the module is abnormal, set the output to 1；
Keep last value	When the module is abnormal, the output is maintained;
Substitute a value(OFF)	When the module is abnormal, the output is clear to 0;
Substitute a value(ON)	When the module is abnormal, the output is set to 1;

3.3.3.2 Address Description



After configuring the DF58-M-16DO-N or DF58-M-16DO-P, add the corresponding data address to the monitoring table to control the output of the DF58-M-16DO-N or DF58-M-16DO-P channel.

Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

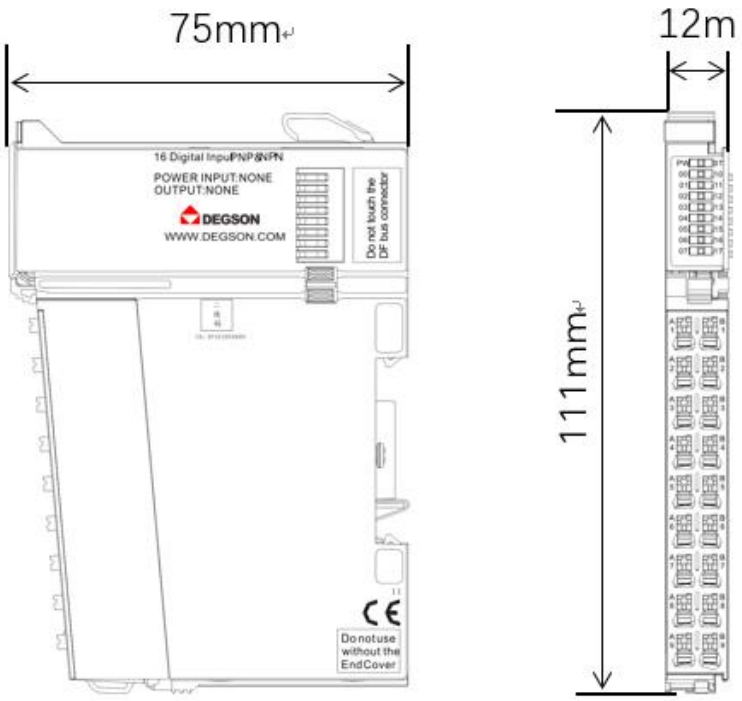
type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	2Byte	Diagnostic information/2 bytes	%IW68	module diagnostic information; Bit0: 1: Bus fault; 0: The bus is normal; Bit1: 1: Channel 24V is not connected; 0: channel 24V access; Bit2: 1: Channel 1~4 has a short circuit in one of the channels; 0: The channel is normal. Bit3: 1: Channel 5~8 has a short circuit in one of the channels; 0: The channel is normal. Bit4: 1: There is a short circuit in one of the channels 9~12; 0: The channel is normal. Bit5: 1: Channel 13~16 has a short circuit in one of the channels; 0: The channel is normal. Bit6~Bit15: reserve
output	2Byte	Output/2Byte	%QW64	Compatible with 16

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
				digital output channels

3.3.4 Mechanical installation

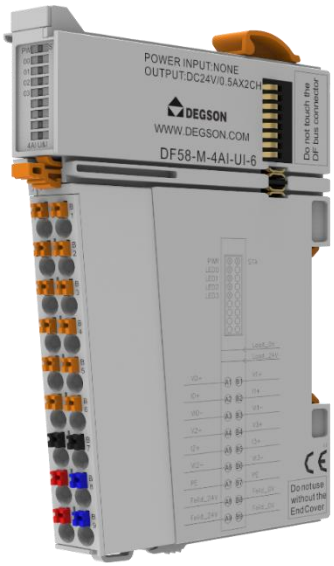
3.3.4.1 Installation dimensions

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



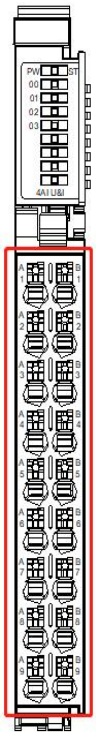
3.4.1 Specifications

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	AInstantaneous ± 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 is -27648 to 27648, which supports ± 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

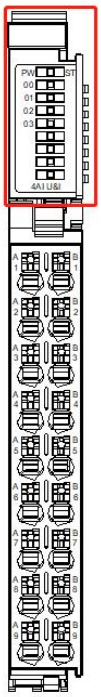
3.4.2 Hardware interface

3.4.2.1 Definition of terminal block



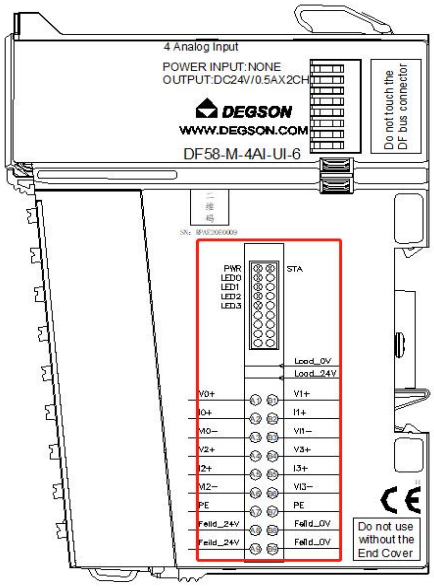
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	V0+	B1	V1+	Positive side of the voltage input channel
A2	I0+	B2	I1+	Current input channel positive
A3	V0-/I0-	B3	V1-/I1-	Negative terminal of voltage/current input
A4	V2+	B4	V3+	Positive side of the voltage input channel
A5	I2+	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

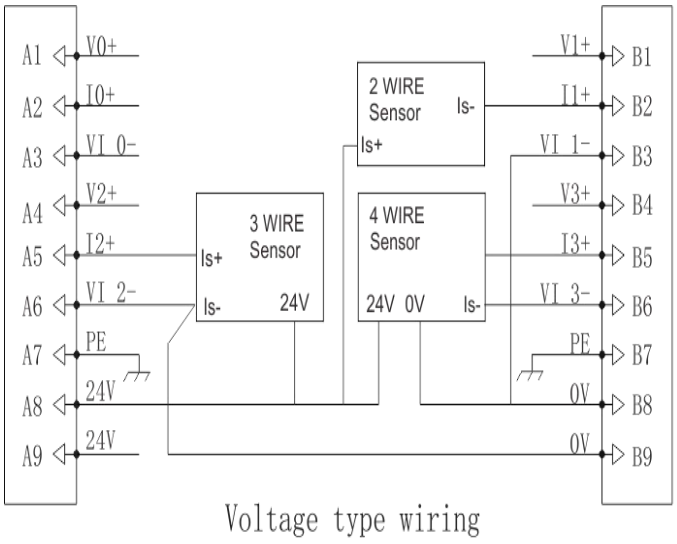
3.4.2.2 LED indicator definition



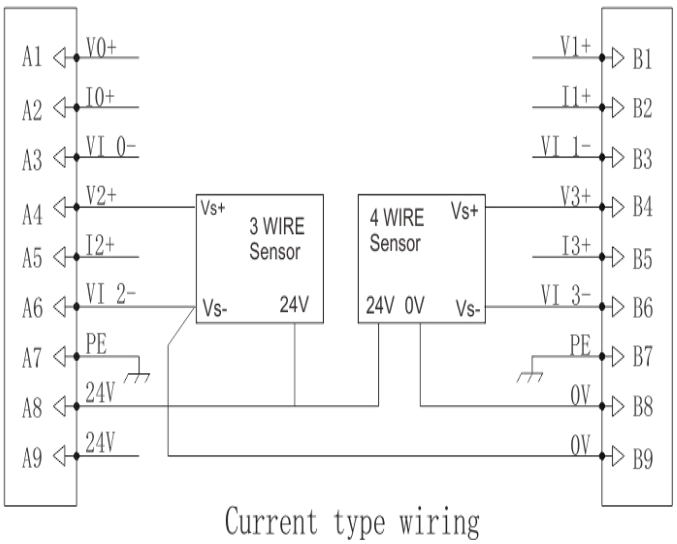
Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
LED0~LED3	No effect

3.4.2.3 Wiring diagram





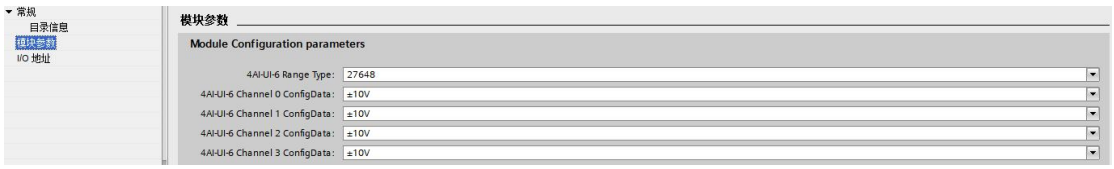
Voltage type wiring



Current type wiring

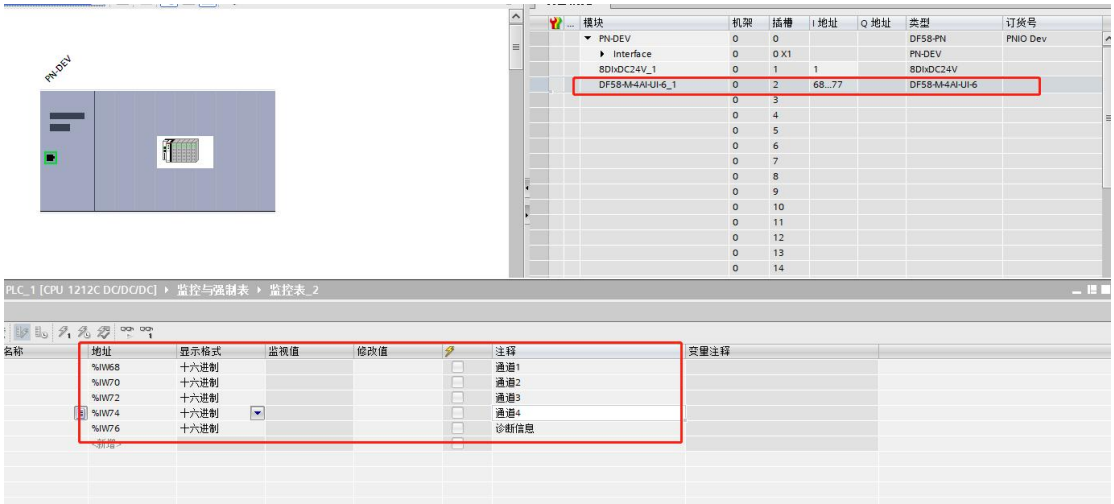
3.4.3 Parameter information

3.4.3.1 Module parameters



Module parameters	definition
4AI-UI-6 Range Type	Set the range is: 27648/32000;
4AI-UI-6 Channel 0 configData	Configure the voltage/current range of input channel 1 via the drop-down box: 1:-10-10VDC 2:0-10VDC 3:2-10VDC 4:-5-5VDC 5:0-5VDC 6:1-5VDC 7:-20-20ma 8:0-20ma 9:4-20ma
4AI-UI-6 Channel 1 configData	Configure the voltage/current range of input channel 2 via the drop-down box: 1:-10-10VDC 2:0-10VDC 3:2-10VDC 4:-5-5VDC 5:0-5VDC 6:1-5VDC 7:-20-20ma 8:0-20ma 9:4-20ma
4AI-UI-6 Channel 2 configData	Configure the voltage/current range of input channel 3 via the drop-down box: 1:-10-10VDC 2:0-10VDC 3:2-10VDC 4:-5-5VDC 5:0-5VDC 6:1-5VDC 7:-20-20ma 8:0-20ma 9:4-20ma
4AI-UI-6 Channel 3 configData	Configure the voltage/current range of input channel 4 via the drop-down box: 1:-10-10VDC 2:0-10VDC 3:2-10VDC 4:-5-5VDC 5:0-5VDC 6:1-5VDC 7:-20-20ma 8:0-20ma 9:4-20ma

3.4.3.2 Address Description



After the DF58-M-4AI-UI-6 is configured, add the DF58-M-4AI-UI-6 data address to the monitoring table to monitor the four channels of DF58-M-4AI-UI-6. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	10Byte	Enter the address/8Byte	%IW68~%IW74	4 input channel addresses, each of which occupies 2 bytes
		Diagnostic information/2 bytes	%IW76	Module Diagnostic Information: Bit0: 1: Bus fault, 0: Bus 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~Bit15: reserve。
output	——	——	——	——

3.4.3.3 Process data definition

Enter the voltage process parameters (the following table), taking the voltage (±10V) range 27648 as an example.

Rated voltage range: The voltage of the input channel is -10V~10V, and the monitored channel value is -27648~27648.

Exceeding the upper limit: The voltage of the input channel is (10V+0.3617mV)~10.12V, and the monitored channel value is 27649~27979.

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 -27649~-27979.

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

Process Data Definition (Voltage Type) 27648 Range

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	27979	0x6D4B	Super Upper Limit
5V+0.1808mV	5V+0.1808mV	10V+0.3617mV	10V+0.3617mV	5V+0.1808mV	10V+0.3617mV	27649	0x6C01	
5	5	10	10	5	10	27648	0x6C00	Rated range

-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
2.5	3	5	6	2.5	5	13824	0x3600	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
0	1	0	2	0	0	0	0x0000	
/	/	/	/	-	-	-	-	
/	/	/	/	-	-	-	-	
/	/	/	/	-2.5	-5	-13824	0xCA00	
/	/	/	/	-	-	-	-	
/	/	/	/	-	-	-	-	
/	/	/	/	-5	-10	-27648	0x9400	
/	/	/	/	-5V-0.1808mV	-10V-0.3617mV	-27649	0x93FF	Ultra-lower limit
/	/	/	/	-5.06	-10.12	-27979	0x92B5	
/	<0.3	/	<0.59	<-5.06	<-10.12	-32768	0x8001	Hypolympation

Process Data Definition (Voltage Type) 32000 Range

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	Rated range
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
2.5	3	5	6	2.5	5	16000	0x3600	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
0	1	0	2	0	0	0	0x0000	
/	/	/	/	-	-	-	-	
/	/	/	/	-	-	-	-	
/	/	/	/	-2.5	-5	-16000	0xC180	
/	/	/	/	-	-	-	-	
/	/	/	/	-	-	-	-	
/	/	/	/	-5	-10	-32000	0x8300	
/	/	/	/	-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 parameter table, taking the current (4~20mA), 27648 range as an example.

Rated voltage range: the current of the input channel is 4~20mA, and the monitored channel value is -27648~27648.

Exceeding the upper limit: When the current of the input channel is 20.005mA~22.81mA, the channel value is 27649~32511.

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.

Process Data Definition (Current) 27648 Range

Process Data Definition (Current)					
Current (0-20mA)	Current (-20-20mA)	Current (4-20mA)	decimal	hexadecimal	
>23.515	>23.515	>22.810	32767	0x7FFF	Overflow
23.515	23.515	22.81	32511	0x7EFF	Super Upper Limit
-	-	-	-	-	
-	-	-	-	-	
20.0007	20.0007	20.0005	27649	0x6C01	
20	20	20	27648	0x6C00	Rated range
-	-	-	-	-	
-	-	-	-	-	
10	10	12	13824	0x3600	
-	-	-	-	-	
-	-	-	-	-	
0	0	4	0	0x0000	
<0.0	<0.0	3.9995	-1	0xFFFF	Ultra-lower limit
-	-	-	-	-	
-	-	-	-	-	
-	-23.515	1.1852	-4864(4~20mA) -32511(-20~20mA)	0xED00(4~20mA) 0x8101(-20~20mA)	
/	<-23.515	<1.1852	-32768	0x8001	Hypolympation

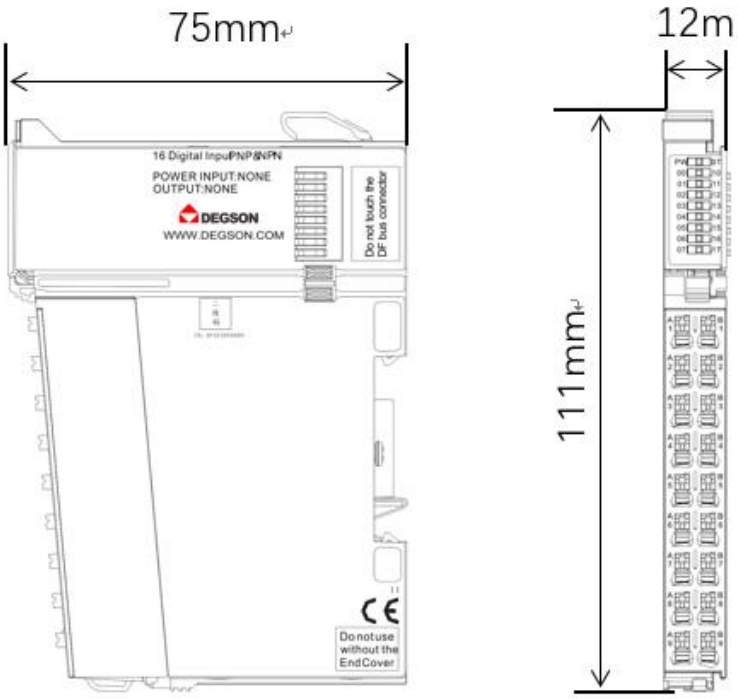
Process Data Definition (Current) 32000 Range

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(-20~20mA)	0xEA02(4~20mA) 0x8101(-20~20mA)	
/	<-20.32	<1.1852	-32768	0x8001	Hypolympation

3.4.4 Mechanical installation

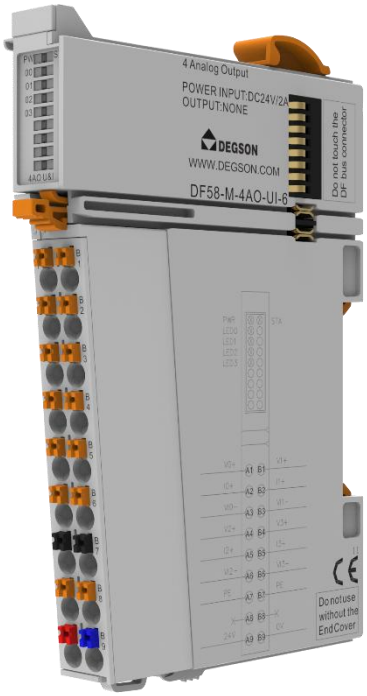
3.4.4.1 Installation dimensions

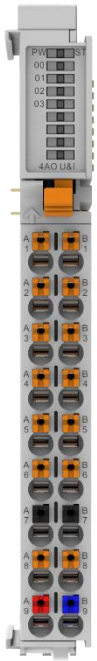
The installation size information is shown in the figure below, and the unit is (mm).


75mm
12m
111mm
16 Digital Input PNP&NPN
POWER INPUT:NONE
OUTPUT:NONE
DEGSON
WWW.DEGSON.COM
Do not touch the DF bus connector
Do not use without the End Cover

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.





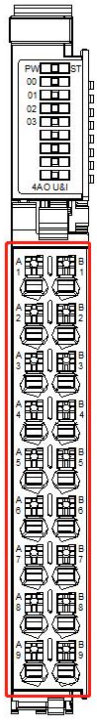
3.5.1 Specifications

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	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，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	The default configuration is -27648 to 27648, which supports ± 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

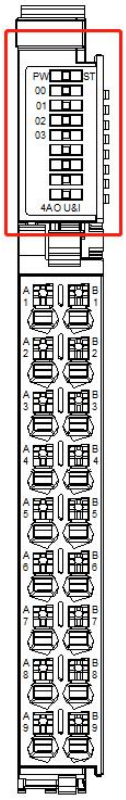
3.5.2 Hardware interface

3.5.2.1 Definition of terminal block



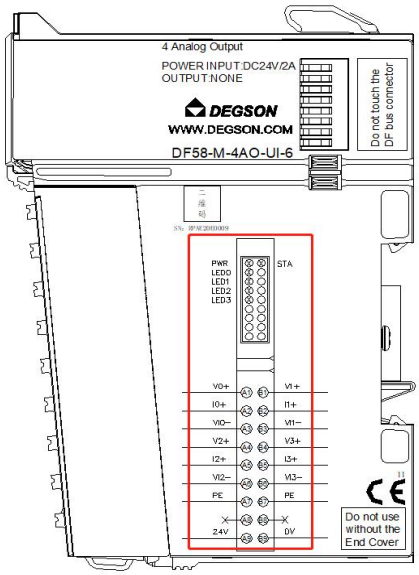
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	V0+	B1	V1+	The positive pole of the voltage output channel
A2	I0+	B2	I1+	The current output channel is positive
A3	V0-/I0-	B3	V1-/I1-	Negative terminal at voltage/current output
A4	V2+	B4	V3+	The positive pole of the voltage output 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

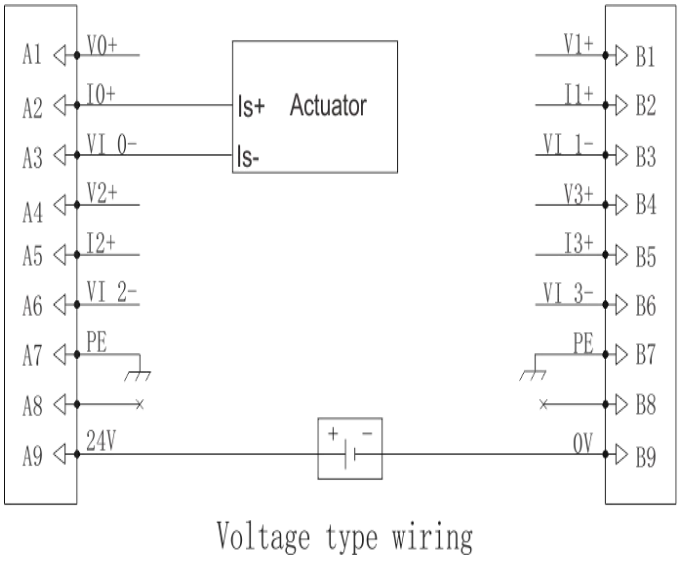
3.5.2.2 LED indicator definition



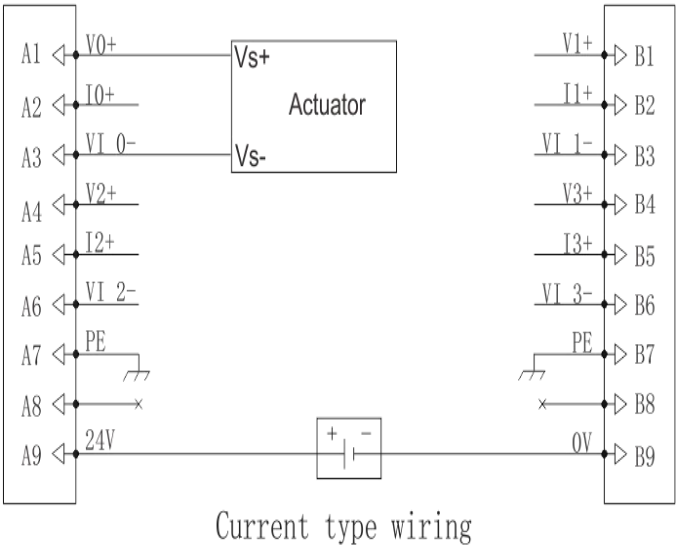
Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.

3.5.2.3 Wiring diagram





Voltage type wiring

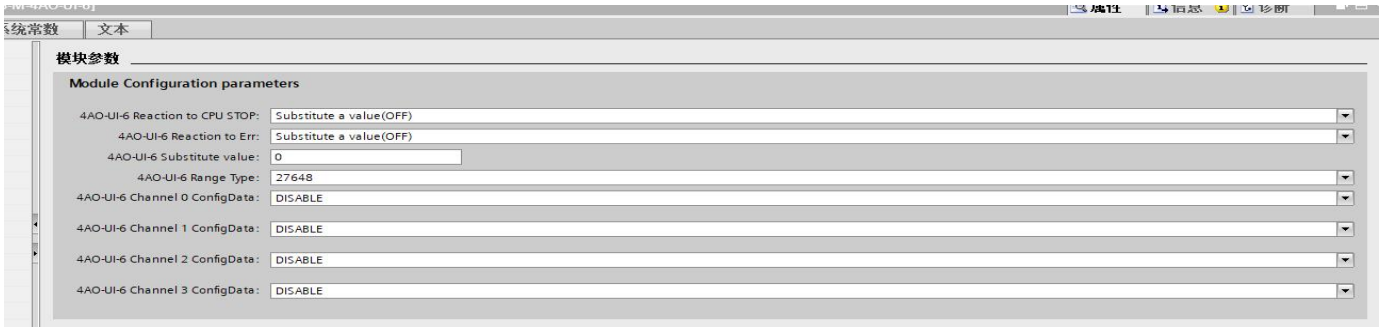


Current type wiring

3.5.3 Parameter information

3.5.3.1 Module parameters

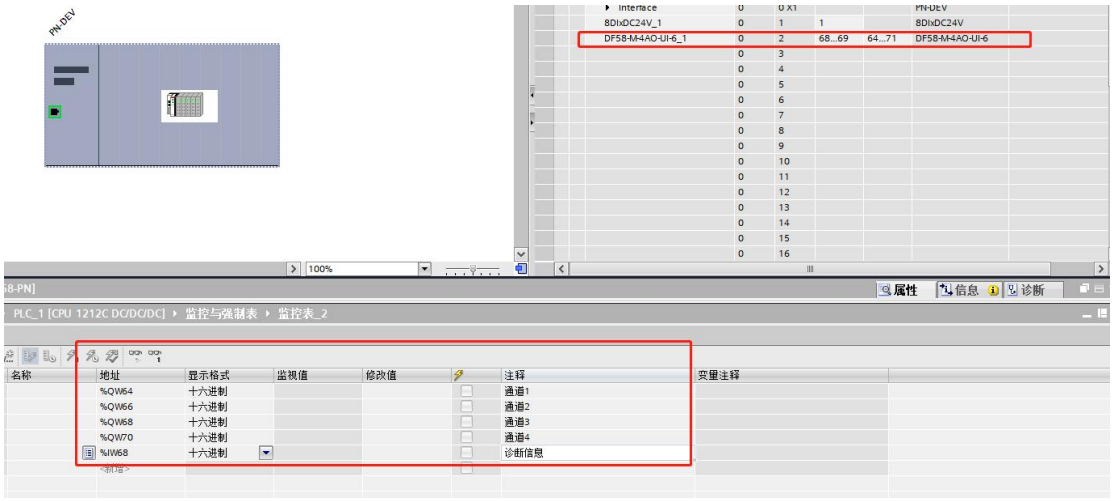
Pay special attention to the DF58-M-4AO-UI-6 channel 1~4 default 0 configuration (output disabled), please configure the channel before using it.



Module parameters	definition
4AO-UI-6 Reaction to CPU STOP	Substitute a value(OFF)： Zero analog output during CPU STOP。 keep last value：When the CPU is stopped, the analog output remains in the final output state。 Substitute a Set value: Simulated output preset value during CPU STOP。
4AO-UI-6 Reaction to Err	Substitute a value(OFF)：Clear analog output to zero during module failure。 keep last value: The analog output remains in the last output state when the module fails. Substitute a Set value: Analog output preset value during module failure。
4AO-UI-6 Substitute value	Output presets
4AO-UI-6 Range Type	Set the range is: 27648/32000; For example, the channel range is -10V~10 V: Set the range range -32000~32000, and the channel display value is 16000 when a 5V signal is detected. Set the range range -27648~27648, and the channel display value is 13824 when a 5V signal is detected.
4AO - UI - 6 Channel 0ConfigData	Configure the voltage/current range of output channel 1 via the drop-down box: 1:DISABLE 2:0-5VDC 3:1-5VDC 4:-5-5VDC 5:0-10VDC 6:2-10VDC 7:-10-10VDC 8:0-20mA 9:4-20mA
4AO-UI-6 Channel 1 ConfigData	Configure the voltage/current range of output channel 2 via the drop-down box: 1:DISABLE 2:0-5VDC 3:1-5VDC 4:-5-5VDC 5:0-10VDC 6:2-10VDC 7:-10-10VDC 8:0-20mA 9:4-20mA
4AO -UI - 6 Channel 2 ConfigData	Configure the voltage/current range of output channel 3 via the drop-down box: 1:DISABLE 2:0-5VDC 3:1-5VDC 4:-5-5VDC 5:0-10VDC 6:2-10VDC 7:-10-10VDC 8:0-20mA 9:4-20mA

Module parameters	definition
4AO - UI - 6 Channel 3 ConfigData	Configure the voltage/current range of output channel 4 via the drop-down box: 1:DISABLE 2:0-5VDC 3:1-5VDC 4:-5-5VDC 5:0-10VDC 6:2-10VDC 7:-10-10VDC 8:0-20mA 9:4-20mA

3.5.3.2 Address Description



After the DF58-M-4AO-UI-6 is configured, add the DF58-M-4AO-UO-6 data address to the monitoring table to control the 4-channel output of the DF58-M-4AO-UO-6. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

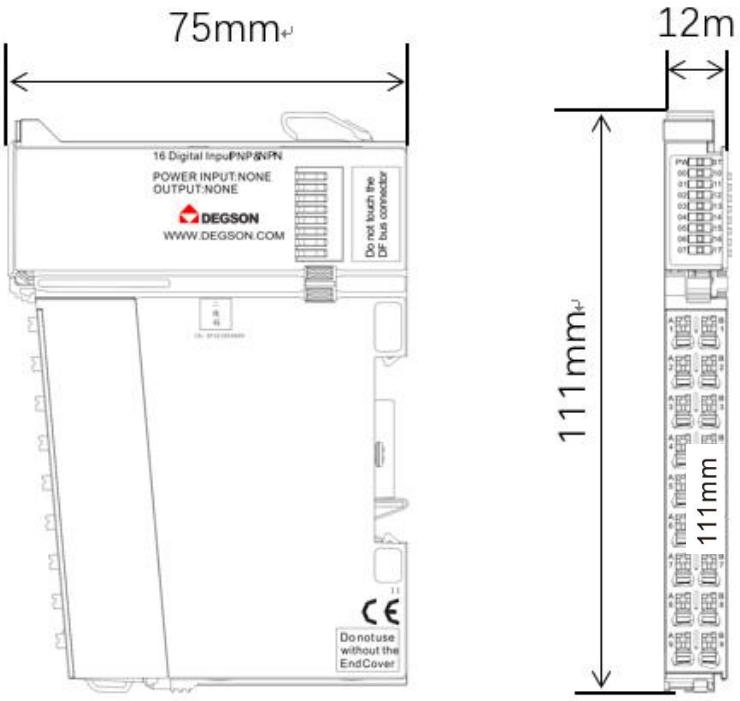
type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	2Byte	Diagnostic information/2 bytes	%IW68	Module Diagnostic Information: Bit0: 1: Bus fault; 0: The bus is normal;

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
				Bit1： 1: Channel 24V is not connected; 0: channel 24V access; Bit2~Bit15： reserve
output	8Byte	Output/8Byte	%QW64~%QW70	Corresponding to 4 analog output channels, each accounting for 2Byte

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.

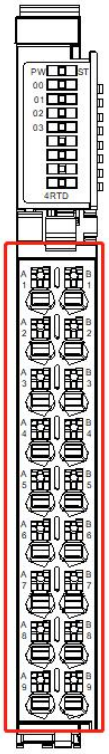
3.6.1 Specifications

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	Yes
Module diagnostics	Yes
Single-channel diagnostics	Yes
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℃/ Per digit
diagnosis	Disconnection / Parameter assignment error
Process alarms	Upper/lower limit per channel
Conversion time	2s/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

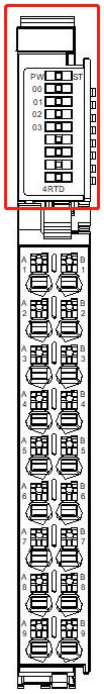
3.6.2 Hardware interface

3.6.2.1 Definition of terminal block



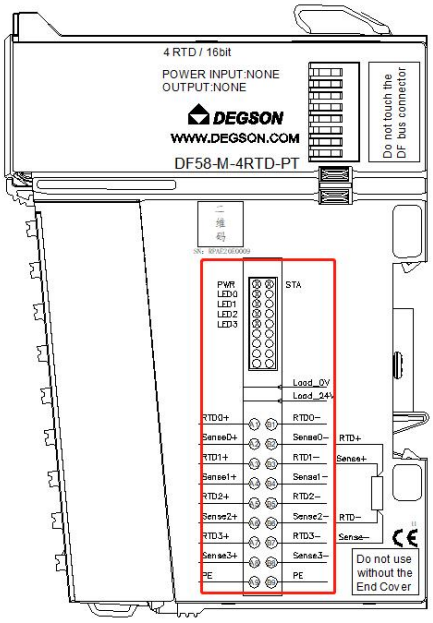
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	RTD0+	B1	RTD0-	RTD signal input channel 1
A2	Sense0+	B2	Sense0-	
A3	RTD1+	B3	RTD1-	RTD signal input channel 2
A4	Sense1+	B4	Sense1-	
A5	RTD2+	B5	RTD2-	RTD signal input channel 3
A6	Sense2+	B6	Sense2-	
A7	RTD3+	B7	RTD3-	RTD signal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

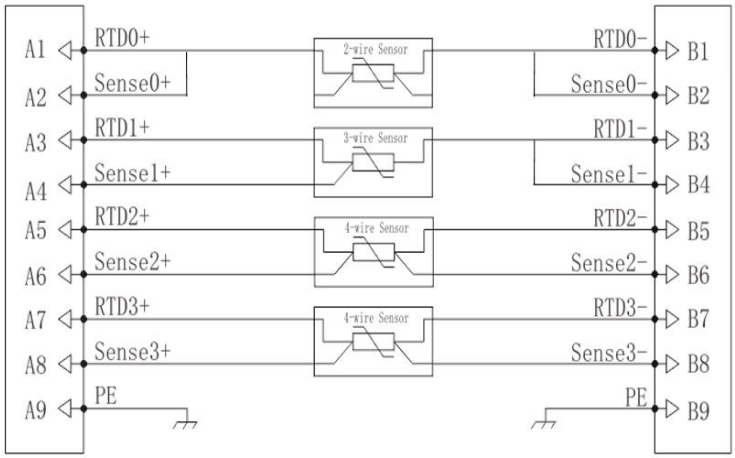
3.6.2.2 LED indicator definition



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





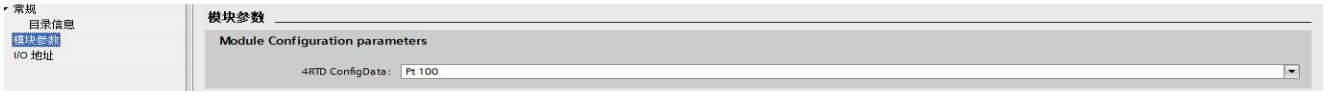
Remark:

The excitation power + and signal + of the RTD sensor **are usually two red wires, which** do not distinguish functions and can be mixed

The excitation power supply-, signal--**is usually two blue wires, or 1 blue and 1 black**, **which can be mixed without distinguishing functions;**

3.6.3 Parameter information

3.6.3.1 Module parameters



Module parameters	meaning
4RTD ConfigData	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni 200, Ni500, Ni1000, Cu10, 40 Ω, 80 Ω, 150 Ω,300 Ω, 500 Ω, 1kΩ, 2kΩ, 4kΩ

3.6.3.2 Address Description

After the DF58-M-4RTD-PT is configured, add the DF58-M-4RTD-PT data address to the monitoring table to monitor the values of the four channels of the DF58-M-4RTD-PT. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	10Byte	Enter the address/8Byte	%IW68~%IW74	4 input channel addresses, each of which occupies 2 bytes
		Diagnostic information/2 bytes	%IW76	module diagnostic information; Bit0: 1: Bus fault 0: The bus is 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
output	——	——	——	——

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	
-	-	-	-	-	27648	0x6C00	rated
-600	-600	-600	-1000	-600	-	-	range
-32767	-32767	-32767	-32767	-32767	0	0x0000	Hypolympation
-32768	-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

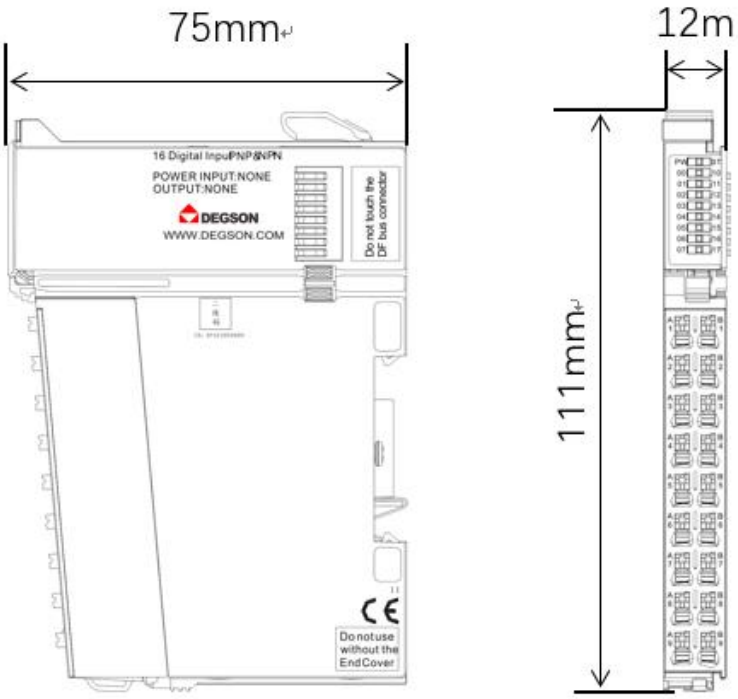
40Ω	80Ω	150Ω	300Ω	decimal	hexadecimal	
>47.04Ω	>94.07Ω	>176.4Ω	>352.77Ω	32767	0x7FFF	Overflow
47.04Ω	94.07Ω	176.4Ω	352.77Ω	32511	0x7EFF	
40Ω	80Ω	150Ω	300Ω	27648	0x6C00	
-	-	-	-	-	-	rated
0Ω	0Ω	0Ω	0Ω	0	0x0000	range
-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

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

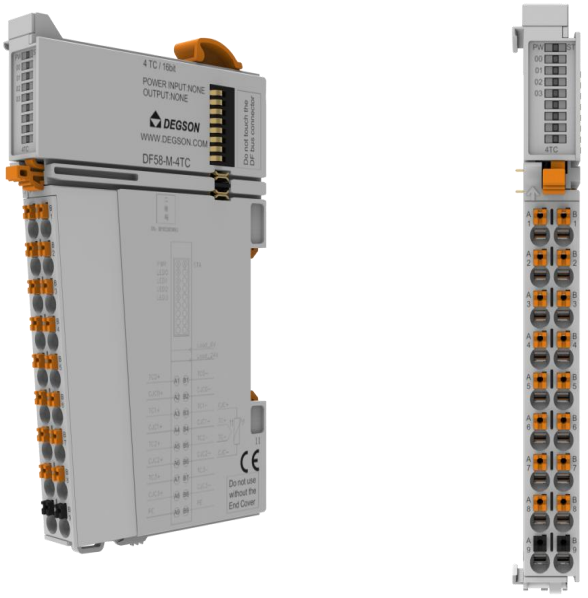
3.6.4.1 Installation dimensions

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


75mm
12m
111mm
16 Digital Input PNP&NPN
POWER INPUT:NONE
OUTPUT:NONE
DEGSON
WWW.DEGSON.COM
Do not touch the DF bus connector
Do not use without the End Cover

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.



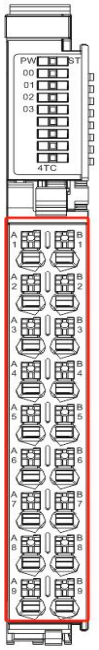
3.7.1 Specifications

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	
Isolation method	Magnetically isolated from the field layer	
Data size	8 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	<100mA	
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)

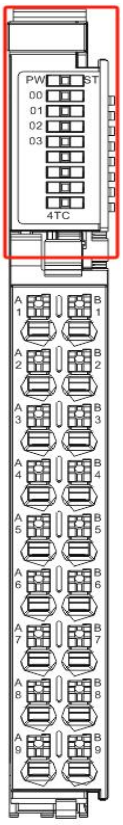
3.7.2 Hardware interface

3.7.2.1 Definition of terminal block



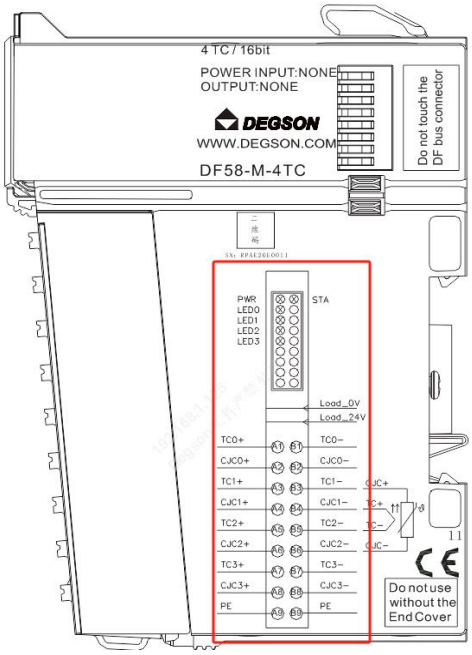
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	SS0+	B1	TC0-	Channel 0 thermocouple terminals
A2	CJC0+	B2	CJC0-	Channel 0 external NTC compensation terminal
A3	SS1+	B3	TC1-	Channel 1 thermocouple terminals
A4	CJC1+	B4	CJC1-	Channel 1 external NTC compensation terminal
A5	SS2+	B5	TC2-	Channel 2 thermocouple terminals
A6	CJC2+	B6	CJC2-	Channel 2 external NTC compensation terminal
A7	SS3+	B7	TC3-	Channel 3 thermocouple terminals
A8	CJC3+	B8	CJC3-	Channel 3 external NTC compensation terminal
A9	PE	B9	PE	earth

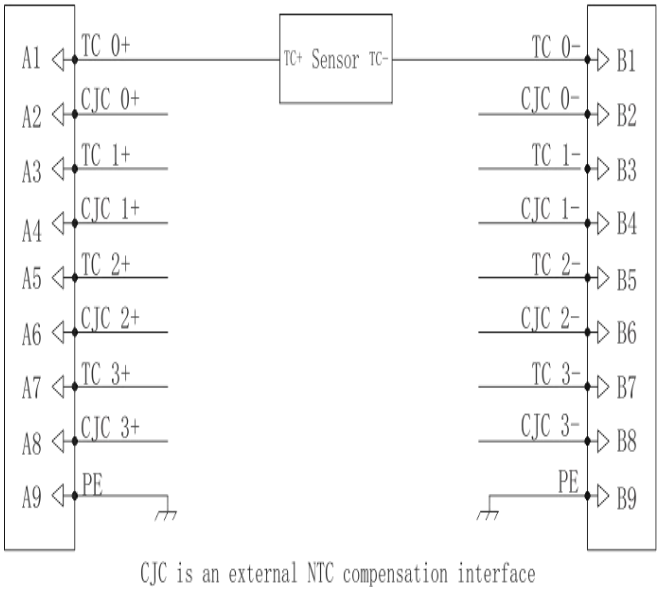
3.7.2.2 LED indicator definition



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

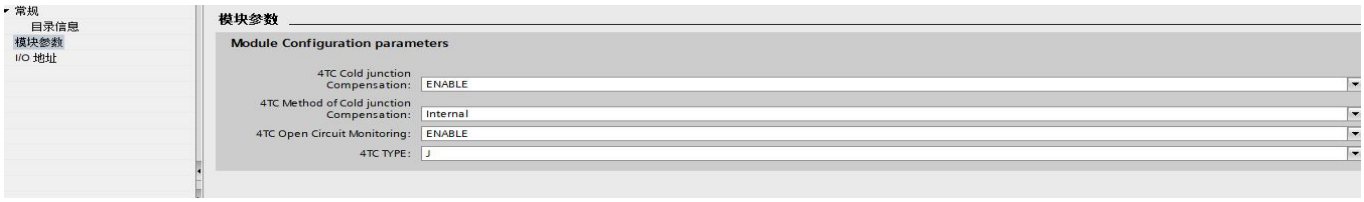




CJC is an external NTC compensation interface

3.7.3 Parameter information

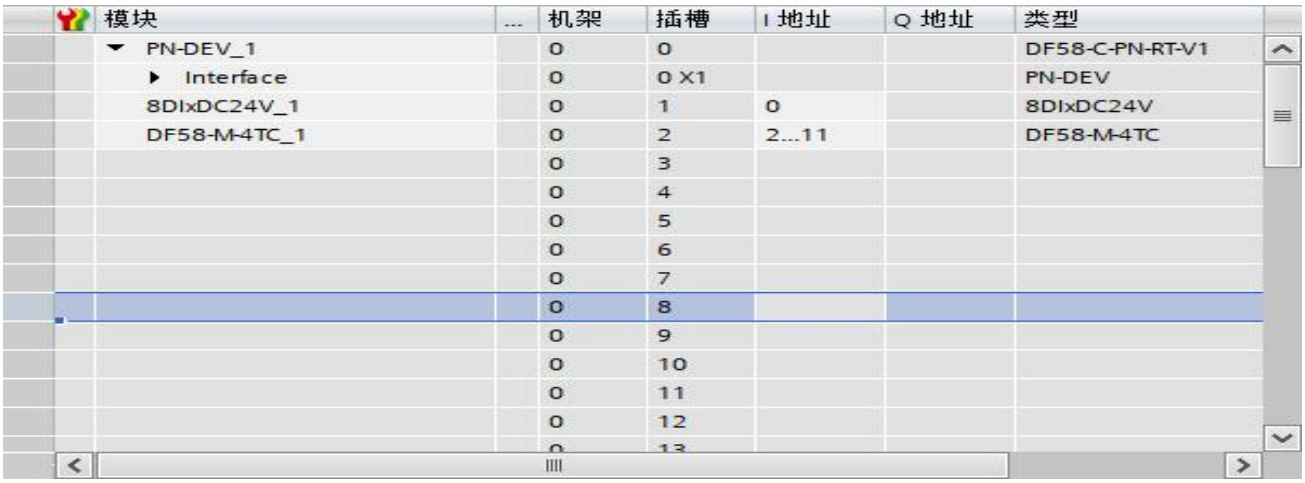
3.7.3.1 Module parameters



ConfigData1	meaning
4TC Cold junction Compensation	Cold junction compensation ; ENABLE: Enable; DISABLE: close;
4TC Method of Cold junction Compensation	method of compensation; Internal: internal compensation; External NTC：External NTC compensation
4TC Open Circuit Monitoring	Wire break detection; ENABLE: Enable; DISABLE: close;
4TC TYPE	Types of Thermocouple Measurements: 0: J type

ConfigData1	meaning
	1: Type K 2: Type E 3: Type T 4: S-type 5: Type R 6: Type B (not supported) 7: N-type 8: Type C (not supported yet) 9: L-type (not supported yet) 10: U-shape (not supported yet) 11:±15.625mv 12:±31.25mv 13:±62.5mv 14:±125mv 15:±250mv 16:±500mv 17:±1000mv 18:±2000mV (not supported)

3.7.3.2 Address Description



After the DF58-M-4TC is configured, add the DF58-M-4TC data address to the monitoring table to monitor the values of the four channels (IW2~IW8) of the DF58-M-4TC. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/data type	Screenshot address (for reference only)	remark
input	10Byte	Enter the address/8Byte	%IW2~%IW8	4 input channel addresses, each of which occupies 2 bytes
		Diagnostic information/2 bytes	%IW10	module diagnostic information; Bit0: 1: Bus fault 0: The bus is 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:

type	Total bytes	Description/data type	Screenshot address (for reference only)	remark
				1: Channel 4 is disconnected or exceeds the upper and lower limits 0: Normal Bit5~Bit15：reserve
output	——	——	——	——

3.7.3.3 Process data definition

3.7.3.3.1 Process data definition type J

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

3.7.3.3.2 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

3.7.3.3.3 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	Wire break detection

3.7.3.3.4 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

3.7.3.3.5 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

3.7.3.3.6 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

3.7.3.3.7 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	Wire break detection

3.7.3.3.8 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

3.7.3.3.9 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

3.7.3.3.10 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

3.7.3.3.11 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)

3.7.3.3.12 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)

3.7.3.3.13 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)

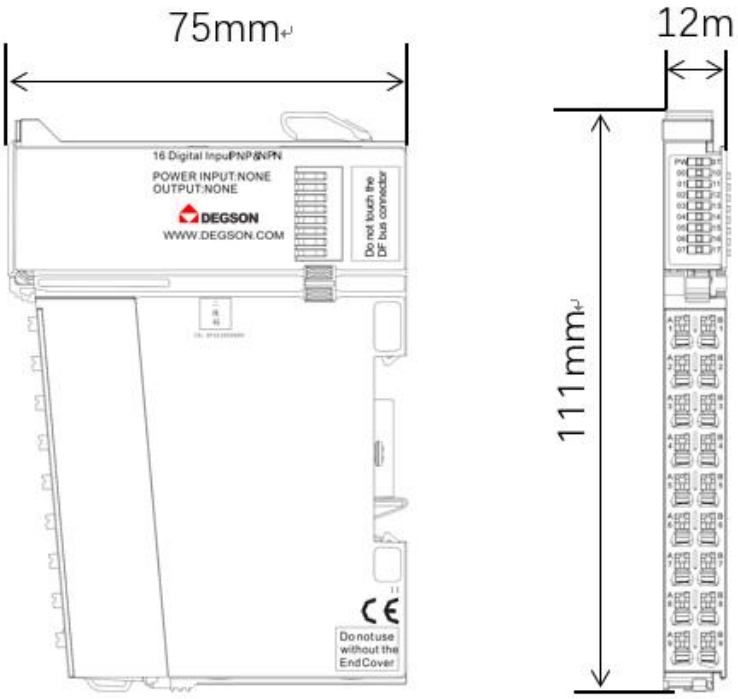
3.7.3.3.14 Process data definition ± 1000mV

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)

3.7.4 Mechanical installation

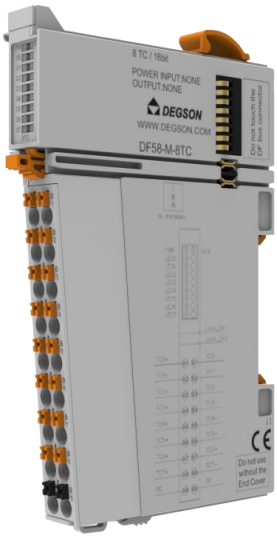
3.7.4.1 Installation dimensions

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


75mm
12m
111mm
16 Digital Input PNP&NPN
POWER INPUT:NONE
OUTPUT:NONE
DEGSON
WWW.DEGSON.COM
Do not touch the DF bus connector
Do not use without the End Cover

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

- The module uses 8-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.



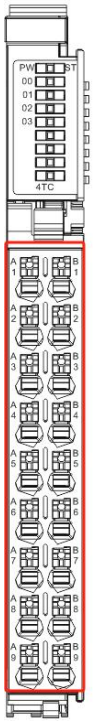
3.8.1 Specifications

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	Internal NTC compensation	
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

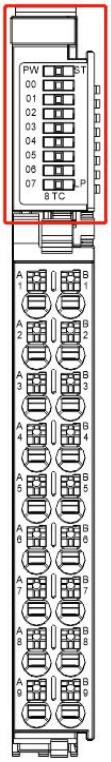
3.8.2.1 Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	SS0+	B1	TC0-	Channel 0 thermocouple terminals
A2	SS1+	B2	TC1-	Channel 1 thermocouple terminals
A3	SS2+	B3	TC2-	Channel 2 thermocouple terminals
A4	SS3+	B4	TC3-	Channel 3 thermocouple terminals
A5	SS4+	B5	TC4-	Channel 4 thermocouple terminals
A6	SS5+	B6	TC5-	Channel 5 thermocouple terminals
A7	SS6+	B7	TC6-	Channel 6 thermocouple terminals
A8	SS7+	B8	TC7-	Channel 7 thermocouple

				terminals
A9	PE	B9	PE	earth

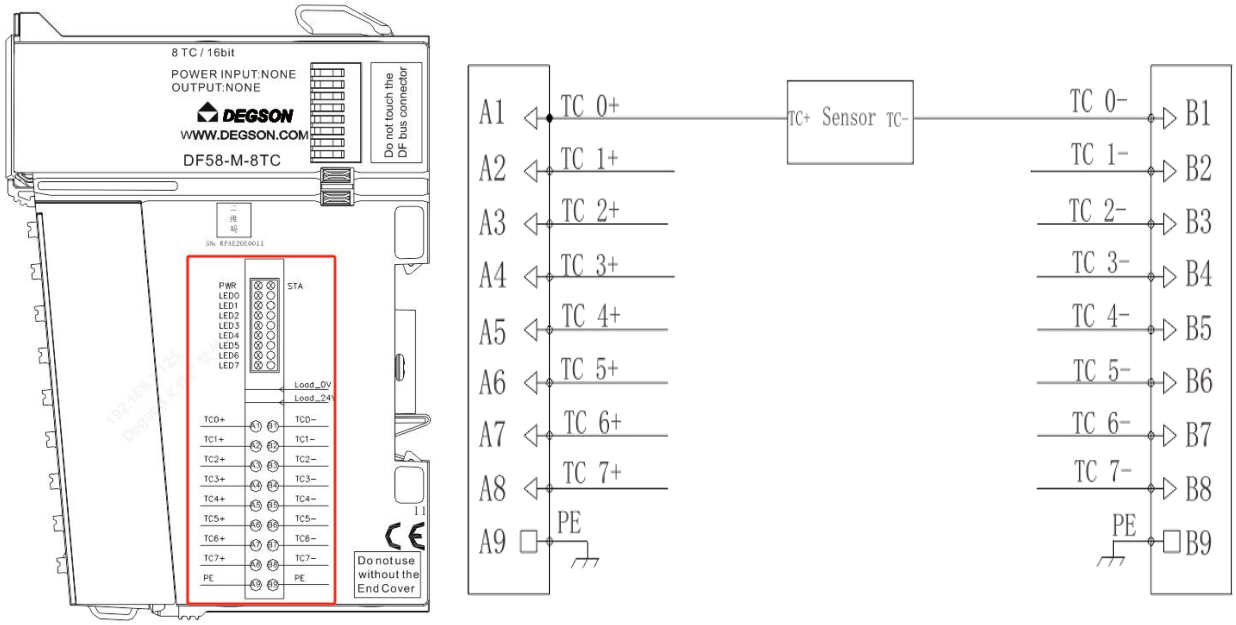
3.8.2.2 LED indicator definition



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:

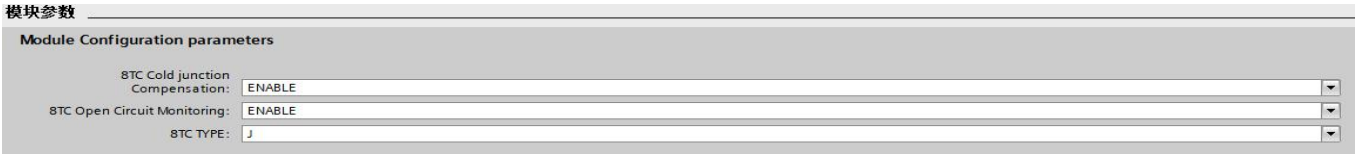
	Extinguished: disconnected;
04 (green)	Channel 5 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
05 (green)	Channel 6 Indicator: Flashing: Normal sampling, Solid: Exceeding upper and lower limits: Extinguished: disconnected;
06 (green)	Channel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

3.8.3.1 Module parameters



ConfigData1	meaning
8TC Cold junction Compensation	Cold junction compensation ; ENABLE: Enable; DISABLE:close;
8TC Open Circuit Monitoring	Wire break detection; ENABLE: Enable; DISABLE:close;

ConfigData1	meaning
8TC TYPE	Types of Thermocouple Measurements: 0: J type 1: Type K 2: Type E 3: Type T 4: S-type 5: Type R 6: Type B (not supported) 7: N-type 8: Type C (not supported yet) 9: L-type (not supported yet) 10: U-shape (not supported yet) 11:±15.625mv 12:±31.25mv 13:±62.5mv 14:±125mv 15:±250mv 16:±500mv 17:±1000mv 18:±2000mV (not supported)

3.8.3.2 Address parameters

After configuring the DF58-M-8TC, add the DF58-M-8TC data address to the monitoring table to monitor the values of the 8 channels (IW2~IW16) of the DF58-M-8TC. Use the address in the

above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/data type	Screenshot address (for reference only)	remark
input	18Byte	Enter the address/16Byte	%IW2~%IW16	8 input channel addresses, each of which occupies 2 bytes.
		Diagnostic information/2 bytes	%IW18	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: 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;

type	Total bytes	Description/data type	Screenshot address (for reference only)	remark
				0: normal; Bit8: 1: Channel 8 is disconnected or exceeds the upper and lower limits; 0: normal; Bit9~Bit15: reserve;
output	——	——	——	——

3.8.3.3 Process data definition

3.8.3.3.1 Process data definition type J

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	Wire break detection

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	Wire break detection

3.3.3.3.8 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)

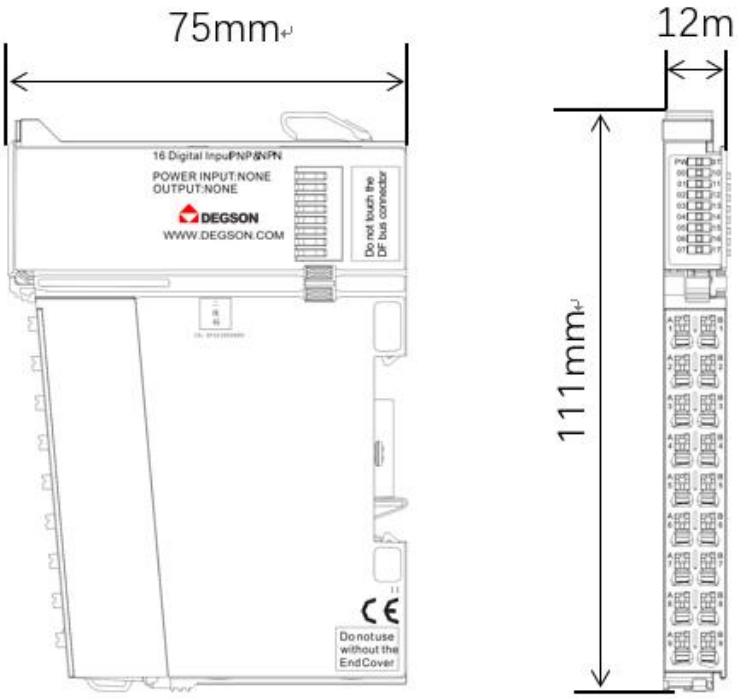
3.8.3.3.14 Process data definition ± 1000mV

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

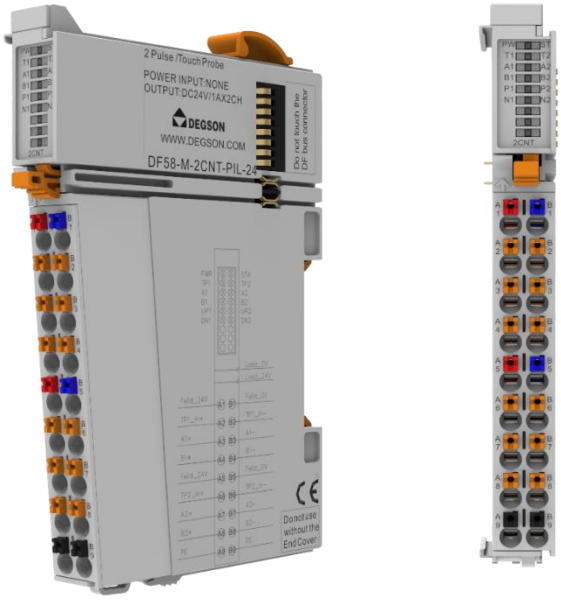
3.8.4.1 Installation dimensions

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


75mm
12m
111mm
16 Digital Input PNP&NPN
POWER INPUT:NONE
OUTPUT:NONE
DEGSON
WWW.DEGSON.COM
Do not touch the DF bus connector
Do not use without the End Cover

3.9 24V to 5V Power isolation module (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.

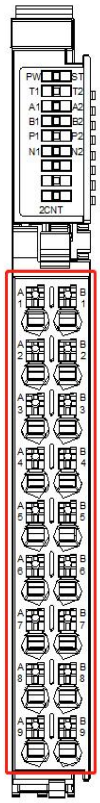


3.9.1 Specifications

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	Reserved 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

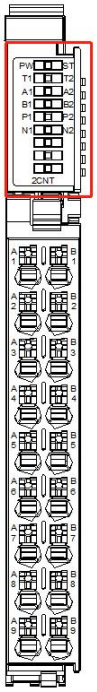
3.9.2 Hardware interface



3.9.2.1 Definition of terminal block

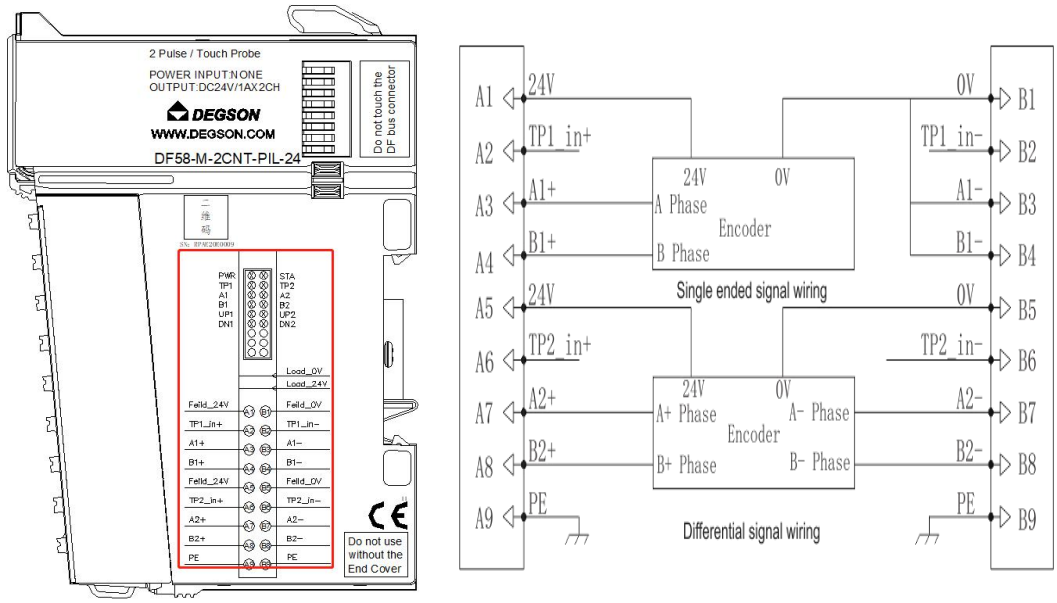
Terminal serial number	Signal	Terminal serial number	Signal	
A1	24V	B2	0V	24V power output
A2	TP1_in+	B3	TP1_in-	Channel 1 latched signal input (24V)
A3	A1+	B4	A1-	Channel 1 A signal input (24V)
A4	B1+	B5	B1-	Channel 1 B signal input (24V)
A5	24V	B6	0V	24V power output
A6	TP2_in+	B7	TP2_in-	Channel 2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

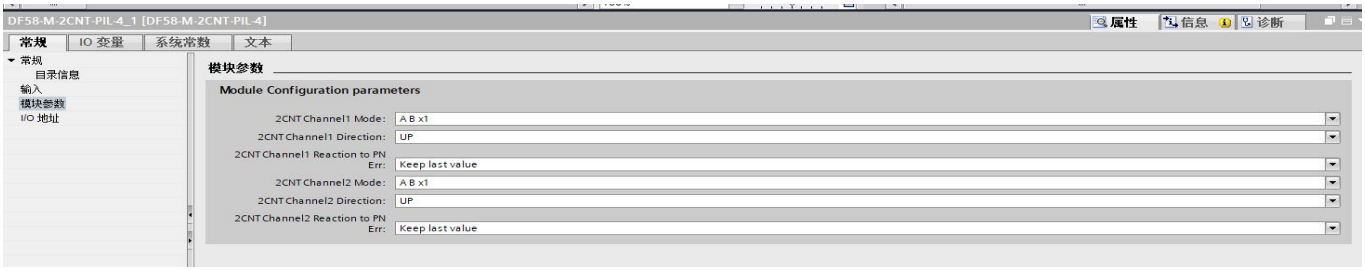
	rotates in the opposite direction
P2 (green)	On: Encoder 2 rotates forward Off: Encoder 2 is stationary or rotates in the opposite direction
N1 (green)	On: Encoder 1 rotates in reverse Off: Encoder 1 is stationary or rotates in a forward direction
N2 (green)	On: Encoder 2 rotates in reverse Off: Encoder 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



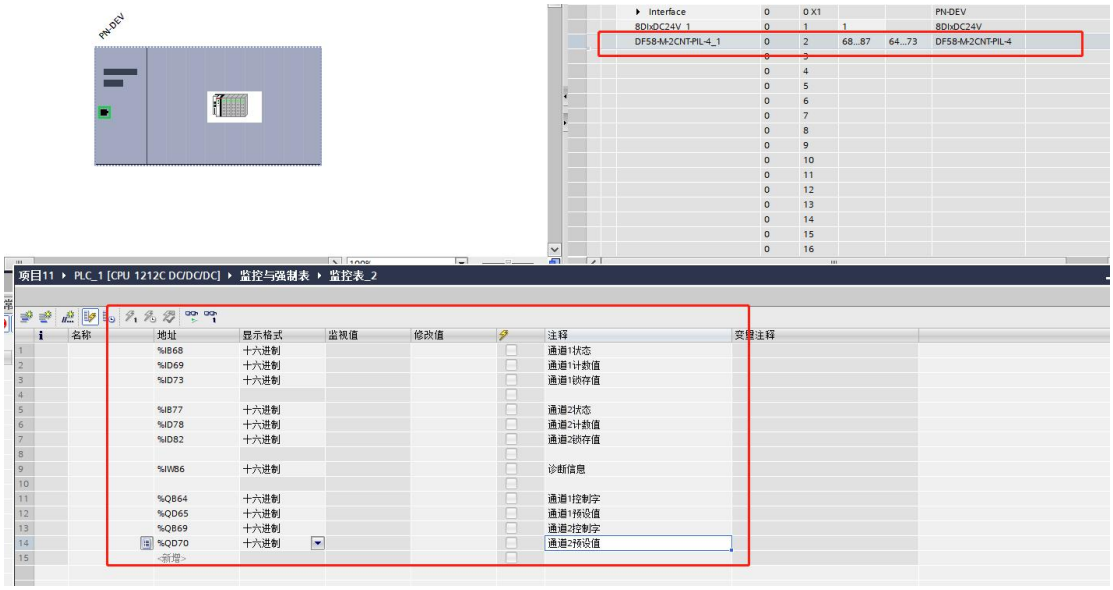
3.9.3 Parameter information

3.9.3.1 Module parameters



ConfigData1	meaning
2CNT Channel1 Mode	ABx1: AB phase 1 octave count ABx4: AB phase 4 octave count Pulse+Dir:Pulse+direction counting
2CNT Channel1 Direction	UP: counts upwards Down: counts downwards
2CNT Channel1 Reaction to PN Err	Keep last value: Keep last value: The counter stops counting during an error such as a PN failure, backplane bus failure, or AB phase loss, and once it resumes normal work, the counter will continue to count from the previous value. Keep on: The counter continues to count during the error.
Filter Time CH1(8bit) Configure the filtering time for A, B, TP	0: No filtering; 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	ABx1: AB phase 1 octave count ABx4: AB phase 4 octave count Pulse+Dir:Pulse+direction counting
2CNT Channel2 Direction	UP: counts upwards Down: counts downwards
2CNT Channel2 Reaction to PN Err	Keep last value: Keep last value: The counter stops counting during an error such as a PN failure, backplane bus failure, or AB phase loss, and once it resumes normal work, the counter will continue to count from the previous value. Keep on: The counter continues to count during the error.
Filter Time CH2(8bit) Configure the filtering time for A, B, TP	0: No filtering; 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 Address Description



After the DF58-M-2CNT-PIL-24 is configured, add the DF58-M-2CNT-PIL-24 data address to the monitoring table to monitor the channel value of the DF58-M-2CNT-PIL-24. Use the address in the above figure to illustrate, and set the starting address by yourself, this example illustrates the address layout.

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
input	20Byte	Enter the address/18Byte	%IB68	Counter 1 Status: Bit0: phase A input Bit1: Phase B input Bit2: latching the success flag. Bit3: Encoder positive indication Bit4: Encoder inverted indication Bit5: 1: Overflowing on the current count value 0: After the count value is overflowed, the count value

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
				continues to exceed 5000. Bit6: 1: Overflow under the 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
			%ID69	Counter 1: The current count value
			%ID73	Counter 1 latches the value, and depending on the configuration, latches the current count value on the rising or falling edge of the TP signal.
			%IB77	Counter 2 Status: Bit0: phase A input Bit1: Phase B input Bit2: latching the success flag. Bit3: Encoder positive indication Bit4: Encoder inverted indication Bit5: 1: Overflowing on the current count value 0: After the count value is overflowed, the count value continues to exceed 5000. Bit6: 1: Overflow under the current count value 0: After the count value

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
				overflows, the count value continues down to exceed 5000. Bit7: The counter is preset successfully, and 1 is valid
			%ID78	Counter 2: The current count value
			%ID82	Counter 2 latches the value, and depending on the configuration, latches the current count value on the rising or falling edge of the TP signal.
		Diagnostic information/2 bytes	%IW86	module diagnostic information; Bit0： 1: Bus fault 0: The bus is normal Bit1: Reserved Bit2： 1: Channel 1 is out of phase, only the AB phase is in quadrature counting mode. 0: normal; Bit3： 1: Channel 2 is out of phase, only the AB phase is in orthogonal counting mode. 0: normal; Bit4~bit15： reserve
output	10Byte	Output address/10Byte	%QB64	Counter 1 sets the control parameters: BIT0:0: INVALID; 1: Set the counter preset value to the current count value; BIT1:0: INVALID;

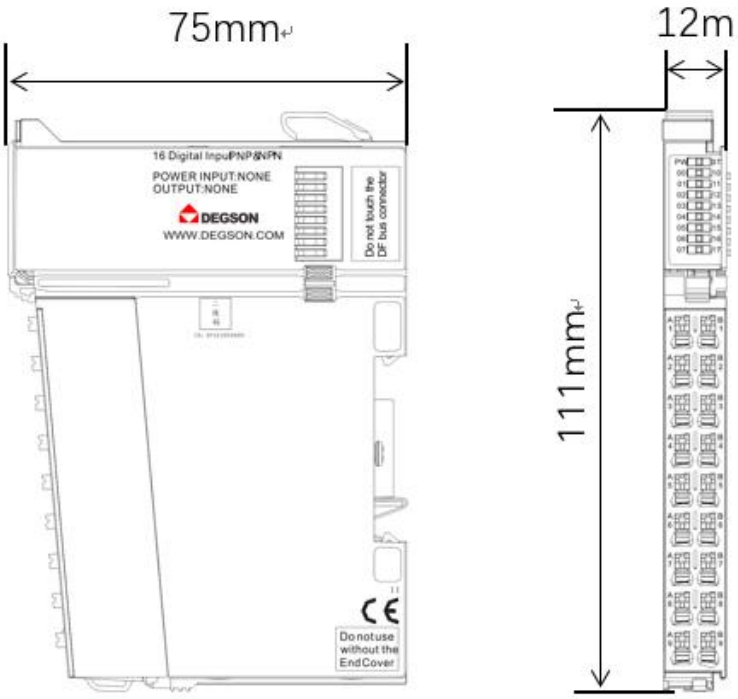
type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
				1: clears the counter value; BIT2:0: INVALID; 1: Clear the overflow mark; BIT3:0: INVALID; 1: Clear the overflow mark; BIT4:0: INVALID; 1: TP signal rising edge latch count value, note that it is only latched once, if you need to start latching again, you need to set 0 and then set 1 again (to avoid invalid abnormal latch due to interference). Bit5:0: Invalid; 1: The falling edge of the TP signal is latched and counted, note that it is only latched once, if you need to start latching again, you need to set the parameter 0 and then set 1 again (to avoid invalid abnormal latch caused by interference). Bit6~Bit7：reserve；
			%QD65	Counter 1 preset setting
			%QB69	Counter 2 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;

type	Total bytes	Description/Occupancy address size	Screenshot address (for reference only)	remark
				1: TP signal rising edge latch count value, note that it is only latched once, if you need to start latching again, you need to set 0 and then set 1 again (to avoid invalid abnormal latch due to interference). Bit5:0: Invalid; 1: The falling edge of the TP signal is latched and counted, note that it is only latched once, if you need to start latching again, you need to set the parameter 0 and then set 1 again (to avoid invalid abnormal latch caused by interference). Bit6~Bit7：reserve；
			%QD70	Counter 2 preset setting

3.9.4 Mechanical installation

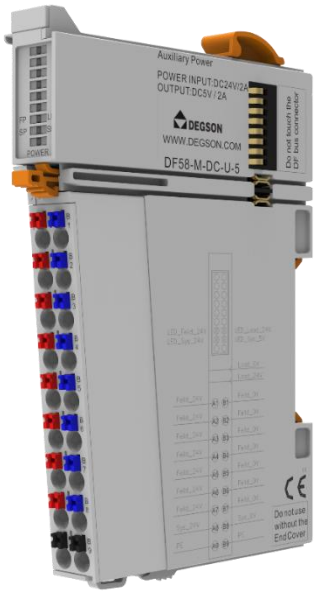
3.9.4.1 Installation dimensions

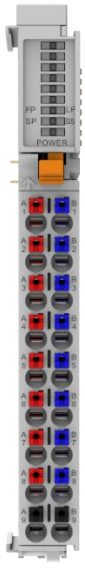
The installation size information is shown in the figure below, and the unit is (mm).


75mm
12m
111mm
16 Digital Input PNP&NPN
POWER INPUT:NONE
OUTPUT:NONE
DEGSON
WWW.DEGSON.COM
Do not touch the DF bus connector
Do not use without the End Cover

3.10 24VDC to 5VDC/2A isolation (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.





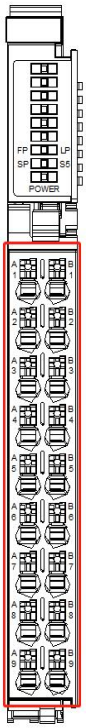
3.10.1 Specifications

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	25ppm

concentration at 75 % relative humidity	
Firmware upgrades	Yes

3.10.2 Hardware interface

3.10.2.1 Definition of terminal block

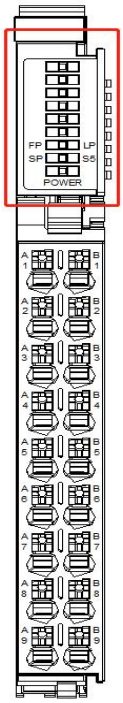


Terminal serial number	Signal	Terminal serial number	Signal	
A1	24V	B2	0V	24V power output
A2	24V	B3	0V	24V power output
A3	24V	B4	0V	24V power output
A4	24V	B5	0V	24V power output
A5	24V	B6	0V	24V power output
A6	24V	B7	0V	24V power output
A7	24V	B8	0V	24V power output
A8	24V	B9	0V	24V power input of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

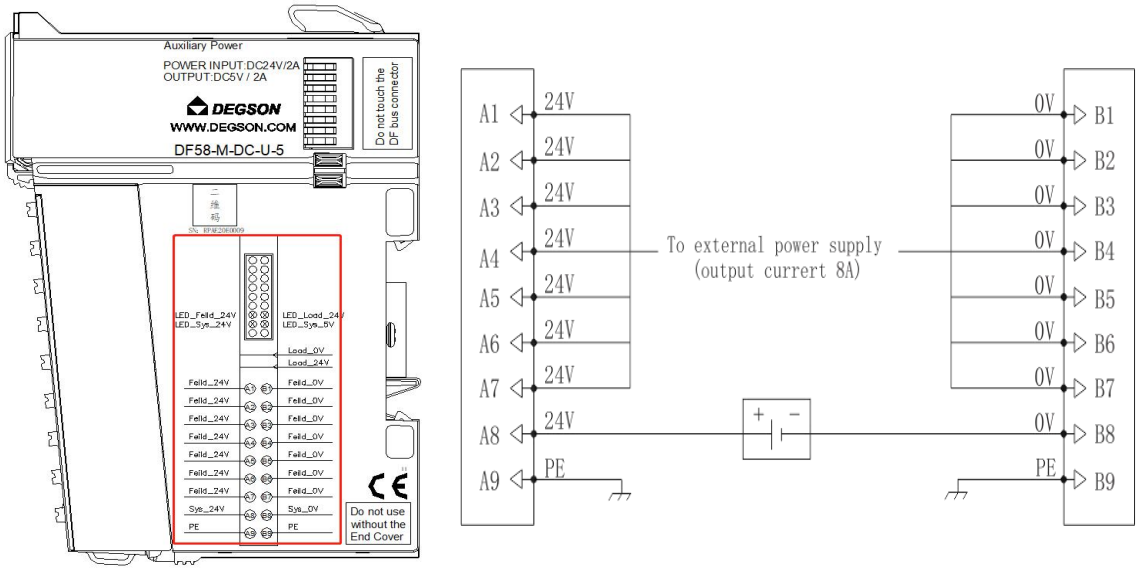
performance.

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

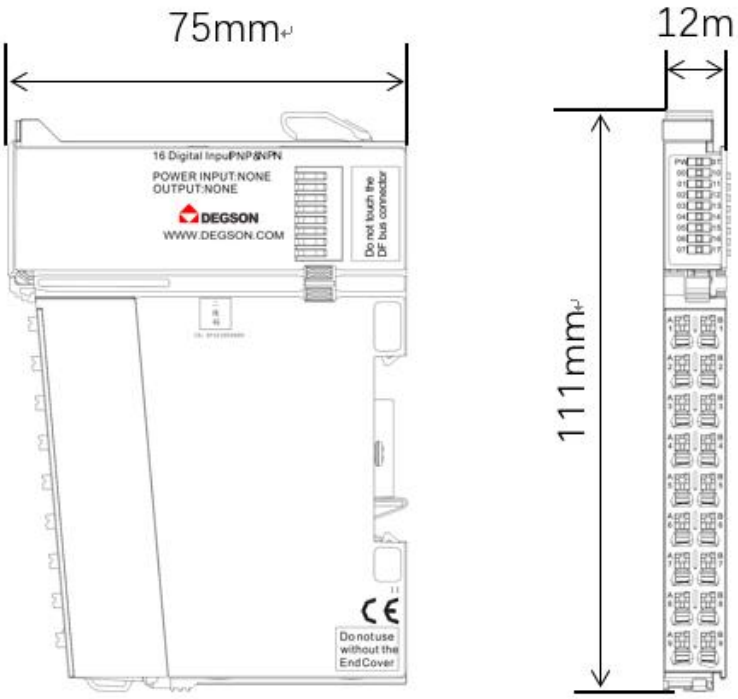


As shown in the diagram, each of the 16 channels can provide a 24VDC voltage rating for an external load.

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).


75mm
12m
111mm
16 Digital Input PNP&NPN
POWER INPUT:NONE
OUTPUT:NONE
DEGSON
WWW.DEGSON.COM
Do not touch the DF bus connector
Do not use without the End Cover

4. Example of use

DF58-C-PN-RT adapter communication

4.1Connection and Configuration of TIA Portal and PROFINET Protocol IO Module

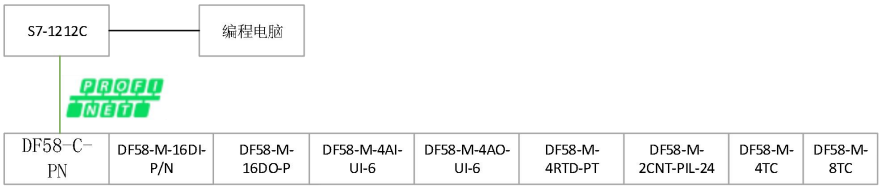
In this example, the S7-1200 uses the S7-1200 to communicate with the DF58-C-PN via a network port.

DF58-M-16DI-P/N,DF58-M-16DO-P,,DF58-M-4AI-UI-6,DF58-M-4AI-UI-6,DF58-M-4AO-UI-6, DF58-M-4RTD-PT，DF58-M-2CNT-PIL-24，DF58-M-4TC，DF58-M-8TC。

4.1.1 Hardware Settings

hardware	quantity	remark
Programming a computer	1	Install the TIA Portal
controller	1	S7-1212C
DF58-C-PN	1	PROFINET protocol coupler
DF58-M-16DI-P/N	1	Expansion modules
DF58-M-16DO-P	1	Expansion modules
DF58-M-4AI-UI-6	1	Expansion modules
DF58-M-4AO-UI-6	1	Expansion modules
DF58-M-4RTD-PT	1	Expansion modules
DF58-M-2CNT-PIL-24	1	Expansion modules
DF58-M-DC-U-5	1	Expansion modules
DF58-M-4TC	1	Expansion modules
DF58-M-8TC	1	Expansion modules
Cable	Several	
DC regulated power supply	1	Controller, module power supply

4.1.2 Communication connection diagram



4.1.3 Install the GSD file

Open TIA Portal V17 and select "Options" > "Manage GSD Profiles" in the menu bar.

This is shown in Figure 4-1-1-1.

Figure 4-1-1 Installing GSD

4.1.4 New engineering and configuration

Open TIA Portal V17, select Create Project and configure it, as shown in Figure 4-1-2

Figure 4-1-2 creates a new project

Configure the device, switch to the network view window, expand the hardware directory on the right, select DF58-C-PN-RT and drag it to the network view, as shown in Figure 4-1-3.

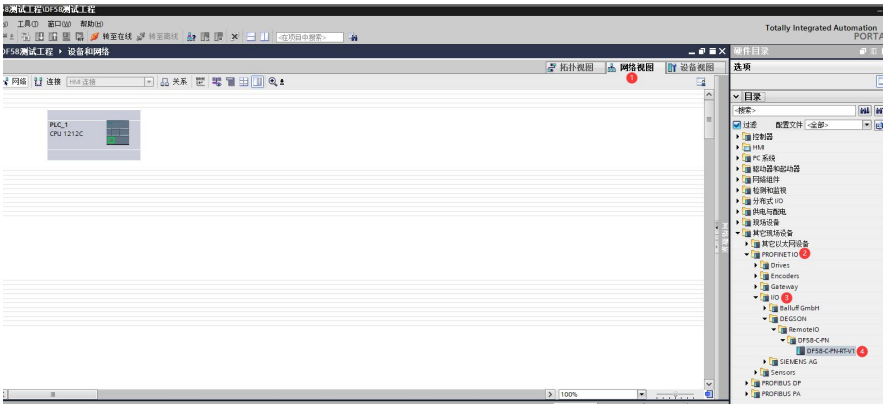


Figure 4-1-3 Configure the device

Assign a controller to the remote IO module in the network view, click "Unassigned" in the

IO module,

Select the PLC_1.PROFINET interface_1, as shown in Figure 4-1-4. Connect the wired connection, as shown in Figure 4-1-5

Figure 4-1-4 Assigning an IO controller

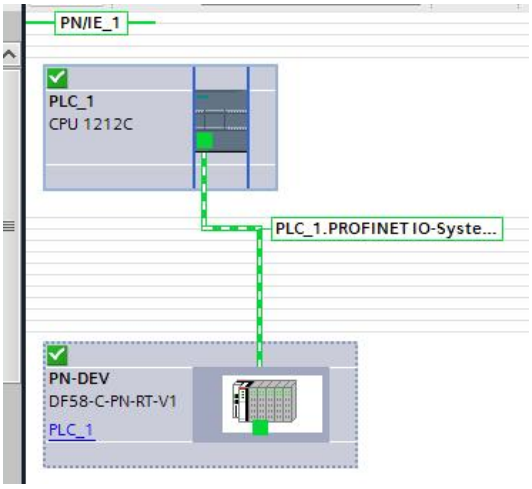


Figure 4-1-5

Set the IP address of the I/O module, and in the device view, double-click the module to enter the properties view, as shown in Figure 4-1-6.

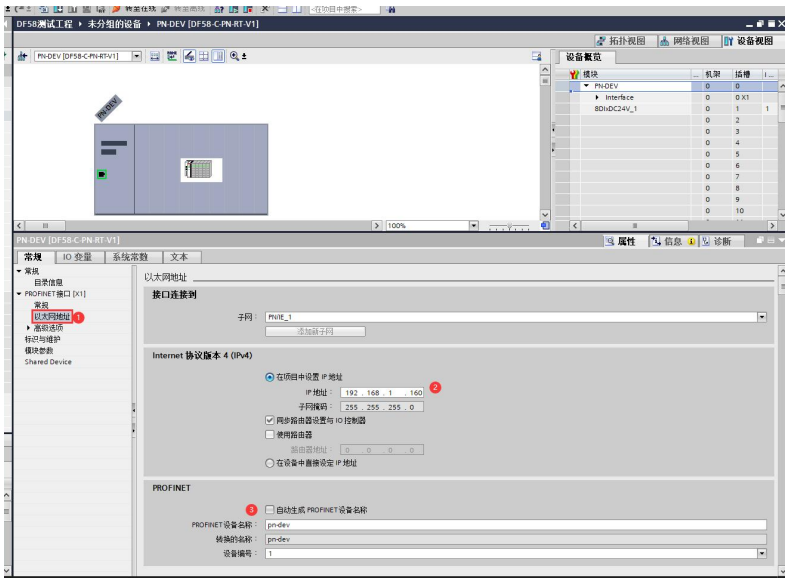


Figure 4-1-6 Assigning IP Addresses

The remote I/O module assigns a device name, right-click the module and select "Assign Device Name" as shown in Figure 4-1-7, select the interface type and update the list and assign the name as shown in Figure 4-1-8.

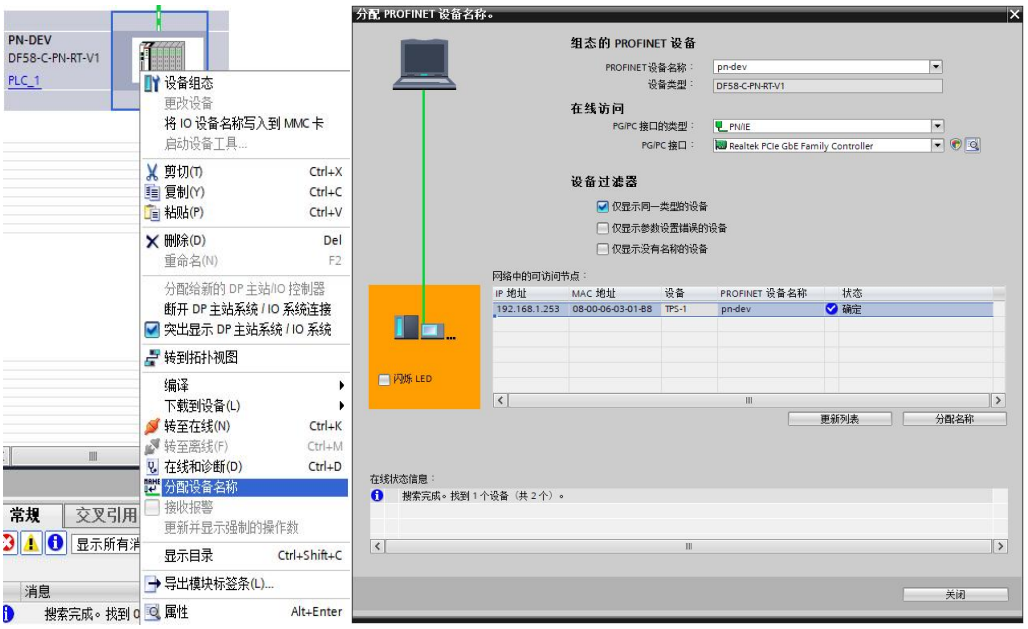


Figure 4-1-7 Figure 4-1-8

Select all devices in the network view and download them, as shown in Figure 4-1-9, and start the CPU after the program download is complete

Operation, and go to the online monitoring to see if the communication is normal, and the normal green display is shown in Figure 4-1-10.

Figure 4-1-9

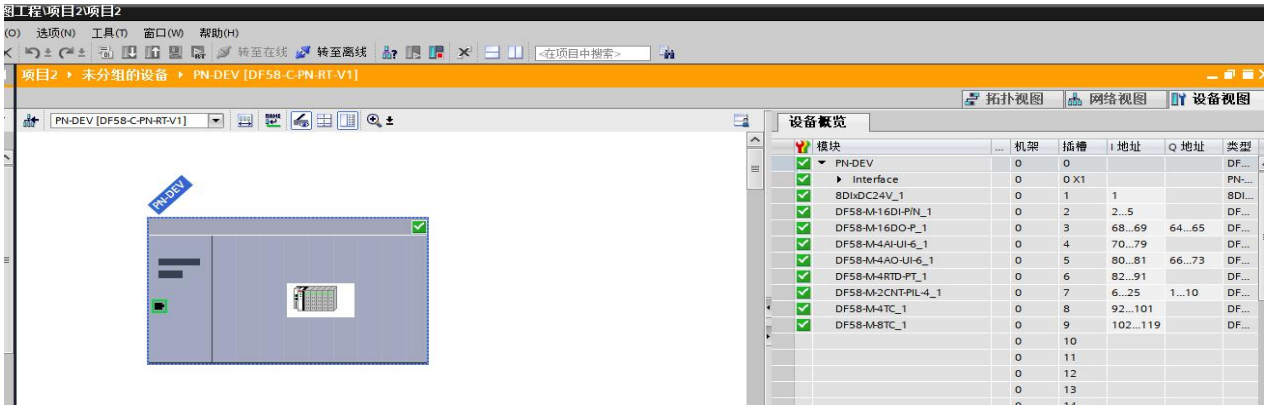


Figure 4-1-10

4.1.5 Configure module parameters

When the S7-1200 is offline, you can set the module parameters, select Go to Offline→ select the attributes → module parameters of the extension module →, and configure the extension module parameters accordingly through the drop-down box, as shown in Figure 4-1-11. Note: DF58-M-4AO-UI-6 channel 1~4 is configured with 0 by default (output disabled), please configure the channel before using it.

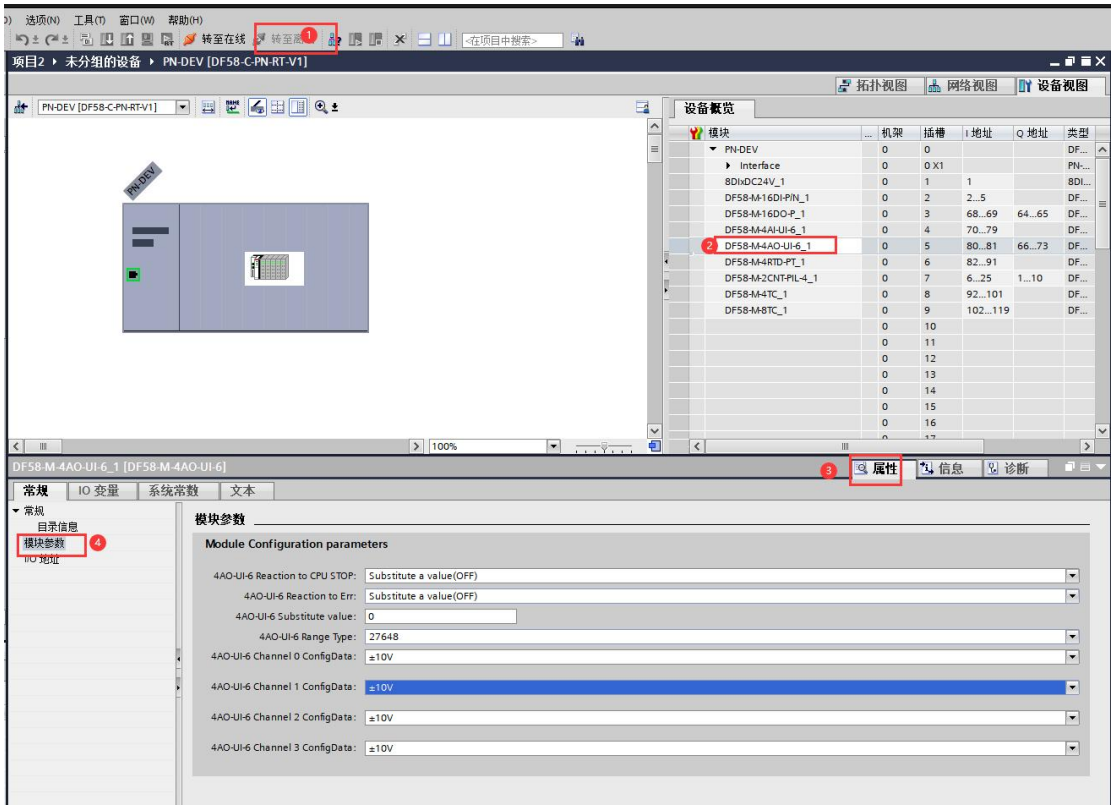


Figure 4-1-11

4.1.6 Address Description

Figure 4-1-12

In this configuration, as shown in Figure 4-1-12, the I and Q address ranges of the coupler and the expansion module can be obtained from the view. You can set the first address in the view.

Address Description:

Module model	Address range	illustrate	Occupy the address	remark
DF58-C-PN	%IB1	Enter the address	%IB1	IB1:I0.0~I0.7
DF58-M-16DI-P/N	%IB2~%IB5	Enter the address	%IB2~IB3	IB2:I0.0~I0.7 IB3:I1.0~I1.7
		Diagnostic information	%IW4	
DF58-M-16DO-P	%IB68~%IB69	Diagnostic information	%IW68	
DF58-M-4AI-UI-6	%IB70~%IB79	Enter the address	%IW70~%IW76	IW70: channel 1 input address; IW72: channel 2 input address; IW74: channel 3 input address; IW76: channel 4 input

Module model	Address range	illustrate	Occupy the address	remark
				address;
		Diagnostic information	%IW78	
DF58-M-4AO-UI-6	%IB80~%IB81	Diagnostic information	%IW80	
DF58-M-4RTD-PT	%IB82~%IB91	Enter the address	%IW82~%IW88	IW82: channel 1 input address; IW84: channel 2 input address; IW86: channel 3 input address; IW88: channel 4 input address;
		Diagnostic information	%IW90	
DF58-M-2CNT-PIL-24	%IB6~%IB25	Channel 1 status	%IB6	
		Channel 1 count value	%ID7	
		Channel 1 latch value	%ID11	
		Channel 2 state	%IB15	
		Channel 2 count value	%ID16	
		Channel 2 latch value	%ID20	
		Diagnostic information	%IW24	
DF58-M-4TC	%IB92~%IB101	Enter the address	%IW92~%IW98	IW92: channel 1 input address; IW94: channel 2 input address; IW96: channel 3 input address; IW98: channel 4 input

Module model	Address range	illustrate	Occupy the address	remark
				address;
		Diagnostic information	%IW100	
DF58-M-8TC	%IB102~%PER119	Enter the address	%IW102~%IW116	IW102: channel 1 input address; IW104: channel 2 input address; IW106: channel 3 input address; IW108: channel 4 input address; IW110: channel 5 input address; IW112: channel 6 input address; IW114: channel 7 input address; IW116: channel 8 input address;
		Diagnostic information	%IW117	

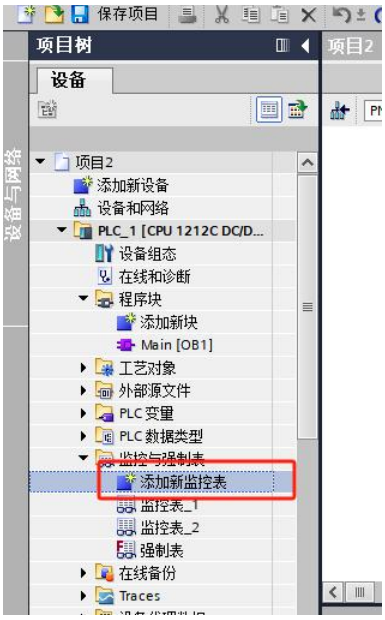
Q Address Description

Module model	Address range	illustrate	Occupy the address	remark
DF58-M-16DO-P	%QB64~%QB65	Output address	%QB64~%QB65	QB64:Q0.0~Q0.7 QB65:Q1.0~Q1.7
DF58-M-4AO-UI-6	%QB66~%QB73	Diagnostic information	%QW66~QW72	QW66: channel 1 output address; QW68: channel 2 output address; QW70: channel 3 output address; QW72: Channel 4 output address;
DF58-M-2CNT-PIL-24	%QB1~%QB10	Counter 1	%QB1	

Module model	Address range	illustrate	Occupy the address	remark
		configures control parameters		
		Counter 1 sets the preset value	%QD2	
		Counter 2 configures control parameters	%QB6	
		Counter 2 sets the preset value	%QD7	

4.1.7 Data Monitoring

Add Monitoring Table to the Monitoring and Mandatory Table, and write the corresponding address to the monitoring table for data monitoring.



4-1-13

According to the configuration, DF58-M-16DO-P output address QB64~QB65,

DF58-M-16DI-P/N input address IB2~IB3, DF58-M-16DO-P Q0.0~Q0.7 and DF58-M-16DI-P/N I0.0~I0.7 are connected together by signal line. The Q0.0~Q0.2 output signal of DF58-M-16DO-P, the QB64 value is written to 0x07, and the IB2 readout data value of DF58-M-16DI-P/N is 0x07. Note: As shown in Figure 4-1-14, the relationship between bytes and words in TIA Portal software shows that the QB64 value is 16#07, the QB65 value is 16#00, the QW64 value is 16#0700, the upper 8 bits of QW64 correspond to QB64, and the lower 8 bits correspond to QB65.

Figure 4-1-14

4.2 Smart200 and PROFINET protocol IO module connection and configuration

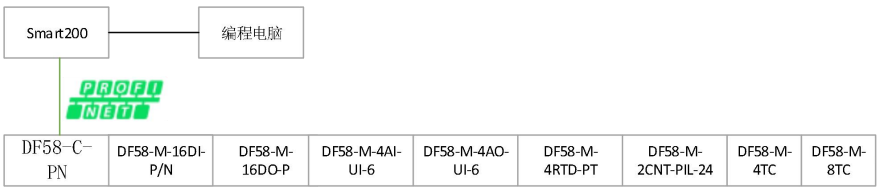
In this example, the Smart200 is used to communicate with the DF58-C-PN via a network port for Profinet. Expansion modules DF58-M-16DI-P/N, DF58-M-16DO-P, DF58-M-4AI-UI-6, DF58-M-4AI-UI-6, DF58-M-4AO-UI-6, DF58-M-4RTD-PT, DF58-M-2CNT-PIL-24, DF58-M-4TC, DF58-M-8TC.

4.2.1 Hardware settings

hardware	quantity	remark

hardware	quantity	remark
Programming a computer	1	Install the smart200 programming software
controller	1	smart200
DF58-C-PN	1	PROFINET protocol coupler
DF58-M-16DI-P/N	1	Expansion modules
DF58-M-16DO-P	1	Expansion modules
DF58-M-4AI-UI-6	1	Expansion modules
DF58-M-4AO-UI-6	1	Expansion modules
DF58-M-4RTD-PT	1	Expansion modules
DF58-M-2CNT-PIL-24	1	Expansion modules
DF58-M-DC-U-5	1	Expansion modules
DF58-M-4TC	1	Expansion modules
DF58-M-8TC	1	Expansion modules
Cable	Several	
DC regulated power supply	1	Controller, module power supply

4.2.2 Communication connection diagram



4.2.3 Install the GSD file

Open STEP7-MicroWIN SMART and select "File" > "GSDML Management" in the menu bar, as shown in the figure

4-2-1.

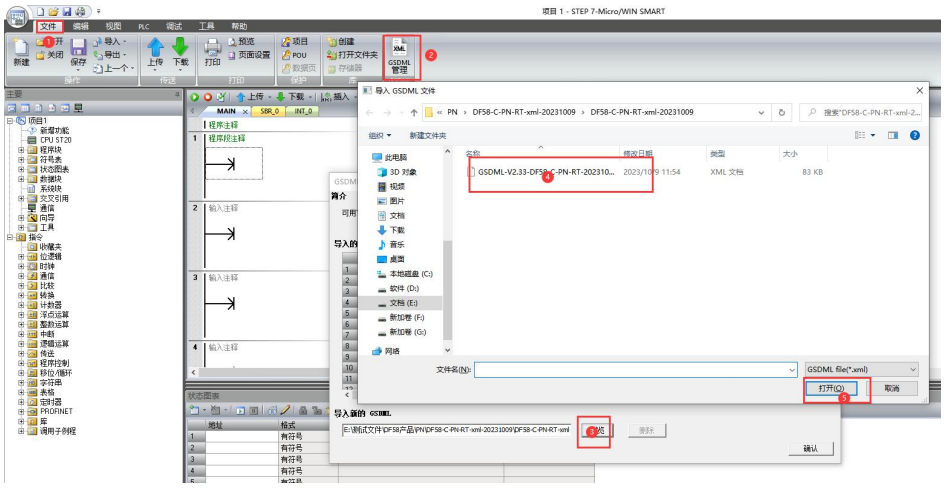
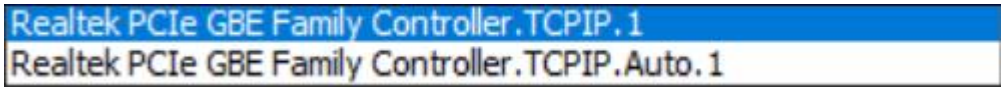


Figure 4-2-1

4.2.4 Assign a device name

Select "Tools" > "Find PROFINET Devices" in the menu bar, select the network card connected to the module in the window and find the device, select the module in the network and edit its device name, as shown in Figure 4-2-2. Note:

① When you select a network card, two options will appear for the same network card, as shown in the following figure, here select the network card without Auto.



② After the device name assignment is completed, note that when configuring the IO module, the device name used must be consistent with the above assigned name, otherwise the PLC will not be able to communicate with the IO module normally.

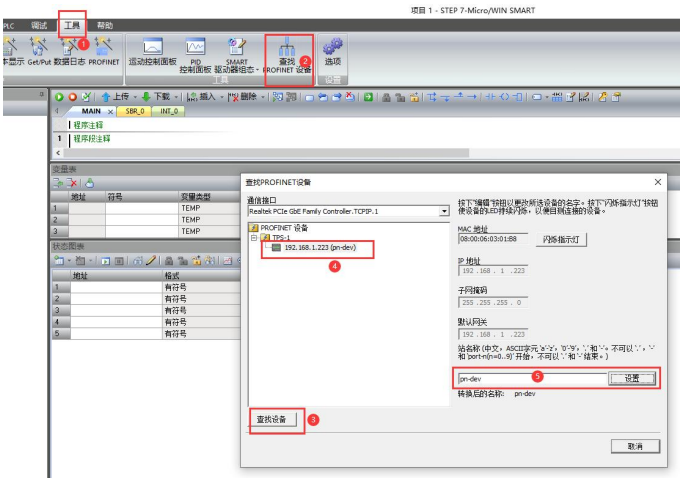


Figure 4-2-2 Assigning a Device Name

4.2.5 New engineering and configuration

Select "Tools" > "PROFINET" in the menu bar, select the PLC role as the controller, fill in the IP address of the PLC, select Next, as shown in Figure 4-2-3, add the IO module and assign the device name (which must be the same as the device name assigned in step 4 above) and the IP address and confirm the generation, as shown in Figure 4-2-4.

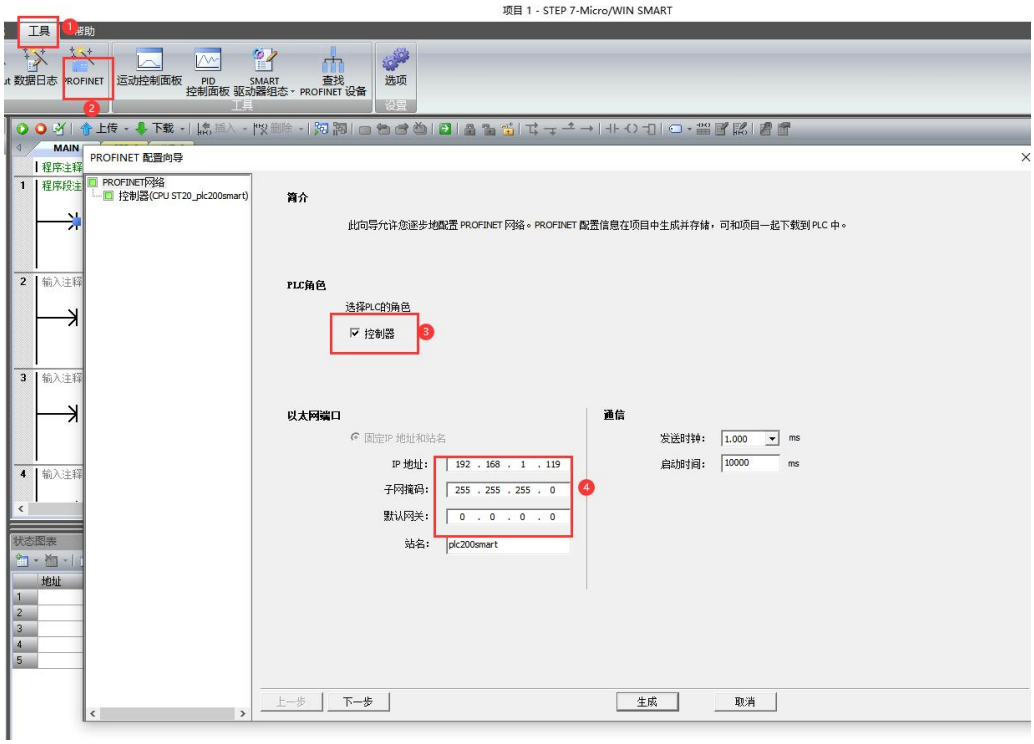


Figure 4-2-3

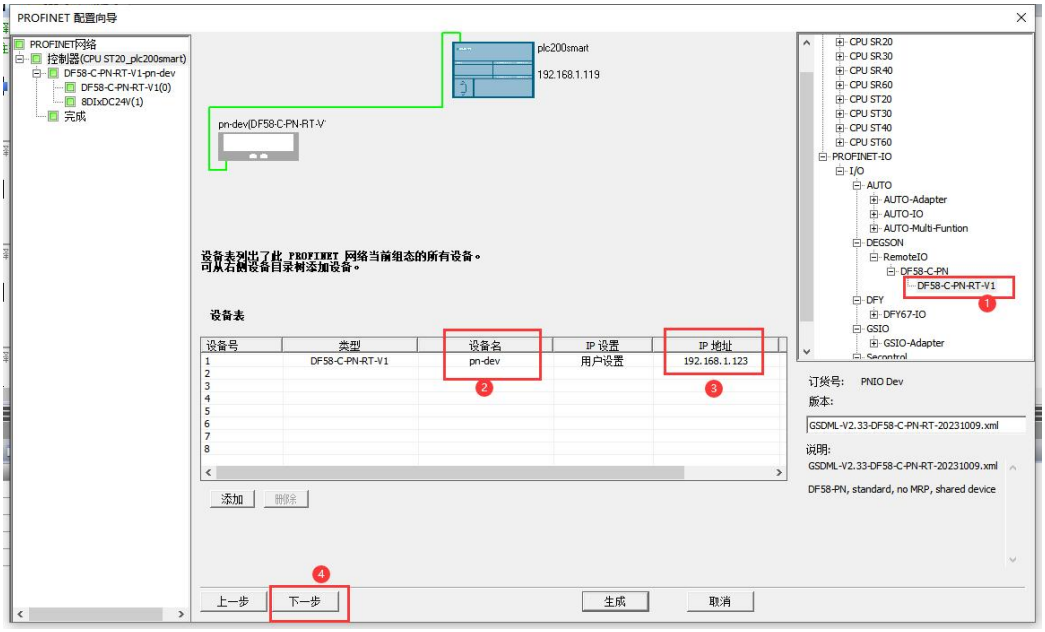


Figure 4-2-4

After the configuration is completed, click Generate to complete the configuration, as shown in Figure 4-2-5.

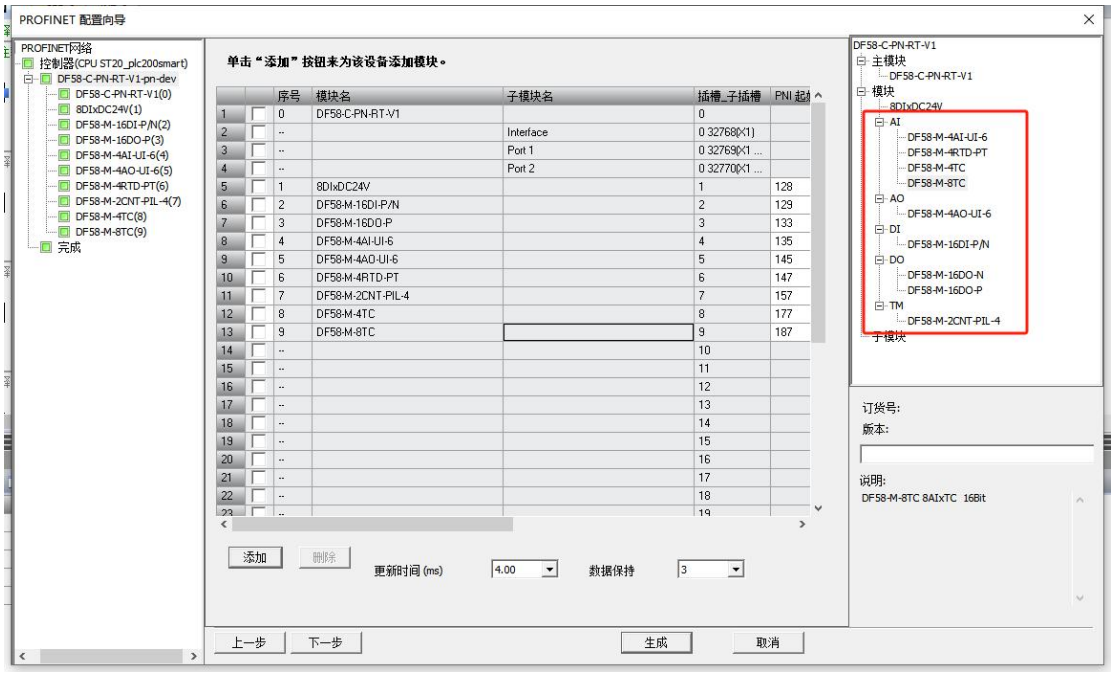


Figure 4-2-5

4.2.6 Program Download

Select PLC > Download in the menu bar and select Find CPU in the communication window

The PLC that needs to download the program is required, and the program is downloaded.

Figure 4-2-6

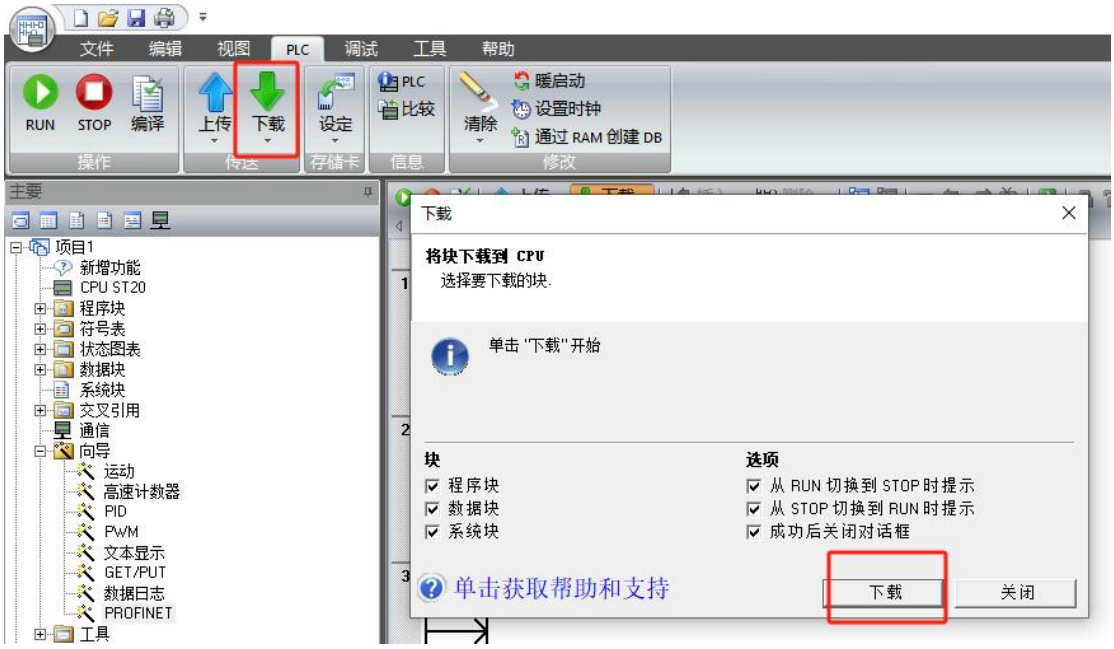


Figure 4-2-6

4.2.7 Address Description

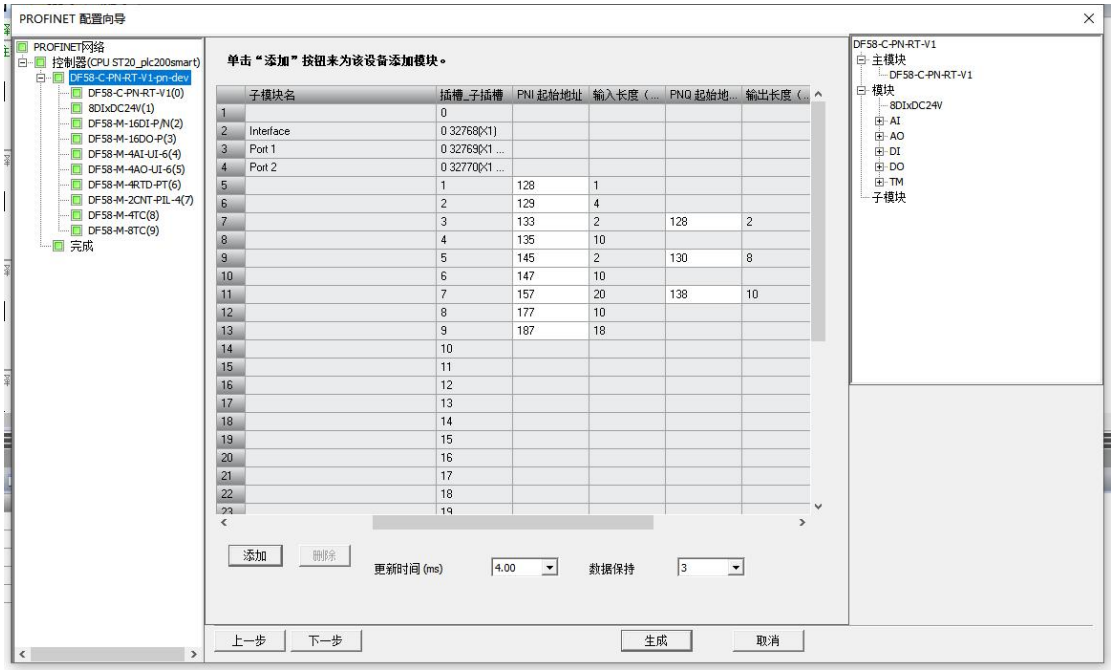


Figure 4-2-7

In this configuration, as shown in Figure 4-2-7, the I and Q address ranges of the coupler and the extension module can be obtained from the view. You can set the first address in

the view. For details about the module address, see the corresponding module description.

4.2.8 Data Monitoring

Create a chart in the status chart, enter the corresponding address, and read and write the data after it is run. This is shown in Figure 4-2-8

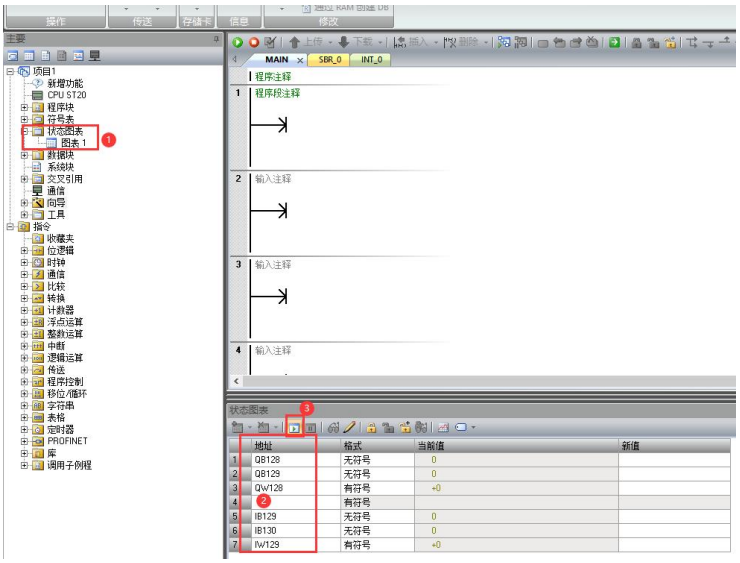


Figure 4-2-8

According to the configuration, DF58-M-16DO-P output address QB128~QB129, DF58-M-16DI-P/N input address IB129~IB330, DF58-M-16DO-P Q0.0~Q0.7 and DF58-M-16DI-P/N I0.0~I0.7 are connected together by signal line. The Q0.0~Q0.2 output signal of DF58-M-16DO-P, the value of QB128 is written to 0x07, and the value of IB128 read out of DF58-M-16DI-P/N is 0x07. Note: The relationship between bytes and words in the Smart software is shown in Figure 4-2-9 below, QB128 is 16#07, QB129 is 16#00, QW128 is 16#0700, the top 8 bits of QW64 correspond to QB128, and the low 8 bits correspond to QB129.


状态图表

	地址	格式	当前值	新值
1	QB128	十六进制	16#07	
2	QB129	十六进制	16#00	
3	QW128	十六进制	16#0700	
4		有符号		
5	IB129	十六进制	16#07	
6	IB130	十六进制	16#00	
7	IW129	十六进制	16#0700	

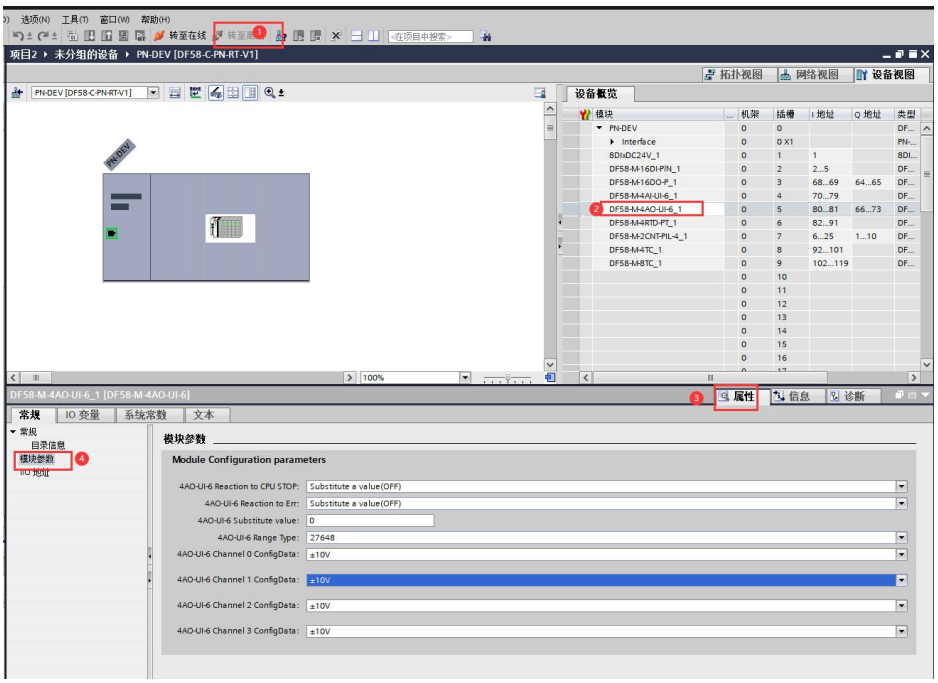
Figure 4-2-9

5. Appendix Module Parameter Configuration

Different software module parameter paths are different, the following is a list of the path of the extension module parameters set by the TIA Portal software and the smart200 programming software.

5.1 TIA Gentles:

When the S7-1200 is offline, you can set the module parameters, select Go to Offline→ select the module to be set→ Properties→ Module Parameters, and configure the extension module parameters through the drop-down list. The configuration takes effect after it is downloaded.



5.2 Smart200 Programming Software:

Select PROFINET in the wizard bar, select the module to be set, and find Module Configuration

Configure the corresponding parameters for Paraneters, which take effect after the configuration is downloaded.