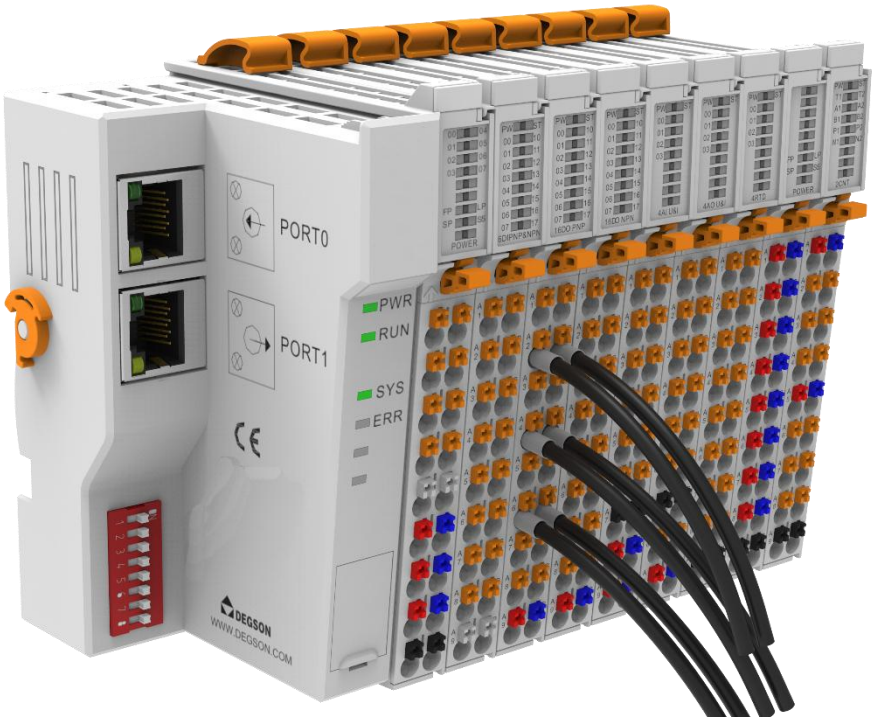
DF58-C-CC-FB

User Manual



Directory

Preface

Scope of this document

This document applies to the DFH20 series remote I/O system

Introduction

This manual mainly introduces the technical specifications, installation, and debugging of DFH20 series remote I/O modules.

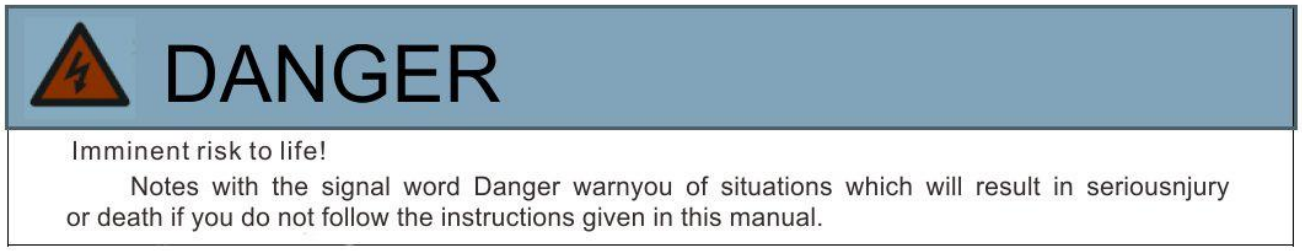
Highlights include:

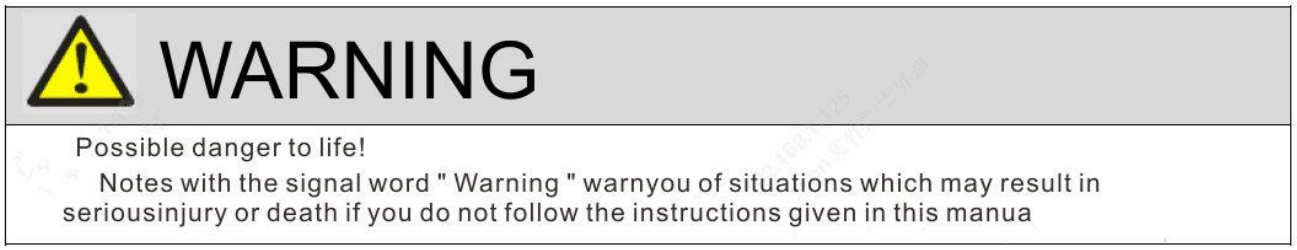
- System Overview: Mainly introduces the product ordering information of DFH20 series remote I/O modules, product composition, system architecture, product transportation, storage environment, etc.;
- Product Description: Introduce the technical parameters of DFH20 series remote I/O module;
- Installation and disassembly guidance: introduce the installation and removal of DFH20 series remote I/O modules, etc.
- Mechanical and electrical diagrams: DFH20 remote I/O module dimensions and electrical wiring diagrams;
- User Guide: Introduce the communication between DFH20 series remote I/O modules and mainstream PLCs through examples.

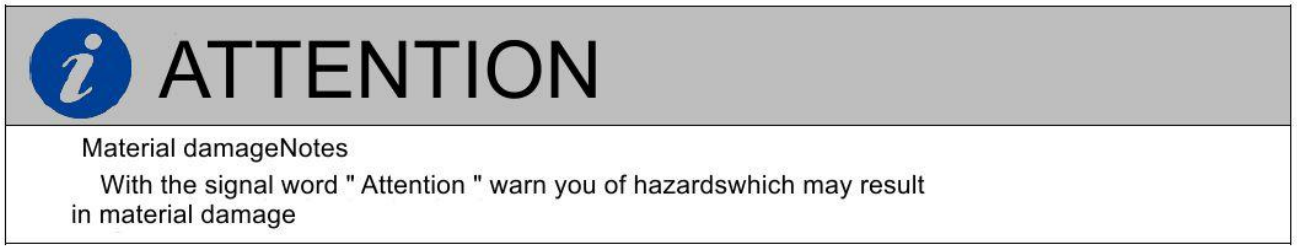
Precautions

This document describes in detail how to use the DFH20 series of 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 DFH20 series remote I/O modules and is designed for engineers, installers, maintenance personnel, and electricians with general knowledge of automation.

Recycling and disposal

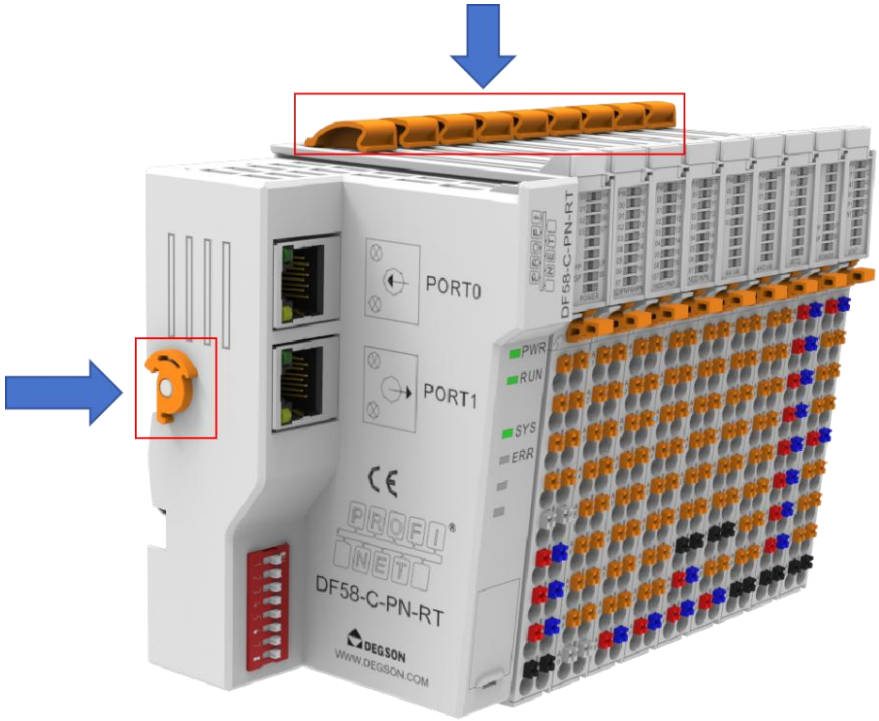
To ensure that the recycling of your old equipment meets environmental requirements, please contact a certified e-waste disposal facility.

1.Product installation and disassembly

1.1.Installation

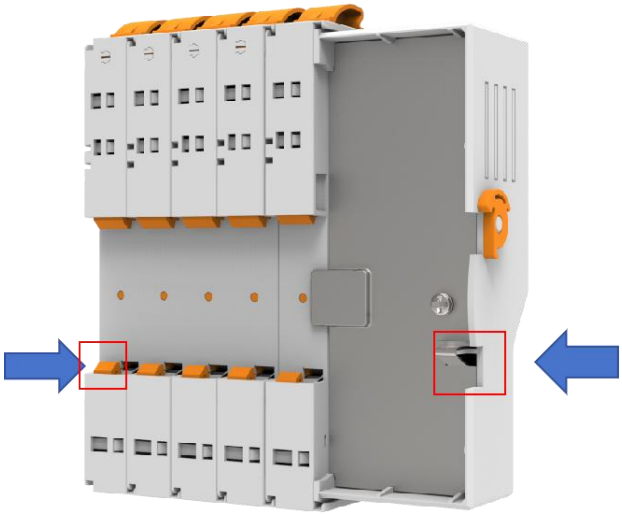
The din rail lock at the bottom of the module can be safely and reliably mounted on a 35 mm din rail when the module is installed, and the module needs to be aligned with its notch, push the module towards the din bayonet, and place the module on the din rail.

When installing the adapter, there is a manual snap above and on the left side for locking the rails.



1.2. Grounding protection

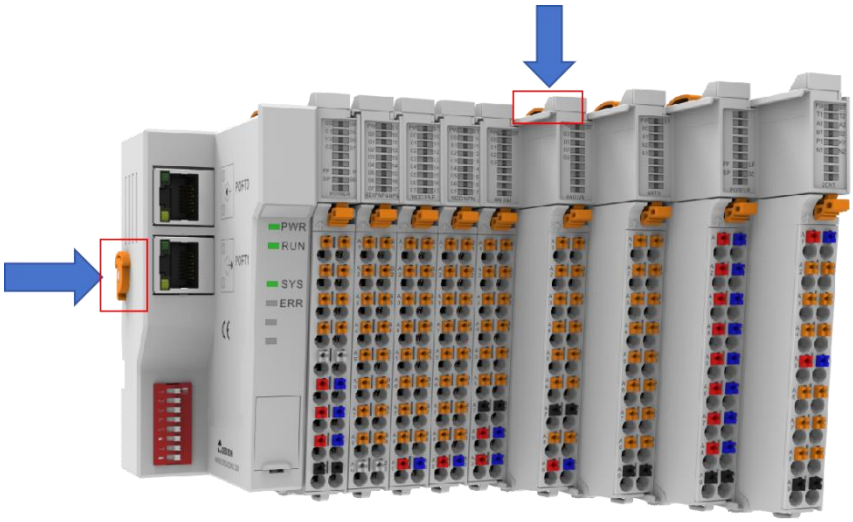
There is a metal shrapnel on the back of the module for effective grounding with the guide rail, and the metal shrapnel is connected to the grounding PE of the adapter module.



1.3.Disassembly method

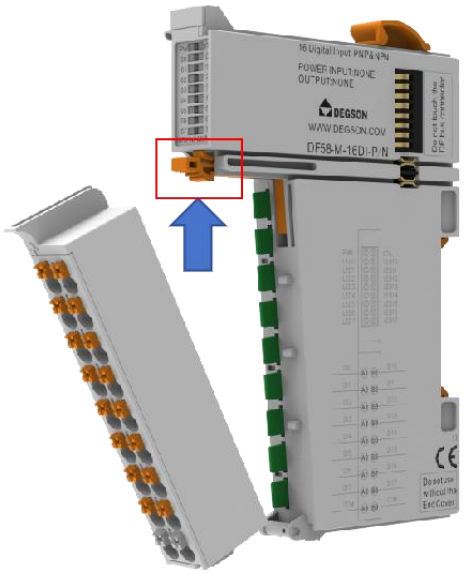
1.3.1. Module disassembly

First of all, remove all signal or power cables of the module, then press the pins (the yellow part of the arrow above 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

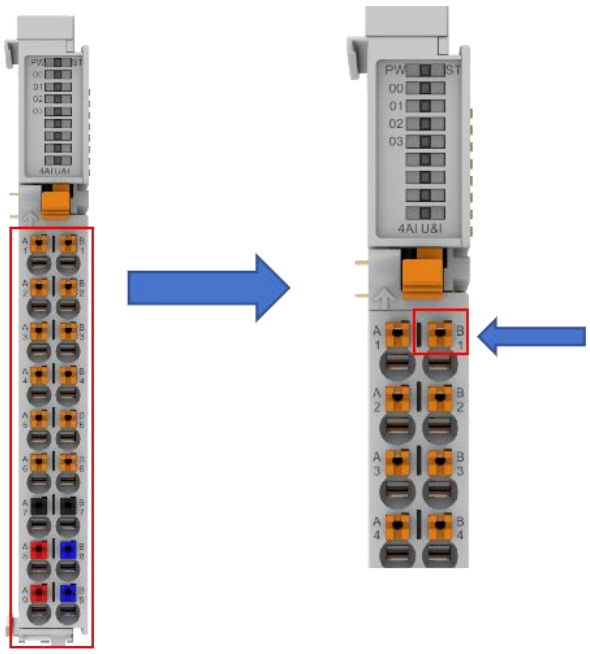
The buckle can be removed separately by pressing the buckle in the direction of the arrow.



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

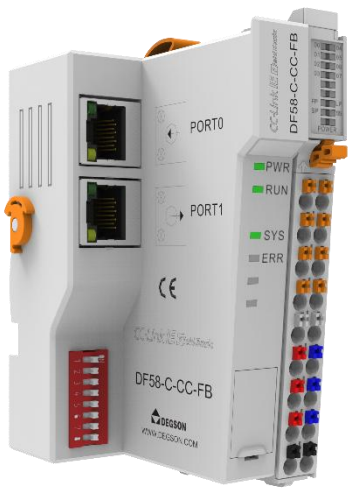
- If the module is difficult to install, do not use brute force to install, so as not to damage the current module or other modules, disassemble the module from the guide rail, check whether the module is abnormal (such as foreign body blockage, etc.), confirm that there is no problem, and then plug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

2.DF58-C-CC-FB

Fieldbus system	Description	Model
CC-Link IE	CC-LINK bus, 2 RJ45, expandable with 32 modules, 24VDC	DF58-C-CC-FB

2.1.CC-LINK IE Field Basic fieldbus adapter (DF58-C-CC-FB)

- The DF58-C-CC-FB fieldbus adapter acts as a slave to the CC-LINK IE Field Basic, which is an open fieldbus. 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 is designed for fieldbus communication in CC-LINKIE Field Basic networks.



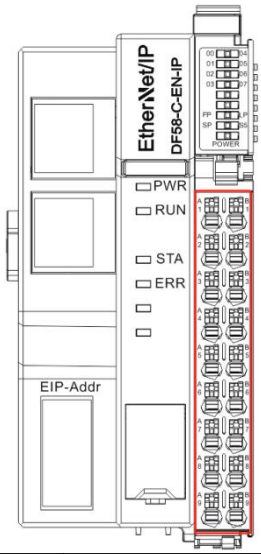
2.1.1. Specifications

Specifications	
Name of article	DF58-C-CC-FB
Product Description:	CC-Link IEF Basic bus，2个RJ45，expandable to 32 modules，24VDC
Communication protocols	CC-Link IEF Basic
Connection	2*RJ45, integrated switch function
Transmission rate	10/100Mbps, full duplex
Transmission distance	100 meters
Scalable number of modules	32
Address mapping	Yes
Bus address Set up	CC-Link IEF Basic Specification, DIP Switches
Transmission medium	Category 5 twisted pair
Isolation method	Electrically isolated from the field layer
Alarm function	Diagnostic alarms, process alarms, plug-in and unplug connector alarms
Minimum period Time	1ms
Power supply parameters	
The terminal input power supply voltage is rated	24V DC(18V DC~ 28V DC)
The terminal input power supply is rated at current	0.6A
Power protection	Overcurrent protection, anti-reverse polarity protection, surge absorption
Connection	PUSH-IN terminal blocks
No-load current	<350mA
Inside is available System voltage	5VDC
Inside is available System current	Max.3A
Load is provided voltage	18V... 28VDC
Load is provided Maximum current	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 interfaces

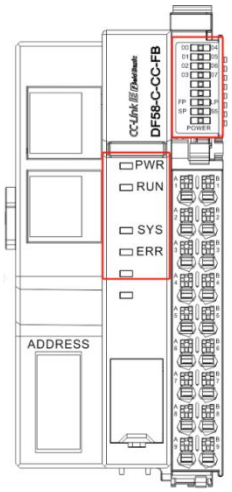
2.1.2.1. Definition of terminal block



Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	DI0	B1	DI4	Digital signal input
A2	OF 1	B2	DI5	
A3	DI2	B3	B6	
A4	B3	B4	DI7	
A5	WITH	B5	WITH	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	ON	B9	ON	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.

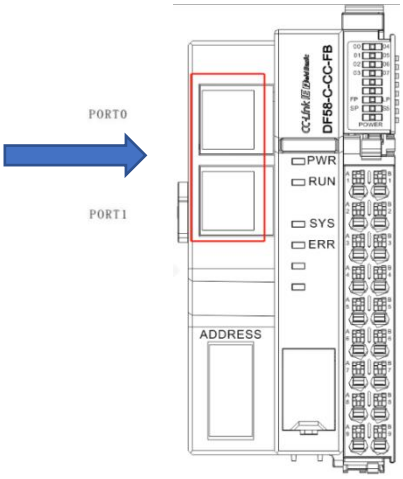
2.1.2.2. Indicator Definition



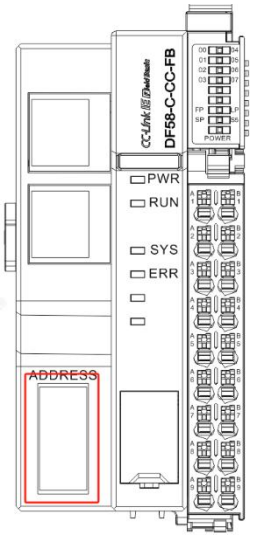
Light	meaning
PWR（green）	Power indicator, PWR indicator lights up when the module is powered normally
RUN (green)	Solid on: The coupler is functioning normally Off: The coupler is operating abnormally Flickering: abnormal configuration;
SYS (green)	On: Communication between the coupler and module is abnormal, Off: The communication between the coupler and module is abnormal
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.

2.12.3. RJ45 interface

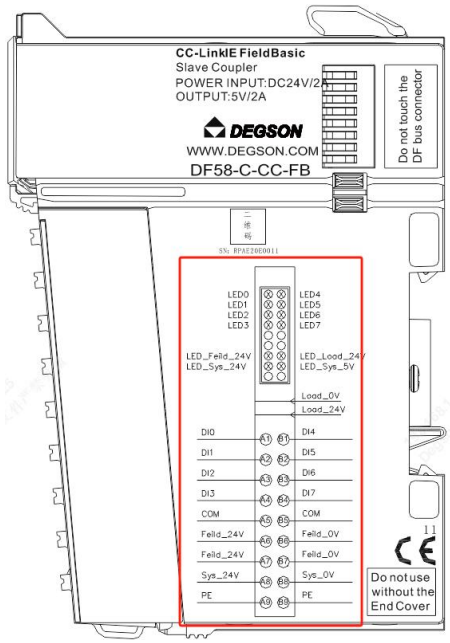
Used to establish communication with the host computer, the dual RJ45 ports make it easy to create a line structure without the need for any additional network components.

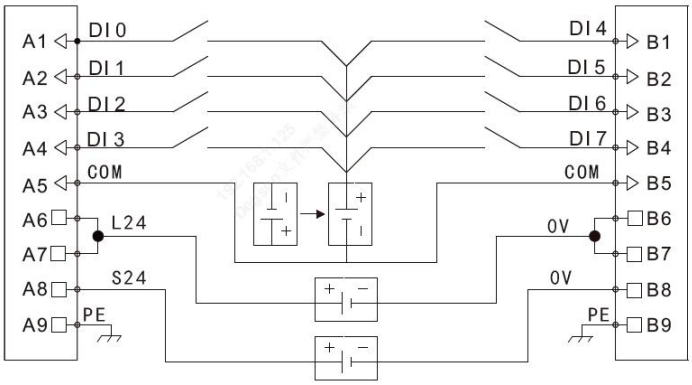


2.12.4. DIP switch



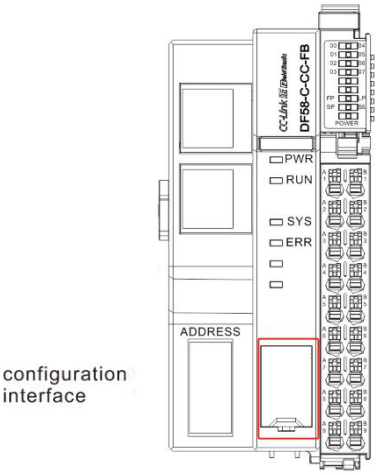
2.1.2.5. Wiring diagram





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

2.12.6. 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. Parameter settings

2.13.1. Web Page Parameters

The RJ45 network port of the module gateway adopts a dual-IP design, with two IP addresses, the default user name **is admin**, and the password is **admin**;

One of the addresses, the default IP, including the IP of the RJ45 network port, can also be accessed through 192.168.1.253:2250 to access the module web page**This address can only be used to modify the parameters on the login page**.

The second address, the IP set by the dial code or the IP set by the web page, please refer to "2.6 Dial Code Parameters" for details, **this address is used to connect to the main site and modify the parameters of the login web page**. You need to add 2250 to enter the web page, for example, 192.168.3.100:2250. The default IP address of the web page is 192.168.1.253, and the default username and password are "**admin**", and you can log in to the web page parameter configuration page to configure the parameters. Figure 2-5-1 is the login page, Figure 2-5-2 is the English page of the module, switch between the Chinese and English pages through the Chinese/English button in the upper right corner, and Figure 2-5-3 is the Chinese page of the module.

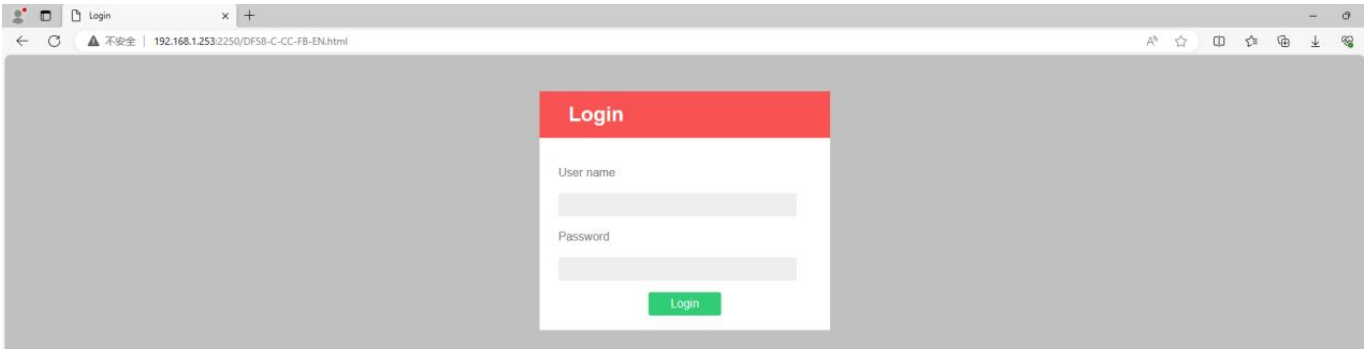


Figure 2-5-1 Login page

Figure 2-5-2

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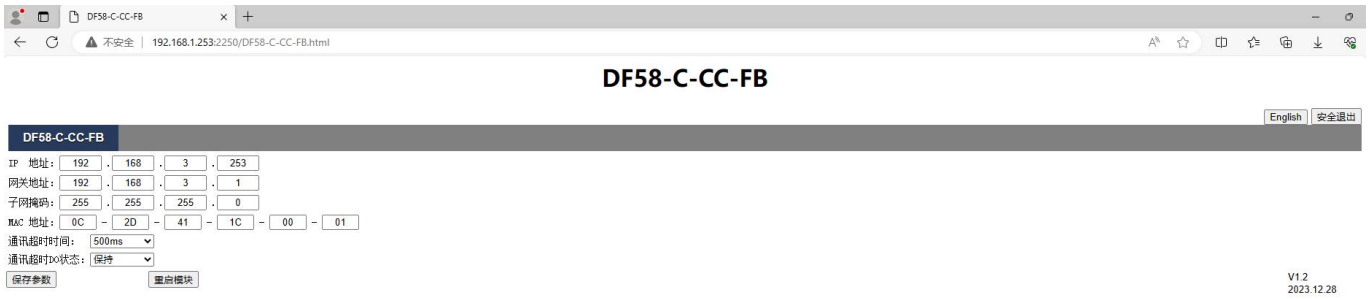


Figure 2-5-3 Chinese page

English/Chinese: switch between English and Chinese interfaces.

Log Out: Exit the module's web interface.

IP address: The coupler must be in the same network segment as the IP address of the controller (192.168.3.253 by default) to communicate with the connected controller.

Gateway Address: Set the gateway of the coupler (default 192.168.3.1).

Subnet Mask: Sets the mask of the coupler (default is 255.255.255.0).

MAC address: Set the MAC address of the coupler, if there are multiple devices in the same network, the MAC address cannot be the same, otherwise the communication will be abnormal.

Communication timeout time: After the communication between the coupler and the controller is disconnected, the output channel of the analog expansion module behind the coupler will be cleared after the corresponding time, with a total of 4 setting items, namely: 200ms, 500ms, 1s, and 3s. When set to 200ms, 500ms, 1s, and 3s, the output channel output of the analog expansion module behind the coupler is cleared to zero after the communication is disconnected for more than the set time.

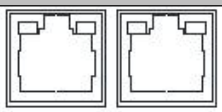
Communication timeout DO state: After the communication between the coupler and the controller is disconnected, the output channel output of the digital expansion module behind the coupler is cleared or maintained, with a total of 3 setting items, namely: hold, clear output, and turn on output.

2.13.2. DIP parameters

DIP switch	illustrate
	When all DIPs are set to OFF, the IP address used by the coupler for CC-Link IEF Basic communication is configured through the web page, and the range XXX.XXX.XXX.1~XXX.XXX.XXX.254 is set. The "XXX.XXX.XXX." indicates the CIDR block to which it is connected in actual use. When the DIP switch is dialed to ON, the last digit of the IP address used by the

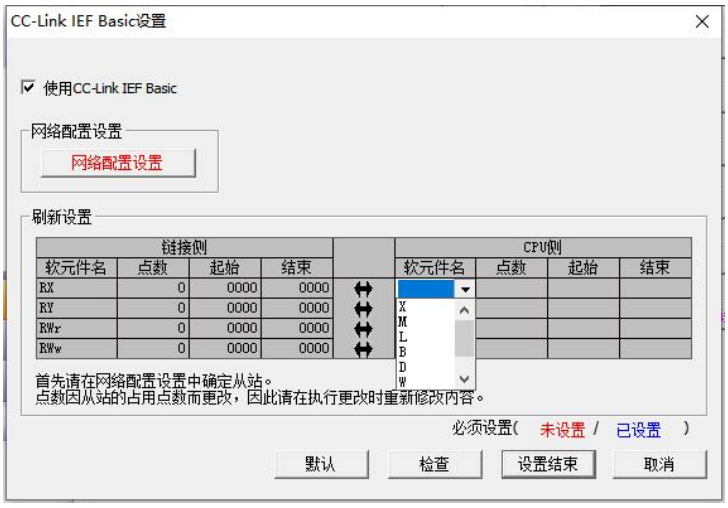
	coupler for CC-Link IEF Basic communication is the value set by the DIP switch, and the network segment is subject to the setting of the web page, for example, the IP address 19 3.168.3.123 is set on the web page, and the DIP switch 1 and 2 are dialed to ON, and the others are OFF, and the IP address of the coupler is 19 3.168.3.3。 地址=SW1×20+SW2×21+...+SW8×27 Concentrate: (1)The maximum range of addresses can be set toXXX.XXX.XXX.1 ~ XXX.XXX.XXX.254 (2) The dial code sets the IP address, and it will only take effect when the module is powered off and restarted.

2.13.3. Network port description

Ethernet port	illustrate
	It is used for CC-Link IEF Basic communication and has a switch function.

2.13.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

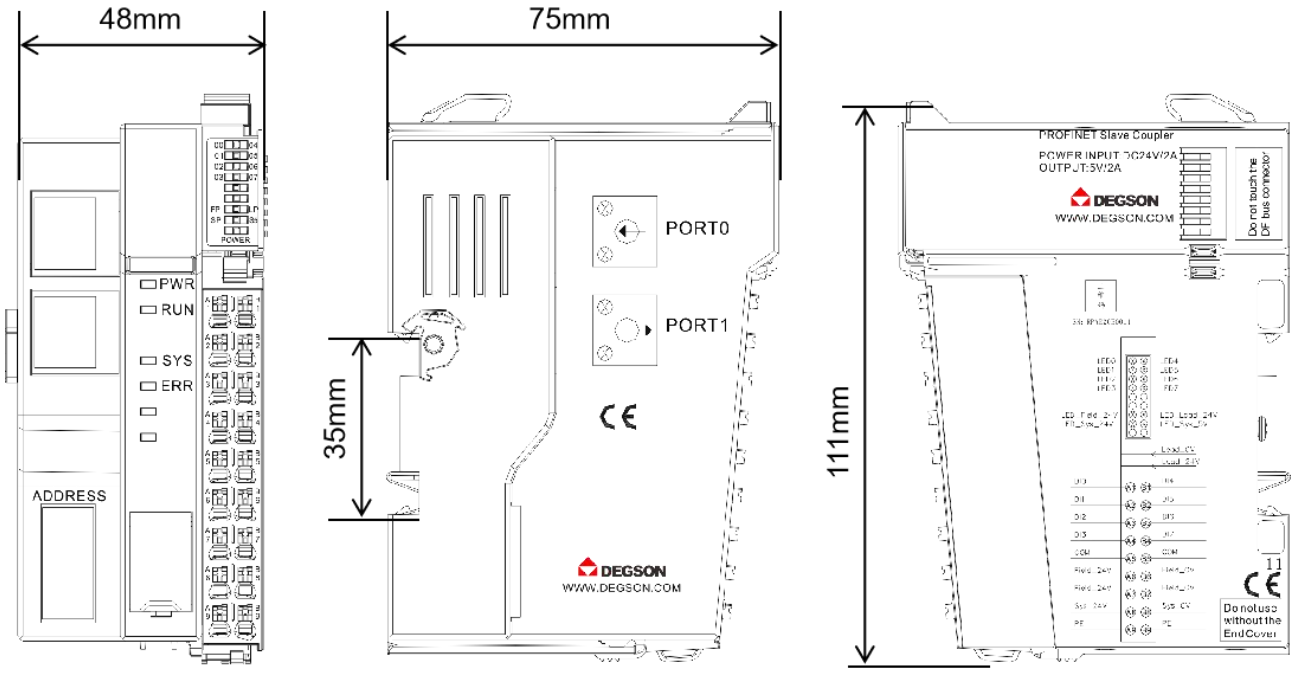
Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-C-CC-FB address description

Link Side (Component Name)	Total bytes	remark
RX	1byte	Bit0~Bit7：I0.0~I0.7
RY	---	---
RWr	---	---
RWw	---	---

2.1.4. Mechanical installation

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

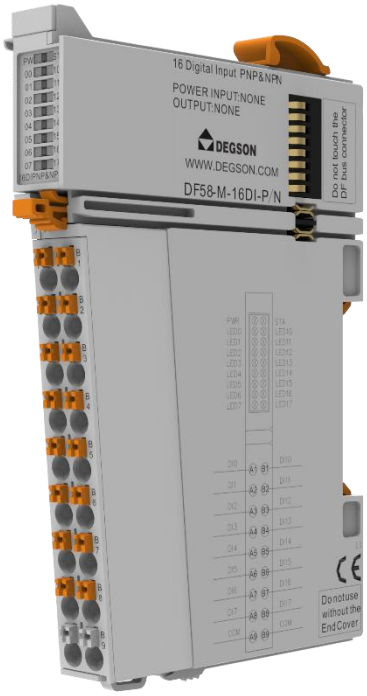


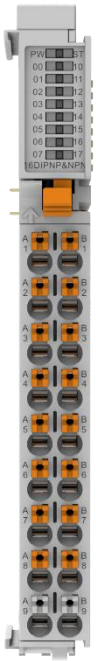
3.Expansion I/O modules

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.





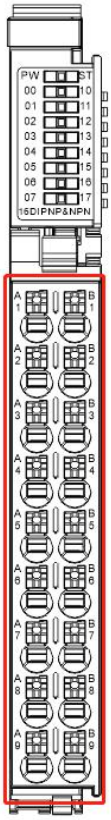
3.1.1. Specifications

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, 2ms, 4ms, 8ms, 16ms, 32ms, you can set 2 groups of filtering parameters, one group for every 8 channels, and one filter parameter is shared 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

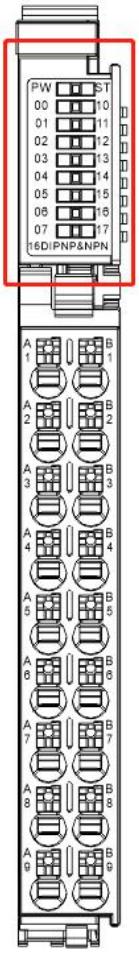
3.1.2. Hardware interfaces

3.12.1. Definition of terminal block



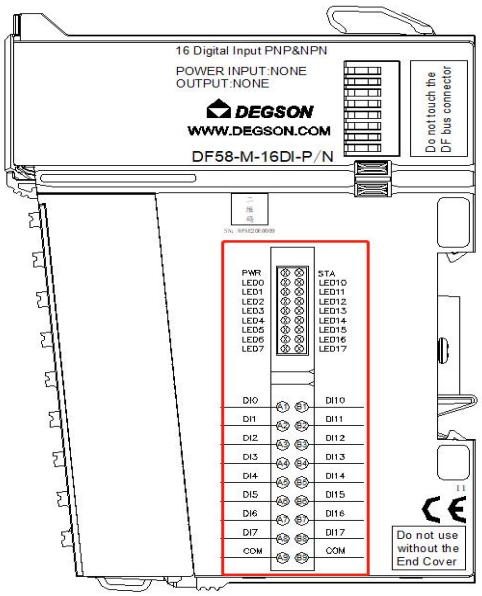
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	OF 0	B1	OF 10	DI signal input
A2	OF 1	B2	OF 11	
A3	OF 2	B3	OF 12	
A4	OF 3	B4	OF 13	
A5	OF 4	B5	OF 14	
A6	OF 5	B6	OF 15	
A7	OF 6	B7	OF 16	
A8	OF 7	B8	OF 17	
A9	WITH	B9	WITH	The DI signal is input to the common end

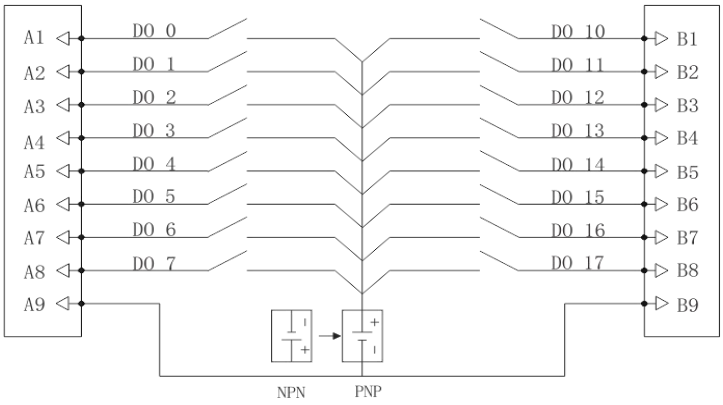
3.12.2. Indicator Definition



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 DI0~DI17.

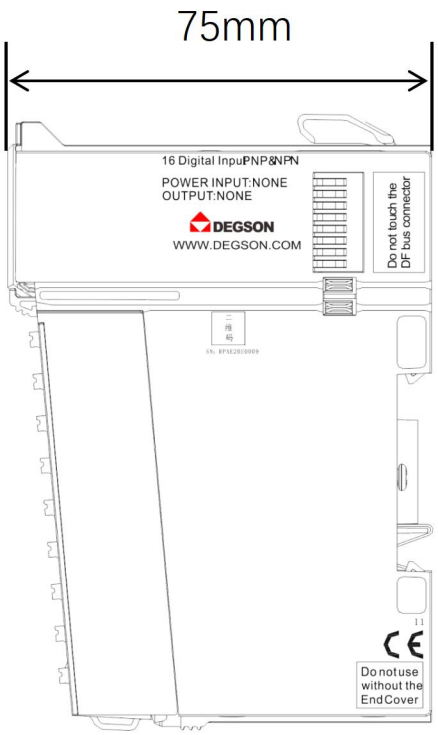
3.12.3. Electrical wiring diagram

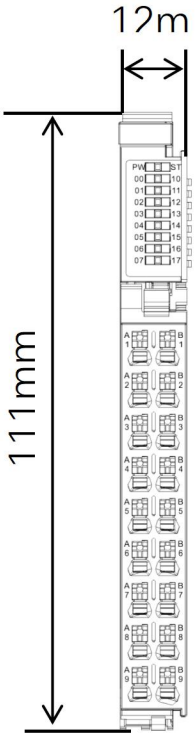




Note: COM is the public side, which is connected to 24V to implement NPN, and external 0V to implement PNP.

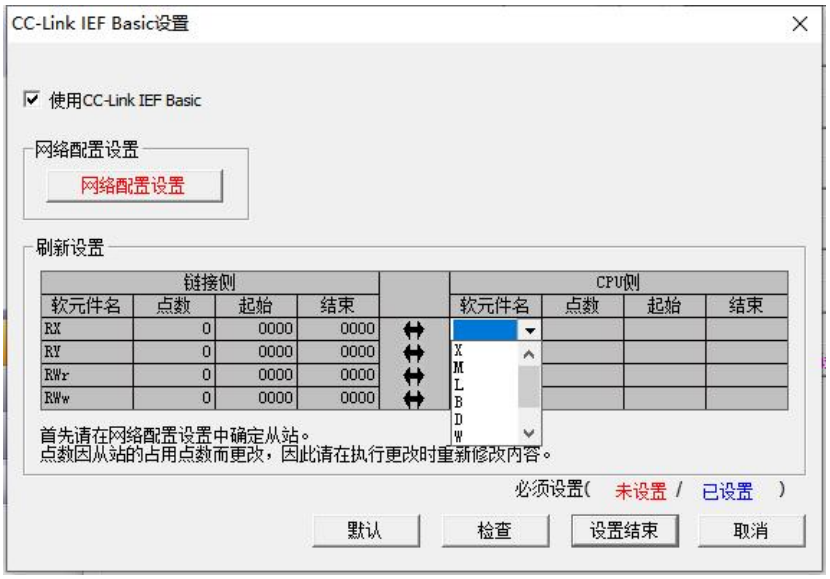
3.1.3. Mechanical installation





3.1.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-16DI-P/N address description

Link side (Component Name)	Total bytes	Description/data type	remark
RX	2Byte (1Word)	Enter the address/1word	Bit0~Bit15：I0.0~I1.7
RY	---	--	---
RWr	2Byte (1Word)	Diagnostic information/1Word	Module diagnostic information Bit0： 0: The bus is normal; 1: Bus fault; Bit1~Bit15：reserve
RWw	2Byte	Parameter	Parameter settings:

Link side (Component Name)	Total bytes	Description/data type	remark
	（1Word）	settings/1Word	Bit0~Bit7: Set the filtering parameters of channels 1~8: 0: No filter (default); 1：0.25ms； 2：0.5ms； 3：1ms； 4：2ms； 5：4ms； 6：8ms； 7：16ms； 8：32ms； Bit8~Bit15: Set the filtering parameters of channels 9~16: 0: No filter (default); 1：0.25ms； 2：0.5ms； 3：1ms； 4：2ms； 5：4ms； 6：8ms； 7：16ms； 8：32ms；

3.2. 16-channel digital output/24VDC/PNP/NPN (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.

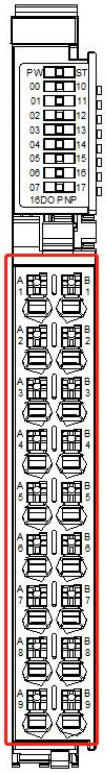
3.2.1. Specifications

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
SwitchingFrequency (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 value 1.9A
The type of load	Inductive (7.2W/dot, 24W/module), Resistive (0.5A/dot, 4A/module), Lamp (5W/dot, 18W/module)
The output action is displayed	When the output is in the driving state, the indicator light is on (the LED is controlled by the IO software of the microcontroller)
Enter the derating	Derate by 50% at 55°C (while the output current of ON does not exceed 2A), or 10°C at full ON at the output point
IO mapping	Supports bit-by-bit access, byte-by-byte access, and word-by-word

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

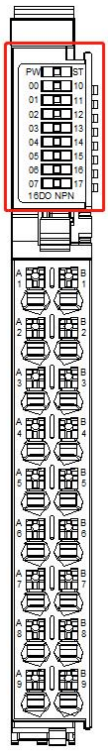
3.2.2. Ardware interfaces

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

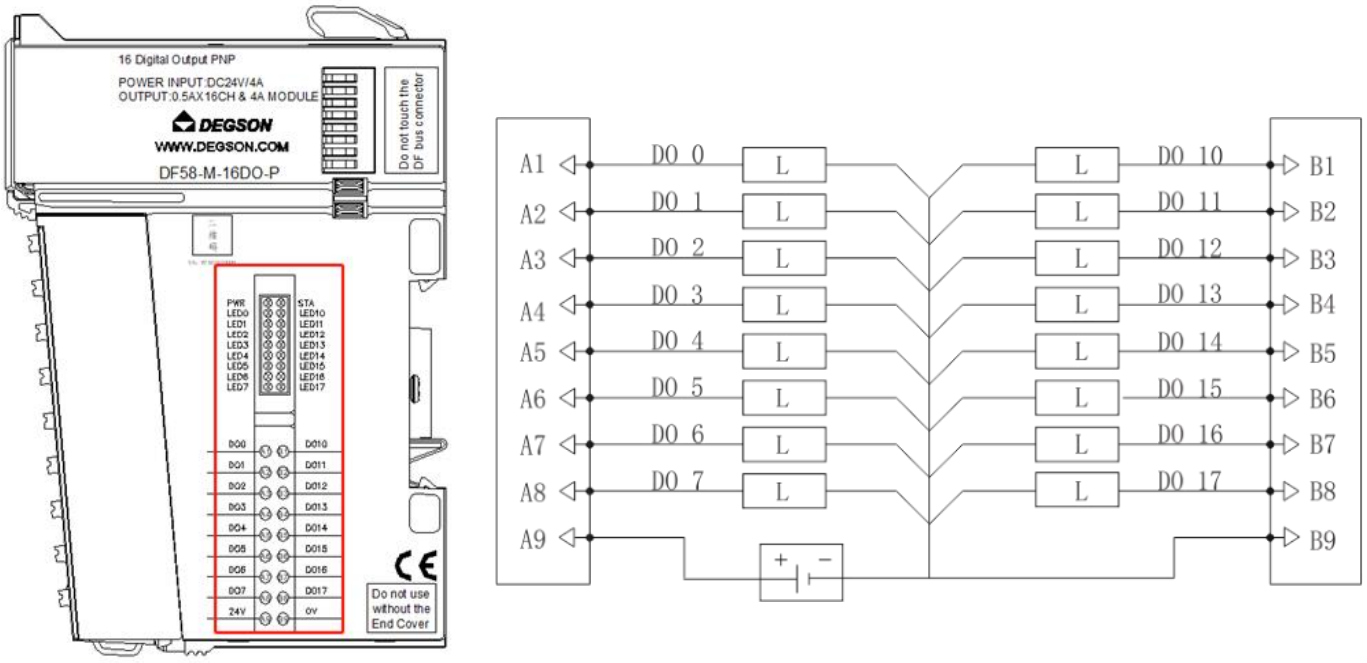
3.2.2.2. Indicator Definition



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.

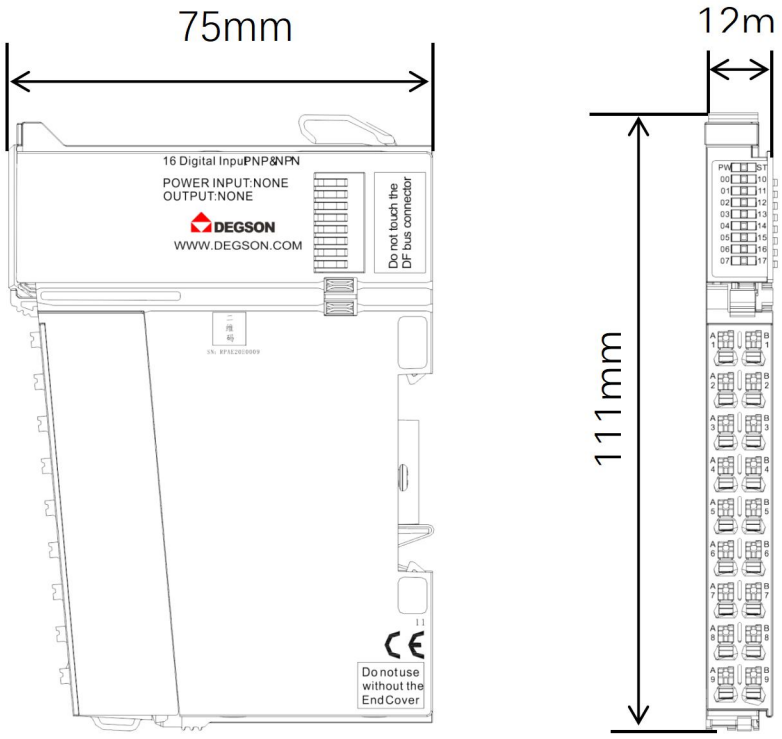
3.2.2.3. Electrical wiring diagram

DF58-M-16DO-P Wiring diagram



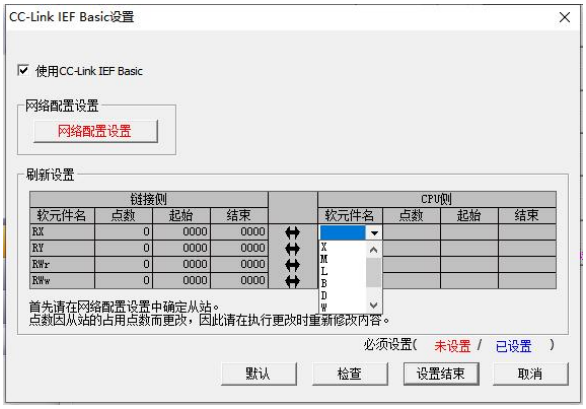
Note: A9 and B9 are connected to 0V power supply and are provided externally.

3.2.3. Mechanical installation



3.2.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR

RWw	L,B,D,W,R,ZR

DF58-M-16DO-P address description

Link side (Component Name)	Total bytes	Type/data size	Address layout	remark
RX	---	---	---	
RY	2Byte (1Word)	Output/1Word	1Word	Bit0~Bit15：Q0.0~Q1.7
RWr	2Byte (1Word)	Diagnostic information/1Word	1Word	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 any channel is short-circuited; 0: The channel is normal Bit3： 1: Channel 9~16 any channel is short-circuited; 0: The channel is normal Bit4~Bit15：reserve
RWw	2Byte (1Word)	Parameter settings/1Word	1Word	BIT0~BIT7: The output status of the module when the connection is disconnected 0: The output remains in the state before disconnection 1: The output is cleared 2: All channels are output BIT8~BIT15:reserve

3.3. 16-channel digital output /24VDC/PNP/NPN(DF58-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.

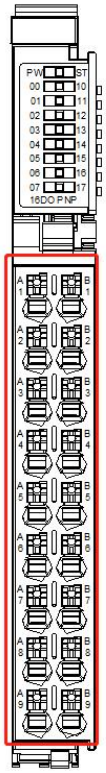
3.3.1.Specifications

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 value 1.9A
The type of load	Inductive (7.2W/dot, 24W/module), Resistive (0.5A/dot, 4A/module), Lamp (5W/dot, 18W/module)
The output action is displayed	When the output is in the driving state, the indicator light is on (the LED is controlled by the IO software of the microcontroller)
Enter the derating	Derate by 50% at 55°C (while the output current of ON does not exceed 2A), or 10°C at full ON at the output point
IO mapping	Supports bit-by-bit access, byte-by-byte access, and word-by-word

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

3.3.2. Hardware interfaces

3.3.2.1. Definition of terminal block



Terminal serial number	Signal	Terminal serial number	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. Indicator Definition

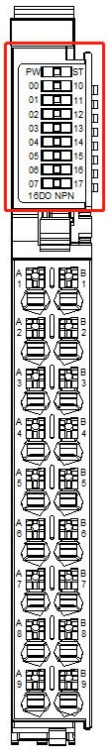
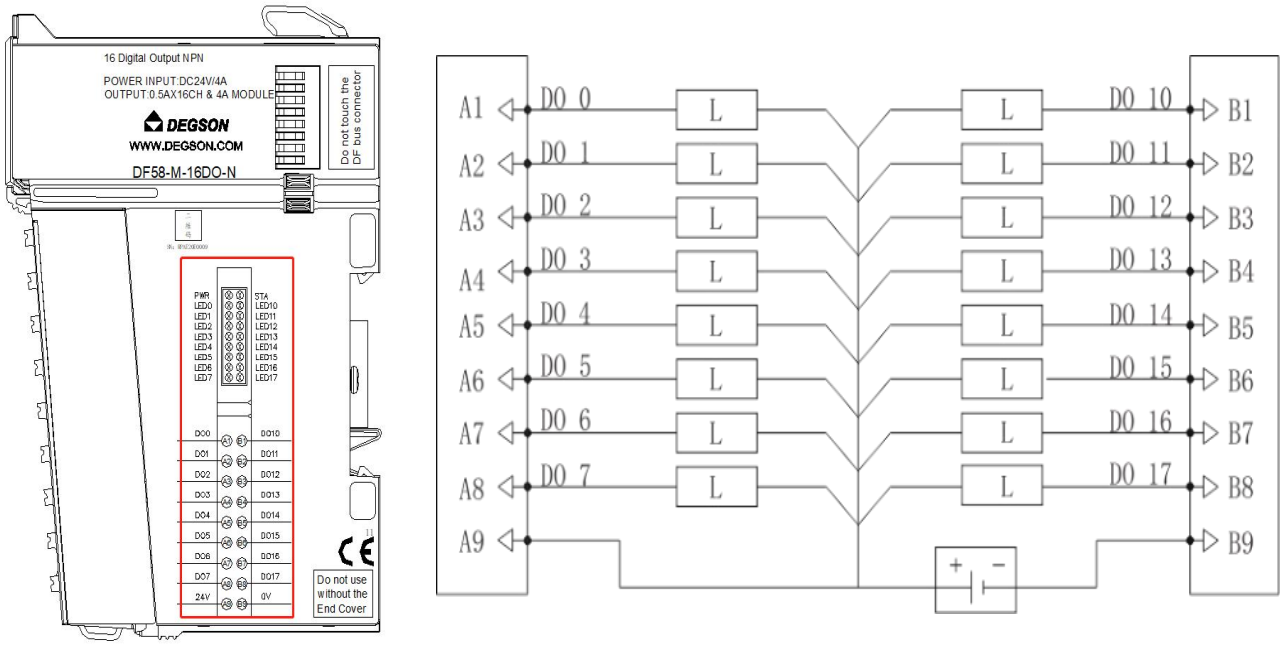


Table 4.3.1 Indicator Definitions

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.

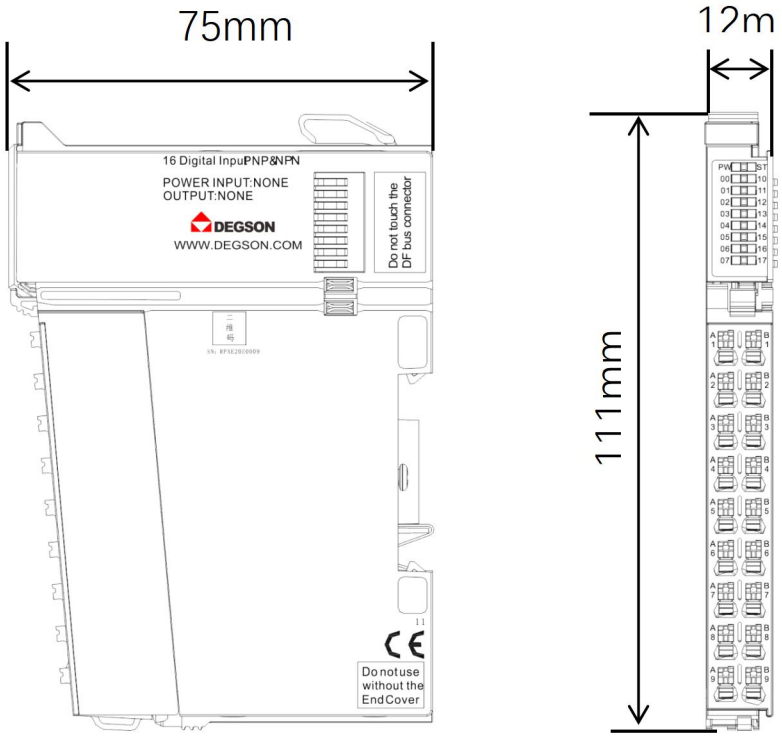
3.3.2.3. Electrical wiring diagram

DF58-M-16DO-N wiring diagram



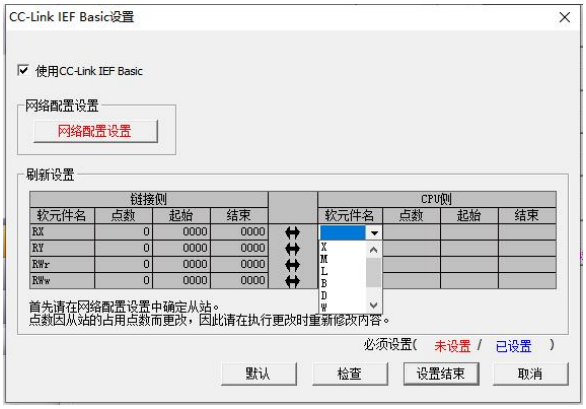
Note: A9 and B9 are connected to 0V power supply and are provided externally.

3.3.3. Mechanical installation



3.3.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR

RWw	L,B,D,W,R,ZR

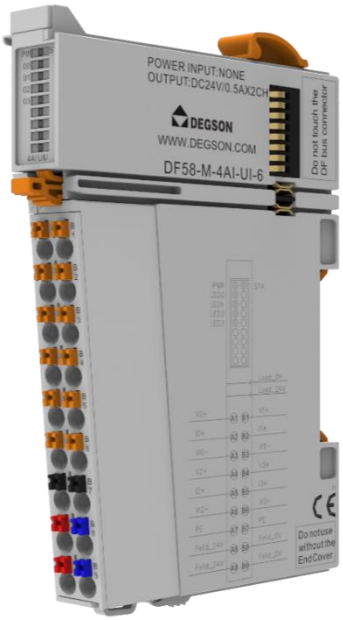
DF58-M-16DO-N address description

Link Side (Component Name)	Total bytes	Type/data size	Address layout	remark
RX	---	---	---	
RY	2Byte (1Word)	Output/1Word	1Word	Bit0~Bit15：Q0.0~Q1.7
RWr	2Byte (1Word)	Diagnostic information/1Word	1Word	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 any channel is short-circuited; 0: The channel is normal. Bit3： 1: Channel 5~8 any channel short circuit; 0: The channel is normal. Bit4： 1: Channel 9~12 any channel short circuit; 0: The channel is normal. Bit5： 1: Channel 13~16 any channel is short-circuited; 0: The channel is normal. Bit6~Bit15：reserve
RWw	2Byte (1Word)	Parameter settings/1Word	1Word	BIT0~BIT7: The output status of the module when the connection is disconnected 0: The output remains in the state before disconnection

Link Side (Component Name)	Total bytes	Type/data size	Address layout	remark
				1: The output is cleared 2: All channels are output BIT8~BIT15:reserve

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



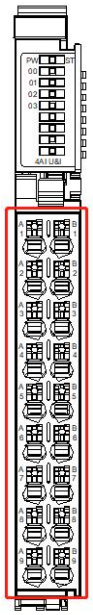
3.4.1. Specifications

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

	synchronous refresh by bus cycle is not required
Stop mode	Keeps the current value and does not refresh again
Signal type	difference
Data size	8 Byte
resolution	16 Bit
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<120mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

3.4.2. Hardware interfaces

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	ON	B7	ON	earth
A8	Load 24V	B8	Load 0V	24V power output
A9	Load 24V	B9	Load 0V	24V power output

3.4.2.2. Indicator Definition

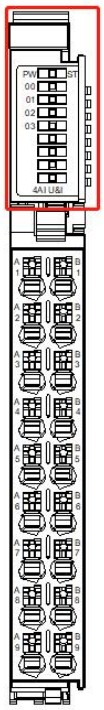
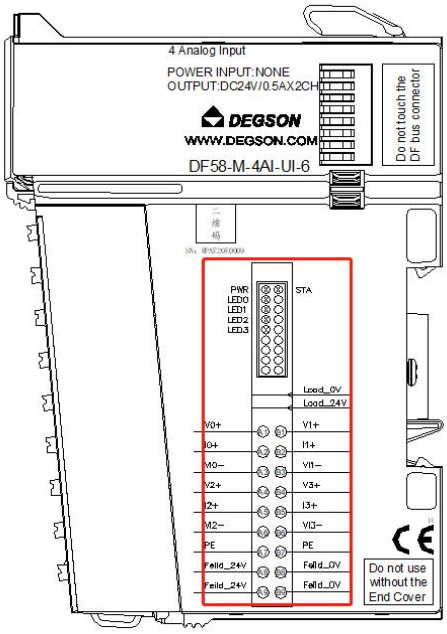
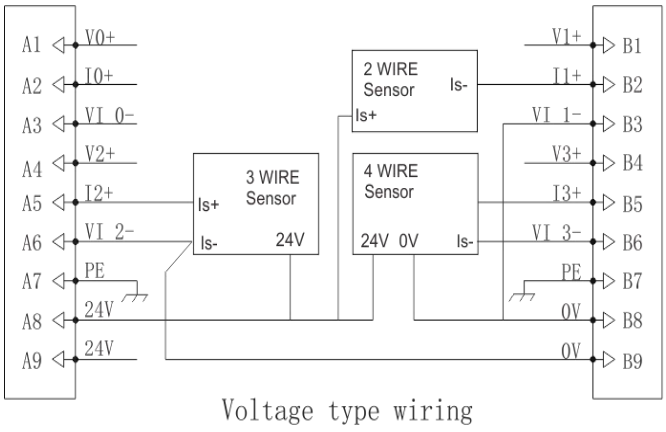


Table 5.3.1 Indicator Definitions

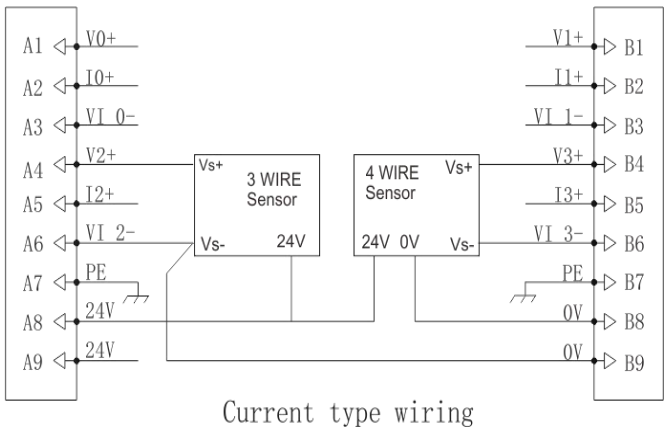
Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
LED0~LED3	No effect

3.4.2.3 Electrical wiring diagram





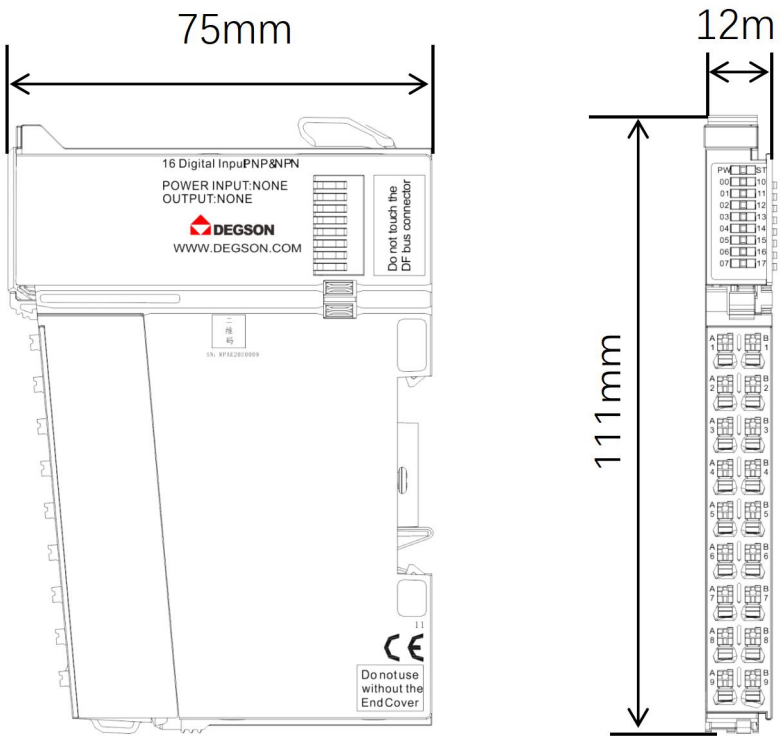
Voltage type wiring



Current type wiring

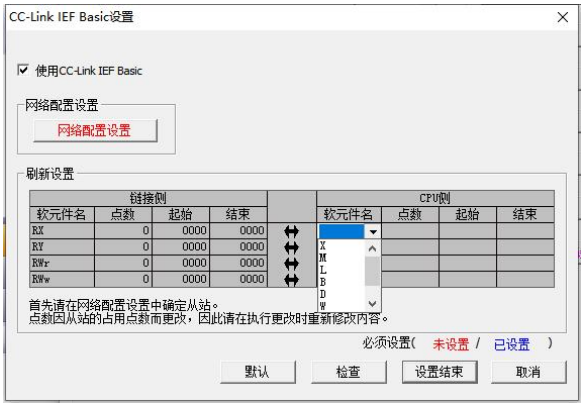
3.4.3. Mechanical installation

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



3.4.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-4AI-UI-6 address description

When using multiple modules, please follow these guidelines:

RWR input area: distribution principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

RWw output area: distribution principle: module parameter setting (all module parameter settings are arranged in order from the first address) + analog output address (the analog output address is arranged after all module parameter settings are arranged).

Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
RX	---		---	
RY	---		---	
RWr	10byte （5Word）	Diagnostic information/1Word	1Word	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.

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				Bit10~Bit15：reserve。
		Enter the address/4Word	Section 1Word	The input address of channel 1
			Section 2Word	Enter the address of channel 2
			Section 3	Enter the address of channel 3
			Section 4Word	The input address of channel 4
RWw	6byte （3Word）	Parameter settings/3Word	Section 1Word	reserve
			Section 2Word	BIT0~BIT7:retain; BIT8~BIT15: Configure the range of channel 1~2: 0:-10~10VDC; 1:0~10VDC; 2:2~10VDC; 3:-5~5VDC; 4:0~5VDC; 5:1~5VDC; 6:-20~20mA; 7:0~20mA; 8:4~20mA;
			Section 3	BIT0~BIT7:retain; BIT8~BIT15: Configure the range of channel 3~4: 0:-10~10VDC; 1:0~10VDC; 2:2~10VDC; 3:-5~5VDC; 4:0~5VDC; 5:1~5VDC; 6:-20~20mA;

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				7:0~20mA; 8:4~20mA;

Process data definitions

Enter the voltage process parameters (Table 5.5.3.1), 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.

Table 5.5.3.1 Process Data Definition (Voltage Type).

Process Data Definition (Voltage Type)								
Voltage (0-5V)	Voltage (1-5V)	Voltage (0-10V)	Voltage (2-10V)	Voltage(±5V)	Voltage(±10V)	decimal	hexadecimal	
>5.06	>5.06	>10.12	>10.12	>5.06	>10.12	32767	0x7FFF	Overflow
5.06	5.06	10.12	10.12	5.06	10.12	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

Enter the current process parameter table (5.5.3.2), take 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.

Table 5.5.3.2 Process Data Definition (Current Type)

Process Data Definition (Current)				
Current (0-20mA)	Current (4-20mA)	decimal	hexadecimal	
>23.515	>22.810	32767	0x7FFF	Overflow
23.515	22.81	32511	0x7EFF	Super Upper Limit
-	-	-	-	

-	-	-	-	
20.0007	20.0005	27649	0x6C01	
20	20	27648	0x6C00	
-	-	-	-	
-	-	-	-	
10	12	13824	0x3600	Rated range
-	-	-	-	
-	-	-	-	
0	4	0	0x0000	
<0.0	3.9995	-1	0xFFFF	
-	-	-	-	
-	-	-	-	Ultra-lower limit
-	1.1852	-4864	0xED00	
/	<1.1852	-32768	0x8001	Hypolympation

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

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

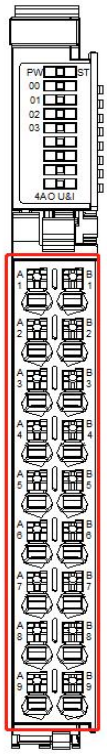
3.5.1. Specifications

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

Stop mode	Output according to the fault shutdown state mode and preset value, no longer refreshed
Signal type	difference
Data size	8 Byte
Error diagnosis	YES
The type of load	Sensual, resistive, capacitive
Protection current	20mA
Temperature coefficient	<20 ppm
Power supply parameters	
Operating voltage	24V DC +20%/ -15%
System feed current	<110mA
Mechanical structure	
Ingress protection	IP20
Rail type	35mm DIN
Environmental requirements	
Operating temperature	-25... 60℃
Storage temperature	-40... 85℃
relative humidity	5... 95% RH (non-condensing)
Pollution level	2. Comply with IEC 61131-2 standard
Working altitude	0 ... 2000 m
Vibration-resistant	4g, according to IEC 60068-2-6
Impact-resistant	15g,IEC 60068-2-27
EMC - Interference immunity	Complies with EN 61000-6-2
EMC - Radiated Interference	Complies with EN 61000-6-3
Corrosion resistance	IEC 60068-2-42 and IEC 60068-2-43 compliant
Permissible H2S pollutant concentration at 75 % relative humidity	10ppm
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

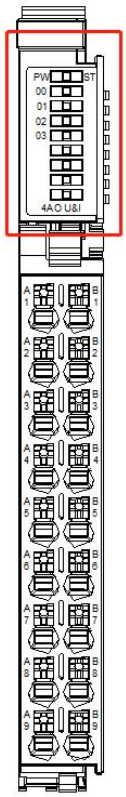
3.5.2. Hardware interfaces

3.5.2.1. Definition of terminal block



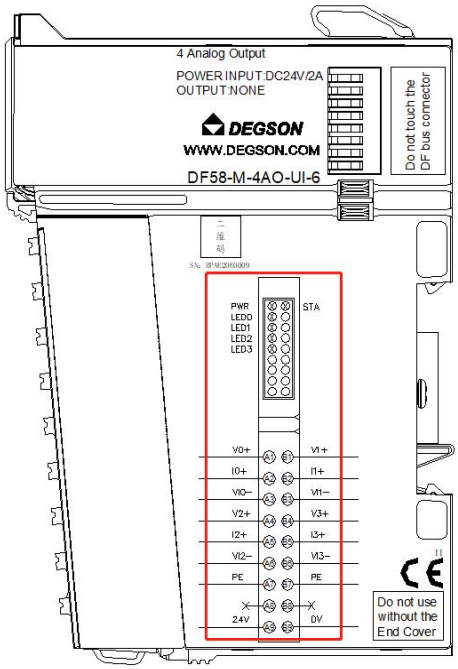
Terminal serial number	Signal	Terminal serial number	Signal	illustrate
A1	V0+	B1	V1+	The positive pole of the voltage output channel
A2	I0+	B2	I1+	The current output channel is positive
A3	V0-/I0-	B3	V1-/I1-	Negative terminal at voltage/current output
A4	V2+	B4	V3+	The positive pole of the voltage output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

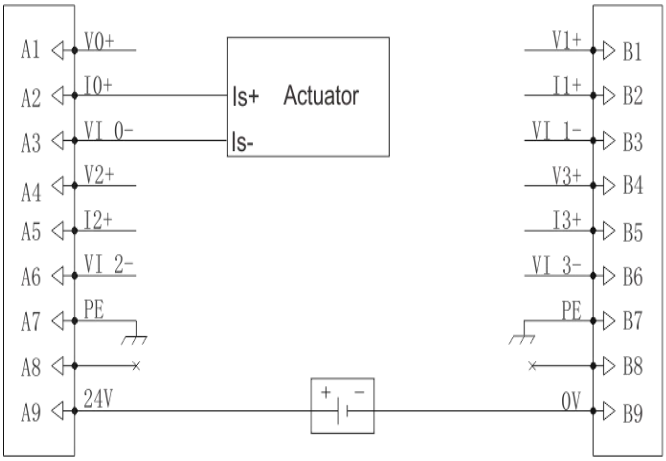
3.5.2.2. Indicator Definition



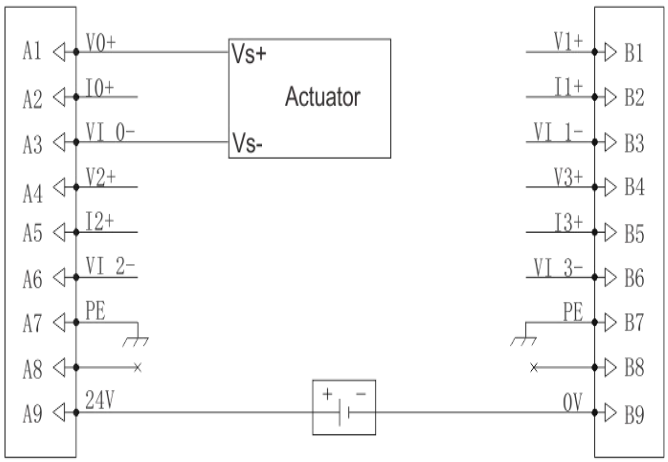
Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.

3.5.2.3. Electrical wiring diagram





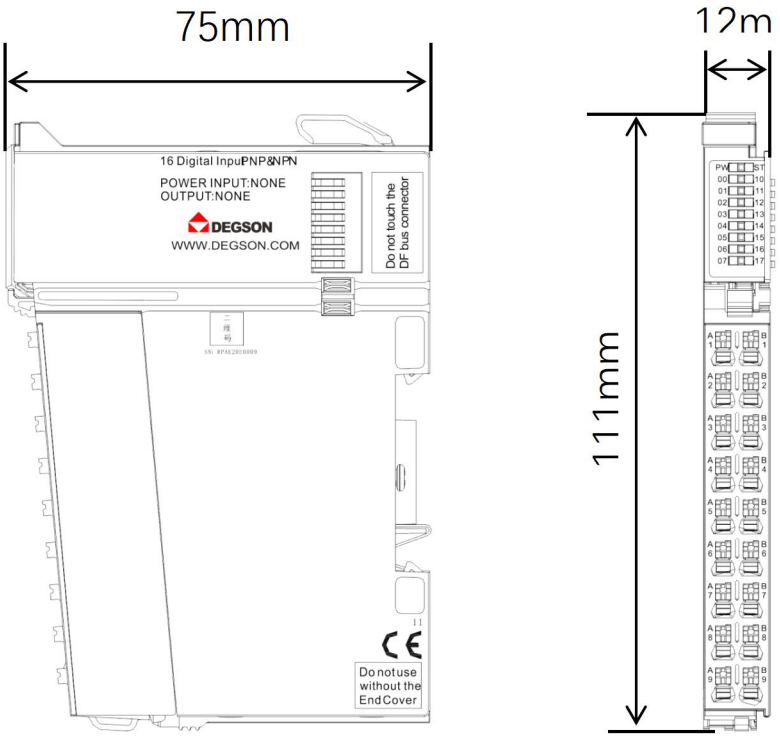
Voltage type wiring



Current type wiring

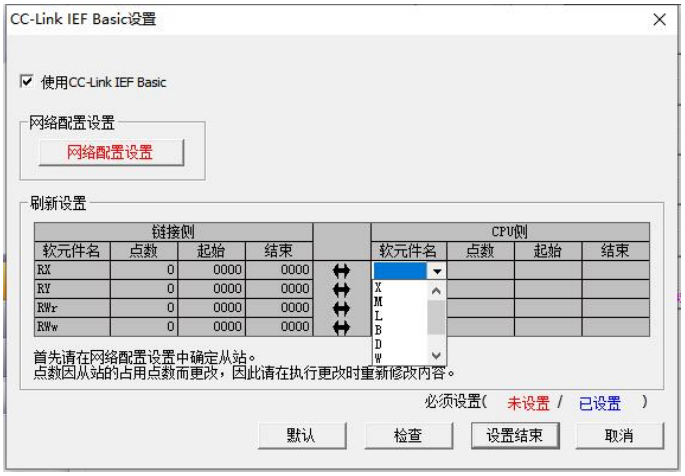
3.5.3. Mechanical installation

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



3.5.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR

RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-4AO-UI-6 address description

When using multiple modules, please follow these guidelines:

RWR input area: distribution principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

RWw output area: distribution principle: module parameter setting (all module parameter settings are arranged in order from the first address) + analog output address (the analog output address is arranged after all module parameter settings are arranged).

Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

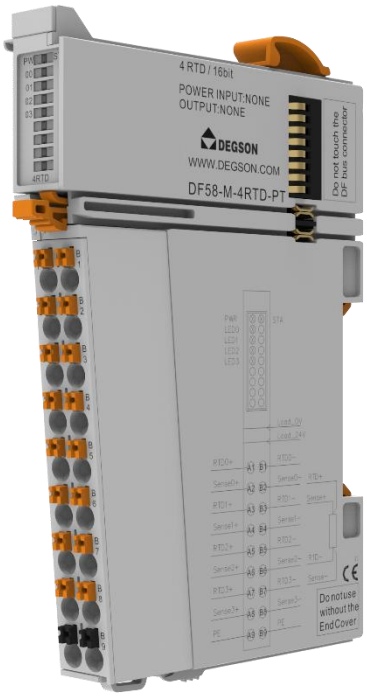
Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
RX	---	---	---	
RY	---	---	---	
RWr	2Byte (1Word)	Diagnostic Information/ 1Word	1Word	Diagnostic information: Bit0: 1: Bus fault; 0: The bus is normal; Bit1: 1: Channel 24V is not connected; 0: channel 24V access; Bit3~Bit15:retain
RWw	18Byte (9Word)	Parameter settings/4Word	Section 1Word	BIT0~BIT7:retain; BIT8~BIT15: Module output status setting when disconnected: 0: The channel output is cleared 1: The channel output remains in the state before the disconnection. 2: The channel output preset
			Section 2Word	Set the output preset
			Section 3	BIT0~BIT7: Configure the range of channel 1: 0:DISABLE (default);

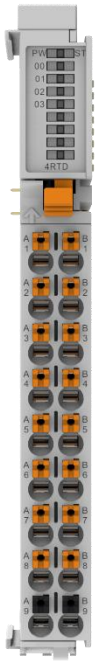
Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				1:0~5VDC; 2:1~5VDC; 3:-5~5VDC; 4:0~10VDC; 5:2~10VDC; 6:-10~10VDC; 7:0~20mA; 8:4~20mA; BIT8~BIT15: Configure the range of channel 2: 0:DISABLE（default）; 1:0~5VDC; 2:1~5VDC; 3:-5~5VDC; 4:0~10VDC; 5:2~10VDC; 6:-10~10VDC; 7:0~20mA; 8:4~20mA;
			Section 4Word	BIT0~BIT7: Configure the range of channel 3: 0:DISABLE（default）; 1:0~5VDC; 2:1~5VDC; 3:-5~5VDC; 4:0~10VDC; 5:2~10VDC; 6:-10~10VDC; 7:0~20mA; 8:4~20mA; BIT8~BIT15: Configure the range of channel 4: 0:DISABLE（default）; 1:0~5VDC; 2:1~5VDC; 3:-5~5VDC; 4:0~10VDC; 5:2~10VDC; 6:-10~10VDC; 7:0~20mA; 8:4~20mA;
			Section 5Word	Reserved, no effect for the time being
		Output channel/5Word	Section 1Word	Channel 1 output address
			Section 2Word	Channel 2 output address
			Section 3	Channel 3 output address
			Section 4Word	Channel 4 output address

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.

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.





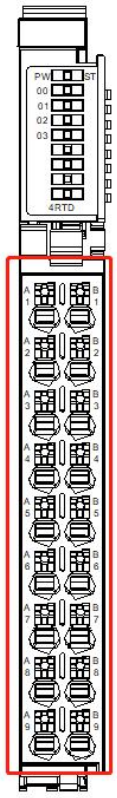
3.6.1. Specifications

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

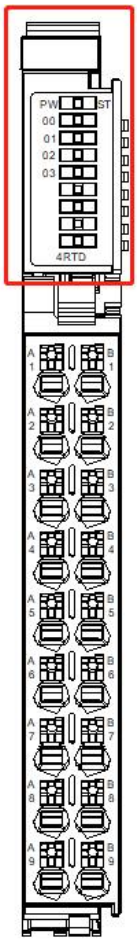
3.6.2. Hardware interfaces

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	ON	B9	ON	earth

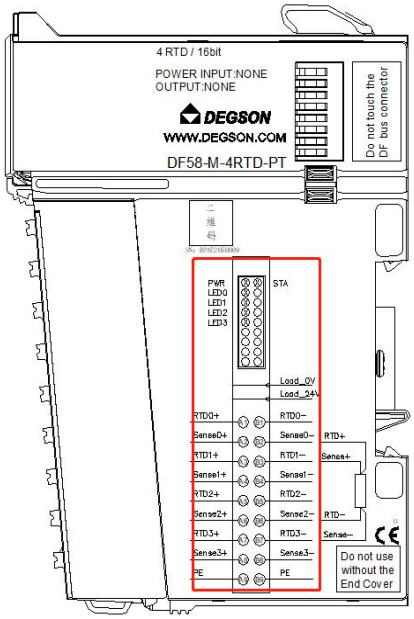
3.6.2.2. Indicator Definition

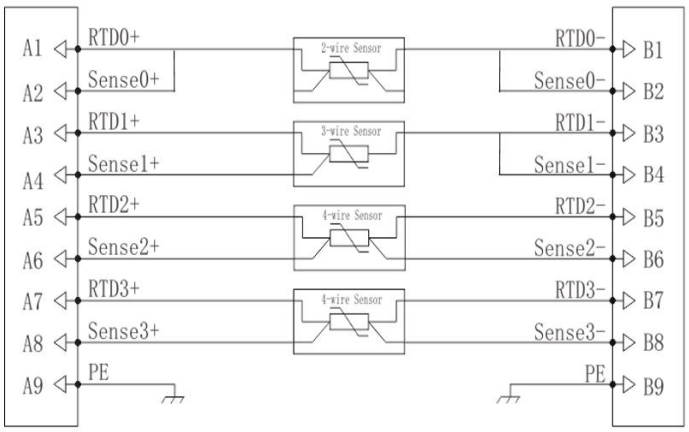


Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00 (green)	Channel 1 Indicator: Flashing: Normal sampling, Solid: Exceeding 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. Electrical wiring diagram





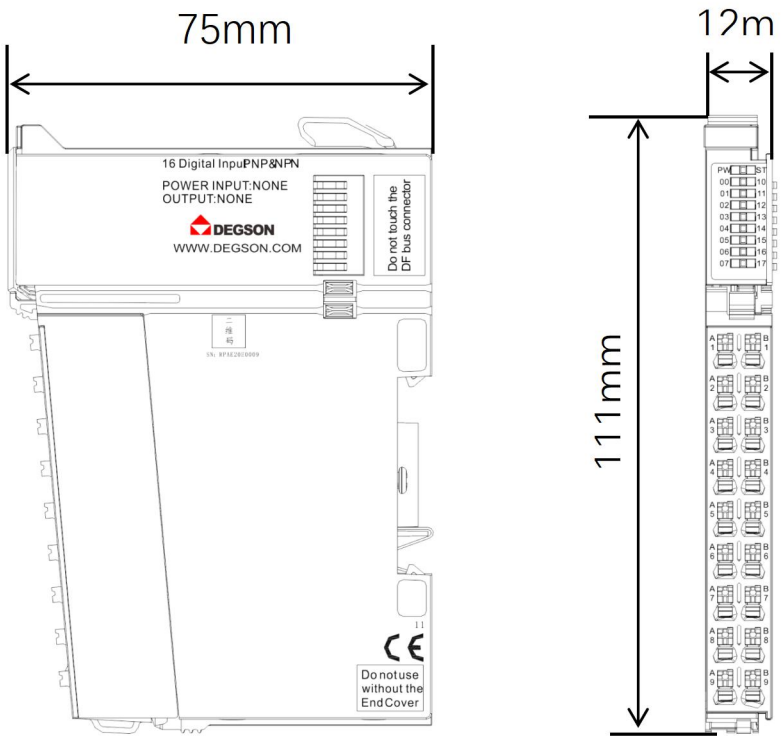
Remark:

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;**

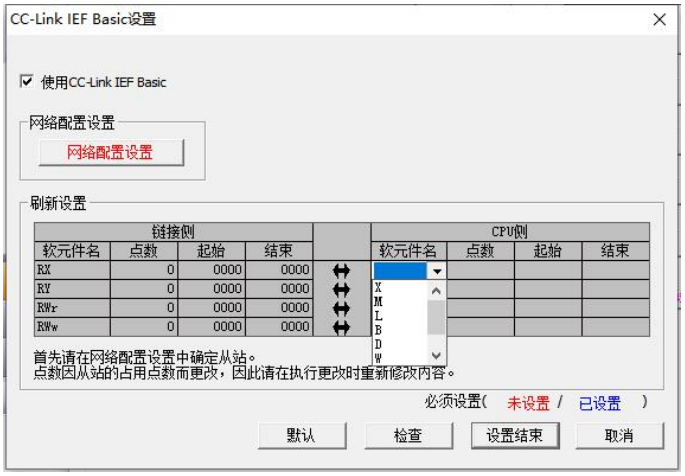
3.6.3. Mechanical installation

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



3.6.4. Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-4RTD-PT address description

When using multiple modules, please follow these guidelines:

RWR input area: distribution principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

RWw output area: distribution principle: module parameter setting (all module parameter settings are arranged in order from the first address) + analog output address (the analog output address is arranged after all module parameter settings are arranged).

Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
RX	---	---	---	
RY	---	---	---	
RWr	10byte(5Word)	Diagnostic information/1Word	1Word	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

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
		Enter the address/4Word	Section 1Word	The input address of channel 1
			Section 2Word	Enter the address of channel 2
			Section 3	Enter the address of channel 3
			Section 4Word	The input address of channel 4
RWw	4Byte (2Word)	Parameter settings/2Word	Section 1Word	reserve
			Section 2Word	BIT0~BIT7: Configure channel 1~4 RTD types 0:Pt100; 1:Pt200: 2:Pt500; 3:Pt1000; 4:Ni100; 5:Ni120; 6:Ni200; 7:Ni500; 8:Ni1000; 9:Cu10; 10:40Ω; 11:80Ω; 12:150Ω; 13:300Ω; 14:500Ω; 15:1kΩ; 16:2kΩ; 17: 4kΩ BIT8~BIT15:reserve

3.6.5.Process data definitions

Pt100	Pt200	Pt500	Pt1000	Ni100	decimal	hexadecimal	

32767	32767	32767	32767	32767	32767	0x7FFF	Overflow
8500	8500	8500	8500	2500	32511	0x7EFF	rated range
-	-	-	-	-	27648	0x6C00	
-2000	-2000	-2000	-2000	-600	-	-	
-32767	-32767	-32767	-32767	-32767	0	0x0000	Hypolympation
-32768	-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

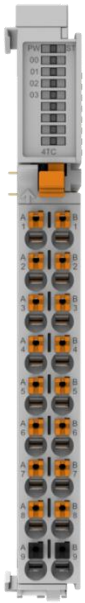
Ni200	Ni500	The 1000	Cu10	Ni200	decimal	hexadecimal	
32767	32767	32767	32767	32767	32767	0x7FFF	Overflow
2500	2500	2500	2600	2500	32511	0x7EFF	rated range
-	-	-	-	-	27648	0x6C00	
-600	-600	-600	-1000	-600	-	-	
-32767	-32767	-32767	-32767	-32767	0	0x0000	Hypolympation
-32768	-32768	-32768	-32768	-32768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

40Ω	80Ω	150Ω	300Ω	decimal	hexadecimal	
>47.04Ω	>94.07Ω	>176.4Ω	>352.77Ω	32767	0x7FFF	Overflow
47.04Ω	94.07Ω	176.4Ω	352.77Ω	32511	0x7EFF	rated range
40Ω	80Ω	150Ω	300Ω	27648	0x6C00	
-	-	-	-	-	-	
0Ω	0Ω	0Ω	0Ω	0	0x0000	
-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	rated range
500Ω	1.0KΩ	2.0KΩ	4.0KΩ	27648	0x6C00	
-	-	-	-	-	-	
0Ω	0Ω	0Ω	0Ω	0	0x0000	
-32768	-32768	-32768	-32768	-32768	0x8000	Breaking

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

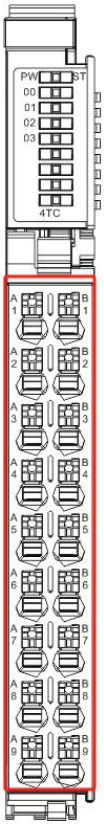
Specifications		
Model	DF58-M-4TC	
Product Description:	Thermocouple (TC) module, 4 inputs, 16-bit resolution	
Measuring range	thermocouple	
Number of channels	4	
Signal type	E(-200 ~ 1000°C),S(-50 ~ 1,768°C),J(-210 ~ 1,200°C) T(-200~400°C),K(-200~1.372°C),N(-200 ~ 1300°C)，R(-50 ~ 1,768°C) ±15.625mV、±31.25mV、±62.5mV、±125mV、±250mV、±500mV、±1V、	
Internal resistance	1 MΩ	
Cold junction compensation	Supports 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 the wire	1.5mm²	

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

3.7.2.Hardware interfaces

3.7.2.1 Definition of terminal block

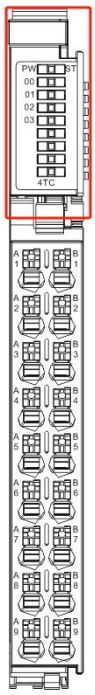
DF58-M-4TC



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	ON	B9	ON	earth

3.7.2.2 Indicator Definition

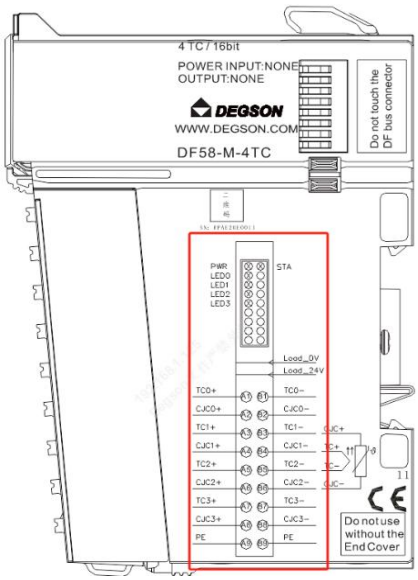


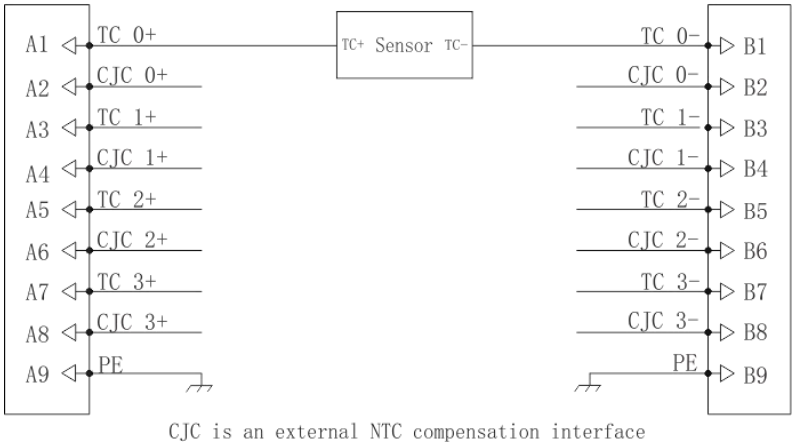
1. DF58-M-4TC indicator definition

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 Electrical wiring diagram

DF58-M-4TC electrical wiring diagram

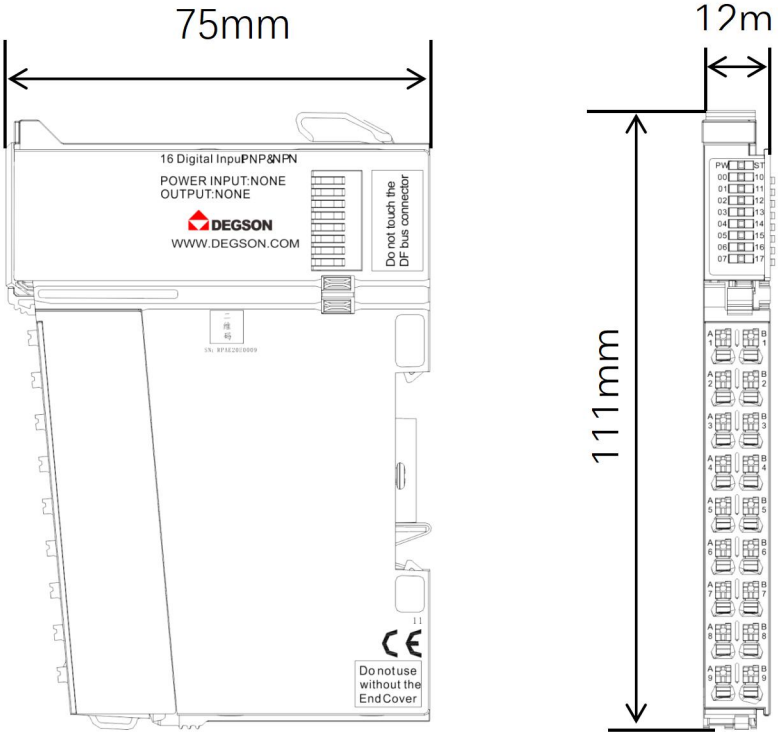




CJC is an external NTC compensation interface

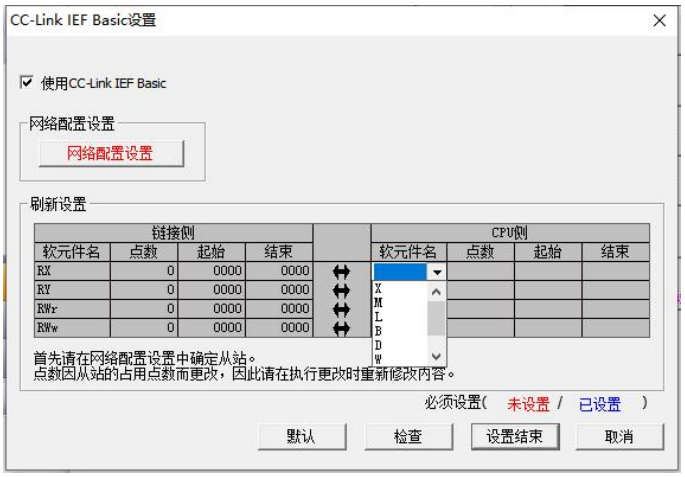
3.7.3.Mechanical installation

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



3.7.4.Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-4TC-PT address description

RWr allocation principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
RX	---		---	
RY	---		---	
RWr	10Byte (5Word)	Diagnostic information/1Word	Section 1Word	module diagnostic information; Bit0: 1: Bus fault; 0: The bus is normal; Bit1: 1: Channel 1 is disconnected or

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				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;
		Enter the address/4Word	Section 1Word	The input address of channel 1
			Section 2Word	Enter the address of channel 2
			Section 3	Enter the address of channel 3
			Section 4Word	The input address of channel 4
RWw	4Byte (2Word)	Parameter configuration/2Word	Section 1Word	Module configuration Bit0 (cold junction compensation switch): 0: On; 1: Closed; Bit1 (cold junction compensation mode): 0: internal compensation; 1: External NTC compensation; Bit2~bit3: reserve; Bit4 (Disconnection Detection Switch): 0: On;

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				1: Closed; Bit5~Bit7:retain; Bit8~Bit15: reserve;
			Section 2Word	Set up 4 channel thermocouple detection types: Bit0~Bit7: 0: J type; 1: Type K; 2: E type; 3: T-type; 4: S-type; 5: R-type; 6: Type B (not supported yet); 7: N-type; 8: Type C (not supported yet); 9: L-type (not supported yet); 10: U-shaped (not supported yet); 11：±15.625mv; 12:±31.25mv; 13:±62.5mv; 14:±125mv; 15:±250mv; 16:±500mv; 17:±1000mv; 18:±2000mV (not supported yet); Bit8~Bit15：reserve;

3.7.5.Process data definitions

3.5.7.1.process data definition is J-type

Process Data Definition (Type J)			
temperature	decimal	hexadecimal	
>1450.0	32767	7FFF	Overflow
1450	14500	38A4	Super Upper Limit
-	-	-	
-	-	-	

1200.1	12001	2EE1	
1200	12000	2EE0	Rated range
-	-	-	
-	-	-	
-210	-2100	F7CC	
<-210	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.5.7.2.process data defines type K

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

3.5.7.3.Process data defines type E

Process Data Definition (Type E)			
temperature	decimal	hexadecimal	
>1200	32767	7FFF	Overflow
1200	12000	2EE0	Super Upper Limit
-	-	-	
-	-	-	
1000.1	10001	2711	
1000	10000	2710	rated range
-	-	-	
-	-	-	
-270	-2700	F574	

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

3.5.7.4.Process data defines a T-shape

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

3.5.7.5.Process data definition is 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

3.5.7.6.process data defines the 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

3.5.7.7.Process data defines N-type

Process Data Definition (N-Type)			
temperature	decimal	hexadecimal	
>1550.0	32767	7FFF	Overflow
1550.0	15500	3C8C	Super Upper Limit
-	-	-	
-	-	-	
1300.1	13001	32C9	
1300.0	13000	32C8	rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Breaking detect

3.5.7.8.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

3.5.7.9.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

3.5.7.10.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

3.5.7.11.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)

3.5.7.12.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)

3.5.7.13.Process data definition ± 500mV

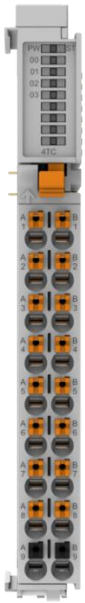
Process Data Definition (±500mV)			
MV value	decimal	hexadecimal	
500mV	32767	7FFF	rated range
-	-	-	
-500mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.5.7.14.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)

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

- The module uses 4/8 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

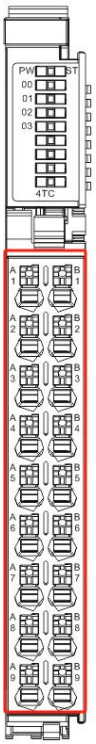
Specifications		
Model	DF58-M-8TC	
Product Description:	Thermocouple (TC) module, 8 inputs, 16-bit resolution	
Measuring range	thermocouple	
Number of channels	8	
Signal type	E(-200 ~ 1000°C),S(-50 ~ 1,768°C),J(-210 ~ 1,200°C) T(-200~400°C),K(-200~1.372°C), N(-200 ~ 1300°C)， R(-50 ~ 1,768°C) ±15.625mV、±31.25mV、±62.5mV、±125mV、±250mV、±500mV、±1V	
Internal resistance	1 MΩ	
Cold junction compensation	Internal NTC compensation	
Module diagnostics	YES	
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 the wire	1.5mm²	

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

3.8.2.Hardware interfaces

3.8.2.1 Definition of terminal block

DF58-M-8TC

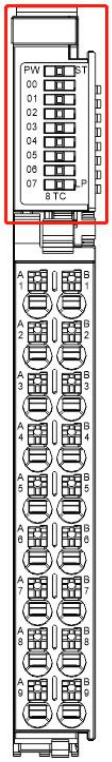


Terminal serial number	Signal	Terminal serial number	signal	illustrate
A1	SS0+	B1	TC0-	Channel 0 thermocouple terminals
A2	SS1+	B2	TC1-	Channel 1 thermocouple terminals
A3	SS2+	B3	TC2-	Channel 2 thermocouple terminals
A4	SS3+	B4	TC3-	Channel 3 thermocouple terminals
A5	SS4+	B5	TC4-	Channel 4 thermocouple 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	ON	B9	ON	earth

3.8.2.2 Indicator Definition

DF58-M-8TC indicator definition

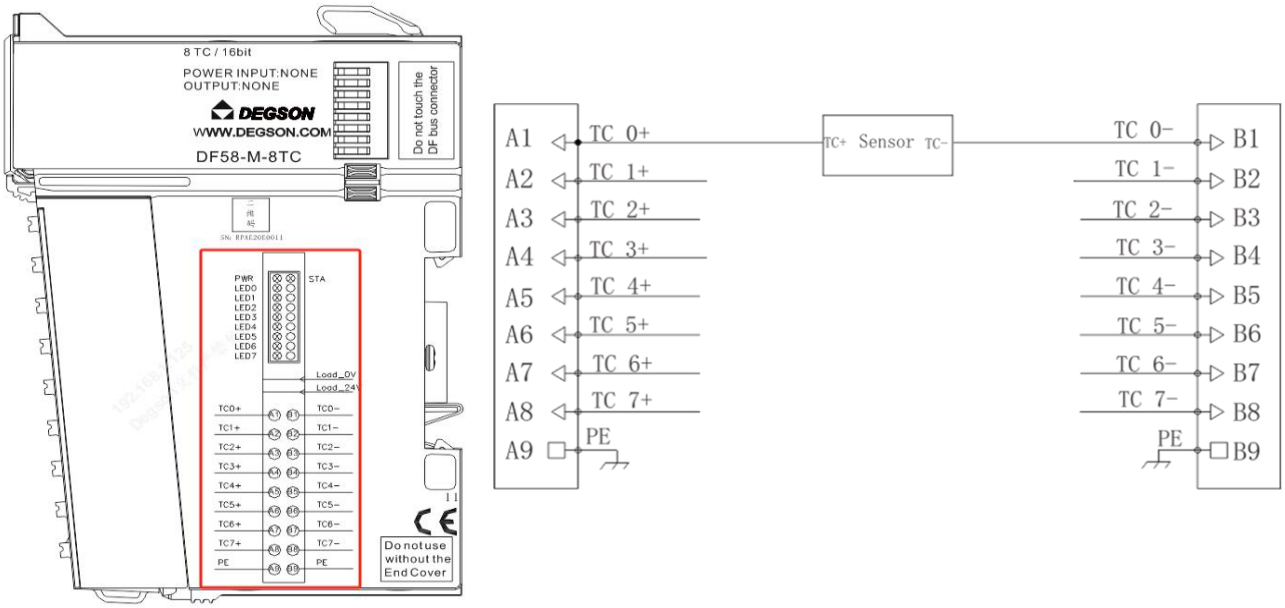


Light	meaning
PW (green)	Bright: The internal bus power supply is normal Off: The internal bus power supply is abnormal
STA (red)	Backplane bus communication fault alarm indication: Solid on: Bus communication failure Off: Normal.
00 (green)	Channel 1 Indicator: Flashing: Normal sampling, Solid: Exceeding 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;

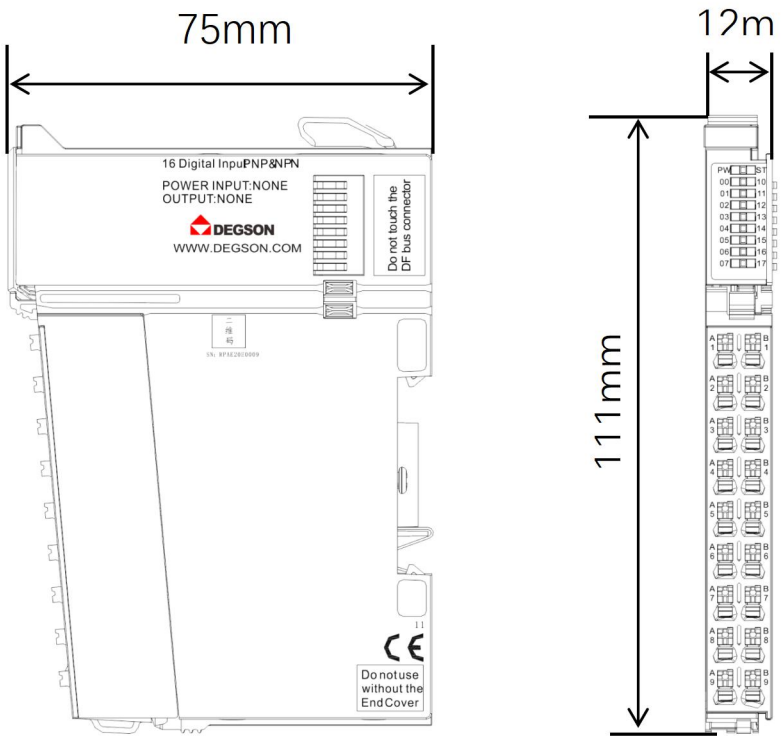
3.8.2.3 Electrical wiring diagram

DF58-M-8TC electrical wiring diagram



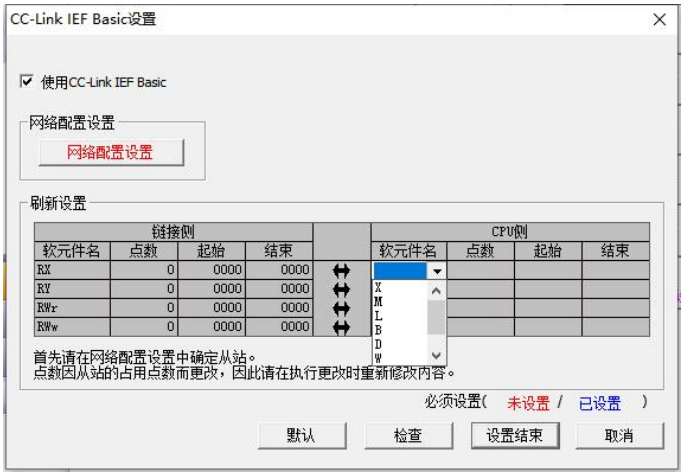
3.8.3.Mechanical installation

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



3.8.4.Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR

RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-8TC-PT address description

RWr allocation principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
RX	---		---	
RY	---		---	
RWr	18Byte (9Word)	Diagnostic information/1Word	Section 1Word	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:

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				1: Channel 6 is disconnected or exceeds the upper and lower limits; 0: normal; Bit7: 1: Channel 7 is disconnected or exceeds the upper and lower limits; 0: normal; Bit8: 1: Channel 8 is disconnected or exceeds the upper and lower limits; 0: normal; Bit9~Bit15: reserve;
		Enter the address/8Word	Section 1Word	The input address of channel 1
			Section 2Word	Enter the address of channel 2
			Section 3	Enter the address of channel 3
			Section 4Word	The input address of channel 4
			Section 5Word	Enter the address for channel 5
			Section 6Word	The input address of channel 6
			Section 7Word	Enter the address for channel 7
			8th Word	Enter the address of channel 8
RWw	4Byte (2Word)	Parameter configuration/2Word	Section 1Word	Module configuration Bit0 (cold junction compensation switch): 0: On; 1: Closed; Bit1: reserved; Bit2~bit3: reserve; Bit4 (Disconnection Detection Switch):

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				0: On; 1: Closed; Bit5~Bit7:retain; Bit8~Bit15: reserve;
			Section 2Word	Set up 8 channel thermocouple detection types: Bit0~Bit7: 0: J type; 1: Type K; 2: E type; 3: T-type; 4: S-type; 5: R-type; 6: Type B (not supported yet); 7: N-type; 8: Type C (not supported yet); 9: L-type (not supported yet); 10: U-shaped (not supported yet); 11： ±15.625mv; 12:±31.25mv; 13:±62.5mv; 14:±125mv; 15:±250mv; 16:±500mv; 17:±1000mv; 18:±2000mV (not supported yet); Bit8~Bit15： reserve;

3.8.5.Process data definitions

3.8.5.1.process data definition is J-type

Process Data Definition (Type J)			
temperature	decimal	hexadecimal	
>1450.0	32767	7FFF	Overflow
1450	14500	38A4	Super Upper Limit
-	-	-	

-	-	-	
1200.1	12001	2EE1	
1200	12000	2EE0	Rated range
-	-	-	
-	-	-	
-210	-2100	F7CC	
<-210	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Wire break detection

3.8.5.2.process data defines type K

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

3.8.5.3.Process data defines type E

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

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

3.8.5.4.Process data defines a T-shape

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

3.8.5.5.Process data definition is 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

3.8.5.6.process data defines the 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

3.8.5.7.Process data defines N-type

Process Data Definition (N-Type)			
temperature	decimal	hexadecimal	
>1550.0	32767	7FFF	Overflow
1550.0	15500	3C8C	Super Upper Limit
-	-	-	
-	-	-	
1300.1	13001	32C9	
1300.0	13000	32C8	rated range
-	-	-	
-	-	-	
-270	-2700	F574	
<-270	-32767	8001	Hypolympation
The sensor is not connected	-32768	8000	Breaking detect

3.8.5.8.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

3.8.5.9.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

3.8.5.10.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

3.8.5.11.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)

3.8.5.12.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)

3.8.5.13.Process data definition ± 500mV

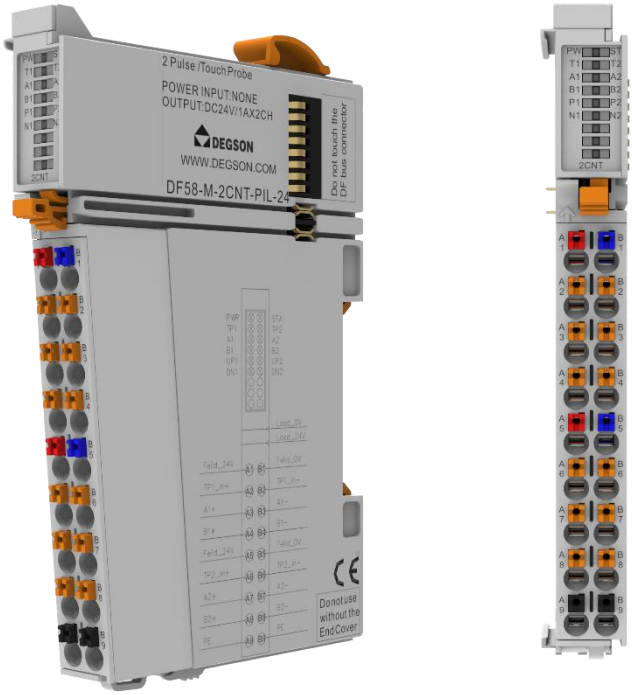
Process Data Definition (±500mV)			
MV value	decimal	hexadecimal	
500mV	32767	7FFF	rated range
-	-	-	
-500mV	-32767	8001	
The sensor is not connected	-32768	8000	Disconnection detection (not supported)

3.8.5.14.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)

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

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



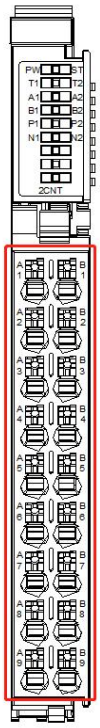
3.9.1.Specifications

Specifications	
Model	DF58-M-2CNT-PIL-24
Product Description:	Pulse counting module, 2 channels
Maximum count frequency	1Mhz
Number of channels	2
Input signal type	Incremental encoder AB or Pulse/Direction signal
Input signal voltage	24V DC
Enter the connection type	4-wire / 2-wire
Reverse circuit protection	Yes
Isolation method	Isolated from field layer optocouplers
Data size	20 Byte
Frequency multiplication mode	x1/x4
Filtering time	configurable ， 0.01 to 1 ms
DI on voltage	Min.5Vdc to Max.28Vdc
DI off voltage	Max.2.7Vdc
DI turns on the current	Max.10mA/channel @28V
DI input impedance	=2.7kΩ
Sensor powered	500mA@5V，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 interfaces

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	ON	B2	ON	earth

3.9.2.2 Indicator Definition

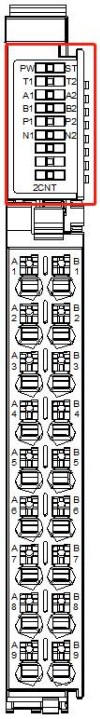
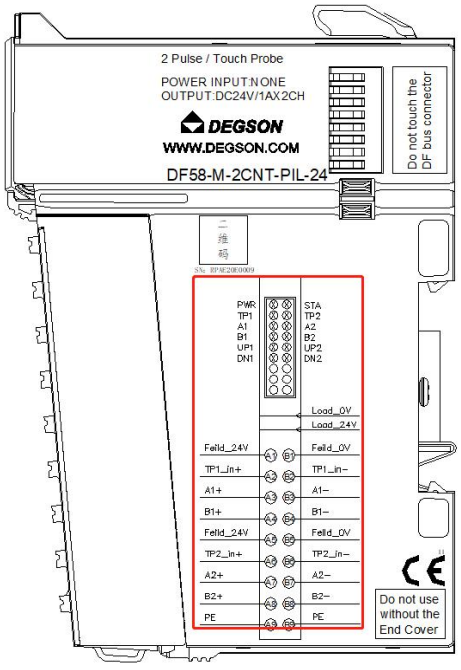


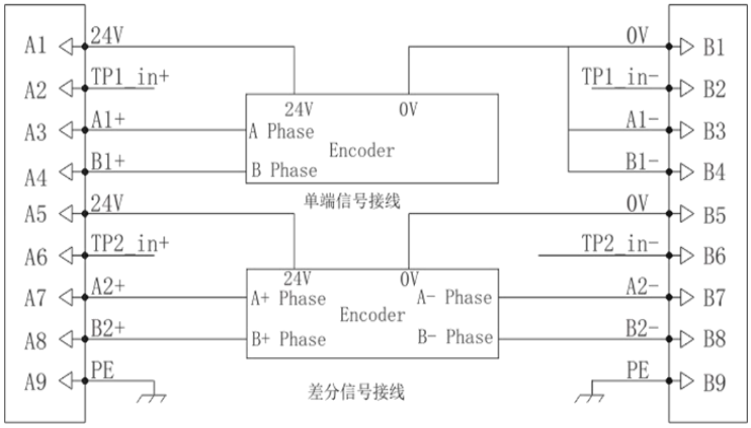
Table 8.3.1 Indicator Definitions

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

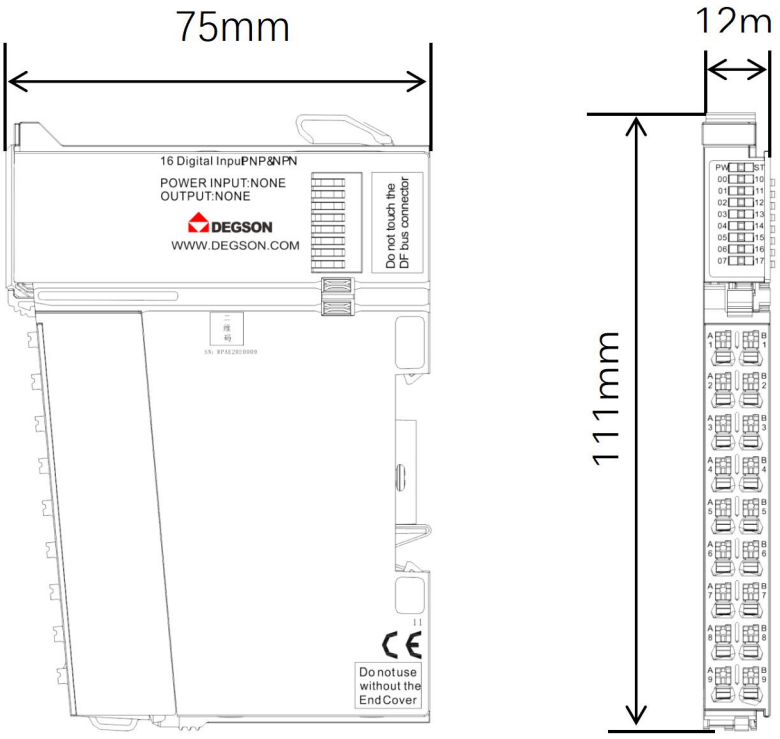
3.9.2.3 Electrical wiring diagram





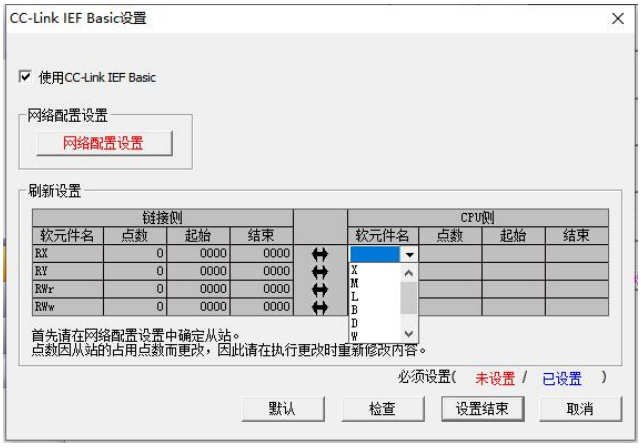
3.9.3.Mechanical installation

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



3.9.4.Module parameters

CC-Link IEF Basic Agreement Description



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

DF58-M-2CNT-PIL-24 Address Description

When using multiple modules, please follow these guidelines:

RWR input area: distribution principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

RWw output area: distribution principle: module parameter setting (all module parameter settings are arranged in order from the first address) + analog output address (the analog output address is arranged after all module parameter settings are arranged).

Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
RX	---	---	---	
RY	---	---	---	
RWr	20Byte (10Word)	Diagnostic information/1Word	Section 1Word	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

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
		Input channel/9Word	Section 1Word	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 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 Counter 2 Status: Bit8: Phase A input Bit9: Phase B input Bit10: latchs the success flag. Bit11: Encoder positive indication Bit12: Encoder Reverse Indication Bit13: 1: Overflowing on the current count value 0: After the count value is overflowed, the count value continues to exceed 5000. Bit14: 1: Overflow under the current count value

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				0: After the count value overflows, the count value continues down to exceed 5000. Bit15: The counter is preset successfully, and 1 is valid
			Section 2~3 Word	Counter 1: The current count value
			4~5 Word	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.
			6~7 Word	Counter 2: The current count value
			8~9Word	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.
RWw	14Byte (7Word)	Parameter configuration/ 7Word	Section 1Word	Counter 1 sets the control parameters: BIT0:0: INVALID; 1: Set the counter preset value to the current count value; BIT1:0: INVALID; 1: clears the counter value; BIT2:0: INVALID; 1: Clear the overflow mark; BIT3:0: INVALID; 1: Clear the overflow mark; BIT4:0: INVALID; 1: 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

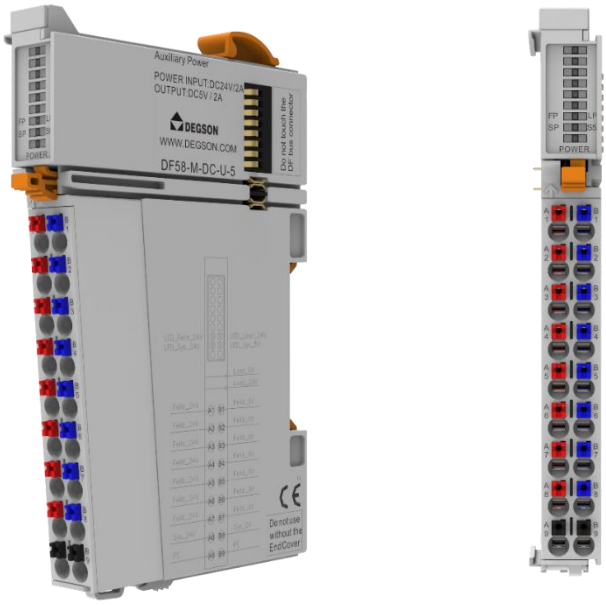
Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				latch due to interference). Bit5:0: Invalid; 1: TP signal rising edge latch count value, note that it is only latched once, if you need to start latching again, you need to set 0 and then set 1 again (to avoid invalid abnormal latch due to interference). Bit6~Bit7：reserve； Counter 2 sets the control parameters: BIT8:0: INVALID; 1: Set the counter preset value to the current count value; BIT9:0: INVALID 1: clears the counter value; BIT10:0: INVALID 1: Clear the overflow mark; BIT11:0: INVALID 1: Clear the overflow mark; BIT12:0: 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). Bit13:0: 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).

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
				Bit14~Bit15：reserve
			Section 2~3 Word	Counter 1 preset setting
			Section 4Word	counter 1 configuration parameters; Bit0~bit1: 0: AB phase 1 octave count 1: AB phase 4 octave counting 2: Pulse + direction counting Bit2： 0: counts upwards 1: Count downward Bit3： 0: Keep Last Value: The counter stops counting during an error (such as a backplane bus failure or AB phase loss) and will continue to count from the previous value once it resumes normal operation 1: The counter continues to count during the error; Bit4~Bit7: Reserved BIT8~BIT15 (Counter 1 Filter Setting): 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；
			5~6 Word	Counter 2 preset setting
			Section	counter 2 configuration parameters;

Link side (Component Name)	Total bytes	Type/data size	Address layout (Descend)	remark
			7Word	Bit0~bit1: 0: AB phase 1 octave count 1: AB phase 4 octave counting 2: Pulse + direction counting Bit2: 0: counts upwards 1: Count downward Bit3: 0: Keep Last Value: The counter stops counting during an error (such as a backplane bus failure or AB phase loss) and will continue to count from the previous value once it resumes normal operation 1: The counter continues to count during the error; Bit4~Bit7: reserve; BIT8~BIT15 (Counter 2 Filter Setting): 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;

3.10 2 24V to 5V Power isolation module /(DF58-M-DC-U-5)

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



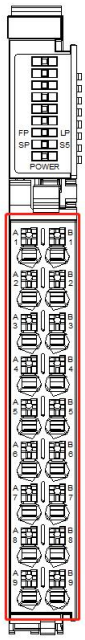
3.10.1.Specifications

Specifications	
Model	DF58-M-DC-U-5
ProductDescription:	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	10ppm

concentration at 75 % relative humidity	
Permissible SO2 pollutant concentration at 75 % relative humidity	25ppm
Firmware upgrades	Yes

3.10.2.Hardware interfaces

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	ON	B2	ON	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 Indicator Definition

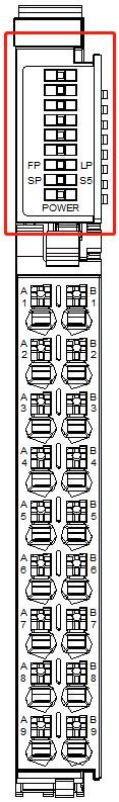
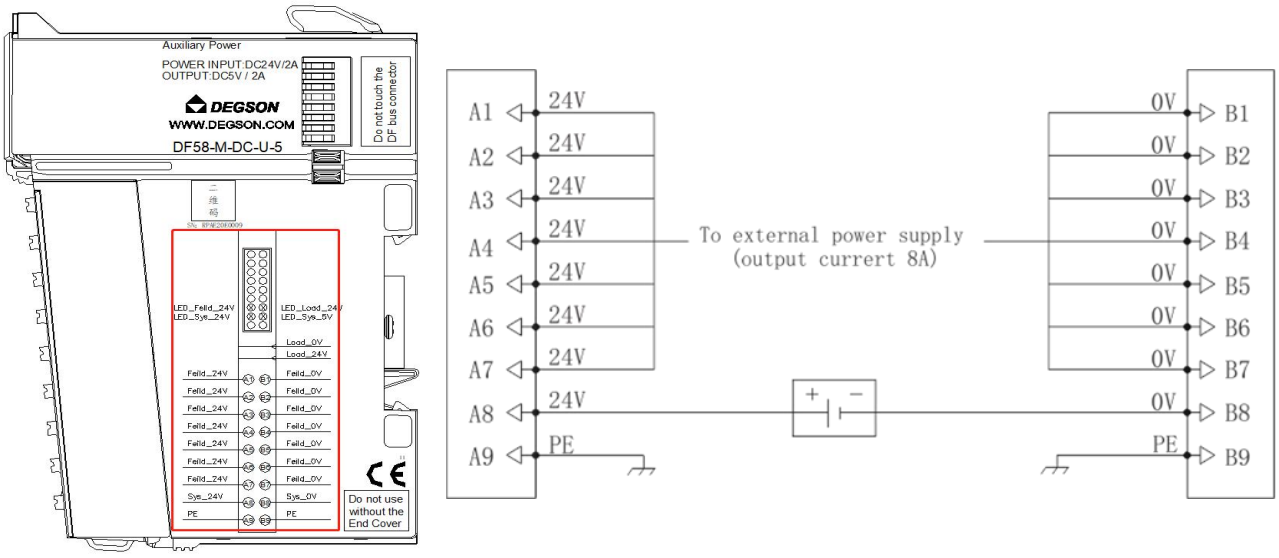


Table 9.3.1 Indicator Definitions

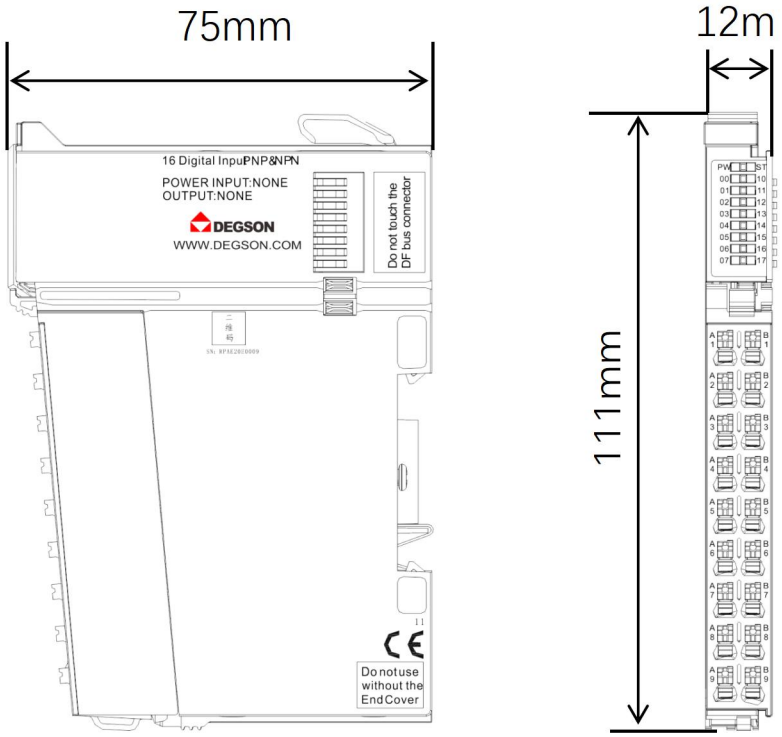
Light	meaning
FP (Green)	Green: The load power supply is running normally.
LP (Green)	Green: The sensor power supply is operating normally.
SP (green)	Green: The internal system power supply is running normally.
S5 (green)	Green: The internal 5V power supply is running normally.

3.10.2.3 Electrical wiring diagram



3.10.3.Mechanical installation

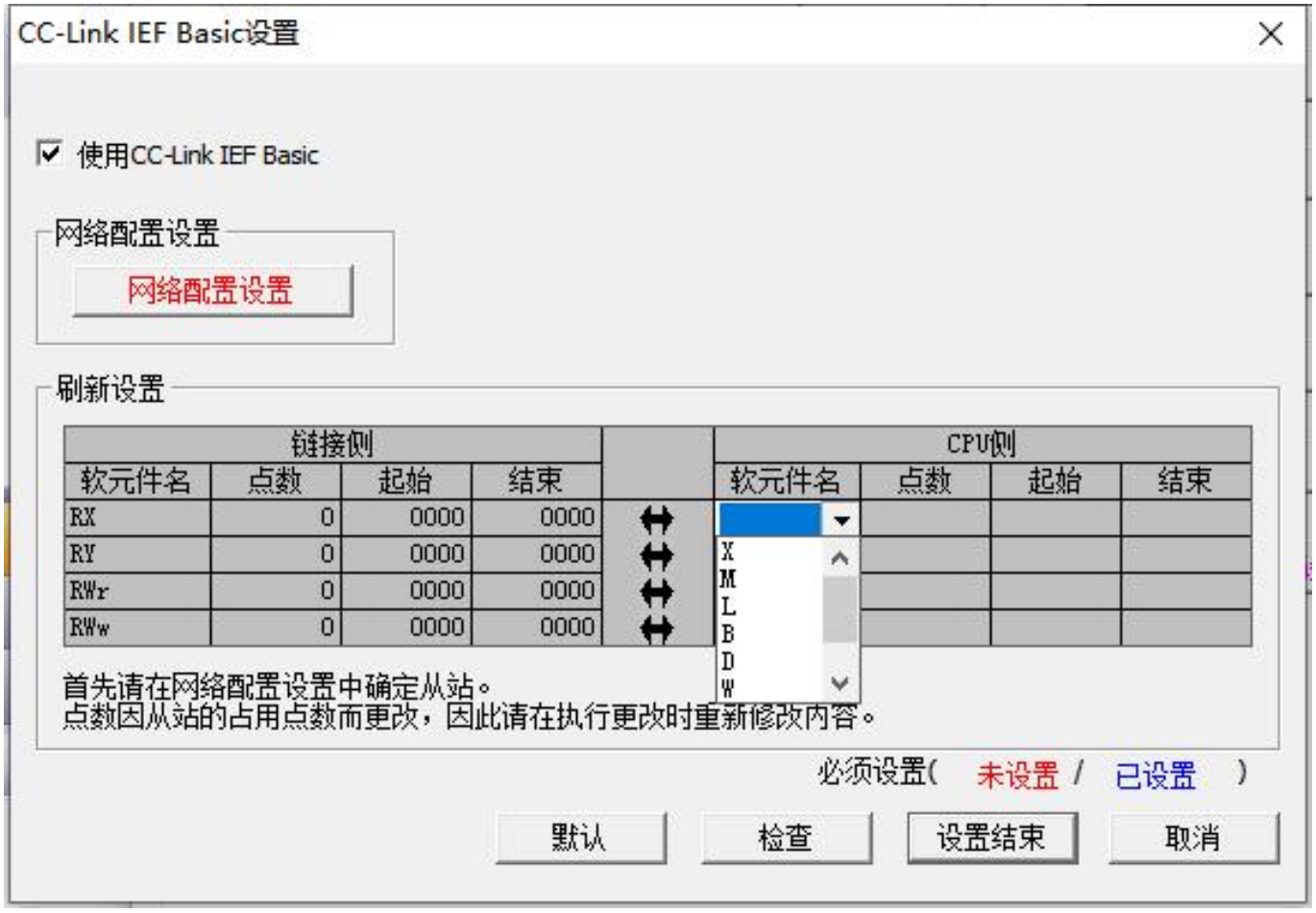
The installation size information is shown in the figure below, and the unit is (mm).



4.Example of use

4.1Simple configuration of CC-Link IEF Basic protocol in GX Works2

4.1.1.Set the name of the soft component

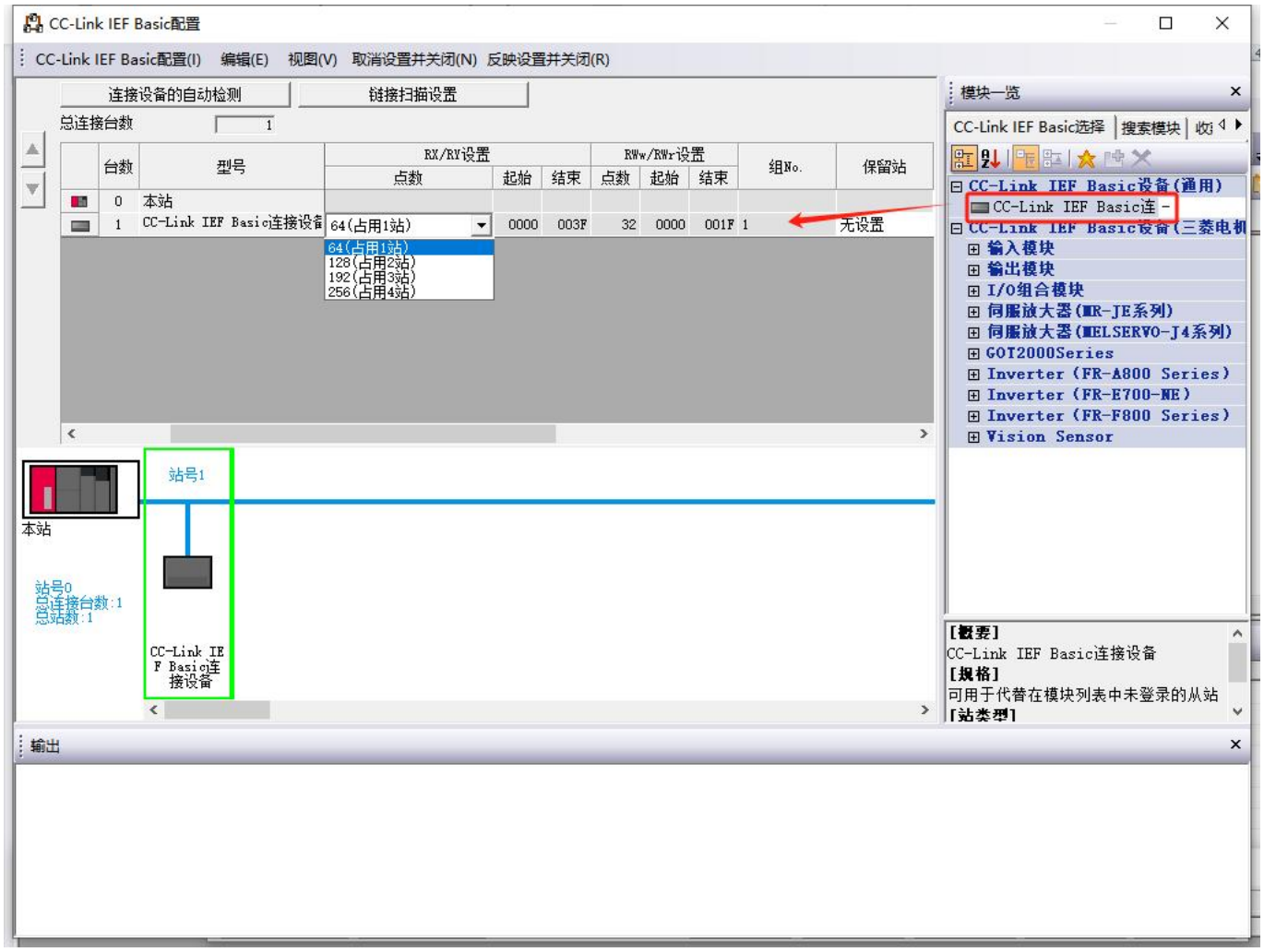


When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

Link Side (Component Name)	CPU (Component Name)
RX	X,M,L,B,D,W,R,ZR
RY	Y,M,L,B,D,W,R,ZR
RWr	L,B,D,W,R,ZR
RWw	L,B,D,W,R,ZR

4.1.2.CC-Link IEF Basic disposition

Drag the CC-Link IEF Basic device (generic) into the settings bar.

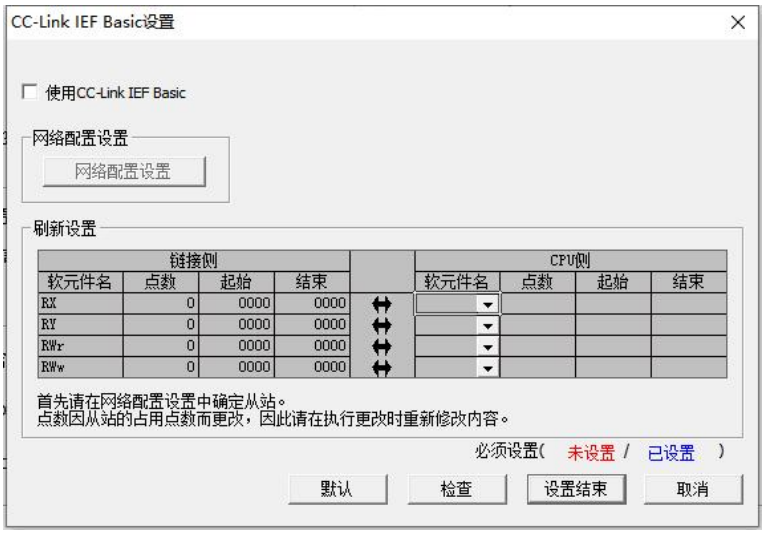


parameter	illustrate
Points	64(occupies 1 station):RX,RY occupy 8 bytes (64bit) respectively,RWr,RWw occupy 32WORD respectively. 128(occupies 2 stations):RX,RY occupy 16Byte(128bit),RWr,RWw occupy 64WORD respectively. 192(occupies 3 stations):RX,RY occupy 24Byte(192bit) respectively,RWr,RWw occupy 96WORD respectively. 256 (occupies 4 stations): RX and RY occupy 31Word (256bit) respectively, and RWr and RWw occupy 128WORD respectively.
IP address	The IP address of the linking module
Subnet mask	The subnet mask of the linked module

Note: In actual use, it is recommended to select 256 (occupying 4 stations), otherwise the address is not

enough, and the CPU of some modules cannot read and write.

4.1.3.Instructions for address layout



When using the CC-Link IEF Basic protocol, the soft components are divided into four zones: Rx, Ry, Rwr, and RWw. The CPU side (software component name) can be set freely.

The name of the soft component	Layout module
Rx	DF58-C-CC-FB，DF58-M-16DI-P/N
Ladies and gentle	DF58-M-16DO-N,DF58-M-16DO-P
Rwr	All expansion modules (diagnostic message address, analog input address)
RWw	All expansion modules (module configuration parameter address, analog output address)

Note: The modules in the same area are arranged in order of address, for example, DF58-C-CC-FB expands 32 modules, including 8 digital input modules, 8 digital output modules, 8 analog input modules, and 8 analog output modules. The order of the slots in which the extension modules are located is random.

Rx (Digital Input Area): DF58-C-CC-FB and 8 digital input modules are arranged in order of address (8 digital input module modules are in any slot).

Ry (digital output area): 8 digital output modules are arranged in order of address (digital output module modules are in any slot);

RWR input area: distribution principle: module diagnostic information (all module diagnostic information is arranged in order from the first address) + analog input address (after all module diagnostic information is arranged, the analog input address will be arranged). Please refer to Chapter 11.3.5 DF58-C-CC-FB Extended Analog Type Module.

RWw output area: module allocation principle: module parameter setting (all module parameter settings are arranged in order from the first address of the setting) + analog output address (the analog output address is arranged after all module parameter settings are arranged).

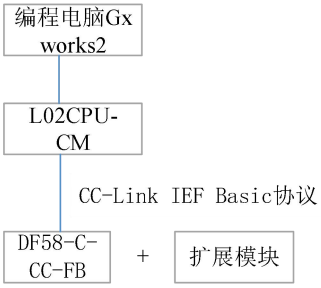
For example, the combination: DF58-C-CC-FB+DF58-M-16DO-N+DF58-M-4AO-UI-6+DF58-M-4AI-UI-6

RWr allocation: 1 Word (DF58-M-16DO-N diagnostic information) + 1Word (DF58-M-4AO-UI-6 diagnostic information) + 1Word (DF58-M-4AI-UI-6 diagnostic information) + 8 bytes (DF58-M-4AI-UI-6 channel input address).

RWw allocation: 1Word (DF58-M-16DO-N parameter configuration) + 10 bytes (DF58-M-4AO-UI-6 parameter configuration) + 6 bytes (DF58-M-4AI-UI-6 parameter configuration) + 8 bytes (DF58-M-4AO-UI-6 channel output address).

4.2.Mitsubishi L02CPU-CM and DF58-C-CC-FB connection example

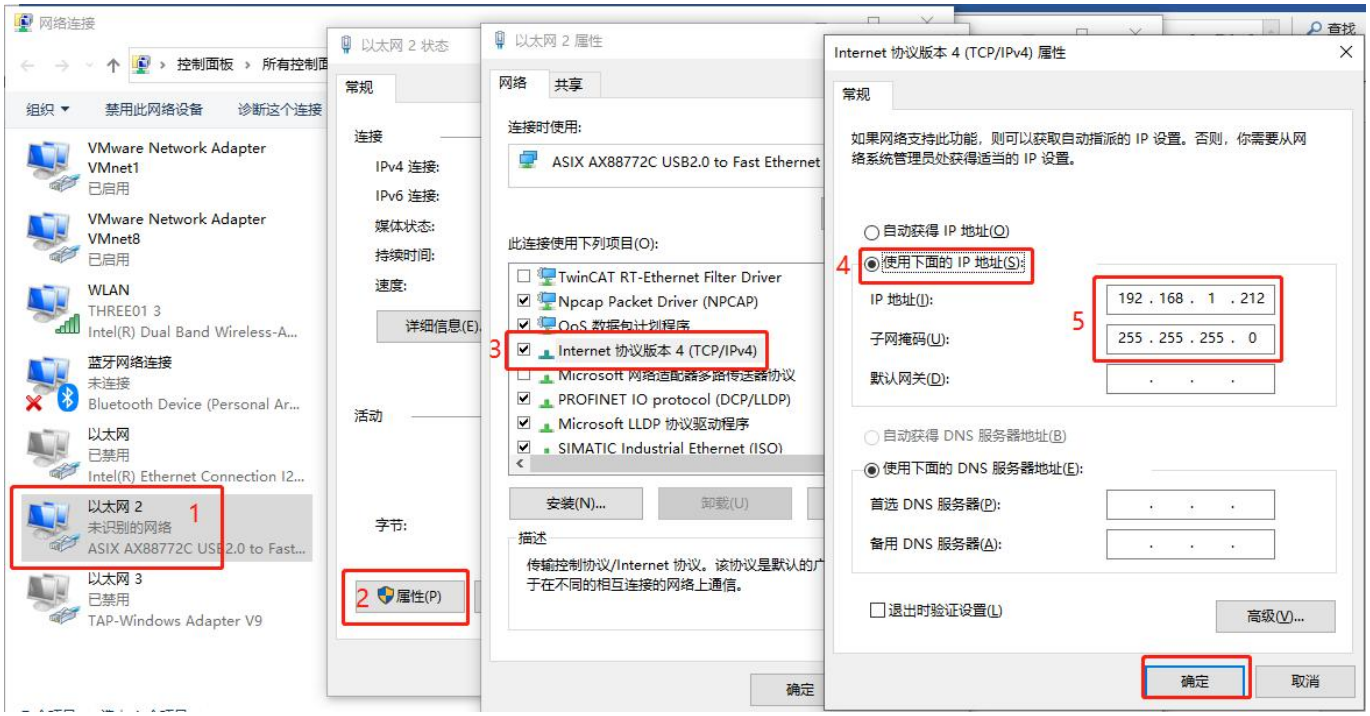
4.2.1.Communication Connections



4.2.2.DF58-C-CC-FB web page parameter settings

Set the local IP address of the computer, because the default IP of the DF58-C-CC-FB module to access the web page is 192.168.1.253, when the module is initially used, the IP of the local connection and the IP of the module must be in the same network segment to achieve normal communication of direct connection, so the IP address of the local connection of the computer needs to be changed

Note: The coupler has two default IP addresses at the factory, 192.168.1.253: used to access web pages, and can be accessed at any time with this IP (including when the IP is forgotten), 192.168.3.253: The IP used to communicate with the CPU, which can be modified by the web page or the DIP switch, and this example can be modified on the web page.

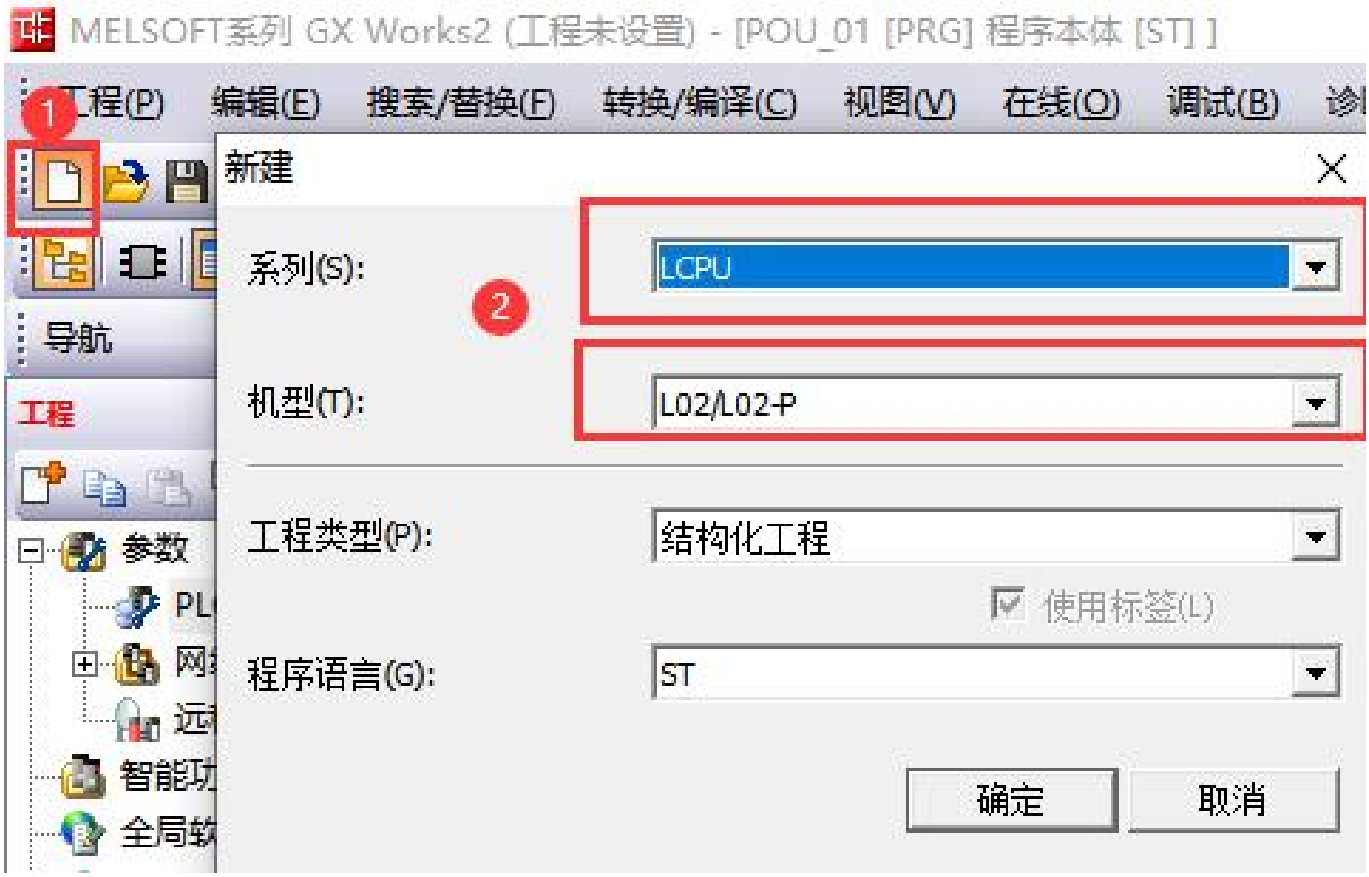


In the case of not knowing the IP of the module, after setting the local IP of the computer, connect the DF58-C-CC-FB module to the computer through the network cable, open the browser (IE browser or 360 browser can be), enter 192.168.1.253 in the address bar, and then press enter to enter the DF58-C-CC-FB web page parameter setting page, you can query the IP address of the module. As shown in the figure below:

4.2.3.GX Works2 parameter settings

Open GX Works2, 

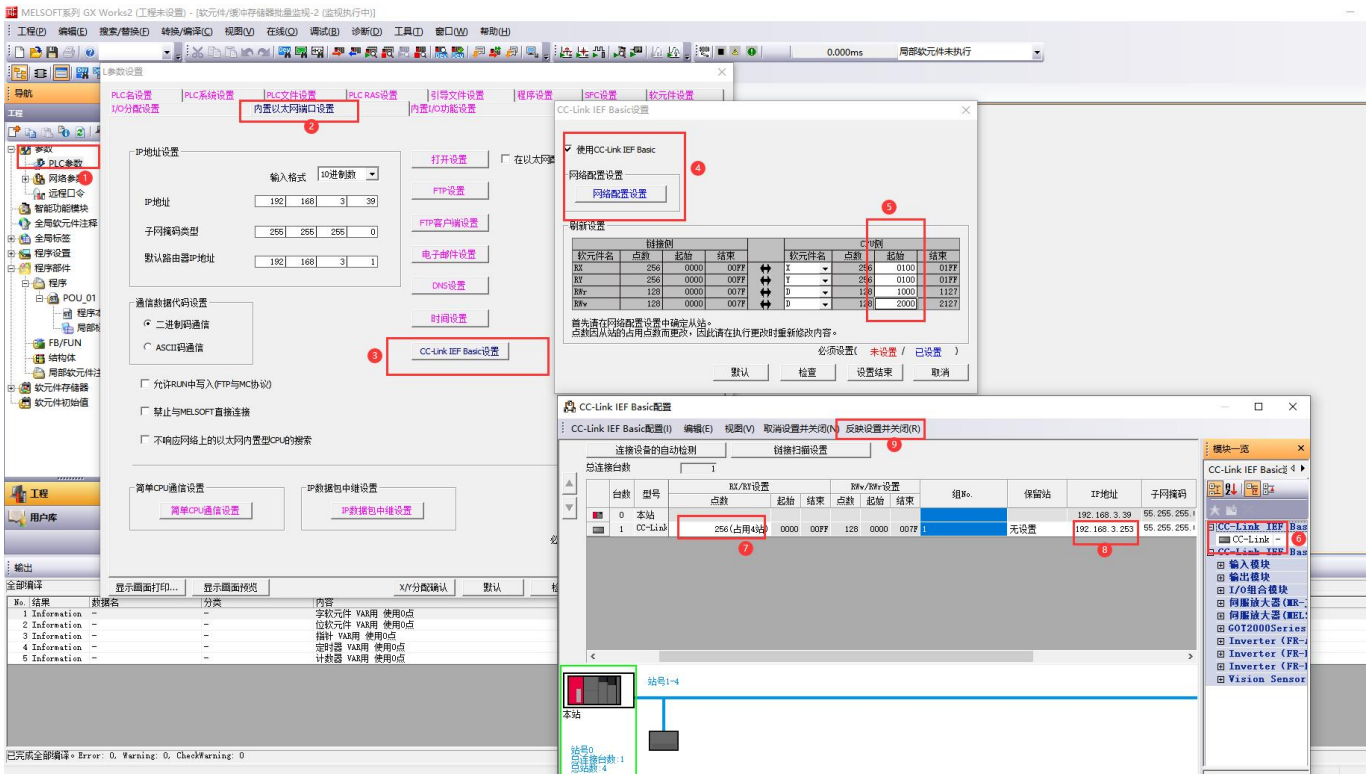
create a new project, select the corresponding CPU series and model, and select L02CPU-CM in this example.



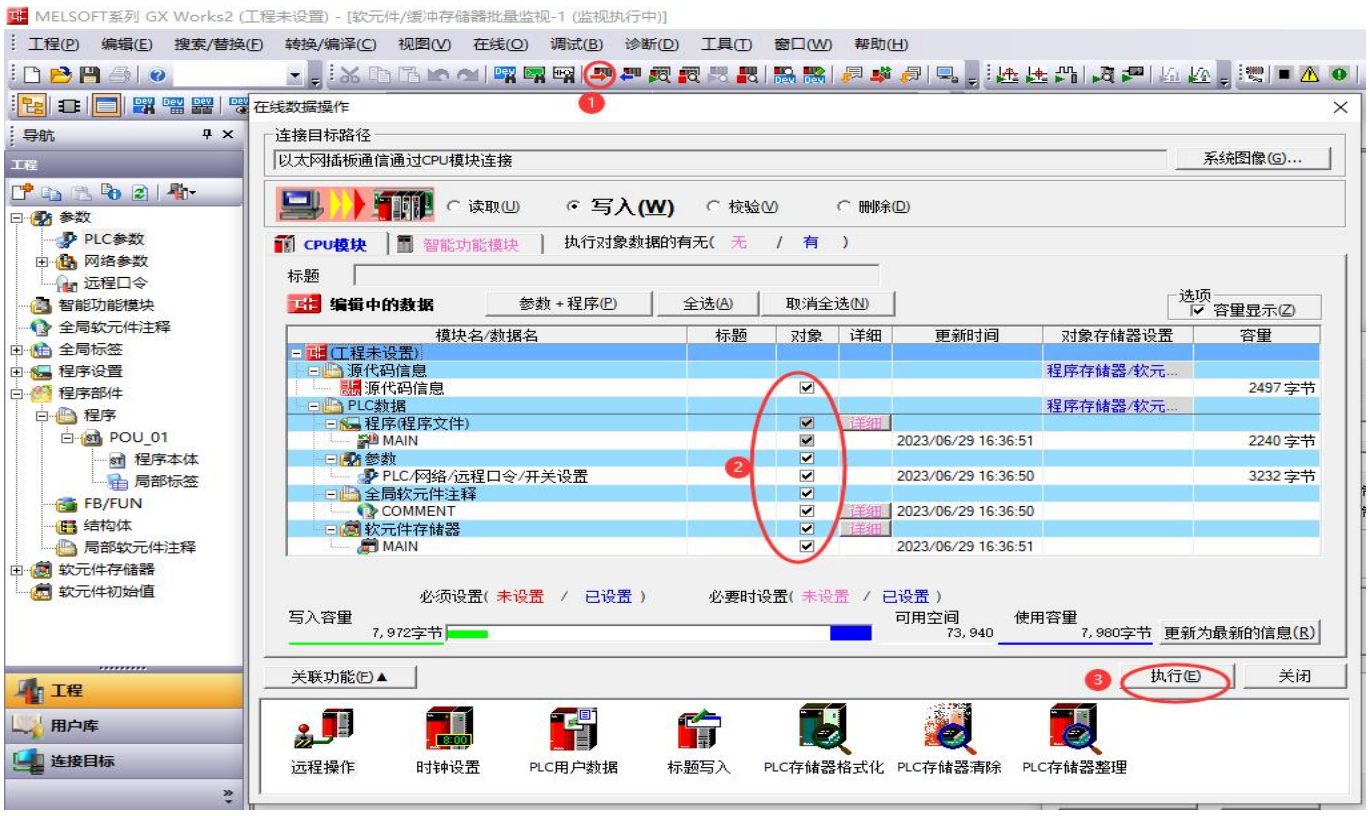
After adding the corresponding PLC, select [PLC Parameters], → [Built-in Ethernet Port Settings], → [CC-Link IEF Basic Settings], → [Network Configuration Settings], → [CC-Link IEF Basic Devices], after adding the CC-Link IEF Basic Devices, write the IP address to the IP address of the coupler, and select 256 points (4 stations) for "Points", and select [Reflect Settings and Close] after the configuration is completed, and then select [End of Settings] for each column. The configuration takes effect.

Note: In actual use, it is recommended to select 256 for "points" (occupying 4 stations), otherwise the address is not enough and the CPU of some modules cannot read and write.

module



After the settings are complete, click Download Parameters to L02CPU-CM, and power on



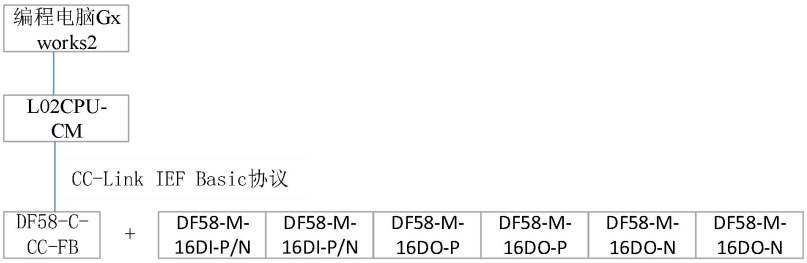
L02CPU-CM again after the download is complete. Complete the communication connection with the module

4.3.DF58-C-CC-FB expands digital type module

4.3.1.Hardware configuration

hardware	quantity	remark
Programming a computer	1 unit	Install Mitsubishi programming software GX Works2
L02CPU-CM	1 pc	Mitsubishi PLC
DF58-C-CC-FB	1 pc	Coupler
DF58-M-16DI-P/N	2 pcs	
DF58-M-16DO-P	2 pcs	
DF58-M-16DO-N	2 pcs	
Cable	Several	
DC regulated power supply	1	Controller, module power supply

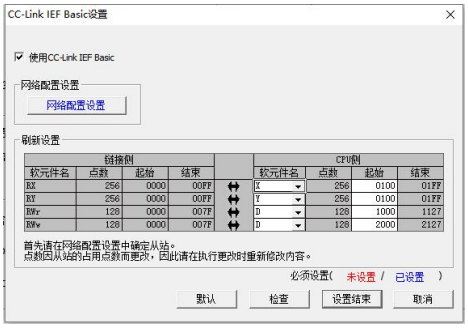
4.3.2.Schematic diagram of the connection



4.3.3.Address distribution

This time, we set CC-Link IEF Basic points to 256 (occupy 4 stations),

Start address RX:X100,RY:Y100,RWr:D1000,RWw:D2000



Link Side (Component Name)	CPU (Component Name)	CPU address range
Rx	X100	X100~X1FF
Ladies and gentle	Y100	Y100~Y1FF
Rwr	D1000	D1000~D1127
RWw	D2000	D2000~D2127

module

The address description of each module is shown in the following table, and the specific description of the configuration parameters of each module is used for the diagnostic information of the module and the actual use of the module parameters.

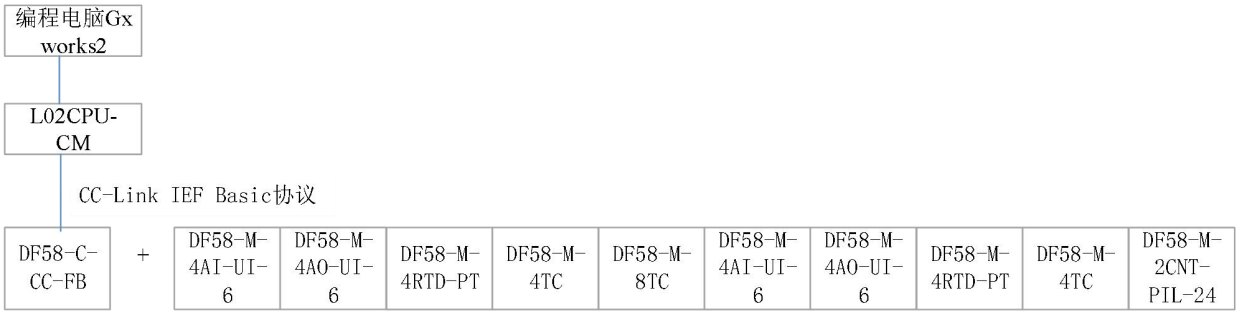
The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
RX	Coupler	DF58-C-CC-FB	X100~X107	1BYTE	X100~x107:I0.0~I0.7
	1	DF58-M-16DI-P/N	X108~X10F X110~X11F	1Word	X108~X10F:I0.0~I0.7 X110~X11F:I1.0~I1.7
	2	DF58-M-16DI-P/N	X118~X11F X120~X12F	1Word	X118~X11F:I0.0~I0.7 X120~X12F:I1.0~I1.7
RY	3	DF58-M-16DO-P	Y100~Y10F	1Word	Y100~Y10F:Q0.0~Q1.7
	4	DF58-M-16DO-P	Y110~Y11F	1Word	Y110~Y11F:Q0.0~Q1.7
	5	DF58-M-16DO-N	Y120~Y12F	1Word	Y120~Y12F:Q0.0~Q1.7
	6	DF58-M-16DO-N	Y130~Y13F	1Word	Y130~Y13F:Q0.0~Q1.7
RWr	1	DF58-M-16DI-P/N	D1000	1Word	Module diagnostic information
	2	DF58-M-16DI-P/N	D1001	1Word	Module diagnostic information
	3	DF58-M-16DO-P	D1002	1Word	Module diagnostic information
	4	DF58-M-16DO-P	D1003	1Word	Module diagnostic information
	5	DF58-M-16DO-N	D1004	1Word	Module diagnostic information
	6	DF58-M-16DO-N	D1005	1Word	Module diagnostic information
RWw	1	DF58-M-16DI-P/N	D2000	1Word	Parameter settings
	2	DF58-M-16DI-P/N	D2001	1Word	Parameter settings
	3	DF58-M-16DO-P	D2002	1Word	Parameter settings
	4	DF58-M-16DO-P	D2003	1Word	Parameter settings
	5	DF58-M-16DO-N	D2004	1Word	Parameter settings
	6	DF58-M-16DO-N	D2005	1Word	Parameter settings

4.4.DF58-C-CC-FB extended analog type module

4.4.1.Hardware configuration

hardware	quantity	remark
Programming a computer	1 unit	Install Mitsubishi programming software GX Works2
L02CPU-CM	1 pc	Mitsubishi PLC
DF58-C-CC-FB	1 pc	Coupler
DF58-M-4AI-UI-6	2	Expansion modules
DF58-M-4AO-UI-6	2	Expansion modules
DF58-M-4RTD-PT	2	Expansion modules
DF58-M-4TC	2	Expansion modules
DF58-M-8TC	1	Expansion modules
DF58-M-2CNT-PIL-24	1	Expansion modules
Cable	Several	
DC regulated power supply	1	Controller, module power supply

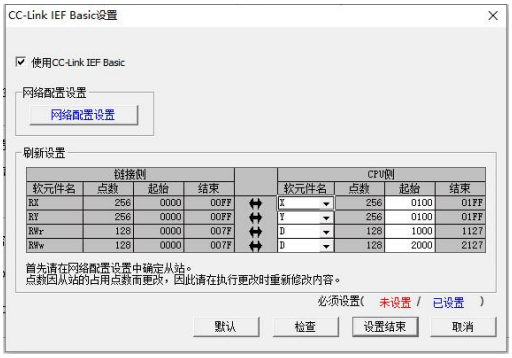
4.4.2.Schematic diagram of the connection



4.4.3.Address distribution

This time, we set CC-Link IEF Basic points to 256 (occupy 4 stations),

Start address RX:X100,RY:Y100,RWr:D1000,RWw:D2000



Link Side (Component Name)	CPU (Component Name)	CPU address range
Rx	X100	X100~X1FF
Ladies and gentle	Y100	Y100~Y1FF
Rwr	D1000	D1000~D1127
RWw	D2000	D2000~D2127

The address description of each module is shown in the following table, and the specific description of the configuration parameters of each module is used for the diagnostic information of the module and the actual use of the 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.

The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
RX	Coupler	DF58-C-CC-FB	X100~X107	1byte	X100~X107: I0.0~I0.7
RY	---	---	---	---	No digital modules
RWr	1	DF58-M-4AI-UI-6	D1000	1Word	Module diagnostic information
	2	DF58-M-4AO-UI-6	D1001	1Word	Module diagnostic information
	3	DF58-M-4RTD-PT	D1002	1Word	Module diagnostic information
	4	DF58-M-4TC	D1003	1Word	Module diagnostic information
	5	DF58-M-8TC	D1004	1Word	Module diagnostic information
	6	DF58-M-4AI-UI-6	D1006	1Word	Module diagnostic information

The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
	7	DF58-M-4AO-UI-6	D1007	1Word	Module diagnostic information
	8	DF58-M-4RTD-PT	D1008	1Word	Module diagnostic information
	9	DF58-M-4TC	D1009	1Word	Module diagnostic information
	10	DF58-M-2CNT-PIL-24	D1010	1Word	Module diagnostic information
	1	DF58-M-4AI-UI-6	D1011~D1014	4WORD	D1011: Channel 1 input D1012: Channel 2 input D1013: Channel 3 input D1014: Channel 4 input
	3	DF58-M-4RTD	D1015~D1018	4WORD	D1015: Channel 1 input D1016: Channel 2 input D1017: Channel 3 input D1018: Channel 4 input
	4	DF58-M-4TC	D1019~D1022	4WORD	D1019: Channel 1 input D1020: Channel 2 input D1021: Channel 3 input D1022: Channel 4 input
	5	DF58-M-8TC	D1023~D1030	8WORD	D1023: Channel 1 input D1024: Channel 2

The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
					input ..... D1029: Channel 6 input D1030: Channel 7 input
	6	DF58-M-4AI-UI-6	D1031~D1034	4WORD	D1031: Channel 1 input D1032: Channel 2 input D1033: Channel 3 input D1034: Channel 4 input
	8	DF58-M-4RTD	D1035~D1038	4WORD	D1035: Channel 1 input D1036: Channel 2 input D1037: Channel 3 input D1038: Channel 4 input
	9	DF58-M-4TC	D1039~D1042	4WORD	D1039: Channel 1 input D1040: Channel 2 input D1041: Channel 3 input D1042: Channel 4 input
	10	DF58-M-2CNT-PIL-24	D1043~D1051	9WORD	For details, please refer to the description of the corresponding module.

The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
RWw	1	DF58-M-4AI-UI-6	D2000~D2002	3WORD	Parameter settings
	2	DF58-M-4AO-UI-6	D2003~D2006	5WORD	Parameter settings
	3	DF58-M-4RTD-PT	D2007~D2008	2WORD	Parameter settings
	4	DF58-M-4TC	D2009~D2010	2WORD	Parameter settings
	5	DF58-M-8TC	D2011~D2012	2WORD	Parameter settings
	6	DF58-M-4AI-UI-6	D2013~D2014	3WORD	Parameter settings
	7	DF58-M-4AO-UI-6	D2015~D2019	5WORD	Parameter settings
	8	DF58-M-4RTD-PT	D2020~D2021	2WORD	Parameter settings
	9	DF58-M-4TC	D2022~D2023	2WORD	Parameter settings
	10	DF58-M-2CNT-PIL-24	D2024~D2030	7WORD	Parameter settings
	2	DF58-M-4AO-UI-6	D2031~D2034	4WORD	D2031: Channel 1 output D2032: Channel 2 output D2033: Channel 3 output D2034: Channel 4 output
	7	DF58-M-4AO-UI-6	D2035~D2038	4WORD	D2036: Channel 1 output D2036: Channel 2 output D2037: Channel 3 output D2038: Channel 4 output

4.5.DF58-C-CC-FB expands digital analog module

4.5.1.Hardware configuration

hardware	quantity	remark
Programming a computer	1 unit	Install Mitsubishi programming software GX Works2
L02CPU-CM	1 pc	Mitsubishi PLC
DF58-C-CC-FB	1 pc	Coupler

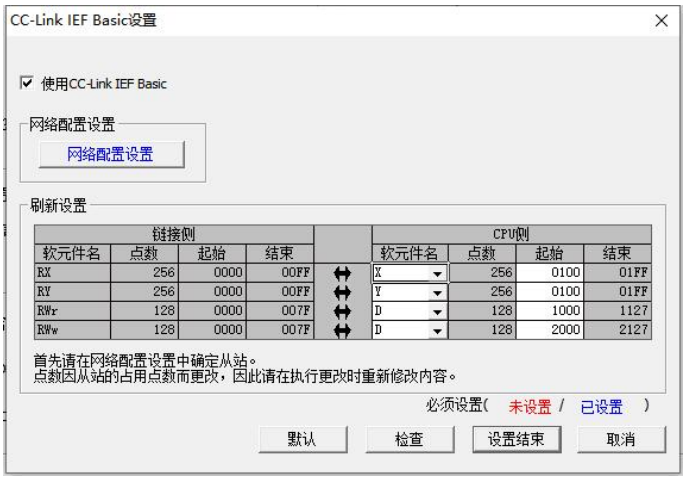
DF58-M-16DI-P/N	1 pc	Expansion modules
DF58-M-16DO-P	1 pc	Expansion modules
DF58-M-4AI-UI-6	1 pc	Expansion modules
DF58-M-4AO-UI-6	1 pc	Expansion modules
Cable	Several	
DC regulated power supply	1	Controller, module power supply

4.5.2.Schematic diagram of the connection

4.5.3.Address distribution

This time, we set CC-Link IEF Basic points to 256 (occupy 4 stations),

Start address RX:X100,RY:Y100,RWr:D1000,RWw:D2000



Link Side (Component Name)	CPU (Component Name)	CPU address range
Rx	X100	X100~X1FF
Ladies and gentle	Y100	Y100~Y1FF

Link Side (Component Name)	CPU (Component Name)	CPU address range
Rwr	D1000	D1000~D1127
RWw	D2000	D2000~D2127

The address description of each module is shown in the following table, and the specific description of the configuration parameters of each module is used for the diagnostic information of the module and the actual use of the 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.

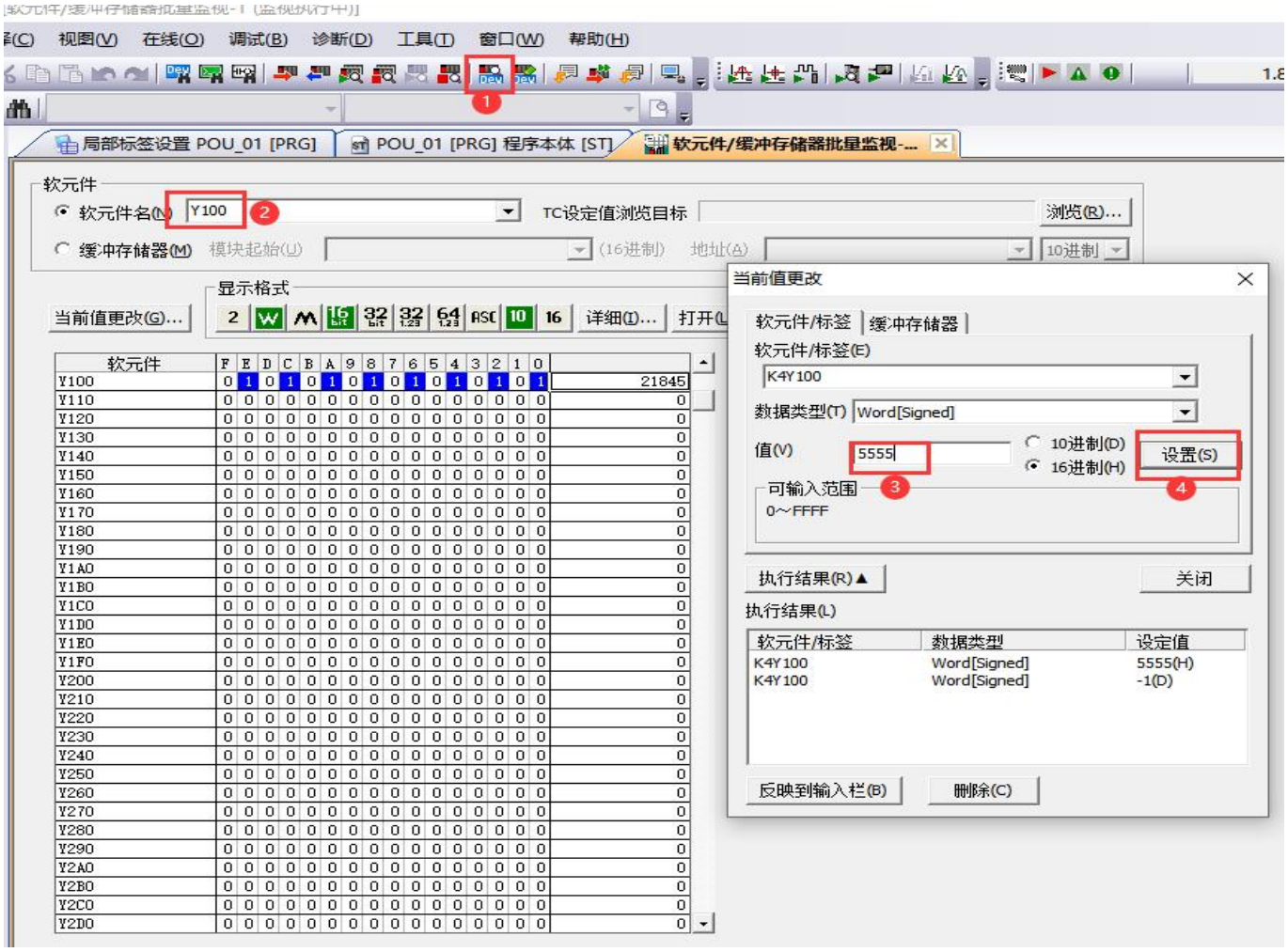
The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
RX	Coupler	DF58-C-CC-FB	X100~X107	1BYTE	X100~x107:I0.0~I0.7
	1	DF58-M-16DI-P/N	X108~X10F X110~X11F	1Word	X108~X10F:I0.0~I0.7 X110~X11F:I1.0~I1.7
RY	2	DF58-M-16DO-P	Y100~Y10F	1Word	Y100~Y10F:Q0.0~Q1.7
RWr	1	DF58-M-16DI-P/N	D1000	1Word	Module diagnostic information
	2	DF58-M-16DO-P	D1001	1Word	Module diagnostic information
	3	DF58-M-4AI-UI-6	D1003	1Word	Module diagnostic information
	4	DF58-M-4AO-UI-6	D1004	1Word	Module diagnostic information
	4	DF58-M-4AI-UI-6	D1005~D1008	4WORD	D1005: Channel 1 input D1006: Channel 2 input D1007: Channel 3 input D1008: Channel 4 input
RWw	1	DF58-M-16DI-P/N	D2000	1Word	Parameter settings
	2	DF58-M-16DO-P	D2001	1Word	Parameter settings
	3	DF58-M-4AI-UI-6	D2002~D2004	3WORD	Parameter settings
	4	DF58-M-4AO-UI-6	D2005~D2009	5WORD	Parameter settings
	4	DF58-M-4AO-UI-6	D2010~D2013	4WORD	D2010: Channel 1 output D2011: Channel 2 output

The name of the soft component	Slot number	Model	Occupy the address	Data size	remark
					D2012: Channel 3 output D2013: Channel 4 output

4.5.4.Data monitoring

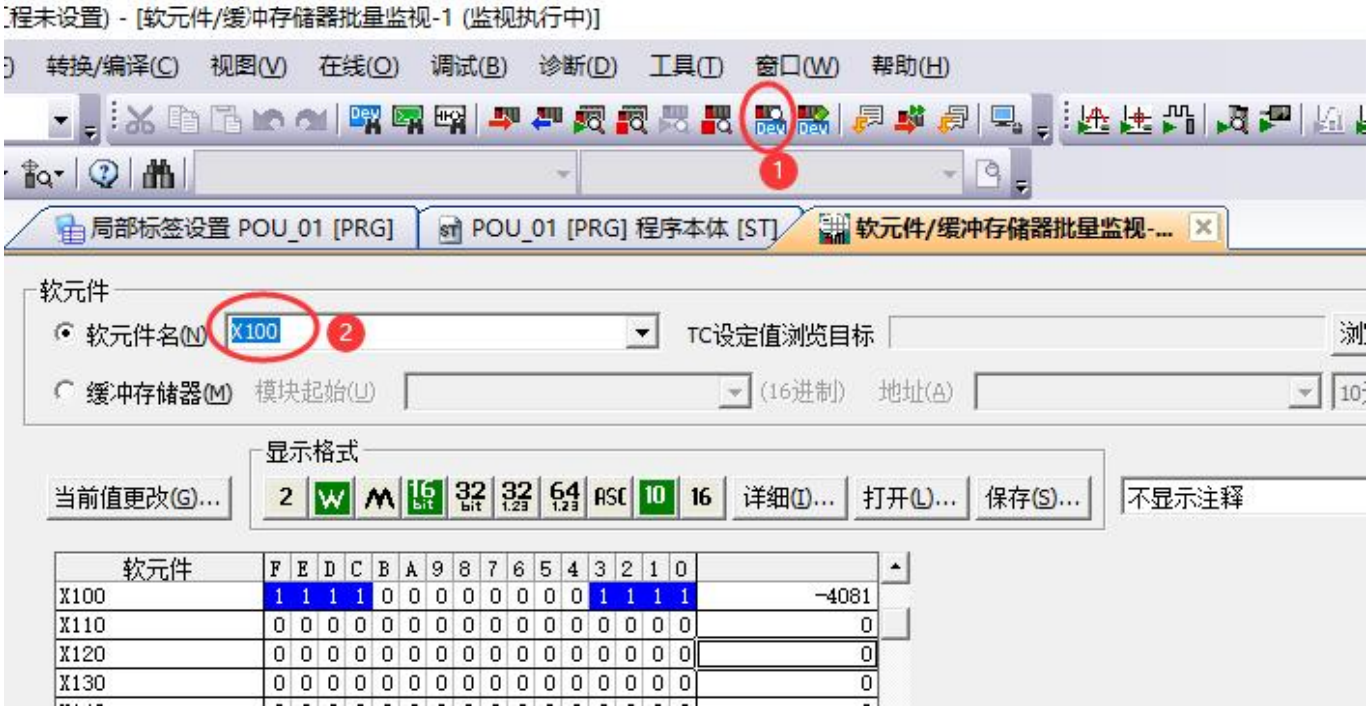
4.5.4.1.RY data monitoring

Select [Bulk Monitoring of Soft Components/Buffer Memory] and enter the corresponding output address (in this example Y100) in [Software Metaname] to control the output of the DF58-M-16DO-P module.



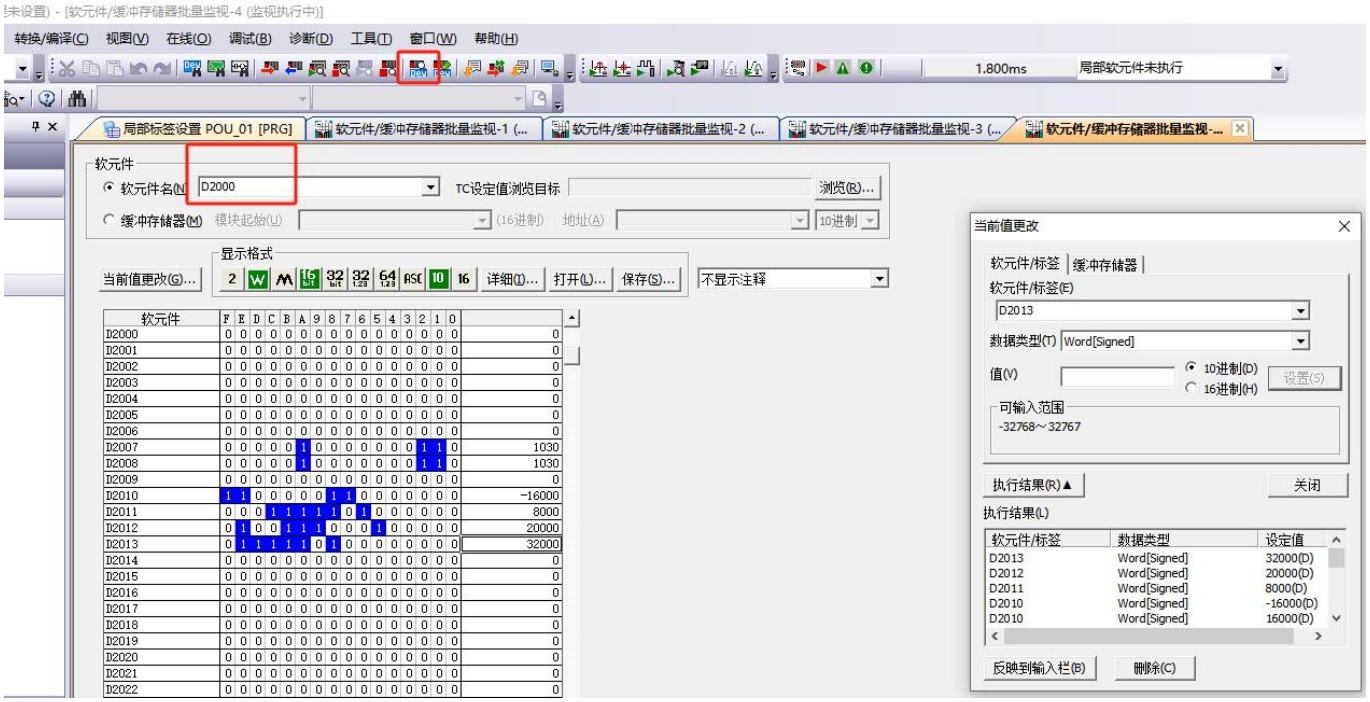
4.5.4.2.RX data monitoring

Select [Batch Monitoring of Soft Components/Buffer Memory] and enter the corresponding output address (as shown in the example X100) in [Software Meta Name] to view the input status of DF58-C-CC-FB and DF58-M-16DI-P/N.



1.5.4.3.RWw data monitoring

Select [Bulk Monitoring of Soft Components/Buffer Memory] and enter the corresponding output address in [Software Metaname] (as shown in Example D2000) to configure the parameters of DF58-M-16DI-P/N, DF58-M-16DO-P, DF58-M-4AI-UI-6, and DF58-M-4AO-UI-6DF58-M-4AO-UI-6 output channel.



The name of the soft component	Slot number	Model	Occupy the address	Data size	remark	Data Implications
RWw	1	DF58-M-16DI-P/N	D2000	1Word	Parameter settings	
	2	DF58-M-16DO-P	D2001	1Word	Parameter settings	
	3	DF58-M-4AI-UI-6	D2002~D2004	3WORD	Parameter settings	
	4	DF58-M-4AO-UI-6	D2005~D2009	5WORD	Parameter settings	D2007: bit0~bit7:6 indicates that the output type of channel 1 is set to -10V~10V. bit0~bit7:4 means that the output type of channel 2 is set to 0~10V. D2008:

						bit0~bit7:5 means that the output type of channel 3 is set to 2~10V. bit0~bit7:0 indicates that the output type of channel 4 is set to disable.
	4	DF58-M-4AO-UI-6	D2010~D2013	4WORD	D2010: Channel 1 output D2011: Channel 2 output D2012: Channel 3 output D2013: Channel 4 output	Channel 1 output - 16000 Channel 2 outputs 8000 Channel 3 outputs 20000 Channel 4 outputs 32000 (because the channel is set to disable, the actual channel has no output value)

Note: DF58-M-4AO-UI-6 channel 1~4 default 0 configuration (output disabled), even if the channel value is set to the output value, the actual module will not output, please use the channel configuration after use.

1.5.4.4.RWr data monitoring

Select Batch Monitoring of Soft Components/Buffer Memory, and enter the corresponding output address (for example, Example D1000) in Software Meta Name to view the diagnostic information of DF58-M-16DI-P/N, DF58-M-16DO-P, DF58-M-4AI-UI-6, and DF58-M-4AO-UI-6DF58-M-4AI-UI-6 input channel value.

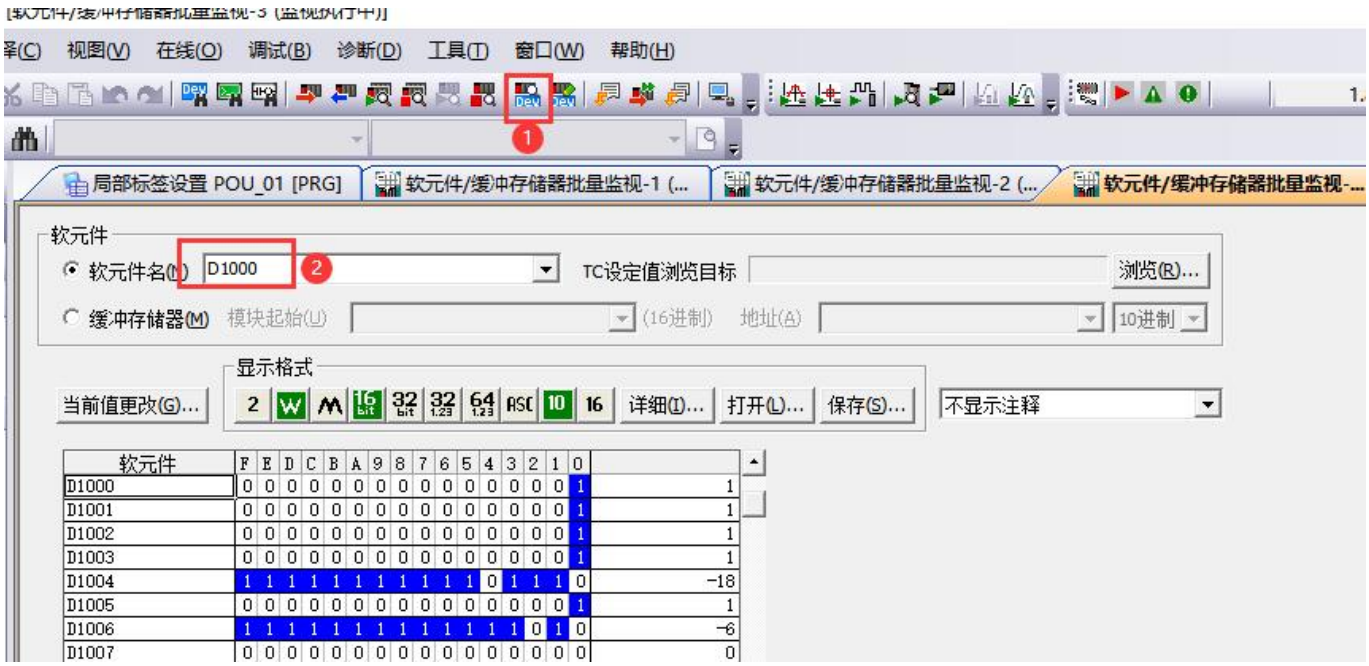


Figure 11-3-6-1

As shown in Figure 11-3-6-1, the four expansion modules are manually unplugged, and the error data of D1000~D1003 is "1". D1004~D1007 is DF58-M-4AI-UI-6 channel data.

The name of the soft component	Slot number	Model	Occupy the address	Data size	remark	data
RWr	1	DF58-M-16DI-P/N	D1000	1Word	Module diagnostic information	0: The module is normal
	2	DF58-M-16DO-P	D1001	1Word	Module	0: The

					diagnostic information	module is normal
	3	DF58-M-4AI-UI-6	D1003	1Word	Module diagnostic information	0: The module is normal
	4	DF58-M-4AO-UI-6	D1004	1Word	Module diagnostic information	0: The module is normal
	5	DF58-M-4AI-UI-6	D1005~D1008	4WORD	D1005: Channel 1 input D1006: Channel 2 input D1007: Channel 3 input D1008: Channel 4 input	D1005：-16006 D1006：7996 D1007：22380 D1008：0