

**D Series**  
**Removable & High-Speed Redundant**  
**Backplane Remote IO**

**User Manual**

V1.00

## Removable & High-Speed Redundant Backplane Remote IO



Odot Automation System Co., Ltd.

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Version Information

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# Security Information

## Important Information

Before attempting to install, operate, service, or maintain the equipment, please read the following instructions carefully and look to familiarize yourself with the equipment. Specific information described below may appear elsewhere in the text or on the device to alert the user to potential hazards, or to call attention to information that clarifies or simplifies a procedure. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



The addition of this symbol to a DANGER or WARNING label indicates the presence of an electric shock hazard which, if instructions are not followed, will result in personal injury.



This is a symbol to remind you to be safe. Remind users of the possible danger of personal injury. Please follow all safety precautions with this symbol to avoid possible personal injury or even death.

### **DANGER**

**DANGER** INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN SERIOUS INJURY OR DEATH.

### **WARNING**

**WARNING** INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN SERIOUS INJURY OR DEATH.

### **CAUTION**

**CAUTION** INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY OR DEATH.

### **NOTICE**

**NOTICE** INDICATES A HAZARD NOT RELATED TO PERSONAL INJURY.

## **Attention**

Installation, operation, repair and maintenance of electrical equipment is restricted to qualified personnel only. Sichuan ODOT Automation System Co., Ltd. shall not be responsible for any consequences arising from the use of this user manual.

Qualified personnel are those who have the skills and knowledge related to the manufacturing and operation of electrical equipment and its installation, and who have been trained in safety to be able to detect and avoid related hazards.

## **Personnel Qualification**

Only properly trained personnel who are familiar with and understand the contents of this manual and all other related product documentation are authorized to use this product.

Qualified personnel must be able to detect possible hazards arising from setting parameters and modifying parameter values, usually from mechanical, electrical or electronic equipment. Qualified personnel must be familiar with the various standards, rules and regulations aimed at preventing industrial accidents and must comply with them when designing and building systems.

## **Expected Usage**

The products described or referred to in this document, together with their software, accessories and options, are expansion modules designed for industrial use and should be used in accordance with the relevant instructions, guide, examples and safety instructions in this document and other supporting documents.

This product must be used in compliance with all applicable safety laws and regulations, specified requirements and technical parameters.

Due to planned application, you must perform a risk assessment before using this product. Appropriate safety-related measures must be taken based on the results of the evaluation.

Since this product should be used as an integral part of the entire machine or process, the safety of personnel must be ensured through the design of the entire system.

This product must be used with the specified cables and accessories. Please use only original spare parts and original replacement parts.

Any use other than that expressly permitted is prohibited as unintended hazards may result.

## **Network Safety Tips**

A. Use controllers and devices only in protected environments to minimize

network exposure and ensure inaccessibility from the outside.

B. Use a firewall to protect the control system network and separate it from other.

C. If remote access is required, please use a VPN (Virtual Private Network) tunnel.

D. Restrict access to development and control systems by physical means, operating system capabilities, etc.

E. Protect development and control systems with the latest virus detection solutions.

# About This Manual

## Document Scope

This guide introduces network adapter modules and expansion IO modules in the distributed remote IO systems, and provides an overview of the features, function descriptions, configuration methods, wiring diagrams, and installation details of related products.

## Validity Statement

In accordance with our policy of continuous improvement, we will continue to revise the content of this manual to make it clearer and more accurate.

**Sichuan ODOT Automation System Co., Ltd. reserves the right of final interpretation of this manual.**

## Product Information



### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Disconnect power from all equipment (including connected equipment) before removing any covers, or installing or removing any accessories, hardware, cables, or wires, unless otherwise specified in the corresponding hardware guide for this equipment.

As directed, at the appropriate place and time, it is important to always use a properly rated voltage sensing devices to detect if the power is off.

Replace and secure all covers, accessories, hardware, cables and wires, and verify proper ground connection before powering on the device.

When operating this equipment and related products, the specified voltage must be used.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**



### **POSSIBLE EXPLOSION HAZARD**

Do not connect or disconnect equipment unless it is unplugged or the location is known to be non-hazardous.

Use the USB port (if equipped) only if the work area is known to be non-hazardous.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

**▲ WARNING**

**OUT OF CONTROL**

The designer of any control scheme must account for the possible failure of the control path and provide a means for certain critical control functions could be restored to a safe state during and after path failure. These critical control functions include emergency stop, over-travel stop, power-off restart, and similar safety measures.

For critical control functions, separate or redundant control paths must be provided. System control paths may include communication links. Consideration must be given to the implications of unforeseen transmission delays or link failures.

Comply with all accident prevention regulations and local safety guidelines.

To guarantee proper operation, each implementation of the device must be fully tested individually before being placed into service.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

**▲ WARNING**

**UNINTENDED EQUIPMENT OPERATION**

Only use software approved by Sichuan ODOT Automation System Co., Ltd. for use with this equipment.

Please update the application after every change to the physical hardware configuration.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

**▲ WARNING**

**UNINTENDED EQUIPMENT OPERATION**

The risk assessment should include the possibility of a communication failure between the logic controller and any I/O expansion modules.

If the I/O module output signal "maintain current value" does not meet your application requirements when the I/O expansion Bus error occurs, other solutions should be used to ensure that the application can cope with Bus error events.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

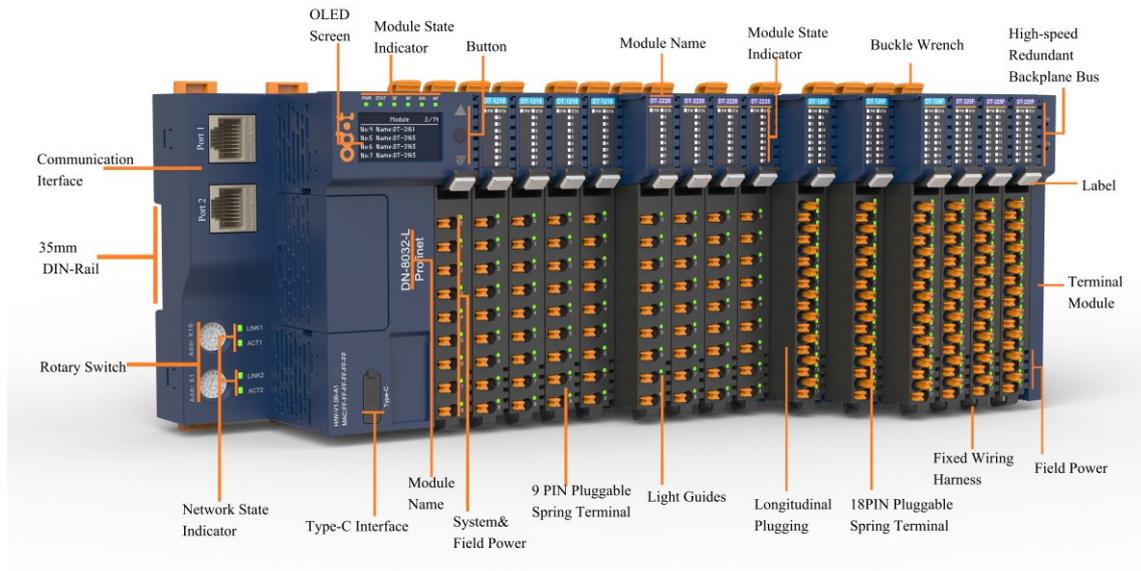
# 1 Product Overview

The D Series removable & high-speed redundant backplane remote IO system consists of the network adapter and expansion IO modules, the network adapter module is responsible for field communication, realize the communication connection with the master controller or host computer software, the maximum number of mounted modules is 32, module terminals are pluggable, high-speed redundant backplane bus, full load refresh cycle is 0.6ms.

Support a variety of mainstream industrial communication protocols: Modbus TCP, PROFINET, EtherCAT, EtherNet/IP, etc. Expansion IO modules are divided into digital input modules, digital output modules, analog input modules, analog output modules, special modules and so on. The network adapter and the expansion IO modules can be freely combined according to the site needs, and the use of distributed IO modules can achieve lower cost requirements in the case of many points.

The module has independent diagnostic function, which can diagnose the working status of the module and the terminal installation status. Staggered layout spring light guide terminals and pluggable terminals, the wiring diameter can be connected to 0.2mm<sup>2</sup> (AWG 24) ~ 1.5mm<sup>2</sup> (AWG 16) cables, making it easy to maintain and replace the module. The module OLED display panel can view the relevant parameters of the module, and obtain some important information without relevant software.

# 1.1 Module Feature

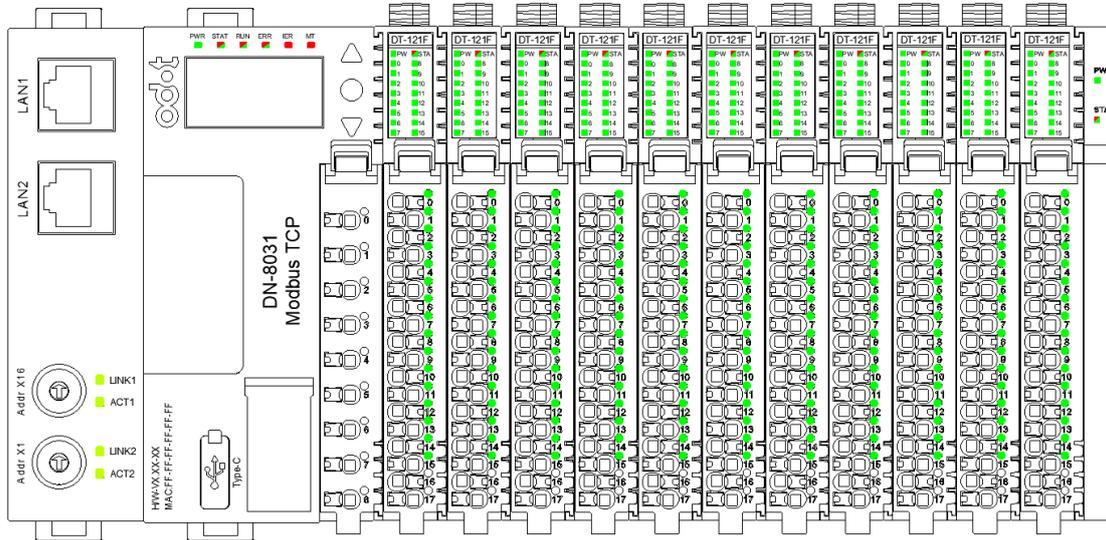


## 1.2 Selection Table

Module	Description	State
<b>Network Adapter Module</b>		
DN-8031	Modbus TCP Network Adapter	Published
DN-8032-L	PROFINET Network Adapter	Published
DN-8033	EtherCAT Network Adapter	Published
DN-8034	EtherNet/IP Network Adapter	Published
DN-8037	CC-Link IE Field Basic Network Adapter	Published
<b>Digital Input Module</b>		
DT-121F	16 Channels digital input module 24VDC/PNP/high level is valid	Published
DT-122F	16 Channels digital input module 24VDC/NPN/ low level is valid	Published
DT-1314	4 Channels digital input module 110 VAC /220VAC	Published
<b>Digital Output Module</b>		
DT-221F	16 Channels digital output module 24VDC/NPN/low level is valid	Published
DT-222F	16 Channels digital output module 24VDC/PNP/high level is valid	Published
DT-2794	4 Channels relay output module 2A@250VAC/30VDC (Resistive load), 1A@250VAC/30VDC (Inductive load)	Published
<b>Analog Input Module</b>		
DT-3168	8 Channels voltage input module 0~5VDC/ 0~10VDC/ $\pm 5VDC/\pm 10VDC$ , 16 bits	Published
DT-3238	8 Channels current input module 0&4-20mA, 16 bits	Published
DT-3364	4 Channels voltage input module 0~5VDC/ 0~10VDC/ $\pm 5VDC/\pm 10VDC$ , 16 bits	Published
DT-3434	4 Channels current input module 0& 4~20mA, 16 bits	Published
<b>Temperature Acquisition Module</b>		
DT-3714	4 Channels RTD input module RTD-PT100	Published
DT-3804	4 Channels thermocouple input module TC-J / K / E / T / S / R / B / N Type	Published
<b>Analog Output Module</b>		
DT-4164	4 Channels voltage output module 0~5VDC/ 0~10VDC/ $\pm 5VDC/\pm 10VDC$ , 16 bits	Published
DT-4234	4 Channels current output module 0&4-20mA, 16 bits	Published
<b>Terminal Module</b>		
DT-5800	Terminal module, required module	Published
<b>Power Expansion Module</b>		
DT-7221	System power and field power expansion module SV: 2A @5VDC /FV: 8A @24VDC	Published

### 1.3 LED Indicators

The user can easily check the power state of adapter and I/O module, I/O module operating state, and the number of I/O channels though LED state. And the detailed indicator state should refer to the related adapter or IO modules.



**▲ WARNING**

**OUT OF CONTROL**

For details about the indicator status of the network adapter module, see related chapters.

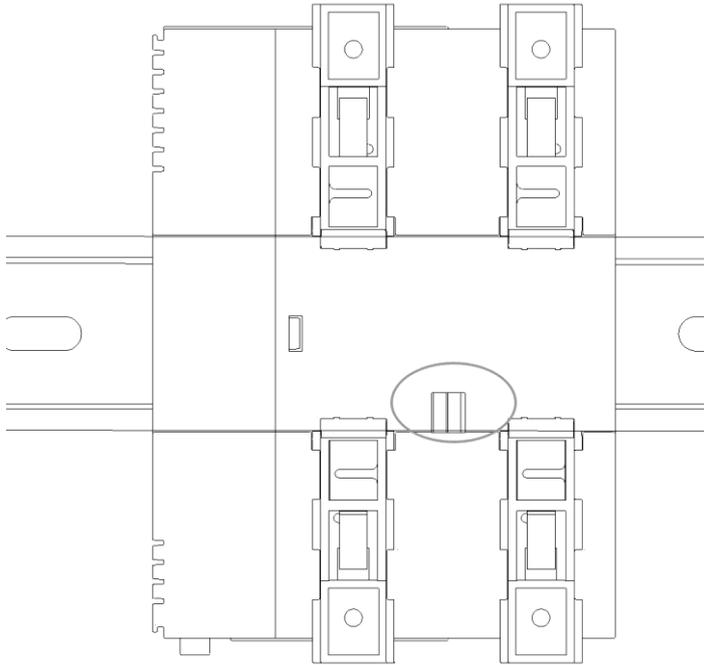
For details about the indicator status of the I/O module, see related chapters.

Different indicator states indicate that the module is in different working states. The indicator status is incorrect, and the module is not working properly.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 1.4 Grounding

There is one metal Spring sheet on the back of the module, which is used for effective grounding with the guide rail.



### Functional grounding on the DIN rail

The system DIN rail is the common functional grounding plane and must always be mounted on a conductive backplane.

The functional grounding (FG) is connected to the conductive backplane by a heavy-duty conductor (usually a braided copper cable with the largest allowable cable cross-section). There is a metal spring plate on the back of the module, which is used for effective grounding with the Din rail, and the metal spring plate is connected to the inside of the terminal PE of the adapter module. The conductor needs to be made of copper wire with a core greater than  $0.2\text{mm}^2$  and less than  $1.5\text{mm}^2$ , and an impedance of less than 10 ohms.

### **⚠ WARNING**

#### UNINTENDED EQUIPMENT OPERATION

·Connect the DIN rail to the functional grounding of the installed equipment.

**Failure to follow instructions specified by the manufacturer may result in serious**

consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.

## System Grounding

Due to the influence of electromagnetic interference, cables carrying fast I/O, analog I/O and fieldbus communication signals must be shielded cables.

### WARNING

#### UNINTENDED EQUIPMENT OPERATION

- Please use shielded cables for all fast I/O, analog I/O, and communication signals.
- Please use shielded cables for single point connection for all fast I/O, analog I/O and communication signals. [1]
- Arrange power cables separately from communication and I/O cables.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

[1] Multi-point grounding is permitted (and in some cases unavoidable) if it is connected to the equipotential grounding plane to avoid damage to the cable shield in the event of a power system short-circuit current. When using shielded cables, the following wiring rules need to be followed:

For the functional grounding (FG), metal pipes or wires can be used as part of the shield length, the premise is it should provide the entire earthing connection continuously without interruption. For functional grounding, shielding is used to reduce electromagnetic interference and the shielding must be continuous throughout the cable without interruption. If for both functional and protective purposes (This is usually the case for communication cables), the shielding of the cable must be continuous without interruption.

Cables carrying different types of signals or power should be separated whenever possible.

## Shielded Cable Connection

Cables carrying fast I/O, analog I/O and fieldbus communication signals must be shielded. The shielded cable must be firmly grounded. The fast I/O and analog I/O shields can be connected to the functional grounding (FG) of the expansion module. The

fieldbus communication cable shields must be connected to functional grounding (FG) via using connection clamps fastened to the conductive backplane installed.

## 1.5 Wiring

Use push-in method to connect single-wire or crimp terminal wires without any other tools. Users can save wiring time and ensure a safe operation regardless of wiring experience.

The module equips with a wiring fixed end for cable harness, which is used to fix the cable when the IO module is wired with multiple cables.

### WARNING

#### UNINTENDED EQUIPMENT OPERATION

Use shielded cables for all fast I/O, analog I/O, and communication signals.

Single-point grounding with shielded cables for all fast I/O, analog I/O, and communication signals.

Route power cables separately from communication cables and I/O cables.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

If connected to an equipotential ground to avoid damaging the cable shield in the event of a short circuit current in the power system, multi-point grounding is allowed (which in some cases is unavoidable).

**Note: Surface temperatures may exceed 60°C (140°F).**

To comply with the IEC-61010 standard, the main wiring (the wires connected to the main power supply) should be arranged separately and separated from the secondary wiring (the ultra-low voltage wiring from the intermediate power supply). If separate wiring is not possible, double insulation, such as conduit or cable gain, must be performed.

**Note: Copper wire is required.**

### DANGER

#### FIRE HAZARD

Only use the correct wire rules for the maximum current capacity of the I/O channels and power supplies.

For relay output (2A) wiring, please use conductors with a cross-sectional area of at least 0.5 mm<sup>2</sup> (AWG20) and a temperature rating of at least 80°C (176°F).

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 1.6 Installation

### 1. Installation and maintenance requirements

The use and application of the information contained in this chapter requires expertise in the design and programming of automatic control systems. Only the user, machine builder or integrator can clearly understand the various situations and factors that may arise during installation and set-up, operation and maintenance, and therefore can determine the effective and correct use of automation and associated equipment, related safety devices and interlocks equipment. When selecting automation and control equipment and any other related equipment or software for a particular application, all applicable local, regional or national standards and/or regulations must also be considered.

In particular, observe any safety information, different electrical requirements and regulatory standards applicable to the machine or the use of the equipment.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

### 2. Cut off the power supply

All options and modules should be assembled before the equipment is installed on the mounting rails, mounting plates or panels; To disassemble, remove the control system from the mounting rails, mounting plates, or panels before disassembling the unit.



**THERE IS A RISK OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- DISCONNECT ALL EQUIPMENT FROM THE POWER SUPPLY (INCLUDING CONNECTED DEVICES) BEFORE REMOVING ANY COVER, OR INSTALLING OR REMOVING ANY ACCESSORIES, HARDWARE, CABLES, OR WIRES, EXCEPT AS OTHERWISE SPECIFIED IN THE CORRESPONDING HARDWARE GUIDE FOR THIS DEVICE.
- ACCORDING TO THE INSTRUCTIONS, IT IS IMPORTANT TO USE VOLTAGE SENSING EQUIPMENT WITH APPROPRIATE RATINGS TO DETECT WHETHER THE POWER IS LOST AT THE APPROPRIATE PLACE AND TIME.
- ACCORDING TO THE INSTRUCTIONS, IT IS IMPORTANT TO USE VOLTAGE SENSING EQUIPMENT WITH APPROPRIATE RATINGS TO DETECT WHETHER THE POWER IS LOST AT THE APPROPRIATE PLACE AND TIME.
- REPLACE AND FASTEN ALL COVERS, ACCESSORIES, HARDWARE, CABLES AND WIRES, AND CONFIRM THAT THE GROUND CONNECTION IS CORRECT BEFORE POWERING ON THE EQUIPMENT.
- WHEN OPERATING THIS EQUIPMENT AND RELATED PRODUCTS, THE SPECIFIED VOLTAGE MUST BE USED.

**FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN THE LOSS OF PROTECTION PROVIDED BY THE DEVICE, WHICH CAN RESULT IN SERIOUS CONSEQUENCES SUCH AS DEATH OR INJURY OR DAMAGE TO THE DEVICE.**

### 3.Environmental Requirements

All expansion module components must be electrically isolated between the internal circuit and the input/output channel, and the modules must be installed in a control cabinet or electric control room. The equipment is intended for use in industrial environments with pollution class 2 and altitudes below 2000 m.

#### WARNING

##### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any ratings specified in the Environmental and Electrical Characteristics Table.  
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

#### WARNING

##### UNINTENDED EQUIPMENT OPERATION

The modules are not suitable for use in harsh environments, such as environments with corrosive gases or salt spray.  
Install and operate this equipment in accordance with the conditions described in "Environmental Characteristics".  
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 4.Installation Precautions

#### WARNING

##### UNINTENDED EQUIPMENT OPERATION

Use appropriate safety interlocks in situations where there may be a risk of personal injury and/or equipment damage.  
Install and operate the equipment in an enclosure that is locked by a key locking device and complies with the level of the environment in which the equipment operates.  
Use the sensor and actuator power supply only for powering the sensors or actuators connected to the module.  
Wiring and output circuits must be wired and fused in accordance with local and national regulations for specific equipment rated amperage and voltage.  
Do not use this device in a safety-critical machine environment unless it is designated as a functional safety device and complies with applicable regulations and standards.

Do not disassemble, repair or modify this equipment.

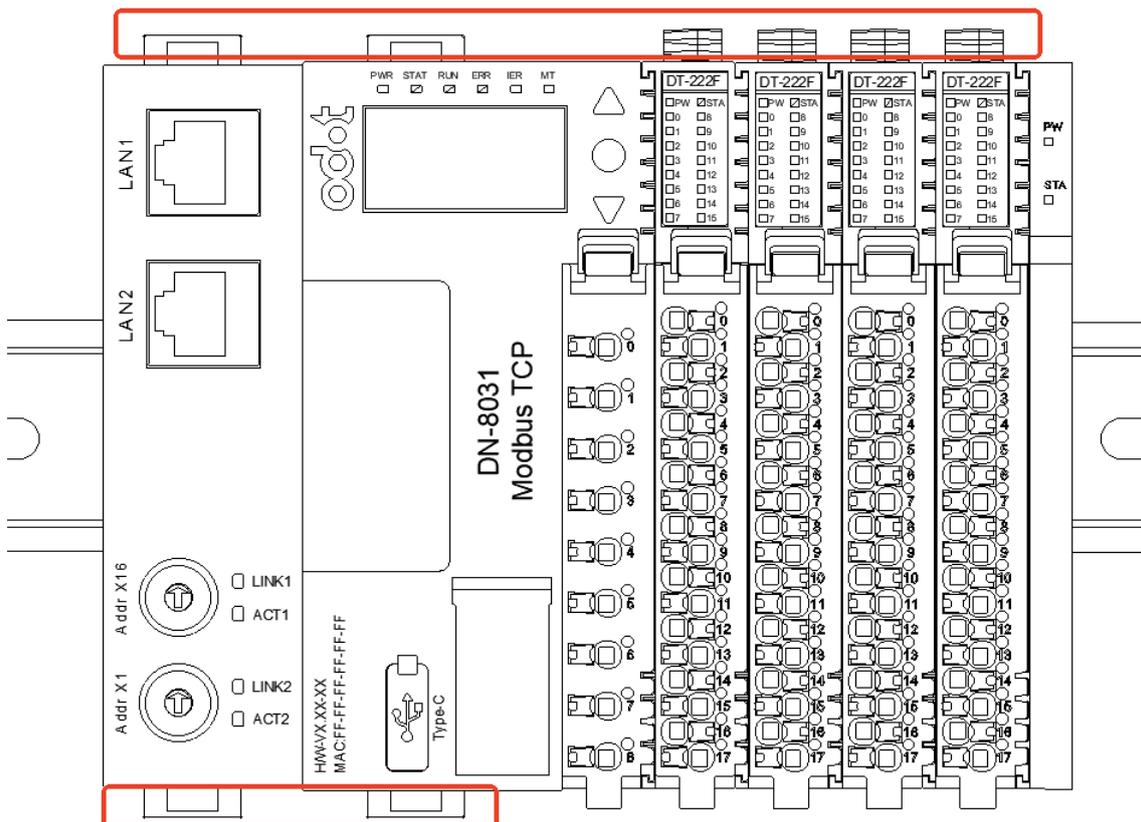
Do not connect any lines to reserved unused connection points, or connection points indicated as No Connection (NC).

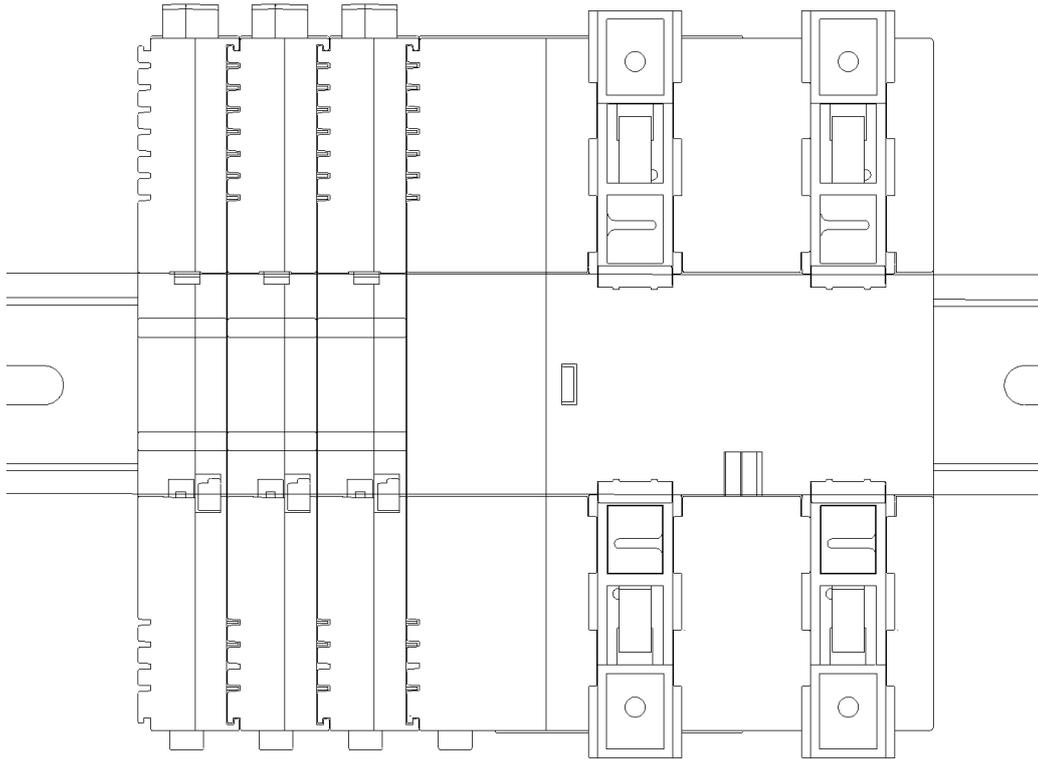
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 5. Correct Installation

DIN-Rail Lock could be safely and reliably installed on 35 mm DIN-Rail. There is a manual closure buckle on the upper side of all modules for locking, and a manual buckle is on the left side of the adapter for locking the guide rail.

The network adapter is installed on the far left, followed by other I/O modules (including digital input/output modules, analog input/output modules, etc., and the terminal modules are installed on the far right).

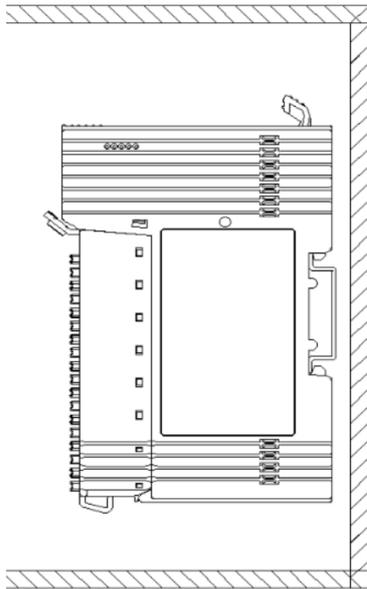




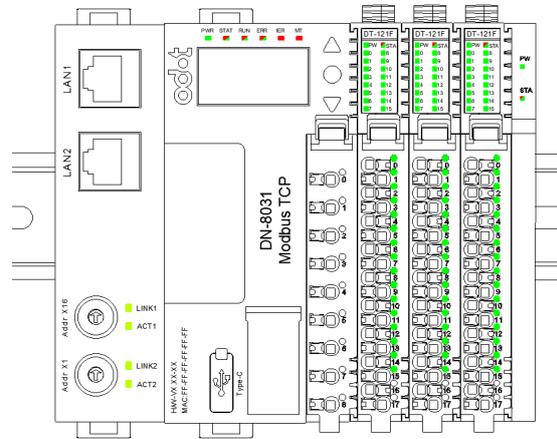
When installing the terminal block, please place the bottom of the terminal block correctly in the card slot, and then press the terminal block inward, and you can hear a "click" sound after successful installation.



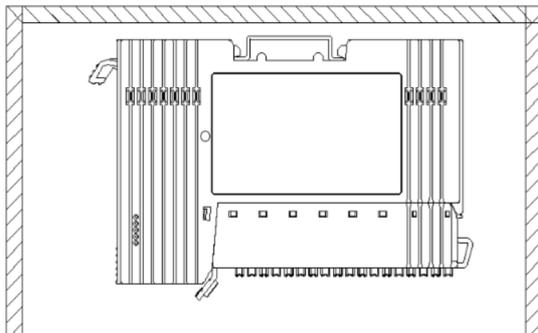
The module can be installed vertically or horizontally, and the schematic diagram of vertical and horizontal installation is as follows:



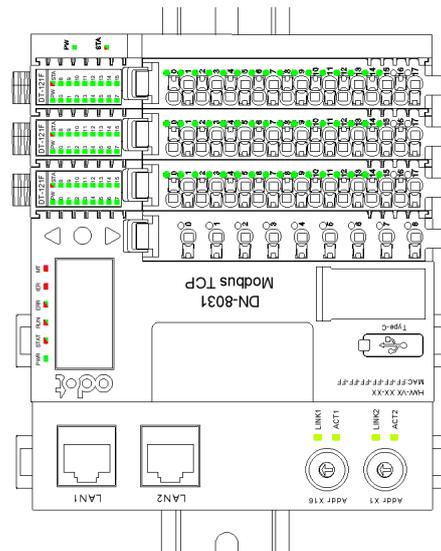
① Right view of horizontal installation



② Horizontal installation



③ Top view of vertical installation



④ Vertical installation

**⚠ WARNING**

**OUT OF CONTROL**

The lock of the I/O module must be pressed firmly; otherwise, the communication of the I/O module may be disconnected.

The lock of the I/O module must be pressed firmly, otherwise the module may fall off.

When installing the I/O module, no gap should be left between the modules. Otherwise, the I/O channel may not work properly.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

**Notice**

**DEVICE INOPERABLE**

The installation position of the I/O module in the middle is not fixed. According to the layout position needed by customer, after the actual project confirms the installation position, it is not allowed to move the position of the I/O module.

Each station needs to add terminal modules.

**Failure to follow the above instructions could result in damage to the equipment.**

**6.The Use of Power Modules**

Power modules need to be added based on the actual number of I/O modules. The positions of power modules are not fixed between I/O modules. Therefore, the designer must determine the installation positions of power modules in advance.

**⚠ WARNING**

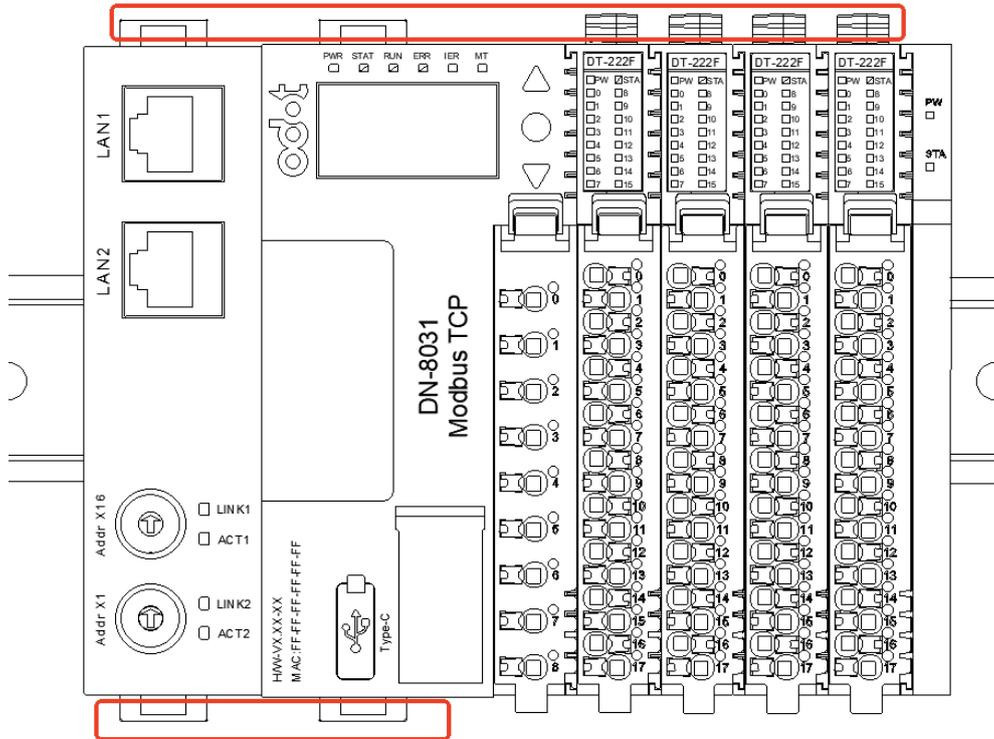
**UNINTENDED EQUIPMENT OPERATION**

If the total current of the I/O modules installed at the rear of the adapter device exceeds the provided current, but no power module is added, the I/O module channels will work abnormally.

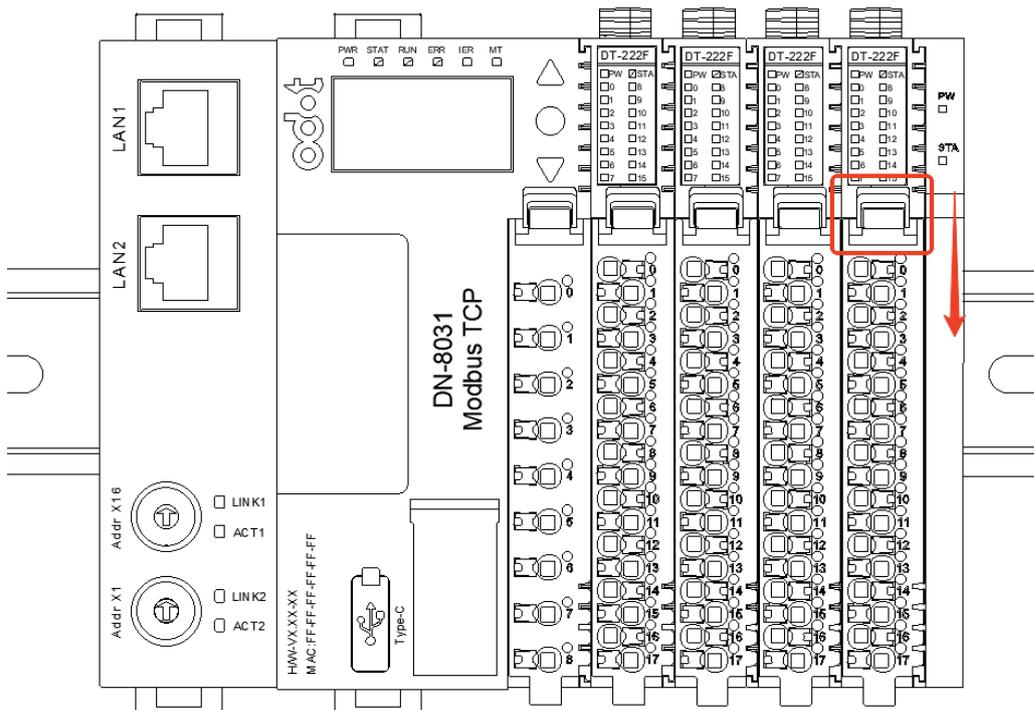
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 7. Removal

When the module is removed, it needs to manually unlock the guide rail on the upper side of the module.



If need to remove the terminal block, first press down on the terminal block snap while removing the terminal block outward.



 **WARNING**

**UNINTENDED EQUIPMENT OPERATION**

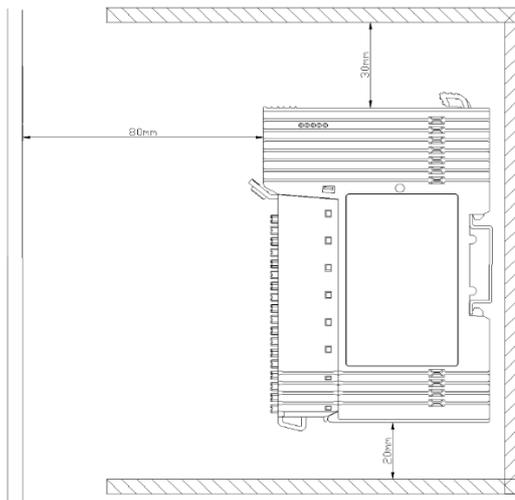
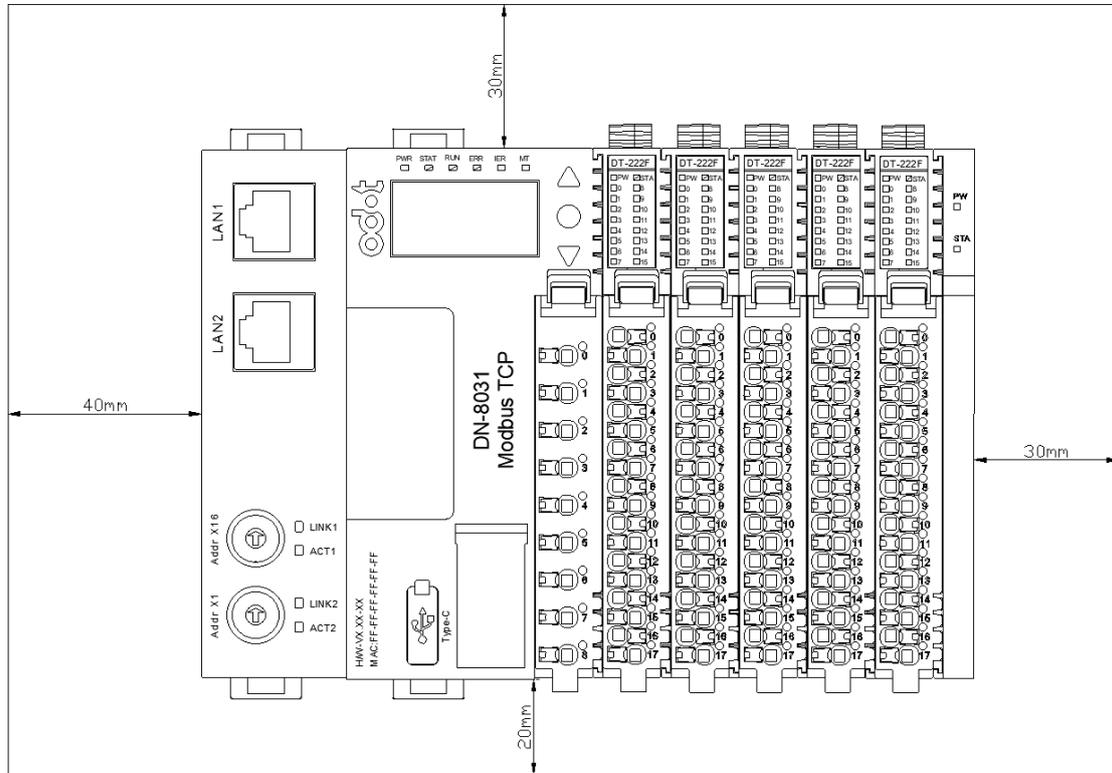
The module does not support the hot swap function. When removing or replacing a module, it is necessary to power off before removing or replacing the module.

When replacing I/O modules in later maintenance, please note that the model and slot number should be replaced correspondingly. It is not allowed to replace with the wrong module model or move the sequence of I/O modules at will, otherwise there will be a risk of burning out the module or damaging the field equipment.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 8. Installation Clearance

When installing or removing a module, leave a minimum clearance.



### **⚠ WARNING**

#### UNINTENDED EQUIPMENT OPERATION

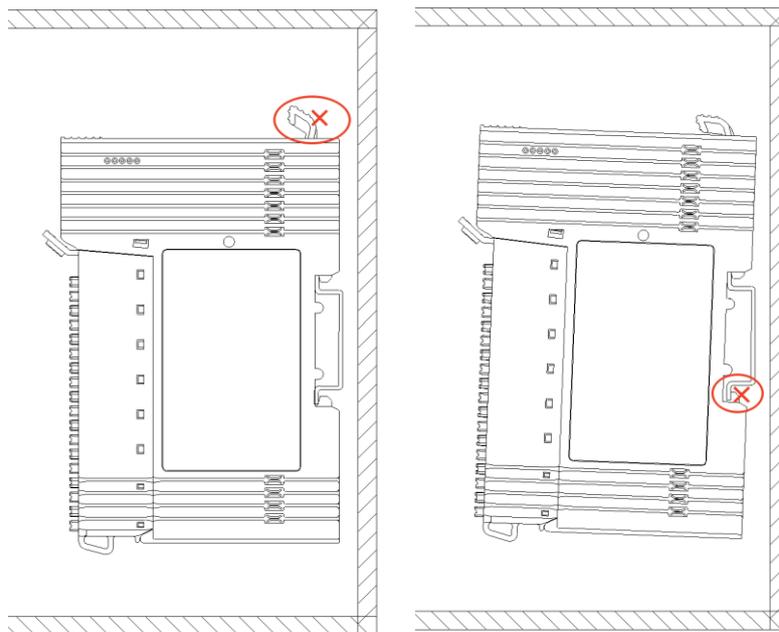
- Install the equipment that dissipates the most heat at the top of the cabinet to ensure proper ventilation.
- Please do not place this device near or above equipment that may cause overheating.
- Install the equipment so that it maintains the minimum clearances stated in this document to all nearby structures and equipment.
- Install all equipment according to the specifications in the relevant documentation.

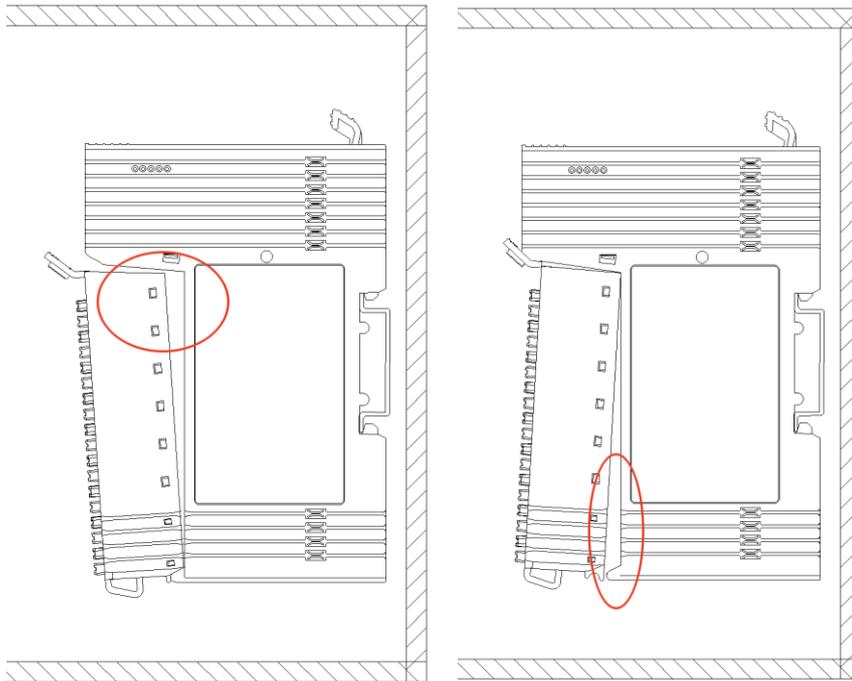
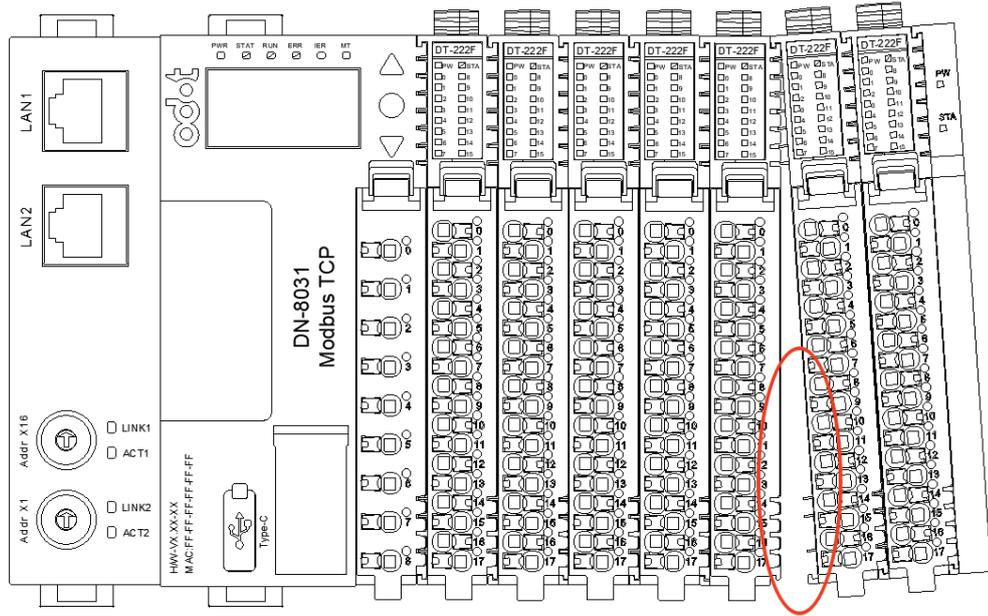
**Failure to follow instructions specified by the manufacturer may result in serious**

consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.

### 9. Incorrect Installation Location

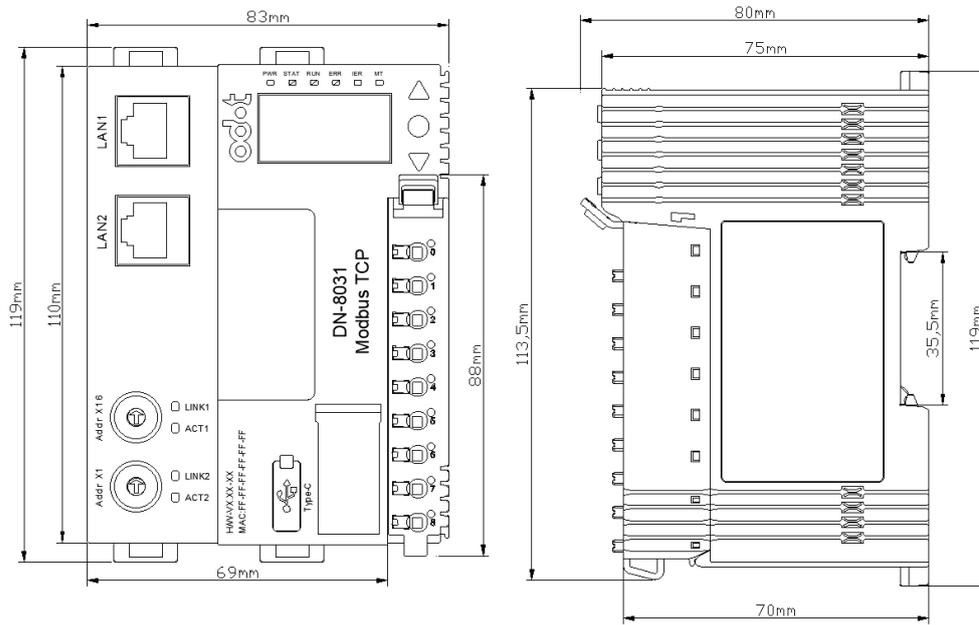
- A. The lock on the left side of the C3351 device is not pressed firmly to the Din rail.
- B. After the installation is completed, the lock on the upper side of the module is not pressed to lock the Din rail, or the pressed position is not in place.
- C. After the installation is completed, the lower part of the side of the module is not installed in place, and the module is not installed vertically, but is inclined to the backplane.
- D. There are gaps between modules.
- E. The terminal blocks are not installed in place



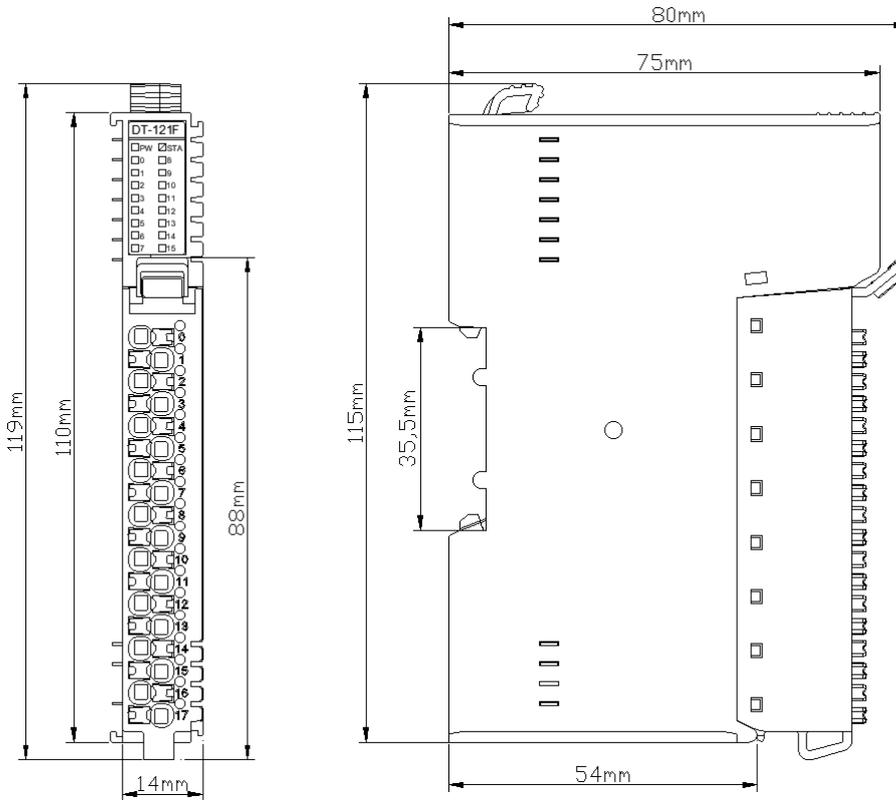


### 10.Installation Size

The installation size of network adapter: 119\*83\*80mm



The installation size of I/O module: 119\*14\*80mm



## 1.7 Power Supply

### DANGER

#### FIRE HAZARD

Use only the correct wire specifications for the maximum current capacity of the power supply.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### WARNING

#### UNINTENDED EQUIPMENT OPERATION

Please do not exceed any ratings specified in the Environmental and Electrical Characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

The device and associated expansion modules require a power supply rated at 24 VDC. According to IEC 61140, the 24 VDC power supply must be rated safety extra-low voltage (SELV) or protective extra-low voltage (PELV). These power supplies are isolated between its electrical input and output circuit.

### WARNING

#### OVERHEATING AND FIRE HAZARD

Never connect the device directly to the line voltage.

Please use only insulated SELV or PELV power supply to power the device.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 1.8 Ventilation Requirements

### NOTICE

IO module, please install in the control cabinet with door lock (control cabinet shell protection >IP20);  
Installation can not be placed under the heat generating elements, the surrounding ventilation and heat dissipation space should be large enough, there should be more than 30MM between the basic unit and the expansion unit;  
The upper and lower parts of the switchgear should have ventilated shutters to prevent direct sunlight exposure;  
During installation, avoid metal shavings and wire tips falling into the controller's ventilation holes, which may cause fire, failure, and misoperation.  
**Failure to follow the above instructions could result in damage to the equipment.**

## 1.9 Scrap Processing

Scrap condition:

1. The use time has exceeded the specified service life, the main structure is obsolete, the components are aging, the performance indicators are reduced, and the basic requirements of use are not met;
2. The damage is so severe that it is beyond repair or the repair cost is close to or exceeds the price of the new purchase of similar electronic equipment;
3. Serious pollution of the environment endangers personal safety and health, technical transformation is difficult or the cost of transformation is uneconomical;
4. Backward technical performance, high energy consumption, low efficiency, maintenance and use of uneconomical.
5. The quality is inferior, does not meet the technical standards, and does not meet the minimum performance indicators in the application.
6. Equipment that cannot be used for other reasons and should not be transferred to other enterprises without retaining value.

### ⚠ WARNING

Since this product cannot be discarded with other household waste, when the end user intends to discard this product, it must be sent to the appropriate facility for recovery and recycling.

Do not discard directly in the trash.  
Comply with the relevant laws and regulations, the destruction process should choose a legitimate organization for processing.

## 1.10 Equipment maintenance and repair

### NOTICE

It is prohibited to replace the detachable power cord with an inappropriate rated wire.  
Any parts that can only be inspected or supplied by the manufacturer or its agents.  
Only for the manufacture of electrical equipment and the operation of personnel with relevant skills and knowledge.  
Confirm the safety status of the equipment after maintenance  
**Failure to follow the above instructions could result in damage to the equipment.**

## 1.11 Disclaimer of Warranties

### Product Usage

### NOTICE

- **WHEN INSTALLING, OPERATING, AND MAINTAINING THE EQUIPMENT, DO NOT EXCEED ANY OF THE RATINGS SPECIFIED IN THE ELECTRICAL CHARACTERISTICS;**
- **WHEN INSTALLING, OPERATING, AND MAINTAINING THE EQUIPMENT, DO NOT EXCEED ANY OF THE RATINGS SPECIFIED IN THE ENVIRONMENTAL CHARACTERISTICS. DO NOT USE THE PRODUCT IN THE FOLLOWING PLACES: PLACES WITH DUST, OIL FUMES, CONDUCTIVE DUST, CORROSIVE GASES, AND FLAMMABLE GASES; DO NOT EXPOSE TO HIGH TEMPERATURES, CONDENSATION, WIND AND RAIN; VIBRATION AND SHOCK WILL ALSO CAUSE DAMAGE TO THE PRODUCT;**

**FAILURE TO FOLLOW THE INSTRUCTIONS MAY RENDER THE PROTECTION PROVIDED BY THE DEVICE NULL AND MAY RESULT IN MINOR BODILY INJURY OR DAMAGE TO THE DEVICE.**

### Disclaimer of Warranties

The Company shall not be liable for any damage or malfunction of the equipment caused by:

1. Transportation damage: equipment damage caused by improper transportation or packaging;
2. Natural factors: damage caused by lightning strikes, voltage fluctuations, water ingress or natural disasters (such as fires, floods, etc.);
3. Improper use: damage caused by overload, non-standard operation, unauthorized modification or use of unqualified accessories;

4. Unauthorized maintenance: equipment failure caused by unauthorized maintenance or alteration;
5. Other non-product reasons: damage caused by other reasons that have nothing to do with the equipment itself.

### **Repair services**

1. For the damage caused by the above reasons, the company will charge the repair fee according to the actual situation.
2. Outside the warranty period, the company provides paid maintenance services, and the cost is charged according to the maintenance situation.

### **Assumption of Risk**

The company shall not be liable for casualties, property damage or other related losses caused by the use of the equipment. All risks are borne by the user.

## **2 Network adapter module**

### **DN-8031 Modbus TCP Network Adapter**

#### **1 Module Features**

- The DN8031 network adapter support standard Modbus TCP server protocol, it supports dual network port switch cascade function, and the module supports simultaneous access by 10 clients;
- The module supports up to 32 IO modules extension, the sum of process data input and output is up to 8192 bytes, flexible selection of IO modules to be paired with adapter;
- The module supports 01/02/03/04/05/06/15/16/23 function code, and it supports Modbus watchdog function;
- Module high speed redundant backplane bus, and the refresh cycle of full load is 0.6ms;
- Module removable installation is more convenient, staggered layout spring light guide terminals, and the terminal is pluggable, it is easy to maintenance and replacement, the wiring diameter is 0.2mm<sup>2</sup> (AWG 24) ~ 1.5mm<sup>2</sup> (AWG 16);
- The internal bus and system power and field power are completely isolated, avoid field equipment signals interfering with module internal communications;
- The module supports communication diagnostics, extended module diagnostic function, with indicator lights such as operating status and communication status;
- The OLED screen can view the module related parameters, it can acquire some important information without the software;

## 2 Technical Parameters

General Parameters	
Module Consumption	78mA@24VDC
System Power	19.2~28.8VDC (Nominal: 24VDC) Anti-inversion protection: support
Internal Bus Supply Current	Max.2A@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Field Power Current	Max. DC 8A
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
The Maximum Number of Expansion Modules	32
Diagnosis Function	Communication diagnostics, extended module status diagnostics
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*83*80mm
Product Certification	CE Certification
Communication Parameters	
Protocol	Modbus TCP server
Interface	2*RJ45, integrated switch capabilities
Line Length	Maximum 100m (segment length) between 2 sites
Transmission Speed	10/100 Mbit/s, full-duplex
Auto-negotiation	Support
Automatic MDI/MDIX	Support
Maximum Number of Input/Output Bytes	Input: 8192 Bytes Output: 8192 Bytes The maximum number of input and output: 8192 Bytes
Redundancy Mode	Not supported
Maximum Number of Client Connections	10
TCP Timed Maintenance	Support
Modbus Watchdog	Support
Modbus Function Code	01/02/03/04/05/06/15/16/23
IP Address Setting	Dial switch or IO Config software
Default IP Address	192.168.1.100
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Air discharge ±8kV, Performance level A;

	SURGE: Common mode $\pm 2\text{kV}$ , Differential mode $\pm 1\text{kV}$ , Performance level A; EFT: $\pm 2\text{kV}$ , Performance level A)
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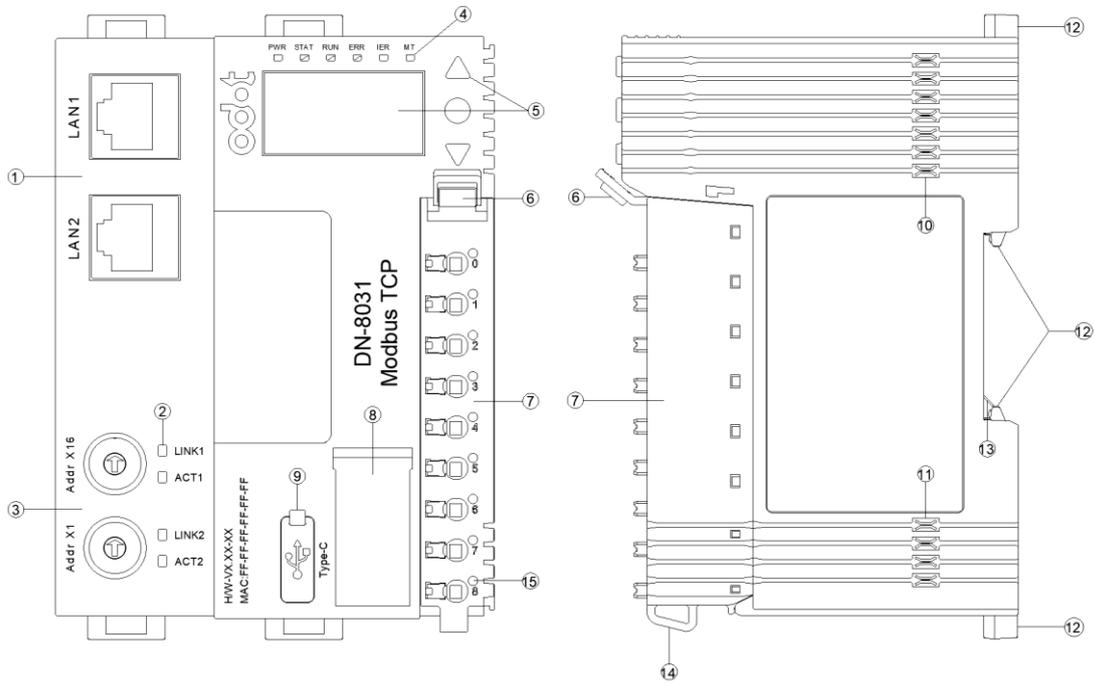
** WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

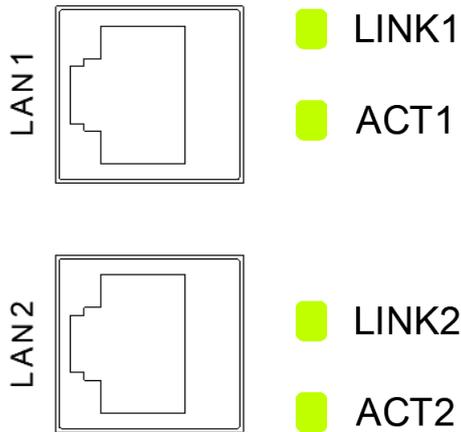
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Network Interface
- ②: Network Interface Indicator
- ③: DIP Switch
- ④: Status Indicator
- ⑤: OLED Screen and Buttons
- ⑥: Wiring Terminal Label
- ⑦: Removable Terminal
- ⑧: Network Adapter Label
- ⑨: Configuration Interface
- ⑩: Internal Bus
- ⑪: Field Power
- ⑫: Buckle
- ⑬: Grounding Spring Sheet
- ⑭: Fixed Wiring Harness
- ⑮: No instruction functions

### 3.1 Network Interface



LAN1/LAN2 supports switch cascading ,10Mbps/100Mbps adaptive rate.

LINK: Link state indicator (Green)

ON: Link UP

OFF: Link DOWN

ACT: Active indicator (Green)

Flash: Active

RJ45 interface pin definition

Pin	Definition	Description
1	TD+	Send +
2	TD-	Send -
3	RD+	Receive +
4	--	--
5	--	--
6	RD-	Receive -
7	--	--
8	--	--

### 3.2 Communication Configuration Interface



Rotary switch for setting IP address (the default IP address is 192.168.1.100).

When the value of rotary switch is 0 or 255, the IP address can be configured by software or with the default IP address.

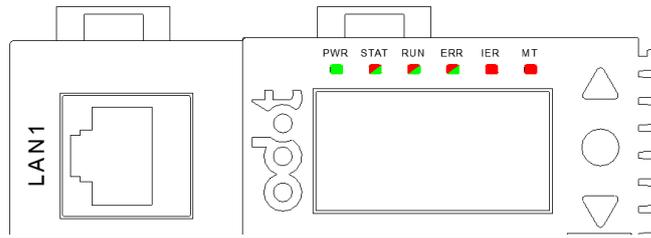
When the rotary switch is not 0 or 255, the last byte of the IP address is determined by the rotary switch, the first 3 bytes can be configured by the software or the first 3 bytes have the default value: 192.168.1.

The relationship between the IP address and the rotary switch value is shown in the following table:

Rotary Switch 0	Rotary Switch 1	Rotary Value	IP Address
0H	0H	00H	Software configuration or default value
0H	1H	01H	X.X.X.1
0H	2H	02H	X.X.X.2
0H	3H	03H	X.X.X.3
.	.	.	.
.	.	.	.
FH	EH	FEH	X.X.X.254

Config: Configuration port, standard Type-C interface for configuring device parameters, firmware upgrades.

### 3.3 LED Indicator

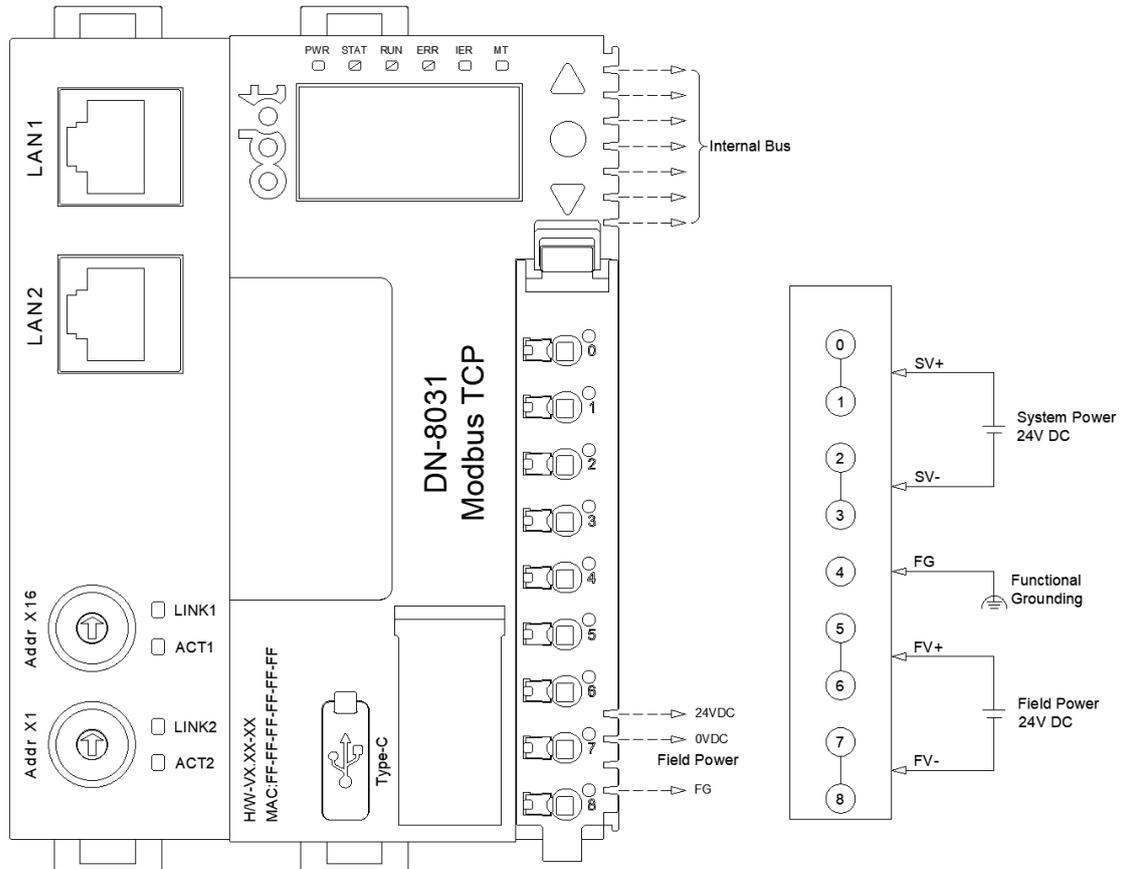


PWR Power indicator (Green)	Definition
ON	The system power supply is normal
OFF	The system power supply is abnormal
STAT Module status indicator (Red/Green)	Definition
ON (Green)	Operation mode
Signal flash (Green)	Stop mode
Slow flash (Green)	Power-on default status
Double flash (Red)	Hardfault abnormal alarms
Flash 3 times (Red)	Task stack overflow alarm
Flash 4 times (Red)	System memory overflow alarm
RUN Network running indicator (Red/Green)	Definition
ON (Green)	The TCP port is connected
OFF	The TCP port is not connected
Flash (Green)	Modbus data exchange
ERR Network error indicator (Red/Green)	Definition
Slow flash (Red)	LAN1 and LAN2 Link-Down
OFF	LAN1 and LAN2 Link-Up
IER IO running indicator (Red)	Definition
OFF	The IO communication is normal
Double flash	The IO communication is abnormal
Fast flash	There is a token line shorted to high level
MT Error indicator (Red)	Definition
OFF	Normal
ON	Maintenance required (current system error)
Flash 4 times	Search interface lit test (with UDP search added).

#### Other indicator status notes:

Indicator Status	Definition
STAT (Red) 2.5HZ flashing, other lights is off	Power on FLASH error
STAT (Red) and RUN (Red) 2.5HZ flashing	Ferroelectric storage error
RUN (Green) and ERR (Red) 10HZ flashing	MAC address is illegal
IER (Green) and MT(Red) 2.5HZ flashing	Configuration parameter memory allocation failed
STAT (Red), RUN (Red), ERR (Red), MT(Red) 2.5HZ flashing	The PHY (switch chip) initialization self-test failed
All indicator lights 2.5HZ flashing	Test mode

## 4 Wiring



### NOTICE

#### Unexpected device operation

Inside the module, two terminal blocks SV+ have been shorted, two terminal blocks SV - have been shorted, two terminal blocks FV+ have been shorted, and two terminal blocks FV - have been shorted. Externally, only one system power supply and one field power supply need to be connected.

The wire should be copper wire with a core greater than 0.2mm<sup>2</sup> and less than 1mm<sup>2</sup>, and the impedance is less than 10Ω.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

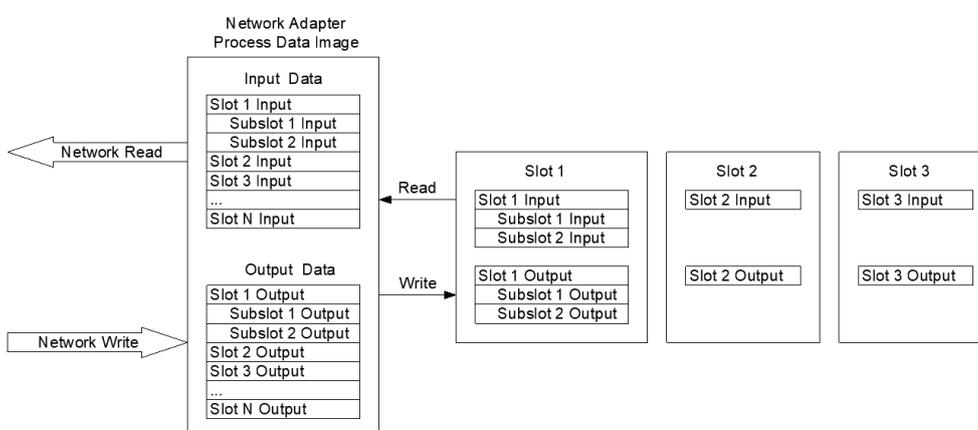
## 5 Process Data Definition

### Adapter process data definition

Modbus TCP adapter itself has no input and output process data.

### IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



One way Modbus address mapping table is different according to different IO module combinations, which can be viewed through the IO Config software, that is, DI mapping to 1xxxx, DO mapping to 0xxxx, AI mapping to 3xxxx, AO mapping to 4xxxx, for special module addresses, please check the address table in the IO Config software.

Another way is to map the addresses of DI, DO, AI, AO, and special modules to 3/4xxxx, corresponding to different address intervals, and the addresses of special modules are sorted backwards in order against the address table in IO Config, and the addresses mapped to 4xxxx are shown in the table below.

Module Type	Address Offset		Read and Write Attributes
	Hexadecimal	Decimal	
AO/DO	0x0000	0	Read and write
AI	0x4000	16384	Read only
DI	0x5000	20480	Read only

DO Mapped to AO Address: Digital Output Mapping to Analog Output Address is set to Enable, the DO area will be mapped to the AO area with the following mapping rules:

When the DO area data length is greater than 0 is mapped to the consecutive addresses

in the AO area. It is also mapped to the AI fixed address 0x3000.

DI area mapping to AI region: When the DI area data length is greater than 0, it is mapped to the AI area continuous address. It is also mapped to the AI area fixed address 0x3000.

## 6 Configuration Parameter Definition

Adapter configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved			Byte Swap	DO Mapped to AO Address	Link down Detection	Fault Action for Input	Reserved
Byte 1	REF Diagnosis Module	Reserved						
Communication configuration parameter								
Bit NO	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	MAC Address [0]							
Byte 1	MAC Address [1]							
Byte 2	MAC Address [2]							
Byte 3	MAC Address [3]							
Byte 4	MAC Address [4]							
Byte 5	MAC Address [5]							
Byte 6	IP Address [0]							
Byte 7	IP Address [1]							
Byte 8	IP Address [2]							
Byte 9	IP Address [3]							
Byte 10	Net Mask [0]							
Byte 11	Net Mask [1]							
Byte 12	Net Mask [2]							
Byte 13	Net Mask [3]							
Byte 14	Net Gateway [0]							
Byte 15	Net Gateway [1]							
Byte 16	Net Gateway [2]							
Byte 17	Net Gateway [3]							
Byte 18	Modbus Port							
Byte 19								
Byte 20	Reserved						Watchdog	
Byte 21	Watchdog Time (s)							
Byte 22	OLED Display Time							
Byte 23-25	Reserved							

Data description:

**Fault Action for Input:** the input fault handling mode, when the IO module is offline, the adapter will use this mode to deal with the input data. (Default value: Cleaning input value)

0: Hold the last input value

1: Cleaning input value

**Link down Detection:** Network fault detection, enable and disable are optional.

(Default value: enable)

**DO Mapped to AO Address:** The digital output is mapped to the analog output address, and enable and disable are optional. (Default: disable)

**Byte Swap:** Byte swap (the digital is mapped to analog), enable and disable are optional. (Default value: enable)

**REF Diagnosis Module:** The diagnostic control module uses prompts, and adds the diagnostic submodule to the terminal module, which is a read-only property. (Default: Add related submodules to the terminal module)

1: Add related submodules to the terminal module

**MAC Address:** MAC address, read only.

**IP Address:** the IP address of adapter.

**Net Mask:** Net mask.

**Net Gateway:** Net gateway.

**Modbus Port:** The port of Modbus-TCP server. (Default value: 502)

**Watchdog:** Modbus watchdog. (Default value: 1)

0: Disable

1: Enable

**Watchdog Time(s):** Modbus watchdog cycle, when the watchdog is enabled, if there is no Modbus data exchange on the TCP connection during this time period, the TCP connection will be disconnected (other TCP connections with data exchange are maintained normally), range: 20~65535. (Default: 30)

**OLED Display Time:** OLED screen display time (min), (default value: 1), the display is normally on when it is 0, range: 0~240 (**because the screen is an OLED screen, there is a risk of burn-in when it is always on, please use it with caution**).

## 7 System Diagnostic Area

System diagnostics are divided into two parts:

Part I: The "Status Input" store, addresses 0x2000-0x209E 158 words in total.

No.	Storage type	Description	Storage capacity	Address range	Read and write
1	3xxxx	System diagnostics - status input	158 Word	0x2000~0x209E	Read only

The Modbus client can use the 04 function code to monitor the 0x2000~0x209E address, and can obtain the status and error code of the IO modules, the data format is shown in the following table:

No.	Modbus address (Decimal)	Modbus address (Hexadecimal)	Data name	Description
1	8192	0x2000	Reset state	
2	8193	0x2001	Reset state 1	Reset state 1*
3	8194	0x2002	DIP switch value	
4	8195	0x2003	Running time - seconds	
5	8196	0x2004	Running time - min	
6	8197	0x2005	Running time - hours	
7	8198	0x2006	Running time - days	
8	8199	0x2007	MAC	The MAC address of current device
9	8200	0x2008		
10	8201	0x2009		
11	8202	0x200A	IP	The IP address of current device
12	8203	0x200B		
13	8204	0x200C	MASK	The MASK address of current device
14	8205	0x200D		
15	8206	0x200E	GATEWAY	The GATEWAY address of current device
16	8207	0x200F		
17	8208	0x2010	DI-size	The size of discrete input data
18	8209	0x2011	DO-size	The size of coil output data
19	8210	0x2012	AI-size	The size of input register data
20	8211	0x2013	AO-size	The size of holding register data
21	8212	0x2014	Config-Client-IP	Configuring Interface Client IP
22	8213	0x2015		
23	8214	0x2016	Config-Client-Port	Configure Interface Client Port
24	8215	0x2017	Modbus-Client-Number	Number of Modbus clients connected
25	8216	0x2018	Modbus-Client-1-IP	Client 1-IP

26	8217	0x2019		
27	8218	0x201A	Modbus-Client-1-Port	Client 1-Port
28	8219	0x201B	Modbus-Client-2-IP	Client 2-IP
29	8220	0x201C		
30	8221	0x201D	Modbus-Client-2-Port	Client 2-Port
.	.	.	.	.
.	.	.	.	.
49	8240	0x2030	Modbus-Client-9-IP	Client 9-IP
50	8241	0x2031		
51	8242	0x2032	Modbus-Client-9-Port	Client 9-Port
52	8243	0x2033	Modbus-Client-10-IP	Client 10-IP
53	8244	0x2034		
54	8245	0x2035	Modbus-Client-10-Port	Client 10-Port
55	8246	0x2036	Module_Error[0]	Module 0 error code
56	8247	0x2037		
57	8248	0x2038	Module_Error[1]	Module 1 error code
58	8249	0x2039		
.	.	.	.	.
.	.	.	.	.
115	8306	0x2072	Module_Error[31]	Module 31 error code
116	8307	0x2073		
117	8308	0x2074	Module_Error[32]	Module 32 error code
118	8309	0x2075		
.	.	.	.	.
137	8328	0x2088	Diagnosis of network adapter	Diagnosis of network adapter
138	8329	0x2089	Module 1 - 8 terminals are abnormal	Diagnosis of module terminal
139	8330	0x208A	Module 9 -16 terminals are abnormal	
140	8331	0x208B	Module 17 -24 terminals are abnormal	
141	8332	0x208C	Module 25 -32 terminals are abnormal	
142	.	.	.	
143	8334	0x208E	Module 1-8 CAN CH1 state	Module CAN CH1 state
.	.	.	.	
147	8338	0x2092	Module 25-32 CAN CH1 state	Module CAN CH2 state
148	8339	0x2093	Module 1-8 CAN CH2 state	
.	.	.	.	
152	8343	0x2097	Module 25-32 CAN CH2 state	Module offline state
153	8344	0x2098	Module 1-8 offline state	
.	.	.	.	
157	8348	0X209C	Module 25-32 offline state	

158	8349	0X209D	CAN CH1 load	
159	8350	0X209E	CAN CH2 load	

\* **Reset state 1** Register 38193 address data format is as follows:

Bit offset	Bit name	Description	Default value
Bit 0-7	Reserved	Reserved	0
Bit 8	HardFault	Hard fault reset	0
Bit 9	StackOver	Stack overflow reset	0
Bit 10	MemoryOver	Memory overflow reset	0
Bit 11-15	Reserved	Reserved	0

\* **Diagnosis of network adapter** Register 38328 address data format is as follows:

Bit offset	Bit name	Description	Default value
Bit 0	Connector err	Terminal error	0
Bit 1	System Power err	System power	0
Bit 2	Field Power err	Field power error	0
Bit 3	Terminal Module err	Terminal module error	0
Bit 4-15	Reserved	Reserved	0

**Part II: Control output Storage, address 0x2000**

No.	Storage type	Description	Storage capacity	Address	Read and write
1	4xxxx	System diagnosis control output	1 Word	0x2000	RW

Modbus client can use the 06/16 function code to write the address 0x2000, to achieve the reset function or the port mirror control function.

Register 408192: bit address data format is as follows:

No.	Modbus address (decimal)	Modbus address (hexadecimal)	Data name	Description
1	8192	0x2000	Restart	When writing 0xC328, enter a soft reset.

## 8 OLED Interface



### Key definition:

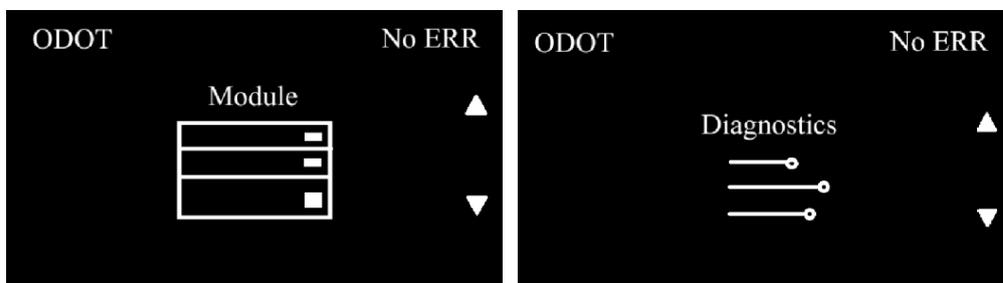
▲ is the page up button, ● is the confirmation and exit button, ▼ is the page down button.

### Special application notes:

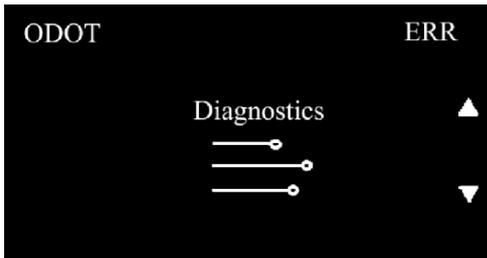
1. Press the up and down buttons ▲ and ▼ at the same time, and the screen will appear "Is it reset?", the network adapter parameters can be reset by pressing the ● button.
2. Short press the middle button ● to confirm, and long press to exit.

### Display interface:

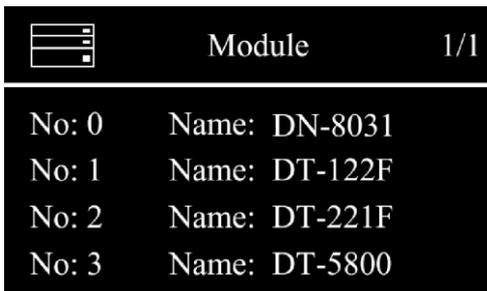
After the initial configuration is completed after power on, there are two interfaces, in which "Module" displays the basic information and channel information of the module. "Diagnostics" is displayed for diagnostic records. Toggle the display by clicking the ▲ and ▼ buttons.



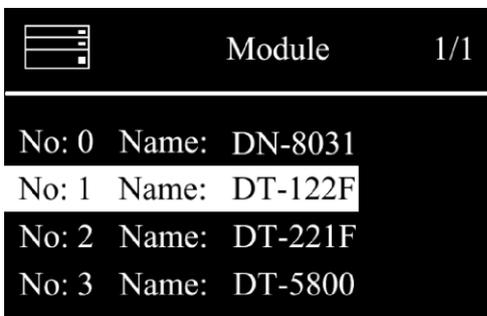
When there is an error, the "ERR" logo will flash in the upper right corner.



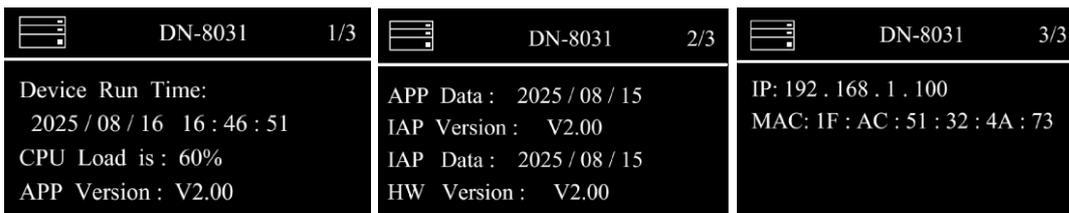
Click ● on the "Module" interface to enter the next-level module selection interface, and switch the display page by press the ▲ and ▼ buttons, as shown in the following figure. At this time, press and hold the ● button to return to the previous level.



Click the ● button in the figure above to enter the next level module selection interface, and click the ▲ and ▼ buttons to switch module selection. At this time, press and hold the ● button to return to the previous level.



Enter the module information display interface and switch the display by clicking the ▲ and ▼ buttons, as shown in the figure below. At this time, press and hold the ● button to return to the previous level.



(Note: The network adapter displays: APP version and date, IAP version and date, hardware version, IP address, MAC address, and other information. Module display:

module type, software version, hardware version, IAP version, and channel status. )

 DT-122F 1/2	 DT-122F 2/2
Type: 16DI Sink Soft Version: V2.00 HW Version: V2.00 IAP Version: V2.00	01234567 89ABCDEF ----- --*****

**Diagnosis interface:**

Display the module diagnostic information on the Diagnostics screen, and click the ▲ and ▼ buttons to switch the display page. At this time, press and hold the ● button to return to the previous level.

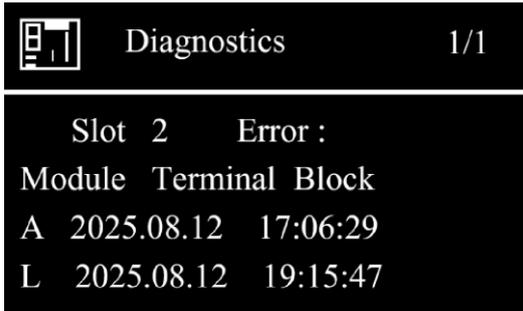
Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	0 L
3	ERR: Connector0	L

(Note: The error that occurs after this interface is displayed first, with a maximum of 200 items, as shown in the above figure, "A" and "L" represent respectively, the error still exists and the error has been eliminated, "Connector" is the specific error of the current error, and "28" is the slot number)

Click the ● button in the interface as shown in the figure above to enter the next level of diagnostic data selection interface, and click the ▲ and ▼ buttons to select and switch the diagnostic data. At this time, press and hold the ● button to return to the previous level.

Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	L
3	ERR: Connector0	L

Enter the module error information display interface, as shown in the figure below, press and hold the ● button to return to the previous level.

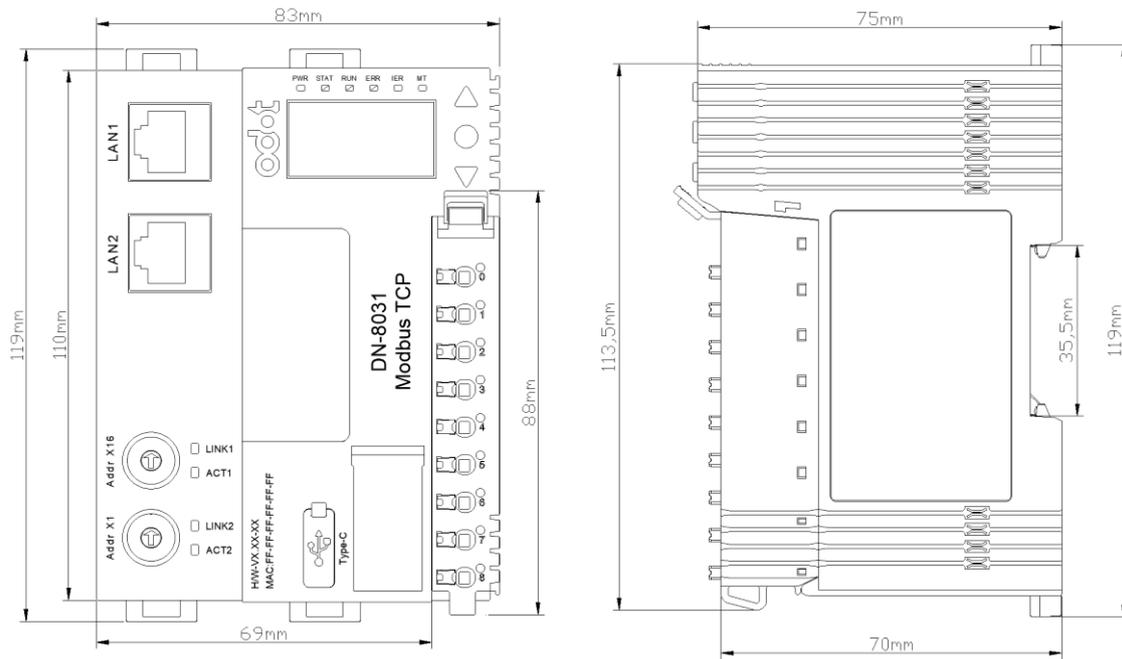


(Note: "Module Terminal Block" is the specific error of the current error, and "slot" is the slot number where the error occurred.) "A" is the time when the error occurred. "L" is the time when the error left)

**Error diagnosis code details**

Error Code	Simple Display	Detailed Display	Definition
0x00000003	Bus1	Module Backplane Bus1	Bus channel 1 is abnormal
0x00000004	Bus2	Module Backplane Bus2	Bus channel 2 is abnormal
0x00000005	Offline	Module Offline	Communication error between the module and the adapter
0x00000006	Connector	Module Terminal Block	Abnormal connection of equipment terminals
0x00000007	S24	System power supply	System power connection is abnormal
0x00000008	F24	Field power supply	Abnormal power connection at the site
0x00000009	Terminal	Terminal equipment	The terminal module is not mounted or the communication of the terminal module is abnormal
0x0000000A	Token	Token line shorted	There is a situation where the token line is short-circuited to a high level
0x0000000B	Memory	Memory Allocation	Exceeded the limit of sub-module additions
0x0000000C	PWR LOW	MCU low Voltage	Abnormal power supply for MCU
0x0000000D	HFER	Hardfault ERR	Hard Fault exception reset
0x0000000E	SOVR	Task stack overflow	Task stack overflow exception reset
0x0000000F	MOVR	Memory overflow	System memory overflow exception reset
0x00000010	Wdg Time	Wdg Timeout alarm	Watchdog timer timeout exception reset
0x00000011	Power Off	Power Is Off	Adapter power failure
0x00000100	MOD over	Module overrun	The number of configured modules has exceeded the limit

## 9 Dimension Drawing



## DN-8032-L PROFINET Network Adapter

### 1 Module Feature

- The DN8032-L network adapter supports standard PROFINET IO Device protocol, and it supports dual network port switch cascade function;
- The module supports up to 32 IO modules expansion, the maximum input of process data is 1440 bytes (Each submodule is 1 byte and is associated with the state of the input data). and the maximum output is 1440 bytes (Each submodule is 1 byte and is associated with the state of the output data), flexible selection of IO modules to be paired with adapter;
- The module not supports the MRP media redundancy and the redundant ring network, it supports RT real-time communication mode, RT real-time communication minimum period is 1ms;
- Module high speed redundant backplane bus, and the refresh cycle of full load is 0.6ms;
- Module removable installation is more convenient, staggered layout spring light guide terminals, and the terminal is pluggable, it is easy to maintenance and replacement, the wiring diameter is 0.2mm<sup>2</sup> (AWG 24) ~ 1.5mm<sup>2</sup> (AWG 16);
- The internal bus and system power and field power are completely isolated, avoid field equipment signals interfering with module internal communications;
- The module supports communication diagnostics, extended module diagnostic function, with indicator lights such as operating status and communication status;
- The OLED screen can view the module related parameters, it can acquire some important information without the software;

## 2 Technical Parameter

General Parameter	
Current Consumption	107mA@24VDC
System Power	19.2~28.8VDC (Nominal: 24VDC) Anti-inversion protection: support
Internal Bus Supply Current	Max.2A@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Field Power Current	Max. DC 8A
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
The Maximum Number of Expansion Modules	32
Diagnosis Function	Communication diagnostics, extended module status diagnostics
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*83*80mm
Product Certification	CE Certification
Communication Parameters	
Protocol	PROFINET IO Device
Input	1440 bytes
Output	1440 bytes
Transmission Speed	10/100 Mbit/s
RT	Support, RT real-time communication minimum period is 1ms
IRT	Not support
MRP	Not support
MRPD	Not support
Device Name Setting	DIP switch or software configuration
Environment Parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Air discharge ±8kV, Performance level A; SURGE: Common mode ±2kV, Differential mode ±1kV, Performance level A; EFT: ±2kV, Performance level A)

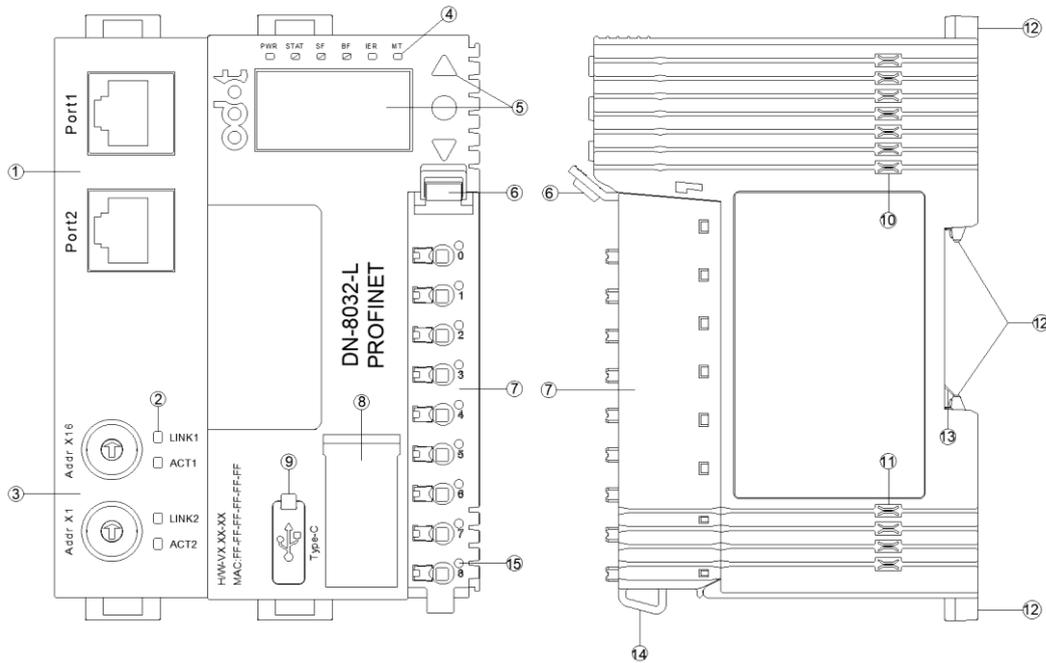
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

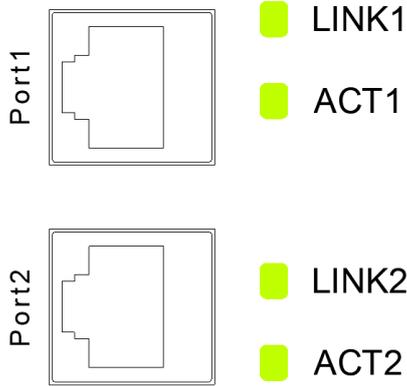
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Network Interface
- ②: Network Interface Indicator
- ③: DIP Switch
- ④: Status Indicator
- ⑤: OLED Screen and Buttons
- ⑥: Wiring Terminal Label
- ⑦: Removable Terminal
- ⑧: Network Adapter Label
- ⑨: Configuration Interface
- ⑩: Internal Bus
- ⑪: Field Power
- ⑫: Buckle
- ⑬: Grounding Spring Sheet
- ⑭: Fixed Wiring Harness
- ⑮: No instruction functions

### 3.1 Hardware Interface



Port1/ Port12 supports switch cascading ,10Mbps/100Mbps adaptive rate.

LINK: Link state indicator (Green)

ON: Link UP

OFF: Link DOWN

ACT: Active indicator (Green)

Flash: Active

RJ45 interface pin definition

Pin	Definition	Description
1	TD+	Send +
2	TD-	Send -
3	RD+	Receive +
4	--	--
5	--	--
6	RD-	Receive -
7	--	--
8	--	--

### 3.2 Communication Configuration Interface



Rotary switch for setting PROFINET device name. (Default value: DN-8032-L-Addr)

When the value of rotary switch is 0, the device name is the default value, or configured by the PROFINET tools.

When the value of rotary switch is not 0, the device name is configured by the rotary switch, the relationship between the device name and the rotary switch value is

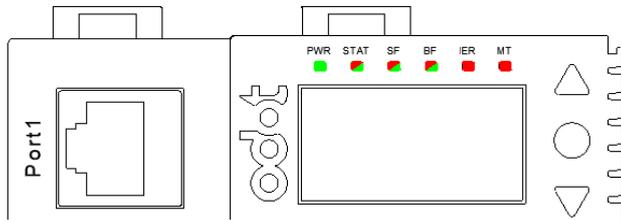
shown in the following table:

Rotary Switch 0	Rotary Switch 1	Rotary Value	Device Name
0H	0H	00H	Software configuration
0H	1H	01H	DN-8032-L-1
0H	...	...	...
0H	FH	0FH	DN-8032-L-15
1H	0H	10H	DN-8032-L--16
1H	1H	11H	DN-8032-L--17
1H	...	...	...
1H	FH	1FH	DN-8032-L--31
...	...	...	...
FH	FH	FFH	DN-8032-L--255

Config: configuration port, standard Type-C interface for configuring device parameters, firmware upgrades.

Note: To communicate using the PROFINET monitor assigning the device name, keep the rotary switch at 0. If the rotary switch value is not 0, there is a conflict between the assignment address and the dial address.

### 3.3 LED Indicator



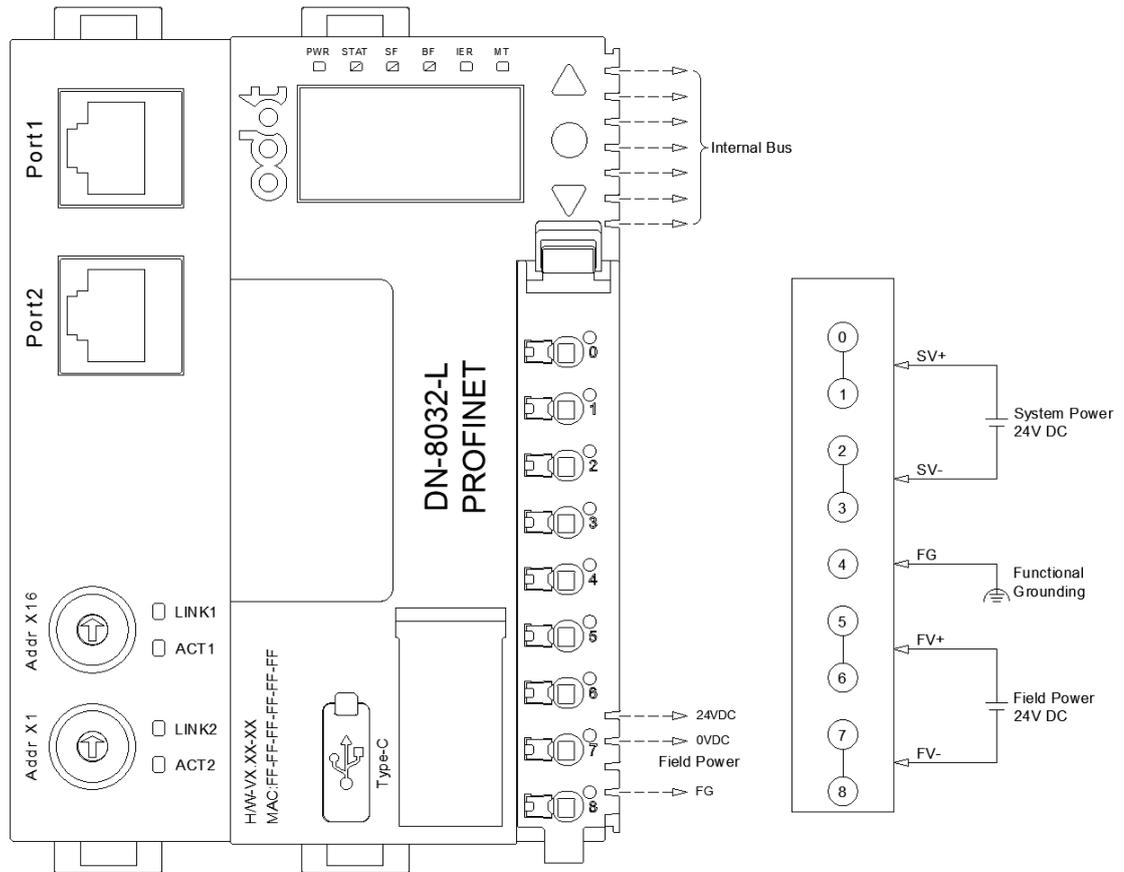
PWR Power indicator (Green)	Description
ON	The system power supply is normal
OFF	The system power supply is abnormal
STAT Module status indicator (Red/Green)	Description
Slow flash (Green)	Power-on default status
ON (Green)	Running mode
Slow flash (Red/Green)	Upgrading mode
Fast flash (Red/Green)	Firmware Upgrading
Double flash (Red)	Hardfault Abnormal alarms
Flash 3 times (Red)	Task stack overflow alarm
Flash 4 times (Red)	System memory overflow alarm
Flash 5 times (Red)	Watchdog reset alarm
SF Network running indicator (Red/Green)	Description
OFF	Normal
Slow flash (Red)	Lighting test
Fast flash (Red)	The MAC address is illegal
BF Running error indicator (Red/Green)	Description
ON (Red)	Port1 and Port2 Link-Down
Slow flash (Red)	The device is offline
OFF	The device is online
IER Running indicator (Red)	Description
OFF	IO communication is normal
Double flash	IO module is offline
Fast flash	There is a token line shorted to high level
MT Error indicator (Red)	Description
OFF	Normal
ON	The current system is faulty and needs maintenance
Flash 4 times	IO Config software lighting test

#### Other indicator status notes:

Indicator Status	Definition
STAT (Red) 2.5HZ flashing, other indicators are off	Power-on FLASH error
STAT (Red) and SF (Red) 2.5HZ flashing	Ferroelectric storage error
IER (Green) and MT (Red) 2.5HZ flashing	Configuration parameter memory allocation failed
STAT (Red), SF (Red), BF (Red), MT (Red) 2.5HZ flashing	The PHY (switch chip) initialization self-test failed
STAT (Green), SF (Green), BF (Green), IER (Red) 2.5HZ flashing	SDRAM self-test error
SF (Red) 10HZ flashing, Link1 indicator is off	Port1 network port is not 100 Mbps full duplex (Note: self-check when plug in the Ethernet cable)

BF (Red) 10HZ flashing, Link2 indicator is off	Port2 network port is not 100 Mbps full duplex (Note: self-check when plug in the Ethernet cable)
BF (Green) 10HZ flashing	There is no data interaction within 10 seconds when the network cable is plugged in
STAT (Red/Green), SF (Red/Green), BF (Red/Green), IER (Red), MT (Red) 10HZ recycle flashing	Test mode, stop the test mode and restore the state before the test mode

## 4 Wiring



### NOTICE

#### Unexpected device operation

Inside the module, two terminal blocks SV+ have been shorted, two terminal blocks SV - have been shorted, two terminal blocks FV+ have been shorted, and two terminal blocks FV - have been shorted. Externally, only one system power supply and one field power supply need to be connected.

The wire should be copper wire with a core greater than 0.2mm<sup>2</sup> and less than 1mm<sup>2</sup>, and the impedance is less than 10Ω.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

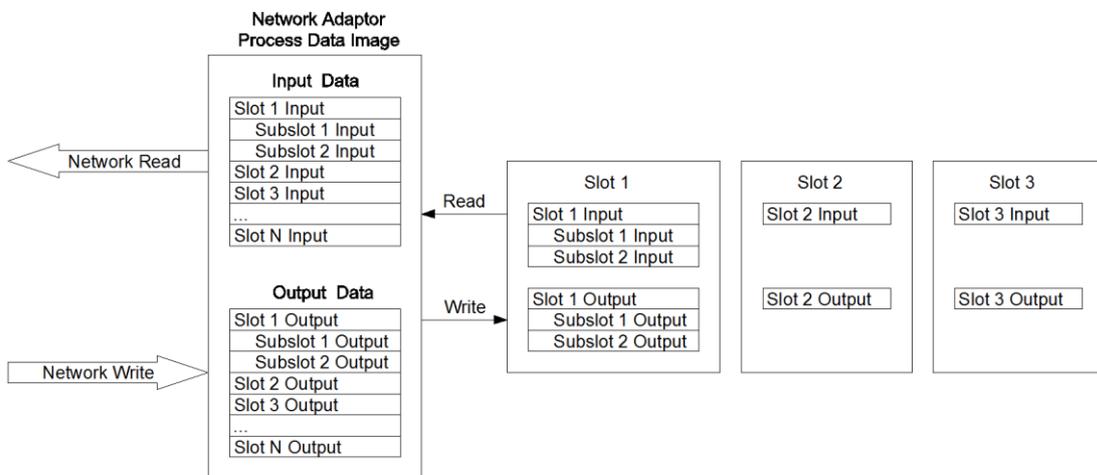
## 5 Process Data Definition

### Adapter process data definition

PROFINET adapter itself has no input and output process data.

### IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



## 6 Configuration Parameter Definition

Adapter configuration parameter									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	REF Diagnosis Module prompt	Reserved				PN Configuration Control	Fault Action for Input	Reserved	
Communication configuration parameter									
Byte 1	MAC Address								
Byte 2									
Byte 3									
Byte 4									
Byte 5									
Byte 6									
Byte 7	IP Address								
Byte 8									
Byte 9									
Byte 10									
Byte 11	Net Mask								
Byte 12									
Byte 13									
Byte 14									
Byte 15	Net Gateway								
Byte 16									
Byte 17									
Byte 18									
Byte 19~82	PROFINET Device Name								
Byte 83	OLED DISPLAY TIME								
Byte 84~115	Reserved								

Data description:

**Fault Action for Input:** The input fault handing mode, when the IO module is offline, the adapter will use this mode to deal with the input data. (Default value: Cleaning input value)

0: Hold the last input value

1: Cleaning input value

**PN Configuration Control:** Allows the device to be reconfigured through the user program (virtual placeholder function), and this function can be enabled, which can be configured to adapt to the changes in the actual hardware by changing the corresponding configuration without changing the PLC configuration program, so as to achieve the following possibilities: 1. The modules in the hardware configuration can

match the actual modules in the socket in any order; 2. The modules configured in the hardware configuration may be missing in the actual module configuration; 3.

Individual slots in the hardware configuration can be deactivated, even if the actual module exists. (Default: Disable)

0: Disable

1: Enable

**REF Diagnosis Module:** The diagnostic control module uses prompts, makes prompts, and adds submodules to the terminal module, which is a read-only property. (Default: Add relevant submodules to the terminal module to use).

1: Add relevant submodules to the terminal module to use

**MAC Address:** Device MAC address, read-only.

**IP Address:** Device IP address, read-only.

**Net Mask:** Device subnet mask, read-only.

**Net Gateway:** Device gateway address, read-only.

**PROFINET Device Name:** Device name, read-only.

**OLED DISPLAY TIME:** OLED screen display time, (default value: 1 min), the display is normally on when it is 0, range: 0~240. **(Because the screen is OLED screen, there is a risk of burn-in when it is always on, please use it with caution).**

## 7 OLED Interface



### Key definition:

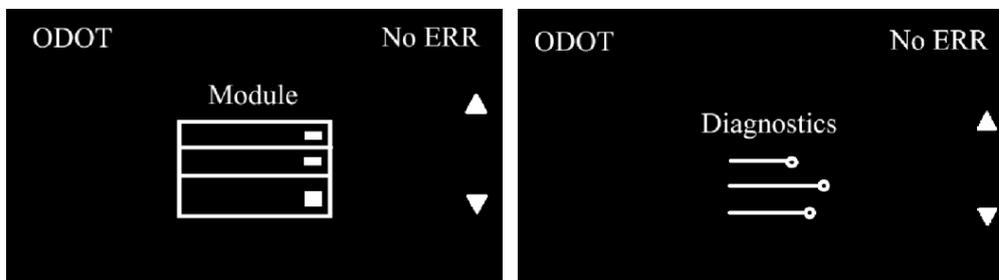
▲ is the page up button, ● is the confirmation and exit button, ▼ is the page down button.

### Special application notes:

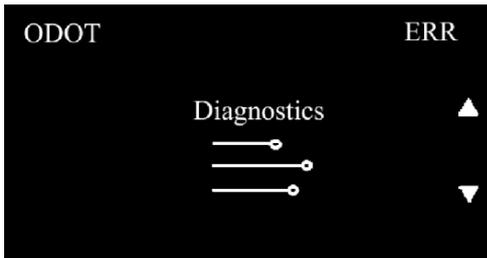
1. Press the up and down buttons ▲ and ▼ at the same time, and the screen will appear “Is it reset ?” , the network adapter parameters can be reset by pressing the ● button.
2. Short press the middle button ● to confirm, and long press to exit.

### Display interface:

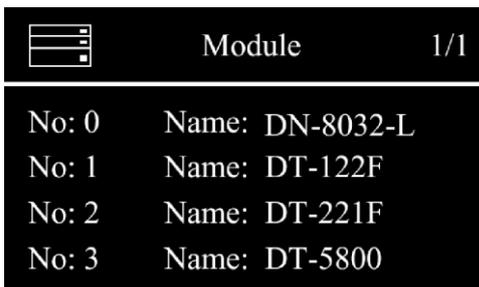
After the initial configuration is completed after power on, there are two interfaces, in which "Module" displays the basic information and channel information of the module. "Diagnostics" is displayed for diagnostic records. Toggle the display by clicking the ▲ and ▼ buttons.



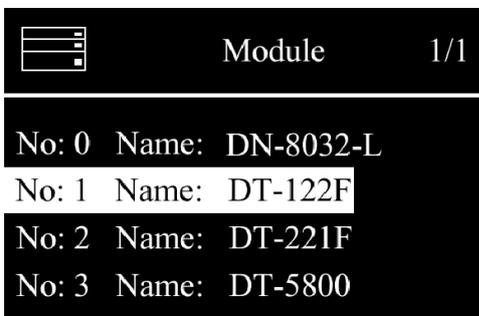
When there is an error, the "ERR" logo will flash in the upper right corner.



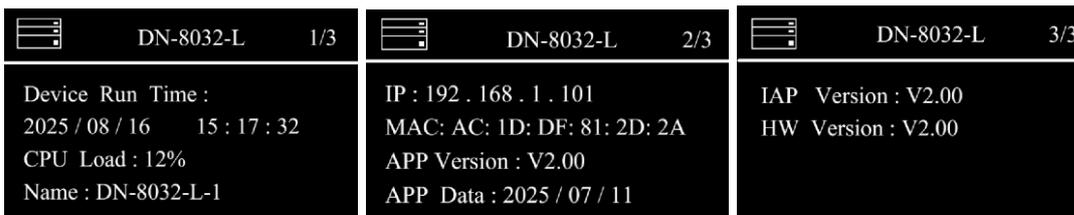
Click ● on the "Module" interface to enter the next-level module selection interface, and switch the display page by press the ▲ and ▼ buttons, as shown in the following figure. At this time, press and hold the ● button to return to the previous level.



Click the ● button in the figure above to enter the next level module selection interface, and click the ▲ and ▼ buttons to switch module selection. At this time, press and hold the ● button to return to the previous level.



Enter the module information display interface and switch the display by clicking the ▲ and ▼ buttons, as shown in the figure below. At this time, press and hold the ● button to return to the previous level.



(Note: The network adapter displays: APP version and date, IAP version and date, hardware version, IP address, MAC address, and other information. Module display:

module type, software version, hardware version, IAP version, and channel status.)

 DT-122F 1/2	 DT-122F 2/2
Type: 16DI Sink Soft Version: V2.00 HW Version: V2.00 IAP Version: V2.00	01234567 89ABCDEF ----- --*****

**Diagnosis interface:**

Display the module diagnostic information on the Diagnostics screen, and click the ▲ and ▼ buttons to switch the display page. At this time, press and hold the ● button to return to the previous level.

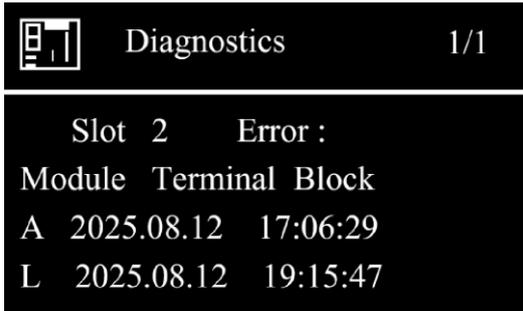
Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	0 L
3	ERR: Connector0	L

(Note: The error that occurs after this interface is displayed first, with a maximum of 200 items, as shown in the above figure, "A" and "L" represent respectively, the error still exists and the error has been eliminated, "Connector" is the specific error of the current error, and "28" is the slot number)

Click the ● button in the interface as shown in the figure above to enter the next level of diagnostic data selection interface, and click the ▲ and ▼ buttons to select and switch the diagnostic data. At this time, press and hold the ● button to return to the previous level.

Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	L
3	ERR: Connector0	L

Enter the module error information display interface, as shown in the figure below, press and hold the ● button to return to the previous level.

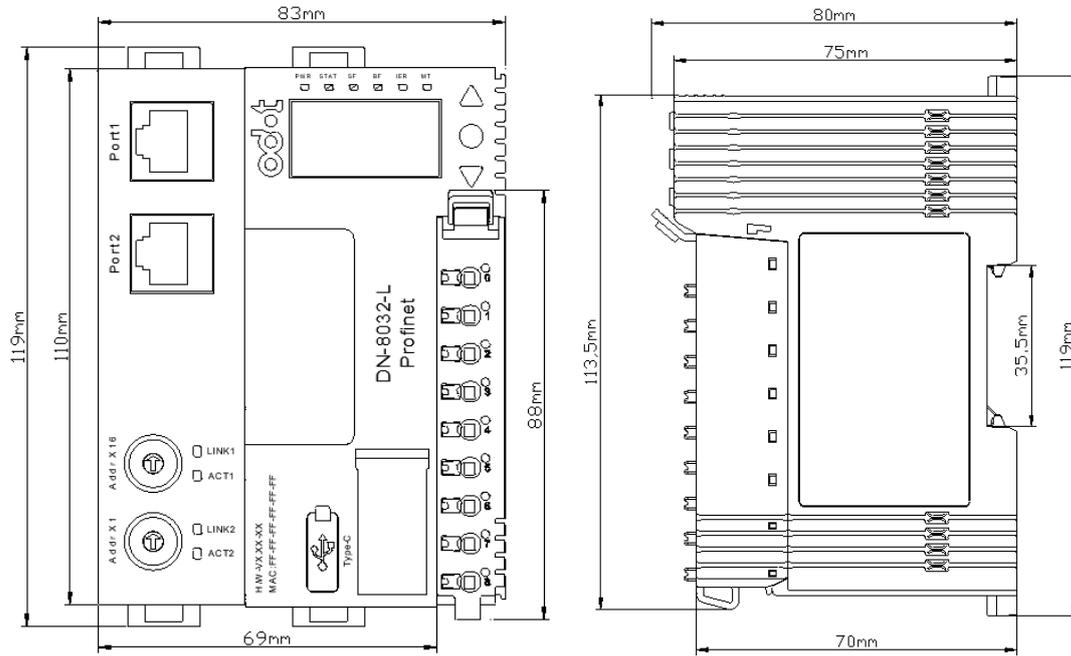


(Note: "Module Terminal Block" is the specific error of the current error, and "slot" is the slot number where the error occurred.) "A" is the time when the error occurred. "L" is the time when the error left)

**Error diagnosis code details**

Error Code	Simple Display	Detailed Display	Definition
0x00000003	Bus1	Module Backplane Bus1	Bus channel 1 is abnormal
0x00000004	Bus2	Module Backplane Bus2	Bus channel 2 is abnormal
0x00000005	Offline	Module Offline	Communication error between the module and the adapter
0x00000006	Connector	Module Terminal Block	Abnormal connection of equipment terminals
0x00000007	S24	System power supply	System power connection is abnormal
0x00000008	F24	Field power supply	Abnormal power connection at the site
0x00000009	Terminal	Terminal equipment	The terminal module is not mounted or the communication of the terminal module is abnormal
0x0000000A	Token	Token line shorted	There is a situation where the token line is short-circuited to a high level
0x0000000B	Memory	Memory Allocation	Exceeded the limit of sub-module additions
0x0000000C	PWR LOW	MCU low Voltage	Abnormal power supply for MCU
0x0000000D	HFER	Hardfault ERR	Hard Fault exception reset
0x0000000E	SOVR	Task stack overflow	Task stack overflow exception reset
0x0000000F	MOVR	Memory overflow	System memory overflow exception reset
0x00000010	Wdg Time	Wdg Timeout alarm	Watchdog timer timeout exception reset
0x00000011	Power Off	Power Is Off	Adapter power failure
0x00000100	MOD over	Module overrun	The number of configured modules has exceeded the limit

## 8 Dimension Drawing



## **DN-8033 EtherCAT Network Adapter**

### **1 Module Features**

- The DN8033 network adapter support standard EtherCAT protocol, ethernet supports 100Mbit/s communication speed;
- The module supports up to 32 IO modules extension, the maximum input of process data is 1024 bytes, and the maximum output is 1024 bytes, flexible selection of IO modules to be paired with adapter;
- The module supports SDO master configuration function, it can be configured by the EtherCAT master software;
- Module high speed redundant backplane bus, and the refresh cycle of full load is 0.6ms;
- Module removable installation is more convenient, staggered layout spring light guide terminals, and the terminal is pluggable, it is easy to maintenance and replacement, the wiring diameter is 0.2mm<sup>2</sup> (AWG 24) ~ 1.5mm<sup>2</sup> (AWG 16);
- The internal bus and system power and field power are completely isolated, avoid field equipment signals interfering with module internal communications;
- The module supports communication diagnostics, extended module diagnostic function, with indicator lights such as operating status and communication status;
- The OLED screen can view the module related parameters, it can acquire some important information without the software;

## 2 Technical Parameter

General Parameters	
Module Consumption	112mA@24VDC
System Power	19.2~28.8VDC (Nominal: 24VDC) Anti-inversion protection: support
Internal Bus Supply Current	Max.2A@5VDC
Filed Power	19.2~28.8VDC (Nominal: 24VDC)
Field Power Current	Max. DC 8A
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
The Maximum Number of Expansion Modules	32
Diagnosis Function	Communication diagnostics, extended module status diagnostics
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*83*80mm
Product Certification	CE Certification
Communication Parameters	
Protocol	EtherCAT slave
Protocol	2*RJ45
Line Length	Maximum 100m (segment length) between 2 sites
Transmission Speed	100 Mbps
Maximum Number of Input/Output Bytes	Input: 1024 Bytes Output: 1024 Bytes
Site Alias Settings	Dial switch or software configuration
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Air discharge ±8kV, Performance level A; SURGE: Common mode ±2kV, Differential mode ±1kV, Performance level A; EFT: ±2kV, Performance level A)

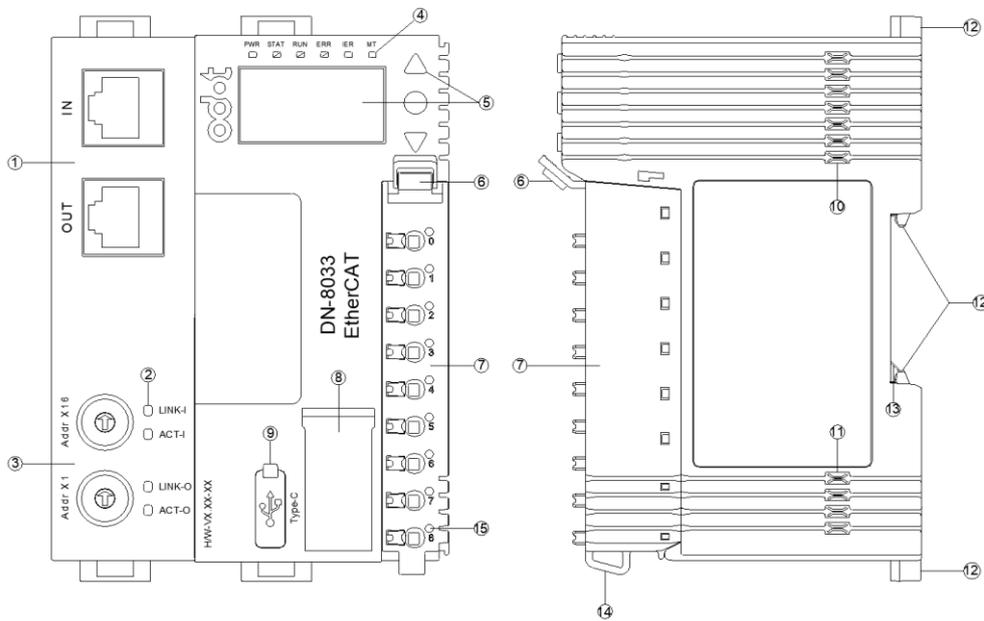
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

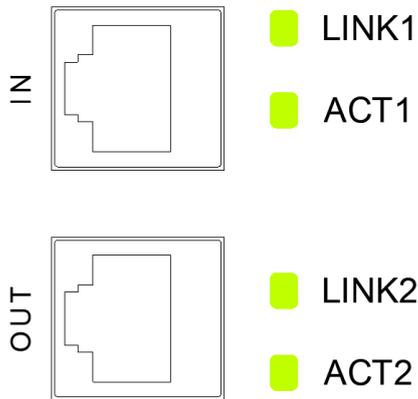
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Network Interface
- ②: Network Interface Indicator
- ③: DIP Switch
- ④: Status Indicator
- ⑤: LCD Screen and Buttons
- ⑥: Wiring Terminal Label
- ⑦: Removable Terminal
- ⑧: Network Adapter Label
- ⑨: Configuration Interface
- ⑩: Internal Bus
- ⑪: Field Power
- ⑫: Buckle
- ⑬: Grounding Spring Sheet
- ⑭: Fixed Wiring Harness
- ⑮: No instruction functions

### 3.1 Network Interface



LINK: Link state indicator (Green)

ON: Link UP

OFF: Link DOWN

ACT: Active indicator (Green)

Flash: Active

RJ45 interface pin definition

Pin	Definition	Description
1	TD+	Send +
2	TD-	Send -
3	RD+	Receive +
4	--	--
5	--	--
6	RD-	Receive -
7	--	--
8	--	--

### 3.2 Communication Configuration Interface



Rotary switch for setting site alias.

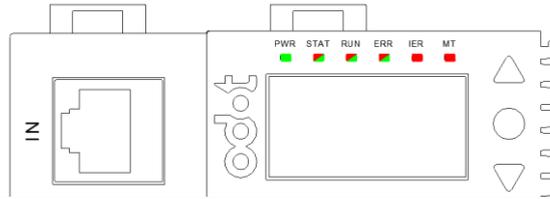
When the value of rotary switch is 0, the site name is default value or configured by the PLC.

When the value of rotary switch is not 0, the value of site name is determined by the rotary switch, the relationship is shown in the following table:

Rotary Switch 0	Rotary Switch 1	Rotary Value	Site Alias
0H	0H	00H	EtherCAT Master configuration
0H	1H	01H	1
0H	...	...	...
0H	FH	0FH	15
1H	0H	10H	16
1H	1H	11H	17
1H	...	...	...
1H	FH	1FH	31
...	...	...	...
FH	FH	FFH	255

Config: Configuration port, standard Type-C interface for configuring device parameters, firmware upgrades.

### 3.3 LED Indicator Definition

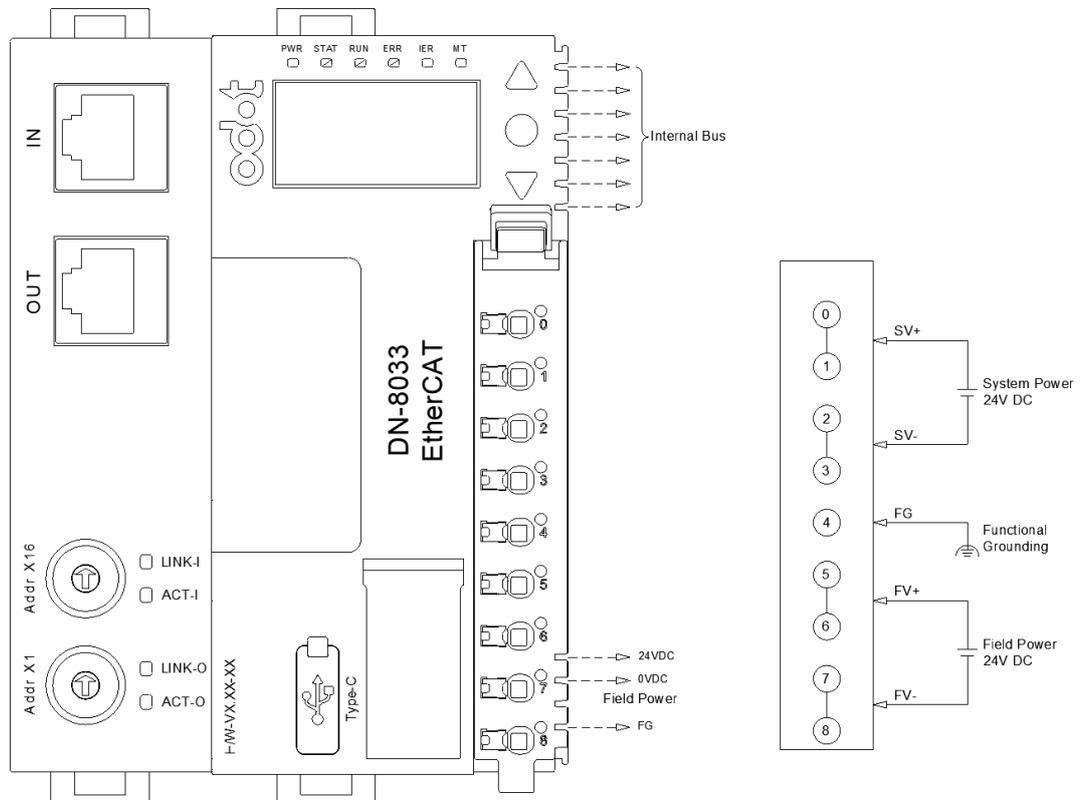


PWR power indicator (Green)	Definition
ON	The system power supply is normal
OFF	The system power supply is abnormal
STAT module state indicator (Red/Green)	Definition
Slow flash (Green)	Power-on default state
ON (Green)	Operation mode
Single flash (Green)	Stop mode
Slow flash (Red/Green)	Upgrading mode
Fast flash (Red/Green)	Firmware Upgrading
Double flash (Red)	Hardfault Abnormal alarms
Flash 3 times (Red)	Task stack overflow alarm
Flash 4 times (Red)	System memory overflow alarm
Flash 5 times (Red)	Watchdog reset alarm
RUN Network running indicator (Red/Green)	Definition
OFF (Green)	Initial state of EtherCAT slave
Flash (Green)	Pre-operation state of EtherCAT slave
Single flash (Green)	Safe-operation state of EtherCAT slave
ON (Green)	Operation mode
OFF (Red)	EEPROM initial is normal
Double flash (Red)	EEPROM initial is abnormal
ERR Running error indicator (Red/Green)	Definition
ON (Green)	The ESC peripheral initial is normal
Double flash (Red)	The ESC peripheral initial is abnormal
IER Error indicator (Red)	Definition
OFF	IO communication is normal
Double flash	IO communication is error
Fast flash	There is a token line shorted to high level
MT Error indicator (Red)	Definition
OFF	Normal
ON	The current system is faulty and needs maintenance

#### Other indicator state description:

Indicator State	Description
STAT (Red) 2.5HZ flashing, other indicators are off	Power-on FLASH error
STAT (Red) and RUN (Red) 2.5HZ flashing	Ferroelectric storage error
IER (Green) and MT (Red) 2.5HZ flashing	Configuration parameter memory allocation failed
STAT (Red/Green), RUN (Red/Green), ERR (Red/Green), IER (Red), MT (Red) 2.5HZ recycle flashing	Test mode, stop the test mode and restore the state before the test mode

## 4 Wiring



### NOTICE

#### Unexpected device operation

Inside the module, two terminal blocks SV+ have been shorted, two terminal blocks SV - have been shorted, two terminal blocks FV+ have been shorted, and two terminal blocks FV - have been shorted. Externally, only one system power supply and one field power supply need to be connected.

The wire should be copper wire with a core greater than  $0.2\text{mm}^2$  and less than  $1\text{mm}^2$ , and the impedance is less than  $10\Omega$ .

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

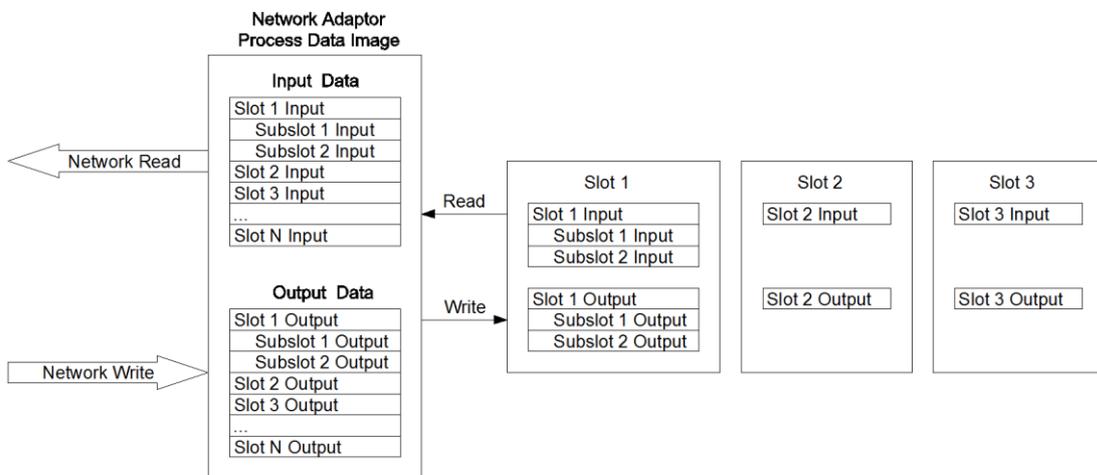
## 5 Process Data Definition

### Process definition of network adapter

EtherCAT adapter itself has no input and output process data.

### IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



## 6 Configuration Parameter Definition

Configuration parameter of adapter									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	REF Diagnosis Module	Reserved					Fault Action for Input	Reserv ed	
Byte 1	ECS Station Alias								
Byte 2									
Byte 3									
Byte 4	OLED Display Time								
....	Reserved								
Byte 35									

Data description:

**Fault Action for Input:** The input fault handing mode, when the IO module is offline, the adapter will use this mode to deal with the input data. (Default value: Cleaning input value)

0: Hold the last input value

1: Cleaning input value

**REF Diagnosis Module:** The diagnostic control module uses prompts, makes prompts, and adds submodules to the terminal module, which is a read-only property. (Default: 1).

1: Add relevant submodules to the terminal module to use

**ECS Station Alias:** EtherCAT slave address, read only, it cannot be configured in the IO config software.

**OLED Display Time:** OLED screen display time (min), (default value: 1), the display is normally on when it is 0, range: 0~240 (**because the screen is an OLED screen, there is a risk of burn-in when it is always on, please use it with caution**).

## 7 OLED Interface



### Key definition:

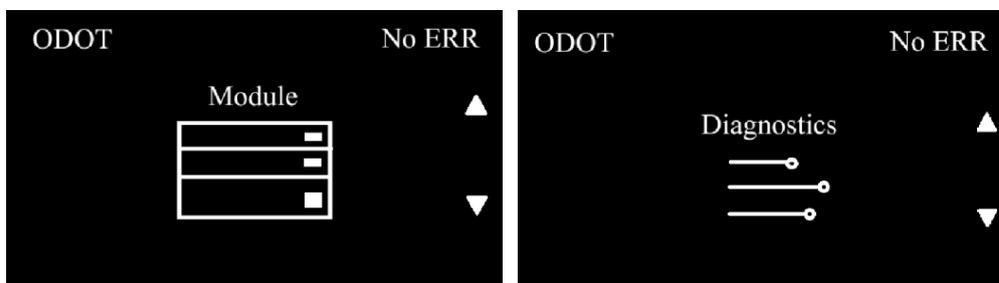
▲ is the page up button, ● is the confirmation and exit button, ▼ is the page down Button.

### Special application notes:

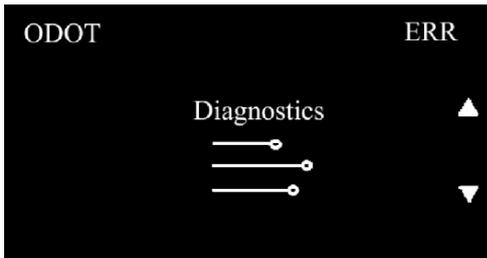
1. Press the up and down buttons ▲ and ▼ at the same time, and the screen will appear “Is it reset ?” , the network adapter parameters can be reset by pressing the ● button.
2. Short press the middle button ● to confirm, and long press to exit.

### Display interface:

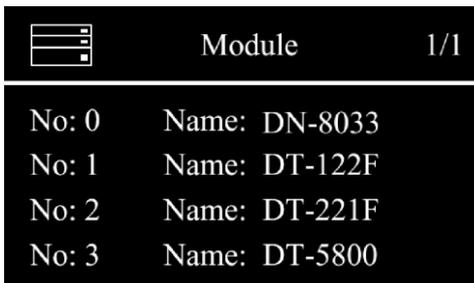
After the initial configuration is completed after power on, there are two interfaces, in which "Module" displays the basic information and channel information of the module. "Diagnostics" is displayed for diagnostic records. Toggle the display by clicking the ▲ and ▼ buttons.



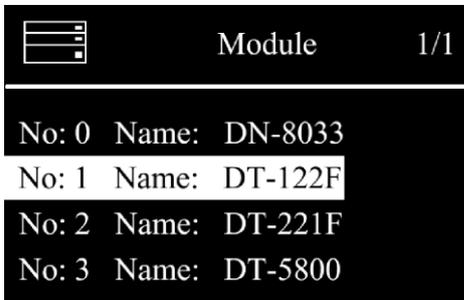
When there is an error, the "ERR" logo will flash in the upper right corner.



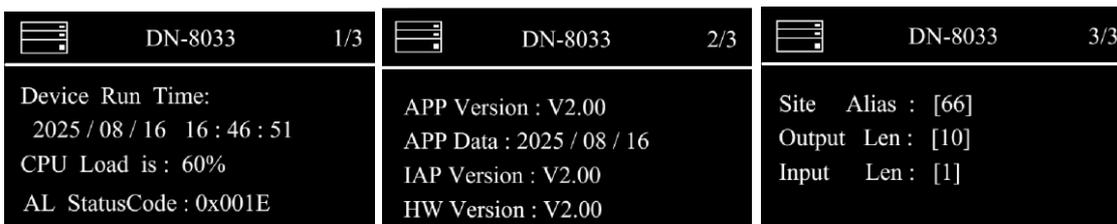
Click ● on the "Module" interface to enter the next-level module selection interface, and switch the display page by press the ▲ and ▼ buttons, as shown in the following figure. At this time, press and hold the ● button to return to the previous level.



Click the ● button in the figure above to enter the next level module selection interface, and click the ▲ and ▼ buttons to switch module selection. At this time, press and hold the ● button to return to the previous level.



Enter the module information display interface and switch the display by clicking the ▲ and ▼ buttons, as shown in the figure below. At this time, press and hold the ● button to return to the previous level.



(Note: The network adapter displays: APP version and date, IAP version and date, hardware version, IP address, MAC address, and other information. Module display:

module type, software version, hardware version, IAP version, and channel status. )

 DT-122F 1/2	 DT-122F 2/2
Type: 16DI Sink Soft Version: V2.00 HW Version: V2.00 IAP Version: V2.00	01234567 89ABCDEF ----- --*****

**Diagnosis interface:**

Display the module diagnostic information on the Diagnostics screen, and click the ▲ and ▼ buttons to switch the display page. At this time, press and hold the ● button to return to the previous level.

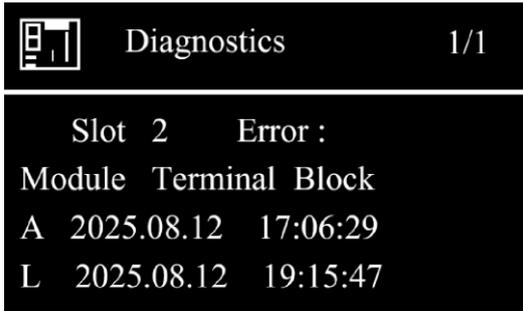
Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	0 L
3	ERR: Connector0	L

(Note: The error that occurs after this interface is displayed first, with a maximum of 200 items, as shown in the above figure, "A" and "L" represent respectively, the error still exists and the error has been eliminated, "Connector" is the specific error of the current error, and "28" is the slot number)

Click the ● button in the interface as shown in the figure above to enter the next level of diagnostic data selection interface, and click the ▲ and ▼ buttons to select and switch the diagnostic data. At this time, press and hold the ● button to return to the previous level.

Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	L
3	ERR: Connector0	L

Enter the module error information display interface, as shown in the figure below, press and hold the ● button to return to the previous level.

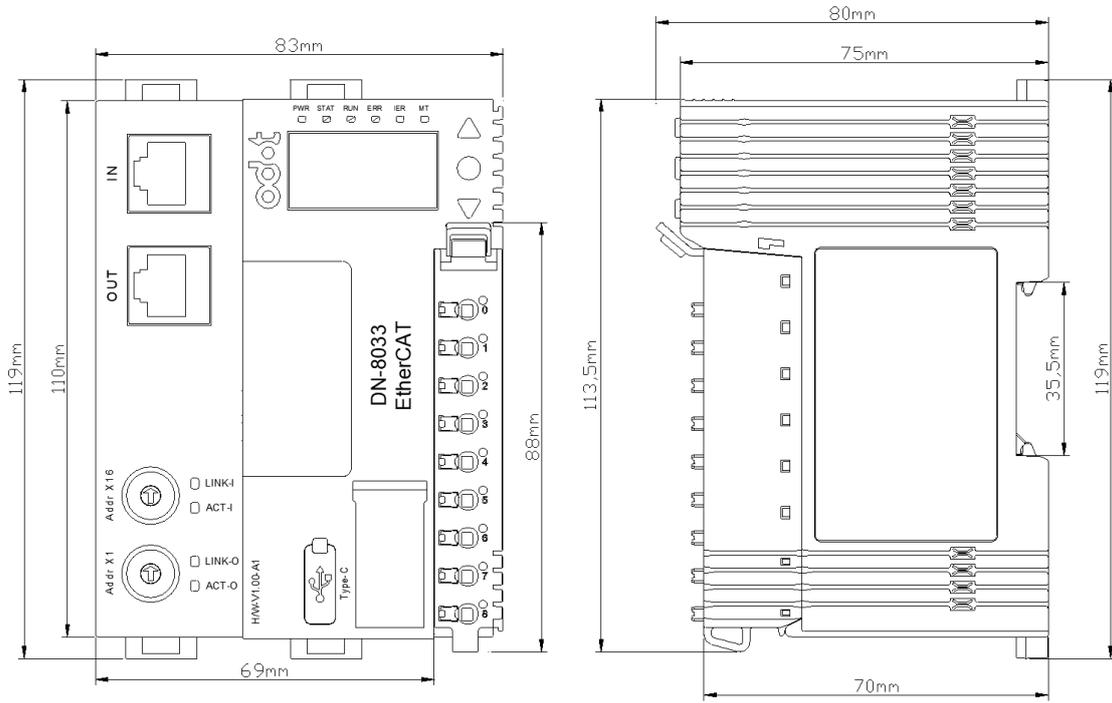


(Note: "Module Terminal Block" is the specific error of the current error, and "slot" is the slot number where the error occurred.) "A" is the time when the error occurred. "L" is the time when the error left)

**Error diagnosis code details**

Error Code	Simple Display	Detailed Display	Definition
0x00000003	Bus1	Module Backplane Bus1	Bus channel 1 is abnormal
0x00000004	Bus2	Module Backplane Bus2	Bus channel 2 is abnormal
0x00000005	Offline	Module Offline	Communication error between the module and the adapter
0x00000006	Connector	Module Terminal Block	Abnormal connection of equipment terminals
0x00000007	S24	System power supply	System power connection is abnormal
0x00000008	F24	Field power supply	Abnormal power connection at the site
0x00000009	Terminal	Terminal equipment	The terminal module is not mounted or the communication of the terminal module is abnormal
0x0000000A	Token	Token line shorted	There is a situation where the token line is short-circuited to a high level
0x0000000B	Memory	Memory Allocation	Exceeded the limit of sub-module additions
0x0000000C	PWR LOW	MCU low Voltage	Abnormal power supply for MCU
0x0000000D	HFER	Hardfault ERR	Hard Fault exception reset
0x0000000E	SOVR	Task stack overflow	Task stack overflow exception reset
0x0000000F	MOVR	Memory overflow	System memory overflow exception reset
0x00000010	Wdg Time	Wdg Timeout alarm	Watchdog timer timeout exception reset
0x00000011	Power Off	Power Is Off	Adapter power failure
0x00000100	MOD over	Module overrun	The number of configured modules has exceeded the limit

## 8 Dimension Drawing



## **DN-8034 EtherNet/IP Network Adapter**

### **1 Module Feature**

- DN8034 Network adapter supports standard EtherNet/IP protocol, and it supports dual network port switch cascade function.
- The module supports up to 32 IO modules extension, the maximum input of process data is 1024 bytes and the maximum output is 1024 bytes, flexible selection of IO modules to be paired with adapter;
- Module high speed redundant backplane bus, and the refresh cycle of full load is 0.6ms;
- Module removable installation is more convenient, staggered layout spring light guide terminals, and the terminal is pluggable, it is easy to maintenance and replacement, the wiring diameter is 0.2mm<sup>2</sup> (AWG 24) ~ 1.5mm<sup>2</sup> (AWG 16);
- The internal bus and system power and field power are completely isolated, avoid field equipment signals interfering with module internal communications;
- The module supports communication diagnostics, extended module diagnostic function, with indicator lights such as operating status and communication status;
- The OLED screen can view the module related parameters, it can acquire some important information without the software;

## 2 Technical Parameter

General Parameter	
Current Consumption	104mA@24VDC
System Power	19.2~28.8VDC (Nominal: 24VDC) Anti-inversion protection: support
Internal Bus Supply Current	Max.2A@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Field Power Current	Max. DC 8A
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
The Maximum Number of Expansion Modules	32
Diagnosis Function	Communication diagnostics, extended module status diagnostics
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*83*80mm
Product Certification	CE Certification
Communication Parameters	
Protocol	EtherNet/IP slave
Interface	2*RJ45, integrated switch capabilities
Line Length	Maximum 100m (segment length) between 2 sites
Transmission Speed	10/100 Mbps, full-duplex
Maximum Number of Input/Output Bytes	Input: 1024 Bytes Output: 1024 Bytes
IP Address Setting	Dial switch or IO Config software
Default IP Address	192.168.1.200
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge $\pm 6$ kV, Air discharge $\pm 8$ kV, Performance level A; SURGE: Common mode $\pm 2$ kV, Differential mode $\pm 1$ kV, Performance level A; EFT: $\pm 2$ kV, Performance level A)

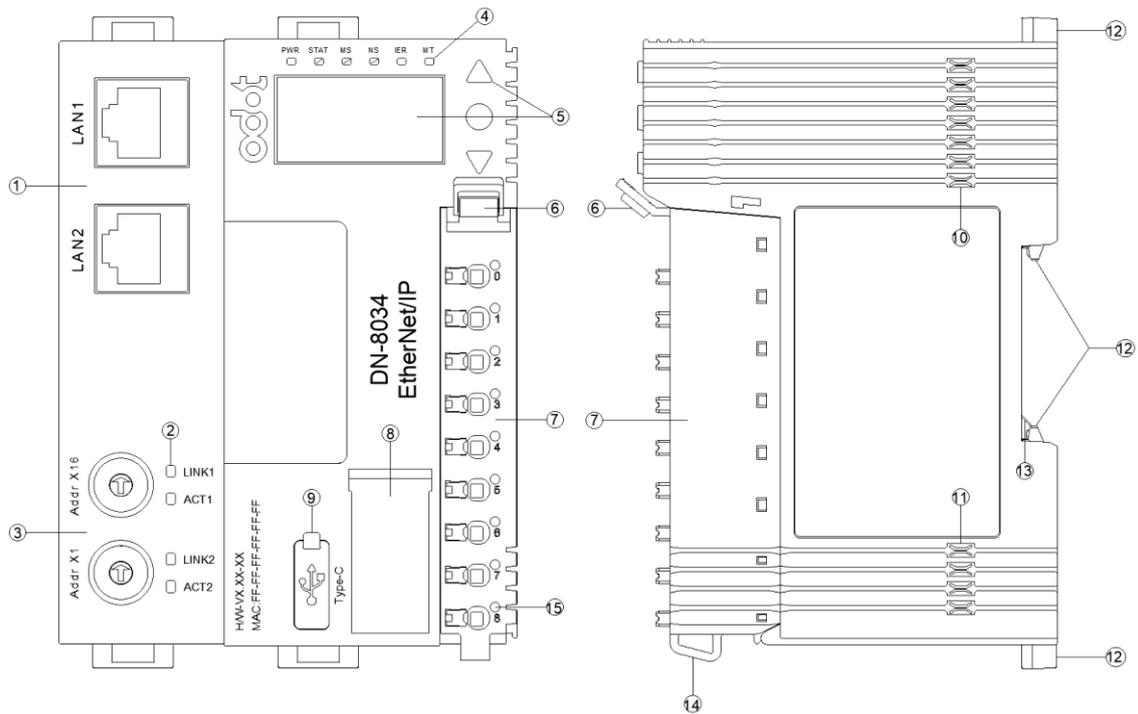
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

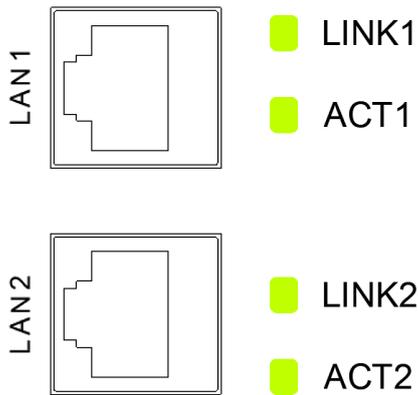
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Network Interface
- ②: Network Interface Indicator
- ③: DIP Switch
- ④: Status Indicator
- ⑤: LCD Screen and Buttons
- ⑥: Wiring Terminal Label
- ⑦: Removable Terminal
- ⑧: Network Adapter Label
- ⑨: Configuration Interface
- ⑩: Internal Bus
- ⑪: Field Power
- ⑫: Buckle
- ⑬: Grounding Spring Sheet
- ⑭: Fixed Wiring Harness
- ⑮: No instruction functions

### 3.1 Network Interface



LAN1/LAN2 supports switch cascading function.

LINK: Link state indicator (Green)

ON: Link UP

OFF: Link DOWN

ACT: Active indicator (Green)

Flash: Active

RJ45 interface pin definition

Pin	Definition	Description
1	TD+	Send +
2	TD-	Send -
3	RD+	Receive +
4	--	--
5	--	--
6	RD-	Receive -
7	--	--
8	--	--

### 3.2 Communication Configuration Interface



Rotary switch for setting IP address (the default IP address is 192.168.1.200).

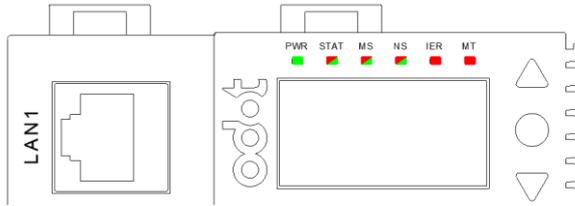
When the value of rotary switch is 0, the IP address can be configured by software or with the default IP address.

When the rotary switch is not 0, the last byte of the IP address is determined by the rotary switch, the relationship between the IP address and the rotary switch value is shown in the following table:

Rotary Switch 0	Rotary Switch 1	Rotary Value	IP Address
0H	0H	00H	Software configuration or default value
0H	1H	01H	192.168.1.1
0H	2H	02H	192.168.1.2
0H	3H	03H	192.168.1.3
.	.	.	.
.	.	.	.
FH	EH	FEH	192.168.1.254
FH	FH	FFH	192.168.1.255

Config: Configuration port, standard Type-C interface for configuring device parameters, firmware upgrades.

### 3.3 LED Indicator

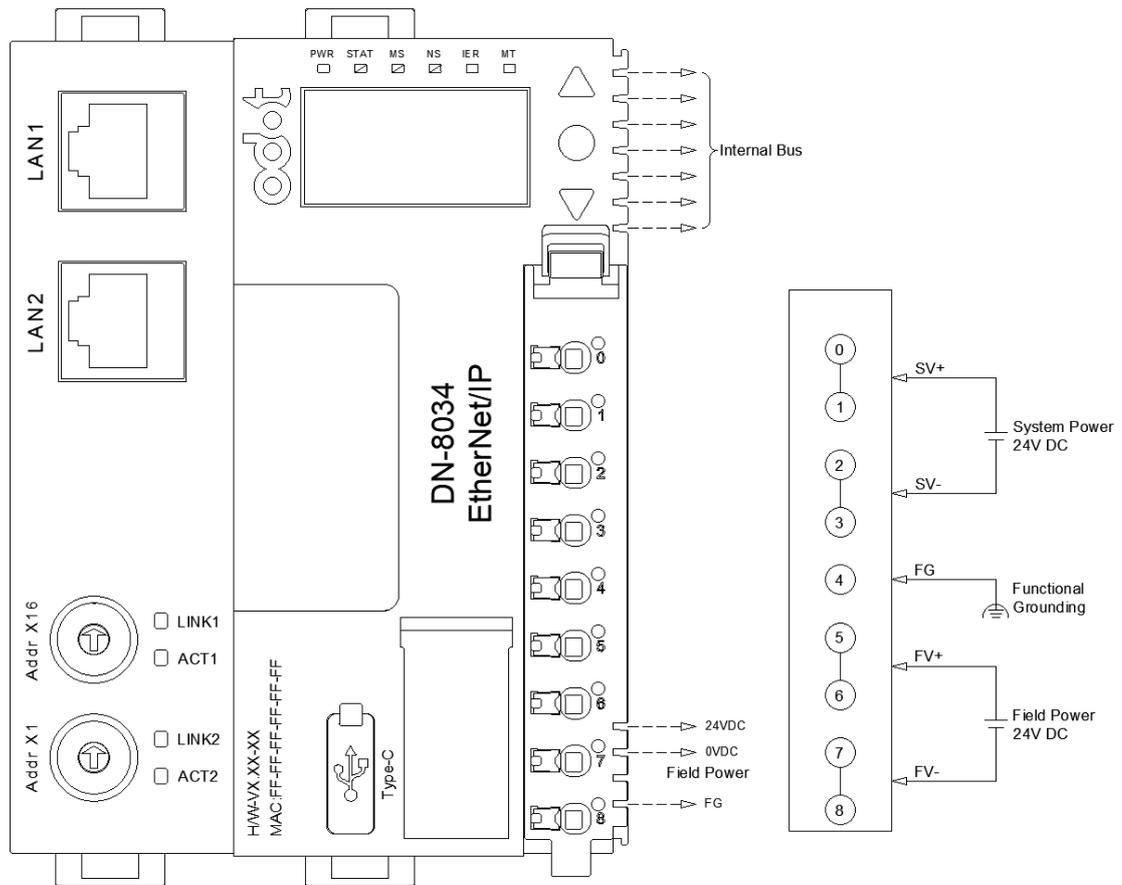


PWR Power indicator (Green)	Definition
ON	The system power supply is normal
OFF	The system power supply is abnormal
STAT Module status indicator (Red/Green)	Definition
Slow flash (Green)	Power-on default status
ON (Green)	Operation mode
Single flash (Green)	Stop mode
Slow flash (Red/Green)	Upgrading mode
Fast flash (Red/Green)	Firmware Upgrading
Double flash (Red)	Hardfault abnormal alarms
Flash 3 times (Red)	Task stack overflow alarm
Flash 4 times (Red)	Alarm for system memory overflow
Flash 5 times (Red)	Watchdog reset alarm
MS module state indicator (Red/Green)	Definition
ON (Green)	Normal
Fast flash (Red)	MAC address is illegal
Slow flash (Red)	Storage failure
NS Network state indicator (Red/Green)	Definition
Fast flash (Red)	MAC address is illegal
ON (Green)	The connection is established
Flash (Green)	The connection is not established
Flash (Red)	Connection is disconnected
IER IO running indicator (Red)	Definition
ON	IO initial is abnormal
OFF	IO initial is normal
Double flash	IO communication is abnormal
Fast flash	There is a token line shorted to high level
MT error indicator (Red)	Definition
OFF	Normal
ON	The current system is faulty and needs maintenance
Flash 4 times	Search lighting test

#### Other indicator state description:

Indicator State	Description
STAT (Red/Green), MS (Red/Green), NS (Red/Green), IER (Red), MT (Red) 2.5HZ recycle flashing	Test mode, stop the test mode and restore the state before the test mode

## 4 Wiring



### NOTICE

#### Unexpected device operation

Inside the module, two terminal blocks SV+ have been shorted, two terminal blocks SV - have been shorted, two terminal blocks FV+ have been shorted, and two terminal blocks FV - have been shorted. Externally, only one system power supply and one field power supply need to be connected.

The wire should be copper wire with a core greater than 0.2mm<sup>2</sup> and less than 1mm<sup>2</sup>, and the impedance is less than 10Ω.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

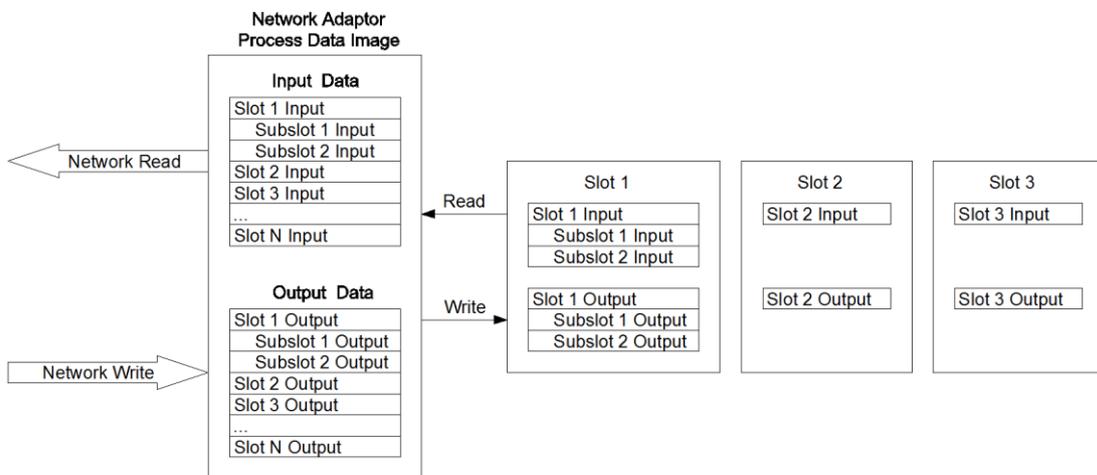
## 5 Process Data Definition

### Adapter process data definition

EtherNet/IP adapter itself has no input and output process data.

### IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



## 6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved		Trig Data Change	Virtual IO Bytes	Reserved		Fault Action IN	Source Config
Byte 1	REF Diagnosis Module	Reserved						

Communication Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	MAC Address [0]							
Byte 1	MAC Address [1]							
Byte 2	MAC Address [2]							
Byte 3	MAC Address [3]							
Byte 4	MAC Address [4]							
Byte 5	MAC Address [5]							
Byte 6	IP Address [0]							
Byte 7	IP Address [1]							
Byte 8	IP Address [2]							
Byte 9	IP Address [3]							
Byte 10	Net Mask [0]							
Byte 11	Net Mask [1]							
Byte 12	Net Mask [2]							
Byte 13	Net Mask [3]							
Byte 14	Net Gateway [0]							
Byte 15	Net Gateway [1]							
Byte 16	Net Gateway [2]							
Byte 17	Net Gateway [3]							
Byte 18~19	T2O Bytes Len							
Byte 20~21	O2T Bytes Len							
Byte 22	OLED DISPLAY TIME							
Byte 23	Reserved							
Byte 24~55	Reserved							

Data description:

**Source Config:** Parameter configuration method. (Default: Configuration software).

0: Configuration software

1: Fieldbus

**Fault Action IN:** The input fault handing mode, when the IO module is offline, the adapter will use this mode to deal with the input data. (Default value: Cleaning input

value)

0: Hold the last input value

1: Cleaning input value

**VIRTUAL IO BYTES:** Virtual byte. (Default value: No virtual bytes)

0: No virtual bytes

1: There are virtual bytes

**REF Diagnosis Module:** The diagnostic control module uses prompts, makes prompts, and adds submodules to the terminal module, which is a read-only property. (Default: 1).

1: Add relevant submodules to the terminal module to use

**MAC Address:** Device MAC address, read-only.

**IP Address:** Device IP address, read-only.

**Net Mask:** Device subnet mask, read-only.

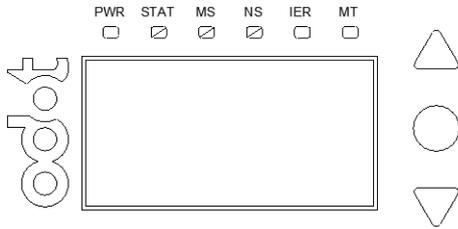
**Net Gateway:** Device gateway address, read-only.

**T2O Bytes Len:** the number of bytes of input process data, read-only.

**O2T Bytes Len:** the number of bytes of output process data, read-only.

**OLED DISPLAY TIME:** OLED screen display time (min), (default value: 1), the display is normally on when it is 0, range: 0~240 (**because the screen is an OLED screen, there is a risk of burn-in when it is always on, please use it with caution**).

## 7 OLED Display Interface



### Key definition:

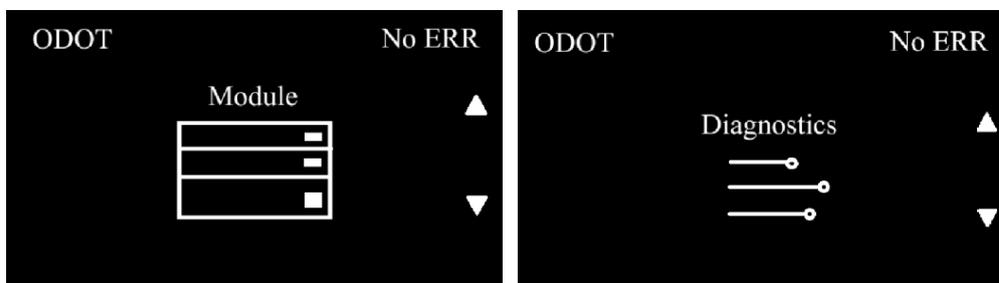
▲ is the page up button, ● is the confirmation and exit button, ▼ is the page down Button.

### Special application notes:

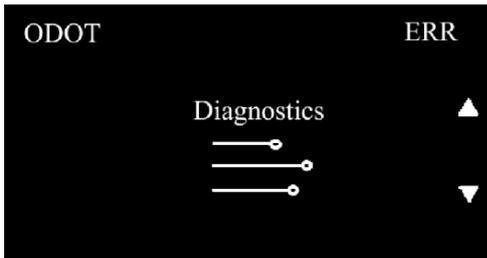
1. Press the up and down buttons ▲ and ▼ at the same time, and the screen will appear “Is it reset ?” , the network adapter parameters can be reset by pressing the ● button.
2. Short press the middle button ● to confirm, and long press to exit.

### Display interface:

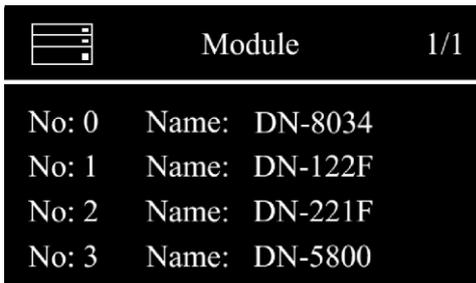
After the initial configuration is completed after power on, there are two interfaces, in which "Module" displays the basic information and channel information of the module. "Diagnostics" is displayed for diagnostic records. Toggle the display by clicking the ▲ and ▼ buttons.



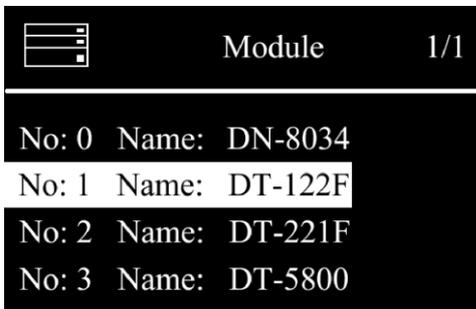
When there is an error, the "ERR" logo will flash in the upper right corner.



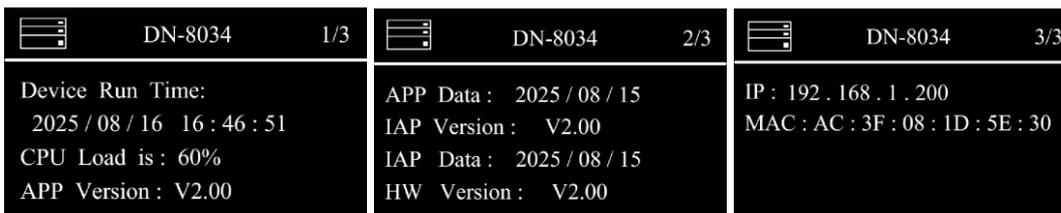
Click ● on the "Module" interface to enter the next-level module selection interface, and switch the display page by press the ▲ and ▼ buttons, as shown in the following figure. At this time, press and hold the ● button to return to the previous level.



Click the ● button in the figure above to enter the next level module selection interface, and click the ▲ and ▼ buttons to switch module selection. At this time, press and hold the ● button to return to the previous level.



Enter the module information display interface and switch the display by clicking the ▲ and ▼ buttons, as shown in the figure below. At this time, press and hold the ● button to return to the previous level.



(Note: The network adapter displays: APP version and date, IAP version and date, hardware version, IP address, MAC address, and other information. Module display:

module type, software version, hardware version, IAP version, and channel status. )

 DT-122F 1/2	 DT-122F 2/2
Type: 16DI Sink Soft Version: V2.00 HW Version: V2.00 IAP Version: V2.00	01234567 89ABCDEF ----- --*****

**Diagnosis interface:**

Display the module diagnostic information on the Diagnostics screen, and click the ▲ and ▼ buttons to switch the display page. At this time, press and hold the ● button to return to the previous level.

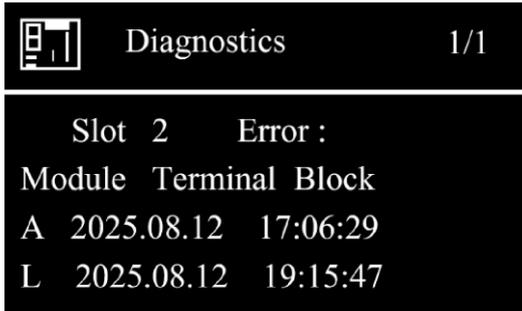
Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	0
3	ERR: Connector0	L

(Note: The error that occurs after this interface is displayed first, with a maximum of 200 items, as shown in the above figure, "A" and "L" represent respectively, the error still exists and the error has been eliminated, "Connector" is the specific error of the current error, and "28" is the slot number)

Click the ● button in the interface as shown in the figure above to enter the next level of diagnostic data selection interface, and click the ▲ and ▼ buttons to select and switch the diagnostic data. At this time, press and hold the ● button to return to the previous level.

Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	L
3	ERR: Connector0	L

Enter the module error information display interface, as shown in the figure below, press and hold the ● button to return to the previous level.

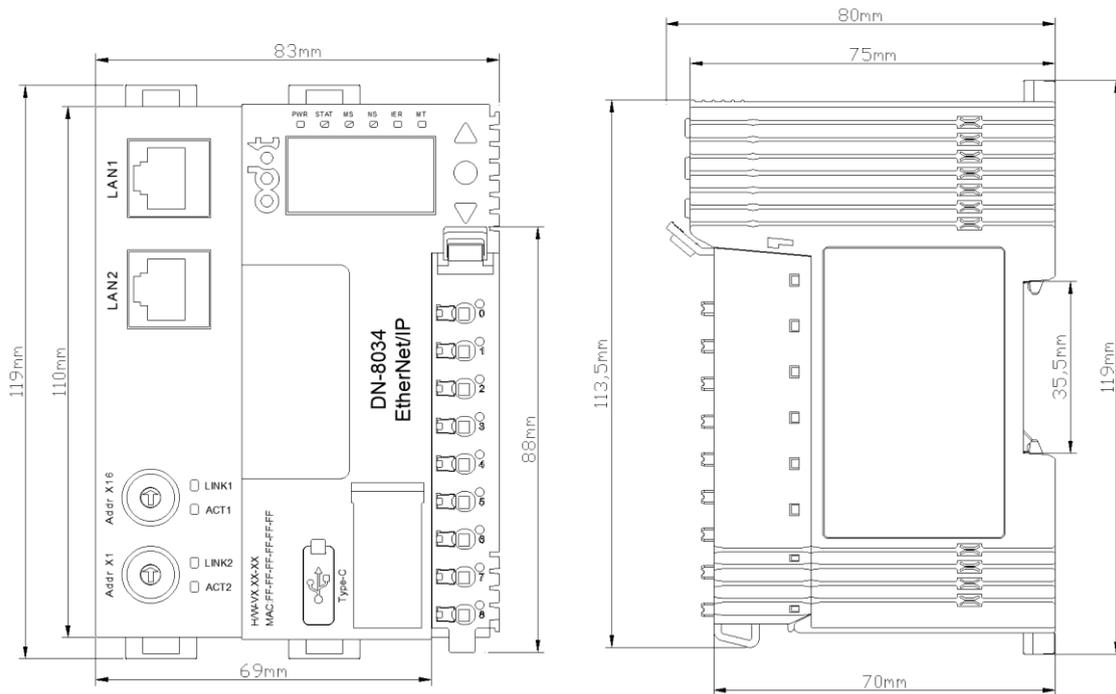


(Note: "Module Terminal Block" is the specific error of the current error, and "slot" is the slot number where the error occurred.) "A" is the time when the error occurred. "L" is the time when the error left)

**Error diagnosis code details**

Error Code	Simple Display	Detailed Display	Definition
0x00000003	Bus1	Module Backplane Bus1	Bus channel 1 is abnormal
0x00000004	Bus2	Module Backplane Bus2	Bus channel 2 is abnormal
0x00000005	Offline	Module Offline	Communication error between the module and the adapter
0x00000006	Connector	Module Terminal Block	Abnormal connection of equipment terminals
0x00000007	S24	System power supply	System power connection is abnormal
0x00000008	F24	Field power supply	Abnormal power connection at the site
0x00000009	Terminal	Terminal equipment	The terminal module is not mounted or the communication of the terminal module is abnormal
0x0000000A	Token	Token line shorted	There is a situation where the token line is short-circuited to a high level
0x0000000B	Memory	Memory Allocation	Exceeded the limit of sub-module additions
0x0000000C	PWR LOW	MCU low Voltage	Abnormal power supply for MCU
0x0000000D	HFER	Hardfault ERR	Hard Fault exception reset
0x0000000E	SOVR	Task stack overflow	Task stack overflow exception reset
0x0000000F	MOVR	Memory overflow	System memory overflow exception reset
0x00000010	Wdg Time	Wdg Timeout alarm	Watchdog timer timeout exception reset
0x00000011	Power Off	Power Is Off	Adapter power failure
0x00000100	MOD over	Module overrun	The number of configured modules has exceeded the limit

## 8 Dimension Drawing



## **DN-8037 CC-Link IE Field Basic Adapter**

### **1 Module Feature**

- The DN-8037 Module supports standard CC-Link IE Field Basic protocol, and it supports dual network port switch cascade function;
- The module supports up to 32 IO modules extension, the RX/RX capacity supports up to 1024 (each station 64 bits), the RWr/RWw capacity supports up to 512 words (each station 32 words), flexible selection of IO modules to be paired with adapter;
- The module supports remote equipment station, it is up to 16 stations, transmission distance up to 100m;
- Module high speed redundant backplane bus, and the refresh cycle of full load is 0.6ms;
- Module removable installation is more convenient, staggered layout spring light guide terminals, and the terminal is pluggable, it is easy to maintenance and replacement, the wiring diameter is 0.2mm<sup>2</sup> (AWG 24) ~ 1.5mm<sup>2</sup> (AWG 16);
- The internal bus and system power and field power are completely isolated, avoid field equipment signals interfering with module internal communications;
- The module supports communication diagnostics, extended module diagnostic function, with indicator lights such as operating status and communication status;
- The OLED screen can view the module related parameters, it can acquire some important information without the software;

## 2 Technical Parameter

General Parameter	
Current Consumption	93mA@24VDC
System Power	19.2~28.8VDC (Nominal: 24VDC) Anti-inversion protection: support
Internal Bus Supply Current	Max.2A@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Field Power Current	Max. DC 8A
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
The Maximum Number of Expansion Modules	32
Diagnosis Function	Communication diagnostics, extended module status diagnostics
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*83*80mm
Product Certification	CE Certification
Communication Parameters	
Protocol	CC-Link IE Field Basic
Interface	2*RJ45, integrated switch capabilities
Line Length	Maximum 100m (segment length) between 2 sites
Transmission Speed	100 Mbps, full-duplex
RX/RX	Max. 1024 Bits
RW <sub>r</sub> /RW <sub>w</sub>	Max. 512 Words
Station Type	Remote equipment station
Number of Logical Stations Occupied	1~16
Site Alias Settings	DIP switch or software configuration
Diagnostic Feature	Communication diagnostics, extended module status diagnostics
Default IP Address	192.168.3.100
Environment Parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ± 6kV, Air discharge ± 8kV, Performance level A; SURGE: Common mode ± 2kV, Differential mode ± 1kV, Performance level A; EFT: ± 2kV, Performance level A)

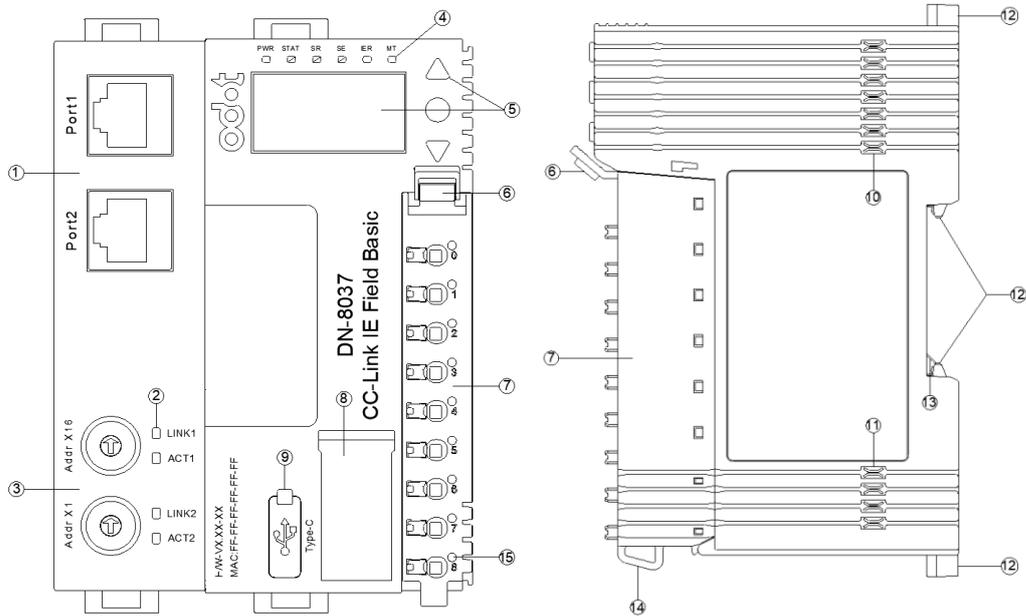
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

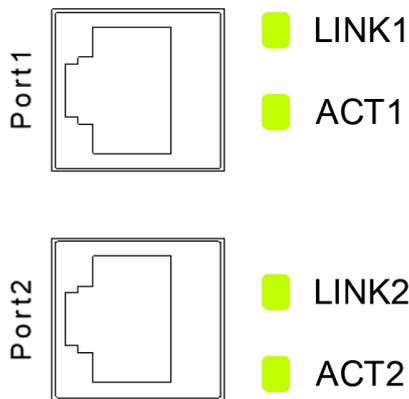
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Network Interface
- ②: Network Interface Indicator
- ③: DIP Switch
- ④: Status Indicator
- ⑤: LCD Screen and Buttons
- ⑥: Wiring Terminal Label
- ⑦: Removable Terminal
- ⑧: Network Adapter Label
- ⑨: Configuration Interface
- ⑩: Internal Bus
- ⑪: Field Power
- ⑫: Buckle
- ⑬: Grounding Spring Sheet
- ⑭: Fixed Wiring Harness
- ⑮: No instruction functions

### 3.1 Hardware Interface



Port 1/ Port 2 supports switch cascading.

LINK: Link state indicator (Green)

ON: Link UP

OFF: Link DOWN

ACT: Active indicator (Green)

Flash: Active

RJ45 interface pin definition

Pin	Definition	Description
1	TD+	Send +
2	TD-	Send -
3	RD+	Receive +
4	--	--
5	--	--
6	RD-	Receive -
7	--	--
8	--	--

### 3.2 Communication Configuration Interface



Rotary switch for setting IP address (The default IP address is 192.168.3.100).

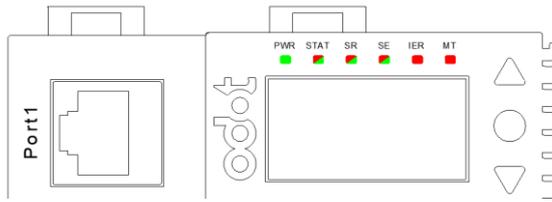
When the value of rotary switch is 0, the IP address can be configured by software or with the default IP address.

When the value of rotary switch is not 0, the last byte of IP address is determined by the rotary switch, the relationship between the site alias and the rotary switch value is shown in the following table:

Rotary switch 0	Rotary switch 1	Rotary Value	IP Address
0H	0H	00H	Software configuration or default value
0H	1H	01H	192.168.3.1
0H	2H	02H	192.168.3.2
0H	3H	03H	192.168.3.3
.	.	.	.
.	.	.	.
FH	EH	FEH	192.168.3.254
FH	FH	FFH	192.168.3.255

Config: configuration port, standard Type-C interface for configuring device parameters, firmware upgrades.

### 3.3 LED Indicator



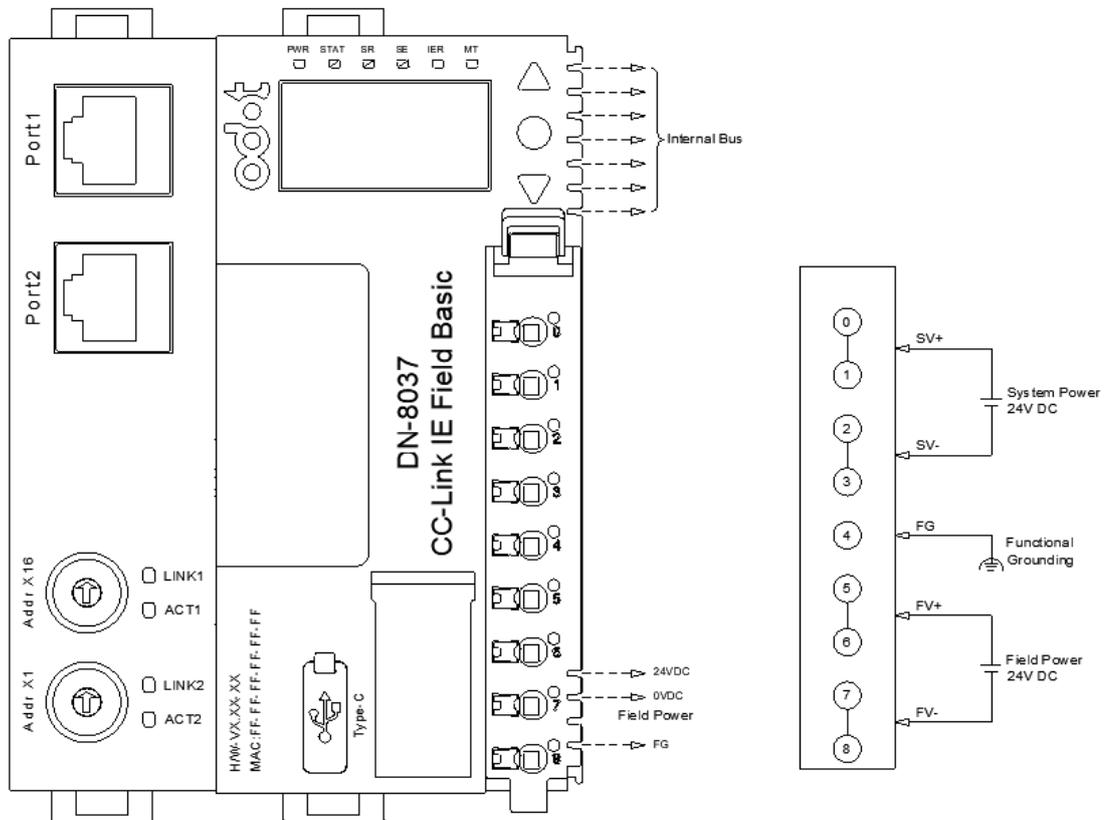
PWR Power indicator (Green)	Definition
ON	The system power supply is normal
OFF	The system power supply is abnormal
STAT Module status indicator (Red/Green)	Definition
Slow flash (Green)	Power-on default status
ON (Green)	Running mode
Single flash (Green)	Stop mode
Slow flash (Red/Green)	Upgrading mode
Fast flash (Red/Green)	Firmware Upgrading
Double flash (Red)	Hardfault Abnormal alarms
Flash 3 times (Red)	Task stack overflow alarm
Flash 4 times (Red)	System memory overflow alarm
Flash 5 times (Red)	Watchdog reset alarm
SR Network running indicator (Red/Green)	Definition
Slow flash (Green)	CC-Link IEFB data exchange
Slow flash (Red)	The cycle data is invalid, and the slave ID is repeat
Fast flash (Red)	Slave ID is error
ON (Red)	Master stop mode
Flash 2 times (Red)	The number of stations does not match (the master is greater than the slave)
Flash 4 times (Red)	The circular data command is abnormal
OFF	No CC-Link IEFB cyclic data exchange
Fast flash (Green)	MAC address is illegal
SE running error indicator (Red/Green)	Definition
ON (Red)	Station disconnected (the network is disconnected, and the master is wrong)
ON (Green)	Station connection, with cycle data
Double flash (Red)	No ethernet connection
Flash 3 times (Red)	The cycle data sending is abnormal
Fast flash (Red)	The MAC address is illegal
IER error indicator (Red)	Definition
OFF	IO initial is normal
Double flash	IO communication is error
Fast flash	There is a token line shorted to high level
MT error indicator (Red)	Definition
OFF	Normal
ON	The current system is faulty and needs maintenance
Flash 4 times	Lighting test

#### Other indicator state description:

Indicator State	Description
STAT (Red) 2.5HZ flashing, other indicators are off	Power-on FLASH error

STAT (Red) and RUN (Red) 2.5HZ flashing	Ferroelectric storage error
SE (Red) 10HZ flashing	MAC address is illegal
IER (Red) and MT (Red) 2.5HZ flashing	Configuration parameter memory allocation failed
STAT (Red), SR (Red), SE (Red), MT (Red) 2.5HZ flashing	The PHY (switch chip) initialization self-test failed
SE (Red/Green) 10HZ flashing	There is no stack data interaction when plugged into the network cable
STAT (Red/Green), SR (Red/Green), SE(Red/Green), IER (Red), MT (Red) 10HZ recycle flashing	Test mode, stop the test mode and restore the state before the test mode

## 4 Wiring



### NOTICE

#### Unexpected device operation

Inside the module, two terminal blocks SV+ have been shorted, two terminal blocks SV - have been shorted, two terminal blocks FV+ have been shorted, and two terminal blocks FV - have been shorted. Externally, only one system power supply and one field power supply need to be connected.

The wire should be copper wire with a core greater than 0.2mm<sup>2</sup> and less than 1mm<sup>2</sup>, and the impedance is less than 10Ω.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

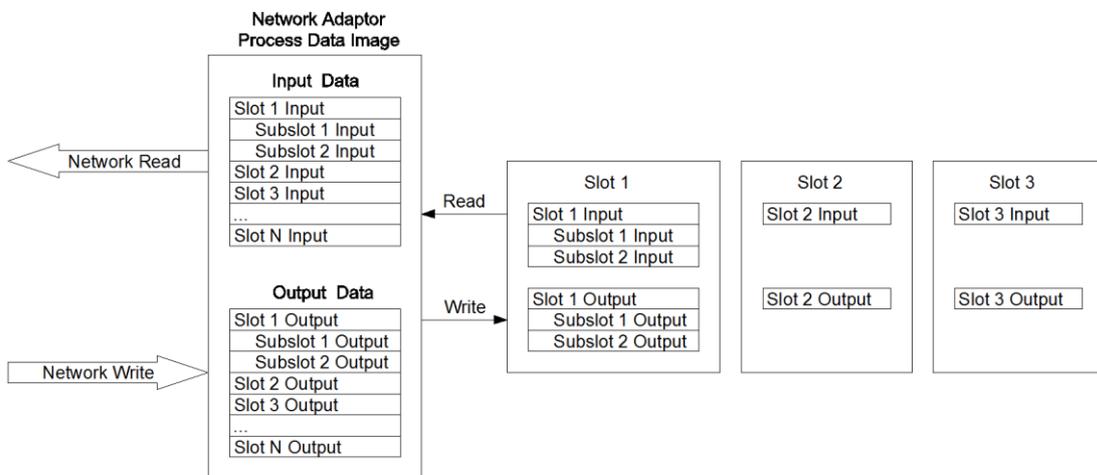
## 5 Process Data Definition

### Adapter process data definition

CC-Link IE Field Basic adapter itself has no input and output process data.

### IO Module process data mapping

The network adapter reads and writes input and output process data of IO module in real time through the internal bus, and its data mapping model is shown as follow:



## 6 Configuration Parameter Definition

Adapter configuration parameter									
Bit No	Bit 7	Bit 6	Bit 5	Bit4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	REF Diagnosis Module	Reserved					Fault Action for Input	Reserv ed	
Communication configuration parameter									
Bit No	Bit 7	Bit 6	Bit 5	Bit4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	MAC Address								
Byte 1									
Byte 2									
Byte 3									
Byte 4									
Byte 5									
Byte 6	IP Address								
Byte 7									
Byte 8									
Byte 9									
Byte 10	Net Mask								
Byte 11									
Byte 12									
Byte 13									
Byte 14	Net Gateway								
Byte 15									
Byte 16									
Byte 17									
Byte 18	Occupied Stations								
Byte 19	Auto Stations Enable								
Byte 20	RX/RX Size (Bits)								
Byte 21	RW <sub>r</sub> /RW <sub>w</sub> Size (words)								
Byte 22	RW <sub>r</sub> /RW <sub>w</sub> Size (words)								
Byte 23	RW <sub>r</sub> /RW <sub>w</sub> Size (words)								
Byte 24	OLED DISPLAY TIME								
Byte 25~58	Reserved								

Data description:

**Fault Action for Input:** the input fault handing mode, when the IO module is offline, the adapter will use this mode to deal with the input data. (Default value: Cleaning input value)

0: Hold the last input value

1: Cleaning input value

**REF Diagnosis Module:** The diagnostic control module uses prompts, makes prompts, and adds submodules to the terminal module, which is a read-only property. (Default: 1).

1: Add relevant submodules to the terminal module to use

**MAC Address:** MAC address, read only.

**IP Address:** the IP address of adapter, when the value of DIP switch is not 0, the last byte of IP address is replaced by the DIP switch value.

**Net Mask:** Subnet mask.

**Net Gateway:** Gateway address.

**Auto Stations Enable:** The number of stations (based on the number of IO modules in the actual configuration) is automatically calculated. (Default: 0)

0: Disable

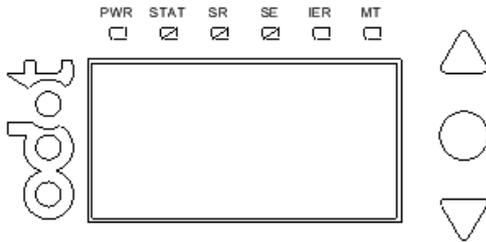
1: Enable

**RX/RX Size (Bits):** RX/RX Capacity (bit).

**RWr/RWw Size(words):** RWr/RWw Capacity (word).

**OLED Display Time:** OLED screen display time (min), (default value: 1), the display is normally on when it is 0, range: 0~240 (**because the screen is an OLED screen, there is a risk of burn-in when it is always on, please use it with caution**).

## 7 OLED Interface



### Key definition:

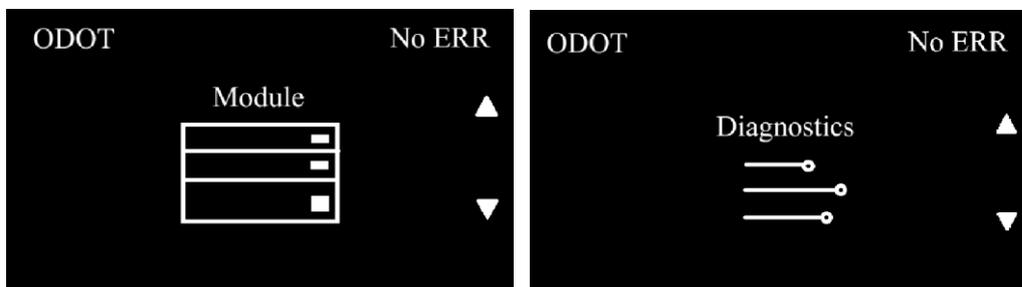
▲ is the page up button, ● is the confirmation and exit button, ▼ is the page down Button.

### Special application notes:

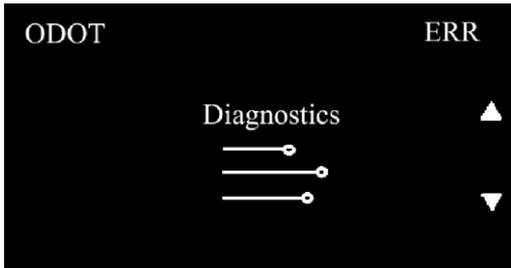
1. Press the up and down buttons ▲ and ▼ at the same time, and the screen will appear “Is it reset ?” , the network adapter parameters can be reset by pressing the ● button.
2. Short press the middle button ● to confirm, and long press to exit.

### Display interface:

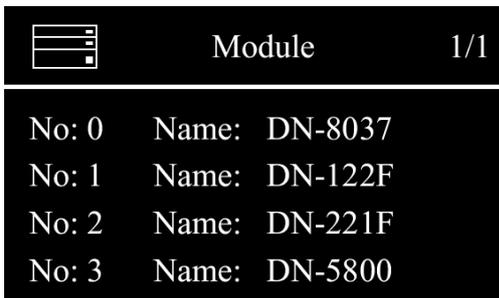
After the initial configuration is completed after power on, there are two interfaces, in which "Module" displays the basic information and channel information of the module. "Diagnostics" is displayed for diagnostic records. Toggle the display by clicking the ▲ and ▼ buttons.



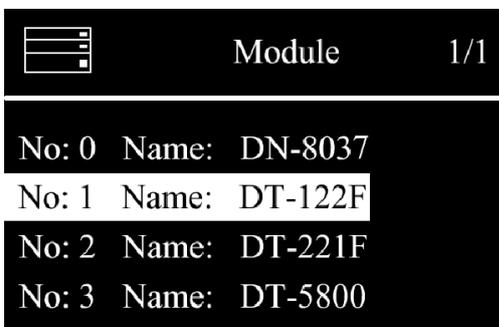
When there is an error, the "ERR" logo will flash in the upper right corner.



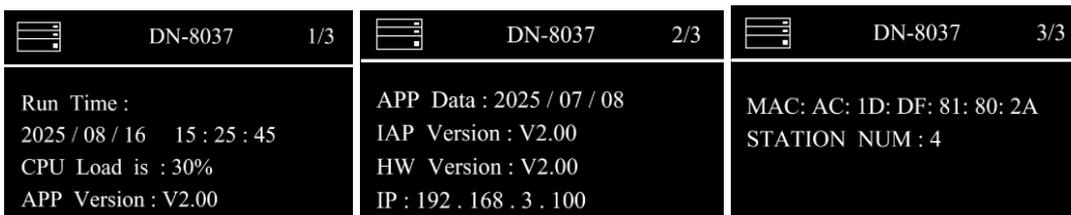
Click ● on the "Module" interface to enter the next-level module selection interface, and switch the display page by press the ▲ and ▼ buttons, as shown in the following figure. At this time, press and hold the ● button to return to the previous level.



Click the ● button in the figure above to enter the next level module selection interface, and click the ▲ and ▼ buttons to switch module selection. At this time, press and hold the ● button to return to the previous level.



Enter the module information display interface and switch the display by clicking the ▲ and ▼ buttons, as shown in the figure below. At this time, press and hold the ● button to return to the previous level.



(Note: The network adapter displays: APP version and date, IAP version and date,

hardware version, IP address, MAC address, and other information. Module display:  
module type, software version, hardware version, IAP version, and channel status. )

 DT-122F 1/2	 DT-122F 2/2
Type: 16DI Sink Soft Version: V2.00 HW Version: V2.00 IAP Version: V2.00	01234567 89ABCDEF ----- --*****

**Diagnosis interface:**

Display the module diagnostic information on the Diagnostics screen, and click the ▲ and ▼ buttons to switch the display page. At this time, press and hold the ● button to return to the previous level.

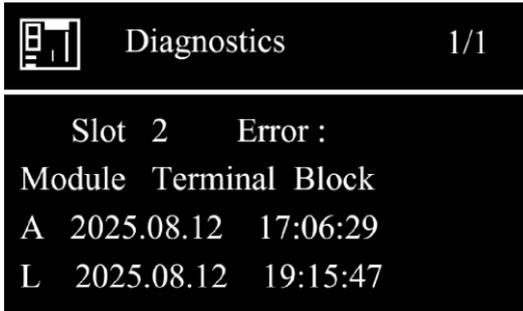
Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	0 L
3	ERR: Connector0	L

(Note: The error that occurs after this interface is displayed first, with a maximum of 200 items, as shown in the above figure, "A" and "L" represent respectively, the error still exists and the error has been eliminated, "Connector" is the specific error of the current error, and "28" is the slot number)

Click the ● button in the interface as shown in the figure above to enter the next level of diagnostic data selection interface, and click the ▲ and ▼ buttons to select and switch the diagnostic data. At this time, press and hold the ● button to return to the previous level.

Diagnostics		1/4
0	ERR: Connector2	L
1	ERR: Connector1	A
2	ERR: F24	L
3	ERR: Connector0	L

Enter the module error information display interface, as shown in the figure below, press and hold the ● button to return to the previous level.

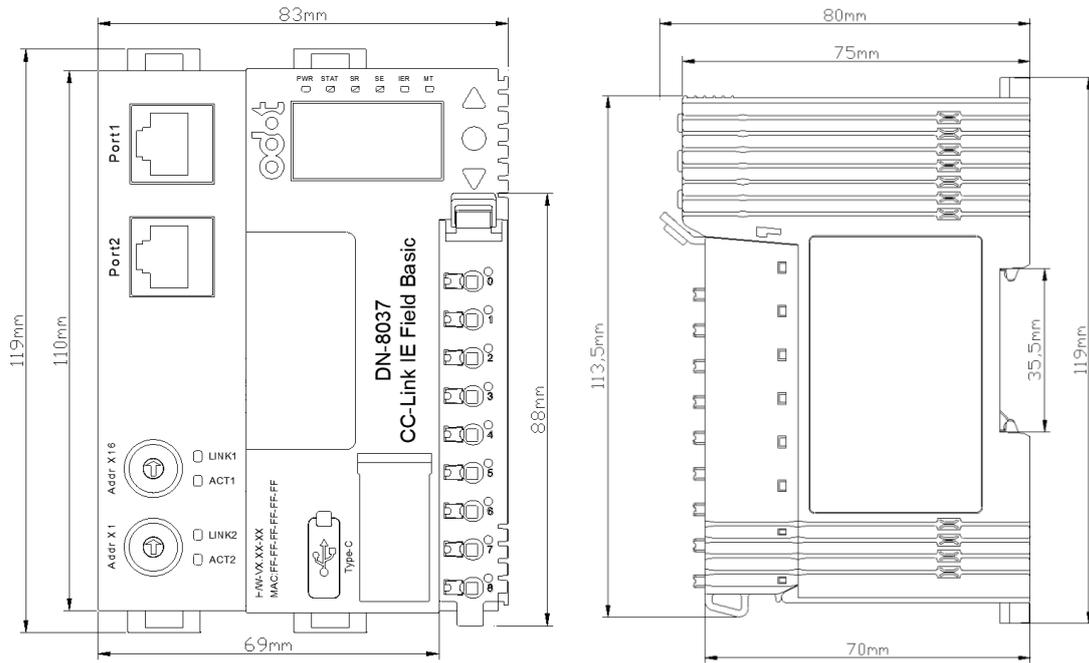


(Note: "Module Terminal Block" is the specific error of the current error, and "slot" is the slot number where the error occurred.) "A" is the time when the error occurred. "L" is the time when the error left)

**Error diagnosis code details**

Error Code	Simple Display	Detailed Display	Definition
0x00000003	Bus1	Module Backplane Bus1	Bus channel 1 is abnormal
0x00000004	Bus2	Module Backplane Bus2	Bus channel 2 is abnormal
0x00000005	Offline	Module Offline	Communication error between the module and the adapter
0x00000006	Connector	Module Terminal Block	Abnormal connection of equipment terminals
0x00000007	S24	System power supply	System power connection is abnormal
0x00000008	F24	Field power supply	Abnormal power connection at the site
0x00000009	Terminal	Terminal equipment	The terminal module is not mounted or the communication of the terminal module is abnormal
0x0000000A	Token	Token line shorted	There is a situation where the token line is short-circuited to a high level
0x0000000B	Memory	Memory Allocation	Exceeded the limit of sub-module additions
0x0000000C	PWR LOW	MCU low Voltage	Abnormal power supply for MCU
0x0000000D	HFER	Hardfault ERR	Hard Fault exception reset
0x0000000E	SOVR	Task stack overflow	Task stack overflow exception reset
0x0000000F	MOVR	Memory overflow	System memory overflow exception reset
0x00000010	Wdg Time	Wdg Timeout alarm	Watchdog timer timeout exception reset
0x00000011	Power Off	Power Is Off	Adapter power failure
0x00000100	MOD over	Module overrun	The number of configured modules has exceeded the limit

## 8 Dimension Drawing



## 3 IO Modules

### DT-121F 16 Channels Digital Input/24VDC/ PNP

#### 1 Module Features

- ◆ The module supports 16 channels digital input, the input high level is valid, it could support PNP sensor.
- ◆ The module could collect digital output signal of field equipment (dry contact or active output).
- ◆ The module could be accessed to 2-wire or 3-wire digital sensor.
- ◆ The module supports the input signal holding function, and the holding time can be set.
- ◆ The module carries 16 digital input channels with LED indicator on each channel.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	Max.52mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input parameters	
Number of channels	16 channels input
Indicator	16 channel indicators
Input characteristics	IEC 61131, Type 3
Signal “0”	-30~5VDC
Signal “1”	11~30VDC
Minimum Voltage	-30VDC
Maximum Voltage	30VDC
Input Current	5.26mA@24VDC
Input Delay	OFF to ON: Max.500μs ON to OFF: Max.500μs
Environment parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge ±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

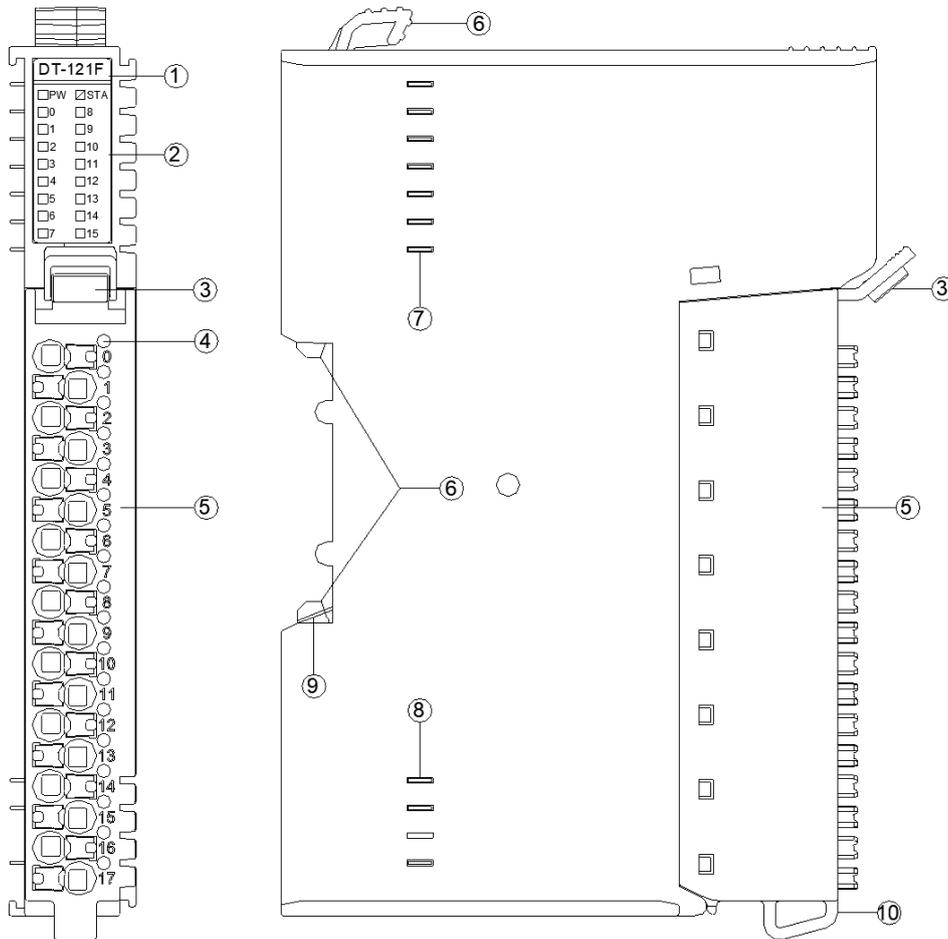
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

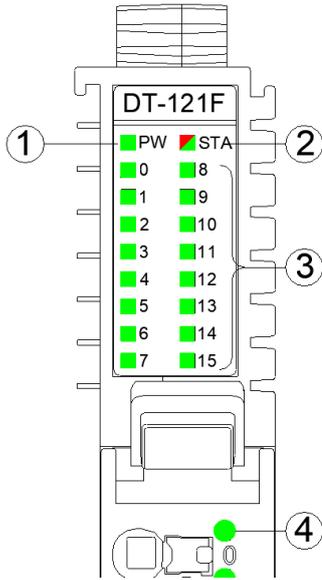
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interfaces



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

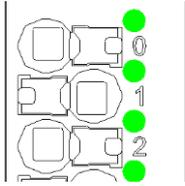
### 3.1 LED Indicator Definition



- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: Channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
Flash 2-5 times (Red)	Internal fault of the module
0~15 channel state indicator (Green)	Description
ON	The input signal is valid
OFF	The input signal is invalid

### 3.2 Channel Indicators

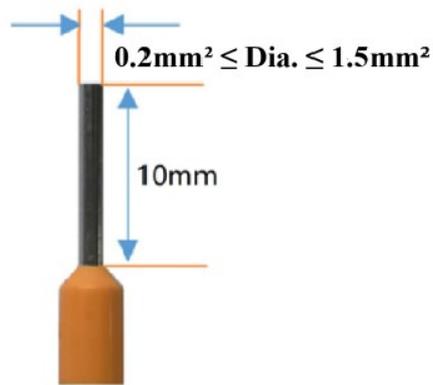


When the input signal is valid, the corresponding channel indicator and channel status indicator is lighted.

### 3.3 Wiring Definition

No.	Symbol	Description
0	DI0	Signal input
1	DI1	
2	DI2	
3	DI3	
4	DI4	
5	DI5	
6	DI6	
7	DI7	
8	DI8	
9	DI9	
10	DI10	
11	DI11	
12	DI12	
13	DI13	
14	DI14	
15	DI15	Power output
16	+24V	
17	+24V	

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



### ⚠ WARNING

#### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to  $0.2\text{mm}^2$  and less than or equal to  $1.5\text{mm}^2$  to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

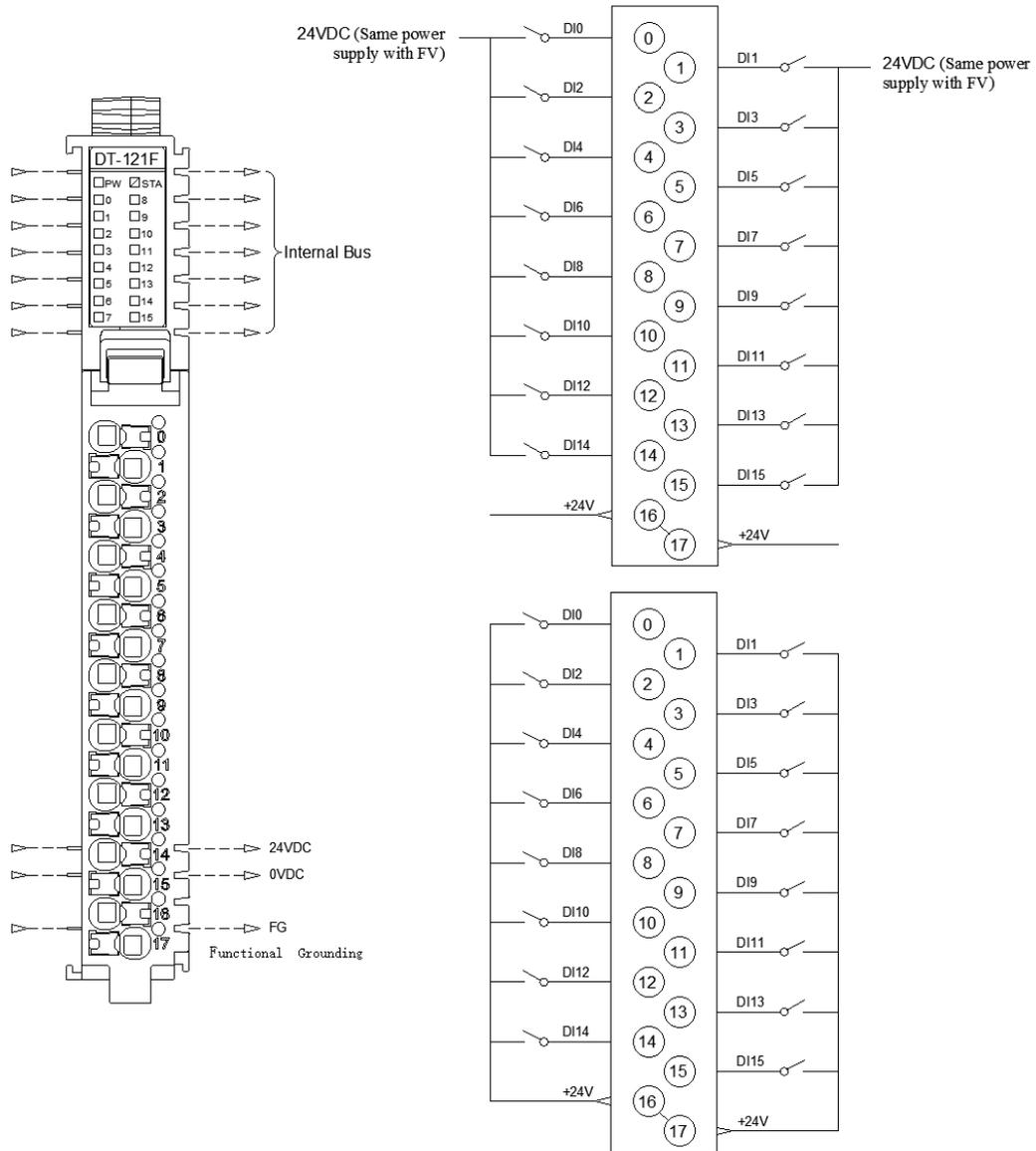
### ⚠ WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



Note: The module terminals 16 and 17 are shorted internally, the 24V on the terminal is used for DI external loop power supply, not as a device power supply.

### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Definition

### The process definition of input data

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0
Byte 1	DI Ch#15	DI Ch#14	DI Ch#13	DI Ch#12	DI Ch#11	DI Ch#10	DI Ch#9	DI Ch#8

Data description:

**DI Ch# (0~15):** When the input signal is valid, the corresponding bit will be set to 1, otherwise the bit is 0.

- 0: The input signal is valid
- 1: The input signal is invalid

## 6 Configuration Parameter Definition

Configuration parameter								
Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input filtering time (ms)							
Byte1								
Byte2	Reserved					Input holding time (ms)		

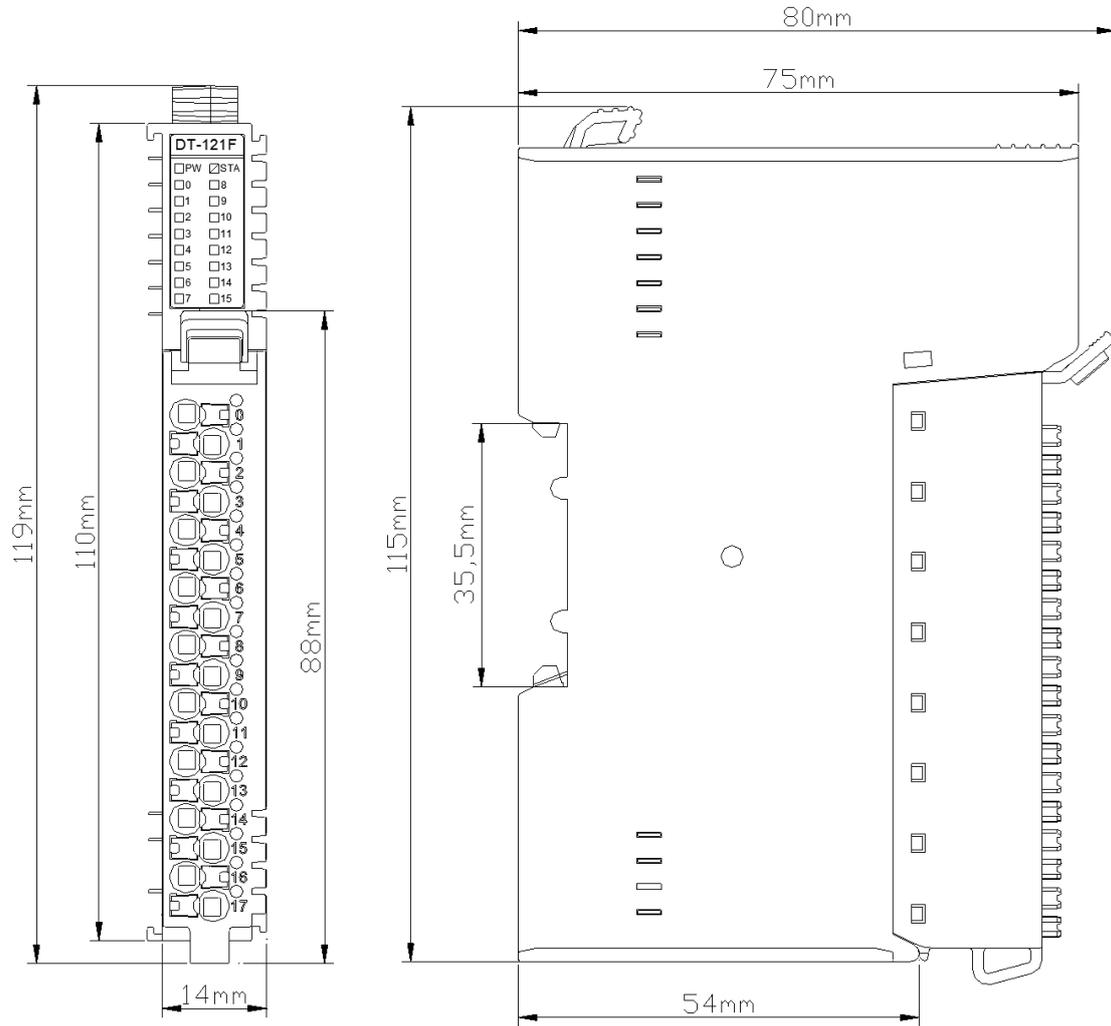
Data description:

**Input Filtering Time(ms):** Channel input filtering time (Default: 10ms)

**Input Holding Time(ms):** Channel signal input holding time. (Default: Disable)

- 0: Disable
- 1: 200ms
- 2: 500ms
- 3: 1000ms
- 4: 1500ms
- 5: 2000ms
- 6: 3000ms
- 7: 5000ms

## 7 Dimension Drawing



## **DT-122F 16 Channels Digital Input /24VDC/NPN**

### **1 Module Feature**

- ◆ The module supports 16 channels digital input, supports low level input, and it can connect to the NPN sensor.
- ◆ The module could collect the digital output signal of field equipment (dry contact or active output).
- ◆ The module could be connected to 2-wire or 3-wire digital sensor.
- ◆ The module supports input signal holding function, holding time can be set.
- ◆ The module carries with 16 digital input channel LED indicator.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	60mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Number of Channels	16 channels input
Indicator	16 channel indicators
Input Characteristics	IEC 61131, Type 3
Signal "0"	-5~30VDC (reference potential FV+)
Signal "1"	-30~-11VDC (reference potential FV+)
Minimum Voltage	-30VDC
Maximum Voltage	30VDC
Input Delay	OFF to ON: Max.500μs ON to OFF: Max.500μs
Environment Parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge ±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

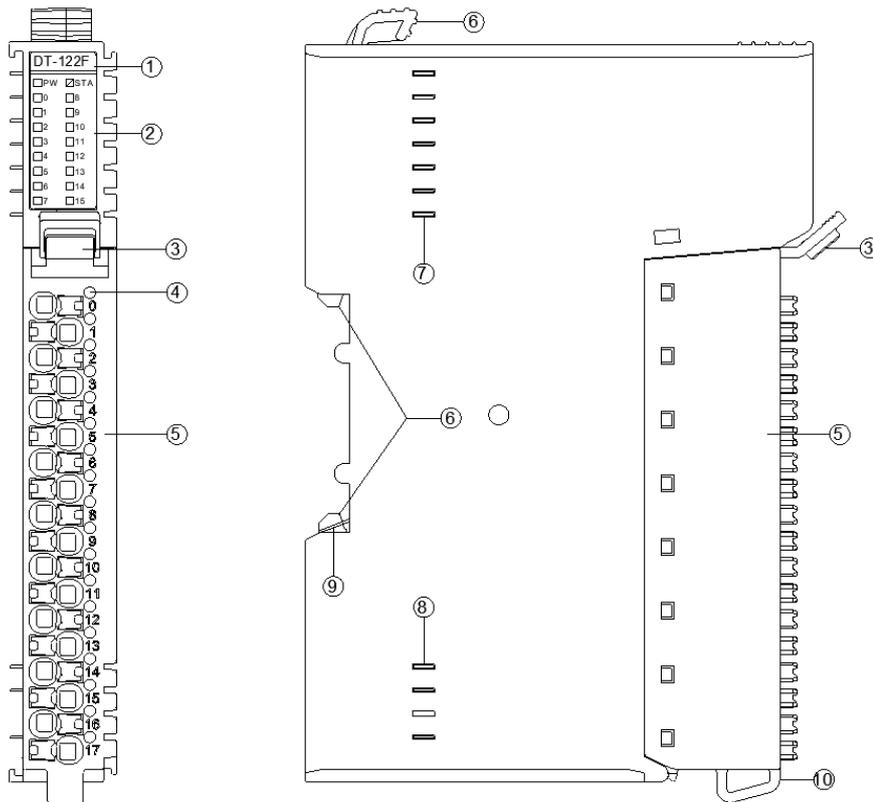
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

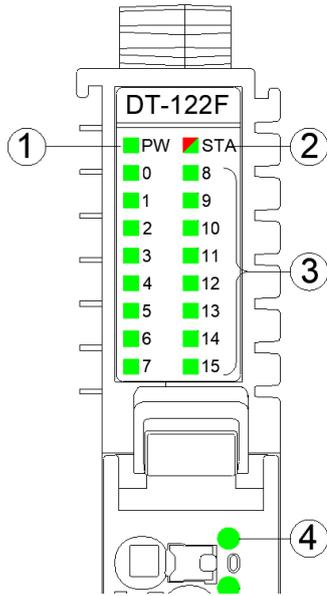
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interfaces



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

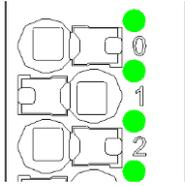
### 3.1 LED Indicator Definition



- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: Channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
Flash 2-5 times (Red)	Internal fault of the module
0~15 channel state indicator (Green)	Description
ON	The input signal is valid
OFF	The input signal is invalid

### 3.2 Channel Indicator



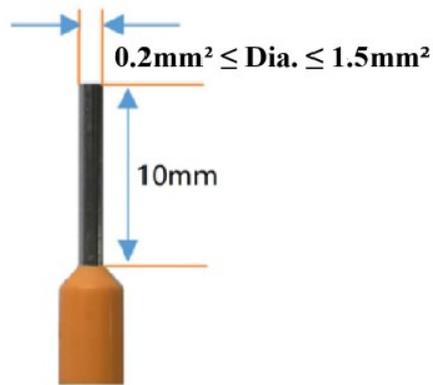
When the input signal is valid, the corresponding channel indicator and channel status indicator is lighted.

### 3.3 Wiring Definition

No.	Symbol	Description
0	DI0	Signal input
1	DI1	
2	DI2	
3	DI3	
4	DI4	
5	DI5	
6	DI6	
7	DI7	
8	DI8	
9	DI9	
10	DI10	
11	DI11	
12	DI12	
13	DI13	
14	DI14	
15	DI15	Power supply
16	0V	
17	0V	

**Module No. 16 and 17 terminals are internal short connection.**

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



## ⚠ WARNING

### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

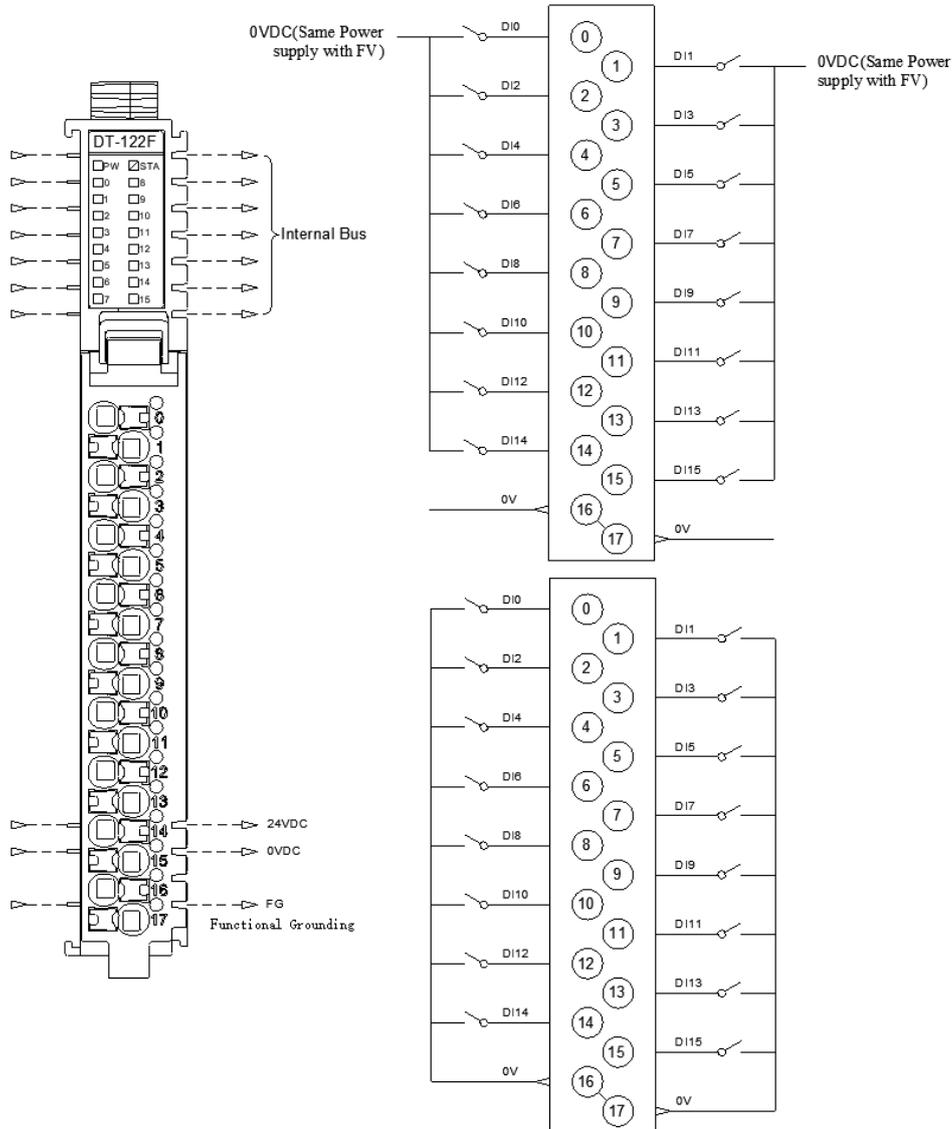
## ⚠ WARNING

### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Definition

### The process definition of input data

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0
Byte 1	DI Ch#15	DI Ch#14	DI Ch#13	DI Ch#12	DI Ch#11	DI Ch#10	DI Ch#9	DI Ch#8

Data description:

**DI Ch# (0~15):** When the input signal is valid, the corresponding bit will be set to 1, otherwise the bit is 0.

- 0: The input signal is valid
- 1: The input signal is invalid

## 6 Configuration Parameter Definition

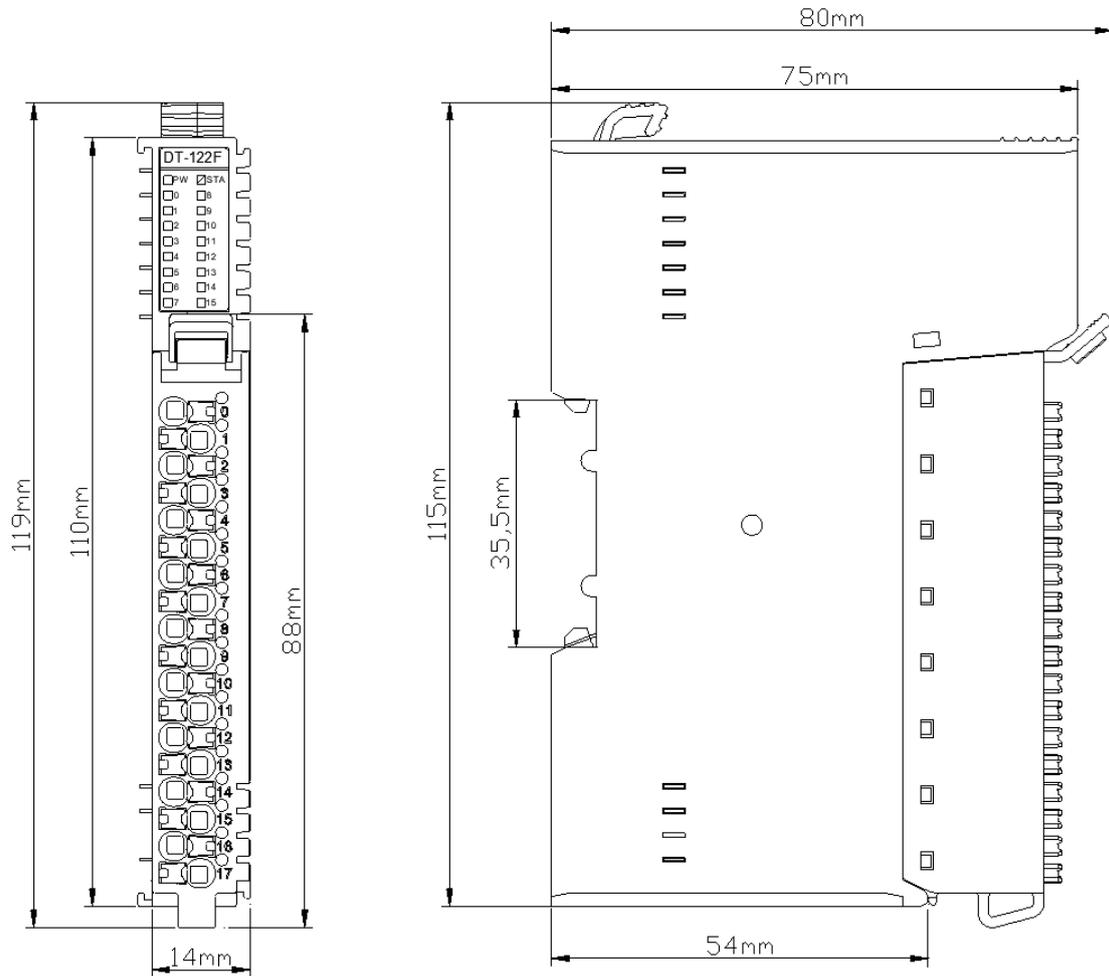
Configuration Parameter								
Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input Filtering Time (ms)							
Byte1								
Byte2	Reserved					Input Holding Time (ms)		

**Input Filtering Time(ms):** Channel input filtering time. (Default: 10ms)

**Input Holding Time(ms):** Channel signal input holding time. (Default: Disable)

- 0: Disable
- 1: 200ms
- 2: 500ms
- 3: 1000ms
- 4: 1500ms
- 5: 2000ms
- 6: 3000ms
- 7: 5000ms

## 7 Dimension Drawing



## **DT-1314 4 Channels Digital Input 110VAC / 220VAC**

### **1 Module Feature**

- ◆ The module supports 4 channels of digital input and 110 VAC /220VAC input.
- ◆ The module could collect the digital output signal of the field equipment (dry contact or active output).
- ◆ The module could be connected to 2-wire or 3-wire digital sensor.
- ◆ The module has 4 independent channels and is isolated between channels.
- ◆ The module supports input signal hold function, and the holding time can be set.
- ◆ The module has 4 digital input channels LED indicators.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	45mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Number of Channels	4 Channels input
Indicator	4 Channels indicators
Input Characteristics	IEC 61131, Type 1@110VAC/ Type 3@220VAC
Voltage Frequency	AC (47 Hz to 63 Hz)
Rated Value	100~240VAC
Signal “0”	0~40VAC
Signal “1”	74~264VAC
OVC	II
Input Delay	OFF to ON: Max.4ms ON to OFF: Max.10ms
Channel Isolation	Isolation
Environment Parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±8kV, Air discharge ±15kV, Performance level B SURGE: Common mode ±3kV, Performance level B EFT: ±2kV, Performance level A)

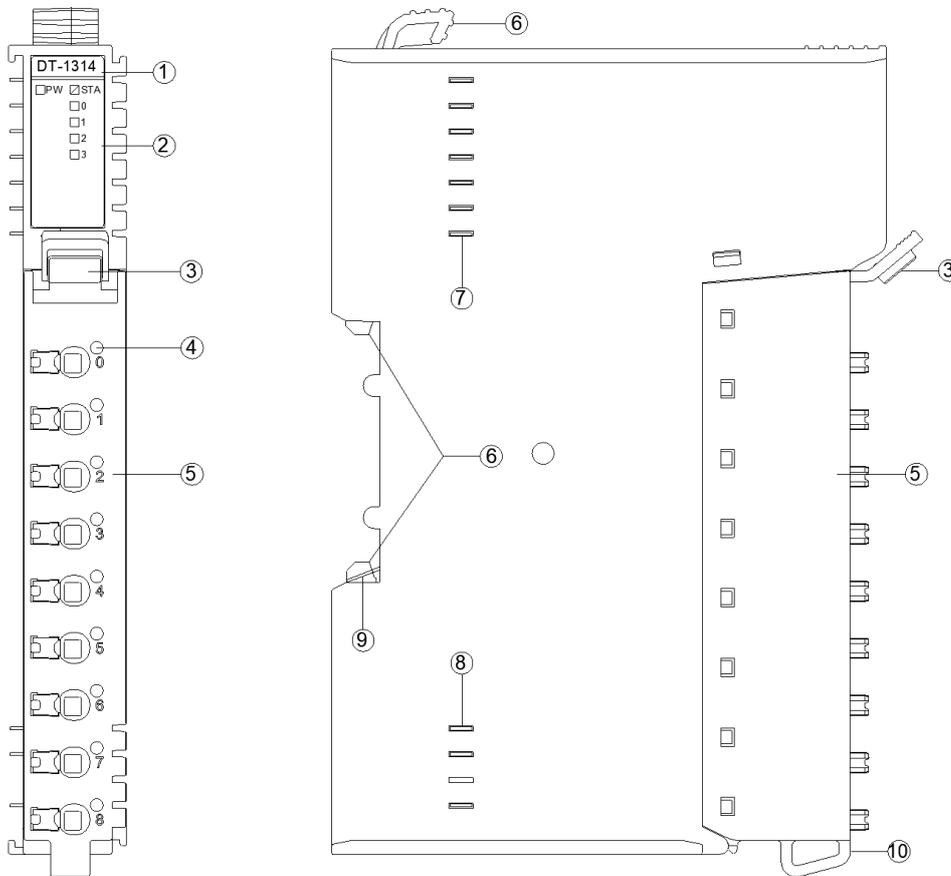
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

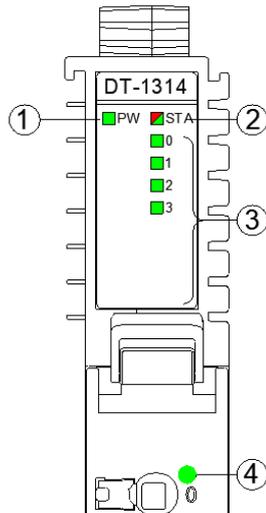
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



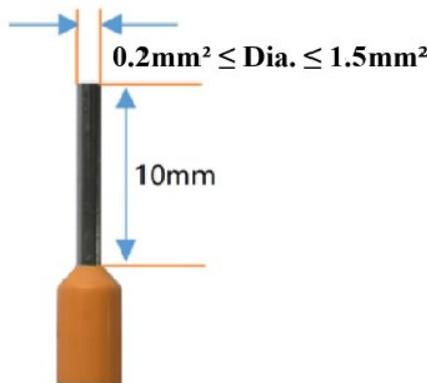
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: Channel indicator

PW Power Indicator (Green)	Definition
ON	The internal bus power supply is normal
OFF	The internal bus power supply is abnormal
STA Module state indicator (Red/Green)	Definition
Slow flash (Green)	The internal bus is not started
Slow flash (Red)	The internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/Green)	Firmware Update
Flash 2-5 times (Red)	Internal fault of the module
0~3 channels state indicator (Green)	Definition
ON	The input signal is valid (input signal $\geq 65V$ )
OFF	The output signal is invalid/channels disabled

### 3.2 Wiring Definition

No.	Symbol	Description
0	DI0_L	Signal input 0
1	DI0_N	
2	DI1_L	Signal input 1
3	DI1_N	
4	DI2_L	Signal input 2
5	DI2_N	
6	DI3_L	Signal input 3
7	DI3_N	
8	NC	No connection

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

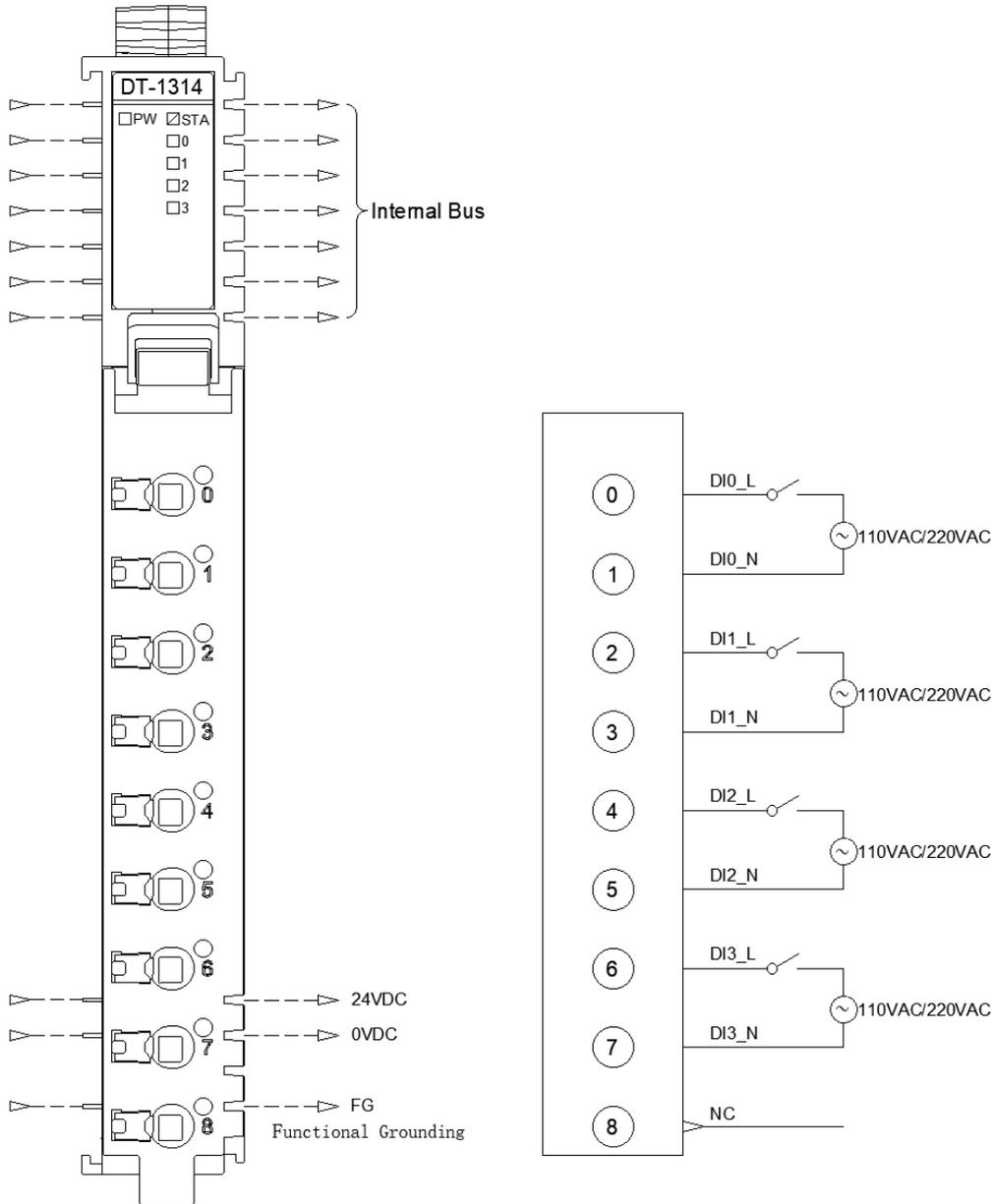
**⚠ WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

**EQUIPMENT INOPERABLE**

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definitions

### The process definition of input data

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0

Data description:

**DI Ch# (0~3):** When the input signal is valid, the corresponding bit will be set to 1, otherwise the bit is 0.

0: The input signal is invalid

1: The input signal is valid

## 6 Configuration Parameter Definition

Configuration Parameter								
Bit 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input Filtering Time (ms)							
Byte1								
Byte2	Reserved					Input Holding Time (ms)		

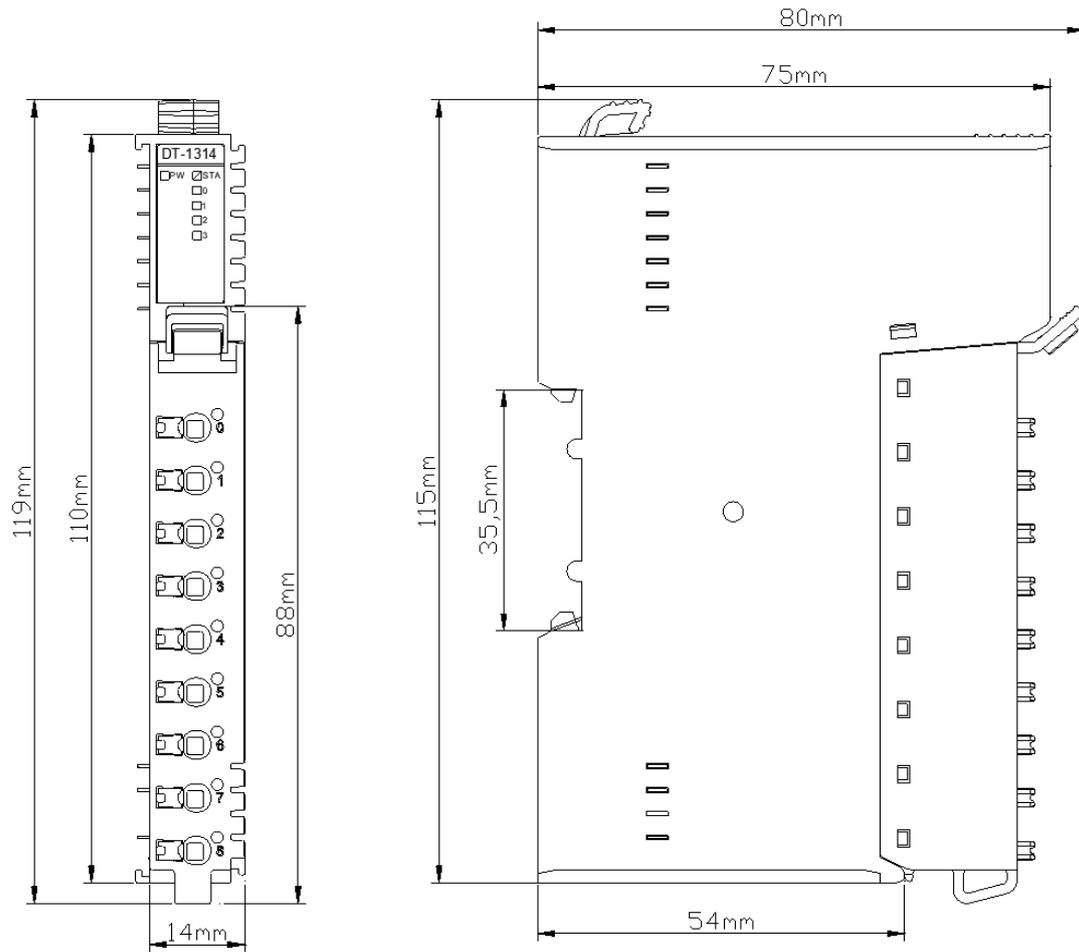
Data description:

Input Filtering Time(ms): Channel input filtering time. (Default: 10ms)

Input Holding Time(ms): Channel signal input holding time. (Default: Disable)

- 0: Disable
- 1: 200ms
- 2: 500ms
- 3: 1000ms
- 4: 1500ms
- 5: 2000ms
- 6: 3000ms
- 7: 5000ms

## 7 Dimension Drawing



## **DT-221F 16 Channels Digital Output /24VDC/NPN**

### **1 Module Feature**

- ◆ The module supports 16 channels digital output, the output low level is valid and the output voltage is 0V.
- ◆ The module carries 16 digital output channel LED indicators.
- ◆ The module has the function of thermal shutdown and over current protection.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	48mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input parameters	
Channel number	16 channels output
Indicator	16 channel indicators
Output Type	Transistor output, NPN
Load capacity	12W (0.5A)/ each channel
Output Current of Module	Max.8A
Load Resistance	Min.48 Ω
Output Delay	OFF to ON: Max.100μs ON to OFF: Max.200μs
Output voltage	0V
Residual Current	<8 μA
Switching Frequency	Resistive load: Max.100Hz Inductive load: Max.2Hz
Module Fault Handling	Output fault value or hold last output value can be configured
Protection Function	Overcurrent protection, protection current: 0.7~1.4A
Environment parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

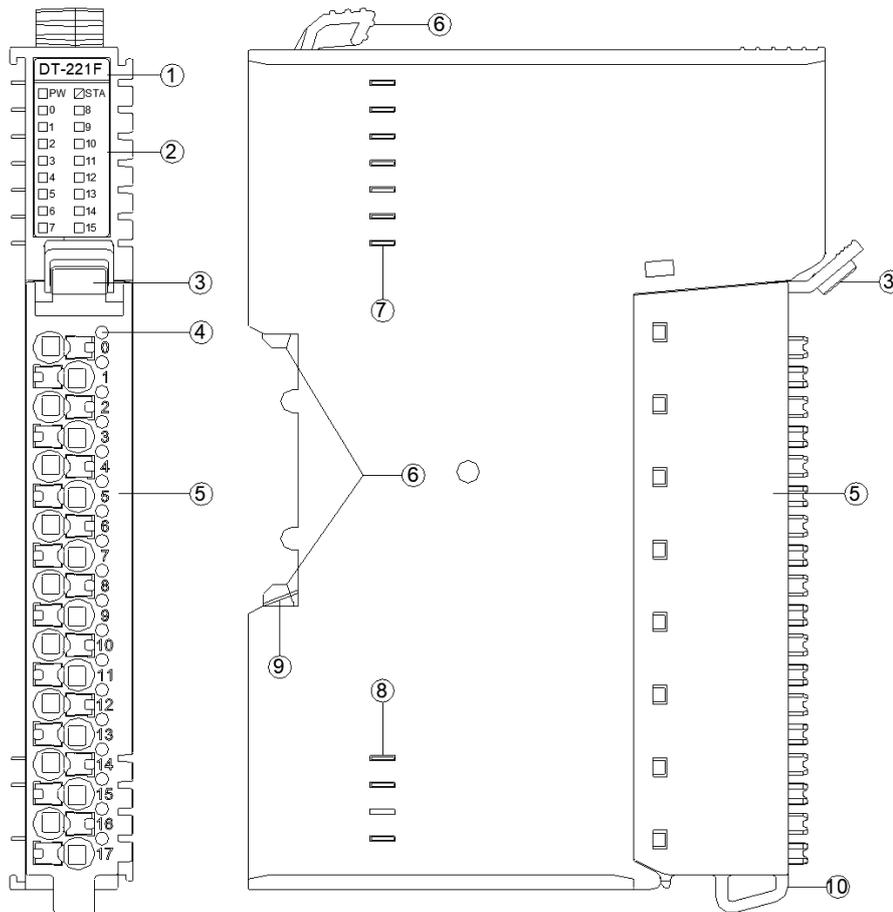
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

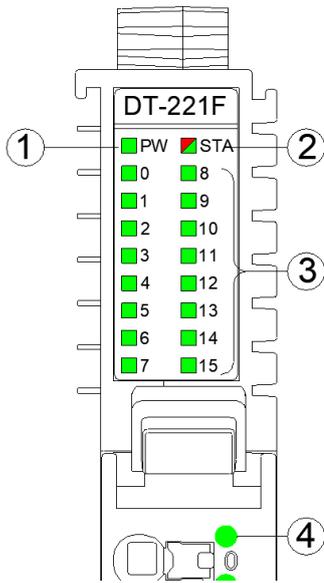
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

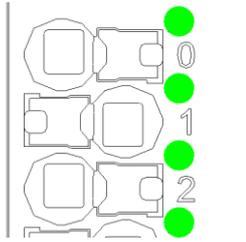
### 3.1 LED Indicator Definition



- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: Channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
Flash 2-5 times (Red)	Internal fault of the module
0~15 channel state indicator (Green)	Description
ON	The output signal is valid
OFF	The output signal is invalid

### 3.2 Channel Indicators



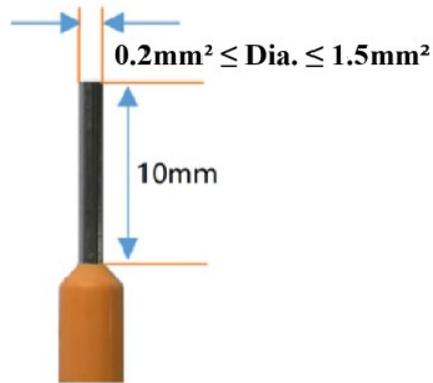
When the input signal is valid, the corresponding channel indicator and channel status indicator is lighted.

### 3.3 Wiring Definition

No.	Symbol	Description
0	DO0	Signal output
1	DO1	
2	DO2	
3	DO3	
4	DO4	
5	DO5	
6	DO6	
7	DO7	
8	DO8	
9	DO9	
10	DO10	
11	DO11	
12	DO12	
13	DO13	
14	DO14	
15	DO15	Power input
16	+24V	
17	+24V	

**Note:** If the load is an inductive load, the 24V terminal must be connected to the power supply.

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



### ⚠ WARNING

#### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to  $0.2\text{mm}^2$  and less than or equal to  $1.5\text{mm}^2$  to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

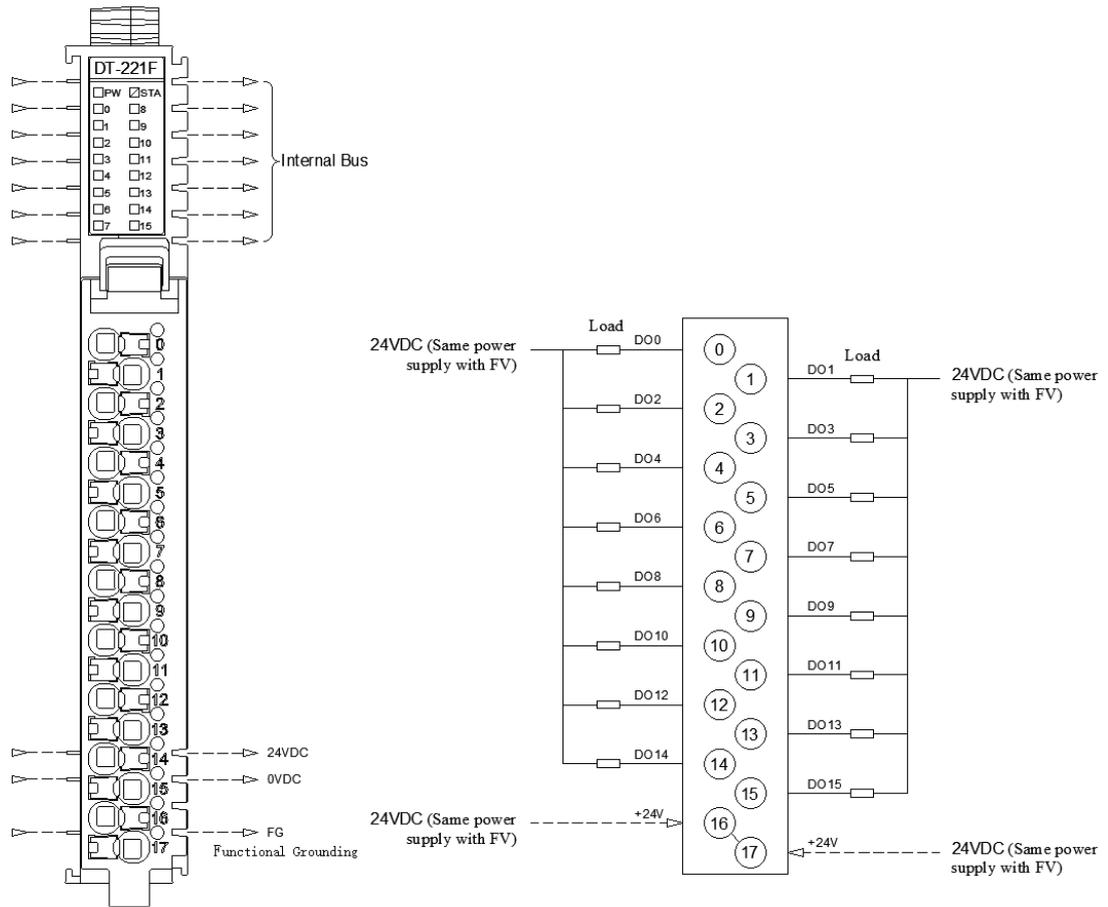
### ⚠ WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



Note: Module 16 and 17 terminals are internally shorted

### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definitions

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DO Ch#7	DO Ch#6	DO Ch#5	DO Ch#4	DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0
Byte 1	DO Ch#15	DO Ch#14	DO Ch#13	DO Ch#12	DO Ch#11	DO Ch#10	DO Ch#9	DO Ch#8

Data description:

**DI Ch# (0~15):** When the bit is 1, the output signal of the corresponding channel is effective, the output is low level, and the output is invalid when it is 0.

0: The output signal is invalid

1: The output signal is valid

## 6 Configuration Parameters Definition

Configured Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault action for output Ch#7	Fault action for output Ch#6	Fault action for output Ch#5	Fault action for output Ch#4	Fault action for output Ch#3	Fault action for output Ch#2	Fault action for output Ch#1	Fault action for output Ch#0
Byte 1	Fault action for output Ch#15	Fault action for output Ch#14	Fault action for output Ch#13	Fault action for output Ch#12	Fault action for output Ch#11	Fault action for output Ch#10	Fault action for output Ch#9	Fault action for output Ch#8
Byte 2	Fault value for output Ch#7	Fault value for output Ch#6	Fault value for output Ch#5	Fault value for output Ch#4	Fault value for output Ch#3	Fault value for output Ch#2	Fault value for output Ch#1	Fault value for output Ch#0
Byte 3	Fault value for output Ch#15	Fault value for output Ch#14	Fault value for output Ch#13	Fault value for output Ch#12	Fault value for output Ch#11	Fault value for output Ch#10	Fault value for output Ch#9	Fault value for output Ch#8

Data description:

**Fault action for output Ch# (0-15):** Fault Output mode, when the IO module detects an internal bus exception and fails to communicate with the adapter. And the module will turn to offline mode, so the output data is processed in this way. (Default value: Output fault value)

0: Holding last output value

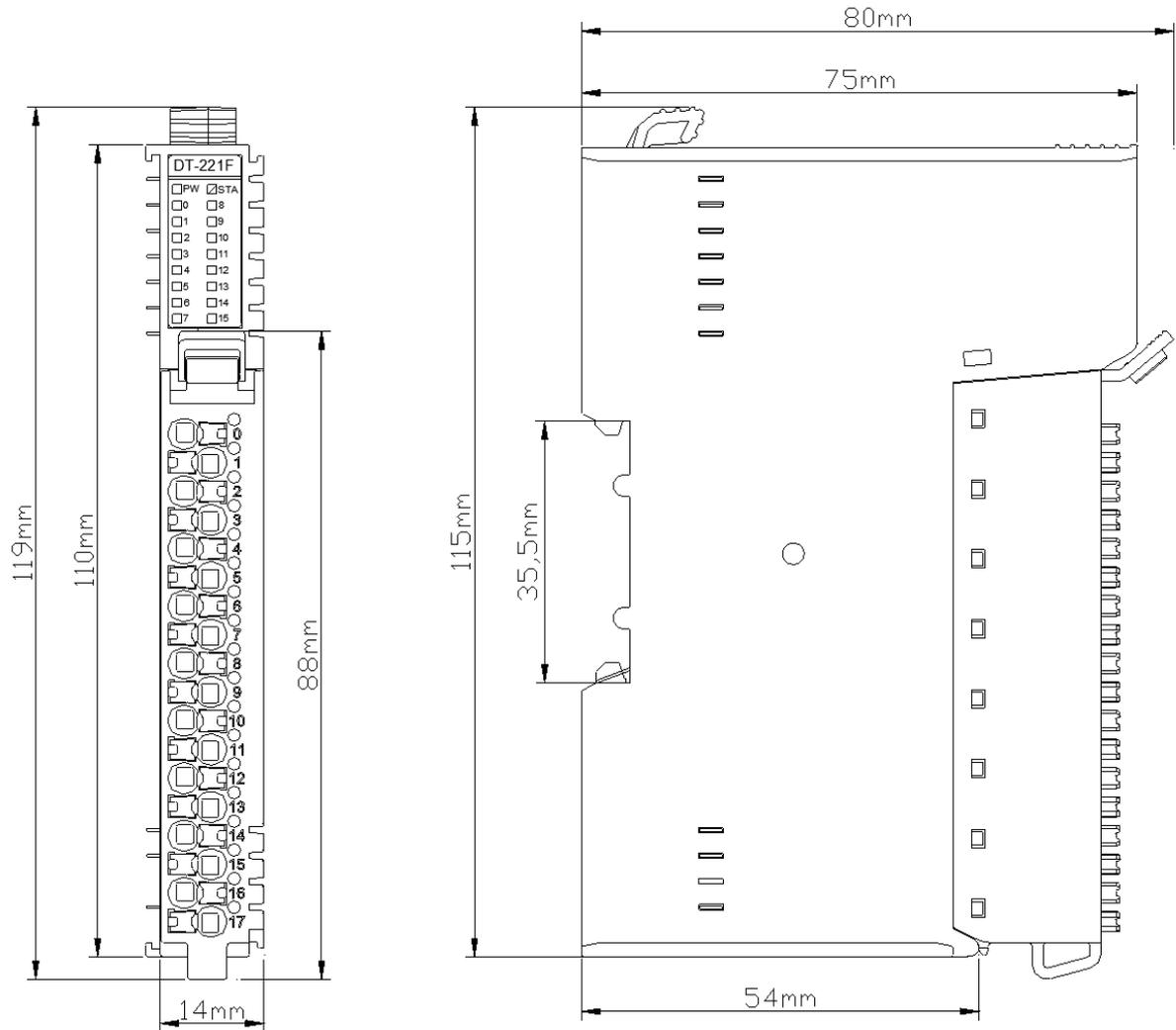
1: Output fault value

**Fault value for output Ch# (0-15):** When the fault action for output is 1, this bit sets output fault value, and this setting value will be outputted when the internal bus of IO module is offline. (Default value: The output is invalid)

0: The output is invalid

1: Output low level

## 7 Dimension Drawing



## **DT-222F 16 Channels Digital Output /24VDC/PNP**

### **1 Module Feature**

- ◆ The module supports 16 channels digital output, the output voltage is 24VDC and the output high level is valid.
- ◆ The module carries 16 digital output channel LED indicator light.
- ◆ The module has the functions of thermal shutdown and overcurrent protection.
- ◆ The module supports short circuit protection and overload protection.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	61mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Output Parameters	
Channel Number	16 channels output
Indicator	16 channel indicators
Output Type	Transistor output, PNP
Load Capacity	12W (0.5A)/ each channel
Output Current of Module	Max.8A
Load Resistance	Min.48 Ω
Output Delay	OFF to ON: Max.100μs ON to OFF: Max.200μs
Switching Frequency	Resistive load: Max.100Hz Inductive load: Max.2Hz
Module Fault Handling	Output fault value or hold last output value can be configured
Protection Function	Overcurrent protection, protection current: 0.7~1.4A
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

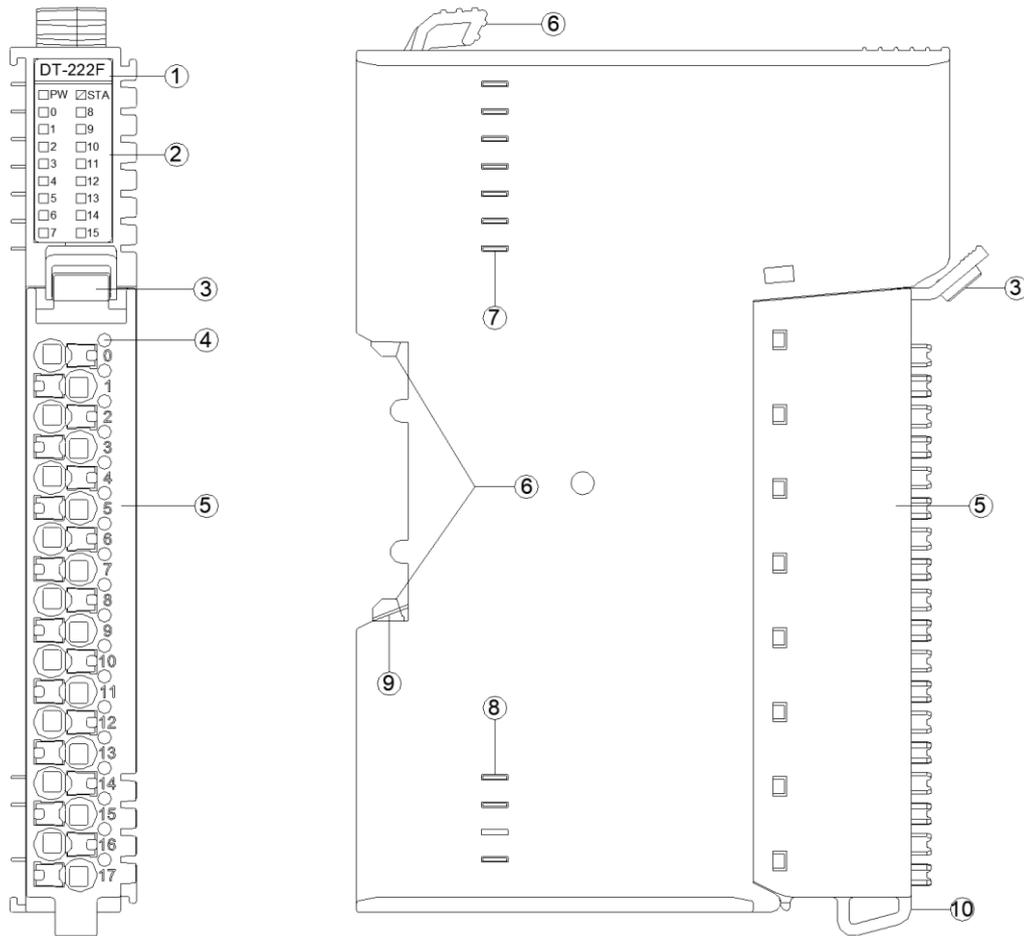
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

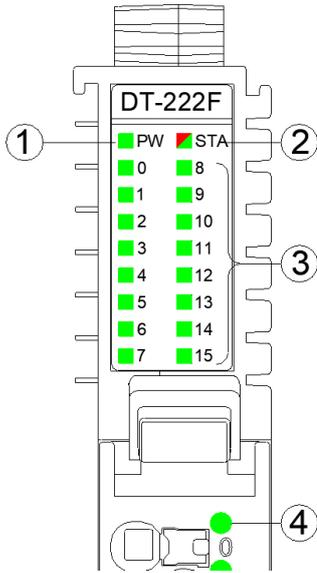
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

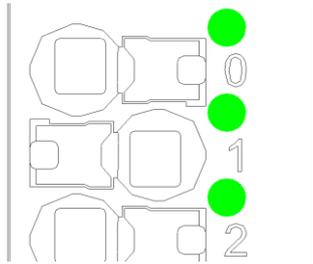
### 3.1 LED Indicator Definition



- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: Channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
Flash 2-5 times (Red)	Internal fault of the module
0~15 channel state indicator (Green)	Description
ON	The output signal is valid
OFF	The output signal is invalid

### 3.2 Channel Indicators



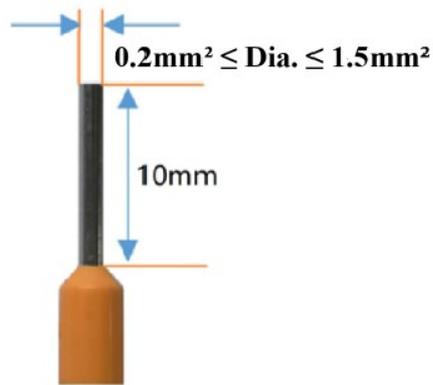
When the input signal is valid, the corresponding channel indicator and channel status indicator is lighted.

### 3.3 Wiring Definition

No.	Symbol	Description
0	DO0	Signal output
1	DO1	
2	DO2	
3	DO3	
4	DO4	
5	DO5	
6	DO6	
7	DO7	
8	DO8	
9	DO9	
10	DO10	
11	DO11	
12	DO12	
13	DO13	
14	DO14	
15	DO15	Power input
16	+24V	
17	+24V	

Note: If the load is an inductive load, the 24V terminal must be connected to the power supply.

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



### ⚠ WARNING

#### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

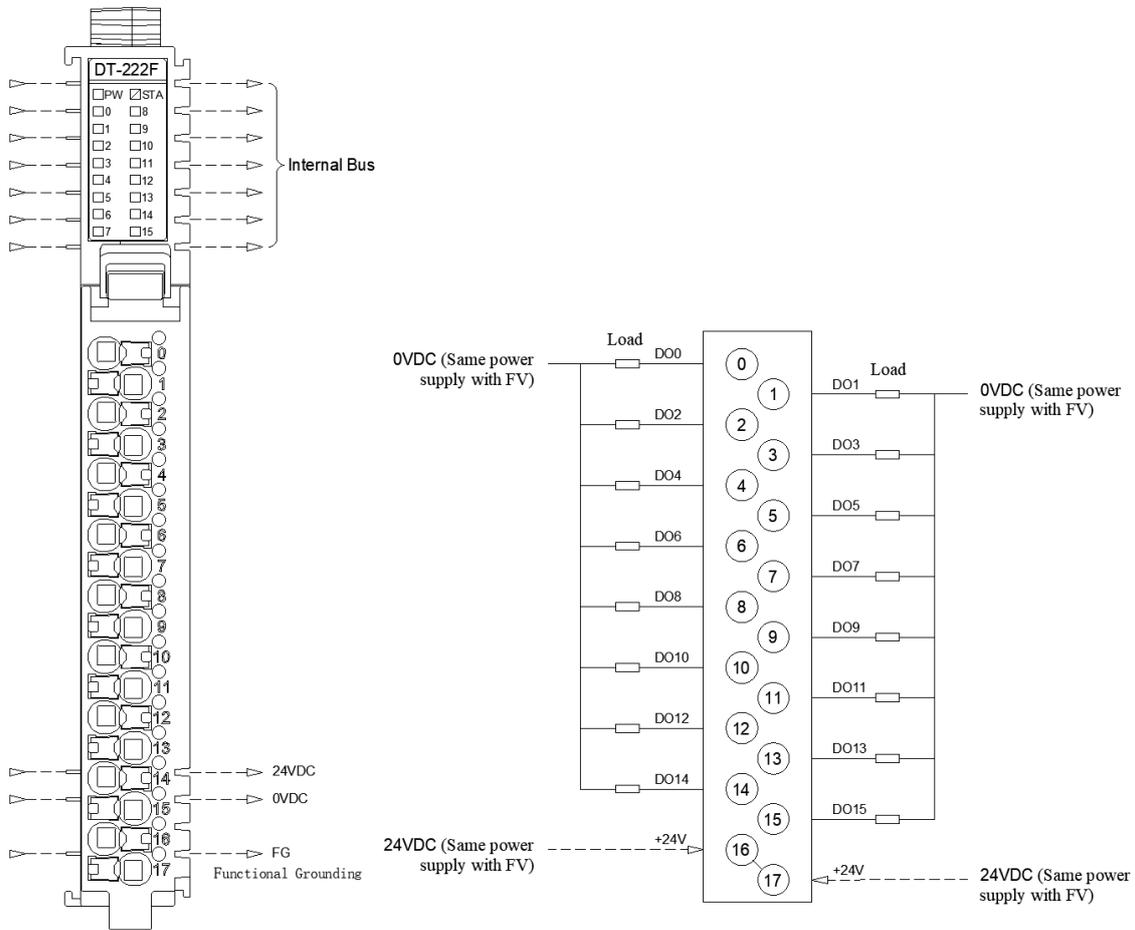
### ⚠ WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



**Note: Module 16 and 17 terminals are internally shorted**

### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definitions

### The process data definition of input data

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	DO Ch#7	DO Ch#6	DO Ch#5	DO Ch#4	DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0
Byte 1	DO Ch#15	DO Ch#14	DO Ch#13	DO Ch#12	DO Ch#11	DO Ch#10	DO Ch#9	DO Ch#8

Data description:

**DO Ch# (0~15):** When the bit is 1, the output signal of the corresponding channel is effective, the output is high level, and the output is invalid when it is 0.

0: The output signal is invalid

1: The output signal is valid

## 6 Configuration Parameters Definition

Configured Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault Action for Output Ch#7	Fault Action for Output Ch#6	Fault Action for Output Ch#5	Fault Action for Output Ch#4	Fault Action for Output Ch#3	Fault Action for Output Ch#2	Fault Action for Output Ch#1	Fault Action for Output Ch#0
Byte 1	Fault Action for Output Ch#15	Fault Action for Output Ch#14	Fault Action for Output Ch#13	Fault Action for Output Ch#12	Fault Action for Output Ch#11	Fault Action for Output Ch#10	Fault Action for Output Ch#9	Fault Action for Output Ch#8
Byte 2	Fault Value for Output Ch#7	Fault Value for Output Ch#6	Fault Value for Output Ch#5	Fault Value for Output Ch#4	Fault Value for Output Ch#3	Fault Value for Output Ch#2	Fault Value for Output Ch#1	Fault Value for Output Ch#0
Byte 3	Fault Value for Output Ch#15	Fault Value for Output Ch#14	Fault Value for Output Ch#13	Fault Value for Output Ch#12	Fault Value for Output Ch#11	Fault Value for Output Ch#10	Fault Value for Output Ch#9	Fault Value for Output Ch#8

Data description:

**Fault Action for Output Ch# (0-15):** Fault Output mode, when the IO module detects an internal bus exception and fails to communicate with the adapter. And the module will turn to offline mode, so the output data is processed in this way. (Default value: Output fault value)

0: Holding last output value

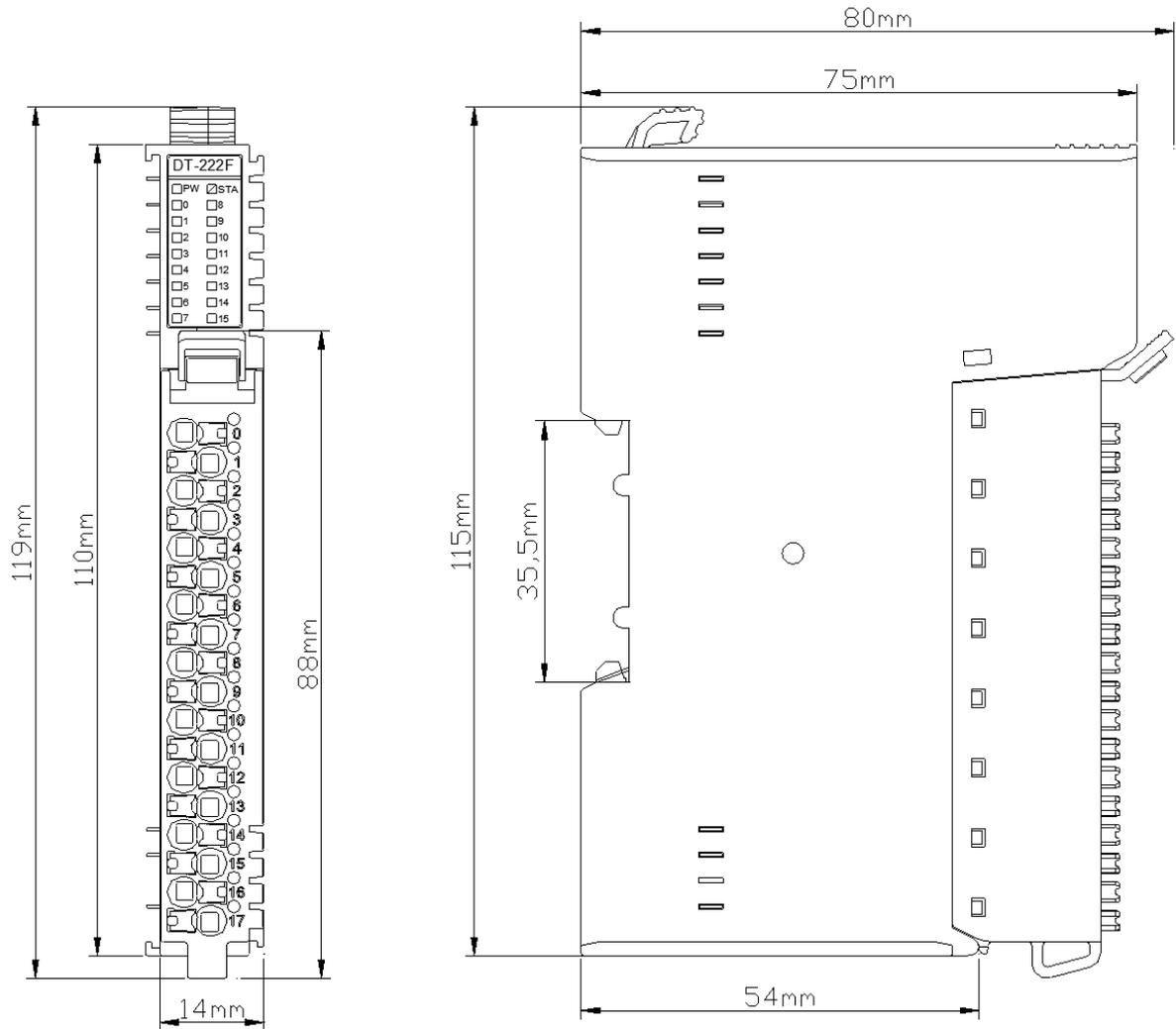
1: Output fault value

**Fault Value for Output Ch# (0-15):** When the fault action for output is 1, this bit sets output fault value, and this setting value will be outputted when the internal bus of IO module is offline. (Default value: The output is invalid)

0: The output is invalid

1: Output high level

## 7 Dimension Drawing



## **DT-2794 4 Channel Relay Output, 2A@250VAC/ 30VDC (Resistive Load), 1A@250VAC/30VDC (Inductive Load)**

### **1 Module Feature**

- ◆ 4 Channels relay normally on output;
- ◆ 4 Channels LED indicators;
- ◆ Low on resistance ( $\leq 100\text{m}\Omega$ );
- ◆ With isolation between channels;
- ◆ Resistive and inductive loads can be connected;
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Power Consumption	143mA@5VDC
Field Powe	19.2~28.8VDC (Nominal: 24VDC)
Wirring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Output Parameter	
Channel Number	4 channels output
Indicator	4 channels indicator
Output Type	Relay output
Load Capacity	Resistive load: 2A Inductive load: 1A Lighting load: 30W DC/200W AC
Output Voltage	Max.250VAC/30VDC
Output Delay	OFF to ON: Max.10ms ON to OFF: Max.10ms
Switching Frequency	Resistive load: Max.1Hz Inductive load: Max.0.5Hz Lighting load: Max.0.5Hz
Module Fault Handling	Output fault value or hold last output value can be configured
Environment parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±8kV, Air discharge ±15kV, Performance level B SURGE: Common mode ±3kV, Performance level B EFT: ±2kV, Performance level A)

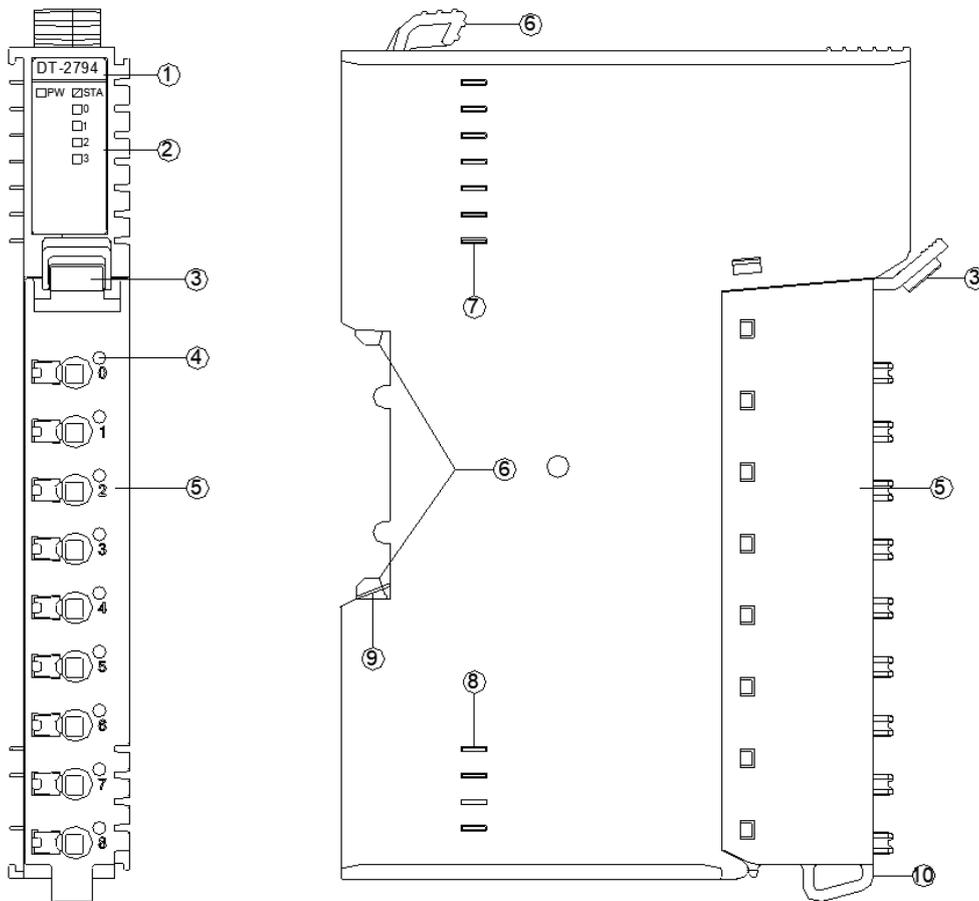
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

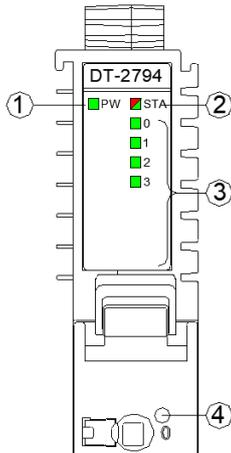
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

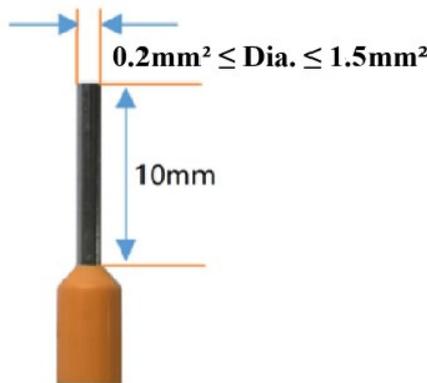
PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
Flash 2-5 times (Red)	Internal fault of the module
0~3 Channel state indicator (Green)	Description
ON	The output signal is valid
OFF	The output signal is invalid

### 3.2 Wiring Definition

No.	Definition	Description
0	DO0	Signal output 0
1	COM0	
2	DO1	Signal output 1
3	COM1	
4	DO2	Signal output 2
5	COM2	
6	DO3	Signal output 3
7	COM3	
8	NC	No connection

Note: If the load is an inductive load, the 24V terminal must be connected to the power supply.

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

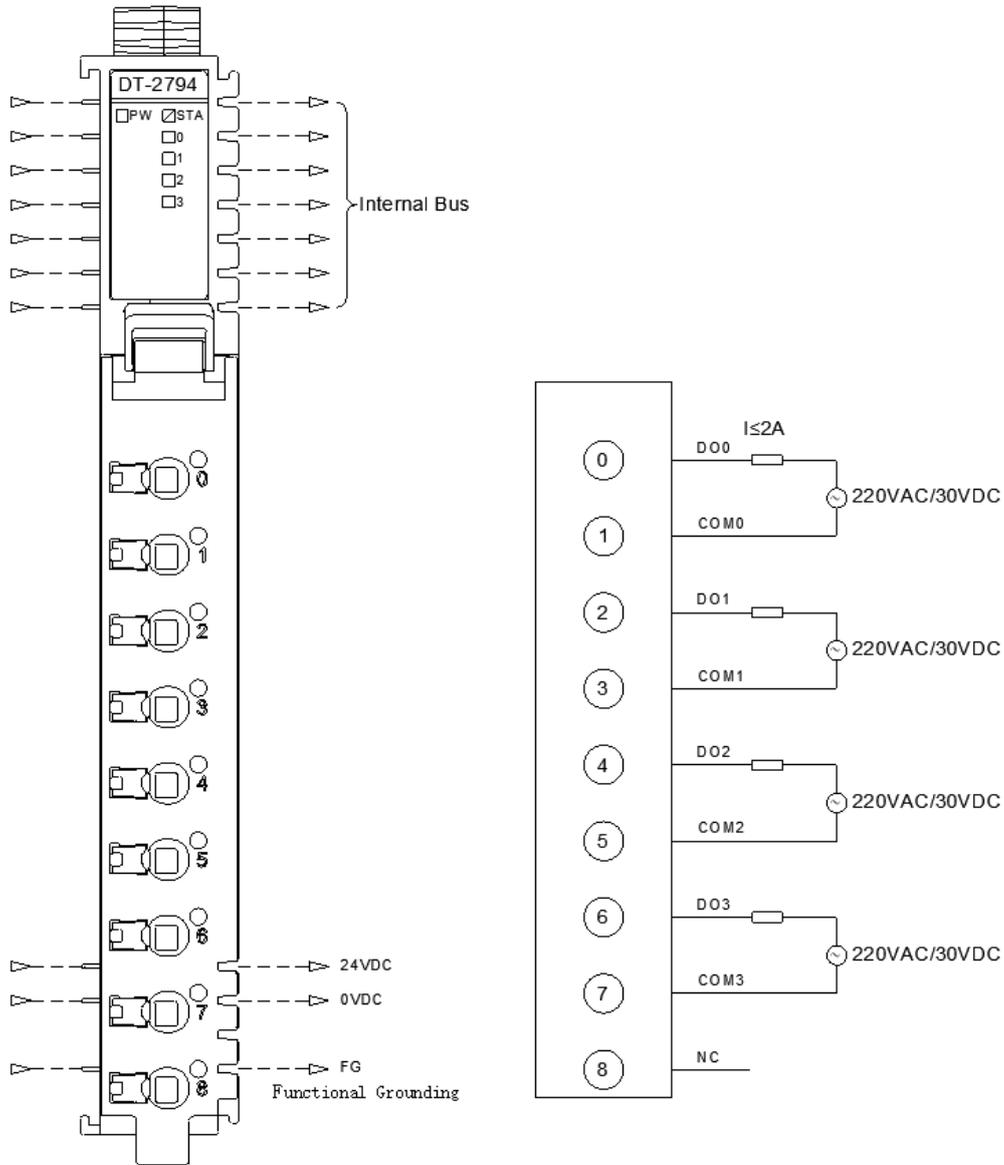
**⚠ WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definitions

### The process data definition of input data

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				DO Ch#3	DO Ch#2	DO Ch#1	DO Ch#0

Data description:

**DO Ch# (0~3):** When the bit is 1, the output signal of the corresponding channel is effective, the output is high level, and the output is invalid when it is 0.

0: The output signal is invalid

1: The output signal is valid

## 6 Configuration Parameters Definition

Configured Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Fault Action for Output Ch#3	Fault Action for Output Ch#2	Fault Action for Output Ch#1	Fault Action for Output Ch#0
Byte 2	Reserved				Fault Value for Output Ch#3	Fault Value for Output Ch#2	Fault Value for Output Ch#1	Fault Value for Output Ch#0

Data description:

**Fault Action for Output Ch# (0-3):** Fault output mode, when the IO module detects an internal bus anomaly and fails to communicate with the adapter and enters offline mode, the output data is processed in this way. (Default: Output fault value)

0: Holding last output value

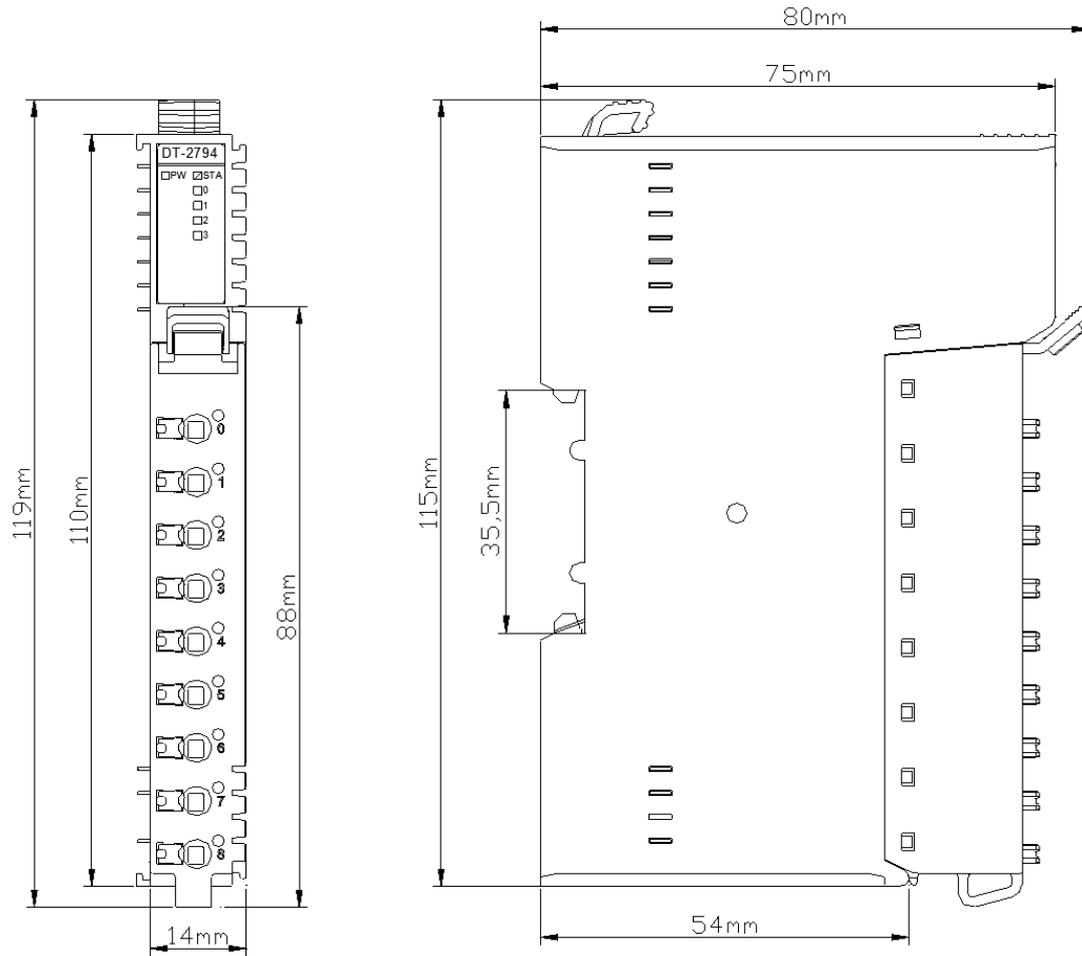
1: Output fault value

**Fault Value for Output Ch# (0-3):** When the fault action for output is 1, this bit sets output fault value, and this setting value will be outputted when the internal bus of IO module is offline. (Default value: The output is invalid)

0: The output is invalid

1: Output high level

## 7 Dimension Drawing



## **DT-3168 8 Channels Voltage Input/ 0~5VDC/ 0~10VDC/ ±5VDC/ ±10VDC/16 Bits**

### **1 Module Features**

- ◆ The module supports 8 channels of voltage signal input
- ◆ The module could collect 0~5VDC, 0~10VDC, ±5VDC, ±10VDC, with 16 bits resolution;
- ◆ The module carries with 8 analog input channel LED indicator
- ◆ The module input signal is a single ended common grounding input
- ◆ Filter time could be set
- ◆ Channels could be disabled independently.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	157mA@5VDC
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	8 channels voltage input
Input Voltage Range	0~5VDC/0~10VDC/±5VDC/±10VDC
Resolution	16 bits (include the symbol bit)
Transition Time	3.87ms/8 channels (filter level is 0)
Input Impedance	100kΩ
Linearity Error	≤ ±0.01%
Temperature Error	≤ ±0.005%/K
Repeatability	≤ ±0.05% (@25°C)
Measurement Error	≤ ±0.2% (@25°C), ≤ ±0.4% (@-35°C~60°C)
Module Diagnosis	ADC Fault: support Overflow/Underflow: support
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

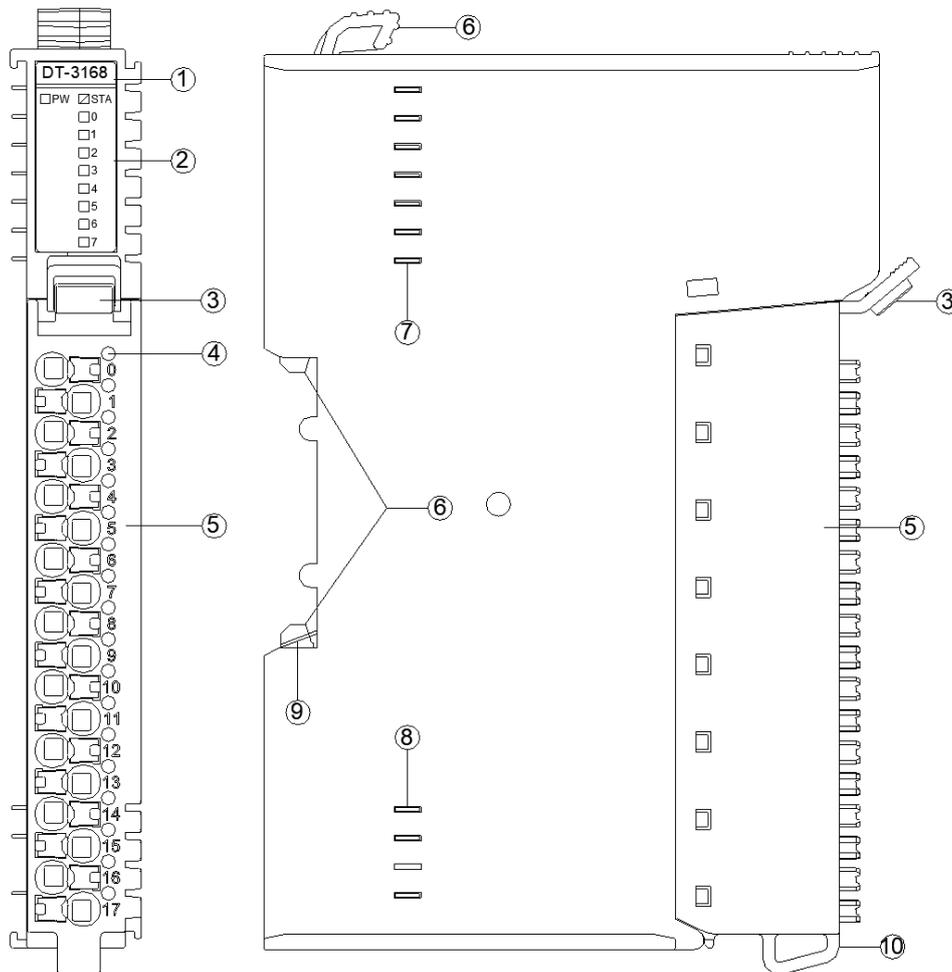
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

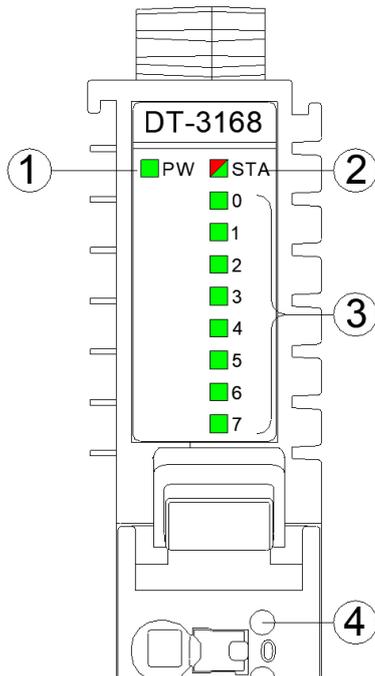
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



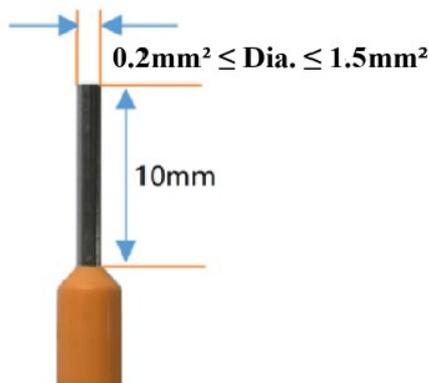
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~7 channel state indicator (Green)	Description
ON	The input signal $\geq 0.5\%$ range
OFF	The input signal $< 0.5\%$ range/ channel disabled

### 3.2 Wiring Definition

No.	Definition	Description
0	AIV0	Input signal CH0
1	GND	
2	AIV1	Input signal CH1
3	GND	
4	AIV2	Input signal CH2
5	GND	
6	AIV3	Input signal CH3
7	GND	
8	AIV4	Input signal CH4
9	GND	
10	AIV5	Input signal CH5
11	GND	
12	AIV6	Input signal CH6
13	GND	
14	AIV7	Input signal CH7
15	GND	
16	SHD	Input signal shield
17	SHD	

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



<b>⚠ WARNING</b>
Unexpected equipment operation Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal

connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

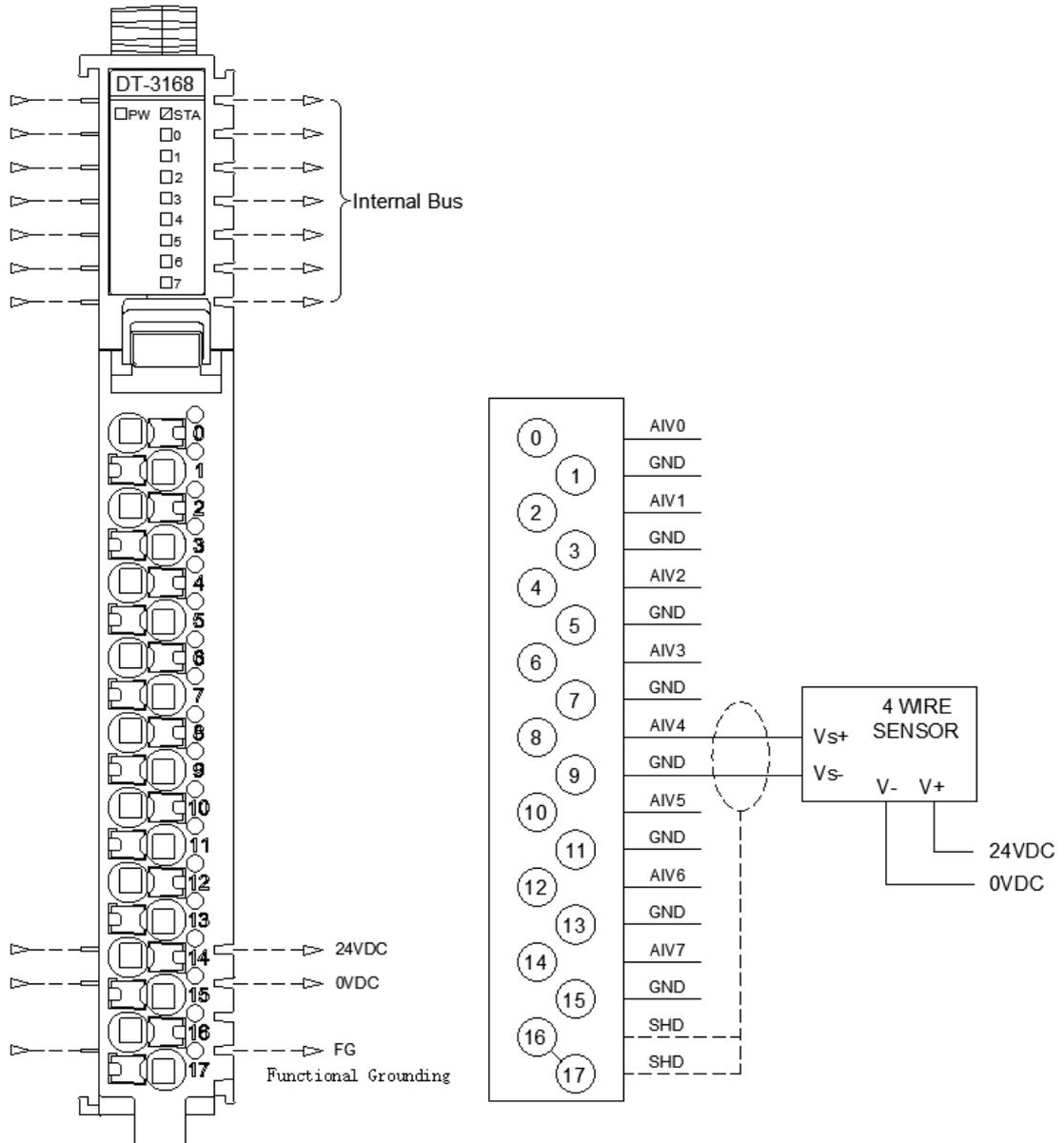
## WARNING

### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



Note: Module 16 and 17 terminals are internally shorted

### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								
Byte 8	Analog Input Data (CH 4)							
Byte 9								
Byte 10	Analog Input Data (CH 5)							
Byte 11								
Byte 12	Analog Input Data (CH 6)							
Byte 13								
Byte 14	Analog Input Data (CH 7)							
Byte 15								

Data description:

**Analog Input Data (CH0-7):** The value of input voltage data.

**Process data definition (standard mode)**

Analog Input Data (CH0-7)						
Voltage (0-5V)	Voltage (0-10V)	Voltage ( $\pm 5V$ )	Voltage ( $\pm 10V$ )	Decimal	Hexadecimal	Range
>5.06	>10.12	>5.06	>10.12	32767	0x7FFF	Overflow
5.06	10.12	5.06	10.12	27979	0x6D4B	Exceeds the upper limit
5V+0.180 8mV	10V+0.36 17mV	5V+0.180 8mV	10V+0.36 17mV	27649	0x60C1	
5	10	5	10	27648	0x60C0	Rated range
...	...	...	...	...	...	
2.5	5	2.5	5	13824	0x3600	
...	...	...	...	...	...	
0	0	0	0	0	0	
/	/	...	...	...	...	
/	/	-2.5	-5	-13824	0xCA00	
/	/	-5	-10	-27648	0x9400	
/	/	-5V- 0.1808mv	-10V- 0.3617mv	-27649	0x93FF	Exceeds the lower limit
/	/	-5.06	-10.12	-27979	0x92B5	
/	/	-5.06<	-10.12<	-32768	0x8000	underflow

Notes:

1. When the voltage exceeds the maximum range, 32767 or 0x7FFF is displayed.
2. Displays -32767 or 0x8001 when the channel is disabled.

**Process data definition (special mode)**

Analog Input Data (CH0-7)						
Voltage (0-5V)	Voltage (0-10V)	Voltage ( $\pm 5V$ )	Voltage ( $\pm 10V$ )	Decimal	Hexadecimal	Range
5	10	5	10	32767	0x7FFF	Rated range
...	...	...	...	...	...	
2.5	5	2.5	5	16383	0x3FFF	
...	...	...	...	...	...	
0	0	0	0	0	0x0000	
/	/	...	...	...	...	
/	/	-2.5	-5	-16383	0xC000	
/	/	...	...	...	...	
/	/	-5	-10	-32767	0x8001	

Notes:

1. When the voltage exceeds the maximum range, 32767 or 0x7FFF is displayed.
2. Displays -32767 or 0x8001 when the channel is disabled.

## 6 Configuration Parameter Definition

Configuration Parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved						Range Mode	16Bit Data Format
Byte 1	Voltage Type (CH 1)			Voltage Type (CH 0)				
Byte 2	Voltage Type (CH 3)			Voltage Type (CH 2)				
Byte 3	Voltage Type (CH 5)			Voltage Type (CH 4)				
Byte 4	Voltage Type (CH 7)			Voltage Type (CH 6)				
Byte 5	Filter Level (CH 1)			Filter Level (CH 0)				
Byte 6	Filter Level (CH 3)			Filter Level (CH 2)				
Byte 7	Filter Level (CH 5)			Filter Level (CH 4)				
Byte 8	Filter Level (CH 7)			Filter Level (CH 6)				
Byte 9 ... Byte 17	Reserved							

Data description:

**16Bit Data Format:** Sequence of 16-bit data byte transmission (Default: A\_B)

0: A\_B

1: B\_A

**Range Mode:** Process data mode (default: standard mode)

Standard mode: same with Siemens process data definition

Special mode: max range of the hardware

**Voltage Type (CH 0-7):** Input voltage type (Default: 0~10VDC)

0: Disabled

1: 0~5VDC

2: -5~5VDC

3: 0~10VDC

4: -10~10VDC

**Filtering Level (CH0-CH7):** Channel input filtering level. (Default: Level 6)

0: Level 0

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

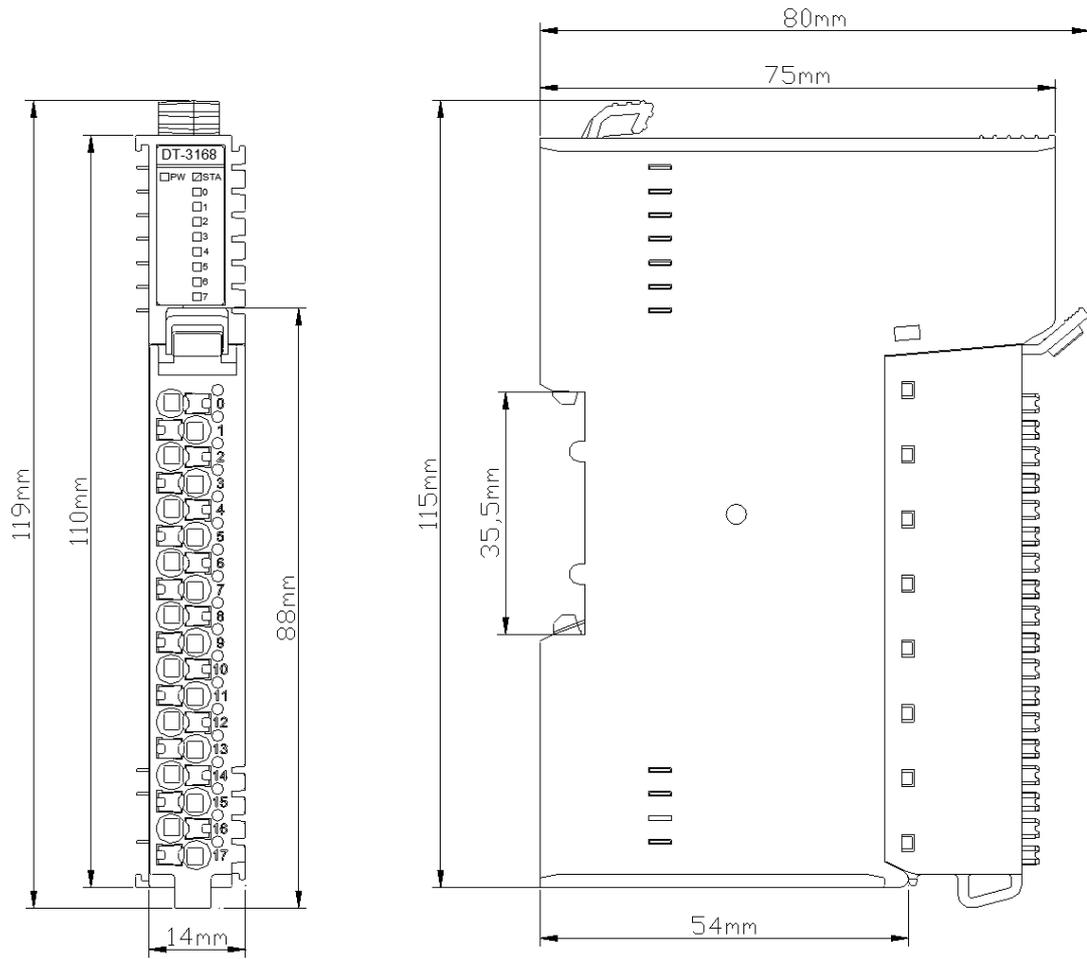
7: Level 7

8: Level 8

9: Level 9

10: Level 10

## 7 Dimension Drawing



## **DT-3238 8 Channels Current Input / 0& 4~20mA /16 Bits**

### **1 Module Features**

- ◆ The module supports 8 channels current signal acquisition.
- ◆ The module can be configured for 0-20mA or 4-20mA current signal acquisition.
- ◆ The module supports 2-wire (non-loop output, external power supply is required) or 4-wire current sensor input.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	52mA@5VDC
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	8 channels current input
Input Range	0~20mA/4~20mA
Resolution	16 bits (include the symbol bit)
Transition Time	8ms/8 channels (the filter level is 0)
Input Impedance	≤300Ω
Linearity Error	≤±0.01%
Temperature Error	≤±0.005%/K
Repeatability	≤±0.05% (@25°C)
Measurement Error	≤±0.2% (@25°C), ≤±0.4% (@-35°C~60°C)
Module Diagnosis	ADC fault: support Break line detection: support Overflow /Underflow: support
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

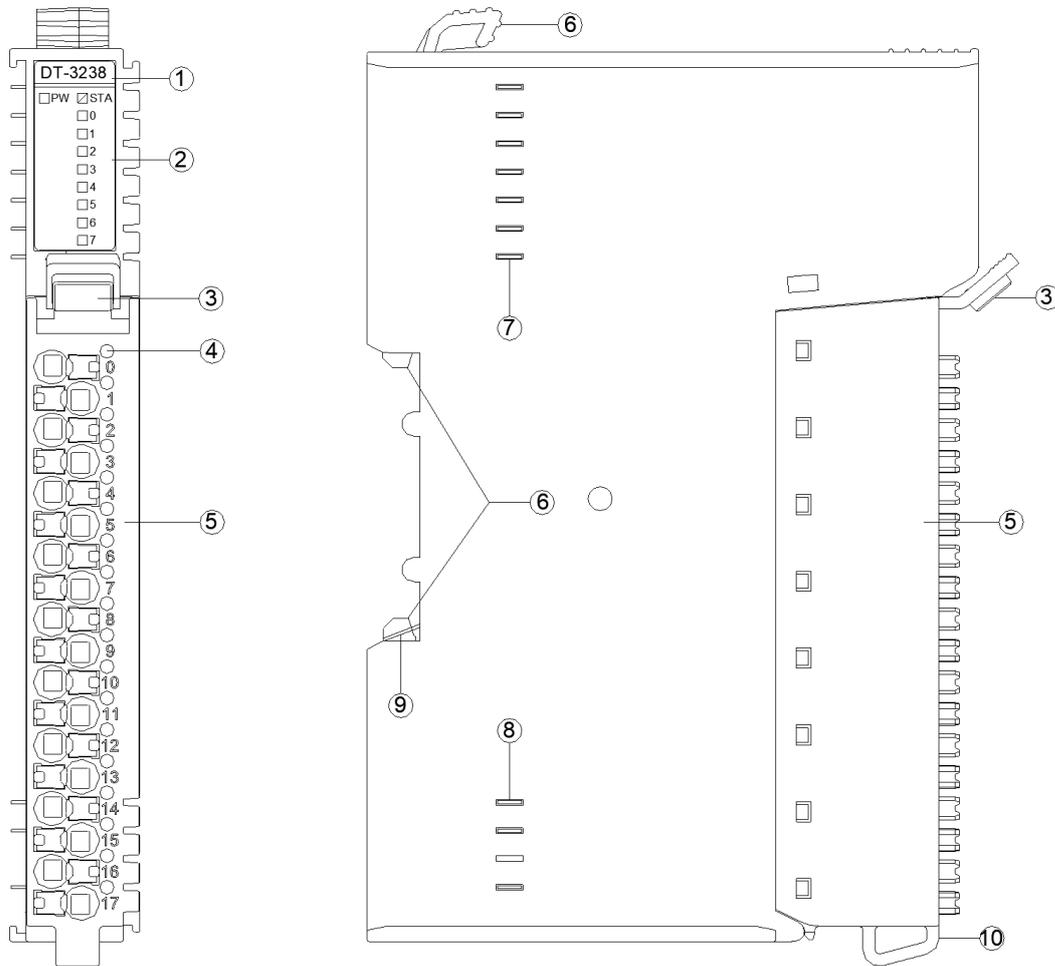
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

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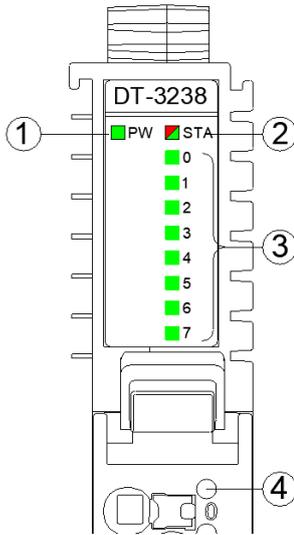
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



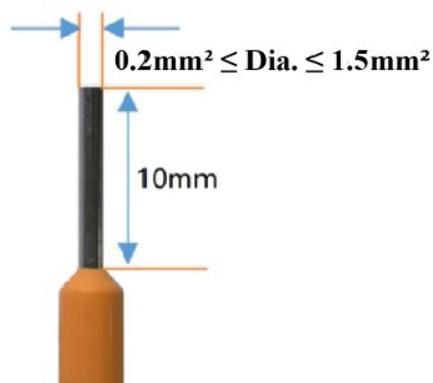
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~7 channel state indicator (Green)	Description
ON	The input signal $\geq 0.5\%$ range
OFF	The input signal $< 0.5\%$ range

### 3.2 Wiring Definition

No.	Definition	Description
0	AII0	Current input CH0
1	GND	
2	AII1	Current input CH1
3	GND	
4	AII2	Current input CH2
5	GND	
6	AII3	Current input CH3
7	GND	
8	AII4	Current input CH4
9	GND	
10	AII5	Current input CH5
11	GND	
12	AII6	Current input CH6
13	GND	
14	AII7	Current input CH7
15	GND	
16	SHD	Input signal shield
17	SHD	

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than  $0.2\text{mm}^2$  and less than  $1.5\text{mm}^2$ , and the parameters of the cold-pressed terminal are referred to as follows:



 **WARNING**

**Unexpected equipment operation**

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

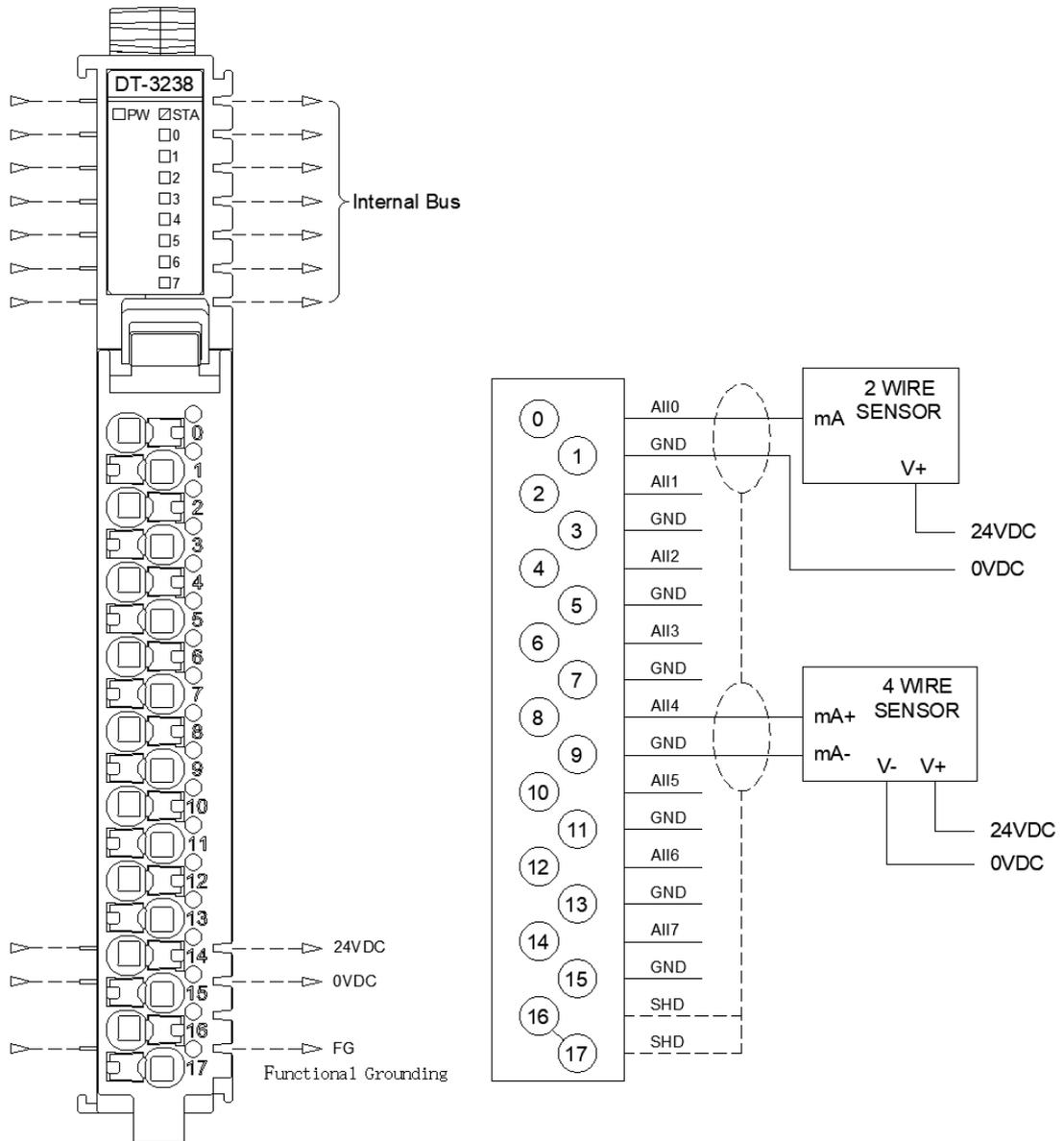
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

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**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								
Byte 8	Analog Input Data (CH 4)							
Byte 9								
Byte 10	Analog Input Data (CH 5)							
Byte 11								
Byte 12	Analog Input Data (CH 6)							
Byte 13								
Byte 14	Analog Input Data (CH 7)							
Byte 15								

Data description:

**Analog Input Data (CH0-7):** the value of input current data.

### Process Data Definition (Standard Mode)

Analog Input Data (DT-3238)				
Current (0-20mA)	Current (0-20mA)	Decimal	Hexadecimal	Range
>23.515	>22.810	32767	7FFF	Overflow
>23.515	>22.810	27979	6D4B	ADC chip fault
>23.515	>22.810	32511	7EFF	Exceeds the upper limit
.	.	.	.	
20.0007	20.0005	27649	6C01	
20	20	27648	6C00	Rated range
.	.	.	.	
0	4	0	0	
<0.0	3.9995	-1	FFFF	Exceeds the lower limit
/	.	.	.	
/	1.1852	-4864	ED00	
/	<1.1852	-32767	8001	Channel disabled
/	<1.1852	-32768	8000	underflow
/	<0.5	32766	8002	Broken line

Note: when the ADC chip is fault, the process data is 32765; when the channel is disabled, the process data is -32767.

**Process Data Definition (Special Mode)**

Analog Input Data (DT-3238)				
Current (0-20mA)	Current (4-20mA)	Decimal	Hexadecimal	Range
20	20	32767	0x7FFF	Rated range
.	.	.	.	
10	12	16383	3FFF	
.	.	.	.	
0	4	0	0	

## 6 Configuration Parameter Definition

Configuration Parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved					Data Range Mode		16Bit Data Format
Byte 1	Current Type (CH 1)				Current Type (CH 0)			
Byte 2	Current Type (CH 3)				Current Type (CH 2)			
Byte 3	Current Type (CH 5)				Current Type (CH 4)			
Byte 4	Current Type (CH 7)				Current Type (CH 6)			
Byte 5	Filter Level (CH 1)				Filter Level (CH 0)			
Byte 6	Filter Level (CH 3)				Filter Level (CH 2)			
Byte 7	Filter Level (CH 5)				Filter Level (CH 4)			
Byte 8	Filter Level (CH 7)				Filter Level (CH 6)			
Byte 9 ... Byte 17	Reserved							

Data description:

**16Bit Data Format:** Sequence of 16-bit data byte transmission (Default: A\_B)

0: A\_B

1: B\_A

**Data Range Mode:** Data mode. (Default: Standard mode)

0: Standard mode

1: Special mode

**Current Type Ch# (0-7):** Type of input signal. (Default: 4-20mA)

0: 0-20mA

1: 4-20mA

**Filtering Level (CH0-CH7):** the filtering level of input channel. (Default: Level 6)

0: Level 0

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

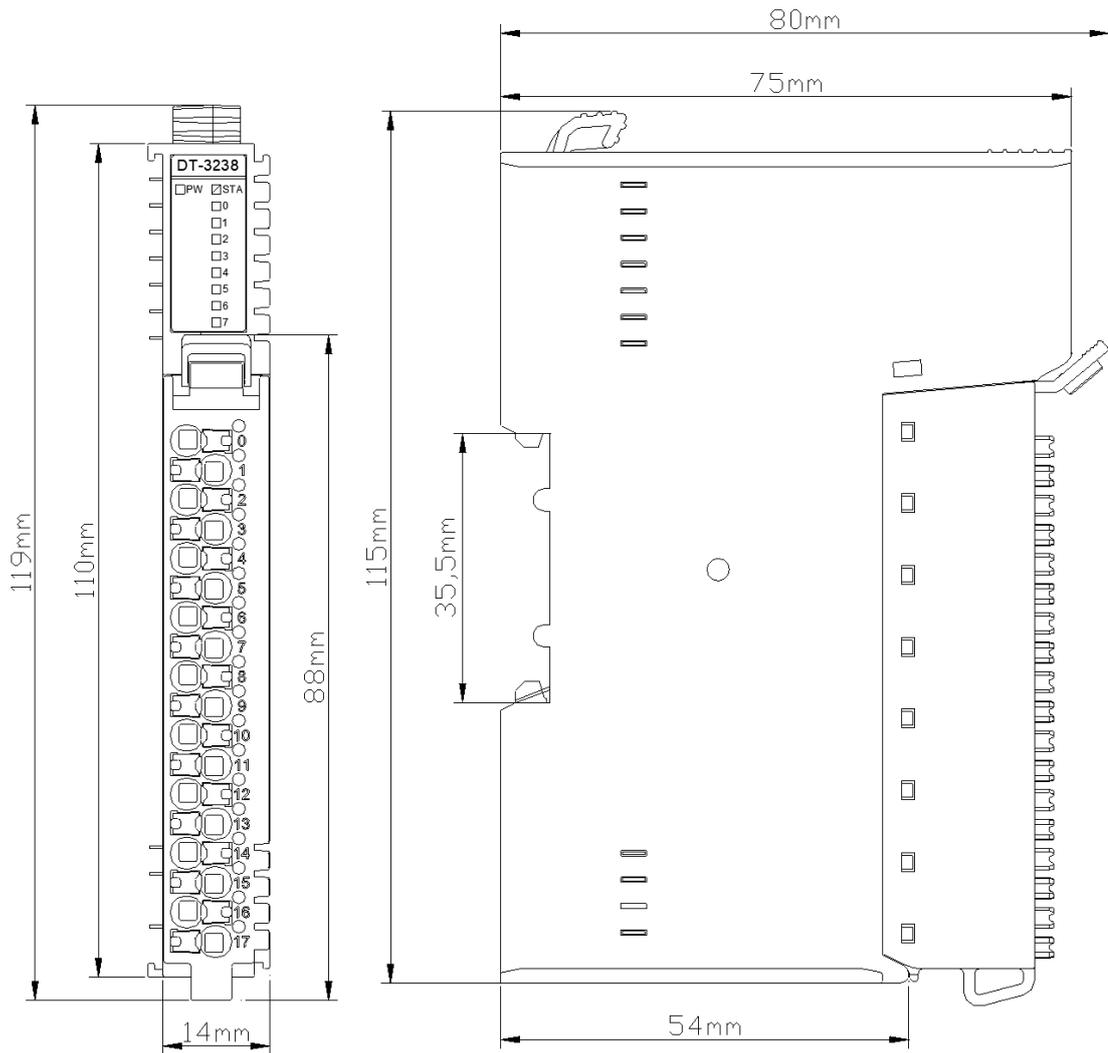
7: Level 7

8: Level 8

9: Level 9

10: Level 10

## 7 Dimension Drawing



## **DT-3364 4 Channels Voltage Input / 0~5VDC/ 0~10VDC/ $\pm$ 5VDC/ $\pm$ 10VDC /16 Bits**

### **1 Module Feature**

- ◆ The module supports 4 channels of voltage signal input.
- ◆ Input range: 0~5VDC, 0~10VDC, -5VDC~5VDC, -10VDC~10VDC voltage signal input, with 16 bits resolution.
- ◆ The module carries with 4 analog input channel LED indicator
- ◆ The module input signal is isolated between channels;
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Module Consumption	200mA@5VDC
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	4 channels voltage input
Input Voltage Range	0~5VDC/0~10VDC/±5VDC/±10VDC
Channel Isolation	Support
Input Impedance	1MΩ
Resolution	16 Bits(include the symbol bit)
Transmission Time	4ms/ 4 channels (filter level is 0)
Linearity Error	≤ ±0.01%
Temperature Error	≤ ±0.005%/K
Repeatability	≤ ±0.05% (@25℃)
Measurement Error	≤ ±0.2% (@25℃), ≤ ±0.4% (@-35℃~60℃)
Module Diagnosis	ADC fault: support Overflow/Underflow: support
Environment Parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

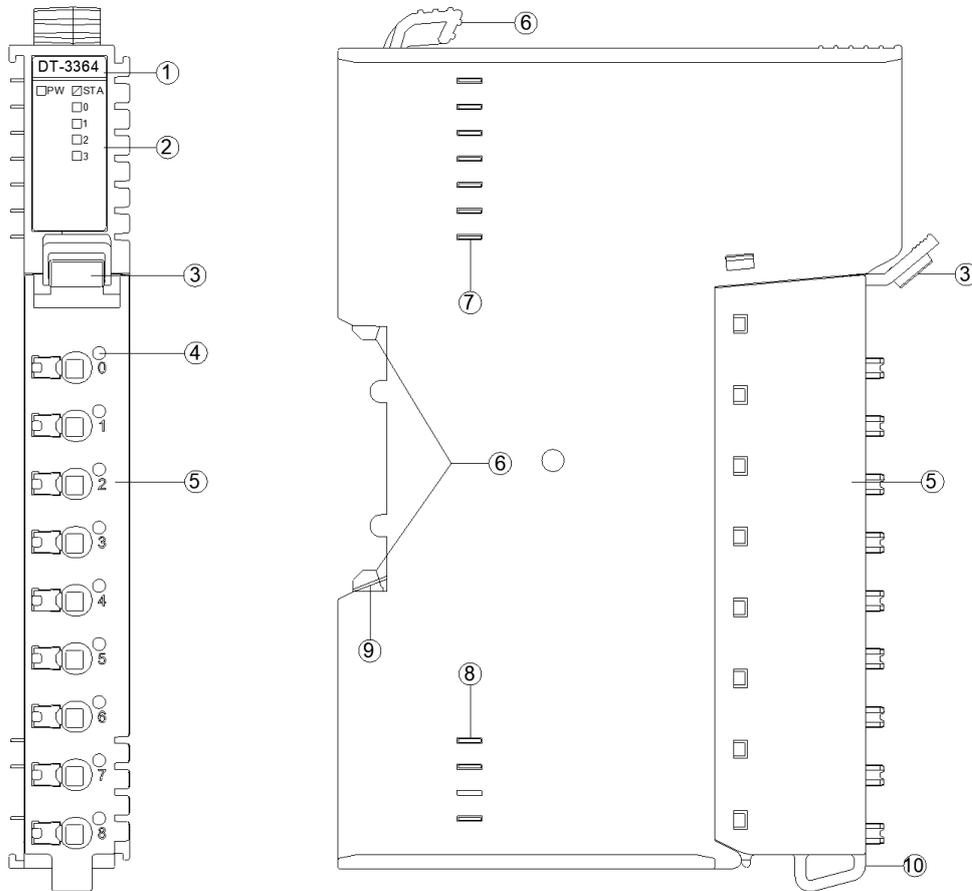
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

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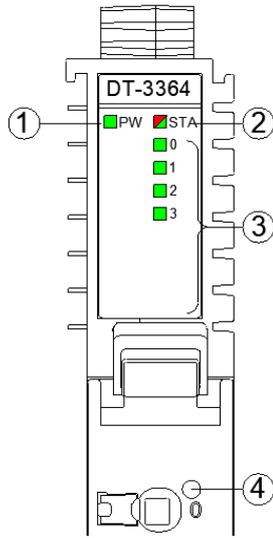
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### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



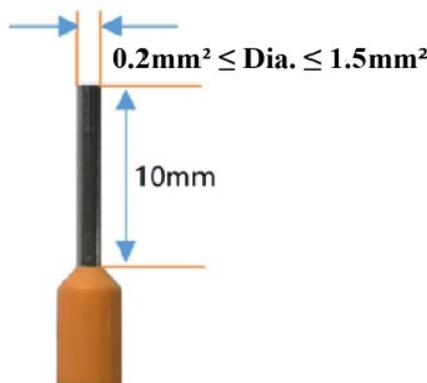
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~3 Channel state indicator (Green)	Description
ON	The input signal $\geq 0.5\%$ range
OFF	The input signal $< 0.5\%$ range/ channel disabled
Flash	Corresponding channel ADC failure

### 3.2 Wiring Definition

No.	Definition	Description
0	AIV0	Voltage input CH0
1	GND0	
2	AIV1	Voltage input CH1
3	GND1	
4	AIV2	Voltage input CH2
5	GND2	
6	AIV3	Voltage input CH3
7	GND3	
8	SHD	Input signal shield

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

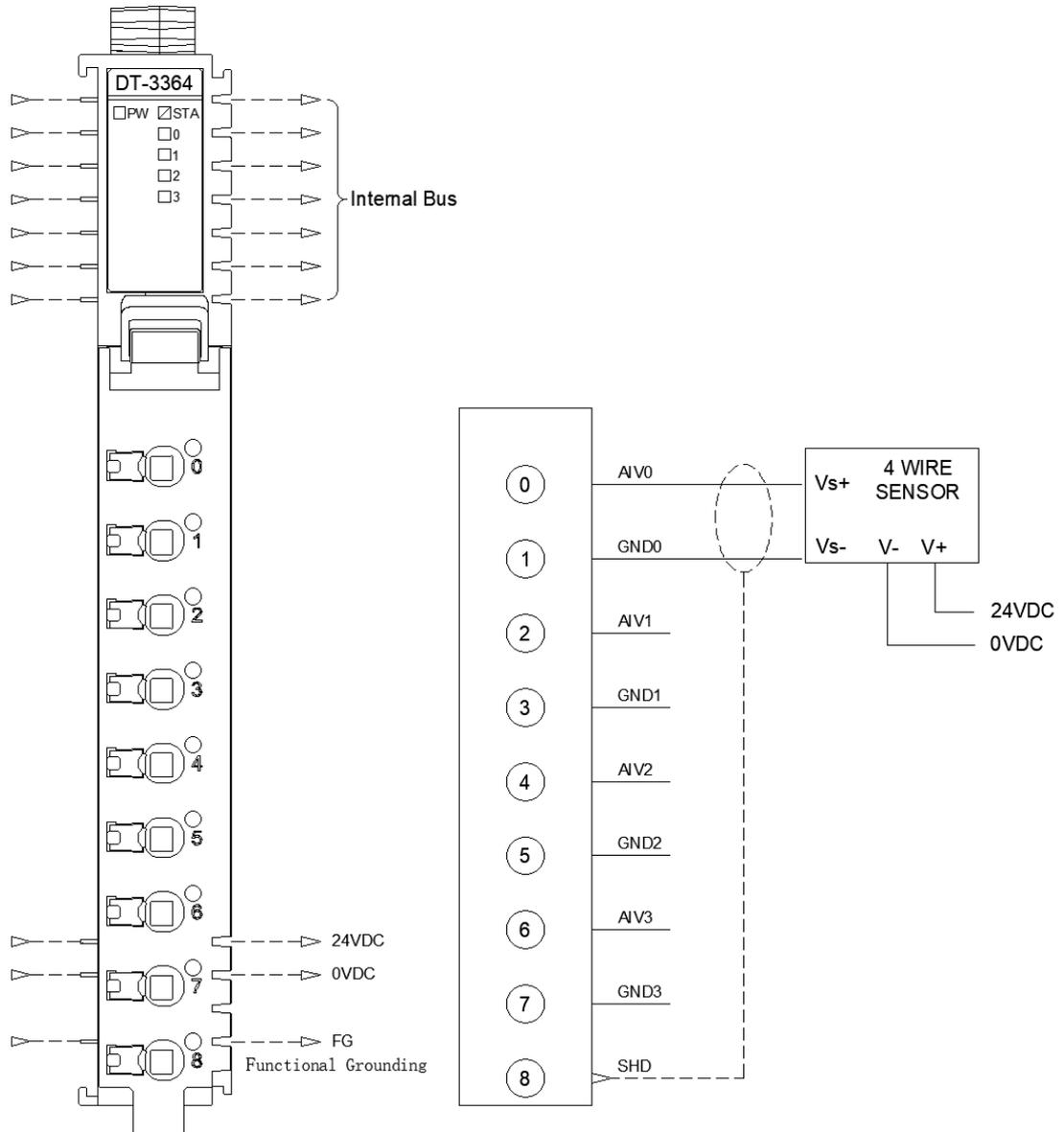
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								

Data description:

**Analog Input Data (CH0-3):** The value of input voltage data.

**Process data definition (standard mode)**

Analog Input Data (CH0-7)						
Voltage (0-5V)	Voltage (0-10V)	Voltage (±5V)	Voltage (±10V)	Decimal	Hexadecimal	Range
>5.06	>10.12	>5.06	>10.12	32767	0x7FFF	Overflow
5.06	10.12	5.06	10.12	27979	0x6D4B	Exceeds the upper limit
5V+0.180 8mV	10V+0.36 17mV	5V+0.180 8mV	10V+0.36 17mV	27649	0x60C1	
5	10	5	10	27648	0x60C0	Rated range
...	...	...	...	...	...	
2.5	5	2.5	5	13824	0x3600	
...	...	...	...	...	...	
0	0	0	0	0	0	
/	/	...	...	...	...	
/	/	-2.5	-5	-13824	0xCA00	
/	/	-5	-10	-27648	0x9400	
/	/	-5V- 0.1808mv	-10V- 0.3617mv	-27649	0x93FF	Exceeds the lower limit
/	/	-5.06	-10.12	-27979	0x92B5	
/	/	-5.06<	-10.12<	-32768	0x8000	underflow

Note:

1. When the voltage exceeds the maximum range, 32767 or 0x7FFF is displayed.
2. Displays -32767 or 0x8001 when the channel is disabled.

**Process data definition (special mode)**

Analog Input Data (CH0-3)						
Voltage (0-5V)	Voltage (0-10V)	Voltage (±5V)	Voltage (±10V)	Decimal	Hexadecimal	Range
5	10	5	10	32767	0x7FFF	Rated range
...	...	...	...	...	...	
2.5	5	2.5	5	16383	0x3FFF	
...	...	...	...	...	...	
0	0	0	0	0	0x0000	
/	/	...	...	...	...	
/	/	-2.5	-5	-16383	0xC000	
/	/	...	...	...	...	
/	/	-5	-10	-32767	0x8001	

Notes:

1. When the voltage exceeds the maximum range, 32767 or 0x7FFF is displayed.
2. Displays -32767 or 0x8001 when the channel is disabled.

## 6 Configuration Parameter Definition

Configuration Parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved					Data Range Mode		16Bit Data Format
Byte 1	Voltage Type (CH 1)				Voltage Type (CH 0)			
Byte 2	Voltage Type (CH 3)				Voltage Type (CH 2)			
Byte 3	Filter Level (CH 1)				Filter Level (CH 0)			
Byte 4	Filter Level (CH 3)				Filter Level (CH 2)			

Data description:

**16Bit Data Format:** Sequence of 16-bit data byte transmission (Default: A\_B)

0: A\_B

1: B\_A

**Data Range Mode:** Process data mode (default: standard mode)

Standard mode: same with Siemens process data definition

Special mode: max range of the hardware

**Voltage Type (CH 0-3):** Input voltage type. (Default: 0~10V DC)

Disable: Output disabled

0~5V DC: 0~5VDC Input

0~10V DC: 0~10VDC Input

-5~5V DC: -5~5VDC Input

-10~10V DC: -10~10VDC Input

**Filtering Level (CH0-CH3):** Channel input filtering level. (Default: Level 6)

0: Level 0

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

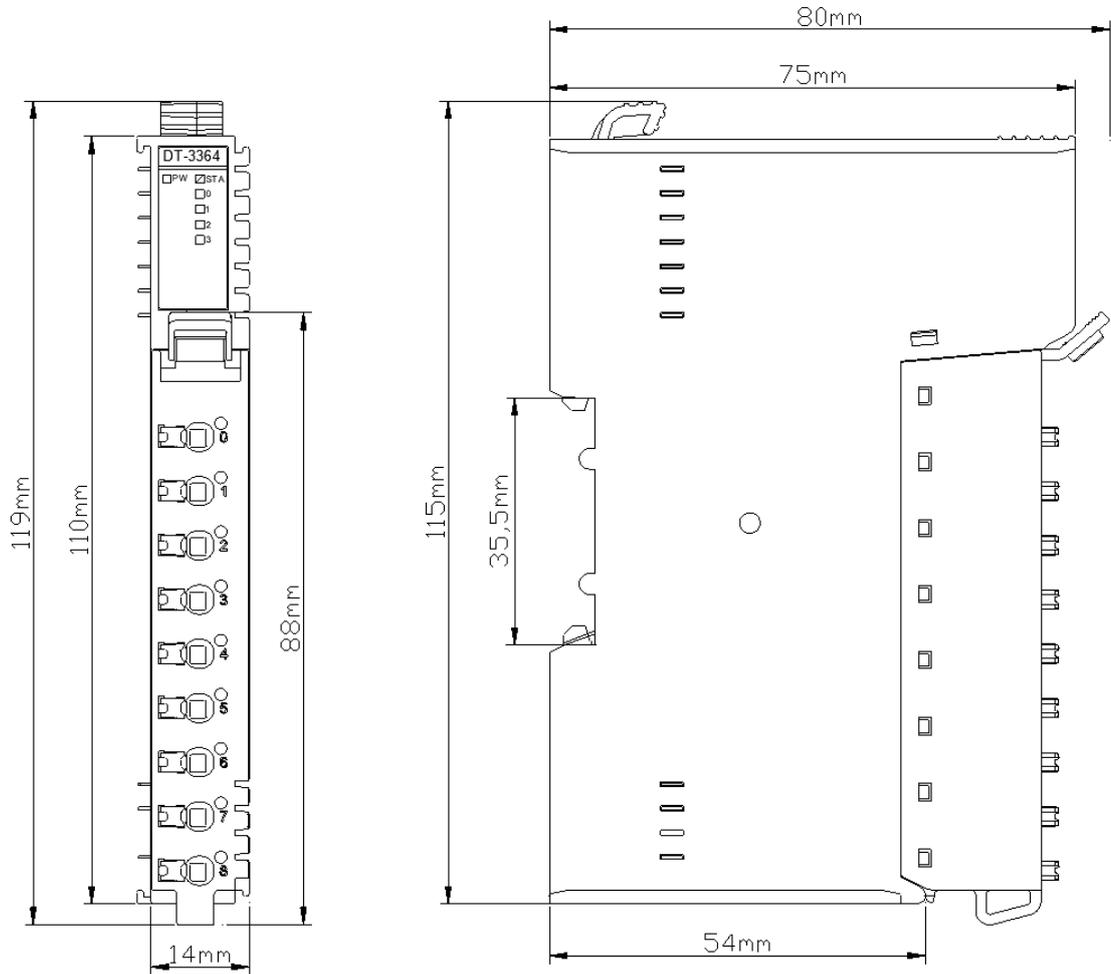
7: Level 7

8: Level 8

9: Level 9

10: Level 10

## 7 Dimension Drawing



## **DT-3434 4 Channels Current Input/ 0& 4~20mA /16 Bits**

### **1 Module Feature**

- ◆ The module supports 4 channels current signal acquisition.
- ◆ Input range: 0~20mA or 4~20mA current signal acquisition, 16 bits resolution.
- ◆ The module carries 4 channels analog input indicators.
- ◆ The module input signal is isolated between channels.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	200mA@5VDC
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	4 Channels current input
Input Range	0~20mA/4~20mA
Resolution	16 Bits (include the symbol bit)
Transition Time	2ms/4 channels (the filter level is 0)
Input Impedance	120Ω
Linearity Error	≤ ±0.01%
Temperature Error	≤ ±0.005%/K
Repeatability	≤ ±0.05% (@25℃)
Measurement Error	≤ ±0.2% (@25℃), ≤ ±0.4% (@-35℃~60℃)
Module Diagnosis	ADC fault: support Break line detection: support Overflow /Underflow: support
Environment Parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

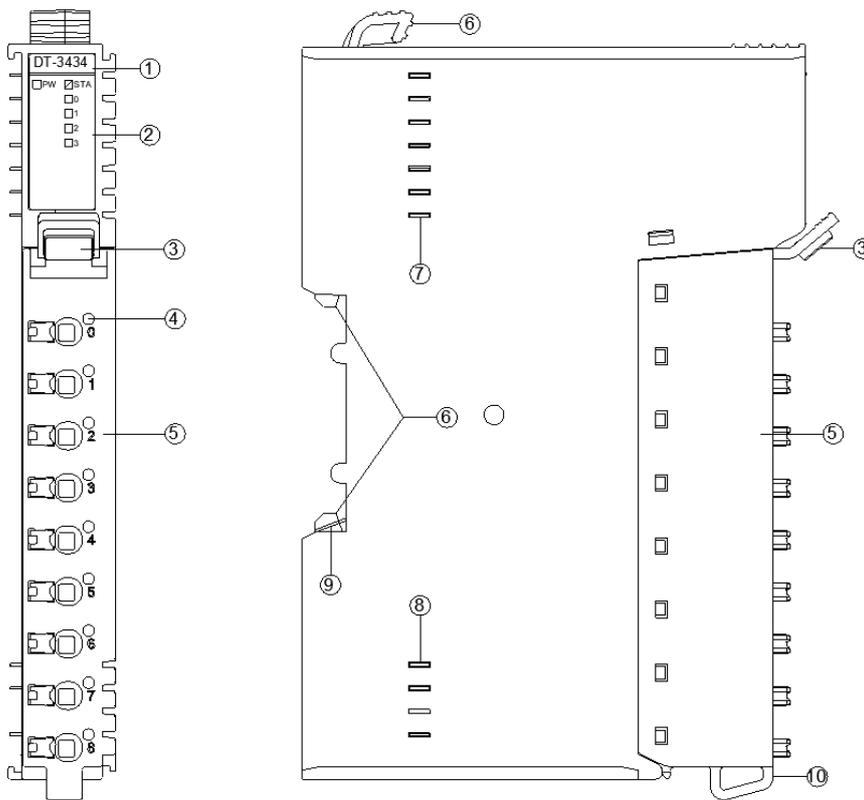
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

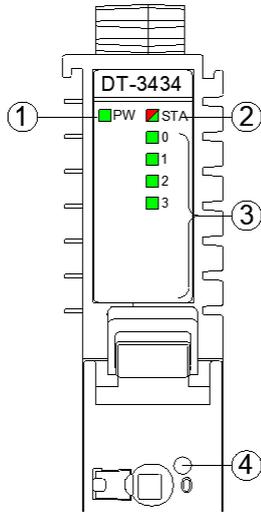
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



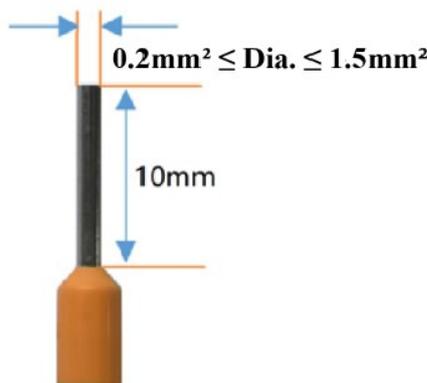
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~7 channel state indicator (Green)	Description
ON	The input signal is valid (input signal $\geq 1\%$ )
OFF	The input signal is invalid / channel disabled
Flash	The ADC fault to the corresponding channel

### 3.2 Wiring Definition

No.	Definition	Description
0	AII0	Current input CH0
1	GND0	
2	AII1	Current input CH1
3	GND1	
4	AII2	Current input CH2
5	GND2	
6	AII3	Current input CH3
7	GND3	
8	SHD	Input signal shield

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

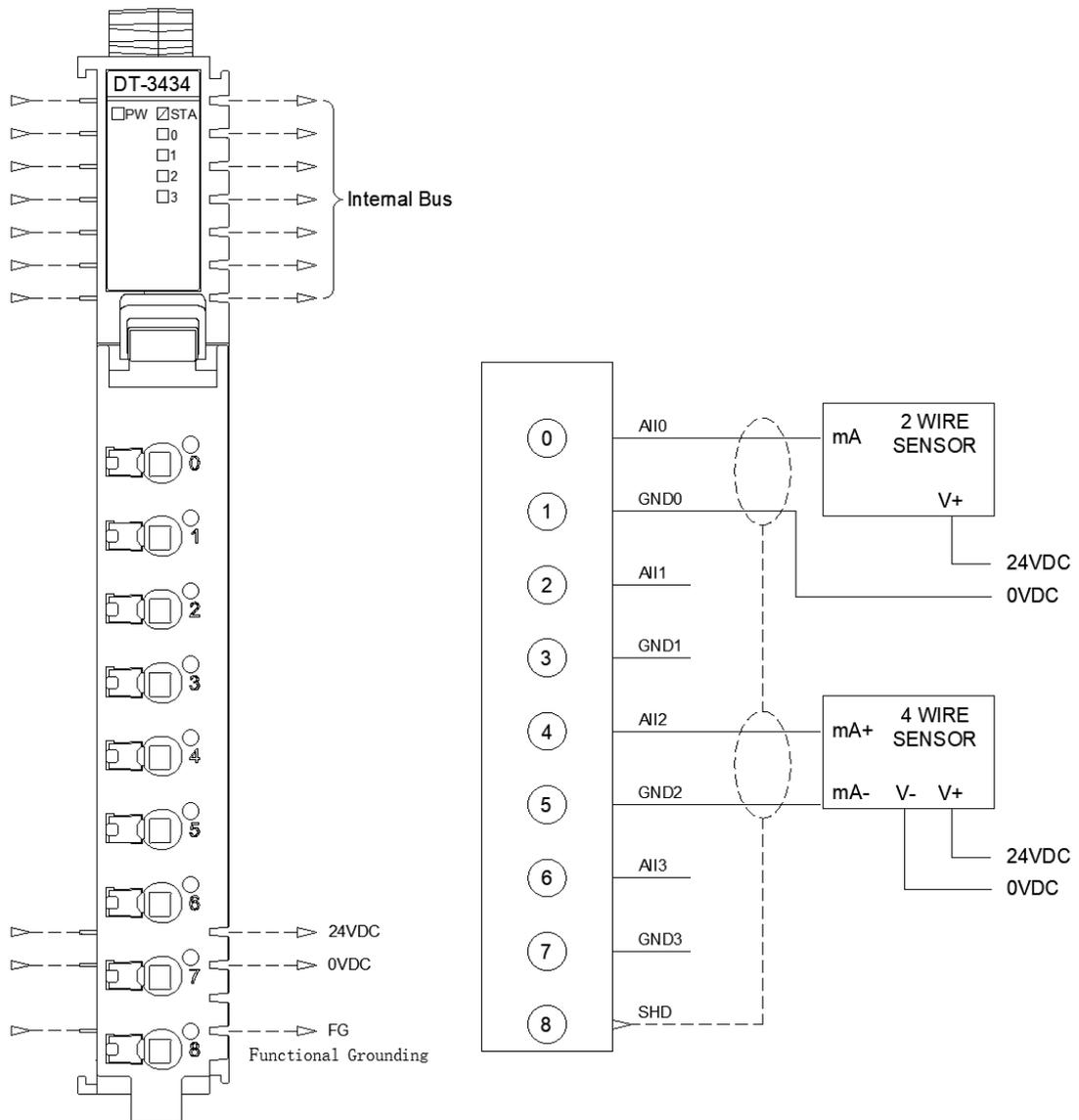
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

**EQUIPMENT INOPERABLE**

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								

Data description:

**Analog Input Data (CH0-3):** The value of input current data.

### Process Data Definition (Standard Mode)

Analog Input Data (DT-3238)				
Current (0-20mA)	Current (0-20mA)	Decimal	Hexadecimal	Range
>23.515	>22.810	32767	7FFF	Overflow
>23.515	>22.810	27979	6D4B	ADC chip fault
>23.515	>22.810	32511	7EFF	Exceeds the upper limit
.	.	.	.	
20.0007	20.0005	27649	6C01	
20	20	27648	6C00	Rated range
.	.	.	.	
0	4	0	0	
<0.0	3.9995	-1	FFFF	Exceeds the lower limit
/	.	.	.	
/	1.1852	-4864	ED00	
/	<1.1852	-32767	8001	Channel disabled
/	<1.1852	-32768	8000	underflow
/	<0.5	32766	8002	Broken line

Note: when the ADC chip is fault, the process data is 32765; when the channel is disabled, the process data is -32767.

Process data definition (special mode)

Analog Input Data				
Current (0-20mA)	Current (4-20mA)	Decimal	Hexadecimal	Description
20	20	32767	0x7FFF	Rated range
.	.	.	.	
10	12	16383	3FFF	
.	.	.	.	
0	4	0	0	

## 6 Configuration Parameter Definition

Configuration Parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Data Range Mode			16Bit Data Format
Byte 1	Current Type (CH 1)				Current Type (CH 0)			
Byte 2	Current Type (CH 3)				Current Type (CH 2)			
Byte 3	Filter Level (CH 1)				Filter Level (CH 0)			
Byte 4	Filter Level (CH 3)				Filter Level (CH 2)			

Data description:

16Bit Data Format: Sequence of 16-bit data byte transmission (Default: A\_B)

0: A\_B

1: B\_A

Data Range Mode: Process data mode. (Default: standard mode)

Standard mode: Same with the Siemens process definition;

Special mode: Hardware maximum range;

Current Type Ch# (0-3): Type of input signal. (Default: 4~20mA)

Disable: Output is disabled;

0~20mA: 0~20mA input ;

4~20mA: 4~20mA input;

Filtering Level (CH0-3): the filtering level. (Default: Level 6)

0: No filter

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

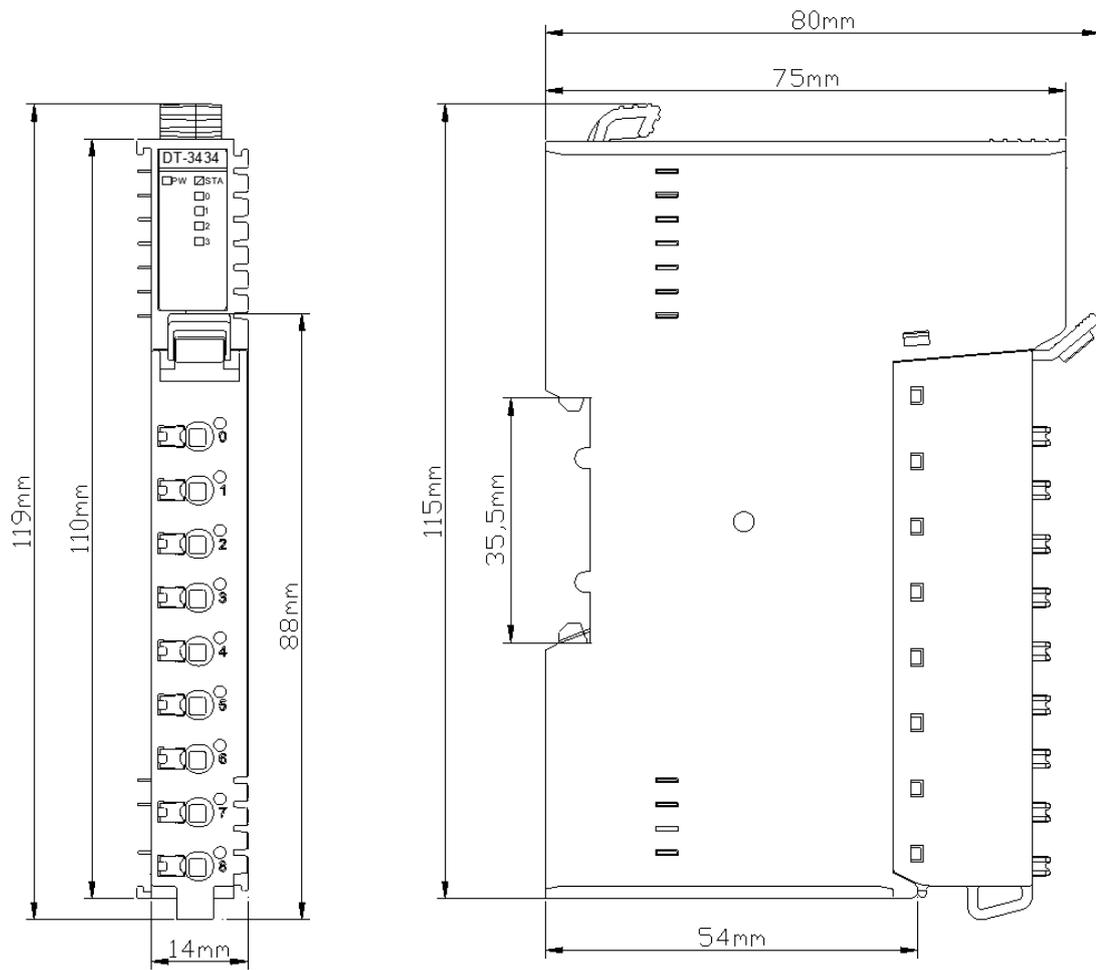
7: Level 7

8: Level 8

9: Level 9

10: Level 10

## 7 Dimension Drawing



## **DT-3714 4 Channels RTD-PT100 Temperature Acquisition Module**

### **1 Module Feature**

- ◆ The module supports channel disable, support the PT-100 2-wire or 3-wire.
- ◆ The filter level of module is adjustable.
- ◆ The module supports fault detection (disconnection, short circuit, overflow, underflow, terminal state).
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	39mA@5VDC
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	4 Channels RTD-PT100 input
Input Range	2-wire or 3-wire
Measurement Range	-200~850°C
Resolution	16 Bit (include the symbol bit)
Transition Time	360ms/4 channels (filter level is 0)
Linearity Error	≤ ±0.01%
Measurement Error	≤ ±0.6°C (@25°C), ≤ ±1.5°C (@-35°C~60°C)
Repeatability	≤ ±0.005% (@25°C)
Module Diagnosis	ADC fault: support Break/short circuit detection: support ADC conversion abnormal: support Overflow /Underflow: support
Unit of Measurement	Configurable, °C / °F / K
Environment Parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

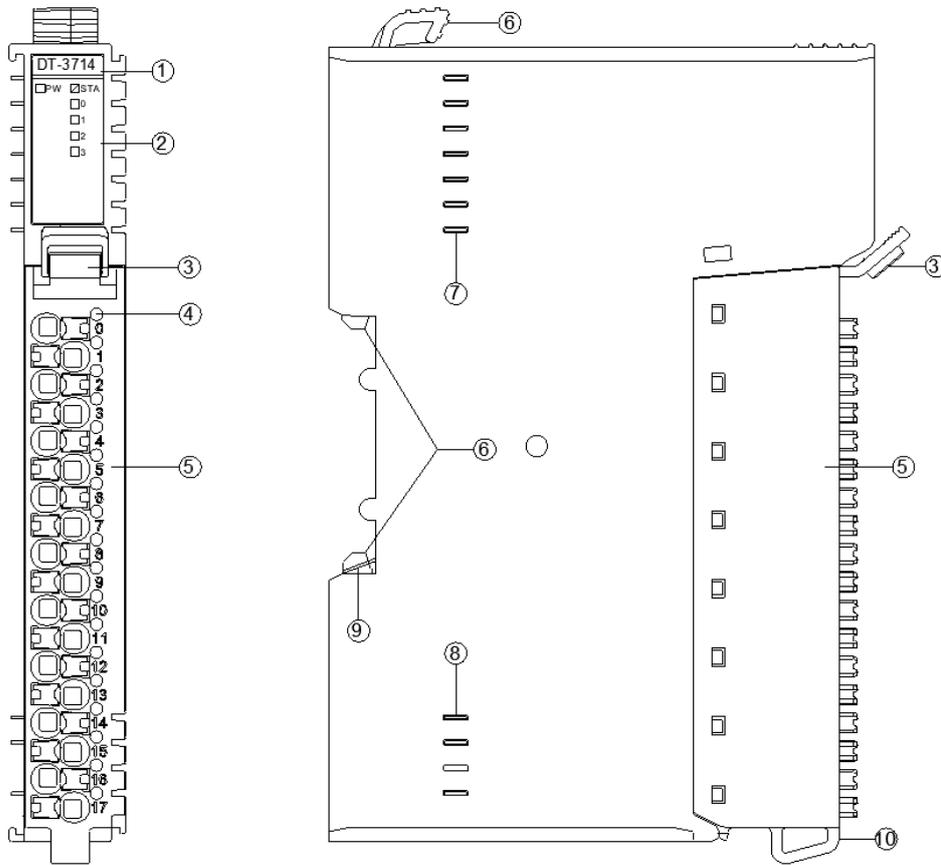
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

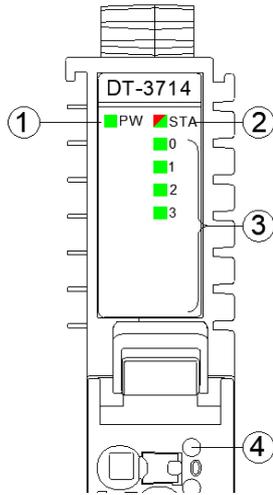
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



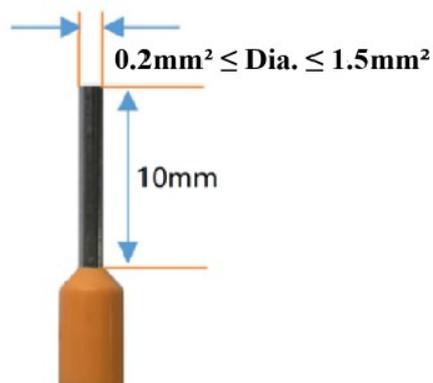
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~7 channel state indicator (Green)	Description
ON	The input signal is valid
OFF	The input signal is invalid / channel disabled

### 3.2 Wiring Definition

No.	Definition	Description
0	FC0+	Signal Input CH0
1	RTD0-	
2	RTD0+	
3	NC	No connection
4	FC1+	Signal Input CH1
5	RTD1-	
6	RTD1+	
7	NC	No connection
8	FC2+	Signal Input CH2
9	RTD2-	
10	RTD2+	
11	NC	No connection
12	FC3+	Signal Input CH3
13	RTD3-	
14	RTD3+	
15	NC	No connection
16	SHD	Input signal shield
17	SHD	

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



<b>⚠ WARNING</b>
Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

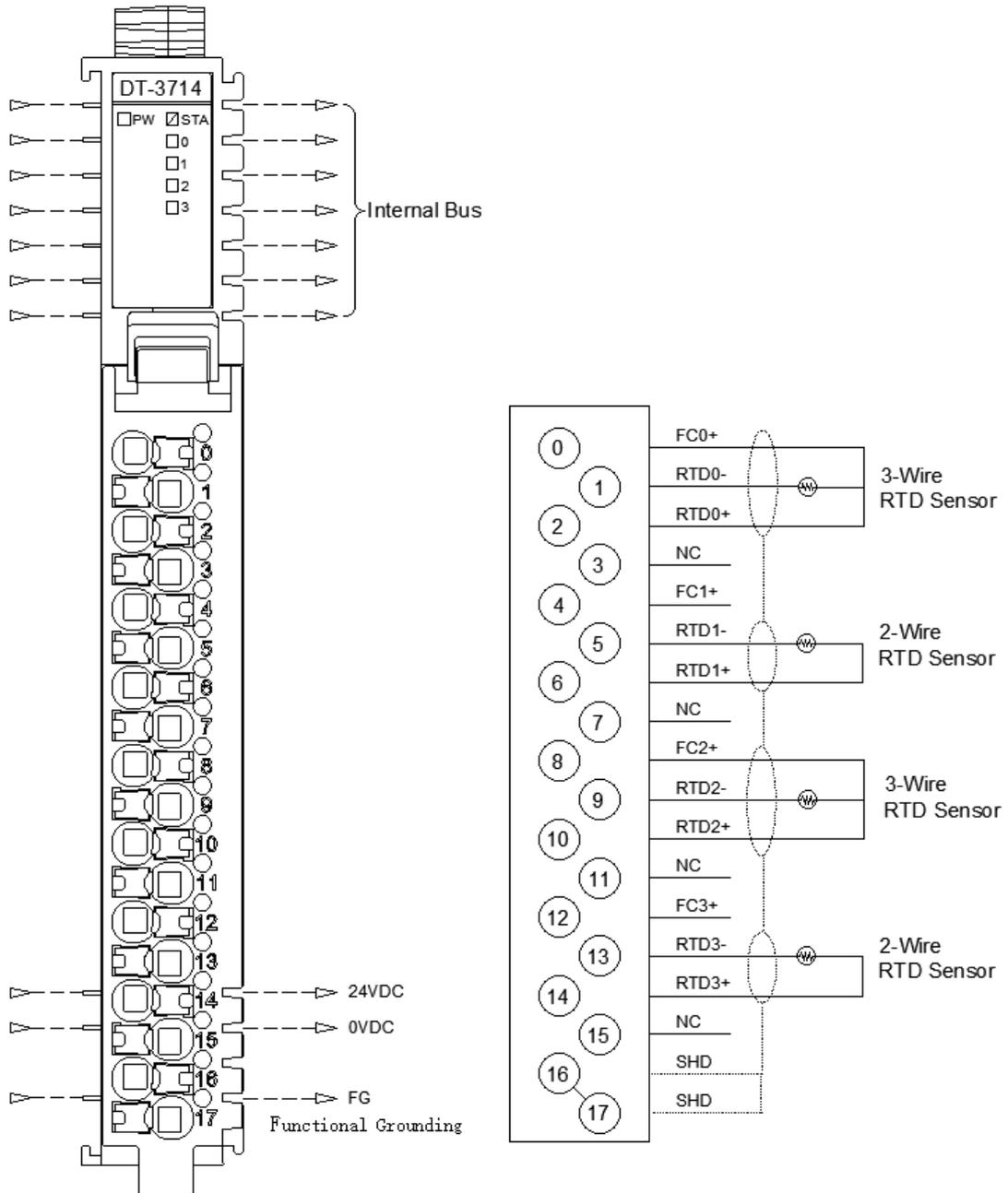
## WARNING

### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

Input data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								

Data description:

**Analog Input Data (CH0-3):** Current temperature acquisition value for the corresponding channel.

Process data definition			
Temperature	Decimal	Hexadecimal	Description
>880.0	32767	7FFF	Overflow
>880.0	32766	7FFE	Disconnection
>880.0	32765	7FFD	ADC Chip fault
>880.0	32763	7FFB	ADC Conversation is abnormal
880.0	8800	2260	Exceed the upper limit
.	.	.	
.	.	.	
850.1	8501	2135	
850.0	8500	2134	Rated range
.	.	.	
.	.	.	
-200.0	-2000	F830	
-200.1	-2001	F82F	Exceed the lower limit
.	.	.	
.	.	.	
-240.0	-2400	F6A0	
<-240.0	-32768	8000	Underflow
<-240.0	-32767	8001	Channel disabled
<-240.0	-32766	8002	Short circuit

## 6 Configuration Parameter

Configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Temperature Unit			16Bit Data Format
Byte 1	CH Line CH3		CH Line CH2		CH Line CH1		CH Line CH0	
Byte 2	Filter Level (CH 1)				Filter Level (CH 0)			
Byte 3	Filter Level (CH 3)				Filter Level (CH 2)			
Byte 4~8	Reserved							

Data description:

**16Bit Data Format:** Sequence of 16-bit data byte transmission; (Default: A\_B)

0: A\_B

1: B\_A

**Temperature Unit:** Temperature unit; (Default value: °C)

0: °C

1: °F

2: K

**CH\_Line (CH 0-3):** Channel type; (Default value: PT100 (3-wire))

0: Disable

1: PT100 (2-wire)

2: PT100 (3-wire)

**Filtering Level (CH0-3):** Input filtering level of the channel; (Default value: Level 6)

0: No filter

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

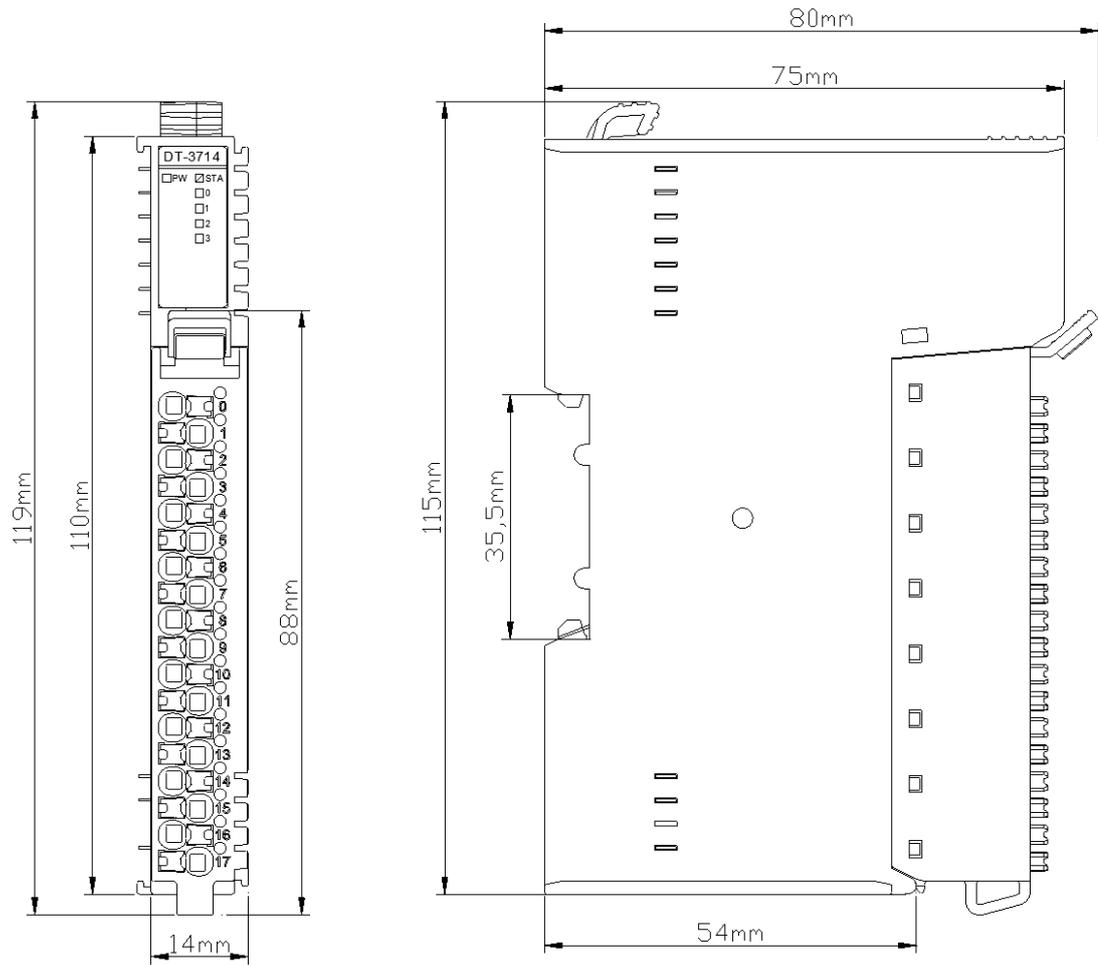
7: Level 7

8: Level 8

9: Level 9

10: Level 10

## 7 Dimension Drawing



# **DT-3804 4 Channels TC Thermocouple Temperature Acquisition Module**

## **1 Module Feature**

- ◆ The module supports 4 channels thermocouple signal acquisition.
- ◆ The module carries with 4 analog indicators
- ◆ The module supports 8 kinds of conventional thermocouple temperature measurement type.
- ◆ The internal bus of the module and field input adopts capacitive isolation.
- ◆ The module input channel supports TVS overvoltage protection.
- ◆ The module's cold end compensation mode supports external reference junction or fixed reference temperature compensation.
- ◆ Module cold end compensation type supports PT100 (2-wire) or PT100 (3-wire).
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Module Consumption	36mA@5VDC
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	4 Channels
Sensor Type	J / K / E / T / S / R / B / N type thermocouple
Resolution	16 Bit (include the symbol bit)
Temperature Compensation	Fixed reference temperature/external reference junction
Conversion Time	500ms/4 channels (filter level is 0)
Linearity Error	$\leq \pm 0.01\%$
Temperature Error	$\leq \pm 0.005\%/^{\circ}\text{C}$
Temperature Error	$\leq \pm 0.03\%$ (@25 $^{\circ}\text{C}$ )
Measurement Error	See schedule 1 below for detailed parameters
Module Diagnosis	Disconnection detection: support Overflow/underflow: support
Temperature Unit	Configurable, $^{\circ}\text{C}$ / $^{\circ}\text{F}$ / K
Environment Parameters	
Horizontal Installation Operating Temperature	-35 $^{\circ}\text{C}$ ~60 $^{\circ}\text{C}$
Vertical Installation Operating Temperature	-35 $^{\circ}\text{C}$ ~50 $^{\circ}\text{C}$
Storage Temperature	-40 $^{\circ}\text{C}$ ~85 $^{\circ}\text{C}$
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge $\pm 6\text{kV}$ , Performance level A; Air discharge $\pm 8\text{kV}$ , Performance level A SURGE: Common mode $\pm 2\text{kV}$ , Performance level A EFT: $\pm 2\text{kV}$ , Performance level A)

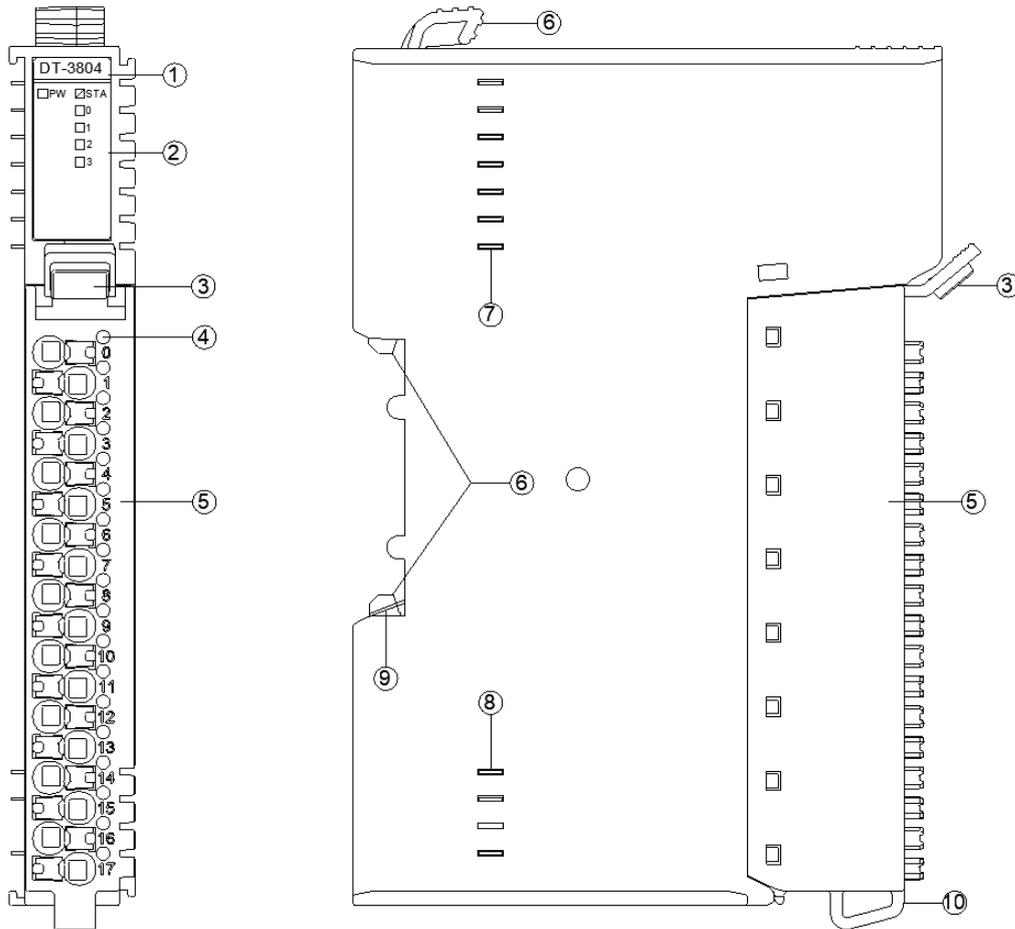
Schedule 1:

Type of Sensor	Measurement Range (Unit: $^{\circ}\text{C}$ )	Measurement Accuracy ( $25^{\circ}\text{C}$ )	Measurement Accuracy ( $-35^{\circ}\text{C}$ ~60 $^{\circ}\text{C}$ )
B	$600 \leq T \leq 1820$	$\leq 0.2\%$	$\leq 0.4\%$
E	$-200 \leq T \leq 1000$	$\leq 0.2\%$	$\leq 0.4\%$
	$-250 \leq T < -200$	$\leq 0.5\%$	$\leq 0.6\%$
N	$-200 \leq T \leq 1300$	$\leq 0.2\%$	$\leq 0.4\%$
	$-250 \leq T < -200$	$\leq 0.5\%$	$\leq 0.6\%$

J	$T > -210$	$\leq 0.2\%$	$\leq 0.4\%$
K	$-200 \leq T \leq 1370$	$\leq 0.2\%$	$\leq 0.4\%$
	$-250 \leq T < -200$	$\leq 0.5\%$	$\leq 0.6\%$
R	$0 \leq T \leq 1760$	$\leq 0.2\%$	$\leq 0.4\%$
S	$0 \leq T \leq 1760$	$\leq 0.2\%$	$\leq 0.4\%$
T	$-200 \leq T \leq 400$	$\leq 0.3\%$	$\leq 0.5\%$
	$-250 \leq T < -200$	$\leq 0.6\%$	$\leq 0.7\%$

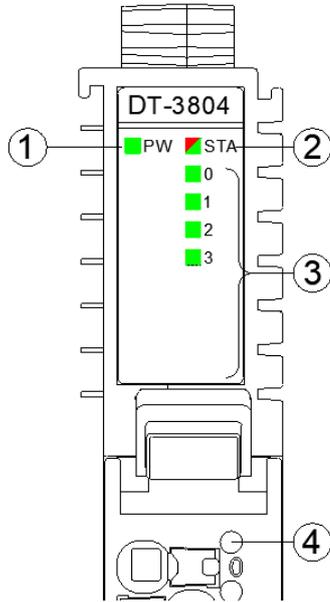
<b>⚠ WARNING</b>
<p><b>UNEXPECTED EQUIPMENT OPERATION</b></p> <p>Do not exceed any of the ratings specified in the environmental and electrical characteristics table.</p> <p><b>Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.</b></p>

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



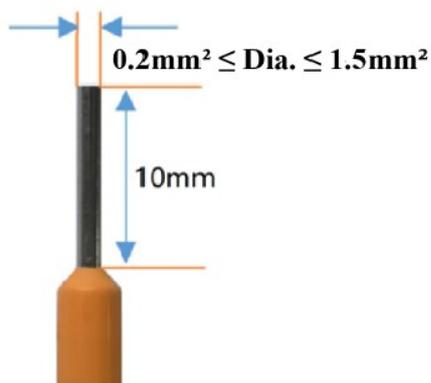
- ①: Power indicator
- ②: Module state indicator
- ③: Channels state indicator
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~3 Channel state indicator (Green)	Description
ON	The input signal is valid
OFF	The input signal is invalid or the chip is fault

### 3.2 Wiring Definition

No.	Definition	Description
0	FC0+	Cold-junction compensation
1	RTD0-	
3	RTD0+	
4	NC	No connection
5	TC0+	Input signal CH0
6	TC0-	
7	TC1+	Input signal CH1
8	TC1-	
9	FC1+	Cold-junction compensation
10	RTD1-	
11	RTD1+	
12	NC	No connection
13	TC2+	Input signal CH2
14	TC2-	
15	TC3+	Input signal CH3
16	TC3-	
17	SHD	Input signal shield
18	SHD	

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



<b>⚠ WARNING</b>
Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

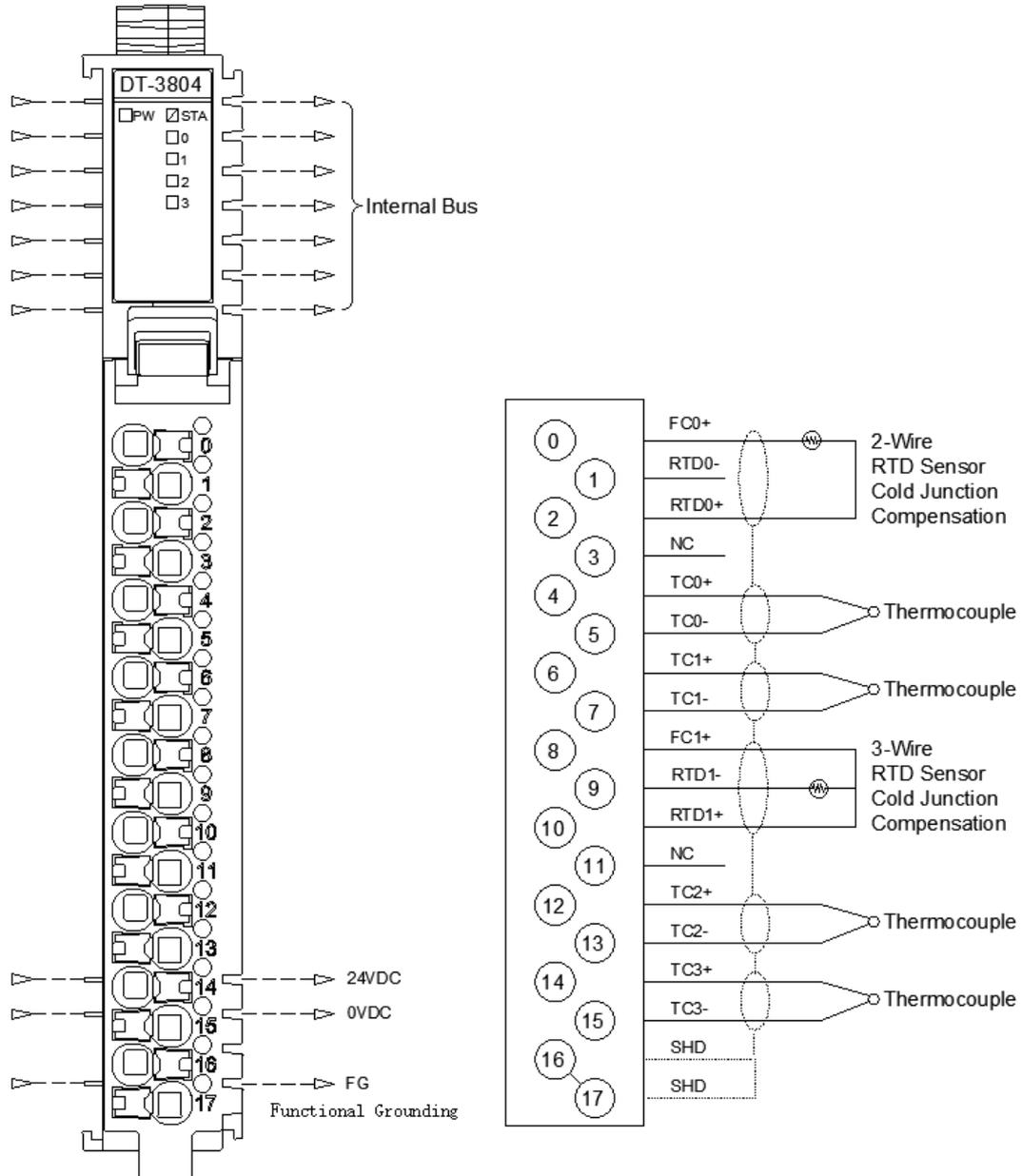
## WARNING

### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

**EQUIPMENT INOPERABLE**

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

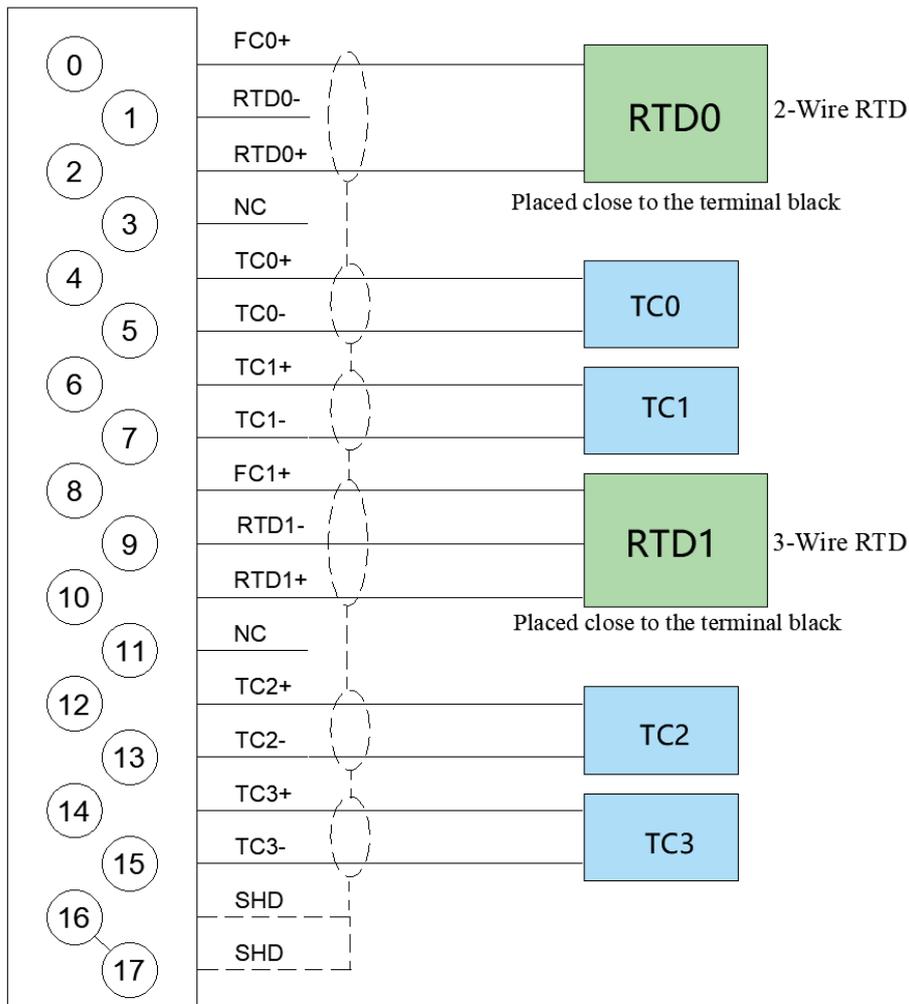
**Failure to follow these instructions may result in equipment damage.**

### 4.1 Description of the cold-end compensation scheme

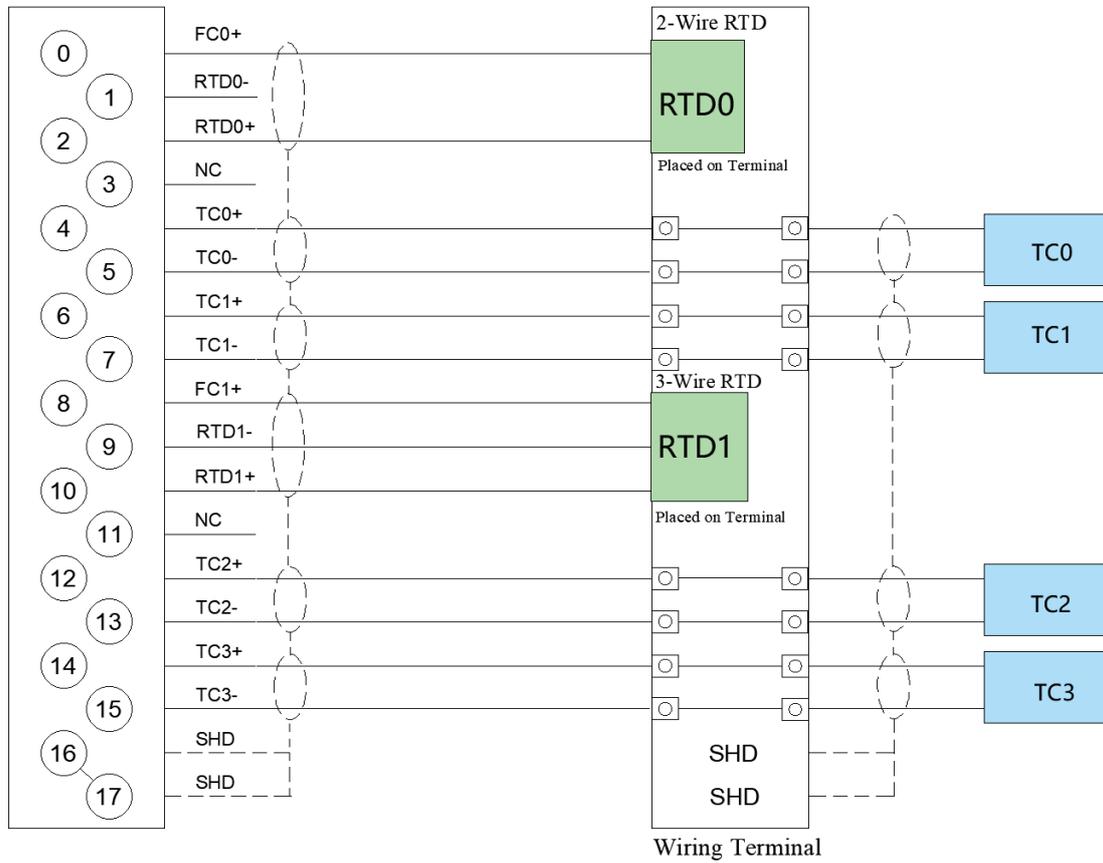
Cold end compensation is used to correct the potential error caused by the thermocouple reference temperature of non-0 °C. This thermocouple module uses real-time measurement of temperature sensors to correct temperature errors. The temperature sensor contains two RTD-PT100 sensors.

Modules support two temperature compensation schemes, near-end compensation and remote temperature compensation.

**Near-end compensation:** refers to the TC sensor directly serialized to the terminal block of the module, and the cold end temperature measurement RTD is on the terminal block of the module, and the near-end compensation scheme is:



**Remote temperature compensation:** It means that the TC sensor is first connected to the external terminal block, and then the signal is connected to the module terminal through an extension cord, and the remote compensation scheme is:



## 5 Process Data Definition

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Input Data (CH 0)							
Byte 1								
Byte 2	Analog Input Data (CH 1)							
Byte 3								
Byte 4	Analog Input Data (CH 2)							
Byte 5								
Byte 6	Analog Input Data (CH 3)							
Byte 7								

Data description:

**Analog Input Data (CH0-3):** The value of input voltage data.

### Process Data Definition (Standard mode)

Process Data Definition -J Type			
Temperature	Decimal	Hexadecimal	Location
>1360.0	32767	7FFF	Overflow
>1360.0	32766	7FFE	Disconnection
>1360.0	32765	7FFD	ADC chip fault
>1360.0	32764	7FFC	Module cold end compensates sensor chip failure
>1360.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
1360.0	13600	3520	Exceed the upper limit
.	.	.	
.	.	.	
1200.1	12001	2EE1	Rated range
1200.0	12000	2EE0	
.	.	.	
.	.	.	
-210.0	-2100	F7CC	Channel disabled
<-210.0	-32767	7FFF	
<-210.0	-32768	8000	

Process Data Definition -K Type			
Temperature	Decimal	Hexadecimal	Location
>1622.0	32767	7FFF	Overflow
>1622.0	32766	7FFE	Disconnection
>1622.0	32765	7FFD	ADC chip fault
>1622.0	32764	7FFC	Module cold end compensates sensor chip failure
>1622.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
1622.0	16220	3F5C	Exceed the upper limit

.	.	.	
.	.	.	
1372.1	13721	3599	
1372.0	13720	3598	Rated range
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32767	7FFF	Channel disabled
<-270.0	-32768	8000	Underflow

Process Data Definition -E Type			
Temperature	Decimal	Hexadecimal	Location
>1200.0	32767	7FFF	Overflow
>1200.0	32766	7FFE	Disconnection
>1200.0	32765	7FFD	ADC chip fault
>1200.0	32764	7FFC	Module cold end compensates sensor chip failure
>1200.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
1200.0	12000	2EE0	Exceed the upper limit
.	.	.	
.	.	.	
1000.1	10001	2711	Rated range
1000.0	10000	2710	
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32767	7FFF	Channel disabled
<-270.0	-32768	8000	Underflow

Process Data Definition -T Type			
Temperature	Decimal	Hexadecimal	Location
>500.0	32767	7FFF	Overflow
>500.0	32766	7FFE	Disconnection
>500.0	32765	7FFD	ADC chip fault
>500.0	32764	7FFC	Module cold end compensates sensor chip failure
>500.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
500	5000	1388	Exceed the upper limit
.	.	.	
.	.	.	
400.1	4001	FA1	Rated range
400.0	4000	FA0	
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32767	7FFF	Channel disabled
<-270.0	-32768	8000	Underflow

Process Data Definition -S Type			
Temperature	Decimal	Hexadecimal	Location
>1800.0	32767	7FFF	Overflow
>1800.0	32766	7FFE	Disconnection
>1800.0	32765	7FFD	ADC chip fault
>1800.0	32764	7FFC	Module cold end compensates sensor chip failure
>1800.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
1800	18000	4650	Exceed the upper limit
.	.	.	
.	.	.	
1760.1	17601	44C1	
1760.0	17600	44C0	Rated range
.	.	.	
.	.	.	
-50.0	-500	FE0C	
-50.1	-501	FE0B	Exceed the lower limit
.	.	.	
.	.	.	
-110	-1100	FBB4	
<-110.0	-32767	7FFF	Channel disabled
<-110.0	-32768	8000	Underflow

Process Data Definition -R Type			
Temperature	Decimal	Hexadecimal	Location
>1940.0	32767	7FFF	Overflow
>1940.0	32766	7FFE	Disconnection
>1940.0	32765	7FFD	ADC chip fault
>1940.0	32764	7FFC	Module cold end compensates sensor chip failure
>1940.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
1940	19400	4BC8	Exceed the upper limit
.	.	.	
.	.	.	
1760.1	17601	44C1	
1760.0	17600	44C0	Rated range
.	.	.	
.	.	.	
-50.0	-500	FE0C	
-50.1	-501	FE0B	Exceed the lower limit
.	.	.	
.	.	.	
-110	-1100	FBB4	
<-110.0	-32767	7FFF	Channel disabled
<110.0	-32768	8000	Underflow

Process Data Definition -B Type			
Temperature	Decimal	Hexadecimal	Location
>2070.0	32767	7FFF	Overflow

>2070.0	32766	7FFE	Disconnection
>2070.0	32765	7FFD	ADC chip fault
>2070.0	32764	7FFC	Module cold end compensates sensor chip failure
>2070.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
2070.0	20700	50DC	Exceed the upper limit
.	.	.	
.	.	.	
1820.1	18201	4719	
1820.0	18200	4718	Rated range
.	.	.	
.	.	.	
100	1000	03C8	
<100.0	-32767	7FFF	Channel disabled
<100.0	-32768	8000	Underflow

Process Data Definition -N Type			
Temperature	Decimal	Hexadecimal	Location
>1550.0	32767	7FFF	Overflow
>1550.0	32766	7FFE	Disconnection
>1550.0	32765	7FFD	ADC chip fault
>1550.0	32764	7FFC	Module cold end compensates sensor chip failure
>1550.0	32763	7FFB	The module cold end compensation sensor is in an abnormal working environment
1550.0	15500	3C8C	Exceed the upper limit
.	.	.	
.	.	.	
1300.1	13001	32C9	
1300.0	13000	32C8	Rated range
.	.	.	
.	.	.	
-270.0	-2700	F574	
<-270.0	-32767	7FFF	Channel disabled
<-270.0	-32768	8000	Underflow

Note: The module cold end compensation sensor is in an abnormal working environment, the high temperature is more than 110°C, the low temperature is less than -50°C.

**Fixed reference temperature process definition**

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fixed Reference Temperature (CH 0)							
Byte 1								
Byte 2	Fixed Reference Temperature (CH 1)							
Byte 3								
Byte 4	Fixed Reference Temperature (CH 2)							

Byte 5	
Byte 6	Fixed Reference Temperature (CH 3)
Byte 7	

Data description:

**Fixed Reference Temperature (CH0~3):** Fixed reference temperature.

## 6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved			Cold Junction Compensation Type (CH2, CH3)	Cold Junction Compensation Type (CH0, CH1)	Temperature Unit		16Bit Data Format
Byte 1	TC Input Type (CH 1)				TC Input Type (CH 0)			
Byte 2	TC Input Type (CH 3)				TC Input Type (CH 2)			
Byte 3	CJC Model (CH 1)				CJC Model (CH 0)			
Byte 4	CJC Model (CH 3)				CJC Model (CH 2)			
Byte 5	Filtering Level (CH 1)				Filtering Level (CH 0)			
Byte 6	Filtering Level (CH 3)				Filtering Level (CH 2)			
Byte 7 ... Byte 11	Reserved							

Data description:

**16Bit Data Format:** Sequence of 16-bit data byte transmission; (Default: A\_B)

0: A\_B

1: B\_A

**Temperature Unit:** temperature unit. (Default: °C)

0: Degree Celsius °C

1: Degrees Fahrenheit °F

2: Kelvin K

**Cold Junction Compensation Type (CH0~ CH3):** Cold-end compensation model.

(Default: 3-Wire)

0: 2-Wire

1: 3-Wire

**TC Input Type (CH 0-3):** Sensor type for this channel. (Default: J Type)

0: None

1: J Type

2: K Type

3: E Type

4: T Type

5: S Type

6: R Type

7: B Type

8: N Type

CJC Model (CH 0-3): Cold Compensation Mode: (Default: External Datum)

0: External datum knot

1: Fixed reference temperature (default 0°C)

Filtering Level Ch (0-3): Filter level. (Default: Level 6)

0: None

1: Level 1

2: Level 2

3: Level 3

4: Level 4

5: Level 5

6: Level 6

7: Level 7

8: Level 8

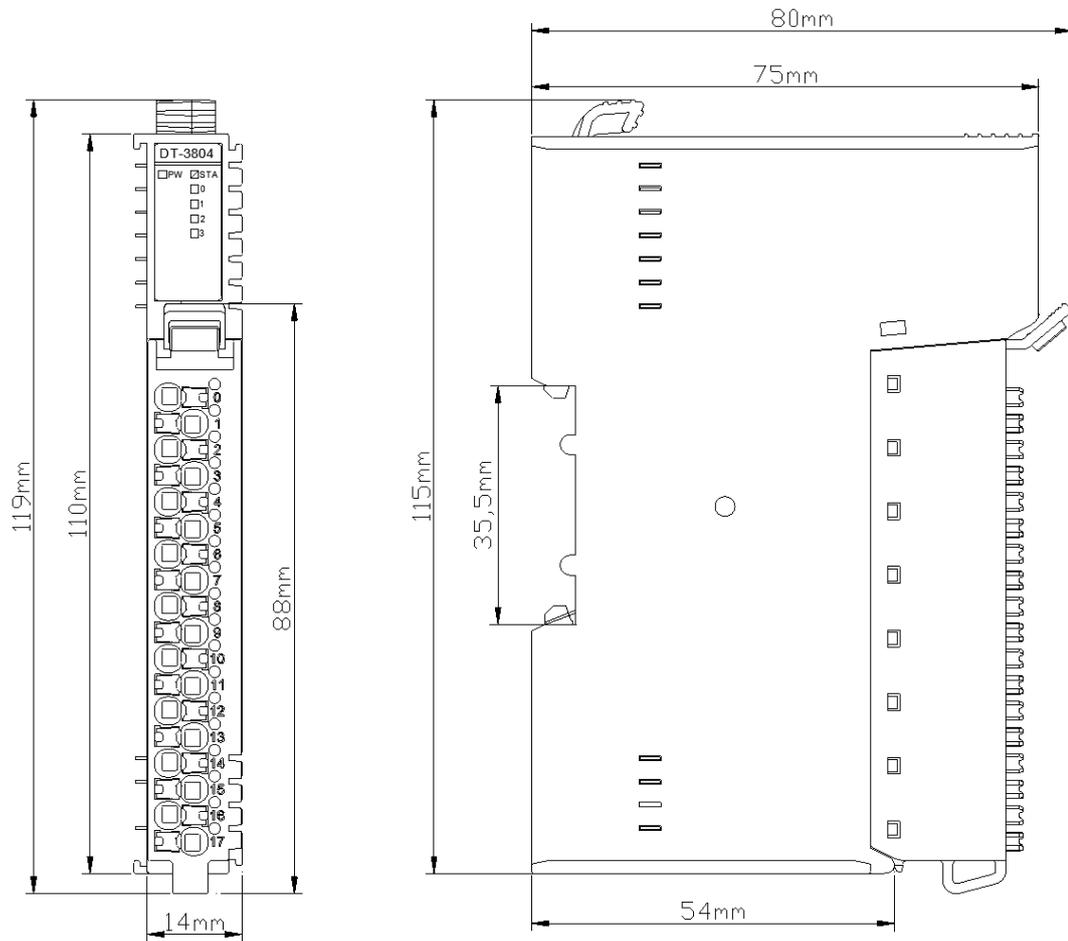
9: Level 9

10: Level 10

**Configuration parameter of submodule**

Configuration parameter									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0..3	Reserved								

## 7 Dimension Drawing



## **DT-4164 4 Channels Voltage Output**

### **0~5VDC/0~10VDC/±5VDC/±10VDC/16 bits**

#### **1 Module features**

- ◆ The module supports 4 channels voltage signal output
- ◆ Output range: 0~5VDC, 0~10VDC, ±5VDC, ±10VDC, 16 bits resolution.
- ◆ The module carries with 4 analog output LED indicators
- ◆ Module output signal is a single-end common ground output.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	169mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Input Parameters	
Channel Number	8 channels voltage output
Resolution	16 bits
Output Range	0~5V/0~10V/ -5V~5V/ -10V~10V
Transition Time	1.5ms/8 channels
Short-circuit Current	15mA
Linearity Error	≤ ±0.03%
Temperature Error	≤ ±0.005%/°C
Repeatability	≤ ±0.05%
Measurement Error	±0.2% (@25°C), ±0.4% (@-35°C~60°C)
Diagnosis Function	DAC overheating fault: Support
Environment parameters	
Horizontal Installation Operating Temperature	-35°C~60°C
Vertical Installation Operating Temperature	-35°C~50°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

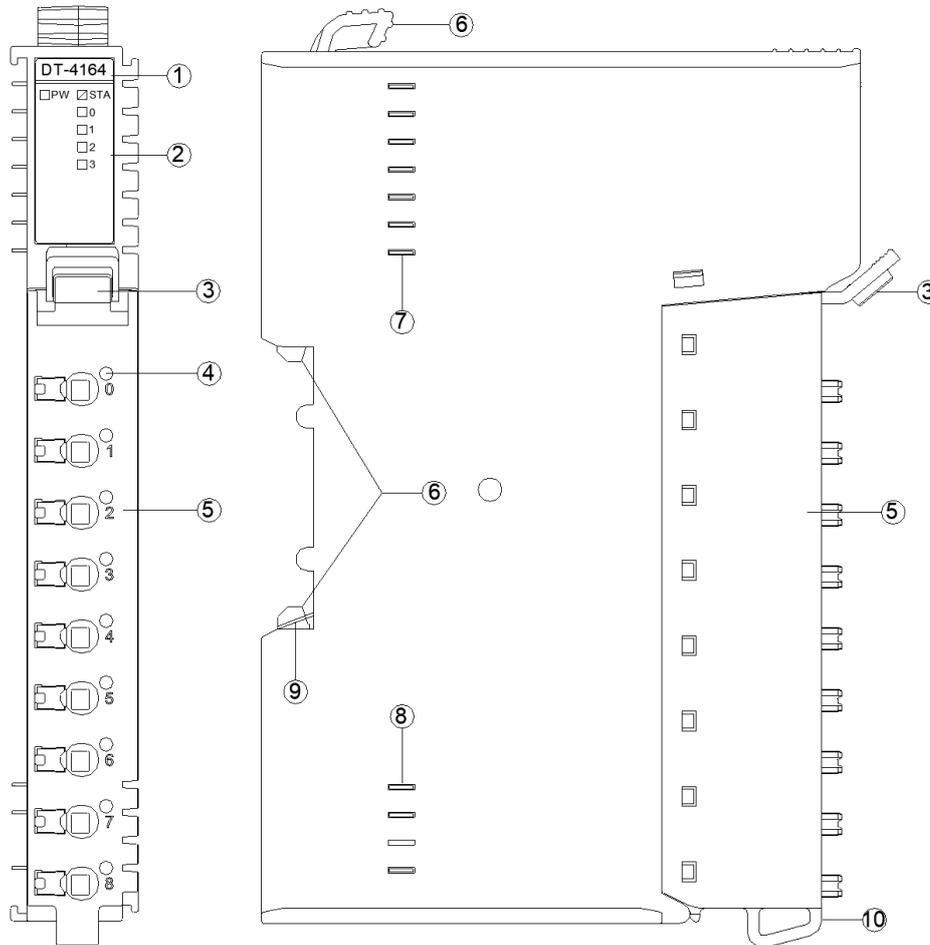
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

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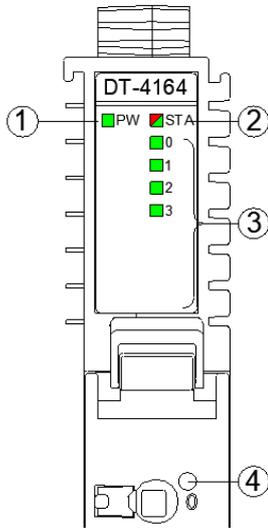
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### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
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- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



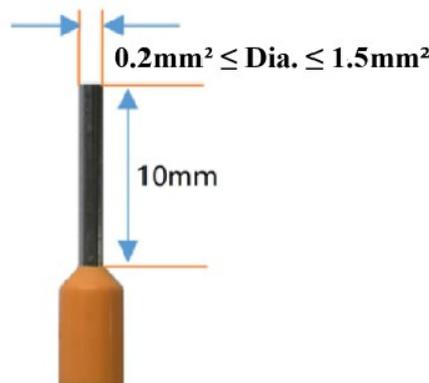
- ①: Power indicator
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- ④: No channel indicator

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OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~3 channel state indicator (Green)	Description
ON	The output signal is valid
OFF	The output signal is invalid / channel disabled

### 3.2 Wiring Definition

No.	Definition	Description
0	AOV0	Signal output CH0
1	GND	
2	AOV1	Signal output CH1
3	GND	
4	AOV2	Signal output CH2
5	GND	
6	AOV3	Signal output CH3
7	GND	
8	SHD	Output signal shield

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

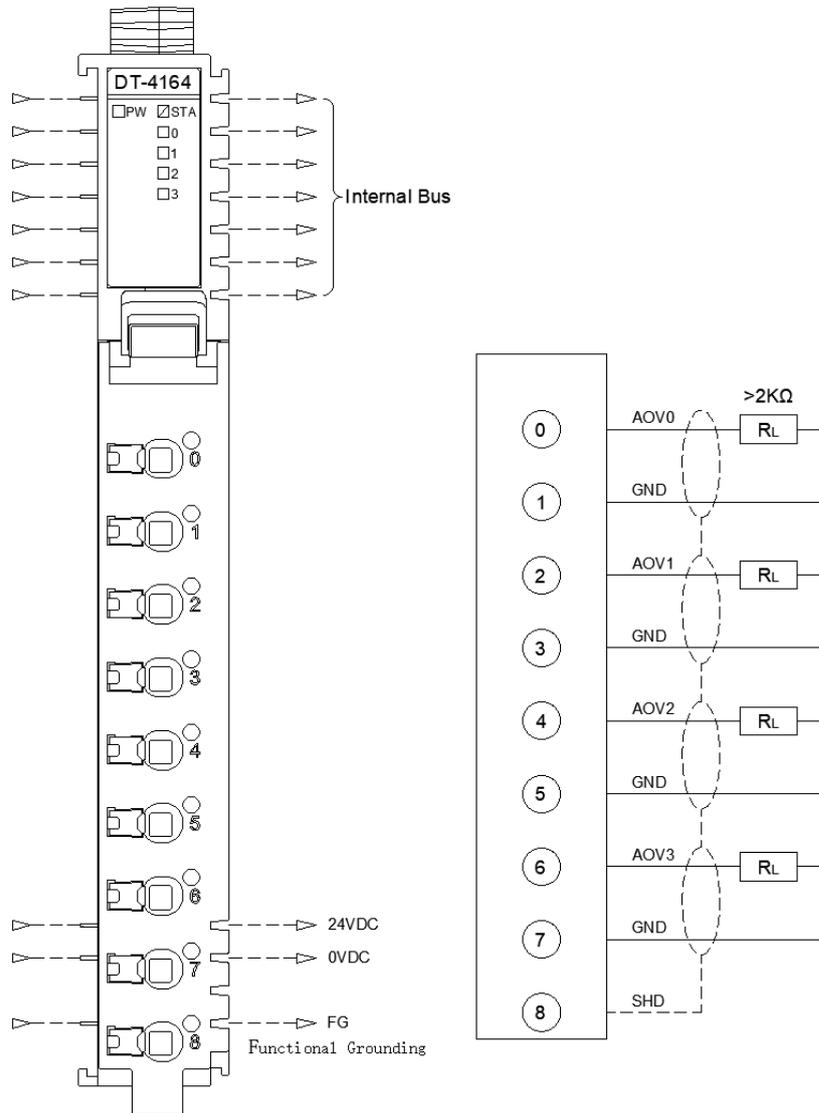
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process data definition

### The process data definition of output

Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Output Data (CH 0)							
Byte 1								
Byte 2	Analog Output Data (CH 1)							
Byte 3								
Byte 4	Analog Output Data (CH 2)							
Byte 5								
Byte 6	Analog Output Data (CH 3)							
Byte 7								

Data description:

**Analog Output Data (CH0~3):** DAC outputs process data.

### Diagnostic sub-module process data definition

Output data									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	Reserved				Communication Error		DAC Err	Overtemperature	

Data description:

**Overtemperature:** This error occurs when the DAC overheats above 140°C.

0: DAC working is normal

1: DAC working is abnormal

**DAC Err:** DAC chip error

0: DAC chip is normal

1: DAC chip is abnormal

**Communication Error:** DAC chip communication is error.

0: DAC is normal

1: DAC chip communication is abnormal

**Process Data Definition (Standard Mode)**

Analog Output Data (0~5v/0~10v)			
Voltage (0~5V)	Voltage (5~ 10V)	Decimal	Hexadecimal
5	10	27648	0x6C00
.	.	.	.
.	.	.	.
2.5	5	13824	0x3600
.	.	.	.
.	.	.	.
0	0	0	0x0000

Analog Output Data (±5v/±10v)			
Voltage (±5V)	Voltage (±10V)	Decimal	Hexadecimal
5	10	27648	0x6C00
.	.	.	.
.	.	.	.
2.5	5	13824	0x3600
.	.	.	.
.	.	.	.
0	0	0	0x0000
.	.	.	.
.	.	.	.
-2.5	-5	-13824	0xCA00
.	.	.	.
.	.	.	.
-5	-10	-27648	0x9400

**Process Data Definition (Special Mode)**

Analog Output Data (0~5V/0~10V)			
Voltage (0~5V)	Voltage (0~10V)	Decimal	Hexadecimal
5	10	32767	0x7FFF
.	.	.	.
.	.	.	.
2.5	5	16383	0x3FFF
.	.	.	.
.	.	.	.
0	0	0	0x0000

Analog Output Data (±5V/±10V)			
Voltage (±5V)	Voltage (±10V)	Decimal	Hexadecimal
5	10	32767	0x7FFF
.	.	.	.
.	.	.	.
2.5	5	16383	0x3FFF
.	.	.	.
.	.	.	.
0	0	0	0x0000
.	.	.	.
.	.	.	.
-2.5	-5	-16383	0xC000

.	.	.	.
.	.	.	.
-5	-10	-32768	0x8000

**The process data definition of diagnostic sub-module**

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							Over temperature

Data description:

**Over temperature:** When the temperature of DAC chip is over 140°C, this bit will be set to 1.

- 0: DAC working is normal
- 1: DAC working is abnormal

## 6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Fault Modet	Range Mode		16Bit Data Format
Byte 1	Voltage Type (CH1)				Voltage Type (CH0)			
Byte 2	Voltage Type (CH3)				Voltage Type (CH2)			

### Data description:

**16Bit Data Format:** the sequence of 16 bits data transmission. (Default value: A\_B)

A\_B: Big-endian format transmission

B\_A: Little-endian format transmission

**Range Mode:** Process data mode (default: standard mode)

Standard mode: same with Siemens process data definition

Special mode: max range of the hardware

**Fault Mode:** When the module is offline, the output data is processed in this way.

(Default value: reset output value)

Hold last output value: When the module is fault, hold the last output value.

Reset output value: when the module is fault, reset output value for all channels.

**Voltage Type (CH 0-3):** Output voltage type. (Default value: 0~10Vdc)

Disable: Output disabled

0~5Vdc: 0~5Vdc output

0~10Vdc: 0~10Vdc output

-5~5Vdc: -5~5Vdc output

-10~10Vdc: -10~10Vdc output

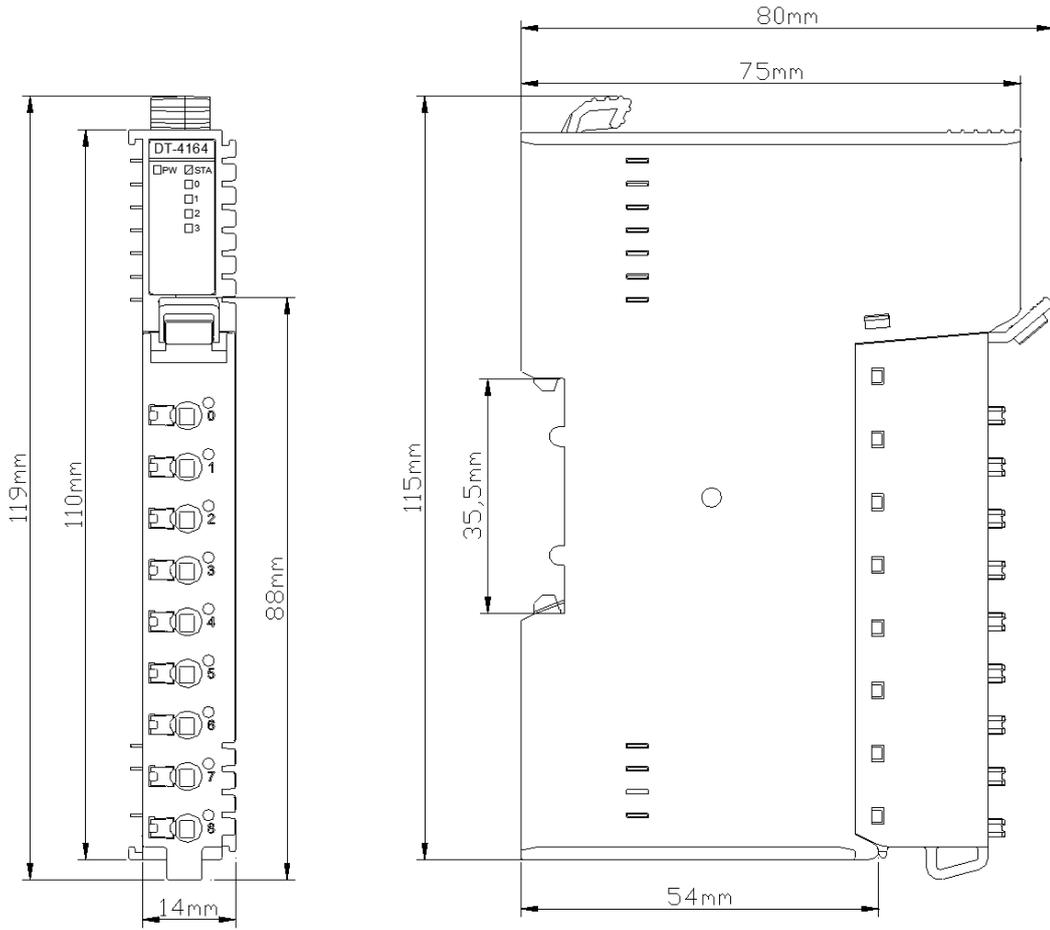
### The configuration definition of sub-module

Configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							

**Fault output sub-module configuration parameter definition**

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault Output Value (CH 0)							
Byte 1								
Byte 2	Fault Output Value (CH 1)							
Byte 3								
Byte 4	Fault Output Value (CH 2)							
Byte 5								
Byte 6	Fault Output Value (CH 3)							
Byte 7								
Byte 8	Reserved							
Byte 9								

## 7 Dimension Drawing



## **DT-4234 4 Channels Current Output 0&4~20mA/16-bit**

### **1 Module Features**

- ◆ 0-20mA or 4-20mA output range can be set.
- ◆ The module internal bus and field output adopts capacitive isolation.
- ◆ Module output signal is a single-end common ground output.
- ◆ Module high speed redundant backplane bus with pluggable terminal blocks.

## 2 Technical Parameters

General Parameters	
Current Consumption	35mA@5VDC
Field Power	19.2~28.8VDC (Nominal: 24VDC)
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Output Parameters	
Channel Number	8 channels current output
Resolution	16 bits
Output Range	0~20mA/4~20mA
Transition Time	1ms/4 channels (the filter level is 0)
Input Impedance	Max.500Ω
Linearity Error	≤ ±0.03%
Temperature Error	≤ ±0.005%/K
Repeatability	≤ ±0.05%
Measurement Error	±0.2% (@25℃), ±0.4% (@-35℃~60℃)
Diagnosis	24V power fault: support Line fault: support DAC communication fault: support
Environment parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

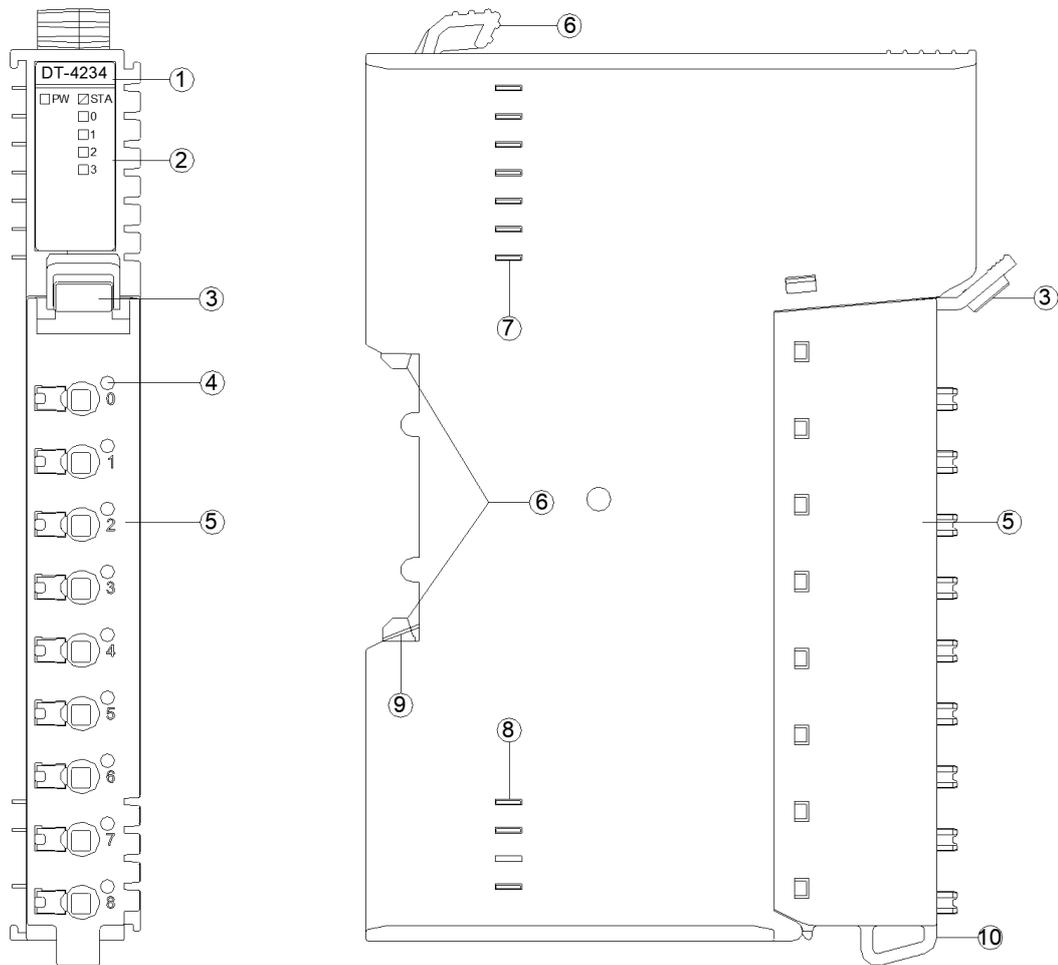
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

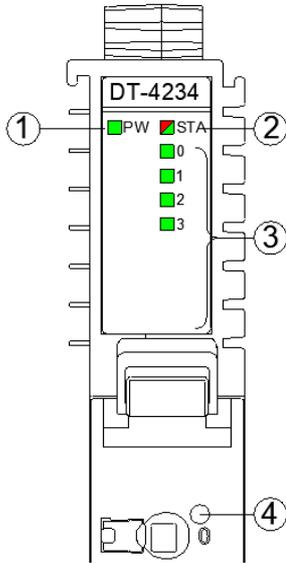
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator Definition



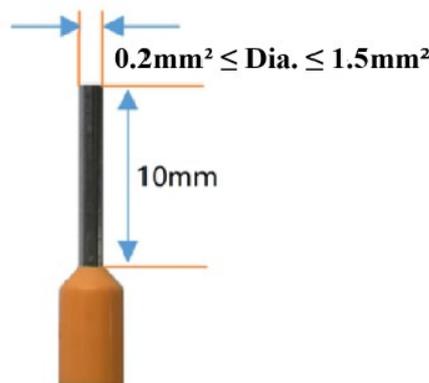
- ①: Power indicator
- ②: Module state indictor
- ③: Channels state indictor
- ④: No channel indicator

PW Power indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module state indicator (Red/ Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/ Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/ Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
0~3 channel state indicator (Green)	Description
ON	The output signal is valid
OFF	The output signal is invalid / channel disabled

### 3.2 Wiring Definition

No.	Definition	Description
0	AOI0	Current output CH0
1	GND	
2	AOI1	Current output CH1
3	GND	
4	AOI2	Current output CH2
5	GND	
6	AOI3	Current output CH3
7	GND	
8	SHD	Input signal shield

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

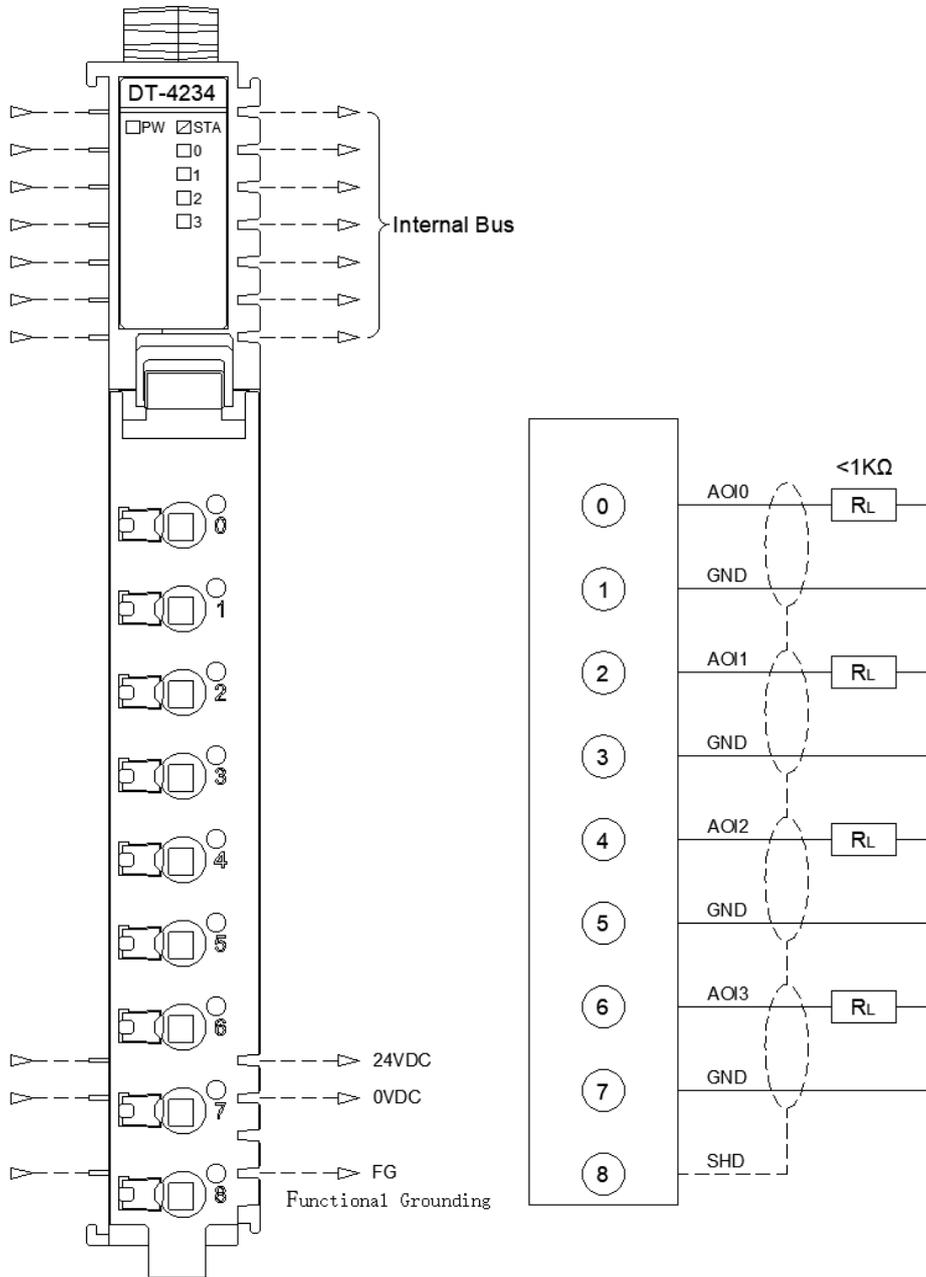
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

The process data definition of output

Output Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog Output Data (CH 0)							
Byte 1								
Byte 2	Analog Output Data (CH 1)							
Byte 3								
Byte 4	Analog Output Data (CH 2)							
Byte 5								
Byte 6	Analog Output Data (CH 3)							
Byte 7								

Data description:

**Analog Output Data (CH0~3):** Analog output value, 16 bits signed integer.

**Process Data Definition (Standard Mode)**

Analog Output Data (DT-4234) (0-20mA)			
Current (0-20mA)	Decimal	Hexadecimal	Range
21mA	32767	7FFF	Overflow
	29031	7167	
21mA	29030	7166	Exceed upper limit
20mA+723.4nA	27649	6C01	
20mA	27648	6C00	Rated range
15mA	20736	5100	
723.4nA	1	1	
0 mA	0	0	
0 mA	-1	FFFF	Underflow
	-32768	8000	

Analog Output Data (DT-4234) (4-20mA)			
Current (0-20mA)	Decimal	Hexadecimal	Range
21mA	32767	0x7FFF	Overflow
	29377	0x72C1	
21mA	29376	0x72C0	Exceed upper limit
20mA+723.4nA	27649	0x6C01	
20mA	27648	0x6C00	Rated range
16mA	20736	0x5100	
4mA +578.7nA	1	0x0001	
4mA	0	0x0000	
3.9995mA	-1	0xFFFF	Exceed lower limit
3.6mA	-692	0xFD4C	
3.6mA	-693	0xFD4B	Underflow
	-32768	0x8000	

**Process Data Definition (Standard Mode)**

Analog Output Data			
Current (0-20mA)	Current (4-20mA)	Decimal	Hexadecimal
20mA	20mA	32767	0x7FFF
.	.	.	.
.	.	.	.
10mA	12mA	16383	0x7FFF
.	.	.	.
.	.	.	.
0mA	4mA	0	0x0000

**The process data definition of diagnosis sub-module**

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved		Field Power Error (CH0-3)	Communication Error (CH 0-3)	Output Channel Open Circuit or Overload (CH 3)	Output Channel Open Circuit or Overload (CH 2)	Output Channel Open Circuit or Overload (CH 1)	Output Channel Open Circuit or Overload (CH 0)

Data Description:

**Field Power Error (CH0-3):** When the field power is abnormal, this bit will be set to 1.

- 0: The system power is normal
- 1: The system power is abnormal

**Communication Error (CH0-3):** When the DAC driver is error, field power is not connected or the isolator is damaged, this bit will be set to 1.

- 0: DAC communication is normal
- 1: DAC communication is abnormal

**Output Channel Open Circuit or Overload (CH0-3):** The status of current output, when the channel is open circuit or overload, this bit will be set to 1; when the load is normal, this bit will be set to 0.

- 0: The load is normal
- 1: The load is open circuit or overload

## 6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved				Module Offline Fault Action for Output	Range Mode		16Bit Data Format
Byte 1	Current Type CH1				Current Type CH0			
Byte 2	Current Type CH4				Current Type CH2			

Data Description:

**16Bit Data Format:** Analog data storage format. (Default: A-B)

0: A-B

1: B-A

**Range Mode:** Process data mode (default: standard mode)

Standard mode: same with Siemens process data definition

Special mode: max range of the hardware

**Module Offline Fault Action for Output:** the fault action for output when the module is offline. (Default value: Hold last output value)

0: Hold last output value

1: Reset output value

**Current Type (CH0-3):** output current type. (Default value: 4-20mA)

0: Disabled

1: 0-20mA

2: 4-20mA

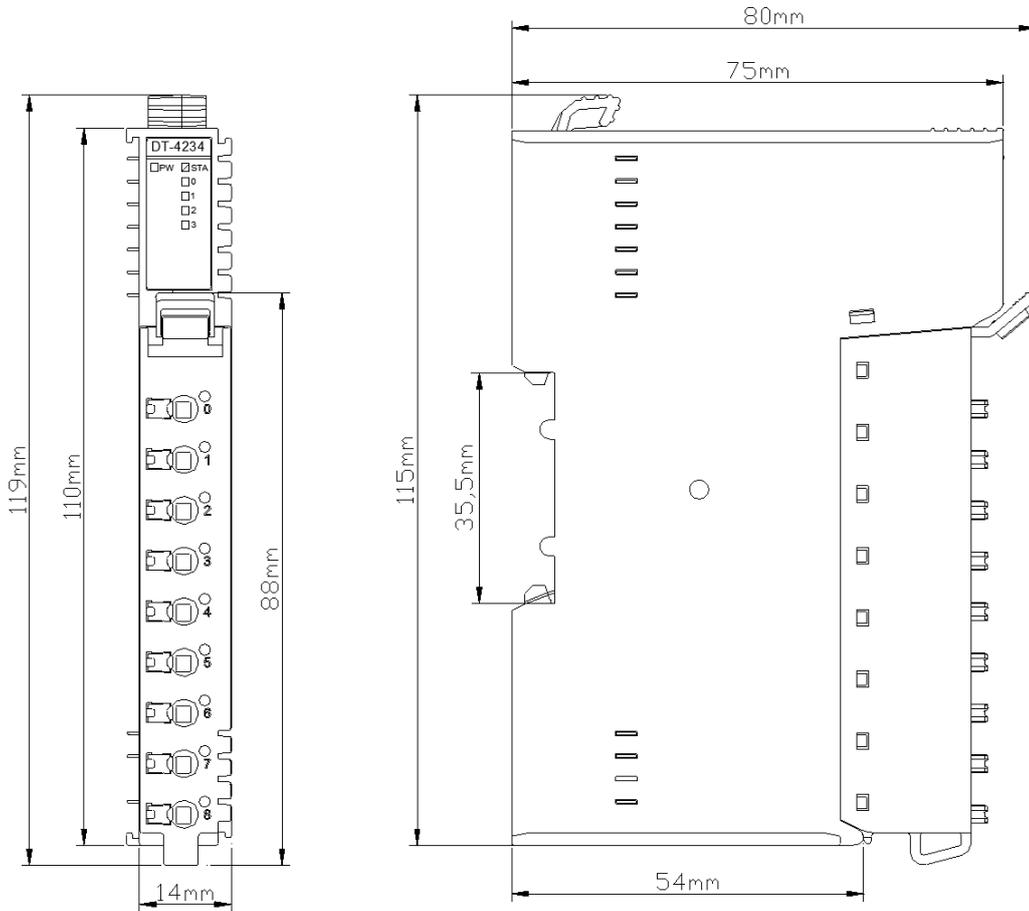
### Configuration Parameter Definition of Sub-module

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserved							

**Fault output sub-module configuration parameter definition**

Configuration parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Fault Output Value (CH 0)							
Byte 1								
Byte 2	Fault Output Value (CH 1)							
Byte 3								
Byte 4	Fault Output Value (CH 2)							
Byte 5								
Byte 6	Fault Output Value (CH 3)							
Byte 7								
Byte 8	Reserved							
Byte 9								

## 7 Dimension Drawing



# DT-5800 Terminal Module

## 1 Module Features

The end card-mandatory module is used to stabilize internal bus communication, and display the diagnostic information of network adapter and general diagnostic. The DT-5800 must be involved in configuration, and will occupy one slot. If there is no DT-5800, it is unable to create configuration.

## 2 Technical Parameters

General Parameter	
Current Consumption	26mA@5VDC
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Configuration	Configuration required, occupying one slot
Diagnosis	Support module online state diagnostics, network adapter operation status diagnostics
Environment parameters	
Horizontal Installation Operating Temperature	-35℃~60℃
Vertical Installation Operating Temperature	-35℃~50℃
Storage Temperature	-40℃~85℃
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4

## 3 Hardware Interface

N/A

## 4 Wiring

N/A

## 5 Process Data Definition

**System power diagnostic sub-module**

Input Data									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	Reserved							5V System Voltage Diagnose	

**5V System Voltage Diagnose:**

- 1: 1:5V Undervoltage (less than 4.77V) or overvoltage (greater than 5.83V)
- 0: 5V system power supply is normal

**System diagnosis sub-module**

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Module Offline Flag (7)	Module Offline Flag (6)	Module Offline Flag (5)	Module Offline Flag (4)	Module Offline Flag (3)	Module Offline Flag (2)	Module Offline Flag (1)	Module Offline Flag (0)
Byte 1	Module Offline Flag (15)	Module Offline Flag (14)	Module Offline Flag (13)	Module Offline Flag (12)	Module Offline Flag (11)	Module Offline Flag (10)	Module Offline Flag (9)	Module Offline Flag (8)
Byte 2	Module Offline Flag (23)	Module Offline Flag (22)	Module Offline Flag (21)	Module Offline Flag (20)	Module Offline Flag (19)	Module Offline Flag (18)	Module Offline Flag (17)	Module Offline Flag (16)
Byte 3	Module Offline Flag (31)	Module Offline Flag (30)	Module Offline Flag (29)	Module Offline Flag (28)	Module Offline Flag (27)	Module Offline Flag (26)	Module Offline Flag (25)	Module Offline Flag (24)
Byte 4...6	Reserved							

**Module Offline Flag:**

- 0: the module is normal
- 1: the module is offline

**The process data definition of general diagnosis module**

Input Data									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	Reserved				Terminal Module Exception Flag	Network Adapter Field	Network Adapter System	Network Adapter Terminal Incorrect	

						Power Incorrect	Power Incorrect	
Byte 1	Module Terminal ERR Flag (7)	Module Terminal ERR Flag (6)	Module Terminal ERR Flag (5)	Module Terminal ERR Flag (4)	Module Terminal ERR Flag (3)	Module Terminal ERR Flag (2)	Module Terminal ERR Flag (1)	Module Terminal ERR Flag (0)
Byte 2	Module Terminal ERR Flag (15)	Module Terminal ERR Flag (14)	Module Terminal ERR Flag (13)	Module Terminal ERR Flag (12)	Module Terminal ERR Flag (11)	Module Terminal ERR Flag (10)	Module Terminal ERR Flag (9)	Module Terminal ERR Flag (8)
Byte 3	Module Terminal ERR Flag (23)	Module Terminal ERR Flag (22)	Module Terminal ERR Flag (21)	Module Terminal ERR Flag (20)	Module Terminal ERR Flag (19)	Module Terminal ERR Flag (18)	Module Terminal ERR Flag (17)	Module Terminal ERR Flag (16)
Byte 4	Module Terminal ERR Flag (31)	Module Terminal ERR Flag (30)	Module Terminal ERR Flag (29)	Module Terminal ERR Flag (28)	Module Terminal ERR Flag (27)	Module Terminal ERR Flag (26)	Module Terminal ERR Flag (25)	Module Terminal ERR Flag (24)
Byte 5	Reserved							
Byte 6	Backplane Bus1 ERR Flag (7)	Backplane Bus1 ERR Flag (6)	Backplane Bus1 ERR Flag (5)	Backplane Bus1 ERR Flag (4)	Backplane Bus1 ERR Flag (3)	Backplane Bus1 ERR Flag (2)	Backplane Bus1 ERR Flag (1)	Backplane Bus1 ERR Flag (0)
Byte 7	Backplane Bus1 ERR Flag (15)	Backplane Bus1 ERR Flag (14)	Backplane Bus1 ERR Flag (13)	Backplane Bus1 ERR Flag (12)	Backplane Bus1 ERR Flag (11)	Backplane Bus1 ERR Flag (10)	Backplane Bus1 ERR Flag (9)	Backplane Bus1 ERR Flag (8)
Byte 8	Backplane Bus1 ERR Flag (23)	Backplane Bus1 ERR Flag (22)	Backplane Bus1 ERR Flag (21)	Backplane Bus1 ERR Flag (20)	Backplane Bus1 ERR Flag (19)	Backplane Bus1 ERR Flag (18)	Backplane Bus1 ERR Flag (17)	Backplane Bus1 ERR Flag (16)
Byte 9	Backplane Bus1 ERR Flag (31)	Backplane Bus1 ERR Flag (30)	Backplane Bus1 ERR Flag (29)	Backplane Bus1 ERR Flag (28)	Backplane Bus1 ERR Flag (27)	Backplane Bus1 ERR Flag (26)	Backplane Bus1 ERR Flag (25)	Backplane Bus1 ERR Flag (24)
Byte 10	Reserved							
Byte 11	Backplane Bus2 ERR Flag (7)	Backplane Bus2 ERR Flag (6)	Backplane Bus2 ERR Flag (5)	Backplane Bus2 ERR Flag (4)	Backplane Bus2 ERR Flag (3)	Backplane Bus2 ERR Flag (2)	Backplane Bus2 ERR Flag (1)	Backplane Bus2 ERR Flag (0)
Byte 12	Backplane Bus2 ERR Flag (15)	Backplane Bus2 ERR Flag (14)	Backplane Bus2 ERR Flag (13)	Backplane Bus2 ERR Flag (12)	Backplane Bus2 ERR Flag (11)	Backplane Bus2 ERR Flag (10)	Backplane Bus2 ERR Flag (9)	Backplane Bus2 ERR Flag (8)
Byte 13	Backplane Bus2 ERR							

	ERR Flag (23)	ERR Flag (22)	Flag (21)	Flag (20)	Flag (19)	Flag (18)	Flag (17)	Flag (16)
Byte 14	Backplane Bus2 ERR Flag (31)	Backplane Bus2 ERR Flag (30)	Backplane Bus2 ERR Flag (29)	Backplane Bus2 ERR Flag (28)	Backplane Bus2 ERR Flag (27)	Backplane Bus2 ERR Flag (26)	Backplane Bus2 ERR Flag (25)	Backplane Bus2 ERR Flag (24)
Byte 15	Reserved							
Byte 16	Module Bus Load1							
Byte 17								
Byte 18	Module Bus Load2							
Byte 19								

Data description:

**Network Adapter Terminal Incorrect:**

- 1: The terminal of network adapter is error
- 0: The terminal of network adapter is normal

**Network Adapter System Power Incorrect:**

- 1: The system power supply of network adapter is error
- 0: The system power supply of network adapter is normal

**Network Adapter Field Power Incorrect:**

- 1: The field power supply of network adapter is error
- 0: The field power supply of network adapter is normal

**Terminal Module Exception Flag:**

- 1: The end card-mandatory module is abnormal
- 0: The end card-mandatory module is normal

**Module Terminal ERR:**

- 1: The terminal of module is error
- 0: The terminal of module is normal

**Backplane Bus1 ERR Flag:**

1: Bus1 is error

0: Bus1 is normal

**Backplane Bus1 ERR Flag:**

1: Bus2 is error

0: Bus2 is normal

**Module Bus Load1:** Bus1 busload situation.

**Module Bus Load2:** Bus2 busload situation.

### The process data definition of DN-8031 Modbus module

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reset status							
Byte 1								
Byte 2	Reservation							
Byte 3								
Byte 4	Knob switch value							
Byte 5								
Byte 6	Running time seconds							
Byte 7								
Byte 8	Running time minutes							
Byte 9								
Byte 10	Running time hours							
Byte 11								
Byte 12	Running time days							
Byte 13								
Byte 14	Current device MAC address							
Byte 15								
Byte 16	Current device MAC address							
Byte 17								
Byte 18	Current device MAC address							
Byte 19								
Byte 20	Current device IP address							
Byte 21								
Byte 22	Current device IP address							
Byte 23								
Byte 24	Current device MASK address							
Byte 25								
Byte 26	Current device MASK address							
Byte 27								
Byte 28	Current device GATEWAY address							
Byte 29								
Byte 30	Current device GATEWAY address							
Byte 31								
Byte 32	Discretization input area data size							
Byte 33								
Byte 34	Data size in the coil output area							
Byte 35								
Byte 36	Input register area data size							
Byte 37								
Byte 38	Maintain the register area data size							
Byte 39								
Byte 40	Configure the interface client IP address							
Byte 41								
Byte 42	Configure the interface client IP address							
Byte 43								
Byte 44	Configure the Port of the interface client							
Byte 45								
Byte 46	Number of Modbus clients connected							
Byte 47								
Byte 48	Client 1 IP address							
Byte 49								
Byte 50	Client 1 IP address							

Byte 51	
Byte 52	Client 1 Port
Byte 53	
Byte 54	Client 2 IP address
Byte 55	
Byte 56	Client 2 IP address
Byte 57	
Byte 58	Client 2 Port
Byte 59	
Byte 60	Client 3 IP address
Byte 61	
Byte 62	Client 3 IP address
Byte 63	
Byte 64	Client 3 Port
Byte 65	
Byte 66	Client 4 IP address
Byte 67	
Byte 68	Client 4 IP address
Byte 69	
Byte 70	Client 4 Port
Byte 71	
Byte 72	Client 5 IP address
Byte 73	
Byte 74	Client 5 IP address
Byte 75	
Byte 76	Client 5 Port
Byte 77	
Byte 78	Client 6 IP address
Byte 79	
Byte 80	Client 6 IP address
Byte 81	
Byte 82	Client 6 Port
Byte 83	
Byte 84	Client 7 IP address
Byte 85	
Byte 86	Client 7 IP address
Byte 87	
Byte 88	Client 7 Port
Byte 89	
Byte 90	Client 6 IP address
Byte 91	
Byte 92	Client 6 IP address
Byte 93	
Byte 94	Client 6 Port
Byte 95	
Byte 96	Client 7 IP address
Byte 97	
Byte 98	Client 7 IP address
Byte 99	
Byte 100	Client 7 Port
Byte 101	
Byte 102	Client 8 IP address
Byte 103	
Byte 104	Client 8 IP address
Byte 105	

Byte 106	Client 8 Port
Byte 107	
Byte 108	Client 9 IP address
Byte 109	
Byte 110	Client 9 IP address
Byte 111	
Byte 112	Client 9 Port
Byte 113	
Byte 114	Client 10 IP address
Byte 115	
Byte 116	Client 10 IP address
Byte 117	
Byte 118	Client 10 Port
Byte 119	
Byte 120	Module 0 error code
Byte 121	
Byte 122	Module 0 error code
Byte 123	
Byte 124	Module 1 error code
Byte 125	
Byte 126	Module 1 error code
Byte 127	
Byte 128	Module 2 error code
Byte 129	
Byte 130	Module 2 error code
Byte 131	
Byte 132	Module 3 error code
Byte 133	
Byte 134	Module 3 error code
Byte 135	
Byte 136	Module 4 error code
Byte 137	
Byte 138	Module 4 error code
Byte 139	
Byte 140	Module 5 error code
Byte 141	
Byte 142	Module 5 error code
Byte 143	
Byte 144	Module 6 error code
Byte 145	
Byte 146	Module 6 error code
Byte 147	
Byte 148	Module 7 error code
Byte 149	
Byte 150	Module 7 error code
Byte 151	
Byte 152	Module 8 error code
Byte 153	
Byte 154	Module 8 error code
Byte 155	
Byte 156	Module 9 error code
Byte 157	
Byte 158	Module 9 error code
Byte 159	
Byte 160	Module 10 error code

Byte 161	
Byte 162	Module 10 error code
Byte 163	
Byte 164	Module 11 error code
Byte 165	
Byte 166	Module 11 error code
Byte 167	
Byte 168	Module 12 error code
Byte 169	
Byte 170	Module 12 error code
Byte 171	
Byte 172	Module 13 error code
Byte 173	
Byte 174	Module 13 error code
Byte 175	
Byte 176	Module 14 error code
Byte 177	
Byte 178	Module 14 error code
Byte 179	
Byte 180	Module 15 error code
Byte 181	
Byte 182	Module 15 error code
Byte 183	
Byte 184	Module 16 error code
Byte 185	
Byte 186	Module 16 error code
Byte 187	
Byte 188	Module 17 error code
Byte 189	
Byte 190	Module 17 error code
Byte 191	
Byte 192	Module 18 error code
Byte 193	
Byte 194	Module 18 error code
Byte 195	
Byte 196	Module 19 error code
Byte 197	
Byte 198	Module 19 error code
Byte 199	
Byte 200	Module 20 error code
Byte 201	
Byte 202	Module 20 error code
Byte 203	
Byte 204	Module 21 error code
Byte 205	
Byte 206	Module 21 error code
Byte 207	
Byte 208	Module 22 error code
Byte 209	
Byte 210	Module 22 error code
Byte 211	
Byte 212	Module 23 error code
Byte 213	
Byte 214	Module 23 error code
Byte 215	

Byte 216	Module 24 error code
Byte 217	
Byte 218	Module 24 error code
Byte 219	
Byte 220	Module 25 error code
Byte 221	
Byte 222	Module 25 error code
Byte 223	
Byte 224	Module 26 error code
Byte 225	
Byte 226	Module 26 error code
Byte 227	
Byte 228	Module 27 error code
Byte 229	
Byte 230	Module 27 error code
Byte 231	
Byte 232	Module 28 error code
Byte 233	
Byte 234	Module 28 error code
Byte 235	
Byte 236	Module 29 error code
Byte 237	
Byte 238	Module 29 error code
Byte 239	
Byte 240	Module 30 error code
Byte 241	
Byte 242	Module 30 error code
Byte 243	
Byte 244	Module 31 error code
Byte 245	
Byte 246	Module 31 error code
Byte 247	
Byte 248	Module 32 error code
Byte 249	
Byte 250	Module 32 error code
Byte 251	

The process data definition of DN-8033 ECAT module

Input Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	WDG Value Feedback							
Byte 1								
Byte 2	Reserve							
Byte 3								
Byte 4								
Byte 5								

Output Data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	WDG Value							
Byte 1								
Byte 2	Reserve						WDG Diagnosis Enable	
Byte 3	Reserve							
Byte 4	Reserve							
Byte 5	Reserve							
Byte 6	Reserve							
Byte 7	Reserve							

## 6 Configuration Parameter Definition

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserve							

The configuration parameter definition of general module

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserve							
Byte 1								
Byte 2								
Byte 3								
Byte 4								

The configuration parameter definition of DN-8031 Modbus diagnosis module

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserve							
Byte 1								
Byte 2								
Byte 3								
Byte 4								

The configuration parameter of DN-8033 ECAT diagnosis module

Configuration Parameter								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Reserve						WDG Diagnosis	
Byte 1	WDG Timeout							
Byte 2	Reserve							
Byte 3								
Byte 4								
Byte 5								
Byte 6								
Byte 7								

WDG Diagnosis:

- 0: Diagnosis disabled
- 1: Diagnosis enabled
- 2: Process data control

WDG Timeout: Watchdog timeout

## **DT-7221 Power Expansion Module 5V/2A**

### **1 Module Feature**

- ◆ System power and field power expansion module
- ◆ System power expands 2A@5VDC
- ◆ Field power expands 8A current
- ◆ Need to be configured and occupy the number of slots.

## 2 Technical Parameter

General Parameter	
Current Consumption	25mA@24VDC
System Power	19.2~28.8VDC (Nominal: 24VDC) Anti-inversion protection: support
Current of System Power	Max.2A
Filed Power	19.2~28.8VDC (Nominal: 24VDC)
Current of Field Power	Max.8A
Short Circuit Protection	Support
Wiring Diameter	Min.0.2mm <sup>2</sup> (AWG24) Max.1.5mm <sup>2</sup> (AWG16)
Terminal Pluggable	Support
Backplane Bus	Double bus redundancy
Installation	35mm DIN-Rail
Dimension	119*14*80mm
Product Certification	CE Certification
Diagnosis Function	File power fault: support System power fault: support 2V power supply undervoltage/overvoltage fault: support
Environment Parameters	
Horizontal Installation Operating Temperature	-35°C~70°C
Vertical Installation Operating Temperature	-35°C~60°C
Storage Temperature	-40°C~85°C
Environment Humidity	5%~95%RH (No condensation)
Installation Altitude	<2000m
Pollution Degree	II
Protection Grade	IP20
Mechanical Properties	Comply with IEC60068-2-6, IEC6008-2-27
Insulation Withstand	Comply with IEC61131-2
EMC Performance	Comply with IEC61131-2, IEC61000-4
EMC Performance	Comply with IEC61131-2, IEC61000-4 (ESD: Contact discharge ±6kV, Performance level A; Air discharge±8kV, Performance level A SURGE: Common mode ±2kV, Performance level A EFT: ±2kV, Performance level A)

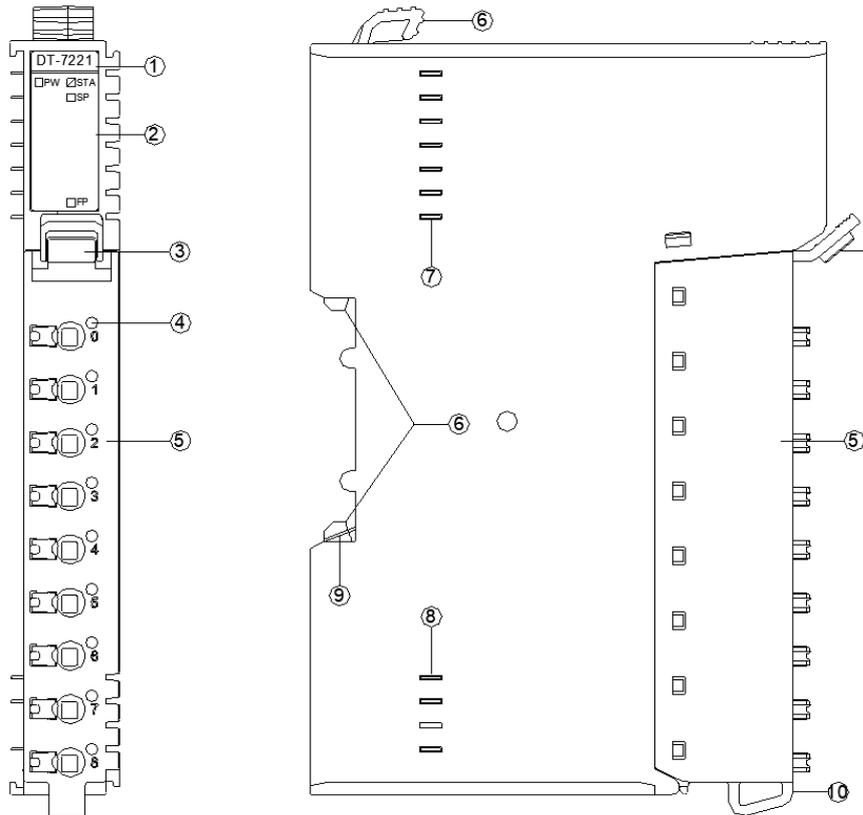
### WARNING

#### UNEXPECTED EQUIPMENT OPERATION

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

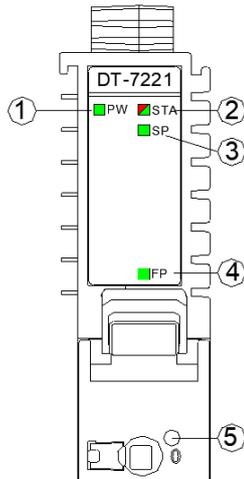
**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

### 3 Hardware Interface



- ①: Module Name
- ②: Status Indicators
- ③: Wiring Terminal Label
- ④: Channel Light Guides
- ⑤: Removable Terminal
- ⑥: Buckle
- ⑦: Internal Bus
- ⑧: Field Power
- ⑨: Grounding Spring Sheet
- ⑩: Fixed Wiring Harness

### 3.1 LED Indicator



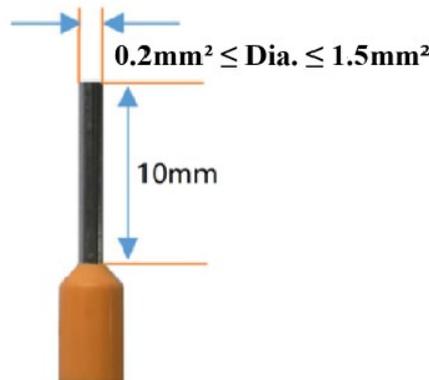
- ①: Power indicator
- ②: Module state indicator
- ③: System power indicator
- ④: Filed power indicator
- ⑤: No channel indicator

PW Power Indicator (Green)	Description
ON	Internal bus power supply is normal
OFF	Internal bus power supply is abnormal
STA Module State Indicator (Red/Green)	Description
Slow flash (Green)	The module internal bus is not started
Slow flash (Red)	The module internal bus is offline
ON (Green)	The module status is normal
Slow flash (Red/Green)	Upgrading mode
The red and green light on together (Orange)	The terminals are not installed in place
Fast flash (Red/Green)	Firmware Update
ON (Red)	Hardware fault (Hardware fault affecting multiple channels)
Flash 2-5 times (Red)	Internal fault of the module
SP System Power Indicator (Green) (Note: Backplane is required for power supply)	Description
ON	The system power supply is normal
OFF	The system power supply is abnormal
FP field power indicator (Green) (Note: Backplane is required for power supply)	Description
ON	The filed power supply is normal
OFF	The filed power supply is abnormal

### 3.2 Wiring Definition

No.	Definition	Description
0	SV+	System power
1	SV+	
2	SV-	
3	SV-	
4	FG	Functional Grounding
5	FV+	Filed power
6	FV+	
7	FV-	
8	FV-	

When the cold-pressed terminal is terminated, it should be terminated and viewed in strict accordance with the corresponding termination specifications or requirements, and terminated according to the corresponding node serial number. The wire needs to be made of copper wire and the core is greater than 0.2mm<sup>2</sup> and less than 1.5mm<sup>2</sup>, and the parameters of the cold-pressed terminal are referred to as follows:



#### **⚠ WARNING**

##### Unexpected equipment operation

Strip the length of the conductor insulation layer is greater than 10mm to ensure reliable signal connection.

The wire needs to use copper wire and the wire core is greater than or equal to 0.2mm<sup>2</sup> and less than or equal to 1.5mm<sup>2</sup> to ensure reliable signal connection.

When connecting a cold-press terminal, connect the cold-press terminal strictly in accordance with the corresponding termination specifications or requirements, and connect the cold-press terminal according to the corresponding node serial number.

Do not power on cold-press terminals until they are properly connected or fully locked.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

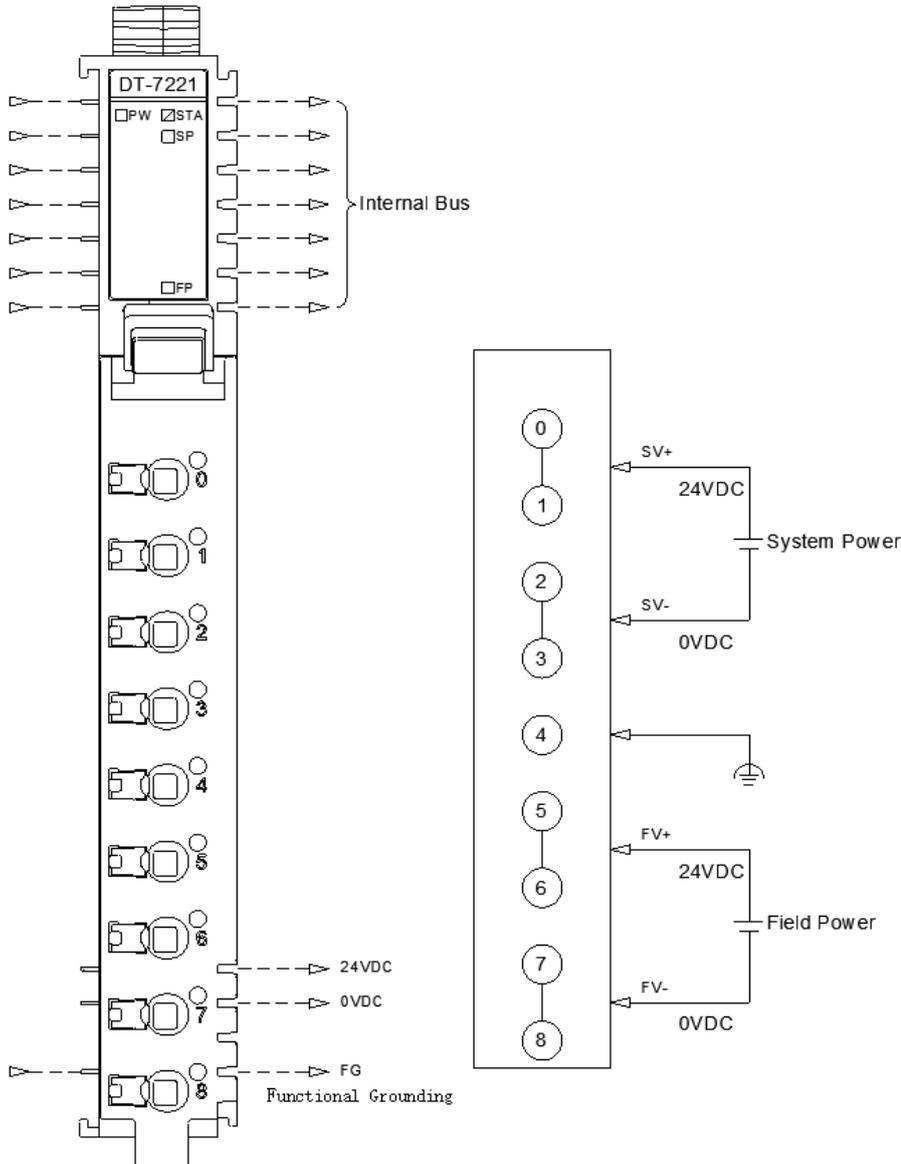
 **WARNING**

**UNEXPECTED EQUIPMENT OPERATION**

Do not exceed any of the ratings specified in the environmental and electrical characteristics table.

**Failure to follow instructions specified by the manufacturer may result in serious consequences such as death, personal injury, or damage to equipment since the protection provided by the equipment may be impaired.**

## 4 Wiring



### NOTICE

#### EQUIPMENT INOPERABLE

Do not crimp the spring terminal with more than the maximum pressure specified for the terminal. Otherwise, the resilience of the spring terminal may be damaged and the terminal rebound may be affected.

Do not press the spring terminal with a sharp tool when removing cable from the channel. Otherwise, the spring terminal will be damaged.

**Failure to follow these instructions may result in equipment damage.**

## 5 Process Data Definition

### Power Diagnostic Submodule

Input data									
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
Byte 0	Reserved					5V System Under Voltage or Over Voltage	Filed Power Error	System Power Error	

Data description:

**System Power Error:** This error occurs when the system power supply is not supplying.

- 0: The system power connection is normal
- 1: The system power connection is abnormal

**Filed Power Error:** This error occurs when the field power supply is not powered

- 0: The on-site power connection is normal
- 1: Abnormal on-site power connection

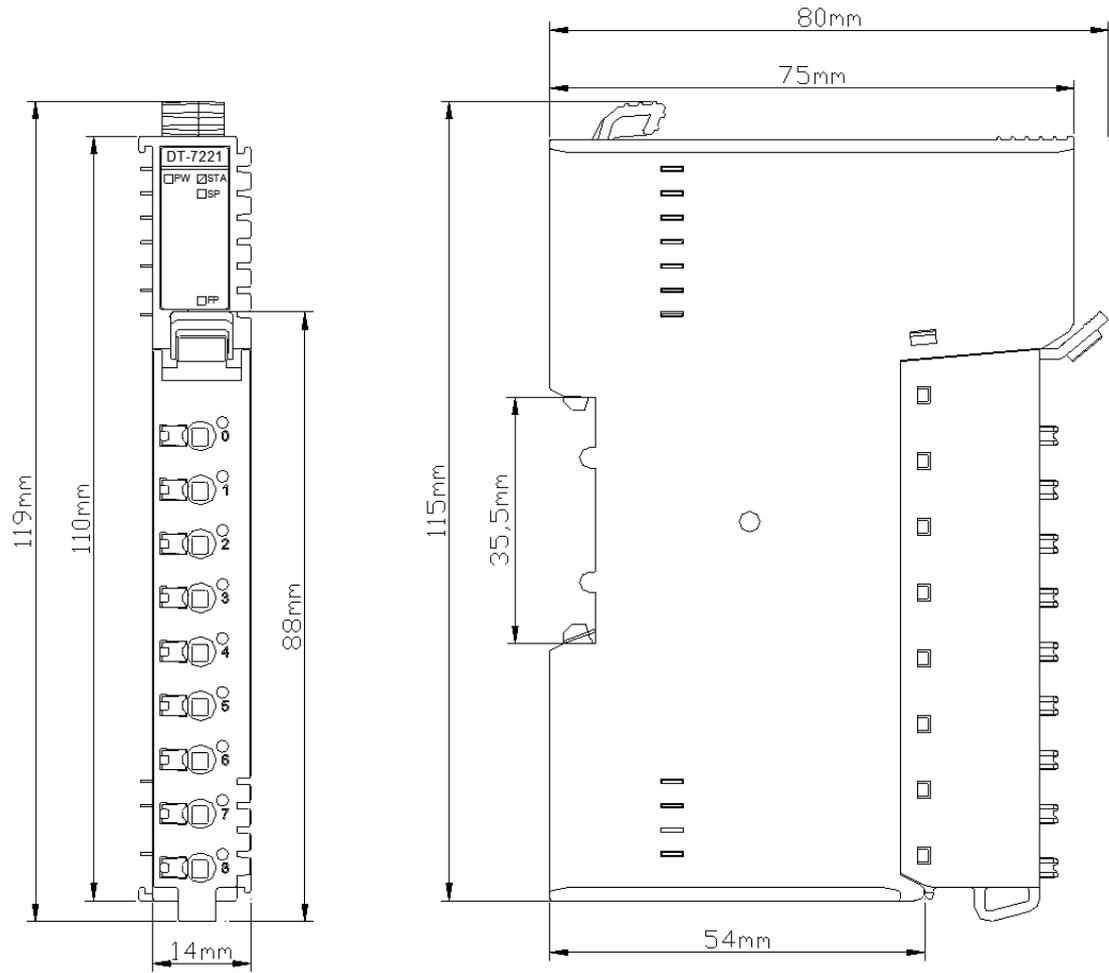
**5V System Under Voltage or Over Voltage:**

- 0: 5V system power supply is normal
- 1: 5V undervoltage (less than 4.77V) or overvoltage (greater than 5.83V)

## **6 Configuration Parameter Definition**

None.

## 7 Dimension Drawing



## 4 IO Config Software

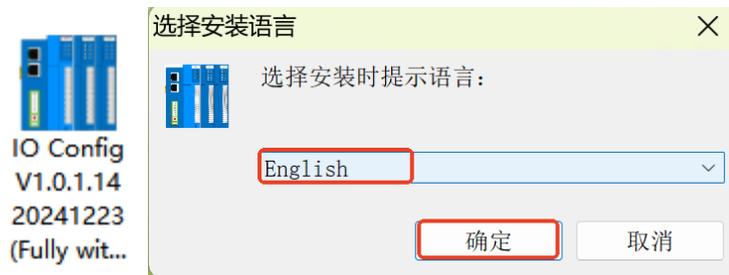
### 4.1 Software Installation

IO Config software installation package download address:

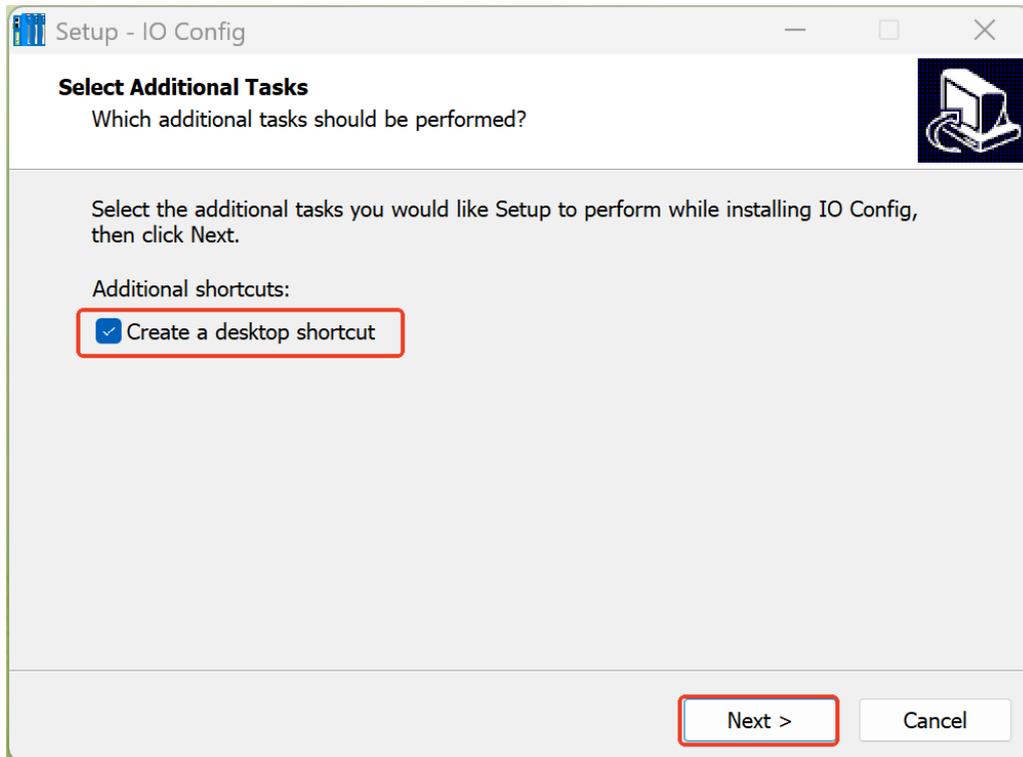
<https://www.odotautomation.com/downloads/>

After the software installation package is downloaded, double-click the IO Config application to install, and in the pop-up window, select the installation language

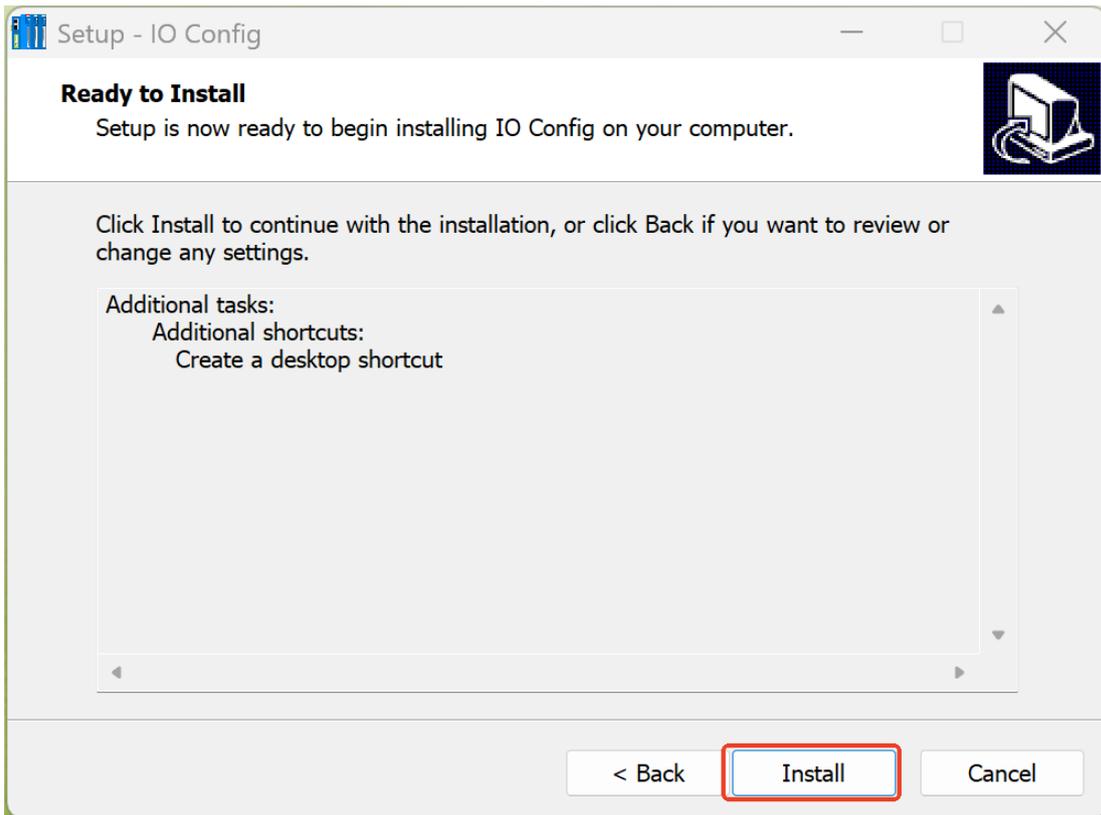
English, click OK.



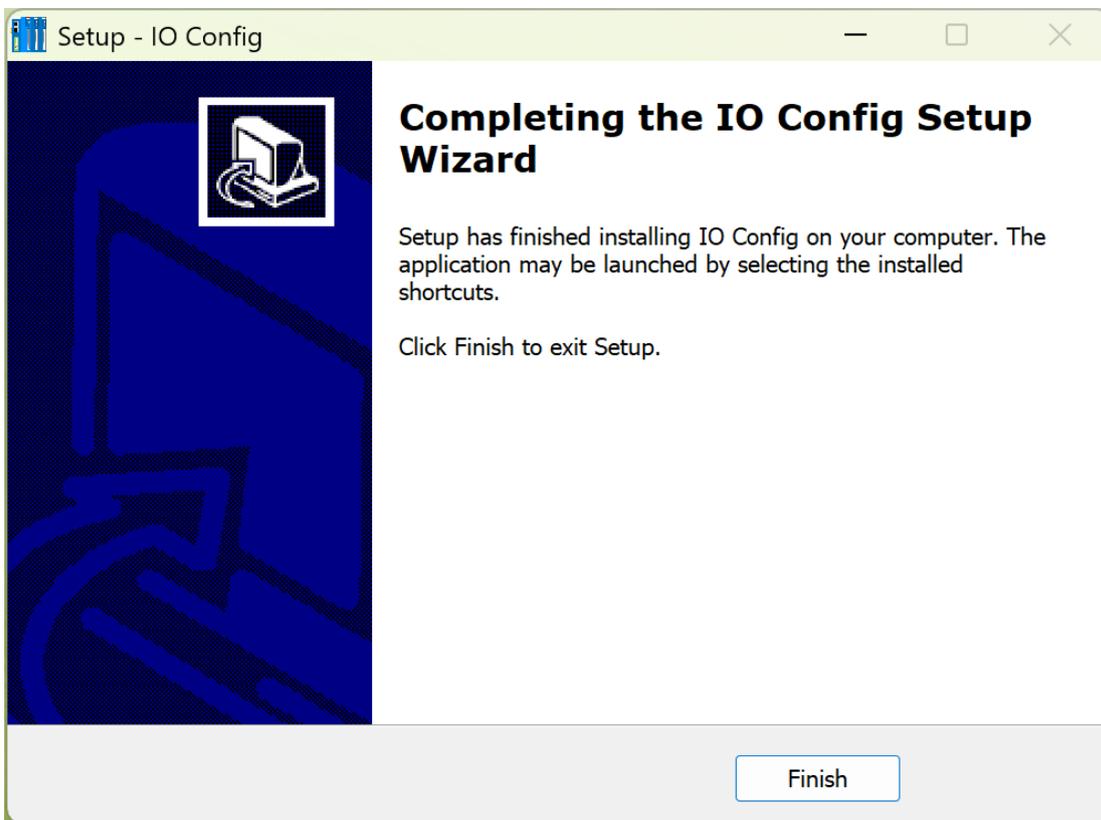
In the window that pops up, check the Create a desktop shortcut and click Next.



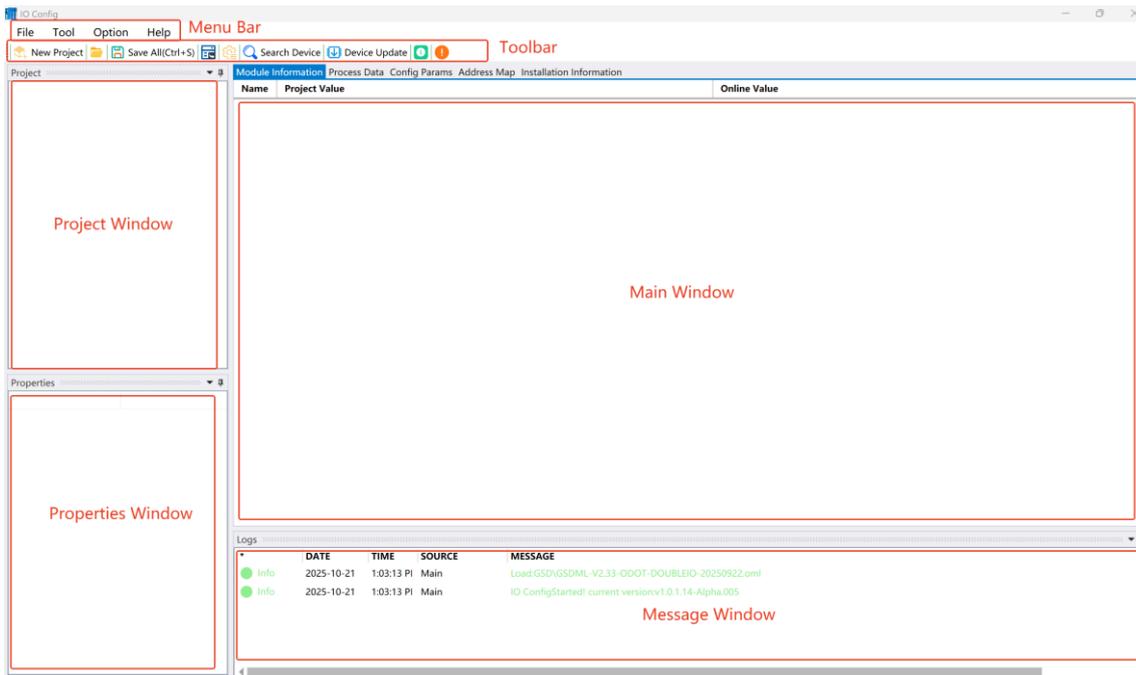
Click Install.



After the software installation is complete, click "Finish" to close the page.



## 4.2 Software Interface



**Menu Bar:** The menu of the IO Config software;

**Toolbar:** Commonly used user menus;

**Project Window:** The tree type displays the currently active projects;

**Properties Window:** Displays the specific parameters of the current item. Network adapter module (module name, module description, device version, number of modules, interface selection, device IP address, serial number, online refresh cycle), IO module (module name, module description, number of submodules)

### Main Window

Basic information: It can view the module name, module number, equipment manufacturer, module description, and current consumption of the module;

Process data: It can be used to monitor channel data online;

Configuration parameters: Module parameters that can be modified by the module;

Status Diagnostics: Used to view the diagnostic information of the module;

Address table: the address relationship occupied by the IO module;

Installation information: It can view the module description, current consumption, module size, and product pictures;

**Message Window:** Output real-time information of current operations, display

operation logs such as new projects, uploads, downloads, and configuration parameter modifications.

## 1 Menu Bar

File		
Project	Submenu	Description
	New Project	Create new project
	Open Project	Open the saved project
	Save all	Save the current project
	Save as	Save the current project as new project
	Paste	Paste the copied project
Exit		Close the project

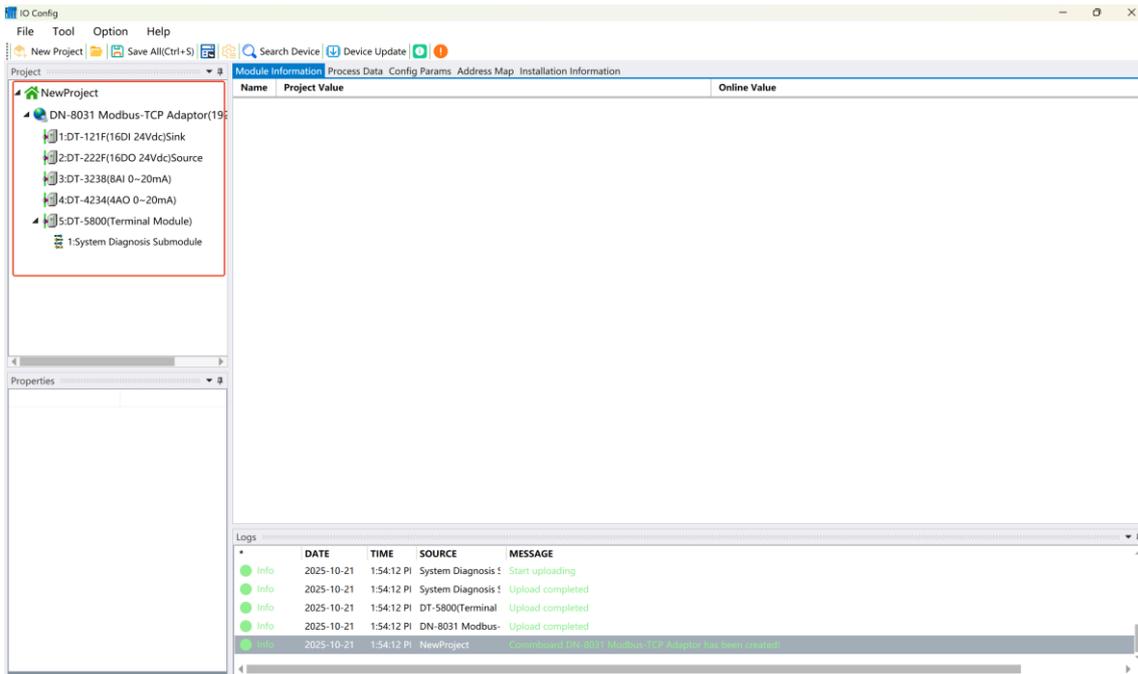
Tool	
Search Device	A new window pops up to search for the device
Device update	A new window pops up for adapter and IO module firmware upgrades
Option	
Config	It can modify the software display language, software interface display color, and device library description file path
Help	
About	You can view the information of Sichuan Odot Automation Company and the version number of the software
About Exceptions	A new window will pop up, abnormal exit reminder, please install the Microsoft patch for the following versions of WIN7 sp1/XP system.

## Shortcut key

Shortcut key	Description
F1	Go to the Help Documentation to view the Remote IO Hardware Manual
Ctrl+C	Copy project, network adapter and IO modules
Ctrl+V	Paste project, network adapter and IO modules
Delete	Delete project, network adapter and IO modules
Ctrl+S	Save the configuration project
Ctrl+M	Export the network adapter and IO module address tables

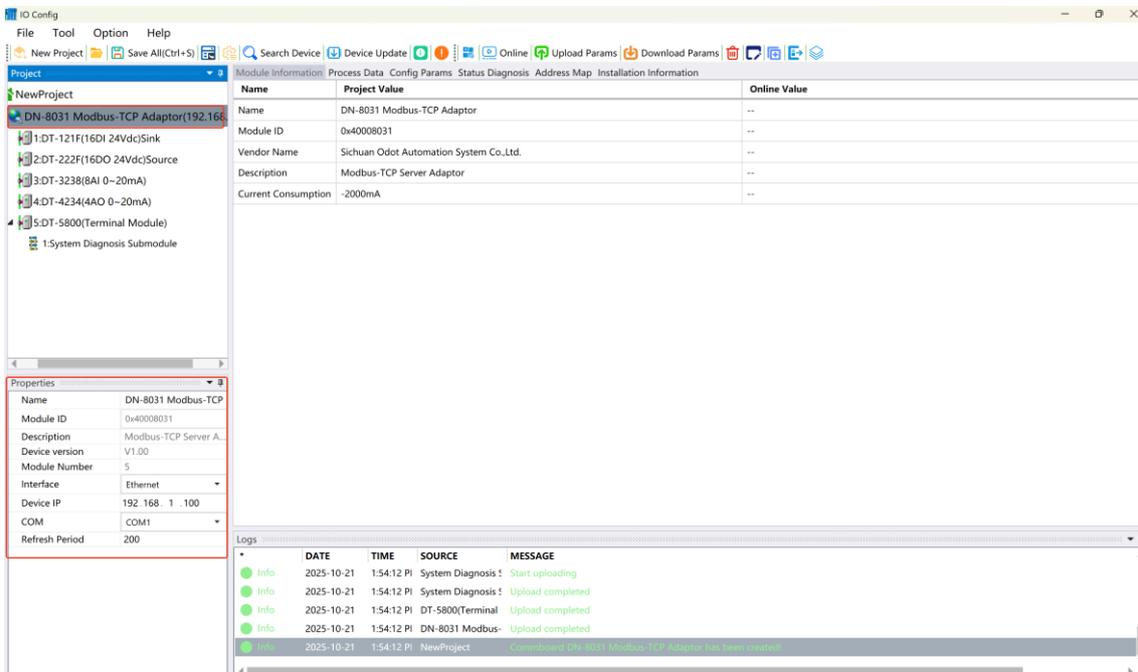
## 2 Project Window

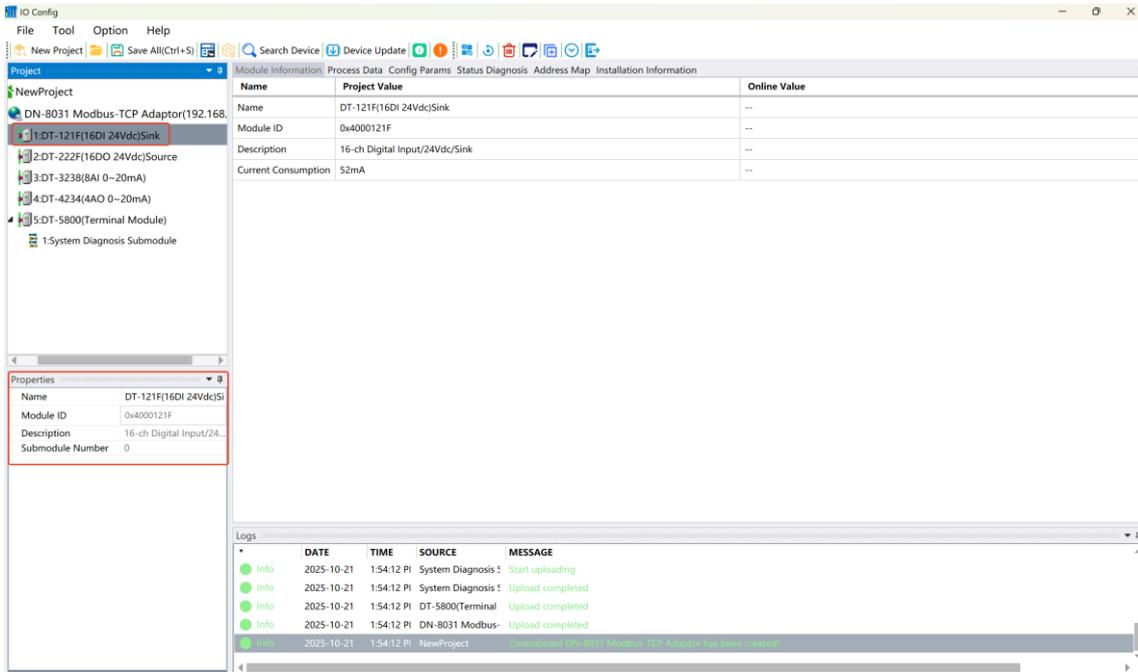
Displays currently active items in a tree form.



### 3 Properties window

Displays the specific parameters of the current item, as well as the parameters related to the network adaptor and the IO module.

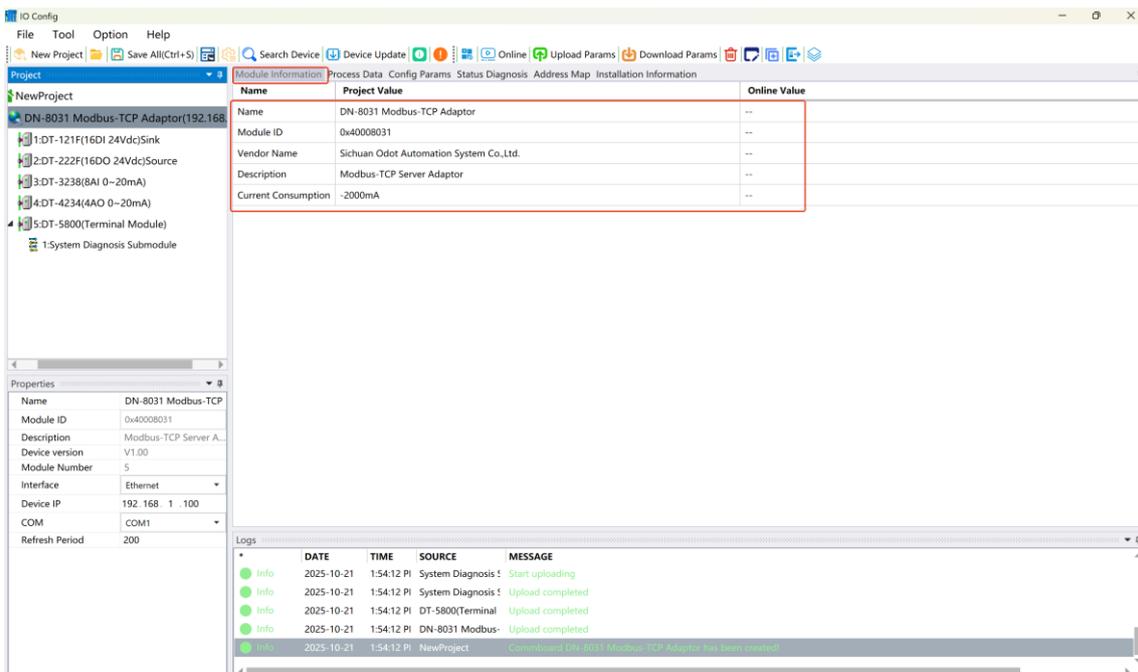




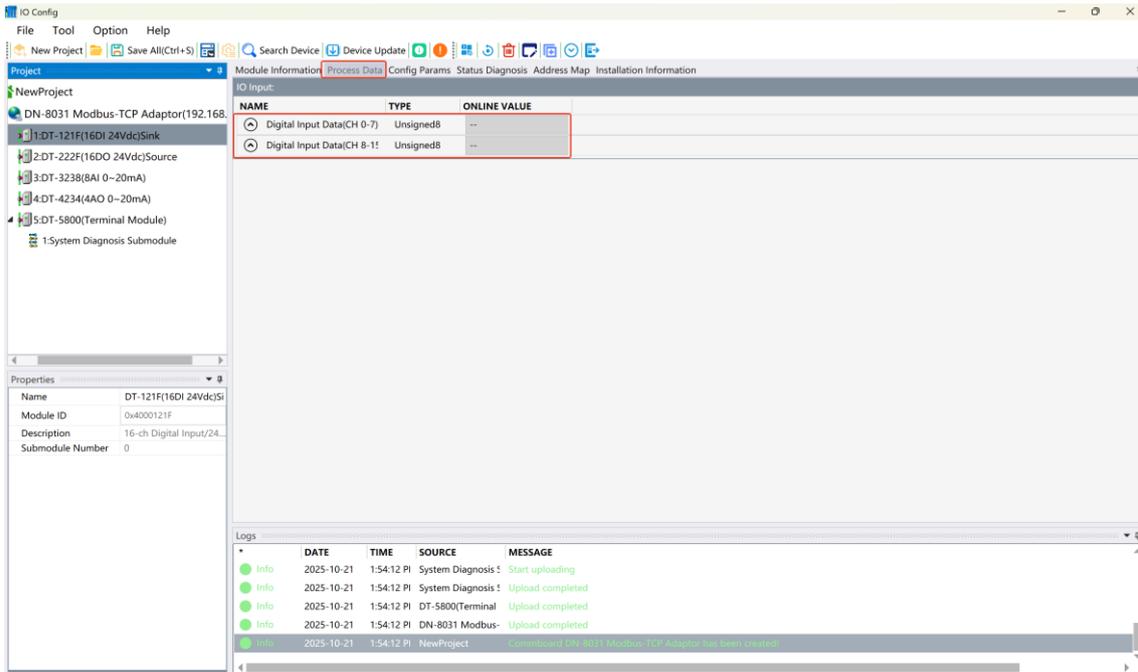
#### 4 Main Window

The main windows include: basic information, process data, configuration parameters, status diagnosis, address table, and installation information interface.

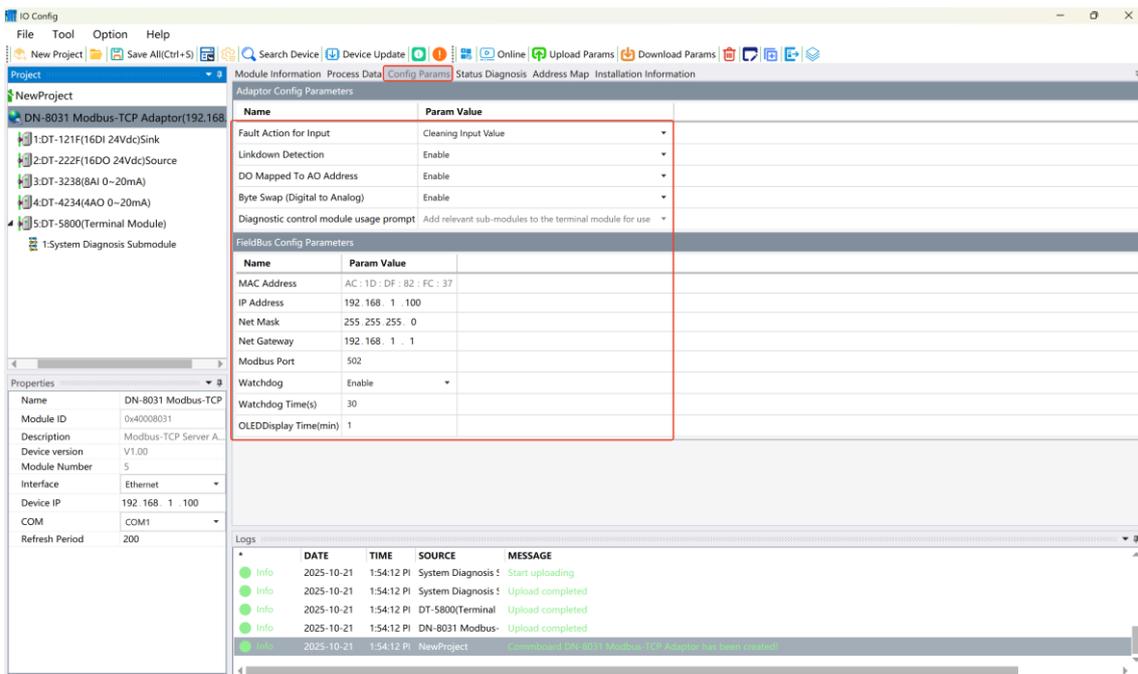
Module Information: Displays module name, module number, equipment manufacturer, module description, and current consumption information.



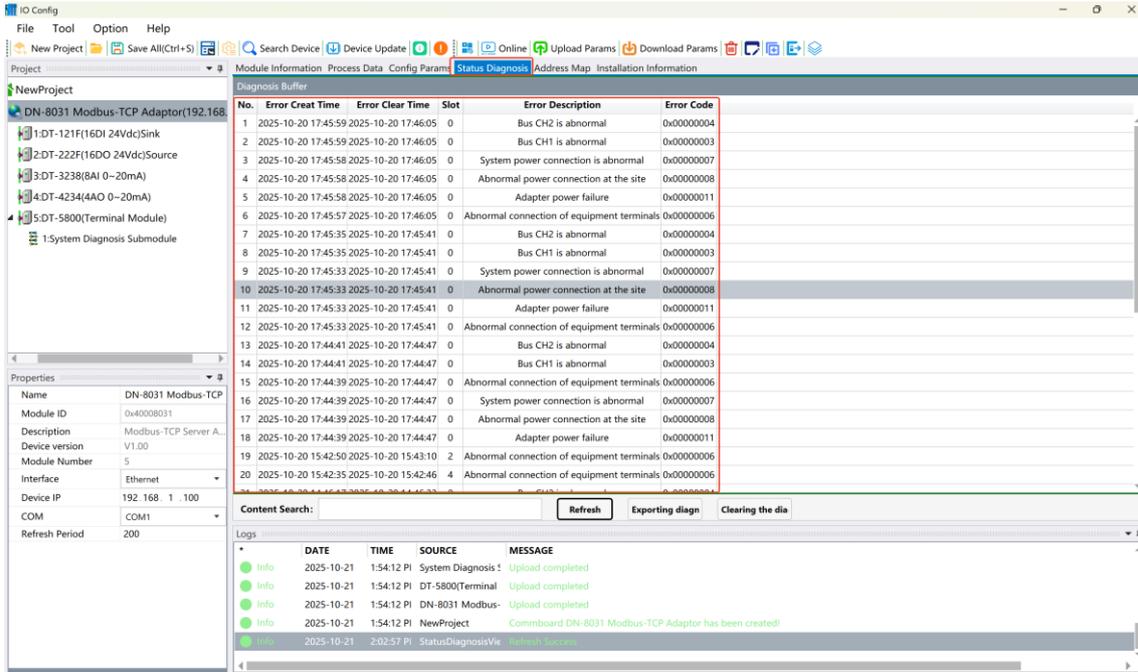
Process Data: Used to monitor IO channel data.



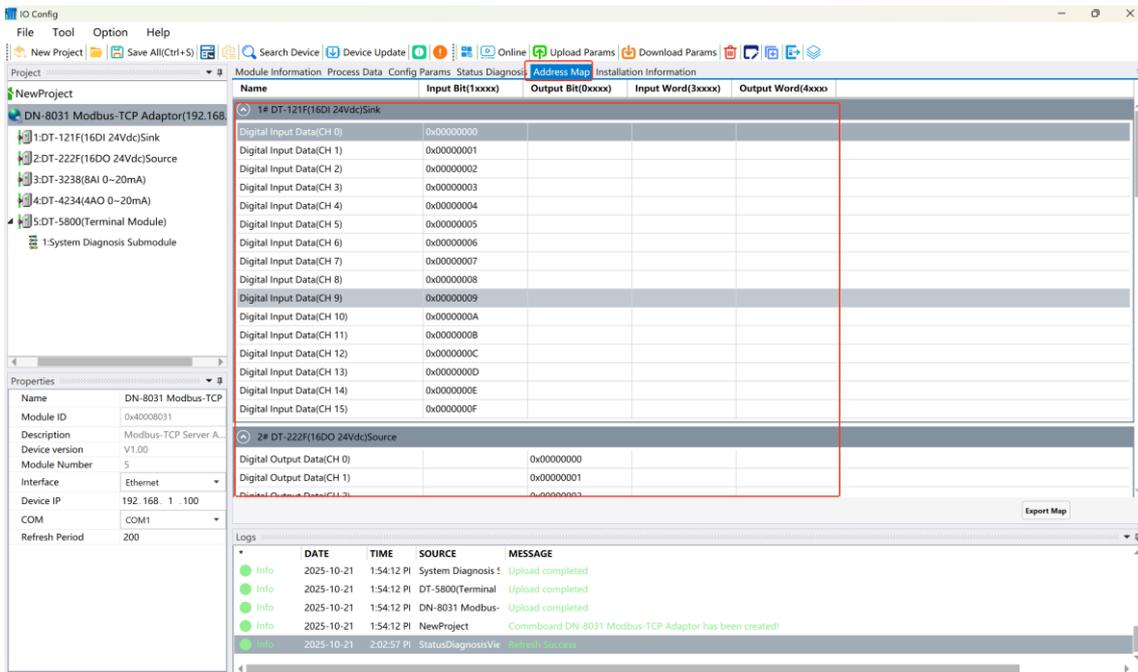
Config Params: Modify the parameters of the network adapter and IO module.



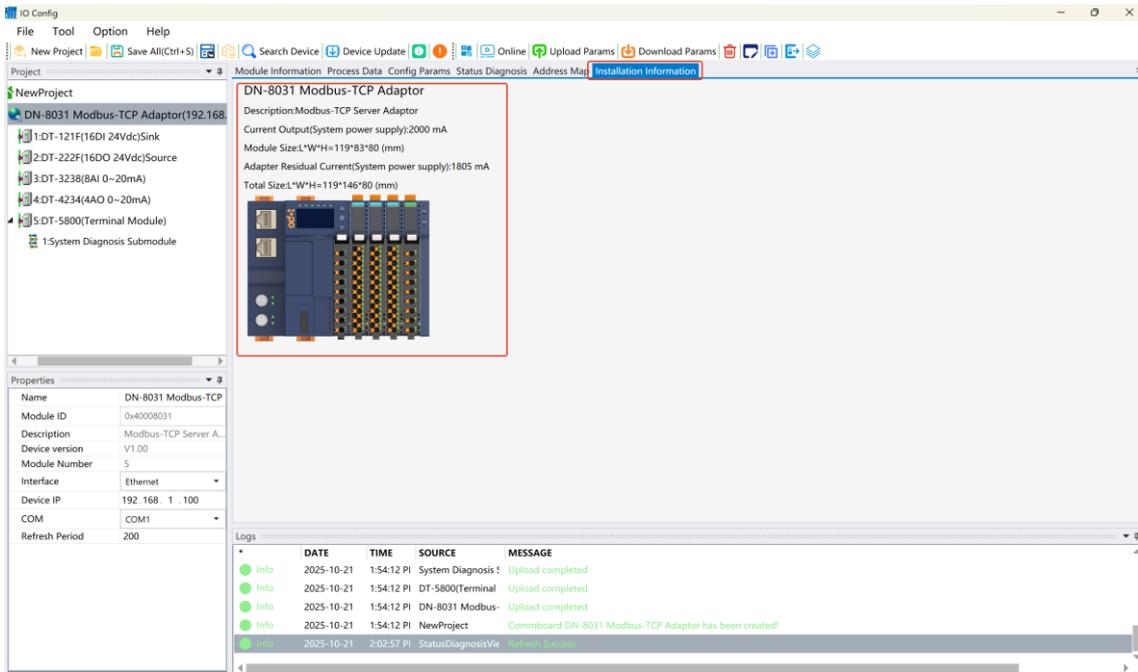
Status Diagnosis: After selecting the network adapter, click Refresh to obtain the diagnostic information of the module. The diagnostic buffer can view the error occurrence time, error clearance time, slots, error description, and error code information.



Address Table: Displays the address mapping information of the IO module.

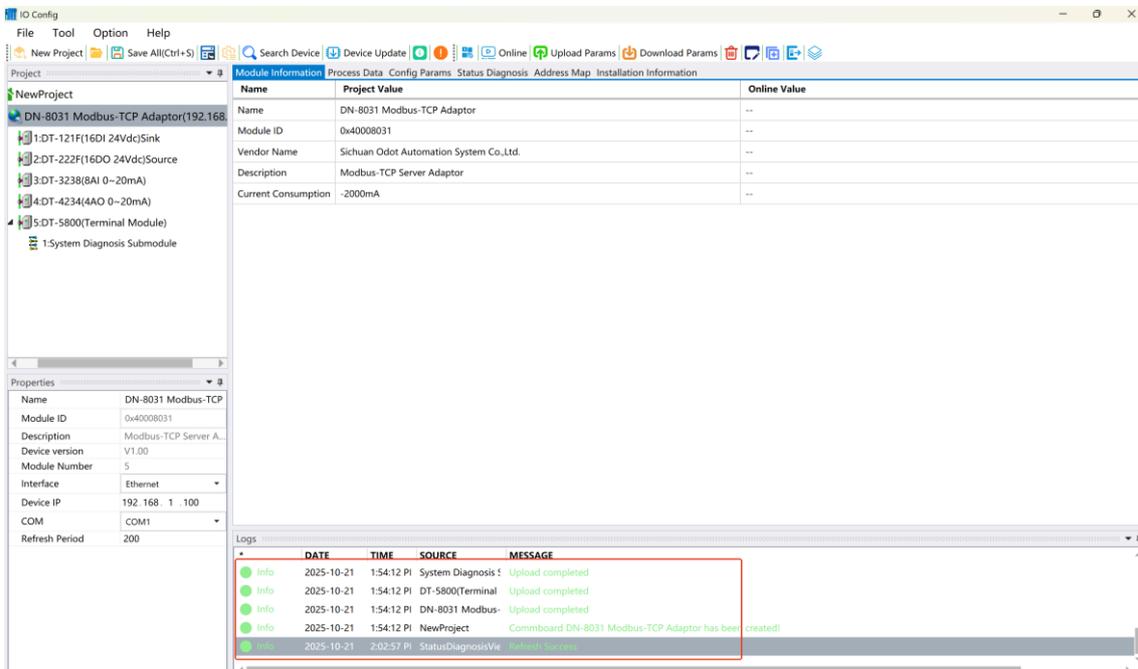


Installation Information: Displays module description, module current, module size and product picture information.



## 5 Message Window

Displays real-time information of current operations, and logs operations such as uploading, downloading, copying and pasting.



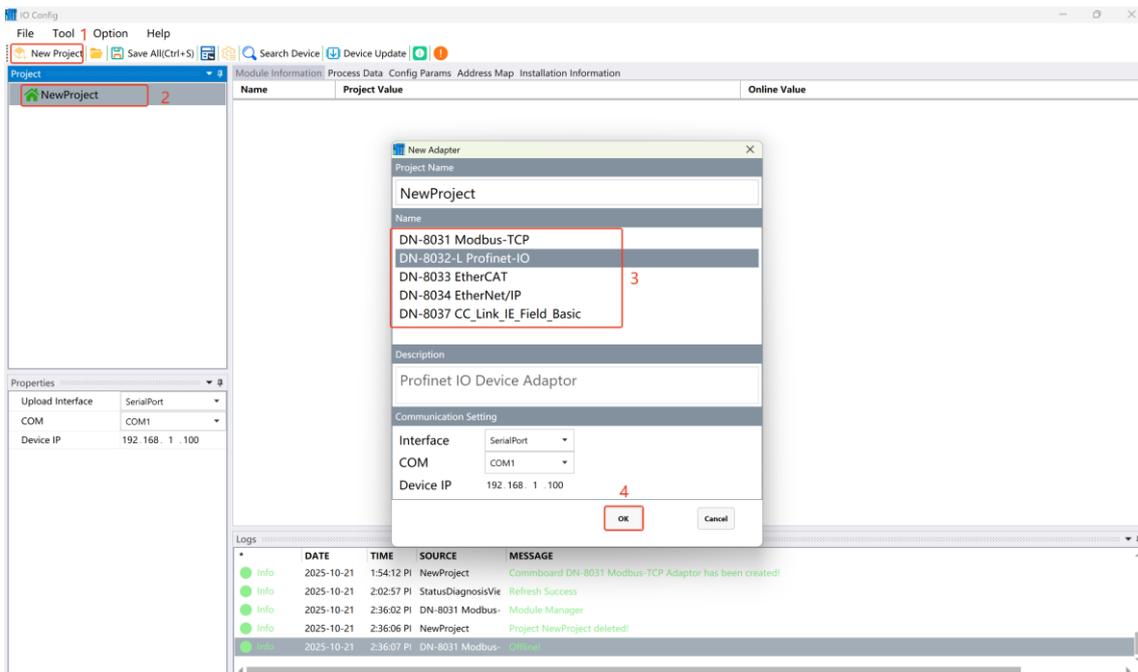
## 4.3 Software Function

IO Config software can realize the following functions: selection, module upload, modification of configuration parameters, online monitoring, firmware upgrade and file export, etc.

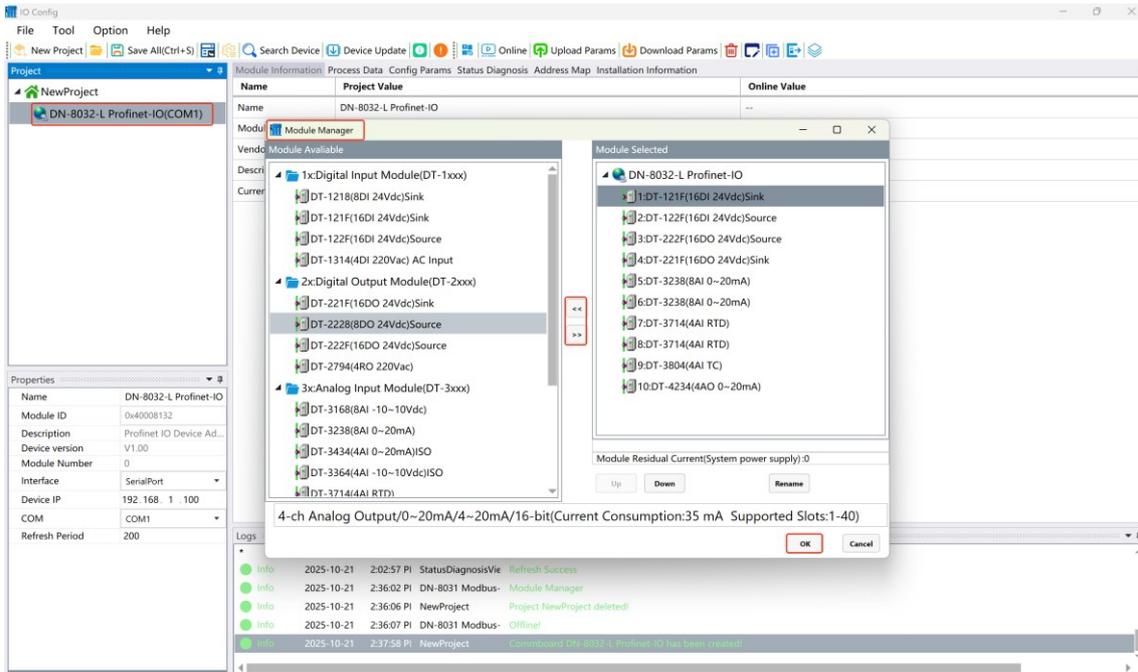
### 4.3.1 Selection

The main purpose is to determine whether additional power modules need to be added to the selected IO modules, calculate the overall module size, and understand module information.

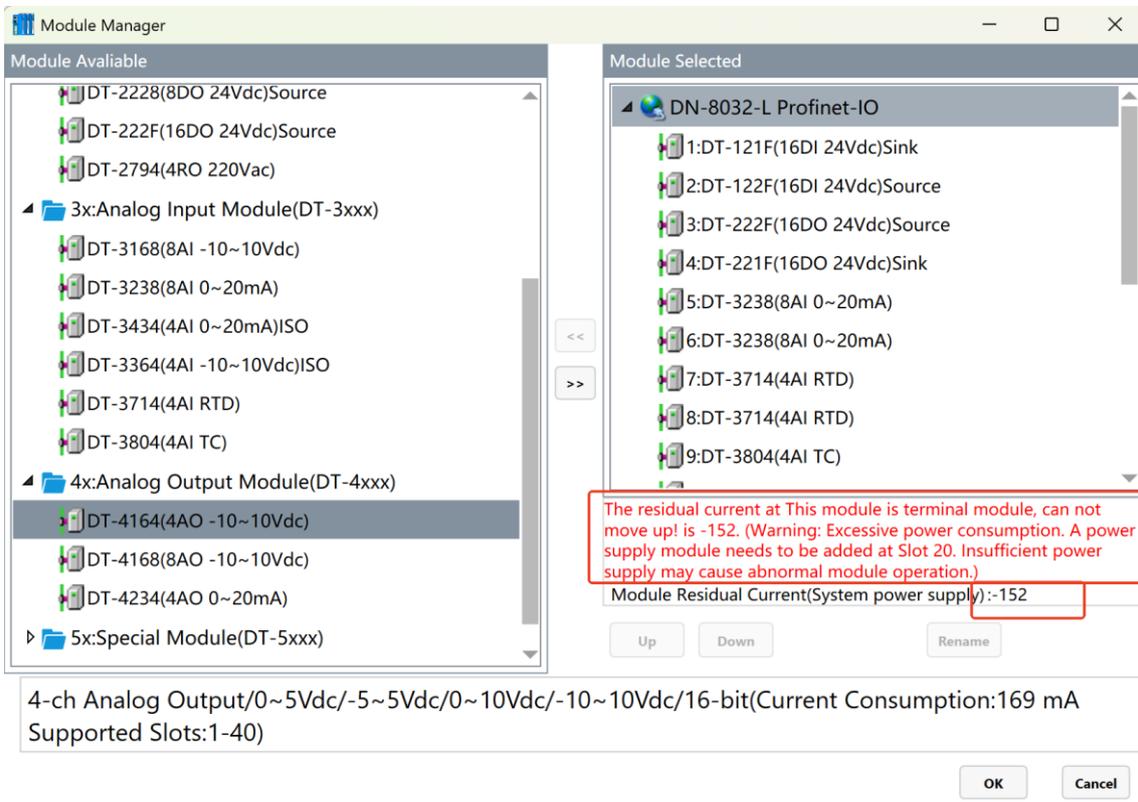
Open the IO Config software, click New Project, right-click the project to select New Adapter, select the network adapter of the corresponding protocol in the pop-up window, and click OK.



Right-click the newly created network adapter DN-8032-L, select Module Manager, and add modules as needed in the pop-up interface, it can click >> icons to add module, or double-click the modules to add. Select the added module and click << icon to remove the module.



When the network adapter is selected, it can view the remaining current of the module. When the total power consumption of the IO module is greater than the current of the network adapter, red font will appear indicating that the power module needs to be added at the location where slot X is required.



After adding power modules in the corresponding slots, continue to add IO modules as

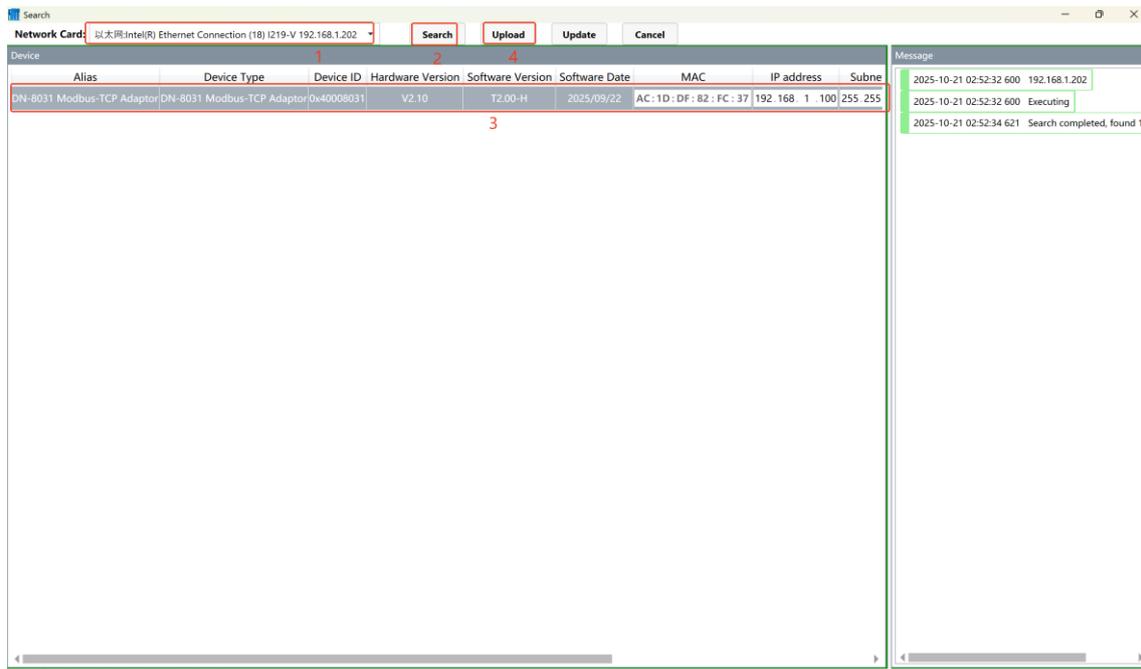
needed.

### 4.3.2 Upload Module

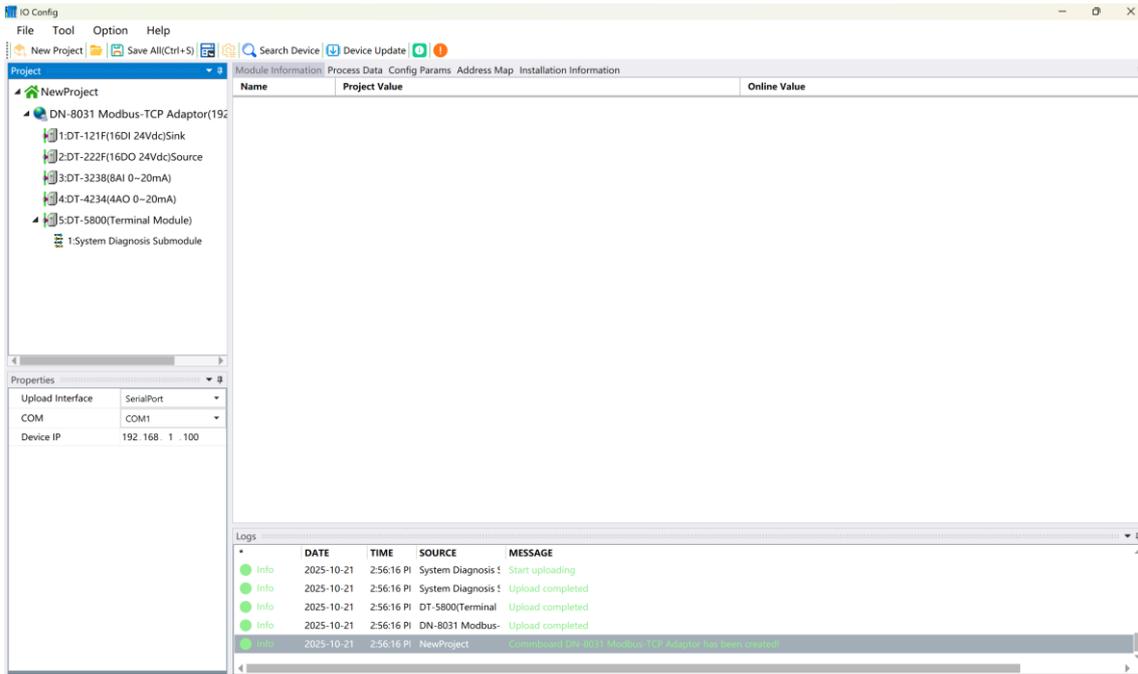
There are two ways to upload modules: Type-C interface upload or Ethernet upload.

#### Upload module by Ethernet interface:

After opening the IO Config software, click Search Devices , select the corresponding network card in the pop-up window, click Search, select the devices to upload, and click Upload.

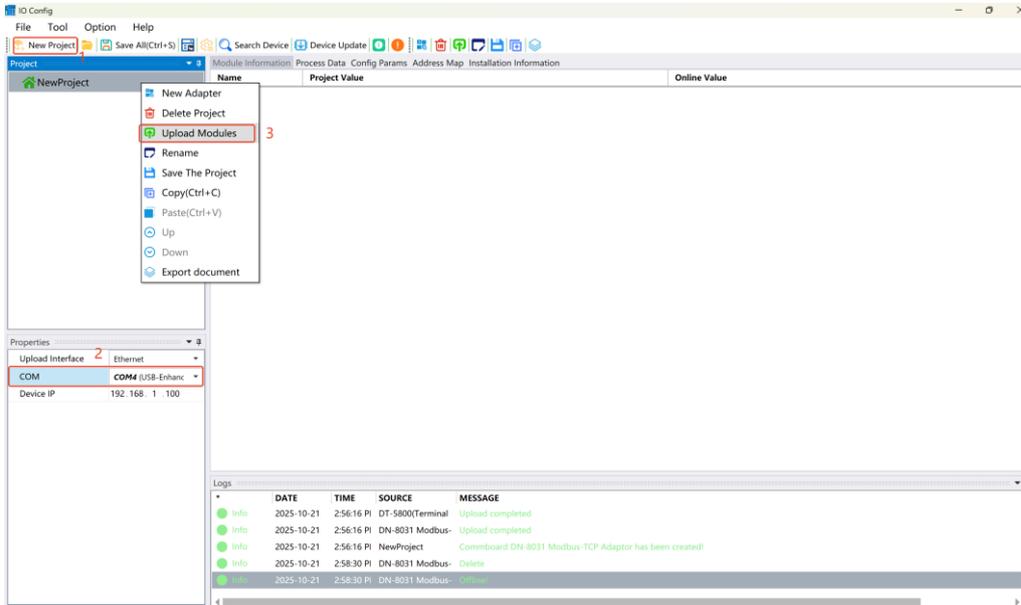


Note: The network block of the module and computer need to be in the network segment, and use the Control Panel - Network and Sharing Center - Change Adapter Settings - Ethernet - Properties - Internet Protocol Version 4 (TCP/IP). V4) to make modifications.

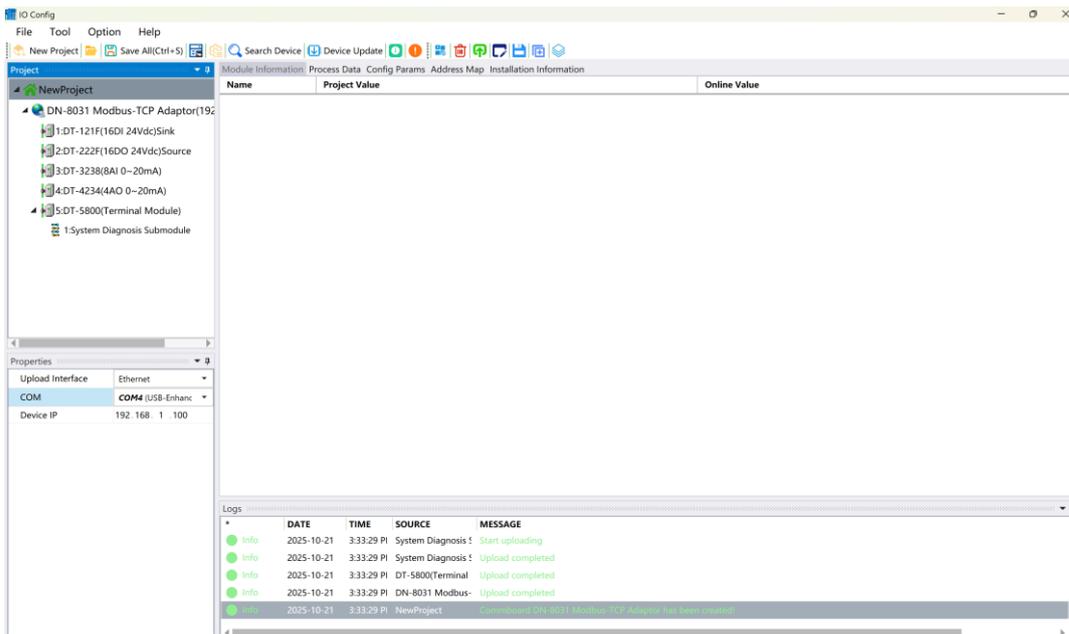


### Upload Module by Type C Interface:

Open the IO Config software, click New Project, select the new project, select the corresponding COM number in the properties, and right-click the project to select the upload modules.



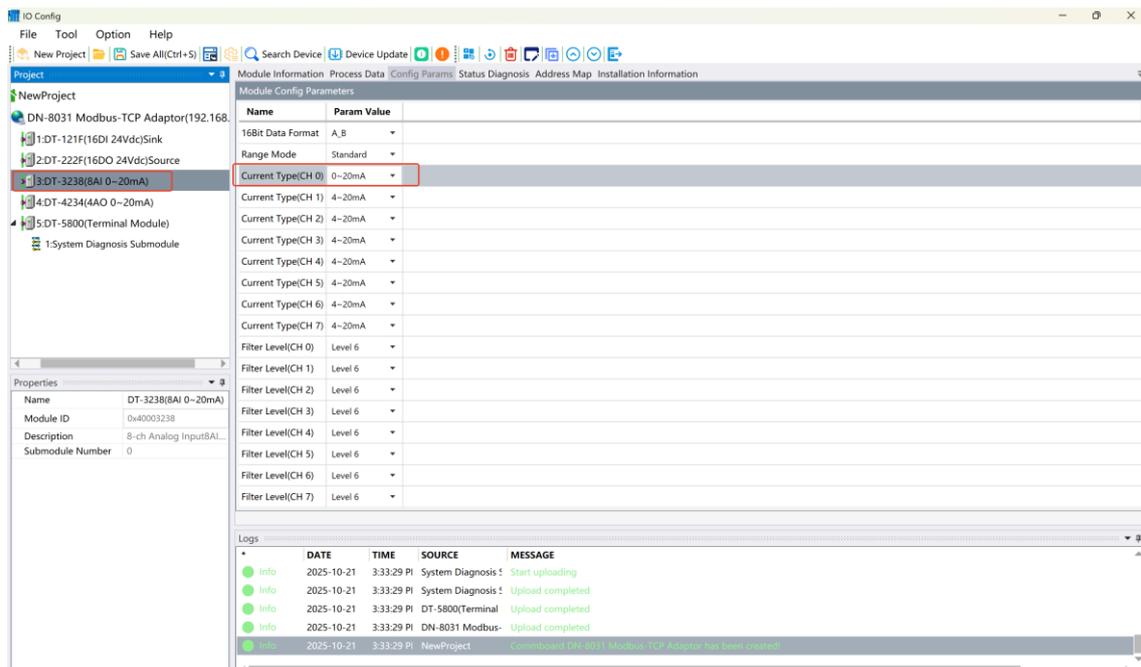
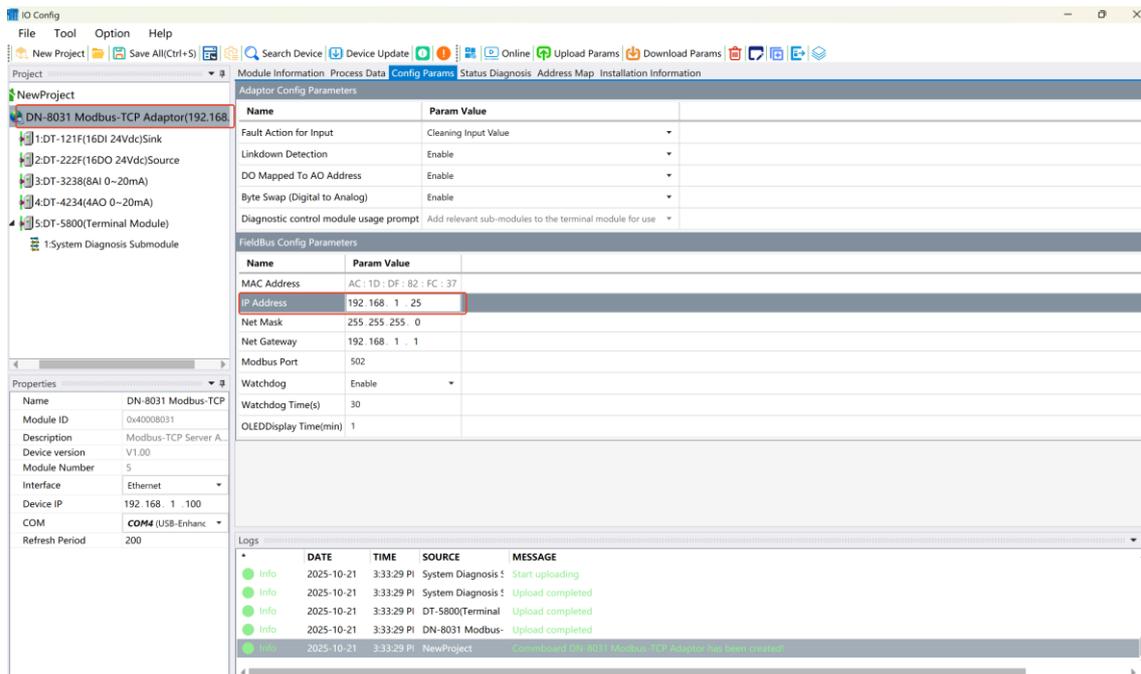
Note: The Type-C data cable used must have data transmission function, some data cables may only have power supply function, after connecting the data cable, the computer will automatically install the driver, and the corresponding port number can be viewed in the device manager.



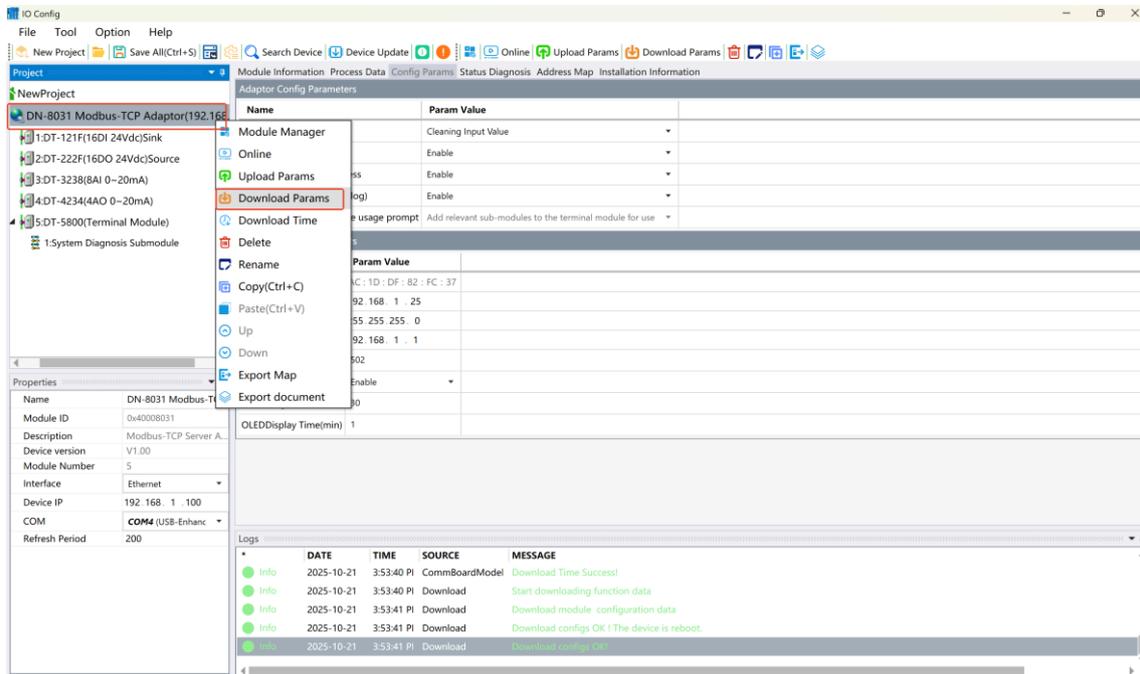
### 4.3.3 Modify Configuration Parameter

Select the adapter or IO module, click the config params, it can modify the configuration parameters of the corresponding module, and the DN-8032-L /DN-8033 module can be configured directly in the third-party configuration software.

For example, the IP address of the DN-8031 module is changed to 192.168.1.25, and the Current type (CH0) of the DT-3238 module is changed to 0~20mA.

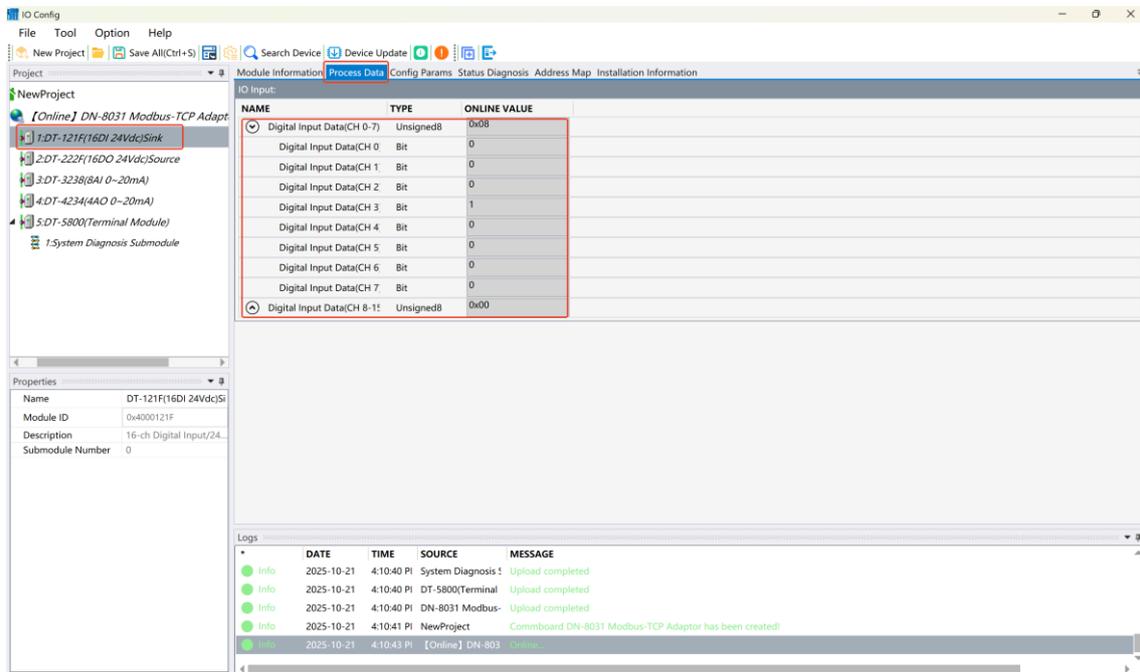
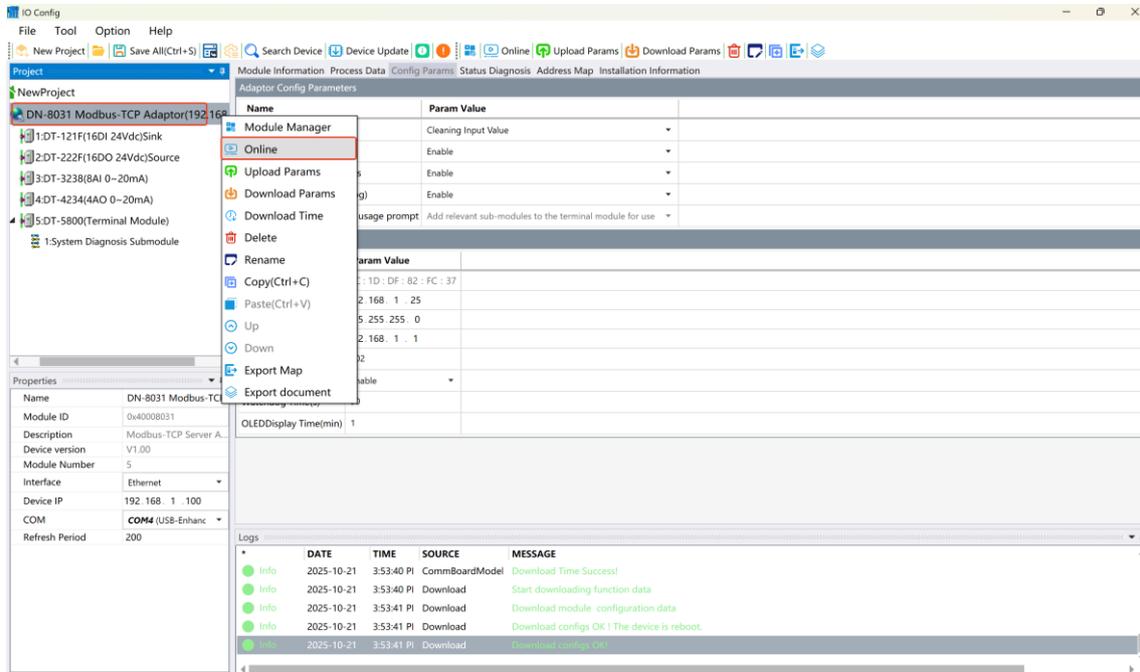


After the parameter modification is completed, right-click the adapter DN-8031 and select Download Params.



### 4.3.4 Online Monitoring

Right-click the adapter module DN-8031, select online, select IO module DT-121F, click the process data, it can monitor the IO module data online.



Select the DT-222F module, give channel 7 an output signal "1", enter 1 at PROJECT VALUE, and then right-click to select Download Current Value.

The screenshot shows the 'IO Config' software interface. On the left, a tree view shows a project named 'NewProject' with an online device 'DN-8031 Modbus-TCP Adaptor'. Underneath, several digital output channels are listed, with '2-DT-222F(16DO 24Vdc)Source' selected. The main area displays a table of these channels with columns for Name, Type, Online Value, Actual Value, and Project Value. A context menu is open over the selected row, offering options like 'Hex Display', 'Update All Hex Displays', and 'Download current value'.

NAME	TYPE	ONLINE VALUE	ACTUAL VALUE	PROJECT VALUE
✓ Digital Output Data(CH 0_	Unsigned8	0x00	0x00	0x80
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	0
Digital Output Data(CH	Bit	0	0	1
⊖ Digital Output Data(CH 8_	Unsigned8	0x00	0x00	0x00

Context Menu Options:

- Hex Display
- Update All Hex Displays
- Apply the selected channel Settings to all channels
- Download current value
- Download update values
- Download all values

Logs:

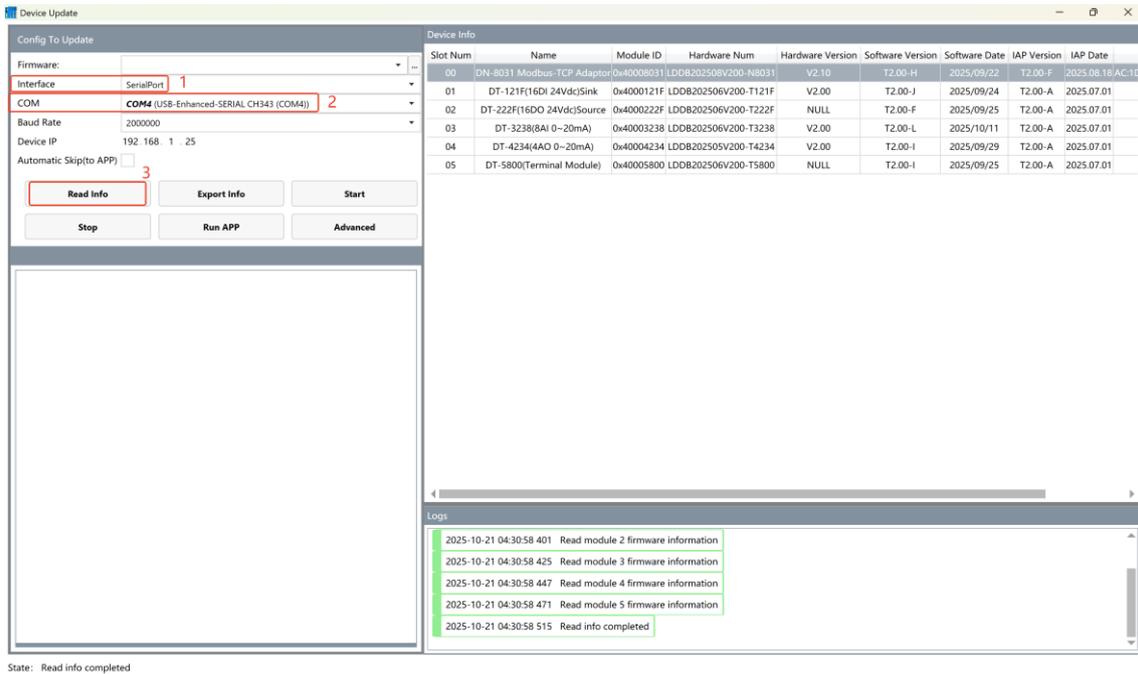
DATE	TIME	SOURCE	MESSAGE
2025-10-21	4:10:40	System Diagnosis	Upload completed
2025-10-21	4:10:40	DT-5800(Terminal	Upload completed
2025-10-21	4:10:40	DN-8031 Modbus-	Upload completed
2025-10-21	4:10:41	NewProject	Commboard DN-8031 Modbus-TCP Adaptor has been created!
2025-10-21	4:10:43	[Online] DN-803	Online

### 4.3.5 Firmware Upgrade

Firmware upgrade can be done through the Ethernet or Type-C interface.

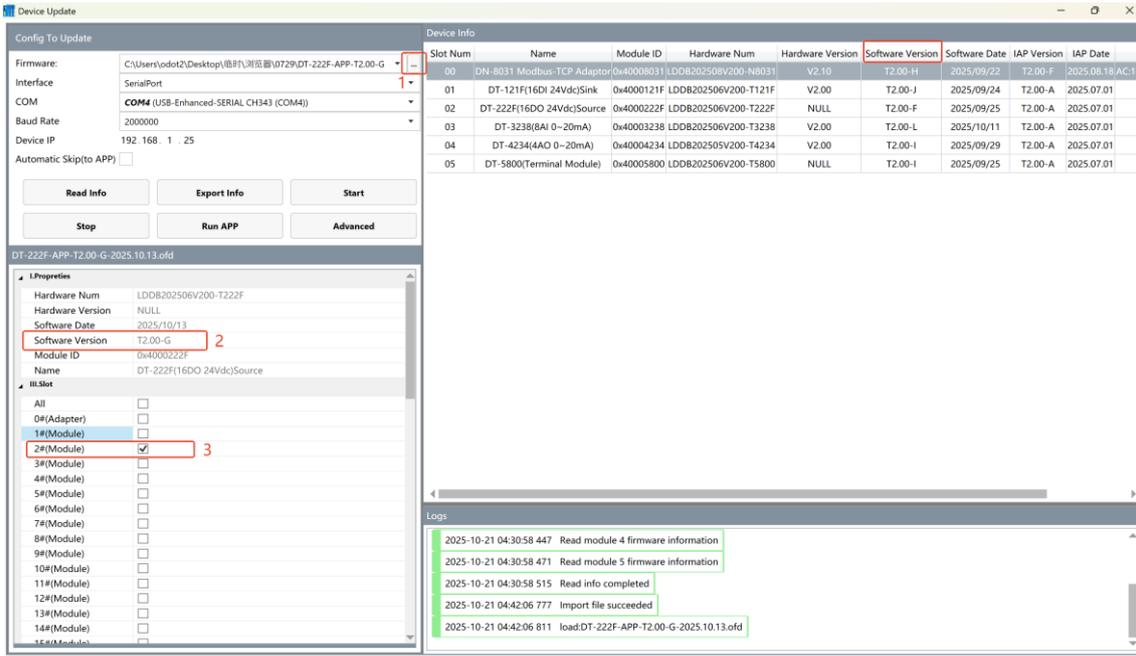
#### Firmware upgrade by Type-C interface

Open the IO Config software, click Device Update  Device Update , select the interface in the pop-up interface: serial port, select the corresponding COM number, click Read info, and it can view the version information of the module.



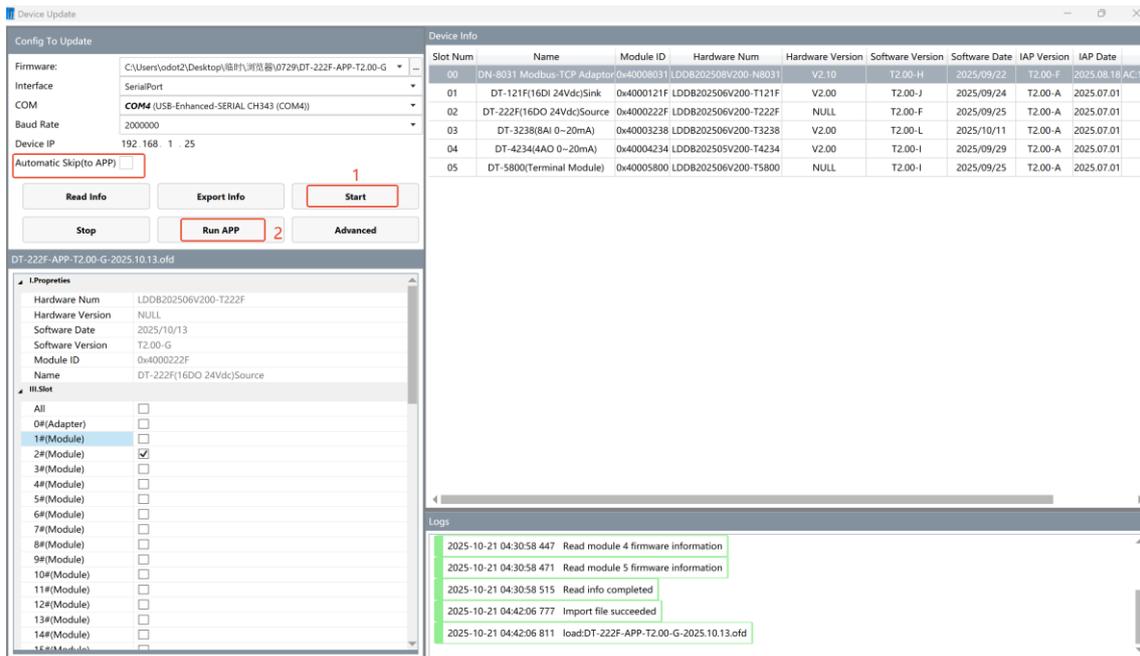
Click on the right side of the Firmware , select the upgrade file of the DT-222F module in the pop-up window, and click Open.

It can view the version information of the file at the bottom left, check whether the software version information of the open file is consistent with the software version of DT-222F, if the version information is the same, check the upgrade firmware after the corresponding module.



State: load:DT-222F-APP-T2.00-G-2025.10.13.ofd

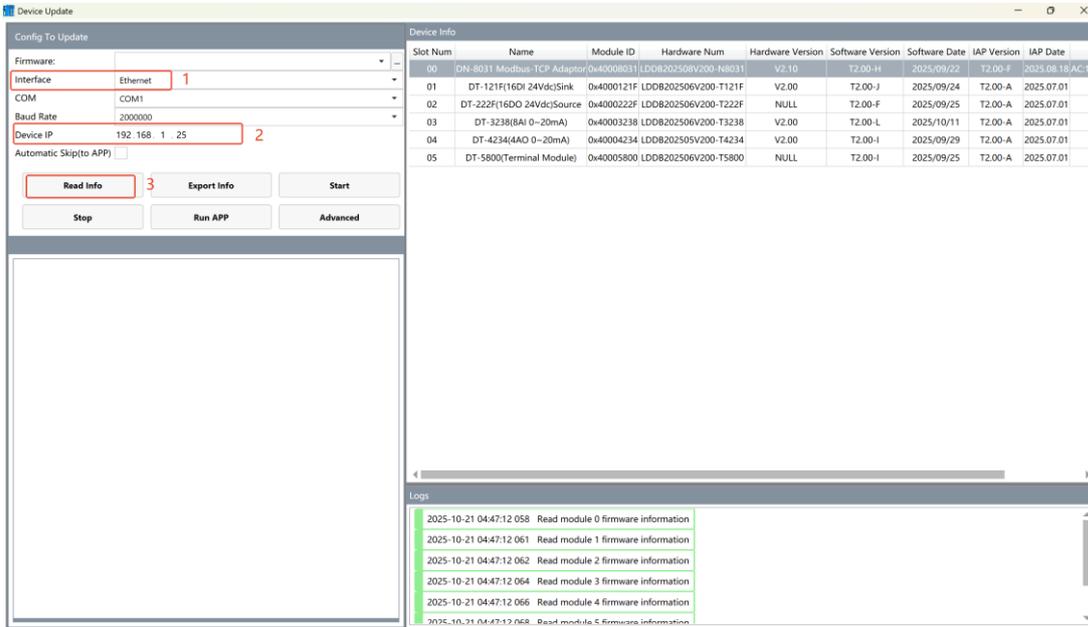
Click Start, and after the upgrade is complete, click Run APP. It can also check the automatic skip (to APP) before upgrading.



State: load:DT-222F-APP-T2.00-G-2025.10.13.ofd

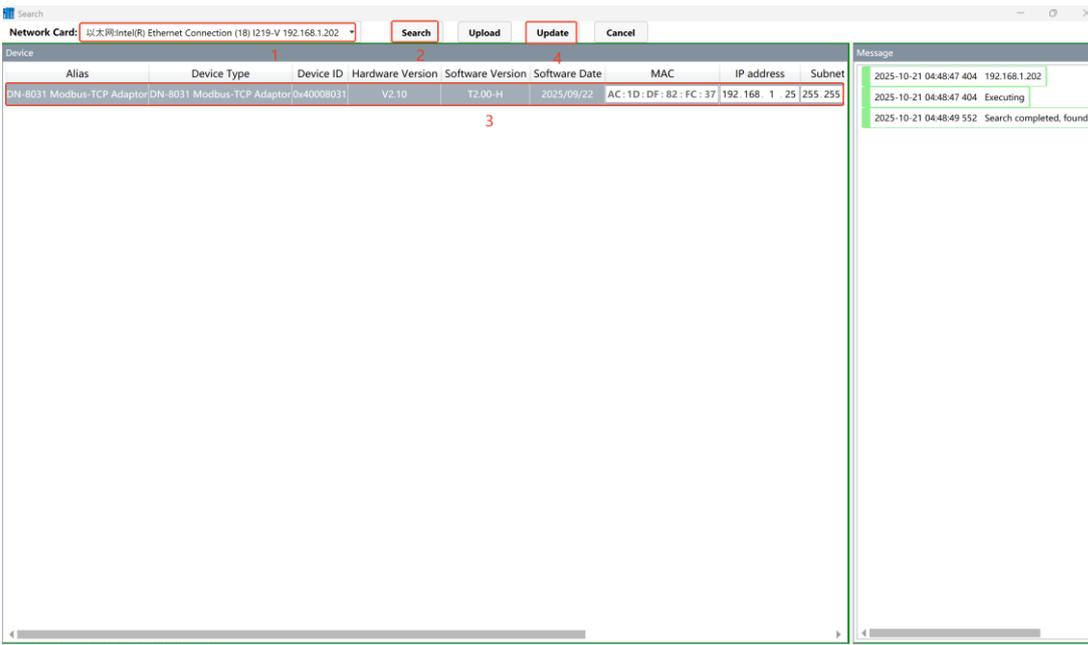
## Firmware upgrade by Ethernet

Open the IO Config software, click Device Update  Device Update , and select Ethernet in the pop-up interface, enter the corresponding IP address, click Read Info, and view the module version information.



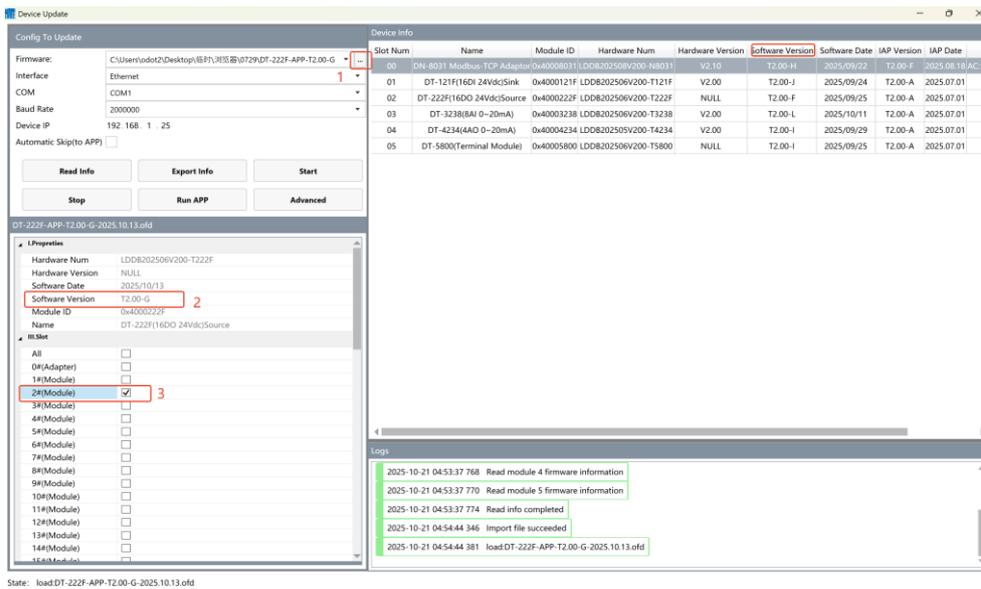
State: Read info completed

It can also click Search Device , select the corresponding network card on the pop-up interface, click Search, select the module that needs to be upgraded, and click Update.

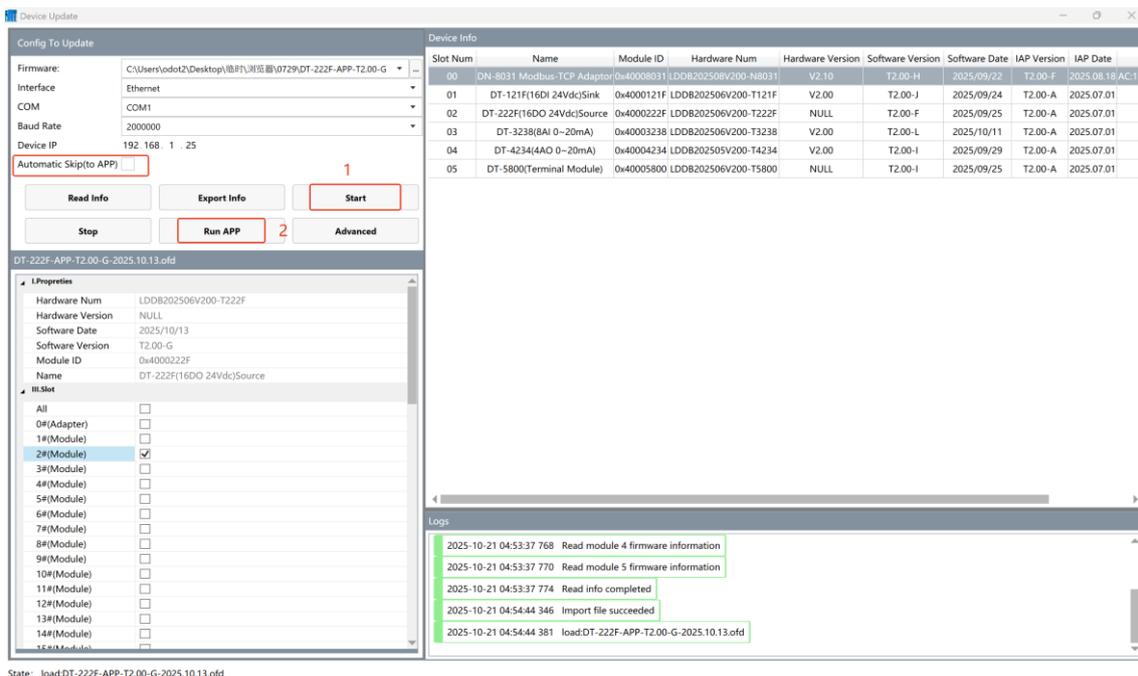


Click on the right side of the Firmware , select the upgrade file of the DT-222F module in the pop-up window, and click Open.

You can view the version information of the file in the lower left corner, check whether the software version information of the open file is consistent with the software version of DT-222F, if the version information is the same, check the upgrade firmware after the corresponding module.



Click Start Upgrade, and after the upgrade is complete, click Run APP. You can also check the automatic jump to APP before upgrading.

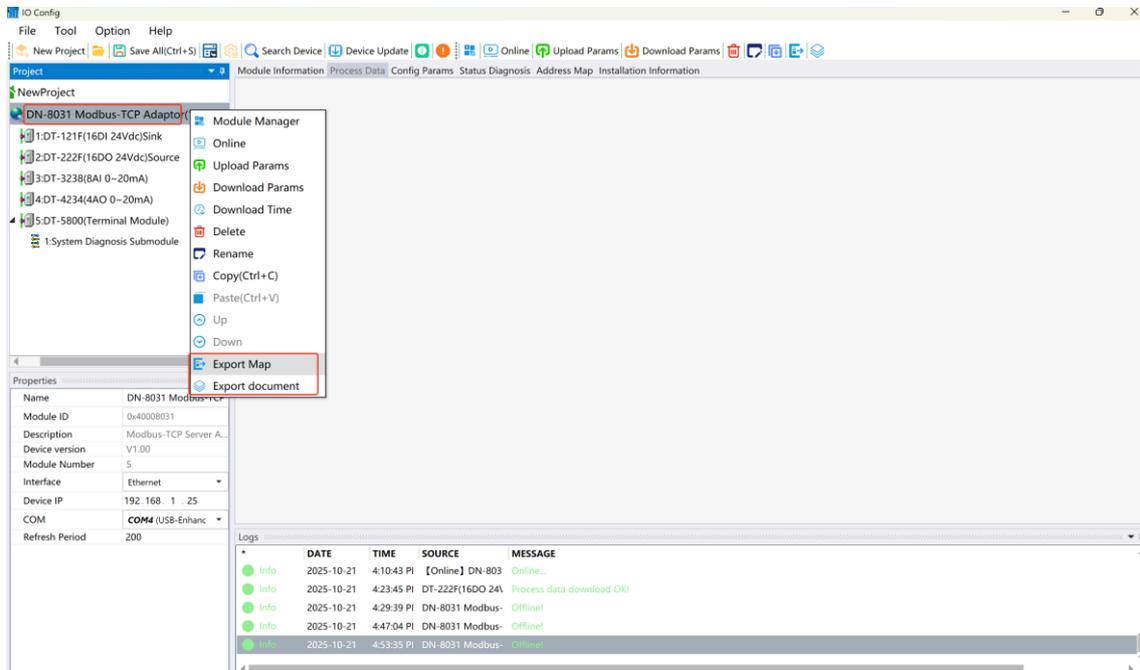


- Note: 1. During the firmware upgrade, please do not disconnect the power supply, connect the network cable or serial port cable;
2. If forget to click Run APP or check Auto Skip (to APP) after the firmware upgrade is completed, the module can be re-powered back to normal.

## 4.3.6 File Export

Right-click the adapter and select Export Address Map or Export Document, or click the

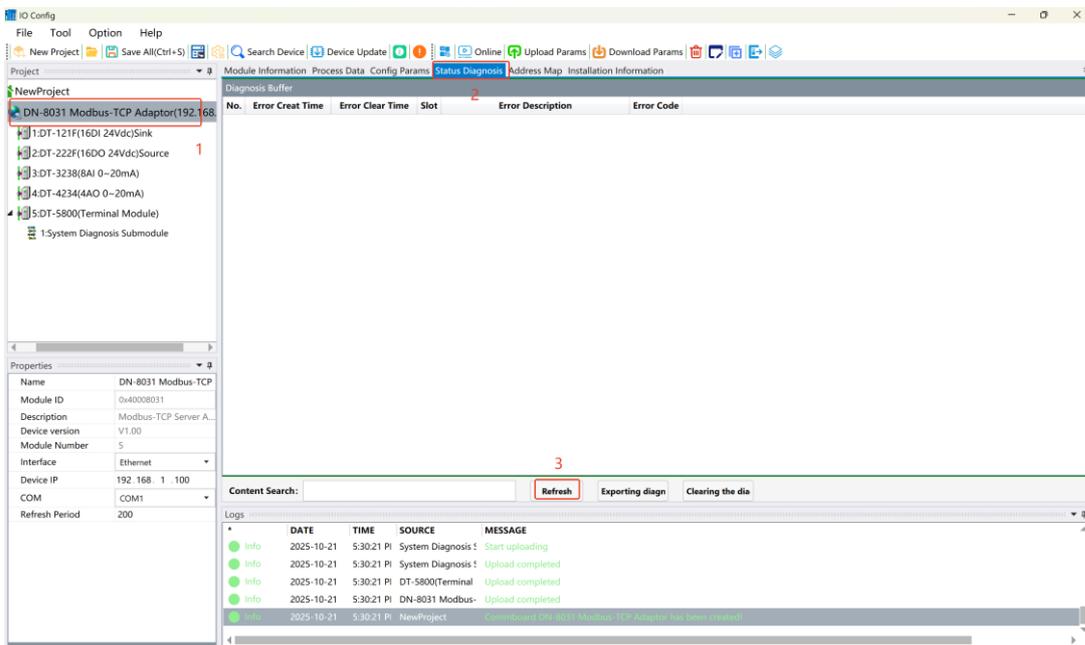
shortcut icon   .



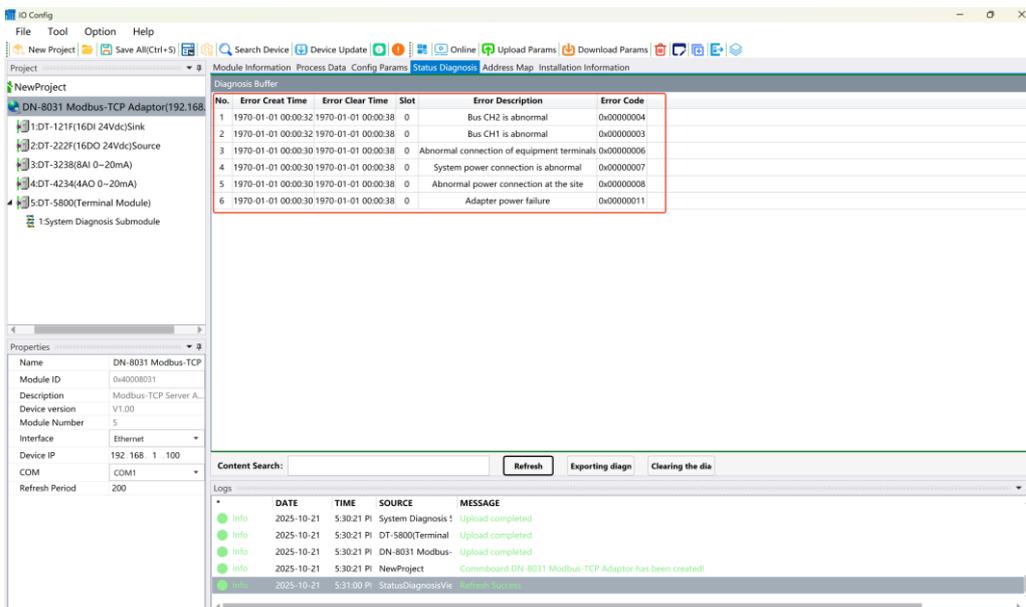
### 4.3.7 Time Calibration & Diagnostic Data

The initial power-on time of the network adapter is 1970/1/1 00:00:00, and if need to change the time to the current time, it can calibrate it through the IO Config software, and the specific time of the fault can be read on the status diagnosis interface.

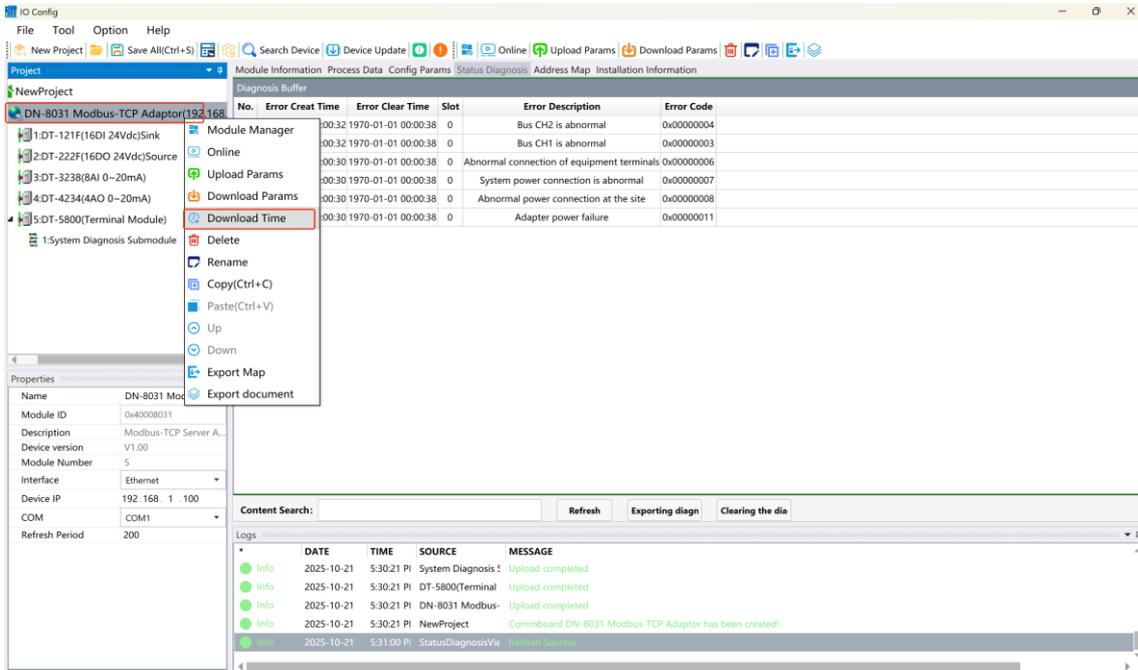
After uploading the device, select the DN-8031 module, select Status Diagnosis, and click Refresh at the bottom of the interface to read the diagnostic information of the current device.



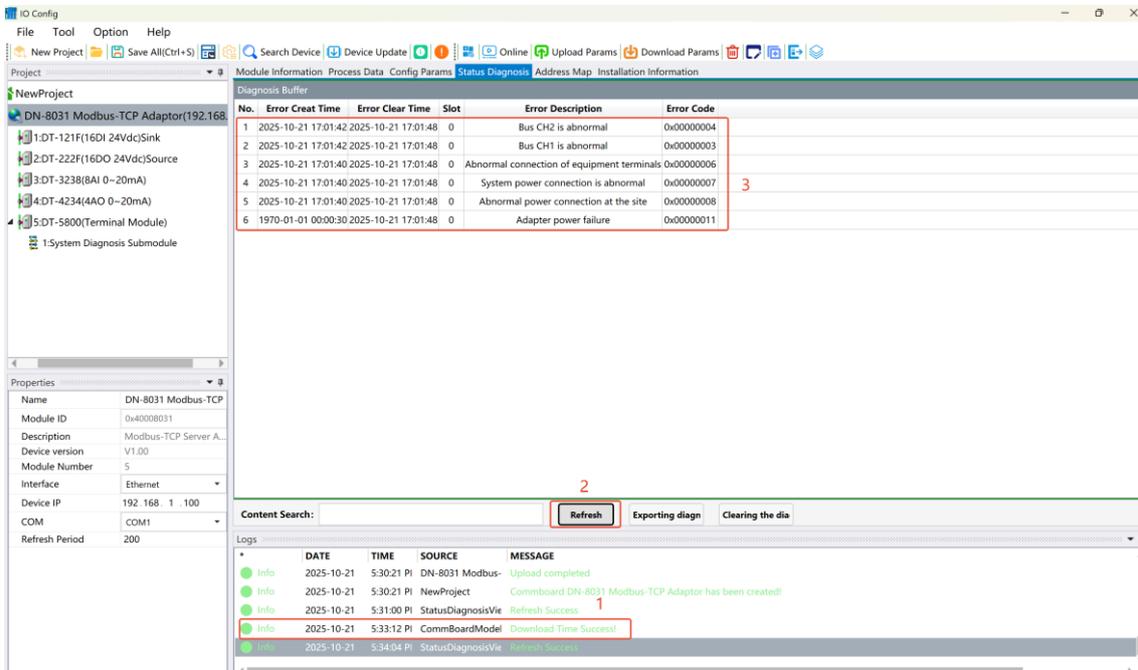
The error occurrence time is the default time of the system.



Right-click the DN-8031 module in the project and select Download Time.



In the information output bar, will display "Download time success", and then click the refresh button again, and the error occurrence time will be updated to the specific occurrence date.



Click Exporting diagnosis, select the exported file format and destination folder in the pop-up window, and click OK.

The screenshot displays the IO Config software interface. At the top, there is a menu bar (File, Tool, Option, Help) and a toolbar with various icons. Below the toolbar, the main window is divided into several sections:

- Left Panel:** A tree view showing the project structure. The selected item is "DN-8031 Modbus-TCP Adaptor(192.168.1.100)". Below it, a "Properties" window shows details for the selected device, including Name, Module ID, Description, Device version, Module Number, Interface, Device IP, COM, and Refresh Period.
- Top Panel:** A "Diagnosis Buffer" table with columns: No., Error Creat Time, Error Clear Time, Slot, Error Description, and Error Code. It lists six error entries.
- Center Dialog:** A "Config" dialog box is open, showing "Format Config" options (txt, xls, etc.), "Path Config" fields for "Folder Path" and "File Name", and "OK" and "Cancel" buttons. Red boxes and numbers 2, 3, and 4 highlight specific elements in the dialog.
- Bottom Panel:** A "Logs" window showing a list of system messages with columns for DATE, TIME, SOURCE, and MESSAGE. A red box and number 1 highlight the "Exporting diagn" button above the logs.

No.	Error Creat Time	Error Clear Time	Slot	Error Description	Error Code
1	2025-10-21 17:01:42	2025-10-21 17:01:48	0	Bus CH2 is abnormal	0x00000004
2	2025-10-21 17:01:42	2025-10-21 17:01:48	0	Bus CH1 is abnormal	0x00000003
3	2025-10-21 17:01:40	2025-10-21 17:01:48	0	Abnormal connection of equipment terminals	0x00000006
4	2025-10-21 17:01:40	2025-10-21 17:01:48	0	System power connection is abnormal	0x00000007
5	2025-10-21 17:01:40	2025-10-21 17:01:48	0	Abnormal power connection at the site	0x00000008
6	1970-01-01 00:00:30	2025-10-21 17:01:48	0	Adapter power failure	0x00000011

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