

## **CT-222D 32 channels digital output/24VDC/Sink**

### **1 Module features**

- ◆ The module supports 32 channels digital output; the output voltage is 24VDC and the output high level is valid.
- ◆ Module can drive field equipment. (relay, solenoid valve, etc.)
- ◆ The internal bus of the module and field output are using opto-coupler.
- ◆ The module carries 32 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.

## 2 Technical Parameters

| General Parameters                               |                                                                                                                                                                 |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power                                            | Max.82mA@5.0VDC                                                                                                                                                 |
| Isolation                                        | Channel and system power isolation voltage: AC 500V<br>Channel and on-site power supply isolation voltage: AC 500V<br>Channel and PE isolation voltage: AC 500V |
| Field Power                                      | Nominal: 24VDC<br>Input range: 20.4~28.8VDC<br>Module alarm when the voltage is lower than 15~17V                                                               |
| Connection                                       | Max.: AWG 18<br>Min.: AWG 24                                                                                                                                    |
| Installation:                                    | 35mm DIN-Rail                                                                                                                                                   |
| Size                                             | 115*27*75mm                                                                                                                                                     |
| Weight                                           | 130g                                                                                                                                                            |
| Vibration Resistance                             | Comply with IEC 61131-2 and IEC 60068-2-6                                                                                                                       |
| Impact Resistance                                | Comply with IEC 61131-2 and I IEC 60068-2-27                                                                                                                    |
| EMC Performance                                  | Comply with IEC 61131-2 and I IEC 61000-4                                                                                                                       |
| Environmental Parameters                         |                                                                                                                                                                 |
| Operating Temperature of Horizontal Installation | -35°C~70°C                                                                                                                                                      |
| Operating Temperature of Vertical Installation   | -35°C~60°C                                                                                                                                                      |
| Relative Humidity                                | < 95%RH non-condensing                                                                                                                                          |
| Storage Temperature                              | -40°C~85°C                                                                                                                                                      |
| Storage Humidity                                 | < 95%RH non-condensing                                                                                                                                          |
| Manufacturing Test Temperature                   | -40°C~75°C                                                                                                                                                      |
| Ingress Protection Rating                        | IP20                                                                                                                                                            |
| Output Parameters                                |                                                                                                                                                                 |
| Number of Channels                               | 32 channels                                                                                                                                                     |
| LED Indicator                                    | 32 panel LEDs and 32 channel LEDs, all green                                                                                                                    |
| Current Rating                                   | Single-channel current: Max.1A<br>Current per channel: 0.5A                                                                                                     |
| Leakage Current                                  | Maximum: 5uA                                                                                                                                                    |
| On-resistance                                    | Typical: 260mΩ                                                                                                                                                  |
| Output Delay                                     | OFF to ON: Max.100us<br>ON to OFF: Max.150us                                                                                                                    |
| Protection Features                              | Over temperature shutdown: typical value of 150 °C<br>Overcurrent protection: 1.3-1.8A<br>Short circuit protection: supported<br>Channel isolation protection   |
| The Type of Load                                 | General use and Resistive, Pilot Duty                                                                                                                           |
| Output type                                      | Source type output/high edge output                                                                                                                             |

 **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.**

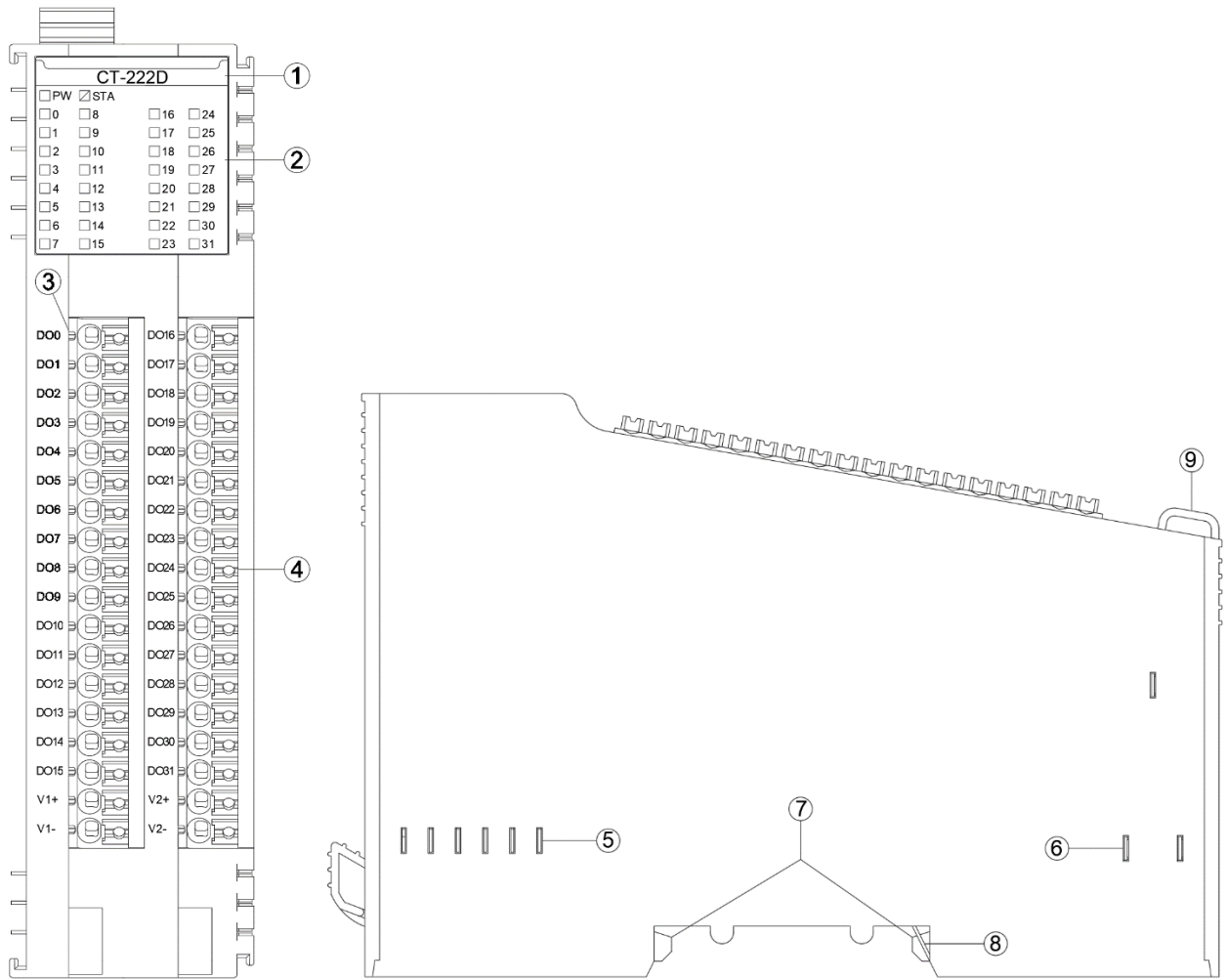
 **AVERTISSEMENT**

**FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT**

Ne dépassez aucune évaluation spécifiée dans le tableau de caractéristiques environnementales et électriques..

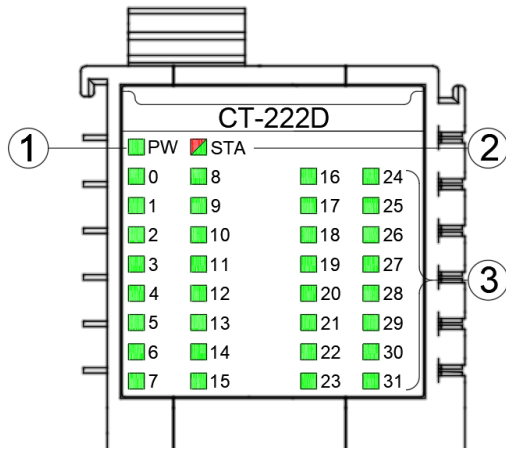
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### 3 Hardware interface



- ① Module Type
- ② State indicator
- ③ Channel indicator
- ④ Wiring Terminal and identification
- ⑤ Internal Bus
- ⑥ Field Power
- ⑦ Buckle
- ⑧ Grounding Spring Sheet
- ⑨ Fixed Wiring Harness

### 3.1 LED Indicator Definition



- ① Power LED indicator (green)
- ② Module State indicator LED (red/green)
- ③ Output Channel indicator LED (green)

| PW Power State (GREEN)       | Definition                                        |
|------------------------------|---------------------------------------------------|
| ON                           | Internal bus power supply normal                  |
| OFF                          | Internal bus power supply failure                 |
| STA Module State (RED/GREEN) | Definition                                        |
| Green slow flash (2.5 Hz)    | Module internal bus is not started                |
| Red slow flash (2.5 Hz)      | Module internal bus offline                       |
| ON (GREEN)                   | Operation normal                                  |
| Flash (2.5 Hz) (RED/GREEN)   | Upgrading mode                                    |
| Flash (10 Hz) (RED/GREEN)    | Firmware upgrading                                |
| Double Flash (RED)           | Module exception has been soft-restarted          |
| 0-31 Channel indicator LED   | Definition                                        |
| ON (GREEN)                   | Indicates that the output channel signal is valid |
| OFF                          | Output signal is invalid                          |

## WARNING

### UNEXPECTED EQUIPMENT OPERATION

By viewing the PW indicator, could determine the power supply status of a module. If the PW is steady green, the power supply is normal. Otherwise, the module cannot work properly.

When the module is initially powered on, there will be 3S for the backplane bus connection. After the backplane bus is initialized, STA is in the green steady state. If STA is in the green blinking state, it indicates that the backplane bus has not been initialized, and it needs to be powered off and restarted for re-initialization.

STA abnormal working state occurs during the normal operation of the module, please check the firmware version information of all modules, and consult ODOT technical support for details.

If a module is upgraded, check that all modules are in the normal state after the upgrade. Otherwise, an exception may occur.

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## AVERTISSEMENT

### FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

En regardant l'état de l'indicateur de PW, jugez l'état d'alimentation du module. Le feu vert PW reste allumé et l'alimentation est normale. Autrement, le module ne fonctionnera pas correctement.

Lorsque le module est alimenté initialement, il y aura 3S pour la connexion de bus de backboard. STA est un état vert permanent après l'initialisation du bus de backboard. Si STA est en état de clignotement vert, cela signifie que l'initialisation du bus de backboard n'est pas passée et doit être redémarrée hors tension et réinitialisée.

L'état de fonctionnement anormal de STA se produit pendant le fonctionnement normal du module, veuillez vérifier les informations de version du firmware de tous les modules, et consulter le support technique ODOT pour plus de détails.

Si le module a une opération de mise à niveau, après l'achèvement de la mise à niveau, le besoin de vérifier que tous les modules sont dans l'état normal avant de courir, sinon il conduira à une exception.

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### 3.2 Terminal Definition

| Illustrate    | Symbol | Terminal serial number | Terminal serial number | Symbol | Illustrate    |
|---------------|--------|------------------------|------------------------|--------|---------------|
| Signal output | DO0    | 1                      | 19                     | DO16   | Signal output |
|               | DO1    | 2                      | 20                     | DO17   |               |
|               | DO2    | 3                      | 21                     | DO18   |               |
|               | DO3    | 4                      | 22                     | DO19   |               |
|               | DO4    | 5                      | 23                     | DO20   |               |
|               | DO5    | 6                      | 24                     | DO21   |               |
|               | DO6    | 7                      | 25                     | DO22   |               |
|               | DO7    | 8                      | 26                     | DO23   |               |
|               | DO8    | 9                      | 27                     | DO24   |               |
|               | DO9    | 10                     | 28                     | DO25   |               |
|               | DO10   | 11                     | 29                     | DO26   |               |
|               | DO11   | 12                     | 30                     | DO27   |               |
|               | DO12   | 13                     | 31                     | DO28   |               |
|               | DO13   | 14                     | 32                     | DO29   |               |
|               | DO14   | 15                     | 33                     | DO30   |               |
|               | DO15   | 16                     | 34                     | DO31   |               |
| 24V           | V1+    | 17                     | 35                     | V2+    | 24V           |
| 0V            | V1-    | 18                     | 36                     | V2-    | 0V            |

#### WARNING

##### UNEXPECTED EQUIPMENT OPERATION

Calculate the maximum field power current consumption of a single module based on the actual field load. If the total field power current consumption of all I/O modules exceeds the power supply capacity of the field power supply, you must add an extra power expansion module. Otherwise, an output channel exception may occur.

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#### AVERTISSEMENT

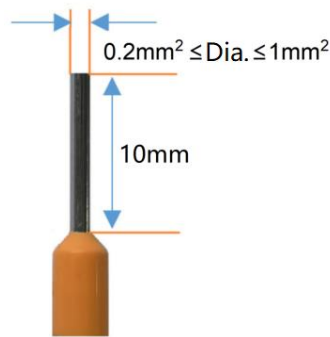
##### FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

Calculez la consommation maximale de courant de champ d'un seul module en fonction de la charge de champ réelle. Si la consommation totale de courant de champ de tous les modules d'E/S dépasse la capacité d'alimentation de l'alimentation de champ, vous devez ajouter un module d'extension de puissance supplémentaire. Dans le cas contraire, une exception de canal de sortie peut se produire.

**Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie**

par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

When connecting a cold-pressed terminal, the terminal must be terminated and checked in strict accordance with the corresponding termination specifications or requirements, and connect the cold-pressed terminal according to the corresponding node serial number. The conductor should use copper conductor and the conductor core should be larger than  $0.2\text{mm}^2$  and smaller than  $1\text{mm}^2$  (AWG18~AWG24). Cold-pressed terminal parameters are 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  $1\text{mm}^2$  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.

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## ! AVERTISSEMENT

### FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

Dépouillez la longueur de la couche isolante du fil plus de 10mm pour assurer la connexion fiable du signal.

Le conducteur doit utiliser le fil de cuivre et le noyau de fil est supérieur ou égal à  $0,2\text{ mm}^2$ , inférieur ou égal à  $1\text{mm}^2$ , afin d'assurer la connexion fiable du signal.

Lorsque les terminaux de presse à froid sont terminés, ils doivent être terminés et visualisés en stricte conformité avec les spécifications ou les exigences correspondantes et terminés selon le

numéro de série de noeud correspondant.

Il est interdit d'activer les bornes à froid avant qu'elles ne soient correctement articulées ou complètement verrouillées.

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## DANGER

### FIRE DANGER

Use the correct wiring rules only for the maximum current capacity of the I/O channel and power supply.

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## WARNING

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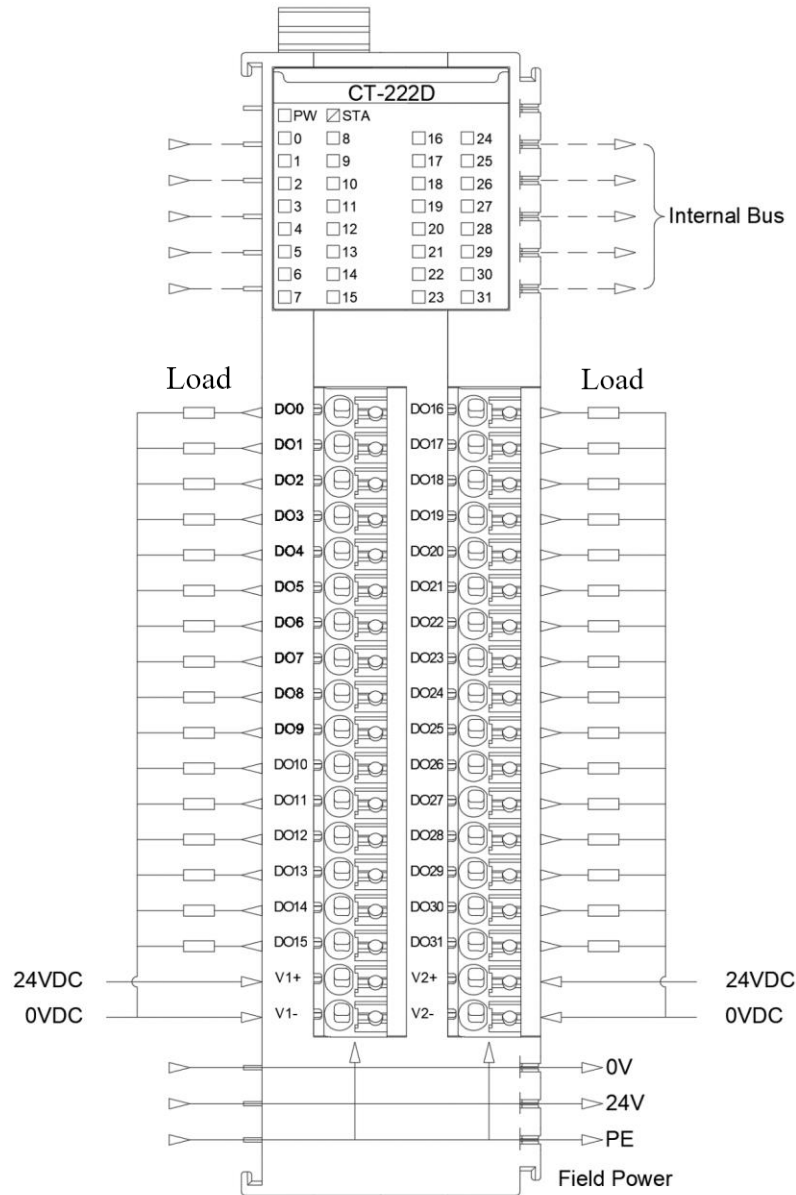
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## 4 Wiring



### 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

| Output 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  |
| Byte 2      | DO Ch#23 | DO Ch#22 | DO Ch#21 | DO Ch#20 | DO Ch#19 | DO Ch#18 | DO Ch#17 | DO Ch#16 |
| Byte 3      | DO Ch#31 | DO Ch#30 | DO Ch#29 | DO Ch#28 | DO Ch#27 | DO Ch#26 | DO Ch#25 | DO Ch#24 |

Data Description:

**DO Ch#(0-31):** When this bit is 1, the corresponding channel output signal is valid, the output is high level, and the output is invalid when it is 0.

0: Output signal is invalid

1: Output signal is valid

## 6 Configuration Parameter Definition

| Configure parameters |                               |                               |                               |                               |                               |                               |                               |                               |
|----------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 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 Action for Output Ch#23 | Fault Action for Output Ch#22 | Fault Action for Output Ch#21 | Fault Action for Output Ch#20 | Fault Action for Output Ch#19 | Fault Action for Output Ch#18 | Fault Action for Output Ch#17 | Fault Action for Output Ch#16 |
| Byte 3               | Fault Action for Output Ch#31 | Fault Action for Output Ch#30 | Fault Action for Output Ch#29 | Fault Action for Output Ch#28 | Fault Action for Output Ch#27 | Fault Action for Output Ch#26 | Fault Action for Output Ch#25 | Fault Action for Output Ch#24 |

|        |                              |                              |                              |                              |                              |                              |                              |                              |
|--------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Byte 4 | 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 5 | 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  |
| Byte 6 | Fault Value for Output Ch#23 | Fault Value for Output Ch#22 | Fault Value for Output Ch#21 | Fault Value for Output Ch#20 | Fault Value for Output Ch#19 | Fault Value for Output Ch#18 | Fault Value for Output Ch#17 | Fault Value for Output Ch#16 |
| Byte 7 | Fault Value for Output Ch#31 | Fault Value for Output Ch#30 | Fault Value for Output Ch#29 | Fault Value for Output Ch#28 | Fault Value for Output Ch#27 | Fault Value for Output Ch#26 | Fault Value for Output Ch#25 | Fault Value for Output Ch#24 |

Data description:

**Fault Action for Output Ch#(0-31):** 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 will be processed in this way. (default: 0)

0: keep the last time output State.

1: output fault value.

**Fault Value for Output Ch#(0-31):** When the Fault Output mode is 1, this bit sets the Fault Output Value, and this setting value will be outputted when the internal bus of IO module is offline. (default: 0)

0: Output low level.

1: Output high level.

A Dimensional drawing

