

2 Technical parameters

General Parameters	
Power Consumption	Max.33mA@5.0VDC
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24VDC, Range: 19.2~28.8VDC
Wiring	Max.: AWG 18 Min.: AWG 24
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operating Temperature of Vertical Installation	-35°C~60°C
Operating Temperature of Horizontal Installation	-35°C~70°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Input Parameters	
Channel Number	8 channel sink input
LED Indicator	8 channel input LED indicator
Turn-on voltage	Min.10VDC to Max.28VDC
Turn-off Voltage	Max.5VDC
Turn-on current	Max. 5mA/channel@28V
Input impedance	>7.5kΩ
Input delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
Filter time	Default 10ms
Sample frequency	500Hz
Counter frequency	<200Hz
Effective pulse width for counting	2.5ms

 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.

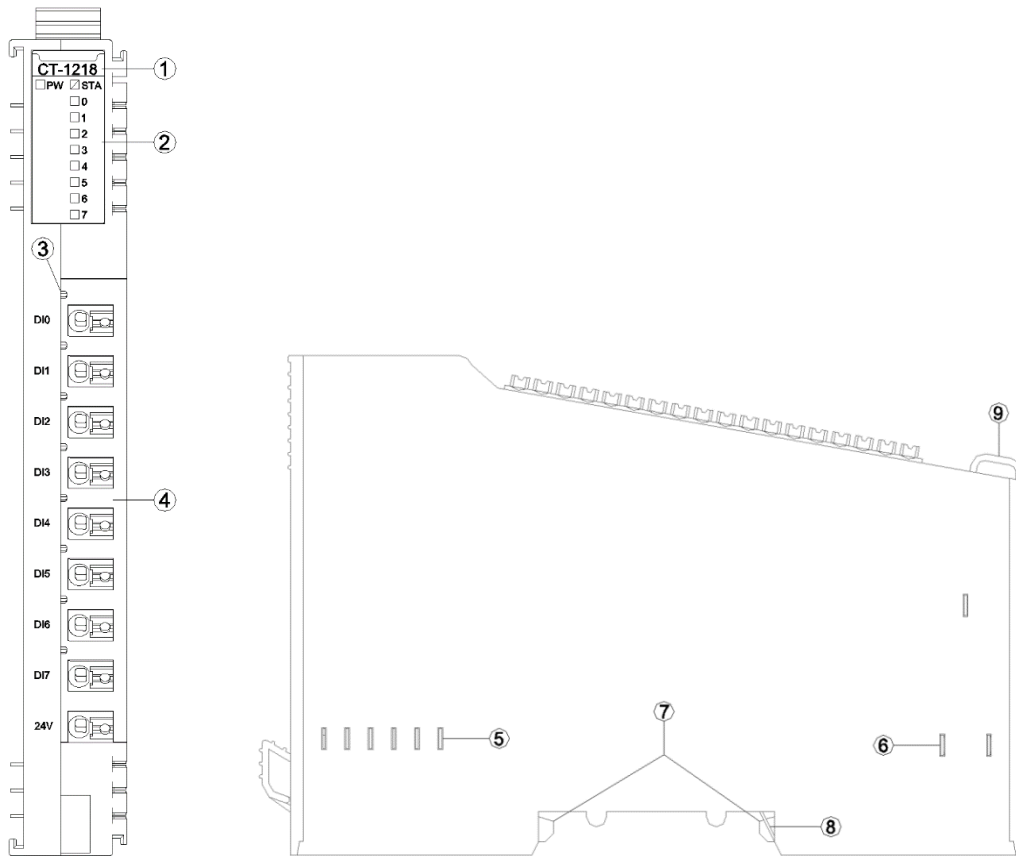
 AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

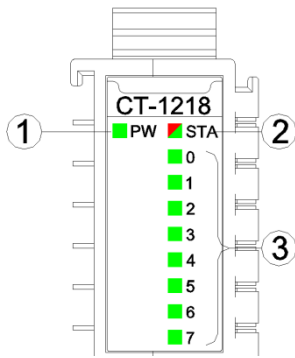
Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

3 Hardware interfaces



- 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 LED indicator (red/green)
- ③ Input channel LED indicator (green)

PW Power State (GREEN)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-7 channel LED indicator	Definition
ON	Input signal valid
OFF	Input signal 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.

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

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.

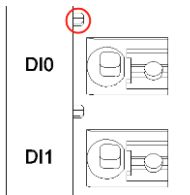
Lorsque le module est alimenté initialement, il y aura 3S pour la connexion de bus de backboard. STA est un état vert permanent après l'initialisation du bus de backboard. Si STA est en état de clignotement vert, cela signifie que l'initialisation du bus de backboard n'est pas passée et doit être redémarrée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

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.

3.2 Field channel LED indicator (Green)



When input signal of input channel is valid, the corresponding field channel LED indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	24V	Power output

WARNING

UNEXPECTED EQUIPMENT OPERATION

The DI channel terminal provides reverse protection.

The FV power supply of the network adapter is normal. The 24V terminal on the DI module can be used for testing. Do not use the FV power supply to supply power to peripherals.

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

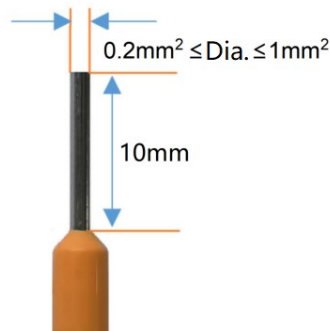
Le terminal de canal d'entrée numérique offre une protection inverse.

L'alimentation FV de l'adaptateur réseau est normale. Le terminal 24V du module DI peut être utilisé pour les tests. Ne pas utiliser l'alimentation FV pour alimenter les périphériques.

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 0.2mm^2 and smaller than 1mm^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 0.2mm^2 and less than or equal to 1mm^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.

! 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 1mm^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.

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.

DANGER

FIRE DANGER

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

UNEXPECTED EQUIPMENT OPERATION

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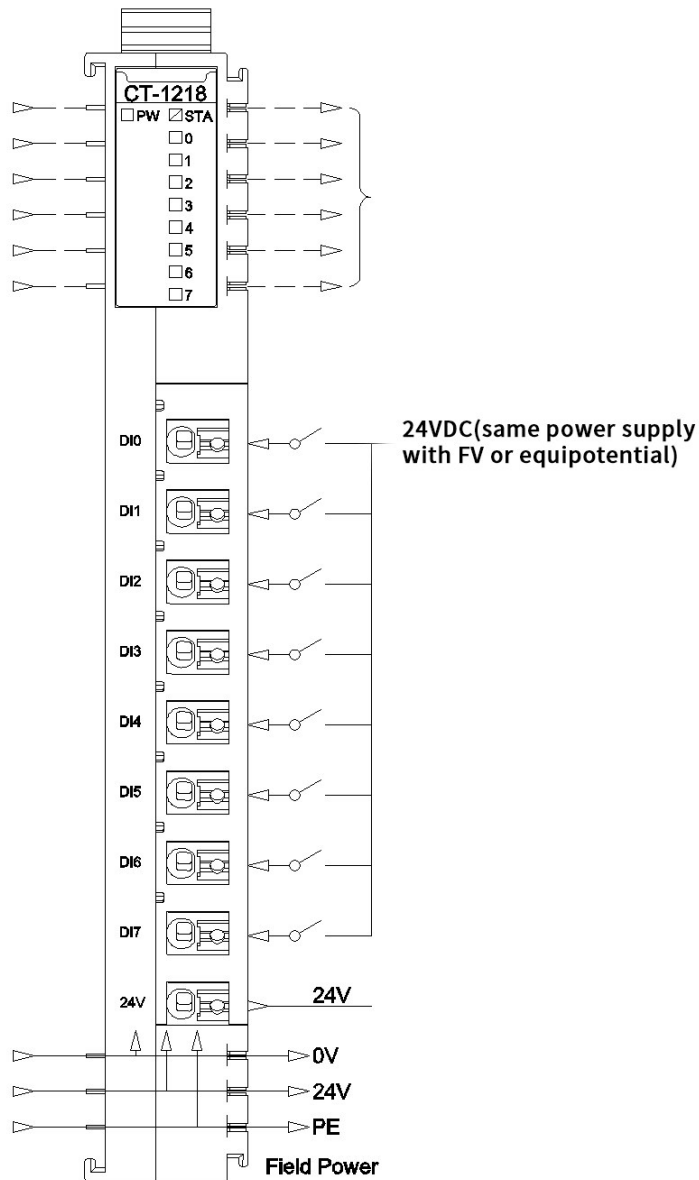
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4 Wiring



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

<8DI Input Status> Submodule 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	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0

Data description:

DI Ch#(0-7): When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

<8DI Counter Submodule> Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								
Byte 23								
Byte 24	Counter Value Ch#6							
Byte 25								
Byte 26								

Byte 27	Counter Value Ch#7							
Byte 28								
Byte 29								
Byte 30								
Byte 31								
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0

Data description:

Counter Value Ch#(0-7): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-7): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

<8DI Input Status> Submodule 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	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

0: Disable

1: 200ms

2: 500ms

3: 1000ms

4: 1500ms

5: 2000ms

6: 3000ms

7: 5000ms

<8DI Counter Submodule> Submodule 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				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch# (0-7): Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

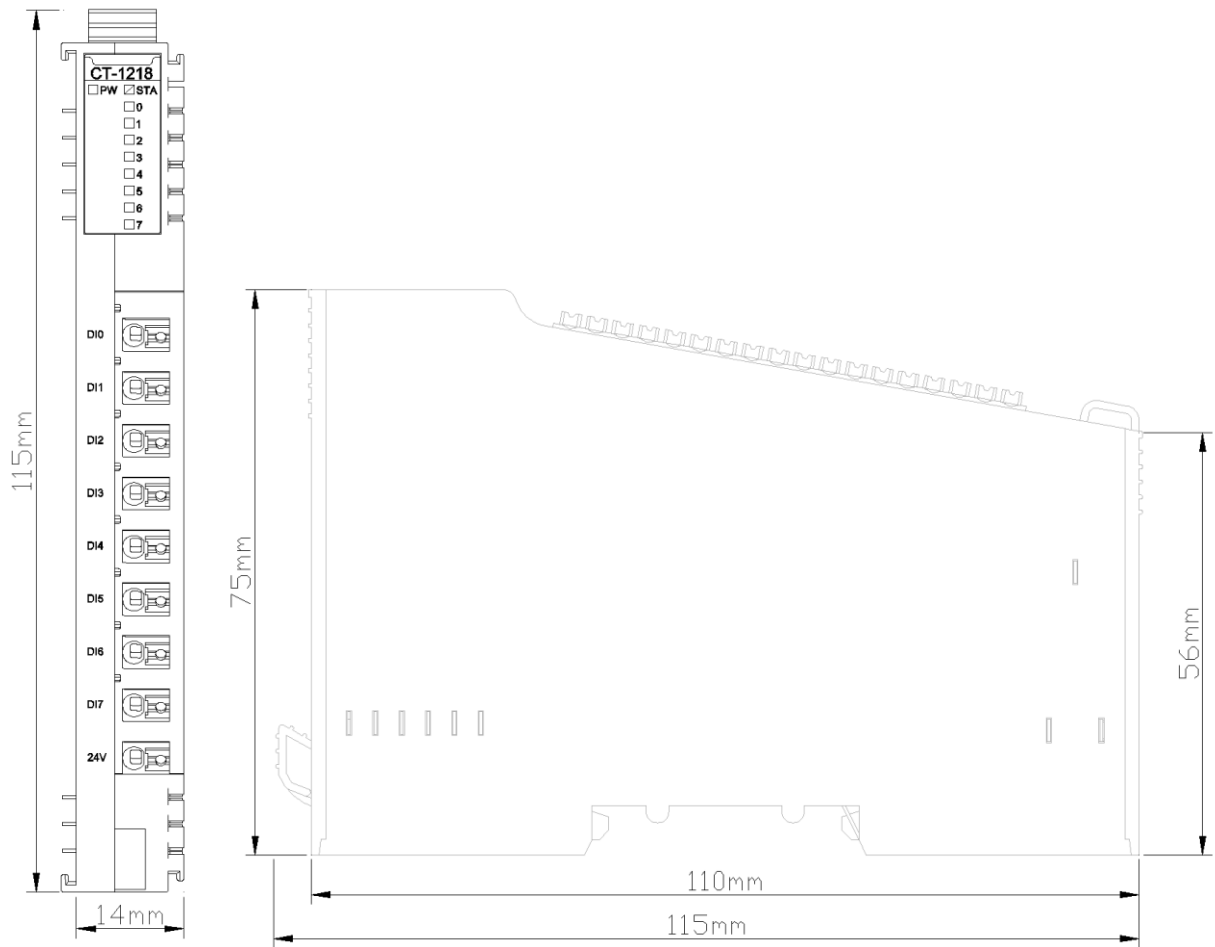
2: double edge count

Count Direction Ch# (0-7): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing



CT-121F 16 channels digital input/24VDC/ PNP

1 Module features

- ◆The module supports 16 channels digital input, supports sink input, and the input voltage is 24VDC and 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 internal bus and field input of the module use opto-isolator.
- ◆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.
- ◆Supports counting function after adding counting sub-module.
- ◆Each input channel of the module supports a 32-bit counter with the counting frequency <200Hz.
- ◆The module could be set the digital signal input filtering time and the byte transmission order of the counter.
- ◆Each channel of the module could be set the counting mode and counting direction independently.

2 Technical parameters

General Parameters	
Power Consumption	Max.63mA@5.0VDC
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24VDC, Range: 19.2~28.8VDC
Wiring	Max.: AWG 18 Min.: AWG 24
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operating Temperature of Vertical Installation	-35°C~60°C
Operating Temperature of Horizontal Installation	-35°C~70°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Vibration Resistance	Comply with IEC 61131-2 and EC 60068-2-6
Impact resistance	Comply with IEC 61131-2 and IEC 60068-2-27
EMC Performance	Comply with IEC 61131-2 and IEC 61000-4
Input Parameters	
Channel Number	16 channel sink input
LED Indicator	16 channel input LED indicator
Turn-on Voltage	Min.10VDC to Max.28VDC
Turn-off Voltage	Max.5VDC
Turn-on Current	Max.5mA/channel@28V
Input impedance	>7.5kΩ
Input Delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
Filter Time	Default 10ms
Sample Frequency	500Hz
Counter Frequency	<200Hz
Effective pulse width for counting	2.5ms

 WARNING

UNEXPECTED EQUIPMENT OPERATION

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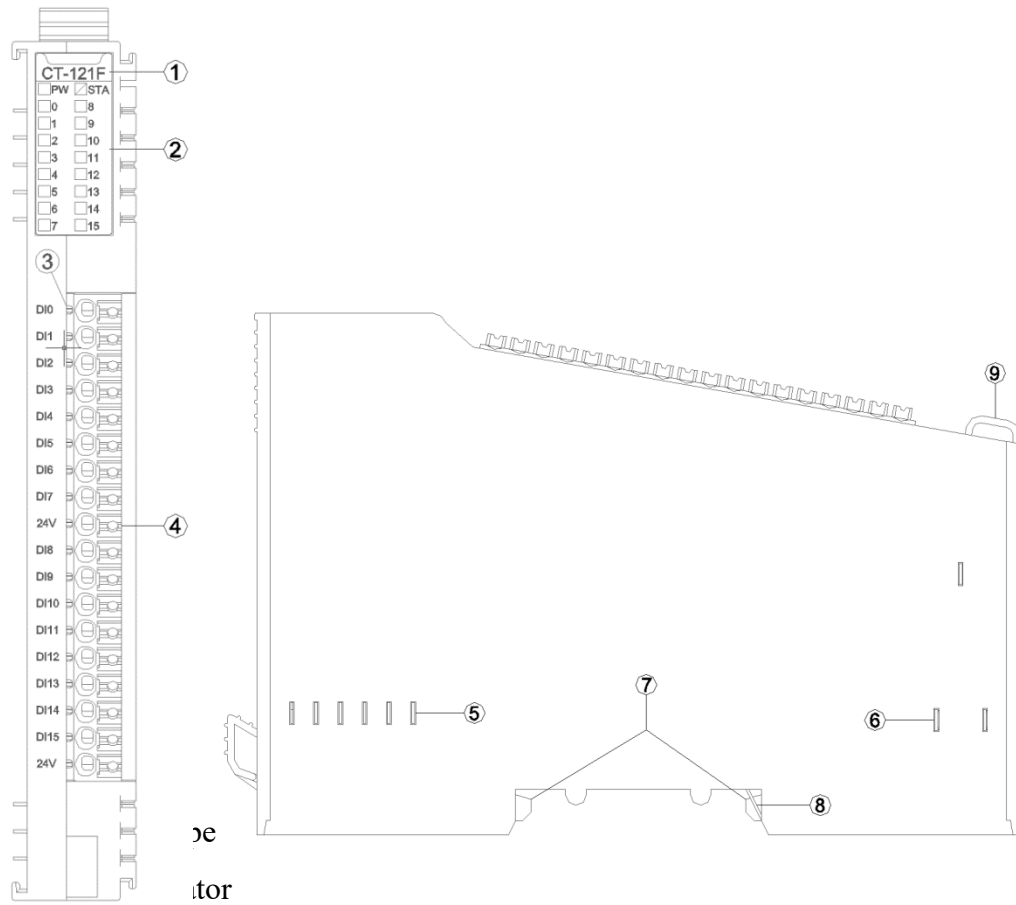
 AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

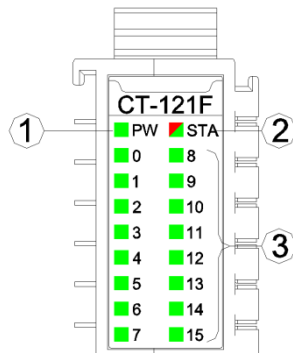
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3 Hardware interfaces



3.1 LED indicator definition



- ① Power LED indicator (green)
- ② Module State LED indicator (red/green)
- ③ Input channel LED indicator (green)

PW Power State (GREEN)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-15 channel indicator light	Definition
ON	Input signal valid
OFF	Input signal 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.

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

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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.

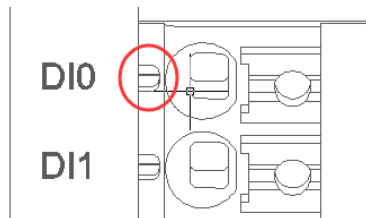
Lorsque le module est alimenté initialement, il y aura 3S pour la connexion de bus de backboard. STA est un état vert permanent après l'initialisation du bus de backboard. Si STA est en état de clignotement vert, cela signifie que l'initialisation du bus de backboard n'est pas passée et doit être redémarrée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

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.

3.2 Field channel LED indicator (Green)



When input signal of input channel is valid, the corresponding field channel LED indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	24V	Power output
10	DI8	Signal input
11	DI9	
12	DI10	
13	DI11	
14	DI12	
15	DI13	
16	DI14	
17	DI15	
18	24V	Power output

WARNING

UNEXPECTED EQUIPMENT OPERATION

The DI channel terminal provides reverse protection.

The FV power supply of the network adapter is normal. The 24V terminal on the DI module can be used for testing. Do not use the FV power supply to supply power to peripherals.

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AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

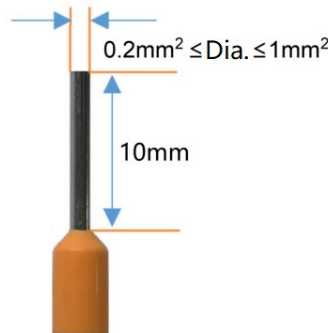
Le terminal de canal d'entrée numérique offre une protection inverse.

L'alimentation FV de l'adaptateur réseau est normale. Le terminal 24V du module DI peut être utilisé pour les tests. Ne pas utiliser l'alimentation FV pour alimenter les périphériques.

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 0.2mm^2 and smaller than 1mm^2 (AWG18~AWG24). Cold-pressed terminal parameters are as follows:



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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^2 and less than or equal to 1mm^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.

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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.

! 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 1mm^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.

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.

DANGER

FIRE DANGER

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

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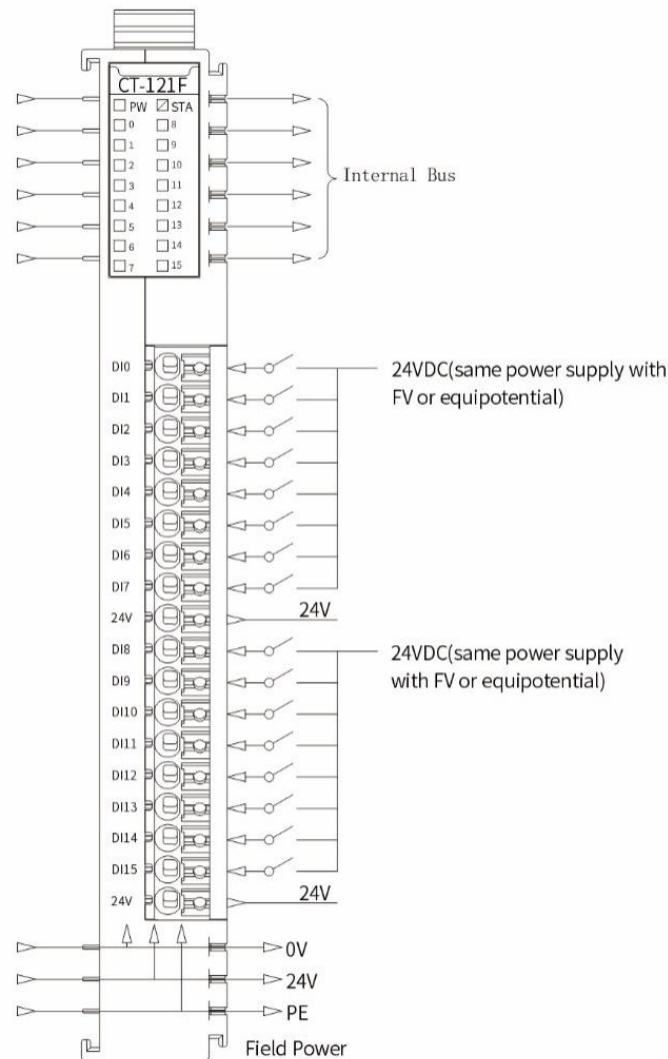
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4 Wiring



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

<16DI Input State> Submodule 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	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 corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

<16DI Counter Submodule> Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								

Byte 23	Counter Value Ch#6							
Byte 24								
Byte 25								
Byte 26								
Byte 27								
Byte 28	Counter Value Ch#7							
Byte 29								
Byte 30								
Byte 31								
Byte 32								
Byte 33	Counter Value Ch#8							
Byte 34								
Byte 35								
Byte 36								
Byte 37								
Byte 38	Counter Value Ch#9							
Byte 39								
Byte 40								
Byte 41								
Byte 42								
Byte 43	Counter Value Ch#10							
Byte 44								
Byte 45								
Byte 46								
Byte 47								
Byte 48	Counter Value Ch#11							
Byte 49								
Byte 50								
Byte 51								
Byte 52								
Byte 53	Counter Value Ch#12							
Byte 54								
Byte 55								
Byte 56								
Byte 57								
Byte 58	Counter Value Ch#13							
Byte 59								
Byte 60								
Byte 61								
Byte 62								
Byte 63	Counter Value Ch#14							
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0

Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8
--------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	--------------------------	--------------------------

Data description:

Counter Value Ch#(0-15): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-15): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

<16DI Input State> Submodule 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	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

0: Disable

1: 200ms

2: 500ms

3: 1000ms

4: 1500ms

5: 2000ms

6: 3000ms

7: 5000ms

<16DI Counter Submodule> Submodule 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				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	
Byte 5	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0

Byte 6	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8
--------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	----------------------------	----------------------------

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch# (0-15): Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

2: double edge count

Count Direction Ch# (0-15): The counting direction of the input channel. (Default: 0)

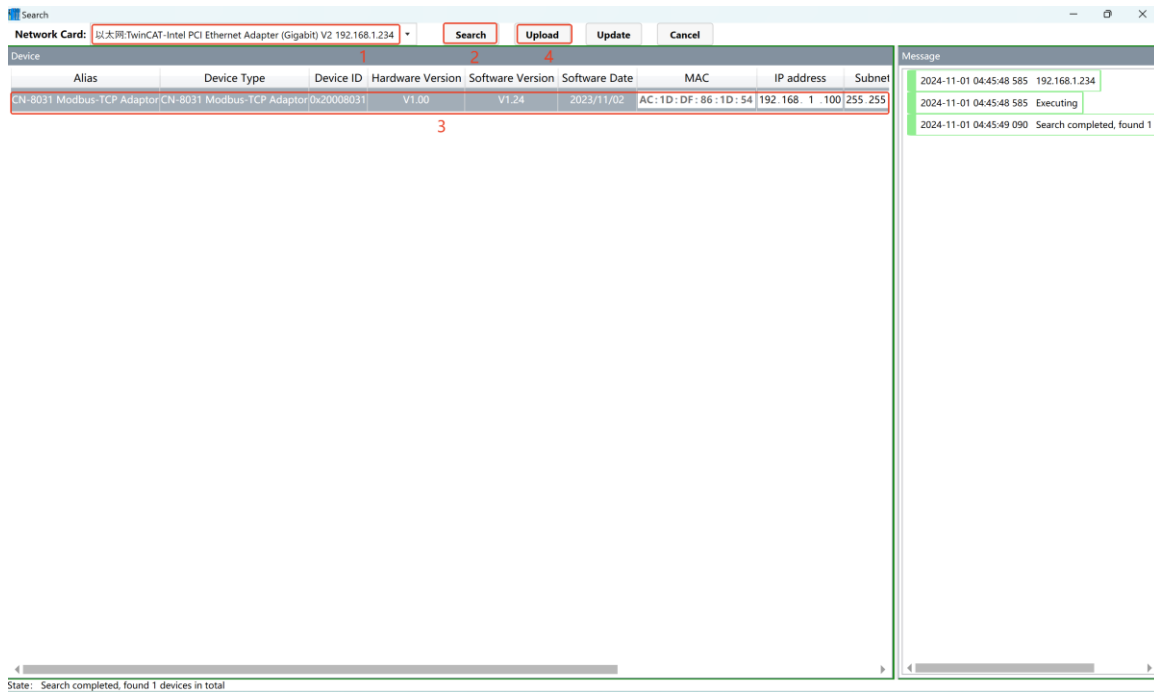
0: count up

1: count down

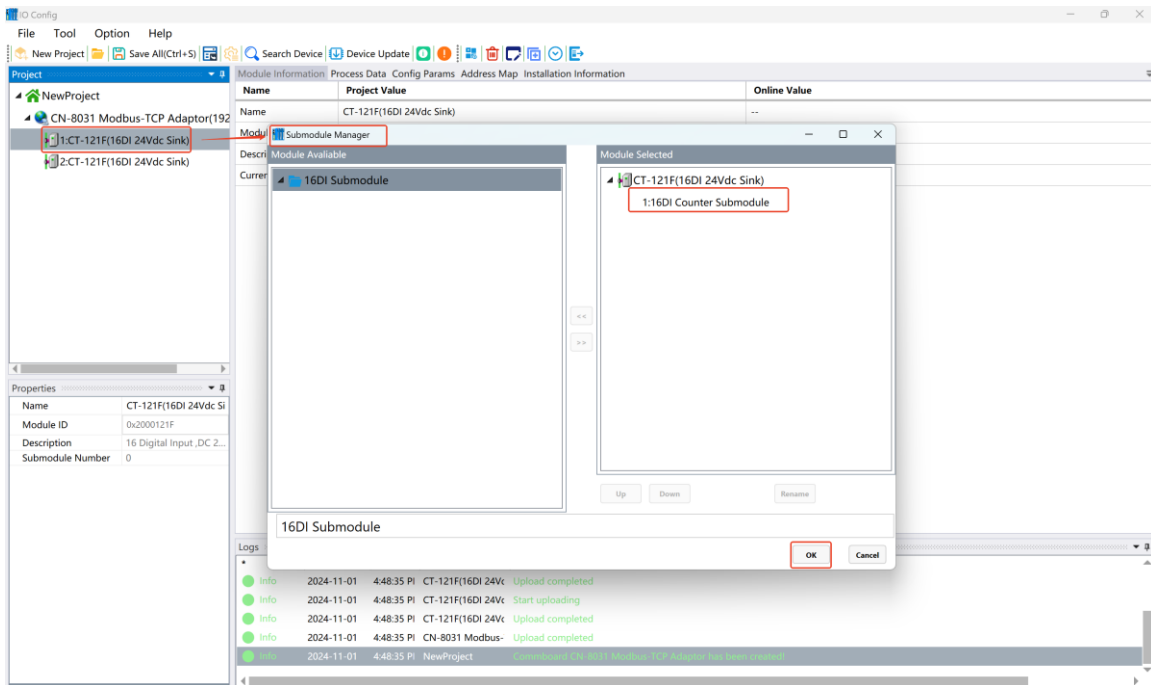
7 The configuration of counter submodule

Hardware composition: CN-8031+CT-121F+CT-121F; Configuration software: IO Config;

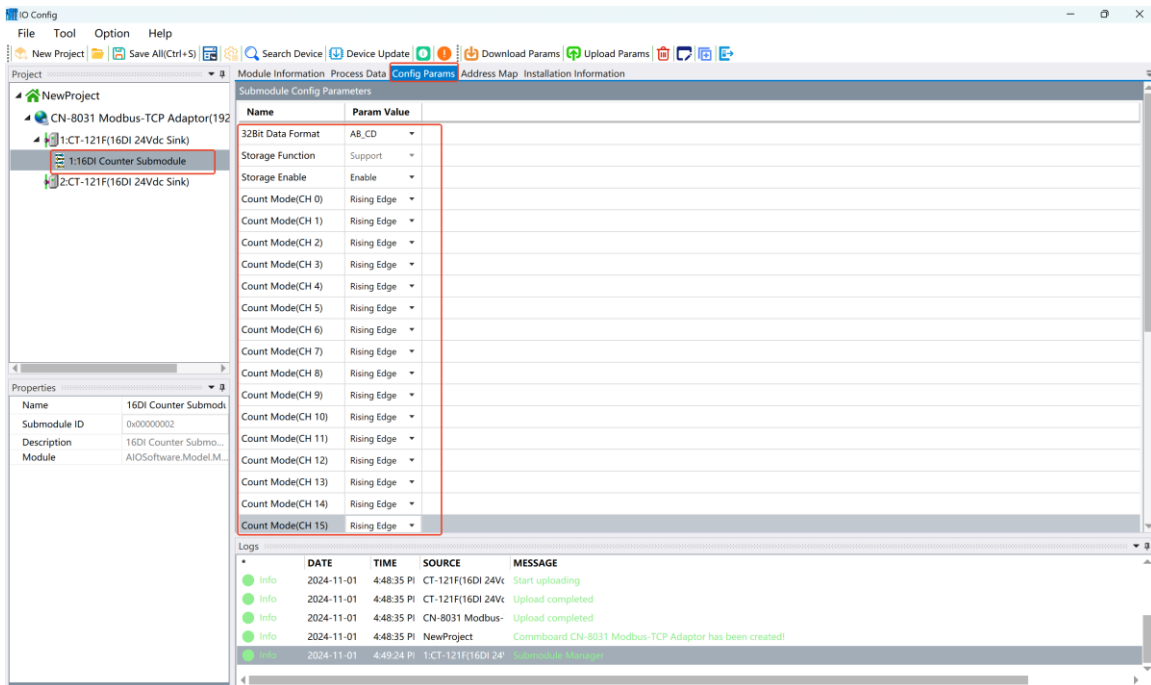
Open the IO Config software, click the search device  Search Device, select the corresponding Network card, click the search device, then click the upload.



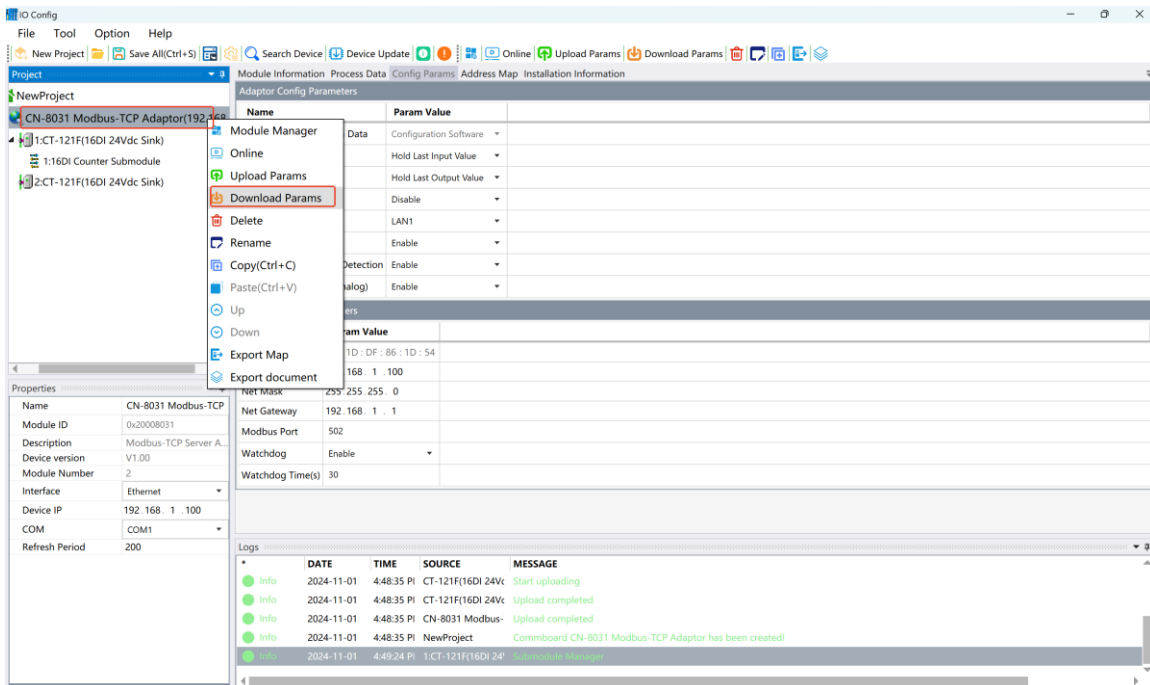
Right-click the CT-121F module, select the submodule manager, double-click to add the counter submodule, then click the OK.



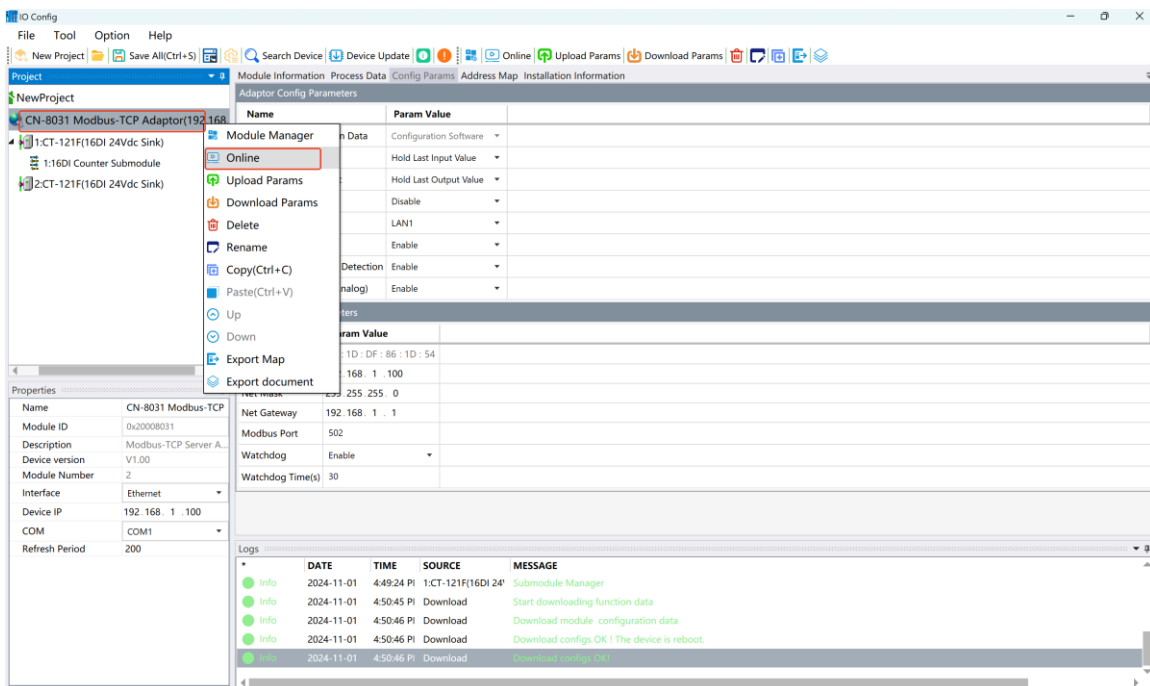
Select the counter submodule, click the config params, the count mode and count direction could be set on demand.



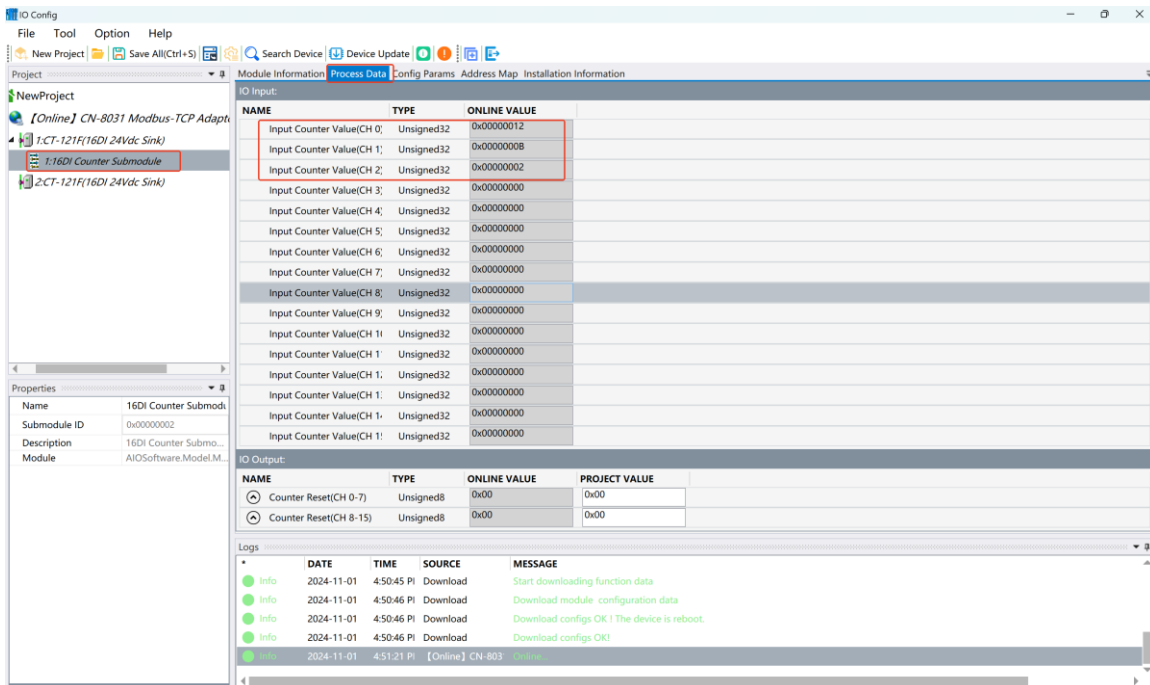
After all parameters are configured, right-click the CN-8031, then select the download params.



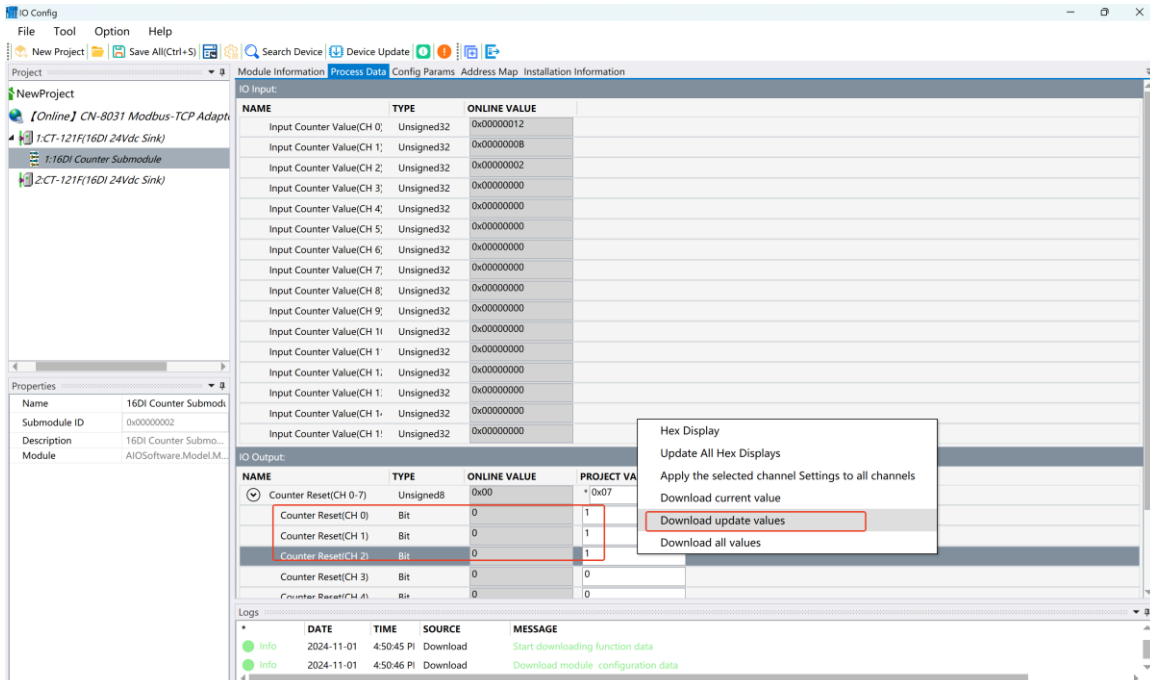
After the config params are downloaded, right-click the CN-8031, then select the online.



Select the count submodule, click the process data, connect channels CH0, CH1, and CH2 of the CT-121F to 24VDC, the input counter value of CH0, CH1 and CH2 could be viewed.



When need to clear the count value, select the count submodule, click the process data, in the IO Output, counter reset CH 0, CH 1, and CH2 are set to 1, and right-click to download the updated value.



After the counter reset settings are downloaded successfully, the input counter value of CH1, CH2 and CH3 are 0.

IO Config

File Tool Option Help

New Project Save All(Ctrl+S) Search Device Device Update

Project Module Information Process Data Config Params Address Map Installation Information

NewProject

【Online】CN-8031 Modbus-TCP Adapt

1-CT-121F(16DI 24Vdc Sink)

1-16DI Counter Submodule

2-CT-121F(16DI 24Vdc Sink)

Properties

Name 16DI Counter Submod...

Submodule ID 0x00000002

Description 16DI Counter Submo...

Module AIOSoftware.Model.M...

IO Input:

NAME	TYPE	ONLINE VALUE
Input Counter Value(CH 0)	Unsigned32	0x00000000
Input Counter Value(CH 1)	Unsigned32	0x00000000
Input Counter Value(CH 2)	Unsigned32	0x00000000
Input Counter Value(CH 3)	Unsigned32	0x00000000
Input Counter Value(CH 4)	Unsigned32	0x00000000
Input Counter Value(CH 5)	Unsigned32	0x00000000
Input Counter Value(CH 6)	Unsigned32	0x00000000
Input Counter Value(CH 7)	Unsigned32	0x00000000
Input Counter Value(CH 8)	Unsigned32	0x00000000
Input Counter Value(CH 9)	Unsigned32	0x00000000
Input Counter Value(CH 10)	Unsigned32	0x00000000
Input Counter Value(CH 11)	Unsigned32	0x00000000
Input Counter Value(CH 12)	Unsigned32	0x00000000
Input Counter Value(CH 13)	Unsigned32	0x00000000
Input Counter Value(CH 14)	Unsigned32	0x00000000
Input Counter Value(CH 15)	Unsigned32	0x00000000

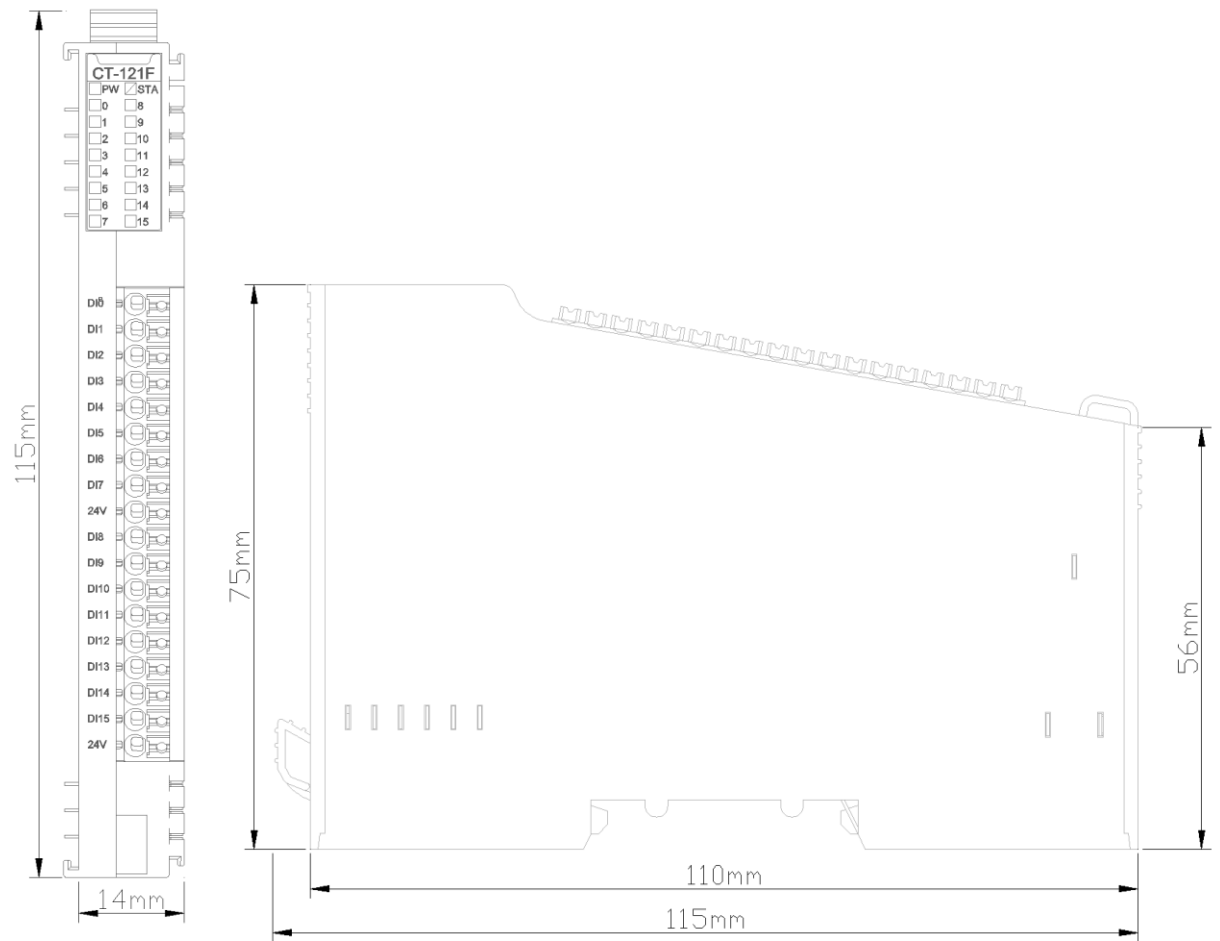
IO Output:

NAME	TYPE	ONLINE VALUE	PROJECT VALUE
Counter Reset(CH 0-7)	Unsigned8	0x07	0x07
Counter Reset(CH 0)	Bit	1	1
Counter Reset(CH 1)	Bit	1	1
Counter Reset(CH 2)	Bit	1	1
Counter Reset(CH 3)	Bit	0	0
Counter Reset(CH 4)	Bit	0	0

Logs

DATE	TIME	SOURCE	MESSAGE
2024-11-01	4:58:50 PM	16DI Counter Sub...	IO Config: 16DI Counter Sub...

A Dimension drawing



CT-1228 8 channels digital input/24VDC/NPN

1 Module features

- ◆The module supports 8 channels digital input, and the input low level is valid. It could support NPN 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 internal bus and field input of the module use opto-isolator.
- ◆The module supports the input signal holding function, and the holding time can be set.
- ◆The module carries 8 digital input channels with LED indicator on each channel.
- ◆Supports counting function after adding counting sub-module.
- ◆Each input channel of the module supports a 32-bit counter with the counting frequency <200Hz.
- ◆The module could be set the digital signal input filtering time and the byte transmission order of the counter.
- ◆Each channel of the module could be set the counting mode and counting direction independently.

2 Technical parameters

General Parameters	
Power Consumption	Max.33mA@5.0VDC
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24VDC, Range: 19.2~28.8VDC
Wiring	Max.: AWG 18 Min.: AWG 24
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operating Temperature of Vertical Installation	-35°C~60°C
Operating Temperature of Horizontal Installation	-35°C~70°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Input Parameters	
Channel Number	8 channels input
LED Indicator	8 channels input LED indicator
Turn-on Voltage	Min.0VDC to Max.14VDC
Turn-off Voltage	Max.19VDC
Turn-on Current	Max.5mA/channel@28V
Input Impedance	>7.5kΩ
Input Delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
Filter Time	Default 10ms
Sample Frequency	500Hz
Counter Frequency	<200Hz
Effective pulse width for counting	2.5ms

 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.

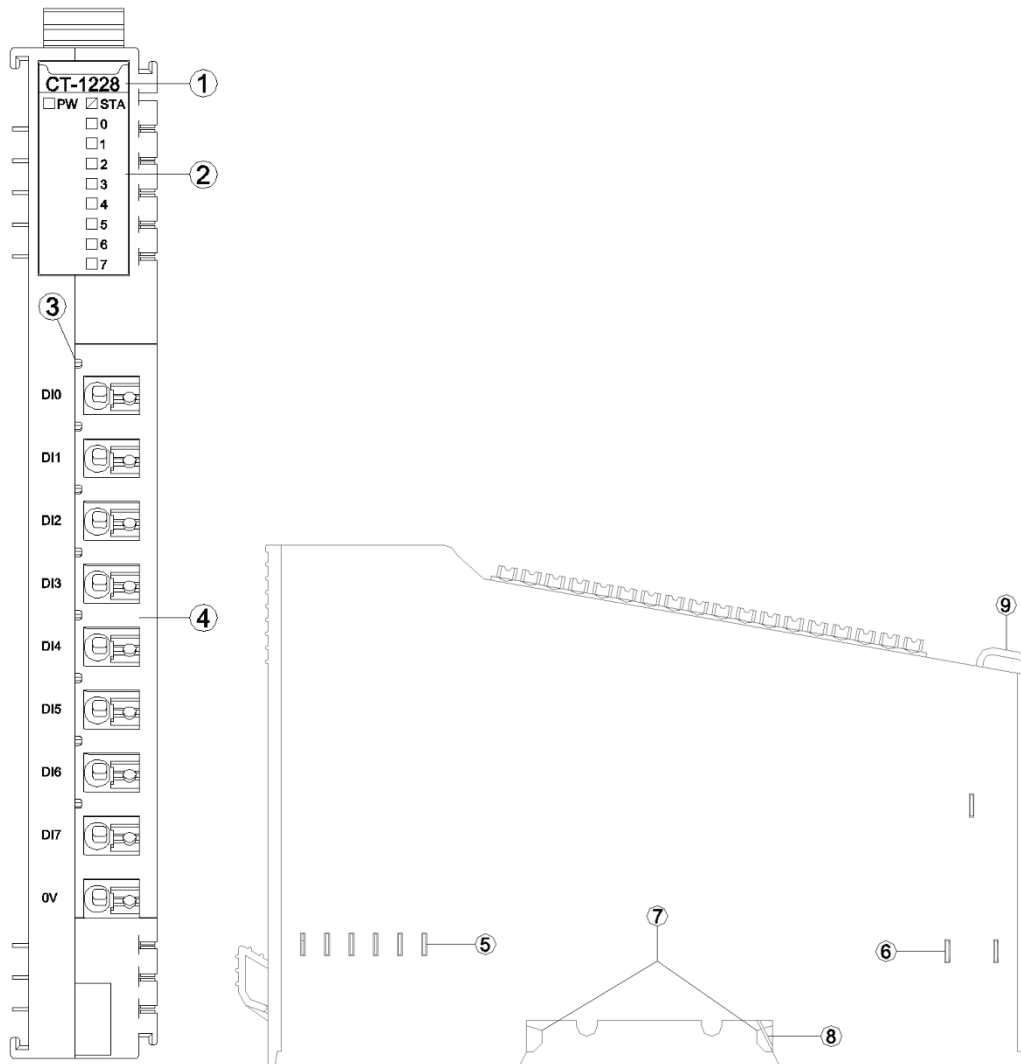
 AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

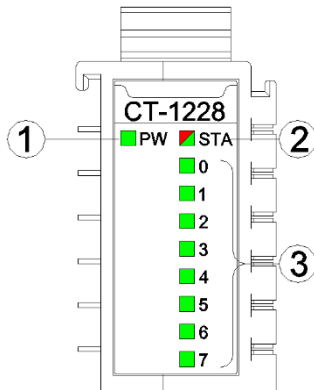
Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

3 Hardware interfaces



- 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 LED indicator (red/green)
- ③ Input channel LED indicator (green)

PW Power State (GREEN)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-7 channel LED indicator	Definition
ON	Input signal valid
OFF	Input signal 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.

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

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.

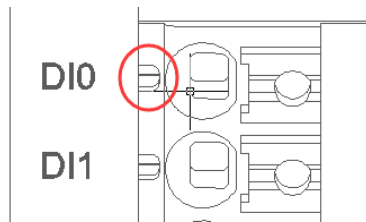
Lorsque le module est alimenté initialement, il y aura 3S pour la connexion de bus de backboard. STA est un état vert permanent après l'initialisation du bus de backboard. Si STA est en état de clignotement vert, cela signifie que l'initialisation du bus de backboard n'est pas passée et doit être redémarrée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

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.

3.2 Field channel LED indicator (Green)



When input signal of input channel is valid, the corresponding field channel LED indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	0V	Power V-

WARNING

UNEXPECTED EQUIPMENT OPERATION

The DI channel terminal provides reverse protection.

The FV power supply of the network adapter is normal.

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

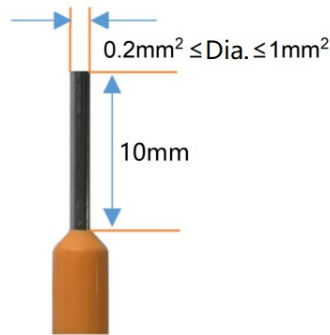
Le terminal de canal d'entrée numérique offre une protection inverse.

L'alimentation FV de l'adaptateur réseau est normale.

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 0.2mm^2 and smaller than 1mm^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 0.2mm^2 and less than or equal to 1mm^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.

! 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 1mm^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.

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.

DANGER

FIRE DANGER

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

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.

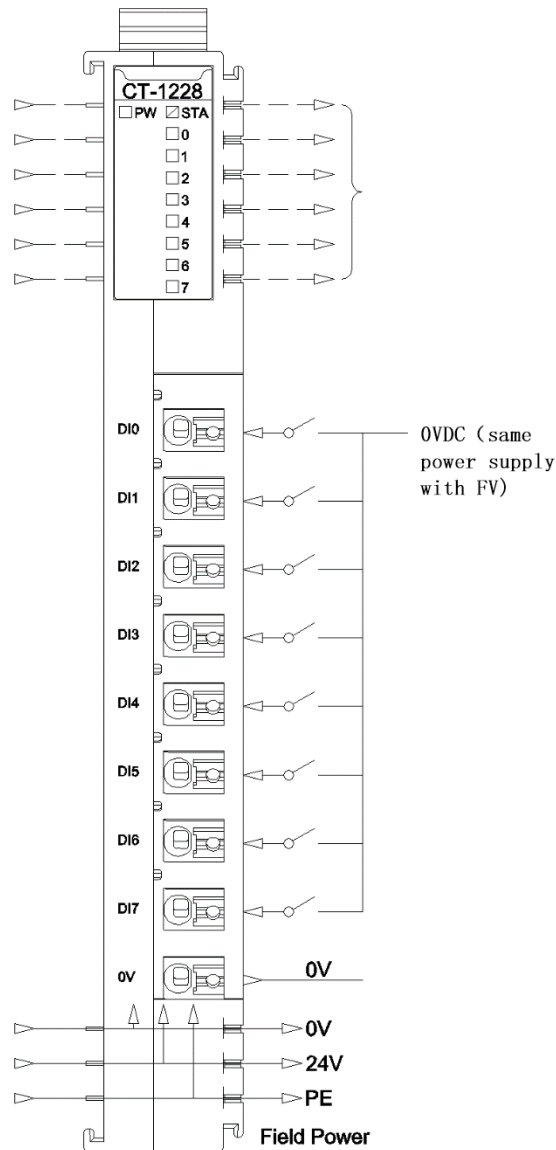
AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

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.

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

<8DI Input Status> Submodule 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	DI Ch#7	DI Ch#6	DI Ch#5	DI Ch#4	DI Ch#3	DI Ch#2	DI Ch#1	DI Ch#0

Data description:

DI Ch#(0-7): When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

<8DI Counter Submodule> Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								
Byte 23								
Byte 24	Counter Value Ch#6							
Byte 25								
Byte 26								

Byte 27	Counter Value Ch#7							
Byte 28								
Byte 29								
Byte 30								
Byte 31								
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0

Data description:

Counter Value Ch#(0-7): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-7): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

<8DI Input Status> Submodule 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	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

0: Disable

1: 200ms

2: 500ms

3: 1000ms

4: 1500ms

5: 2000ms

6: 3000ms

7: 5000ms

<8DI Counter Submodule> Submodule 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				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3...4	Reserved							
Byte 5	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch#(0-7): Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

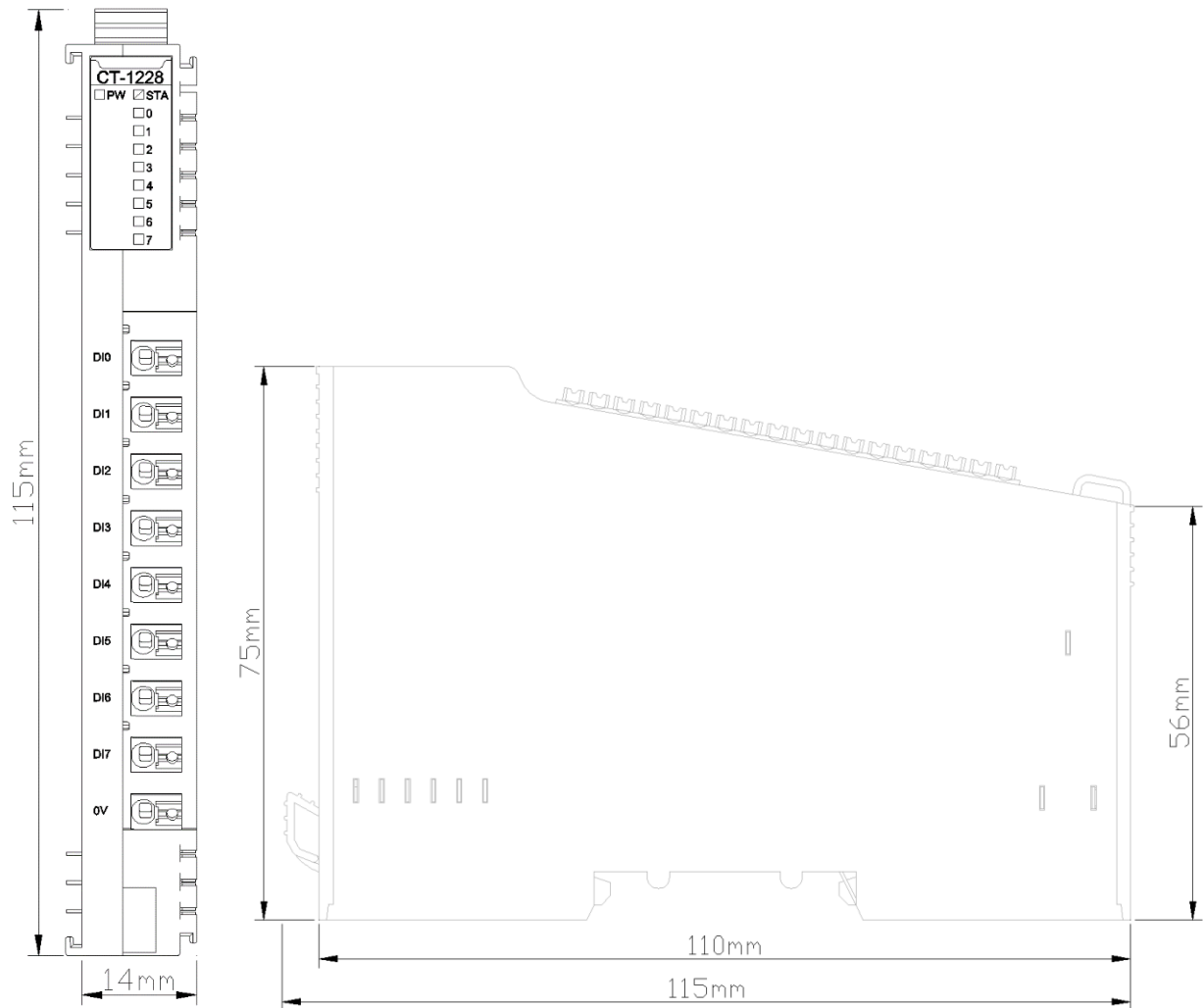
2: double edge count

Count Direction Ch#(0-7): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing



CT-122F 16 channels digital input/24VDC/NPN

1 Module features

- ◆The Module supports 16 channels digital input, supports source input, the input voltage is 0V and the input low level is valid.
- ◆The module could collect the digital output signal of field equipment (dry contact or active output).
- ◆The module could be connected to a 2-wire or 3-wire digital sensor.
- ◆The internal bus of the module and field input are isolated by optocoupler.
- ◆The module supports input signal holding function, holding time can be set.
- ◆The module carries with 16 digital input channel LED indicator.
- ◆After adding counting submodule, the counting function is effective.
- ◆Each input channel of the module supports 32-bit counter with counting frequency <200Hz.
- ◆The module could be set the digital signal input filter time and counter byte transmission sequence.
- ◆Each channel of the module could be set the counting mode and counting direction independently.

2 Technical parameters

General Parameters	
Power Consumption	Max.60mA@5.0VDC
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24VDC, Range: 19.2~28.8VDC
Wiring	Max.: AWG 18 Min.: AWG 24
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operating Temperature of Vertical Installation	-35°C~60°C
Operating Temperature of Horizontal Installation	-35°C~70°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Input Parameters	
Channel Number	16 channels source input
LED Indicator	16 channels input LED indicator
Turn-on Voltage	Min.0VDC to Max.14VDC
Turn-off Voltage	Max.19VDC
Turn-on Current	Max.5mA/channel@28V
Input Impedance	>7.5kΩ
Input Delay	OFF to ON :Max.3ms ON to OFF :Max.2ms
Filter Time	Default 10ms
Sample Frequency	500Hz
Counter Frequency	<200Hz
Effective pulse width for counting	2.5ms

 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.

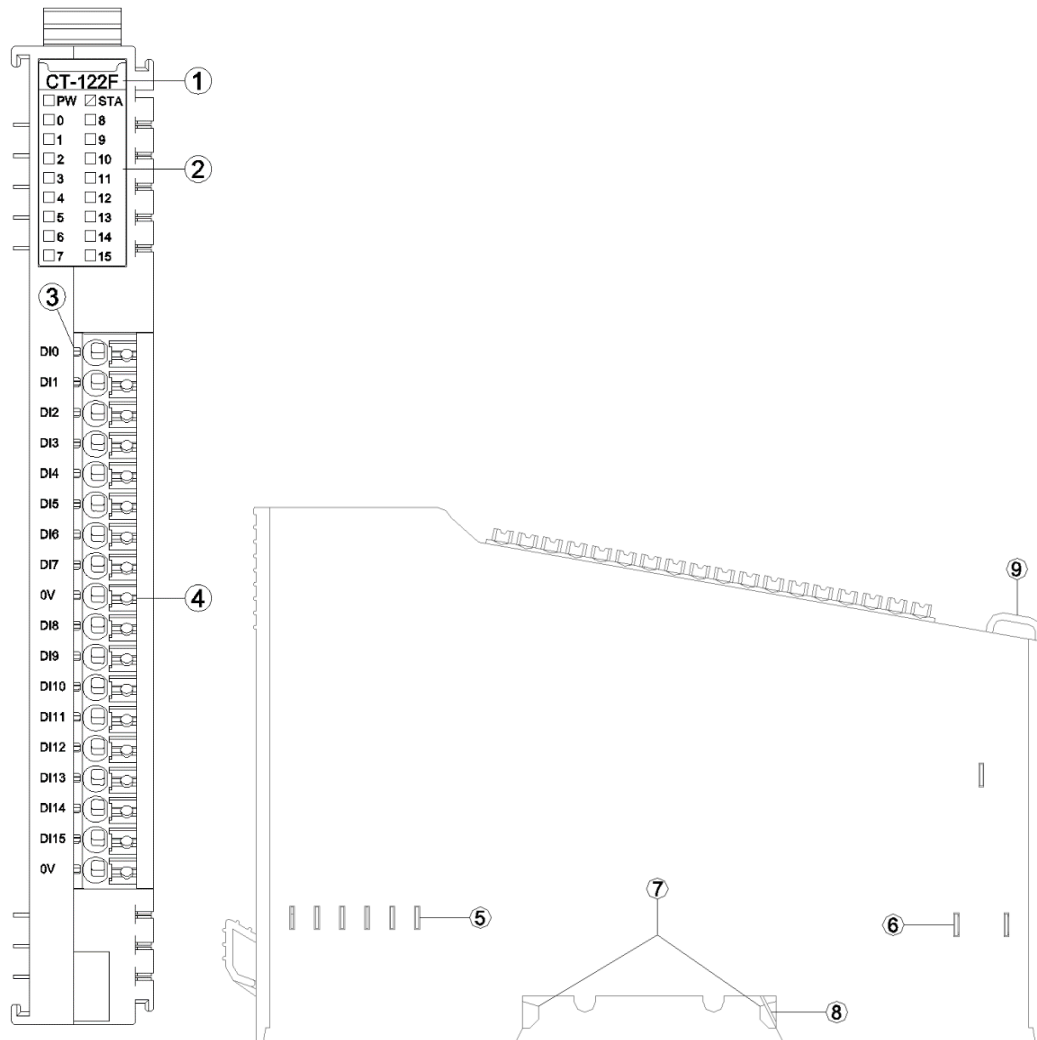
 AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

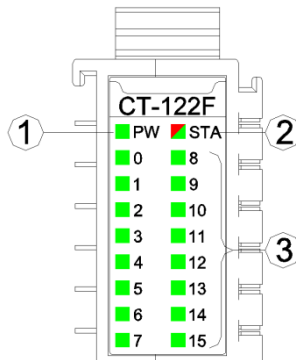
Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

3 Hardware interfaces



- 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 LED indicator (red/green)
- ③ Input channel LED indicator (green)

PW Power State (GREEN)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-15 channel indicator light	Definition
ON	Input signal valid
OFF	Input signal 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.

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

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.

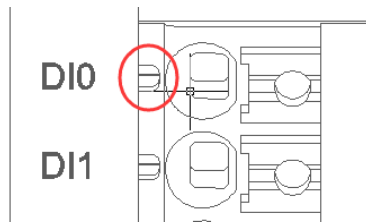
Lorsque le module est alimenté initialement, il y aura 3S pour la connexion de bus de backboard. STA est un état vert permanent après l'initialisation du bus de backboard. Si STA est en état de clignotement vert, cela signifie que l'initialisation du bus de backboard n'est pas passée et doit être redémarrée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

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.

3.2 Field channel LED indicator (Green)



When input signal of input channel is valid, the corresponding field channel LED indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	0V	Power V-
10	DI8	Signal input
11	DI9	
12	DI10	
13	DI11	
14	DI12	
15	DI13	
16	DI14	
17	DI15	
18	0V	Power output V-

WARNING

UNEXPECTED EQUIPMENT OPERATION

The DI channel terminal provides reverse protection.

The FV power supply of the network adapter is normal.

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

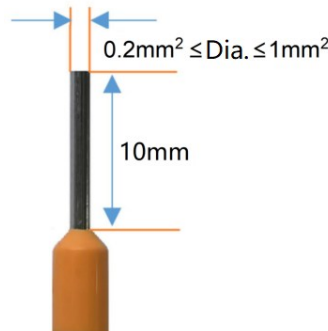
FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

Le terminal de canal d'entrée numérique offre une protection inverse.

L'alimentation FV de l'adaptateur réseau est normale.

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 0.2mm^2 and smaller than 1mm^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 0.2mm^2 and less than or equal to 1mm^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.

! 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 1mm^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.

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.

DANGER

FIRE DANGER

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

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.

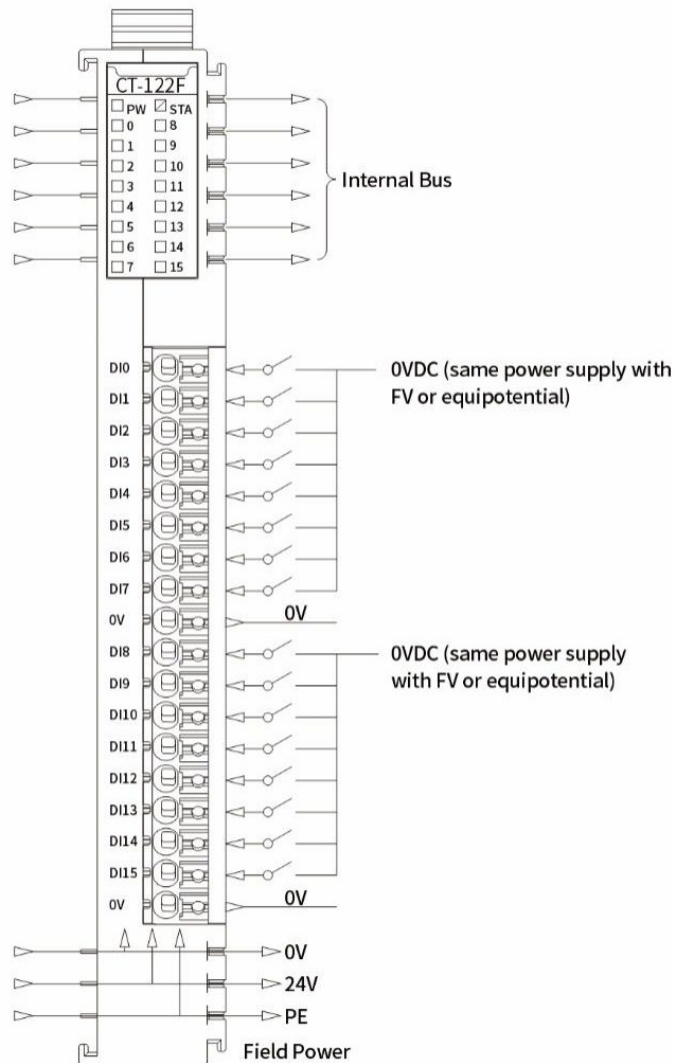
AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

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.

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

<16DI Input State> Submodule 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	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 corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

<16DI Counter Submodule> Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								

Byte 23	Counter Value Ch#6							
Byte 24								
Byte 25								
Byte 26								
Byte 27								
Byte 28	Counter Value Ch#7							
Byte 29								
Byte 30								
Byte 31								
Byte 32								
Byte 33	Counter Value Ch#8							
Byte 34								
Byte 35								
Byte 36								
Byte 37								
Byte 38	Counter Value Ch#9							
Byte 39								
Byte 40								
Byte 41								
Byte 42								
Byte 43	Counter Value Ch#10							
Byte 44								
Byte 45								
Byte 46								
Byte 47								
Byte 48	Counter Value Ch#11							
Byte 49								
Byte 50								
Byte 51								
Byte 52								
Byte 53	Counter Value Ch#12							
Byte 54								
Byte 55								
Byte 56								
Byte 57								
Byte 58	Counter Value Ch#13							
Byte 59								
Byte 60								
Byte 61								
Byte 62								
Byte 63	Counter Value Ch#14							
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0

Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8
--------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	--------------------------	--------------------------

Data description:

Counter Value Ch#(0-15): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-15): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

<16DI Input State> Submodule 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	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

0: Disable

1: 200ms

2: 500ms

3: 1000ms

4: 1500ms

5: 2000ms

6: 3000ms

7: 5000ms

<16DI Counter Submodule> Submodule 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				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	
Byte 5	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0

Byte 6	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8
--------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	----------------------------	----------------------------

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch# (0-15): Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

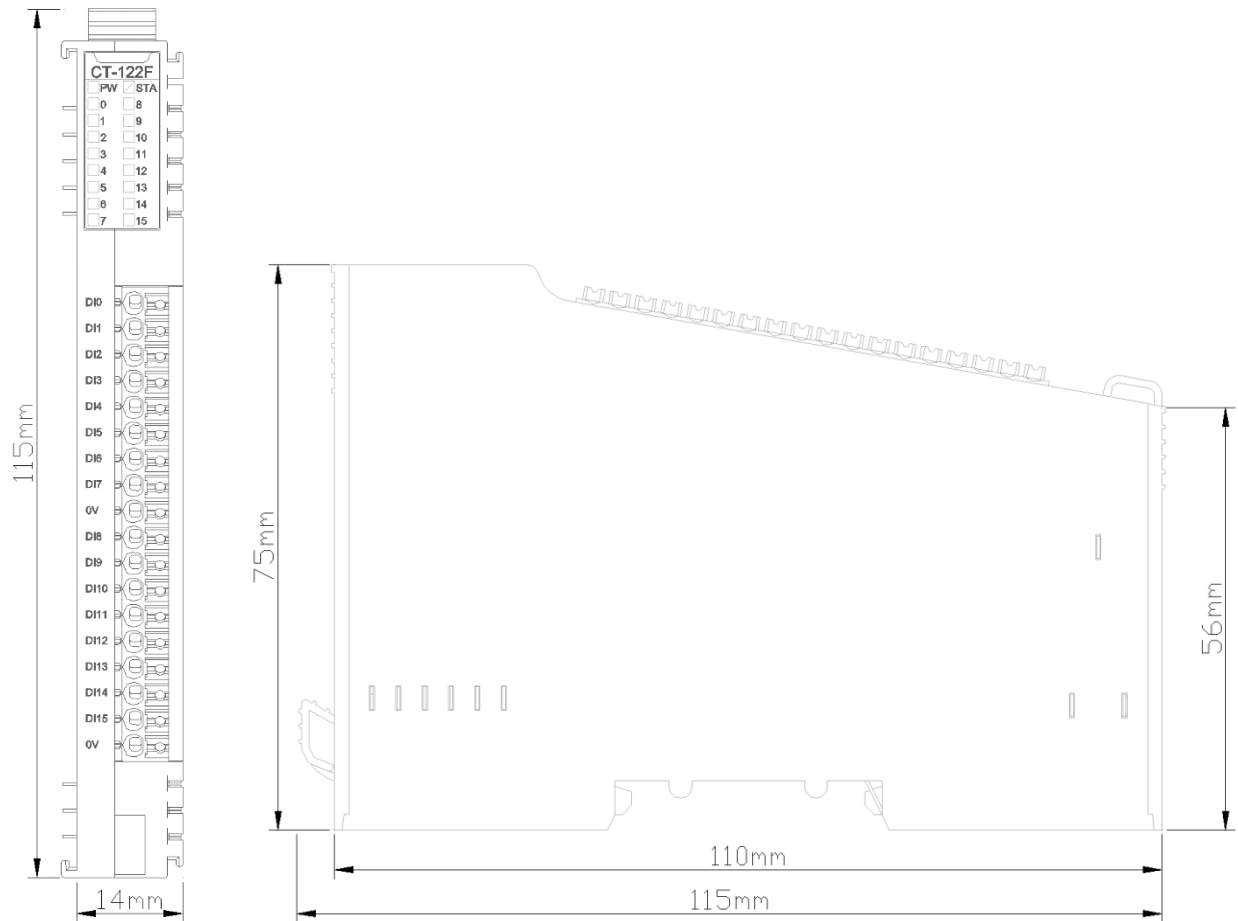
2: double edge count

Count Direction Ch# (0-15): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing



CT-124H 32 channels digital input/24VDC/PNP or NPN

1 Module features

- ◆The module supports 32 channels digital input, it supports sink input and the input high level is valid as it could support PNP sensor; it also supports source input and the input low level is valid as it could support 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 internal bus of the module and field input are isolated by optocoupler.
- ◆The module supports input signal holding function, holding time can be set.
- ◆After adding counting submodule, the counting function is effective.
- ◆Each input channel of the module supports 32-bit counter with counting frequency <200Hz.
- ◆The module could be set the digital signal input filter time and counter byte transmission sequence.
- ◆Each channel of the module could be set the counting mode and counting direction independently.

2 Technical parameters

General Parameters	
Power Consumption	Max.52mA@5.0VDC
Isolation	I/O to internal bus: opto-couple isolation (3KVrms)
Field Power	Nominal:24VDC, Range: 19.2~28.8VDC
Wiring	34P male connector 2.54mm Pin header
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operating Temperature of Vertical Installation	-35°C~60°C
Operating Temperature of Horizontal Installation	-35°C~70°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Vibration Resistance	Comply with IEC 61131-2 and EC 60068-2-6
Impact resistance	Comply with IEC 61131-2 and IEC 60068-2-27
EMC Performance	Comply with IEC 61131-2 and IEC 61000-4
Input Parameters	
Channel Number	32 channels input
LED Indicator	32 channels input LED indicator
Turn-on Voltage	High input: Min.10VDC to Max.28VDC (Common Terminal:0VDC) Low input: Min.0VDC to Max.14VDC (Common Terminal:24VDC)
Turn-off Voltage	High input:Max.5VDC (Common Terminal:0VDC) Low input: Min.19VDC (Common Terminal:24VDC)
Turn-on Current	Max.5mA/channel@28V
Input Impedance	>7.5kΩ
Input Delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
Filter Time	Default 10ms
Sample Frequency	500Hz
Counter Frequency	<200Hz
Effective pulse width for counting	2.5ms

 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.

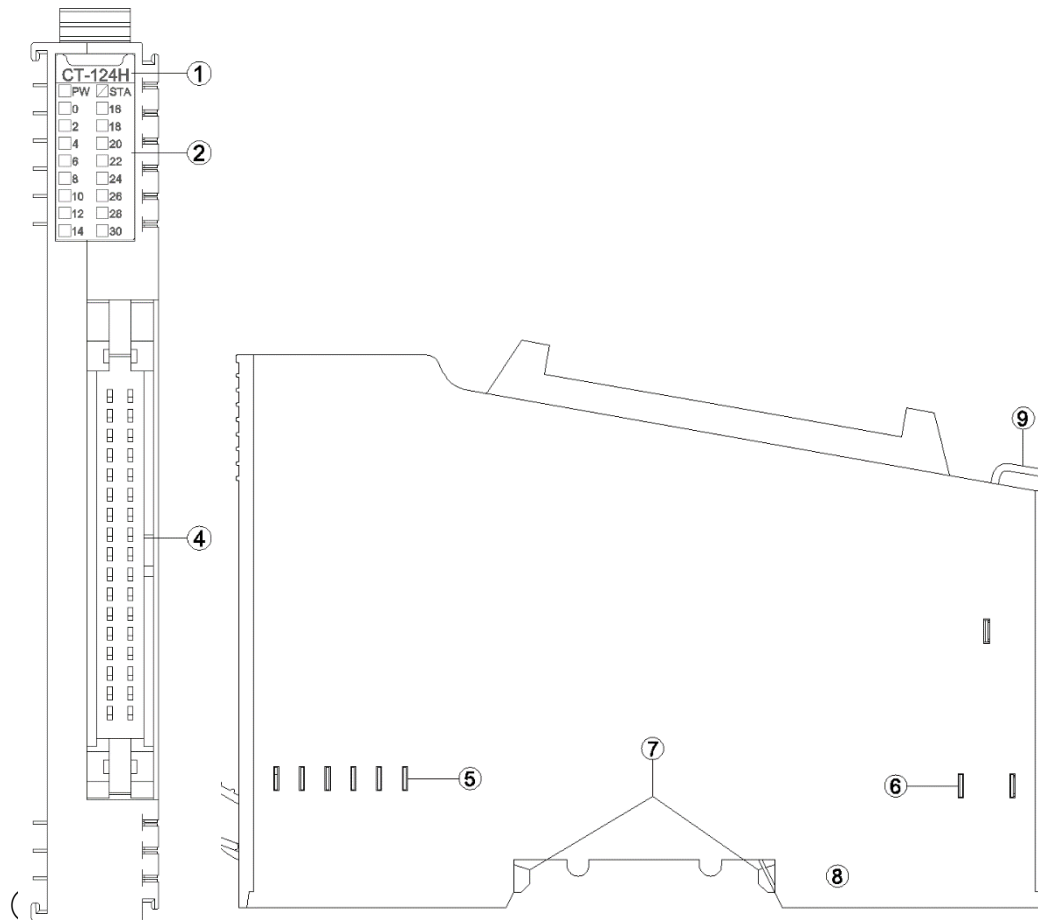
 AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

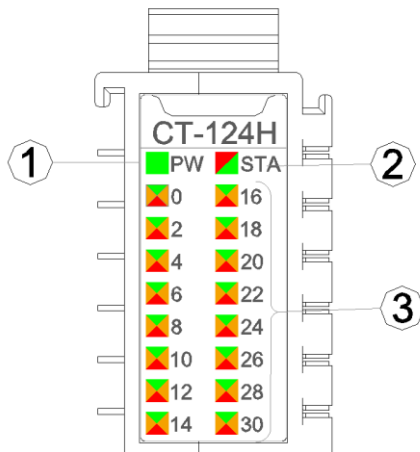
Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

3 Hardware interfaces



- ② State indicator
- ④ 34P male connector
- 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 LED indicator (red/green)
- ③ Input channel LED indicator (green/red/orange)

PW Power State	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State Indicator	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz)(RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-31 channel indicator light	Definition
ON (GREEN)	Indicates that the input channel signal is valid
ON (RED)	Indicates that the input channel +1 signal is valid
ON (ORANGE)	Indicates that the input channel and channel +1 signal are valid
OFF	Input 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.

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

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.

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.

3.2 Terminal definition

Description	Symbol	Terminal Number	Terminal Number	Symbol	Description
Signal input	DI0	1	18	DI16	Signal input
	DI1	2	19	DI17	
	DI2	3	20	DI18	
	DI3	4	21	DI19	
	DI4	5	22	DI20	
	DI5	6	23	DI21	
	DI6	7	24	DI22	
	DI7	8	25	DI23	
	DI8	9	26	DI24	
	DI9	10	27	DI25	
	DI10	11	28	DI26	
	DI11	12	29	DI27	
	DI12	13	30	DI28	
	DI13	14	31	DI29	
	DI14	15	32	DI30	
	DI15	16	33	DI31	
0V or 24V	COMA	17	34	COMB	0V or 24V



WARNING

UNEXPECTED EQUIPMENT OPERATION

The DI channel terminal provides reverse protection.

The FV power supply of the network adapter is normal.

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

Le terminal de canal d'entrée numérique offre une protection inverse.

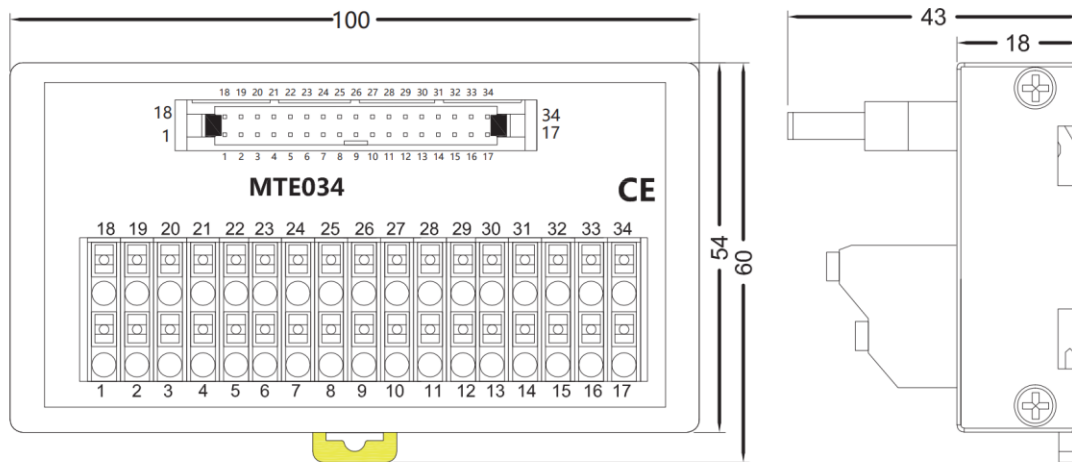
L'alimentation FV de l'adaptateur réseau est normale.

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.

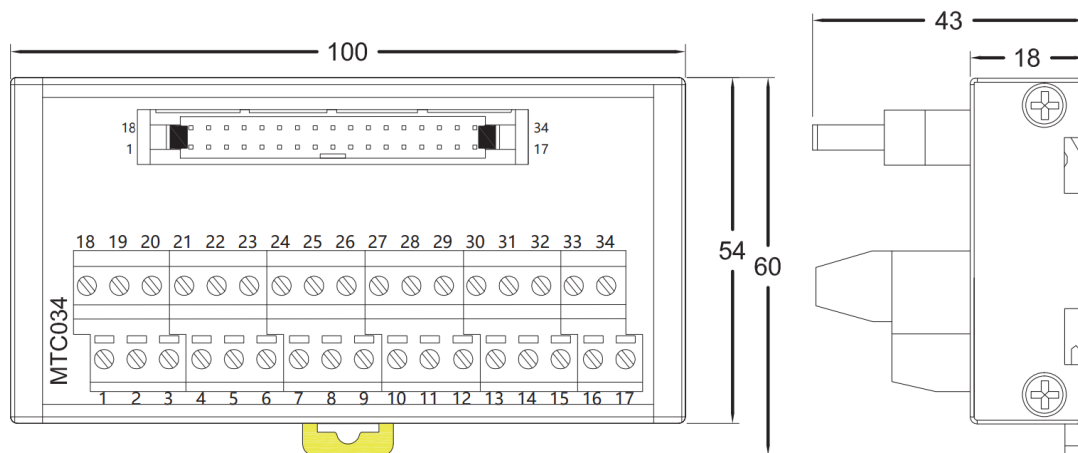
3.3 External terminal block

Module number	MTC034	MTE034
Name	Scre terminal block	Spring terminal block
Suitable cable	DX210-3SFX-2000	
Nominal current	1A	
Nominal voltage	DC24V	
Wiring	Max. AWG 18	

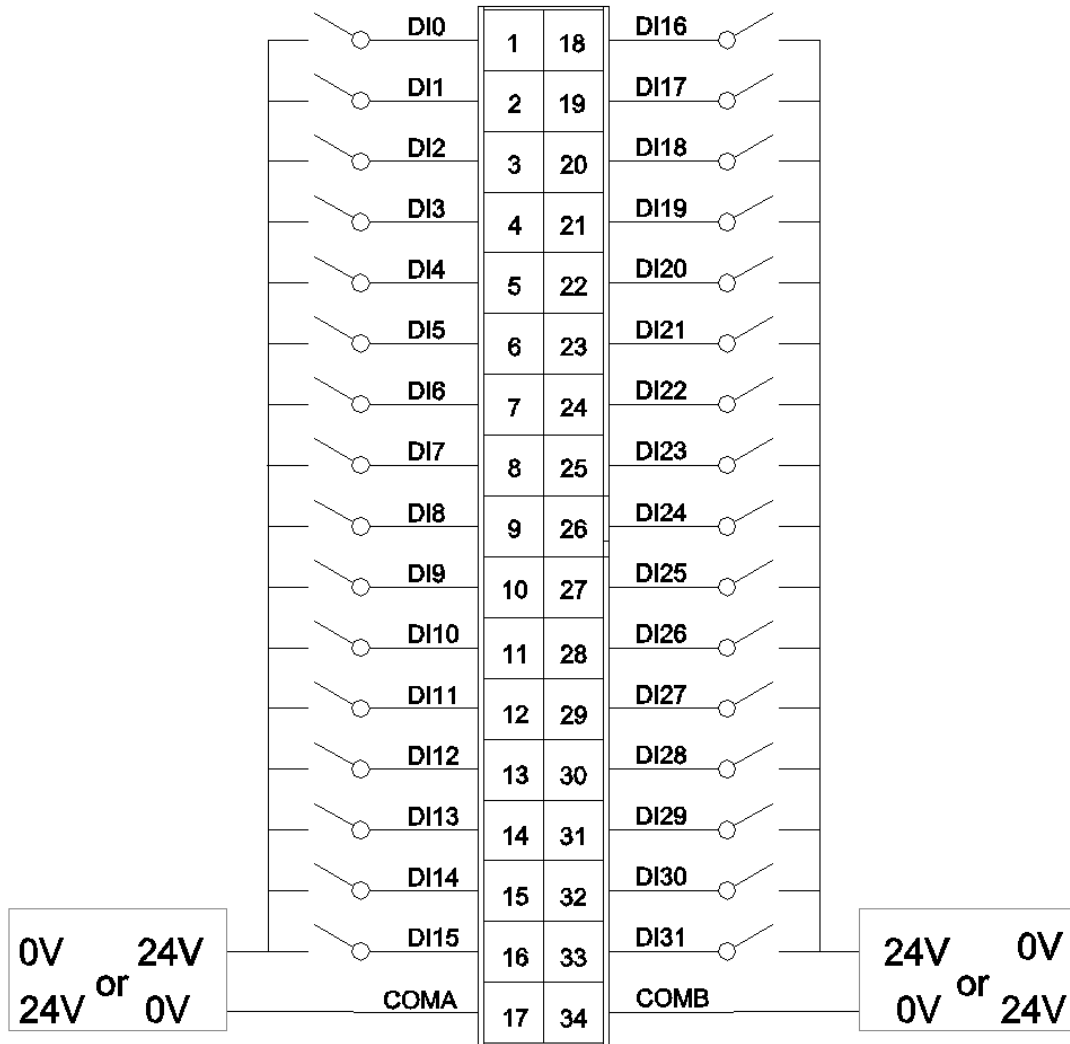
MTE034



MTC034



4 Wiring



5 Process data definition

<32DI Input Status> Submodule 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	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
Byte 2	DI Ch#23	DI Ch#22	DI Ch#21	DI Ch#20	DI Ch#19	DI Ch#18	DI Ch#17	DI Ch#16
Byte 3	DI Ch#31	DI Ch#30	DI Ch#29	DI Ch#28	DI Ch#27	DI Ch#26	DI Ch#25	DI Ch#24

Data description:

DI Ch#(0-31): When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

<16DI Counter Submodule> Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								

Byte 18								
Byte 19								
Byte 20								
Byte 21	Counter Value Ch#5							
Byte 22								
Byte 23								
Byte 24								
Byte 25	Counter Value Ch#6							
Byte 26								
Byte 27								
Byte 28								
Byte 29	Counter Value Ch#7							
Byte 30								
Byte 31								
...								
...	...							
...								
...								
...								
...	...							
...								
...								
...								
Byte 116	Counter Value Ch#29							
Byte 117								
Byte 118								
Byte 119								
Byte 120	Counter Value Ch#30							
Byte 121								
Byte 122								
Byte 123								
Byte 124	Counter Value Ch#31							
Byte 125								
Byte 126								
Byte 127								
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0
Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8
Byte 2	Counter Reset Ch#23	Counter Reset Ch#22	Counter Reset Ch#21	Counter Reset Ch#20	Counter Reset Ch#19	Counter Reset Ch#18	Counter Reset Ch#17	Counter Reset Ch#16

Byte 3	Counter Reset Ch#31	Counter Reset Ch#30	Counter Reset Ch#29	Counter Reset Ch#28	Counter Reset Ch#27	Counter Reset Ch#26	Counter Reset Ch#25	Counter Reset Ch#24
--------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------

Data description:

Counter Value Ch#(0-31): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-31): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note: the maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

6 Configuration parameter definitions

Configuration parameters								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

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

<32DI Counter Submodule>Submodule 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				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	
Byte 5	Count Mode Ch#19		Count Mode Ch#18		Count Mode Ch#17		Count Mode Ch#16	
Byte 6	Count Mode Ch#23		Count Mode Ch#22		Count Mode Ch#21		Count Mode Ch#20	
Byte 7	Count Mode Ch#27		Count Mode Ch#26		Count Mode Ch#25		Count Mode Ch#24	
Byte 8	Count Mode		Count Mode		Count Mode		Count Mode	

	Ch#31		Ch#30		Ch#29		Ch#28	
Byte 9	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0
Byte 10	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8
Byte 11	Count Direction Ch#23	Count Direction Ch#22	Count Direction Ch#21	Count Direction Ch#20	Count Direction Ch#19	Count Direction Ch#18	Count Direction Ch#17	Count Direction Ch#16
Byte 12	Count Direction Ch#31	Count Direction Ch#30	Count Direction Ch#29	Count Direction Ch#28	Count Direction Ch#27	Count Direction Ch#26	Count Direction Ch#25	Count Direction Ch#24

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch# (0-31): Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

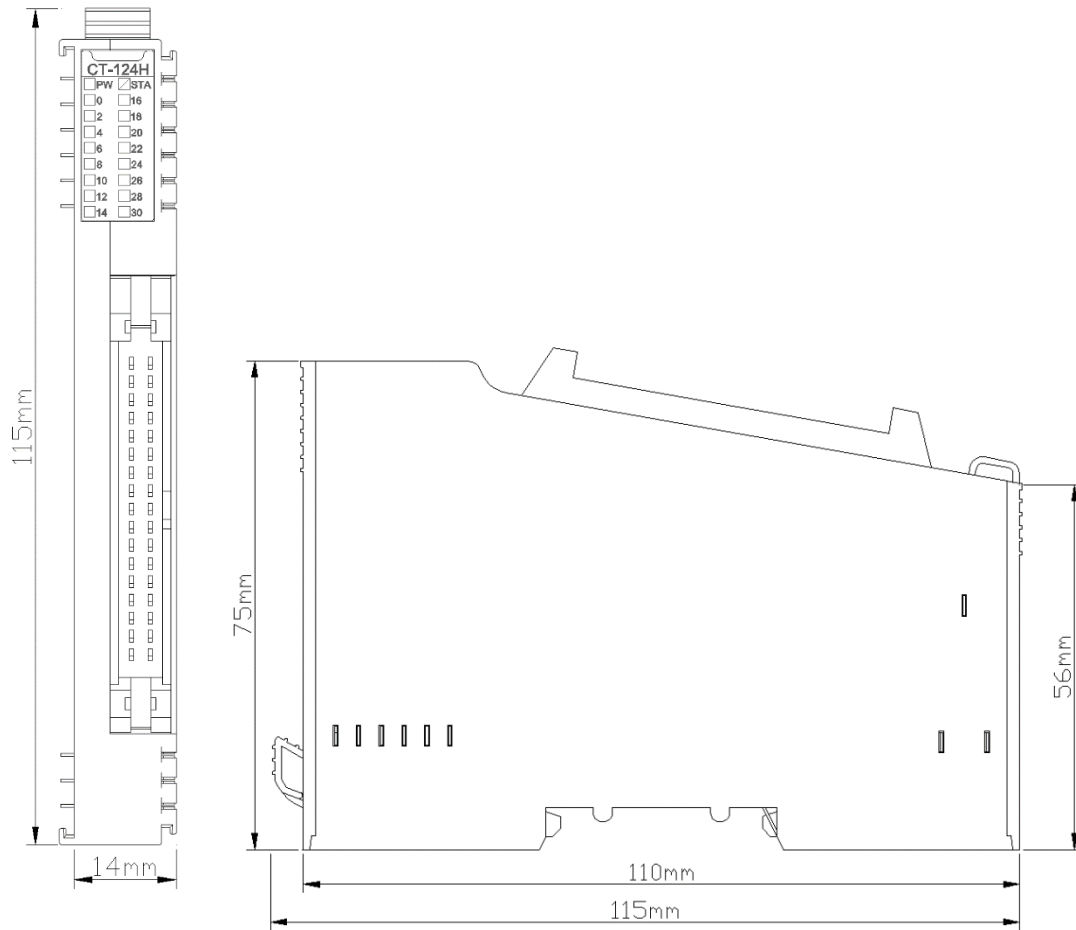
2: double edge count

Count Direction Ch# (0-31): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing



CT-124D 32-channel digital input/24VDC/ PNP or NPN

1 Module features

- ◆ The module supports 32 channels of digital input, supports high-level input, and could be connected to PNP sensor, and supports low-level input, and could be connected to NPN sensor.
- ◆ The module can collect the digital output signal (dry contact or active output) of the field device.
- ◆ The module can be connected to 2-wire or 3-wire digital sensor.
- ◆ The internal bus and field input of the module are isolated by optocoupler.
- ◆ The module supports the input signal holding function, and the holding time can be set.
- ◆ After adding the counting submodule, the counting function is available.
- ◆ Each input channel of the module supports 32-bit counter, and the counting frequency < 200Hz.
- ◆ The module can set the digital signal input filtering time and counter byte transmission sequence.
- ◆ The module can independently set the counting mode and counting direction for each channel.

2 Technical Parameters

General Parameters	
Power	Max.82mA@5.0VDC
Isolation	Isolation voltage between the channel and system power supply: AC 500V Isolation voltage between channel and field power supply: AC 500V Isolation voltage between the channel and PE: AC 500V
Wiring	Max.: AWG 18 Min.: AWG 24
Installation Mode	35mm DIN-Rail
Size	115*27*75mm
Weight	110g
Environmental Parameters	
Operating Temperature of Vertical Installation	-35°C~60°C
Operating Temperature of Horizontal Installation	-35°C~70°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Vibration Resistance	Comply with IEC 61131-2 and IEC 60068-2-6
Impact resistance	Comply with IEC 61131-2 and IEC 60068-2-27
EMC Performance	Comply with IEC 61131-2 and IEC 61000-4
Input Parameters	
Channel Number	32 channels
LED Indicator	32 panel LED indicators and 32 channel LED indicators, all this are green
Input Type	PNP/NPN
Input Standard	The input conforms to IEC 61131-2 Type3
Opening Voltage	Min.11VDC to Max.30VDC
Turn-off Voltage	Max.5VDC
Opening Current	6.5mA@24V
Input impedance	3.7kΩ
Input Delay	OFF to ON: Max.3ms ON to OFF: Max.2ms
Filtering Time	Default 10ms

Counting Frequency	500Hz
Opening Voltage	200Hz (Duty cycle 50%, filtering time 0ms)
Effective pulse width for counting	2.5ms

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.

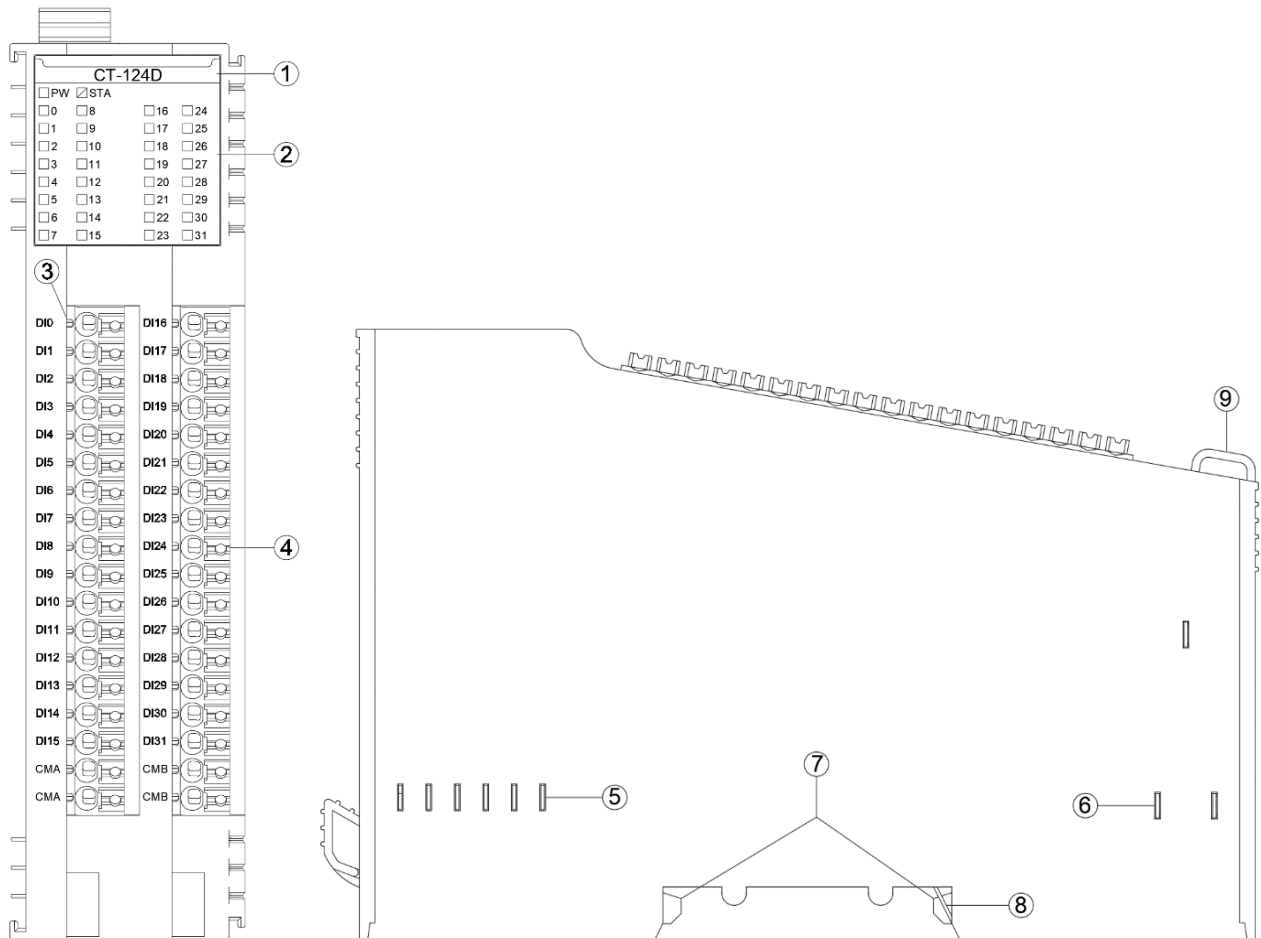
AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

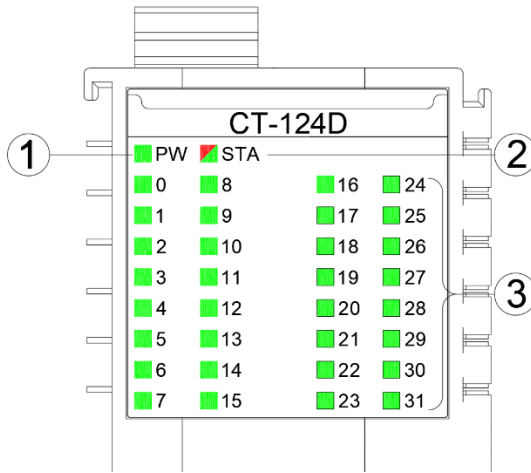
Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

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 indicator (green)
- ② Module status indicator (red/green)
- ③ Input channel indicator (green)

PW Power State (GREEN)	Definition
ON	The internal bus power supply is normal
OFF	The internal bus power supply is abnormal
STA Module State (RED/GREEN)	Definition
Green Slow Flashing (2.5Hz)	The module's internal bus is not started
Red Slow Flashing (2.5Hz)	The internal bus of the module is offline
On(GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware upgrading
Double Flash (RED)	Module exception has been soft-restarted
0-31 Channel Indicator (GREEN)	Definition
ON	The input signal is valid
OFF	The input 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.

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

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.

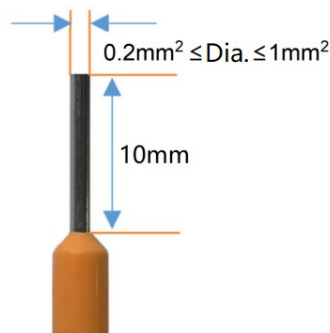
Si le module a une opération de mise à niveau, après l'achèvement de la mise à niveau, le besoin de vérifier que tous les modules sont dans l'état normal avant de courir, sinon il conduira à une exception.

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.

3.2 Terminal Definition

Instructions	Symbol	Terminal serial number	Terminal serial number	Symbol	Instructions
Signal input	DI0	1	19	DI16	Signal input
	DI1	2	20	DI17	
	DI2	3	21	DI18	
	DI3	4	22	DI19	
	DI4	5	23	DI20	
	DI5	6	24	DI21	
	DI6	7	25	DI22	
	DI7	8	26	DI23	
	DI8	9	27	DI24	
	DI9	10	28	DI25	
	DI10	11	29	DI26	
	DI11	12	30	DI27	
	DI12	13	31	DI28	
	DI13	14	32	DI29	
	DI14	15	33	DI30	
	DI15	16	34	DI31	
0V or 24V	CMA	17	35	CMB	0V or 24V
0V or 24V	CMA	18	36	CMB	0V or 24V

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 0.2mm^2 and smaller than 1mm^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 0.2mm² and less than or equal to 1mm² 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.

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 mm², inférieur ou égal à 1mm², 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.

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.

DANGER

FIRE DANGER

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

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.

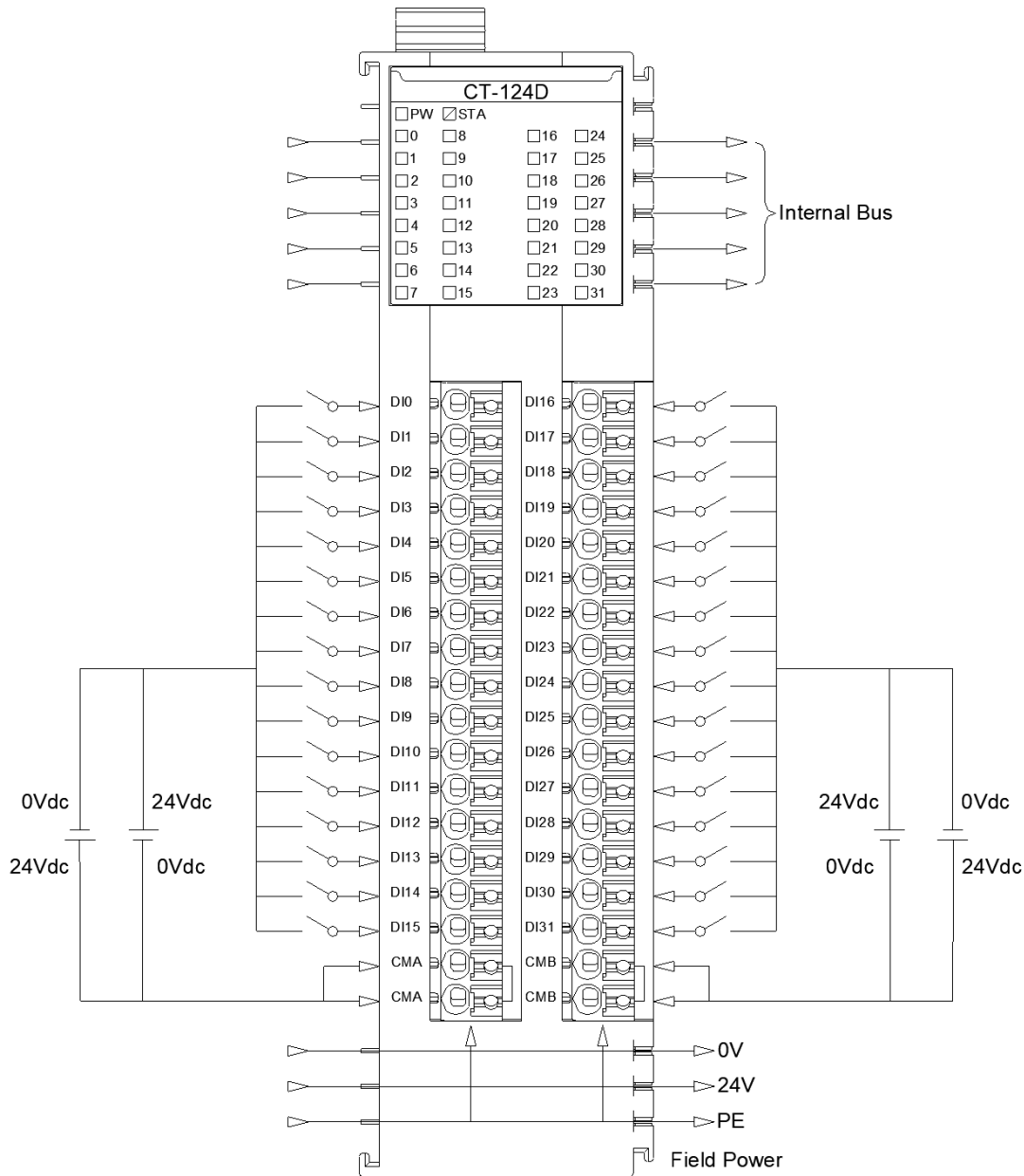
** AVERTISSEMENT**

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

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.

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

<32DI Input Status > submodule 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	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
Byte 2	DI Ch#23	DI Ch#22	DI Ch#21	DI Ch#20	DI Ch#19	DI Ch#18	DI Ch#17	DI Ch#16
Byte 3	DI Ch#31	DI Ch#30	DI Ch#29	DI Ch#28	DI Ch#27	DI Ch#26	DI Ch#25	DI Ch#24

Data Description:

DI Ch# (0-31): When the input signal of the corresponding channel is valid, the bit is forced to 1, and when the input is invalid, it is 0

0: The input signal is invalid

1: The input signal is valid

<16DI Counter Submodule > Counting Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								

Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								
Byte 23								
Byte 24	Counter Value Ch#6							
Byte 25								
Byte 26								
Byte 27								
Byte 28	Counter Value Ch#7							
Byte 29								
Byte 30								
Byte 31								
...	...							
...								
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...								
...	...							
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...								
Byte 116	Counter Value Ch#29							
Byte 117								
Byte 118								
Byte 119								
Byte 120	Counter Value Ch#30							
Byte 121								
Byte 122								
Byte 123								
Byte 124	Counter Value Ch#31							
Byte 125								
Byte 126								
Byte 127								
Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0
Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8
Byte 2	Counter Reset Ch#23	Counter Reset Ch#22	Counter Reset Ch#21	Counter Reset Ch#20	Counter Reset Ch#19	Counter Reset Ch#18	Counter Reset Ch#17	Counter Reset Ch#16
Byte 3	Counter Reset Ch#31	Counter Reset Ch#30	Counter Reset Ch#29	Counter Reset Ch#28	Counter Reset Ch#27	Counter Reset Ch#26	Counter Reset Ch#25	Counter Reset Ch#24

Data Description:

Counter Value Ch#(0-31): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-31): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is zeroed.

Note: The maximum frequency of the input channel is 200Hz, when the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

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	Input Filtering Time(ms)							
Byte 1								
Byte 2	Reserved					Input Holding Time(ms)		

Data Description:

Input Filtering Time (ms): Input filtering time of channel(ms) (Default: 10).

Input Holding Time (ms): Signal input holding time of channel(ms)(Default: 0).

0: Disable

1: 200ms

2: 500ms

3: 1000ms

4: 1500ms

5: 2000ms

6: 3000ms

7: 5000ms

< 32DI Counter Submodule > Submodule 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	Reserved				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	
Byte 5	Count Mode Ch#19		Count Mode Ch#18		Count Mode Ch#17		Count Mode Ch#16	
Byte 6	Count Mode Ch#23		Count Mode Ch#22		Count Mode Ch#21		Count Mode Ch#20	
Byte 7	Count Mode Ch#27		Count Mode Ch#26		Count Mode Ch#25		Count Mode Ch#24	

Byte 8	Count Mode Ch#31		Count Mode Ch#30		Count Mode Ch#29		Count Mode Ch#28	
Byte 9	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0
Byte 10	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8
Byte 11	Count Direction Ch#23	Count Direction Ch#22	Count Direction Ch#21	Count Direction Ch#20	Count Direction Ch#19	Count Direction Ch#18	Count Direction Ch#17	Count Direction Ch#16
Byte 12	Count Direction Ch#31	Count Direction Ch#30	Count Direction Ch#29	Count Direction Ch#28	Count Direction Ch#27	Count Direction Ch#26	Count Direction Ch#25	Count Direction Ch#24

Data description:

32Bit Data Format: Byte transmission sequence of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch# (0-31): Count mode of the input channel. (Default: 0)

0: Rising edge count

1: Falling edge count

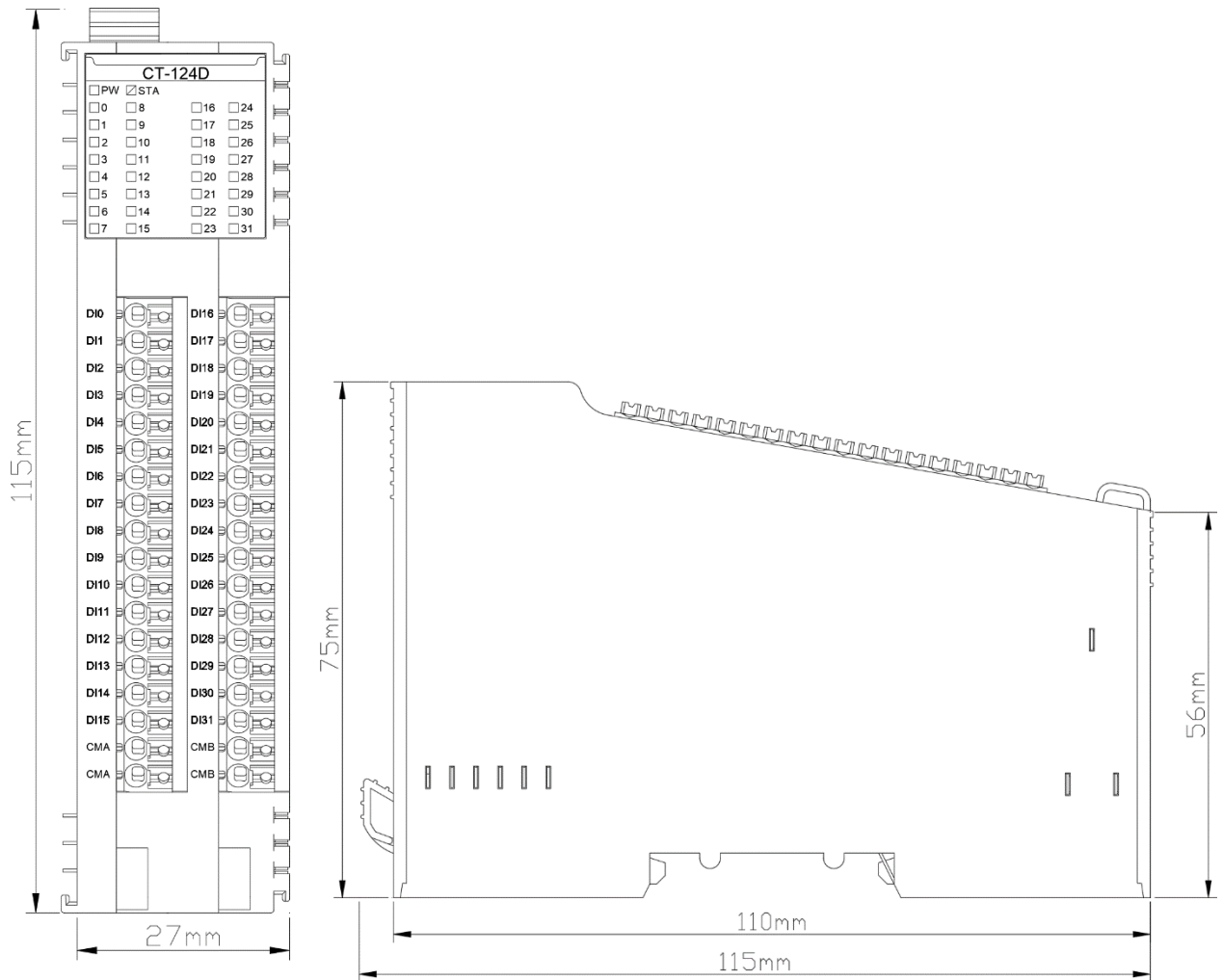
2: Bilateral edge counting

Count Direction Ch# (0-31): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimensional drawing



CT-125F 16 channels digital input/24VDC/ PNP

1 Module features

- ◆The module supports 16 channels digital input, and 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 internal bus and field input of the module is isolated.
- ◆The module supports the input signal holding function, and the holding time could be set.
- ◆The module carries 16 digital input channels with LED indicator on each channel.
- ◆Supports counting function after adding counting sub-module.
- ◆The field power detection function is effective after the onsite power detection submodule is added
- ◆Each input channel of the module supports a 32-bit counter with the counting frequency <200Hz.
- ◆The module could be set the digital signal input filtering time and the byte transmission order of the counter.
- ◆Each channel of the module could be set the counting mode and counting direction independently.
- ◆The module input channel loop power supply requires 24VDC external power supply.

2 Technical parameters

General Parameters	
Power Consumption	Max.63mA@5.0VDC
Isolation	The isolation voltage between the I/O channel and the system power supply: AC500V The isolation voltage between the I/O channel and the field power supply: AC500V Isolation voltage between the I/O channel and PE: AC 500V
Field Power	Nominal:24VDC, Range: 19.2~28.8VDC
Wiring	Max.: AWG 18 Min.: AWG 24
Installation	35mm DIN-Rail
Size	115*14*75mm
Weight	65g
Environment Specification	
Operating Temperature of Vertical Installation	-35°C~50°C
Operating Temperature of Horizontal Installation	-35°C~60°C
Relative Humidity	5~ 95%RH (No Condensation)
Storage Temperature	-40°C~85°C
Storage Humidity	5~ 95%RH (No Condensation)
Manufacturing Test Temperature	-40°C~75°C
Ingress Protection Rating	IP20
Vibration Resistance	Comply with IEC 61131-2 and IEC 60068-2-6
Impact Resistance	Comply with IEC 61131-2 and IEC 60068-2-27
EMC Performance	Comply with IEC 61131-2 and IEC 61000-4
Input Parameters	
Channel Number	16 channels high level input
LED Indicator	16 channels input LED indicator
Input type	IEC 61131-2 Tyepe3
Turn-on Voltage	Min. 11VDC to Max. 30VDC (Relative to 0V terminal)
Turn-off Voltage	Min. -3VDC to Max. 30VDC (Relative to 0V terminal)
Turn-on Current	11VDC 3.953mA
Input impedance	>2.5kΩ
Input Delay	OFF to ON: Max. 1.097ms ON to OFF: Max.781us
Filter Time	Default 10ms
Sample Frequency	500Hz
Counter Frequency	<200Hz

Effective pulse width for counting	2.5ms
------------------------------------	-------

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.

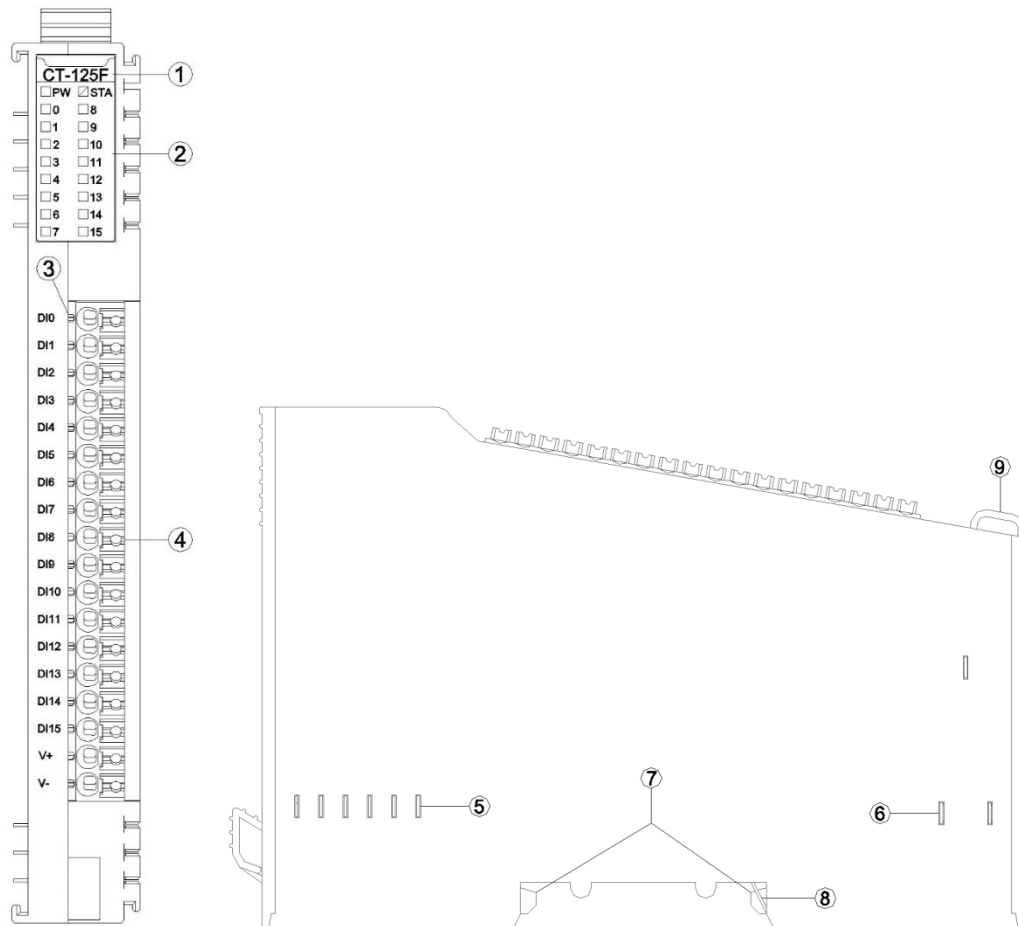
AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

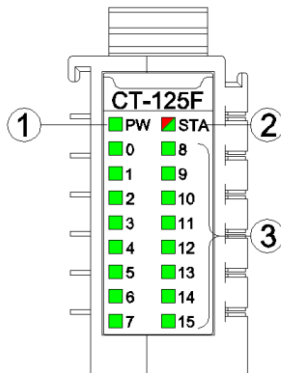
Le fait de ne pas suivre les instructions peut entraîner une défaillance de la protection fournie par l'équipement, ce qui peut entraîner des conséquences graves, comme des blessures ou des dommages à l'équipement.

3 Hardware interfaces



- 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 LED indicator (red/green)
- ③ Input channel LED indicator (green)

PW Power State (GREEN)	Definition
ON	Internal bus Power Normal
OFF	Internal bus Power Failure
STA Module State (RED/GREEN)	Definition
Green slow flash (2.5Hz)	Module internal bus is not started
Red slow flash (2.5Hz)	Module internal bus offline
ON (GREEN)	Operation normal
Flash(2.5Hz) (RED/GREEN)	Upgrading mode
Flash(10Hz) (RED/GREEN)	Firmware Update
Double Flash (RED)	Module Exception has been soft-restarted
0-15 channel indicator light	Definition
ON	Input signal valid
OFF	Input signal 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.

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

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.

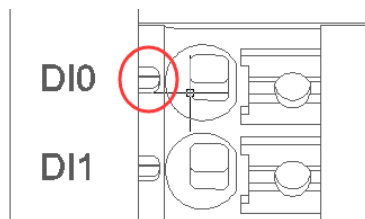
Lorsque le module est alimenté initialement, il y aura 3S pour la connexion de bus de backboard. STA est un état vert permanent après l'initialisation du bus de backboard. Si STA est en état de clignotement vert, cela signifie que l'initialisation du bus de backboard n'est pas passée et doit être redémarrée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

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.

3.2 Field channel LED indicator (Green)



When input signal of input channel is valid, the corresponding field channel LED indicator is on.

3.3 Terminal definition

Terminal Number	Symbol	Description
1	DI0	Signal input
2	DI1	
3	DI2	
4	DI3	
5	DI4	
6	DI5	
7	DI6	
8	DI7	
9	DI8	Signal input
10	DI9	
11	DI10	
12	DI11	
13	DI12	
14	DI13	
15	DI14	
16	DI15	
17	V+	Power input
18	V-	Power input

WARNING

UNEXPECTED EQUIPMENT OPERATION

The DI channel terminal provides reverse protection.

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

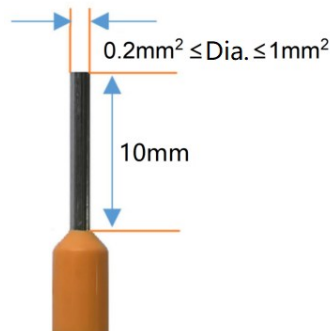
FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

Le terminal de canal d'entrée numérique offre une protection inverse.

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 0.2mm^2 and smaller than 1mm^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 0.2mm^2 and less than or equal to 1mm^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.

! 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 1mm^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.

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.

DANGER

FIRE DANGER

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

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.

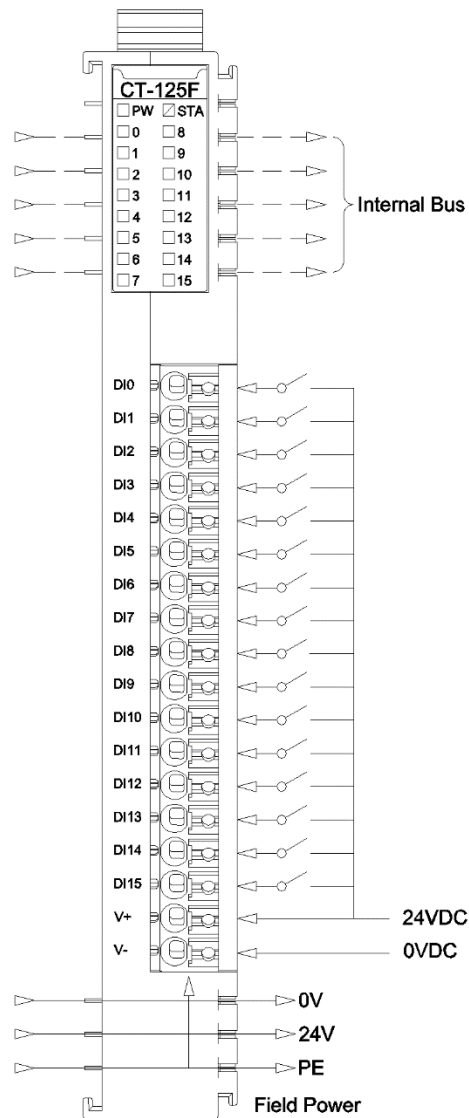
AVERTISSEMENT

FONCTIONNEMENT INATTENDU DE L'EQUIPEMENT

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

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.

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

<16DI Input State> Submodule 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	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 corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: Input signal invalid

1: Input signal valid

<16DI Counter Submodule> Submodule 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	Counter Value Ch#0							
Byte 1								
Byte 2								
Byte 3								
Byte 4	Counter Value Ch#1							
Byte 5								
Byte 6								
Byte 7								
Byte 8	Counter Value Ch#2							
Byte 9								
Byte 10								
Byte 11								
Byte 12	Counter Value Ch#3							
Byte 13								
Byte 14								
Byte 15								
Byte 16	Counter Value Ch#4							
Byte 17								
Byte 18								
Byte 19								
Byte 20	Counter Value Ch#5							
Byte 21								
Byte 22								

Byte 23	Counter Value Ch#6
Byte 24	
Byte 25	
Byte 26	
Byte 27	
Byte 28	Counter Value Ch#7
Byte 29	
Byte 30	
Byte 31	
Byte 32	
Byte 33	Counter Value Ch#8
Byte 34	
Byte 35	
Byte 36	
Byte 37	Counter Value Ch#9
Byte 38	
Byte 39	
Byte 40	
Byte 41	Counter Value Ch#10
Byte 42	
Byte 43	
Byte 44	
Byte 45	Counter Value Ch#11
Byte 46	
Byte 47	
Byte 48	
Byte 49	Counter Value Ch#12
Byte 50	
Byte 51	
Byte 52	
Byte 53	Counter Value Ch#13
Byte 54	
Byte 55	
Byte 56	
Byte 57	Counter Value Ch#14
Byte 58	
Byte 59	
Byte 60	
Byte 61	Counter Value Ch#15
Byte 62	
Byte 63	
Byte 63	

Output data								
Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Byte 0	Counter Reset Ch#7	Counter Reset Ch#6	Counter Reset Ch#5	Counter Reset Ch#4	Counter Reset Ch#3	Counter Reset Ch#2	Counter Reset Ch#1	Counter Reset Ch#0
Byte 1	Counter Reset Ch#15	Counter Reset Ch#14	Counter Reset Ch#13	Counter Reset Ch#12	Counter Reset Ch#11	Counter Reset Ch#10	Counter Reset Ch#9	Counter Reset Ch#8

Data description:

Counter Value Ch#(0-15): Count value, 32-bit unsigned integer, automatically zeroing after overflow.

Counter Reset Ch#(0-15): When the data bit changes from 0 to 1 (rising edge), the input counter of the corresponding channel is cleared.

Note:

A. Count submodules can only be configured in submodule slot 2

B. The maximum counting frequency of the input channel is 200Hz. When the input signal exceeds this frequency, the counting result may be inconsistent with the actual value.

<16DI Field Power Check Submodule> Submodule 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	NULL	NULL	NULL	NULL	NULL	NULL	NULL	DI Ch 0~15

Data description:

DI Ch 0-15: Field power supply detection in the channel. When the corresponding channel input signal is valid, the bit is 1, and when the input is invalid, it is 0.

0: The field power connection is invalid

1: The field power supply is valid

Note: 16-channel field power inspection in submodules can be configured in submodule slot 2 or 3.

6 Configuration parameter definitions

<16DI Input State> Submodule 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	Input Filtering Time(ms)										
Byte 1											
Byte 2	Reserved					Input Holding Time(ms)					
Byte 3	Reserved										
Byte 4											

Data description:

Input Filtering Time(ms): Input filter time of Channel (ms) (Default: 10)

Input Holding Time(ms): Signal input holding time of Channel (ms) (Default:0)

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

<16DI Counter Submodule> Submodule 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				Storage Enable	Storage Function	32Bit Data Format	
Byte 1	Count Mode Ch#3		Count Mode Ch#2		Count Mode Ch#1		Count Mode Ch#0	
Byte 2	Count Mode Ch#7		Count Mode Ch#6		Count Mode Ch#5		Count Mode Ch#4	
Byte 3	Count Mode Ch#11		Count Mode Ch#10		Count Mode Ch#9		Count Mode Ch#8	
Byte 4	Count Mode Ch#15		Count Mode Ch#14		Count Mode Ch#13		Count Mode Ch#12	

Byte 5	Count Direction Ch#7	Count Direction Ch#6	Count Direction Ch#5	Count Direction Ch#4	Count Direction Ch#3	Count Direction Ch#2	Count Direction Ch#1	Count Direction Ch#0
Byte 6	Count Direction Ch#15	Count Direction Ch#14	Count Direction Ch#13	Count Direction Ch#12	Count Direction Ch#11	Count Direction Ch#10	Count Direction Ch#9	Count Direction Ch#8

Data description:

32Bit Data Format: Byte transfer order of Channel count value (Default: 0)

0: AB-CD

1: BA-DC

2: CD-AB

3: DC-BA

Storage Function: Storage Function is supported or not, read only, and this value is the actual value of the module when uploading device parameters.

0: storage is not supported

1: storage is supported

Storage Enable: Storage enable, when the Storage Function enables, the IO module will save the count value in real time to non-volatile memory, and load the last saved count value on the next power on. (Default: 1)

0: Disabled

1: Enable

Count Mode Ch# (0-15): Count mode of the input channel. (Default: 0)

0: rising edge count

1: falling edge count

2: double edge count

Count Direction Ch# (0-15): The counting direction of the input channel. (Default: 0)

0: count up

1: count down

A Dimension drawing

