

# EtherCAT Bus IO Card User Manual

## Preface

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Thank you for choosing the EtherCat IO card from Guangzhou Yanwei Electronic Technology Co., Ltd. We will wholeheartedly provide you with the best service. This manual will mainly introduce the functions, settings, and parameter settings required for the IO card. 1. Operating environment:

- Operating temperature: 0 ~ 60 ℃ · Storage temperature: -20 ~ 80 ℃ · Humidity: 5 ~ 95% non-condensing
2. Do not place the device in the following environment:
- Direct sunlight · Ambient temperature exceeds the specified value · Ambient humidity exceeds the specified value
  - Temperature changes dramatically and condensation may occur · Corrosive or flammable gas · Excessive dust, dirt, or high salt or iron powder · Water, oil, medicine, etc. may splash
  - May transmit vibration or shock directly to the body
3. Avoid using the device in the following places as much as possible, and take corresponding measures when using the device.
- Places where static electricity may cause interference
  - Places where strong electromagnetic fields occur
  - Places where radiation may occur
  - Places where strong electric arcs occur
  - Places where strong current power lines pass nearby
4. Use qualified accessories, such as switches, encoders, etc., and perform correct wiring, otherwise it may cause system operation confusion.
- chaos.
5. Avoid placing heavy objects on the product and avoid dust on it.
6. It is strictly forbidden to modify the product, otherwise there is a risk of product failure and equipment damage.
7. Before the product is put into use in the equipment, it should be programmed and tested first, and it should be officially put into use only after ensuring that the configuration is correct and all components are valid.
8. The trial run should be carried out only after confirming that the equipment is not affected in any way, otherwise it may cause damage to the equipment.
9. Before officially starting, please make sure that the set parameters and accessories are operating normally, otherwise the equipment may be damaged. 10. When the system is in operation, it is absolutely forbidden to place any part of the body or any items related to the body in the operating area of the equipment, otherwise there is a risk of injury.

11. When an error occurs, check and eliminate the cause, and ensure safety before resetting the parameters for operation.

Failure to do so may result in injury or damage to the equipment.



#### Ordering Notes:

#### 1. Quality Assurance

##### (1) Guarantee Period

Our warranty period is 1 year after we deliver the product to you. (2) Warranty Scope If any quality problems

occur during the warranty period, our company will repair the defective product free of charge.

or replacement, the user can replace or request repair at the place of purchase, except for the following circumstances: a Failure caused

by use outside the conditions, environment, and usage methods specified in the product specifications; b Failure caused by

reasons other than our company's products; c Failure caused by

modification or repair not performed by our company; d Failure caused by use not in

accordance with the inherent usage methods of our company's products; e Failures that could

not be discovered at the level of science and technology at the time the product was put into circulation; f Failure caused

by force majeure or other reasons that are not the responsibility of our company. In

addition, the warranty described in this article refers to the warranty of our company's products themselves, and the warranty for the failure of our company's products is not

#### 2. Exclusion of liability (1) Our liability is limited to replacement or repair of our

products if they fail

during the warranty period. In no event shall our liability be for any loss, including special or consequential damages, caused

by our products. (2) When using programmable devices, our company shall not be liable for any consequences caused by

programming not performed by our personnel.

#### 3. Suitable applications and conditions (1) When using our products in combination with other products, customers should

confirm the applicable

standards and relevant laws

and regulations in advance. When using our products in customers' systems, equipment, and devices, customers should

confirm their suitability. We do not assume any responsibility for problems caused by product compatibility. (2) When using our

products in the following situations, please consult with our sales staff in advance, confirm the design

specifications, and when selecting products, leave sufficient margin in terms of specifications and performance, and consider

various safety measures to minimize the risk even if a failure occurs:

a Used outdoors or in situations where there may be potential chemical pollution or electrical

interference; b Used in atomic control equipment, incineration equipment, railways, aviation, medical equipment, safety

facilities and other special equipment that must be

approved by relevant departments; c Used in systems, equipment and devices

that may endanger human life or property; d Other uses similar to a - c above that require high safety and high reliability.

(3) When customers use our products in situations that are closely related to personal and property safety, we should clearly inform users of the overall dangers of the system and take special additional designs to ensure safety. 4. Changes in Design

#### Specifications The design

specifications listed in this product catalog may be changed as needed due to various reasons.

Please confirm the actual design specifications with the sales outlet staff when purchasing. 5.

#### Service Scope

The price of our products does not include the cost of technical personnel dispatch and other service fees.

For technical services, please contact the sales outlets. 6.

#### Applicable scope

The above content is limited to transactions in mainland China. For transactions and usage precautions in other regions and overseas, please consult with the staff of the local sales outlets.

#### 7. Regarding the overseas

use of this product, if it contains export goods (or technologies) that require a license as stipulated in the foreign exchange and international trade management law, please apply for a license and go through the relevant procedures for export (or provide this product to

foreign citizens). 9. The company reserves the right to revise this manual. The revision and update of the manual will be published on the company website without prior notice. Please pay attention to our website for details.

10. Last revised date: 20191108



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## 1 Description

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EtherCAT IO card is an IO card based on EtherCAT bus communication.

Communicate with IO card, network port (OUT) can be connected with other EtherCAT slave devices.

### 1.1 Hardware Resources

1. 2 Ecat bus network interfaces.

2. 16 switch outputs. 3.

16 switch inputs. 4. 2

analog inputs. 5. 2

analog outputs. 6. 2

PWM outputs. 7. 1

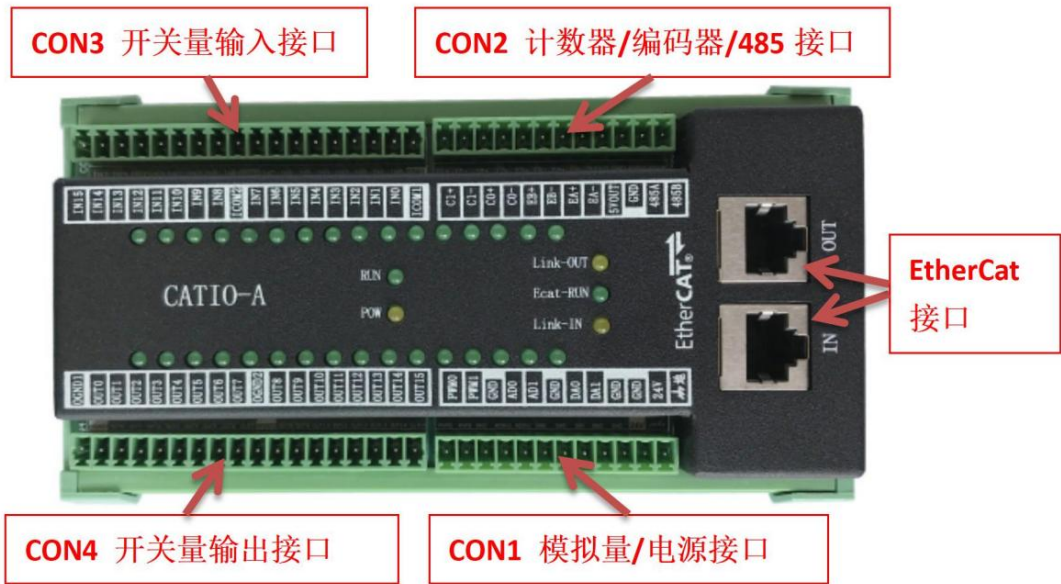
encoder interface. 8. 2

counter interfaces. 9.

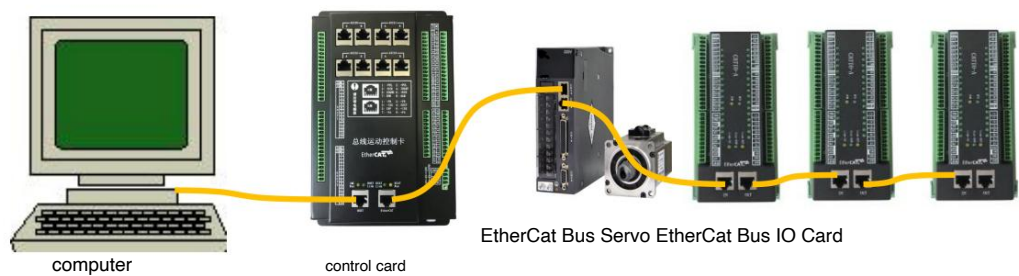
1 485 serial port.

2 Interface Layout

The overall layout of the IO card is shown in the figure:

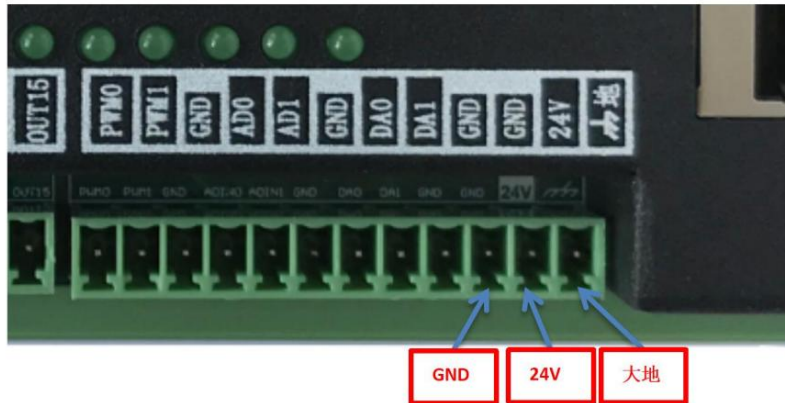


Wiring diagram:



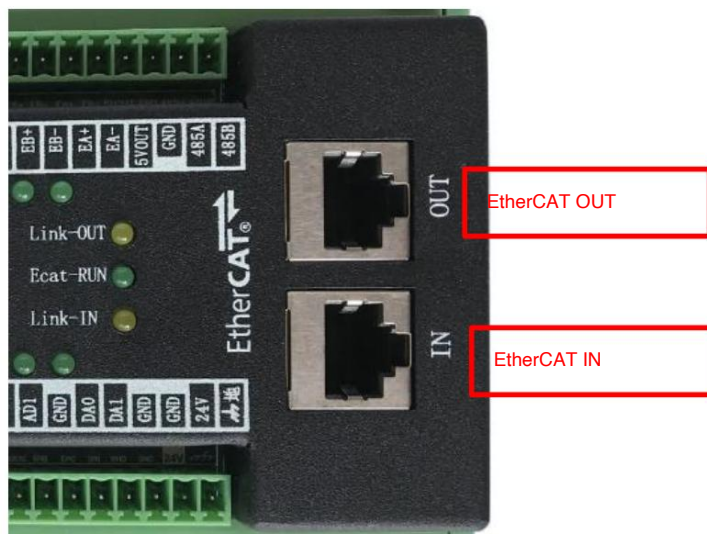
## 2.1 Power Interface

The power input of the IO card is located at the CON1 terminal, as shown in the figure below, where from the right are the ground, 24V, and GND:



## 2.2 EtherCat interface

The EtherCAT interface is shown in the figure, and the link indicators correspond to Link-IN and Link-OUT respectively.



The communication indicator light Ecat-RUN can indicate the EtherCat communication status:

Long off: INIT state Fast

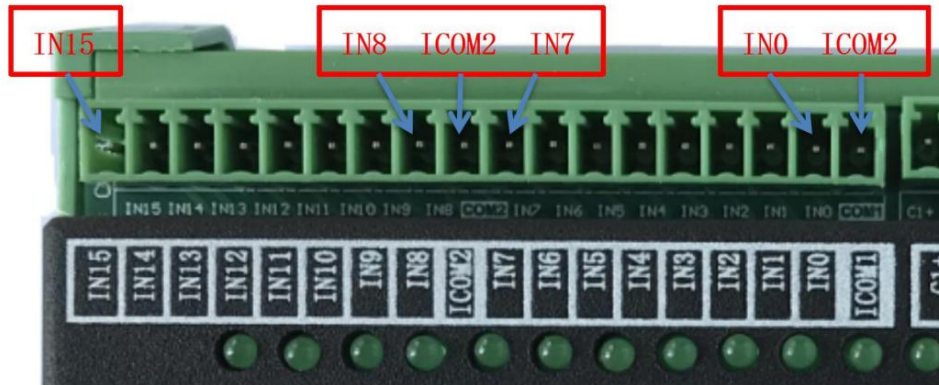
flashing: Pre-OP state Slow

flashing: Safe-OP state Long

on: OP state

## 2.3 Switching input

Provides 16 switch input interfaces, divided into 2 groups, one group IN0 ~ IN7 share a common input terminal ICOM1, the other group IN8 ~ IN15 share another common input terminal ICOM2. ICOM1, ICOM2 are connected to 24V. As shown in the figure:



Each interface has an LED light to show whether the switch is open or closed.

The wiring scheme is shown in "Figure 2-1 Wiring scheme for switch input interface":

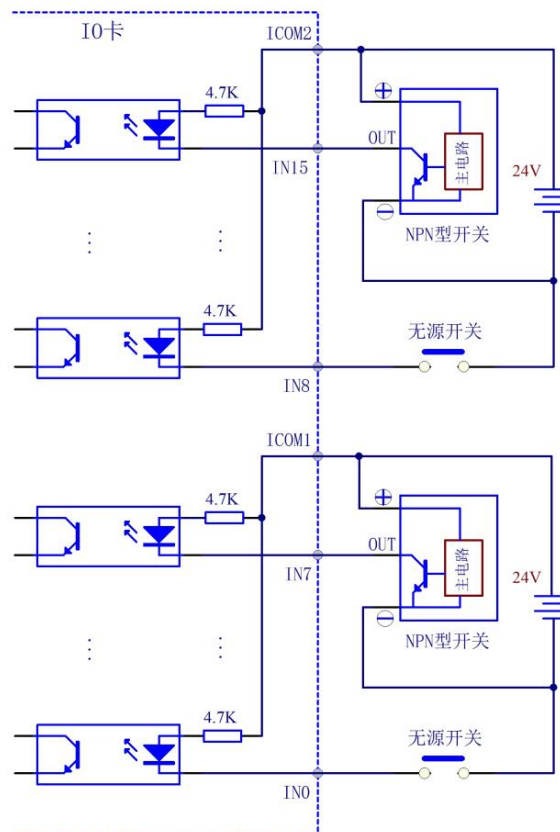
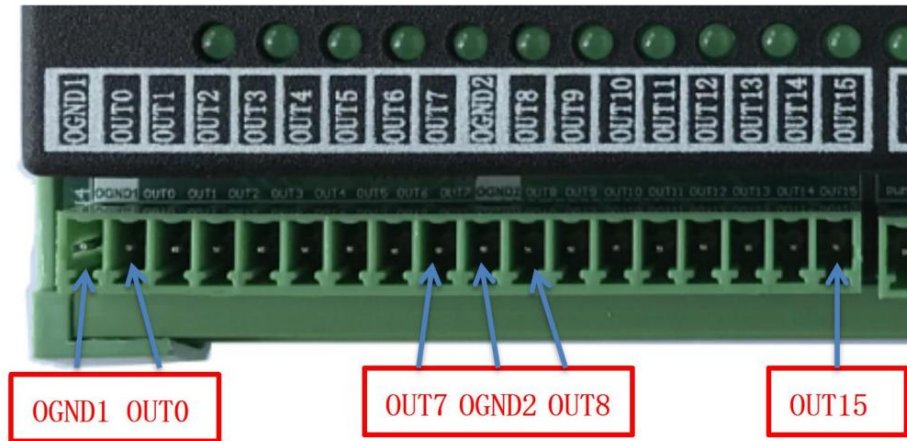


Figure 2-1 Switch input interface wiring scheme

## 2.4 Switching output

Provides 16 switch output interfaces, divided into 2 groups, one group of OUT0 ~ OUT7 share an output common

The other group of OUT8 ~ OUT15 share another output common terminal OGND2, as shown in the figure:



Each interface has an LED light to show whether the output is open or closed. The

maximum input current of each output cannot exceed 1A. To extend the life, it is recommended to be less than 500mA.

If a larger power load is used, please use a relay or other transfer circuit. The 24V power supply of the relay and other peripheral devices in "Figure 2-2 Wiring scheme of switch output interface" can share a set of power supply with the control card, or use an independent power supply (with stronger anti-interference performance).

The wiring scheme is shown in "Figure 2-2 Switching output interface wiring scheme":



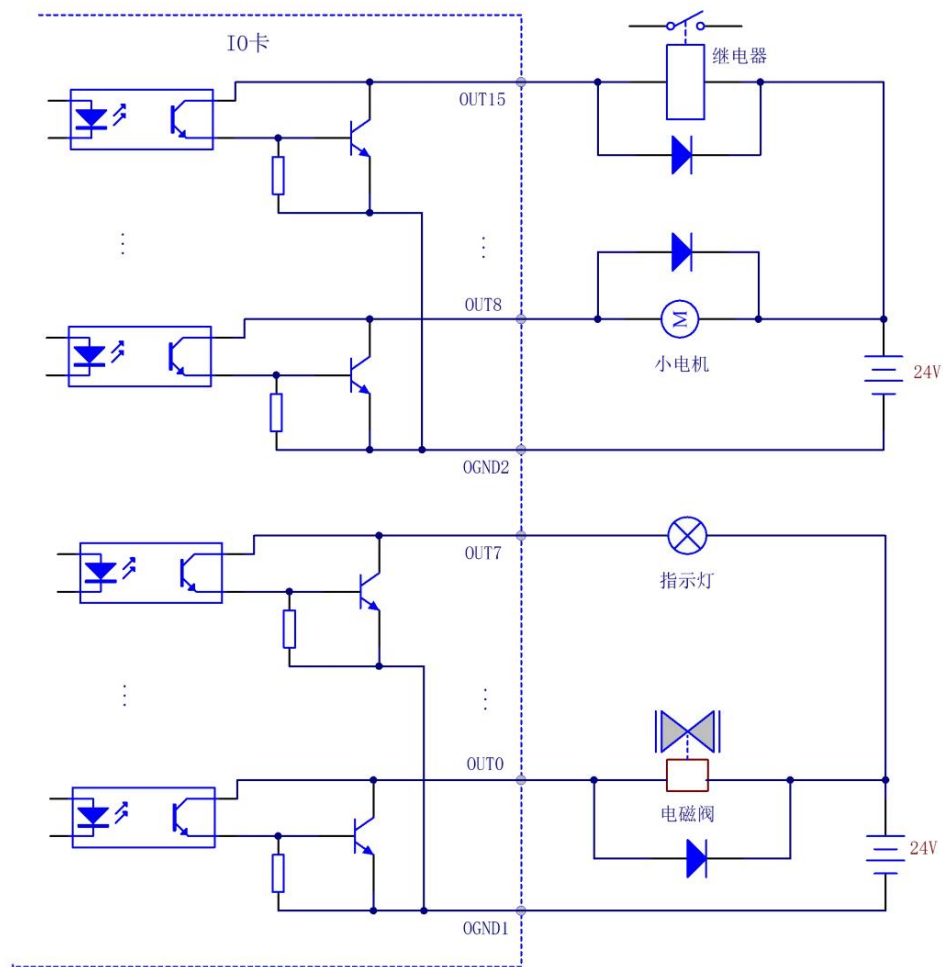
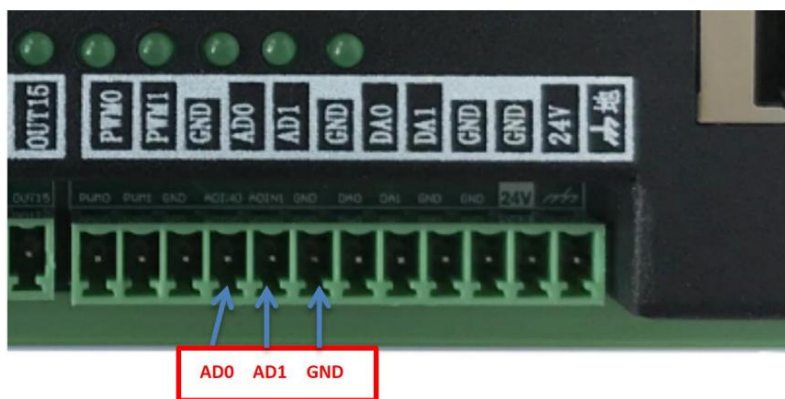


Figure 2-2 Switching output interface wiring scheme

## 2.5 Analog Input

Provides 2 analog inputs at the CON1 terminal, as shown in the figure, and the input voltage range is 0 ~ 10V.



The wiring scheme is shown in "Figure 2-3 Analog input interface wiring scheme"

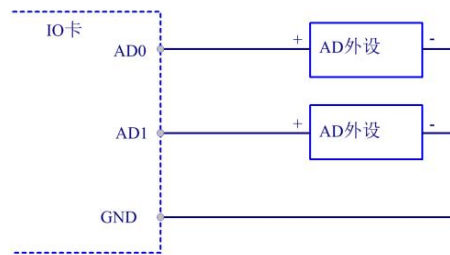
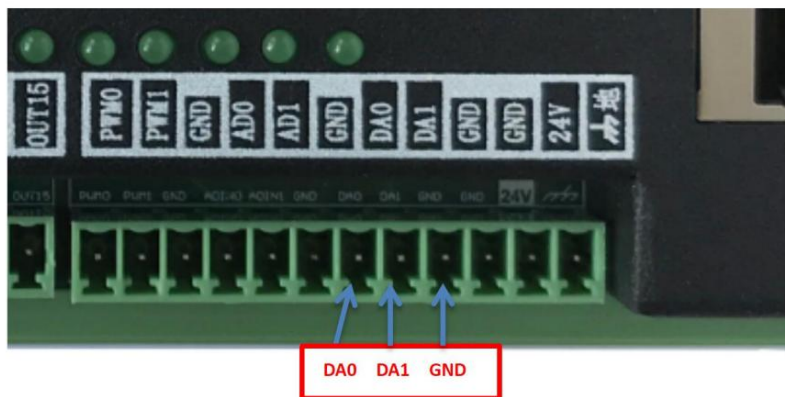


Figure 2-3 Analog input interface wiring scheme

## 2.6 Analog output

Provides 2 analog outputs at the CON1 terminal, as shown in the figure, and the output voltage range is 0 ~ 10V.



The wiring scheme is shown in "Figure 2-4 Analog output interface wiring scheme".

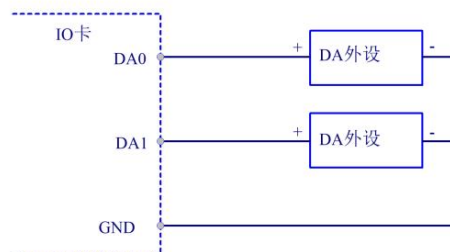
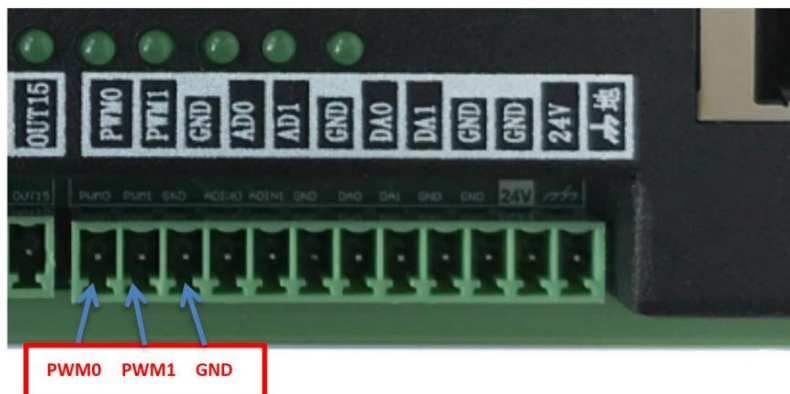


Figure 2-4 Analog output interface wiring scheme

## 2.7 PWM

Provides 2 PWM outputs at the CON1 terminal, as shown in the figure. PWM output is TTL level (5V), maximum frequency 65K, can set the effective level of PWM.



The wiring scheme is shown in "Figure 2-5 PWM output interface wiring scheme".

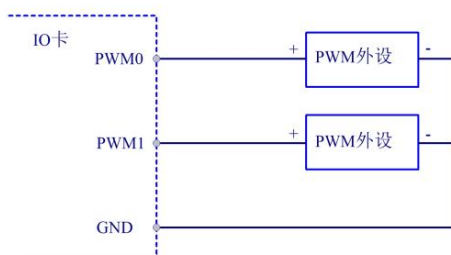
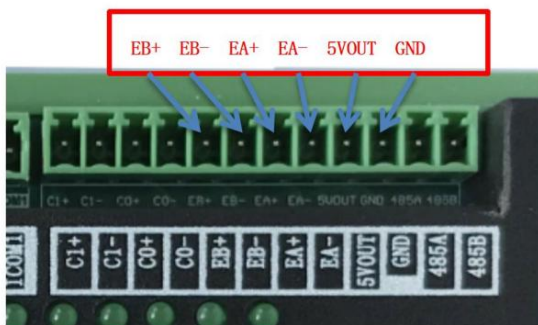


Figure 2-5 PWM output interface wiring scheme

## 2.8 Encoder

Provides an encoder interface at the CON2 terminal, as shown in the figure. The encoder counts 32 bits.

1. It can be used to connect peripherals such as electronic handwheels and grating rulers. This interface can receive EIA/TIA-422-B or EIA/TIA-423-B standard differential signals, such as differential signals driven by devices such as MC3487 or AM26LS31. EA+ and EA- are the positive and negative ends of the differential signal pair of phase A, respectively, and EB+ and EB- are the differential signal pair of phase B. If the handwheel outputs a single-ended signal, it is only necessary to connect the output of each phase of the electronic handwheel to the negative end of each differential pair (EA-, EB-), and connect the VCC of the electronic handwheel to the positive end of the differential pair.



Only supports 5V level output electronic handwheel, if it is 12V or 24V level output

The sub-handwheel needs to be level-converted before connecting to this interface.

The wiring scheme is shown in "Figure 2-6 Encoder differential connection scheme" and "Figure 2-7 Encoder single-ended connection scheme":

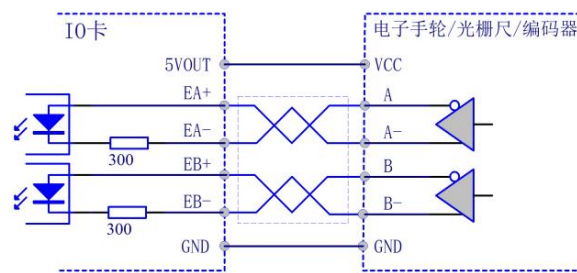


Figure 2-6 Encoder differential connection scheme

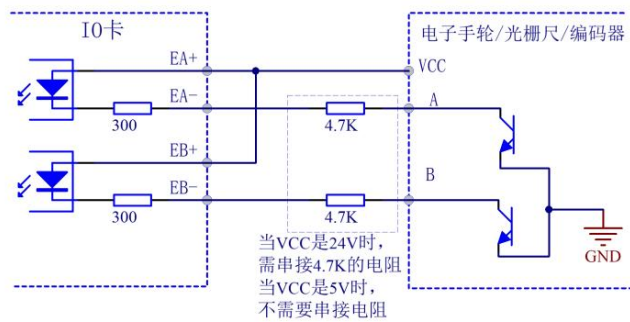
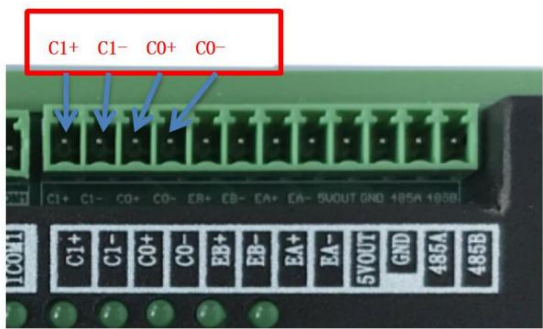


Figure 2-7 Encoder single-ended connection scheme

## 2.9 Counter

Provides 2 counter interfaces at the CON2 terminal, as shown in the figure. The effective level of the input can be set (valid edge), and count the valid input signal (increment or decrement), the counter has 32 bits, The frequency can reach 4M.



Only supports 5V level output peripherals. If it is a 12V or 24V level output peripheral, It is necessary to perform level conversion before connecting to this interface. The wiring scheme is shown in "Figure 2-8 Counter Interface Wiring Scheme".

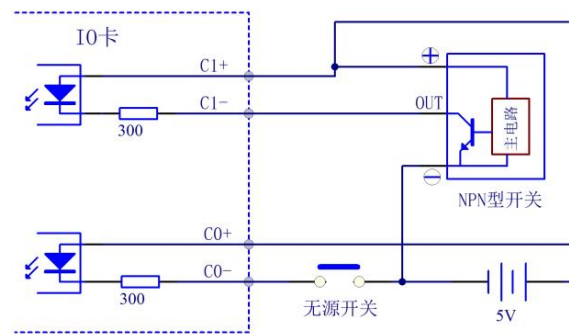


Figure 2- 8 Counter interface wiring scheme

## 2.10 485 Serial Port

Provides one 485 serial port, on the CON2 terminal, as shown in the figure.

