GCAN-5032

EtherCAT Remote I/O Module

User Manual



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Revision History

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1. Function Overview

1.1 General Description

The GCAN-5032 EtherCAT remote I/O module is a high-performance, general-purpose bus remote I/O module independently developed by our company based on the EtherCAT bus. It saves costs, simplifies wiring and improves system reliability. The system has 16 DI channels and 16 DO channels (outputs are PNP transistor type by default, NPN type optional; inputs can be switched between source and sink type by wiring). With the GCAN-5032 module, users can acquire digital input signals and output digital signals; this series of I/O is particularly suitable for centralized control with a large number of field points and signal types.

Information in the process image area of the GCAN-5032 remote I/O module is displayed in byte-array format.

The GCAN-5032 remote I/O module supports automatic configuration; there is no need to set parameters on a PC. The power supply and bus interface of the module integrate isolation protection to prevent damage from transient overvoltage or overcurrent. The DIN-rail mounting design makes it easier to integrate into various control cabinets.

1.2 Features

- Two EtherCAT bus interfaces: EtherCAT/IN and EtherCAT/OUT (RJ45).
- Bus transmission rate: 100 Mbps.
- Bus transmission distance (station-to-station interval): 100 m.
- Power supply: 24 V DC (-15%/+20%).
- Electrical isolation: 1500 V DC.
- Number of digital input channels: 16.
- Number of digital output channels: 16.
- Digital input/output channels: inputs can be switched between source and sink type by wiring; outputs are PNP transistor outputs by default, NPN outputs optional.
- Digital input ON signal: voltage >= 9 V DC; input OFF signal: voltage <= 5 V DC.
- PNP source-type digital output voltage is the IO operating voltage 24 V, with a maximum output current of 500 mA (single channel) and 300 mA (simultaneous output).
- NPN sink-type digital output voltage is the IO operating voltage 24 V, with a maximum output current of 500 mA (single channel) and 280 mA (simultaneous output).
- EMC immunity support: module power supply channel.
- Module power supply channel: electrostatic contact discharge +/-4 kV, electrostatic air discharge +/-8 kV, electrical fast transient burst +/-2 kV, lightning (surge) +/-1 kV.
- Operating temperature range: -40 °C ~ +85 °C.
- Dimensions: length 115 mm x width 100 mm x height 58 mm.

1.3 Typical Applications

- Connect to distributed bus terminal modules to form a complete control node.
- Perform data acquisition and transmit data using the EtherCAT protocol.

2. Device Installation and Usage

This chapter describes in detail the installation method, wiring method, and the meanings of the indicators and interfaces of the GCAN-5032 EtherCAT remote I/O module.

2.1 Device Appearance and Dimensions

The appearance of the GCAN-5032 is shown in Figure 2.1, with dimensions of (length) 115 mm x (width) 100 mm x (height) 58 mm. The device contains two EtherCAT communication interfaces, one USB Type-C interface, one power interface, two sets of I/O power interfaces (internally shorted), and four DI COM interfaces. The USB interface can be used to upgrade the firmware.

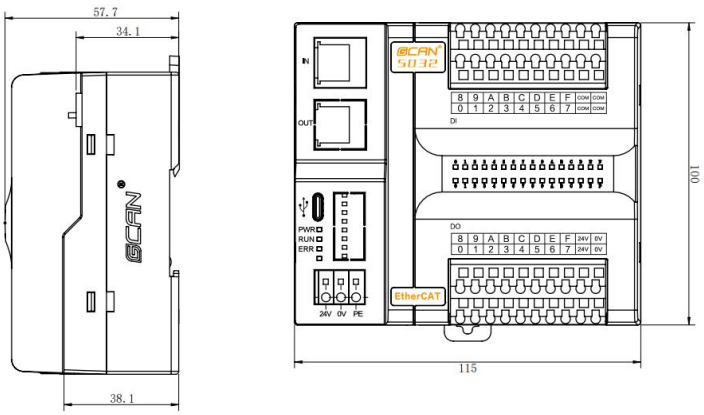

Figure 2.1 GCAN-5032 module outline dimensions

2.2 Installation and Removal

To install the module: first pull out the DIN-rail latch at the bottom of the module with a flat-head screwdriver; then hang the module on the DIN rail and push the bottom latch back in with the screwdriver to lock it, as shown in the figure below.

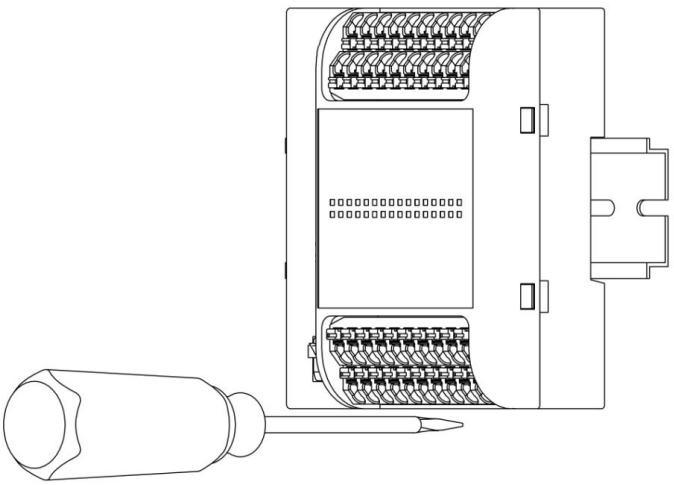

Figure 2.2 GCAN-5032 EtherCAT module installation

To remove the module: first pull out the bottom DIN-rail latch with a flat-head screwdriver; then pull the module outward to form an angle with the DIN rail, and the module can be pulled upward, as shown in the figure below.

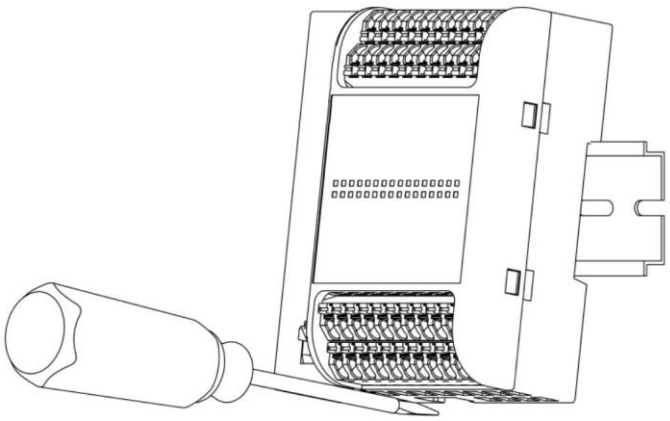

Figure 2.3 GCAN-5032 EtherCAT module removal

2.3 Interface Definitions and Functions

The GCAN-5032 module integrates two EtherCAT communication interfaces, one USB Type-C interface, one power interface, two sets of I/O power interfaces (internally shorted), and four DI COM interfaces. The positions of the EtherCAT communication interfaces and power interface of the GCAN-5032 module are shown in Figure 2.4; the power interface definition is listed in Table 2.1.

The EtherCAT interface and power interface positions are shown below.

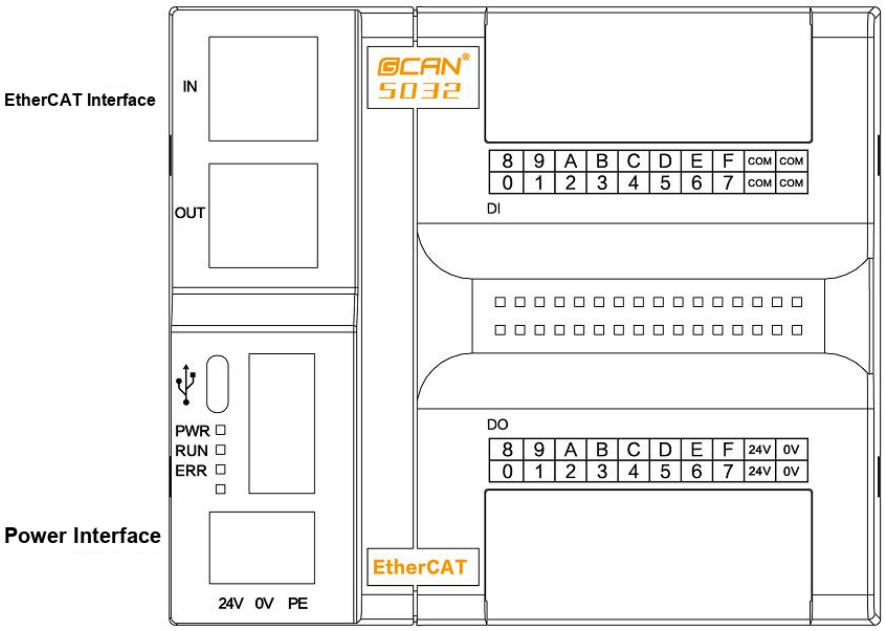

Figure 2.4 EtherCAT interface and power interface positions

Table 2.1 Power interface definition

Pin (left to right)	Port	Name	Function
1	Power	24V	24 V DC power positive
2		0V	24 V DC power negative
3		PE	PE

2.3.1 DO Interface Definition and Wiring

The main control module of the GCAN-5032 has four rows of terminal blocks on the top and bottom. The lower two rows are DO terminal blocks, namely DO0~DO7 and DO8~DOF, a total of 16 digital output points, together with two groups of IO power inputs (the IO working power is isolated from the system power, the power supplies are internally shorted, and the IO module requires one group of power supply to work normally), as shown in the figure. The serial numbers and meanings of each terminal are listed in Table 2.2.

DO

8	9	A	B	C	D	E	F	24V	0V
0	1	2	3	4	5	6	7	24V	0V

Table 2.2 GCAN-5032 EtherCAT remote I/O module DO and IO power terminal definitions

DO terminal no.	Meaning	DO terminal no.	Meaning
0	DO0	8	DO0
1	DO1	9	DO1
2	DO2	A	DO2
3	DO3	B	DO3
4	DO4	C	DO4
5	DO5	D	DO5
6	DO6	E	DO6
7	DO7	F	DO7
24V	IO working power input +24 V	24V	IO working power input +24 V
0V	IO working power input 0 V	0V	IO working power input 0 V

There are two wiring methods for the DO terminal block:

1. Transistor PNP output wiring, as shown in the figure below.

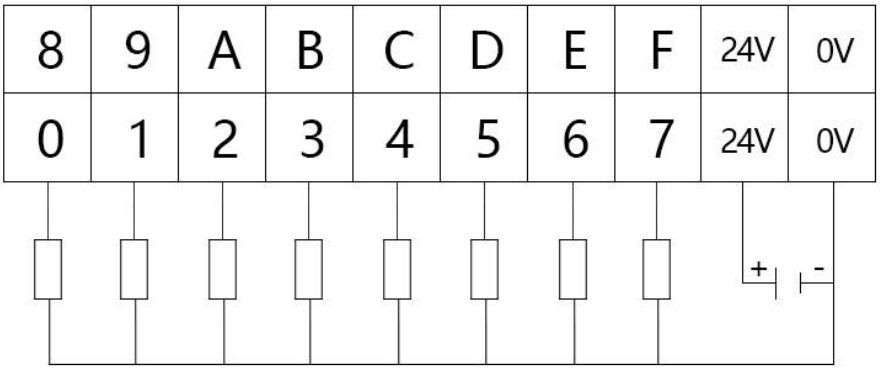

Figure 2.5 GCAN-5032 transistor PNP output (channels 0-7) wiring

2. Transistor NPN output wiring, as shown in the figure below.

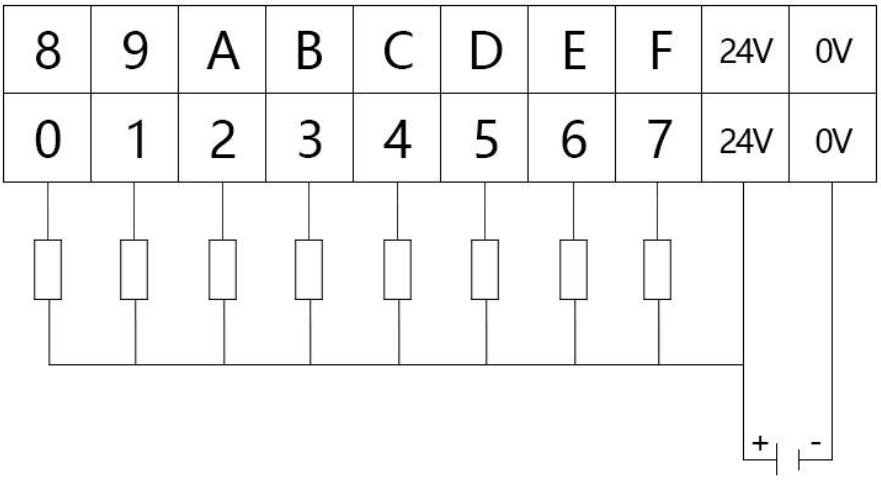

Figure 2.6 GCAN-5032 transistor NPN output (channels 0-7) wiring

2.3.2 DI Interface Definition and Wiring

The upper two rows are DI terminal blocks, namely DI0~DI7 and DI8~DIF, a total of 16 digital input points, together with four DI COM interfaces (any one of the four COM ports can be connected), as shown in the figure. The serial numbers and meanings of each terminal are listed in Table 2.3.

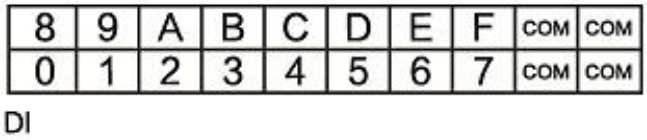

Table 2.3 GCAN-5032 EtherCAT remote I/O module DI terminal definitions

DI terminal no.	Meaning	DI terminal no.	Meaning
0	DI0	8	DI0
1	DI1	9	DI1
2	DI2	A	DI2
3	DI3	B	DI3
4	DI4	C	DI4
5	DI5	D	DI5
6	DI6	E	DI6
7	DI7	F	DI7
COM	DI common terminal COM	COM	DI common terminal COM
COM	DI common terminal COM	24V	DI common terminal COM
		0V	DI common terminal COM

There are two wiring methods for the DI terminal block:

1. Sink-type input wiring, as shown in the figure below.

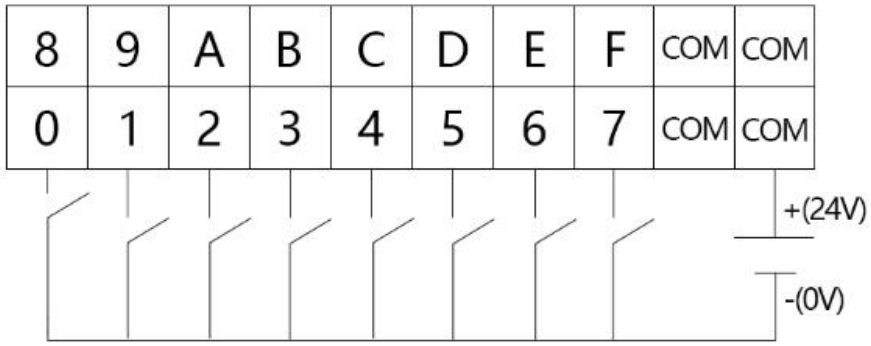

Figure 2.7 GCAN-5032 sink input (channels 0-7) wiring

2. Source-type input wiring, as shown in the figure below.

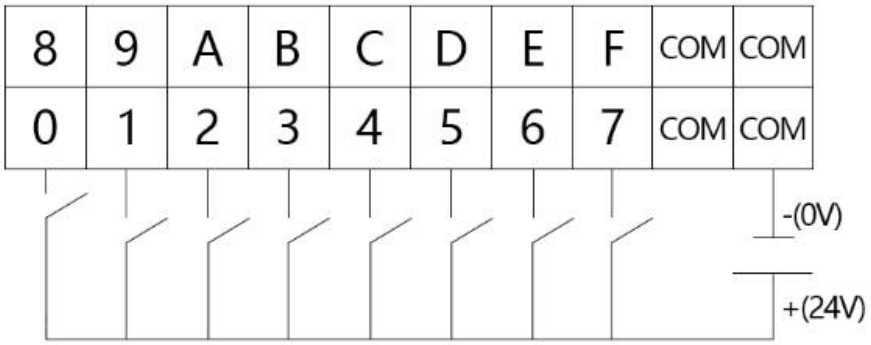

Figure 2.8 GCAN-5032 source input (channels 0-7) wiring

2.4 System Status Indicators and IO Indicators

The GCAN-5032 EtherCAT remote I/O module has two groups of indicators: system status indicators and IO indicators. The system status indicators include one PWR indicator, one RUN indicator and one ERR indicator to show the operating status of the device.

Table 2.4 GCAN-5032 EtherCAT remote I/O module indicators

Indicator	Color	Indication
PWR	Green	Power indication
RUN	Green	Connection indication
ERR	Red	Error indication

Table 2.5 GCAN-5032 EtherCAT remote I/O module indicator status

Indicator	Status	Indication
PWR	Steady on	Power supply normal
	Off	Power supply abnormal
RUN	Blinking	Connected to master normally
	Off	Not connected to the master or connection abnormal
ERR	Blinking	Not connected to the master or connection abnormal
	Off	Running normally

The IO indicators are used to indicate the IO operating status of the device.

Indicator	Color	Status	Indication
DI	Green	Off	No input on the corresponding DI
		On	Input present on the corresponding DI
DO	Green	Off	No output on the corresponding DO
		On	Output present on the corresponding DO

3. Communication Connection

The GCAN-5032 EtherCAT remote I/O module uses an Ethernet CAT5 cable (Category 5 twisted pair) to connect to the EtherCAT master and other slave devices. The GCAN-5032 EtherCAT remote I/O module is equipped with two RJ45 interfaces, allowing users to conveniently insert the GCAN-5032 EtherCAT remote I/O module into the EtherCAT bus.

The connection between the GCAN-5032 EtherCAT remote I/O module and an EtherCAT controller is shown in the figure below.

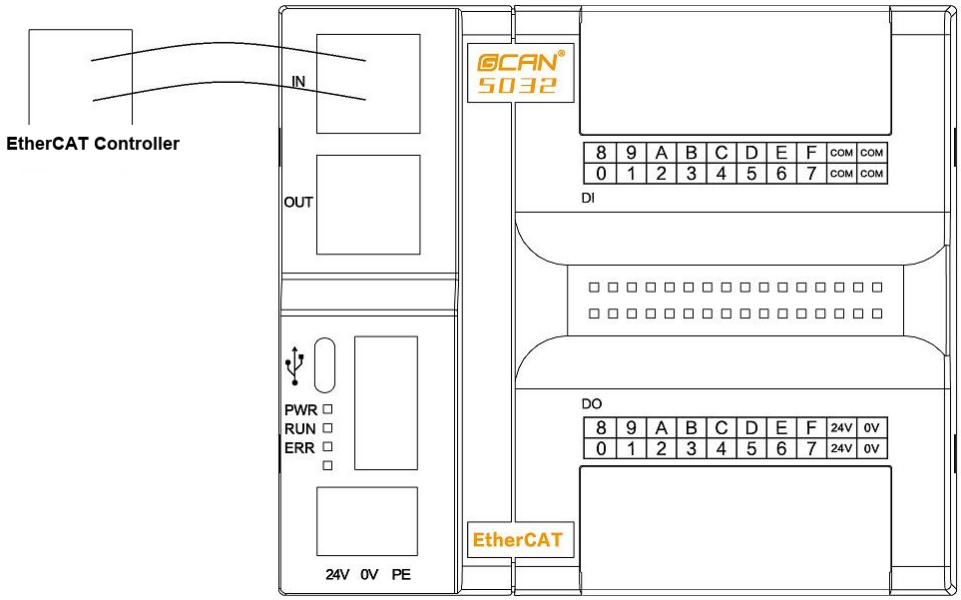

Figure 3.1 GCAN-5032 connected to an EtherCAT controller

The data flow of the GCAN-5032 EtherCAT remote I/O module connected to the bus is shown in the figure below.

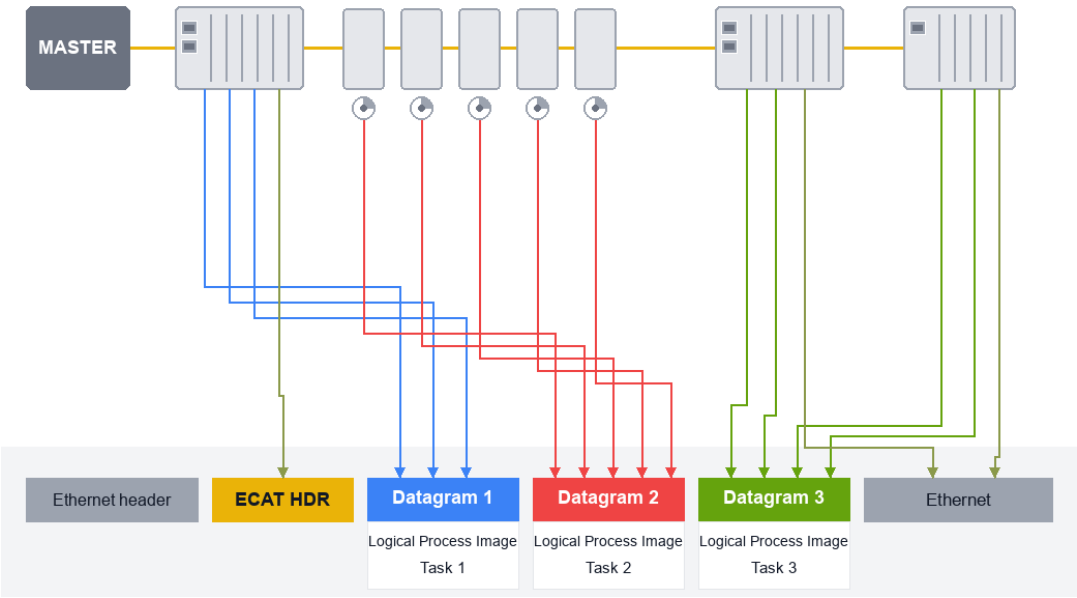

Figure 3.2 GCAN-5032 connected to the bus data flow

4. Technical Specifications

Category	Item	Specification
Connection	Power/IO interface	Spring push-in screwless terminal block
Interface features	Connection	2 x RJ45
	Transmission medium	Ethernet CAT5 cable
	Transmission distance	100 m station-to-station interval
	Transmission rate	100 Mb/s
Technical parameters	Supply voltage	24 V DC (-15%/+20%)
	Input current	60 mA + (total GC-bus current) / max. 1 A (IO independently powered, max. at 24 V)

	Startup current	Approx. 1.5 times the continuous current
	Electrical isolation	1500 V DC
Environmental	Operating temperature	-40 °C ~ +85 °C
	Operating humidity	95% RH, non-condensing
	EMC test	GB/T 9254.2-2021
	Vibration/shock resistance	EN 60068-2-6 / EN 60068-2-27/29
	EM immunity/emission	EN 61000-6-2 / EN 61000-6-4
	Protection class	IP 20
General	Outline dimensions	115 mm x 100 mm x 58 mm
	Weight	230 g

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