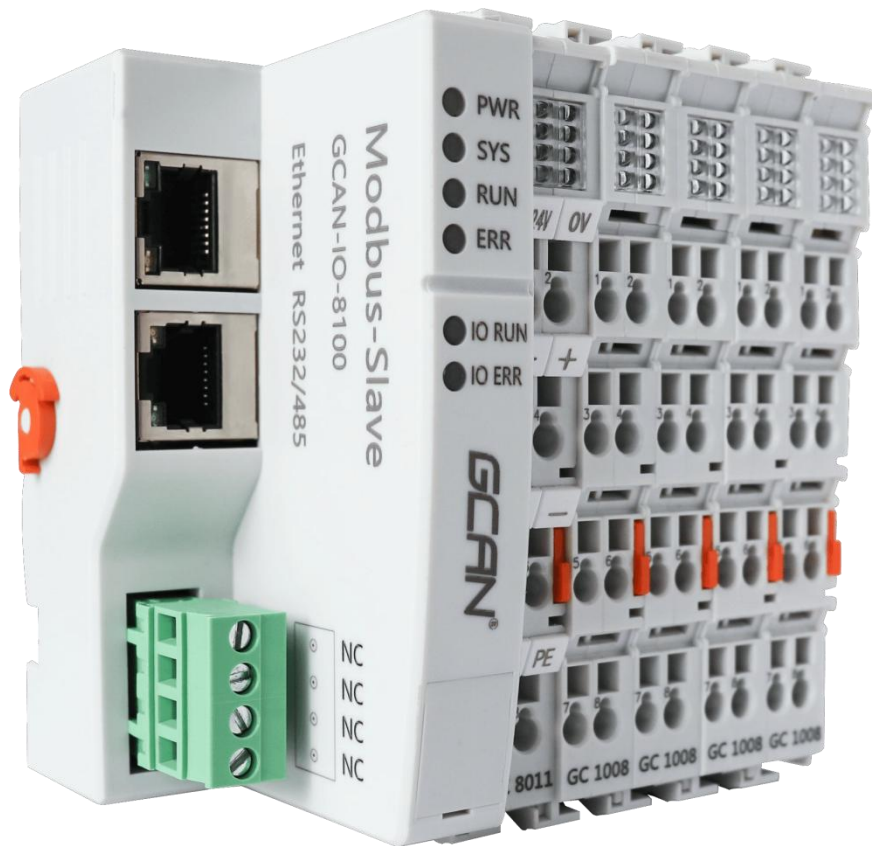


GCAN-IO-8100

Modbus I/O coupler

User manual



Document version V4.01 (2021/07/16)

Revision History:

Version	Date	Reason
V1.00	2015/10/16	Create
V2.01	2015/12/20	Fixed working parameters
V3.01	2017/11/22	Add parameters
V3.02	2018/01/22	Add protocol
V4.00	2021/03/25	Modify product appearance
V4.01	2021/07/16	Modify product appearance

Contents

1. Introduction	4
1.1 Overview	4
1.2 Performance	4
1.3 typical application	5
2. Installation and usage	6
2.1 Fixed module	6
2.2 Wiring method	7
2.3 System status indicator	8
2.4 Interface definition	10
3. Communication connection	11
3.1 Serial connection	11
3.2 Ethernet connection	11
4. Communication example	12
4.1 Equipped with GC-1008module	13
4.2 Equipped with GC-2008module	13
4.3 Equipped with GC-3804 module	14
4.4 Equipped with multiplemodules	16
5. Module selection table	17
6. Technical specifications	19
Sales and service	20

1. Introduction

1.1 Overview

GCAN-8100 Modbus I/O Coupler can be used to connect Modbus system and distributed bus terminal module, and these terminal modules can be expanded in a modular way. A complete node consists of a bus coupler, 1-32 arbitrary number of terminal modules and a terminal module

GCAN-8100 Modbus Bus Coupler uses standard Modbus protocol, a standard slave station. The GCAN-8100 Bus Coupler has two kinds of style, GCAN-8100-TCP supports Modbus TCP communication, GCAN-8100-RTU supports Modbus RTU communication. Besides, the firmware can be upgraded by configuring the interface.

GCAN-8100 Bus Coupler supports automatic configuration, and you do not need to set parameters on the PC. When GCAN-8100 bus coupler uses Modbus RTU communication, communication parameters can be configured by RS485 interface; When uses Modbus TCP communication, communication parameters can be configured by Ethernet interface

1.2 Performance

- Support standard Modbus protocol, a standard Modbus slave station
- Support Modbus TCP, Modbus RTU communication (corresponding to two kinds of style)
- RS485 interface adopts standard two-wires system
- Serial interface baud rate supports 600bps~115200bps, configured by serial interface
- The maximum number of bus terminals module is 32
- Configuration mode is automatic configuration, expanded freely
- Ethernet interface supports static or dynamic IP acquisition
- Ethernet interface supports heartbeat and timeout disconnection
- Ethernet work interface is fixed, target IP and target interface can be set
- Automatic restoration of connection resources after the Ethernet interface is disconnected, and reliable establishment of TCP connections
- Ethernet interface is compatible with the SOCKET working mode (TCP Server, TCP Client, UDP, etc.). The upper computer communication software complies with the standard SOCKET rules.

- Supply power: 24V DC(-15%/+20%)
- Input current, 70mA+ (total GC-bus current), maximum4500mA
- Starting current: about 2.5 times continuous current
- Power contacts: maximum 24V DC/maximum10A
- Electrical isolation: 1000 Vrms (power contact/bus coupled power voltage)
- Working temperature: -40.00°C~85.00°C
- Standard DIN rail, designed for industrial design
- Dimensions: 100mm(L) * 69mm(W) * 48mm(H)

1.3 Typical application

- Connect with the distributed bus terminal module to form a complete control node
- Perform data acquisition and data transmission with Modbus protocol.

2. Installation and usage

This chapter introduces the method installation and wiring, the meaning of the indicator and the interface.

2.1 Fixed module

The installation method of GCAN-8100 Modbus bus Coupler is shown in **Figure 2.1**

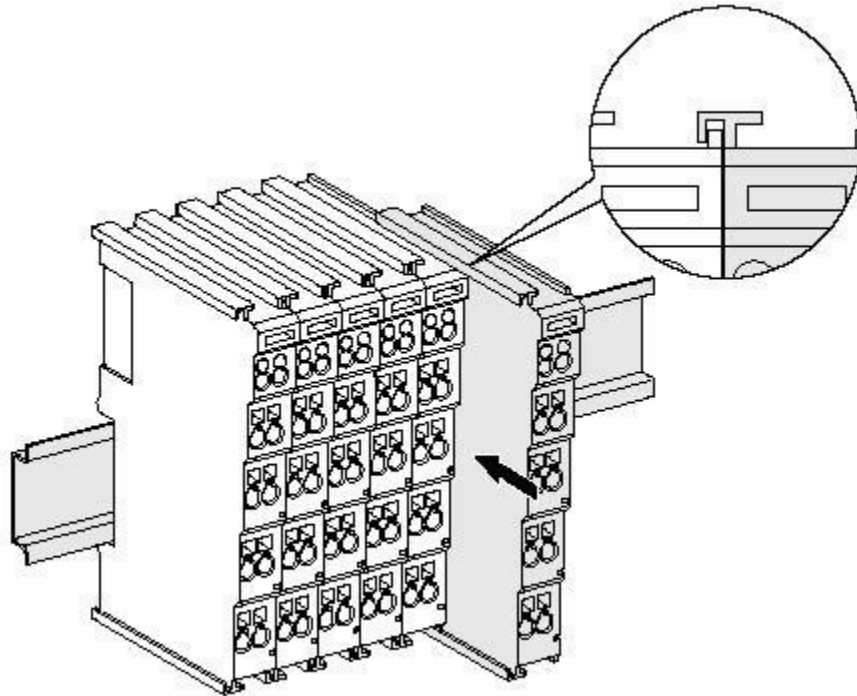


Figure 2.1 GCAN-8100 module installation

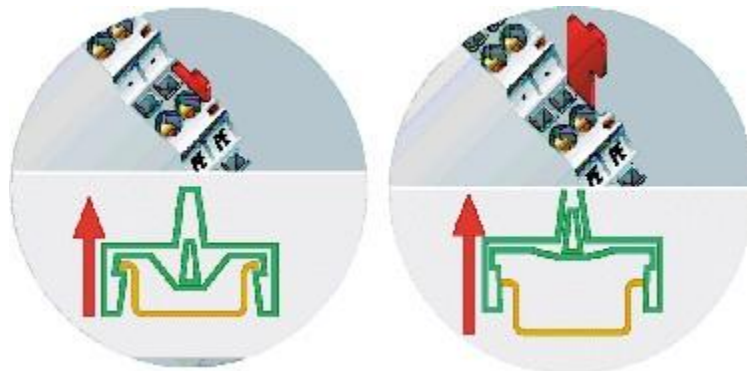


Figure 2.2 GCAN-8100 module self-locking mechanism

As shown **figure 2.1**, install the GCAN-8100 Modbus Bus Coupler on the guide rail until the lock is stuck. The GCAN-8100 Modbus Bus Coupler has a self-locking mechanism that can effectively prevent equipment from falling. As shown **figure 2.2**, you can release the self-locking mechanism by pulling out the orange label

The GCAN-8100 Modbus Bus Coupler can connect up to 32 distributed bus terminal modules. When inserting bus terminal module, be sure to insert it along the groove on the right side of the existing module sequentially until the lock is stuck. At the right end of the entire node, you need to install terminal module. The terminal will guarantee the data transmission and power supply of the GC-Bus.

When you assemble the nodes correctly, there is no obvious gap between the terminal modules. If the modules are not assembled correctly, the entire node will not operate normally.

2.2 Wiring method

The power wiring as shown in [figure 2.3](#). First, use a flat-blade screwdriver to insert into the square hole, hold the top edge of the metal sheet in the square hole, and press toward the hole. Then, insert the wire into the hole. After plugging in, pull out the screwdriver and the wire can be firmly locked in the hole.

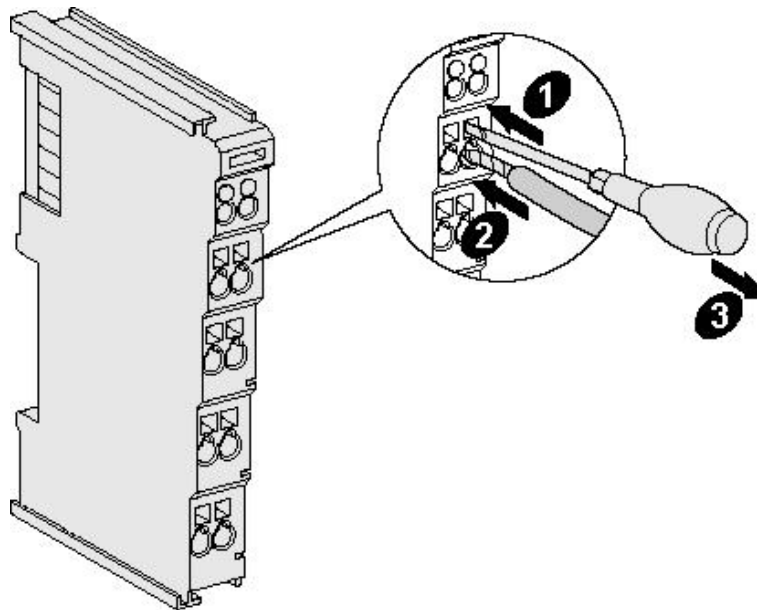


Figure 2.3 GCAN-8100 module installation



Figure 2.4 GCAN-IO-8100 module wiring terminal block

The wiring terminal block of the GCAN-8100 Modbus Bus Coupler is shown in **Figure 2.4**, including 8 terminals. The number corresponding to each terminal and its meaning are shown in **Table 2.1**.

Note: connecting between terminal 3 and terminal 4, terminal 5 and terminal 6, terminal 7 and terminal 8 inside the module.

Terminal	Number	Definition
24V	1	Input 24V power
0V	2	GND power
+	3	IO positive power
+	4	IO positive power
-	5	IO negative power
-	6	IO negative power
PE	7	shield
PE	8	shield

Table 2.1 GCAN-8100 module, wiring terminal definition

2.3 System status indicator

GCAN-8100 Modbus bus Coupler has two sets of status indicators, contains 6 circular status indicators in the left area and 2 power indicators in the right area. The specific indicating function of the indicator is shown in table 2.2.

Indicator	Color	Status
PWR	green	Power
SYS	green	System
RUN	green	Run
ERR	green	Error
IO RUN	green	GC-Bus run
IO ERR	green	GC-Bus error
NO.1 on the right	green	Power
NO.3 on the right	green	GC-Bus power

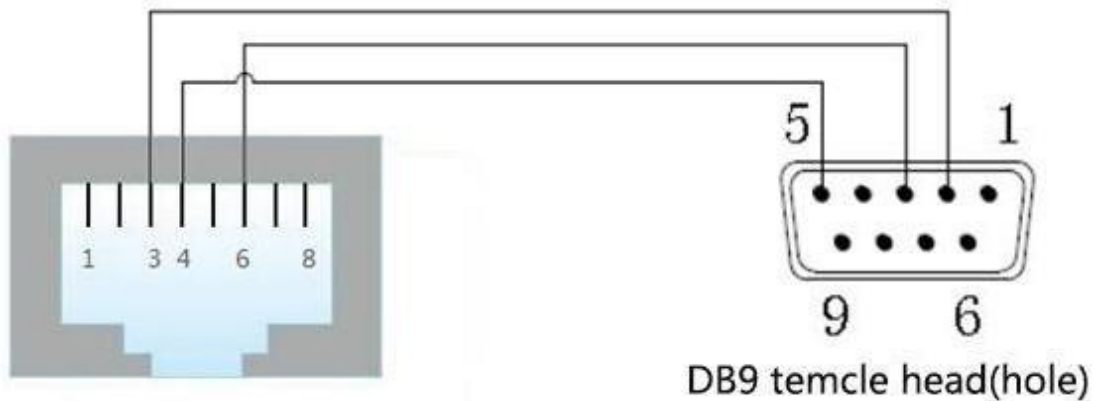
Table 2.2 GCAN-8100 module, indicators

Indicator	Status	Meaning
PWR	bright	Power supply normally
	not bright	Power supply abnormally
SYS	Blinking	Working status
	not bright	Initialization error
RUN	Blinking	Run normal
	not bright	stop
ERR	bright	System error
	not bright	System normal
IO RUN	Blinking	GC-Bus run normally
	not bright	GC-Bus stop
IO ERR	bright	GC-Bus error
	not bright	GC-Bus normal
Terminal module		
NO.1 on the right	bright	Power supply normally
	not bright	Power supply abnormally
NO.3 on the right	bright	Internal power supply normally
	not bright	Internal Power supply abnormally

Table 2.3 GCAN-8100 module, indicators status

2.4 Interface definition

GCAN-IO-8100 Modbus bus coupler is composed of bus communication module and power supply module. The bus communication module integrates one Ethernet interface, one RS232 or RS485 interface, and one CAN bus interface, which are led out by RJ45 interface, RJ45 interface, and terminal interface respectively. The RS232 or RS485 interface style is shown in [Figure 2.5](#), and its interface definition is shown in [Table 2.4](#);



[Figure 2.5](#) RS-232 interface style of GCAN-IO-8100

Terminal	RJ45 number	DB9 number	Meaning
RS232_TX	3	2	RS232 data send
RS232_RX	6	3	RS232 data receive
GND	4	5	Signal ground
RS485_A+	8	7	RS485 signalA+
RS485_B-	1	8	RS485 signal B-

[Table 2.4](#) RS232 or RS485 interface definition of GCAN-IO-8100

3. Communication connection

3.1 Serial connection

GCAN-8100-RTU module uses standard serial port level (RS485), so the module can directly connect to the device with RS485 interface.

3.2 Ethernet connection

Users can connect directly to the LAN interface of the GCAN-8100-TCP module by more than 5 kinds of cable and establish communication.

4. Communication example

GCAN-8100 Modbus Bus Coupler execute Modbus communication protocol for Modbus slave devices.

When equipped with the GC-1008 module (8-channels digital input), the GCAN-8100 will store the DI data in the Modbus digital input register. You can read it using the 02 function code.

When equipped with GC-2008 module (8-channels digital output), GCAN-8100 will store DO data in the Modbus digital output register, you can write it down through 05, 15 function code, read it through the 01 function code.

When equipped with GC-3804 module (4-channels PT100 analog input), GCAN-8100 will store AI data in Modbus analog input register, you can read it through 04 function code

This chapter will use Modbus TCP as an example. Use the Network Debugging Assistant to receive and transmit Modbus protocol data. The Modbus Poll software has a Modbus master function that allows you to debug the GCAN-8100 Modbus slave, which is very convenient and practical. You can send control instructions to the GCAN-8100 Modbus Bus Coupler via the Network Debugging Assistant or Modbus Poll software.

If we use a GCAN-8100 Modbus slave equipped with two GC-1008 modules (8-channels digital inputs) and two GC-2008 modules (8-channels digital outputs), so the closest GC-1008 module to the GCAN-8100 module is 1008-1, and the farther GC-1008 is 1008-2.

Control instruction	Control and return instruction	Function code and its meaning
Enable the first channel of 2008-1	Transmit: 00 00 00 00 00 06 01 05 00 00 FF 00 Return: 00 00 00 00 00 06 01 05 00 00 FF 00	05 Force single coil
Enable the second channel of 2008-1	Transmit: 00 00 00 00 00 06 01 05 00 01 FF 00 Return: 00 00 00 00 00 06 01 05 00 01 FF 00	05 Force single coil
Unabled the first channel of 2008-1	Transmit: 00 00 00 00 00 06 01 05 00 00 00 00 Return: 00 00 00 00 00 06 01 05 00 00 00 00	05 Force single coil
Read all channels of 1008-1	Transmit: 00 00 00 00 00 06 01 02 00 00 00 08 Return: 00 00 00 00 00 04 01 02 01 0C	02 Read input state
Enable all 2008-2	Transmit: 00 00 00 00 00 08 01 0F 00 08 00 08 01	04 Read analog input register

	FF	
	Return: 00 00 00 00 00 08 01 0F 00 08 00 08	

Figure 4.1 Modbus TCP testing instruction

4.1 Equipped with GC-1008module

The state of the digital input is represented by one byte, channel 8 is high and channel 1 is low.

Eg: GSCAN-8100 module node number is set to 1. The channel 8 and channel 4 status are 1 and the other status are 0, and the DI status data displayed on one end of the Modbus is 88. The following table lists two common DI states and their corresponding state data.

DI State								
Channel Number	8	7	6	5	4	3	2	1
State	1	0	0	0	1	0	0	0
Modbus data	88							

DI State								
Channel Number	8	7	6	5	4	3	2	1
State	0	1	0	1	1	0	1	0
Modbus data	5A							

Table 4.1

4.2 Equipped with GC-2008module

The state of the digital output is represented by one byte, channel 8 is high and channel 1 is low.

Eg: GSCAN-8100 module node number is set to 1. Set the status of channel 8 and channel 4 to 1, and set the other status to 0. The data of the Modbus DO status to be sent is 88 (15 function code).

DO State								
Channel Number	8	7	6	5	4	3	2	1
State	1	0	0	0	1	0	0	0
Modbus data	88							

DO State								
Channel Number	8	7	6	5	4	3	2	1
State	0	1	0	1	1	0	1	0
Modbus data	5A							

Table 4.2

4.3 Equipped with GC-3804 module

The temperature status of each channel is represented by two bytes, eight bytes for four channels.

Among them, the two bytes representing the temperature state, the first byte is low, and the data of byte to be converted to decimal and multiplied by 0.1. The second byte is high, the data of byte need to be converted to decimal and multiplied by 25.6.

Finally add the two values, which is the final temperature value, and the unit is degrees Celsius.

Eg: The temperature of the four channels is 25.6 degrees, 25.5 degrees, 20 degrees, and 30 degrees respectively. The analog input data is 0x00, 0x01, 0xFF, 0x00, 0xC8, 0x00, 0x2C, 0x01.

GC-3804 temperature and CAN data		
Modbus data	Low byte C8	High byte 00
coefficient	200 (0xC8) x0.1	0 (0x00) x25.6
temperature	20°C	

GC-3804 temperature and CAN data		
Modbus data	Low byte 2C	High byte 01
coefficient	44 (0x2C) x0.1	1 (0x01) x25.6
temperature	30°C	

Table 4.3

4.4 Equipped with multiple modules

If GCAN-8100 is equipped with multiple sets of GC-1008 modules at the same time, then we number them from near to far, the nearest one is number 1. The GCAN-8100 coupler will confirm the first address of the digital input register according to the following table. For example, when GCAN-8100 is equipped with 9 GC-1008 modules, the digital input register addresses are 01-09.

If GCAN-8100 is equipped with multiple sets of GC-2008 modules at the same time, then we number them from near to far, the nearest one is number 1. The GCAN-8100 coupler will confirm the first address of the digital output register according to the following table. For example, when GCAN-8100 is equipped with 9 GC-1008 modules, the digital output register addresses are 01-09.

If GCAN-8100 is equipped with multiple sets of GC-3804 modules at the same time, then we number them from near to far, the nearest one is number 1. The GCAN-8100 coupler will confirm the first address of the analog input register according to the following table. For example, when GCAN-8100 is equipped with 3 GC-3804 modules, the analog input register addresses are 01-04、05-08、09-12..

5. Module selection table

GSCAN-8100 series products consist of a programmable main control module, several GC series IO modules and a terminal resistance module. GC series IO modules currently include five categories: digital input, digital output, analog input, analog output, and communication extension. The specific selection table is shown in Table 5.1.

I/O	Type	Characteristic	Signal	Channel
PLC Control module	GSCAN-PLC-400	CPU:168M	-	-
	GSCAN-PLC-510	CPU:400M	-	-
	GSCAN-PLC-511	CPU:400M (2CAN)	-	-
Digital input	GC-1008	Digital input (PNP)	24V DC	8-channel
	GC-1018	Digital input (NPN)	24V DC	8-channel
	GC-1502	Counter (200kHz max)	-	2-channel
Digital output	GC-2008	Digital output (PNP)	24V DC	8-channel
	GC-2018	Digital output (NPN)	24V DC	8-channel
	GC-2204	relay output	-	4-channel
	GC-2302	PWM (20Hz~200kHz)	-	2-channel
Analog input	GC-3604	Voltage input, 16 bits	-5~+5V	4-channel
	GC-3624	Voltage input, 16 bits	10V~+10V	4-channel
	GC-3644	Current input, 16 bits	0-20mA	4-channel
	GC-3654	Current input, 16 bits	4-20mA	4-channel
	GC-3664	Voltage input, 16 bits	0~+5V	4-channel
	GC-3674	Voltage input, 16 bits	0~+10V	4-channel
	GC-3804	2-wire PT100, 16 bits	Thermal resistance	4-channel
	GC-3822	3-wire PT100, 16 bits	Thermal resistance	2-channel

	GC-3844/3854/3864	K type / S type / T type thermocouple	Thermocouple	4-channel
Analog output	GC-4602	Voltage output, 16 bits	-5V~+5V	2-channel
	GC-4622	Voltage output, 16 bits	-10V~+10V	2-channel
	GC-4642	Current output, 16 bits	0-20mA	2-channel
	GC-4652	Current output, 16 bits	4-20mA	2-channel
	GC-4662	Voltage output, 16 bits	0~5V	2-channel
	GC-4672	Voltage output, 16 bits	0~10V	2-channel
	GC-4674	Voltage output, 12 bits	0~10V	4-channel
Special module	GC-6101	RS232/RS485 extension	-	-
	GC-6201	GPRS extension	-	-
	GC-6221	4G extension	-	-
	GC-6501	WiFi extension	-	-

Table 5.1 Selection table

6. Technical specifications

PLC Parameters	
Modbus protocol	Modbus TCP, Modbus RTU
Bus terminal module quantity	Up to 32 modules
The biggest byte number of profibus	32 bytes input and 32 bytes output
Digital I/O signal	256 input/output
Analog I/O signal	127input/64output
Configuration mode	automatic configuration
Bus interface	RJ45
Power	24V DC (-15%/+20%)
Input current	70mA+ (total GC-bus current) /maximum2.5A
Starting current	About 2.5 times continuous current
GC-bus current supply	500mA
Fuse capacity	≤10A
Power supply	Maximum 24V DC/maximum 10A
Electrical isolation	1000 Vrms (power contact/bus coupled power voltage)
Environmental testing	
Working temperature	-40°C~+85°C
Working humidness	95%RH, without condensation
EMC test	EN 55024:2011-09 EN 55022:2011-12
Anti-vibration / impact resistance performance	EN 60068-2-6/EN 60068-2-27/29
Anti-electromagnetic interference/radiation performance	EN 61000-6-2 /EN 61000-6-4
IP grade	IP 20
Basic information	
Dimension	100mm *69mm *44mm
Weight	100g

Sales and service



Shenyang Vhandy Technology Co., Ltd.

Address: Room 401, D11 Block, SISP., Hunnan District, Shenyang, Liaoning, China

E-mail: sygckj@gmail.com

Tel/ Whatsapp: +86 13644001762

Skype: live:sygckj

WeChat: gckj777

Website: gcanbus.com