GCAN-302

Ethernet - CANopen slave converter

User Manual

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Contents

1. Introduction

1.1 Overview

The GCAN-302 is a CANopen slave and Ethernet converter. The CAN side of the GCAN-302 integrates the CANopen slave protocol. The GCAN-302 converts the CANopen slave protocol signal to the Ethernet signal or converts the Ethernet signal to the CANopen slave protocol signal. With this converter, devices using the CANopen master protocol can connect to Ethernet without changing the hardware architecture and extending the range of CAN bus applications.

Note: CAN-302 is required to be customized.

1.2 Properties at a glance

1.2.1 Hardware

- High-speed 32-bit processor

- Embedded hardware watchdog timer

- Power supply voltage: DC24V, maximum current: 40mA

- Electrostatic discharge immunity level: contact discharge±2KV, air discharge ±15KV

- Electrical fast transient burst immunity level: ±1KV

- Surge immunity level: ±1KV

- Operating temperature range: -40℃~+85℃

- Operating humidity range: 5%~95% RH no condensation

- Dimensions: 113mm * 100mm * 21mm

- Standard DIN rail mounting, designed for industrial design

1.2.2 CANopen

- Integrated 1 CAN-Bus interface with terminal

- CAN-Bus signals include: CAN_H, CAN_L, CAN_GND

- CAN-Bus isolation converter insulation voltage: DC1500V

- CANopen supports CAN2.0A frame format, supports NMT, PDO, SDO, Heartbeat, Guardlife, SYNC

- CANopen baud rates range from 10Kbps to 1Mbps

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● CANopen node number support 1 ~ 127

1.2.3 Ethernet

● RJ45, support 10 / 100M adaptive

● Support static or dynamic IP access

● Support heartbeat and timeout interrupt function

● The working port, the target IP and the target port can be set

● After the network is disconnected, the connection resource is automatically restored and the TCP connection is established reliably

● Support protocols include EtherNET, ARP, IP, ICMP, UDP, DHCP, DNS, TCP

● Compatible with SOCKET work (TCP Server, TCP Client, UDP, etc.), the host computer communication software follows the standard SOCKET rules

2. Installation

2.1 Installation and fixation

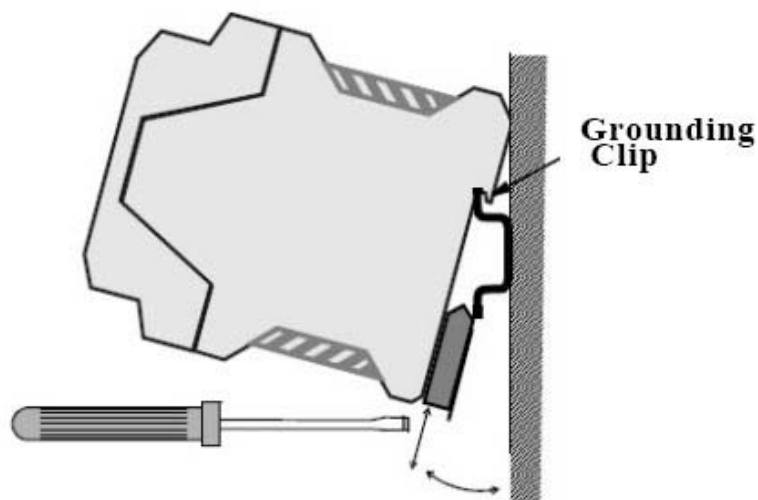GCAN-302 can be installed on a DIN rail, as shown in figure 2.1.

Figure 2.1 GCAN-302 module installation

Note: DIN rails require to connect with ground wire.

GCAN-302 power interface definitions are shown in table 2.1.

DC24V		explanation
1	+	24V DC+
2	−	GND
3	NC	NC
4	NC	NC

Table 2.1 Power interface definition

2.2 Connect to PC

Connect the converter to computer with a network cable. Then GCAN-302 LAN interface can establish communication.

2.3 Connect to CANopen

The pin definitions for the CAN side of GCAN-302 are shown in table 2.3.

Pin	Port	Name	Features
G		CAN-G	CAN_GND
L	CAN	CAN-L	CAN_L signal line
H		CAN-H	CAN_H signal line

Table 2.3 CAN-Bus signal assignment for GCAN-302

Only CAN_H and CAN_H connect with each other, then CAN_L and CAN_L connect with each other. Then we establish a connection.

3. Connection and use

3.1 Configure with PC connections

The GCAN-302 converter uses a 24V DC power supply. By using the "TCP-CANopen Config" software, the GCAN-302 converter can configure the working model and the parameter. GCAN-302 only supports communication between TCP to CANopen, other protocols are not supported.

3.1.1 Restore the factory settings

GCAN-302 converter factory IP: 192.168.1.10. If users have changed the IP and forgot it, users can operate the DIP switch to reset the parameters.

Figure 3.1 The switch of GCAN-302

Operation method: first open the converter's shell and find the switch shown in Figure 3.1. Second switch the No. 2 to "ON", then supply the power, waiting for 3 seconds. After the "SYS" indicator flashing, turn off the power and switch back to "OFF". Now, the converter has been restored to the factory default state, and set the system factory to IP: 192.168.1.10.

Please note: after the converter has been reset, all parameter settings and mapping table settings will be cleared. Please be careful.

3.2 Connect to Ethernet

The Ethernet interface of the GCAN-302 converter integrates a 10 / 100M adaptive Ethernet chip. The converter conforms to the Ethernet standard protocol specification.

3.3 Connect to CAN-Bus

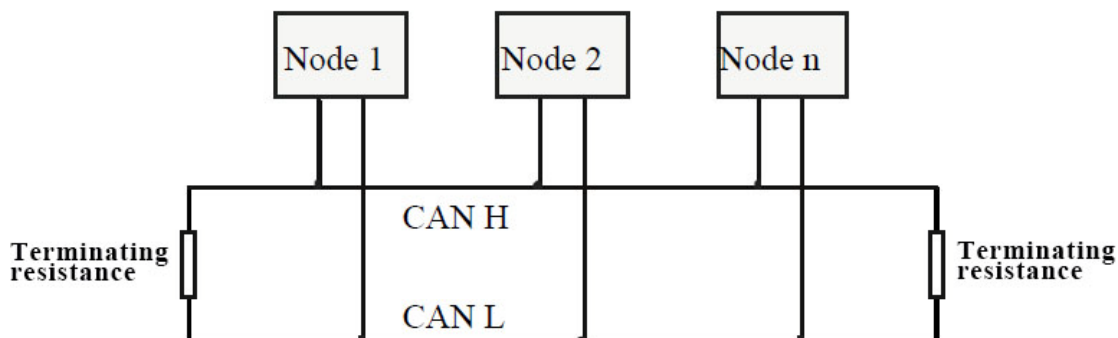CAN-Bus connection is shown in figure 3.2.

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Figure 3.2 Topology structure of CAN-Bus

3.4 Termination resistor

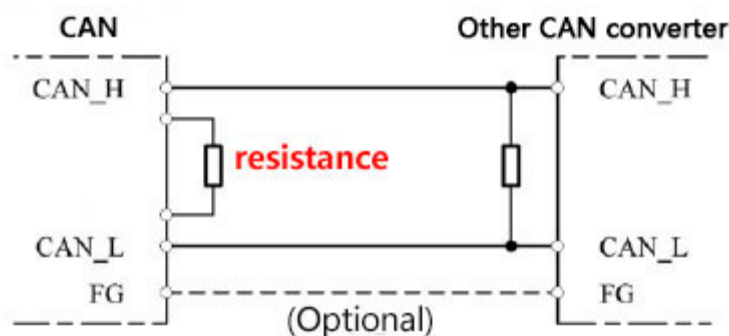CAN-Bus requires two 120Ω termination resistors in the furthest of the two terminals, as shown in figure 3.3.

Figure 3.3 GCAN-302 connection to other CAN converter

Please note: You should connect the two ends of the resistor to CAN_L and CAN_H respectively.

3.5 System LED

GCAN-302 converter has one SYS indicator, one DAT indicator. More functions are shown in table 3.2.

Indicator light	Color	Indicates the state
SYS	Green	System operation instructions
DAT	Green	Data conversion transfer instructions

Table 3.2: Indicators for the GCAN-302 converter

After power on the converter, the SYS indicator light indicates that power is being supplied and the system is initializing; otherwise, it indicates power failure or an error occurred.

If the bus has data transmission, DAT indicator will flash.

Indicator light	Status	Indicates the state
SYS	Blinking	System initialization pass, standby state
	OFF	System initialization failed
DAT	Blinking	There is data transmission between the buses
	OFF	There is no data transmission between the buses

Table 3.3: Status of the GCAN-302 converter indicator

4. TCP format

4.1 CANopen slave→Ethernet（RPDO）

| number	field name	byte offset	length (byte)	field description	for example
1	start byte1	0	1	fixed to FC	FCH
2	start byte2	1	1	fixed to F4	F4H
3	start byte3	2	1	fixed to FC	FCH
4	start byte4	3	1	fixed to F4	F4H
5	RPDO1 RPDO2 RPDO3 RPDO4 RPDO5 RPDO6 RPDO7 RPDO8	4-67	64	RPDO1　（1-8） RPDO2　（9-16） RPDO3　（17-24） RPDO4　（25-32） RPDO5　（33-40） RPDO6　（41-48） RPDO7　（49-56） RPDO8　（57-64）	
6	accumulate and verify	68	1	accumulate and verify	ibid

4.2 Ethernet→CANopen slave（TPDO）

| number	field name	byte offset	length (byte)	field description	for example
1	start byte1	0	1	fixed to F4	F4H
2	start byte2	1	1	fixed to FC	FCH
3	start byte3	2	1	fixed to F4	F4H
4	start byte4	3	1	fixed to FC	FCH
5	TPDO1 TPDO2 TPDO3 TPDO4 TPDO5 TPDO6 TPDO7 TPDO8	4-67	64	TPDO1　（1-8） TPDO2　（9-16） TPDO3　（17-24） TPDO4　（25-32） TPDO5　（33-40） TPDO6　（41-48） TPDO7　（49-56） TPDO8　（57-64）	
6	accumulate and verify	68	1	accumulate and verify	ibid

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5. Configuration instructions

The GCAN-302 converter can be configured by using the"TCP-CANopen Config" software, including the basic parameters such as operating mode, working port, target port, target IP, CAN operating mode, CAN baud rate.

5.1 Connect the GCAN-302 converter to the computer

Power on the converter, and connect the converter to the computer with a network cable. Open the "TCP-CANopen Config" software. Enter the IP address of GCAN-302 and Click "Connect".
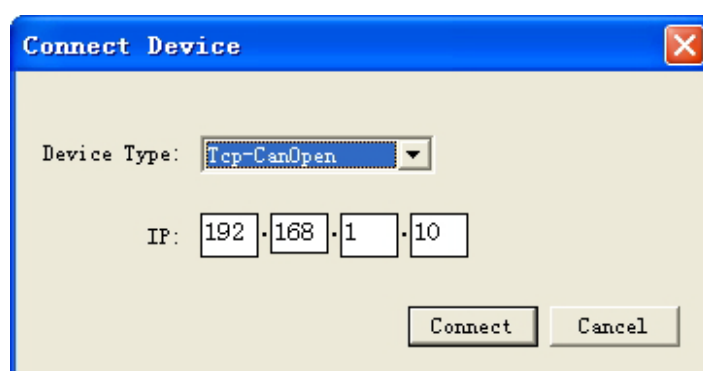
Click "Connect", and then it will appear the following software interface.
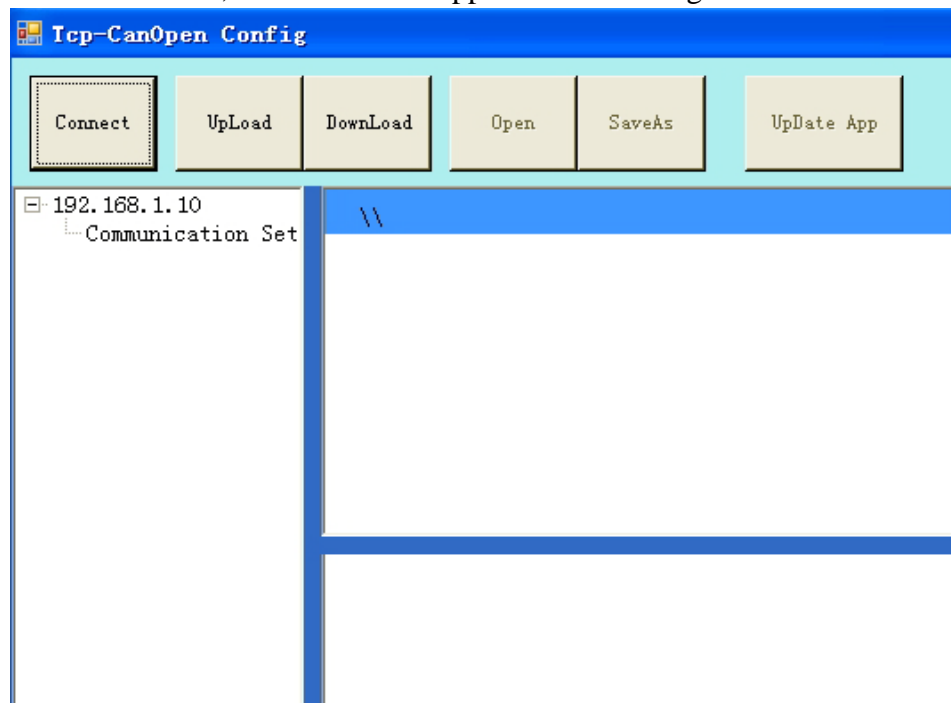
"Connect"——connect the converter
"Upload"——read out the configuration information in the converter
"DownLoad"——download the configuration information to the converter flash
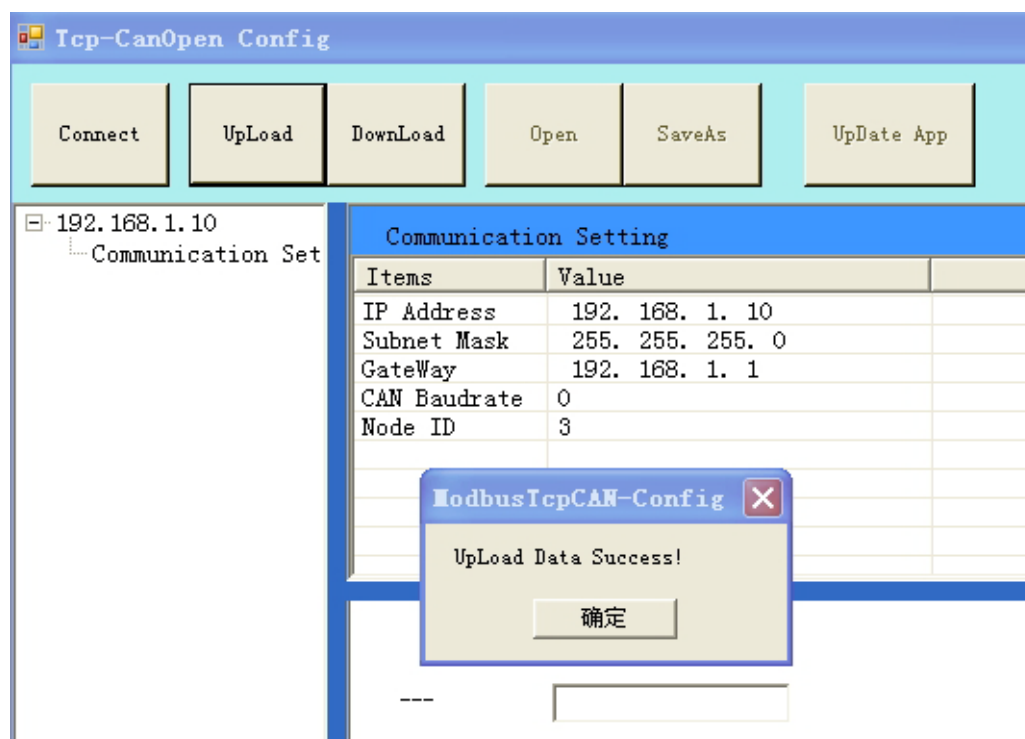"Open"——open and read the configuration information file in the PC

"SaveAs"——save the configuration information file to your computer

"UpData App"——upgrade the GCAN-302 firmware kernel. (Please use this function under guidance)

5.2 Basic information

After the connection is successful, click "UpLoad" to upload the parameters of the converter to the computer.

"IP Address Info"——set the GCAN-302 IP address

"GateWay"——set the GCAN-302 gateway

"Subnet Mask"——set the GCAN-302 subnet mask

"Can Baudrate"——set the CAN-Bus communication baud rate

"Node ID"——set the node ID number of the CANopen side

"CAN Baud rate" can set the baud rate of the CAN-Bus, the corresponding table is as follows:

Parameter	Baud rate
0	1Mbps
1	800Kbps
2	500Kbps
3	250Kbps

4	125Kbps
5	100Kbps
6	50Kbps
7	20Kbps
8	10Kbps

5.3 Download to the Flash of GCAN-302

When the configuration is complete, users can click on the "DownLoad" to write data into the converter flash. When the data is written successfully, you need to re-power to enable the new settings.
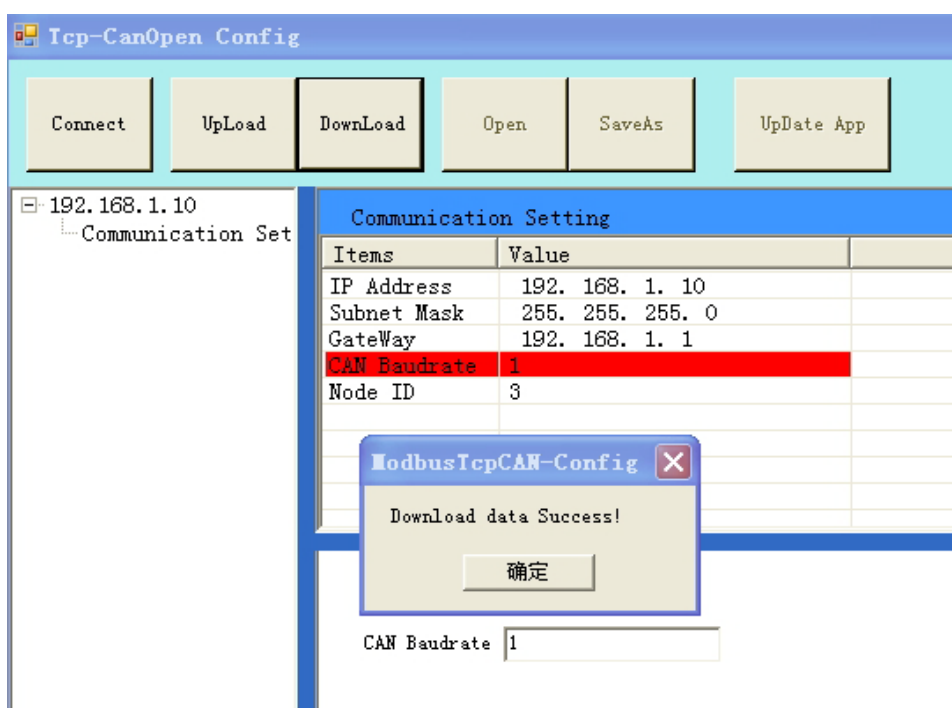
Please note: power-on again after the completion of the download, and then the new configuration will take effect.

5.4 Upgrade GCAN-302(use this function under guidance)

If you need to upgrade, please contact us.

6. Technical specifications

Connection	
Ethernet	RJ45
CAN interface	OPEN4 terminal blocks
Interface characteristics	
Ethernet interface	10 / 100M adaptive
TCP Server	Configurable
CAN interface	Follow the ISO 11898 standard to support CAN2.0A / B
CAN baud rate	10Kbit/s~1Mbit/s
Electrical isolation	1500V，DC-DC
120 ohm resistance	Not integrated
Power supply	
Voltage	+24V DC
Supply current	Maximum 40mA
Environmental testing	
Operating temperature	-40℃~+85℃
Working humidity	15%~90%RH，No condensation
EMC testing	EN 55024:2011-09 EN 55022:2011-12
Protection class	IP 20
The basic information	
Outline size	113mm *100mm *26mm
Weight	150g

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