

GCAN-301

CANopen-RS485 converter

User Manual



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Contents

1 Introduction.....	3
1.1 Overview.....	3
1.2 Properties at a glance.....	3
2. Installation.....	4
2.1 Installation and fixation.....	4
2.2 Connect to Serial bus.....	4
2.3 Connect to CAN-Bus.....	5
3. Node ID and CAN-Bus baud rate setting.....	6
4. Custom protocol.....	8
4.1 CANopen slave station to RS485 (RPDO)	8
4.2 RS485 to CANopen slave station (TPDO)	9
4.3 Check digit calculation method.....	9
5. Technical Specifications.....	10
Appendix A: GCAN-301 object dictionary.....	11
Sales and service.....	15

1 Introduction

1.1 Overview

GCAN-301(CANopen-RS485) has one standard CAN-Bus interface and one standard RS485 interface , it can realize the RS485 equipment as CANopen slave station access to CANopen network. It's a custom product.

1.2 Properties at a glance

- CAN-Bus interface adopts German CiA standard DB9 interface form
- The built-in CANopen protocol stack follows the protocol description document, DS 301
- The CANopen node number is 32(customizable), which can be configured by software
- CAN-Bus baud rate is 250Kbps by default(customizable), which can be configured by software
- CAN-Bus isolation module insulation voltage: DC 1500V
- Standard asynchronous 485 communication: 1 start bit, 1 terminator bit, 8 bits data(customizable)
- 485 interface baud rate of 9600bps, the communication cycle is 500ms, with accumulation and calibration(customizable)
- 485 interface adopts OPEN - 4 terminals
- 232 interface (OPEN - 4 terminals for upgrade)
- Power supply voltage: 9 ~ 30V DC, the maximum current is 20mA, with the rectifier bridge, the terminal is OPEN - 4
- Installation method: DIN guide rail
- Working temperature range from -40 to 85 °C
- Size: (L)113mm * (W)100mm * (H)21mm

2. Installation

2.1 Installation and fixation

GCAN-301 can be installed on a DIN rail, as shown in figure 2.1.

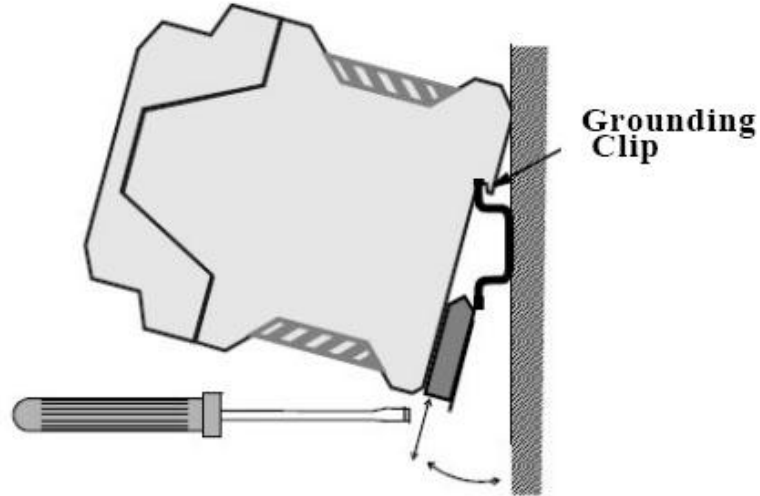


Figure 2.1 GCAN-301 module installation

Note: DIN rails require to connect with ground wire.

GCAN-301 power interface definition, as shown in table 2.1.

DC24V		explanation
1	+	24V DC+
2	-	0V
3	NC	NC
4	PE	shield

Table 2.1 Power interface definition

2.2 Connect to Serial bus

GCAN-301 serial interface use RS485 interface. The pin definitions are shown in table

2.2.

Pin	Port	Name	Features
C-BUS1	RS485	B-	485 B (-) signal line
C-BUS4		A+	485 A (+) signal line

Table 2.2 RS485 interface definitions

2.3 Connect to CAN-Bus

The pin definitions for the CAN side of GCAN-301 are shown in table 2.3.

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

Table 2.3 CAN-Bus signal assignment for GCAN-301

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. Node ID and CAN-Bus baud rate setting

GCAN - 301 can use "serial debugging assistant" to change the CAN bus node ID and baud rate. The instructions are shown in table 3.1, the baud rate index is shown in table 3.2.

After entering the "serial debugging assistant", Serial port rate is set to 9600bps, parity bit is none, the data bit is 8, stop bit is 1. Please select hexadecimal when sending and receiving display.

If you change the node ID or CAN baud rate, GCAN-301 will automatically return the data you sent, otherwise it is failure. After the setting is successful, users need to power-on again.

	Send data (HEX)	Exemplify (HEX)
Modify node ID	4E 4F 44 45 Nodeid 49 44	Set to 03, send 4E 4F 44 445 03 49 44.
Modify the CAN baud rate	43 41 4E Canbt 42 54	Set to 250K, send 43, 41, 4E, 03, 42, 54.

Table 3.1 Description of GCAN - 301 node ID and CAN baud rate

Baud rate index	Baud rate
0	1Mbps
1	800Kbps
2	500Kbps
3	250Kbps
4	200Kpbs
5	125Kbps
6	100Kbps
7	50Kbps

Table 3.2 Index value of GCAN - 301 baud rate

4. Custom protocol

4.1 CANopen slave station to RS485 (RPDO)

Serial number	Field name	Byte offset	Length (byte)	Field description	Example	Remark
1	Initial byte 1	0	1	FC	FCH	
2	Initial byte 2	1	1	F4	F4H	
3	Initial byte 3	2	1	FC	FCH	
4	Initial byte 4	3	1	F4	F4H	
5	RPDO1 RPDO2 RPDO3 RPDO4	4-35	32	RPDO1 (1-8) RPDO2 (9-16) RPDO3 (17-24) RPDO4 (25-32)		
6	Accumulate and check-up	36	1	Accumulate and check-up	Ditto	

4.2 RS485 to CANopen slave station (TPDO)

Serial number	Field name	Byte offset	Length (byte)	Field description	Example	Remark
1	Initial byte 1	0	1	F4	F4H	
2	Initial byte 2	1	1	FC	FCH	
3	Initial byte 3	2	1	F4	F4H	
4	Initial byte 4	3	1	FC	FCH	
5	TPDO1 TPDO2 TPDO3 TPDO4	4-35	32	TPDO1 (1-8) TPDO2 (9-16) TPDO3 (17-24) TPDO4 (25-32)		
6	Accumulate and check-up	36	1	Accumulate and check-up	Ditto	

Note: The agreement can be customized according to your requirements

4.3 Check digit calculation method

The checksum = data1 data2 + +...+ data32, if the checksum is greater than 255, the result is a low 8 bite.

5. Technical Specifications

Connection	
Serial interface	RS485:
CAN interface	DB9 or OPEN4
Interface characteristics	
Serial interface	Standard RS485 interface
Serial port baud rate	Customizable
CAN interface	ISO 11898 standard, CAN2.0A/B
CAN baud rate	1000K,800K,500K,250K, 200K,125K,100K,50K Customizable
Electrical isolation	1500V, DC-DC
Power supply	
Power supply voltage	+9~30V DC
The power supply current	40mA (24V DC)
Environmental testing	
Working temperature	-40°C~+85°C
Working humidity	15%~90%RH, no condensation
EMC test	EN 55024:2011-09 EN 55022:2011-12
Protection grade	IP 20
The basic information	
Outline size	113mm * 99.4mm * 22.6mm
Weight	100g

Appendix A: GCAN-301 object dictionary

Index	Sub index	Name	Type	Attribute	Default	Describe
Communication parameter area						
0x1000	-	Device Type	UINT32	RO	0x000A0011	
0x1001		Error Register	UINT8	RO	0	type of error
0x1003	0	number of errors	UINT8	RO	0	-
	1~4	standard error field	UINT32	RO	0	Historical emergency error code
0x1005	-	COB-ID SYNC	UINT32	RW	0x80	-
0x1007		Sync Windows Length	UINT32	RW	0	-
0x1008		GCAN-301name	STRING	Const	GCAN-301	GCAN-301name
0x1009		GCAN-301 hardware version	STRING	Const	V1.01	GCAN-301 hardware version
0x100A		GCAN-301 software version	STRING	Const	V1.00	GCAN-301 software version
0x100C		Guard Time	UINT16	RW	0	-
0x100D		Life Time Factor	UINT8	RW	0	-
0x1010	0	largest supported Sub-Index	UINT8	RO	1	-
	1	save all parameters	UINT32	RW	0	-
0x1011	0	largest supported Sub-Index	UINT8	RO	1	-
	1	restore all default para.	UINT32	RW	0	-
0x1014		COB-ID Emergency	UINT32	RW	Node ID	-

		message				
0x1016	0	Number Of Entries	UINT8	RO	0x01	-
	1	Consumer Heartbeat Time #1	UINT32	RW	-	-
0x1017		Producer Heartbeat Time	UINT16	RW	0	-
0x1018	0	number of Entries	UINT8	RO	0x04	-
	2	Product code	UINT32	RO	-	GCAN-301product code
	3	Revision number	UINT32	RO	-	GCAN-301Revised code
	4	Serial number	UINT32	RO	-	GCAN-301sequence code
RPDO communications parameters						
0x1400	0	largest subindex supported	UINT8	RO	2	-
	1	COB-Id used	UINT32	RW	NodeID+ 0x200	RPDO COB-ID
	2	transmission type	UINT8	RW	0xFE	-
0x1401	0	largest subindex supported	UINT8	RO	2	-
	1	COB-Id used	UINT32	RW	NodeID+ 0x300	RPDO COB-ID
	2	transmission type	UINT8	RW	0xFE	-
0x1402	0	largest subindex supported	UINT8	RO	2	-
	1	COB-Id used	UINT32	RW	NodeID+ 0x400	RPDO COB-ID
	2	transmission type	UINT8	RW	0xFE	-
0x1403	0	largest subindex supported	UINT8	RO	2	RPDO COB-ID
	1	COB-Id used	UINT32	RW	NodeID+ 0x500	
	2	transmission type	UINT8	RW	0xFE	-
TPDO communications parameters						
0x1800	0	largest subindex	UINT8	RO	0x05	-

		supported				
	1	COB-ID used	UINT32	RW	NODEID+ 0x180	TPDO COB-ID
	2	transmission type	UINT8	RW	0xFE	Transport type
	3	inhibit time	UINT16	RW	0	Transmission PDO prohibition time
	5	event timer	UINT16	RW	0	Transmission PDO prohibition time
0x1801	0	largest subindex supported	UINT8	RO	0x05	-
	1	COB-ID used	UINT32	RW	NODEID+ 0x280	TPDO COB-ID
	2	transmission type	UINT8	RW	0xFE	Transport type
	3	inhibit time	UINT16	RW	0	Transmission PDO prohibition time
	5	event timer	UINT16	RW	0	Transmission PDO prohibition time
0x1802	0	largest subindex supported	UINT8	RO	0x05	-
	1	COB-ID used	UINT32	RW	NODEID+ 0x380	TPDO COB-ID
	2	transmission type	UINT8	RW	0xFE	Transport type
	3	inhibit time	UINT16	RW	0	Transmission PDO prohibition time
	5	event timer	UINT16	RW	0	Transmission PDO prohibition time
0x1803	0	largest subindex supported	UINT8	RO	0x05	-
	1	COB-ID used	UINT32	RW	NODEID+ 0x480	TPDO COB-ID

	2	transmission type	UINT8	RW	0xFE	Transport type
	3	inhibit time	UINT16	RW	0	Transmission PDO prohibition time
	5	event timer	UINT16	RW	0	Transmission PDO prohibition time

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