

GCAN-401

CAN-Bus data recorder

User Manual



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1. Introduction

1.1 Functional Overview

GCAN-401 CAN-Bus data recorder is specially used for offline record CAN-Bus data.

GCAN-401 has integrated one CAN interface . Users can use TF card record bus data real-time.

GCAN-401 adapter is suitable for historical data playback, error message analysis.

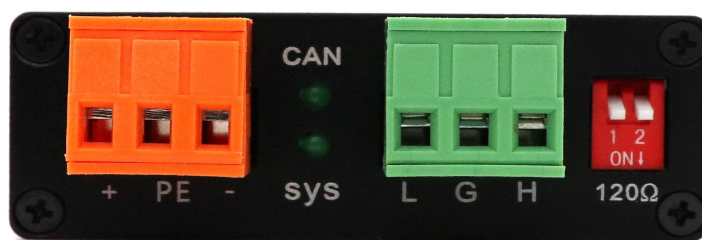
1.2 Properties at a Glance

- GCAN-401 in Aluminum casing
- High speed 32-bit industrial-grade processor
- Power supply: DC +9~30V, 100mA
- EMC: contact $\pm 2\text{KV}$, air $\pm 15\text{KV}$
- EFT: $\pm 1\text{KV}$
- SURGE: $\pm 1\text{KV}$
- CAN-Bus connection via OPEH3, PHOENIX;
- Compliant with CAN specifications CAN 2.0A (11-Bit ID) and CAN 2.0B (29-Bit ID)
- CAN-Bus baud rate: 10Kbps~1Mbps, set by code switch
- Galvanic isolation on the CAN connection up to 1500 V
- The highest receiving data traffic: 14000 fps/s
- CAN data time stamp resolution 100 μs
- Working temperature: -40 to 85 °C
- Dimensions: (L) 102 mm * (W) 63mm * (H)23mm

2. Installation

2.1 Power supply

GCAN-401 support DC +9~30V power supply, so it can be applied to most industrial field and in vehicle, power supply terminals defined in table 2.1.



Port	Name	Function
Power	+	DC 9~30V Positive
	PE	For shield, connect to shell/earth
	-	DC 9~30V Negative

Table 2.1 GCAN-401 power terminal interface definition

2.2 Connect to CAN-Bus

GCAN-401 CAN-Bus Terminal pin definition as table 2.2.

Port	Name	Function
CAN	H	CAN_H
	G	CAN_G
	L	CAN_L

Table 2.2 GCAN-401 CAN-Bus pin definition

Note: In practical use, most of the time just connected the CAN_H to CAN_H and CAN_L to CAN_L, then communication can be realized.

3. Adapter in use

3.1 Set system time

GCAN-401 has integrated system clock, system clock and file system can record data by date.

GCAN-401 will create folder every day named by date. CAN data will be automatically deposited in the corresponding folder.

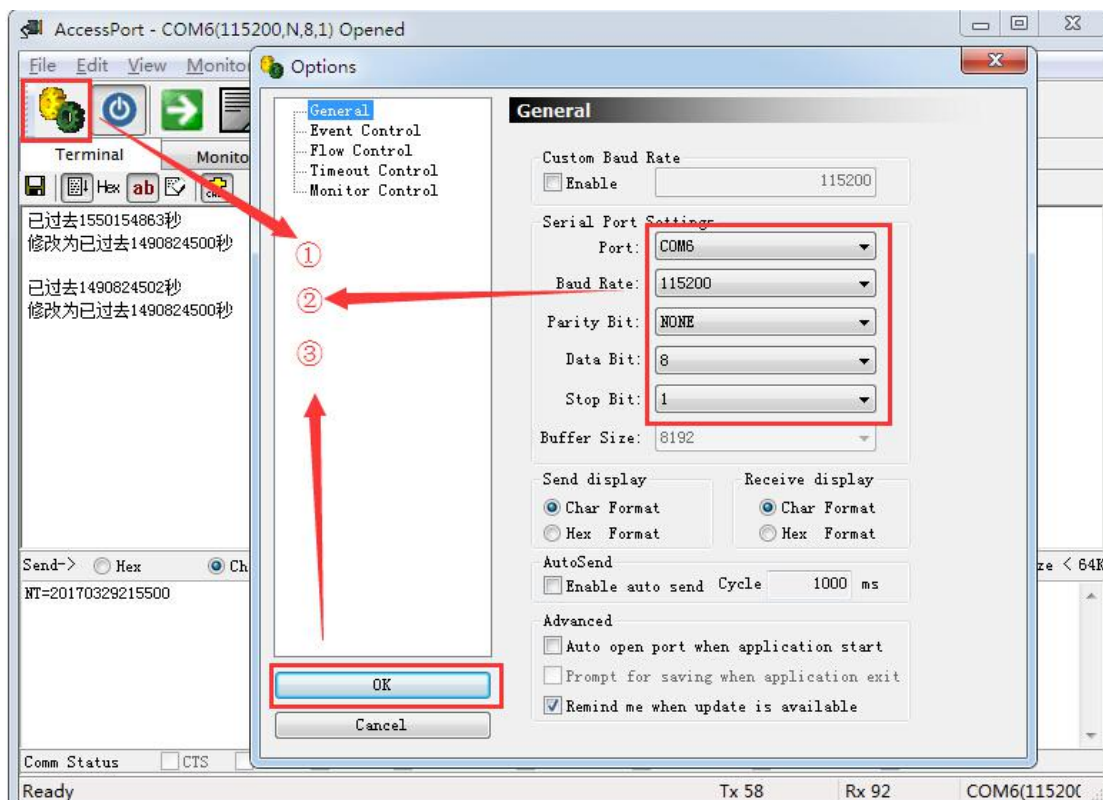
GCAN-401 will create a new file per minute, data will saved to the corresponding file.

If GCAN-401 adapter's system clock not real before use, user can adjust their own time by following methods.

1. Connect GCAN-401 and PC with USB cable. (USB port in Figure 3.2)
2. Use "AccessPort" send your time to GCAN-401.

(serial port baud rate: 115200, parity bit None, data bits: 8, stop bit: 1, send/receive display: Char format. Instruction is: "NT=XXX". For example: send "NT=20170329215500", will amend the system time to March 29, 2017 21:55:00.)

Please note: after enter "NT-XXX", also should enter an "Enter", then click "send". 2 lines of words display represent the successful modification.



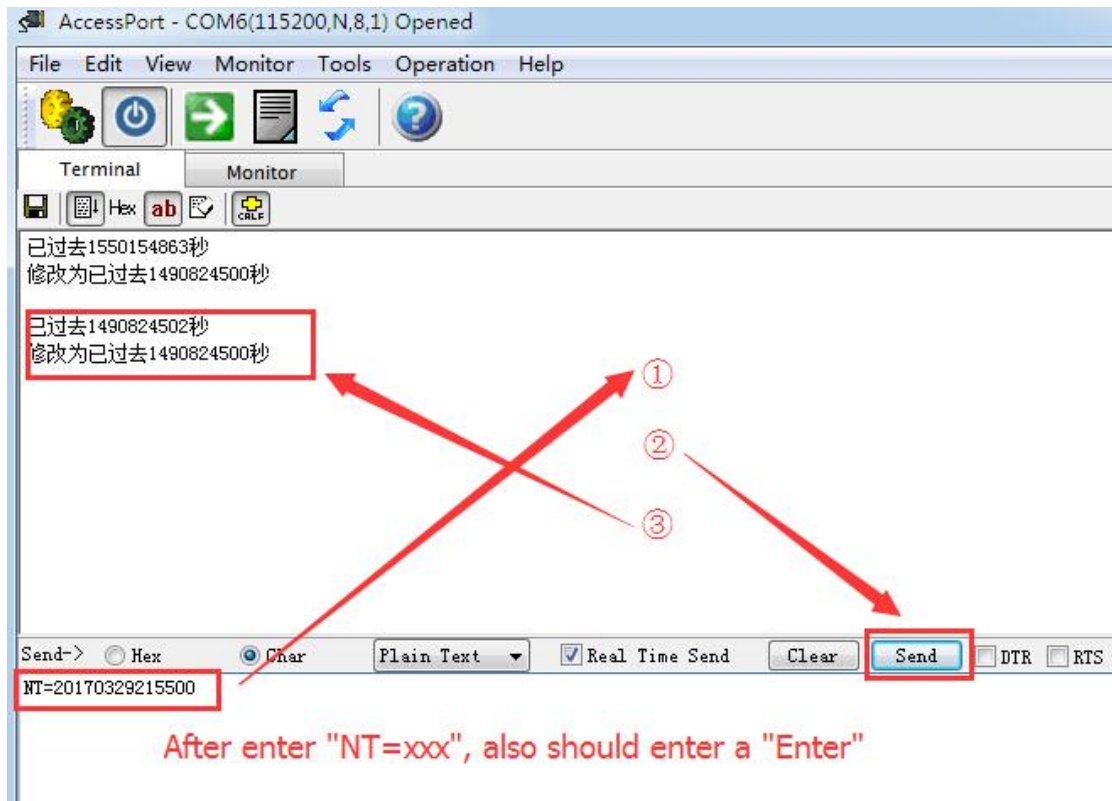


Figure 3.1 GCAN-401 correction system time interface

3.2 CAN bus configuration

GCAN-401 adapter generally require users to set the CAN-Bus communication parameters according to the actual demand before use.

3.2.1 CAN-bus baud rate configuration

GCAN-401 can support some commonly used baud rate between 10K~1000K. Baud rate can be set by code switch, the code switch position as shown in figure 3.2.



Figure 3.2 GCAN-401 profile

The code switch "1, 2, 3, 4" can set the CAN-Bus baud rate, and the other switch (5, 6,

8) has a special definition, the default side down, please do not arbitrarily set. Dial the code switch down the default is 0, each baud rate as shown in the table 3.1.

Note: Modify the baud rate must power down

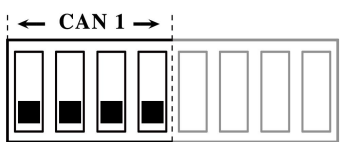
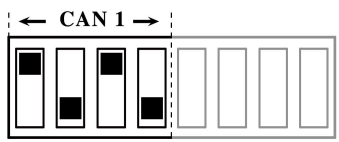
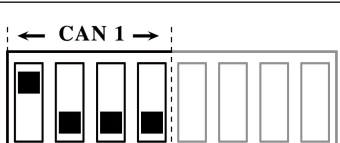
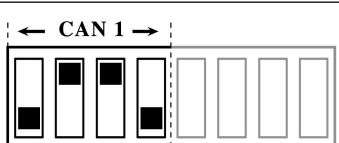
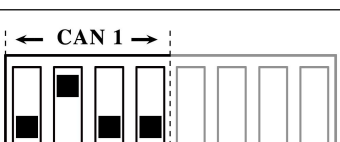




Graphical	Baud rate	Graphical	Baud rate
	1000k		100k
	800k		50k
	500k		20k
	250k		10k
	125k		

Table 3.1 GCAN-401 Baud rate configuration chart

3.2.2 CAN-Bus terminal resistance configuration

GCAN-401 has been integrated internal 120Ω terminal resistor, users can choose whether access through dial the code switch.

3.3 Connect to CAN

GCAN-401 connect to CAN-Bus as chapter 2.2, CAN_H to CAN_H, CAN_L to CAN_L.

The CAN-bus network adopts topological structure, only the two furthest terminal need to connect 120Ω terminal resistance between CAN_H and CAN_L. For branch connection, its length should not be more than 3m. CAN-bus nodes connection as shown in figure 3.1

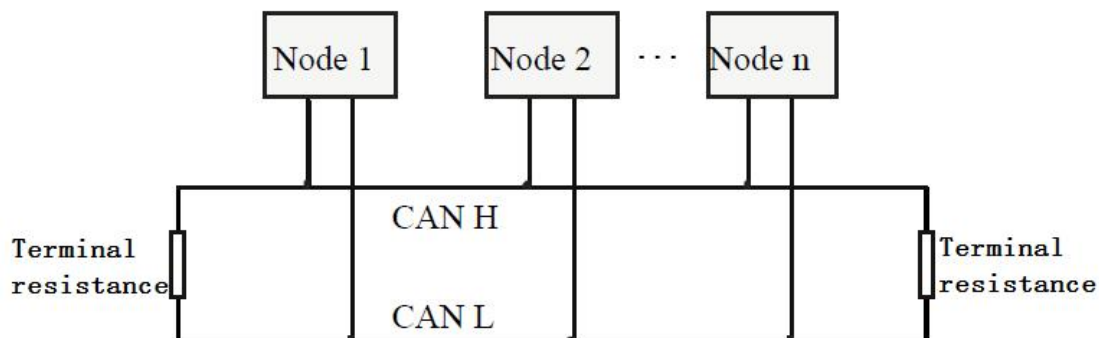


Figure 3.1 CAN-bus network

Note: The CAN-bus cable can use ordinary twisted-pair cable, shielded twisted-pair cable. Theory of the maximum communication distance depends on the bus baud rate, Their relationship as shown in the Table 3.1.

Baud rate	Distance
1 M bit/s	40m
500 k bit/s	110m
250 k bit/s	240m
125 k bit/s	500m
50 k bit/s	1.3km
20 k bit/s	3.3km
10 k bit/s	6.6km
5 k bit/s	13km

Table 3.1 relationship of baud rate and distance

3.4 CAN-Bus terminal resistance

In order to improving the communication reliability and eliminating CAN-Bus terminal reflection, the two furthest terminal need to connect terminal resistance between CAN_H and CAN_L as shown in figure 3.2. Terminal resistance values determined by the characteristic impedance of the cables. Such as, the characteristic impedance is 120Ω.

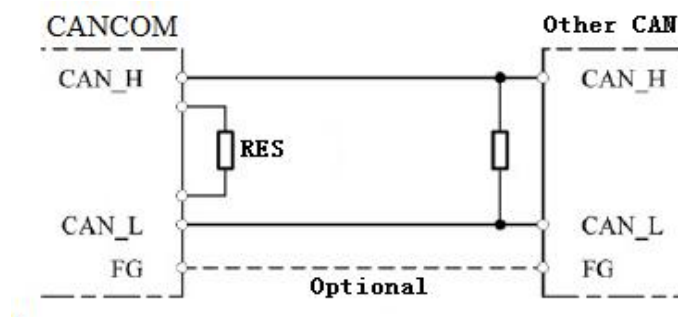


Figure 3.2 CANCOM connect to other CAN devices

Note: GCAN-401 has integrated 120Ω terminal resistance, users should connect it if necessary.

3.5 System LED

GCAN-401 adapter with one SYS indicator, one CAN indicator to indicate the adapter status. More functions are shown in table 3.3 and 3.4.

LED	Colour	State
SYS	Green	System run
CAN	Green	CAN-Bus state

Table 3.3 GCAN-401 state LED

When GCAN-401 adapter power on, SYS LED blinking, indicates the adapter has power supply, the system is initialized; Otherwise, a system power failure.

When power up, CAN LED on indicates TF card error.

When CAN LED on and then off, indicates TF card work fine .

When adapter receive data, CAN LED will blinking.

LED	State	Indicates
SYS	OFF	System error
	ON	System initialization failed
	Blinking	System initialization OK
CAN	ON then turn OFF	No CAN-Bus data
	Blinking	CAN-Bus data transfer
	ON	TF card error

Table 3.4 GCAN-401 state

4. File saving

Note: GCAN-401 only supports a maximum capacity of 32G and the file system is FAT32 format TF card, if your TF card is not the FAT32, the card must be reformatted into FAT32 format, data will be removed, please careful operation.

If the time interval between frames is 1 ms,the data can be stored for 24 days(32GTFcard).

GCAN-401 has integrated system clock, system clock and file system can record data by date.

GCAN-401 will create folder every day named by date. Bus data will be automatically deposited in the corresponding folder.

GCAN-401 will create a new file per minute, data will saved to the corresponding file. Shown in figure 4.1

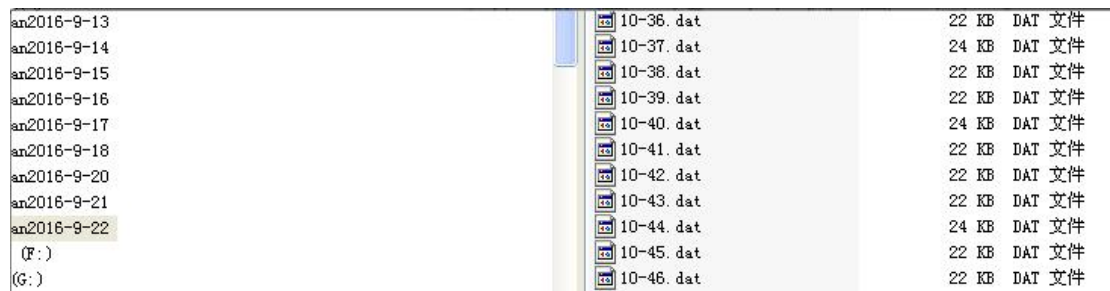


Figure 4.1 file form

GCAN-401 supports two kinds of saving data format: text file (TXT), binary files (DAT), through NO.7 code switch, as shown in figure 4.2.

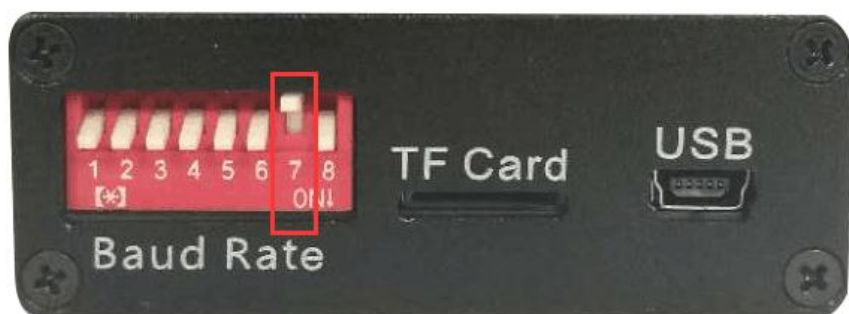


Figure 4.2 File type switch

Switch up is a text document format (TXT), switch down is the binary file format (DAT).

4.1 Example for text document format (TXT)

TXT file saved data content as shown in figure 4.3.

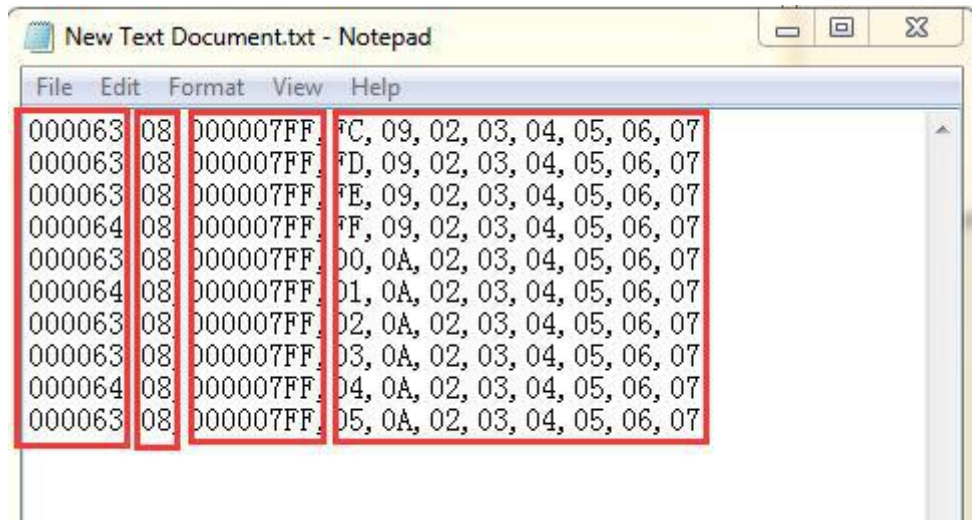


Figure 4.3 TXT file format

When users selects to save into a text file format, the specific data as shown below:

- The first column:** time interval between frames, (6 bit)
- The second column:** frame info (2 bit, please refer to the appendix B for the specific meaning)
- The third column:** frame ID (8 bit)
- The fourth column:** frame data

4.2 Example for binary file format (DAT)

DAT file saved data content as shown in figure 4.4.

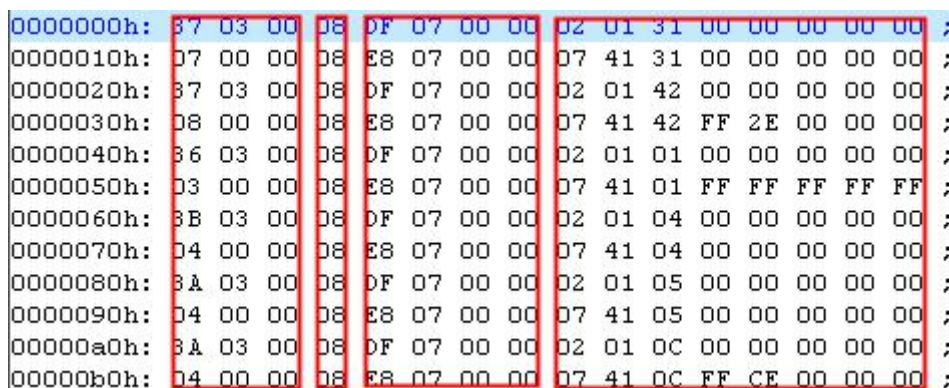


Figure 4.4 DAT file format

When users selects to save into a binary file format, the specific data as shown below:

- The first second third byte:** time interval between frames,

The fourth byte: frame info (2 characters, please refer to the appendix B for the specific meaning)

The fifth sixth seventh eighth byte: frame ID

After ninth bytes: frame data


5. Technical Specifications

Connection	
CAN	OPEN3 PHOENIX
POWER	OPEN3 PHOENIX
TF card	
TF card	Maximum 32G , FAT32 format
CAN-Bus	
CAN standard	ISO 11898, CAN2.0A/B
CAN baud rate	10Kbit/s~1Mbit/s
Isolate	1500V, DC-DC
Terminal Resistor	Integrated
Power	
Voltage	+9~30V DC
Current	20mA
Environment	
Temperature	-40℃~+85℃
Humidness	15%~90%RH
EMC test	EN 55024:2011-09 EN 55022:2011-12
IP grade	IP 20
Basic	
Dimension	102mm *63mm *23mm
Weight	130g

Appendix A: CAN-Bus data frame definition

A CAN frame contains 13 bytes. The content of 13 bytes CAN frame information + frame ID + frame data.



 frame information, 1 byte, used to identify CAN frame info, such as type, length, etc.

BIT7

BIT0

FF	Reserve	Reserve	RTR	B3	B2	B1	B0
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FF: Standard and extended identification, 1 for the extended frame, 0 for the standard frame

RTR: Remote and data identification, 1 for remote frame, 0 for the data frame.

Reserve: Retains the value is 0, cannot 1.

B3~B0: The data length(DLC), identify the frame length of the data.

For example:

Frame information	Specific meaning
08	Standard, data frame, DLC=8
88	Extended, data frame, DLC=8
18	Standard, remote frame, DLC=8
98	Extended, remote frame, DLC=8

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