ECAN-401 Intelligent Protocol Converter
User Manual



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1. Product Overview

1.1 Brief Introduction

ECAN-401 is a small intelligent protocol conversion product independently developed by Chengdu Ebyte Electronic Technology Co., Ltd. The product uses 8V ~ 28V wide voltage power supply, integrates 1 CAN-BUS interface, 1 RS485 interface, 1 RS232 interface and 1 RS422 interface, which can realize two-way conversion between CAN and RS485/RS232/RS422 different protocol data. The product supports serial AT command configuration and host computer configuration device parameters and working modes, and supports five data conversion modes including transparent conversion, transparent conversion with logo, protocol conversion, Modbus RTU conversion, and user-defined (user). At the same time, ECAN-401 intelligent protocol converter has the characteristics of small size, easy installation, and high protection isolation design for CAN interface. It has a very high cost performance in the development of CAN-BUS products and data analysis applications. It is an engineering application and project debugging. And reliable assistants for product development. .



1.2 Feature

- Bidirectional conversion between CAN and RS485/RS232/RS422 different protocol data;
- Support transparent conversion, transparent conversion with logo, protocol conversion, Modbus RTU conversion, custom protocol conversion;
- Support RS485/RS232/RS422 interface parameter configuration;
- Support AT command parameter configuration;
- Support the configuration of upper computer parameters;
- Support AT command and host computer to restore factory settings;
- With power indicator, status indicator and other status indicators;
- Multi-master and multi-slave function;
- CAN interface adopts high protection isolation design.

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1.3 Application

- CAN-BUS network such as industrial control
- Networking of automobiles and railway equipment
- Security and fire protection network
- Underground remote communication
- Public address system
- Parking equipment control
- Smart home, smart building

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2. Product specifications and characteristics

2.1 Basic parameters

Main parameters	Specification
voltage	8V ~ 28V, 12V or 24V power supply is recommended
Working current	18mA@12V (standby)
Operating temperature	-40℃ ~ 85℃, industrial grade
Interface Type	RS485/RS422/CAN: 5.08 terminal block, crimping method RS232: DB9 terminal

2.2 Factory default parameters

RS485/RS232/RS422	Serial port baud rate	115200 bps
	Parity check	No
	Data bit	8
	Stop bit	1
	Flow Control	shut
CAN	CAN baud rate	100K bps
	CAN ID	0x00000000
Default	Transparent transmission	Receive all data types

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3. Hardware parameter design introduction

3.1 Design introduction



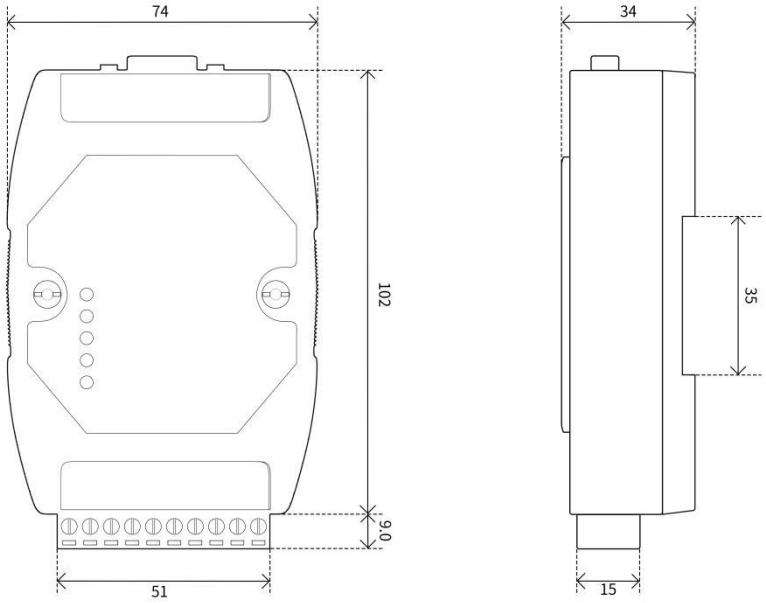
No	Name	Pin usage
1	RS232	DB9 communication terminal
2	PWR	Power Indicator
3	CAN_ERR	Error light
4	CAN_DATA	Data light
5	RX	Serial port receiving indicator
6	TX	Serial port sending indicator
7	V-	Power ground
8	V+	Power supply, default 8-28V (standard 5V version can be customized), 12V/24V is recommended
9	GND	RS485/RS422 common terminal, connect to the GND of other equipment RS485/RS422 equipment
10	T+(A)	RS422 bus data T+/RS485 bus data A
11	T-(B)	RS422 bus data T-/RS485 bus data B
12	R+	RS422 bus data R+
13	R-	RS422 bus data R-
14	CAN_G	CAN ground
15	CAN_L	CAN communication interface

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16	CAN_H	CAN communication interface

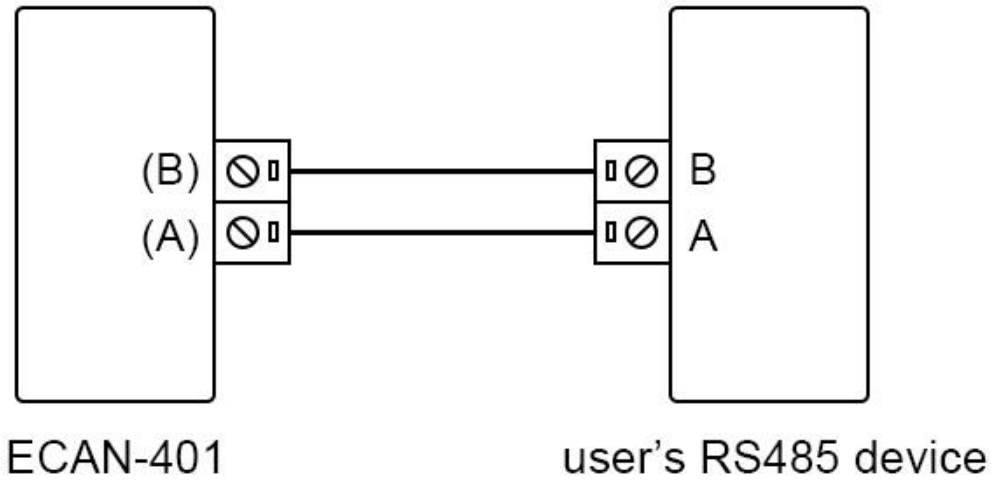
3.2 Dimensions



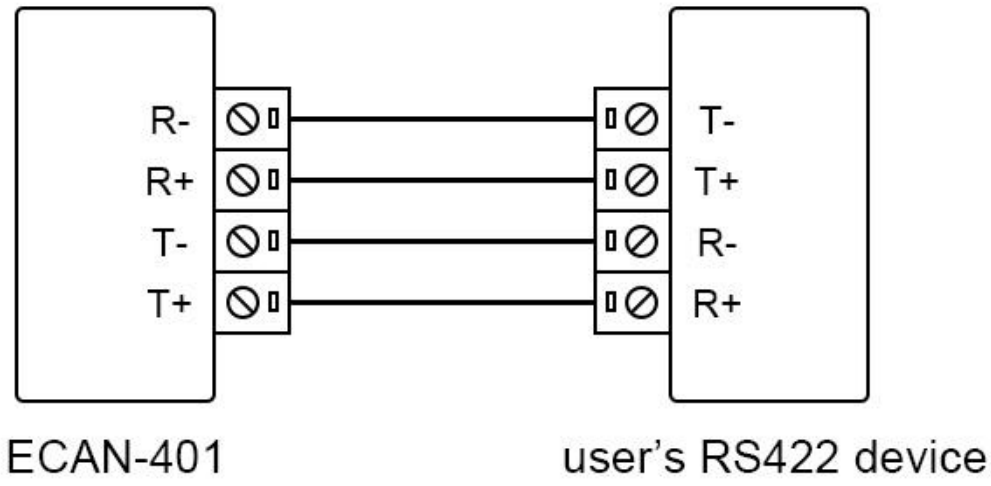
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3.3 Connection method

3.3.1 RS485 connection method

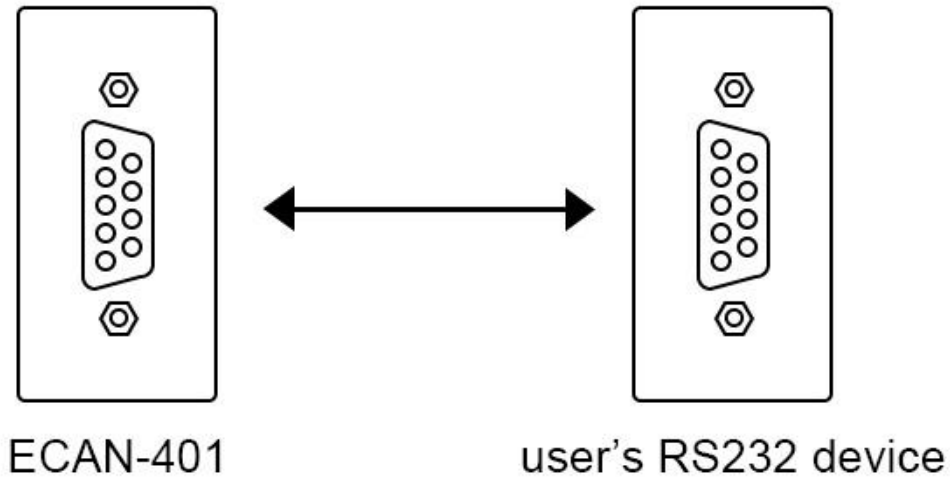


3.3.2 RS422 connection method

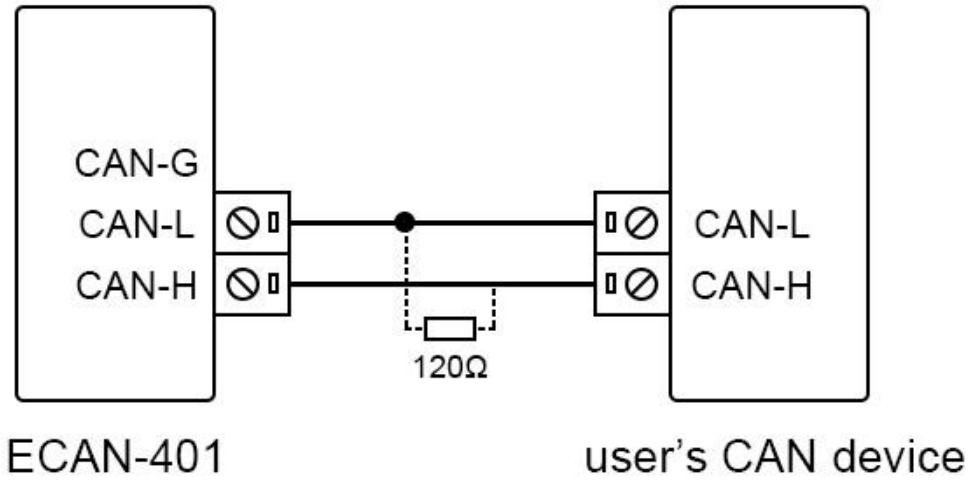


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3.3.3 RS232 connection method



3.3.4 CAN connection method



The linear topology is the most commonly used in the CAN bus wiring specification. That is, the two lines of the main trunk branch out branch lines to each node. Both ends of the backbone are equipped with suitable terminal resistors to achieve impedance matching (usually 120 ohms within 2km).

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4. Mode Description

In "transparent conversion" and "format conversion", one byte of frame information is used to identify some information of the CAN frame, such as type, format, length, etc. The frame information format is as follows.

Frame information description

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
FF	RTR	NO	NO	DLC3	DLC2	DLC1	DLC0

Table 1.1 Frame information

FF: the identification of standard frame and extended frame, 0 is standard frame, 1 is extended frame;

RTR: identification of remote frame and data frame, 0 is data frame, 1 is remote frame;

NO: not used;

NO: not used;

DLC3~DLC0: Identifies the data length of the CAN message;

4.1 Data conversion method

ECAN-401 device supports five data conversion methods: transparent conversion, transparent conversion with logo, protocol conversion, MODBUS conversion and custom protocol conversion. Support two-way conversion between CAN and RS485/RS232/RS422.

Data conversion method	Switch direction
Transparent conversion	CAN and RS485 bidirectional conversion
Transparent band information conversion	CAN and RS485 bidirectional conversion
Protocol conversion	CAN and RS485 bidirectional conversion
MODBUS conversion	CAN and RS485 bidirectional conversion

4.1.1 Transparent conversion mode

Transparent conversion: The converter converts the bus data in one format as it is to the data format of another bus without adding or modifying the data. In this way, the data format is exchanged without changing the data content. For the bus at both ends, the converter is like "transparent", so it is a transparent conversion.

The ECAN-401 device can convert the valid data received by the CAN bus to the serial bus output intact. Similarly, the device can also convert the valid data received by the serial bus to the CAN bus output intact. Realize the transparent conversion between RS485/RS232/RS422 and CAN.

1. Convert serial frame to CAN message

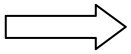
All the data of the serial frame are sequentially filled into the data field of the CAN message frame. After the module detects that there is data on the serial bus, it immediately receives and converts it. The converted CAN message frame information (frame type part) and frame ID come from the user's prior configuration, and the frame type and frame ID remain unchanged during the conversion process.

CAN Message	
Frame information	User configurati

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Serial frame	
0	data 1
1	data 2
2	data 3
3	data 4
4	data 5
5	data 6
6	data 7
7	data 8



	on
Frame ID	User configuration
	User configuration
Data field	data 1
	data 2
	data 3
	data 4
	data 5
	data 6
	data 7
	data 8

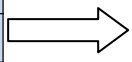
Convert serial frame into CAN message (transparent mode)

Conversion example:

The serial frame is converted into a CAN message (transparent mode).

Assuming that the configuration CAN frame information is "standard frame", frame ID: "0x0213, serial frame data is 0x01 ~ 0x0C, then the conversion format is as follows. The frame ID of the CAN message is 0x0213 (user configuration), frame type: standard Frame (user configuration), the data part of the serial frame will be converted to the CAN message without any modification.

Serial frame
0x01
0x02
0x03
0x04
0x05
0x06
0x07
0x08
0x09
0x0A
0x0B
0x0C



	CAN Message 1	CAN Message 2
Frame information	0x08	0x04
Frame ID	0x02	0x02
	0x13	0x13
Data field	0x01	0x09
	0x02	0x0A
	0x03	0x0B
	0x04	0x0C
	0x05	
	0x06	
	0x07	
	0x08	

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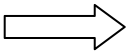
Convert serial frame into CAN message (transparent mode)

2. CAN message to serial frame

During the conversion, all the data in the CAN message data field are sequentially converted into the serial frame. If you check "Enable Frame Information" during configuration, the module will directly fill the "Frame Information" byte of the CAN message into the serial frame. If you check "Enable Frame ID", then all the "Frame ID" bytes of the CAN message are also filled into the serial frame.

Note: If you want to receive CAN frame information or frame ID on the serial interface, you need to enable the corresponding function. Only then can you receive the corresponding information.

CAN Message	
Frame information	User configuration
Frame ID	User configuration
	User configuration
Data field	data 1
	data 2
	data 3
	data 4
	data 5
	data 6
	data 7
	data 8

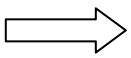


Serial frame	
Frame information	User configuration
Frame ID	User configuration
	User configuration
0	data 1
1	data 2
2	data 3
3	data 4
4	data 5
5	data 6
6	data 7
7	data 8

Conversion example:

The CAN message "frame information" is enabled and "frame ID" is enabled in this example configuration. Frame ID1: 0x123, frame type: standard frame, frame type: data frame. Conversion direction: two-way. The data is 0x12, 0x34, 0x56, 0x78, 0xab, 0xcd, 0xef, 0xff. The data before and after conversion is as follows:

CAN Message	
Frame information	0x08
Frame ID	0x01
	0x23
Data field	0x12
	0x34
	0x56
	0x78



Serial frame
0x08
0x01
0x23
0x12
0x34
0x56
0x78

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	0xAB	0xAB
	0xCD	0xCD
	0xEF	0xEF
	0xFF	0xFF

CAN message is converted into serial frame (transparent mode)

4.1.2 Transparent transmission with logo mode

Transparent conversion with identification is a special usage of transparent conversion. The serial frame carries the ID information of the CAN message, and CAN messages with different IDs can be sent as needed. It is helpful for users to construct their own network more conveniently through the module, and use self-defined application protocol. This method automatically converts the ID information in the serial frame into the frame ID of the CAN bus. As long as the module is told in the configuration that the ID information is at the start position and length of the serial frame, the module extracts the frame ID and fills it in the frame ID field of the CAN message when converting, as the CAN when the serial frame is forwarded The ID of the message. When the CAN message is converted into a serial frame, the ID of the CAN message is also converted to the corresponding position of the serial frame.

Conversion method:

1. Convert serial frame to CAN message

The start address and length of the "frame ID" of the CAN message contained in the serial frame in the serial frame can be set by configuration. The starting address ranges from 0 to 7, and the length ranges from 1 to 2 (standard frame) or 1 to 4 (extended frame). During the conversion, the CAN message "frame ID" in the serial frame is converted into the frame ID field of the CAN message according to the prior configuration (if the number of frame IDs is less than the number of frame IDs of the CAN message, then The high byte of the frame ID in the CAN message is filled with 0.), other data is converted in order, if a CAN message has not been converted to the serial frame data, the same ID is still used as the frame of the CAN message ID continues to convert until the serial frame conversion is completed

Note: If the ID length is greater than 2, the frame type sent by the device will be set as an extended frame. At this time, the frame ID and frame type configured by the user are invalid and are determined by the data in the serial frame. The frame ID range of the standard frame is: 0x000-0x7ff, which are respectively represented as frame ID1 and frame ID0, where frame ID1 is the high byte, and the frame ID range of extended frames is: 0x00000000-0x1fffffff, which are represented as frame ID3, frame ID2, and Frame ID1, frame ID0, among which frame ID3 is the high byte

Serial frame	
0	Data 1(ID1)
1	Data 2(ID0)
2	Data 3
3	Data 4
4	Data 5
5	Data 6
6	Data 7



	CAN Message	CAN Message x
Frame information	User configuration	User configuration
Frame ID	Data 1(ID1)	Data 1(ID1)
	Data 2(ID0)	Data 2(ID0)
Data field	Data 3	Data ...
	Data 4	Data N-1
	Data 5	Data N
	Data 6	

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7	Data 8
…	…
N	Data N
Address N	Data N

	Data 7	
	Data 8	
	Data 9	
	Data 10	

Serial frame is converted into CAN message (transparent transmission with identification)

Conversion example:

Serial frame to CAN message (transparent with logo).

CAN configuration parameters configured in this example. Conversion mode: Transparent conversion with logo, starting address 2, length 3. Frame type: extended frame, frame ID: no configuration required, conversion direction: two-way. The data before and after conversion is as follows.

Serial frame
01
02
03
04
05
06
07
08
09
0A
0B
0C
0D
0E
0F
10



	CAN Message 2		CAN Message 2
Frame information	88	Frame information	85
Frame ID	00	Frame ID	00
	03		03
	04		04
	05		05
Data field	01	Data field	0C
	02		0D
	06		0E
	07		0F
	08		10
	09		
	0A		
	0B		

2. CAN message to serial frame

For CAN messages, a frame is immediately forwarded after a frame is received. Each time it is forwarded, the ID in the received CAN message is corresponding to the position and length of the CAN frame ID configured in advance in the serial frame. Conversion. Other data are forwarded in order. It is worth noting that the frame format (standard frame or extended frame) of both serial frame and CAN message in application should meet the pre-configured frame format requirements, otherwise it may cause the communication to be unsuccessful.

CAN Message	
Frame information	Frame information



Serial frame
ID1

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Frame ID	ID1		ID0
	ID0		Data 1
Data field	Data 1		Data 2
	Data 2		Data 3
	Data 3		Data 4
	Data 4		Data 5
	Data 5		Data 5
	Data 5		Data 7
	Data 7		Data 8
	Data 8		

Convert CAN messages to serial frames

Conversion example:

CAN configuration parameters configured in this example. Conversion mode: Transparent conversion with logo, starting address 2, length 3. Frame type: extended frame, frame type: data frame. Conversion direction: two-way. Send identifier: 0x00000123, then the data before and after conversion is as follows.

CAN Message			**Serial frame**
Frame information	88		99
Frame ID	00		88
	00		00
	01		01
	23		23
Data field	99		77
	88		66
	77		55
	66		44
	55		33
	44		22
	33		

Example of CAN message conversion to serial frame (transparent with information conversion)

4.1.3 Protocol mode

The fixed 13 bytes of CAN format conversion represent a CAN frame data, and the content of 13 bytes includes CAN frame information + frame ID + frame data. In this conversion mode, the CANID set is invalid, because the identifier (frame ID) sent at this time is filled with the frame ID data in the serial frame of the above format. The configured frame type is also invalid. The frame type is determined by the frame information in the format serial frame. The format is as follows:

CAN fixed format serial frame (13 bytes)		
Frame informati	Frame ID	Frame Data

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on		
1Byte	4Byte	8Byte

The frame information is shown in Table 1.1

The length of the frame ID is 4 bytes, the standard frame valid bit is 11 bits, and the extended frame valid bit is 29 bits.

Extended frame ID number 0x12345678			
0x12	0x34	0x56	0x78

Standard frame ID number 0x3FF			
0x00	0x00	0x03	0xFF

1. Convert serial frame to CAN message

In the process of converting a serial frame to a CAN message, in a serial data frame aligned with a fixed byte (13 bytes), if the data format of a certain fixed byte is not standard, the fixed byte length will not be converted. Then convert the following data. If you find that some CAN messages are missing after conversion, please check whether the fixed byte length serial data format of the corresponding message does not conform to the standard format.

2. Convert serial frame to CAN message

When the frame data is converted in CAN format, the length is fixed to 8 bytes. The effective length is determined by the value of DLC3~DLC0. When the effective data is less than the fixed length, it needs to be filled with 0 to the fixed length.

In this mode, it is necessary to pay attention to the serial data format in strict accordance with the fixed byte format to successfully convert. The CAN mode conversion can refer to the example (CAN format conversion standard frame example). When converting, first ensure that the frame information is correct and the data length indicates No errors, otherwise no conversion will be performed.

Conversion example:

Serial frame to CAN message (protocol mode).

CAN configuration parameters configured in this example. Conversion mode: protocol mode, frame type: extended frame, conversion direction: two-way. Frame ID: No need to configure, the data before and after conversion is as follows.

Serial frame
88
17
65
43
21
99
88
77
66
55
44
33
22



CAN Message	
Frame information	88
Frame ID	17
	65
	43
	21
Data field	99
	88
	77
	66
	55
	44
	33
	22

Serial frame to CAN message (protocol mode)

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4.1.4 Modbus mode

Modbus protocol is a standard application layer protocol, which is widely used in various industrial control occasions. The protocol is open, with strong real-time performance, and good communication verification mechanism. It is very suitable for occasions with high communication reliability requirements. The module uses the standard Modbus RTU protocol format on the serial port side, so the module not only supports the user to use the Modbus RTU protocol, but also the module. It can directly interface with other devices that support Modbus RTU protocol. On the CAN side, a simple and easy-to-use segmented communication format is developed to realize Modbus communication. A method for segmenting and reorganizing information with a length greater than the maximum data length of a CAN message. "Data 1" is used to segment identification data. , The transmitted Modbus protocol content can start from the "data 2" byte, if the protocol content is greater than 7 bytes, then the remaining protocol content will continue to be converted according to this segmented format until the conversion is completed. When there is no other data on the CAN bus, the frame filter may not be set. The communication can be completed. When there are other data on the bus, a filter needs to be set. Distinguish the source of data received by the device. According to this approach. It can realize the communication of multiple hosts on a bus. The data transmitted on the CAN bus does not require a CRC validation method. Data validation on the CAN bus already has a more complete validation method. In this mode, the device supports Modbus verification and forwarding, not the Modbus master or slave, and the user can communicate according to the Modbus protocol.

Segmented transmission protocol:

A method for segmenting and reorganizing information with a length greater than the maximum data length of a CAN message. In the case of a CAN message, "Data 1" is used to segment identification data. The format of the segment message is as follows, and the content of the transmitted Modbus protocol is sufficient. Starting from the "data 2" byte, if the protocol content is greater than 7 bytes, the remaining protocol content will continue to be converted in this segmented format until the conversion is completed.

Segment mark	Segment type		Segment counter				
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Segmented message tag: indicates whether the message is a segmented message. If this bit is 0, it means a separate message, and it is 1 it means

Belongs to a frame in the segmented message.

Segment type: Indicate whether it is the first paragraph, the middle paragraph or the last paragraph.

Place value	meaning	illustrate
0	First segment	If the segment counter contains the value 0, then this is the first segment in the segment series
1	Middle segment	Indicates that this is an intermediate segment
2	Last segment	Mark the last segment

Segment counter: The mark of each segment indicates the sequence number of the segment in the entire message. If it is the number of segments, the value of the counter is the number. In this way, it is possible to verify whether any segments are missing when receiving. 5Bit is used in total, and the range is 0~31.

No	7	6	5	4	3	2	1	0

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Frame information	FF	RTR	EDL	BRS	DLC（Data length）
Frame ID3	X	X	X	ID.28-ID.24	
Frame ID2	ID.23-ID.16				
Frame ID1	ID.15-ID.8				
Frame ID0	ID.7-ID.0				
Data 1	Segment mark	Segment type	Segment counter		
Data 2	DATE				
Data 3	DATE				
Data 4	DATE				
Data 5	DATE				
Data 6	DATE				
Data 7	DATE				
Data 8	DATE				

1. **Convert serial frame to can message**

The serial interface adopts the standard Modbus RTU protocol, so the user frame only needs to comply with this protocol. If the transmitted frame does not conform to the Modbus RTU format, the module will discard the received frame without converting it.

2. can message to serial frame

For the Modbus protocol data of the CAN bus, there is no need to do cyclic redundancy check (CRC16), the module receives according to the segmentation protocol, and automatically adds the cyclic redundancy check (CRC16) after receiving a frame analysis, and converts it into Modbus RTU frame to send To the serial bus. If the received data does not conform to the segmentation protocol, the group of data will be discarded without conversion.

Modbus RTU Frame
Address domain
function code
Data field
CRC field



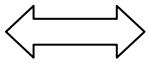
CAN Message	CAN Message 1	CAN Message x
Frame Information	Frame Information	Frame Information
Frame ID3	0x00	0x00
Frame ID2	0x00	0x00
Frame ID1	0x00	0x00
Frame ID0	Frame ID (user setting)	Frame ID (user setting)
Data 1	[Use of Segmented Protocol]	[Use of Segmented Protocol]
Data 2	Address field	

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Data 3	Data field	Data field
Data 4		
Data 5		
Data 6		
Data 7		
Data 8		

Conversion example:

Modbus RTU Frame	Serial frame
Address field	55
function code	0F
Data field	00
	00
	00
	04
	02
	00
	00
CRC Field	29
	13



CAN Message	CAN Message 1	CAN Message c2
Frame Information	08	02
Frame ID3	00	00
Frame ID3	00	00
Frame ID1	00	00
Frame ID0	Frame ID	Frame ID
Data 1	81	C2
Data 2	55	00
Data 3	0F	00
Data 4	00	
Data 5	00	
Data 6	00	
Data 7	04	
Data 8	02	

4.1.5 Custom protocol mode

It must be a complete serial frame format that conforms to the custom protocol, and it must contain all the serial frames in the mode configured by the user.

There is content, except for the data field, if the content of other bytes is wrong, this frame will not be sent successfully.

The content of the serial frame: frame header, frame length, frame information, frame ID, data field, frame end.

Note: In this mode, the frame ID and frame type configured by the user are invalid, and the data will be forwarded according to the format in the serial frame.

1. Convert serial frame to CAN message

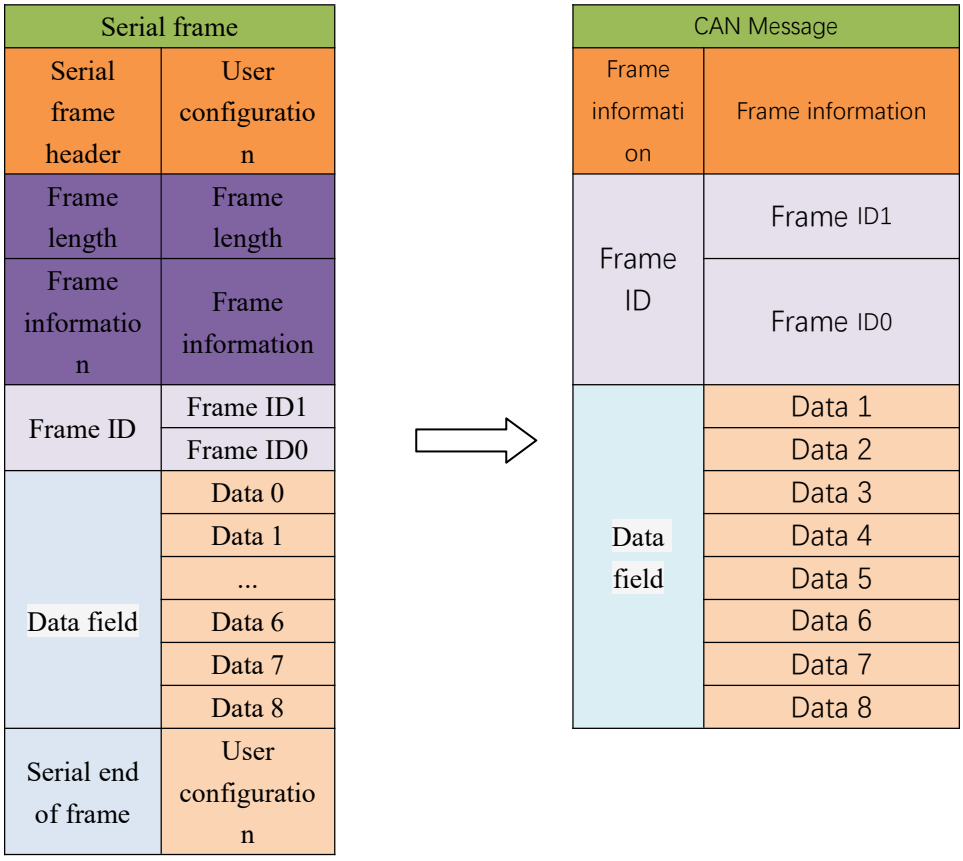
The serial frame format must conform to the specified frame format. Because the CAN frame format is based on messages, the serial frame format is based on byte transmission. Therefore, in order to allow users to use CAN-bus conveniently, the serial frame format is moved closer to the CAN frame format, and the start and end of a frame are specified in the serial frame, that is, the "frame head" and "frame end" in the AT command. , Users can configure by themselves. Frame length refers to the length from the beginning of the frame information to the end of the last data,

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excluding the end of the serial frame. Frame information is divided into extended frames and standard frames. The standard frame is fixed as 0x00, and the extended frame is fixed as 0x80, which is different from transparent conversion and transparent conversion with identification. In custom protocol conversion, regardless of the data length contained in the data field of each frame How much, the content of the frame information is fixed. When the frame type is a standard frame (0x00), the last two bytes of the frame type represent the frame ID, with the high order first; when the frame information is an extended frame (0x80), the last 4 bytes of the frame type represent the frame ID, where High ranking first.

Note: In the custom protocol conversion, regardless of the data length contained in the data field of each frame, the frame information content is fixed. It is fixed as standard frame (0x00) or extended frame (0x80). The frame ID needs to conform to the ID range, otherwise the ID may be wrong.

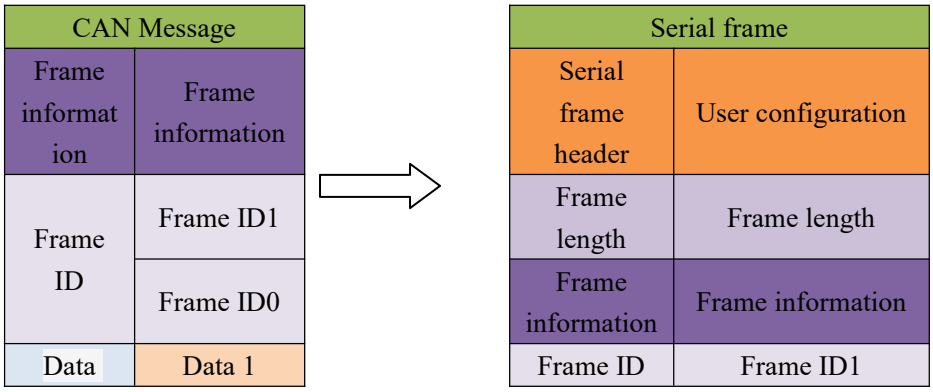


Serial frame	
Serial frame header	User configuration
Frame length	Frame length
Frame information	Frame information
Frame ID	Frame ID1
	Frame ID0
Data field	Data 0
	Data 1
	...
	Data 6
	Data 7
	Data 8
Serial end of frame	User configuration

CAN Message	
Frame information	Frame information
Frame ID	Frame ID1
	Frame ID0
Data field	Data 1
	Data 2
	Data 3
	Data 4
	Data 5
	Data 6
	Data 7
	Data 8

2. Convert CAN message to serial frame

CAN bus message receives a frame and then forwards a frame. The module will convert the data in the CAN message data field in turn, and at the same time add frame header, frame length, frame information and other data to the serial frame, which is actually a serial frame Transfer the reverse form of CAN message.



CAN Message	
Frame information	Frame information
Frame ID	Frame ID1
	Frame ID0
Data	Data 1

Serial frame	
Serial frame header	User configuration
Frame length	Frame length
Frame information	Frame information
Frame ID	Frame ID1

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field	Data 2		Frame ID0
	Data 3	Data field	Data 0
	Data 4		Data 1
	Data 5		...
	Data 6		Data 6
	Data 7		Data 7
	Data 8	Serial end of frame	User configuration

Convert CAN messages to serial frames

Conversion example:

Serial frame to CAN message (custom protocol).

CAN configuration parameters configured in this example. Conversion mode: custom protocol, frame header AA, frame end: FF, conversion direction: bidirectional. Frame ID: No need to configure, Frame type: No need to configure, the data before and after conversion is as follows.

CAN message to serial frame: the reverse form of serial frame to CAN message.

Serial frame	
Serial frame header	AA
Frame length	07
Frame information	00
Frame ID	01
	23
Data field	11
	22
	33
	44
Serial end of frame	FF

⟺

CAN Message	
Frame information	00
Frame ID	01
	23
Data field	11
	22
	33
	44

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5. AT Command

1. Enter AT command mode: send +++ via serial port, send AT again within 3 seconds, the device will return AT MODE, then enter AT command mode.
2. If there is no special instruction, all subsequent AT command operations need to add "\r\n".
3. All examples are performed with the command echo function turned off.
4. After setting the parameters, you need to restart the device to make the set parameters take effect.

Error code table:

error code	instruction
-1	Invalid command format
-2	Invalid command
-3	Not yet defined
-4	Invalid parameter
-5	Not yet defined

Default parameters

Parameter category	parameter name	Parameter value	Related instructions
Serial port	Baud rate	115200	AT+UART
	digit	8	
	Stop bit	1	
	Parity check	None	

5.1 Enter AT command

Command	AT
Function	Enter AT command mode
Send	AT
Back	<CR><LF>+OK<CR><LF>

【Example】

Send: +++ // no line break

Send: AT // no line break

Response: <CR><LF>AT MODE<CR><LF>

5.2 Exit AT command

Command	EXAT
Function	Exit AT command mode

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Setting	AT+EXAT<CR><LF>
Back	<CR><LF>+OK<CR><LF>

【Example】

Send: AT+EXAT\r\n

Response: <CR><LF>+OK<CR><LF>

5.3 Query version

Command	VER?
Function	Query firmware version
Inquire	AT+VER?<CR><LF>
Back	<CR><LF> VER=x.x<CR><LF>
Remark	x.x version number

【Example】

Send: AT+VER? \r\n

Response: <CR><LF> VER=x.x <CR><LF>

5.4 Restore default parameters

Command	RESTORE
Function	Restore the default parameters of the device (factory parameters)
Setting	AT+RESTORE<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Remark	Need to restart the device for the parameters to take effect

【Example】

Send: AT+RESTORE \r\n

Response: <CR><LF>+OK<CR><LF>

5.5 Echo settings

Command	E
Function	User command echo setting/query
Setting	AT+E=ON<CR><LF><CR><LF>
Back	<CR><LF>+OK<CR><LF>
Remark	ON OFF

【Example】

set up:

Send: AT+E=OFF\r\n

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Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+E?\r\n

Response: <CR><LF>+OK<CR><LF>

5.6 Serial port parameters

Command	UART
Function	Set the serial communication parameters of the module
Setting	AT+UART=baud,date,stop,parity,flowcontrol
Back	<CR><LF>+OK=<snString><CR><LF>
Inquire	AT+UART?
Parameter	Baud（Serial port baud rate）: 600,1200,2400,4800,9600,14400,19200,38400,43000,57600, 76800, 115200, 128000, 230400, 256000, 460800, 921600 单位：bps date: 8 stop: 1,2 parity: NONE,EVEN,ODD. flowcontrol：NFC(No flow control), FC(Flow Control),

【Example】

set up:

Send: AT+UART=115200,8,1,EVEN,NFC\r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+UART?\r\n

Response: <CR><LF>+OK<CR><LF> AT+UART=115200,8,1,EVEN,NFC <CR><LF>

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5.7 Setting/Querying CAN Information

Command	CAN
Function	Set CAN interface communication parameters
Setting	AT+CAN =baud,id,mode<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+CAN?
Parameter	Baud(CANBaud rate): 6K,10K,20K,50K,100K,120K,125K,150K,200K,250K, 400K, 500K, 600K, 750K, 1000K unit ： bps id (Frame ID): 0~7FF(Standard frame) , 0~1FFFFFFF(Extended frame) mode:(Frame category)： NDTF(Standard frame)， EDTF(Extended frame)

【Example】

set up:

Send: AT+CAN=100,70,NDTF\r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+ CAN?\r\n

Response: <CR><LF>+OK<CR><LF> AT+CAN=100,70,NDTF <CR><LF>

5.8 Setting/Querying Module Conversion Mode

Command	MODE
Function	Set/query module conversion mode
Setting	AT+ MODE=mode<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+MODE?
Parameter	mode (Module working mode):TRANS(transparent), TPRTL(Transparent with logo), PROTOL(Protocol mode), USER(Custom protocol), MODBUS(MODBUS),

【Example】

set up:

Send: AT+CANLT=ETF\r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+ CANLT?\r\n

Response: <CR><LF>+OK<CR><LF> AT+CANLT=ETF<CR><LF>

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5.9 Set/query the filtering mode of the CAN bus

Command	CANLT
Function	Set/query the filtering method of CAN bus
Setting	AT+CANLT =mode<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+CANLT?
Parameter	mode (Filter mode):OFF(Receive all functions), ETF(Only receive extended frames), NTF(Only receive standard frames), USER (customize)

【Example】

set up:

Send: AT+MODE=MODBUS\r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+ MODE?\r\n

Response: <CR><LF>+OK<CR><LF>AT+MODE=MODBUS <CR><LF>

5.10 Set/query frame header and frame end data

Command	UDMHT
Function	Set/query frame header and end data in custom mode
Setting	AT+UDMHT=head,tail<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+ UDMHT?
Parameter	head (Header data)，tail (End-of-frame data). data range 0~0xFF

【Example】

Settings: Set the frame header data to FF and the frame end data to 55

Send: AT+UDMHT=FF,55 \r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+UDMHT?\r\n

Response: <CR><LF>+OK<CR><LF> AT+UDMHT=FF,55<CR><LF>

5.11 Setting/Querying Identification Parameters

Command	RANDOM
Function	Set/query query identification parameters
Setting	AT+RANDOM = idLength, idLocation <CR><LF>

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Back	<CR><LF>+OK<CR><LF>
Inquire	AT+RANDOM?
Parameter	idLength (Frame header ID length)，idLocation (Frame ID position)。 Data range: length range 0-4 position 0-7

【Example】

Settings: Set the frame ID length to 4, position 2

Send: AT+RANDOM=4,2 \r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+ RANDOM?\r\n

Response: <CR><LF>+OK<CR><LF> AT+RANDOM=4,2 <CR><LF>

5.12 Setting/Querying Identification Parameters

Command	MSG
Function	Set/query frame ID frame information enable
Setting	AT+MSG =flag_id, flag_type<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+MSG?
Parameter	flag_id (frame header data), tail (frame tail data). Data range 0~0xFF

【Example】

Settings: enable frame ID, frame information

Send: AT+MSG=1,1 \r\n

Response: <CR><LF>+OK<CR><LF>

Inquire:

Send: AT+ MSG?\r\n

Response: <CR><LF>+OK<CR><LF> AT+MSG=1,1<CR><LF>

5.13 Set/query transmission direction

Command	DIRECTION
Function	Set/query frame ID frame information enable
Setting	AT+DIRECTION= parameter<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+ DIRECTION?
Parameter	parameter (direction parameter), UART-CAN (serial port to can). CAN-UART (CAN to serial port) BOTHWAY (two-way)

【Example】

Setting: Only convert serial port data to can bus

Send: AT+DIRECTION=UART-CAN\r\n

Response: <CR><LF>+OK<CR><LF>

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Inquire:

Send: AT+ DIRECTION?\r\n

Response: <CR><LF>+OK<CR><LF> AT+DIRECTION=UART-CAN <CR><LF>

5.14 Setting/Querying Filter Parameters

Command	FILTER
Function	Set/query filter frame information
Setting	AT+FILTER=id_type,date<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Inquire	AT+FILTER?
Parameter	type (frame type), date (frame data) type: NDTF represents this command is a standard ID, EDTF represents this command is an extended frame ID date: ID data.

【Example】

Settings: Set frame filtering parameters: standard frame ID, 719

Send: AT+LFILTER=NDTF,719 \r\n

Response: <CR><LF>+OK<CR><LF>

Query: Will return all IDs that have been set

Send: AT+ FILTER?\r\n

Response: <CR><LF>+OK<CR><LF> AT+LFILTER=NDTF,719 <CR><LF>

5.15 Delete the filter parameters that have been set

Command	DELFILTER
Function	Set/query filter frame information
Setting	AT+DELFILTER=id_type,date<CR><LF>
Back	<CR><LF>+OK<CR><LF>
Parameter	type (frame type), date (frame data) NDTF: Represents this command as a standard ID, EDTF represents this command as an extended frame ID. date: ID data.

【Example】

Setting: delete filter parameter: standard frame 719

Send: AT+DELFILTER=NDTF,719 \r\n

Response: <CR><LF>+OK<CR><LF>

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6. Revision history

Version	Date	Description	Issued by
1.0	2021-10-08	Initial version	WSM
1.1	2021-12-21	Content updates	XXN
1.2	2025-03-06	Modify the pin mapping	ZYD

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