

Modbus / CAN Gateway GT100-CAN-MS

User Manual

V1.0

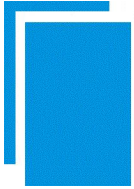
Rev A



SST Automation

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Important Information

Warning

The data and examples in this manual cannot be copied without authorization. SST Automation reserves the right to upgrade the product without notifying users.

The product has many applications. The users must make sure that all operations and results are in accordance with the safety of relevant fields, and the safety includes laws, rules, codes and standards.

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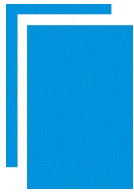
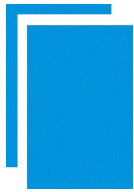


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1 Product Overview

1.1 Product Function

The gateway GT100-CA-MS can connect multiple devices with Modbus master interface to CAN networks, enabling communication between them. Modbus/RS-485 network devices can be converted to CAN network devices.

1.2 Product Features

- Wide Application: Modbus masters can communicate with devices that have a CAN interface;
- Easy to use: Simple configuration that enables quick network communication;
- Transparent Communication: Each Modbus input/output frame consists of 8 registers;

1.3 Technical Specifications

[1] Modbus side

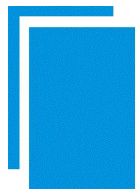
- One Modbus slave interface, supporting function codes 03, 04, and 16;
- Serial port baud rates: 300, 600, 1200, 2400, 9600, 19200, 38400, 57600 and 115200bps;
- Input register start address is 0, supporting function codes 04;
- Output register start address is 0, supporting function codes 03 and 16;
- Every 8 registers (16 bytes) are 1 CAN frame;
- Each Modbus command includes 1 CAN frame;

[2] CAN side

- Supports bidirectional data communication, capable of both receiving and transmitting CAN frames;
- Supports CAN2.0A and CAN2.0B;
- Supports CAN baud rates of 1M, 500K, 250K, 125K, 100K, 62.5K, 31.25K, 20K, and 10Kbps;
- The FIFO for both transmitting and receiving CAN frames is 16 frames;

[3] Operating Environmental Conditions:

- Rel. Humidity: 5%-95% RH non-condensing
- Operating Temp: -4°F to 140°F (-20°C to 60°C)



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➤ Class of pollution: $\leq$ Level 3

[4] Power Supply: DC 24V (11V~30V), maximum current consumption: 80mA (24V)

Internal DC/DC conversion, minimum conversion efficiency: $\geq$ 70%.

[5] External dimension (W*H*D): 3.94 in*2.76 in*0.98 in (100mm* 70mm * 25mm)

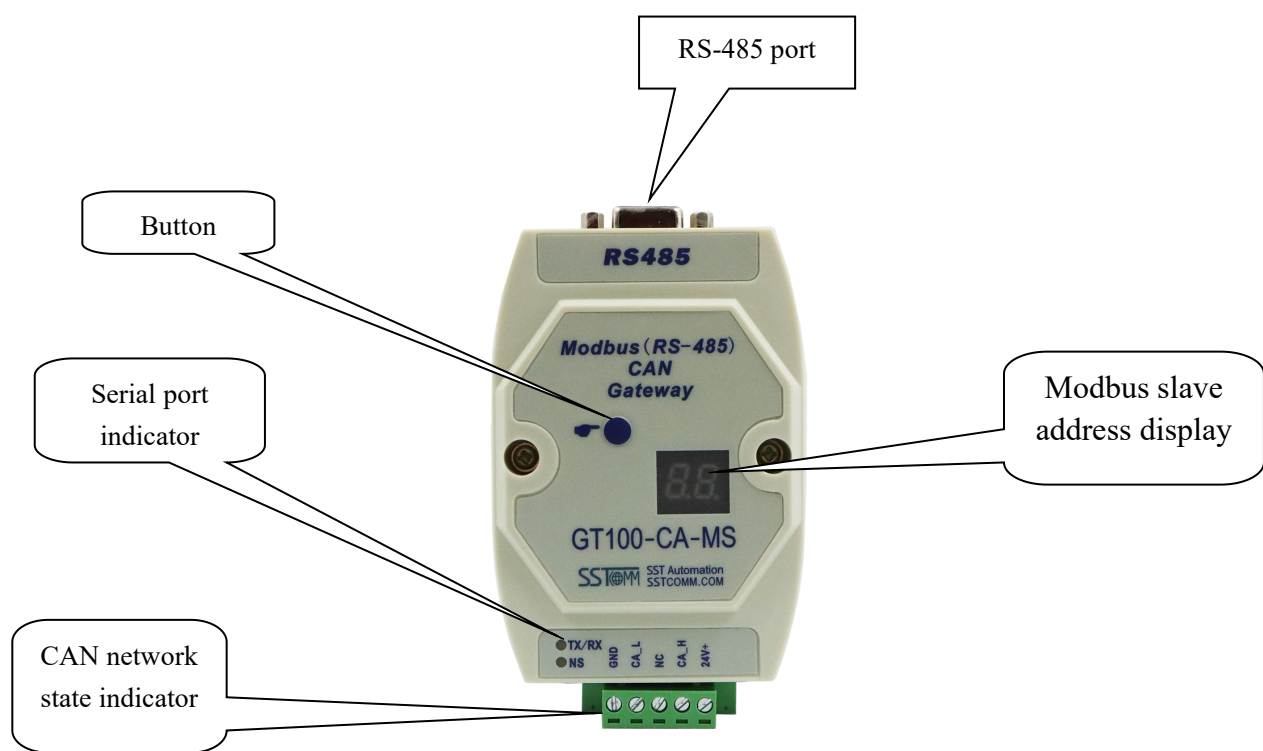
[6] Protection Level: IP20

1.4 Revision History

Date	Revision	Description
02/27/2026	V1.0 RevA	Updated the product picture and dimensions
07/24/2016	V1.0	New Release

2 Hardware Descriptions

2.1 Product Appearance



2.2 Indicators

Indicators	State	Description
TX/RX	Green Blinking	RS-485 port is sending data.
	Red Blinking	RS-485 port is receiving data.
NS	Always Green	CAN network normal
	Always Red	CAN network failure



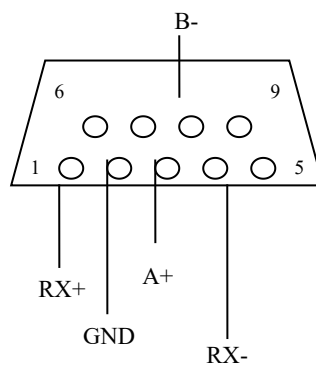
2.3 Configuration Button and LED Display

1. Double-click the button to enter configuration mode.
2. The LED displays the Modbus slave address in communication mode; it shows 'CF' in configuration mode.

2.4 Communication Interface

2.4.1 Modbus Interface

DB9 female connector:



Modbus side wiring:

RS-485 connection:

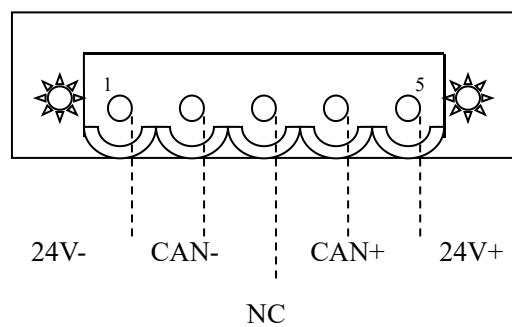
Pin	Wiring
Pin 3	A+
Pin 8	B-
Pin 2	GND

2.4.2 CAN Interface

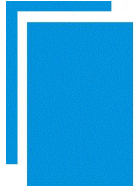
CAN side connector:

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Pin	Wiring
Pin 1	GND(24V-)
Pin 2	CAN-
Pin 3	NC
Pin 4	CAN+
Pin 5	24V+



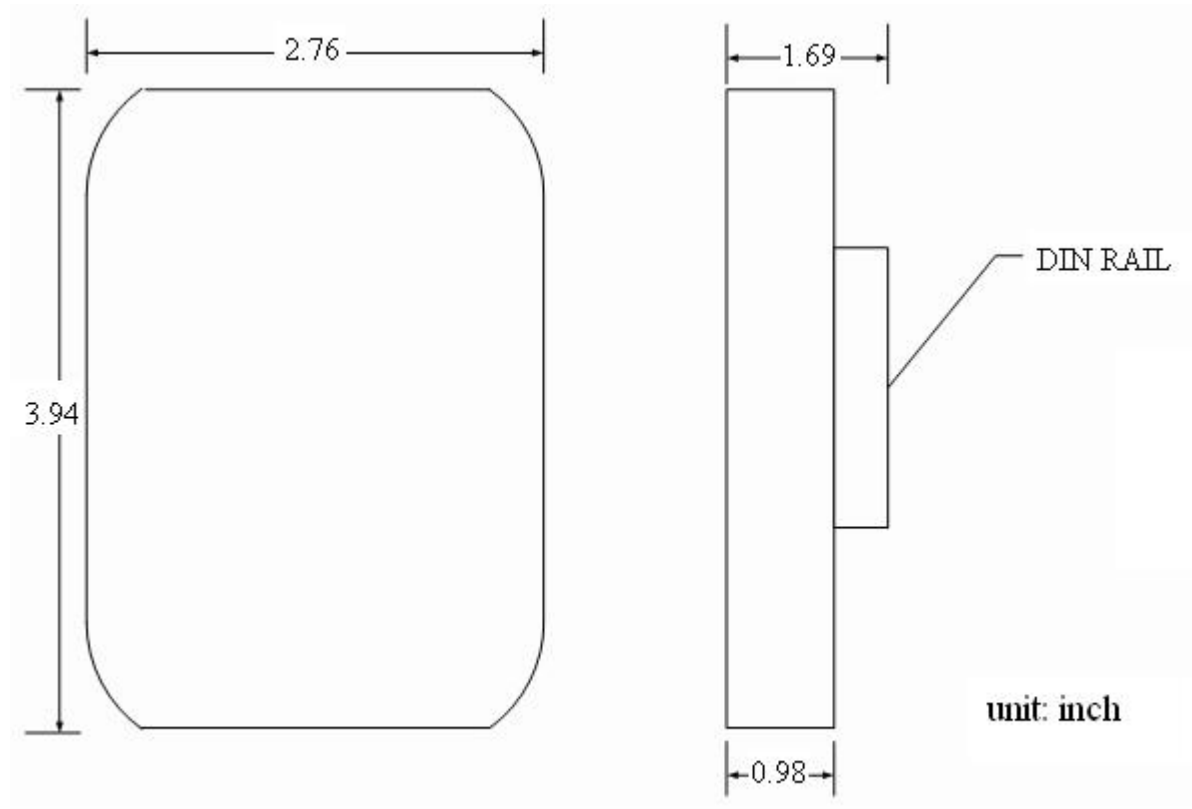
3 Hardware Installation

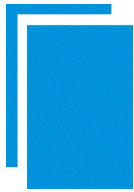
3.1 Machine Dimension

Size: 3.94in (width)*2.76 in (height)*0.98 in (depth) (not including DIN RAIL connector)

3.2 Installation Method

Using 35mm DIN RAIL





4 Use Method

4.1 Quick Start Guide

1. Connect the GT100-CA-MS to the PC via an RS-232/485 converter, check that the power and wiring are correct, then power on.;

2. In configuration mode, use the gateway configuration software SST-CAM-CFG to configure the Modbus slave address, Modbus baud rate, parity, CAN working mode, CAN baud rate, and other settings.

To enter configuration mode: After powering on, the NS indicator will remain on; double-click the blue configuration button to enter configuration mode. Then, use SST-CAM-CFG to configure. After configuration, reboot the gateway (power it off and on) to start operation..

3. Correctly wire the Modbus and CAN interface, and check the wiring.

4. Power on, the module enter run mode.

4.2 Hardware Wiring

1. Follow the CAN interface instructions in Chapter 3 to properly wire each pin of the 5-pin terminal. Note that the device should not be powered on at this stage.

2. Follow the Modbus interface instructions in Chapter 3. For RS-485 communication, wire at least pins 3 and 8 (pin 2 is optional). Since the configuration port and Modbus port share the RS-485 connection, ensure that other Modbus nodes are powered off or disconnected from the RS-485 port on the GT100-CA-MS to avoid configuration issues.

3. Check that the wiring is correct according to the manual instructions.

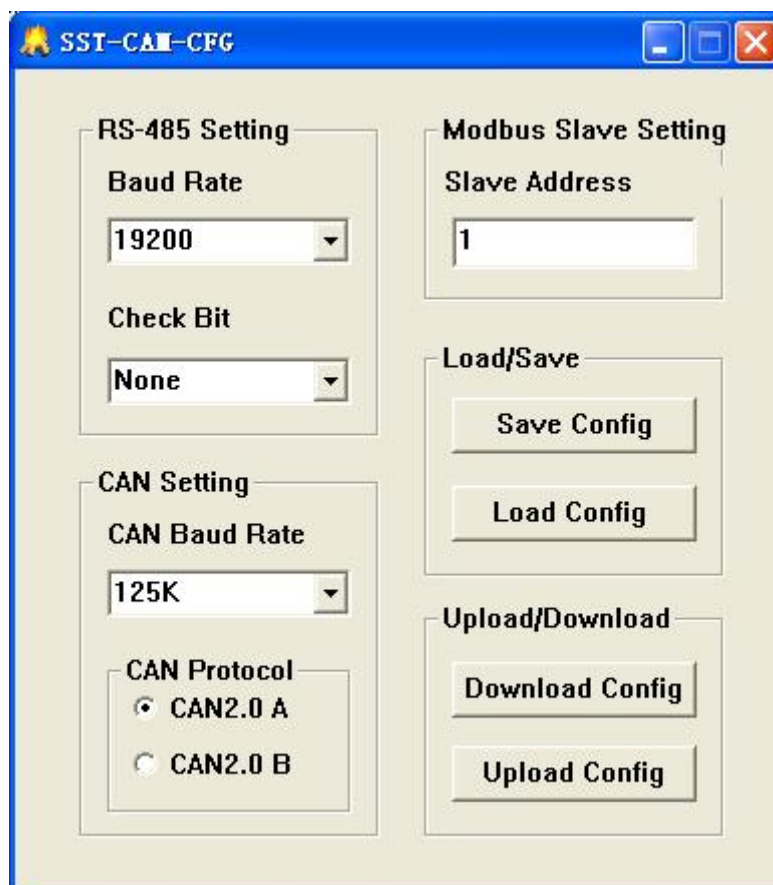
4. Power on the module and enter run mode.

4.3 Software Configuration

Users can connect the GT100-CA-MS to a PC using an RS-485 converter. They can then configure the Modbus and CAN parameters through the gateway configuration software SST-CAM-CFG. After powering on, double-click the button

to enter configuration mode.

The following Modbus and CAN parameters are configurable: serial baud rate, parity, Modbus slave address, CAN baud rate, and CAN protocol (CAN 2.0A or CAN 2.0B).



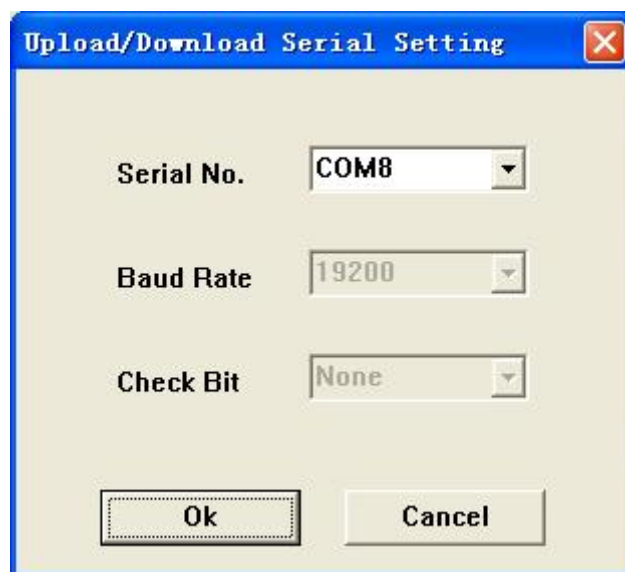
Configuration Software SST-CAM-CFG

4.3.1 Load/Save

Users can open and save configuration information as a .txt file in order to check the configuration.

4.3.2 Upload/Download

Users can upload or download configuration through the COM port on the PC. Select the correct port number and complete the upload/download process. The interface is shown below:

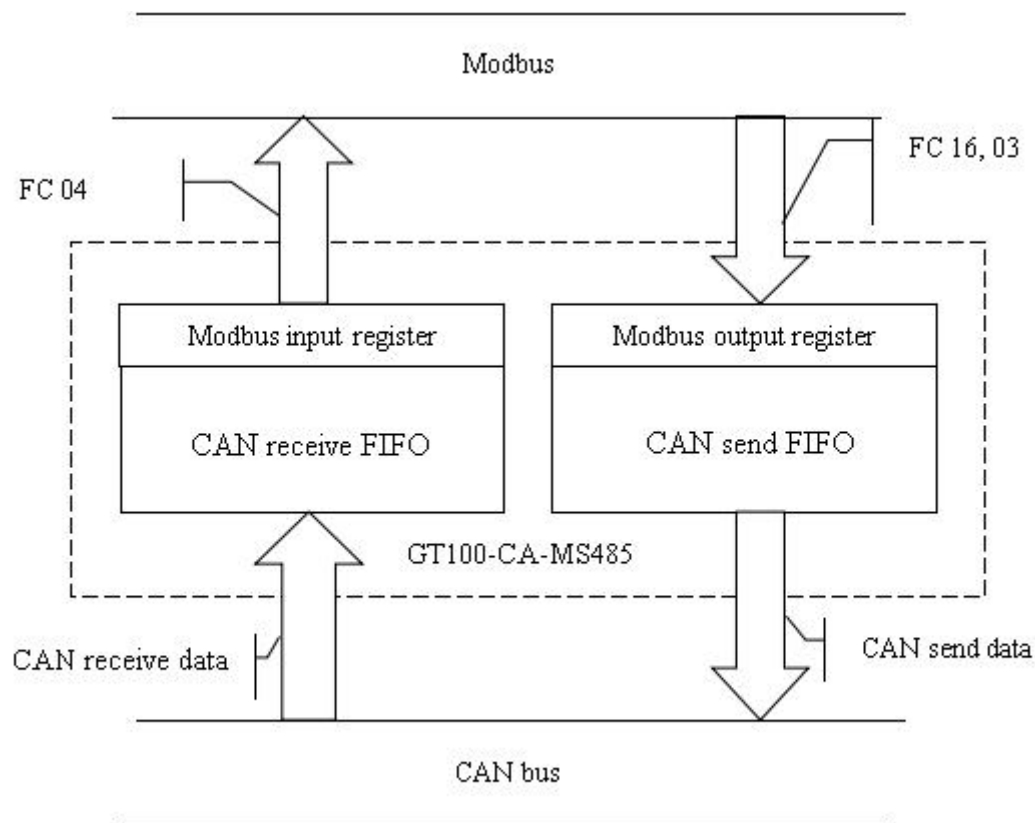


4.4 Working Principle

4.4.1 Data Exchange

CAN data transmission and reception follow FIFO (First In, First Out) order, with a FIFO buffer of 16 CAN frames for both sending and receiving.

In the picture below, 'FC' stands for function code.



4.4.2 The Relationship between Modbus Data and CAN Frame

a) Modbus Input Register

Use function code 04 to read the Modbus input register, which corresponds to received CAN data.

The starting address is 0.

Each frame must read 8 registers (16 bytes); otherwise, a Modbus exception response will be returned.

Byte	0	1	2	3	4-7	8-15
Meaning	0xFF	The data number of CAN frame including	Sequence Number	Reserved	Frame header and CAN frame mode control	CAN frame data

When the GT100-CA-MS receives a CAN frame on the CAN network, the sequence number of the input frame will be incremented by 1. Users can choose whether to use these CAN frames based on their requirements.

b) Modbus Output Register

Use function code 16 to write data to the Modbus output register of the GT100-CA-MS, which corresponds to the CAN frame to be sent.

The starting address is 0.

Each frame must contain 8 registers (16 bytes); otherwise, a Modbus exception response will be returned.

Byte	0	1	2	3	4-7	8-15
meaning	Single/ Repeat control	The data number of CAN frame including	Sequence Number	Reserved	Frame header and CAN frame mode control	CAN frame data

c) Bytes Definition

Byte 0 to byte 3 are controlling bytes

Byte 0: When the value is zero, this byte indicates that the CAN frame with the sequence number is sent once. If it is non-zero, it indicates periodic transmission of the CAN frame with the sequence number. The transmission cycle is determined by the value of Byte 0: transmission period = Byte 0 value * 10ms. For example, if Byte 0 is 10, the transmission period is 100ms, meaning the frame is sent once every 100ms.

Byte 1: Indicates the number of data bytes in the CAN frame, with a range of 0 to 8.

Byte 2: Sequence number. The initial sequence number in the output frame is non-zero (any value except zero). In single transmission mode, the number must increment by 1 for each new frame, and the gateway will recognize this as single transmission data. If the sequence number reaches 255, it will roll over to 0. In periodic mode, the sequence number does not increment. To switch from single transmission mode to periodic mode, increment the sequence number by 1, and set Byte 0 to a non-zero value. To switch from periodic mode to single transmission mode, increment the sequence number by 1, and set Byte 0 to 0.

Bytes 4 to 7 represent the CAN frame header and mode control (29-bit CAN ID).

The format of byte 4 is as follows:

Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Meaning	Reserved	RTR	Reserved	The top five bits of frame header				

Bit 6 of byte 4: RTR (Remote Transmission Request). 0 indicates a data frame, while 1 indicates a remote frame.

Bit 0 to 4 of byte 4 to byte 7, CAN2.0A/2.0B frame header.

Byte 5:

Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
-----	-------	-------	-------	-------	-------	-------	-------	-------

Meaning	The second high 8 bits of frame header
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Byte 6:

Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Meaning	The second low 8 bits of frame header							

Byte 7:

Bit	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Meaning	The lowest 8 bits of frame header							

Bytes 8 to 15 contain the CAN frame data. If the CAN frame contains fewer than 8 bytes, the remaining bytes are set to 0.

d) Modbus Message Examples:

i. Get the received CAN frame

For example: Modbus slave address is 1, sequence number is 10, CAN2.0A, CAN frame ID is 0x123, and CAN frame data is 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08.

The user's Modbus master sends the request frame:

01 04 00 00 00 08 F1 CC

The response frame of GT100-CA-MS:

01 04 10 FF 08 0A 00 00 00 01 23 01 02 03 04 05 06 07 08 7A A0

ii. Write the CAN frame to be sent

For example: Modbus slave address is 1, single transmission mode, sequence number is 5, CAN2.0A, CAN frame ID is 0x123, and CAN frame data is 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08.

The user's Modbus master sends request frame:

01 10 00 00 00 08 10 00 08 05 00 00 00 01 23 01 02 03 04 05 06 07 08 38 FE

The response frame of GT100-CA-MS:

01 10 00 00 00 08 C1 CF