

CAN / EtherNet/IP Gateway GT200-EI-CA

User Manual

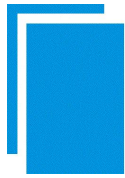
V2.1



SST Automation

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Important Information

Warning

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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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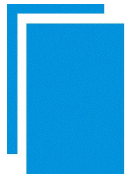


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1 Product Overview

1.1 Product Function

GT200-EI-CA is a gateway that can realize mutual conversion between CAN protocol and EtherNet/IP protocol, and supports CAN2.0A/CAN2.0B devices to connect to EtherNet/IP Scanner for data communication.

1.2 Product Features

- Supports one CAN interface.
- CAN interface: 3KV photoelectric isolation.
- Supports two 10M/100M auto-negotiating network ports. Supports half duplex and full duplex transmission.

1.3 Technical Specifications

[1] CAN Side

- Supports CAN2.0A and CAN2.0B.
- CAN Baud rate supports 1M, 500K, 250K, 125K, 100K, 50K, 20K, 10K bps.

[2] Ethernet Side

- Supports ODVA standard EtherNet/IP communication protocol.
- Supports 10M / 100M (auto-negotiating)

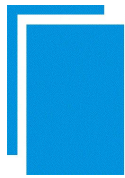
[3] Operating environment:

- REL Humidity: 5% to 95% (non-condensing).
- Work circumstance temperature: -4°F~122°F(-20°C to 60°C) and 24-hour average value does not exceed 45°C (except for special orders).
- The altitude of the installation site does not exceed 2000 meters.
- Pollution level: class 3.

[4] Power: 24 VDC (11~30 VDC), 80mA(24VDC).

[5] Dimensions (W*H*D): 1.0 in * 4.0 in *3.6 in (25 mm * 100 mm * 90 mm).

[6] Installation: 1.4 in (35 mm) DIN RAIL.

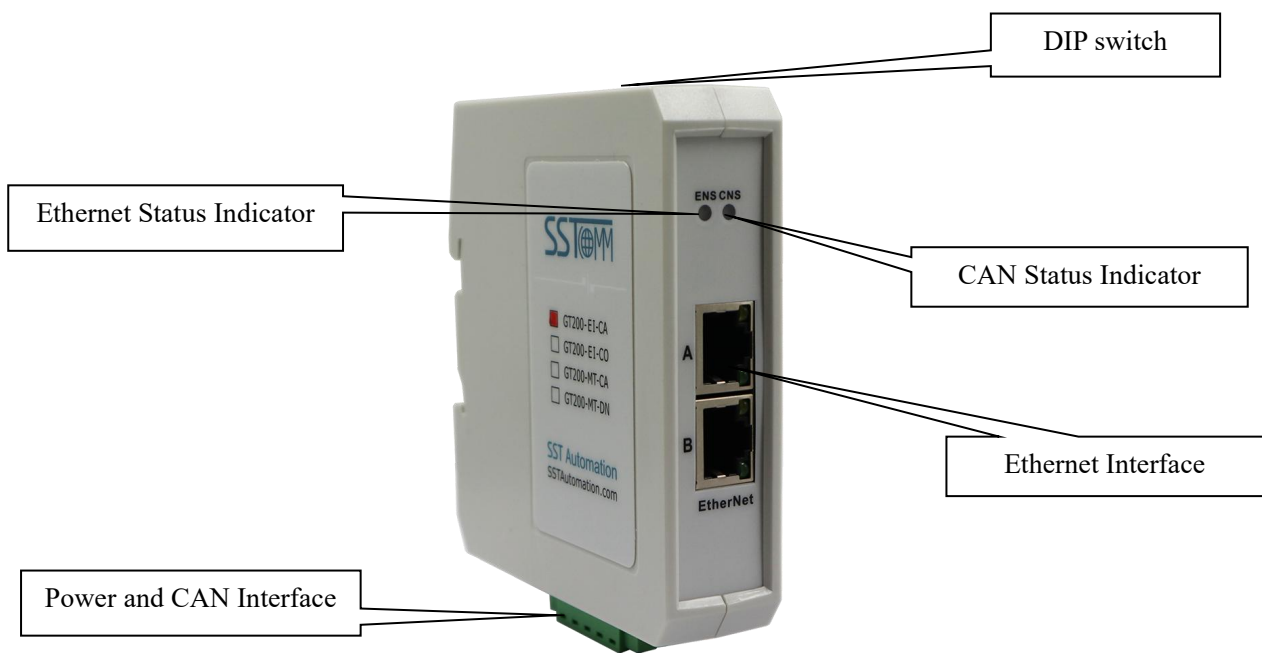


1.4 Revision History

Revision	Date	Chapter	Description
V2.1	2/9/2023	Chapter 6.2, 6.3, 6.4	Fixed the description of Byte 2 in Chapter 6.3 and the Input Instance size in Chapter 6.2
V1.2	1/9/2023	ALL	New release

2 Hardware Descriptions

2.1 Product Appearance



Note: This picture is for reference only. The product appearance is subject to the actual product.

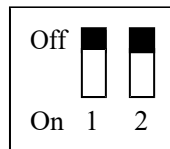
2.2 Indicators

The indicator light is shown in the following table:

Indicators	Status	Descriptions
ENS	Green	EtherNet/IP connection has been established.
	Green blinking	EtherNet/IP connection has not been established.
	Orange light Blinking (Blinking alternately with the orange light of CNS)	Configuration Mode
	Orange light on once	Startup status
CNS	Green	CAN network normal
	Red	CAN network error
	Orange light Blinking (Blinking alternately with the orange light of ENS)	Configuration Mode
	Orange light on once	Startup status

2.3 DIP Switch

The configuration DIP switch is used to set the operating mode of the GT200-EI-CA and is located on the top of the gateway. Bit 1 is the Function Bit, and Bit 2 is the Mode Bit.



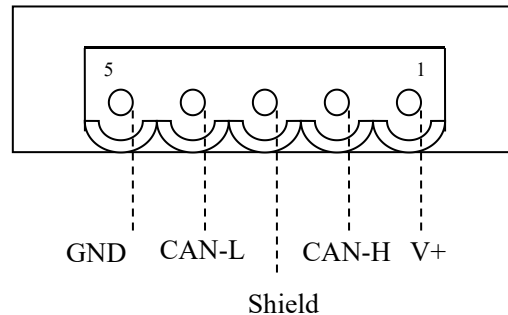
Function (Bit 1)	Mode (Bit 2)	Description
OFF	OFF	Run mode: allow data exchange and upload/download configuration.
ON	OFF	Run mode: only perform data exchange, but cannot be configured.
OFF	ON	Configuration mode: IP address is 192.168.0.10 (fixed). Only allow upload/download configuration.
ON	ON	BootLoader mode, with fixed IP address 192.168.0.10

Note: After re-configuring DIP switch, you must restart the gateway GT200-EI-CA (power off and power on) to let the configuration take effect! After configuration is done, it is suggested to set the DIP switch to "1(ON)1(OFF)" (Run mode: only perform data exchange, but cannot be configured).

2.4 Interface

2.4.1 Power and CAN Interface

CAN side connector:



Pin	Wiring
Pin 1	V+(optional)
Pin 2	CAN-H
Pin 3	Shield (optional)
Pin 4	CAN-L
Pin 5	GND, GND of 24V (optional)

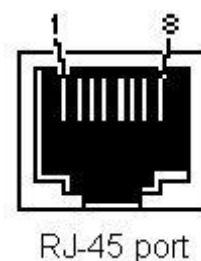
Note: Here, the shield port is optional. The CAN-L and CAN-H pins must be connected. Here pin 1 and 5 are connected to the pin 3 and pin 1 of power port internally.

Attention: Here only one interface of 24V interface and power interface is required to connect, but should not be connected simultaneously.

2.4.2 Ethernet Interface

The Ethernet interface uses RJ45 interface, follows the IEEE802.3u 100BASE-T standard, 10/100M auto-negotiation. Its pin (standard Ethernet signal) is defined below:

Pin	Description
S1	TXD+, Transmit Data+
S2	TXD-, Transmit Data-
S3	RXD+, Receive Data+
S4	Bi-directional Data+
S5	Bi-directional Data-
S6	RXD-, Receive Data-
S7	Bi-directional Data+
S8	Bi-directional Data-

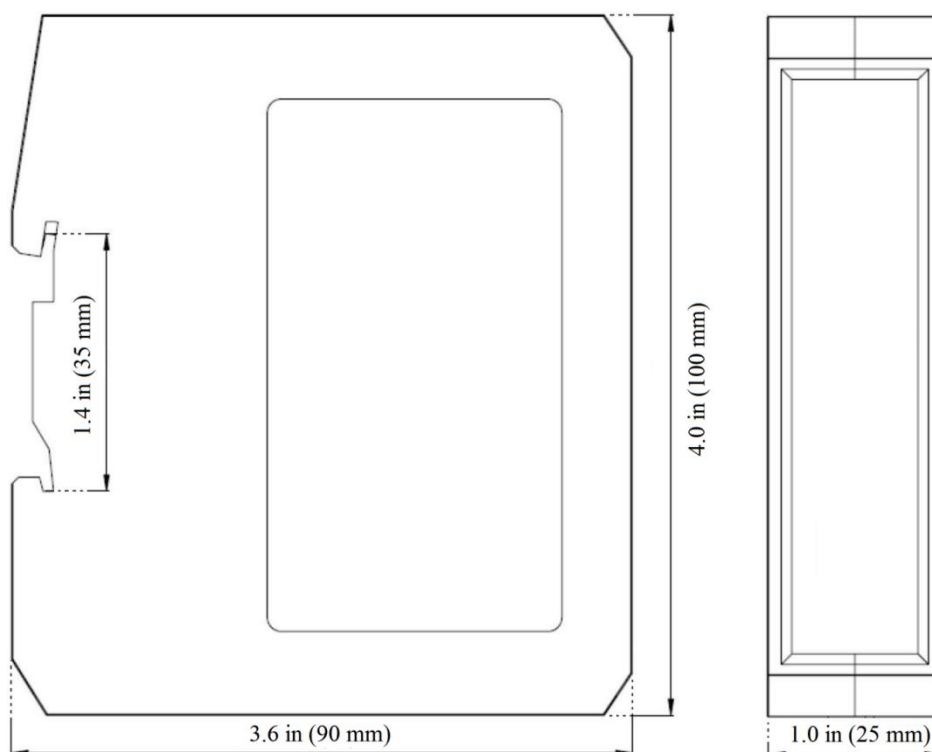


3 Hardware Installation

3.1 Mechanical Dimension

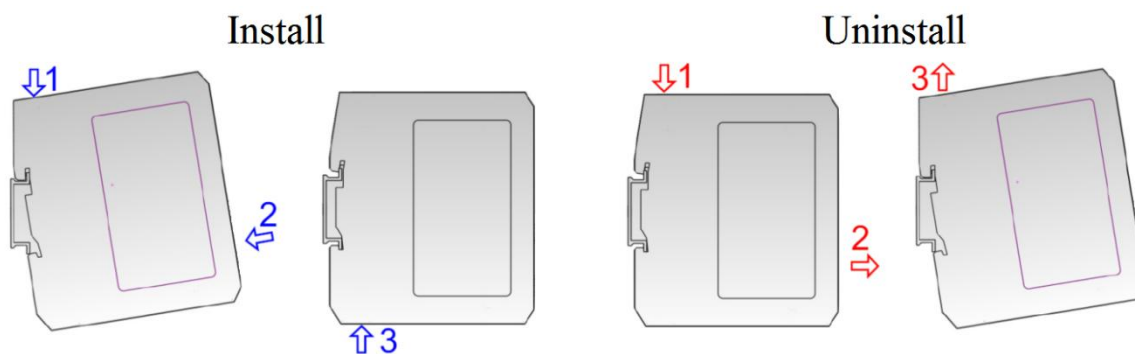
Size (width * height * depth):

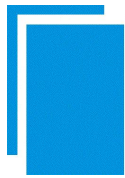
1.0 in * 4.0 in * 3.6 in (25 mm * 100 mm * 90 mm)



3.2 Installation Method

Using 1.4 in (35mm) DIN RAIL.





4 Quick Start Guide

4.1 Gateway Configuration

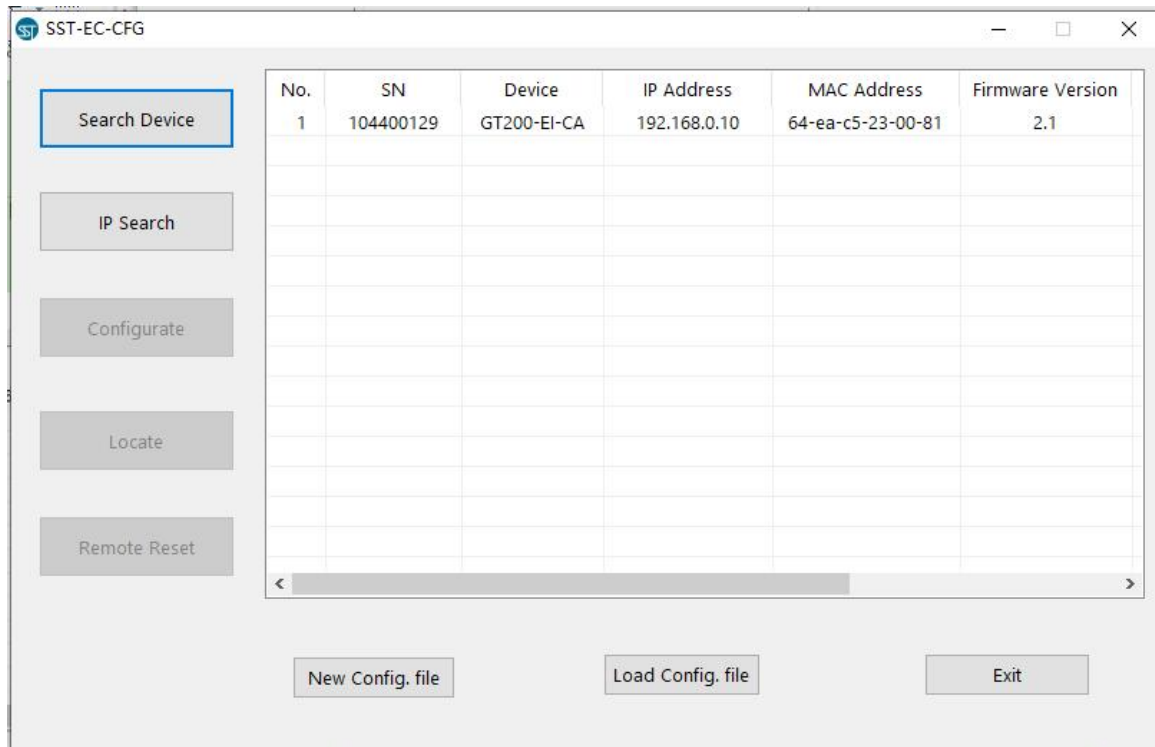
1. Use an Ethernet cable to connect the GT200-EI-CA to the PC.
2. Set DIP Switch to "1(OFF), 2(ON)".
3. In configuration mode, use SST-EC-CFG configuration software to set parameters such as IP address and CAN baud rate (see Chapter 5 for details).
4. After the gateway has been configured, set the configuration DIP switch to "1(OFF), 2(OFF)". Power on again and the module will go into run mode.

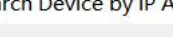
4.2 Connection

1. According to the RJ45 port instructions in [Chapter 2.4.2](#), properly wires every pin of 5-pin terminal.
2. According to the CAN interface instructions in [Chapter 2.4.1](#), properly wires at least pin 2,4 and 5. Noted it is not the right time to power on.
3. Check whether the wiring complies with the instruction manual.
4. Power on the module to enter the run mode.

5.2.2 Search Device

Click "Search Device" you can search all devices on the network.



[illegible]

[illegible]

Configuration Information

Device

Industrial Ethernet
CAN

Configuration

Select Protocol	EtherNet/IP
Assign IP Mode	Manually Assign
IP Address	192.168.0.10
Subnet Mask	255.255.255.0
Gateway Address	192.168.0.1
DNS1	0.0.0.0
DNS2	0.0.0.0
VendCode(1~65535)	1

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Exit

5.2.5 Industrial Ethernet

Configure Ethernet parameters including "Select Protocol", "Assign IP Mode", "IP Address", "Subnet Mask", "Gateway Address", "DNS1", "DNS2", and "VendCode".

Device	Configuration
Industrial Ethernet	Select Protocol: EtherNet/IP
CAN	Assign IP Mode: Manually Assign
	IP Address: 192.168.0.10
	Subnet Mask: 255.255.255.0
	Gateway Address: 192.168.0.1
	DNS1: 0.0.0.0
	DNS2: 0.0.0.0
	VendCode(1~65535): 1

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The parameters that can be configured are as follows:

Assign IP Mode: Supports Manual Assign and DHCP.

IP Address: Set the IP address of the device.

Subnet Mask: Set the subnet mask of the device.

Gateway Address: Set the gateway address of the device.

DNS1: Primary Domain name server (may not be set in LAN).

DNS2: Secondary domain name server.

VendCode: The input range is 1 to 65535.

5.2.6 CAN

Configuration Information
✕

Device

Industrial Ethernet
CAN

Configuration

CAN Protocol Type	CAN 2.0B
Baud Rate	100K
Time Stamp	
Maximum CAN Frames	
Delay between Frames (ms)	

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CAN Protocol Type: Supports CAN 2.0A and CAN 2.0B.

Baud Rate: 10K-1Mbps

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Save Config. File to PC: Save the configuration parameters to the computer (.chg) for later viewing, pay attention to save this file.

Export Excel to PC: Save configuration parameters to computer (xls).

Select the device in the list, click the "Save Config. File to PC" or "Export Excel to PC" button, and select the path to complete the operation.

Configuration Information

Device

Industrial Ethernet
CAN

Configuration

Select Protocol	EtherNet/IP
Assign IP Mode	Manually Assign
IP Address	192.168.0.10
Subnet Mask	255.255.255.0
Gateway Address	192.168.0.1
DNS1	0.0.0.0
DNS2	0.0.0.0
VendCode (1~65535)	1

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Configuration Information		
Device	Configuration	
Industrial Ethernet CAN	Select Protocol	TCP Server
	Assign IP Mode	Manually Assign
	IP Address	192.168.0.34
	Subnet Mask	255.255.255.0
	Default Gateway	192.168.0.1
	DNS1	0.0.0.0
	DNS2	0.0.0.0
	Local Port	8888
	Keep Alive	Enable
	Keep Alive Time	6
	Remote Device IP Address	
	Remote Device Port	

Info News

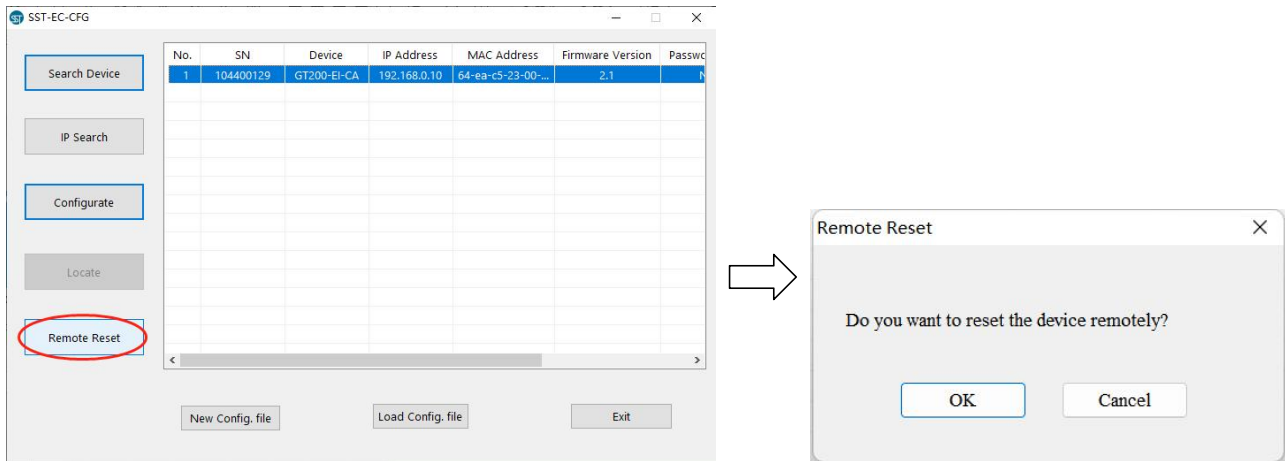
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5.2.9 Remote Reset

Click the "Remote Reset" button, as shown in the pop-up interface as follows.

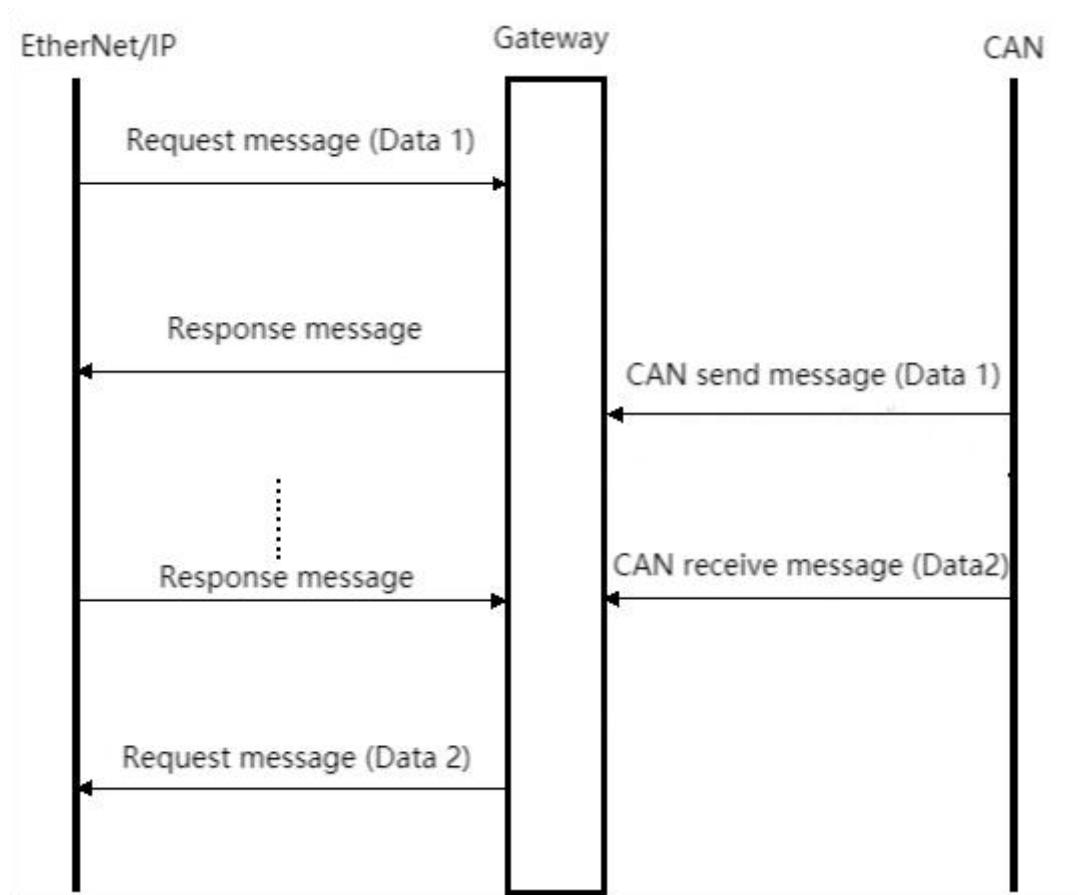
Click on "OK", then execute remote reset operation, the gateway will restart (power off and power on). Click on "Cancel", and then cancel the reset operation.



6 Working Principle

6.1 Data Exchange Mode

The communication mode between CAN and EtherNet/IP is asynchronous, as shown in the figure below:



"Data 1" shows the data transmission process from EtherNet/IP to CAN. "Data 2" shows the data transmission process from CAN to EtherNet/IP.

An EtherNet/IP I/O output can carry 1 CAN frames. After the gateway receives the CAN frame, it sends out the CAN frame, and then packs the received CAN response frame into I/O input and sends it to the EtherNet IP master.

6.2 EtherNet/IP Connection Parameters

The combination of connection parameters provided by the gateway is as follows:

Number	Input Instance	Output Instance	Configuration Instance
1	102 (20 Bytes)	101 (16 Bytes)	103 (10 Bytes)

Note: The input is 4 bytes more than the output since it uses the first 4 bytes to show the status of the GT200-EI-CA.

6.3 Instance 101 Data Byte Definition

Data direction: EtherNet/IP -> CAN

The corresponding meaning of 16 bytes is as follows: 16 bytes can only contain one CAN frame.

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

Bytes Definition

✧ Byte 0 to 3 are controlling bytes

Byte 0: It indicates sending this sequence number of CAN frame once if it is zero, and it indicates sending this sequence number of CAN frame periodically if it is non-zero, the cycle value is decided by this byte value: period of transmission=the value of byte 0 * 10ms. For example, if the value of byte 0 is 10, the period of transmission is 100ms, that is to say sending the frame one time every 100ms.

Byte 1: Indicates the data number of CAN frame, the range is 0~8.

Byte 2: Sequence number. The initial value of sequence number in output frame is non-zero (any value except zero), if the mode is single transmission mode, the number must add 1 when sending a new frame, the gateway will recognize that it is single transmission data, if the number reaches 255, the number will be 0 when adding 1. CAN frame sequence number sends now must be different with the entire CAN frame sequence number sent last time, or it won't do any operation to current CAN frame. If you want to switch from single transmission mode to repeated transmission mode, the sequence number needs to be increased by 1, and the bytes 0 is a non-zero value; if you want to switch from repeated transmission mode to single transmission mode, the sequence number needs to be increased 1, and the bytes 0 is 0.

✧ Byte 4 to 7 are CAN frame header and CAN frame mode control (29 bit CAN ID). If the current CAN ID of CAN frame is same with one in a cycle of transmission, the latter is removed, the current CAN is frame kept into the buffer.

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, 0 stands for data frame, 1 stands for 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							

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							

✧ Byte 8 to 15 are the CAN frame data, if the data number of CAN frame is less than 8 bytes, then it is 0.

6.4 Instance 102 Data Byte Definition

Data direction: CAN -> EtherNet/IP

The first 4 bytes of the EtherNet/IP message are the status bytes of the GT200-EI-CA. The next 16 bytes are used to show information about the CAN frame message.

The corresponding meaning of those 16 bytes is as follows:

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

If GT200-EI-CA received CAN frame on CAN network, the sequence number of input frame will add 1. Users decide whether to use these CAN frame according to the needs.

For example:

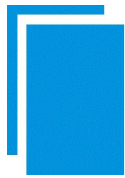
Send a CAN frame, the sequence number is 10, the data frame in CAN2.0A working mode, ID=0x123, and the data is 01 02 03 04 05 06 07 08. Single shot. Then the output format is as follows (Hex):

FF 08|0A|00|00 00 01 23|01 02 03 04 05 06 07 08

Note:

The default initial value of a single send is 0, so the corresponding byte is 0.

ID=0x123, right-aligned, zero-padded in front, so the corresponding binary is 0000 0000 0000 0000 0000 0001 0010 0011.



6.5 Terminal Resistor

Under high baud rates (1M, 500k) situation, CAN network require each of two endpoints in the farthest networks to connect terminal resistor of 120ohm.