Modbus/BACnet IP Gateway
GT200-BM-2RS

User Manual

V2.2

RevB

SST Automation

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www.SSTAutomation.com

Important Information

Warning

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1 Product Overview

1.1 Product Function

The GT200-BM-2RS is a gateway designed to exchange data between Modbus serial protocols and BACnet/IP. The gateway functions as a **BACnet/IP server** and a **Modbus RTU master**, enabling seamless integration of serial Modbus devices into BACnet/IP-based systems.

1.2 Product Features

- Supports redundant power supply inputs.
- Provides two independent RS485 interfaces with 1 kV optical isolation.
- Supports network security configuration.
- Supports online device scanning and configuration.
- Supports automatic command demotion and comprehensive error handling for Modbus communication.
- Easy-to-use configuration software: SST-BM-CFG.

1.3 Technical Specifications

[1] The gateway supports communication between BACnet/IP and Modbus RTU.

[2] 10/100 Mbps auto-negotiating Ethernet interface.

[3] Supports up to 500 BACnet BIs, 300 BOs, 300 BVs, 500 AIs, 300AOs, 300 AVs, 500 MSIs and 100MSOs, and the total number of BACnet IP objects must not exceed 1264.

[4] Supports the following BACnet IP services: Who Is, I Am, Who Has, I Have, Read Property, Write Property, Read Property Multiple.

[5]Supports modification of BACnet engineering units.

[6] Each serial port can support up to 100 Modbus commands.

[7] Serial interface is RS485, half-duplex, and baud rate support: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 bps. Supports parity options: None, Odd, Even, Mark, and Space. Supports 1 or 2 stop bits.

[8] Two independent RS485 interfaces with 1 kV optical isolation.

[9] Power supply: 24VDC (11V - 30V), 90mA (24VDC).

[10] Operating temperature: -40 °F-140 °F (-40 °C-60 °C). Humidity: 5%- 95% (non-condensing).

[11] External dimension (W*H*D): 1.3in*4.6in*4.2in (34mm*116mm*107mm).

[12] Installation method: 35 mm DIN rail mounting.

[13] Protection class: IP20.

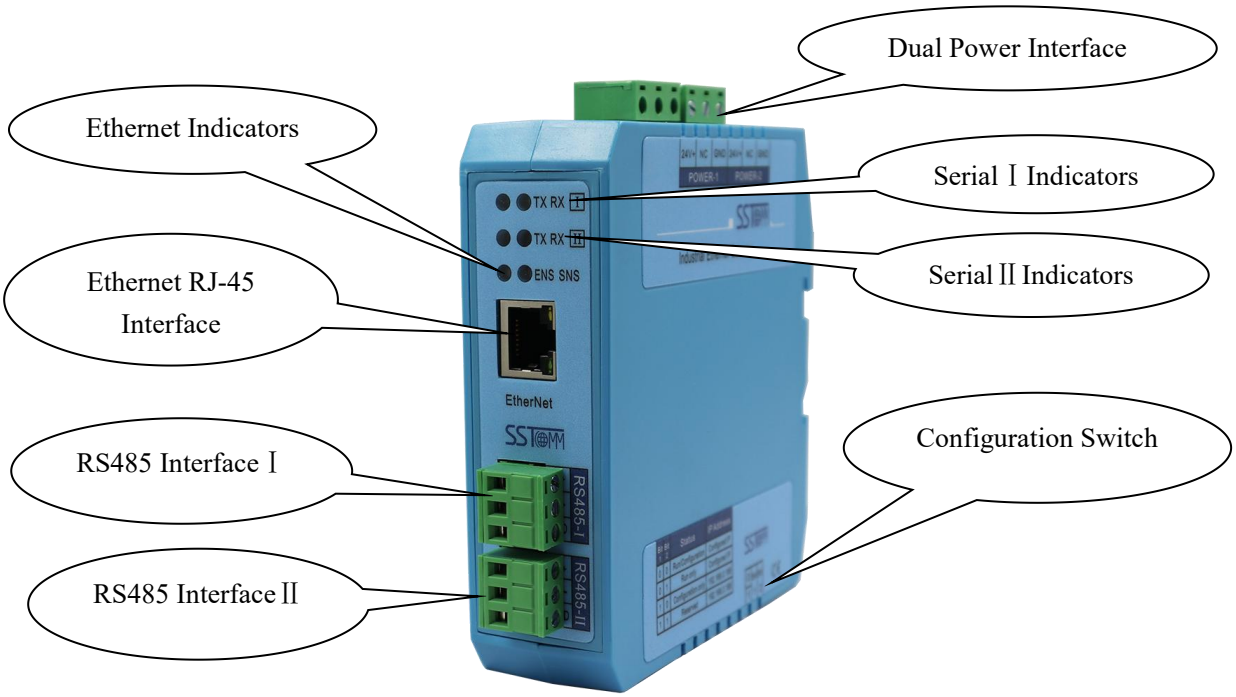
[14]Test standard: EMC test standards.

1.4 Revision History

Revision	Date	Chapter	Description
V2.2 Rev B	3/16/2026	ALL	Optimize document descriptions
V2.2 Rev A	12/19/2025	PART	Deleted RS232 interface description
V2.2	3/1/2024	PART	New release for supporting modification of BACnet engineering units
V1.5	8/2/2021	ALL	New release as universal manual for GT200-BM-RS and GT200-BM-2RS

2 Hardware Descriptions

2.1 Product Appearance

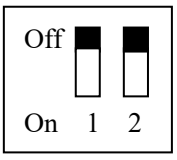


2.2 Indicators

Indicators	State	Description
ENS	Green On	IP address without conflict
	Red On	IP address conflict
	Red Blinking	DHCP, BOOTP, IP address conflict detection
SNS	Green On	BACnet/IP interface data is being transmitted or received.
	Green Blinking	No data transmission detected on the BACnet/IP interface.
ENS (Orange) and SNS (Orange) (Orange: Red and green on at the same time)	Simultaneously On	At power-up
	Blink Alternately	Configuration Mode
	Blink Alternately (for 3 seconds)	Use locating function
SerialITX	Green Blinking	Serial data sending
	OFF	No serial data is being transmitted
SerialIRX	Green Blinking	Serial data receiving
	OFF	No serial data is being received
SerialIITX	Green Blinking	Serial data sending
	OFF	No serial data is being transmitted
SerialIIRX	Green Blinking	Serial data receiving
	OFF	No serial data is being received

2.3 Configuration Switch

The configuration switch is located on the bottom of the gateway. Bit 1 is the mode switch, and Bit 2 is the function switch.



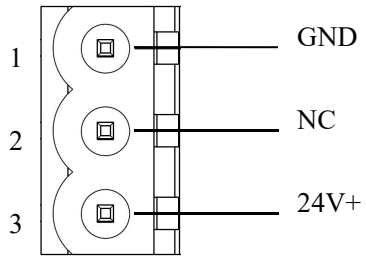
Mode (Bit 1)	Function (Bit 2)	Mode	Description
Off	Off	Run mode	BACnet IP and Modbus RTU data can be exchanged. Allow reading and writing configuration data. Restart the GT200-BM-2RS for the new configuration to take effect.
Off	On	Run mode	BACnet IP and Modbus RTU data can be exchanged. Configuration read/write operations are disabled.
On	Off	Configuration Mode	The IP address is fixed at 192.168.0.188. In this mode, the device supports configuration read/write operations only and does not allow communication between BACnet/IP and Modbus RTU.
On	On	Configuration Mode	The IP address is fixed at **192.168.0.188**. In this mode, the device allows **read-only access to configuration data** and does not support communication between **BACnet/IP** and **Modbus RTU**.

Note: Restart the GT200-BM-2RS (power cycle) after changing the configuration to apply the settings.

2.4 Interface

2.4.1 Power Interface

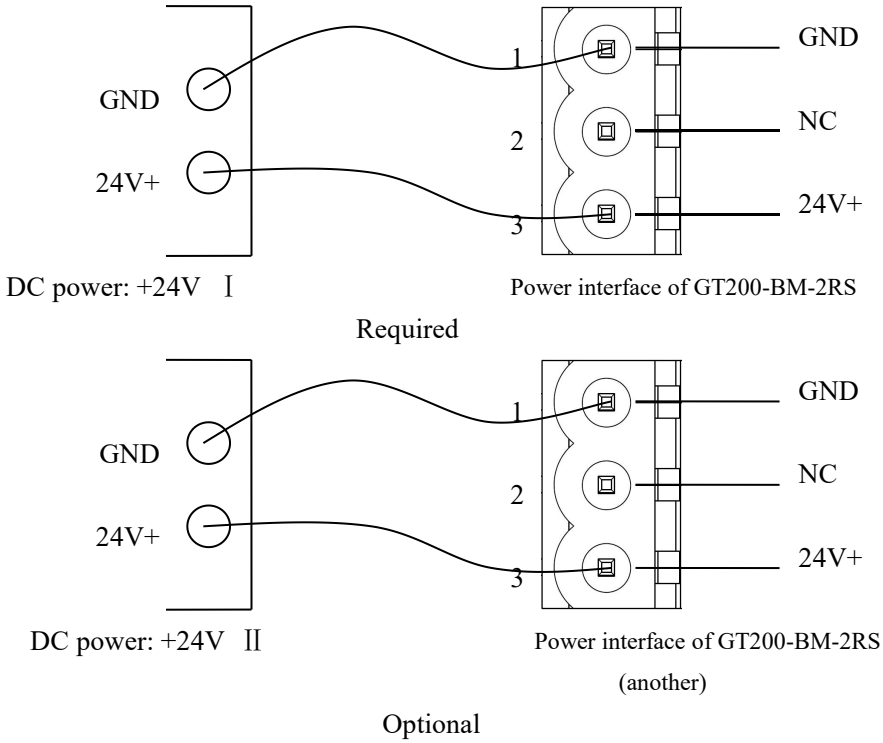
GT200-BM-2RS uses a 24V DC power supply. It provides two power input terminals with redundancy support. One or two power supplies may be connected.



Pin	Function
1	GND
2	NC (Not Connected)
3	24V+, DC

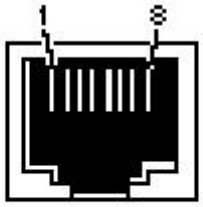
In a redundant power configuration, if one supply fails, the backup power ensures continuous operation.

The power wiring is shown below.



2.4.2 Ethernet Interface

The Ethernet interface uses an RJ-45 connector and supports 10/100 Mbps adaptive Ethernet. The pin definition (standard Ethernet signal) is shown below:



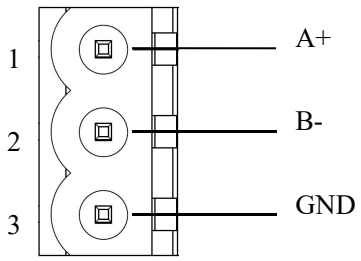
RJ-45 port

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

2.4.3 RS485 Interface

GT200-BM-2RS supports standard dual port RS485.

The RS485 pin assignments are defined as follows:



Pin	Function
1	A+, RS485
2	B-, RS485
3	GND

The RS485 interface of GT200-BM-2RS is a standard one, and the RS485 characteristics of the product are shown as follows:

1. The basic characteristics of RS485 transmission technology

①Network topology: Linear bus topology, there are active bus terminal resistors at both sides.

②Transmission rate: 1200 bps-115.2Kbps.

③Media: Shielded twisted-pair cable (unshielded cable may be used depending on EMC conditions), depending on environmental conditions (EMC).

④Site number: 32 stations per subsection (without repeater), and can increase up to 127 stations (with repeater).

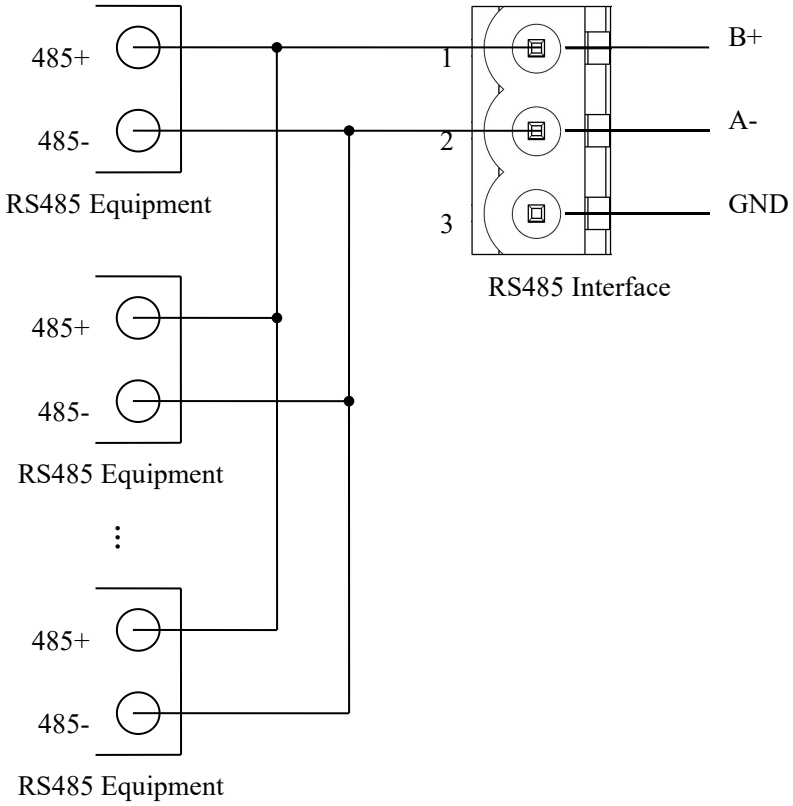
⑤Plug connection: 3-pin pluggable terminal.

2. The main points on the installation of RS485 transmission equipment

①All devices are connected to the RS485 bus.

②Each segment can connect up to 32 nodes.

③Termination resistors must be installed at both ends of the bus. - 120Ω 1/2W to ensure reliable operation of the network.



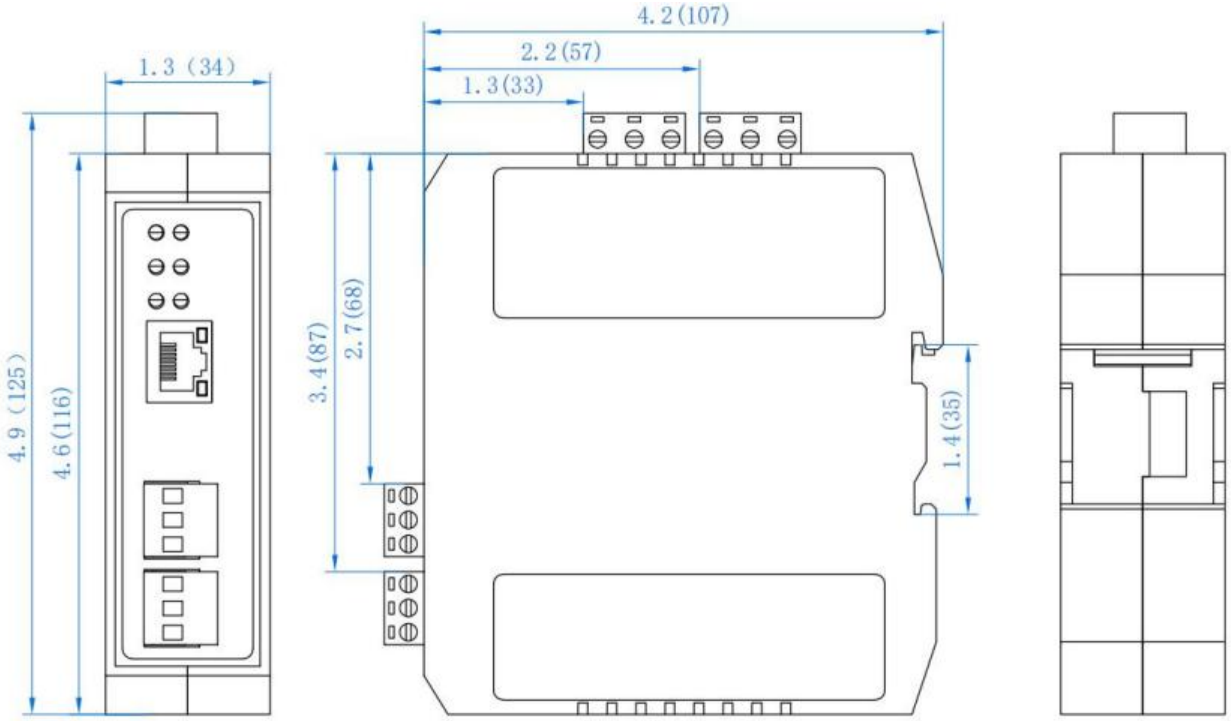
When RS485 communication is operated in multidrop mode, to reduce signal reflection and interference, it is recommended to connect a termination resistor at both far ends of the bus. The recommended termination resistor is 120 Ω, 1/2 W. No internal termination resistor is provided on the serial port of the GT200-BM-2RS.

3 Hardware Installation

3.1 Mechanical Dimensions

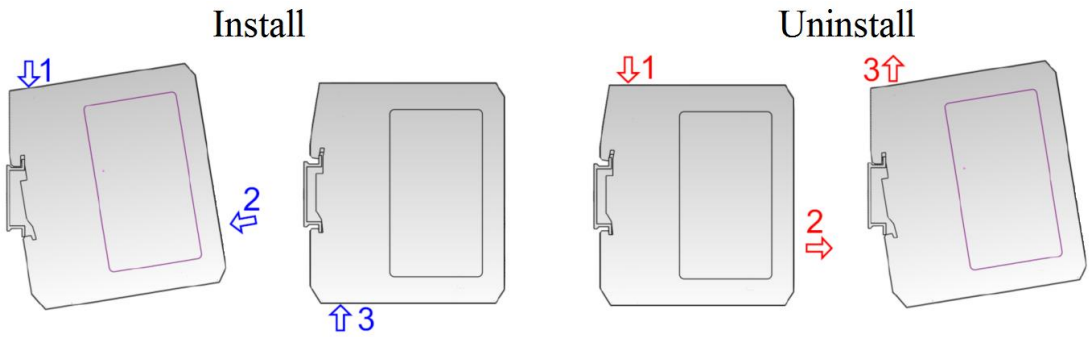
Size (width * height * depth):

1.3in * 4.6in * 4.2in (34mm * 116mm * 107mm)



3.2 Installation Method

Using 1.4 in (35mm) DIN RAIL.



4 Quick Start Guide

4.1 Hardware Connection

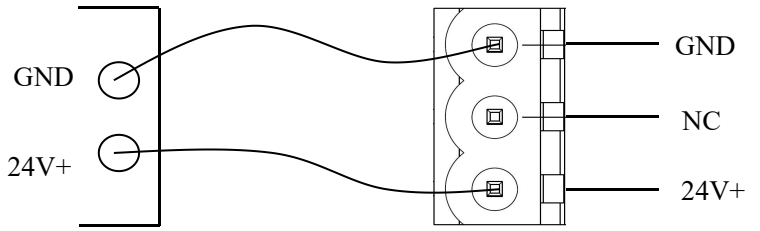
1. Ensure that the GT200-BM-2RS is set to an operating mode that allows configuration access. Set the gateway to Configuration Mode by setting DIP switch 1-OFF and 2-ON while the device is powered off.

Note: The factory default network setting of the GT200-BM-2RS is DHCP. If the network does not have a DHCP server, set configuration switch 1 to the ON position and restart the GT200-BM-2RS gateway to apply the settings. The IP address of the GT200-BM-2RS is fixed at 192.168.0.188, subnet mask is 255.255.255.0 and gateway address is 192.168.0.1.

2. Connect the Ethernet port of the gateway to the network port of the computer with a network cable. Refer to the topology displayed in Chapter 2.4.2.

3. Connect the serial devices to the GT200-BM-2RS. Refer to the wiring diagrams shown in Chapter 2.4.3.

4. Connect the power supply to the gateway as shown in the figure below.



24V DC Power GT200-BM-2RS Power Interface

5. Power on the gateway; it will now be in Configuration Mode. The IP of the gateway is fixed to 192.168.0.188, and the IP of the connected computer should be set to a static IP within the 192.168.0.X subnet. Double-click the SST-BM-CFG software icon to start configuring the gateway.

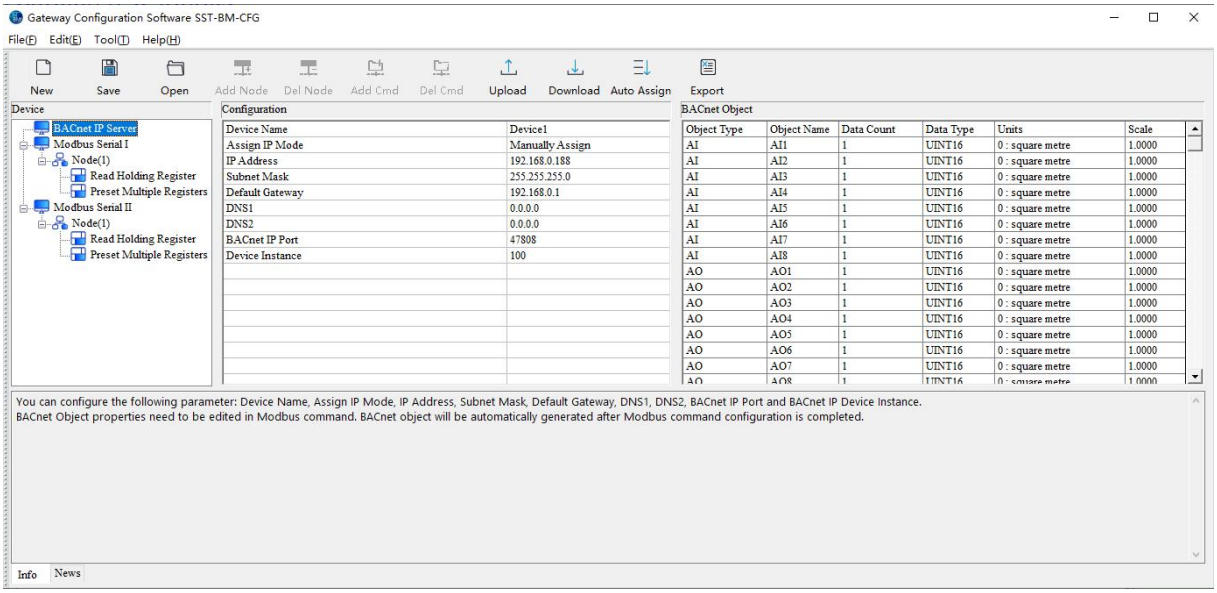
6. After configuration, power off the gateway, set it to Run Mode (DIP switches 1-OFF, 2-OFF), and then power it on again.

4.2 Software Configuration

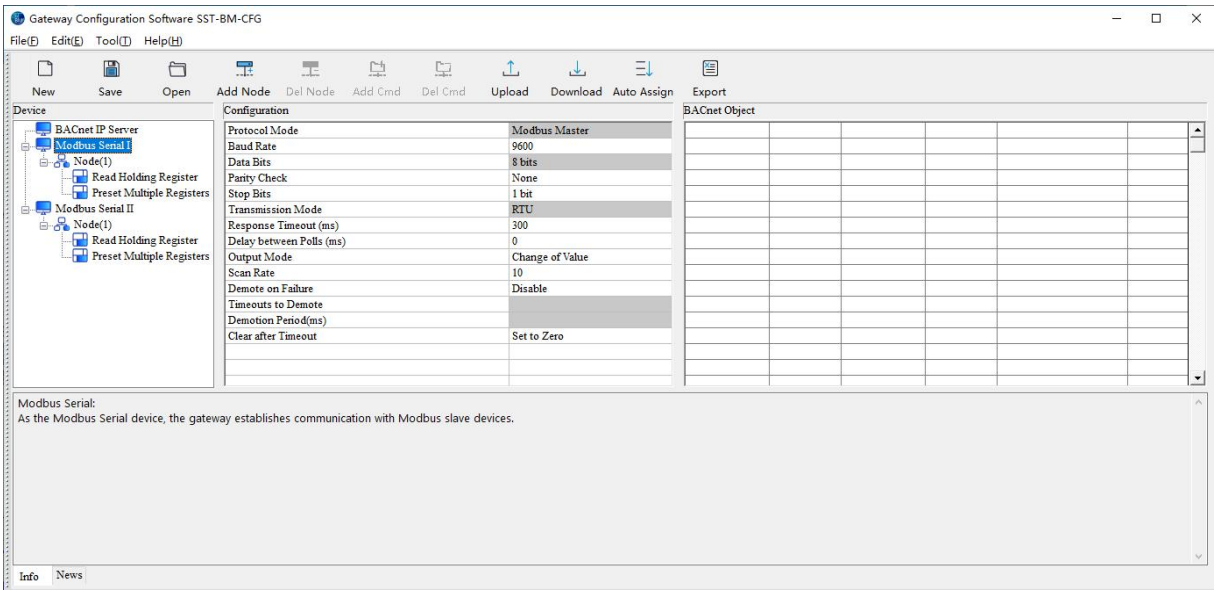
1. SST-BM-CFG is a Windows-based configuration tool used for GT200-BM-2RS, GT200-BM-RS, and GT200-BM-MT devices. Open the SST-BM-CFG software installed on your computer and select

"GT200-BM-2RS".

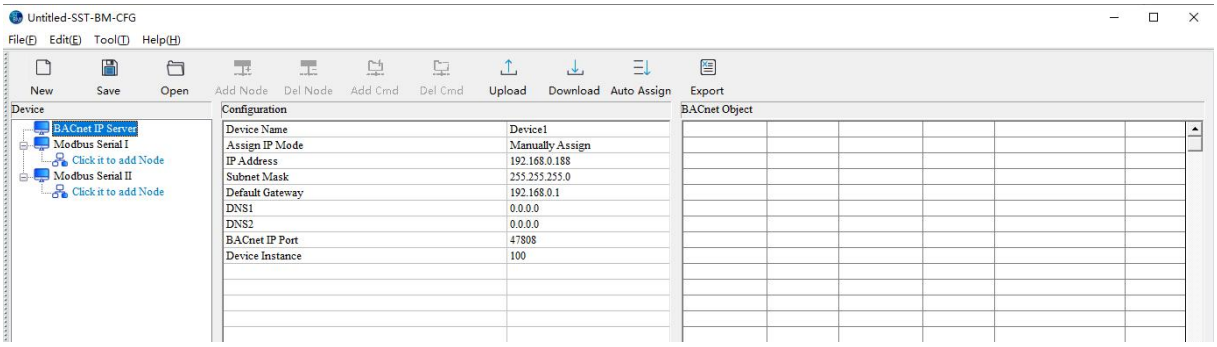
2. Click "BACnet IP Server" in the navigation pane and configure the BACnet/IP parameters. Configure the relevant BACnet IP Server parameters as follows:



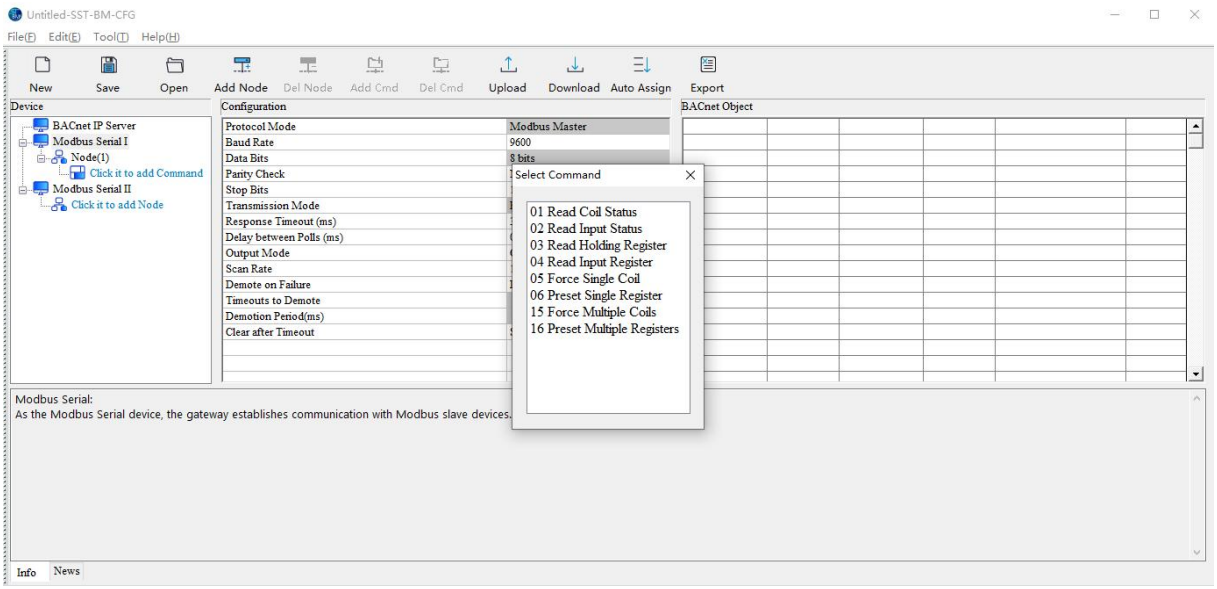
3. Select "Modbus Serial" on the left and set the Modbus serial parameters. Click "BACnet IP Server" in the navigation pane and configure the BACnet/IP parameters.



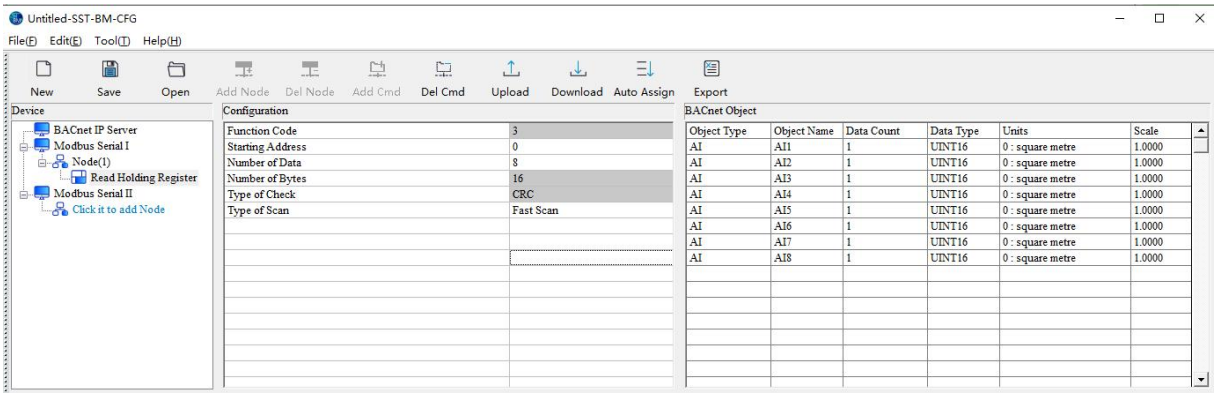
4. You can either click "Click to add a node", select "Modbus Serial I or II" and click "Add Node" on the toolbar, or right-click "Modbus Serial I or II" and click "Add Node" to add a node to the Modbus Serial I or II.



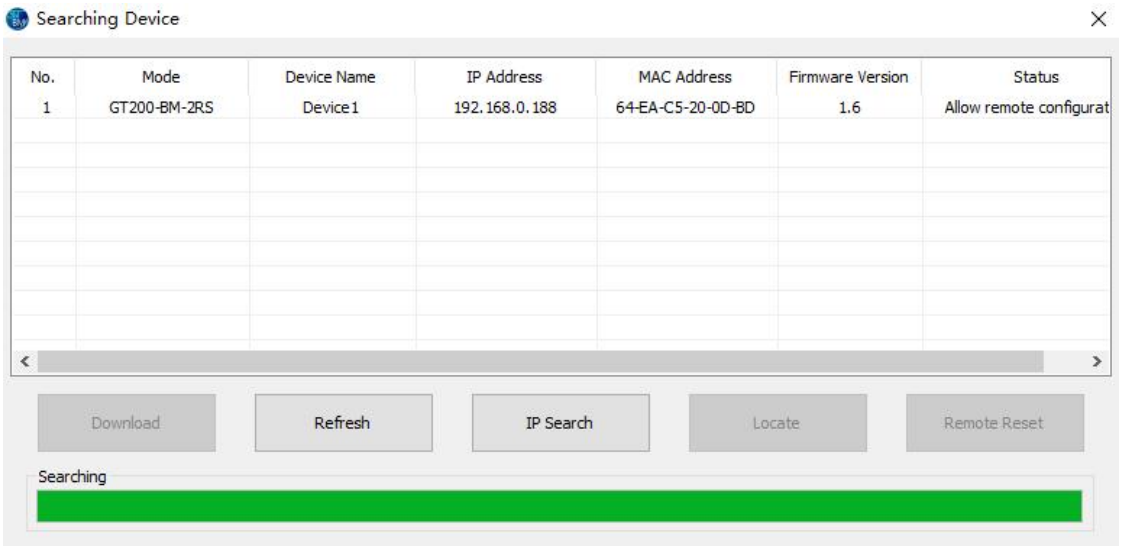
5. You can either click "Click to add a command", select "Node (1)" and click "Add Cmd" in the toolbar, or right-click "Node (1)" and click "Add command" to add a command in the corresponding node. Double-click the command in the pop-up dialog box.

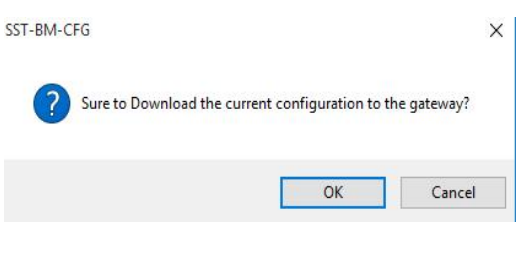


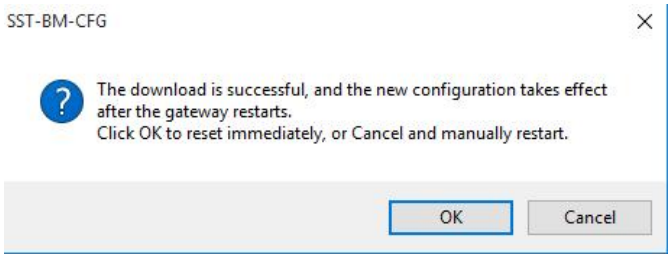
6. Click a Modbus command. The relevant parameters are configured as follows:



7. Click on the icon Download, select the gateway in the pop-up dialog box and click on "Download", then click on "Download Configuration".




SST-BM-CFG
Sure to Download the current configuration to the gateway?
OK
Cancel


SST-BM-CFG
The download is successful, and the new configuration takes effect after the gateway restarts.
Click OK to reset immediately, or Cancel and manually restart.
OK
Cancel

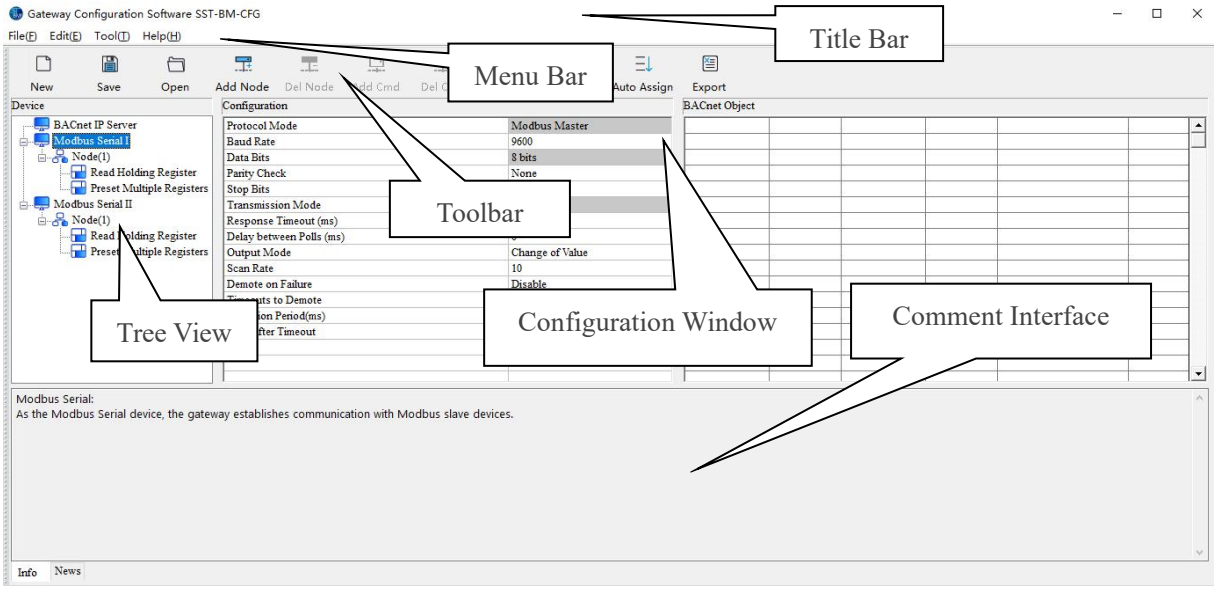
5 Software Instructions

5.1 Main Interface

Double-click the software installation package to install SST-BM-CFG. Follow the on-screen instructions to complete the installation, then open the installed configuration software and begin to configure the GT200-BM-2RS.

The software interface consists of the Title Bar, Menu Bar, Toolbar, Configuration Window, and Tree View.

Note: The gray parameters cannot be changed.



5.2 Toolbar

The toolbar is shown as below:

The software interface consists of the Title Bar, Menu Bar, and Toolbar. The toolbar provides shortcut icons for common configuration functions.

New: Create a new configuration project.

Save: Save the current configuration.

Open: Open a configuration project.

Add Node: Add a Modbus slave node.

Delete Node: Delete a Modbus slave node.

Add Command: Add a Modbus command.

Delete Command: Delete a Modbus command.

Upload: Upload the configuration from the gateway.

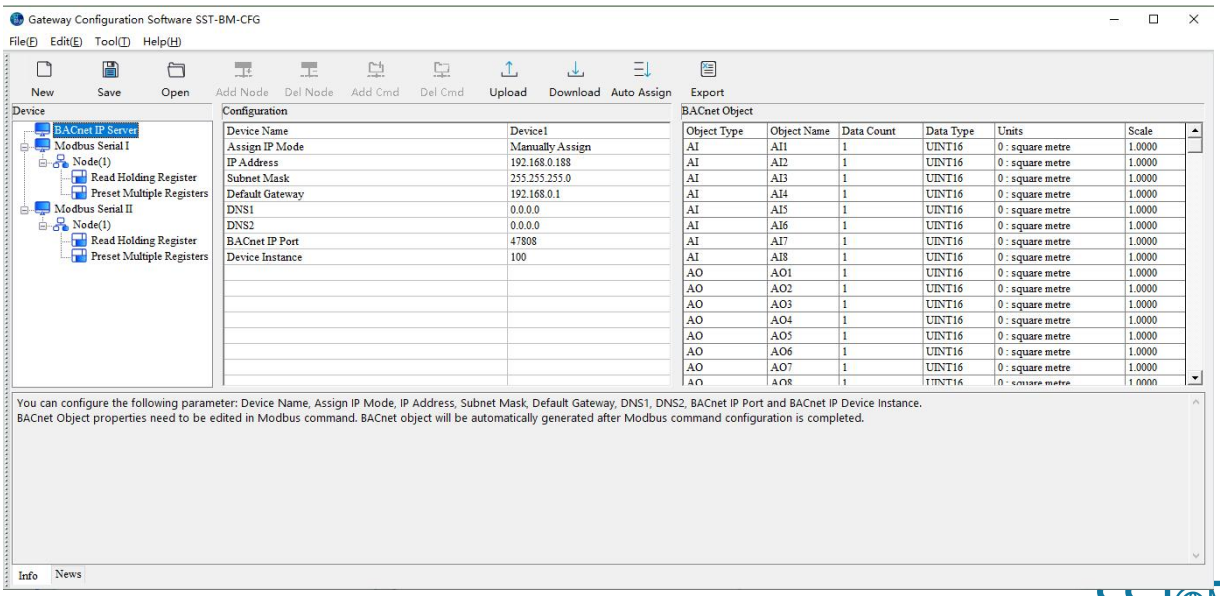
Download: Download the configuration to the gateway.

Auto Assign: Automatically assign the object name.

Export Excel: Exports the current configuration as a table and saves it as an *.xls file.

5.3 Configure BACnet IP Parameters

BACnet IP Server parameters include: "Device Name", "Assign IP Mode", "IP Address", "Subnet Mask", "Default Gateway", "DNS1", "DNS2", BACnet IP Port and Device Instance.



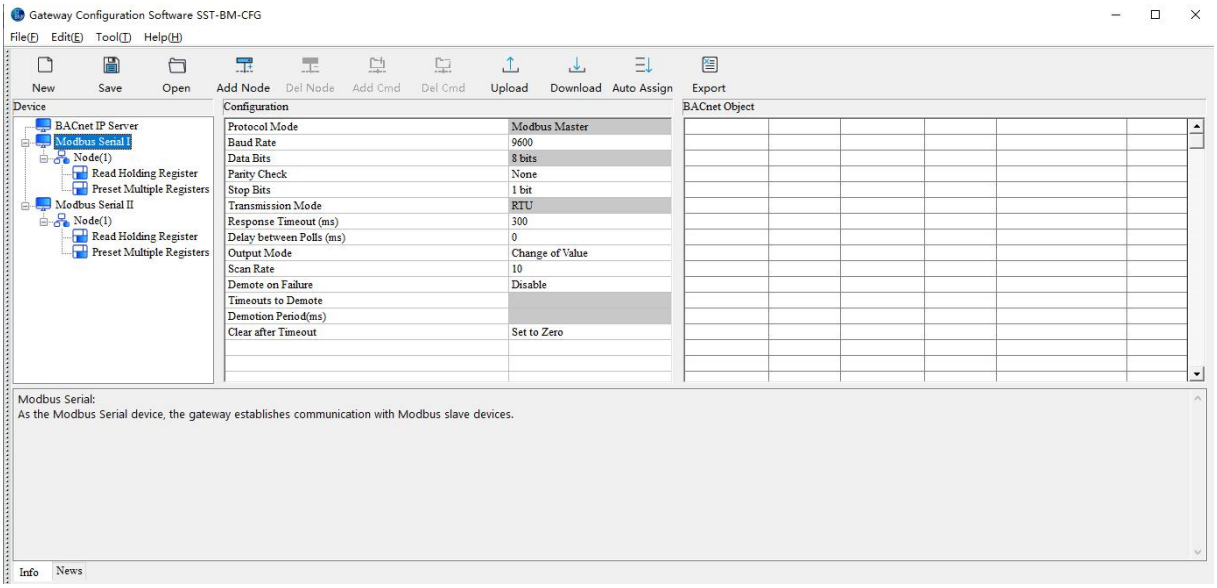
- Device Name - Enter a unique name to identify the device.

  Note: The name cannot have spaces, up to 16 characters.

- Assign IP Mode - Set the IP address assignment mode.
- IP address - Set the IP address of the device.
- Subnet Mask - Set the subnet mask of the device.
- Default Gateway - Set the gateway address for the device.
- DNS1- Primary DNS server (not configurable in LAN-only mode).
- DNS2 - Standby domain name server.
- BACnet IP port - Set the BACnet IP port number of the gateway. Range: 1 - 65535. Default value is 47808.
- Device Instance - Set the BACnet device instance number of the gateway. Range: 0 - 4194303. Default value is 100.

5.4 Configure Modbus Serial Parameters

Serial parameters include: "Baud Rate", "Check Bit", "Stop Bits" and "Data Bits" etc.



- Baud Rate - This parameter sets the Modbus baud rate. Supported baud rates: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200. Default value is 9600.
- Data Bits - Fixed at 8 bits.

- Check Bit - Support none, odd, even, space and mark. Default is "None".
- Stop Bits - 1, 2.
- Transmission Mode -RTU.
- Response Timeout -The time the Modbus master waits for a slave response. Range: 300-60000 ms.
- Delay between polls - The delay time before sending the next command after receiving a valid response. Range: 0-2500ms.
- Output Mode - Modbus write command (command output) has two output modes: cycle and change of value output.

  Change of Value: When the output data has changed, it outputs the write command and stop outputting after receiving correct response.

  Cycle: the same with Modbus read command output mode, and output according to the scan rate.
- Scan Rate - Scan Rate is ratio of fast scan to slow scan. Every Modbus command can be set to fast scan or slow scan. If this parameter value is set to 10 then every fast scan command will be sent 10 times and those slow commands will be sent once. Range: 1-255. Default value is 10.
- Enable Auto Demotion - Disabled by default. When Auto Demotion is enabled, if a fast scan command fails to receive a valid response for N consecutive times, it is demoted to a slow scan command. This parameter is valid for Modbus reading command and cycle writing command.
- Demote on Failure - Support "Disable" and "Enable". Default is "Disable".When Demote on Failure is "Enable", after N times of command response failures (errors), if the command is a fast scan, it will be demoted to a slow scan. This parameter is valid for Modbus Reading command and cycle Writing command.
- Timeouts to Demote -Number of attempts to write before entering degradation. Range: 1- 255. Default value is 3.
- Clear after Timeout - Keep data unchanged or set to zero after consecutive missing responses.

  Set to Zero: Clear the data.

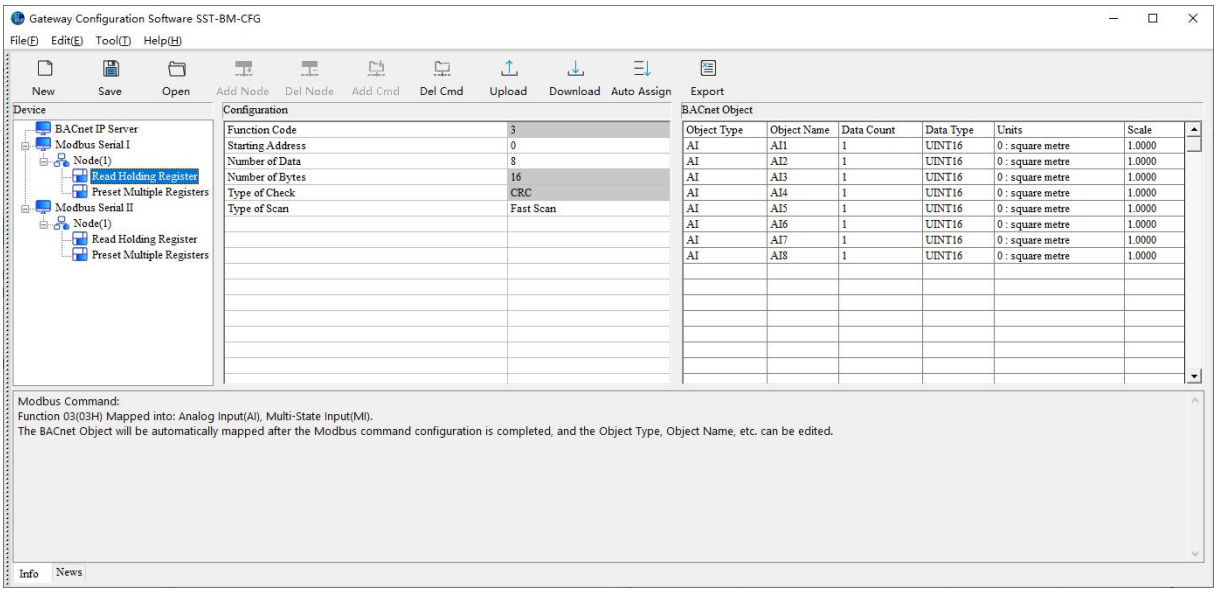
  Keep: Keep the last data.

Note: The gray parts cannot be changed.

5.4.1 Command Configuration

Select a command and double-click to add it.

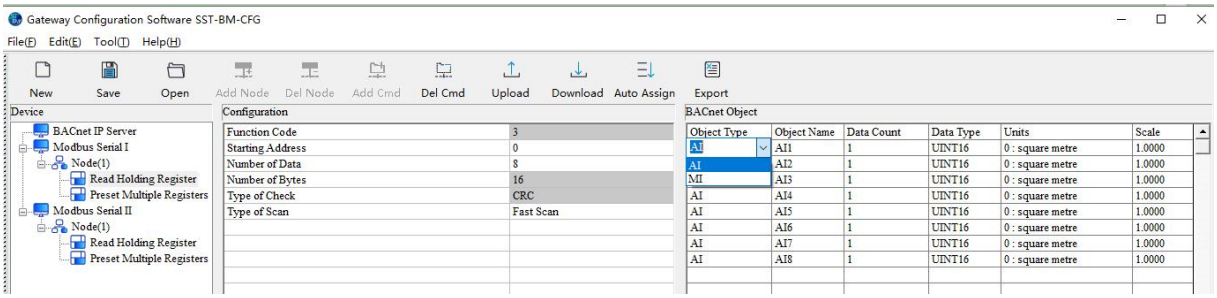
After configuration, SST-BM-CFG automatically maps each Modbus command to the corresponding BACnet object.



Read Coil Status - Enter the data count. The data is automatically mapped to a BACnet BI (Binary Input). Take above picture as an example.

Read input status - mapped to BACnet BI (binary input).

Read Holding Registers - mapped to BACnet AI (analog input) or MI (multistate input). As shown below, click the "AI" will open a drop-down menu.



- Object type: AI and MI optional, default is AI.
- Object Name: Editable, the maximum data length it supports is 12.
- Data Count: 1 and 2 optional, default is 1 (Map one Modbus register to a BACnet object).
- Data Types : BOOL, INT16 (signed 16-bit integer data), UINT16 (unsigned 16-bit integer data), INT32 (signed 32-bit integer data), INT32V (INT32 Inverse, contrary to high and low word INT32), UINT32 (unsigned 32-bit integer data), UINT32V (UINT32 Inverse, contrary to high and low word of UINT32),

Float, and FloatV (Float Inverse, contrary to high and low word of Float) optional (different display for different types of BACnet object).

- Units:BACnet Engineering Units

  Units - BACnet engineering units, Range:0-236, Default value is 0: square metre.

- Scale -Editable. Range: 0.01 to 100. Default: 1.0.

Read Input Register -- Maps to a BACnet AI (Analog Input) or MI (Multistate Input), user-selectable.

Force Single Coil -- Maps to a BACnet BO (Binary Output) or BV (Binary Value), user-selectable.

Preset Single Register -- Maps to a BACnet AO (Analog Output), AV (Analog Value), or MO (Multistate Output), user-selectable.

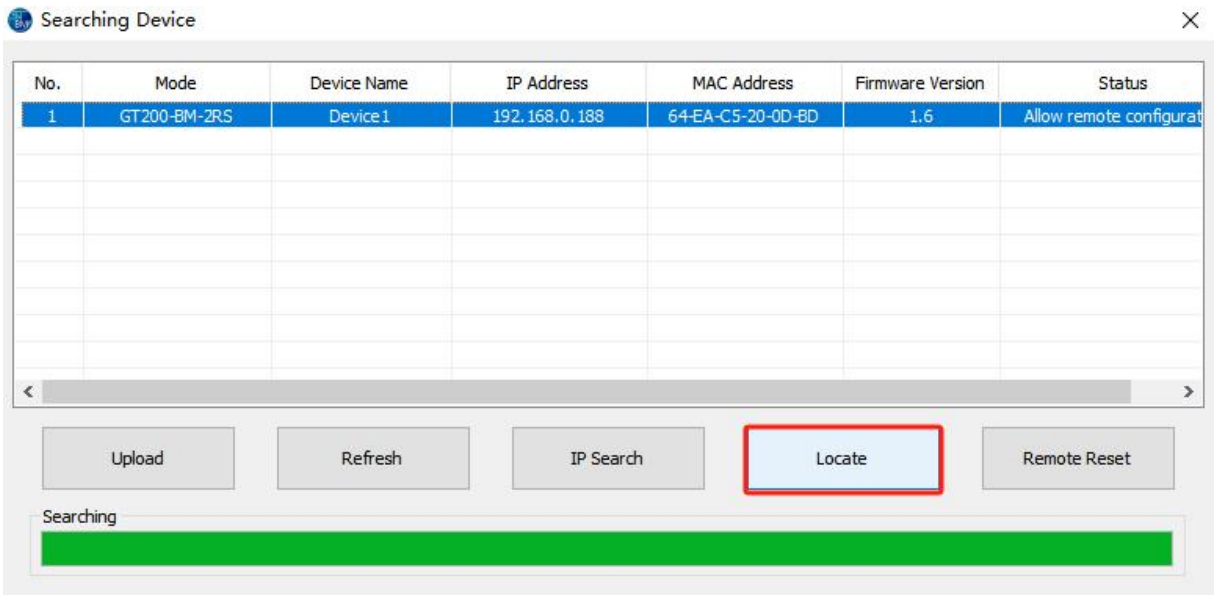
Force Multiple Coils -- Maps to a BACnet BO (Binary Output) or BV (Binary Value), user-selectable.

Preset Multiple Registers -- Maps to a BACnet AO (Analog Output), AV (Analog Value), or MO (Multistate Output), user-selectable.

5.5 Locate

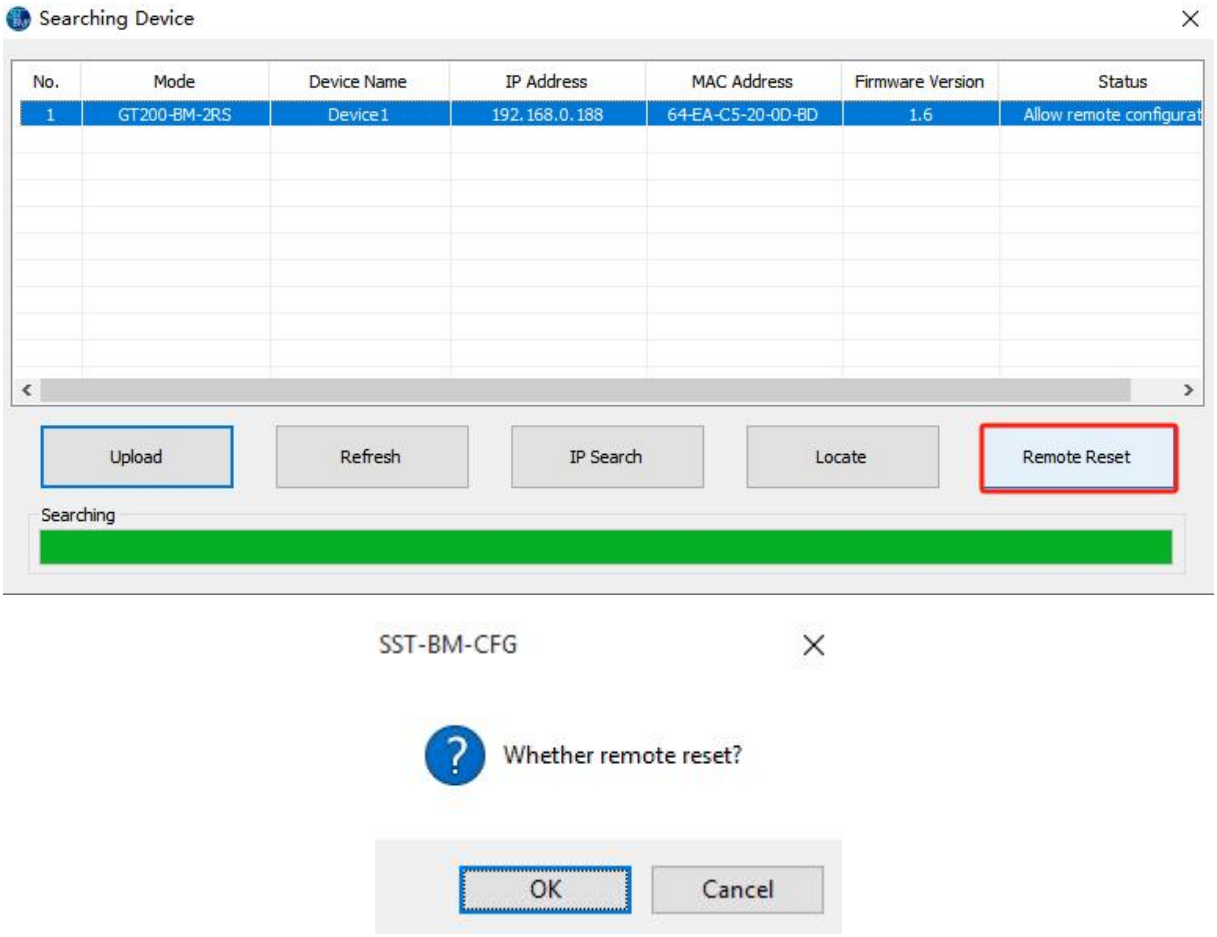
When managing multiple GT200-BM-2RS gateways, the Locate function is used to identify the device currently being configured.

Users click on the "Locate" button and the device is still in the network, The two orange indicators blink alternately for several seconds to help locate the device.



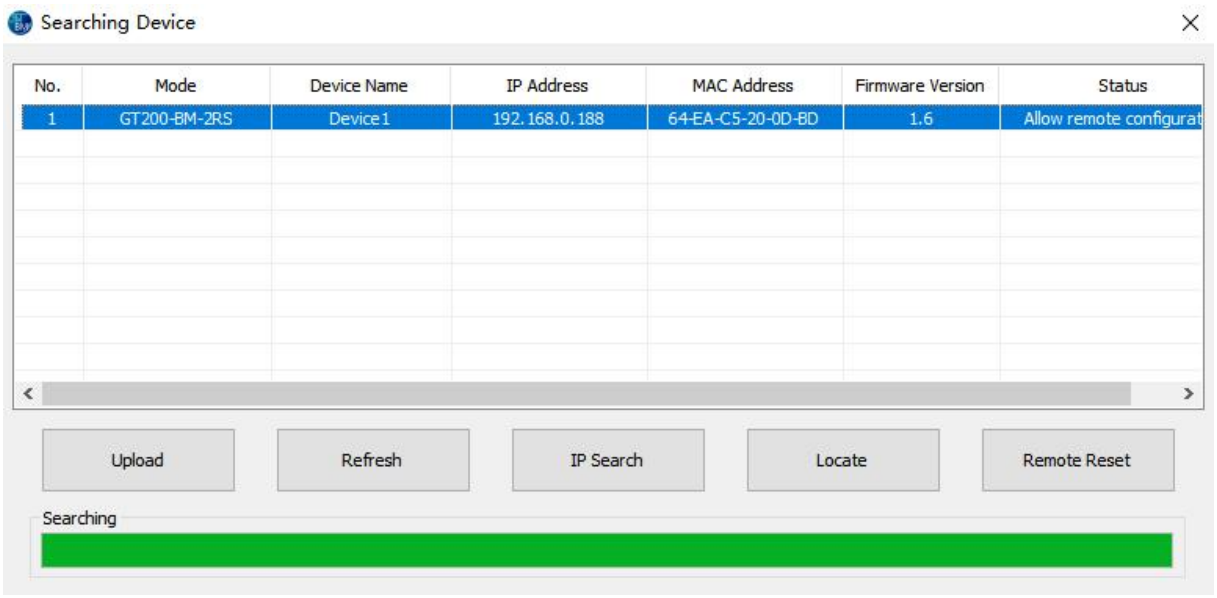
5.6 Remote Reset

Select the device in the list and click the "Remote Reset" button. A confirmation dialog will appear; click "OK" to confirm and complete the operation.



5.7 Upload Configuration

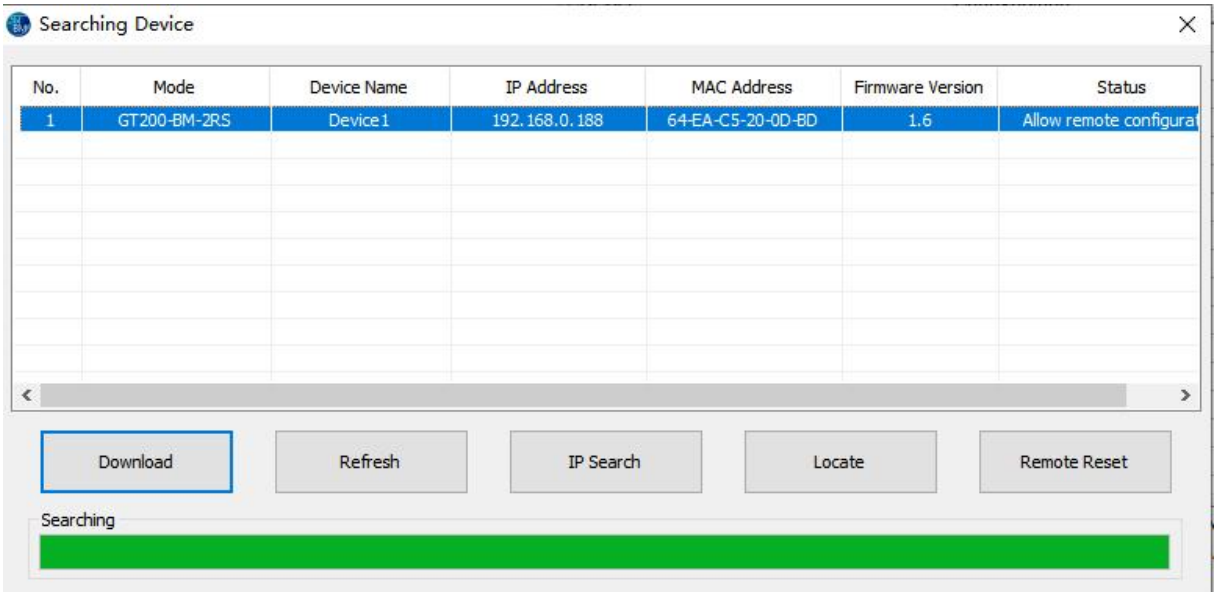
Select Upload Configuration. A device search dialog box is displayed:



Select the equipment you want to configure and click "Upload" to enter into the upload dialog box.

5.8 Download Configuration

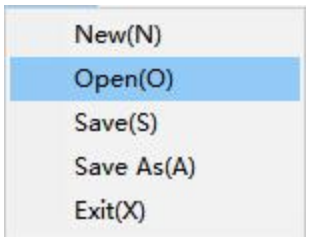
Downloading the configuration is similar to uploading it.



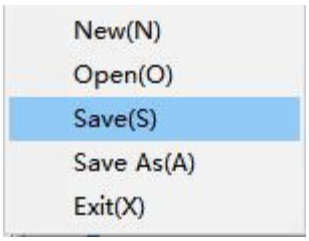
Note: Before downloading, ensure that all configurations are complete and correct.

5.9 Open/Save Project

Select "Open" to open an existing configuration project:



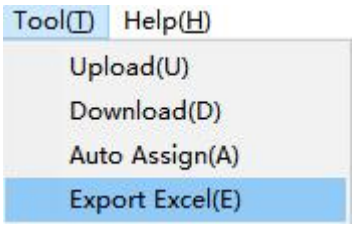
Select "Save" or "Save As..." to save the configuration project as a *.chg file.



5.10 Export Excel

The configuration can be exported as a table.

Ensure that Microsoft Excel is installed on the computer before using this function.



6 Typical Application

The GT200-BM-2RS connects Modbus slave devices to an Ethernet network. The GT200-BM-2RS acts as a communication bridge between BACnet/IP and Modbus RTU.

The following is the typical application of GT200-BM-2RS.

For example, the multifunction energy meter shown above is a current measuring meter with a Modbus slave station interface. The measured current value is stored at Modbus register address 40001. In the SST-BM-CFG, Configure Function Code 03 (Read Holding Registers), start address is 0 (corresponds to the Modbus register 40001 address), and then the data will be automatically mapped to the BACnet object AnalogInput (analog input). On the BACnet master PC, the current value can be monitored through corresponding AnalogInput.