

Modbus / BACnet IP Gateway

GT200-BM-MT

User Manual

V2.1



SST Automation Co., Ltd.

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Important Information

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Technical Support

Website: www.sstautomation.com

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Safety Information

This section summarizes essential safety requirements for installation, wiring, configuration, operation, and maintenance of the GT200-BM-MT gateway. Always follow local regulations, site safety procedures, and the product label.

DANGER — Hazardous Voltages and Unsafe Conditions

Disconnect external power before wiring, installing, removing, or servicing the gateway.

Do not install or operate the gateway in an explosive atmosphere, in a wet location, or in any location outside the specified environmental range.

If the gateway is installed in a cabinet connected to higher-voltage equipment, keep signal wiring separated from hazardous voltage wiring according to the site electrical code.

WARNING — Qualified Personnel and Intended Use

Only qualified personnel familiar with industrial communication equipment and RS-485/Ethernet wiring should install, configure, and maintain the gateway.

Read the complete manual before installation and commissioning.

The gateway is intended for industrial communication and building automation data exchange. It is not intended for emergency stop, safety interlock, life-support, or other safety-critical control functions unless an independently certified safety system is used.

CAUTION — Electrical Safety

Use a regulated 24 V DC power supply. Keep the supply voltage within 9 V to 30 V DC.

Verify polarity before power-on. Connect 24V+ to the 24V+ terminal and GND to the GND terminal.

Do not short the power terminals or RS-485 terminals.

Use surge protection and proper grounding in lightning-prone or electrically noisy environments.

CAUTION — Installation and Environmental Safety

Mount the gateway on a 35 mm DIN rail in a dry, ventilated, IP-rated cabinet suitable for the installation site.

Operating temperature: -40°C to 60°C. Relative humidity: 5% to 95%, non-condensing.

Provide sufficient clearance for ventilation, wiring, and cable bending radius.

Do not apply heavy pressure, impact, or mechanical stress to the enclosure or connectors.

CAUTION — Operation, Firmware, and Configuration

Back up the configuration before restoring defaults or updating firmware.

Do not power off the gateway or disconnect Ethernet during firmware update.

After downloading a configuration, restart the gateway when required so that the new configuration takes effect.

Verify mapping, scaling, byte order, and address offset settings before connecting the gateway to a live automation system.

NOTICE — Prohibited Actions and Risks

Action	Risk
Disassembling or modifying the enclosure	May damage the product and void warranty coverage.
Exceeding the rated power supply range	May cause permanent hardware damage.
Using the gateway as the only safety-control device	May create unsafe operation because the gateway is not a safety controller.
Changing network or mapping parameters without backup	May interrupt BACnet/IP or Modbus communication.
Powering off during firmware update	May leave the device in an unusable state until recovery is performed.

For technical support, contact support@sstautomation.com or visit www.SSTAutomation.com.



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1 Product Overview

1.1 Product Function

The GT200-BM-MT is a communication gateway for data exchange between BACnet/IP client/master devices and Modbus devices. On the BACnet/IP side, the gateway works as a BACnet/IP server/slave device. On the Modbus side, it supports Modbus RTU/ASCII master communication through two independent RS-485 serial ports and supports Modbus TCP client/master or server/slave communication through the Ethernet ports. Modbus RTU and Modbus TCP can be used at the same time.

1.2 Product Features

Protocol conversion between BACnet/IP and Modbus devices.

Supports Modbus RTU/ASCII master, Modbus TCP client/master, and Modbus TCP server/slave modes.

Two 10/100 Mbps Ethernet ports with built-in switch functionality; both ports can be used for BACnet/IP and Modbus TCP communication.

Two independent RS-485 serial ports for Modbus RTU/ASCII devices.

Supports DHCP and static IP configuration. If DHCP fails to obtain an address within approximately 30 seconds, the gateway falls back to 192.168.0.10.

Supports one-click data mapping, manual mapping, scaling, byte swap, and multiple data types.

Supports firmware update and factory reset through the hardware button.

Configured with SST-BMS-CFG configuration software.

1.3 Technical Specifications

Item	Specification
BACnet/IP role	BACnet/IP server/slave device for communication with BACnet/IP client/master devices
BACnet/IP services	Who-Is, I-Am, Who-Has, I-Have, ReadProperty, WriteProperty, ReadPropertyMultiple
BACnet objects	Up to 500 BI, 300 BO, 300 BV; 500 AI, 300 AO, 300 AV; 500 MSI, 100 MSO, and 100 MSV
Modbus TCP client/master	Up to 36 different slave IP addresses or ports; up to 200 commands; default port 502; FC 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, 17H
Modbus TCP server/slave	Up to 36 connections; supports 0x/1x/3x/4x area start address and block size settings; supports Unit Identifier check and FC 01H/02H, 03H/04H exchange
Modbus RTU/ASCII master	Two RS-485 ports; RTU and ASCII formats; up to 200 commands per master; FC 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, 17H
Serial parameters	Half-duplex; baud rate 300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2Kbps; 7/8 data bits; none/odd/even/mark/space parity; 1/2 stop

	bits
Data mapping	Scaling 0.0001 to 1000; no swap, byte swap, four-byte swap, word swap; Bool, INT16, UINT16, INT32, UINT32, Float
Power supply	24 V DC, 9 V to 30 V, approximately 80 mA at 24 V DC
Operating temperature	-40°C to 60°C
Relative humidity	5% to 95%, non-condensing
Dimensions (W x H x D)	34 mm x 116 mm x 105 mm, excluding rail connector
Mounting	35 mm DIN rail
Protection class	IP20
Compatibility	Compatible with V1.4 configuration/project usage

1.4 Revision History

Revision	Date	Chapter	Description
V2.1	2026-05-26	ALL	Updated manual for GT200-BM-MT V2.1: added Modbus RTU, updated Modbus TCP master/slave functions, new SST-BMS-CFG workflow, button operation, diagnostics, maintenance, and appendix.
V1.4 Rev A	2026-03-16	ALL	Previous English manual optimized for Modbus TCP / BACnet/IP gateway.
V1.4	2024-08-01	PART	New release for supporting modification of BACnet engineering units.
V1.2	2022-12-15	ALL	New release.

2 Hardware Descriptions

2.1 Product Appearance



Figure 2-1 Product appearance (for reference only; refer to your physical product for exact details).

2.2 LED Indicators

Indicator	State	Description
RX (Serial I / Serial II)	Green blinking	Data is being received on the corresponding serial port.
	Off	No data is being received.
TX (Serial I / Serial II)	Green blinking	Data is being transmitted on the corresponding serial port.
	Off	No data is being transmitted.
BIS (BACnet/IP network status)	Green on	BACnet/IP data is being transmitted or received.
	Green blinking	No BACnet/IP data is being transmitted or received.
	Red blinking	The gateway is obtaining an IP address by DHCP.
	Orange on (red and green simultaneously on)	Bootloader / firmware update mode.

Note: In DHCP mode, if an IP address is not obtained within approximately 30 seconds, the gateway changes to the fallback static IP address 192.168.0.10.

2.3 Button

The button is located on the bottom of the product. It is used for factory reset and firmware update mode.

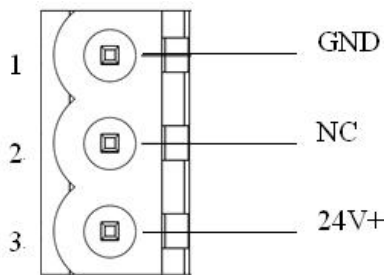
Firmware update mode: Before powering on the device, press and hold the button. Power on the device and release the button after the BIS indicator shows the firmware update state.

Factory reset: Within 10 seconds after startup is complete (BIS green on or blinking), press and hold the button for 5 seconds until the BIS indicator flashes orange. Release the button and click it again within 5 seconds. The gateway restores the default configuration and restarts automatically. After reset, the IP mode changes to DHCP. If DHCP fails within approximately 30 seconds, the IP address becomes 192.168.0.10.

2.4 Interfaces

2.4.1 Power Interface

The gateway uses one power connector. A 24V DC power supply is recommended.



Pin	Description
1	GND
2	NC (not connected)
3	24V+, DC

Figure 2-2 Power connector pin assignment.

2.4.2 Ethernet Interface

Pin	Signal description
S1	TXD+, Transceive Data+, Output
S2	TXD-, Transceive Data-, Output
S3	RXD+, Receive Data+, Input
S6	RXD-, Receive Data-, Input
S4/S5/S7/S8	Reserved

The two Ethernet interfaces use RJ-45 connectors and comply with IEEE 802.3u 100BASE-T. Both ports can be used for BACnet/IP and Modbus TCP communication.

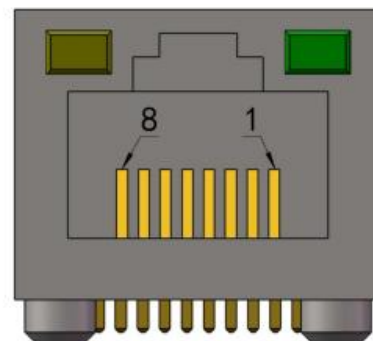
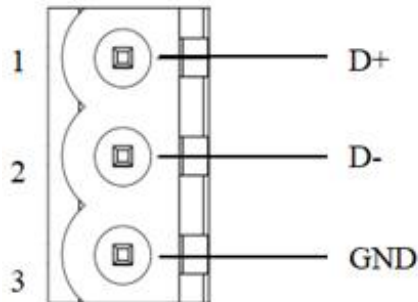


Figure 2-3 Ethernet RJ-45 pin reference.

2.4.3 Serial Interfaces

Serial I and Serial II are independent RS-485 interfaces. The terminal resistor and bias resistors can be enabled or disabled in the configuration software.



Pin	Wiring
1	D+, connect to RS-485 D+
2	D-, connect to RS-485 D-
3	GND, connect to RS-485 GND

Figure 2-4 RS-485 serial terminal pin assignment.

3 Hardware Installation

3.1 Mechanical Dimensions

Dimensions: 34 mm (W) x 116 mm (H) x 105 mm (D), excluding rail connector.

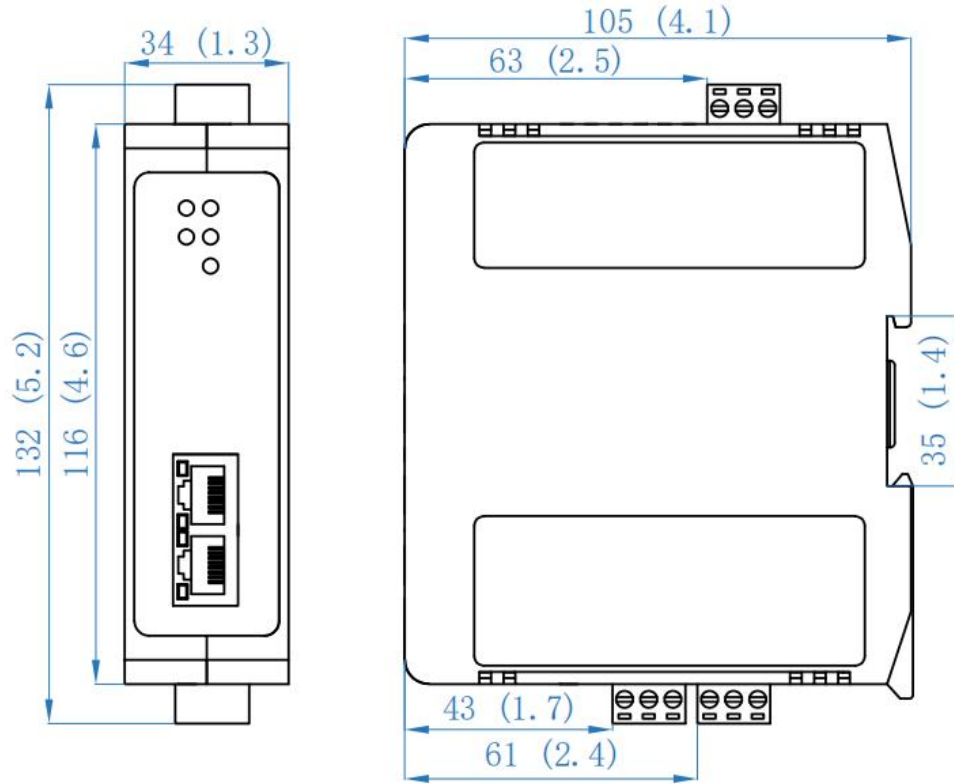


Figure 3-1 Mechanical dimensions.

3.2 Installation Method

The gateway is designed for 35 mm DIN rail mounting. Install or remove the product only when wiring is safe and the device is powered down, unless site procedures explicitly permit live work.

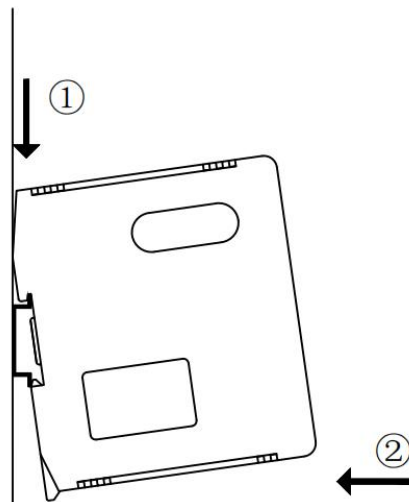




Figure 3-2 DIN rail installation.

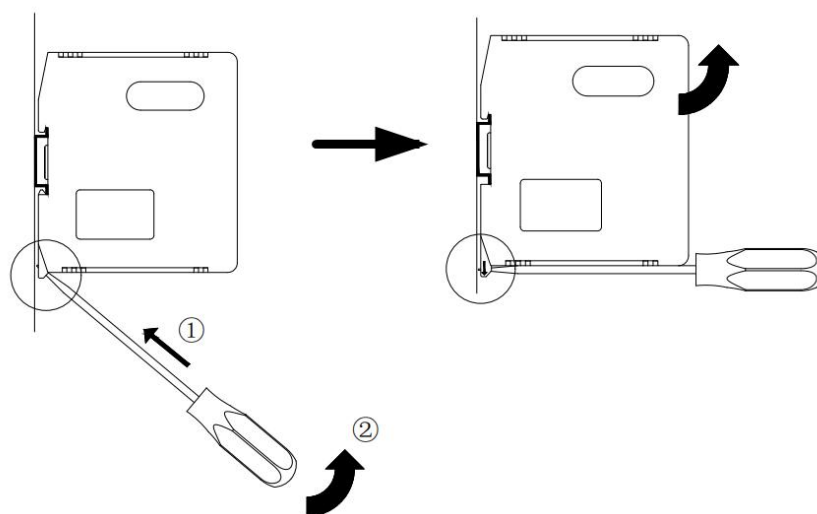


Figure 3-3 DIN rail removal.

4 Quick Start Guide

4.1 Hardware Connection

Step 1: Connect the power supply: connect a 24V DC power supply according to the power connector definition in Section 2.4.1.

Step 2: Connect the configuration interface: use an Ethernet cable to connect either Ethernet port of the gateway to the PC for search, configuration, and debugging.

Step 3: Connect Modbus serial devices: connect Serial I or Serial II to Modbus RTU/ASCII slave devices through RS-485.

Step 4: Connect Ethernet devices: connect either Ethernet port to Modbus TCP client/master or server/slave devices, BACnet/IP client/master devices, or an Ethernet switch.

Step 5: Power on the gateway only after all wiring is checked.

Note: The two Ethernet ports are internally switched. Both ports can be used for BACnet/IP and Modbus TCP communication. The factory network mode is DHCP. If there is no DHCP server, the fallback IP address is 192.168.0.10.

4.2 Configuration Software Preparation

Obtain and install SST-BMS-CFG from the official SST Automation download page:

<https://sstautomation.com/Download1/>

Run the installer and follow the wizard until installation is complete.

Open the software from the desktop shortcut.

Make sure the PC and the gateway are on the same subnet. For example, if the gateway uses 192.168.0.10, set the PC to an unused address such as 192.168.0.20.

4.3 Basic Configuration Flow

Step 1: Connect hardware according to Section 4.1.

Step 2: Install and open SST-BMS-CFG.

Step 3: Configure the BACnet/IP side, including IP settings, BACnet/IP port, device instance, and object quantities.

Step 4: Configure Modbus Serial I/II: set serial parameters, add slave nodes, and add read/write commands.

Step 5: Configure Modbus TCP: select client/master or server/slave mode. In client/master mode, set the slave IP/port and add nodes and commands. In server/slave mode, set the port, Unit Identifier option, area start addresses, and block sizes.

Step 6: Configure data mapping: use One-Click Mapping or New Mapping, then configure scaling and byte swap as required.

Step 7: Download the configuration and restart the gateway for the new configuration to take effect.

5 Software Instructions

5.1 Notes before Configuration

SST-BMS-CFG is a Windows-based configuration software used to configure the GT200-BM-MT V2.1 gateway. Before configuration, ensure that the PC and the gateway can communicate over Ethernet and that firewall settings do not block device search or communication.

5.2 User Interface

The SST-BMS-CFG interface includes the menu/title bar, toolbar, tree view, configuration view, and comments/news view. Grayed-out fields are read-only.

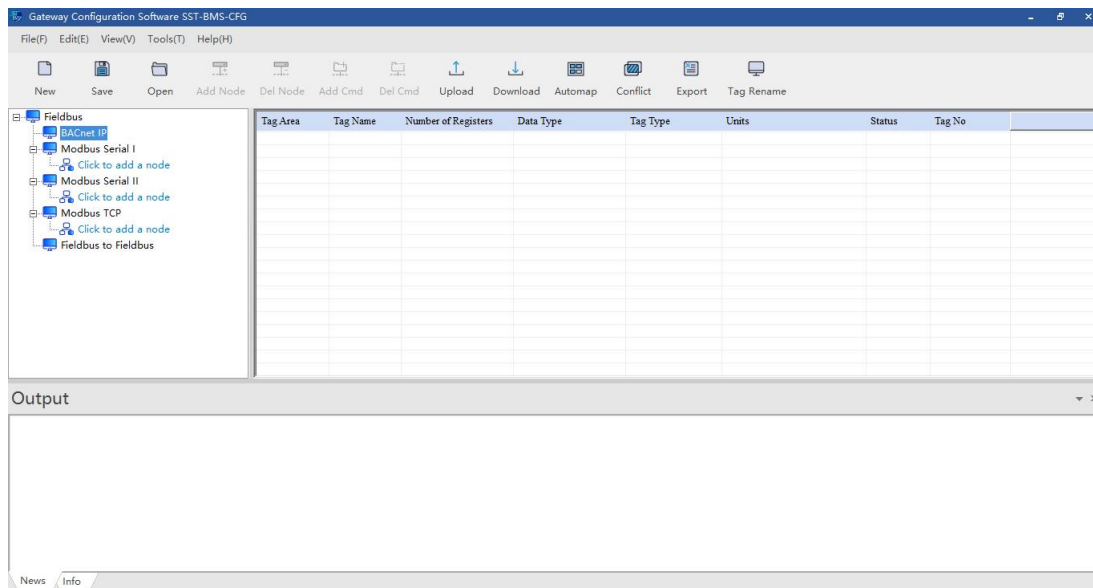


Figure 5-1 SST-BMS-CFG main interface.

Area	Name	Function
1	Menu/title bar	Includes File, Edit, Tools, View, and Help menus.
2	Toolbar	Common functions such as New, Save, Upload, Download, Debug, Auto Mapping, and Conflict Check.
3	Tree view	Hierarchical configuration tree for BACnet/IP and Modbus parameters.
4	Configuration view	Shows configurable parameters for the selected tree node.
5	Comments/news view	Shows parameter descriptions and product update information.

5.3 Search Device and Check IP Address

Several software functions, such as Upload, Download, and Debug, open the Search Device interface. The IP address displayed in the Search Device window is the gateway IP address used for Modbus TCP, BACnet/IP, search, upload, download, and debugging.

Connect the PC to either Ethernet port of the gateway.

Click Upload, Download, Debug, or Search Device to open the search window.

If the gateway is not found, use Specified IP Search and enter the gateway IP address.

Use Locate to identify a selected gateway. The status indicator flashes for several seconds during location.

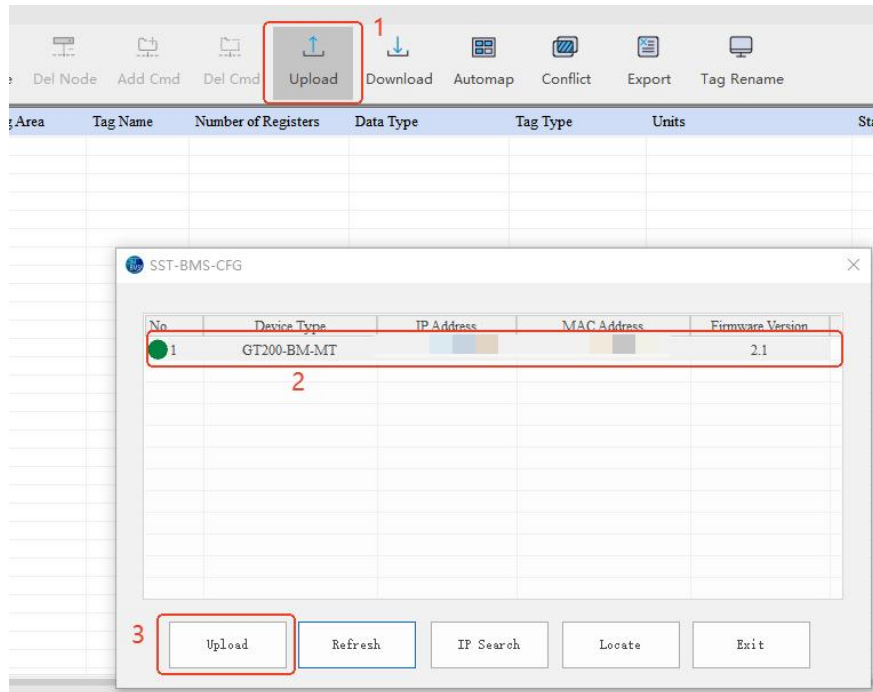


Figure 5-2 Search Device window example.

5.4 BACnet/IP Configuration

Select BACnet IP in the tree view and open the configuration window. The BACnet/IP page is used to configure the shared network address, BACnet/IP port, device instance, and BACnet object quantities and object properties.

Set IP parameters: Assign IP mode, IP address, subnet mask, default gateway, and DNS fields as needed. The IP address is also used by Modbus TCP communication and device search/upload/download/debugging.

Set BACnet/IP parameters: Configure port number and device instance. The default BACnet/IP port is 47808.

Set BACnet object quantities and properties: Configure object counts for BI, BO, BV, AI, AO, AV, MSI, MSO, and MSV within the supported range. Double-click an object property to configure parameters such as engineering units.

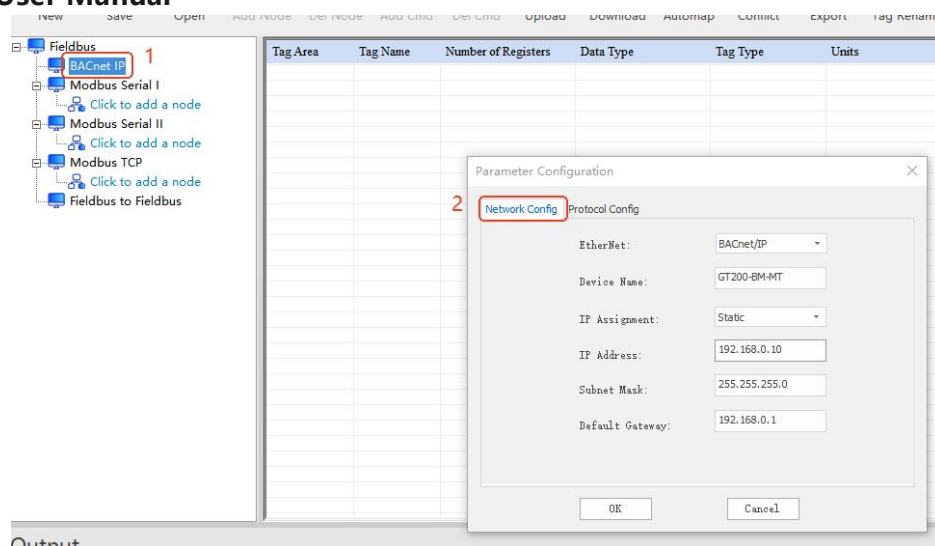


Figure 5-3 BACnet/IP configuration example.

5.5 Modbus Serial I/II Configuration

Modbus Serial I and Modbus Serial II use the same configuration method. The gateway works as a Modbus RTU/ASCII master on each serial port.

5.5.1 Set Serial Parameters

Select Modbus Serial I or Modbus Serial II in the tree view.

Set baud rate, data bits, stop bits, parity, RTU/ASCII format, and other serial parameters.

Enable or disable the terminal resistor and bias resistors according to the RS-485 network condition.

Configure advanced parameters such as response timeout, delay between polls, output mode, scan ratio, auto demotion, and status word as needed.

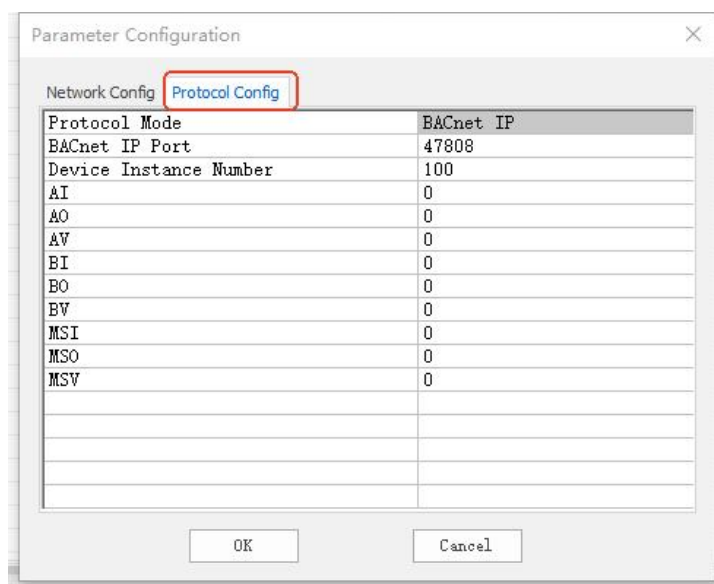


Figure 5-4 Serial parameter configuration example.

5.5.2 Add Slave Nodes and Commands

Add a node from the Edit menu, toolbar, or right-click menu. The node represents a Modbus slave device.

Configure the slave address for the node.

Right-click the node and select Add Command. Double-click the required command in the command selection dialog. Configure the command starting address, data count, mapping start address, bit offset, scan mode, and timeout handling.

Use Auto Mapping to automatically allocate memory mapping start addresses and avoid address conflicts.

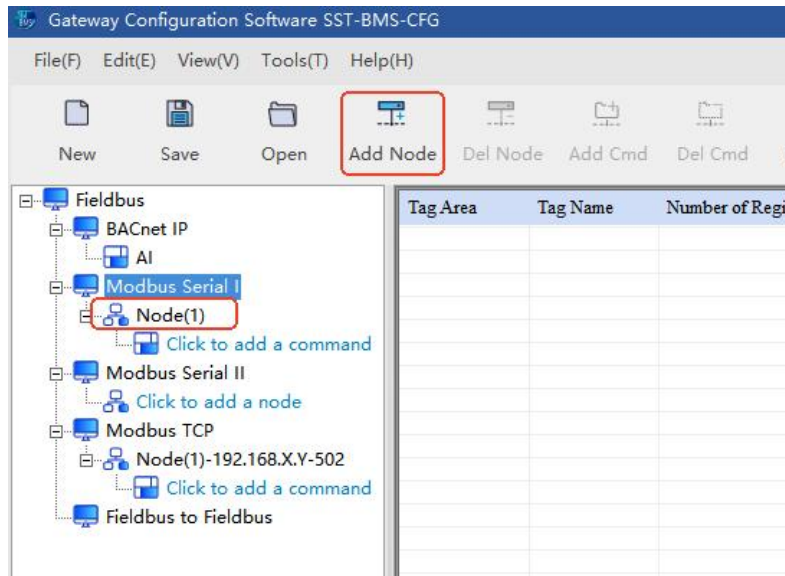


Figure 5-5 Add command from the toolbar.

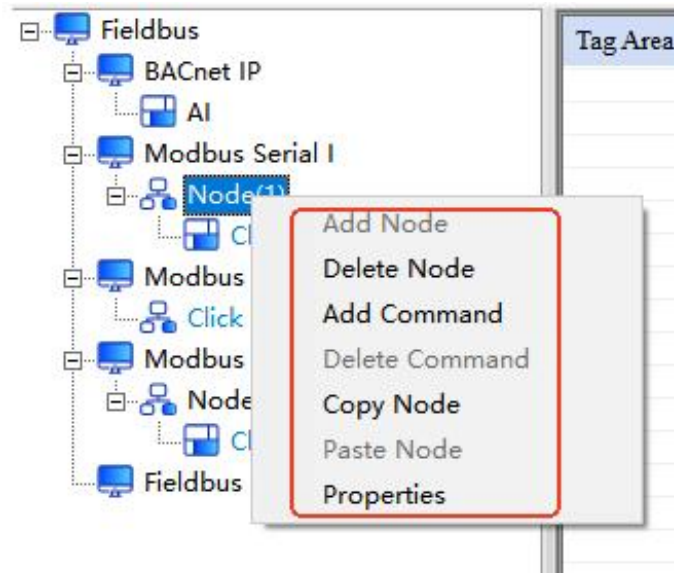


Figure 5-6 Node context menu.

5.5.3 Modbus Address Setting Rule

Modbus addresses may be represented as 1-based display addresses or 0-based protocol/configuration addresses. In

SST-BMS-CFG, the Modbus register starting address is entered as a decimal 0-based address.

Function code area	1-based display address	0-based setting
Coils (FC 01/05/15)	00001 to 00010	00000 to 00009
Discrete inputs (FC 02)	10001 to 10010	00000 to 00009
Holding registers (FC 03/06/16/23)	40001 to 40010	00000 to 00009
Input registers (FC 04)	30001 to 30010	00000 to 00009

5.6 Modbus TCP Configuration

The Modbus TCP side supports two operating modes: Modbus TCP client/master and Modbus TCP server/slave.

5.6.1 Modbus TCP Client/Master Mode

Select Modbus TCP in the tree view and choose Modbus TCP Client/Master mode.

Network parameters are shared with the BACnet/IP network configuration and are edited on the BACnet/IP page.

Configure response timeout, delay between polls, output mode, command output mode, and timeout handling.

Add nodes for Modbus TCP server/slave devices. Up to 36 different slave IP addresses or ports are supported, and all nodes together support up to 200 commands.

For each node, set slave address, server IP address, port number (default 502), and optional device status monitoring.

Add and configure read/write commands, then use Auto Mapping and Conflict Check before downloading.

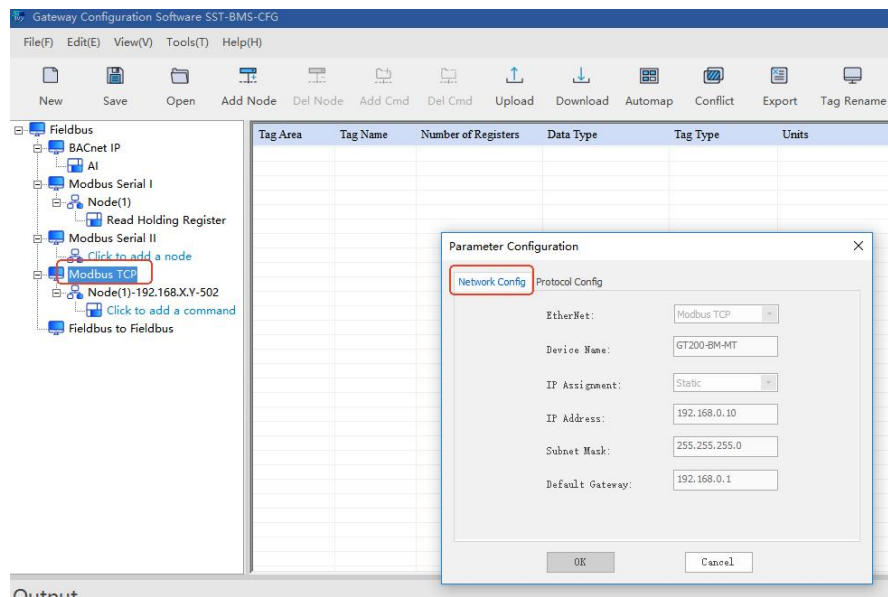


Figure 5-7 Modbus TCP mode selection example.

5.6.2 Modbus TCP Server/Slave Mode

Select Modbus TCP Server/Slave mode. In this mode, the gateway accepts connections from Modbus TCP client/master devices.

Up to 36 Modbus TCP client/master connections are supported.

Set the gateway IP address on the BACnet/IP page. This IP is used by both Modbus TCP and BACnet/IP
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Set start addresses and block sizes for coil status, input status, holding registers, and input registers. After setting the block size, data properties appear and can be configured.

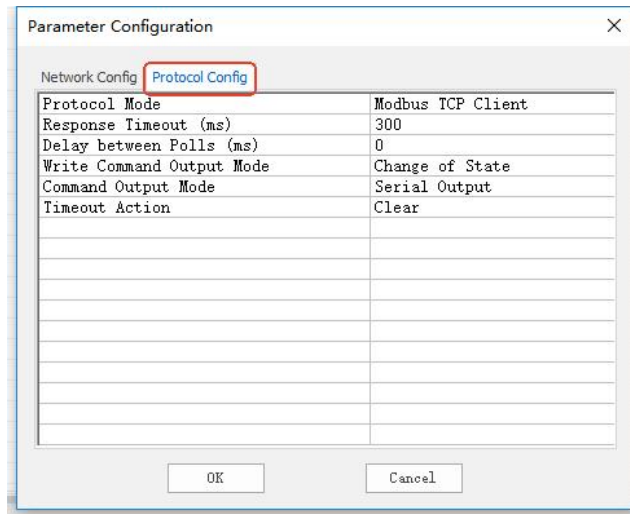


Figure 5-8 Modbus TCP server/slave parameters example.

5.7 Data Mapping Configuration

Protocol conversion is established by mapping data between BACnet/IP properties and Modbus data. Use One-Click Mapping for most configurations, or New Mapping for manual mapping when required.

One-Click Mapping: Select Fieldbus to Fieldbus, right-click in the mapping area, and select One-Click Mapping. The software automatically maps configured BACnet/IP data and Modbus data. Existing mapping is cleared by One-Click Mapping, so confirm before executing it.

Manual mapping: Select New Mapping and choose the input and output properties on both sides according to the application requirement.

Mapping parameters: Double-click a mapping item to configure input data, output data, byte swap, and scaling.

Supported scaling range: 0.0001 to 1000. Supported byte swap modes include no swap, byte swap, four-byte swap, and word swap.

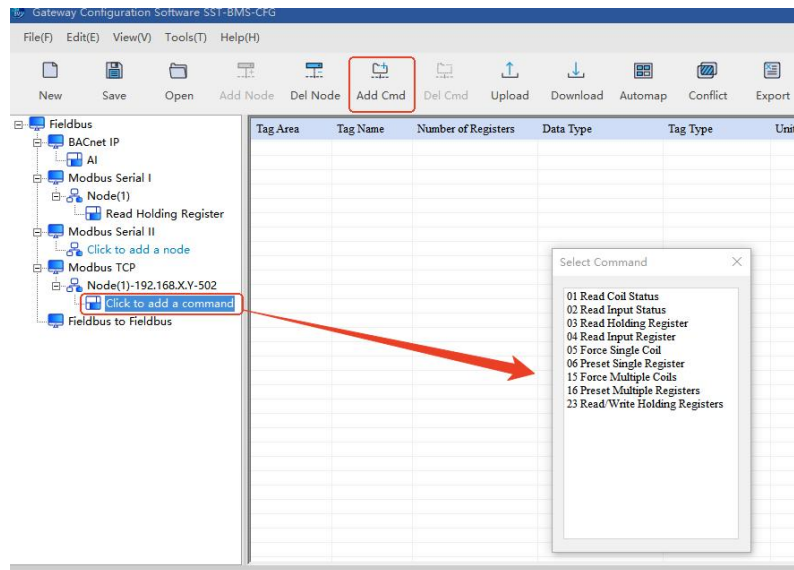


Figure 5-9 One-Click Mapping example.

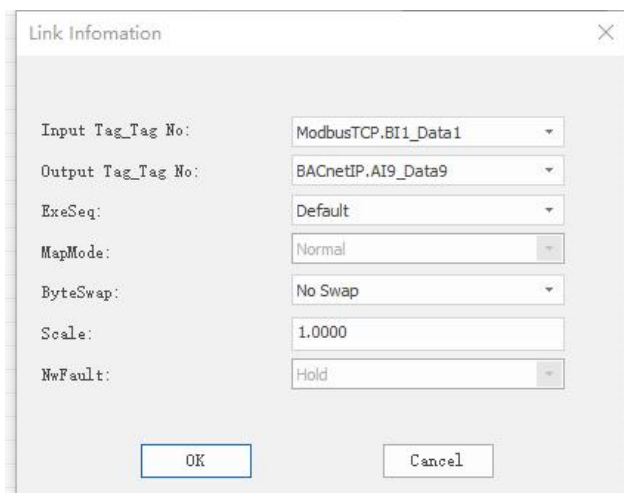


Figure 5-10 Mapping parameter configuration example.

5.8 Advanced Functions

5.8.1 Upload Configuration

Upload reads the configuration from the gateway into SST-BMS-CFG for viewing or backup. Click Upload, select the gateway in the Search Device window, and click Upload again to execute the operation.



Figure 5-11 Upload confirmation example.

5.8.2 Download Configuration

Download writes the current configuration in SST-BMS-CFG to the gateway. After download, the gateway must be restarted before the new configuration takes effect. If the software prompts for restart, click OK to restart automatically, or restart manually later if Cancel is selected.

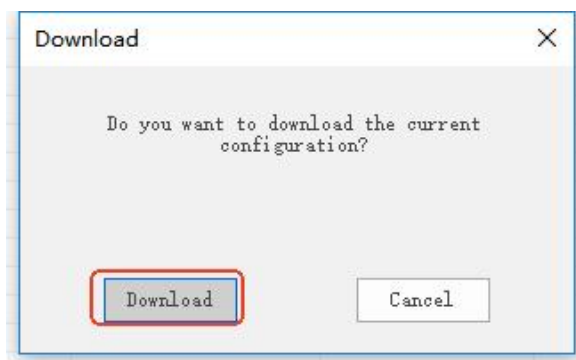


Figure 5-12 Download confirmation example.

5.8.3 Conflict Check

Conflict Check shows the gateway memory mapping address occupation and helps identify address conflicts. If conflicts exist, use Auto Mapping to automatically assign memory mapping start addresses.

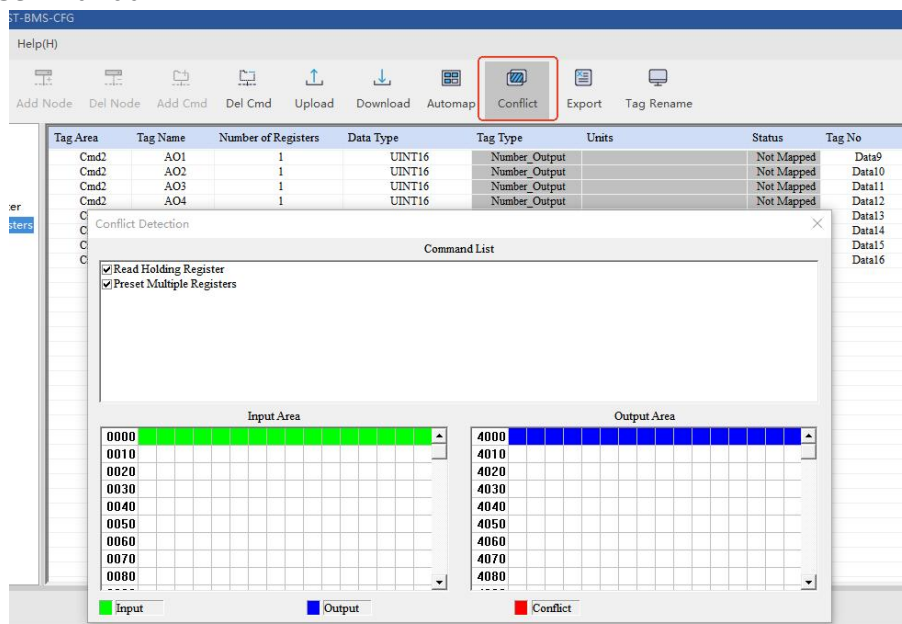


Figure 5-13 Conflict Check example.

5.8.4 Export Document

Export Document saves the current configuration information as an Excel file for review and documentation. Select the output path and file name, then save the document.

Device Name															
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Device Name	Assign IP Mode	IP Address	Subnet Mask	Default Gateway	BACnet IP Port	Device Instance	AI	AO	AV	BI	BO	BV	MSI	MSV
2	GT200-BM-MT	Static	192.168.0.10	255.255.255.0	192.168.0.1	47808	100	0	0	0	0	0	0	0	0
3															
4															
5															
6															

Figure 5-14 Exported Excel example.

6 Status Monitoring and Troubleshooting

6.1 LED Status Quick Reference

Indicator/status	Meaning	Recommended checks
RX/TX off on Serial I/II	No serial data is being received or transmitted.	Check RS-485 wiring, terminal connection, baud rate, data bits, stop bits, parity, slave ID, function code, start address, data length, and resistor settings.
BIS green on	BACnet/IP data is being transmitted or received.	Normal state.
BIS green blinking	No BACnet/IP data is being transmitted or received.	Check Ethernet cable, IP subnet, IP conflict, BACnet/IP port, device instance, and BACnet/IP client/master status.
BIS red blinking	DHCP address acquisition.	Wait approximately 30 seconds. If no DHCP server exists, connect using fallback IP 192.168.0.10 after setting the PC to the same subnet.
BIS orange on	Bootloader / firmware update mode.	Only firmware update is available. Restart the gateway to exit if update is not required.

6.2 Troubleshooting

Use the following table to isolate common power, network, configuration, and data communication issues. Always check power, wiring, IP address, and configuration consistency before replacing hardware.

Category	Symptom	Possible cause	Recommended action
Power	The gateway does not start or all indicators are off.	No power, reversed polarity, loose terminal, or power supply outside the rated range.	Check the 24 V DC wiring, GND connection, terminal tightness, and supply range of 9 V to 30 V DC.
	Gateway restarts repeatedly.	Unstable power supply, voltage drop during load change, or wiring fault.	Use a regulated power supply with adequate capacity; check for short circuits and voltage drops at the terminals.

Network	SST-BMS-CFG cannot find the gateway.	PC and gateway are on different subnets, firewall blocks discovery, Ethernet cable/link issue, or DHCP has not completed.	Connect directly to either Ethernet port, check link status, disable blocking firewall rules temporarily, use Specified IP Search, or set the PC to 192.168.0.x and search 192.168.0.10.
	The IP address changes after restart.	DHCP mode is enabled and a DHCP server assigns a new address.	Use SST-BMS-CFG to set a static IP address when a fixed engineering address is required.
	IP conflict or intermittent Ethernet communication.	Another device uses the same IP address, or network topology/cabling is unstable.	Ping the gateway IP, disconnect duplicate devices, assign a unique IP address, and check cable quality and switch ports.
Configuration	Download fails or times out.	Network interruption, wrong target IP, firewall restriction, or the gateway is busy.	Confirm the target IP, retry after communication is stable, connect the PC directly if needed, and restart the gateway before downloading again.
	Configuration does not take effect.	Gateway was not restarted after download, or the wrong project was downloaded.	Restart the gateway after download, upload the configuration for comparison, and verify project parameters.
BACnet/IP	BACnet/IP client cannot discover the gateway.	Wrong IP subnet, BACnet/IP port, device instance conflict, or object quantity not configured.	Check network settings, BACnet/IP port 47808, device instance uniqueness, and configured object counts.
	BACnet values are present but not updating.	Mapping missing, Modbus side offline, or mapped data type/scaling mismatch.	Check Fieldbus-to-Fieldbus mapping, Modbus command status, scaling, data type, and byte swap.
Modbus Serial	No response from RS-485 slave devices.	D+/D- reversed, wrong slave ID, baud rate, parity, stop bits, function code, or timeout setting.	Verify RS-485 wiring and all serial parameters; test one slave device first and increase timeout if needed.
	CRC/LRC errors or unstable serial communication.	Electrical noise, long cable, missing termination/biasing, or multiple grounding points.	Enable/disable terminal and bias resistors according to the wiring topology, shorten cable if possible, and improve shielding/grounding.

Modbus TCP	Modbus TCP client/master cannot connect.	Wrong server IP/port, route issue, server offline, or port blocked.	Check server IP, TCP port 502 or configured port, subnet/gateway, and server connection limit.
	Modbus TCP server/slave data cannot be read correctly.	Unit Identifier check, area start address, block size, or FC 01/03 exchange setting does not match the client.	Check Unit Identifier policy, start address, block size, and function code exchange settings.
Data Mapping	BACnet values are shifted by one address.	1-based display address was entered as a 0-based configuration address, or vice versa.	Use the address rule in Section 5.5.3 and enter 0-based decimal addresses in SST-BMS-CFG.
	32-bit integer or float values are incorrect.	Byte order, word order, data type, or scaling is not matched to the field device.	Try byte swap, four-byte swap, or word swap; verify source data type and scaling range.
LED/Recovery	BIS is red blinking for a long time.	Gateway is obtaining an IP address through DHCP or cannot obtain a DHCP address.	Wait for DHCP completion. If no DHCP server is available, use fallback IP 192.168.0.10 after approximately 30 seconds.
Firmware	The gateway remains in firmware update mode.	Button was held during power-on or firmware update did not complete normally.	Power cycle the gateway without pressing the button. If needed, repeat firmware update using 192.168.0.10.

If a problem remains after these checks, export the project file, record the LED status, firmware version, IP settings, and wiring topology, then contact technical support.

6.3 FAQ

FAQ1: The software cannot find the gateway. What should I do?

Click Refresh or use Specified IP Search and search again.

Confirm that the network cable is connected to one of the gateway Ethernet ports.

Replace the Ethernet cable and check whether the Link indicator is on.

Confirm that the PC and gateway are in the same subnet. If DHCP fails, set the PC to the 192.168.0.x subnet and connect to fallback IP 192.168.0.10.

Check firewall settings that may block device discovery.

FAQ2: The configuration does not take effect after download. What should I do?

Restart the gateway after download. The new configuration takes effect only after restart.

Upload the configuration from the gateway and compare it with the expected configuration.

Check device wiring and LED status.

If the configuration is damaged or inconsistent, restore initial configuration and download a complete configuration again.

FAQ3: Modbus serial communication is abnormal. What should I check?

Check RS-485 D+, D-, and GND wiring and terminal tightness.

Confirm that serial parameters match the Modbus slave device.

Confirm slave ID, function code, start address, and data length.

Try enabling or disabling the terminal resistor and bias resistors according to the field wiring condition.

FAQ4: Modbus TCP communication is abnormal. What should I check?

Check whether the Modbus TCP device is powered and the Ethernet cable is connected.

Confirm that the gateway and Modbus TCP device IP addresses are in the same subnet and have no conflict.

Check TCP port number, default 502 unless modified.

Confirm slave ID / Unit Identifier, function code, start address, and data length.

If DHCP mode is used, confirm the current gateway IP address after restart.

FAQ5: BACnet/IP communication is abnormal. What should I check?

Check Ethernet cable and link status.

Confirm that the gateway and BACnet/IP client/master are in the same IP subnet.

Confirm BACnet/IP port number and device instance.

Confirm that the required BACnet objects have been configured and mapped correctly.

FAQ6: Can Modbus RTU/ASCII and Modbus TCP be used at the same time?

Yes. The gateway supports simultaneous use of Modbus RTU/ASCII through Serial I/II and Modbus TCP through the Ethernet ports. Configure each side separately and map data through Fieldbus-to-Fieldbus.

FAQ7: What is the default or fallback IP address?

The factory network mode is DHCP. If DHCP fails to obtain an address within approximately 30 seconds, the gateway uses fallback IP address 192.168.0.10.

In firmware update mode, the gateway IP address is fixed at 192.168.0.10.

FAQ8: What should I check before downloading a configuration?

Check that the PC and gateway are on the same subnet, confirm the target device in the Search Device window, run Conflict Check, and back up the current configuration if it is already in service.

FAQ9: How many Modbus TCP connections or commands are supported?

In Modbus TCP client/master mode, up to 36 different slave IP addresses or ports and up to 200 commands are supported.

In Modbus TCP server/slave mode, up to 36 Modbus TCP client/master connections are supported.

FAQ10: How should I handle Modbus address offset problems?

SST-BMS-CFG uses decimal 0-based starting addresses. For example, display address 40001 corresponds to setting address 00000. Check Section 5.5.3 before commissioning.

FAQ11: When should byte swap or word swap be used?

Use byte swap, four-byte swap, or word swap when 16-bit/32-bit values or floating-point values are displayed with the wrong magnitude or order. Match the setting to the byte order used by the Modbus device.

FAQ12: Does factory reset erase the IP address?

Yes. Factory reset clears user configuration and resets the IP mode to DHCP. If no DHCP address is obtained, the gateway uses fallback IP 192.168.0.10.

FAQ13: What information should be sent to technical support?

Provide the model, firmware version, configuration project, wiring diagram, PC IP address, gateway IP address, LED status, error screenshots, and a description of the BACnet/IP and Modbus devices connected to the gateway.

7 Device Maintenance

7.1 Restore Initial Configuration

Warning: This operation clears all user configuration, including IP address settings. Back up important configurations before restoring defaults.

Within 10 seconds after startup is complete (BIS green on or blinking), press and hold the button for 5 seconds until the BIS indicator flashes orange, then release the button.

To confirm, click the button once within 5 seconds after the BIS indicator starts flashing. The device restores default configuration and restarts automatically.

To cancel, do not click the button within 5 seconds. The gateway exits this mode and continues normal operation.

After restart, IP mode is reset to DHCP. If no DHCP address is obtained within approximately 30 seconds, the gateway uses 192.168.0.10.

7.2 Firmware Update

Step 1: In Bootloader mode, the gateway IP address is fixed at 192.168.0.10. Normal communication is disabled and the mode is used only for firmware update.

Step 2: Power off the device. Press and hold the button and power on the device.

When the BIS indicator turns orange, the device has entered Bootloader mode and the button can be released.

Step 3: Connect the gateway Ethernet port and the PC, and set the PC Ethernet IP address to the 192.168.0.x subnet.

Step 4: Open the firmware update tool in SST-BMS-CFG and enter 192.168.0.10 as the access address.

Step 5: Select the new firmware file and start the update. Do not power off the device or disconnect the network during the update.

Step 6: After the update succeeds, wait for the device to restart and return to normal operation mode.

7.3 Daily Maintenance

Protect the module from heavy pressure to avoid panel damage.

Avoid impact, which may damage internal components.

Keep the supply voltage within the specified range.

Prevent water ingress. Water may cause abnormal operation or permanent damage.

Before power-on, check all wiring for wrong connection or short circuit.

8 Technical Reference

8.1 Modbus TCP Client/Master Working Principle

Data conversion between Modbus TCP and BACnet/IP is established by mapping. The gateway contains a network input buffer and a network output buffer relative to the BACnet/IP side. In Modbus TCP client/master mode, Modbus read commands write data read from Modbus TCP server/slave devices into the network input buffer for BACnet/IP reading. Modbus write commands obtain data from the network output buffer and write it to the corresponding Modbus TCP server/slave device.

The network input buffer range is 0x0000 to 0x01FF. The network output buffer range is 0x4000 to 0x41FF. The supported function codes depend on the configured command type.

8.2 Modbus TCP Server/Slave Working Principle

In Modbus TCP server/slave mode, Modbus write commands from a Modbus TCP client/master write data into the gateway network input buffer, which can then be read by BACnet/IP. Modbus read commands obtain data from the network output buffer and return it to the Modbus TCP client/master.

As a Modbus TCP server/slave, the gateway supports FC 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, and 17H. FC 05/06/15/16 write data to the network input buffer, and FC 01/03 can read back written data. BACnet/IP output data can be read by Modbus TCP client/master devices through FC 02/04 according to the configured mapping.

8.3 Modbus RTU/ASCII Master Working Principle

The GT200-BM-MT gateway operates as a Modbus RTU/ASCII master on each of its two independent RS-485 serial ports (Serial I and Serial II). The master cyclically polls configured Modbus slave devices according to the command list defined in the SST-BMS-CFG configuration. Data conversion between Modbus RTU/ASCII and BACnet/IP is established by data mapping, using the same network input and output buffer mechanism as Modbus TCP.

In Modbus RTU/ASCII master mode, read commands (FC 01H, 02H, 03H, 04H) read data from Modbus slave devices and store it in the gateway network input buffer (0x0000 to 0x01FF). This data can then be read by BACnet/IP client/master devices through the configured data mapping. Write commands (FC 05H, 06H, 0FH, 10H) obtain data from the network output buffer (0x4000 to 0x41FF) and write it to Modbus slave devices. BACnet/IP output data is written to the network output buffer, and the Modbus master then sends the corresponding write commands to the target slave devices.

Each serial port supports up to 200 Modbus commands. The two RS-485 ports (Serial I and Serial II) operate independently, allowing simultaneous communication with separate Modbus RTU/ASCII networks. The terminal resistor and bias resistors for each port can be enabled or disabled through the configuration software according to the RS-485 wiring topology.

8.4 Network Status Monitoring

The gateway supports status monitoring in SST-BMS-CFG for Modbus RTU and Modbus TCP client/master or server/slave status. When enabled, Modbus command status can be mapped to BACnet/IP MSI properties. Each command uses one bit to indicate execution status: 1 indicates success and 0 indicates failure.

For Modbus TCP client/master status monitoring, each slave occupies one bit. A value of 1 indicates that the slave is online; 0 indicates offline. For Modbus TCP server/slave status monitoring, the status data indicates the number of established Modbus TCP client/master connections.

9 Typical Applications

The GT200-BM-MT can connect BACnet/IP building automation systems to Modbus field devices. Typical applications include collecting data from power meters, environmental sensors, HVAC controllers, water system meters, and other Modbus RTU or Modbus TCP devices, then exposing the data to a BACnet/IP client/master system through BACnet objects.

BACnet/IP client/master reads analog values mapped from Modbus holding registers or input registers.

BACnet/IP client/master writes output objects that are mapped to Modbus coils or registers.

Modbus RTU/ASCII devices and Modbus TCP devices can be integrated in the same gateway project.

Status monitoring can be mapped to BACnet/IP MSI objects for online/offline or command execution diagnostics.

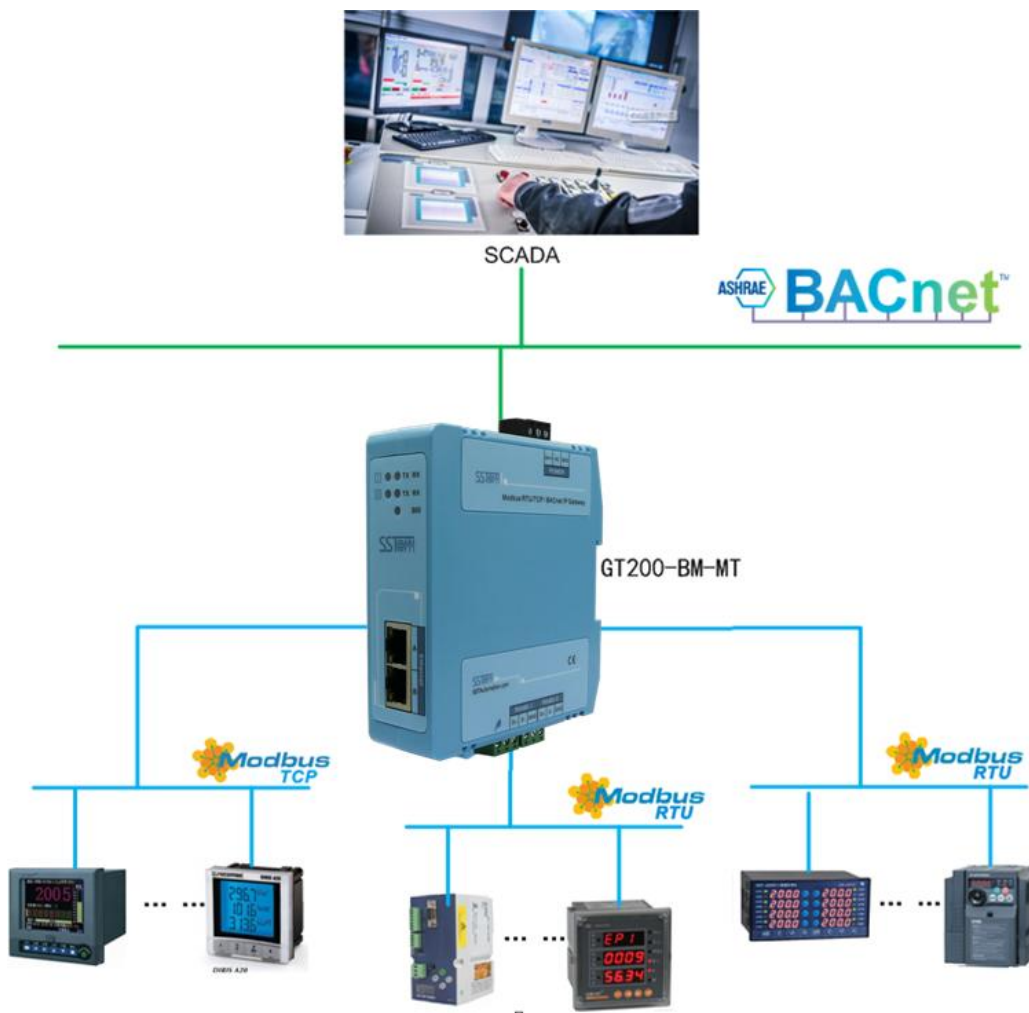


Figure 9-1 Case Study.

10 Appendix

10.1 Complete Technical Parameters

Category		Supported parameters
BACnet/IP		Default port 47808; configurable device instance; configurable engineering units; supported services: Who-Is, I-Am, Who-Has, I-Have, ReadProperty, WriteProperty, ReadPropertyMultiple; object limits as specified in Section 1.3.
Modbus Client/Master	TCP	FC 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, 17H; up to 36 server/slave IP/port nodes; up to 200 commands; serial/parallel command output depending on software settings; timeout clear/hold; status word.
Modbus Server/Slave	TCP	FC 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, 17H; up to 36 connections; 0x, 1x, 3x, and 4x start address and block size; Unit Identifier check; FC 01/02 and FC 03/04 exchange.
Modbus Master	RTU/ASCII	Two independent RS-485 ports; electronic terminal and bias resistor settings; RTU/ASCII; up to 200 commands per master; serial parameter settings as described in Section 1.3.
Data mapping		BACnet/IP data property mapped to Modbus data; scaling 0.0001 to 1000; no swap, byte swap, four-byte swap, word swap; Bool, INT16, UINT16, INT32, UINT32, Float.
Physical and environmental		24 V DC, 9 V to 30 V, approximately 80 mA at 24 V DC; -40°C to 60°C; 5% to 95% RH non-condensing; 34 x 116 x 105 mm; DIN rail; IP20; EMC test standard compliance.

10.2 Glossary

Term	Description
BACnet/IP	BACnet (Building Automation and Control Networks) over IP/Ethernet networks.
Modbus	A communication protocol originally designed by MODICON and widely used in industrial automation.
Modbus RTU	Modbus serial protocol format commonly used over RS-485.
Modbus TCP	Modbus communication over TCP/IP Ethernet networks.
Client/Master	Device that initiates requests or commands.
Server/Slave	Device that responds to client/master requests.
SST-BMS-CFG	Configuration software for the GT200-BM-MT V2.1 gateway.
DHCP	Dynamic Host Configuration Protocol. Automatically assigns IP addresses to devices

	on a network.
RS-485	A differential serial communication standard widely used in industrial automation for long-distance, multi-drop networks.
DIN Rail	A standard 35 mm wide metal rail used for mounting industrial control equipment inside equipment cabinets.
BACnet Object	A data point in BACnet representing physical or virtual values. Object types include BI, BO, BV, AI, AO, AV, MSI, MSO, and MSV.

10.3 Copyright and Use Statement

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Users are responsible for ensuring that use of the product complies with local safety regulations, laws, and applicable industry standards.

10.4 Register Mapping Quick Reference

This quick reference summarizes common Modbus function codes, address conventions, mapping buffers, byte-swap modes, and default network parameters used when configuring the gateway.

Function code	Function	Typical data area	Direction	Notes
01H	Read Coils	0x / coil status	Read	Reads Boolean coil data.
02H	Read Discrete Inputs	1x / input status	Read	Reads Boolean input data.
03H	Read Holding Registers	4x / holding registers	Read	Reads 16-bit register data.
04H	Read Input Registers	3x / input registers	Read	Reads 16-bit input register data.
05H	Write Single Coil	0x / coil status	Write	Writes one Boolean coil.
06H	Write Single Register	4x / holding registers	Write	Writes one 16-bit register.
0FH	Write Multiple Coils	0x / coil status	Write	Writes multiple coils.
10H	Write Multiple Registers	4x / holding registers	Write	Writes multiple registers.
17H	Read/Write Multiple	4x / holding	Read &	Supported by the gateway

	Registers	registers	write	where configured.
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Address rule: in SST-BMS-CFG, enter Modbus starting addresses as decimal 0-based addresses. For example, 40001, 30001, 10001, and 00001 correspond to setting address 00000 in their respective data areas.

Parameter	Specification / Reference
Network input buffer	0x0000 to 0x01FF. Used by Modbus write data or data mapped into the BACnet/IP side according to the configured mode.
Network output buffer	0x4000 to 0x41FF. Used by data read from the BACnet/IP side or mapped to Modbus read commands according to the configured mode.
Supported data types	Bool, INT16, UINT16, INT32, UINT32, Float.
Scaling range	0.0001 to 1000.
Byte-swap modes	No swap, byte swap, four-byte swap, word swap.
BACnet/IP objects	BI, BO, BV, AI, AO, AV, MSI, and MSO according to the configured object quantities.

Mode	Description	Typical use
No swap	Keeps the byte and word order unchanged.	Use when values are displayed correctly.
Byte swap	Swaps bytes inside each 16-bit word.	Use for 16-bit values with reversed byte order.
Four-byte swap	Reorders the four bytes of a 32-bit value.	Use for 32-bit integers or float values when the byte sequence is reversed.
Word swap	Swaps the high and low 16-bit words.	Use for 32-bit values when word order differs between devices.

Item	Default / reference value	Configurable
BACnet/IP port	47808	Yes
Modbus TCP port	502 by default; valid range depends on product restrictions.	Yes
Factory network mode	DHCP	Yes
Fallback IP address	192.168.0.10 after DHCP timeout of approximately 30 seconds.	N/A
Firmware update IP	192.168.0.10 in Bootloader mode.	No
Mounting	35 mm DIN rail	No
Power supply	24 V DC recommended; 9 V to 30 V DC supported.	No

10.5 Compliance and Warranty Notes

Use only official product labels, declarations of conformity, and regional approval documents to claim CE, FCC, RoHS, WEEE, or other compliance status. Do not add regulatory claims to customer-facing material unless the corresponding certification is verified.

The gateway is intended for industrial and building automation communication. It is not a safety-rated controller and must not be used as the sole device for personnel protection or emergency shutdown.

The product is covered by a 3-year limited warranty from the date of purchase. Warranty terms, service scope, and return procedures are subject to the sales contract or the official SST Automation warranty policy applicable to the region.

For technical support, provide the model, serial number if available, firmware version, configuration project, wiring information, and fault description.