

Modbus TCP / EtherNet/IP / PROFINET Gateway GT200-PN-MT

User Manual

V4.2

Rev C



SST Automation

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Important Information

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Safety Information

Read this section carefully before installing or operating the GT200-PN-MT gateway.

WARNING — General Safety

- This product must be installed and maintained by qualified personnel familiar with industrial automation equipment.
- Read the entire user manual before installation, configuration, or operation.
- Disconnect all power sources before wiring or performing maintenance.
- Failure to follow these instructions may result in equipment damage, personal injury, or voiding of the warranty.

CAUTION — Electrical Safety

- The GT200-PN-MT gateway operates on 24V DC power only. Do not connect to AC mains or any voltage exceeding the rated specification.
- Ensure correct polarity when connecting the power supply:
 - 24V+ → positive terminal
 - GND → ground terminal
 - NC → no connection (spare)
- Use a regulated 24V DC power supply with adequate current rating. An unstable or under-rated power supply may cause erratic operation or damage.
- The gateway does NOT include a power switch. Install an external disconnect device (circuit breaker or switch) within easy reach.
- Do not operate the device if the power cable or connector is damaged.

CAUTION — Installation Safety

- Mount the gateway on a standard **35 mm DIN rail** in a clean, dry, and well-ventilated environment.
- Ensure adequate airflow around the device. Do not block ventilation openings.
- **Operating temperature:** -40 °C to 70 °C (-40 °F to 158 °F). Avoid installation near heat sources or in direct sunlight.
- **Operating humidity:** 5% to 95% RH (non-condensing).
- Secure all cables to prevent accidental disconnection and strain on connectors.
- Do not install the device in explosive atmospheres or corrosive environments.

CAUTION — Operation Safety

- Do **not** connect or disconnect cables or power while the gateway is in operation (hot-plugging may cause data loss or damage).

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

- Ensure the device is properly grounded to prevent electrical noise and surge damage.
- In areas prone to lightning or power surges, install external surge protection devices.
- The gateway has two PROFINET ports (P1/P2) and two Modbus TCP / EtherNet/IP ports (P3/P4). Cascade connections are supported **within each port pair only**. Do NOT connect a PROFINET port to a Modbus TCP / EtherNet/IP port in a cascaded configuration.
- During firmware updates or configuration downloads, do **not** power off the device. Interrupting power during these operations may cause permanent damage.

CAUTION — Electrostatic Discharge (ESD)

- The GT200-PN-MT contains static-sensitive electronic components.
- Before handling the device, discharge any accumulated static electricity by touching a grounded metal surface.
- Handle the device by its enclosure edges only. Avoid touching exposed connectors or circuit boards.
- Store and transport the device in anti-static packaging when not installed.

NOTICE — Prohibited Actions

Action	Risk
Disassembling the device	Warranty void; risk of electric shock
Operating with damaged cables	Short circuit; fire hazard
Exceeding rated voltage (24VDC)	Permanent component damage
Immersing in liquid or operating in wet conditions	Short circuit; corrosion
Using in safety-critical applications without redundancy	System failure may cause injury



Table of Contents

1 Product Overview	7
1.1 Product Overview	7
1.2 Product Features	7
1.3 Technical Specifications	7
1.4 Related Products	10
1.5 Revision History	10
2 Hardware Descriptions	11
2.1 Product Appearance	11
2.2 Indicators	11
2.3 Button	12
2.4 Interface	12
2.4.1 Power Interface	12
2.4.2 Ethernet Interface	13
3 Hardware Installation	14
3.1 Mechanical Dimension	14
3.2 Installation Method	14
4 Quick Start Guide	15
4.1 Connection	15
4.2 Configuration	15
5 Software Instructions	17
5.1 Main Interface	17
5.2 Tree View Operations	18
5.2.1 Edit the Items in the Left Tree View	18
5.3 The Operation of Configuration Interface	21
5.3.1 Interface of PROFINET Configuration	21
5.3.2 Modbus TCP Client Configuration	22
5.3.3 Modbus TCP Server Configuration	28
5.3.4 EtherNet/IP Scanner Configuration	30
5.3.5 EtherNet/IP Adapter Configuration	34
5.4 Tool	35
5.4.1 Locate	35
5.4.2 View Device Information	36
5.4.3 Upload Config and Download Config	36
5.4.4 Auto Mapping	39
5.4.5 Conflict Detect	39
5.4.6 Export Xls	41
5.4.7 Debug	41
5.5 Save and Open Configuration	43
5.5.1 Save Configuration Project	43
5.5.2 Open Configuration Project	43



GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

6 Working Principle	44
6.1 Modbus TCP Master	44
6.2 Modbus TCP Server	44
7 EtherNet/IP Connection Parameters	47
7.1 Implicit I/O Messaging Connection Method (Recommended)	49
7.2 Explicit MSG Connection Method	54
7.2.1 Read MSG Instruction Block	54
7.2.2 Write MSG Instruction	60
8 Working Principle of EtherNet/IP Scanner Mode Using MSG Method	65
9 Typical Application	67
9.1 Modbus TCP Server Devices Interconnect with PROFINET Master PLC	67
9.2 Modbus TCP Client Devices Interconnect with PROFINET Master PLC	68
9.3 EtherNet/IP Scanner Interconnects with PROFINET Master PLC	69
9.4 EtherNet/IP Adapters Interconnect with PROFINET Master PLC	70
11 Troubleshooting	71
11.1 Power Issues Network Connection Issues	71
11.2 Configuration Issues	71
11.3 Data Communication Issues	72
12 Frequently Asked Questions	73
Appendix A: Register Mapping Quick Reference	77
A.1 Modbus TCP Function Codes & Mapping	77
A.2 Byte Swap Modes	77
A.3 PROFINET I/O Data Mapping	78
A.4 EtherNet/IP Object Mapping (MSG Method)	78
MSG Request (Output Data from PROFINET Master)	78
MSG Response (Input Data to PROFINET Master)	78
A.5 Bit Offset Reference (Coils & Discrete Inputs)	79
A.6 Default Network Settings	79



1 Product Overview

1.1 Product Overview

The GT200-PN-MT is a gateway that enables interconnection between different industrial Ethernet network devices. It supports Modbus TCP master (client) or slave (server), EtherNet/IP scanner or adapter, and PROFINET slave, facilitating data exchange between Modbus TCP networks and PROFINET networks, as well as between EtherNet/IP networks and PROFINET networks. It supports the interconnection of PLCs from Schneider, AB, OMRON, and Siemens, and also allows Modbus TCP slave devices to be connected to PROFINET networks.

1.2 Product Features

- Ring Network Redundancy: Supports PROFINET MRP media redundancy and SR system redundancy, enhancing network reliability and gateway stability.
- High-Capacity Data Processing: The PROFINET interface provides strong data processing capability, supporting up to 1440 bytes of input and output to meet large data transmission requirements.
- Dual network segment communication capability: Provides dual Ethernet ports for each network, specially designed to meet the data transmission needs between different network segments.
- Efficient communication mode: Provides two output command modes, serial output and parallel output, to meet diverse communication needs and improve the overall communication efficiency of the system.
- Real-time network monitoring: Built-in network status monitoring function, real-time monitoring of the connection status of PROFINET, Modbus TCP, and EtherNet/IP devices, ensuring device online status and data transmission continuity.

1.3 Technical Specifications

[1] The gateway has 4 Ethernet interfaces (PROFINET P1/P2 and Modbus TCP / EtherNet/IP P3/P4):

- ◆ PROFINET Ethernet interfaces supports cascading, Modbus TCP / EtherNet/IP network port supports cascading.
- ◆ Cascading between PROFINET network port and Modbus TCP / EtherNet/IP network port is not supported.

[2] PROFINET side acts as a slave device.

- ◆ Support RT and IRT protocols of standard PROFINET.
- ◆ Supports MRP (Media Redundancy Protocol) and SR (System Redundancy).



◆ PROFINET supports up to 32 slots, the maximum number of input bytes is 1440 and the maximum number of output bytes is 1440. (The length available to the user is limited by the specific PLC and PDU size of the communication module. When configuring the slot, each slot will take up 1 or 2 bytes of status bit information, so it can actually store up to 1428 bytes of valid data, 512+512+256+128+16+4) Slots can be configured in the PLC.

◆ The supported PROFINET module types are as follows:

- **Input 001 byte**
- **Input 002 bytes**
- **Input 004 bytes**
- **Input 008 bytes**
- **Input 016 bytes**
- **Input 032 bytes**
- **Input 064 bytes**
- **Input 128 bytes**
- **Input 256 bytes**
- **Input 512 bytes**
- **Output 001 byte**
- **Output 002 bytes**
- **Output 004 bytes**
- **Output 008 bytes**
- **Output 016 bytes**
- **Output 032 bytes**
- **Output 064 bytes**
- **Output 128 bytes**
- **Output 256 bytes**
- **Output 512 bytes**
- **Input / Output 001 byte**
- **Input / Output 002 bytes**
- **Input / Output 004 bytes**
- **Input / Output 008 bytes**

- **Input / Output 016 bytes**
- **Input / Output 032 bytes**
- **Input / Output 064 bytes**
- **Input / Output 128 bytes**
- **Input/Output 256 bytes**
- **Input/Output 512 bytes**

[3] Modbus TCP side:

- ◆ Supports byte swap function: no swap, two byte swap, four byte swap.
- ◆ Supports server port setting, the default is 502.

[4] Modbus TCP acts as client:

- ◆ Supports access to up to 72 Modbus TCP servers/slaves.
- ◆ Supports function codes: 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, 17H.
- ◆ Supports up to 300 commands.
- ◆ Supports 2 command output modes: serial output and parallel output.

[5] Modbus TCP act as server:

- ◆ Supports connecting up to 72 modbus TCP clients/masters.
- ◆ Supports function code: 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H, 17H.
- ◆ Supports the exchange of function codes 1 and 2 and function codes 3 and 4.

[6] EtherNet/IP side:

- ◆ Supports the ODVA standard EtherNet/IP communication protocol.
- ◆ EtherNet/IP I/O data read and write operations support two methods:
 - ① Directly establish I/O connection to read/write I/O data.
 - ② Use MSG instruction to read/write I/O data.
- ◆ Supports Non-DLR function.
- ◆ Supports byte swap functionality: no swap, two byte swap, four byte swap, and two words swap.

(1) EtherNet/IP acts as an scanner:

- ◆ Input bytes: up to 1428 bytes.
- ◆ Output bytes: up to 1428 bytes.
- ◆ For each adapter device, the maximum input and output bytes are:



GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

Up to 505 bytes each in Standard Mode.

Up to 1428 bytes each in Large Data Mode.

- ◆ Supports up to 64 adapter devices.
- ◆ Supports I/O (Class 1) and MSG (Class 3) communication modes.
- ◆ Supports monitoring the online status of adapter devices.

(2) EtherNet/IP acts as an adapter:

- ◆ Input bytes: Instance102 maximum 492 bytes, Instance202 maximum 1428 bytes.
- ◆ Output bytes: Instance101 maximum 492 bytes, Instance201 maximum 1428 bytes.
- ◆ Supports QoS function.

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

[8] Operating temperature: -40°F to 158°F (-40°C to 70°C). Humidity: 5% - 95% (non-condensing).

[9] Dimensions (W*H*D): 1.3 in*4.6 in*4.1 in (34mm*116mm*105mm).

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

[11] Protection level: IP20.

1.4 Related Products

The related products include: GT200-PN-RS, GT200-DP-MT etc.

To get more information about related products, please visit SSTCOMM website: www.sstautomation.com

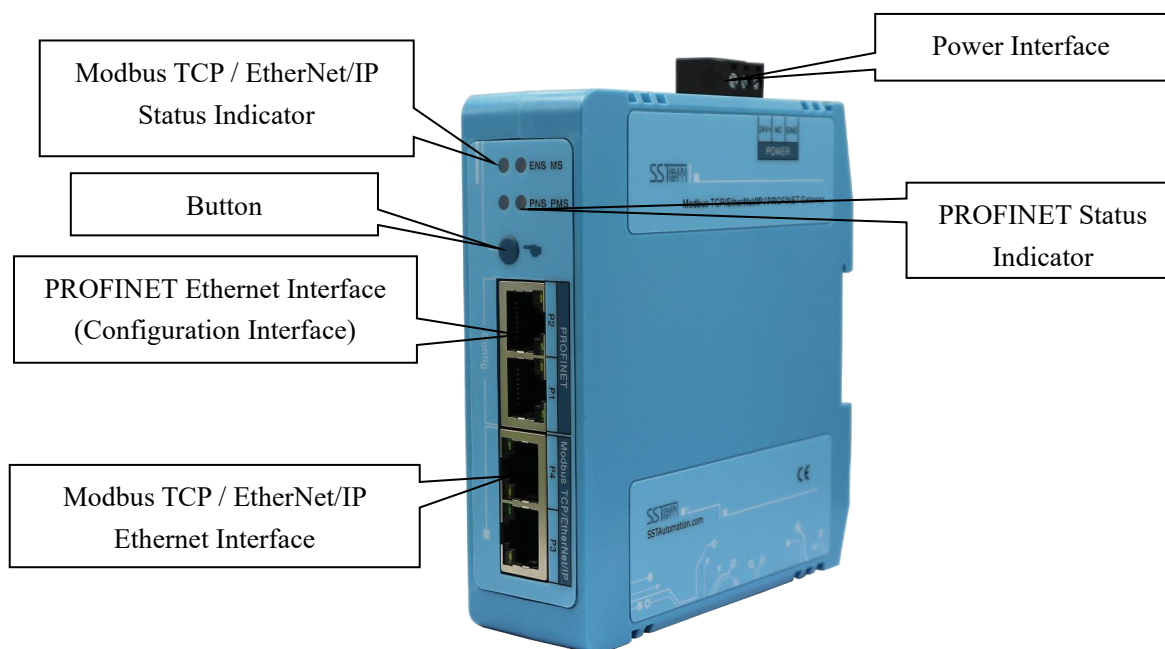
1.5 Revision History

Revision	Date	Chapter	Description
V4.2 Rev C	6/24/2026	PART	Fix known errors
V4.2 Rev B	5/13/2026	ALL	Optimize document descriptions and add new chapters
V4.2 Rev A	3/13/2026	ALL	Optimize document descriptions
V4.2	10/10/2025	PART	Support System Redundancy
V4.1	6/23/2025	PART	Add EtherNet/IP scanner functionality
V3.1	3/20/2025	PART	Add EtherNet/IP adapter functionality
V2.0	10/24/2024	PART	Increase the Modbus TCP connection performance, support PROFINET MRP ring redundancy function.
V1.2	7/25/2024	ALL	New Release



2 Hardware Descriptions

2.1 Product Appearance



Notes: This picture is for reference only. The actual product may differ in appearance.

2.2 Indicators

Indicators	Status	Descriptions
MS	Green on	Startup completed
	Blinking(Red) (lasts 3 seconds)	Locate Function
PMS	Green on	PROFINET connection is established.
	Blinking(Red) (lasts 3 seconds)	Start-up state, waiting to initialize
PNS	Green on	Establish a connection with the PLC and communicate normally.
	Red on	No Ethernet cable connected
	Blinking(Red) (1Hz)	Initialize completed, not established a connection with the PLC
	Blinking(Red)	The physical connection does not match the

	(2Hz)	configuration in IRT mode
ENS Modbus TCP Client Mode (Modbus TCP network status indicator)	Green on	All Modbus TCP node connections have been established
	Green blinking quickly (on 500ms, off 500ms)	Modbus TCP connection is not established
	Green blinking slowly (1700ms on, 300ms off)	Some Modbus TCP nodes have been connected (Not all nodes have been connected)
	Blinking(Red) (lasts 3 seconds)	Node disconnection
	Blinking(Red)	All nodes are disconnected (failed to establish connection)
ENS Modbus TCP Server Mode (Modbus TCP network status indicator)	Green on	Modbus TCP connection established
	Blinking(Green)	Modbus TCP connection not established or disconnected
	Blinking(Red) (lasts 3 seconds)	Node disconnection
ENS EtherNet/IP scanner mode (EtherNet/IP network status indicator)	Green on	All EtherNet/IP node connections have been established
	Green blinking quickly (on 500ms, off 500ms)	EtherNet/IP connection not established
	Green blinking slowly (1700ms on, 300ms off)	The EtherNet/IP partial node connections have been established
	Blinking(Red)	DHCP state
ENS EtherNet/IP adapter mode (EtherNet/IP network status indicator)	Green on	EtherNet/IP connection established
	Blinking(Green)	EtherNet/IP connection not established
	Blinking(Red)	DHCP state

2.3 Button

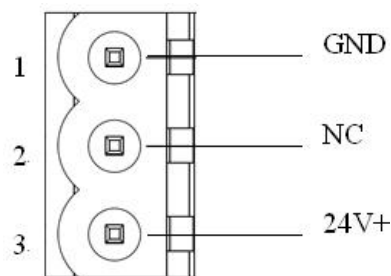
Restore Factory Settings: Press and hold the button for 5 seconds within 10 seconds after the device is powered on (the PMS indicator is always on). The PMS indicator will blink green (2Hz). Press the button again within 5 seconds, the PMS indicator will turn off, the device will be restored to factory settings and automatically restart. If the button is not pressed within 5 seconds, the PMS indicator will return to normal display, and the device will resume normal operation.

2.4 Interface

2.4.1 Power Interface

The GT200-PN-MT has one power interface, recommended for a 24V DC power supply.

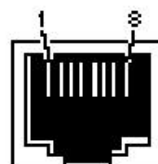
Pin	Function
1	GND
2	NC, not connected
3	24V+ , DC 24V



2.4.2 Ethernet Interface

The Ethernet interface uses RJ45 interface, follows the IEEE802.3u 100BASE-T standard. Its pinout (standard Ethernet signal) is defined as below:

Pin	Signal Description
1	TXD+, Transmit Data+
2	TXD-, Transmit Data-
3	RXD+, Receive Data+
4	Bi-directional Data+
5	Bi-directional Data-
6	RXD-, Receive Data-
7	Bi-directional Data+
8	Bi-directional Data-



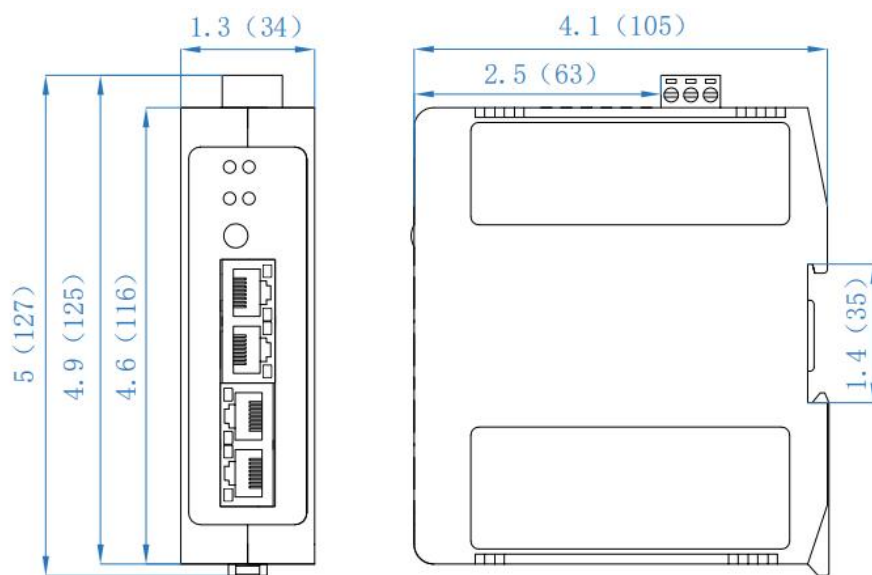
RJ-45 port

3 Hardware Installation

3.1 Mechanical Dimension

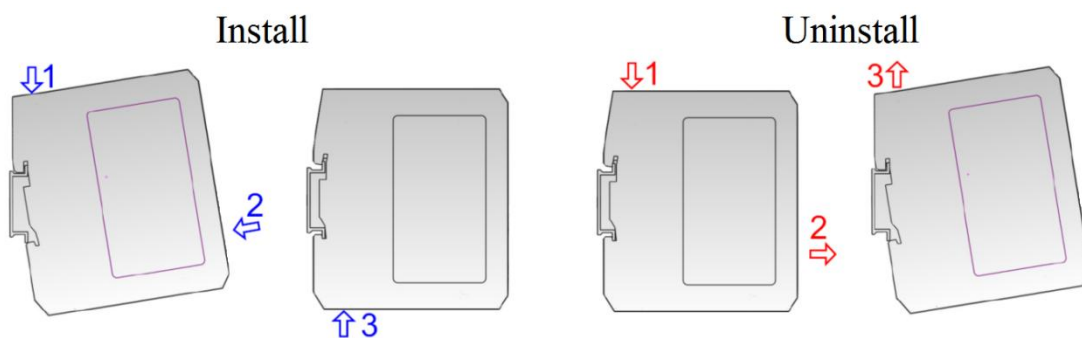
Size (width * height * depth):

1.3 in * 4.6 in * 4.1 in (34mm * 116mm * 105mm)



3.2 Installation Method

Using 1.4 in (35mm) DIN RAIL.



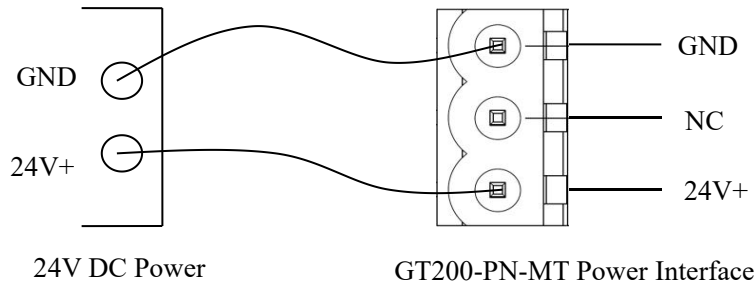


4 Quick Start Guide

4.1 Connection

1. Connect the power supply as follows.

Note: Please do not power on the devices before finishing all the connections.



2. Connecting Network Ports:

(1) PROFINET Port: Used for PROFINET communication and for searching/configuring the gateway. This product has two PROFINET ports (internally cascaded). One port can be connected to the PROFINET master device, and the other can be connected to a PC (with the configuration software SST-EPN-CFG installed) for gateway configuration and search. The default factory IP address is 192.168.0.33.

(2) Modbus TCP/EtherNet/IP Port: Used solely for Modbus TCP / EtherNet/IP communication and cannot be used for searching/configuring the gateway. This product has two Modbus TCP ports (internally cascaded), either of which can be connected to a Modbus TCP master/slave device or an EtherNet/IP master/slave device.

Note:

- The default factory setting for the Modbus TCP / EtherNet/IP port is DHCP. In DHCP mode, after 30 seconds without receiving an IP address, the gateway will automatically assign the fixed IP address 192.168.0.11. This IP address is used only for communication and cannot be used for upload/download operations.
- The PROFINET port IP address and the Modbus TCP / EtherNet/IP port IP address can either be in the same subnet or in different subnets.

3. Power on the GT200-PN-MT gateway.

4.2 Configuration

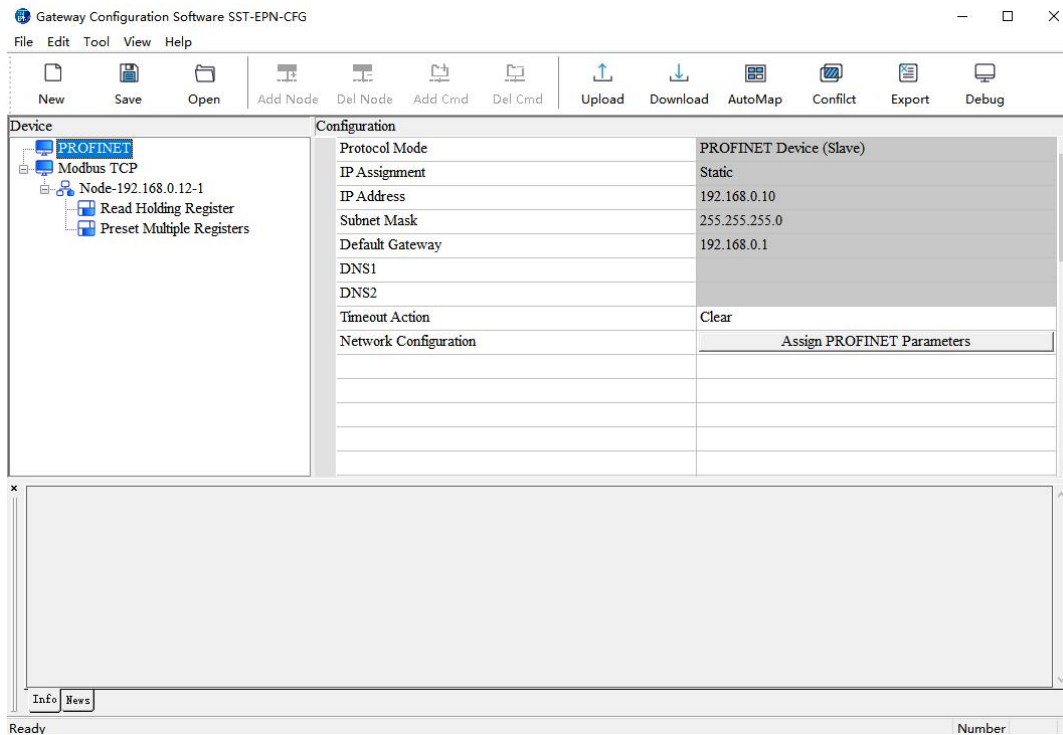
1. Download the configuration software SST-EPN-CFG from <https://www.sstautomation.com/Download1/> and install it. Open the software and enter the configuration interface.

2. Configure the PROFINET Interface parameters.

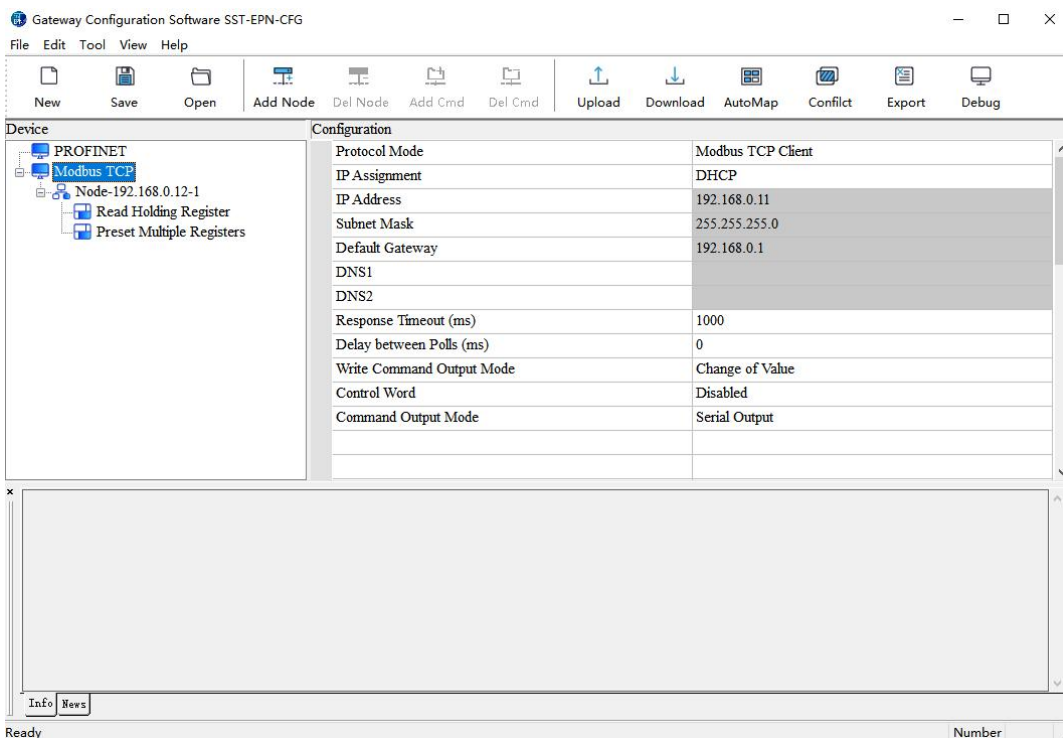
GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual



3. Configure the Modbus TCP Interface parameters.



4. Check the mapping buffer. Use the "Auto Mapping" functions.

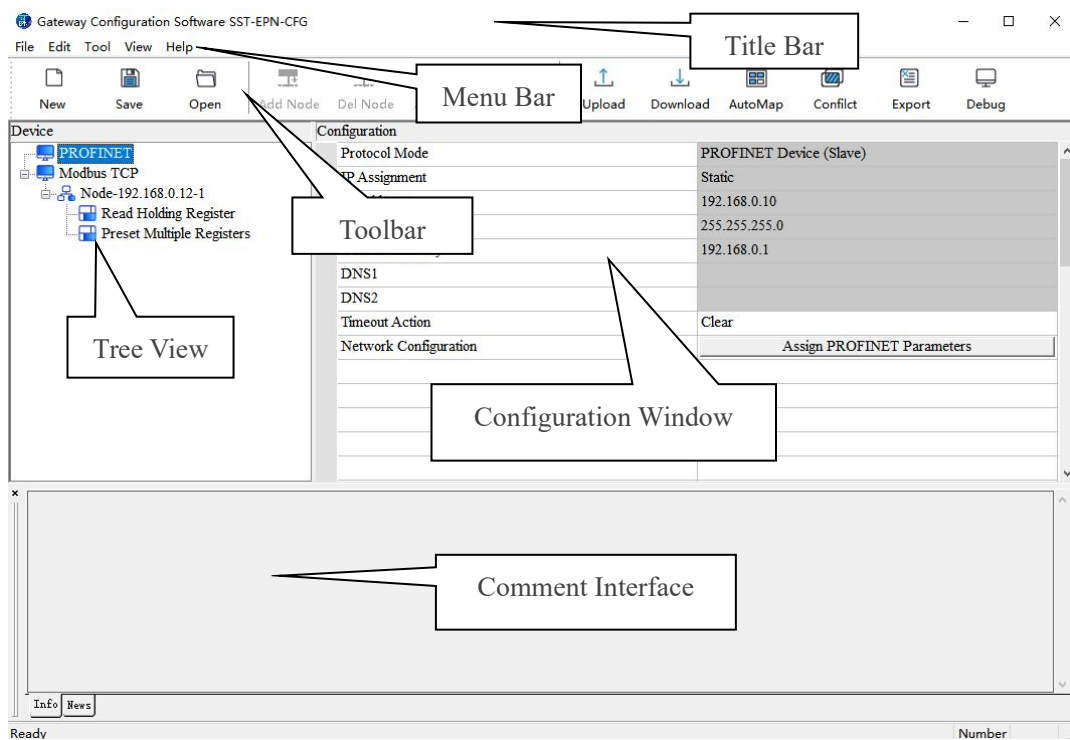
5. Save the configuration and download to the gateway.

5 Software Instructions

5.1 Main Interface

SST-EPN-CFG is a Windows-based configuration software. It is used to configure the GT200-PN-MT gateway and set parameters for the connected networks.

Double-click the icon to open the software's main interface:



Remark: All the gray part in the software cannot be changed.

Toolbar

Toolbar is shown as below:



The toolbar provides icon shortcuts to major functions.



New: Create a new configuration project.



Save: Save current configuration.



Open: Open a configuration project.



Add Node

Add Node: Add a Modbus TCP server node.



Del Node

Del Node: Delete a Modbus TCP server node.



Add Cmd

Add Command: Add a Modbus command.



Del Cmd

Delete Command: Delete a Modbus command.



Upload

Upload Config: Read the configuration information from the module and shown in the software.



Download

Download Config: Download the configuration file to the gateway.



AutoMap

Auto Mapping: Used to automatically calculate the mapped memory address without conflicts by each command.



Conflict

Conflict Detect: To check whether there are some conflicts with configured commands in the gateway memory data buffer.



Export

Export Xls: Export current configuration to the local hard disk, saved as .xls file.



Debug

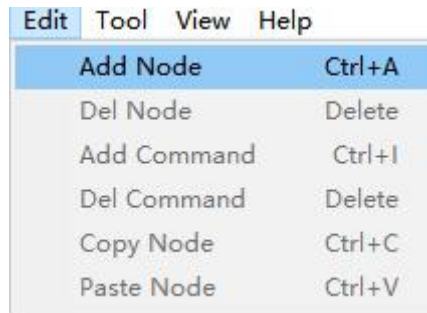
Debug: Monitor the gateway memory buffer data.

5.2 Tree View Operations

5.2.1 Edit the Items in the Left Tree View

Users can edit the items in the left tree view three different ways:

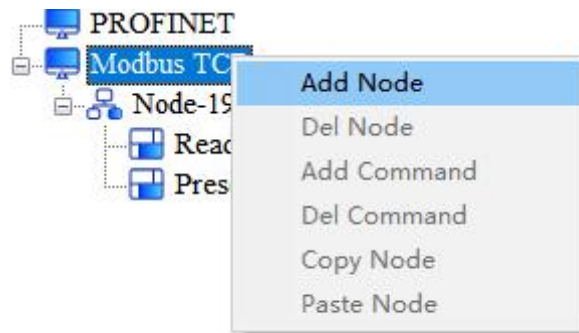
1. Using the Edit menu.



2. Edit with the icon in the toolbar. Please see "[Toolbar](#)" chapter for details.



3. Right-click on the item.



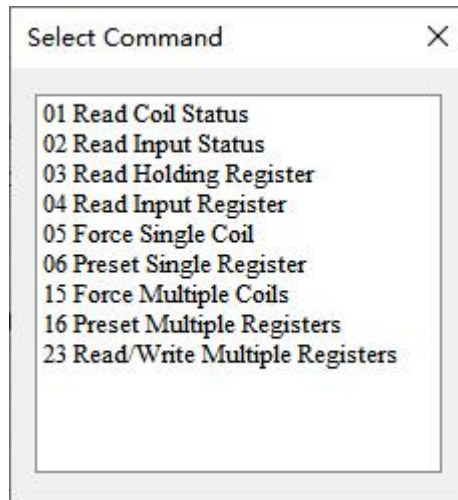
1) Add nodes: Right-click on serial or existing nodes, and then perform the operation of adding a new node.

Then there is a new node named "Node-x" under serial .

2) Delete nodes: Right-click on the node to be deleted, and then perform the operation of deleting the node.

The node and its all commands will be deleted.

3) Add commands: Right-click on the node, and then perform the operation of adding command to add a command for the node. The dialog box will be shown as follow:



Select the command: Double click the command

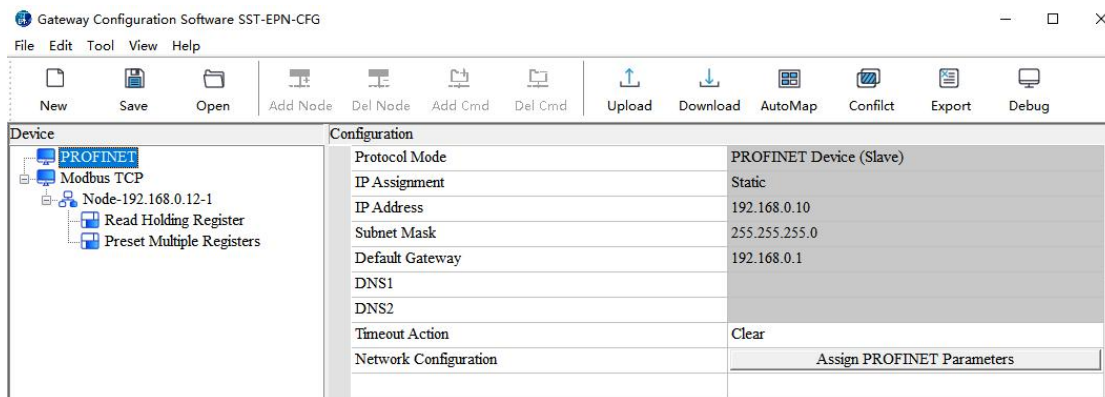
4) Delete commands: Right-click on the command and then perform the operation of deleting the command.

5) Copy node: Click on the existing node, choose the node and execute the operation of copying nodes (include all commands under the node)

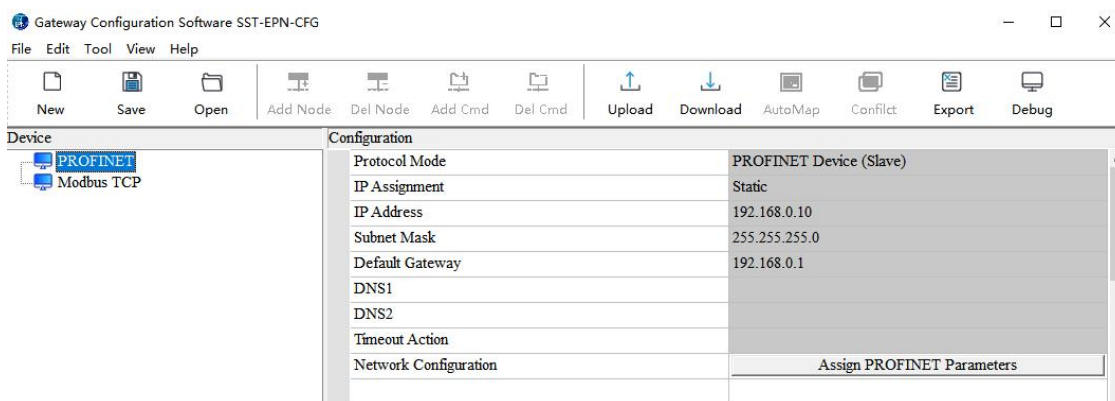
6) Paste node: Click and choose any existing node, execute operation of pasting node. Then under the serial tree you can see a new node (include all commands under the node). The new node's parameters are set to default and need to be configured.

5.3 The Operation of Configuration Interface

5.3.1 Interface of PROFINET Configuration



Modbus TCP Client Mode-PROFINET Configuration Interface



Modbus TCP Server Mode-PROFINET Configuration Interface

Protocol Mode: The gateway functions as a PROFINET Device (Slave).

IP Assignment: Static IP addressing (manual configuration) is the only mode supported.

Note: To modify the PROFINET network parameters, please click the [Assign PROFINET Parameters] button.

IP Address: Shows the configured IP address of the gateway's PROFINET interface.

Note: To modify the PROFINET interface IP address, please click the [Assign PROFINET Parameters] button.

Subnet Mask: Shows the configured subnet mask of the gateway's PROFINET interface.

Note: To modify the PROFINET interface subnet mask, please click the [Assign PROFINET Parameters] button.

Default Gateway: Shows the configured network default gateway IP address for the PROFINET interface.

Note: To modify PROFINET network default gateway IP address, please click the [Assign PROFINET Parameters] button.

Timeout Action: The action the gateway will take when it fails to receive a correct response message from any

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Modbus node after sending read commands.

Clear: Set the PROFINET input data to zero.

Hold: Keep the PROFINET input data unchanged.

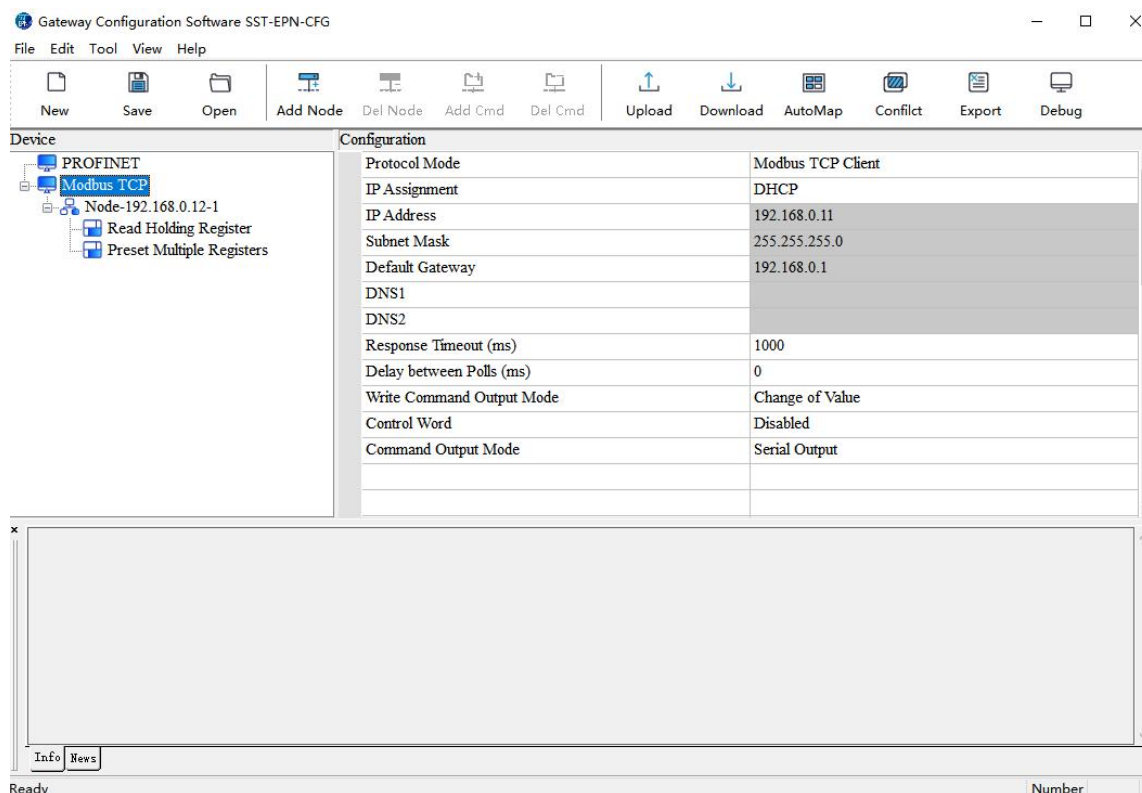
Default Value: Clear

Note: This setting is only available in Modbus TCP Client mode.

Network Configuration: Assign the gateway's IP address and device name.

5.3.2 Modbus TCP Client Configuration

Configurable items include: Protocol Mode, IP Assignment, Response Timeout (ms), Delay between Polls (ms), Write Command Output Mode, Control Word and Command Output Mode.



Protocol Mode: Sets the Modbus TCP operation mode of the gateway.

Modbus TCP Client: The gateway functions as a Modbus TCP Client (Master) to connect to Modbus TCP Server (Slave) devices.

Modbus TCP Server: The gateway functions as a Modbus TCP Server (Slave) to connect to Modbus TCP Client (Master) controllers.

IP Assignment: Sets how the IP address of the gateway's Modbus TCP interface is configured.

Static: Manually assign a static IP address.

DHCP: Automatically receive an IP address from a DHCP server on the network.

IP Address: Sets the IP address of the gateway's Modbus TCP interface.

Note: This setting is only available in Static IP Configuration mode.

Subnet Mask: Sets the subnet mask of the gateway's Modbus TCP interface.

Note: This setting is only available in Static IP Configuration mode.

Default Gateway: Sets the network default gateway IP address for the Modbus TCP interface.

Note: This setting is only available in Static IP Configuration mode.

Response Timeout (ms): The amount of time, measured in milliseconds (ms), that the gateway should wait to receive a response from a Modbus TCP Server for a command before issuing a response timeout error.

Range: 300-60000ms. Default Value: 1000ms.

Delay between Polls (ms): The amount of time, measured in milliseconds (ms), the gateway should wait after receiving a response from a Modbus TCP Server before sending the next request.

Range: 0-2500ms. Default Value: 0ms.

Write Command Output Mode	Control Word Configuration	Read Command Behavior	Write Command Behavior	Control Word / Status Word Function
Change of Value	All Commands	Controlled by Control Word	Sent once on data change (when enabled)	Acts as a toggle switch: • 1: Communication allowed • 0: Communication disabled
Change of Value	Only Write Command	Communicates normally	Sent once on data change (when enabled)	Acts as a toggle switch (1= Allowed, 0=Disabled) only for write commands.
Cyclic	All Commands	Controlled by Control Word	Sent cyclically (when enabled)	Acts as a toggle switch: • 1: Communication allowed • 0: Communication disabled
Cyclic	Only Write Command	Communicates normally	Sent cyclically (when enabled)	Acts as a toggle switch (1= Allowed, 0=Disabled) only for write commands.
Disabled (Forbidden)	All Commands	Communicates normally	Always Disabled	Control Word is ignored.

Write Command Output Mode	Control Word Configuration	Read Command Behavior	Write Command Behavior	Control Word / Status Word Function
Disabled (Forbidden)	Only Write Command	Communicates normally	Always Disabled	Control Word is ignored (has no effect).
Control Word	All Commands	Triggered by rising edge (0 to 1)	Triggered by rising edge (0 to 1)	Requires a 0-to-1 transition to execute each subsequent command.
Control Word	Only Write Command	Communicates normally	Triggered by rising edge (0 to 1)	Requires a 0-to-1 transition to execute each subsequent write command.
Control Word	Disable	Communicates normally	Sent once upon power-on (if output data is not equal 0)	No further write commands are output until the gateway is power-cycled or restarted.

Command Output Mode: Sets how commands are sent from the gateway to Modbus TCP Server devices.

Serial Output: All commands for a single Modbus TCP Server device are sent one by one. The next command is sent only after a response is received or a timeout occurs.

Parallel Output: All commands for a single Modbus TCP Server device are sent simultaneously.

1. Node

The Configuration view supports three types of operation: Edit Menu, Edit Toolbar and Right-click edit Menu.

[1] **Add node:** Click on Modbus TCP or existing nodes, and then perform the operation of adding a new node.

Then there is a new node named "New node" under Modbus TCP.

[2] **Delete node:** Click the node you wish to delete and select 'Del Node'. The node and all commands will be deleted.

[3] **Copy node:** Click the existing node, choose the node and execute the operation of copying nodes (include all commands under the node)

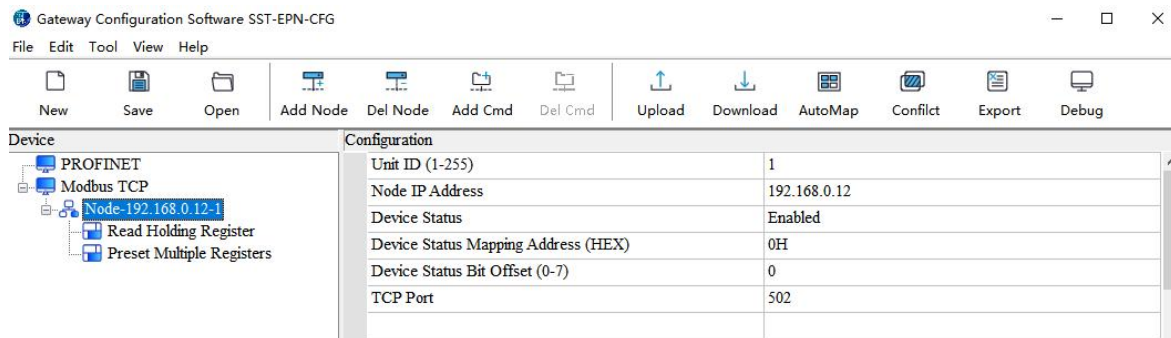
[4] **Paste node:** Click and choose any existing node, and select 'Paste Node'. A new node will appear at the bottom of the Subnet list (include all commands under the node). The parameters of the new node are at their default settings and must be configured.

The node interface is displayed as follows:

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual



Unit ID (1-255): The Unit ID address (Slave ID) of the target Modbus TCP Server node. Range: 1-255.

Node IP Address: The IP address of the target Modbus TCP Server node.

Device Status: When this setting is enabled, 1 bit of data will be reserved in the PROFINET input data buffer to monitor the connection status of this Modbus TCP Server node on the network.

The location of this Device Status bit on the PROFINET input data buffer can be configured using the "Mapping Address(HEX)" and "Bit Offset (0-7)" settings in this window.

The Device Status setting supports the following options: "Disabled" and "Enabled".

Default Value: Enabled.

Device Status Mapping Address (HEX): Sets the byte address location of the Device Status parameter in the gateway's input memory buffer, which corresponds to the PROFINET input data buffer.

Range: 0x0000-0x0593.

The [AutoMap] button can be used to let the software automatically calculate and fill in this field.

Device Status Bit Offset (0-7): Sets the bit location of the Device Status parameter within the byte address specified in the "Device Status Mapping Address(HEX)" field. Range: 0-7.

TCP Port: The TCP port number used by the target Modbus TCP Server node.

Range: 1-65535. Default Value: 502.

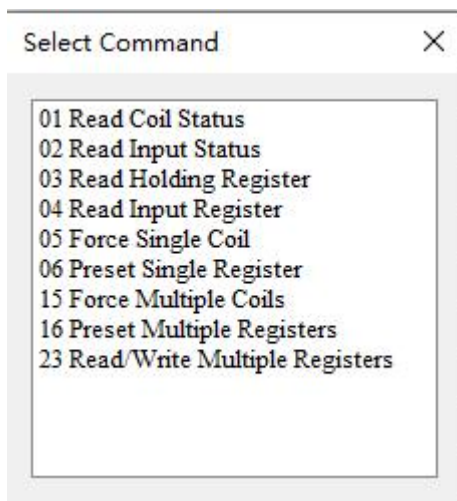
2. Command

The Configuration view supports three types of operation: Edit Menu, Edit Toolbar and Right-click edit Menu.

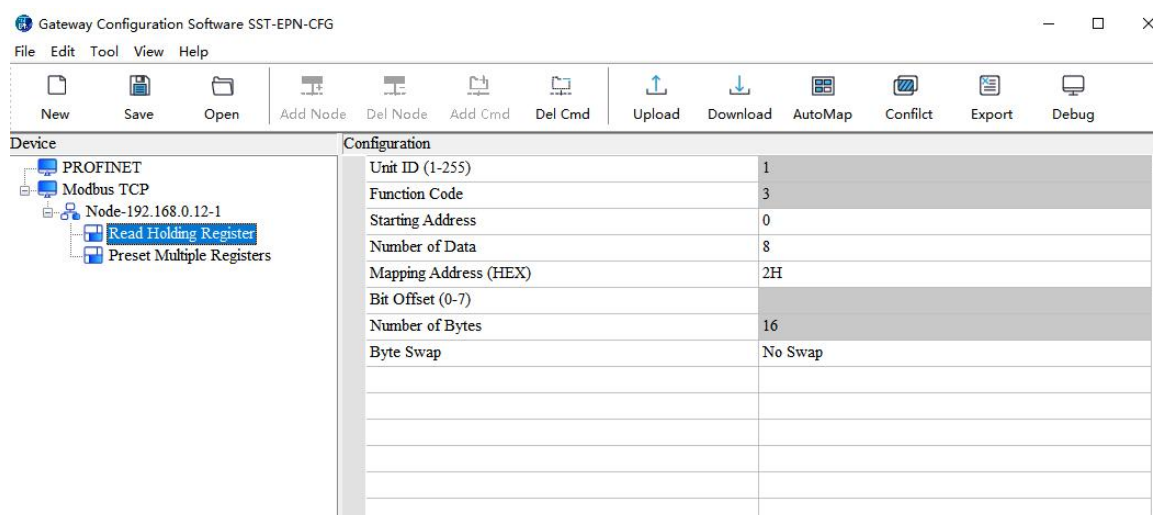
[1] **Add command:** Click on the node, and then perform the operation of adding command to add a command for the node.

[2] **Delete command:** Click on the command to be deleted, perform the operation of deleting the command.

It supports the commands: 01, 02, 03, 04, 05, 06, 15 and 16. Double click the command to select the command.



The command interface is displayed as follows:



Starting Address: Displayed in decimal.

The starting address of the Modbus slave device to start reading/writing commands. Range: 0-65535.

Note:

There are two address formats of Modbus command: protocol address (base 0) and PLC address (base 1). The protocol address (base 0) format needs to be filled in here.

For example:

Function: 03, PLC address: 40006, enter 5 (protocol address format) in here.

Following table shows the PLC address and corresponding protocol address examples:

Command	PLC address examples	Corresponding protocol address
Coil state	00001-00010	00000-00009
Input state	10001-10010	00000-00009
Holding register	40001-40010	00000-00009
Input register	30001-30010	00000-00009

Number of Data: The number of registers, **discrete inputs**, or coils in the Modbus server.

Function code (3, 4, 16, 23). Range: 1-127.

Function code (1, 2, 15). Range: 1-400.

Mapping Address (HEX): The mapping address range of data in module memory:

Read command: 0x0000-0x0593.

Write command: 0x4000-0x4593.

Write commands as a local data exchange can also use the region: 0x0000-0x0593.

Bit Offset (0 - 7): Modbus function codes 01, 02, 05, 15 can set the position of the bit address in bytes through this parameter. Range: 0-7.

Byte Swap: There are three types: No Swap, Two Bytes Swap, Four Bytes Swap.

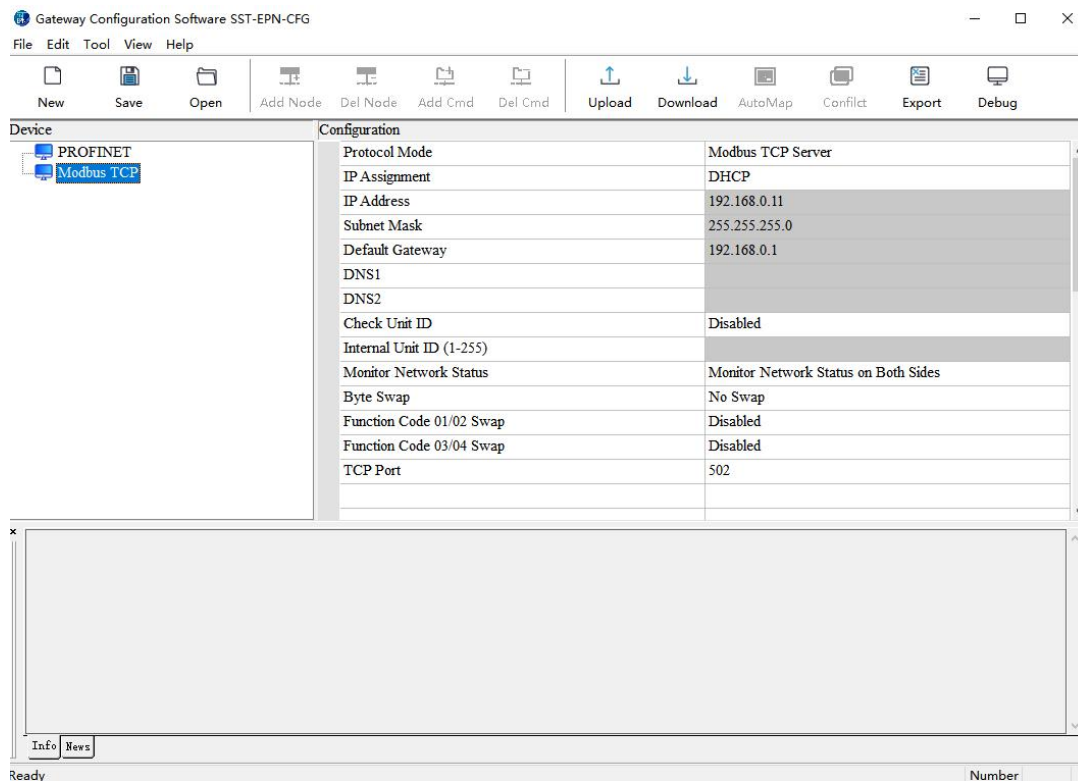
No Swap: No byte order exchange.

Two Bytes Swap: The high and low bytes of the 2 bytes are exchanged. For example: 0x1234, convert to 0x3412.

Four Bytes Swap: The high and low bytes of the 4 bytes are exchanged, and the next high and second low bytes are exchanged. For example: 0x12345678, convert to 0x78563412.

Two-word swap: The first 2 bytes and the last 2 bytes of 4 bytes are swapped. For example, 0x12345678 is converted to 0x56781234.

5.3.3 Modbus TCP Server Configuration



The configurable parameters are as follows:

Protocol Mode: Sets the Modbus TCP operation mode of the gateway.

Modbus TCP Client: The gateway functions as a Modbus TCP Client (Master) to connect to Modbus TCP Server (Slave) devices.

Modbus TCP Server: The gateway functions as a Modbus TCP Server (Slave) to connect to Modbus TCP Client (Master) controllers.

IP Assignment: Sets how the IP address of the gateway's Modbus TCP interface is configured.

Static: Manually assign a static IP address.

DHCP: Automatically receive an IP address from a DHCP server on the network.

IP Address: Sets the IP address of the gateway's Modbus TCP interface.

Note: This setting is only available in Static IP Configuration mode.

Subnet Mask: Sets the subnet mask of the gateway's Modbus TCP interface.

Note: This setting is only available in Static IP Configuration mode.

Default Gateway: Sets the network default gateway IP address for the Modbus TCP interface.

Note: This setting is only available in Static IP Configuration mode.



Check Unit ID: Sets whether the gateway responds to all Modbus commands or only to those that match its internal Unit ID (Slave ID).

Enabled: As a Modbus TCP Server device, the gateway will only respond to Modbus commands that match its internal Unit ID (Slave ID).

Disabled: As a Modbus TCP Server device, the gateway will respond to any Modbus command from the Modbus TCP Client.

Internal Unit ID (1-255): Sets the gateway's Unit ID address (Slave ID) when the gateway functions as a Modbus TCP Server (Slave) device.

Note: This setting is only available when Check Unit ID is Enabled. Range: 1-255.

Monitor Network Status: When this setting is enabled, the gateway will monitor the connection status of the PROFINET/Modbus TCP networks.

Monitor Modbus TCP Network Status on PROFINET Side: The first two bytes of the PROFINET input data buffer are reserved to function as the Modbus TCP Status bytes. The data indicates the number of connections that the gateway has established with the Modbus TCP Client.

Monitor PROFINET Network Status on Modbus TCP Side: The first two bytes of the Modbus TCP input side will be reserved to function as the PROFINET Status bytes. The data content indicates the PROFINET communication fault status, where 1 indicates fault, and 0 indicates normal.

Byte Swap: When this setting is enabled, the gateway will rearrange the order of the data bytes that are sent or received. There are three options supported: No Swap, Two Byte Swap, and Four Byte Swap.

No Swap: No byte order change is made.

Two Byte Swap: Swaps the high and low bytes in a 2 byte group. For example: 0x1234 converts to 0x3412.

Four Byte Swap: Swaps the high and low bytes, and the middle high and middle low bytes in a 4 byte group. For example: 0x12345678 converts to 0x78563412.

Two-word swap: The first 2 bytes and the last 2 bytes of 4 bytes are swapped. For example, 0x12345678 is converted to 0x56781234.

Function Code 01/02 Swap: Sets which Modbus read commands from the Modbus TCP Client are used to read boolean data to/from PROFINET.

Disabled: Function Code 01 is used to read back data sent to PROFINET, and Function Code 02 is used to read data from PROFINET.

Enabled: Function Code 01 is used to read data from PROFINET, and Function Code 02 is used to read back data sent to PROFINET.

Note: This setting does not affect Modbus write commands. Function Codes 05/15 are always used to send boolean data to PROFINET.

Function Code 03/04 Swap: Sets which Modbus read commands from the Modbus TCP Client are used to read register data to/from PROFINET.

Disabled: Function Code 03 is used to read back data sent to PROFINET, and Function Code 04 is used to read data from PROFINET.

Enabled: Function Code 03 is used to read data from PROFINET, and Function Code 04 is used to read back data sent to PROFINET.

Note: This setting does not affect Modbus write commands. Function Codes 06/16 are always used to send register data to PROFINET.

TCP Port: Sets the TCP port number for the gateway to use as a Modbus TCP Server device.

Range: 1-65535. Default Value: 502.

5.3.4 EtherNet/IP Scanner Configuration

The steps to set up the EtherNet/IP Scanner mode are as follows:

1. Protocol Mode : Select 'EtherNet/IP Scanner', and the basic parameters to be set are as follows:

Device	Configuration	
PROFINET Subnet Click to add a node	Protocol Mode	EtherNet/IP Scanner
	IP Assignment	DHCP
	IP Address	192.168.0.11
	Subnet Mask	255.255.255.0
	Default Gateway	192.168.0.1
	DNS1	
	DNS2	
	VendCode	1376
	Non-DLR	Disabled

For detailed description of the functions of related parameters, please refer to the 'Info' on the software interface.

IP Assignment: Supports DHCP and Static.

VendCode: VendCode can be modified as required. Range: 1-65535. Default Value: 1376.

Non-DLR: Supports Disabled and Enabled, with the default setting as Disabled. If used on a DLR ring network, please enable this feature; otherwise, turn off this feature. If used on non redundant branches of the DLR system,



please disable this feature.

2. Add/Delete nodes:

Device	Configuration
PROFINET	Node IP Address: 192.168.0.12
Subnet	Device Status: Enabled
Node(1)-192.168.0.12	Device Status Mapping Address: 0
	Device Status Bit Offset (0-7): 0
	Byte Swap: No Swap
	I/O Mode(Class1): Enabled
	Input Data Transfer Type(T->O): Point-to-Point
	Hide Input Data Frame Header(T->O): Disabled
	Input Data Length (T->O): 5
	Output Data Length(O->T): 1
	Input Data RPI (ms, T->O): 10
	Output Data RPI (ms, O->T): 10
	Input Instance (T->O): 102
	Output Instance (O->T): 101
	Config Instance: 0
	Input Data Mapping Address (T->O): 0
	Output Data Mapping Address(O->T): 0
	Input Data Clear/Hold: Clear
	Data Mode: Standard
	Timeout Multiplier: x16
	MSG Mode(Class3): Disabled
	Response Mapping Address (T->O):
	Response Mapping Length (T->O):
	Request Mapping Address (O->T):
	Request Mapping Length (O->T):

✧ For detailed description of the functions of related parameters, please refer to the 'Info' on the software interface.

Node IP Address: The IP address of the target EtherNet/IP Adapter.

Device Status: Indicates the online and offline status of EtherNet/IP Adapter devices. Default is Enabled. When enabled, the online status of EtherNet/IP Adapter devices can be monitored on the PROFINET side. This status occupies a memory-mapped address in the gateway, which can be configured via 'Mapping Address and Bit Offset'. Each slave occupies 1 bit, where a status value of 1 indicates the slave is online, and a status value of 0 indicates the slave is offline.

I/O Mode(Class 1): Default is Enabled. When enabled, the master connects to the server via Class 1 implicit messaging for cyclic I/O using predefined Assembly IDs.

Input Data Transfer Type(T->O): Defines the communication mode for input data from the target device (T->O). Supported options: Point-to-Point and Multicast (default: Point-to-Point).

Hide Input Data Frame Header(T->O): Default is Disabled.

When enabled, the input data frame header is not treated as input data and is not mapped to the input data area.

When disabled, the full packet (header + data) is mapped. The input data frame header occupies 4 bytes. Bit 0 being 1 indicates RUN, and bit 0 being 0 indicates IDLE.



Input/Output/Config Instance: Identifies the object instance for the device. Must be unique across all instances under the same Class. Range: 0-255.

Input Data Clear/Hold: When an EtherNet/IP device goes offline or fails, the corresponding input data area in the EtherNet/IP section can be configured to either 'Clear' or 'Hold'.

Clear: The input data of the corresponding node is set to 0.

Hold: The last received data is retained.

Data Mode: Two modes available: Standard and Big Data (default: Standard).

Standard: The maximum input/output data size per slave is 505 bytes each.

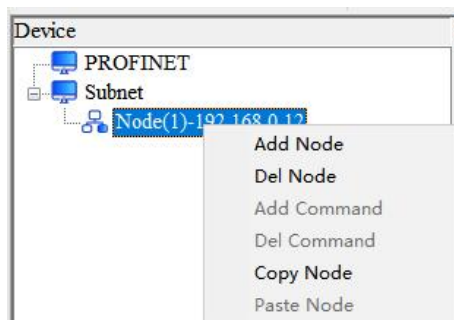
Big Data: The maximum input/output data size per slave is 1428 bytes each.

MSG Mode (Class 3) : Default is Disabled. When Enabled: Activates Class 3 explicit messaging between the EtherNet/IP Scanner and Adapter for non-cyclic, on-demand data exchange (e.g., parameter configuration, diagnostics).

Other Parameters: Unless otherwise specified, retain all default settings.

● Node setup instructions:

There are four node operations: Add Node, Delete Node, Copy Node, and Paste Node.



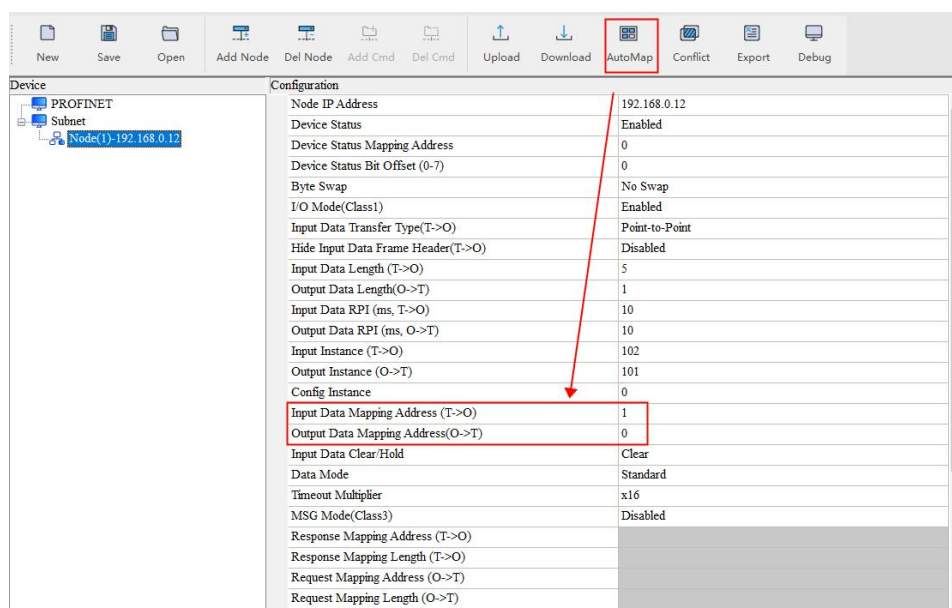
- **Add Node:** Right-click and select 'Subnet/Node', a pop-up option prompt box will appear, select 'Add Node' to complete the node adding operation. Alternatively, you can click 'Menu Bar-Edit-Add Node'/'Toolbar-Add Node' button to complete the operation.
- **Delete Node:** There are several ways to delete a node:
 - ① Right-click the node to be deleted, select 'Del Node' from the pop-up menu to complete the operation.
 - ② Click 'Menu Bar-Edit-Del Node'/'Toolbar-Del Node' button to complete the operation.
 - ③ Select the node to be deleted with the left mouse button, or use the shortcut key 'Delete' to delete

the node.

- **Copy Node:** Right-click and select the node to be copied. An option prompt box will pop up. Select 'Copy Node' to complete the copy node operation.
- **Paste Node:** After clicking 'Copy Node', right-click an existing node, an option prompt box will pop up, select 'Paste Node' to complete the operation.

3. Auto Map:

After the node settings are completed, you can click the 'Toolbar - Auto Map' button to automatically assign the 'Input/Output Data Mapping Address' and 'Response/Request Mapping Address'. This address is the starting address of the input/output buffer where data is stored inside the gateway. It can be assigned automatically or filled in manually.



4. Download configuration:

Click on 'Conflict Detection' to check if there are no address conflicts in the gateway buffer. Click the 'Toolbar - Download' button to download the configuration to the gateway. After the download is complete, restart the gateway as prompted for the configuration to take effect.

To verify the gateway's configuration, click the 'Toolbar - Upload' button to view the configuration stored in the gateway.



5.3.5 EtherNet/IP Adapter Configuration

The steps to set up the EtherNet/IP Adapter mode are as follows:

1. **Protocol Mode:** Select 'EtherNet/IP Adapter', and the basic parameters to be set are as follows:

Device	Configuration																																				
PROFINET Subnet	<table><tr><td>Protocol Mode</td><td>EtherNet/IP Adapter</td></tr><tr><td>IP Assignment</td><td>DHCP</td></tr><tr><td>IP Address</td><td>192.168.0.11</td></tr><tr><td>Subnet Mask</td><td>255.255.255.0</td></tr><tr><td>Default Gateway</td><td>192.168.0.1</td></tr><tr><td>DNS1</td><td></td></tr><tr><td>DNS2</td><td></td></tr><tr><td>Number of Input Bytes(Instance102)</td><td>496</td></tr><tr><td>Number of Output Bytes (Instance101)</td><td>492</td></tr><tr><td>Number of Input Bytes(Instance202)</td><td>1432</td></tr><tr><td>Number of Output Bytes (Instance201)</td><td>1428</td></tr><tr><td>VendCode</td><td>1376</td></tr><tr><td>Monitor Network Status</td><td>Disabled</td></tr><tr><td>Byte Swap</td><td>No Swap</td></tr><tr><td>EtherNet/IP Timeout Action</td><td>Clear</td></tr><tr><td>QoS</td><td>Disabled</td></tr><tr><td>Non-DLR</td><td>Disabled</td></tr><tr><td>Enable DLR</td><td>Disabled</td></tr></table>	Protocol Mode	EtherNet/IP Adapter	IP Assignment	DHCP	IP Address	192.168.0.11	Subnet Mask	255.255.255.0	Default Gateway	192.168.0.1	DNS1		DNS2		Number of Input Bytes(Instance102)	496	Number of Output Bytes (Instance101)	492	Number of Input Bytes(Instance202)	1432	Number of Output Bytes (Instance201)	1428	VendCode	1376	Monitor Network Status	Disabled	Byte Swap	No Swap	EtherNet/IP Timeout Action	Clear	QoS	Disabled	Non-DLR	Disabled	Enable DLR	Disabled
Protocol Mode	EtherNet/IP Adapter																																				
IP Assignment	DHCP																																				
IP Address	192.168.0.11																																				
Subnet Mask	255.255.255.0																																				
Default Gateway	192.168.0.1																																				
DNS1																																					
DNS2																																					
Number of Input Bytes(Instance102)	496																																				
Number of Output Bytes (Instance101)	492																																				
Number of Input Bytes(Instance202)	1432																																				
Number of Output Bytes (Instance201)	1428																																				
VendCode	1376																																				
Monitor Network Status	Disabled																																				
Byte Swap	No Swap																																				
EtherNet/IP Timeout Action	Clear																																				
QoS	Disabled																																				
Non-DLR	Disabled																																				
Enable DLR	Disabled																																				

For detailed description of the functions of related parameters, please refer to the 'Info' on the software interface.

2.Byte settings:

Number of Input Bytes (Instance102): Range: 5-496 Bytes. Default value is 496.

Number of Output Bytes (Instance101): Range: 1-492 Bytes. Default value is 492.

Number of Input Bytes(Instance202): Range: 5-1432 Bytes. Default value is 1432.

Number of Output Bytes (Instance201): Range: 1-1428 Bytes. Default value is 1428.

3. Set advanced features:

VendCode: VendCode can be modified as required. Range: 1-65535. Default value is 1376.

Monitor Network Status:The gateway allows optional settings to enable or disable monitoring of the device online status on the PROFINET or EtherNet/IP side.

Monitor EtherNet/IP Network Status on PROFINET Side: The first two bytes at the PN (PROFINET) end will be occupied, and the data indicates the EtherNet/IP communication fault status, where 0 indicates fault, and 1 indicates normal.

Monitor PROFINET Network Status on EtherNet/IP Side: The first two bytes of the EtherNet/IP input side will be reserved to function as the PROFINET Status bytes. The data content indicates the PROFINET communication fault status, where 0 indicates fault, and 1 indicates normal.



Byte Swap: There are four options supported: No Swap, Two Byte Swap, Four Byte Swap, and Two Words Swap.

EtherNet/IP Timeout Action:

Clear: After the PROFINET is disconnected or failed. Set the EtherNet/IP input data to zero.

Hold: Keep the EtherNet/IP input data unchanged.

4. Download configuration:

Click the 'Toolbar - Download' button to download the configuration to the gateway. After the download is complete, restart the gateway as prompted for the configuration to take effect.

To verify the gateway's configuration, click the 'Toolbar - Upload' button to view the configuration stored in the gateway.

5.4 Tool

The "Tool" option on the menu bar contains the following functions:

- Upload Config
- Download Config
- Auto Mapping
- Conflict Detect
- Export Xls
- Debug

5.4.1 Locate

When users manage multiple GT200-PN-MT gateways, the "Locate" function can be used to identify gateway that will be configured.

Users can click on the "Locate" button when the gateway is connected to Ethernet to cause the MS indicator on the gateway to blink red alternately.

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

Device Select

NIC Bonding: Realtek PCIe GbE Family Controller

NIC Address: IPv4:192.168.0.185,

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.33	64-EA-C5-2D-01-BD	dut33	192.168.0.33	255.255.255.0

Upload Refresh Device Info Locate Cancel

Search completed

5.4.2 View Device Information

Before configuring parameters, the user will need to search for the gateway using the software.

Click "Upload" or "Download" button of the main interface and the software will search all of the available devices and list them in the main interface. Click the "Device Info" button on the device select interface to check the device name, IP address, product version, device model, and MAC addresses for PROFINET.

Device Information

PROFINET:		Modbus TCP / EtherNet/IP:	
Device Name	dut33	IP Assignment	Static
IP Address	192.168.0.33	IP Address	192.168.0.11
Product Version	3.2	Subnet Mask	255.255.255.0
Device Model	GT200-PN-MT	Default Gateway	192.168.0.1
MAC Address	64-EA-C5-2D-01-BD	MAC Address	64-EA-C5-2D-01-BC

OK

5.4.3 Upload Config and Download Config

1. Upload Config

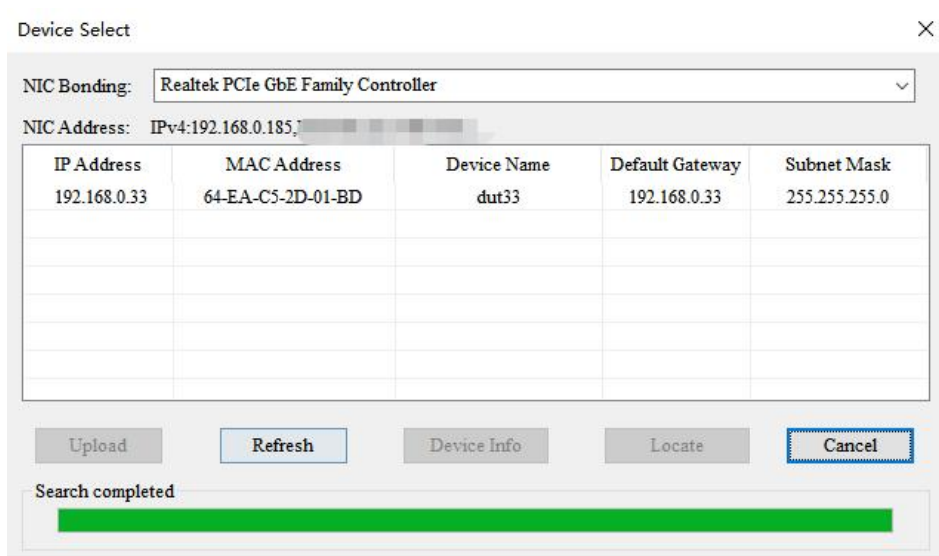
Select "Upload" to upload the gateway configuration information from the device to the software.

When uploading the configuration from the gateway to the software, the pop-up window is as below:

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual



Device Select

NIC Bonding: Realtek PCIe GbE Family Controller

NIC Address: IPv4:192.168.0.185

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.33	64-EA-C5-2D-01-BD	dut33	192.168.0.33	255.255.255.0

Upload Refresh Device Info Locate Cancel

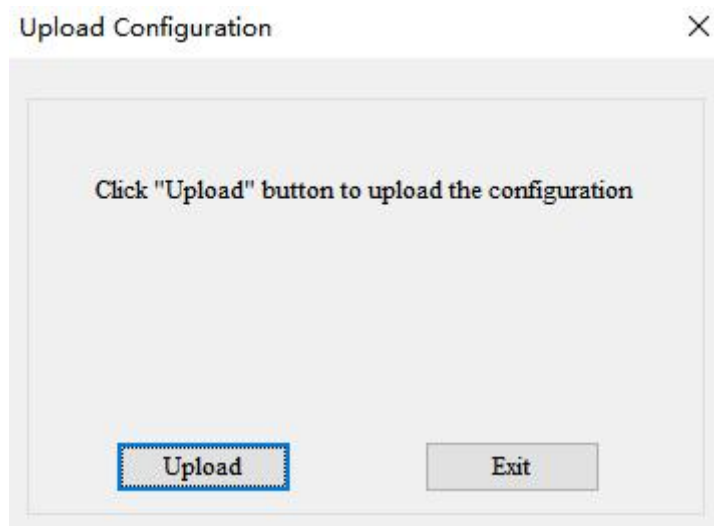
Search completed

NIC Bonding:

This drop-down menu is used to select the **local computer's network adapter** that is connected to the same network as the gateway. Ensure the selected NIC is on the same local area network as the gateway device.

Click the 'Refresh' button will search for devices on the network again.

Select the gateway you want to configure and click "Upload" to enter into the upload dialog box. The interface is shown below:



Upload Configuration

Click "Upload" button to upload the configuration

Upload Exit

2. Download Config

Select "Download" to download the configured gateway information to the gateway device. The operation of download configuration is the same as upload configuration:

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

Device Select

NIC Bonding: Realtek PCIe GbE Family Controller

NIC Address: IPv4:192.168.0.185

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.33	64-EA-C5-2D-01-BD	dut33	192.168.0.33	255.255.255.0

Download Refresh Device Info Locate Cancel

Search completed

Select the gateway you want to configure and click "Download" to enter into the download dialog box. The interface is shown below:

Download Configuration

Click "Download" button to download the configuration

Download Exit

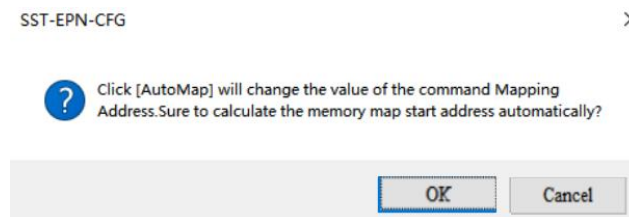
Notes:

1. Before downloading, please confirm all configurations have been completed and right.
2. The downloaded configuration requires a gateway restart to take effect
3. Modbus TCP sets the IP address in DHCP mode by default. If there is no DHCP server or switch in the network, and the IP address is not obtained within about 30 seconds after power-on or restart, it will automatically revert to a fixed IP address. The fixed IP address is 192.168.0.11.



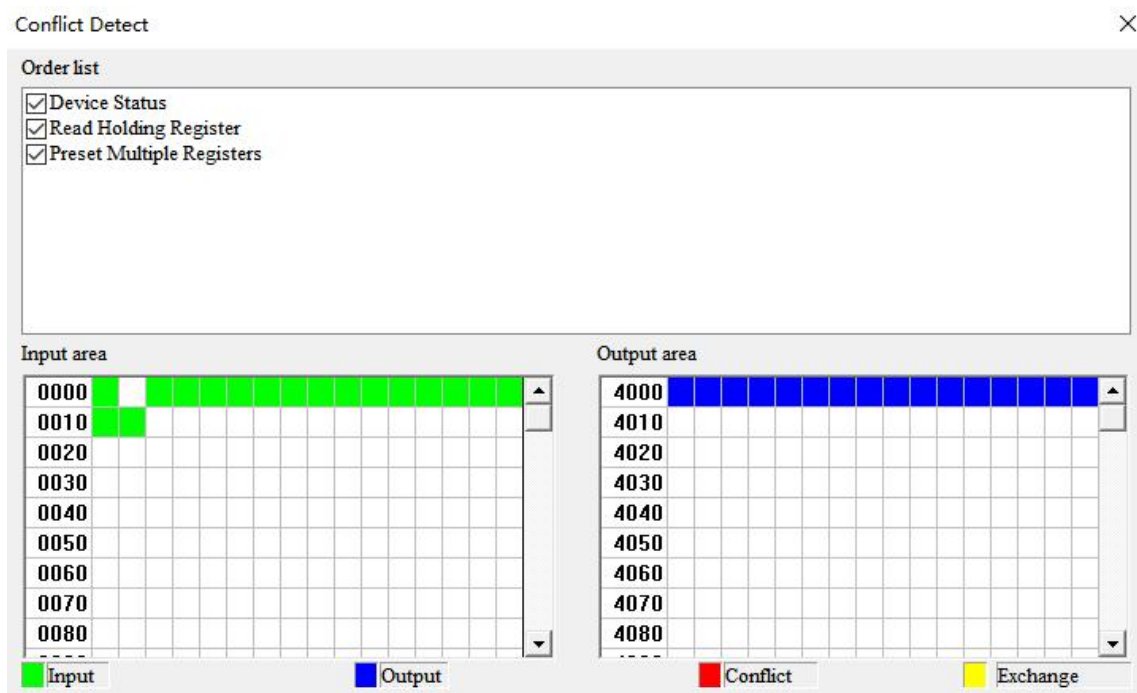
5.4.4 Auto Mapping

The automatic mapping function automatically calculates the mapping address and fills in the value. After this function takes effect, the set data will be refilled. After automatic mapping, there is no address conflict in the mapping buffer. It is related to the parameter "Number of Data". This parameter cannot be empty. Select "Auto Mapping" in the "Tools" menu, or click the "Auto Mapping" icon, and the following prompt will pop up:



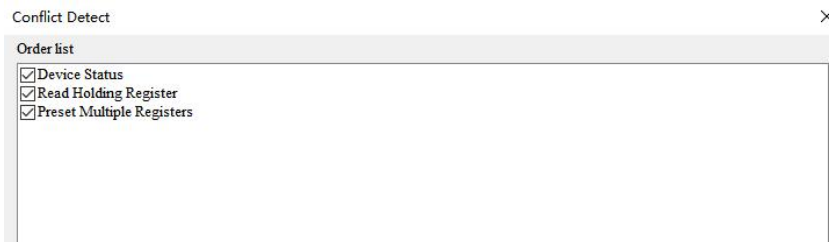
5.4.5 Conflict Detect

The 'Conflict Detect' function is used to check for memory mapping conflicts. If users find conflicts, it can be adjusted in time. The interface is shown below:



1. Command List Operation

It shows configured command in the command list interface. Check box before each command is used to check the position of this command in memory mapping area. Click one command and check the box, it will show the position where relevant commands occupy in the memory mapping area. Click the command again and uncheck the box, the command will not be shown in the mapping area. This function will be used for conflicts detect among commands in memory mapping area.



2. Memory Mapping Operation

Memory mapping area divides into input area and output area.

Input mapping address range: 0x0000-0x0593.

Output mapping address range: 0x4000-0x4593.

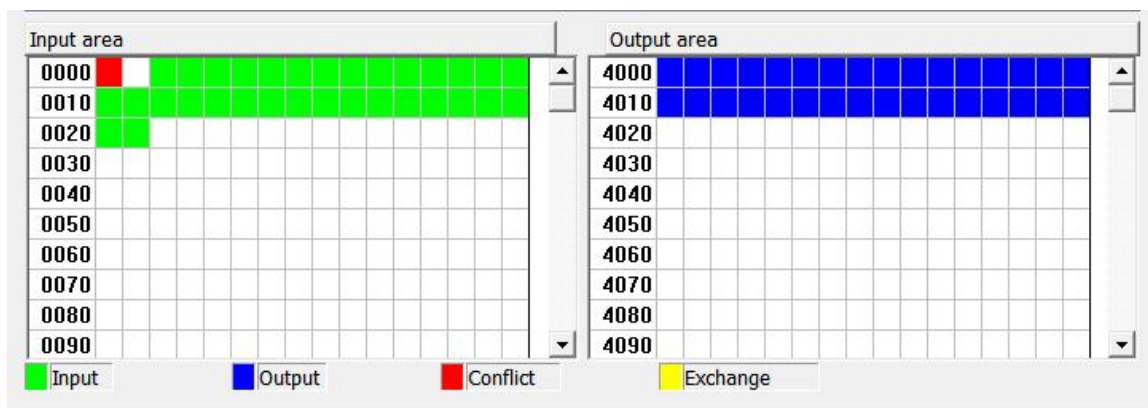
Each grid represents one byte address.

Green: Read command is shown in input mapping area, it will be in green without conflict.

Yellow: Write command: When address mapping area is located in input area, it will be in yellow without conflict.

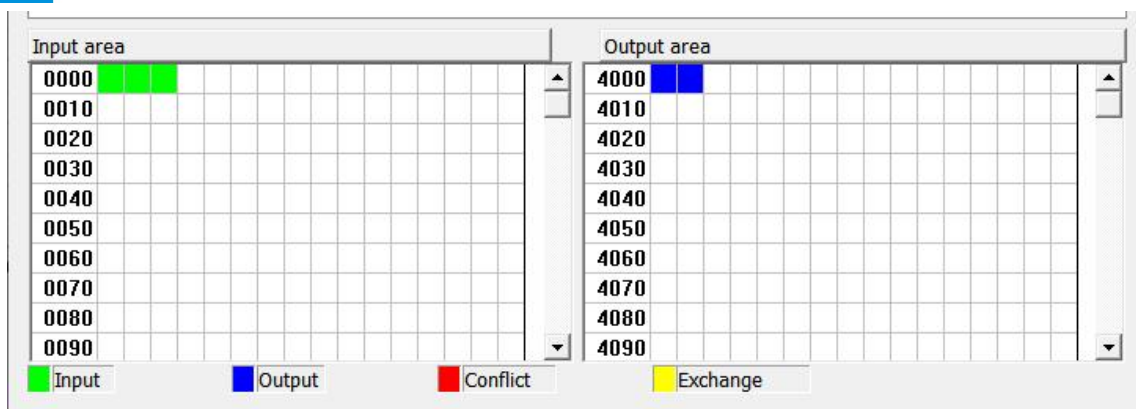
Blue: When address mapping area is located in output area, it will be in blue without conflict.

Red: If different commands occupy the same byte, that byte area will be highlighted in red.



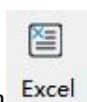
For bit operation command, the above grid displaying meaning works the same.

Click input/output area grids, each bit of relevant byte in the grid will show whether each bit is occupied. As is shown below:

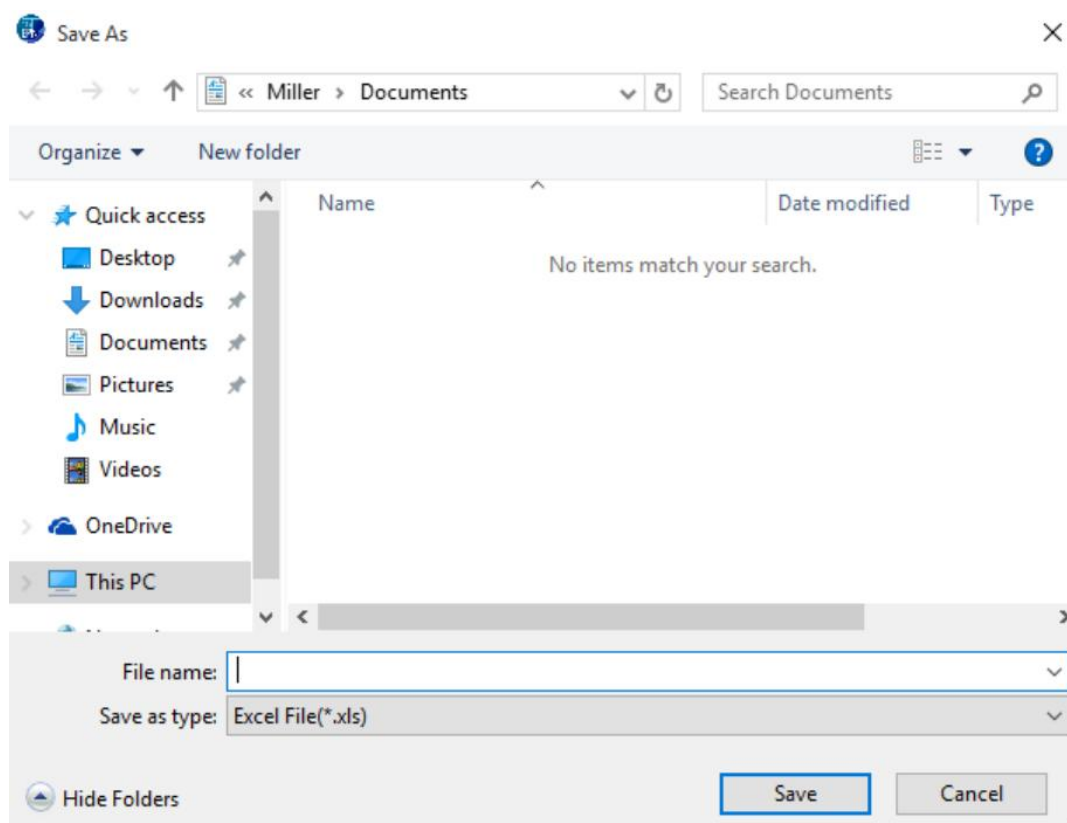


5.4.6 Export Xls

Excel configuration Excel file will help users to check the relevant configuration.



Select the excel icon , export the configuration information to excel and save. Select the appropriate path, shown as below:



5.4.7 Debug



Debug

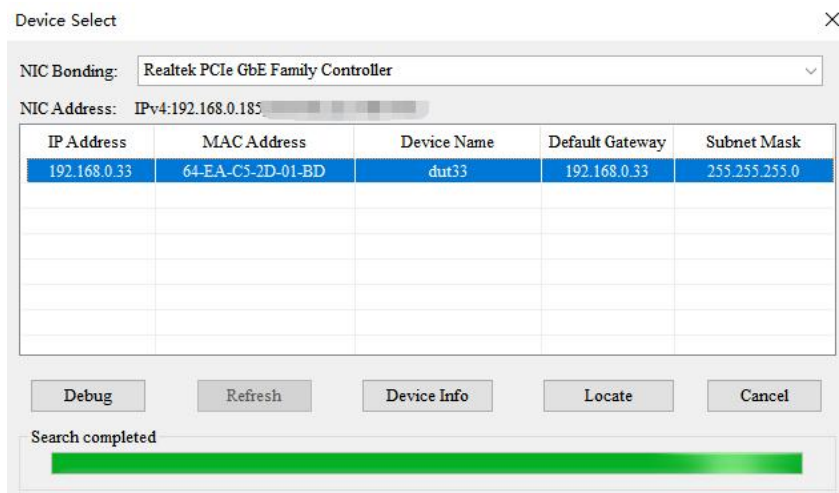
This function is used to monitor the buffer data, select the monitor icon or click "Debug" in the tools and

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

it will pop up the dialog box of searching equipment:



Device Select

NIC Bonding: Realtek PCIe GbE Family Controller

NIC Address: IPv4:192.168.0.185

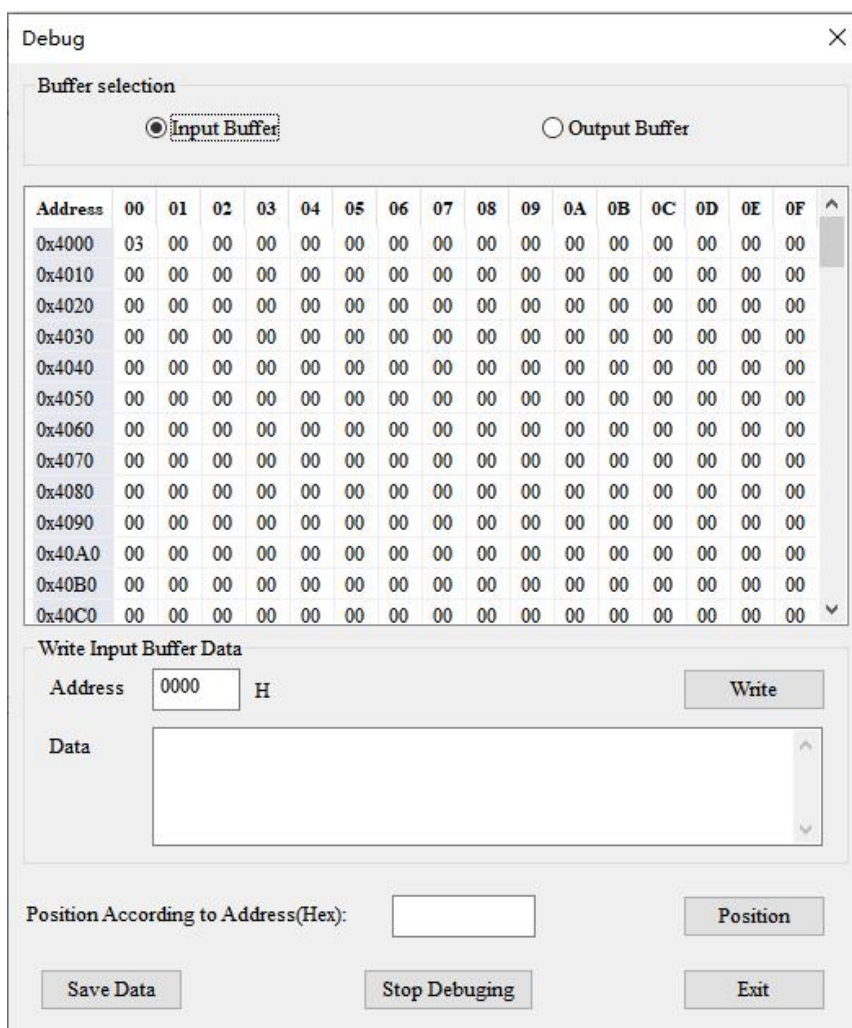
IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.33	64-EA-C5-2D-01-BD	dut33	192.168.0.33	255.255.255.0

Debug Refresh Device Info Locate Cancel

Search completed

Progress bar: 100%

Click "Debug", it will pop up the data monitor dialog box below:



Debug

Buffer selection

☒ Input Buffer ☐ Output Buffer

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0x4000	03	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4020	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4030	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4040	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4050	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4060	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4080	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x4090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x40A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x40B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x40C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Write Input Buffer Data

Address: 0000 H Write

Data:

Position According to Address(Hex): Position

Save Data Stop Debugging Exit

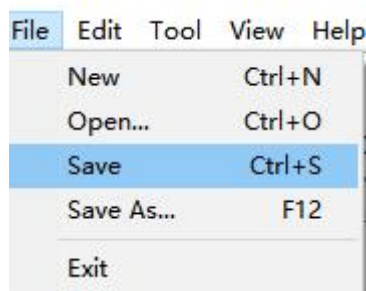
Click the "Save Data" button to save the current buffer data to the PC's hard disk.



5.5 Save and Open Configuration

5.5.1 Save Configuration Project

Click the "Save" button on the menu bar or toolbar to save the configured project as .xml file.



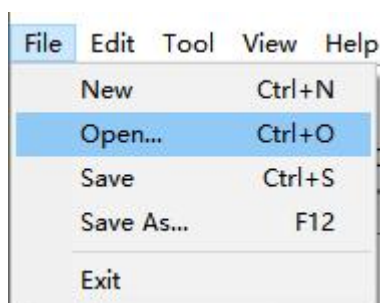
Menu bar



Toolbar

5.5.2 Open Configuration Project

Click the "Open" button on the menu bar or toolbar to open the saved.xml file.



Menu bar



Toolbar



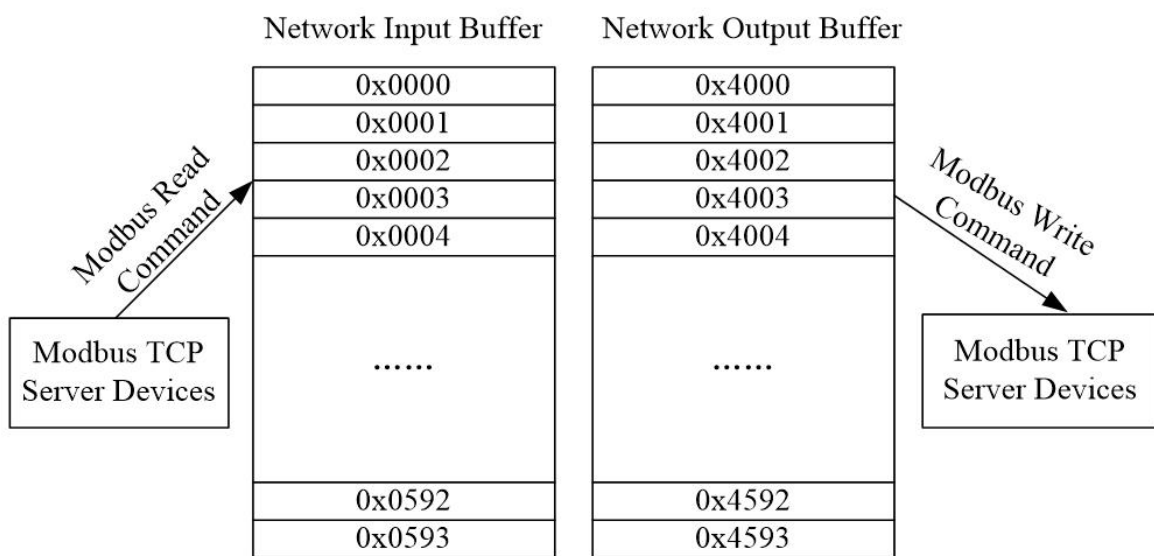
6 Working Principle

6.1 Modbus TCP Master

Ethernet supports Modbus TCP function, described as below:

Data exchange of Modbus TCP and PROFINET of GT200-PN-MT is set up through "mapping". There are two data buffer areas, one is PROFINET network input buffer and the other is PROFINET network output buffer.

Network input and output buffer is all for PROFINET master. When the gateway is Modbus TCP master, Modbus read command will write the read data to the network input buffer for PROFINET accessing. Modbus write commands retrieve data from the network output buffer and send it to the Modbus TCP server devices.



As is shown above: Network input buffer range is 0x0000-0x0593 (function code 01, 02, 03, 04, 23 as data input. function 05, 06, 15, 16, 23 as local data exchange). Network output buffer range is 0x4000-0x4593 (function code 05, 06, 15, 16, 23 as data output).

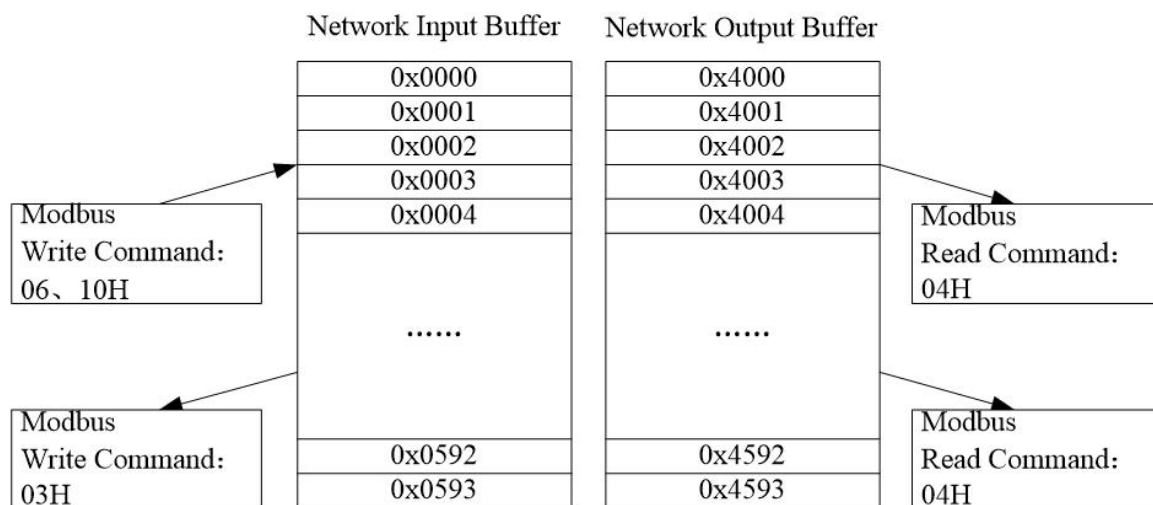
Ethernet can support configuring at most 300 commands, each one can read one group of continuous Modbus registers.

6.2 Modbus TCP Server

1. Data Exchange



Data exchange of Modbus TCP and PROFINET of GT200-PN-MT is set up through "mapping". There are two data buffer areas, one is PROFINET network input buffer and the other is PROFINET network output buffer. Network input and output buffer is all for PROFINET. When the gateway is Modbus TCP server, Modbus write register command will write the read data to the network input buffer for PROFINET accessing. Modbus read command gets data from network output buffer and export to the Modbus TCP master equipment through response message.



The gateway acts as Modbus TCP server, support function: 03H, 04H, 06H 10H and 17H.

Network input buffer is Modbus TCP master output at the Modbus TCP side. It is mapped to the Modbus read holding register. Users can use 03 command to read back. It supports 03H, 06H, 10H and 17H function code. Register starting address is 40001(0).

Network output buffer is Modbus TCP master input. It is mapped to Modbus input register. Users can use 04 function code to read data. It supports 04H function code. Register starting address is 30001 (0).

2. Monitor Network Status

When the gateway operates as a Modbus TCP Server, it features a network status monitoring function. You can configure the "Network Status Monitor" parameter in the SST-EPN-CFG configuration software. This setting provides four options:

1. Monitor network status on both sides
2. Monitor Modbus TCP network status on PROFINET side
3. Monitor PROFINET network status on Modbus TCP side
4. Disabled

The detailed descriptions are as follows:

1. Monitor Modbus TCP network status on PROFINET side:



When enabled: The first two bytes of the PROFINET input buffer are reserved for a status word. This data indicates the number of Modbus TCP Clients (Masters) currently connected to the gateway.

When disabled: The input buffer address is not reserved for the status word, and the starting address will directly store the data received from the Modbus TCP side.

2. Monitor PROFINET network status on Modbus TCP side:

When enabled: The first two bytes of the data read by the Modbus TCP Client are reserved for a status word. This word monitors the PROFINET communication fault status (1 indicates normal communication, and 0 indicates a fault).

When disabled: The output buffer address is not reserved for the status word, and the starting address will directly store the output data from the PROFINET side.

The Modbus TCP Client can read data from the gateway's output buffer using the following function codes and starting addresses:

Function Code 04H, starting register address 30001 (0)

Function Code 02H, starting register address 10001 (0)

Notes: Regardless of whether the monitoring function is enabled or disabled, register address 35001 (5000) is permanently allocated to display the PROFINET network status.



7 EtherNet/IP Connection Parameters

Connection parameters the gateway provides are as below:

Parameters	Instance Number	Data Size (Bytes)
Input	102	Range: 5-496 Default: 496
Output	101	Range: 1-492 Default: 492
Configuration	113	10 (Fixed)

The data size of input instance 102 can be configured within the range of 5 to 496 bytes using the SST-EPN-CFG configuration software, where the first 4 bytes are reserved for the real-time frame header.

The data size of output instance 101 can be configured within the range of 1 to 492 bytes using the SST-EPN-CFG configuration software.

Take configuration parameters of Studio 5000 Logix as an example:

Note: The following example shows how to enter the configuration parameters in Studio 5000 Logix:

New Module

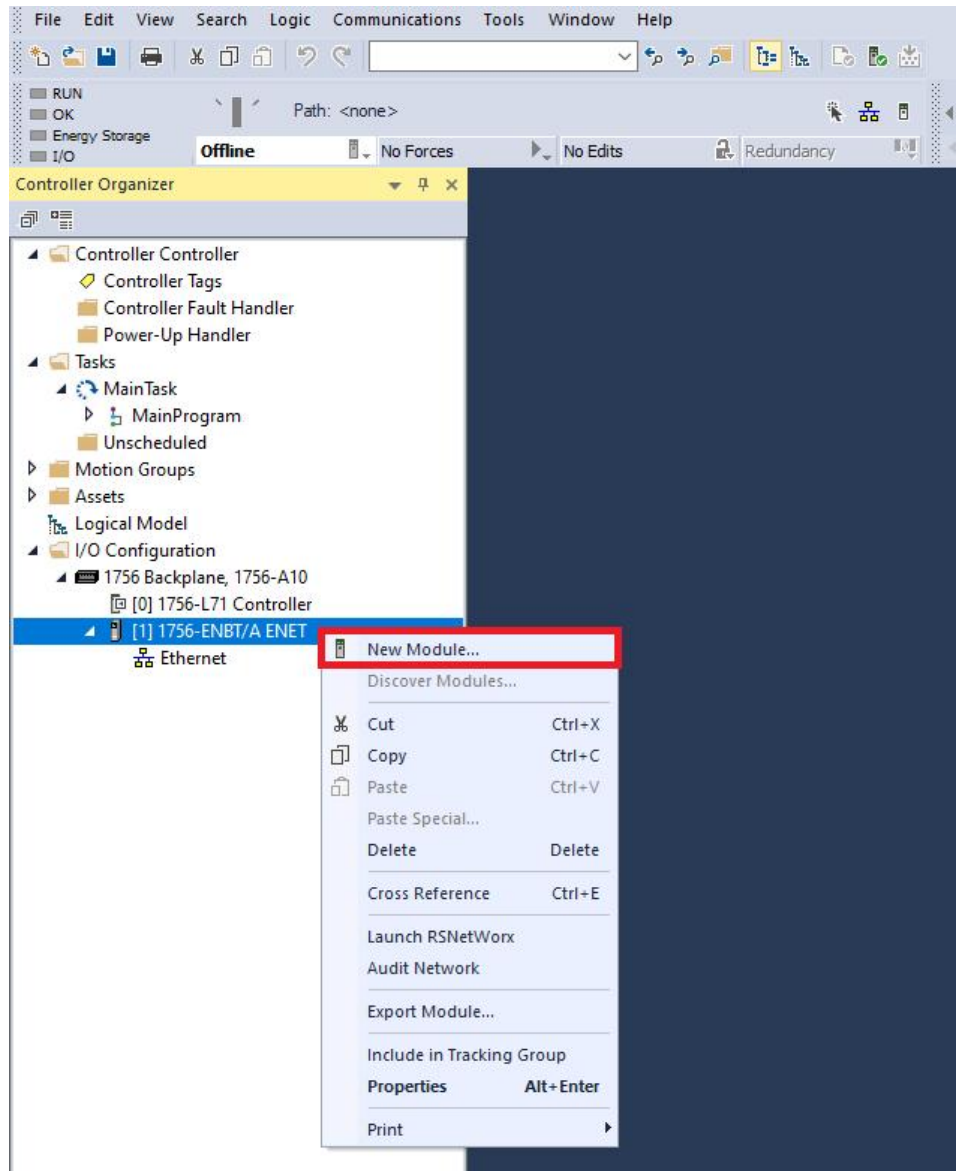
Type: ETHERNET-MODULE Generic Ethernet Module
 Vendor: Rockwell Automation/Allen-Bradley
 Parent: ENET
 Name: SSTGateway
 Description:
 Comm Format: Data - DINT
 Address / Host Name
☒ IP Address: 192 . 168 . 0 . 10
☐ Host Name:
 Connection Parameters
 Input: 102 Assembly Instance: 124 Size: 124 (32-bit)
 Output: 101 Assembly Instance: 123 Size: 123 (32-bit)
 Configuration: 113 Assembly Instance: 10 Size: 10 (8-bit)
 Status Input:
 Status Output:
☒ Open Module Properties
 OK Cancel Help

The data size configured in Studio 5000 Logix must match the data size configured in the SST-EPN-CFG configuration software. For example, if the input data size configured in the SST software is 496 bytes, and if Studio 5000 Logix is using DINT (32-bit), then the input data size must be set to 124 ($496 \times 8/32 = 124$).

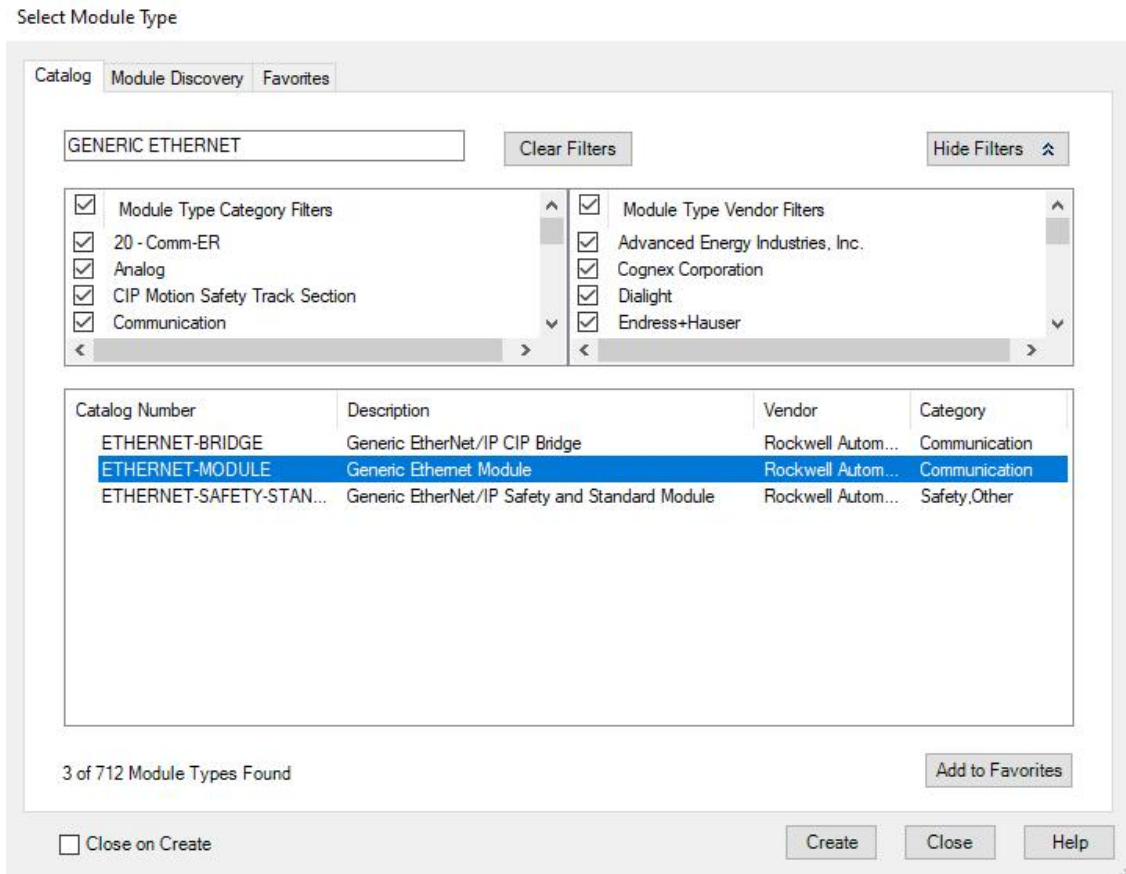
7.1 Implicit I/O Messaging Connection Method (Recommended)

The following Studio 5000 Logix example will show how to connect using Implicit I/O Messaging.

First, right-click on the EtherNet/IP scanner module and click "New Module", as shown below:



In the pop-up dialog box, search for "GENERIC ETHERNET", choose "ETHERNET-MODULE", and click "Create" as shown below:



GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

Configure relevant information of GT200-PN-MT in the pop-up window, as shown below:

New Module

Type: ETHERNET-MODULE Generic Ethernet Module
 Vendor: Rockwell Automation/Allen-Bradley
 Parent: ENET
 Name: SSTGateway
 Description:
 Comm Format: Data - DINT
 Address / Host Name
☒ IP Address: 192 . 168 . 0 . 10
☐ Host Name:
☒ Open Module Properties

Connection Parameters

Assembly Instance:
 Input: 102 124 (32-bit)
 Output: 101 123 (32-bit)
 Configuration: 113 10 (8-bit)
 Status Input:
 Status Output:

Set the device name.

Set Communication Parameters. Please refer to [Chapter 7](#).

IP address of the SST gateway.

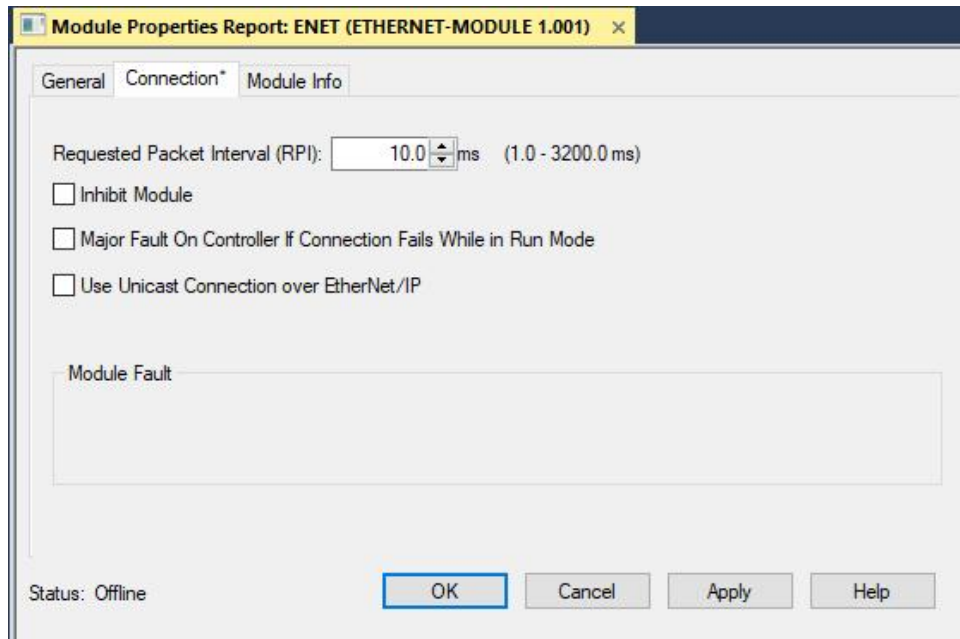
Cancel Help

In the above picture, the module information needs to be configured includes:

- Name:** The name of the added EtherNet/IP device module.
- Comm Format:** Configure data types such as DINT, INT, SINT, REAL and etc. After confirmation, this cannot be changed. To change data types, a new module must be created.
- IP Address:** Set the IP address of the added EtherNet/IP device module (The IP address of GT200-PN-MT, which is configured by the software SST-EPN-CFG).
- Connection Parameters:** Set the Connection Parameters for communication. For more details, please refer to the beginning of [Chapter 7](#).

Note: "Size" (configured bytes) in the image above should be the consistent with relevant input and output bytes of the instance in the above chapter.

Click "OK", set scanner polling time interval in the pop-up dialog box, the default is 10ms, as shown below:



After setting this interval, click "OK" to save.

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

To view the output data, first double click the "Controller Tags" tree. Then expand the "SSTGateway:O" tag as shown below:

The screenshot displays the SSTAutomation software interface. On the left, the 'Controller Organizer' tree is expanded to show 'Controller Tags'. Under 'Controller Tags', the 'SSTGateway:O' tag is selected. The main window shows a table of tags for 'SSTGateway:O'. The table has columns for Name, Value, Force Mask, Style, Data Type, Description, and Constant. The tags are listed as follows:

Name	Value	Force Mask	Style	Data Type	Description	Constant
SSTGateway:C	{...}	{...}	{...}	AB:ETHERNET_MODU...		☐
SSTGateway:I	{...}	{...}	{...}	AB:ETHERNET_MODU...		☐
SSTGateway:O	{...}	{...}	{...}	AB:ETHERNET_MODU...		☐
SSTGateway:O.Data	{...}	{...}	{...}	DINT[124]		
SSTGateway:O.Data[0]	0	0	Decimal	DINT		
SSTGateway:O.Data[1]	0	0	Decimal	DINT		
SSTGateway:O.Data[2]	0	0	Decimal	DINT		
SSTGateway:O.Data[3]	0	0	Decimal	DINT		
SSTGateway:O.Data[4]	0	0	Decimal	DINT		
SSTGateway:O.Data[5]	0	0	Decimal	DINT		
SSTGateway:O.Data[6]	0	0	Decimal	DINT		
SSTGateway:O.Data[7]	0	0	Decimal	DINT		
SSTGateway:O.Data[8]	0	0	Decimal	DINT		
SSTGateway:O.Data[9]	0	0	Decimal	DINT		
SSTGateway:O.Data[10]	0	0	Decimal	DINT		
SSTGateway:O.Data[11]	0	0	Decimal	DINT		
SSTGateway:O.Data[12]	0	0	Decimal	DINT		
SSTGateway:O.Data[13]	0	0	Decimal	DINT		
SSTGateway:O.Data[14]	0	0	Decimal	DINT		
SSTGateway:O.Data[15]	0	0	Decimal	DINT		
SSTGateway:O.Data[16]	0	0	Decimal	DINT		
SSTGateway:O.Data[17]	0	0	Decimal	DINT		
SSTGateway:O.Data[18]	0	0	Decimal	DINT		
SSTGateway:O.Data[19]	0	0	Decimal	DINT		
SSTGateway:O.Data[20]	0	0	Decimal	DINT		
SSTGateway:O.Data[21]	0	0	Decimal	DINT		
SSTGateway:O.Data[22]	0	0	Decimal	DINT		
SSTGateway:O.Data[23]	0	0	Decimal	DINT		
SSTGateway:O.Data[24]	0	0	Decimal	DINT		
SSTGateway:O.Data[25]	0	0	Decimal	DINT		
SSTGateway:O.Data[26]	0	0	Decimal	DINT		
SSTGateway:O.Data[27]	0	0	Decimal	DINT		
SSTGateway:O.Data[28]	0	0	Decimal	DINT		

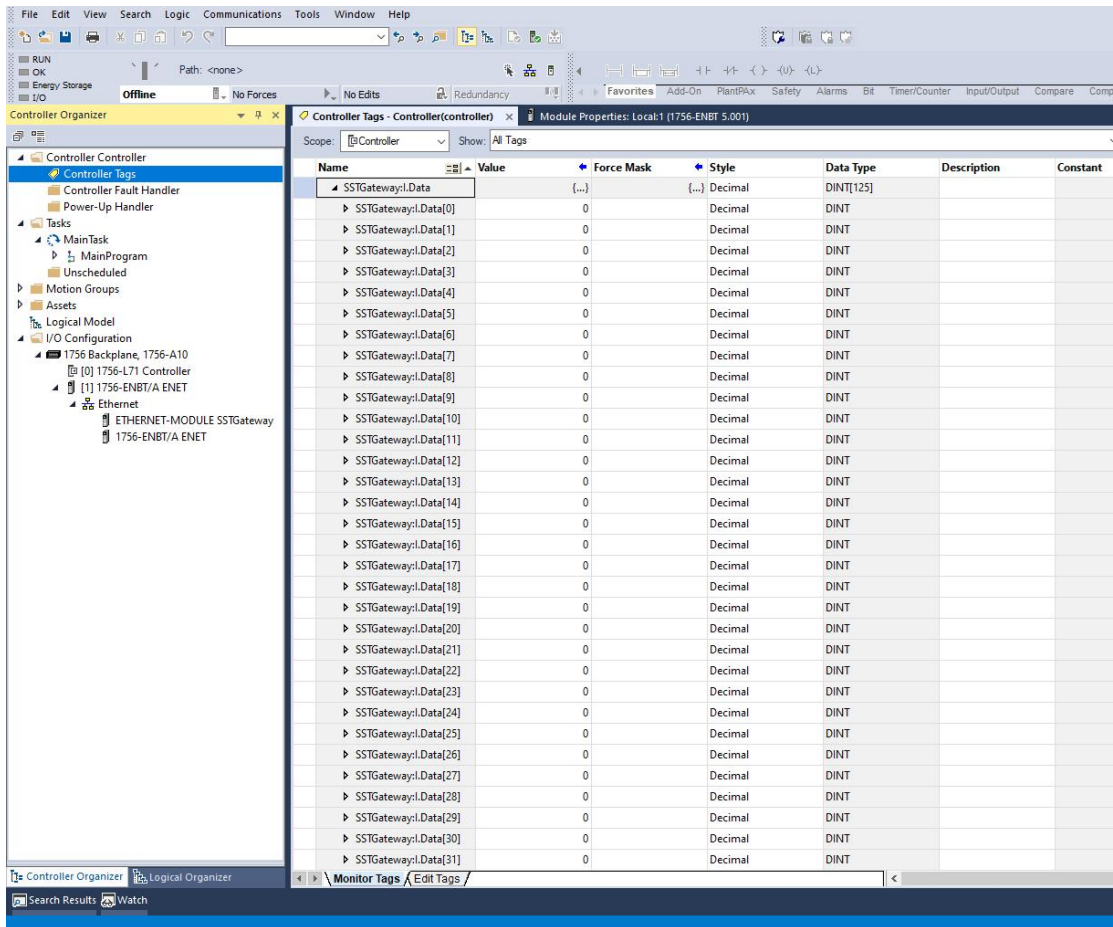
The SSTGateway:O data tag represents the corresponding output data addresses of the SST Gateway.

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

To view the input data, expand the "SSTGateway: I" tag as shown below:



The SSTGateway:I data tag represents the corresponding input data addresses of the SST Gateway.

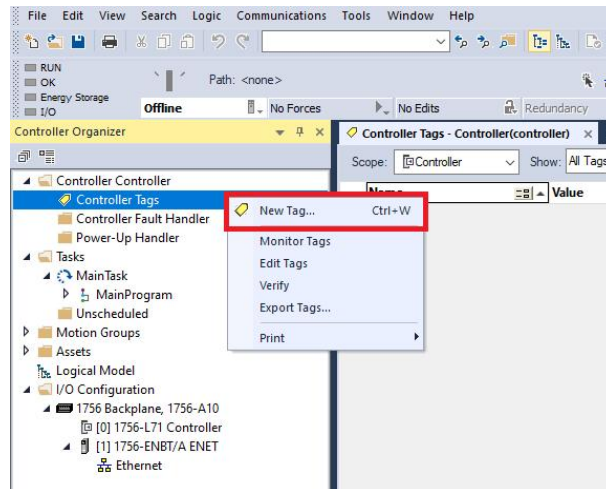
Please note that the first 4 input bytes are used to display the status bytes of the SST Gateway. See [Chapter 6](#) for more details.

7.2 Explicit MSG Connection Method

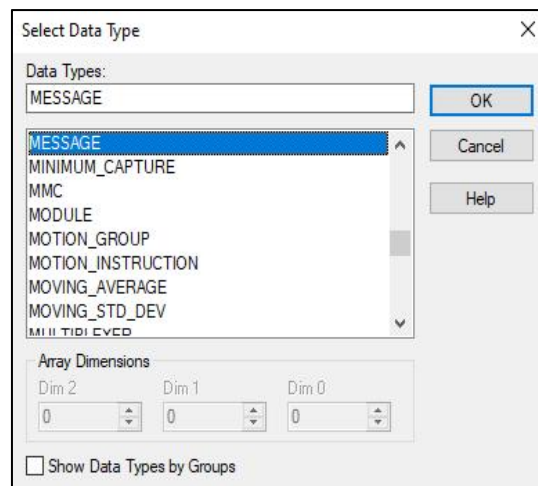
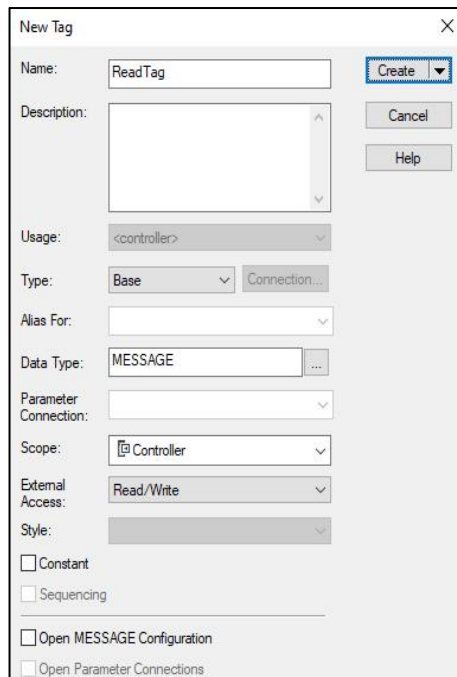
The following Studio 5000 Logix example will describe how to read/write EtherNet/IP data using explicit MSG messaging.

7.2.1 Read MSG Instruction Block

To start, create a new project in "Offline" mode. Then under "Controller Tags", add two new tags named "ReadTag" and "ReadData" as shown below:



Set the data type of "ReadTag" as "MESSAGE":



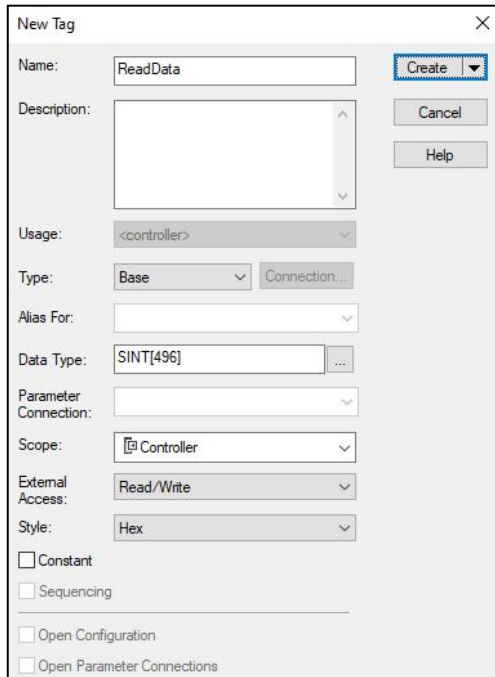
GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

Set the data type of "ReadData" as "SINT", then set the Array Dimension "Dim 0" to match the Input Data Size.

Refer to the connection parameters from the beginning of [Chapter 7](#):



New Tag

Name: Create Cancel Help

Description:

Usage:

Type: Connection...

Alias For:

Data Type: ...

Parameter Connection:

Scope:

External Access:

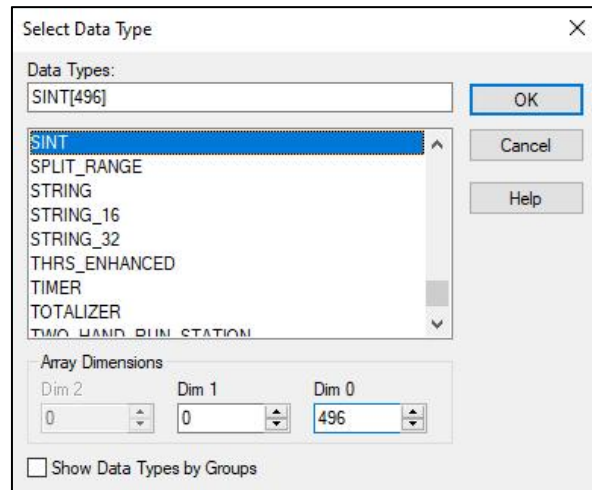
Style:

☐ Constant

☐ Sequencing

☐ Open Configuration

☐ Open Parameter Connections



Select Data Type

Data Types: OK Cancel Help

...

SPLIT_RANGE

STRING

STRING_16

STRING_32

THRS_ENHANCED

TIMER

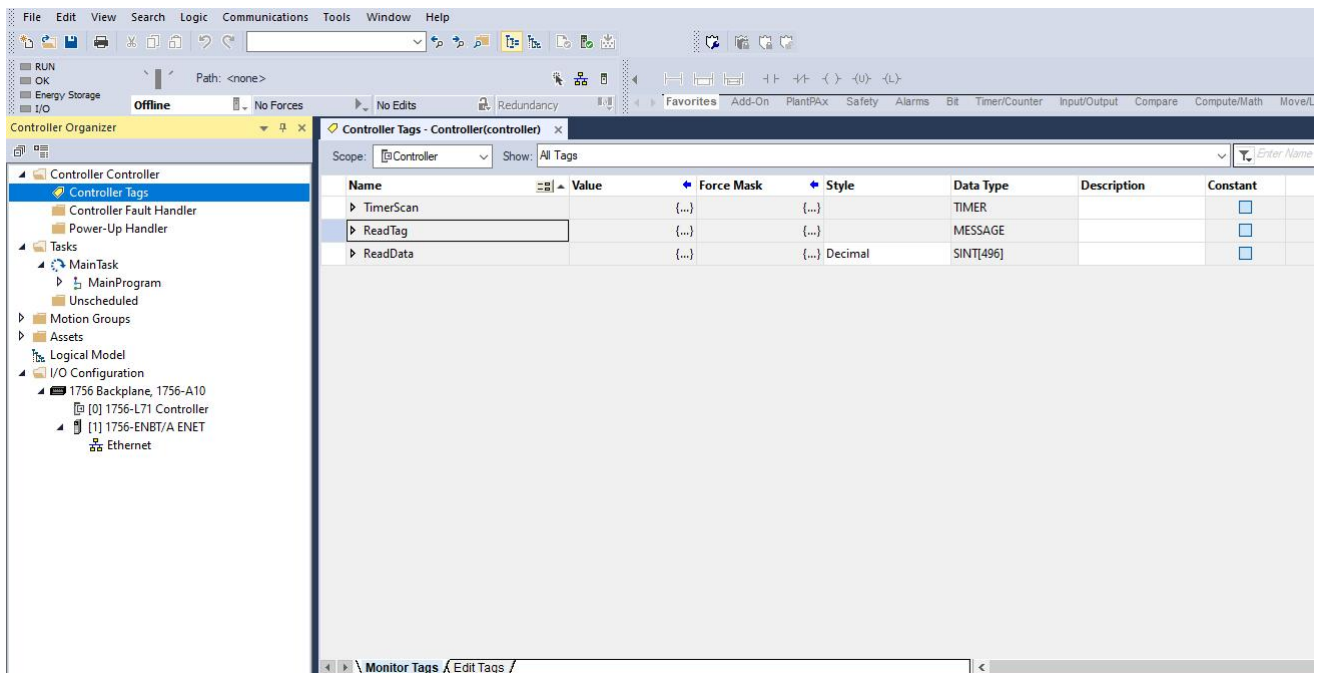
TOTALIZER

TWO_HAND_DIM_STATION

Array Dimensions

Dim 2: Dim 1: Dim 0:

☐ Show Data Types by Groups



The screenshot shows the SST Automation software interface. The **Controller Organizer** pane on the left displays the project structure, including **Controller Tags**. The **Controller Tags - Controller(controller)** pane on the right shows a table of tags.

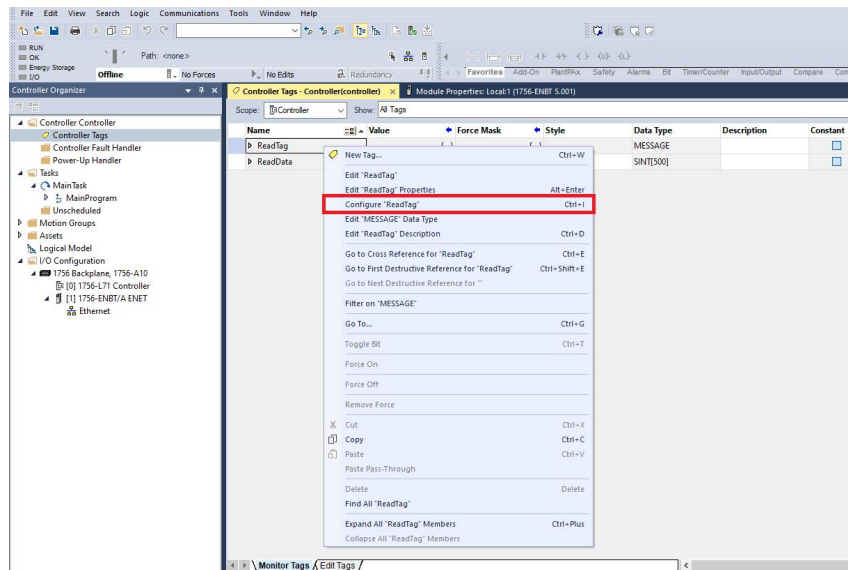
Name	Value	Force Mask	Style	Data Type	Description	Constant
TimerScan	{...}	{...}	{...}	TIMER		☐
ReadTag	{...}	{...}	{...}	MESSAGE		☐
ReadData	{...}	{...}	Decimal	SINT[496]		☐

GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

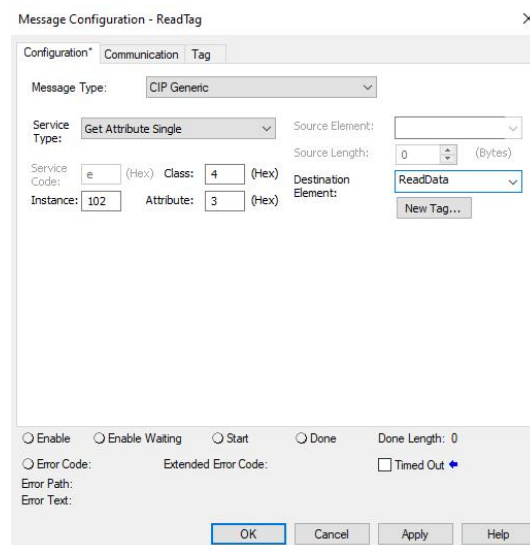
User Manual

Right-click on "ReadTag", select "Configure 'ReadTag'" as shown below:



In pop-up window, configure the following settings:

- Message Type:** CIP Generic.
- Service Type:** Select "Get Attribute Single". The relevant service code will become "e (Hex)".
- Class:** 4 (Hex)
- Instance:** 102
- Attribute:** 3 (Hex)
- Destination:** Select the "ReadData" tag. The obtained data will be saved in this tag.



GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

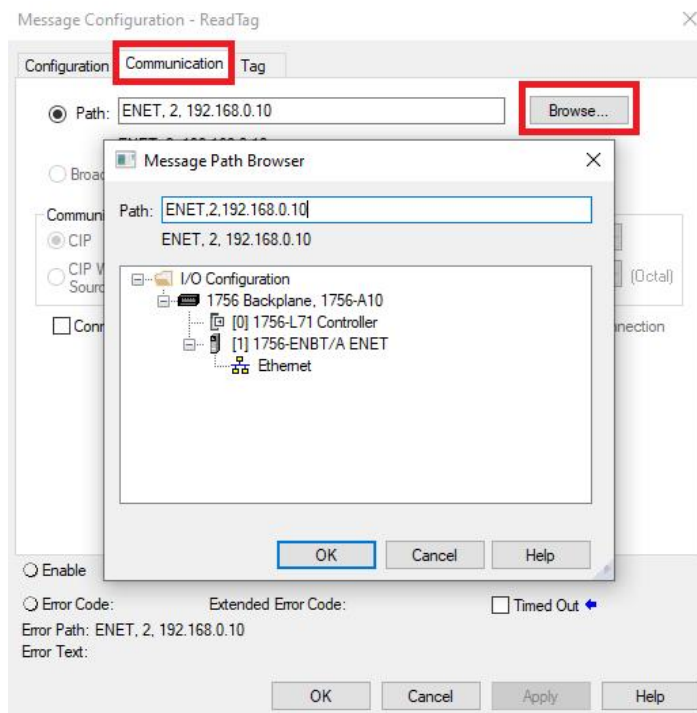
User Manual

Select the "Communication" tab and click the "Browse" button. Then input the network path to connect to the GT200-PN-MT.

Enter the network path in the following format:

[EtherNet/IP Interface Name], 2 (Ethernet Communication), [GT200-PN-MT IP Address]

Then click "OK" to confirm:



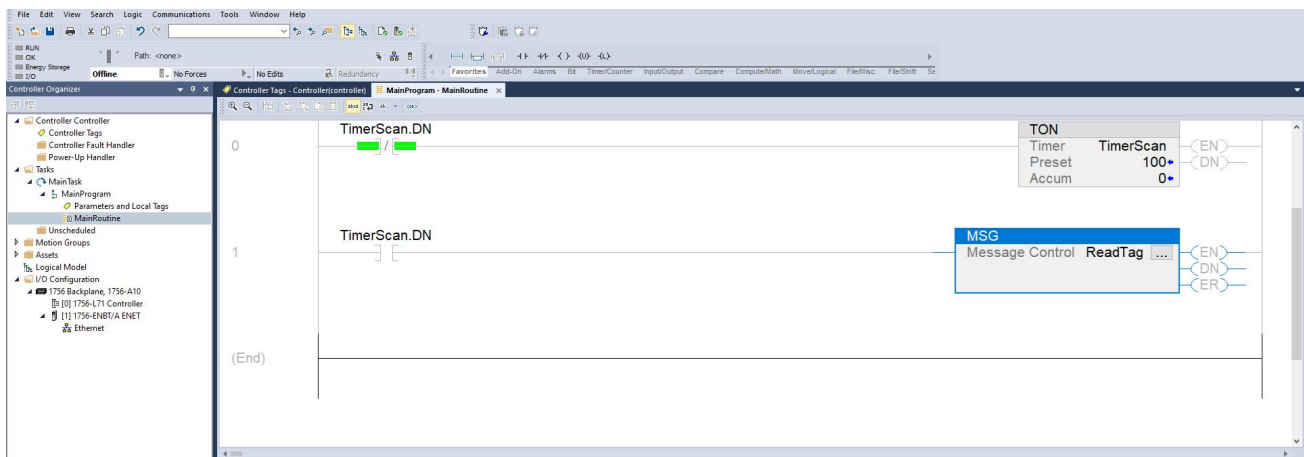
GT200-PN-MT

Modbus TCP / EtherNet/IP / PROFINET Gateway

User Manual

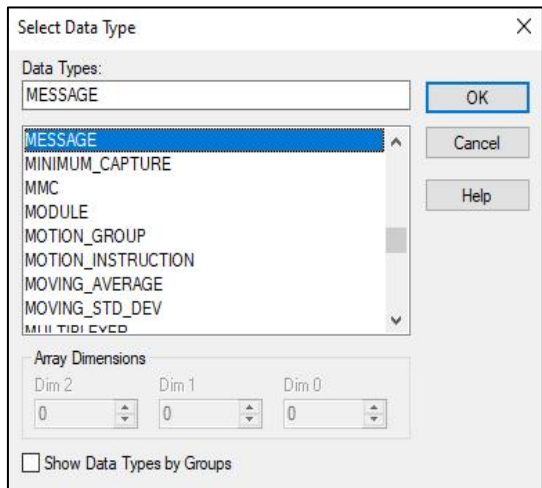
Add a "MSG" command and select "ReadTag" as "Message Control" in the "MainRoutine" of "MainProgram" as shown in the image below. This is a simple command which can send a read request. The user still needs to add some logic commands to trigger this command in common program. For further details, refer to Studio 5000 Logix reference material.

Download the program to the PLC and set PLC into "Online" state.



Click "Control Tags" and select "Monitor Tags". Expand "ReadData" to see that PLC can read Modbus TCP data through the GT200-PN-MT gateway.

Switch to "Offline" mode and add two new tags "WriteTag" and "WriteData", under the "Controller Tags". Define the type of "WriteTag" as "MESSAGE" and "WriteData" as "SINT[500]" as shown below:



www.SSTAutomation.com

New Tag

Name: Create

Description:

Usage: Cancel

Type: Connection...

Alias For:

Data Type: ...

Parameter Connection:

Scope: Controller

External Access: Read/Write

Style: Hex

☐ Constant

☐ Sequencing

☐ Open Configuration

☐ Open Parameter Connections

Select Data Type

Data Types:

OK

Cancel

Help

Help

Help

Help

Help

Help

Help

Help

Array Dimensions

Dim 2: Dim 1: Dim 0:

☐ Show Data Types by Groups

File Edit View Search Logic Communications Tools Window Help

Path: <none>

Offline No Forces No Edits Redundancy Favorites Add-On Alarms Bit Timer/Counter Input/Output Compare Compute/Math Move/Logical File/Misc

Controller Organizer

- Controller Controller
 - Controller Tags
 - Controller Fault Handler
 - Power-Up Handler
- Tasks
 - MainTask
 - MainProgram
 - Parameters and Local Tags
 - MainRoutine
 - Unscheduled
 - Motion Groups
 - Assets
 - Logical Model
 - I/O Configuration
 - 1756 Backplane, 1756-A10
 - [0] 1756-L71 Controller
 - [1] 1756-ENBT/A ENET
 - Ethernet

Scope: Show: Enter Name

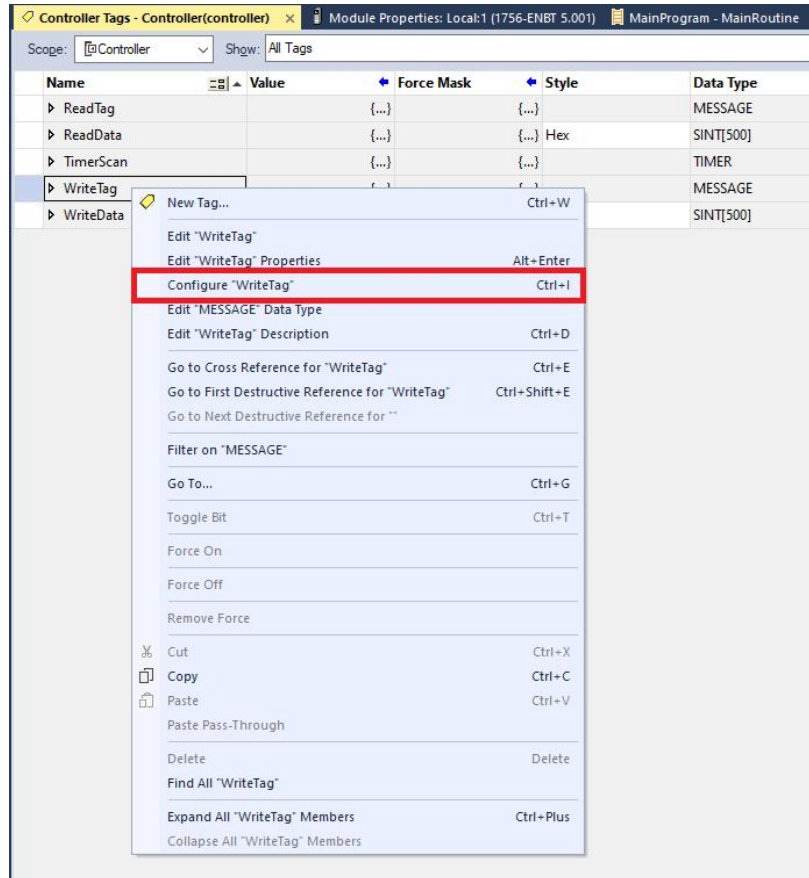
Name	Value	Force Mask	Style	Data Type	Description	Constant
TimerScan		{...}	{...}	TIMER		☐
ReadTag		{...}	{...}	MESSAGE		☐
ReadData		{...}	{...} Decimal	SINT[496]		☐
WriteTag		{...}	{...}	MESSAGE		☐
WriteData		{...}	{...} Decimal	SINT[492]		☐

Monitor Tags Edit Tags

Enter into the "Monitor Tags" interface and input some data in the "WriteData" tag. This data will be outputted to GT200-PN-MT through the PLC. As shown in the image below, 0x10, 0x20, 0x30, 0x40, 0x50, 0x60, 0x70, 0x80 and 0x90 are the data that will be outputted.

Controller Tags - Controller(controller) x MainProgram - MainRoutine						
Scope: Controller		Shgw: All Tags				
Name	Value	Force	Mask	Style	Data Type	Description
▶ TimerScan	{...}			{...}	TIMER	
▶ ReadTag	{...}			{...}	MESSAGE	
▶ ReadData	{...}			{...} Hex	SINT[496]	
▶ WriteTag	{...}			{...}	MESSAGE	
▲ WriteData	{...}			{...} Hex	SINT[492]	
▶ WriteData[0]	16#10			Hex	SINT	
▶ WriteData[1]	16#20			Hex	SINT	
▶ WriteData[2]	16#30			Hex	SINT	
▶ WriteData[3]	16#40			Hex	SINT	
▶ WriteData[4]	16#50			Hex	SINT	
▶ WriteData[5]	16#60			Hex	SINT	
▶ WriteData[6]	16#70			Hex	SINT	
▶ WriteData[7]	16#80			Hex	SINT	
▶ WriteData[8]	16#90			Hex	SINT	
▶ WriteData[9]	16#00			Hex	SINT	
▶ WriteData[10]	16#00			Hex	SINT	

Right-click "WriteTag" and select "Configure "WriteTag" as shown below:





In the new pop-up window, configure the following settings:

Message Type:	CIP Generic
Service Type:	Select "Set Attribute Single", and the relevant Service Code will become "10 (Hex)"
Class:	4 (Hex)
Instance:	101
Attribute:	3 (Hex)
Source Element:	Select "WriteData" tag, indicating that the data in the "WriteData" tag will become the data PLC outputs.

Source Length:

Use byte as unit, and this value should be less than or equal to the currently selecting bytes which instance represents (Configured bytes number in SST-EPN-CFG).

Message Configuration - WriteTag

Configuration* Communication Tag

Message Type: CIP Generic

Service Type: Set Attribute Single

Source Element: WriteData

Source Length: 492 (Bytes)

Service Code: 10 (Hex) Class: 4 (Hex)

Destination Element:

Instance: 101 Attribute: 3 (Hex)

New Tag...

☐ Enable ☐ Enable Waiting ☐ Start ☐ Done Done Length: 0

☐ Error Code: Extended Error Code: ☐ Timed Out

Error Path:

Error Text:

OK Cancel Apply Help

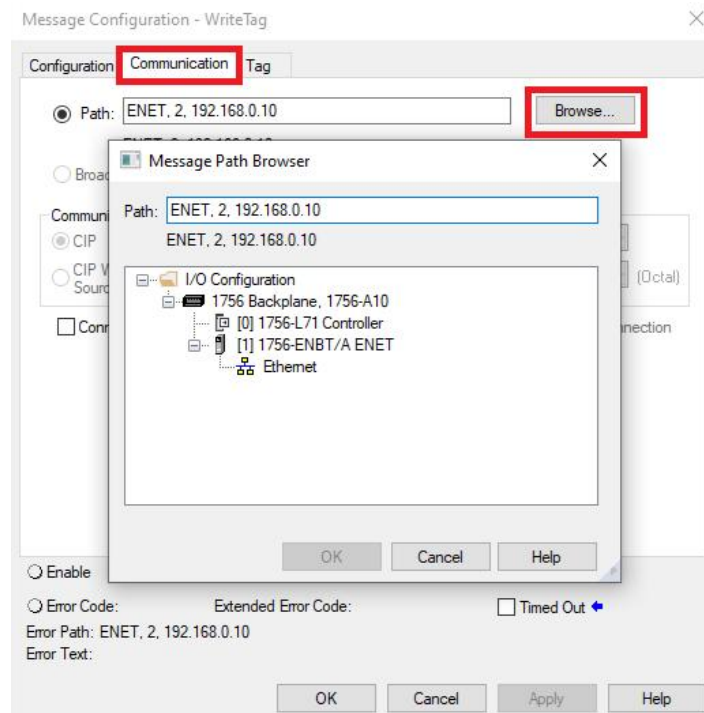
GT200-PN-MT Modbus TCP/PROFINET Gateway User Manual

Select the "Communication" tab and click the "Browse" button. Then input the network path to connect to the GT200-PN-MT.

Enter the network path in the following format:

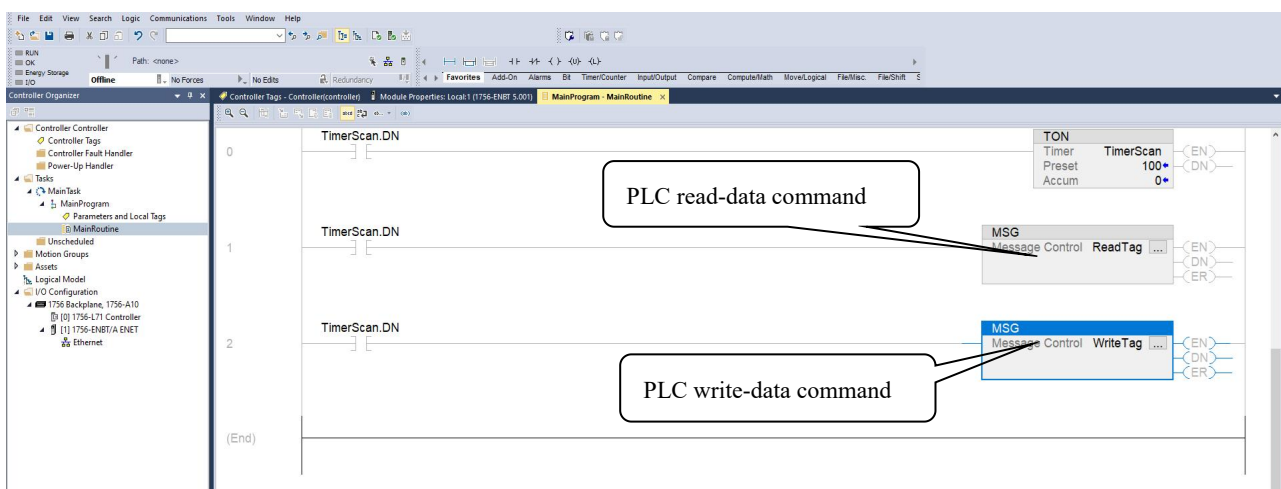
[EtherNet/IP Interface Name], 2 (Ethernet Communication), [GT200-PN-MT IP Address]

Then click "OK" to confirm:



Add a "MSG" command in the "MainRoutine" of "MainProgram" and select "WriteTag" as "Message Control" as shown below.

Download the PLC program to the PLC and set PLC to "Online" state,. The data in "WriteData" will be outputted to Modbus TCP master or server through GT200-PN-MT.



8 Working Principle of EtherNet/IP Scanner Mode Using MSG Method

The gateway, acting as an EtherNet/IP scanner, supports data read/write using the MSG method (Class 3). The MSG request and response are mapped to the output and input data of the PROFINET master device, respectively.

1. MSG Request Description (Output Data from the PROFINET Master)

No	Data	Bytes	Descriptions
1	Sequence No	1	Range: 0 to 255; any change indicates new data.
2	Reserved	1	0
3	Valid Length	2	Range: 6 to 1424
4	Service	1	Only supports 0x0E and 0x10.
5	Class	2	Valid range: 0 to 0x00FF, reserved range: 0x0100 to 0xFFFF.
6	Instance	2	Valid range: 0 to 0x00FF, reserved range: 0x0100 to 0xFFFF.
7	Attribute	1	Range: 0 to 0xFF
8	Write Data	N	Occupies multiple bytes. If it is a read operation, this part of the data is not present.

2. MSG Response Description (Input Data to the PROFINET Master)

No	Data	Bytes	Descriptions
1	Sequence No	1	Range: 0 to 255. Any change indicates new data. Typically, the value increments by 1, and when it reaches 255, it rolls over to 0.
2	State	1	Meaning: 0 – Invalid 1 – Success 2 – Failure 3 – Request valid length is out of allowed range 4 – Requested service not supported 5 – Received response data length exceeds the allowed valid response length. Note: For status 2 (Failure), if the mapped response area length is greater than 4 bytes, one byte of read data is used to display the



GT200-PN-MT

Modbus TCP/PROFINET Gateway

User Manual

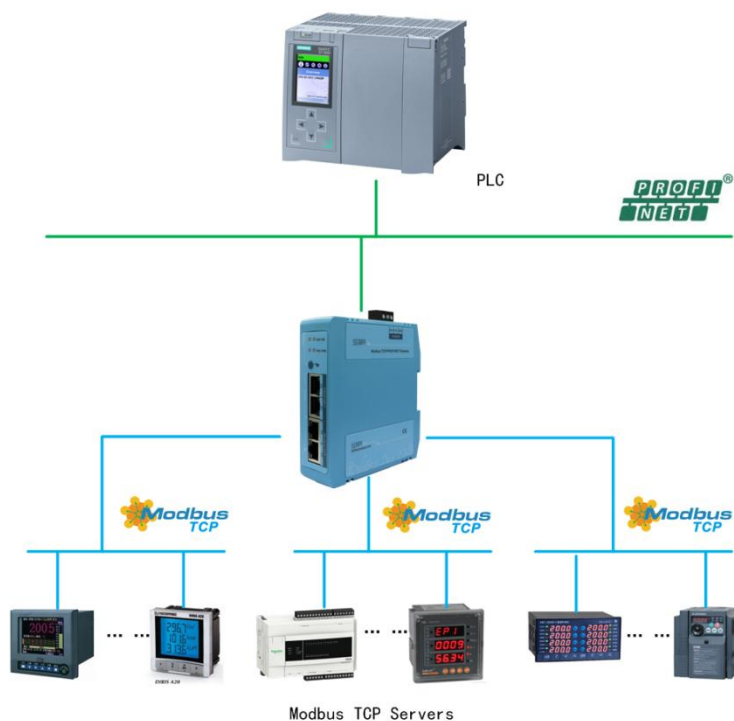
			EtherNet/IP status code. Otherwise, this byte is not included.
3	Valid Length	2	Range: 0 to 1424
4	Read Data	N	Occupies multiple bytes. If it is a write operation, this part of the data is not present.

9 Typical Application

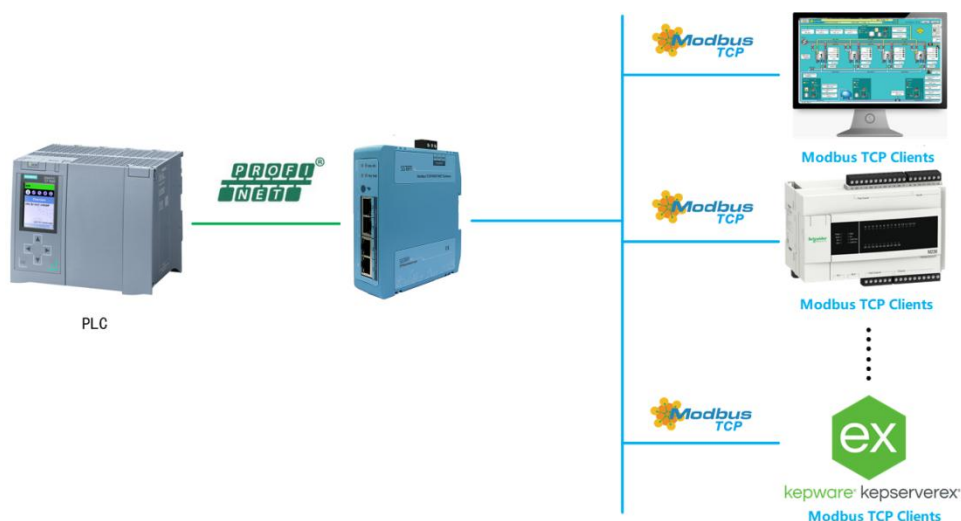
The GT200-PN-MT gateway can connect Modbus TCP devices to a PROFINET network. It functions as a bridge in the communication network to convert between Modbus TCP and PROFINET.

Here are some typical applications of GT200-PN-MT.

9.1 Modbus TCP Server Devices Interconnect with PROFINET Master PLC

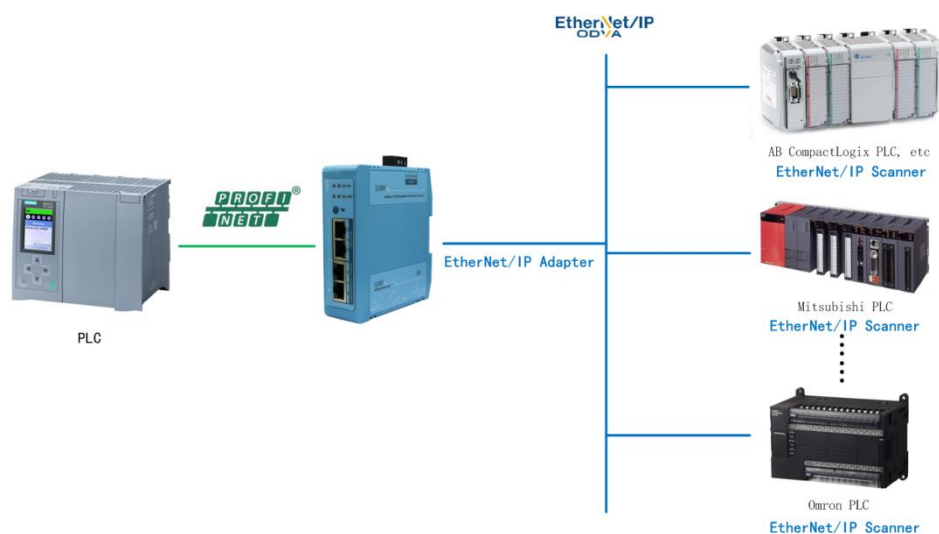


9.2 Modbus TCP Client Devices Interconnect with PROFINET Master PLC



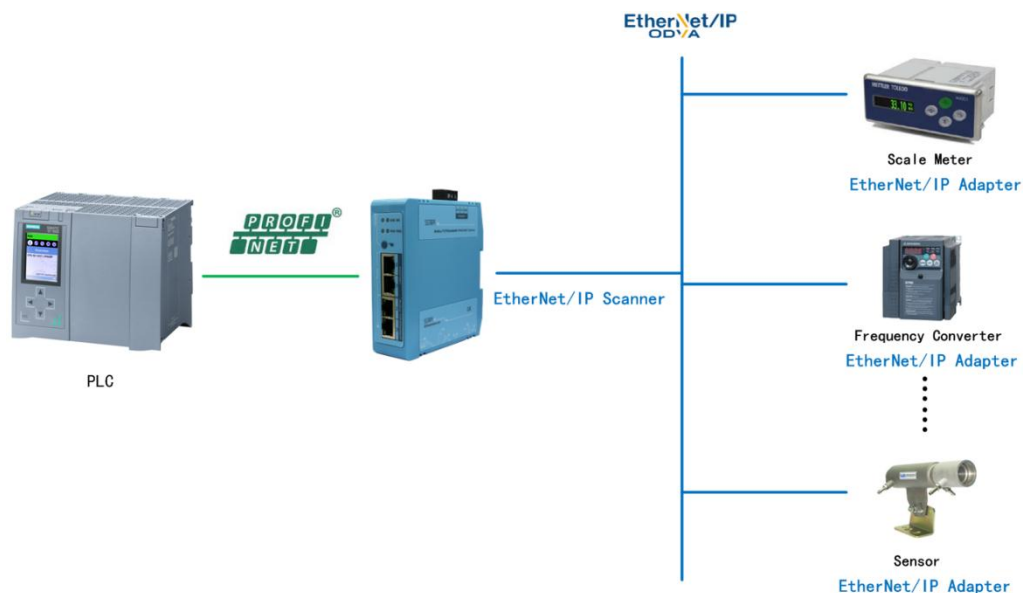
In the above two cases, different Modbus TCP client or server devices are connected to the same Siemens PLC with GT200-PN-MT gateway through an Ethernet switch, this allows many Modbus TCP clients or servers to communicate with PROFINET master PLC.

9.3 EtherNet/IP Scanner Interconnects with PROFINET Master PLC



In this case, any supported EtherNet/IP controller can be connected to a Siemens PLC with GT200-PN-MT gateway through Ethernet switch machine, this allows EtherNet/IP controller like AB CompactLogix, Mitsubishi or Omron PLC to communicate with PROFINET master PLC.

9.4 EtherNet/IP Adapters Interconnect with PROFINET Master PLC



In this case, any device supporting EtherNet/IP adapter can be connected to Siemens PLC with GT200-PN-MT gateway through an Ethernet switch, this allows EtherNet/IP adapters to communicate with PROFINET master PLC.

10 Troubleshooting

This chapter lists common issues encountered during installation and operation of the GT200-PN-MT gateway. For each issue, the possible cause and recommended solution are provided.

10.1 Power Issues Network Connection Issues

Symptom	Possible Cause	Solution
PROFINET PMS LED off	Ethernet cable disconnected or faulty	Check the Ethernet cable connection on the PROFINET port (P1 or P2). Replace the cable if damaged.
PROFINET PMS LED off	Connected to wrong port	Verify the cable is connected to the PROFINET port (P1/P2), not the Modbus TCP / EtherNet/IP port (P3/P4).
PROFINET PMS LED red	PROFINET communication error	Check the PROFINET master PLC configuration. Verify the GSDML file is correctly imported and the device name matches.
PROFINET PMS LED red	Configuration not downloaded	Download the configuration to the gateway using SST-EPN-CFG software. The gateway requires a restart after download.
Modbus TCP ENS LED off	Ethernet cable disconnected or faulty	Check the cable on the Modbus TCP / EtherNet/IP port (P3 or P4). Replace if damaged.
Modbus TCP / EtherNet/IP cannot communicate	IP address conflict or wrong subnet	Verify the gateway IP address. Default: DHCP (falls back to 192.168.0.11 after 30 seconds). Ensure your device is on the same subnet.
Modbus TCP / EtherNet/IP cannot communicate	DHCP server unavailable	If no DHCP server exists, wait 30 seconds after power-on for the fallback IP (192.168.0.11) to be assigned. Or configure a static IP via SST-EPN-CFG.
Cannot search/discover gateway	PC connected to wrong port	The gateway can only be discovered via the PROFINET port (P1/P2). Connect the PC to a PROFINET port.
Cannot search/discover gateway	PC NIC not on same network	In SST-EPN-CFG, select the correct network adapter that is on the same LAN as the gateway. Click "Refresh" to re-scan.

10.2 Configuration Issues

Symptom	Possible Cause	Solution
Configuration download fails	Gateway not found by SST-EPN-CFG	Ensure the PC is connected to a PROFINET port (P1/P2). Verify the PC and gateway are on the same subnet.
Configuration download fails	Firewall blocking communication	Temporarily disable the firewall or add an exception for SST-EPN-CFG.
Configuration does	Gateway not restarted	The downloaded configuration requires a gateway restart. Power

not take effect		cycle the device or use the restart function in SST-EPN-CFG.
IP address reverts after restart	DHCP mode selected but no DHCP server	The Modbus TCP / EtherNet/IP port defaults to DHCP. If no DHCP server is available, assign a static IP address in the configuration.
Unit ID mismatch (Modbus TCP)	"Check Unit ID" setting enabled	If "Check Unit ID" is enabled, the gateway only responds to Modbus commands matching its internal Unit ID. Disable this option or ensure the master sends the correct Unit ID.

10.3 Data Communication Issues

Symptom	Possible Cause	Solution
Data not updating	Wrong function code or register address	Verify the Modbus function code and register range in the configuration match the target device specifications.
Data values appear incorrect	Byte swap setting wrong	Check the "Byte Swap" parameter (No Swap / Two Bytes / Four Bytes / Two-Word Swap). Adjust to match the data format expected by the target device.
Data values appear incorrect	Bit offset wrong (for coils/discrete inputs)	For function codes 01, 02, 05, 15, verify the "Bit Offset" parameter (0–7) is set correctly.
PROFINET I/O data mismatch	Mapping address conflict	Use the "Conflict Detect" tool in SST-EPN-CFG to check for overlapping memory mapping areas. Re-run "Auto Mapping" if needed.
EtherNet/IP MSG read returns no data	Sequence number not changing	The MSG command requires the Sequence Number to change between requests. Verify your PLC logic increments this value.
EtherNet/IP MSG returns failure status	Invalid class/instance/attribute	Check the EtherNet/IP object parameters (Class, Instance, Attribute) against the target device documentation. Refer to Chapter 8 for status code definitions.



11 Frequently Asked Questions

Q1: What is the GT200-PN-MT and what does it do?

The GT200-PN-MT is a protocol gateway that enables data exchange between different industrial Ethernet networks. It supports **Modbus TCP** (client or server), **EtherNet/IP** (scanner or adapter), and **PROFINET** (slave/device). It allows devices on a Modbus TCP or EtherNet/IP network to communicate with a PROFINET master PLC (such as Siemens S7 series).

Q2: Which PLC brands are compatible with the GT200-PN-MT?

The GT200-PN-MT works with any PLC that supports **PROFINET** as a master/controller. Commonly used PLC brands include:

Siemens (S7-1200, S7-1500, ET 200SP, etc.)

Any other PROFINET-compatible controller

For the Modbus TCP / EtherNet/IP side, the gateway can connect to PLCs and devices from **Schneider Electric**, **Allen-Bradley (Rockwell)**, **OMRON**, **Mitsubishi**, and other manufacturers supporting Modbus TCP or EtherNet/IP.

Q3: How do I configure the gateway for the first time?

Follow the Quick Start Guide in Chapter 4:

Download and install the configuration software **SST-EPN-CFG** from www.sstautomation.com/Download1/

Connect your PC to a **PROFINET port** (P1 or P2) of the gateway

Power on the gateway (24V DC)

Open SST-EPN-CFG and use the "Upload" function to discover the gateway

Configure the PROFINET and Modbus TCP / EtherNet/IP parameters

Use "Auto Mapping" to allocate the data mapping buffer

Save the configuration and "Download" it to the gateway

Restart the gateway for the configuration to take effect

Q4: What is the default IP address of the gateway?

PROFINET port (P1/P2): Default factory IP is **192.168.0.33**. This port is used for both PROFINET communication and gateway configuration/discovery.

Modbus TCP / EtherNet/IP port (P3/P4): Default mode is **DHCP**. If no DHCP server is available, the gateway automatically assigns the fallback IP **192.168.0.11** after approximately 30 seconds.

Q5: How do I set a static IP address for the Modbus TCP / EtherNet/IP port?

Connect your PC to a PROFINET port (P1 or P2)

Open SST-EPN-CFG and upload the current configuration from the gateway

In the Modbus TCP or EtherNet/IP configuration interface, change "IP Assignment" from **DHCP** to **Static**

Enter the desired IP address, subnet mask, and default gateway

Download the configuration to the gateway and restart

Q6: What is the maximum data size the gateway can handle?

The PROFINET interface supports up to **1440 bytes of input data** and **1440 bytes of output data**. This capacity is shared across all configured Modbus TCP or EtherNet/IP commands. Use the "Auto Mapping" function in SST-EPN-CFG to efficiently allocate the mapping buffer.

Q7: What does "Byte Swap" mean and which option should I choose?

Byte Swap determines how multi-byte data (16-bit or 32-bit values) is ordered when transferred between different protocols. Different PLC vendors use different byte orders. The options are:

Option	Description	Example
No Swap	No byte order change	0x1234 → 0x1234
Two Bytes Swap	Swap high and low bytes of 2-byte data	0x1234 → 0x3412
Four Bytes Swap	Swap all 4 bytes of 4-byte data	0x12345678 → 0x78563412

Two-Word Swap	Swap the two 16-bit words of 32-bit data	0x12345678 → 0x56781234
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If your data values appear incorrect (e.g., swapped bytes), try a different Byte Swap setting until the data matches the expected format.

Q8: Does the gateway support ring/star network topologies?

Yes. The GT200-PN-MT supports **PROFINET MRP (Media Redundancy Protocol)** for ring network redundancy and **SR (System Redundancy)**. Each network segment (PROFINET P1/P2 and Modbus TCP / EtherNet/IP P3/P4) has two cascaded ports, supporting daisy-chain and ring topologies within each segment.

Important: Cascade connections are supported within the same port pair only. Do NOT connect a PROFINET port to a Modbus TCP / EtherNet/IP port in a cascade configuration.

Q9: How do I recover or reset the gateway if something goes wrong?

Try these steps in order:

Restart the gateway: Disconnect and reconnect the 24V DC power.

Check LED indicators: Refer to Section 11.5 for LED status interpretation.

Force fallback IP: For the Modbus TCP / EtherNet/IP port, disconnect the Ethernet cable and wait 30 seconds after power-on. The gateway will use fallback IP 192.168.0.11.

Re-download configuration: Connect via the PROFINET port, use SST-EPN-CFG to upload the current configuration, correct any issues, and re-download.

If the problem persists, contact SST Automation support at support@sstautomation.com.

Q10: Which operating systems does SST-EPN-CFG support?

SST-EPN-CFG is a Windows-based configuration software. It supports **Windows 7, Windows 10, and Windows 11** (both 32-bit and 64-bit editions). For the latest version and system requirements, visit the download page at www.sstautomation.com/Download1/.

Q11: Can I connect multiple Modbus TCP devices through one gateway?



GT200-PN-MT Modbus TCP/PROFINET Gateway User Manual

Yes. The GT200-PN-MT supports connecting multiple Modbus TCP client or server devices through an Ethernet switch connected to the Modbus TCP / EtherNet/IP port (P3 or P4). The gateway's data mapping buffer (up to 1440 bytes each for input and output) is shared across all configured devices. Plan your data requirements accordingly using the SST-EPN-CFG configuration software.

Q12: What protocol modes does the gateway support?

The GT200-PN-MT supports four operation modes on the non-PROFINET side:

Mode	Description
Modbus TCP Client (Master)	The gateway reads/writes data from/to Modbus TCP Server (Slave) devices.
Modbus TCP Server (Slave)	The gateway responds to read/write requests from Modbus TCP Client (Master) controllers.
EtherNet/IP Scanner	The gateway scans and exchanges data with EtherNet/IP Adapter devices.
EtherNet/IP Adapter	The gateway acts as an EtherNet/IP Adapter for an EtherNet/IP Scanner to connect to

Appendix A: Register Mapping Quick Reference

This appendix provides quick-reference tables for the most commonly used register mappings, data formats, and configuration parameters of the GT200-PN-MT gateway. For detailed explanations, refer to the source chapters indicated in each section.

A.1 Modbus TCP Function Codes & Mapping

Function Code	Modbus Data Type	Address Range	Mapping Address (HEX)	Max Data Count	Reference
01	Read Coils	00001–0xxxx	0x0000–0x0593	400	Chapter 5.3.2
02	Read Discrete Inputs	10001–1xxxx	0x0000–0x0593	400	Chapter 5.3.2
03	Read Holding Registers	40001–4xxxx	0x0000–0x0593	127	Chapter 5.3.2
04	Read Input Registers	30001–3xxxx	0x0000–0x0593	127	Chapter 5.3.2
05	Write Single Coil	00001–0xxxx	0x0000–0x0593	1	Chapter 5.3.2
06	Write Single Register	40001–4xxxx	0x0000–0x0593	1	Chapter 5.3.2
15	Write Multiple Coils	00001–0xxxx	0x0000–0x0593	400	Chapter 5.3.2
16	Write Multiple Registers	40001–4xxxx	0x0000–0x0593	127	Chapter 5.3.2
23	Read/Write Multiple Registers	40001–4xxxx	0x0000–0x0593	127	Chapter 5.3.2

Note: Mapping address range for read commands is 0x0000–0x0593. Write commands can use 0x4000–0x4593. Write commands operating as local data exchange can also use 0x0000–0x0593.

A.2 Byte Swap Modes

Mode	Description	Input Example	Output Result	Reference
No Swap	Original byte order preserved	0x1234	0x1234	Chapter 5.3.2
Two Bytes Swap	Swap high/low bytes within 2 bytes	0x1234	0x3412	Chapter 5.3.2
Four Bytes Swap	Swap all 4 bytes (1↔4, 2↔3)	0x12345678	0x78563412	Chapter 5.3.2
Two-Word Swap	Swap the two 16-bit words of 32-bit data	0x12345678	0x56781234	Chapter 5.3.2

Tip: If data values appear incorrect after configuration, the Byte Swap setting is the most

common cause. Try each mode until the data matches the expected format of your target device.

A.3 PROFINET I/O Data Mapping

Parameter	Specification	Reference
Max Input Data Size	1440 bytes	Chapter 1.2
Max Output Data Size	1440 bytes	Chapter 1.2
Mapping Address Range (Read)	0x0000–0x0593	Chapter 5.3.2
Mapping Address Range (Write)	0x4000–0x4593	Chapter 5.3.2
Output Command Modes	Serial Output / Parallel Output	Chapter 1.2

PROFINET input data = data read from Modbus TCP / EtherNet/IP devices and sent to the PROFINET master. PROFINET output data = data received from the PROFINET master and written to Modbus TCP / EtherNet/IP devices.

A.4 EtherNet/IP Object Mapping (MSG Method)

MSG Request (Output Data from PROFINET Master)

No.	Field	Bytes	Description
1	Sequence No	1	Range: 0–255. Any change indicates new data.
2	Reserved	1	Set to 0
3	Valid Length	2	Range: 6–1424
4	Service	1	0x0E (Get Attribute Single) or 0x10 (Set Attribute Single)
5	Class	2	Valid: 0–0x00FF. Reserved: 0x0100–0xFFFF.
6	Instance	2	Valid: 0–0x00FF. Reserved: 0x0100–0xFFFF.
7	Attribute	1	Range: 0–0xFF
8	Write Data	N	Present only for write operations (Service 0x10)

MSG Response (Input Data to PROFINET Master)

No.	Field	Bytes	Description
1	Sequence No	1	Echoes request sequence. Increments by 1, rolls over at 255.
2	State	1	0=Invalid, 1=Success, 2=Failure, 3=Valid length out of range, 4=Unsupported service, 5=Response exceeds max length
3	Valid Length	2	Range: 0–1424
4	Read Data	N	Present only for read operations (Service 0x0E)

A.5 Bit Offset Reference (Coils & Discrete Inputs)

For Modbus function codes 01 (Read Coils), 02 (Read Discrete Inputs), 05 (Write Single Coil), and 15 (Write Multiple Coils), the **Bit Offset** parameter (0–7) determines which bit within a byte the coil/discrete input data occupies.

Bit Offset	Bit Position	Example (Byte = 0x00)
0	Bit 0 (LSB)	0x01
1	Bit 1	0x02
2	Bit 2	0x04
3	Bit 3	0x08
4	Bit 4	0x10
5	Bit 5	0x20
6	Bit 6	0x40
7	Bit 7 (MSB)	0x80

A.6 Default Network Settings

Interface	Parameter	Default Value	Configurable
PROFINET (P1/P2)	IP Address	192.168.0.33	Yes
PROFINET (P1/P2)	Purpose	Communication + Configuration/Discovery	N/A
Modbus TCP / EtherNet/IP (P3/P4)	IP Assignment	DHCP	Yes (Static/DHCP)
Modbus TCP / EtherNet/IP (P3/P4)	Fallback IP	192.168.0.11 (after 30s without DHCP)	N/A
Modbus TCP / EtherNet/IP (P3/P4)	Purpose	Communication only (no configuration)	N/A