

Modbus / EtherNet/IP Gateway

GT200-EI-2RS485

User Manual

V 4.1



SST Automation

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Important Information

Warning

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

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

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1 Product Overview

1.1 Product Function

GT200-EI-2RS485 gateway enables the mutual conversion between the EtherNet/IP protocol and the Modbus protocol or other custom serial protocols (depending on the specific protocol). It allows multiple serial devices to be connected to the EtherNet/IP network, facilitating easy bidirectional data exchange. Both serial ports support RS-485.(GT200-EI-2RS's Serial port 1 supports RS485, while serial port 2 supports either RS485 or RS232) depending on the user's needs, which should be specified when ordering..

1.2 Feature

- ◆ Supports either RS485 or RS232 interfaces; Please specify the model when placing an order.
- ◆ The serial port has built-in termination resistors, making it suitable for various complex communication environments.
- ◆ Dual Ethernet ports with built-in Ethernet switching functionality, supporting cascading connections.
- ◆ Supports both static IP configuration and DHCP. If DHCP times out, the system automatically assigns the default IP: 192.168.0.11.
- ◆ Supports Non-DLR functionality and can be directly integrated into a DLR ring network.
- ◆ Easy to use configuration software SST-MI-CFG.

1.3 Technical specification

- [1] EtherNet/IP network is independent with two Modbus subnet;
- [2] Ethernet 10/100M adaptive;Built-in Ethernet switching functionality, supports cascading connections.
- [3] Support the ODVA Standard EtherNet/IP communication protocol;
- [4] Serial Port Parameters:
 - Operation mode: Half-duplex.,
 - Baud rate: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 bps optional.

- Data bits: 7, 8 optional.
- Parity: None, Odd, Even, Mark and space optional.
- Stop bits: 1,2 optional.

[5] Modbus master:

- Function code: 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H and 17H.
- Format: RTU and ASCII.
- Function: Cycle output, Disabled output, Change of value and Control word trigger.
- Each master can configure up to 100 Modbus commands.
- Supports auto demotion function of Modbus commands.
- Support IO status word.
- Support input data timeout clear/hold setting.
- Support control word function, there are disable, all commands and only write commands to choose from
- Modbus function codes 03H, 04H, 06H, 10H, and 17H support "byte swapping" functionality, helping users address the big-endian and little-endian data format issue between two networks.

[6] Two independent RS-485 interfaces with 1KV optical isolation;

[7] The maximum number of input and output bytes of EtherNet/IP:

Maximum number of input bytes: 492Bytes

Maximum number of output bytes: 492Bytes

[8] Power supply: 24VDC (9V - 30V), 110mA (24VDC);

[9] Working temperature: -4°F-140°F(-20°C- 60°C), relative humidity: 5% - 95% (no condensation);

[10] External dimensions (W*H*D): 1 in*4 in*3.6 in (25mm*100mm*90mm).

[11] Installation: 35mm DIN rail;

[12] Protection class: IP20;

[13] Test standard: EMC test standards.

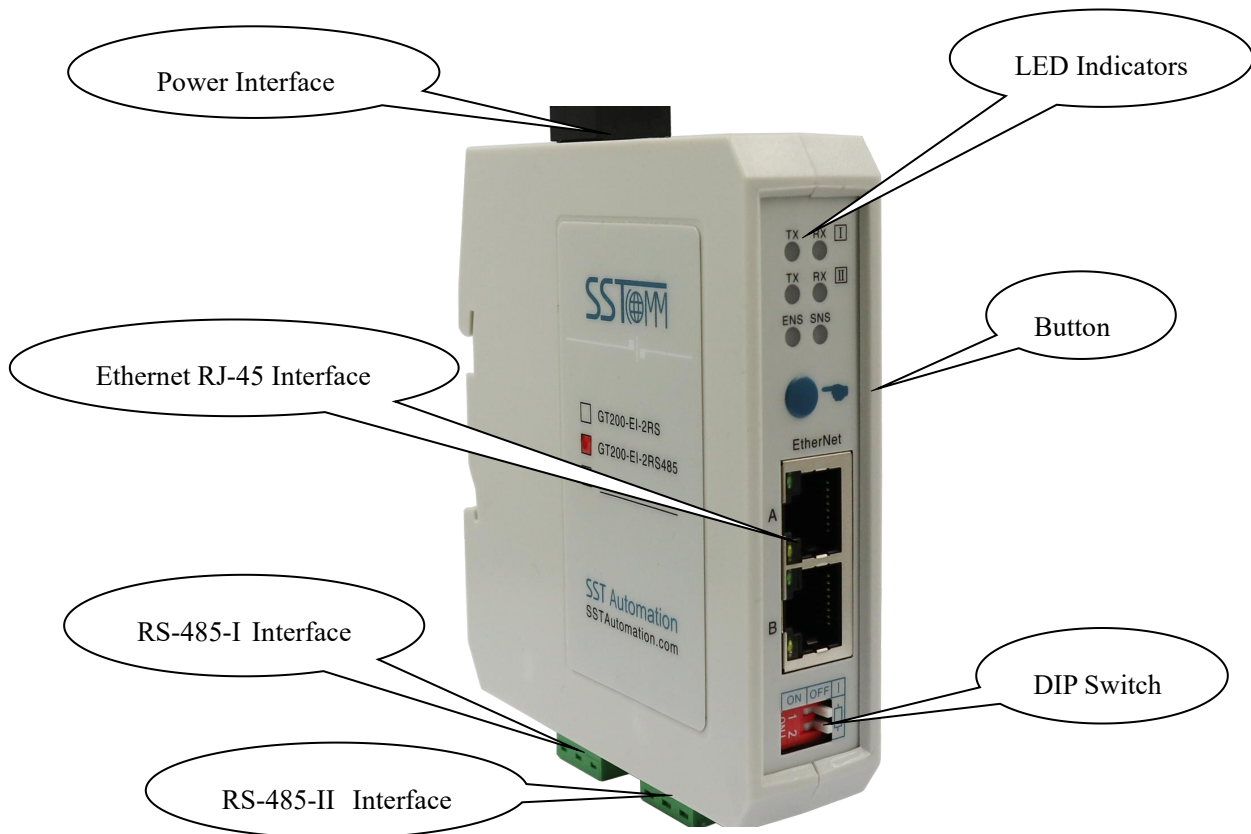
1.4 Revision History

Revision	Date	Chapter	Description
V4.1	9/5/2024	PART	supports Non-DLR function, Modbus master adds function code 23,etc.
V3.3	8/23/2022	PART	Updated the product picture and dimensions
V2.3, Rev A	3/26/2021	ALL	Supports changing to Modbus TCP function
V2.3	7/14/2017	ALL	New release



2 Hardware Description

2.1 Appearance



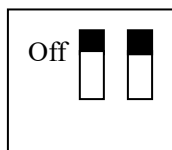
Notes: This picture is for reference only. The product appearance is subject to the actual product.

2.2 LED Indicators

Indicator	State	Description
Serial I TX	Flashing Green	Sending Modbus data
	OFF	No data transferring
Serial I RX	Flashing Green	Receiving Modbus data
	OFF	No data transferring
Serial II TX	Flashing Green	Sending Modbus data
	OFF	No data transferring
Serial II RX	Flashing Green	Receiving Modbus data
	OFF	No data transferring
ENS	Green	EtherNet/IP connection is established
	Flashing Green	EtherNet/IP connection is not established
	OFF	IP address conflict
	Flashing Red	Obtain IP settings via DHCP
SNS	Green	Modbus Communication is ready
ENS & SNS	ENE Orange & SNS OFF	Firmware update mode.
	SNS turn red and turns off in 500ms.	Locking Configurations
	SNS turn red for 300 ms, turns off for 400 ms, then turns on n for 300 ms before turning off.	Unlocking Configurations

2.3 DIP Switch

A 2-position DIP switch is used to configure whether the RS485 serial port has a termination resistor.



SW(Bit 1, Bit 2)	Pull-up resistor.	Pull-down resistor.	Termination resistor.
OFF, OFF	10 k Ω	10 k Ω	-
ON, ON	1.3 k Ω	1.3 k Ω	120 Ω

2.4 Button

Lock/Unlock Configuration:

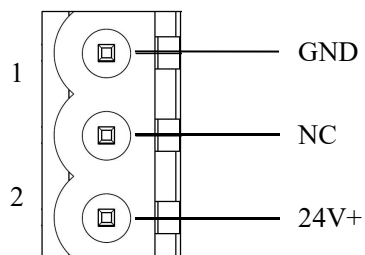
While the device is running, double-clicking the button will cause the SNS red light to turn on for 500 ms and then turn off, indicating that the configuration is locked. Double-clicking the button again will cause the SNS red light to turn on for 300 ms, off for 400 ms, and then on for another 300 ms before turning off, indicating that the configuration is unlocked.

When the configuration is locked, the configuration software can detect the device but cannot upload or download the device settings. Once the configuration is unlocked, the configuration software can detect the device and upload or download settings as normal.

2.5 Interface

2.5.1 Power Interface

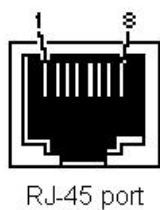
GT200-EI-2RS485 uses a 24V DC power supply. The power interface uses a 3-pin 7.62mm pluggable terminal block. The pinout is defined as follows.



Pin	Function
1	GND,
2	NC, no connection
3	24V+ , DC

2.5.2 Ethernet Interface

Ethernet interface apply RJ-45 connector, 10/100M adaptive.

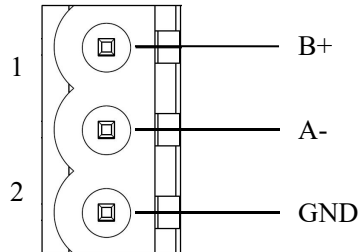


Pin	Signal Description
S1	TXD+, Tranceive Data+, Output
S2	TXD-, Tranceive Data-, Output
S3	RXD+, Receive Data+, Input
S4	Bi-directional Data+
S5	Bi-directional Data-
S6	RXD-, Receive Data-, Input
S7	Bi-directional Data+
S8	Bi-directional Data-



2.5.3 RS-485 Interface

1. Serial interface uses 3-pin pluggable terminal and users can wire it according to the wiring instructions on the panel.



Pin	Function
1	B(+), RS-485
2	A(-), RS-485
3	GND

2. Basic Characteristics of RS485 Transmission Technology:

Network Topology: Linear bus with active bus termination resistors at both ends. If communication quality is unstable, consider adding termination resistors at both ends ($120\ \Omega$ 1/2W).

Transmission Rate: 1200 bit/s to 115.2 Kbit/s.

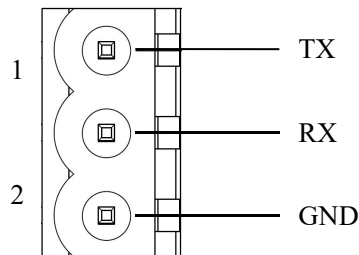
Medium: Shielded twisted pair cable, with the option to remove shielding depending on environmental conditions (EMC).

Number of Stations: 32 stations per segment (without repeaters), expandable up to 127 stations (with repeaters).

Connector: 3-pin pluggable terminal (RS485 uses 3 pins).

2.5.3 RS-232 Interface

The RS232 interface of the GT200-EI-2RS product uses an open 3-pin pluggable terminal, with the pin description as follows:

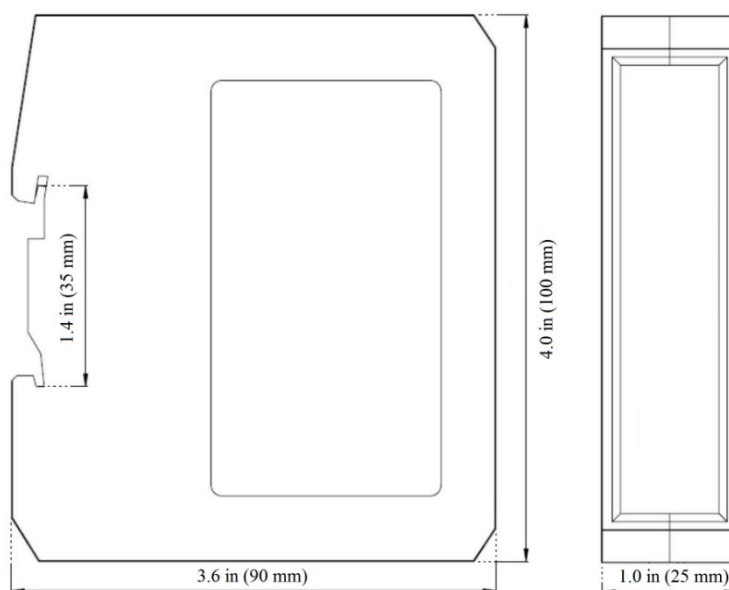


Pin	Function
1	TX
2	RX
3	GND

3 Hardware Installation

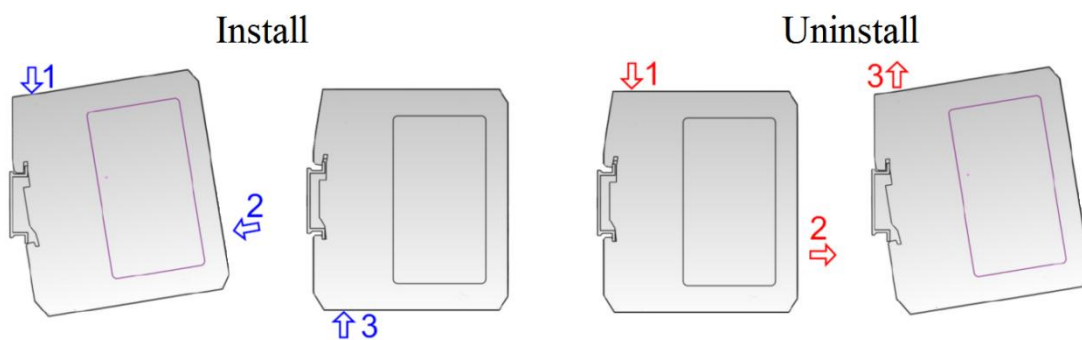
3.1 Mechanical Dimensions

1 in* 4 in* 3.6 in (25mm*100mm*90mm)



3.2 Installation Method

Using 1.4 in (35mm) DIN RAIL.





4 How to Start

4.1 Wiring

1. Complete the hardware wiring according to the manual "[2.5.1 Power Interface](#)" and use an Ethernet cable to connect the device and the PC to the same network segment.
2. Connect the serial device.
3. Power on the device.

4.2 Basic Software Operation

1. Download the software: Visit the official website of SST Automation (<https://www.sstcomm.com/>) to download the corresponding configuration software for the gateway, "SST-MI-CFG"

2. After installing the configuration software SST-MI-CFG, double-click the desktop shortcut to open the configuration interface. A default configuration is provided for reference, but users need to modify the settings according to their specific requirements. Once the configuration is complete, download it to the product. For detailed instructions on using the software, refer to Chapter 5.

- For information on device status and button operations, see Section 3.2 on indicators and Section 3.4 on buttons.
- If the gateway cannot be detected: Ensure that the computer and the device are on the same network segment. Check whether the network cable is correctly connected, or contact us for technical support assistance.
- If the download fails: Verify whether the configuration is correct and ensure the device is in the unlocked configuration mode. If issues persist, contact us for technical support.

3. After the configuration download is complete, the device can be rebooted either automatically or manually. Once the reboot is finished, the downloaded configuration will take effect, allowing normal communication.

Note: The factory default network setting for GT200-EI-2RS485 is DHCP. In DHCP mode, if IP allocation times out after 30 seconds, the gateway automatically assigns a fixed IP: 192.168.0.11.

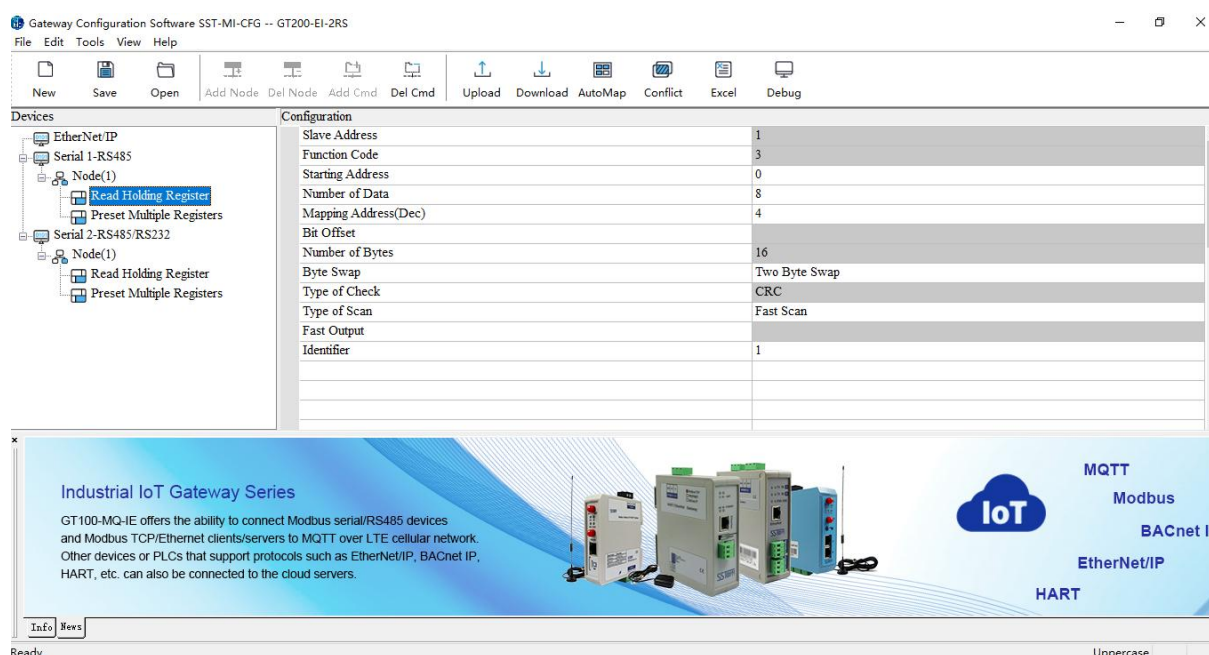
5 Configuration Software

5.1 Notes before Configuration

SST-MI-CFG is a product based on Windows platform, and used to configure GT200-EI-2RS485. It can set related parameters and commands of Modbus and other bus.

The document mainly introduces the use method of GT200-EI-2RS.

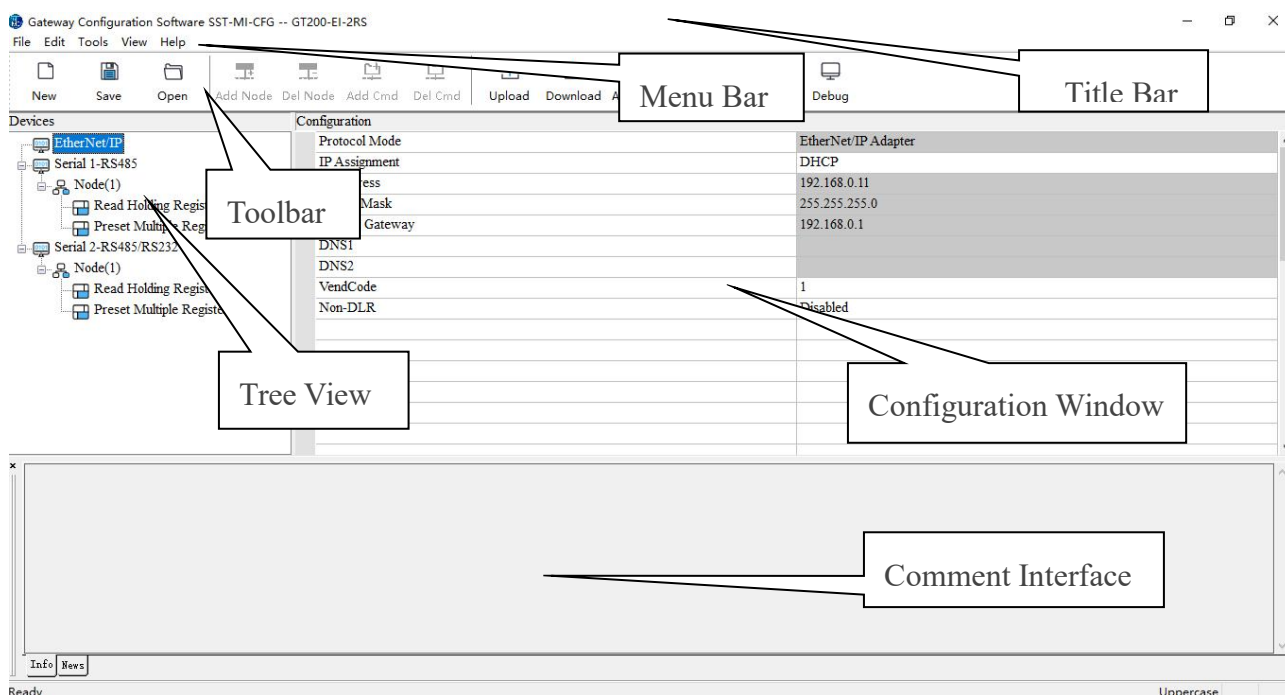
Double-click the icon to enter the main interface of the software:



5.2 User Interface

SST-MI-CFG interface include: title bar, menu bar, toolbar, status bar, equipment section, configuration section and notes section.

Notes: All the gray part in the software can not be changed.



Tool bar interface is shown as below:



New

New: Create a new configuration project.



Save

Save: Save the configuration project.



Open

Open: Open the configuration project.



Add Node

Add Node: Add a Modbus slave node.

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Add Cmd

Delete Node: Delete a Modbus slave node.



Add Cmd

Add Command: Add a Modbus command.



DelCmd

Delete Command: Delete a Modbus command.



Upload

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



Download

Download: Download the configuration file to the gateway.



AutoMap

AutoMap: Used to automatically calculate the mapped memory address without conflict by each command.



Conflict

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



Export

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

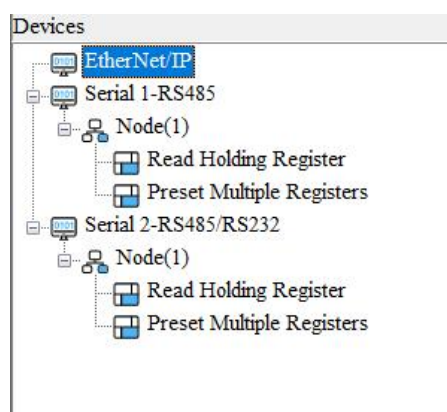


Debug

Debug: Monitor or modify the gateway memory buffer data.

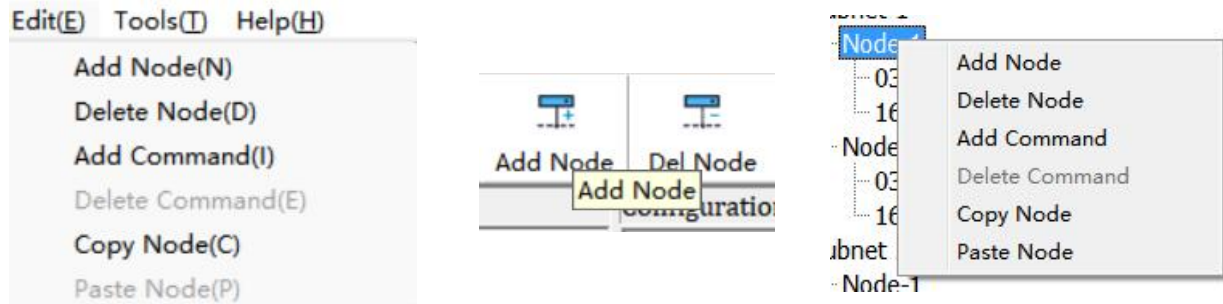
5.3 Operation of Devices view

5.3.1 Devices View Interface



5.3.2 Operation Mode

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

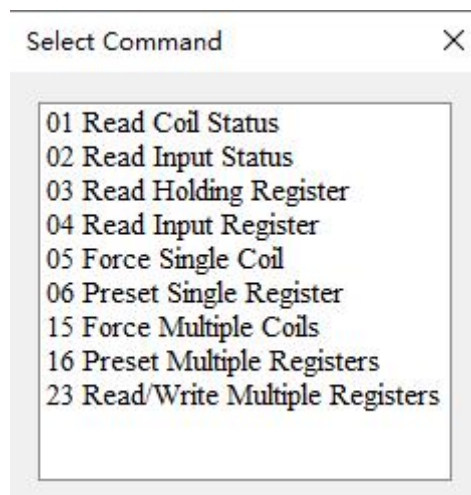


5.3.3 Operation types

1. Add nodes: Right click on subnet or existing nodes, and then perform the operation of adding a new node. Then there is a new node named "new node" under subnet.
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:

Currently, it supports the commands: 01, 02, 03, 04, 05, 06, 15, 16 and 23.

Select the command: Double click the command



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

5.4 Operation of Configuration View

5.4.1 Ethernet Configuration

In the interface of device view, click Ethernet, and then the configuration view is shown as follows:

Configurable items include: IP Assignment, IP Address, Subnet Mask, Gateway Address, DNS1, DNS2, VendCode, Non-DLR.

devices	Configuration																																		
EtherNet/IP Serial 1-RS485 Node(1) Read Holding Register Preset Multiple Registers Serial 2-RS485/RS232 Node(1) Read Holding Register Preset Multiple Registers	<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>VendCode</td><td>1</td></tr> <tr><td>Non-DLR</td><td>Disabled</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </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		VendCode	1	Non-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																																			
VendCode	1																																		
Non-DLR	Disabled																																		

Protocol Mode: Supports EtherNet/IP slave.

IP Assignment: Manual Assign, BOOTP, DHCP can be selected.

IP Address: Set the device IP address.

Subnet Mask: Set subnet mask of the device.

Gateway Address: Set gateway address.

DNS1: Set the device DNS1 address.

DNS2: Set the device DNS2 address.

VendCode: Can be modified based on requirements. Range: 1 to 65535, default value: 1.

Non-DLR Function: Supports "Off" and "On," with the default set to "Off."

If the device is used in a DLR ring network, enable this function; otherwise, disable it.

If used on a non-redundant branch of a DLR system, disable this function.

5.4.2 Serial Configuration

1.Protocol is Modbus master

Configurable parameters are shown as follows:

Baud Rate, Data Bits, Parity check mode, Stop bit, Transmission mode, Response timeout, Delay between polls, Polling mode of outputting commands, Time between two continuous pluses (the polling mode of outputting commands is pulse output), Scanning ratio, Status of Modbus Command Response, Demote on Failure, Timeouts to Demote, Demotion Period(ms), Control Word, Timeout Action, Modbus Command Retransmission Times.

Interface of configuration view is shown as follow:

Devices	Configuration																																
- EtherNet/IP - Serial 1-RS485 - Node(1) - Read Holding Register - Preset Multiple Registers - Serial 2-RS485/RS232 - Node(1) - Read Holding Register - Preset Multiple Registers	<table> <tr><td>Protocol Mode</td><td>Modbus Master</td></tr> <tr><td>Baud Rate</td><td>19200</td></tr> <tr><td>Data Bits</td><td>8 bits</td></tr> <tr><td>Parity Check</td><td>None</td></tr> <tr><td>Stop Bits</td><td>1 bit</td></tr> <tr><td>Transmission Mode</td><td>RTU</td></tr> <tr><td>Response Timeout (ms)</td><td>300</td></tr> <tr><td>Delay between Polls (ms)</td><td>0</td></tr> <tr><td>Write Command Output Mode</td><td>Change of Value</td></tr> <tr><td>Scan Rate</td><td>10</td></tr> <tr><td>Status of Modbus Command Response</td><td>Enabled</td></tr> <tr><td>Demote on Failure</td><td>Disabled</td></tr> <tr><td>Timeouts to Demote</td><td></td></tr> <tr><td>Demotion Period(ms)</td><td></td></tr> <tr><td>Control Word</td><td>Disabled</td></tr> <tr><td>Timeout Action</td><td>Clear</td></tr> </table>	Protocol Mode	Modbus Master	Baud Rate	19200	Data Bits	8 bits	Parity Check	None	Stop Bits	1 bit	Transmission Mode	RTU	Response Timeout (ms)	300	Delay between Polls (ms)	0	Write Command Output Mode	Change of Value	Scan Rate	10	Status of Modbus Command Response	Enabled	Demote on Failure	Disabled	Timeouts to Demote		Demotion Period(ms)		Control Word	Disabled	Timeout Action	Clear
Protocol Mode	Modbus Master																																
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Parity Check	None																																
Stop Bits	1 bit																																
Transmission Mode	RTU																																
Response Timeout (ms)	300																																
Delay between Polls (ms)	0																																
Write Command Output Mode	Change of Value																																
Scan Rate	10																																
Status of Modbus Command Response	Enabled																																
Demote on Failure	Disabled																																
Timeouts to Demote																																	
Demotion Period(ms)																																	
Control Word	Disabled																																
Timeout Action	Clear																																

Baud Rate: There are 300, 600, 1200, 2400, 9600, 19200, 38400, 57600 and 115200bps to be selected.

Data bits: 8 or 7 bits

Parity: There are none, odd, even, mark and space to be selected.

Stop Bits: There are 1 and 2 to be selected.

Transmission Mode: There are RTU and ASCII to be selected.

Response timeout: When the Modbus master send commands, the time waiting for response from the slave, the range is 300-60000ms.

Delay between polls: After an command of Modbus having been sent and having received correct response, the time before next command being sent, the range is: 0 - 2500ms.

Output Mode:

Modbus writing command (output command) has 3 kinds of outputting modes: Cycle, Forbidden, Change of Value.

Cycle: The same with Modbus read command, and output according to the scanning ratio.

Forbidden: Prohibit outputting Modbus write command.

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

Scan Rate: Rate of slow-scan and quick-scan. If the quick-scan command sends 10 times, slow-scan command sends 1 time.

Status of Modbus Command Response: Supports "Disabled" and "Enabled".Default Value: Enabled.

When the Modbus status word is set to "Enabled," each command uses a bit to indicate its execution status. If the command is successfully executed, the corresponding bit is set to 1; otherwise, it is set to 0.

Demote on Failure: Supports "Disabled" and "Enabled," with the default set to "Enabled."

When Demote on Failure is "Enabled," after a certain number of command response failures (errors), if the command is set for fast scanning, it will be downgraded to slow scanning. This parameter applies only to Modbus read commands and continuously output write commands.

Timeouts to Demote: After n command response failures (errors), the system enters auto downgrade mode. The value of n can be configured, with a range of 1 to 255, and the default is set to 3.

Demotion Period(ms): When the Demotion Time timeout the command will promote a fast command. The range of the parameter value is 100 to 3600000ms. Default value is 10000ms.

Control Word: Generate a control word at the front of the output data buffer, one command corresponds to one bit, and the command takes effect by setting the corresponding position; there are disable, all commands, and only write commands optional.

Output Mode + Control Word:

Change of Value + All Commands = Each command corresponds to 1 bit, according to the control bit is set to 1 and 0 to control the sending of the corresponding command. The function of the status word is equivalent to a switch. Setting the address to 1 means that the corresponding command allows communication, and 0 means that communication is forbidden.

Change of Value + Only Write Command = Same as above, read command communicates normally, only when the write command control bit is 1, the write command can output data change, the control bit is 0, the write command cannot be output.

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Cycle+ All Commands = Each command corresponds to 1 bit, according to setting the control bit to 1 or 0, to control the sending of the corresponding command. The function of the status word is equivalent to a switch. Setting the address to 1 means that the corresponding command allows communication, and 0 means communication is forbidden.

Cycle + Only Write Command = Same as above, read command communicates normally, only for write command, when the corresponding control bit is 1, write command can be output continuously

Forbidden+ All Commands = The function of the status word is useless, the writing command is forbidden and the communication of the reading command is normal.

Forbidden + Only Write Command = same as above.

Output once + All Commands = When it is enable, the value of the control word must be set to 0 first, and then set to 1, now a read command or write command can be issued. After the communication is finished, it needs to be set to 0 first, and then set to 1 to execute the next command.

Output once + Only Write Command = Same as above, read command communicates normally, only for write command.

Output once + Disable = Write command starts from the gateway power on, as long as the output data is not 0, it will only output once, and then no longer output, unless the gateway is reset or restarted.

2. User Config mode

Devices	Configuration
EtherNet/IP	Protocol Mode
Serial 1-RS485	Baud Rate
Serial 2-RS485/RS232	Data Bits
Node(1)	Parity Check
Read Holding Register	Stop Bits
Preset Multiple Registers	Frame Type
	Time Interval between Characters (ms)
	Frame Length
	Start Delimiter
	End Delimiter
	Enable Auto Sending
	Period of Auto Sending (ms)
	Enable CRC Check
	Enable Data Length Mapping on Ethernet Side
	Transaction No.
	Memory Starting Address of Sending Data

Frame Type: There are three control modes for receiving data via the serial port: Time Interval between Character, Frame count and Delimiter.

Time Interval between Character: Determines the end of a frame of serial data by judging the time interval between characters.

Frame count: Determines the end of a frame by counting the number of characters received.

Delimiter: Determines the start and end of a frame by recognizing the start and end delimiters of the data

frame.

Time Interval between Character(ms): The maximum allowed time interval between characters. Range: 10 to 60,000 ms, Default: 10 ms.

Frame Length: The number of characters in a data frame received via the serial port, only valid when the control mode is set to "Frame length." Range: 1 to 254, Default: 111.

Start Delimiter: The start character of the received data frame, only valid when the control mode is set to "Delimiter". When data bits are set to 8 bits: Range is 0 to 255. When data bits are set to 7 bits: Range is 0 to 127. Default value: 0.

End Delimiter: The Ending character of the received data frame, only valid when the control mode is set to "Delimiter." When data bits are set to 8 bits: Range is 0 to 255. When data bits are set to 7 bits: Range is 0 to 127. Default value: 0.

Enable Auto Sending: Supports "Enabled" and "Disabled," with the default set to "Disabled."

Enabled: The serial port sends data periodically according to the automatic send interval, regardless of whether the serial data has changed.

Disabled: Data is sent only when there is a change in the data to be transmitted.

Period of auto Sending(ms): The time interval between each cycle for automatically sending serial port data. This setting is only valid when "Enable Auto Sending" is enabled. Range: 10-60000ms. Default Value: 1000ms.

Enable CRC Check: Supports "Disabled" and "Enabled".

Disabled: Don't use CRC check.

Enabled: Sending data through a serial port can automatically add two bytes of CRC checksum. The serial port can automatically determine whether the CRC checksum is correct when receiving data, and automatically remove two bytes of CRC checksum from EtherNet/IP input data.

Only valid when the Data Bits is "8 bits" and the Frame Type is "Time Interval between Characters" or "Frame Length". Default Value: Disabled.

Enable Data Length Mapping on Ethernet Side: Supports "Disabled" and "Enabled". Default Value: Enabled

The first byte in Ethernet input data indicates the length of serial receiving data frame.

Transaction No.:

Add a byte at the frame header to represent the transaction sequence number, which identifies the data frame, with

When inputting data on the EtherNet/IP end, input one frame of data with a transaction sequence number plus 1.

Memory Starting Address of Sending Data:

Length of Sending Data:The number of bytes mapped to the output buffer;Range: 2-256.

Map address offset in input buffer;Data Direction Serial->EtherNet/IP;Range: 0-490.

5.4.3 Node Configuration

Devices	Configuration	
EtherNet/IP	Slave Address	1
Serial 1-RS485		
Node(1)		
Read Holding Register		
Preset Multiple Registers		
Serial 2-RS485/RS232		
Node(1)		
Read Holding Register		
Preset Multiple Registers		

5.4.4 Command Configuration

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Devices	Configuration
EtherNet/IP	Slave Address: 1
Serial 1-RS485	Function Code: 3
Node(1)	Starting Address: 0
Read Holding Register	Number of Data: 8
Preset Multiple Registers	Mapping Address(Dec): 4
Serial 2-RS485/RS232	Bit Offset: 16
Node(1)	Number of Bytes: 16
Read Holding Register	Byte Swap: Two Byte Swap
Preset Multiple Registers	Type of Check: CRC
	Type of Scan: Fast Scan
	Fast Output: 1
	Identifier: 1

Starting Address: The starting address of register or switching value or loop and so on in Modbus slave and the range is 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.

Number of Data: The length of data. Two bytes are one data length.

Function code (3, 4, 16, 23). Range: 1-100.

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

Mapping Address(DEC): The starting address of data in memory buffer of the module.

The address range of data mapping in the module memory:

Read command :0~491.

Write command : 0~491.

Bit Offset: For the bit operation commands, the position range of start-bit byte is 0 - 7.

Byte Swap: There are four mode of Byte Swap: No swap, Double-byte swap, Four-byte swap and Four-Byte Big-endian and Little-endian Swap.

Double-byte swap: The high and low bytes of 2 bytes (one register) are exchanged,e.g., 0x1234 to 0x3412.

Four-byte swap: The first two bytes are exchanged with the last two bytes,e.g., 0x12345678 to 0x56781234.

Four-byte Big-endian and Little-endian Swap: e.g., 0x12345678 to 0x78563412.

Type of Scan: There are two kinds of scanning mode: quick-scan and slow-scan. It is fit for requests of user about quick-scan or slow-scan of different commands. Slow-scan is equal to quick-scan being multiplied by scan ratio.
(Configure it in the interface of subnet configuration interface)

Fast Output: This option is valid only in Change of Valuet - write command mode.



Identifier: The unique number of this command within the current serial.

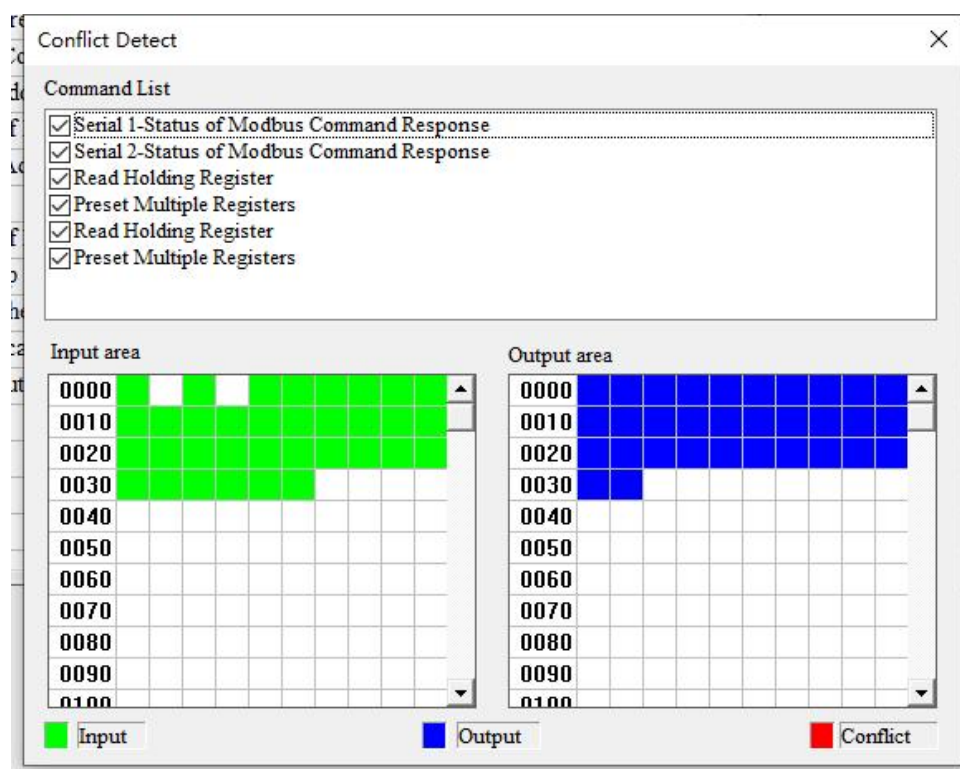
5.4.5 Annotation View

The Annotation view displays an explanation of the corresponding configuration item. For example, when you configure the Mapped Address, the Comments view displays the following.

Mapping Address(Dec):
The mapping address range of data in module memory:
Read command: 0-491.
Write command: 0-491.

5.5 Conflict Detection

For the detection of whether there is conflict of "the starting address of memory mapping", if conflict it can adjust in time. The interface is shown as follow:



5.5.1 Operation of Command List

All the configuration commands can be shown at the command list. Each select box before command is used for checking the memory-mapping location of that command. Click on the command can select the check box, and in the memory-mapping area it can show the corresponding share of spatial location. Click the command again will remove the selected box and it doesn't show the mapping location. The function can be used to conflict detect of memory-mapping area.



5.5.2 Operation of Memory Mapping Area

Memory mapping area is divided two parts: input area and output area.

Input-mapping address: 0x0000 - 0x0240;

Output-mapping address: 0x4000 - 0x4240.

Each box represents a byte address.

Green: Read command show in the input-mapping area; no conflict;

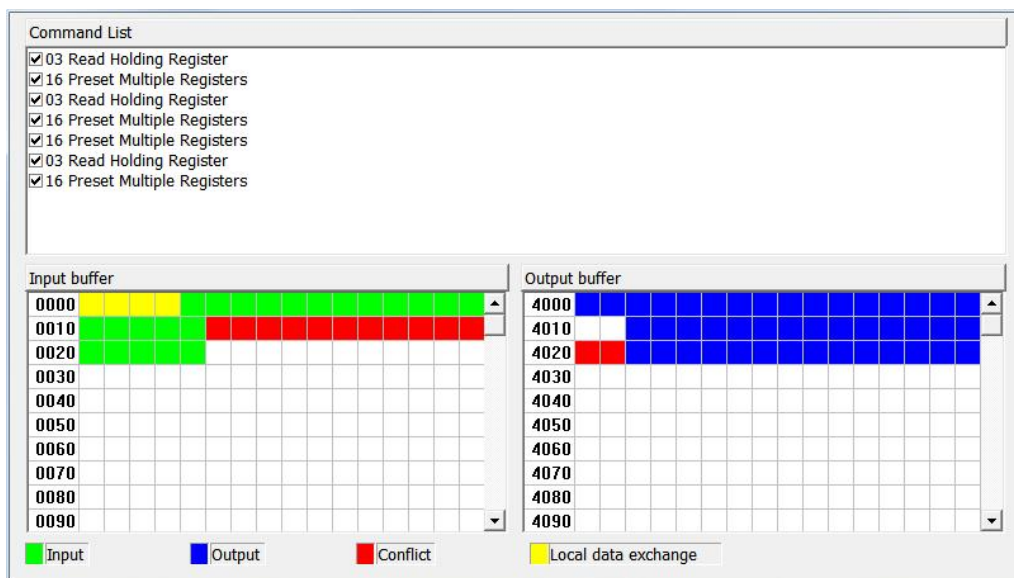
Yellow: Write command show when the mapping addresses in the input area; no conflict;

Blue: When the address mapping area is located in the output area; no conflict.

Red: Output area or input area, different commands occupy the same byte address, the byte is shown as red.

For bit operation commands, the meanings of above shows are also applicable.

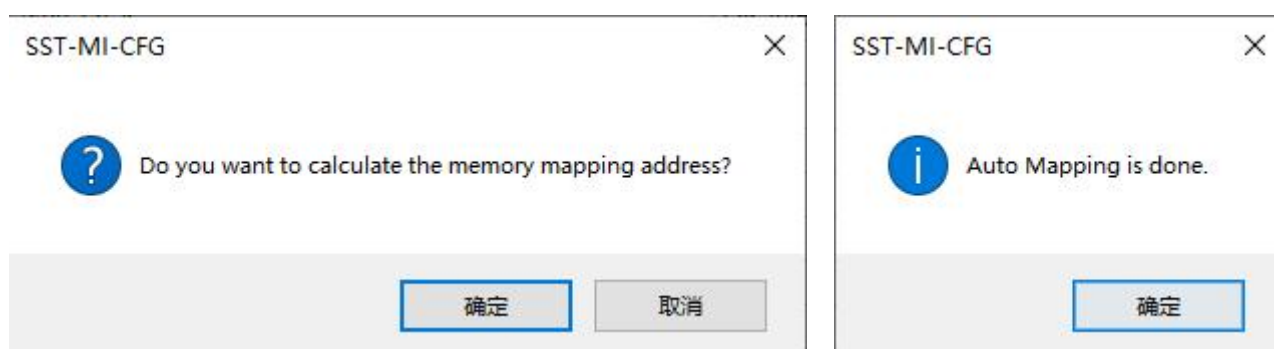
Click the input-output regional grid, whether the grid is occupied or not is shown as follows:



5.6 Auto Mapping

Auto Mapping function automatically calculates the mapping address and fills in the values. Once activated, this function re-applies the preset data. After auto-mapping, there will be no address conflicts in the mapped buffer. This function is related to the 'Number of Data' parameter, which must not be empty.

To use auto-mapping, select 'Auto-Mapping' from the 'Tools' menu, or click the 'Auto-Mapping' icon, and the following prompt will appear:



5.7 Hardware Communication

5.7.1 Search Device

Before configuring the GT200-EI-2RS485 parameters, the user must first search for the GT200-EI-2RS485 device. This configuration software provides two methods to search for the GT200-EI-2RS485 device that the user intends to configure.

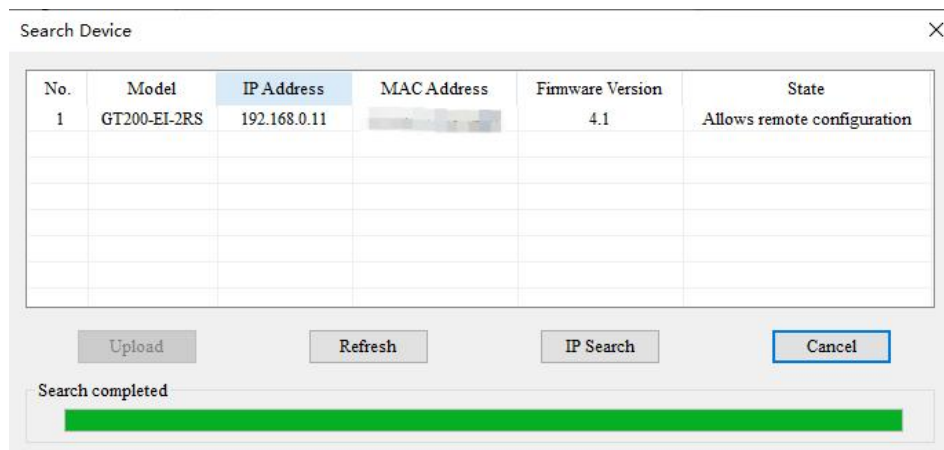
Method 1: Search for All Devices on the Ethernet

Click the "Upload" or "Download" button in the software toolbar, and the software will search for all GT200-EI-2RS485 devices on the Ethernet. The found devices will then be displayed in the list on the main page.

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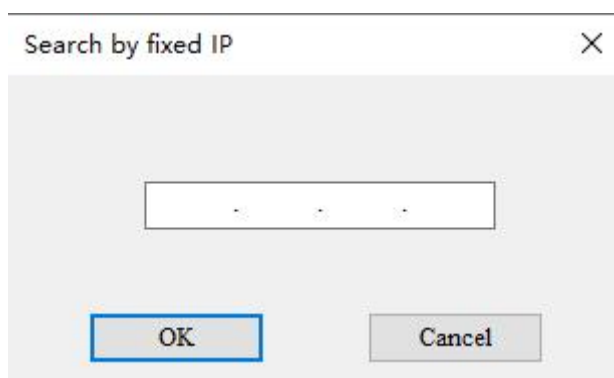
The 'Search Device' dialog box contains a table with the following data:

No.	Model	IP Address	MAC Address	Firmware Version	State
1	GT200-EI-2RS	192.168.0.11		4.1	Allows remote configuration

Below the table are buttons for 'Upload', 'Refresh', 'IP Search', and 'Cancel'. A 'Search completed' status bar with a green progress indicator is at the bottom.

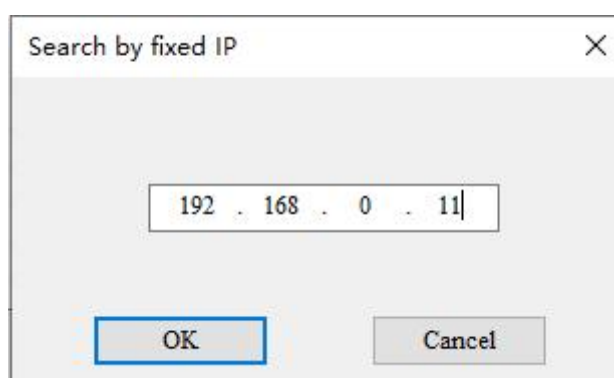
Method 2: Search for Devices by Specified IP

Click the "IP Search" button in the device search interface, and a dialog box will appear prompting for the IP address to search.



The 'Search by fixed IP' dialog box features a single text input field for entering an IP address. Below the field are 'OK' and 'Cancel' buttons.

After entering the correct IP address, the software will search the network for GT200-EI-2RS485 device with that IP address.



The 'Search by fixed IP' dialog box shows the IP address '192 . 168 . 0 . 11' entered into the input field. The 'OK' and 'Cancel' buttons remain at the bottom.

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The 'Search Device' dialog box contains a table with the following data:

No.	Model	IP Address	MAC Address	Firmware Version	State
1	GT200-EI-2RS	192.168.0.11	[blurred]	4.1	Allows remote configuration

Below the table are four buttons: 'Upload', 'Refresh', 'IP Search' (highlighted with a blue border), and 'Cancel'. At the bottom, there is a 'Search completed' label and a green progress bar.

After the device is found, click 'OK,' and the device information will be displayed in the main interface list.

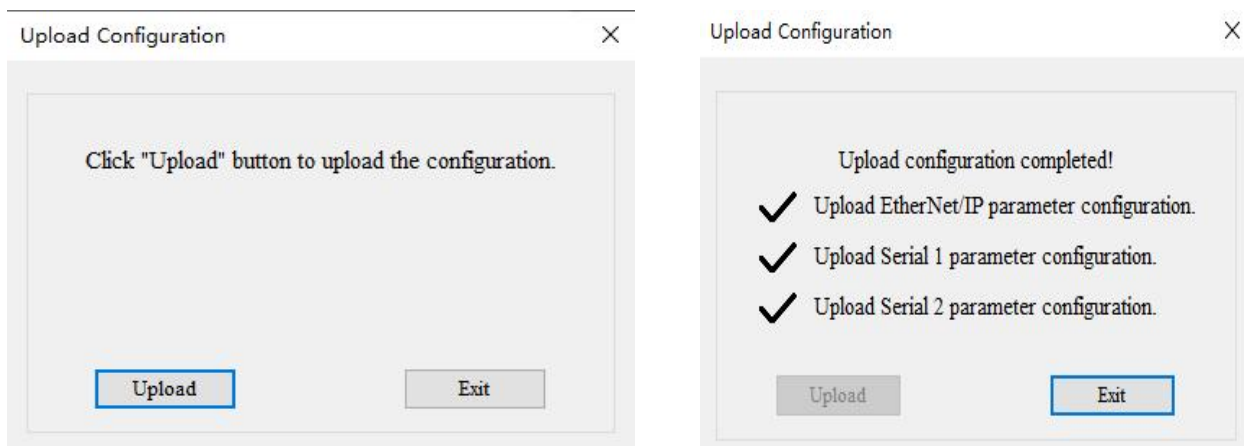
Note: If the user selects "Search by Specified IP," please ensure the accuracy of the entered IP address; otherwise, the device will not be found.

5.7.1 Upload Config

Choose to upload configuration dialog box will pop up the search appliance:

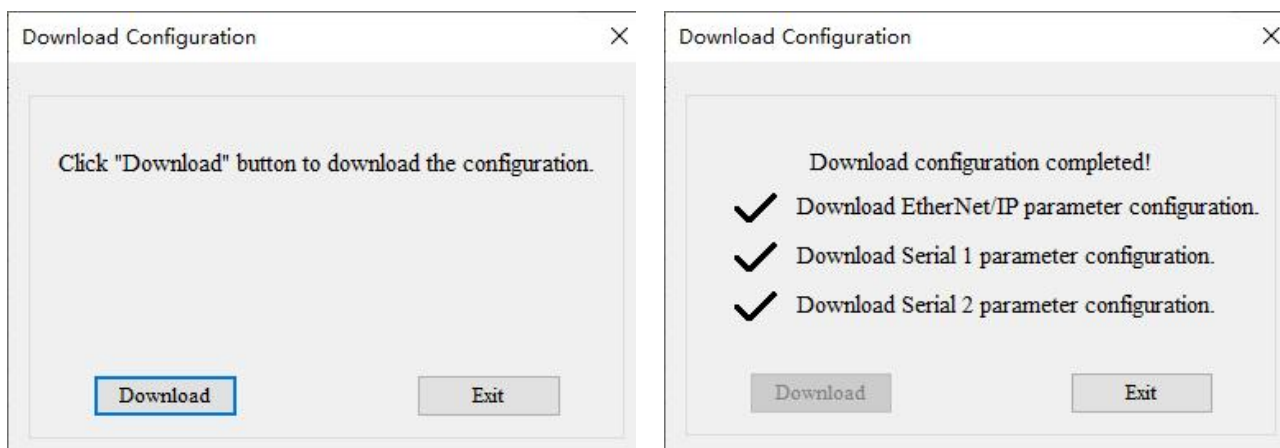
This is an identical screenshot of the 'Search Device' dialog box shown in the previous block, featuring the same table with one device and the same set of buttons and progress bar.

Select the device you want to configure and click "Upload". Gateway configuration information will be uploaded to the software from the device. The pop-up window is as follows:



5.7.2 Download Config

Download configuration and upload configuration similarly:

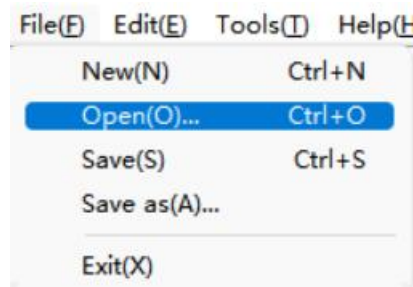


Notes: Before downloading, make sure all the configuration has been completed and correct.

5.8 Load and Save Configuration

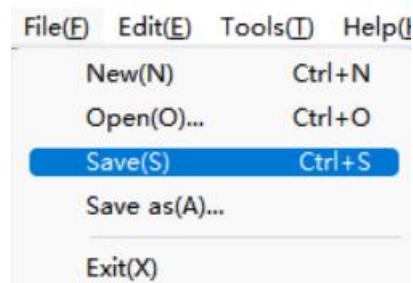
5.8.1 Load Configuration Project

Select "Open" and then you can open a project:



5.8.2 Save Configuration Project

Select "Save" can save the project:



5.9 Export Excel

Excel document helps users to examine the configuration related.

Choose the icon , save the configuration as excel document and choose the right path.

5.10 Debug

The debugging feature offers two types of debugging modes:

"Debug Modbus" is only available when the serial port is in Modbus master mode.

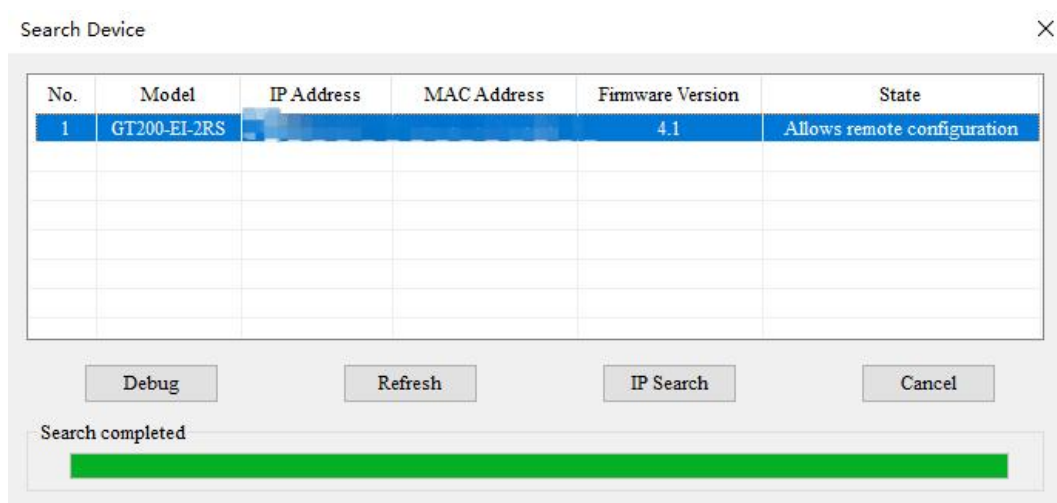
"Debug Buffer" is available in both Modbus master mode and general mode.

These modes allow for specific testing and analysis based on the selected configuration and communication protocol.

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After selecting the debugging type, the device search interface appears as follows:



Select the desired device for debugging and click 'Debug' to enter the debugging interface.

5.10.1 Debugging Modbus

The interface for debugging Modbus functionality is shown below:

The Debug window displays a table of Modbus transactions and input fields for debugging. The table has the following columns: Serial Index, State, Slave Address, Function Code, Starting Address, and Data / exception code.

Serial Index	State	Slave Address	Function Code	Starting Address	Data / exception code
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 00 00 00 00 00 00 00 ...

Read Data: 12 34 56 78 00 00 00 00 00 00 00 00 00 00 00 00

Memory Mapping Address: 4000 H

Data: 00 01 02 03

Buttons: Save Data, Pause Show, Clear Data, Send, Exit

Memory Mapped Address: The starting address where data is written into the gateway's memory.

Data: The data to be written into the gateway's memory.

When the input buffer data in the gateway memory times out or there is no response:

The Debug window displays a table of Modbus transactions with 'Response Timeout' states. The table has the following columns: Serial Index, State, Slave Address, Function Code, Starting Address, and Data / exception code.

Serial Index	State	Slave Address	Function Code	Starting Address	Data / exception code
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				
1	Response Timeout				

Read Data: 12 34 56 78 44 44 00 00 00 00 00 00 00 00 00 00

Memory Mapping Address: 4000 H

Data: 00 01 02 03

Buttons: Save Data, Pause Show, Clear Data, Send, Exit

When the input buffer data in the gateway memory is correct:

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Serial Index	State	Slave Address	Function Code	Starting Address	Data / exception code
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...

Read Data: 12 34 56 78 44 44 00 00 00 00 00 00 00 00 00 00

Memory Mapping Address: 4000 H

Data: 00 01 02 03

Save Data Pause Show Clear Data Send Exit

Once the user has correctly filled in the 'Memory Mapped Address' and 'Data,' the 'Send' button can be clicked to transmit the data packet.

Debug

Serial Index	State	Slave Address	Function Code	Starting Address	Data / exception code
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	3	0	12 34 56 78 44 44 00 00 00 00 00 ...
1	Correct response	1	16	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...

Read Data: 01 00 03 02 00 00 00 00 00 00 00 00 00 00 00 00

Memory Mapping Address: 4000 H

Data: 00 01 02 03

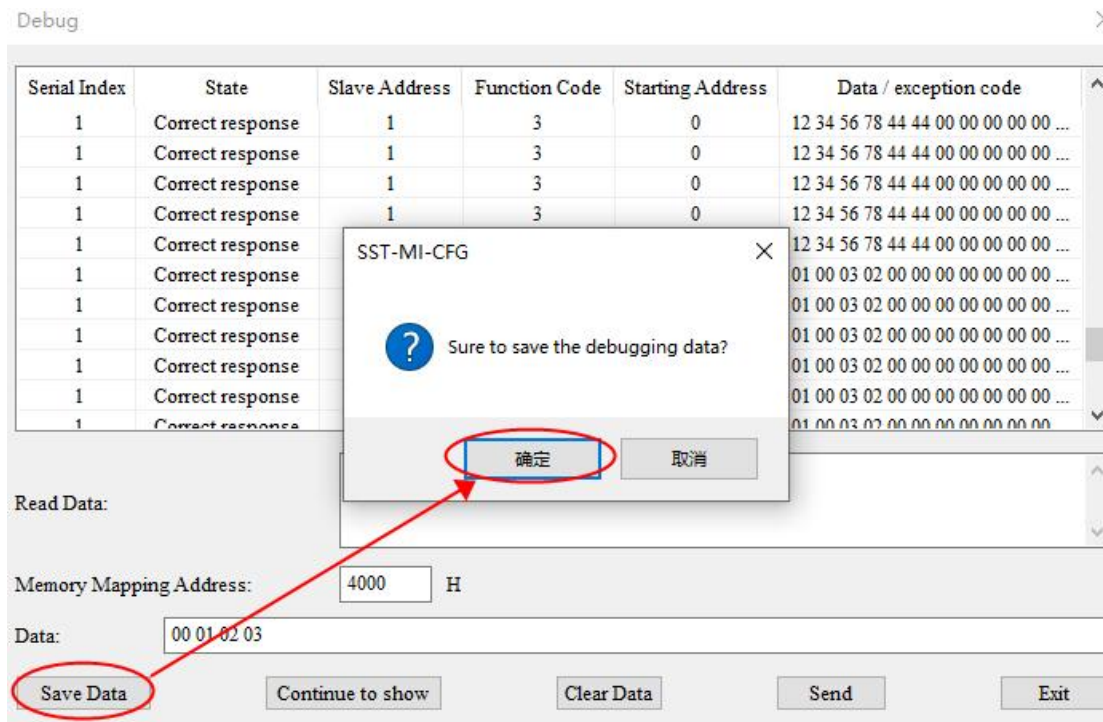
Save Data Continue to show Clear Data Send Exit

The user can click the 'Save' button to store the received data on the computer's hard drive.

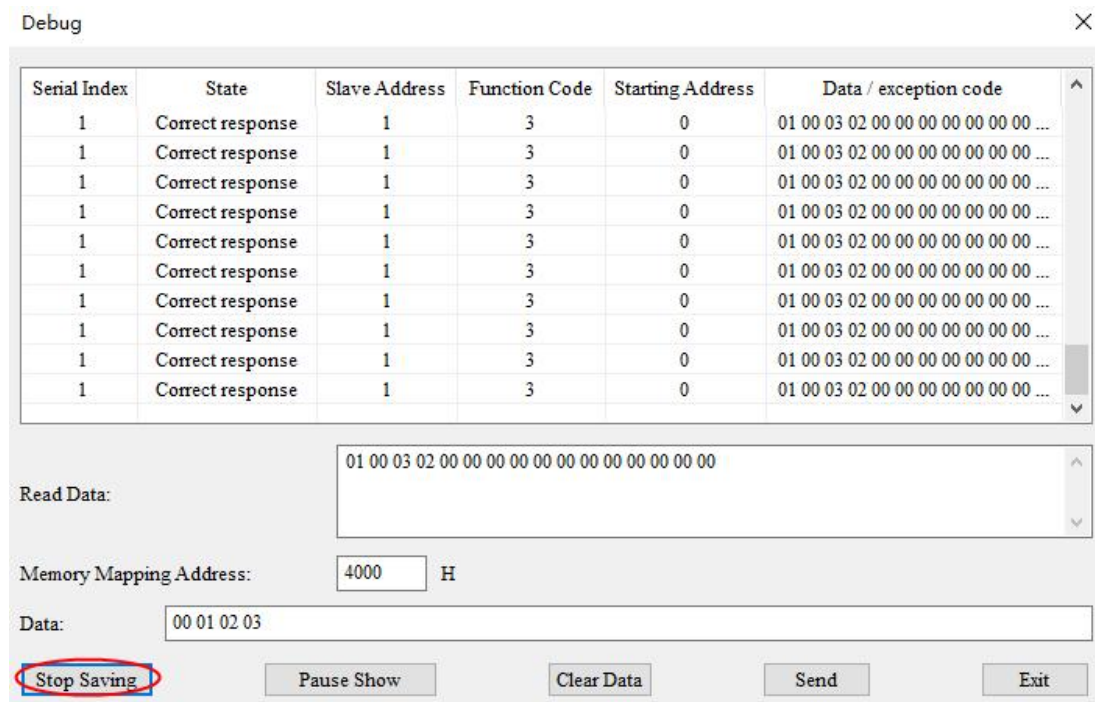
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After saving, the user can click the 'Stop Saving' button to stop storing the received data on the computer's hard drive.



Click to open the .txt file saved to the hard drive.

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Serial Index	1	
State	Correct response	
Slave Address	1	
Function Code	3	
Starting Address	0	
Data / exception code	01 00 03 02 00 00 00 00 00 00 00 00 00 00 00	

Serial Index	1	
State	Correct response	
Slave Address	1	
Function Code	3	
Starting Address	0	
Data / exception code	01 00 03 02 00 00 00 00 00 00 00 00 00 00 00	

Serial Index	1	
State	Correct response	
Slave Address	1	
Function Code	3	
Starting Address	0	
Data / exception code	01 00 03 02 00 00 00 00 00 00 00 00 00 00 00	

The user can click the 'Pause show' button to stop displaying the received data.

Debug

Serial Index	State	Slave Address	Function Code	Starting Address	Data / exception code
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 00 00 ...

Read Data:

01 00 03 02 00 00 00 00 00 00 00 00 00 00

Memory Mapping Address:

4000

H

Data:

00 01 02 03

Save Data

Pause Show

Clear Data

Send

Exit

After pausing, the user can click the 'Resume Display' button to continue displaying the received data.

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Serial Index	State	Slave Address	Function Code	Starting Address	Data / exception code
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...
1	Correct response	1	3	0	01 00 03 02 00 00 00 00 00 00 00 ...

Read Data: 01 00 03 02 00 00 00 00 00 00 00 00 00 00

Memory Mapping Address: 4000 H

Data: 00 01 02 03

Save Data Continue to show Clear Data Send Exit

5.10.2 Debugging Buffer

The interface for Debugging Buffer is shown 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	00	01	02	03	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
0x40D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0x40E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Write Output Buffer Data

Address 4000 H Write

Data

Position According to Address(Hex): Position

Save Data Stop Debugging Exit

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The user can switch the buffer to be debugged through the 'Buffer Selection' option.

Buffer selection

☐ Input Buffer ☒ Output Buffer

The data from the selected buffer for debugging will be displayed in the table interface below.

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	
0x0000	03	00	00	00	00	01	02	03	00	00	00	00	00	00	00	00	
0x0010	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0020	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0030	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0040	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0050	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0060	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0080	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x0090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x00A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x00B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x00C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x00D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
0x00E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	

The user can quickly navigate to the corresponding address for debugging by entering the address in the 'Position According to Address(HEX)' field and clicking the 'Position' button.

0x00E0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

0x00F0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Write Input Buffer Data

Address H

Data

Position According to Address(Hex):

The user can write data into the corresponding buffer by clicking the 'Write' button in the 'Write Input Buffer Data' section:

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Address: The starting address where data is written into the gateway's memory.

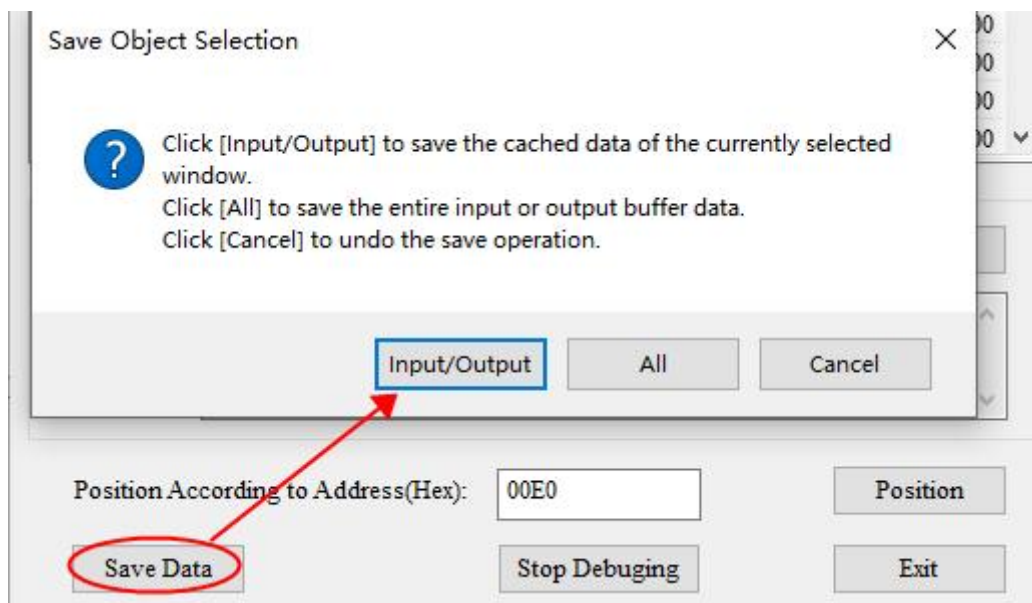
Data: The data to be written into the gateway's memory.



The 'Write Input Buffer Data' dialog box contains a label 'Address' followed by a text input field containing '0000' and a dropdown menu set to 'H'. To the right is a 'Write' button. Below the address field is a label 'Data' followed by a large, empty text area with a vertical scrollbar on the right.

The user can click the 'Save Data' button to store the received data on the computer's hard drive.

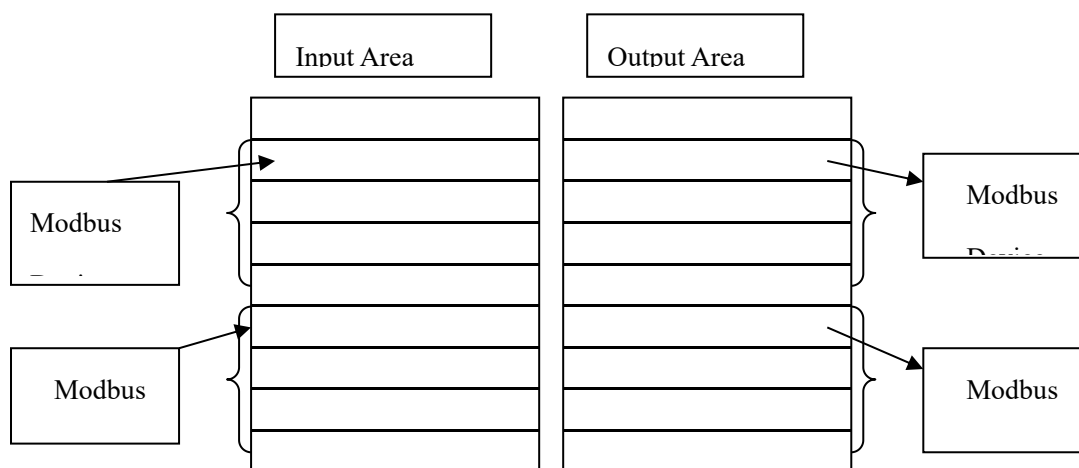
By selecting 'Input/Output,' only the buffer data displayed in the current window of the selected buffer will be saved. By selecting 'All,' the entire buffer data of the selected buffer will be saved.



The 'Save Object Selection' dialog box features a question mark icon and the following instructions: 'Click [Input/Output] to save the cached data of the currently selected window.', 'Click [All] to save the entire input or output buffer data.', and 'Click [Cancel] to undo the save operation.' At the bottom are three buttons: 'Input/Output', 'All', and 'Cancel'. The 'Input/Output' button is highlighted with a blue border. A red arrow points from the 'Save Data' button in the background window to the 'Input/Output' button. The background window shows a 'Position According to Address(Hex):' field with '00E0' and buttons for 'Position', 'Save Data', 'Stop Debugging', and 'Exit'. The 'Save Data' button is circled in red.

6 Modbus Master Operating Principle

The data conversion between Modbus and EtherNet/IP in the GT200-EI-2RS485 is established through a "mapping" relationship. There are two data buffers in the GT200-EI-2RS485: one is the EtherNet/IP network input buffer, and the other is the EtherNet/IP network output buffer. Modbus read commands write the retrieved data into the network input buffer, where it is available for reading by the EtherNet/IP network. Modbus write register commands take data from the network output buffer and output it to the corresponding Modbus device through write commands.

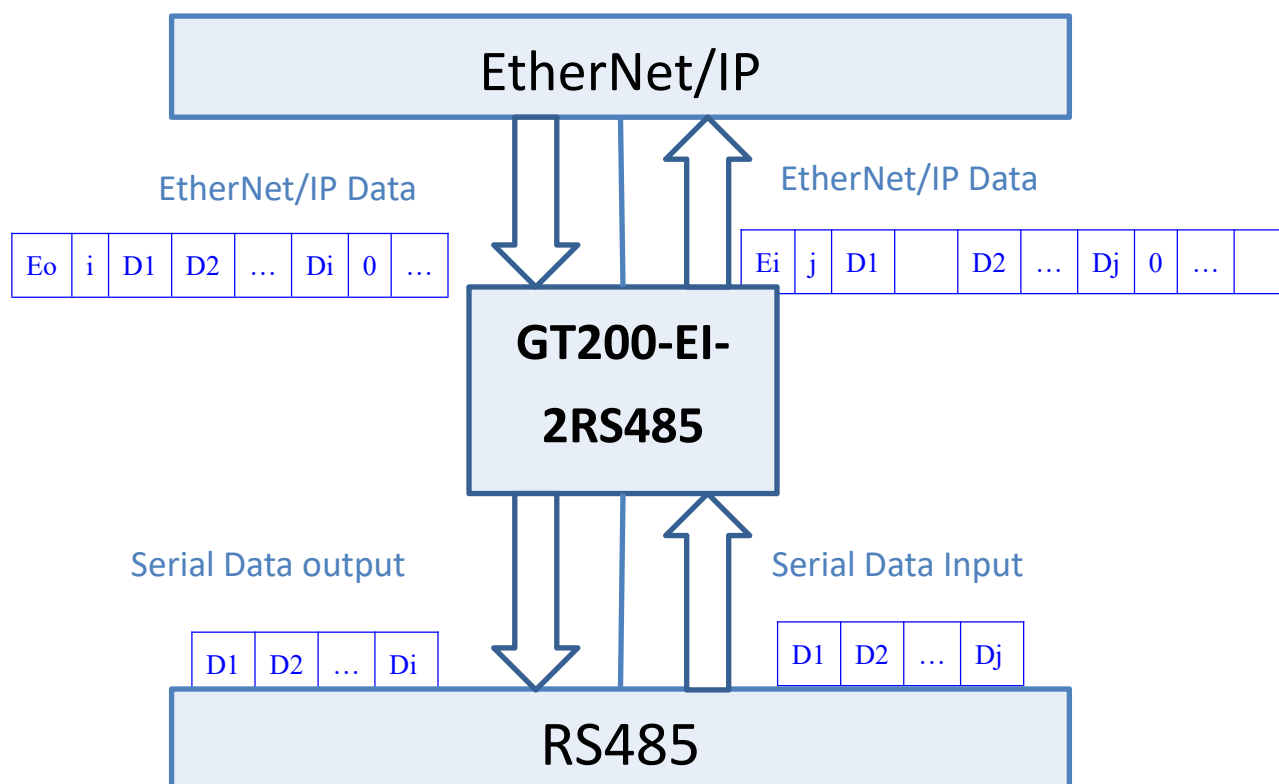


The user can configure up to 100 commands, with each Modbus command capable of reading a group of consecutive Modbus registers.

7 User Config

7.1 Data Exchange

This gateway facilitates data exchange between the EtherNet/IP industrial Ethernet protocol and the serial port. The data conversion and transmission between EtherNet/IP and the serial port is bidirectional. EtherNet/IP output data is sent to the serial bus via the serial port, while data received through the serial port is placed into the EtherNet/IP input data buffer. The data exchange is illustrated as shown below:



- **In the diagram above:** E_o is the transaction number of the EtherNet/IP output data. i is the number of serial data to be sent, contained in the output data. $D_1 - D_i$ are the serial data being sent. E_i is the transaction number of the EtherNet/IP input data. j is the number of serial data received, contained in the input data. $D_1 - D_j$ are the serial data received



7.2 User Config

EtherNet/IP Output Data Format:

[Transaction Number] [Serial Output Data (n)] [Serial Output Data 1] ... [Serial Output Data n] [0x00] [0x00]
|— n —| |— m —|

Note:

The EtherNet/IP output byte count should be a number greater than or equal to $n+2$.

The M number of 0x00 bytes are padding data (which can be any value), and $n+m+2$ should equal the EtherNet/IP output byte count.

Transaction Number: When sending output data, the transaction number must be incremented by one to indicate a new data frame.

Example:

If the user selects 8 bytes for EtherNet/IP input and output, with a serial output data length of 3 and data values of 01 02 03, and the current transaction number is 01, the output data format will be:

[01][03][01][02][03][00][00][00]

EtherNet/IP Input Data Format:

[Transaction Number] [Serial Output Data (n)] [Serial Output Data 1] ... [Serial Output Data n] [0x00] [0x00]
|— n —| |— m —|

Note:

The EtherNet/IP input byte count should be a number greater than or equal to $n+2$.

The M number of 0x00 bytes are padding data, and $n+m+2$ should equal the EtherNet/IP input byte count.

Transaction Number: Incrementing the transaction number by one indicates the presence of a new input data frame.

Example:

If the user selects 8 bytes for EtherNet/IP input and output, with a serial output data length of 3 and data values of 04 05 06, and the current transaction number is 01, the input data format will be:

[01][03][04][05][06][00][00][00]

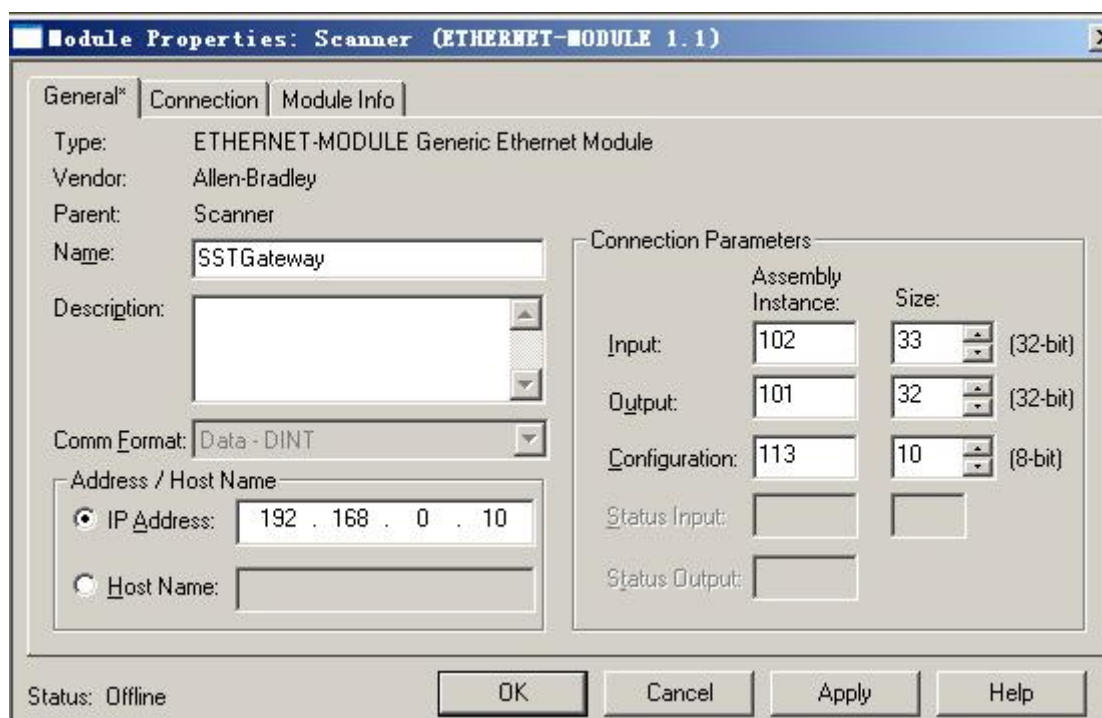
8 EtherNet/IP Connection Parameters

Connection parameters the adapter provides are as below:

Parameters \ Data Size	128 Bytes	256 Bytes	492 Bytes
Input Instance	102	112	122
Output Instance	101	111	121
Configuration Instance	103	113	123

Notes: The Input data size should include 4-byte status. For example, when using the 256-byte parameters, the input size should be 260 bytes.

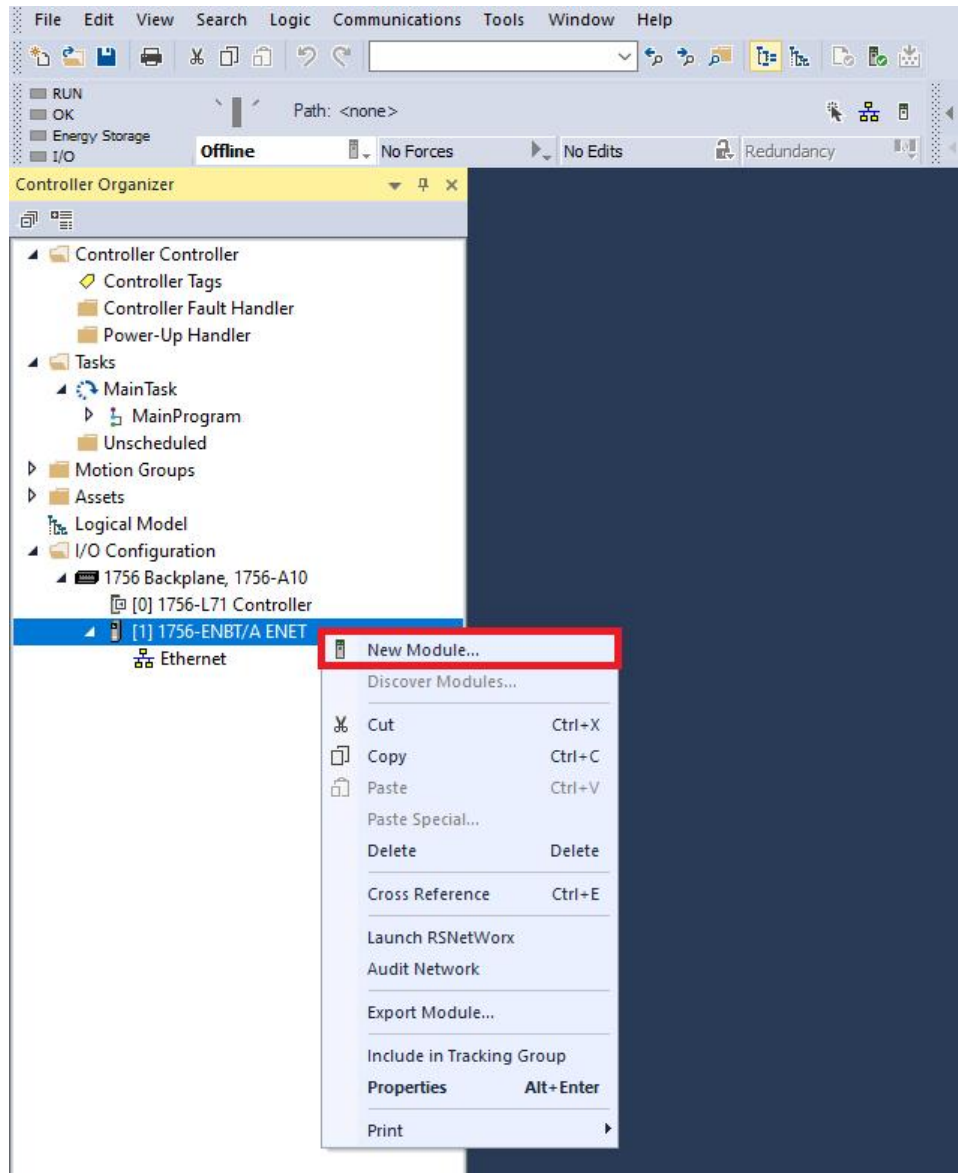
Take configuration parameters of Studio 5000 Logix as an example:



8.1 Implicit I/O Messaging Connection Method (Recommended)

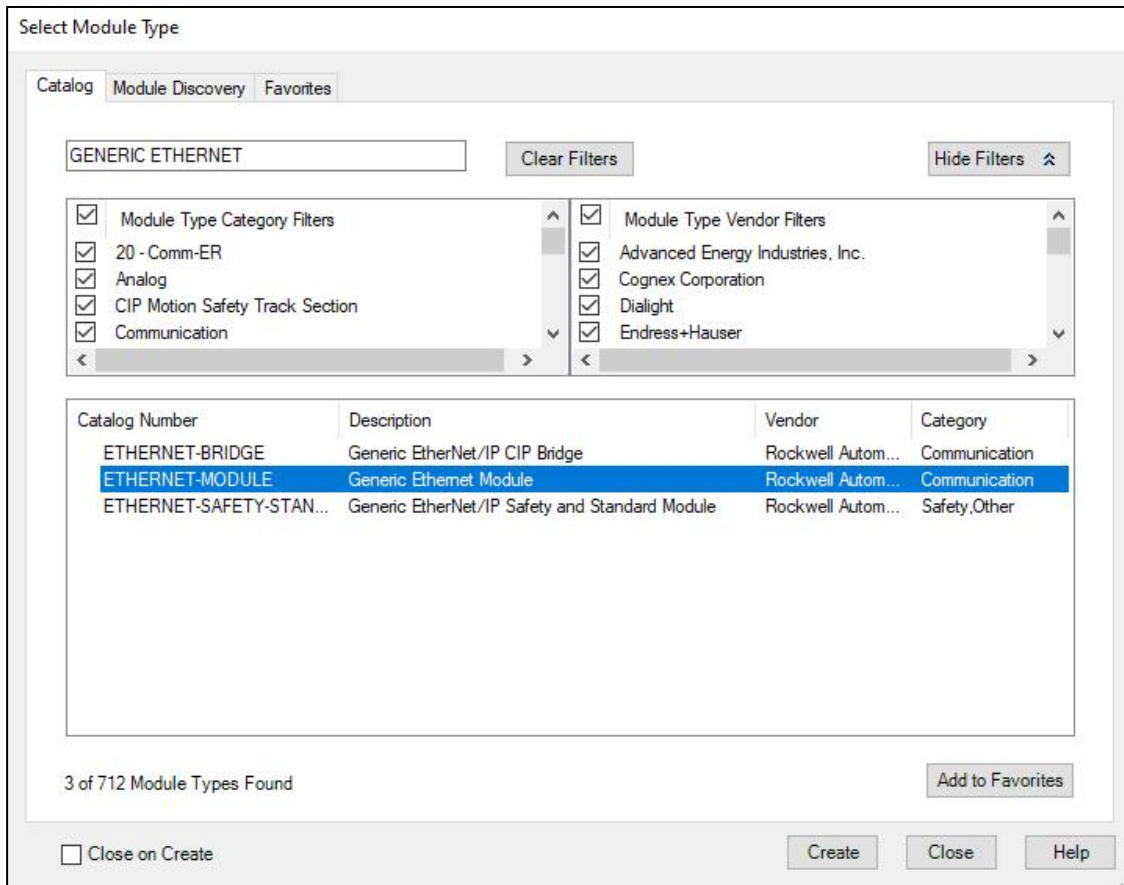
First, right click on the EtherNet/IP scanner module and click "New Module", as shown below:

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

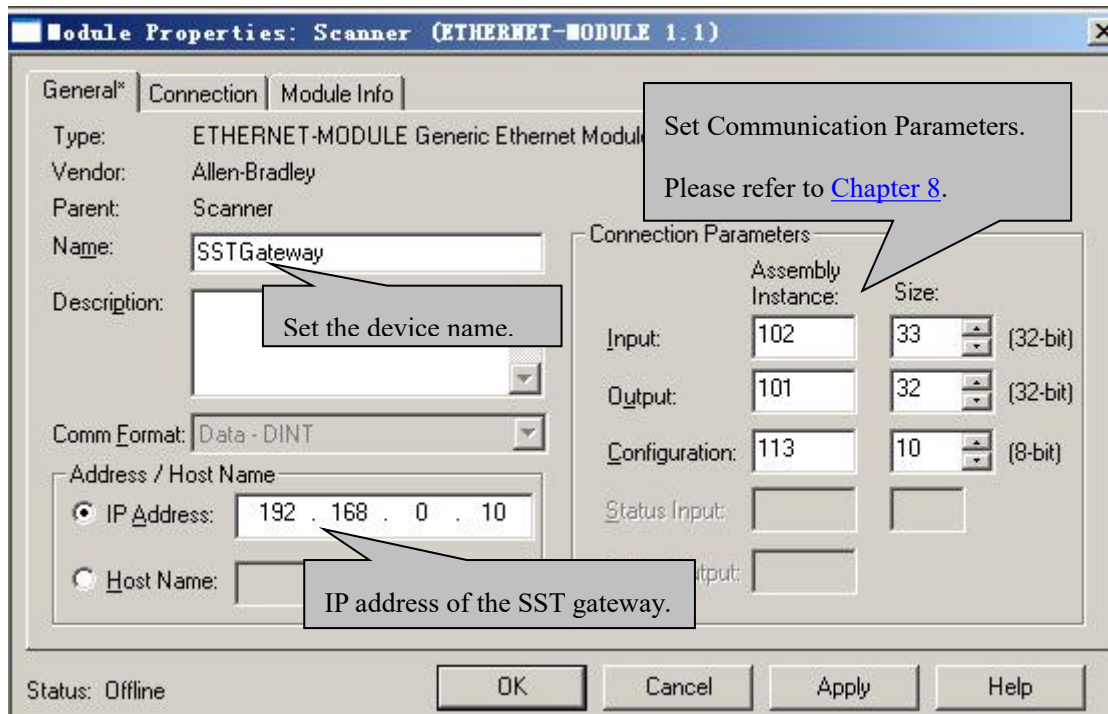


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Configure relevant information of GT200-EI-2RS485 in the pop-up window, as shown below:



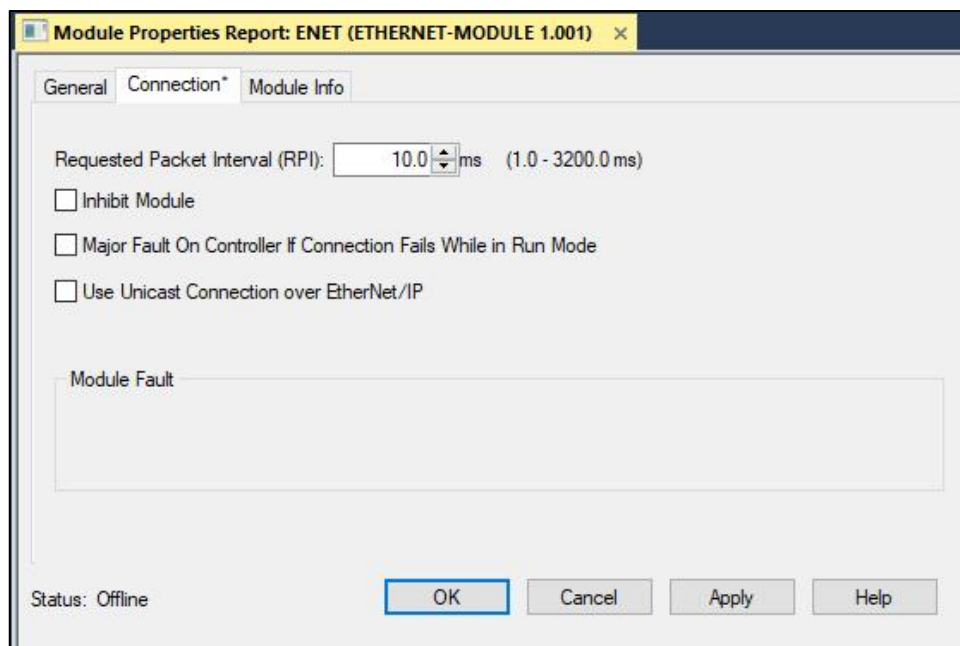
In the above picture, the module information needs to be configured includes:

- 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-EI-2RS485, which is configured by the software SST-MI-CFG).
- Connection Parameters:** Set the Connection Parameters for communication. For more details, please refer to the beginning of [Chapter 8](#).

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.

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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.

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

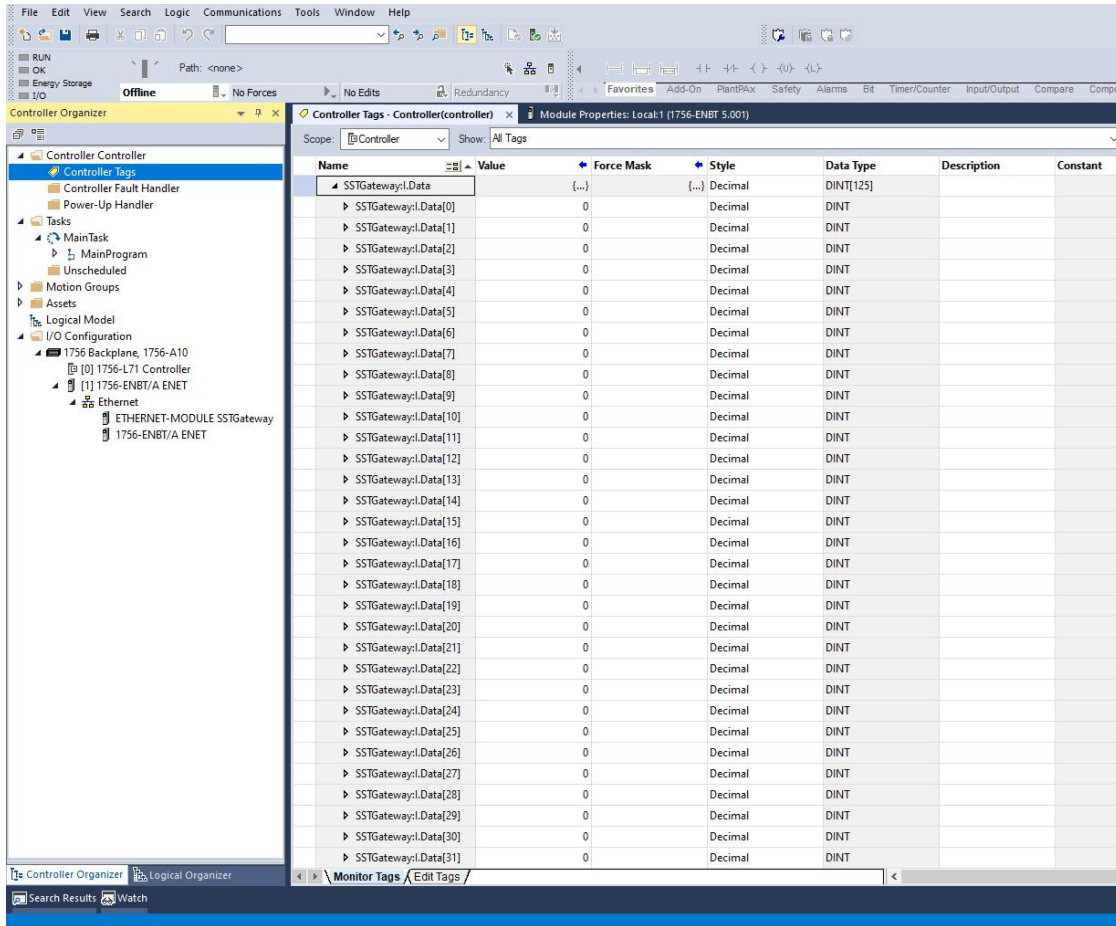
The screenshot displays the SST Automation software interface. On the left, the 'Controller Organizer' tree is expanded to show the 'Controller Tags' section. Under 'Controller Tags', the 'SSTGateway:O' tag is selected. The main window shows a table of data tags for 'SSTGateway:O'. The table has columns for Name, Value, Force Mask, Style, Data Type, Description, and Constant. The 'SSTGateway:O.Data' tag is expanded, showing a list of data addresses from 0 to 28, all of which are DINT type and have a value of 0.

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		Decimal	DINT		
SSTGateway:O.Data[1]	0		Decimal	DINT		
SSTGateway:O.Data[2]	0		Decimal	DINT		
SSTGateway:O.Data[3]	0		Decimal	DINT		
SSTGateway:O.Data[4]	0		Decimal	DINT		
SSTGateway:O.Data[5]	0		Decimal	DINT		
SSTGateway:O.Data[6]	0		Decimal	DINT		
SSTGateway:O.Data[7]	0		Decimal	DINT		
SSTGateway:O.Data[8]	0		Decimal	DINT		
SSTGateway:O.Data[9]	0		Decimal	DINT		
SSTGateway:O.Data[10]	0		Decimal	DINT		
SSTGateway:O.Data[11]	0		Decimal	DINT		
SSTGateway:O.Data[12]	0		Decimal	DINT		
SSTGateway:O.Data[13]	0		Decimal	DINT		
SSTGateway:O.Data[14]	0		Decimal	DINT		
SSTGateway:O.Data[15]	0		Decimal	DINT		
SSTGateway:O.Data[16]	0		Decimal	DINT		
SSTGateway:O.Data[17]	0		Decimal	DINT		
SSTGateway:O.Data[18]	0		Decimal	DINT		
SSTGateway:O.Data[19]	0		Decimal	DINT		
SSTGateway:O.Data[20]	0		Decimal	DINT		
SSTGateway:O.Data[21]	0		Decimal	DINT		
SSTGateway:O.Data[22]	0		Decimal	DINT		
SSTGateway:O.Data[23]	0		Decimal	DINT		
SSTGateway:O.Data[24]	0		Decimal	DINT		
SSTGateway:O.Data[25]	0		Decimal	DINT		
SSTGateway:O.Data[26]	0		Decimal	DINT		
SSTGateway:O.Data[27]	0		Decimal	DINT		
SSTGateway:O.Data[28]	0		Decimal	DINT		

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

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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.

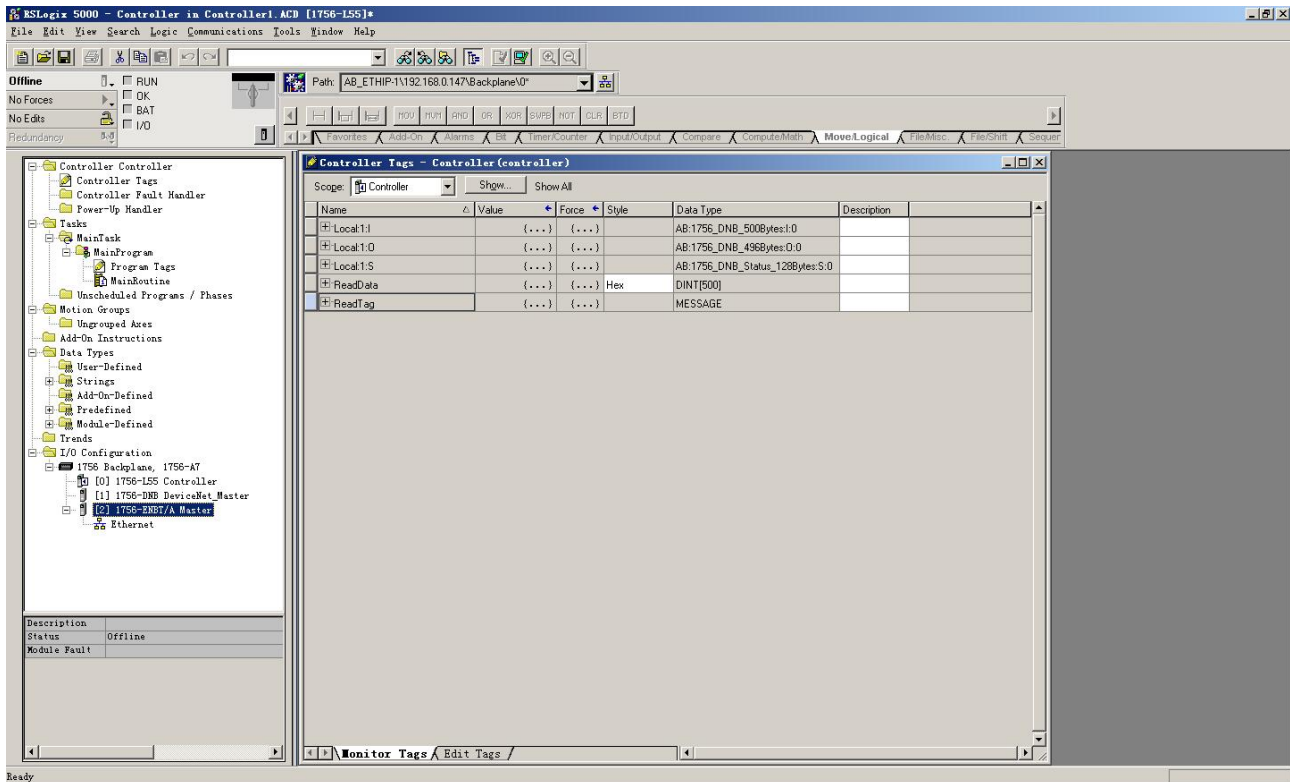
Please note that the first 4 input bytes are used to display the status bytes of the SST Gateway. See [Chapter 6](#) for more details.

8.2 Read/Write Data by MSG

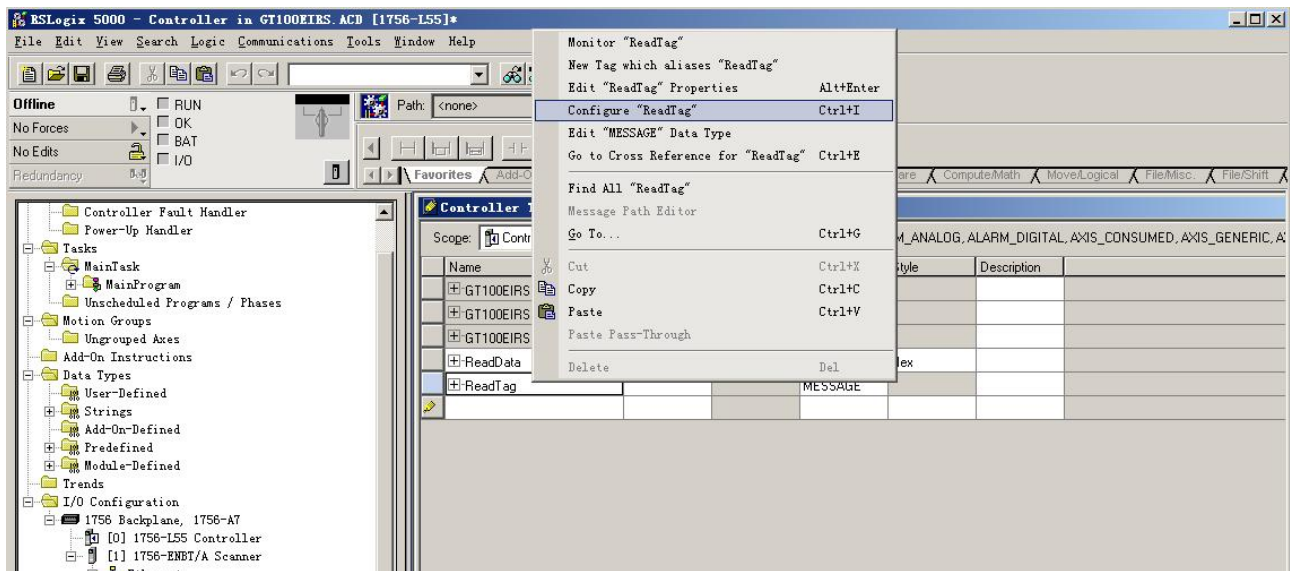
8.2.1 Read Data

Create a new project; it is in the "Offline" mode. Add two new tags "ReadTag" and "ReadData" under the "Controller Tags" and set the type of "ReadTag" as "MESSAGE" and "ReadData" as "DINT [500]".

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Right click "ReadTag", select "Configure "ReadTag":



In the new pop-up window, it needs to set some parameters as below:

Message Type: CIP Generic

Service Type: Select "Get Attribute Single", now, relevant service code will become "e (Hex)"

Class: 4 (Hex)

Instance: Please refer to chapter 6 EtherNet/IP Connection Parameters.

Attribute: 3 (Hex)

Destination: Select "ReadData" label, now, the data that have been received will be saved in this tag.

Message Configuration - ReadTag

Configuration* Communication Tag

Message Type: CIP Generic

Service Type: Get Attribute Single

Service Code: e (Hex) Class: 4 (Hex) Instance: 102 Attribute: 3 (Hex)

Source Element: Source Length: 0 (Bytes) Destination: ReadData

New Tag...

☐ Enable ☐ Enable Waiting ☒ Start ☐ Done Done 0

☐ Error Code: Extended Error ☐ Timed Out

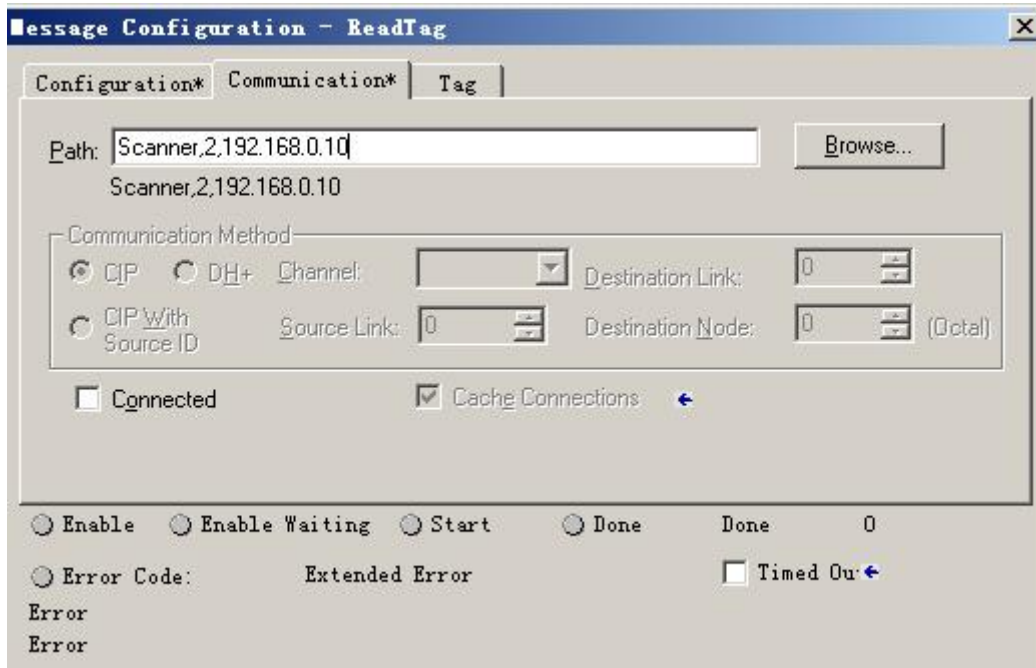
Error

Error

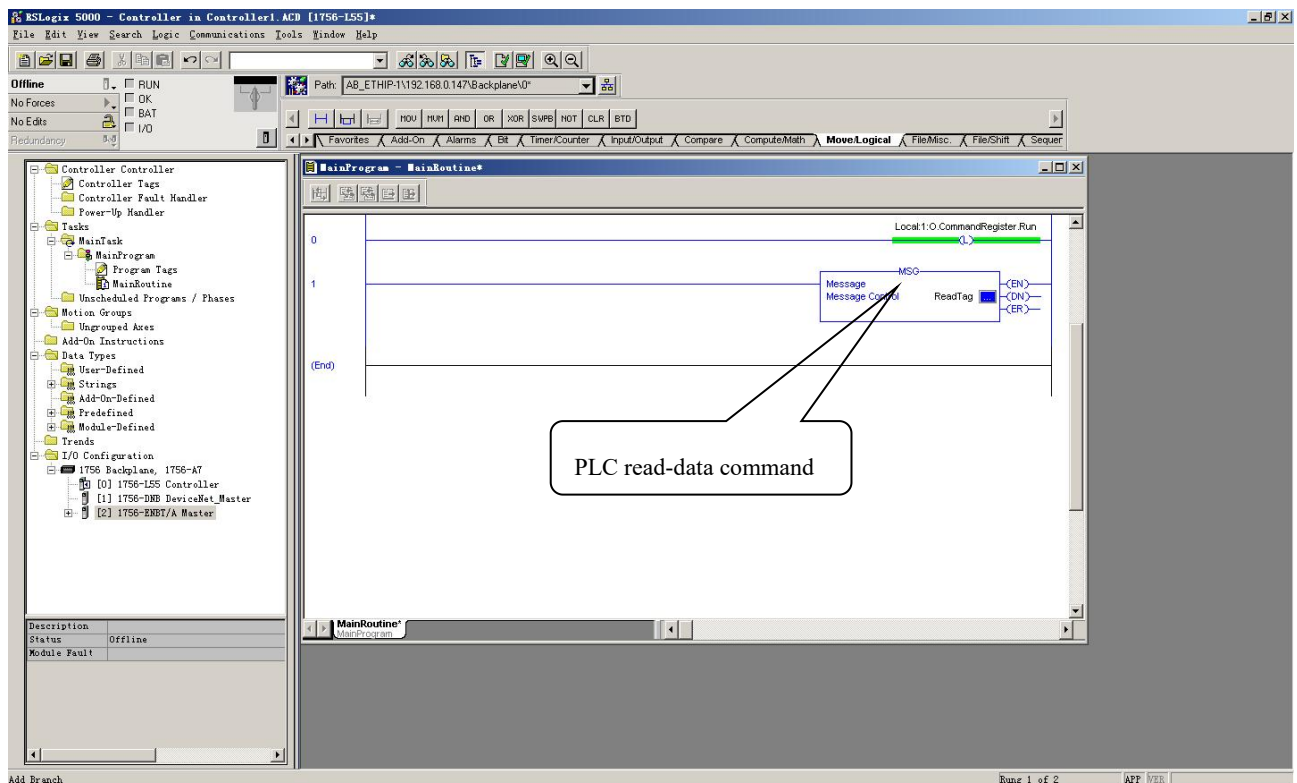
Choose "Communication" label, input the relevant path of connecting EtherNet/IP adapter in the blank space behind the Path, the path format is: EtherNet IP hostname, EtherNet/IP scanner slot No., IP address of EtherNet/IP adapter, after setting the path, click "Apply", "Confirm". As is shown below:

In this instance, EtherNet/IP hostname is "Scanner", EtherNet/IP scanner slot No. Is "2", EtherNet/IP adapter is "192.168.0.10". IP address of SST Gateway is the address which is configured by the configuration software.

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Add a "MSG" command in "MainRoutine" under the "MainProgram" and choose "ReadTag" as "Message Control", as shown below:



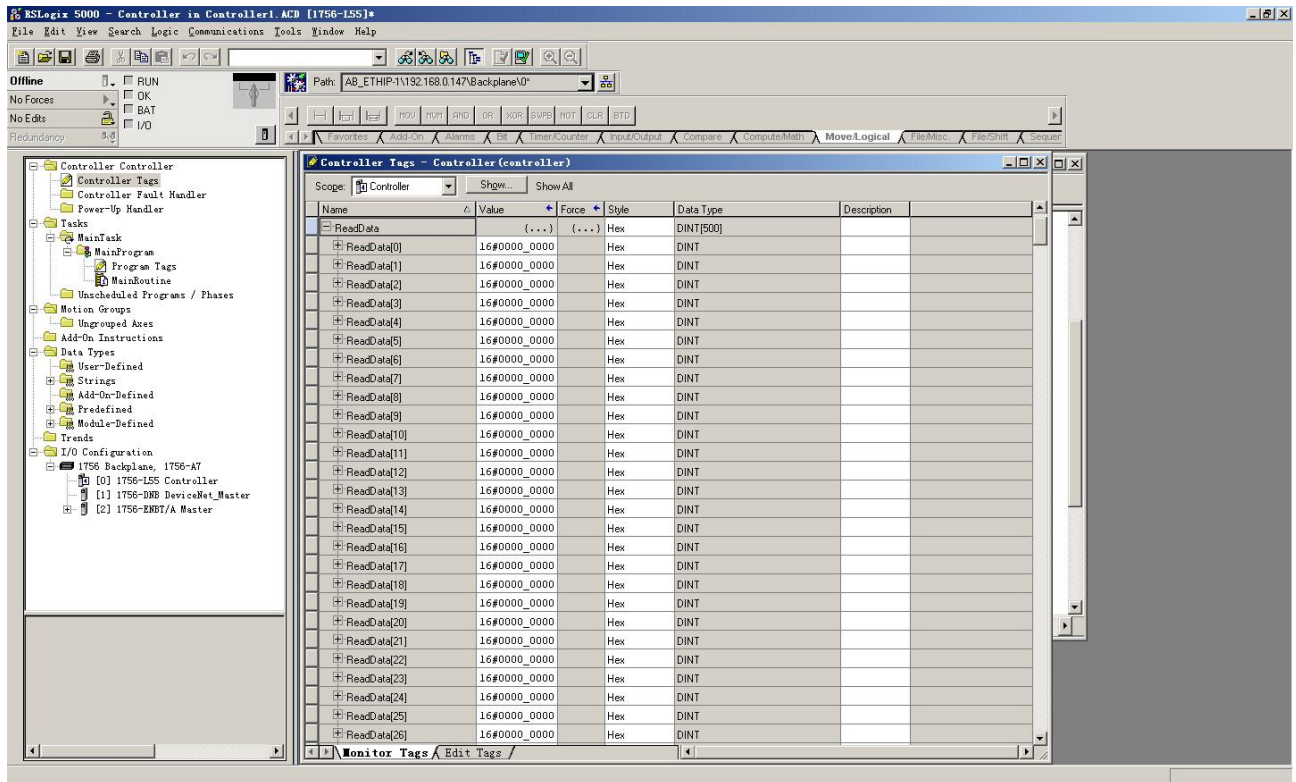
This is a simple command which can sent a read request, it still needs to add some logic commands to trigger this

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command in common program. About the detailed information, please refer to RSLogix5000.

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

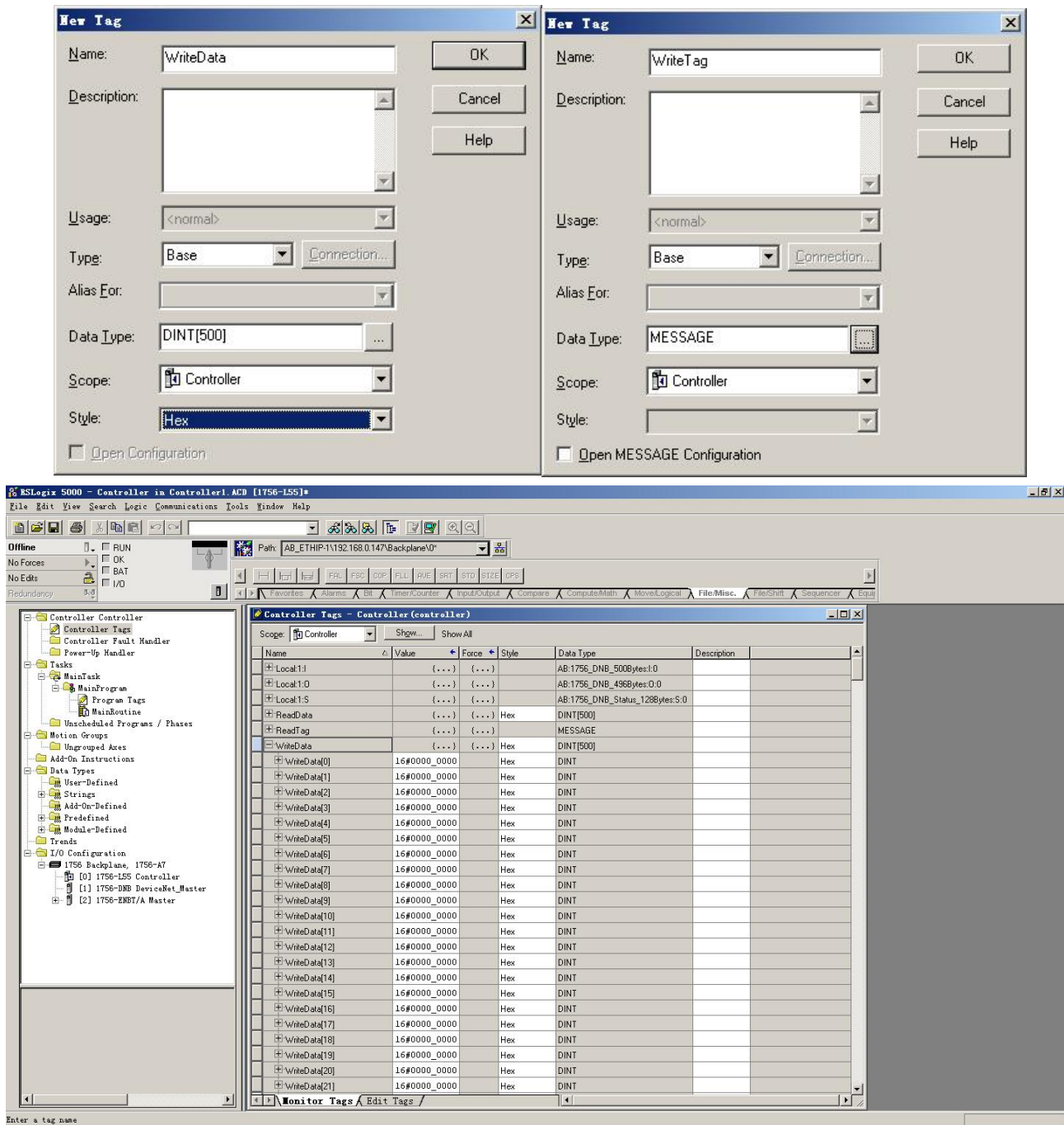
Click "Control Tags" and select "Monitor Tags", unfold "ReadData", you will see that PLC can read the data from EtherNet/IP adapter SST Gateway.



8.2.2 Write Data

Enter the "Offline" mode, add two new tags "WriteTag" and "WriteData" under the "Controller Tags". Define the type of "WriteTag" as "MESSAGE" and "WriteData" as "DINT [500]":

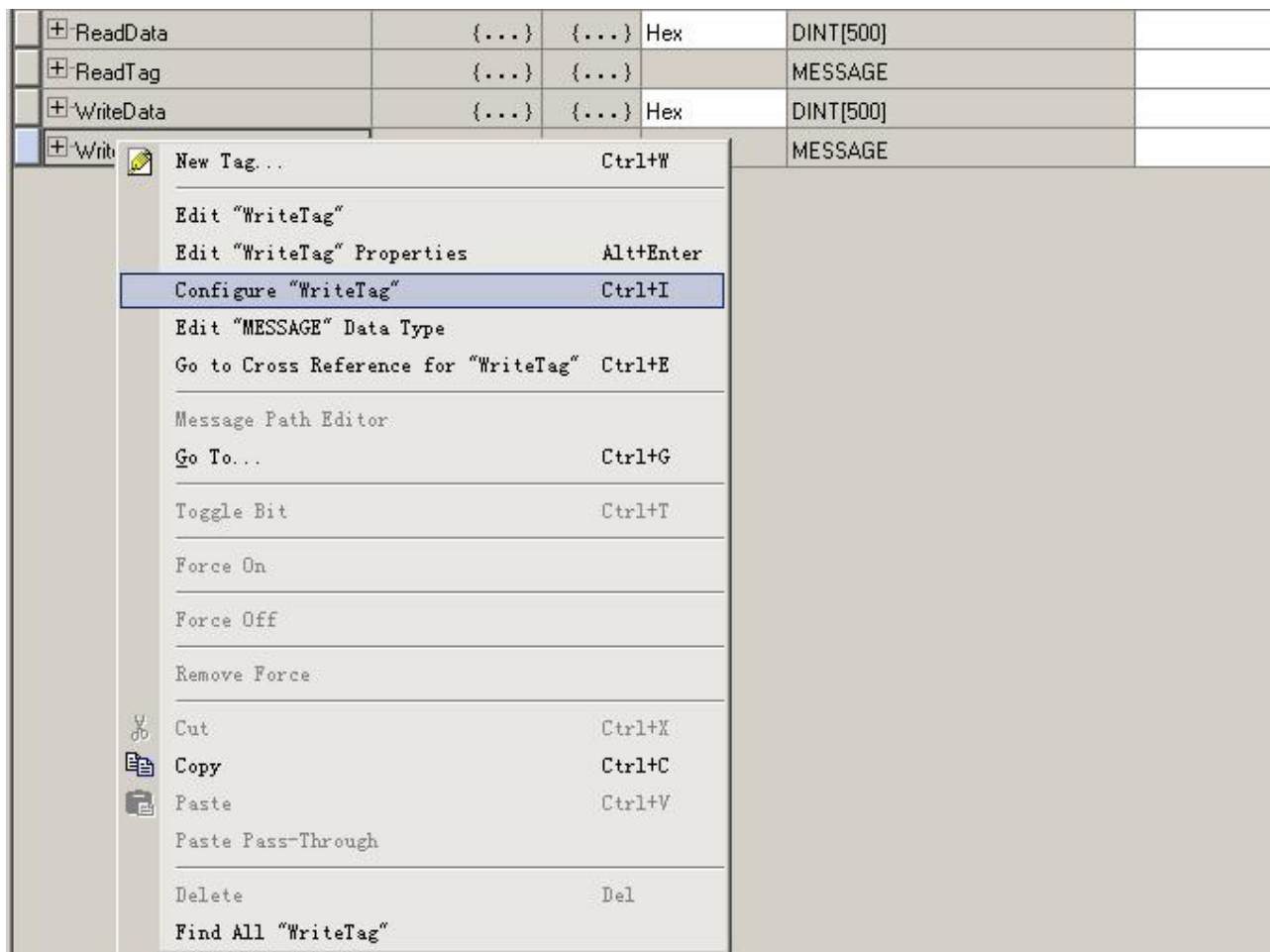
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Enter the "Monitor Tags" interface; input some data beginning from address WriteData[0] in the "WriteData" tag.

There data will be outputted to SST Gateway.

Right click "WriteTag", select "Configure "WriteTag"":



In the new pop-up window, it needs to configure as below:

Message Type: CIP Generic

Service Type: Select "Set Attribute Single", now, relevant Service Code will become "10 (Hex)"

Class: 4 (Hex)

Instance: Please refer to chapter 6 EtherNet/IP Connection Parameters.

Attribute: 3 (Hex)

Source Element: Select "WriteData" tag, it indicates the data in the "WriteData" tag will become the data PLC outputs.

Source Length: Use byte as unit, this value should be less than or equal to the current selecting bytes which Instance represents.

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The screenshot shows the 'Message Configuration - WriteTag' dialog box with the 'Configuration' tab selected. The 'Message Type' is set to 'CIP Generic'. The 'Service Type' is 'Set Attribute Single'. The 'Source Element' is 'WriteData'. The 'Source Length' is '128 (Bytes)'. The 'Service Code' is '10 (Hex)', 'Class' is '4 (Hex)', 'Instance' is '101', and 'Attribute' is '3 (Hex)'. The 'Destination' field is empty. There is a 'New Tag...' button. At the bottom, there are radio buttons for 'Enable', 'Enable Waiting', 'Start', and 'Done', with 'Done' selected. There is also a 'Timed Out' checkbox.

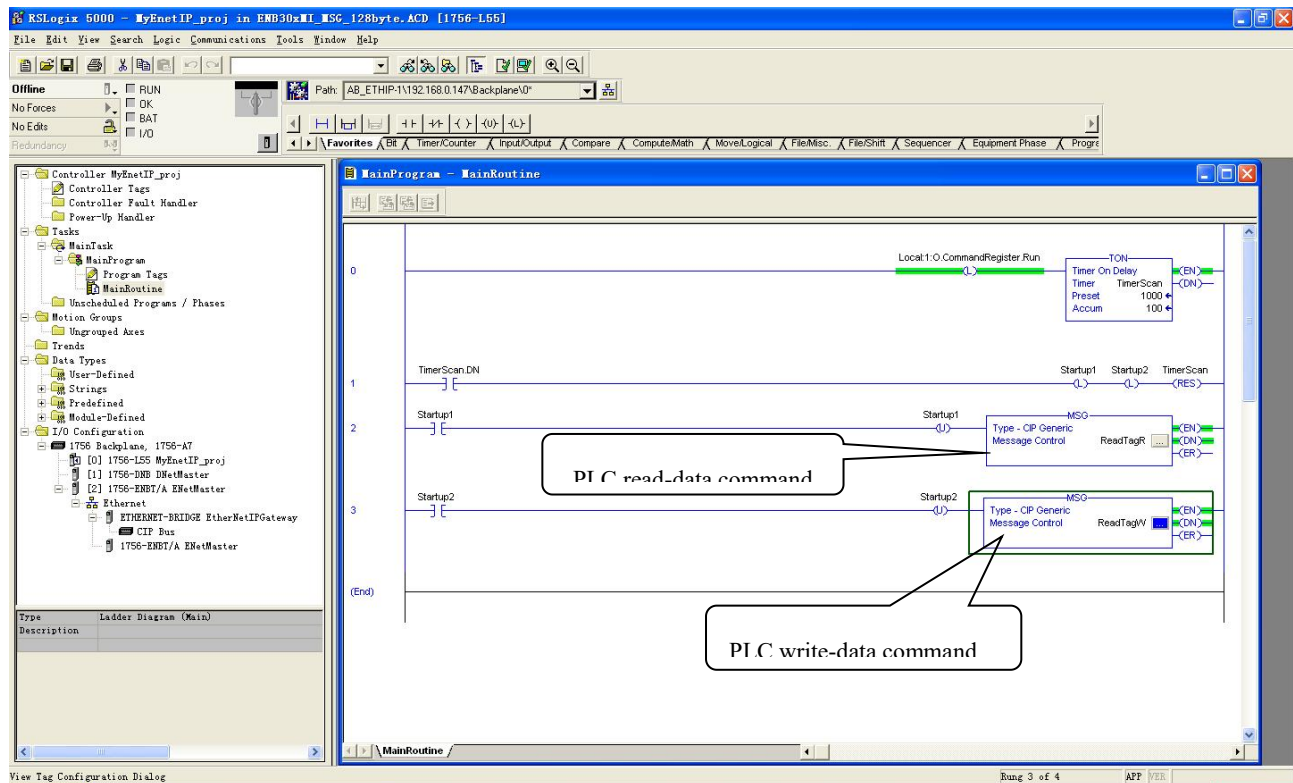
Choose "Communication" label, input the relevant path of connecting EtherNet/IP adapter in the blank space behind the Path, the path format is: EthetNet IP hostname, EtherNet/IP scanner slot No., IP address of EtherNet/IP adapter, after setting the path, click "Apply", "Confirm". As is shown below:

The screenshot shows the 'Message Configuration - WriteTag' dialog box with the 'Communication' tab selected. The 'Path' field contains 'Scanner,2,192.168.0.10'. The 'Communication Method' section has 'CIP' selected. The 'Channel' field is empty. The 'Destination Link' is '0'. The 'Source Link' is '0'. The 'Destination Node' is '0 (Octal)'. There are checkboxes for 'Connected' and 'Cache Connections'. At the bottom, there are radio buttons for 'Enable', 'Enable Waiting', 'Start', and 'Done', with 'Done' selected. There is also a 'Timed Out' checkbox.

In this instance, EtherNet/IP hostname is "Scanner", EtherNet/IP scanner slot No. Is "2", EtherNet/IP adapter (SST Gateway) is "192.168.0.10". IP address of SST Gateway is the address which is configured by the configuration software.

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Add a "MSG" command in "MainRoutine" under the "MainProgram" and choose "WriteTag" as "Message Control", as shown below:



Download PLC program to the PLC and set PLC to "Online" state, the data in "WriteData" will be outputted to EtherNet/IP adapter (SST Gateway)..

9 Typical Application

GT200-EI-2RS485 can connect Modbus devices to the EtherNet/IP network, and achieve communication between PLC (or PC) with EtherNet / IP interface and Modbus devices:

