

Modbus /EtherNet/IP (DLR) Gateway

GT300-EI-2RS485

User Manual

V 1.5

RevA



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

GT300-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. It supports DLR Node (beacon mode) function and has millisecond-level link redundancy self-healing capability. In the event of a single point of failure, the network can switch seamlessly, making it suitable for harsh industrial scenarios. Both serial ports support RS485.

1.2 Feature

- ◆ Supports two serial RS-485 interfaces.
- ◆ 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 DLR Node (beacon mode) function, allowing direct connection to a DLR ring network.
- ◆ Easy to use configuration software SST-MI-CFG.
- ◆ OLED color display for more information, facilitating on-site monitoring.
- ◆ Termination resistors and pull-up/down resistors for the RS485 interface can be configured via software.
- ◆ Supports DLR status monitoring function.
- ◆ Supports Ethernet port status monitoring function.

1.3 Technical specification

[1] EtherNet/IP network is independent with two Modbus subnet.

[2] Ethernet 10/100/1000M 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: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 bps optional.
- Data Bits: Supports 7 bits or 8 bits.
- Parity Check: Supports None, Odd, Even, Mark and Space.
- Stop Bits: Supports 1bit or 2bits.

[5] Modbus Master Mode

- Function code: Supports 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H and 17H.
- Transmission Mode: Supports RTU and ASCII.
- Write Command Output Mode: Supports Cyclic, Disabled, 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.
- Supports Control Word function, with options for Disabled, All commands, and Only Write Commands.
- Modbus function codes 03H, 04H, 06H, 10H, and 17H support 'Byte Swap' functionality, helping users address the big-endian and little-endian data format issue between two networks.

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

For Instance 101 and 102: IO communication has a maximum of 492 bytes, while MSG communication has a maximum of 492 bytes.

For Instance 201 and 202: IO communication has a maximum of 1444 bytes, while MSG communication has a maximum of 2000 bytes.

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

[8] Working temperature:-4°F-140°F(-20°C- 60°C). Relative humidity: 5% - 95% (no condensation).

[9] External dimensions (W*H*D): 0.9 in*3.9 in*4.5 in (22.5mm*99mm*114.5mm).

[10] Installation: 35mm DIN rail.

[11] Protection class: IP20.

[12] Test standard: EMC test standards.



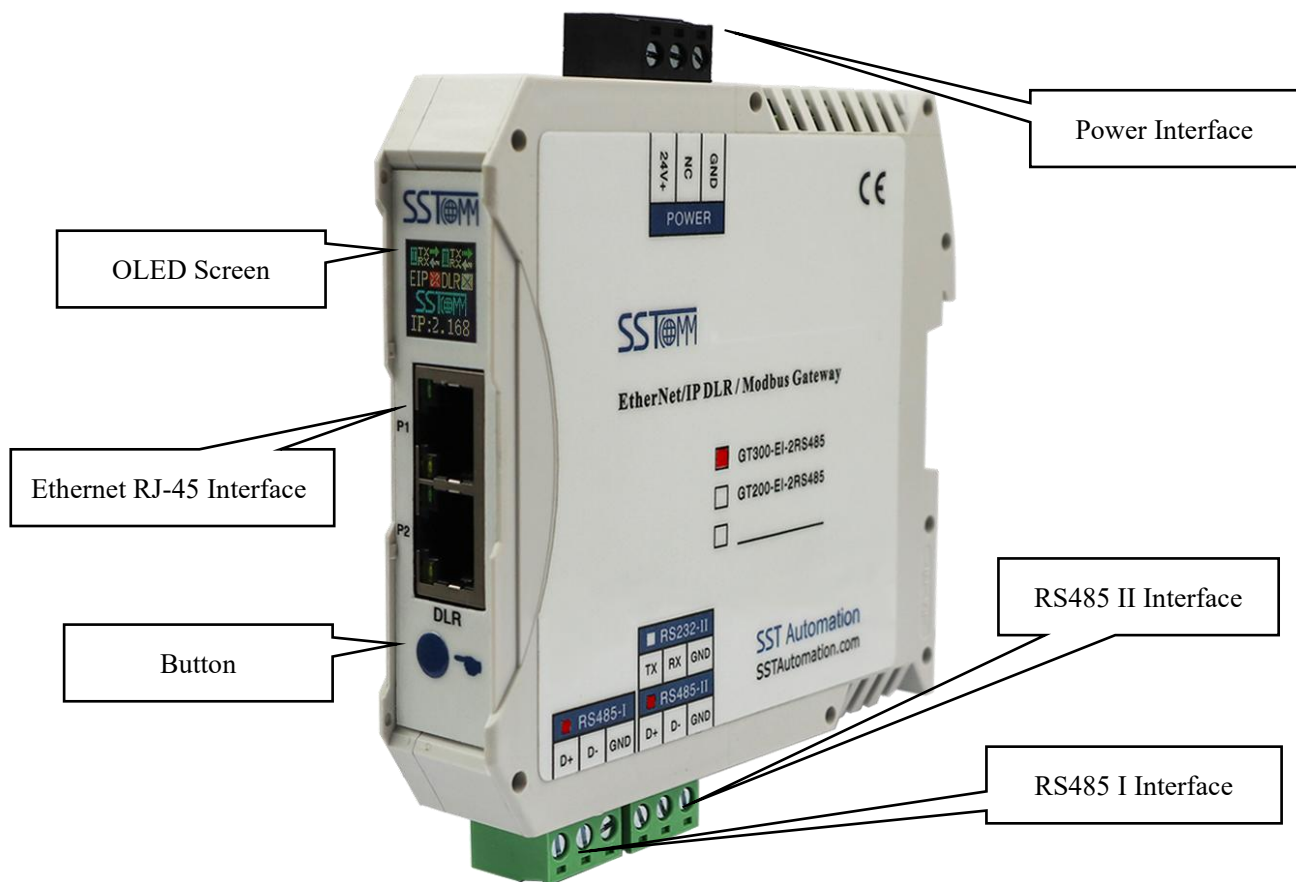
1.4 Revision History

Revision	Date	Chapter	Description
V1.3 RevA	10/24/2025	All	Update the picture
V1.3	7/22/2025	All	New release
V1.5	1/7/2026	Hardware Description	Update the Display States description



2 Hardware Description

2.1 Appearance



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



2.2 OLED Screen

The product uses OLED to display device status and information.

1.Main interface functions:

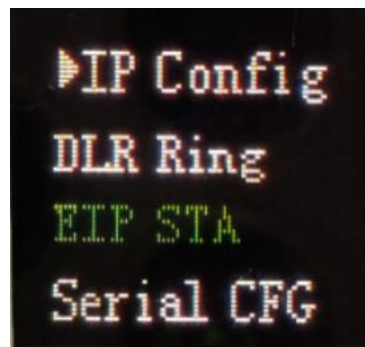
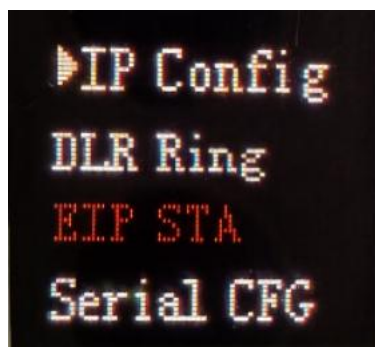


Indicator	State	Illustration	Description
Serial I TX	Solid Green		Serial port I has TX data
Serial I RX	Solid Green		Serial port I has RX data
Serial II TX	Solid Green		Serial port II has TX data
Serial II RX	Solid Green		Serial port II has RX data
EIP	Solid Red		EtherNet/IP link down or disconnected
	Solid Green		EtherNet/IP link established
	Solid Grey		DLR Ring is disabled



	Solid Red		DLR Ring failure
	Solid Green		DLR Ring normal
P1	Display network speed		Network Port 1 is connected normally
P2	Display network speed		Network Port 2 is connected normally
Error Messages	EIP DISC		EtherNet/IP link down or disconnected
	DLR ERR		DLR Ring failure
IP	DHCP characters flash green		Obtain IP settings via DHCP
	IP Address		Scroll and loop to display IP addresses
	Locked		Locking Configurations
	Unlock		Unlocking Configurations

2.Sub interface functions:



IP Config: Display the current IP configuration method and IP address information.

DLR Ring: Display the DLR Ring status.

EIP STA: Display EtherNet/IP connection status.



Serial CFG: Display the serial port information and protocol type of two serial ports. Termination resistors and pull-up/pull-down resistors can be configured in the 'Resistor' menu.

Note: The 'DLR Ring' and 'EIP STA' options display colors based on the gateway state:

Red: DLR Fault / EIP Disconnected.

Green: DLR Normal / EIP Linked.

White: DLR Disabled.

3. Display States:

After power-on, the display transitions through three timer-based states: Startup (0–15 min), Stable (15–45 min), and Protection (>45 min).

If communication is lost, Ethernet is disconnected, or a ring network fault occurs, the timer resets and the state returns to Startup.

The display blinks with an ON/OFF pattern of 10 s/5 s in Startup, 10 s/10 s in Stable, and 5 s/55 s in Protection

2.3 Button

1. Screen Operations:

Single tap: Switch screens and Scroll down

Double tap: Confirm

Press and hold: Return

2. Lock/Unlock Configuration:

When on the main screen, double-click the button to lock the configuration. The screen will display 'Locked' indicating configuration functions are disabled. Double-click the button again to unlock. The screen will display 'Unlock' indicating configuration functions are enabled.

Locked: When configuration is locked, the configuration software cannot upload or download device configurations even if the device is detected.

Unlock: When configuration is unlocked, the configuration software can normally upload and download device configurations after detecting the device.

3. Restore Default Settings:

Within 10 seconds after powering on, press and hold the button for 5 seconds. The display will show the prompt



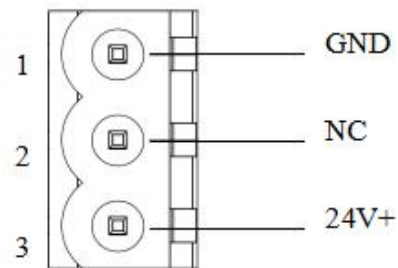
'Reset Default?'. Click to select 'Yes', then double-click to confirm. The gateway will automatically restart and restore to its initial configuration. If no confirmation is made within a certain period, it will return to the Main interface.

2.4 Interface

2.4.1 Power Interface

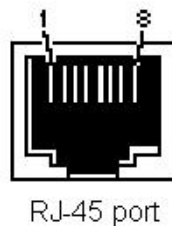
GT300-EI-2RS485 uses a 24V DC power supply. The pinout is defined as follows.

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



2.4.2 Ethernet Interface

Ethernet interface apply RJ-45 connector. IEEE802.3u 1000BASE—T standard.



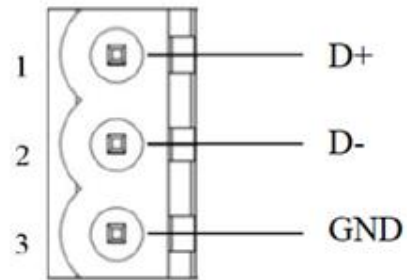
2.4.3 RS485 Interface

The 485 interface of GT300-EI-2RS485 product is a standard RS485 interface.

1.The RS485 interface pins are defined as follows:



Pin	Function
1	D+, RS485 Transmit Positive
2	D-, RS485 Transmit Negative
3	GND



2. Basic Characteristics of RS485 Transmission Technology:

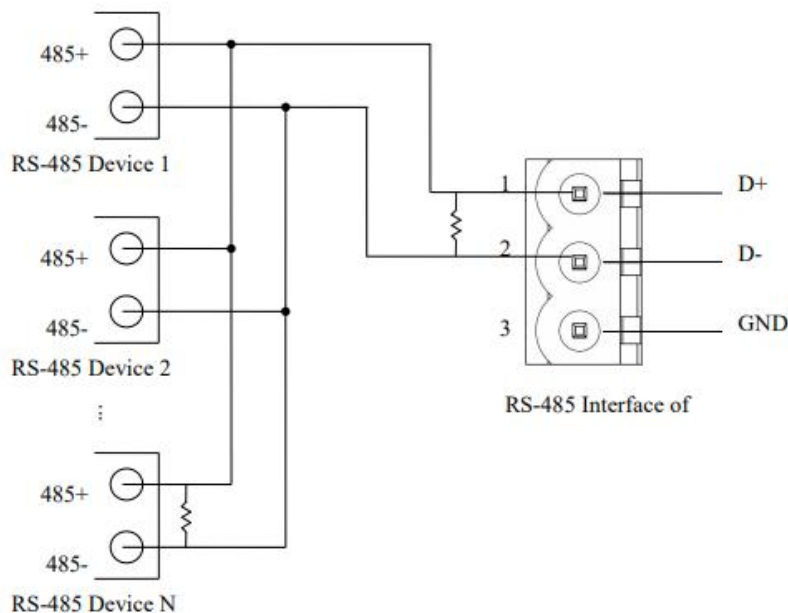
Network Topology: Linear bus with active bus termination resistors at both ends. If communication quality is unstable, consider adding termination resistors at both ends (120Ω 1/2W).

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).



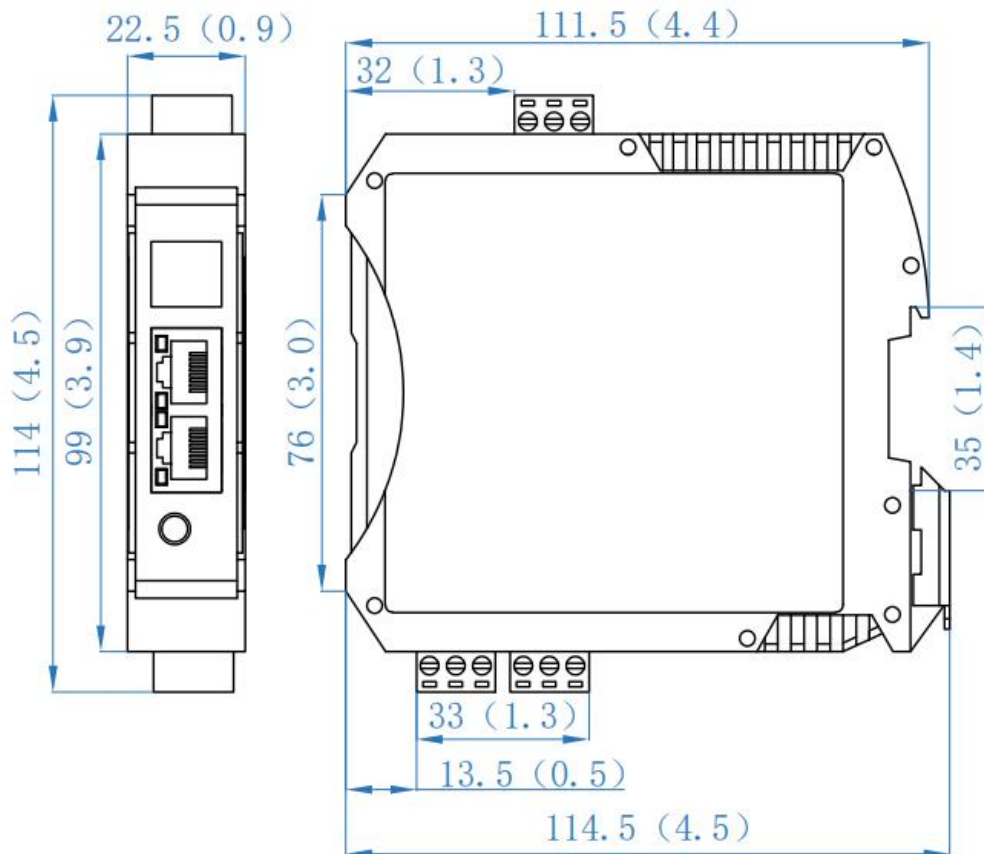
RS485 networks in point-to-multipoint configurations require 120Ω 1/2W termination resistors at both ends to suppress signal reflections and interference.



3 Hardware Installation

3.1 Mechanical Dimensions

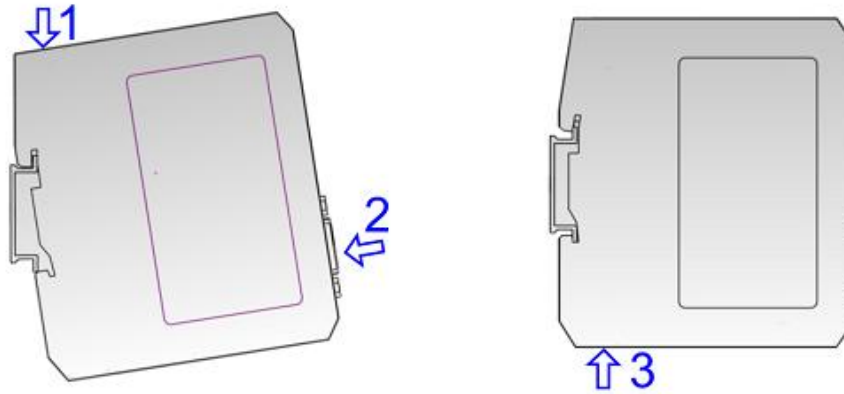
0.9 in*3.9 in*4.5 in (22.5mm*99mm*114.5mm)



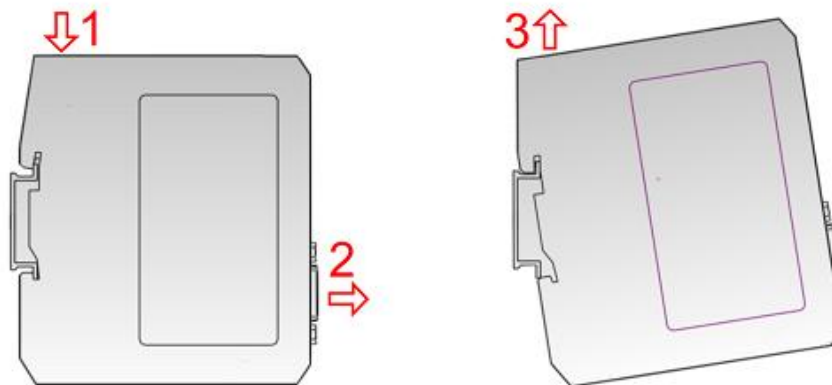


3.2 Installation Method

Install



Uninstall



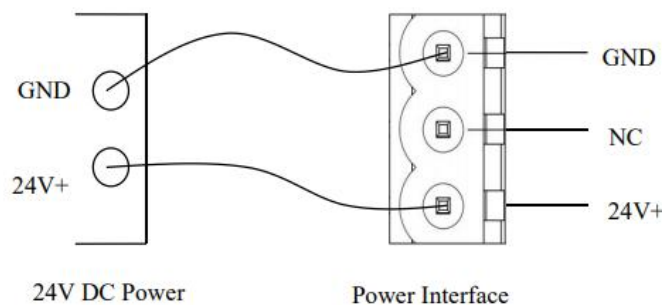


4 Quick Start Guide

4.1 Connecting the Device

1. Connect the power supply as follows.

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



2. Gateway Configuration Interface: Ethernet interface.

Use an Ethernet cable to connect the gateway to the PC.

3. The PC connected to the gateway should have its IP address set to the same subnet as the gateway.

When using the gateway for the first time, the default factory setting of the gateway is DHCP. If the DHCP mode times out after 30 seconds without assigning an IP, the gateway will automatically assign a fixed IP of 192.168.0.11.

4. Power on the gateway.

4.2 Basic Software Operation

1. Download the configuration software SST-MI-CFG from <https://www.sstautomation.com/Download1/>.

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 *5 Software Instructions*.

- For information on device status and button operations, refer to section *2.2 OLED Screen* and section *2.3 Button*.
- 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 GT300-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 Software Instructions

5.1 Notes before Configuration

SST-MI-CFG is a Windows-based software tool designed for configuring fieldbus gateway devices, including the GT100-EI-RS485, GT100-EI-RS, GT200-EI-2RS485, and GT300-EI-2RS series. It supports the setup of Modbus and other fieldbus parameters and commands.

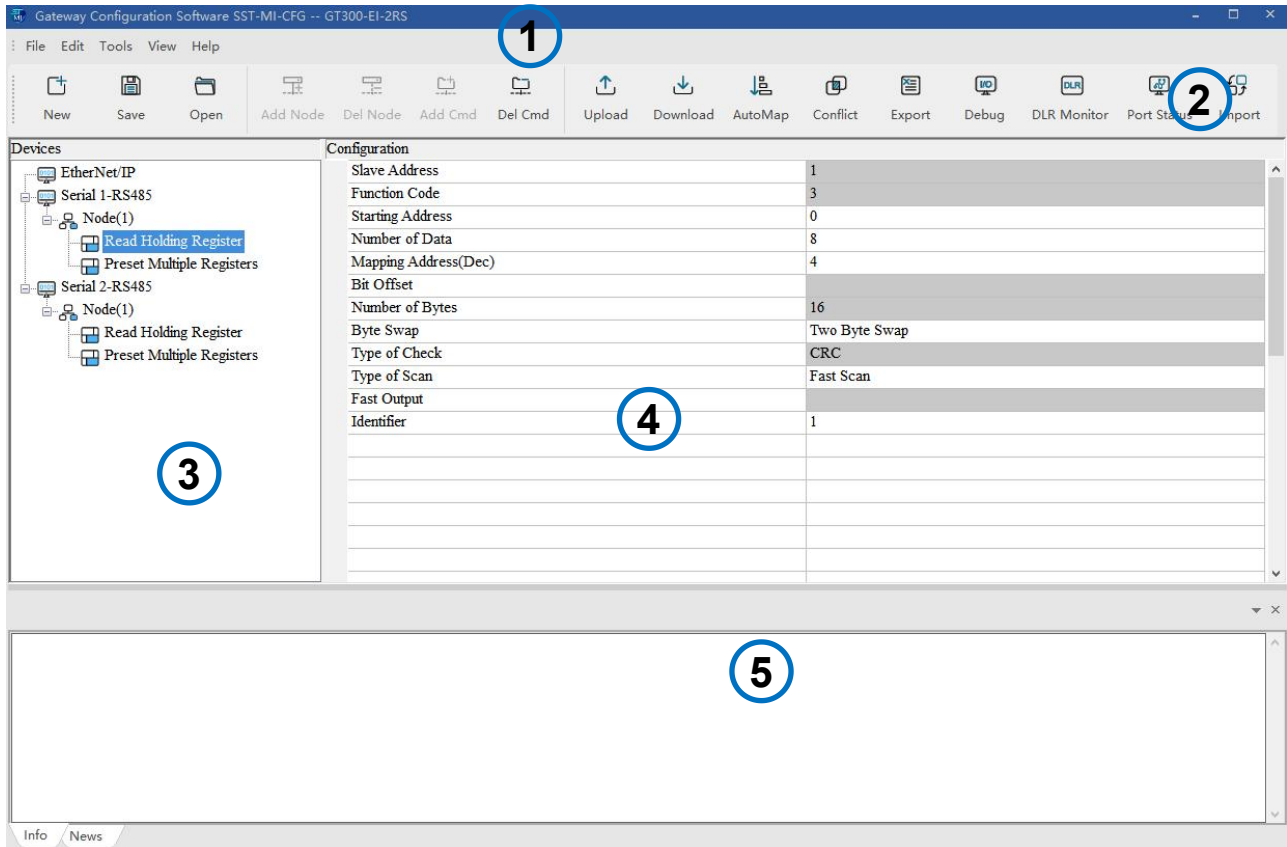
This manual primarily covers the usage of the GT300-EI-2RS.

To launch the software, double-click the icon, then select the device model (GT300-EI-2RS) to enter the main interface.





5.2 Main Interface



1: Title Bar and Menu Bar

2: Toolbar

Common menu commands can be accessed by clicking the buttons on the toolbar.

3: Tree View

The configuration hierarchy tree view is mainly divided into two parts:

- (1) EtherNet/IP: Used for EtherNet/IP protocol settings
- (2) Serial: Used for Modbus Master and User Config settings

4: Configure View

Selecting an item in the tree view allows you to configure the corresponding parameters. The gray sections are not editable.

Parameter settings can be adjusted either by selecting from a dropdown menu or by manually entering values, depending on the specific parameter.

5: Info and News

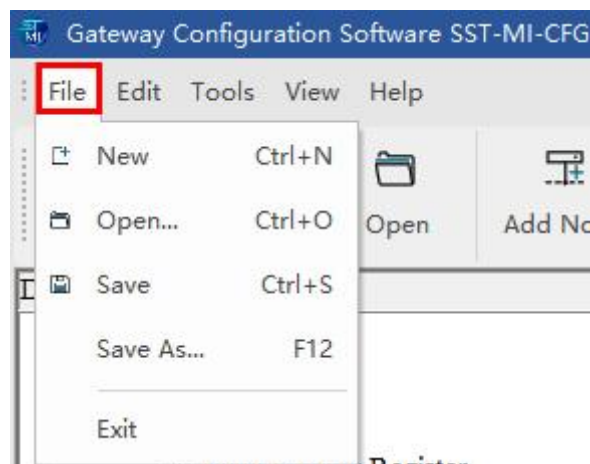


Select a parameter in the configuration view to display its function and setting instructions.

Select 'News' to view the latest updates about the product.

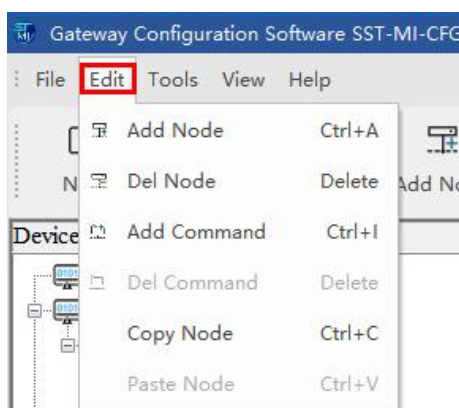
5.3 Menu Bar Button Description

5.3.1 File



The configuration software has 'New, Open, Save, Save As, Exit' operation functions for project files . You can click the relevant buttons in 'Menu Bar-File' or toolbar to perform operations.

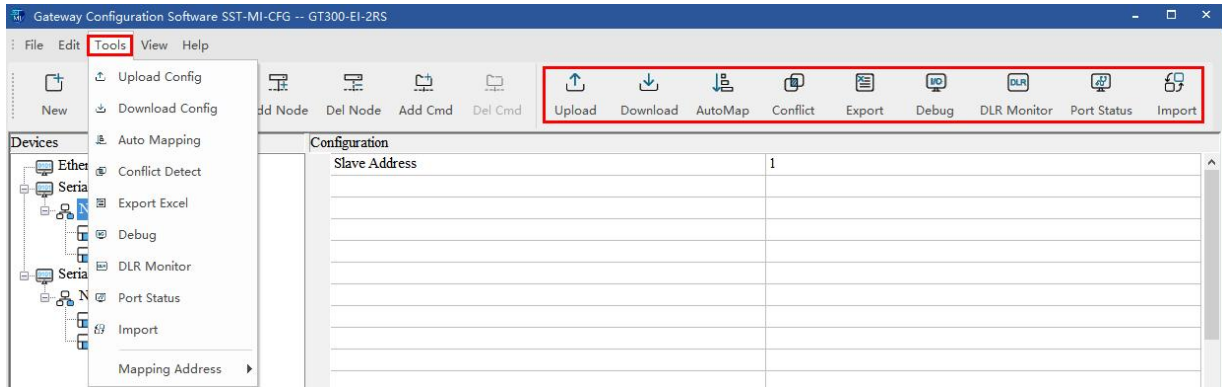
5.3.2 Edit



During the configuration process, operations related to nodes and commands can be performed by selecting buttons under the 'Menu Bar-Edit' section. Alternatively, buttons on the toolbar can also be clicked to adjust settings, or right-clicking on the Serial, node, or command will bring up a context menu for related operations.



5.3.3 Tools

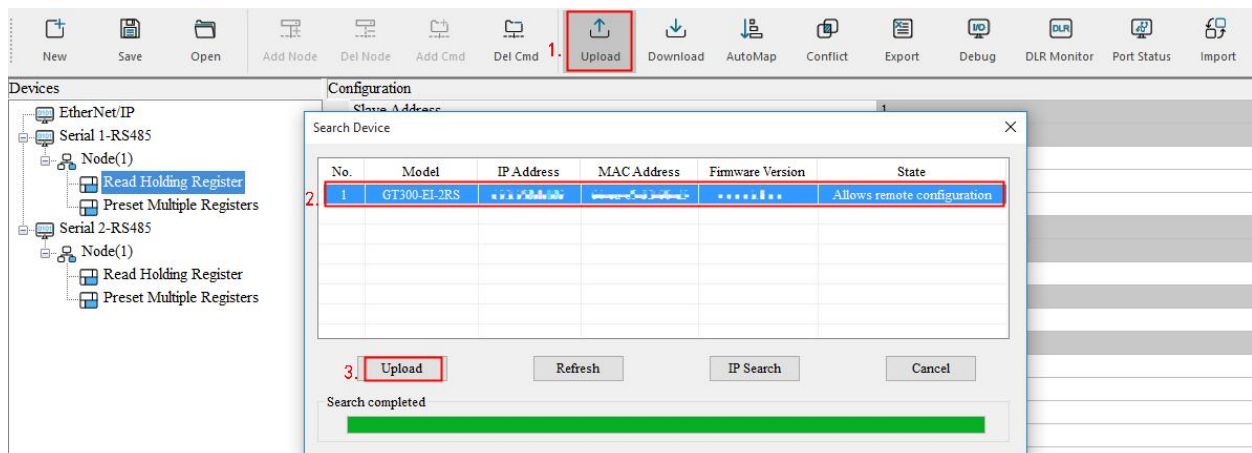


1.Upload Config

Upload Config: Upload the configuration information from the gateway to the configuration software interface for viewing .

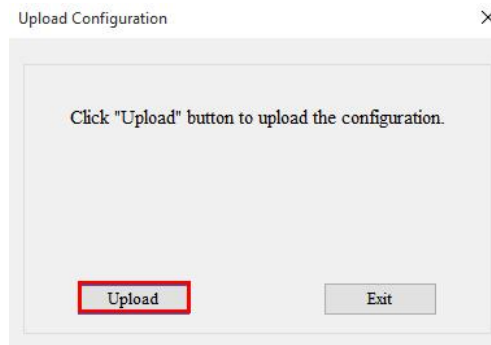
The specific operations are as follows:

- (1) Click the 'Upload' button on the toolbar to open the 'Search Device' interface.

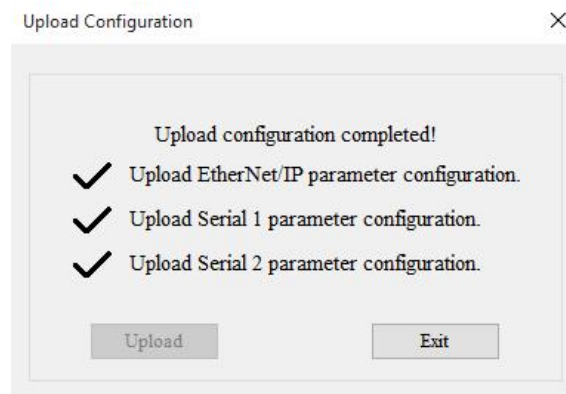


• If the device cannot be found, please refer to the FAQ 'How to Resolve Device Search Issues'.

- (2) Select the gateway to be uploaded, then click 'Upload' to open the Upload Configuration window:



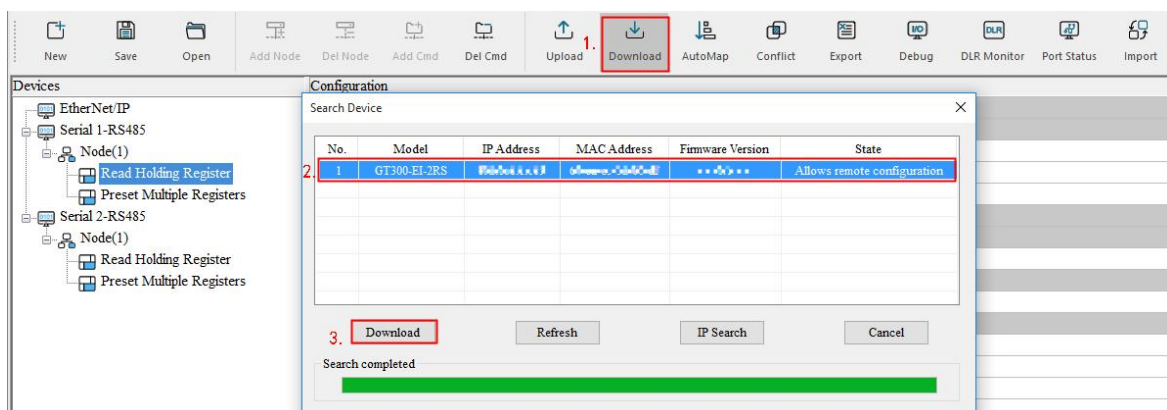
(3) Click the 'Upload' button to execute the upload. Once the configuration is successfully uploaded, you can view the configuration:



2.Download Config

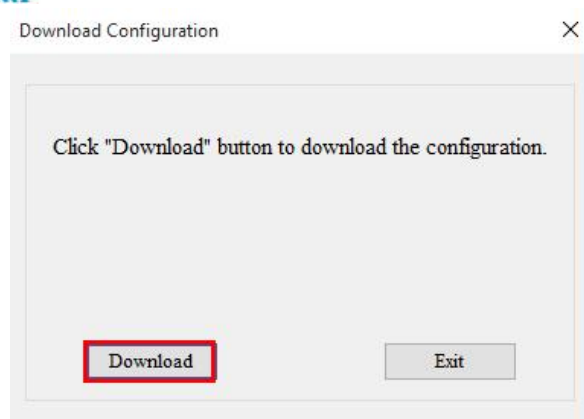
Download Config: Download the configuration information set in the current software interface to the gateway.
The specific operations are as follows:

(1) Click the 'Download' button on the toolbar to open the 'Search Device' interface.

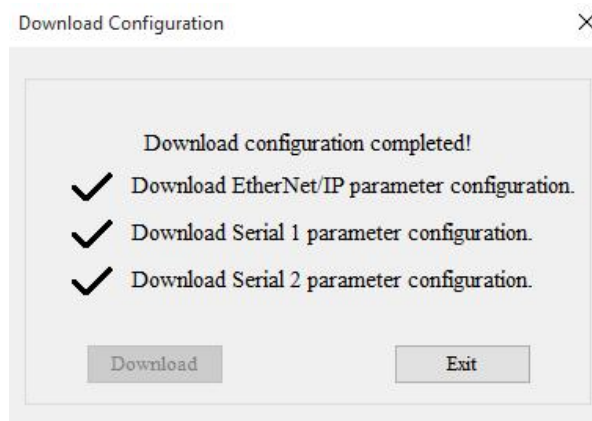


● If the device cannot be found, please refer to the FAQ '[How to Resolve Device Search Issues](#)'.

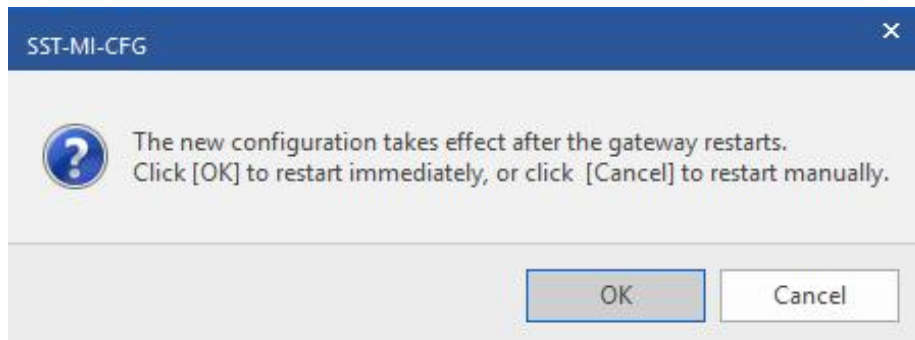
(2) Select the gateway to be downloaded, then click 'Download' to open the Download Configuration window:



- (3) Click the 'Download' button to successfully execute the configuration download.



- (4) Click 'Exit' and the following prompt box will pop up:



After the download is complete, the gateway needs to be restarted for the configuration to take effect.

- Click 'OK': The gateway will automatically restart, and the downloaded configuration will take effect, enabling communication according to the new configuration.
- Click 'Cancel': The gateway will not restart. Although the gateway configuration has been successfully downloaded, communication will continue according to the previous configuration. The gateway must be manually restarted for the new configuration to take effect.



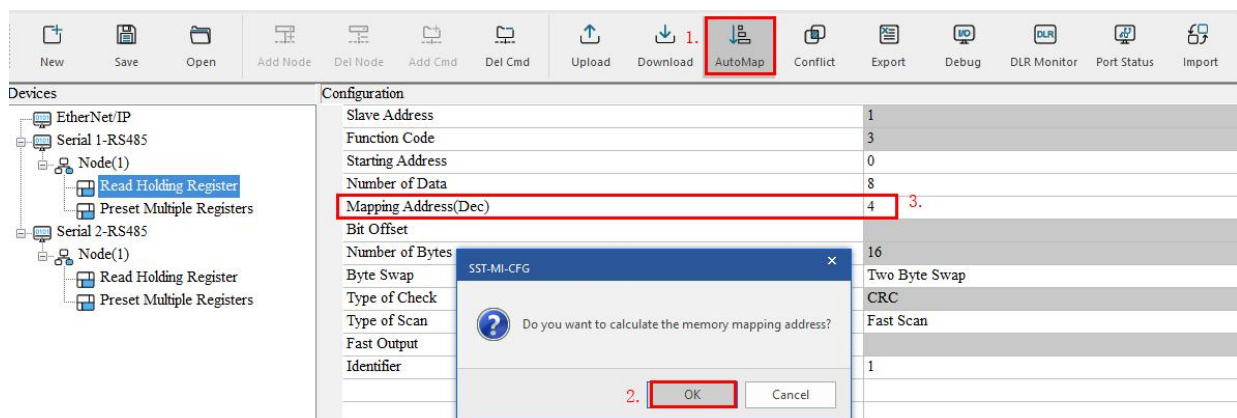
3.Auto Mapping

The 'Auto Mapping' function can help users automatically fill in the value of the 'Mapping Address' parameter in the gateway, which can effectively avoid address conflicts. The Mapping Address can also be filled in manually, but be sure to avoid any address conflicts.

The operating modes involving the memory mapping start address parameter setting are: Modbus Master (read/write command), and User Config.

Instructions :

After setting the number of data items for read/write commands in the Modbus Master mode, completing the length of the mapped data in the User Config Mode , you can click the 'Menu Bar-Tools-Auto Mapping' / 'Toolbar-AutoMap' button to automatically fill in the value of the Mapping Address. As shown in the figure below:



4.Conflict Detect

The 'Conflict Detect' function can check the memory mapping address occupancy of the gateway and whether there is any conflict.

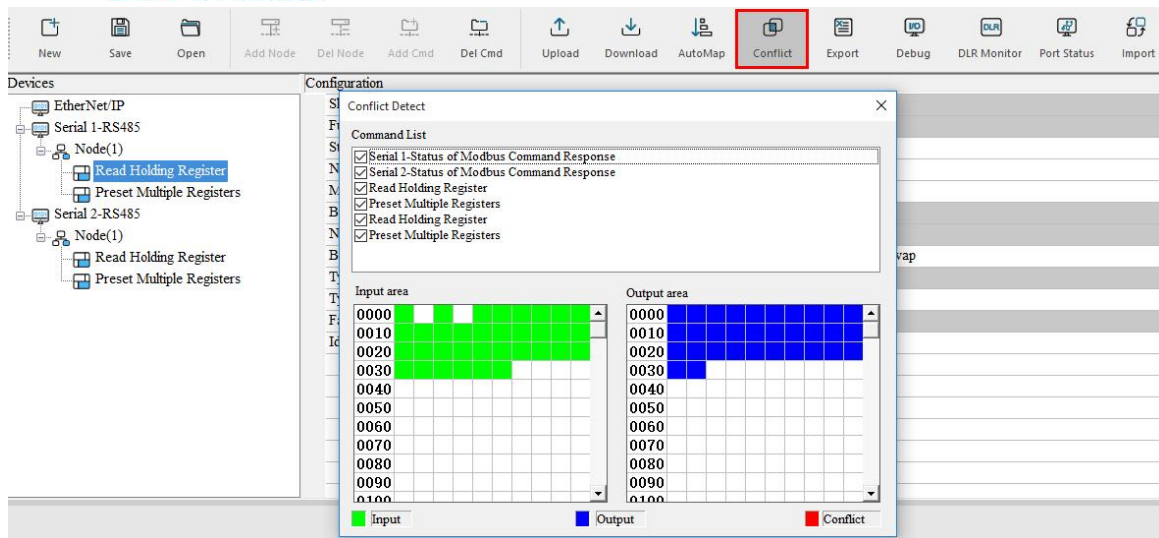
Click the 'Menu Bar - Tools - Conflict Detect' / 'Toolbar - Conflict' button to open the conflict detection window.

As shown in the figure below:



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Each square represents one byte. When you left-click a square with the mouse, it will display the occupancy status of the 8 bits in that byte.

Green: Input buffer address occupancy status, generally for read commands. When there is no conflict, it appears green.

Blue: Output buffer address occupancy status, generally for write commands. When there is no conflict, it appears blue.

Red: Indicates a conflict in the memory mapping address allocation within the input or output section. When a conflict is detected, the area will appear red.

5.Export Excel

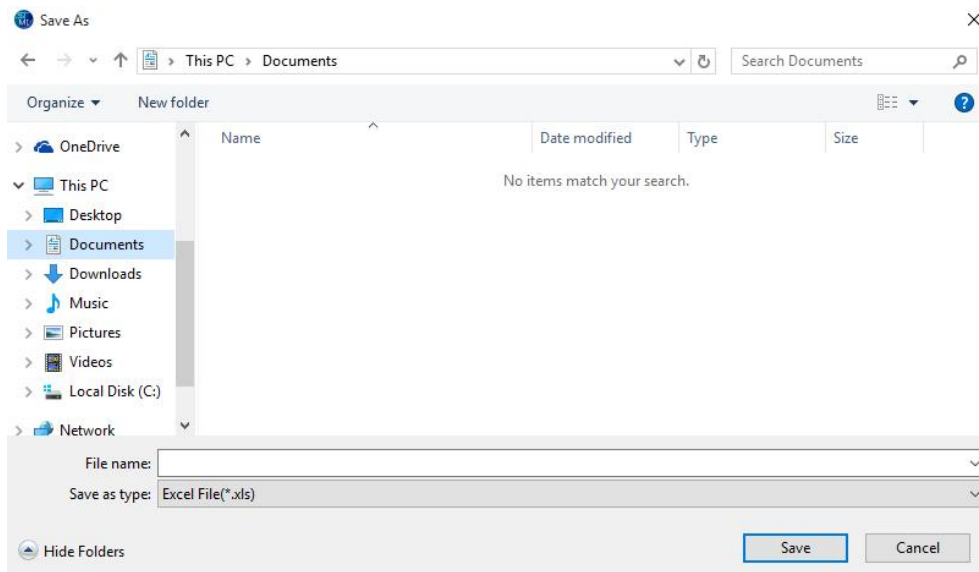
The 'Export Excel' function can save the configuration information as an Excel document, making it convenient for users to view the relevant configurations.

Click the 'Menu Bar - Tools - Export Excel' / 'Toolbar - Export' button, and the Save As window will pop up. As shown in the figure below:



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Select the appropriate path, enter the file name, and click Save. The Excel file will open automatically. Select different forms to view specific configuration information:

	A	B	C	D	E	F
1	Protocol Mode	IP Assignment	IP Address	Subnet Mask	Default Gateway	DNS1
2	EtherNet/IP Adapter	DHCP	192.168.0.11	255.255.255.0	192.168.0.1	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						

6.Debug

The 'Debug' function allows users to easily view the data communication status of both ends of the gateway protocol. When data exchange is abnormal, this function can be used to troubleshoot the problem.

Click the 'Menu Bar-Tools -Debug' / 'Toolbar-Debug' button, and the debugging type window will pop up :



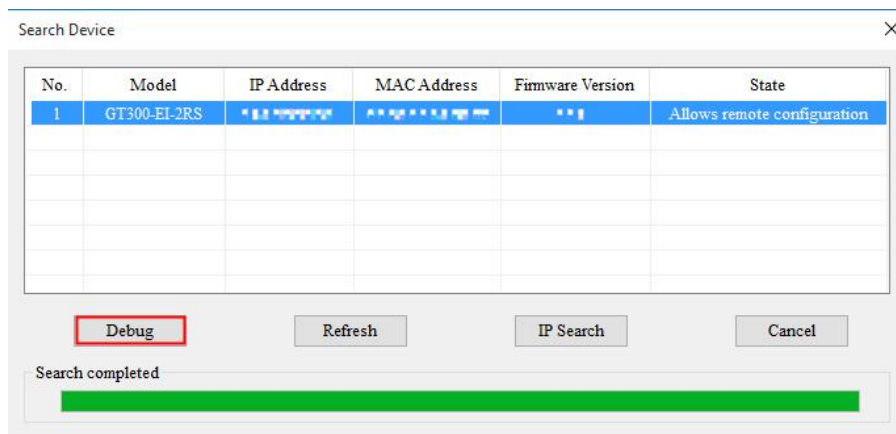
GT300-EI-2RS485

Modbus/EtherNet/IP Gateway

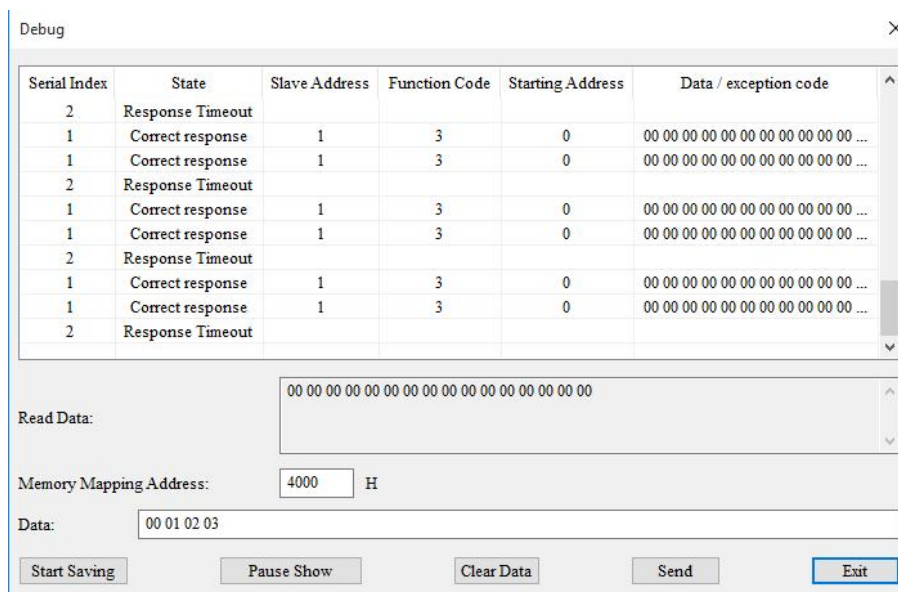
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After confirming the debugging type, the search device interface will pop up. Select the gateway to be debugged and click the 'Debug' button to open the debugging window.



6.1 Debugging Modbus

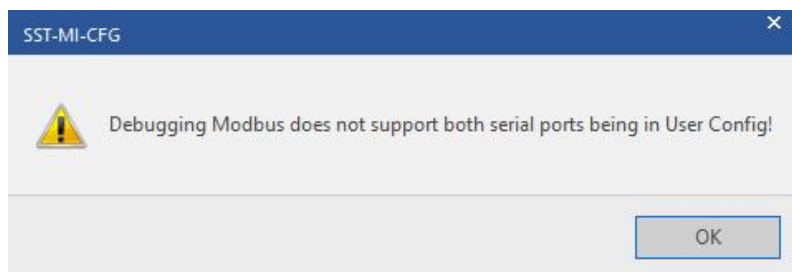


- (1) Displays data exchange status.
- (2) Read Data: Displays the status of the selected data.



- (3) Memory Mapping Address: The starting address where data is written to the gateway's memory.
- (4) Data: When not connected to an EtherNet/IP master device, data to be written to the gateway memory can be set here.
- (5) Start Saving/Stop Saving: Click 'Start Saving' to save the buffer data as a txt file. Click the 'Stop Saving' button to stop the saving process.
- (6) Pause Show/Continue to show: Click 'Pause Show' to pause displaying the received data. Click 'Continue to show' to resume displaying the received data.
- (7) Clear Data: Click 'Clear Data' to clear the data exchange status messages.

Note: This debugging window does not support both serial ports in User Config mode.



6.2 Debugging Buffer

- **Output Buffer:**

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	78	56	34	12	00	00	00	00	00	00	00	00	00	00	00	00
0x4010	00	00	00	00	34	12	32	56	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

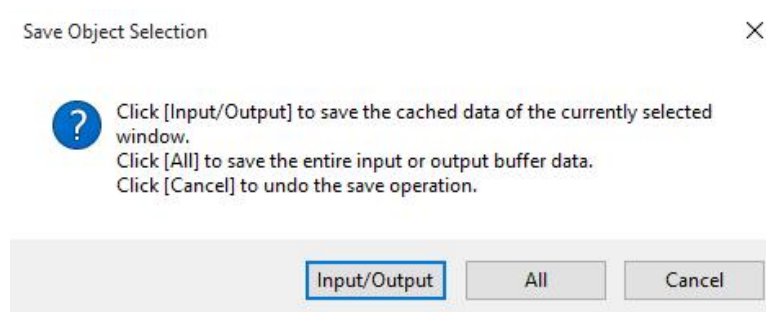
Data:

Position According to Address(Hex): Position

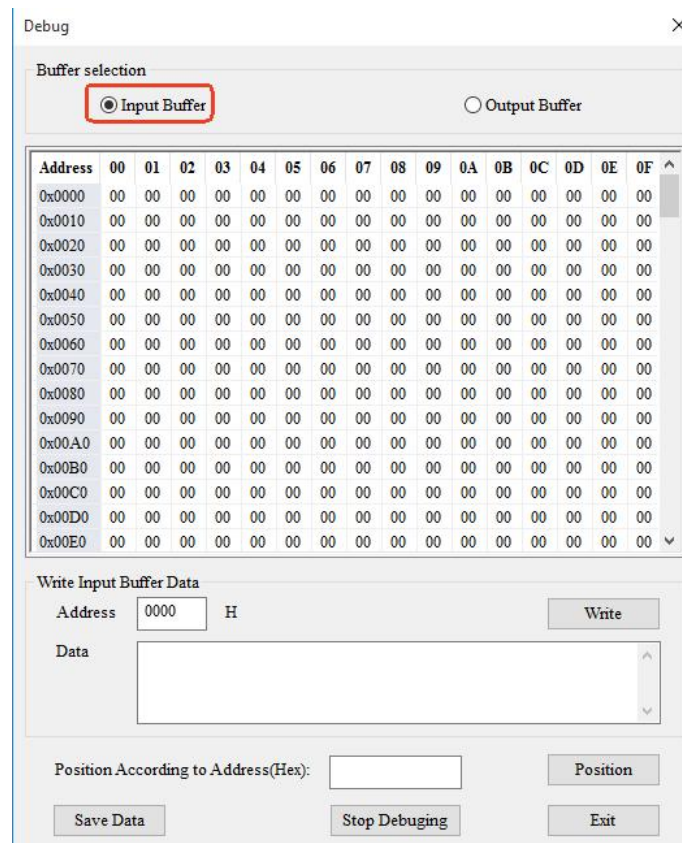
Save Data Stop Debugging Exit



- (1) Shows the data contents of the gateway's output buffer.
- (2) Write Output Buffer Data: When not connected to an EtherNet/IP master device, you can modify and send the output buffer data in this interface.
- (3) Position: You can locate and view the data at a specific address in the output buffer.
- (4) Save Data: The data in the buffer can be saved as a txt file. Click 'Save Data' to pop up the following dialog.
Save the file according to your needs.



- **Input Buffer:**

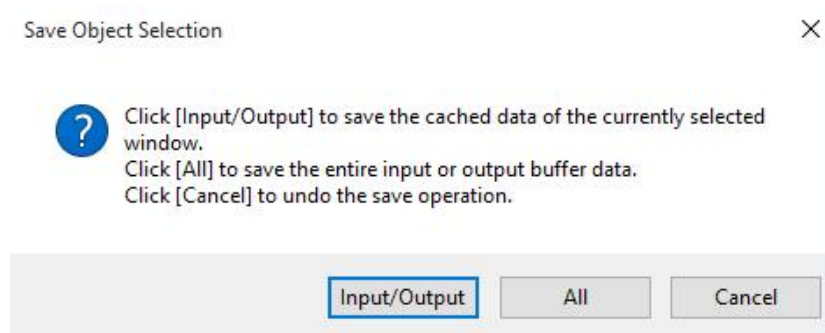


- (1) Shows the data contents of the gateway's input buffer.
- (2) Write Input Buffer Data: When the serial port device is not connected, the data value of the input buffer can be modified and sent in this interface.



- (3) Position: You can locate and view the data at a specific address in the input buffer.
- (4) Save Data: The data in the buffer can be saved as a txt file. Click 'Save Data' to pop up the following dialog.

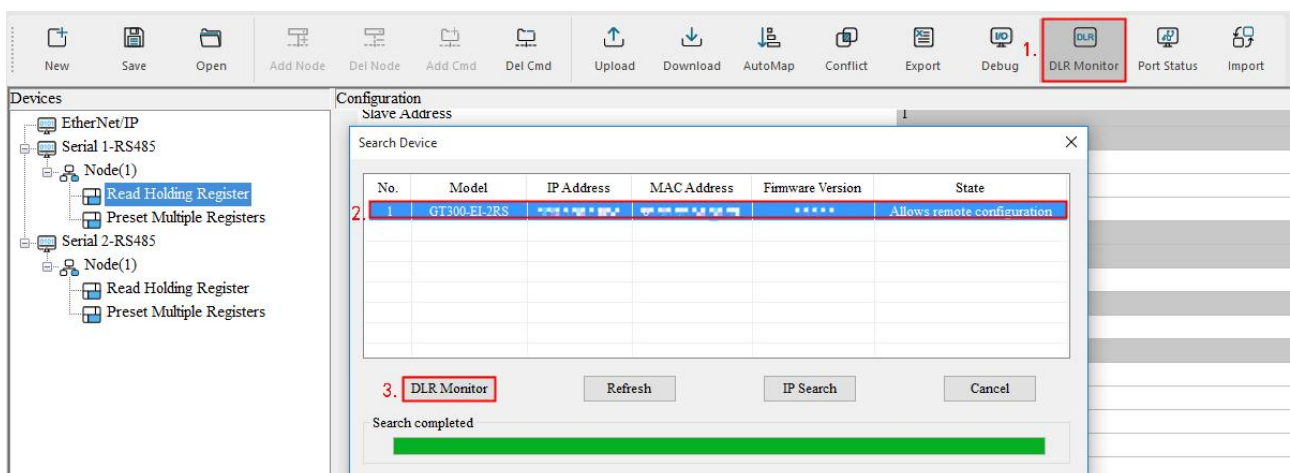
Save the file according to your needs.



7.DLR Monitor

The 'DLR Monitor' function allows users to monitor the DLR ring network status and related ring monitor parameters online. When an error occurs in the ring network, this function helps check the number of errors that have occurred.

Click the 'Menu Bar-Tools -DLR Monitor' / 'Toolbar - DLR Monitor' button, and the Search Device interface will pop up:



In the Search Device interface, select the gateway to be monitored, and click the 'DLR Monitor' button to open the monitoring window.



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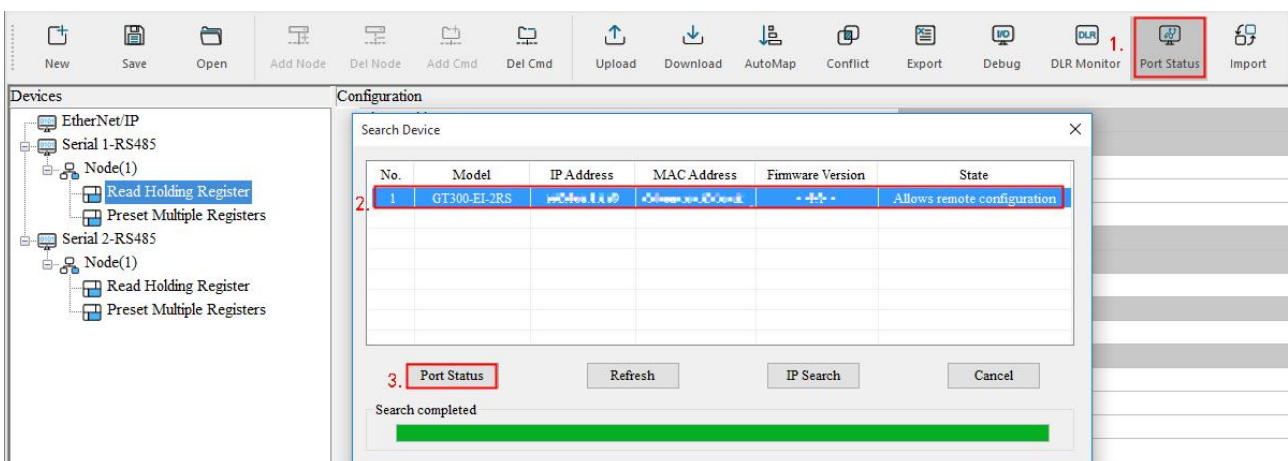
DLR Monitor

Parameter	Value
Network Information	
Network Topology	Linear
Network Status	Normal
DLR Network Fault Diagnosis	
Ring Error Count	0
Ring Supervisor Parameters	
Ring Supervisor	IP:0.0.0.0 MAC:00-00-00-00-00-00
Ring Supervisor Priority	0
Beacon Interval (us)	0
Beacon Timeout (us)	0
Ring VLAN ID	0

8.Port Status

The 'Port Status' function allows users to view the status and speed information of the two network ports of the gateway in real-time.

Click the 'Menu Bar-Tools -'Port Status' / 'Toolbar - Port Status' button, and the Search Device interface will pop up:



In the Search Device interface, select the gateway and click the 'Port Status' button to open the Network Settings window.



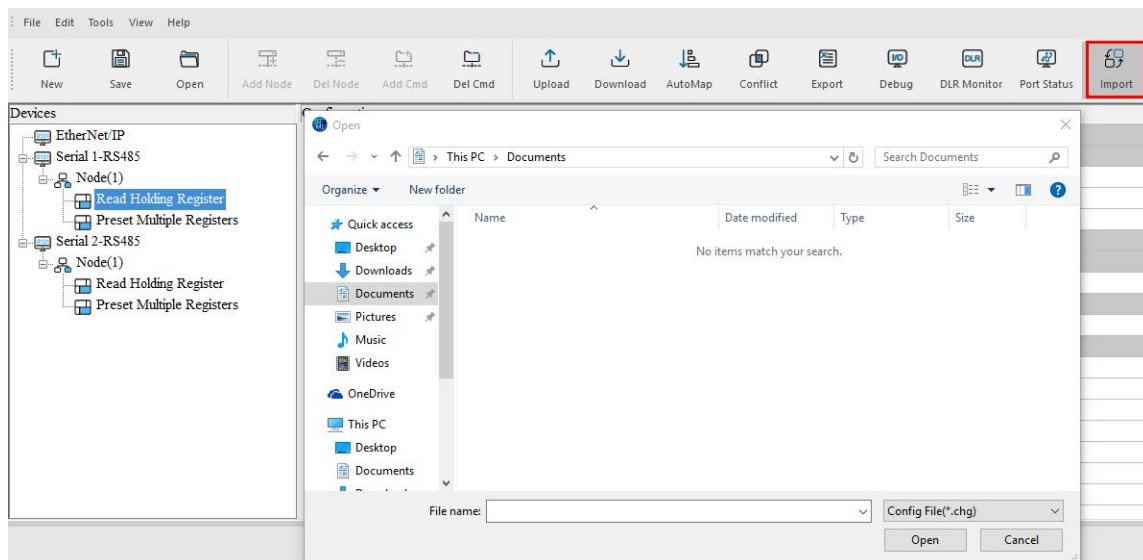
Network Settings



Parameter	Value
Ethernet Port 1	
Network Status	Connected
Duplex Mode	Full Duplex
Speed	100
Ethernet Port 2	
Network Status	Connected
Duplex Mode	Full Duplex
Speed	100

9.Import

The 'Import' function allows accessing configuration files from previous V2.X versions and importing them into the new version gateway configuration.



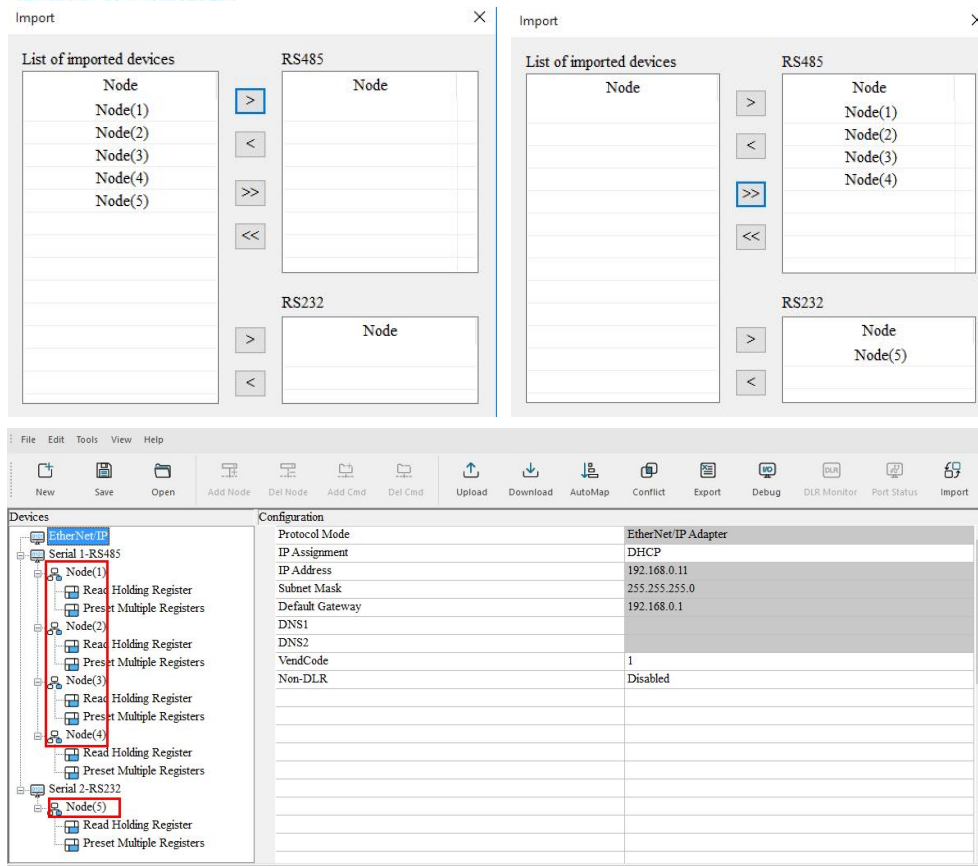
After selecting the configuration file, if its version information is not significantly different from the latest version, it can be directly converted and used. Otherwise, the node information in the configuration will be automatically recognized and can be manually assigned to the new configuration.

Example of GT100-EI-RS:



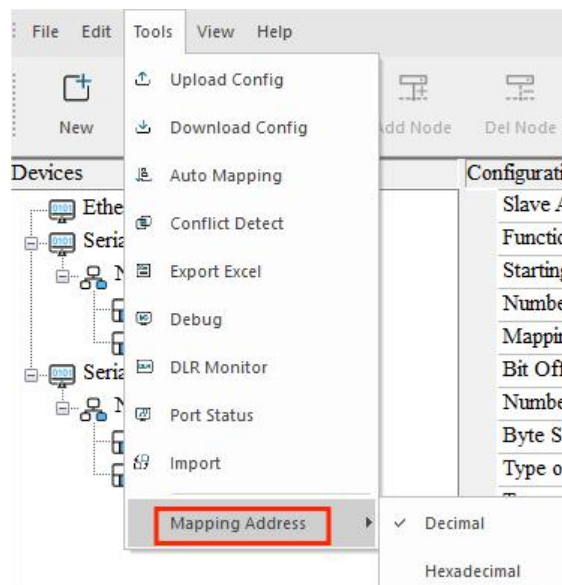
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10.Mapping Address

In Modbus Master and User Config modes, the parameter 'Memory Mapping Starting Address' is displayed in both 'Decimal' and 'Hexadecimal' formats. The default display format is 'Decimal'.





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Using Modbus Master as an example:

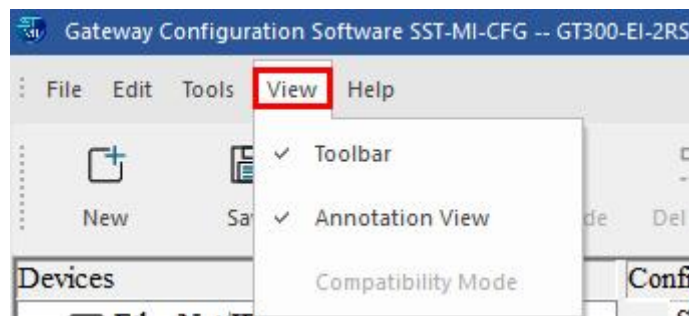
Devices	Configuration
EtherNet/IP	Slave Address 1
Serial 1-RS485	Function Code 3
Node(1)	Starting Address 0
Read Holding Register	Number of Data 8
Preset Multiple Registers	Mapping Address(Dec) 4
Serial 2-RS485	Bit Offset
Node(1)	Number of Bytes 16
Read Holding Register	Byte Swap Two Byte Swap
Preset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

Display format is 'Decimal'

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(Hex) 4H
Serial 2-RS485	Bit Offset
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
	Identifier 1

Display format is 'Hexadecimal'

5.3.4 View

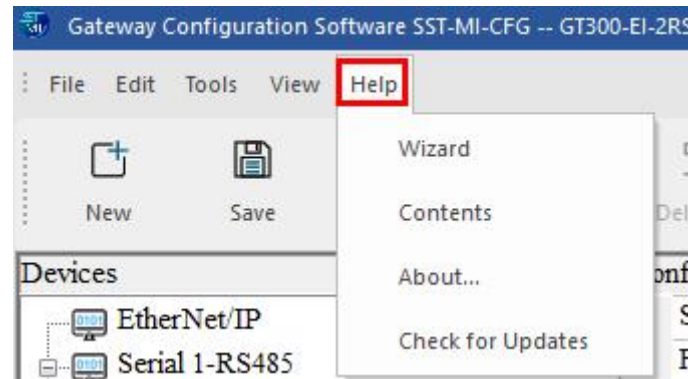


Menu Bar-View, 'Toolbar' and 'Annotation View' are checked by default, and the software interface displays 'Toolbar' and 'Annotation View' by default.

Compatibility Mode: Applicable to GT100-EI-RS. After selection, it is compatible with the GT100-EI-RS V2.X version.



5.3.5 Help



1.Wizard:

Click 'Wizard' to quickly configure according to the corresponding window guidance.

2.Contents:

Click 'Contents' to open the software manual and view the instructions for using the software.

3. About:

Click 'About' to view detailed information about the configuration software version and other related details.

4.Check for Updates:

The 'Check for Updates' feature allows for real-time online updates of the latest version of the configuration software.

When the computer with the configuration software is connected to the network, click 'Menu Bar-Help-Check for Updates' will display whether the current software version is the latest and if a new version is available.



GT300-EI-2RS485

Modbus/EtherNet/IP Gateway

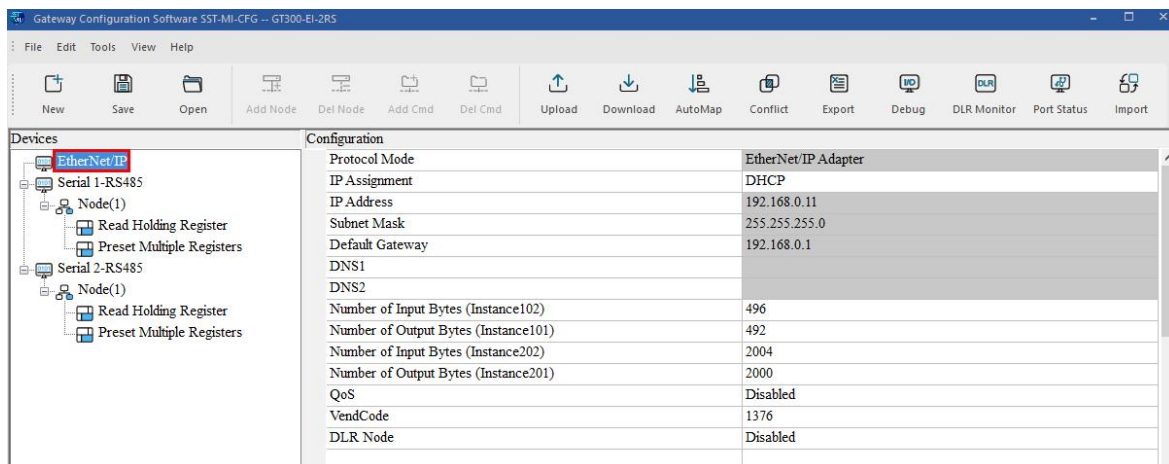
User Manual



There are three button options: Skip this version, Remind me later, and Install update.

Click the 'Install update' button to begin the process of uninstalling the current version and installing the updated version. Follow the prompts to complete the update.

5.4 EtherNet/IP Settings Instructions



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: 5-2004 Bytes. Default value is 2004.

Number of Output Bytes (Instance201) : Range: 1-2000 Bytes. Default value is 2000.

QoS: Default value is Disabled. When set to Enabled, it allows specific types of network packets to receive appropriate priority handling within the network.

VendCode: Range: 1-65535. Default value is 1376.



DLR Node: Supports EtherNet/IP DLR ring networks and acts as a DLR node.

Enabled: Both ports must be connected to the DLR ring.

Disabled: Both ports operate as a standard switch.

5.5 Serial Settings Instructions

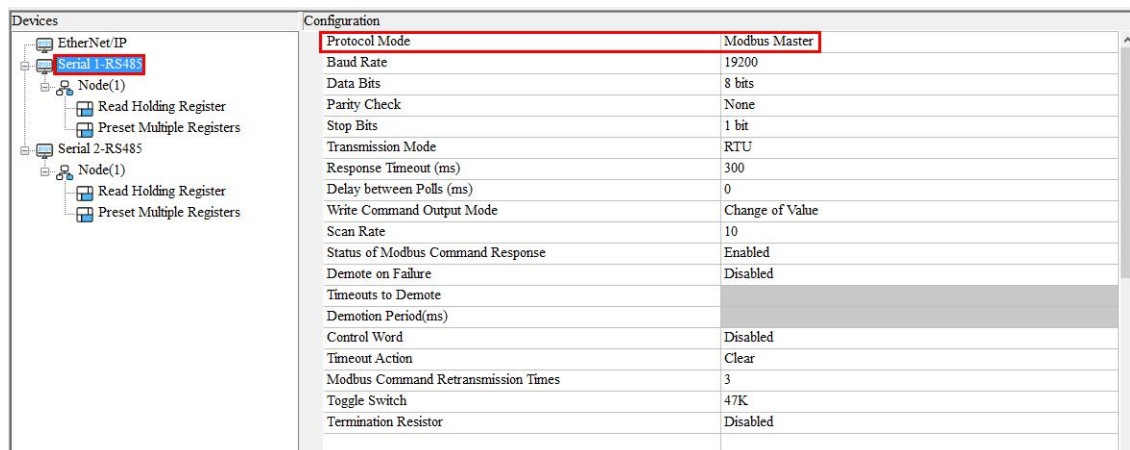
The gateway in this serials support two working modes for the serial port: Modbus Master and User Config. These modes can be selected through the software interface's tree view by selecting the 'Serial' and choosing the desired working mode in the 'Protocol Mode' field.

5.5.1 Modbus Master

Select 'Serial' in the tree view and select 'Modbus Master' in 'Protocol Mode', which means that the gateway now communicates as a Modbus master and can connect multiple Modbus slave devices.

The steps to set up the Modbus Master mode are as follows:

1. **Protocol Mode** : Select 'Modbus Master', and the basic parameters to be set are as follows:



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

- (1) **Set the basic parameters of the serial** : Baud Rate, Data Bits, Parity Check, Stop Bits, Transmission Mode, Response Timeout(ms), Delay between Polls(ms), Write Command Output Mode, Scan Rate.
- (2) **Set advanced features** :
 - **Status of Modbus Command Response:** Default value is Enabled. When Enable, each command uses a bit



to indicate the execution status of the command. If the execution is successful, the corresponding bit is set to 1, otherwise it is set to 0.

· **Demote on Failure:** Default value is Disabled. This parameter is valid for Modbus reading command and cycle writing command. When Demote on Failure is 'Enabled', after N times of command response failures (errors), if the command is a fast scan, it will be demoted to a slow scan.

· **Control Word :** The starting position of the gateway output data buffer is the command setting control word configured in the Modbus. One command corresponds to one bit, and the command is effective by setting the corresponding position to 1. There are options for Disabled, All Commands, and Only Write Commands .

The default setting is Disabled. The gateway executes read/write commands normally, and write commands are output according to the 'Write Command Output Mode'.

When 'All Commands' or 'Only Write Commands' is selected, the following is performed in conjunction with the setting of 'Output Mode':

- Change of Value + All Commands = Each command corresponds to 1 bit, and the sending of the corresponding command is controlled by setting the control bit to 1 or 0. Setting it to 1 means that the corresponding command allows communication, and setting it to 0 means that communication is prohibited .
- Change of Value + Only Write Commands = Same as above, read command communicates normally, only when the write command control position is 1, the write command can be output on every change, if the control position is 0, the write command cannot be output .
- Cyclic + All Commands = Each command corresponds to 1 bit, and the sending of the corresponding command is controlled by setting the control bit to 1 or 0. Setting it to 1 means that the corresponding command allows communication, and setting it to 0 means that communication is prohibited .
- Cyclic + Only Write Commands = Same as above, read command communicates normally, only for write command, when the corresponding control position is 1, the write command can be output continuously .
- Disabled + All Commands = control word function is invalid , write command is prohibited, read command communication is normal .
- Disabled + Only Write Commands = same as above ;
- Control Word Trigger + All Commands = When turned on, the value of the control word must be set to



0 first, then to 1, before a read command or a write command can be issued . After the communication is completed, it must be set to 0 again, then to 1, before the next command can be communicated ;

- Control Word Trigger + Only Write Commands = Same as above, read command communicates normally, only for write command ;
- Control Word Trigger + Disabled = Write command. From the time the gateway is powered on, as long as the output data is not 0, it will only be output once, and will not be output again unless the gateway is reset or powered off and restarted .

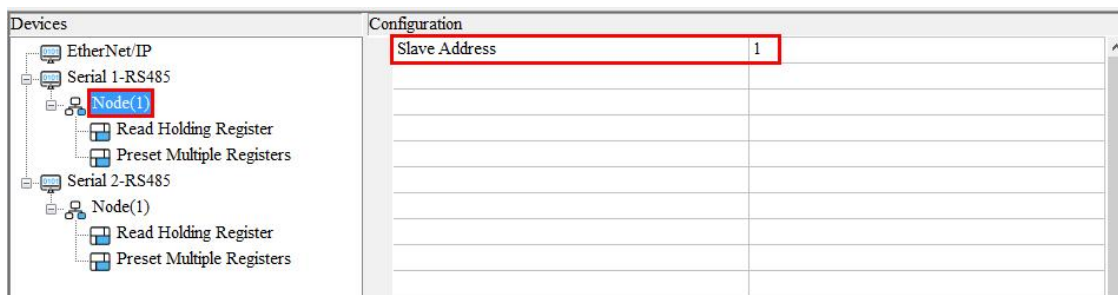
· **Timeout Action:** The action the gateway will take when it fails to receive a correct response message from any Modbus node after sending read commands.

Clear: Set the EtherNet/IP input data to zero.

Hold: Keep the EtherNet/IP input data unchanged.

· **Modbus Command Retransmission Times:** When the Modbus command response is wrong, set the number of retransmissions of the command. Range: 2-254. Default Value is 3.

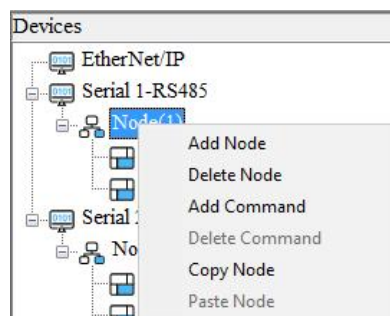
2. Add/Delete nodes:



As a Modbus Master, the gateway can connect to multiple Modbus slave devices. Each node represents a slave device. Fill in the slave device address in Slave Address.

● Node setup instructions:

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



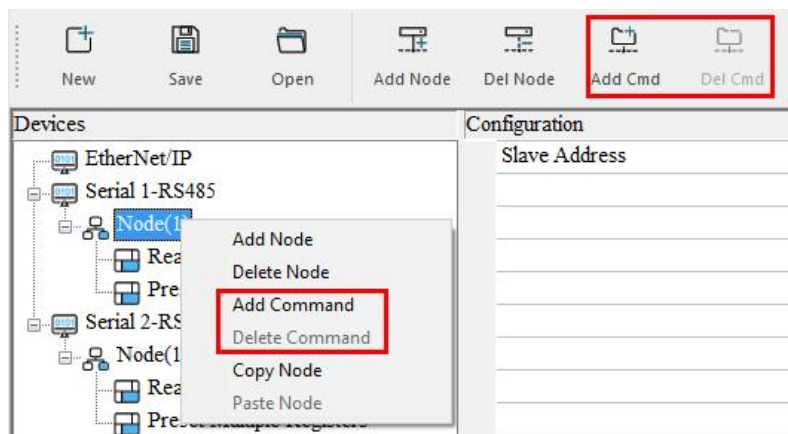


- **Add Node:** Right-click and select 'Serial/Node', a pop-up option prompt box will appear, select 'Add Node' to complete the node adding operation. Alternatively, you can click 'Menu Bar-Edit-Add Node'/'Toolbar-Add Node' button to complete the operation.
- **Delete Node:** There are several ways to delete a node:
 - ① Right-click the node to be deleted, select 'Delete Node' from the pop-up menu to complete the operation.
 - ② Click 'Menu Bar-Edit-Delete node'/' Toolbar-Delete 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. Add/Delete Commands:

The gateway needs to add commands based on the specific Modbus commands supported by the slave device.

There are two types of command operations: Add commands and Delete commands.



- **Add Command :** Right-click the node to which you want to add a command, select 'Add Command' from the pop-up menu, and a pop-up window of command options will pop up. Double-click the command you want to add to complete the command adding operation. Alternatively, you can click the 'Menu Bar-Edit - Add Command' / 'Toolbar - Add Cmd' button to complete the operation.
- **Delete Command :** There are several ways to delete a command:



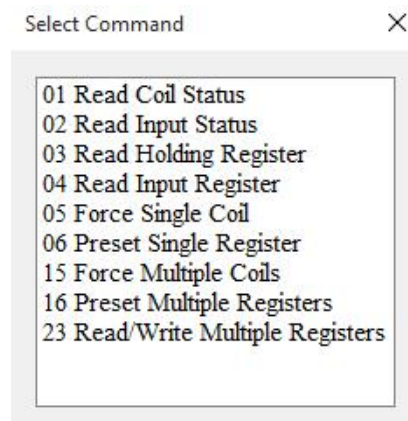
- ① Right-click the command to be deleted, select 'Delete Command' from the pop-up menu to complete the operation.
- ② Click the 'Menu Bar-Edit-Delete Command'/'Toolbar-Delete Cmd' button to complete the operation.
- ③ Select the command to be deleted with the left mouse button, or use the shortcut key 'Delete' to delete the command.

● Modbus command setting instructions

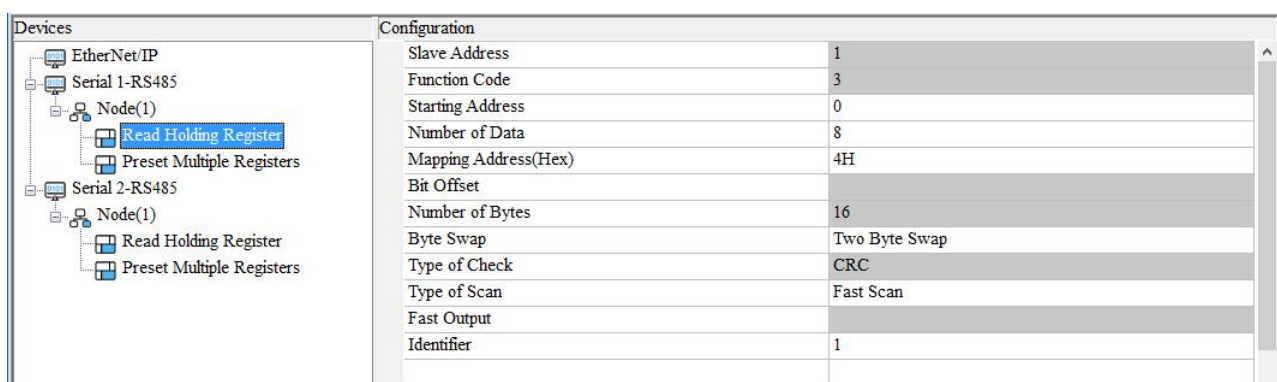
Modbus Master supports the following command function codes: 01, 02, 03, 04, 05, 06, 15, 16, 23.

When you select the 'Add Command' function, a command option pop-up window will pop up, as shown below :

Double-click the command you want to add to complete the command addition operation.



An example of the Modbus command configuration interface is as follows:



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

Modbus commands are 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.

- **Number of Data:** The number of data in the command, a decimal value.
- **Mapping Address(HEX):** This command reads/writes the data stored in the gateway's internal input/output buffer start address, a hexadecimal value. This address can be manually entered or automatically filled in by clicking the 'Auto Map' button on the toolbar after filling in the 'Number of Data'.
- **Bit Offset:** It is valid for command settings 01/02/05/15. You can set the position of the start bit in the byte. The default setting is usually 0, which means no offset.

Other parameters can remain at default settings unless otherwise specified.

- **Explanation on 'Starting Address':**

The address of the Modbus command has two forms: one is based on 0, and the other is based on 1. The following are examples of these two addresses:

Function Code	1-based address display	0-based address display
Coil status(Function code: 01,05,15)	00001~00010	00000~00009
Input Status(Function code: 02)	10001~10010	00000~00009
Holding Registers(Function code: 03, 06, 16,23)	40001~40010	00000~00009
Input Register(Function code: 04)	30001~30010	00000~00009

The address set on the configuration interface of this software is a 0-based address and is displayed in decimal.

- **Modbus command setting example:**

Users need to use the gateway to read the following communication data information of the Modbus slave device:

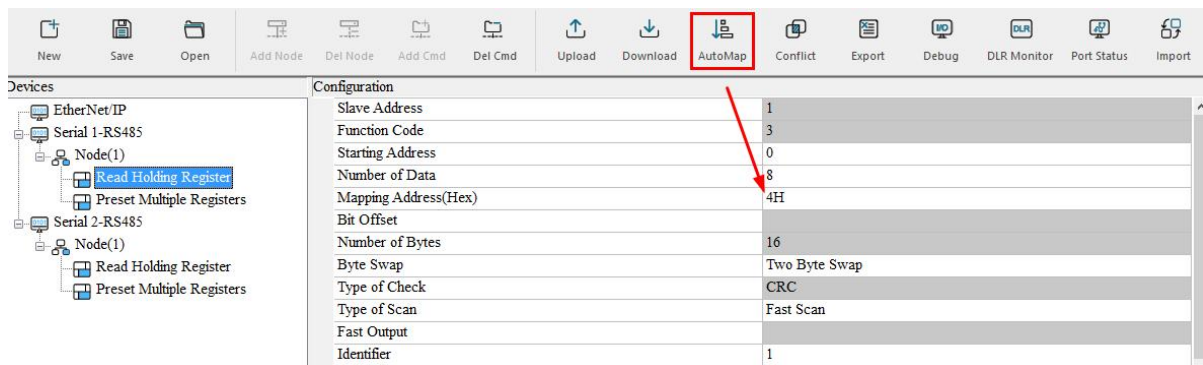
Function Code	1-based address content	Data length
01	0X0001~0X0002	2
02	1X0058	1
03	4X0004~4X0013	10
04	3X0025	1

The contents that should be set in SST-MI-CFG are:

Command function code	Modbus register start address (0-based address)	Number of data (decimal number)
01	0	2
02	57	1
03	3	10
04	24	1

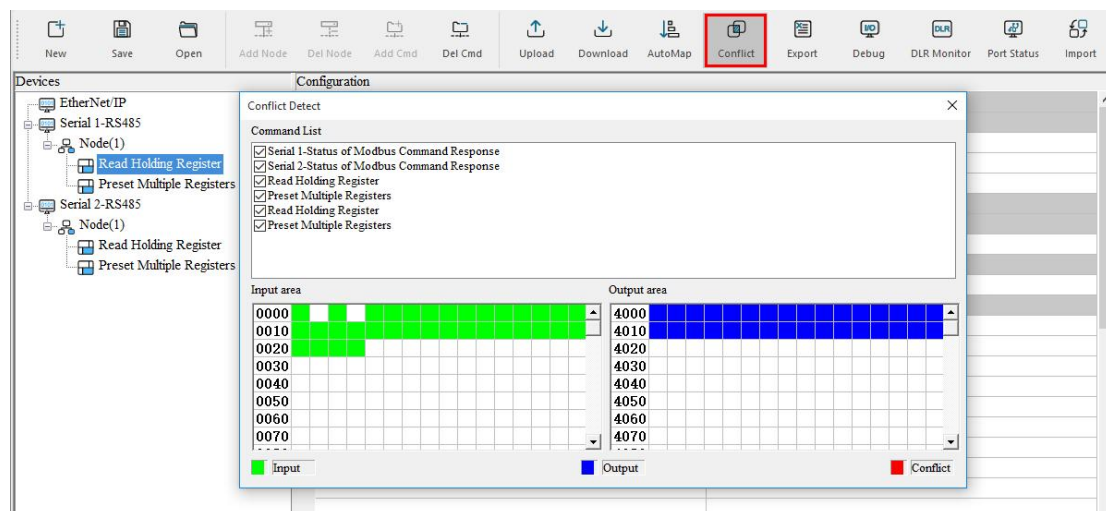
4. Auto Map:

After the node and command settings are completed, you can click the 'Toolbar - Auto Map' button to automatically assign the 'Mapping Address(HEX)' of the Modbus read/write command. 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.



5. Conflict Detection:

After setting the 'Mapping Address(HEX)', you can click the 'Toolbar - Conflict' button to view the address allocation status of the gateway's input/output buffers and check for any address conflicts.



6. Download configuration:



Once the required configuration is set, 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.

5.5.2 User Config

Select 'Serial' in the tree view and select 'User Config' in 'Protocol Mode'. The gateway collects data from universal serial port devices.

The steps to set up the User Config mode are as follows:

1. **Protocol Mode** : Select 'User Config', and the basic parameters to be set are as follows:

Devices	Configuration																																										
- EtherNet/IP - Serial 1-RS485 - Serial 2-RS485 - Node(1) - Read Holding Register - Preset Multiple Registers	<table> <tr> <th>Protocol Mode</th><th>User Config</th></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>Frame Type</td><td>Time Interval between Characters</td></tr> <tr><td>Time Interval between Characters (ms)</td><td>10</td></tr> <tr><td>Frame Length</td><td></td></tr> <tr><td>Start Delimiter</td><td></td></tr> <tr><td>End Delimiter</td><td></td></tr> <tr><td>Enable Auto Sending</td><td>Disabled</td></tr> <tr><td>Period of Auto Sending (ms)</td><td></td></tr> <tr><td>Enable CRC Check</td><td>Disabled</td></tr> <tr><td>Enable Data Length Mapping on Ethernet Side</td><td>Disabled</td></tr> <tr><td>Transaction No.</td><td>Enabled</td></tr> <tr><td>Memory Starting Address of Sending Data</td><td>4000H</td></tr> <tr><td>Length of Sending Data</td><td>246</td></tr> <tr><td>Memory Starting Address of Receiving Data</td><td>0H</td></tr> <tr><td>Length of Receiving Data</td><td>246</td></tr> <tr><td>Toggle Switch</td><td>47K</td></tr> <tr><td>Termination Resistor</td><td>Disabled</td></tr> </table>	Protocol Mode	User Config	Baud Rate	19200	Data Bits	8 bits	Parity Check	None	Stop Bits	1 bit	Frame Type	Time Interval between Characters	Time Interval between Characters (ms)	10	Frame Length		Start Delimiter		End Delimiter		Enable Auto Sending	Disabled	Period of Auto Sending (ms)		Enable CRC Check	Disabled	Enable Data Length Mapping on Ethernet Side	Disabled	Transaction No.	Enabled	Memory Starting Address of Sending Data	4000H	Length of Sending Data	246	Memory Starting Address of Receiving Data	0H	Length of Receiving Data	246	Toggle Switch	47K	Termination Resistor	Disabled
Protocol Mode	User Config																																										
Baud Rate	19200																																										
Data Bits	8 bits																																										
Parity Check	None																																										
Stop Bits	1 bit																																										
Frame Type	Time Interval between Characters																																										
Time Interval between Characters (ms)	10																																										
Frame Length																																											
Start Delimiter																																											
End Delimiter																																											
Enable Auto Sending	Disabled																																										
Period of Auto Sending (ms)																																											
Enable CRC Check	Disabled																																										
Enable Data Length Mapping on Ethernet Side	Disabled																																										
Transaction No.	Enabled																																										
Memory Starting Address of Sending Data	4000H																																										
Length of Sending Data	246																																										
Memory Starting Address of Receiving Data	0H																																										
Length of Receiving Data	246																																										
Toggle Switch	47K																																										
Termination Resistor	Disabled																																										

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

2. **Set the basic parameters of the serial** : Baud Rate, Data Bits, Parity Check, Stop Bits.

3. **Set the Frame Type** : There are three frame type to set, Time Interval between Characters, Frame Length and Delimiter.

- **Time Interval between Character(ms)** : Determine the end of a frame of serial port data by judging the time interval between characters. The maximum time interval allowed between characters. Range: 10 - 60000ms. Default value is 10ms.
- **Frame Length**: Determine the end of a frame of serial port data by judging the number of characters. The number of characters in the serial port receiving data frame is only valid when the control mode is



'Frame Length'. Range: 1-254. default value is 111.

- **Delimiter:** Determine the start and end of a frame of serial port data by judging the start and end characters of the data frame. Receive the start or end characters of the data frame, only valid when the control mode is 'Delimiter'. Range: 0-255. Default value is 0. (Note: When the Data Bits is set to 7 bits, the range is 0-127, default value is 0.)

4. Set advanced features:

- **Enable Auto Sending:** The default is Disabled. Set to 'Enabled' to automatically send serial data at the configured cycle, regardless of whether there is any change in the serial data. Set to 'Disabled' to only send serial data 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 is 1000ms.
- **Enable CRC Check:** The default is Disabled. Set to 'Enabled', the serial port can automatically add two bytes of CRC check code when sending data. The serial port can automatically determine whether the CRC checksum is correct when receiving data, and automatically remove the two bytes of CRC checksum in the EtherNet/IP input data. (Note: only valid when the Data Bits is '8 bits' and the Frame Type is 'Time Interval between Characters' or 'Frame Length'.)
- **Enable Data Length Mapping on Ethernet Side:** 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 a cycle of 0-255.

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

When outputting data on the EtherNet/IP end, the transaction sequence number is incremented by 1 to output one frame of data.

- **Memory Starting Address of Sending Data:** Map address offset in the output buffer, data direction EtherNet/IP->Serial.
- **Length of Sending Data:** The number of bytes mapped to the output buffer. Range : 2-256.
- **Memory Starting Address of Receiving Data:** Map address offset in input buffer, data direction



Serial->EtherNet/IP.

- **Length of Receiving Data:** The number of bytes mapped to the input buffer. Range: 2-256.

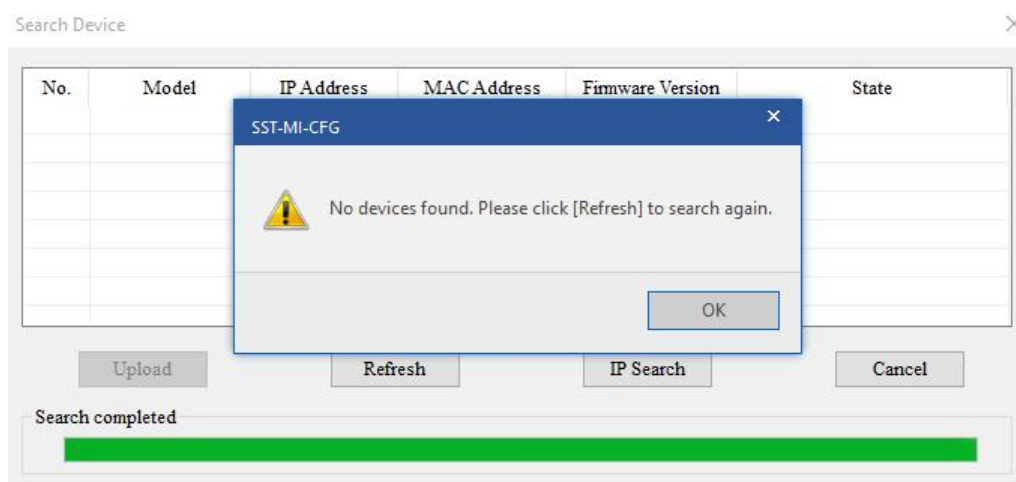
5. Download configuration :

Once the required configuration is set, you can click the 'Conflict' button on the toolbar to view the address allocation status of the gateway's input/output buffers and check for any address conflicts.

Click the 'Download' button on the toolbar 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 'Upload' button on the toolbar to view the configuration stored in the gateway.

5.6 How to Resolve Device Search Issues?



The configuration software has several features related to device search. If the gateway cannot be found, the following troubleshooting steps can be performed:

- (1) If the device is not found, click the 'Refresh' button to search again. Sometimes there may be a delay, so simply try searching again.
- (2) Please confirm whether the network cable connecting the PC to the gateway is normal.
- (3) Please confirm whether the PC and the gateway are on the same subnet.

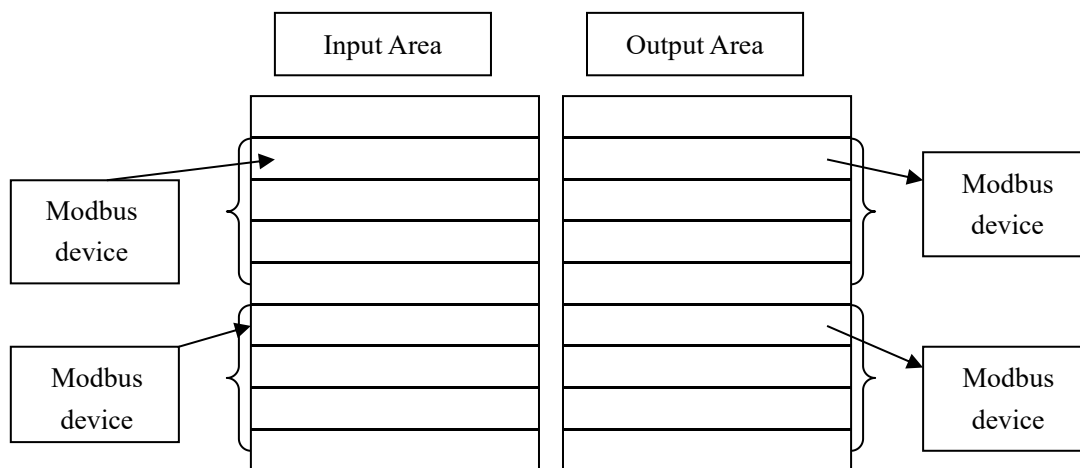
If the IP Assignment is DHCP, and there is no DHCP server or switch in the network, no IP address is obtained after about 30 seconds upon power-on or restart, it will automatically revert to the fixed IP address 192.168.0.11.

In this case, set the PC to the 0 subnet and perform the search again.



6 Modbus Master Operating Principle

The data conversion between Modbus and EtherNet/IP in the GT300-EI-2RS485 is established through a 'mapping' relationship. There are two data buffers in the GT300-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.



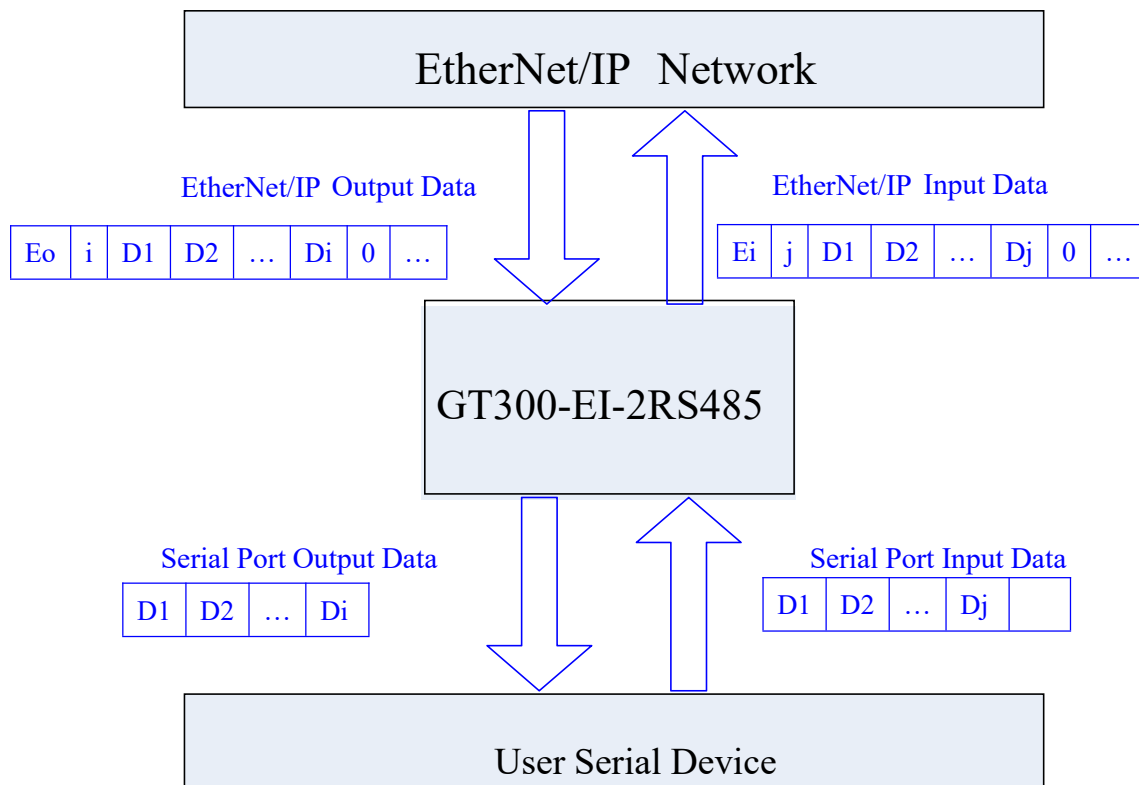
The user can configure up to 100 commands, with each Modbus command capable of reading a group of consecutive Modbus registers.



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:

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 Config Bytes (Instance113) : Fixed at 10 bytes.

Number of Input Bytes (Instance202) : Range: 5-2004 Bytes. Default value is 2004.

Number of Output Bytes (Instance201) : Range: 1-2000 Bytes. Default value is 2000.

Number of Config Bytes (Instance203) : Fixed at 10 bytes.

Take configuration parameters of RSLogix5000 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:
☒ Open Module Properties

Connection Parameters

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

OK Cancel Help

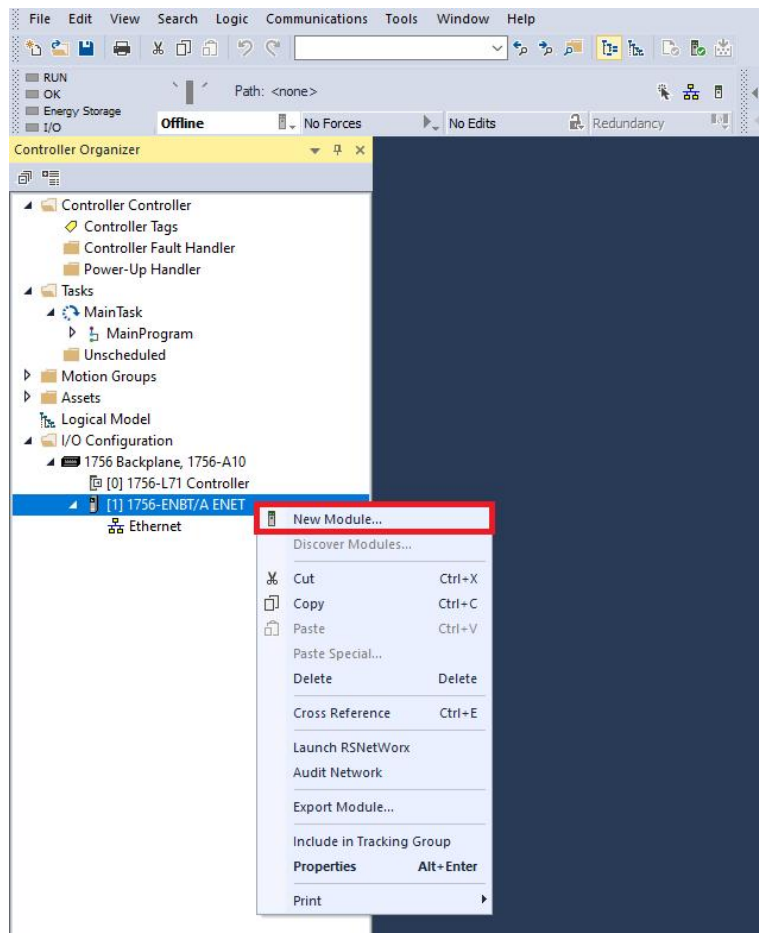
The data size configured in Studio 5000 Logix must match the data size configured in the SST-MI-CFG configuration software. For example, if the input data size configured in the SST software is 496 bytes, and if Studio 5000 Logix is using DINT (32-bit), then the input data size must be set to 124 ($496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



8.1 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:

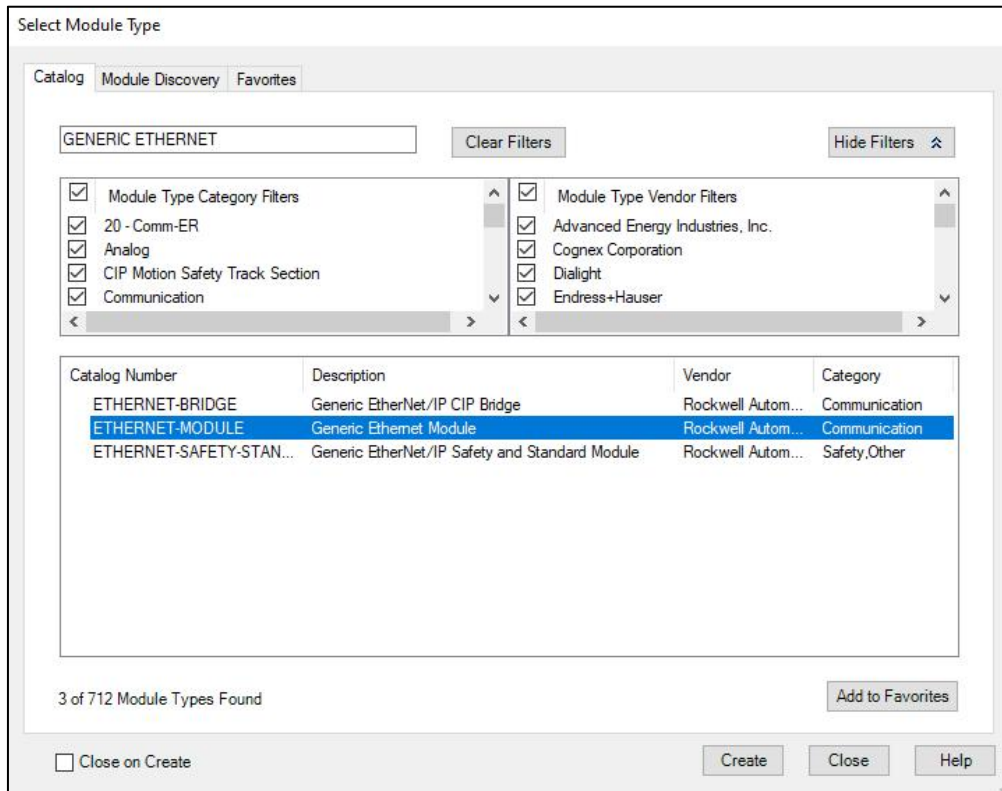


In the pop-up dialog box, search for 'GENERIC ETHERNET', choose 'ETHERNET-MODULE', and click 'Create' as shown below:

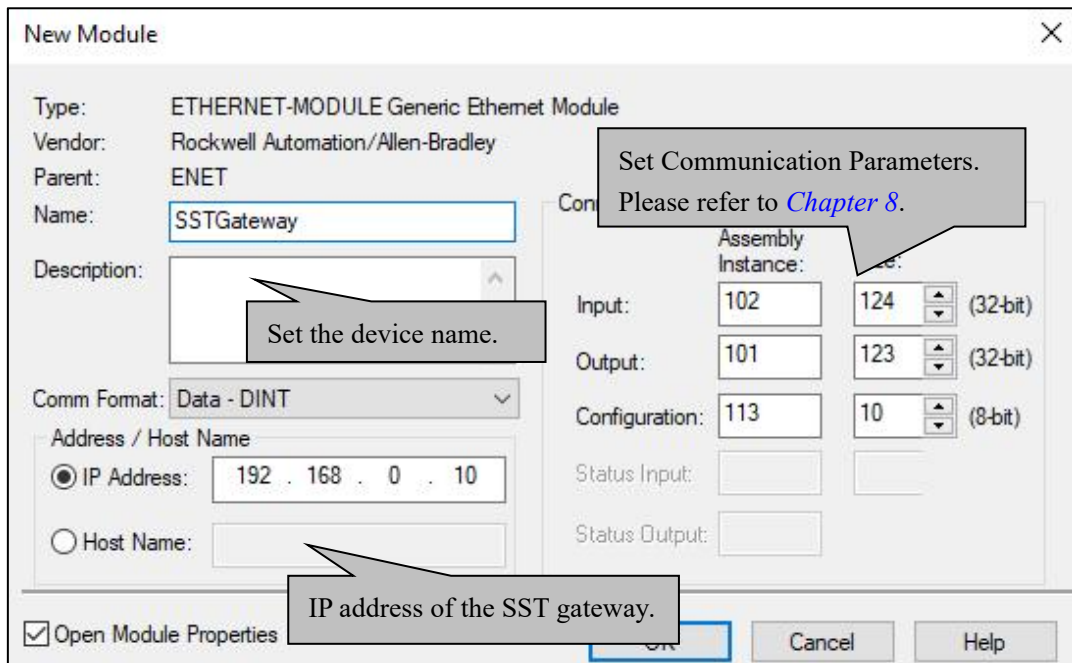
GT300-EI-2RS485

Modbus/EtherNet/IP Gateway

User Manual



Configure relevant information of GT300-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.

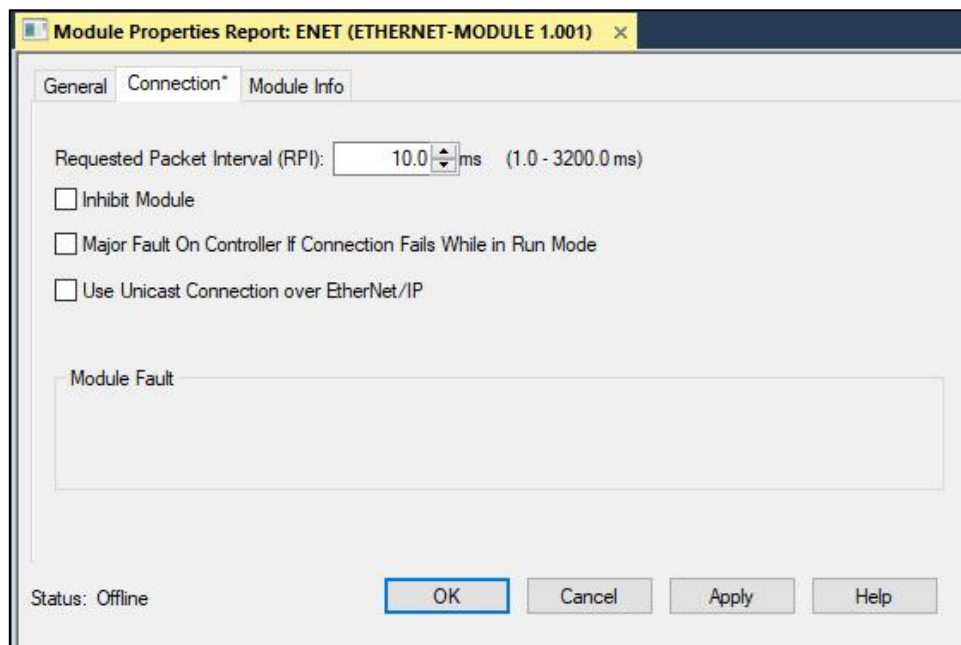


IP Address: Set the IP address of the added EtherNet/IP device module (The IP address of GT300-EI-2RS485, which is configured by the software SST-MI-CFG).

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.

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.

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

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The screenshot displays the SST Automation software interface. On the left is the 'Controller Organizer' tree, showing a hierarchy from 'Controller Controller' down to '1756-ENBT/A ENET'. The main window is titled 'Controller Tags - Controller(controller)' and shows a table of tags. The table has columns for Name, Value, Force Mask, Style, Data Type, Description, and Constant. The 'SSTGateway:O' tag is expanded, showing a list of output data addresses from 0 to 28, all of which are DINT type and have a value of 0.

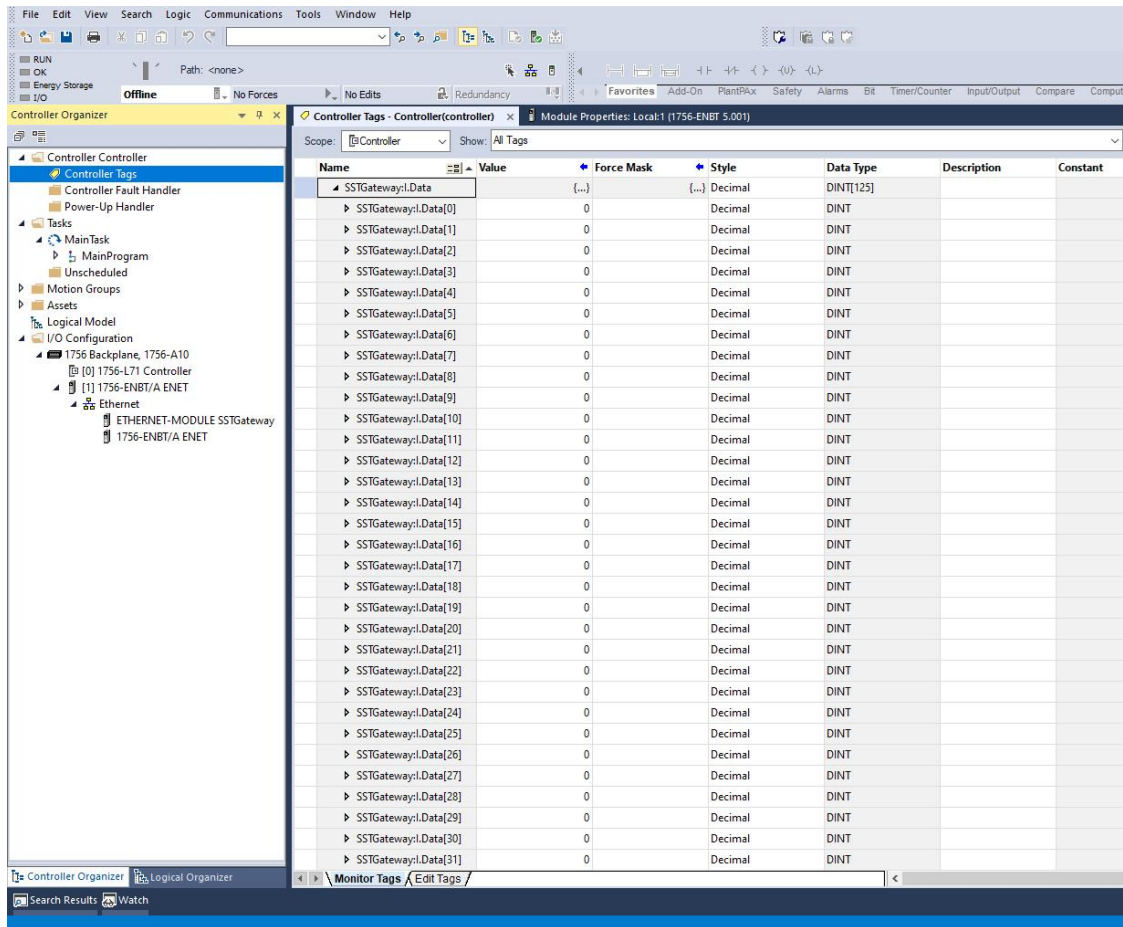
Name	Value	Force Mask	Style	Data Type	Description	Constant
SSTGateway:C	{...}	{...}	{...}	AB:ETHERNET_MODU...		☐
SSTGateway:I	{...}	{...}	{...}	AB:ETHERNET_MODU...		☐
SSTGateway:O	{...}	{...}	{...}	AB:ETHERNET_MODU...		☐
SSTGateway:O.Data	{...}	{...}	Decimal	DINT[124]		
SSTGateway:O.Data[0]	0		Decimal	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.

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



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

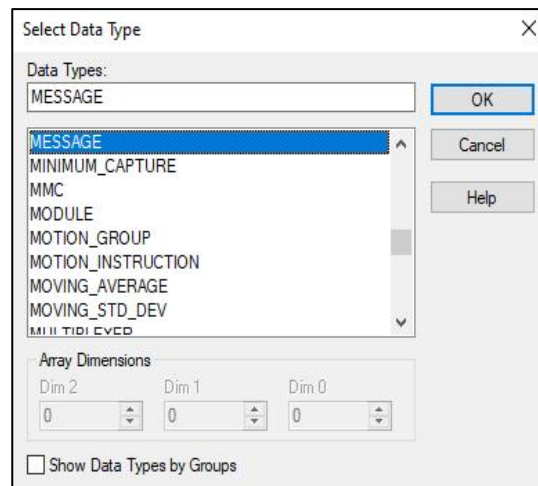
Please note that the first 4 input bytes are used to display the status bytes of the SST Gateway.

8.2 Explicit MSG Connection Method

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

8.2.1 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:



Refer to the connection parameters from the beginning of *Chapter 8*:

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Modbus/EtherNet/IP Gateway

User Manual

New Tag

Name: Create

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

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

Controller Organizer

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

Controller Tags - Controller(controller)

Scope: Show: All Tags

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

Monitor Tags Edit Tags

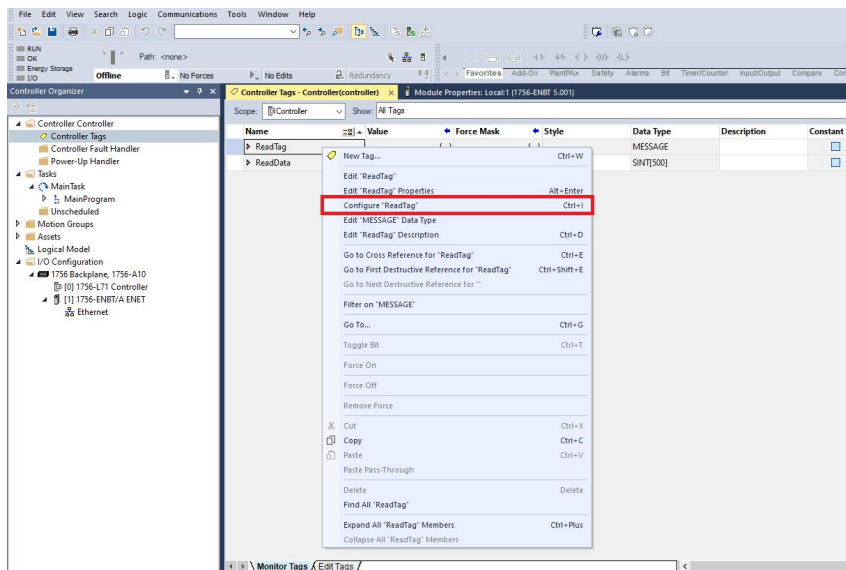
Right click on 'ReadTag', select 'Configure 'ReadTag"' as shown below:



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In pop-up window, configure the following settings:

Message Type: CIP Generic.

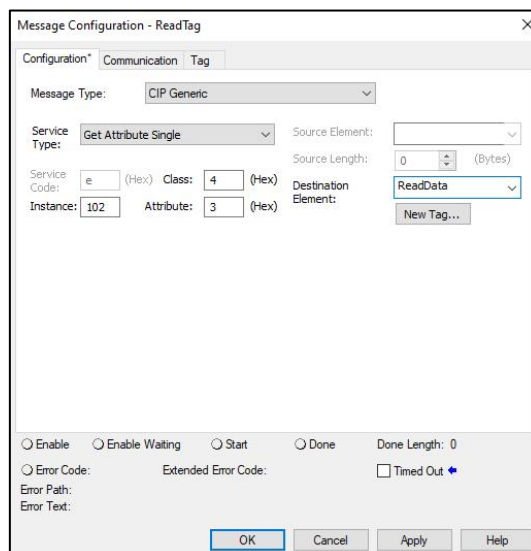
Service Type: Select 'Get Attribute Single'. The relevant Service Code will become 'e (Hex)'.

Class:4 (Hex)

Instance:102

Attribute:3(Hex)

Destination: Select the 'ReadData' tag. The obtained data will be saved in this tag.



Select the 'Communication' tab and click the 'Browse' button. Then input the network path to connect to the GT300-EI-2RS485.

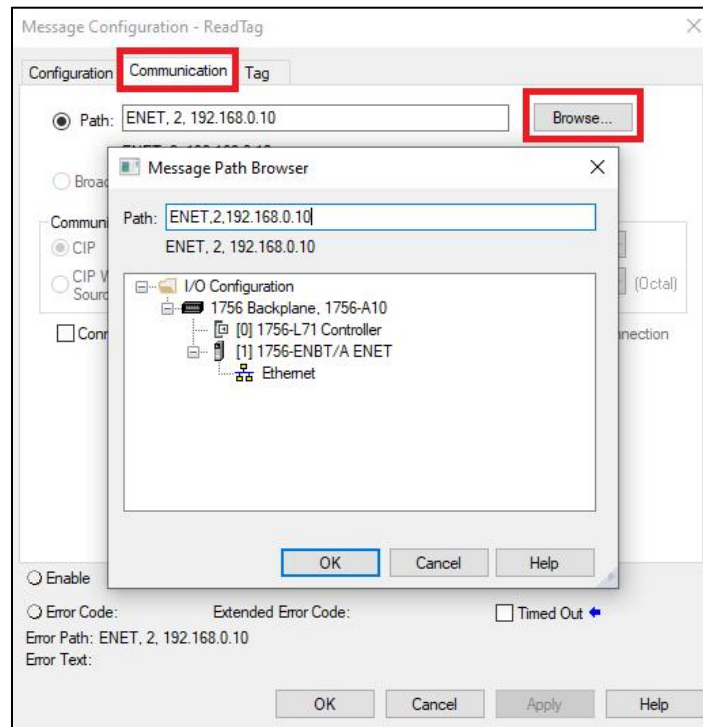
Enter the network path in the following format:

[EtherNet/IP Interface Name], 2 (Ethernet Communication), [GT300-EI-2RS485 IP Address]



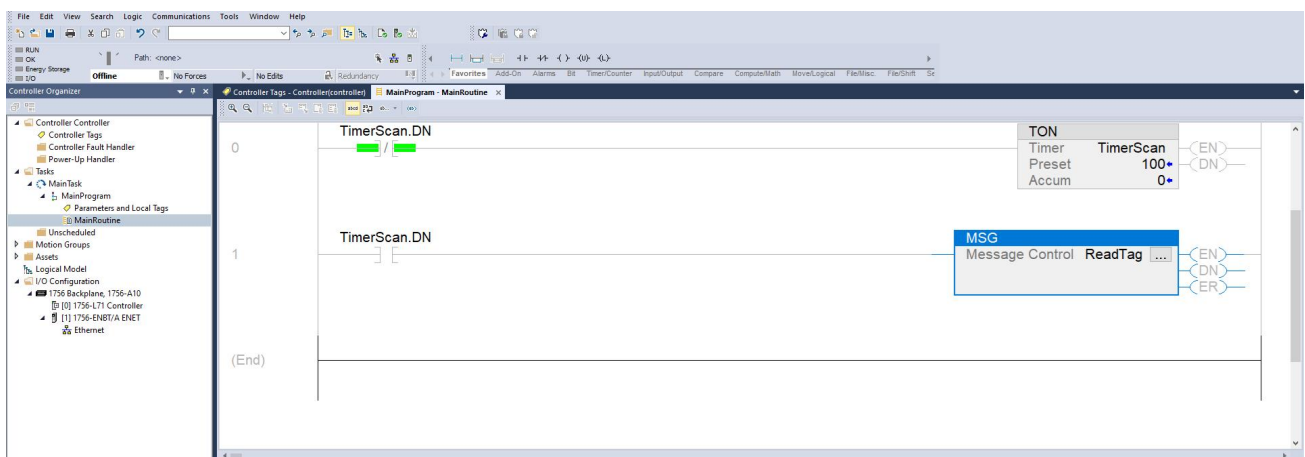
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Then click 'OK' to confirm:



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, please refer to Studio 5000 Logix reference material.

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

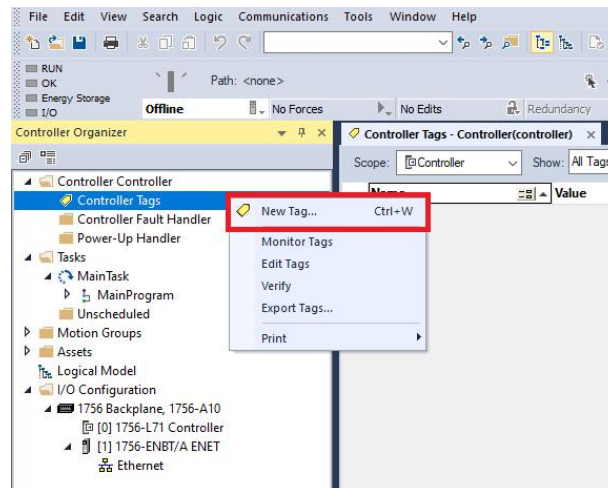


Click 'Control Tags' and select 'Monitor Tags'. Expand 'ReadData' to see that PLC can read Modbus TCP data through the GT300-EI-2RS485 gateway.

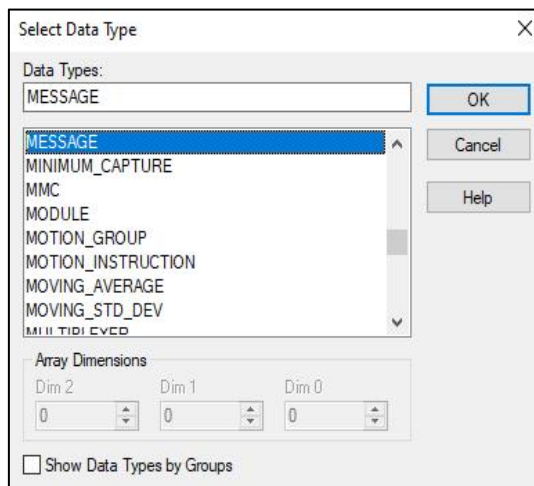
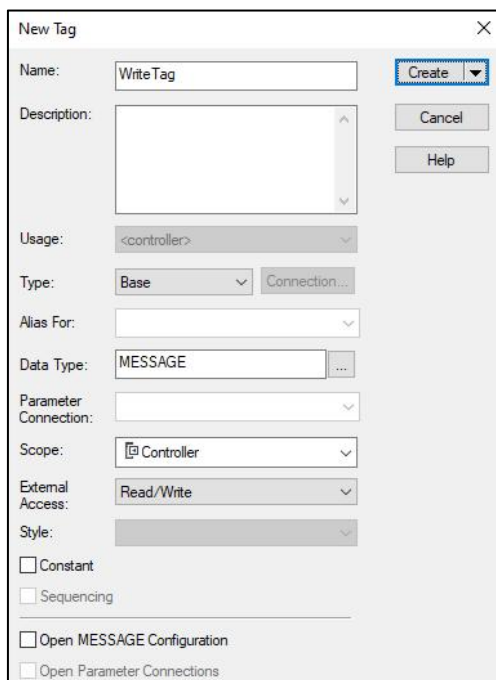


8.2.2 Write MSG Instruction

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:



Set the data type of 'WriteTag' as 'MESSAGE':



Set the data type of 'WriteData' as 'SINT', then set the Array Dimension 'Dim 0' to match the Output Data Size. Refer to the connection parameters from the beginning of [Chapter 8](#):

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User Manual

New Tag

Name: Create

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

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>

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

Controller Tags - Controller(controller)

Scope: Show: Enter Name

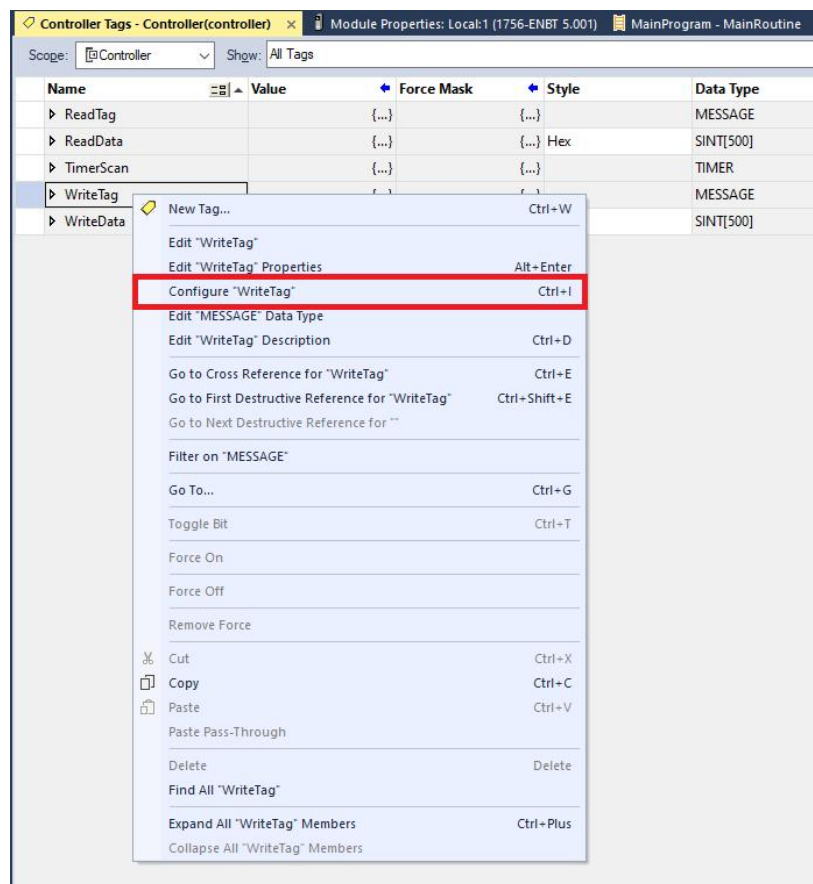
Name	Value	Force Mask	Style	Data Type	Description	Constant
TimerScan	{...}	{...}	{...}	TIMER		☐
ReadTag	{...}	{...}	{...}	MESSAGE		☐
ReadData	{...}	{...}	Decimal	SINT[496]		☐
WriteTag	{...}	{...}	{...}	MESSAGE		☐
WriteData	{...}	{...}	Decimal	SINT[492]		☐

Monitor Tags / Edit Tags

Enter into the 'Monitor Tags' interface and input some data in the 'WriteData' tag. This data will be outputted to GT300-EI-2RS485 through 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-MI-CFG).

Select the 'Communication' tab and click the 'Browse' button. Then input the network path to connect to the GT300-EI-2RS485.

Enter the network path in the following format:

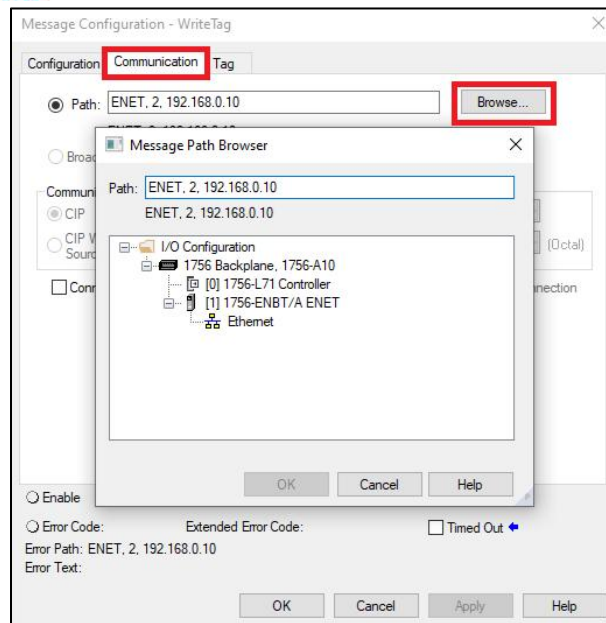
[EtherNet/IP Interface Name], 2 (Ethernet Communication), [GT300-EI-2RS485 IP Address]

Then click 'OK' to confirm:

GT300-EI-2RS485

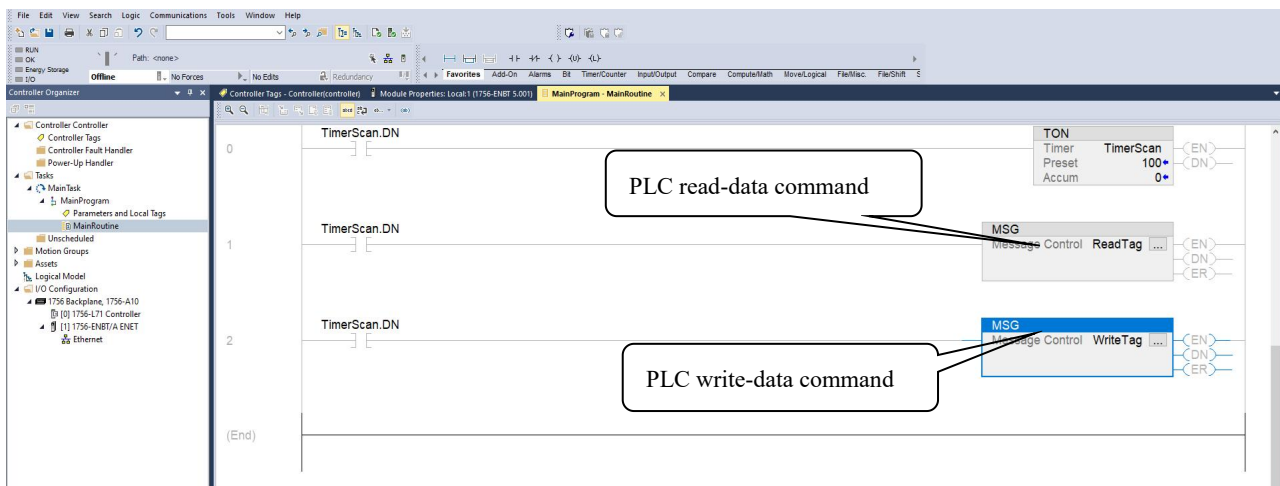
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Add a 'MSG' command in the 'MainRoutine' of 'MainProgram' and select 'WriteTag' as 'Message Control' as shown below.

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 GT300-EI-2RS485.





9 How to use DLR function

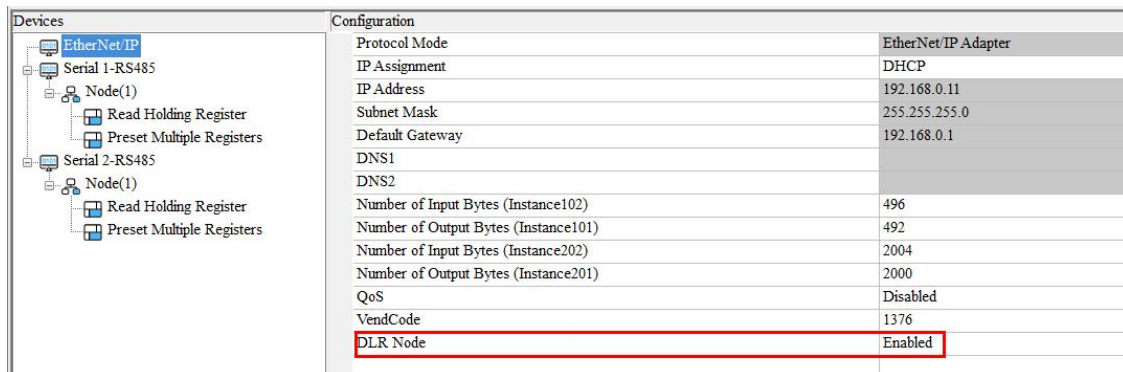
GT300-EI-2RS485 supports DLR ring node function and can be directly added to the DLR ring network to achieve DLR ring network redundancy function, ensuring that network communication will not be disconnected.

The configuration is as follows:

1.Double-click the SST-MI-CFG, then select the device model (GT300-EI-2RS) to enter the main interface.



2.Set 'DLR Node' to Enabled, and then download to use the DLR ring node function.

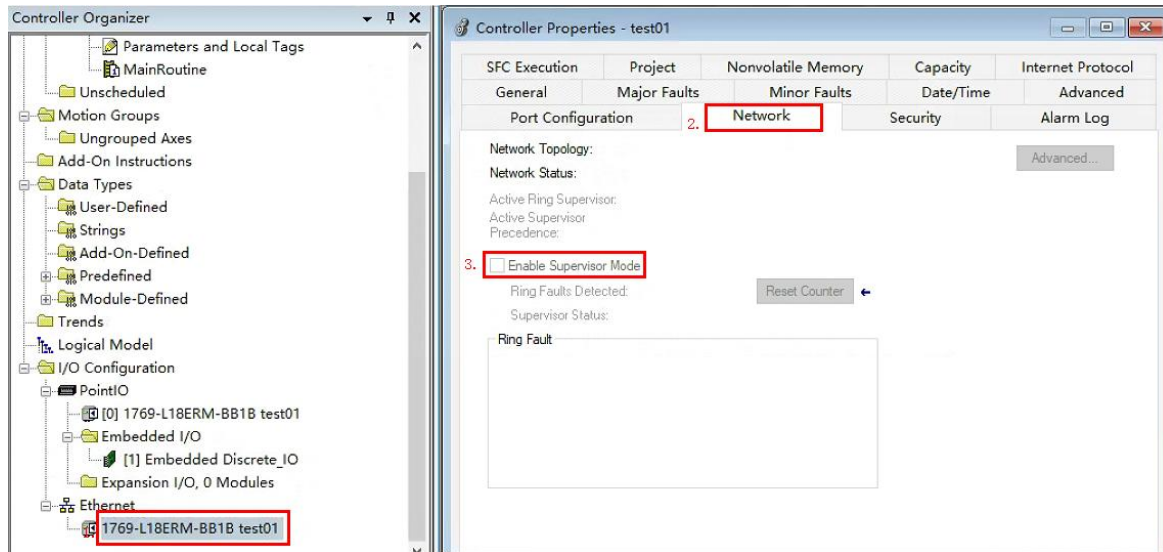


3.To activate the ring monitor mode, check the 'Enable Supervisor Mode' option in the 'Network' interface of Studio 5000.

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4. In this configuration, the PLC acts as the ring network supervisor, while the GT300-EI-2RS485 functions as a ring network node. If a ring network failure occurs, the number of errors can be checked via the 'DLR Monitor' feature in SST-MI-CFG.