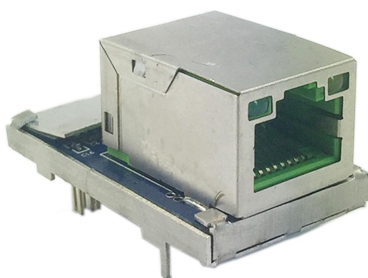


Embedded EtherNet/IP Module GS11-EI

User Manual

V 1.4

Rev B



SST Automation

Email: support@sstautomation.com

www.SSTAutomation.com



Important Information

Warning

The data and examples in this manual cannot be copied without authorization. SST Automation 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

GS11-EI is an embedded EtherNet/IP module which can provide easy EtherNet/IP connectivity via a UART interface with a simple polling protocol. Any user board that supports UART can use the GS11-EI module to connect to any EtherNet/IP Scanner.

1.2 Product Features

- Easily upgrade any UART or serial device to EtherNet/IP.
- Ethernet 10/100M (auto-negotiating).
- Supports one EtherNet/IP connection.
- Easy-to-use user configuration software SST-EIP-CFG.
- Setting the IP address via UART (Configurable Feature).

1.3 Technical Specifications

- [1] Supports the EtherNet/IP communication protocol and follows ODVA standards.
- [2] GS11-EI provides one Ethernet port and one UART interface (included in the 20-pin connector) to convert data between EtherNet/IP and serial.
- [3] Ethernet 10/100M (auto-negotiating).
- [4] The size of input and output buffers can be set by users:
 - ◆ Maximum input buffer size: 256 bytes.
 - ◆ Maximum output buffer size: 256 bytes.
- [5] Functions as an EtherNet/IP Adapter (Server) device on the Ethernet side and can only support one EtherNet/IP Scanner (Client) connection at a time. The minimum data transmit rate is 5ms.

[6] Serial interface parameters:

- ◆ UART.
- ◆ Operation mode: Half duplex.
- ◆ Data Bits: 8.
- ◆ Stop Bits: 1.
- ◆ Parity: None.
- ◆ Baud Rate: Supports 2400, 4800, 9600, 19200, 38400, 57600, 115200, and 230400 bps options.

[7] Serial port uses a pre-defined UART message protocol that is easy to use for serial communication.

[8] Power supply: +3.3VDC (3.14 ~ 3.45V), 190mA.

[9] Working temperature: -40°F~185°F (-40°C~85°C), humidity: 5% ~ 90%.

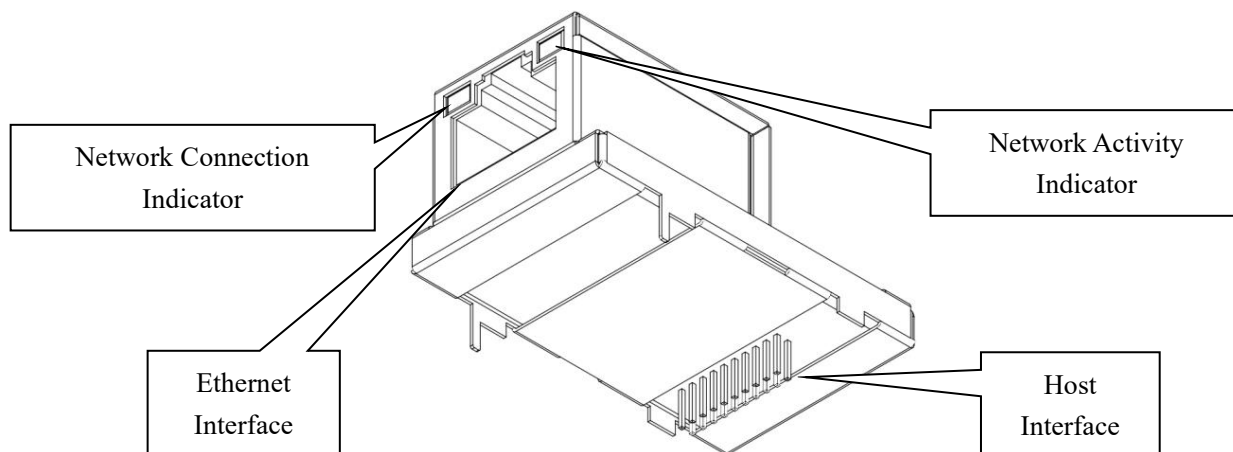
[10] Dimensions (L x W x H): 1.51 in x 0.91 in x 0.85 in (38.3mm x 23.0mm x 21.5mm).

1.4 Revision History

Revision	Date	Chapter	Description
V1.4 Rev B	1/30/2023	PART	Revision for GS11-EI V1.4 Rev B
V1.4 Rev A	6/24/2022	PART	Revision for GS11-EI V1.4 Rev A
V1.4	3/1/2022	PART	Revision for GS11-EI V1.4
V1.3	5/10/2018	ALL	New release

2 Hardware Description

2.1 Product Appearance



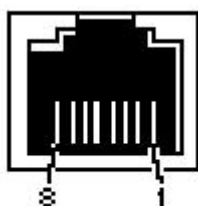
Note: This picture is for reference only. Product appearance is subject to the actual product.

2.2 Indicators

Indicator	Status	Description
Green	Off	No network connection
	Always on	Network connection normal
Yellow	Off	No network data transmitting
	Blinking	Network data transmitting normal

2.3 Interfaces

2.3.1 Ethernet Interface



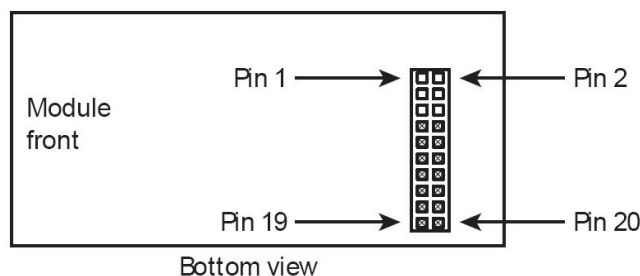
RJ-45 port

The Ethernet interface uses an 8-position RJ-45 interface, follows IEEE802.3u 100BASE-T standard, with 10/100M auto-negotiation. The pin definitions are as follows:

Pins	Signals	Descriptions
Pin 1	TXD+	Transmit Data+
Pin 2	TXD-	Transmit Data-
Pin 3	RXD+	Receive Data+
Pin 4	BID+	Bi-directional Data+
Pin 5	BID-	Bi-directional Data-
Pin 6	RXD-	Receive Data-
Pin 7	BID+	Bi-directional Data+
Pin 8	BID-	Bi-directional Data-

2.3.2 Host Interface

GS11-EI has a 20-pin socket connector (needle-type), including power interface, UART interface and GPIO. The pin position and definition are as follows:



Pins	Signals	Description
1 ~ 6	NC	Reserved
7	RXD	UART Receive (Input), connect with TXD of host processor or MCU
8	TXD	UART Transmit (Output), connect with RXD of host processor or MCU
9	GPIO	Reserved
10	/RUN	The status of GS11-EI (Output), which needs a 10kΩ pull-up resistor on the user board. Logic 1 (light on): The GS11-EI module on the startup. Logic 0 (light off): The module's startup has been completed. (Include waiting for initialization state, start the EtherNet/IP protocol stack and data exchange state, etc.) *Default IP address mode: By pulling down Pin 10 to low voltage before starting the module (by using a 1kΩ pull-down resistor), the module will start with default IP address (192.168.0.11), and this mode is only used to update the firmware.
11	BAUD2	Set the UART baud rate (Input), see the following table in Chapter 2.4 .
12	BAUD1	
13	BAUD0	
14	/RESET	Reset signal (Input), Active low.
15	+3.3V	+3.3V DC power Supply
16	GND	GND power Supply
17 ~ 19	NC	Reserved

20	/DATAEXCH	Data Exchange (Output), and needs a 10kΩ pull-up resistor on the user board. Logic 1 (light on): The module is in non-data exchange state (such as start state, waiting for initialization state, start the EtherNet/IP protocol stack, etc.) Logic 0 (light off): The module is ready for data exchange.
----	-----------	--

2.4 UART Baud Rate

UART baud rate settings are as follows:

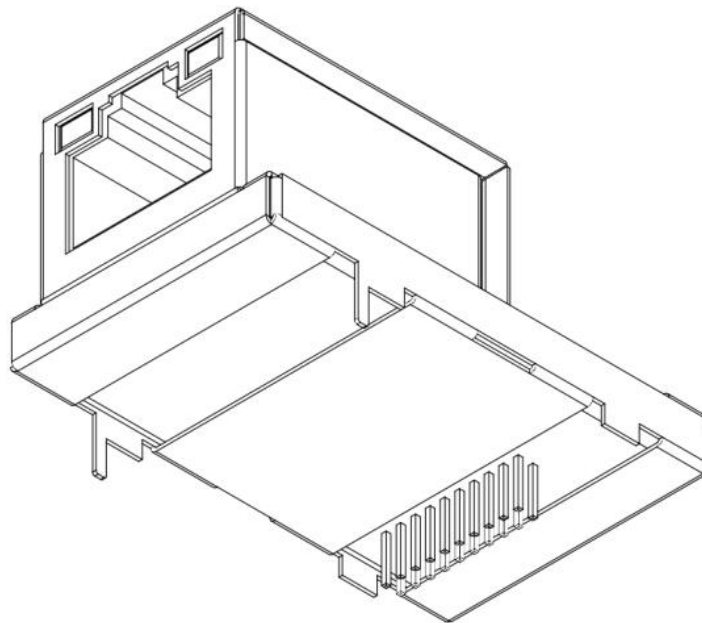
Index	BAUD2	BAUD1	BAUD0	Baud Rate (bps)
0	0	0	0	2400
1	0	0	1	4800
2	0	1	0	9600
3	0	1	1	19200
4	1	0	0	38400
5	1	0	1	57600
6	1	1	0	115200
7	1	1	1	230400

2.5 Reset Signal

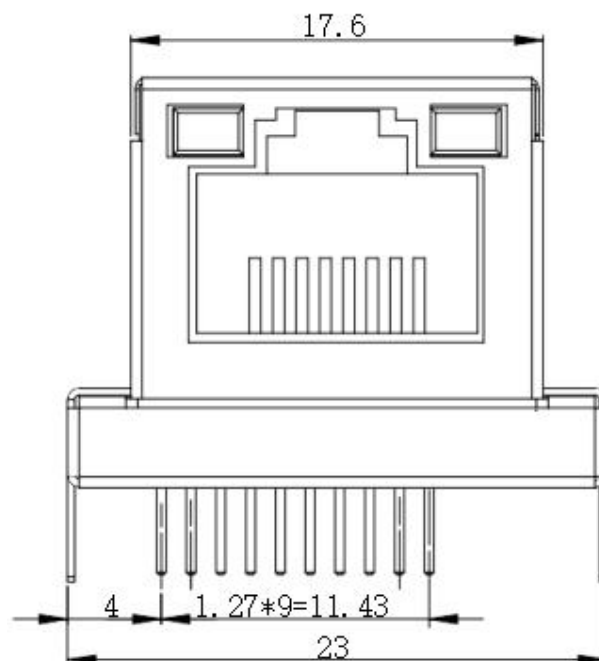
GS11-EI RESET (Pin 14) supports input of hardware reset signal. When the RESET pin is pulled down to GND or connects with voltage lower than 2.88V for more than 1 millisecond, the module will be forced to reset. The host must wait for 250 ms (typical value, after reset the module) after reset, then the user must check the Pin 10 (/RUN) and Pin 20(/DATAEXCH). If the two pins are both Logic 0 (low voltage), then the host (user board) can exchange data.

3 Dimensions

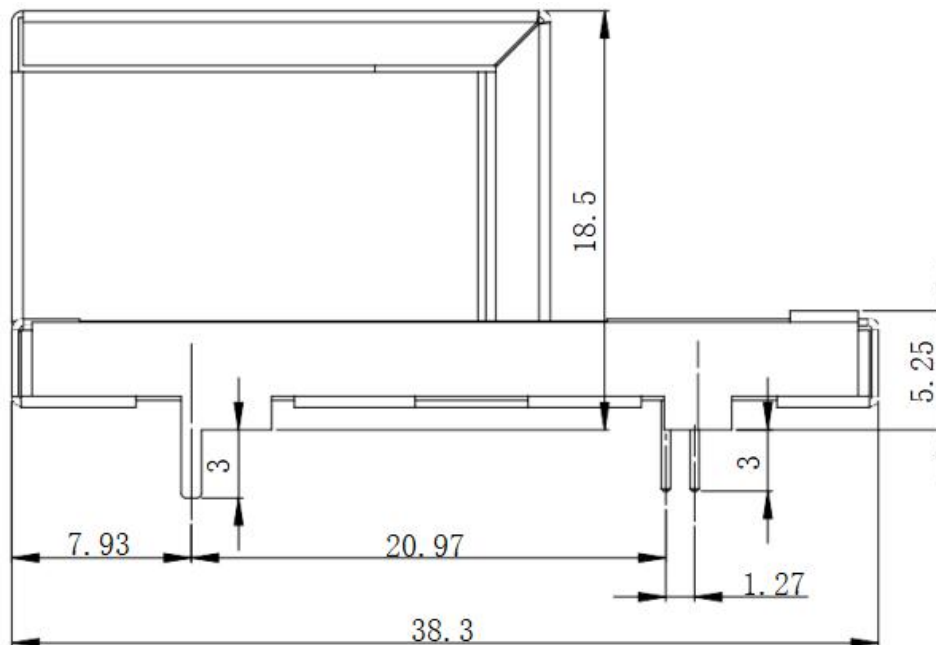
Unit: [mm]



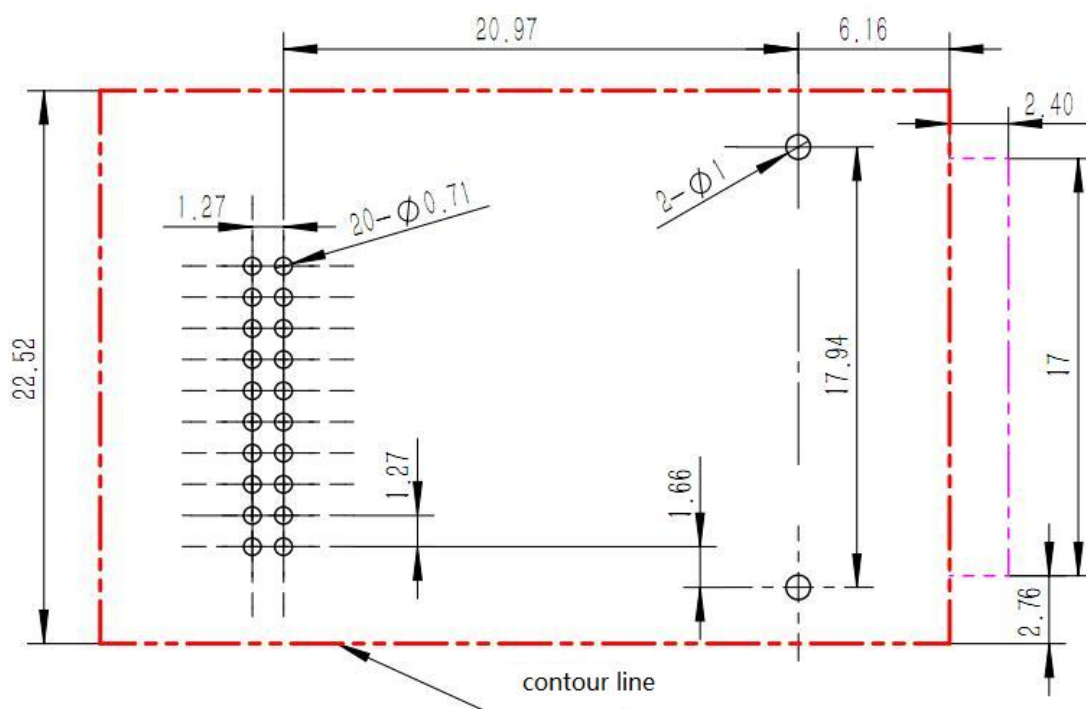
Front:



Side:



PCB dimensions:

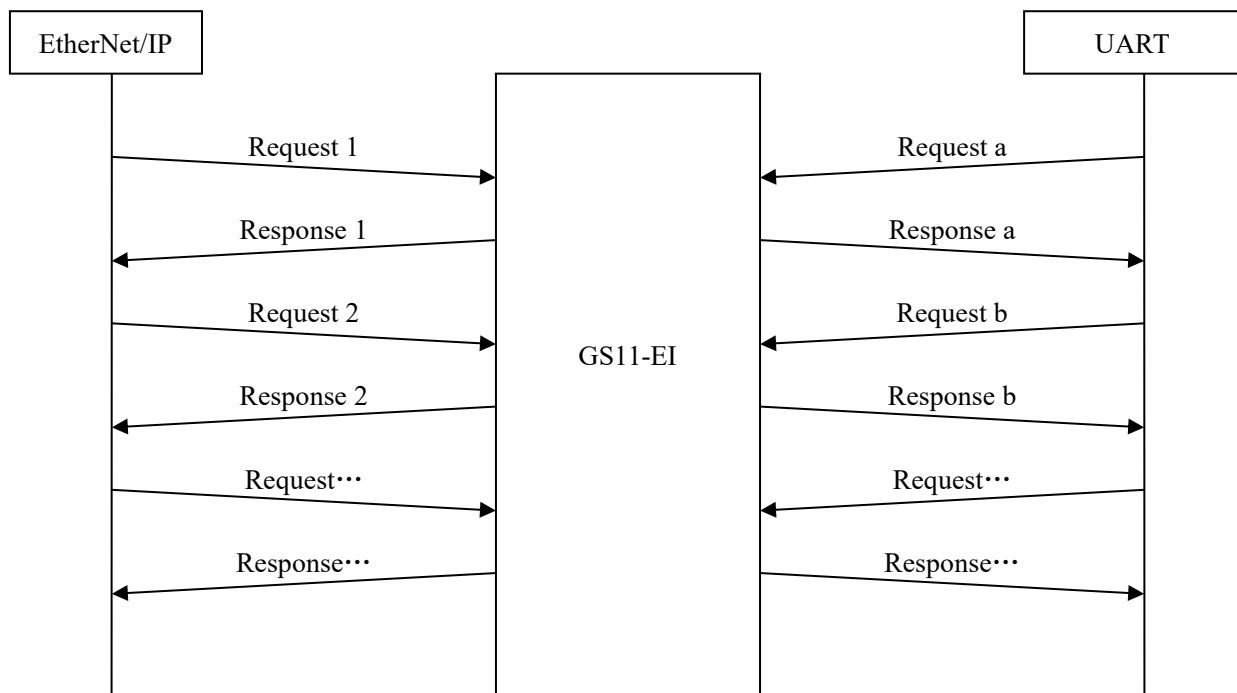


4 Communication Protocol

4.1 Description

GS11-EI acts as an EtherNet/IP adapter at the Ethernet side, and communicates with a user-defined protocol over UART at the serial port side. The EtherNet/IP communication and UART communication are completely independent. The data exchange can be finished through the internal input and output data buffer of GS11-EI. According to the GS11-EI serial communication protocol, the user board can complete the input and output data exchange.

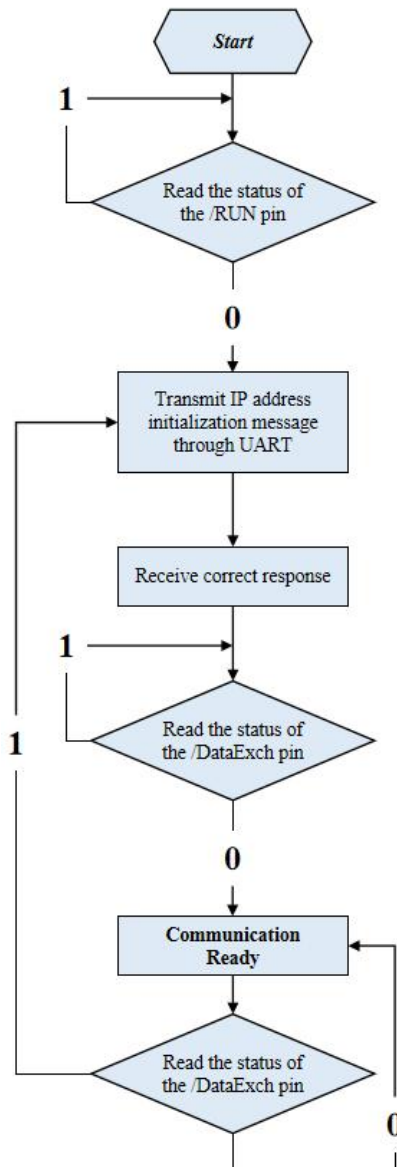
The procedure of message transmission is as follows:



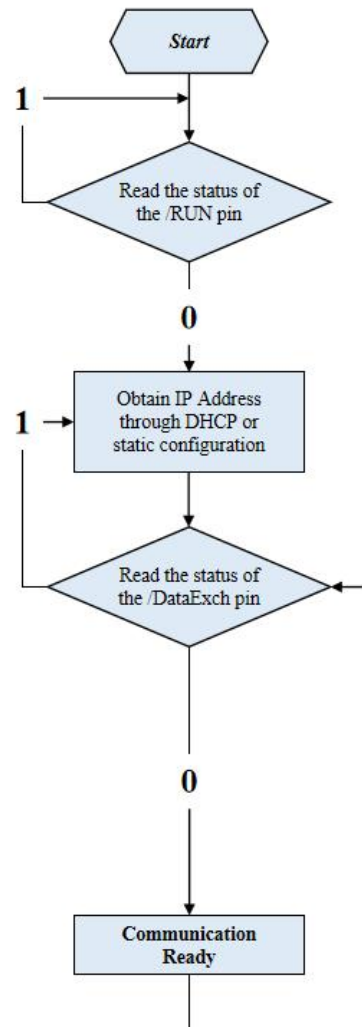
4.2 GS11-EI Initialization Flowchart

The IP Address for the GS11-EI module can be initialized by using UART or the SST-EIP-CFG PC configuration software. The flowcharts in this chapter show the steps for the two kinds of IP configuration modes. Users can choose either one of them according to their application needs. Before choosing flowchart, please refer to the “How to Set the Module’s IP Address” section in [Chapter 6.5.4](#) to set the IP configuration mode. The factory default for the GS11-EI module is set to PC configuration with DHCP.

**Initialization flow chart for using
the serial port (UART) method:**



**Initialization flow chart for using the
PC configuration software method:**





4.3 Real-Time IP Address Monitoring

If the GS11-EI module is set to DHCP, then the module will monitor its IP address while it is running. If the IP address changes, it will pull up the /DATAEXCH pin to logic 1. The GS11-EI module's action after this will depend on the IP configuration mode:

- 1. When using the configuration software IP address setting mode:** The module will obtain an IP address again. The user will need to read //DATAEXCH pin state. If it returns to logic 0, this indicates that the module has obtained IP address and that the module is ready to communicate.
- 2. When using the UART IP address setting mode:** The module will wait for the user to send the IP Address Initialization request message. The next step will be the same as with the first initialization.

4.4 Communication Initialization through UART

Communication direction: The User Board (host) is the communication initiator, and the GS11-EI module sends a response back.

Baud rate configuration: Once the GS11-EI is powered on or reset, it reads the pins BAUD0, BAUD1, BAUD2 to automatically select the UART baud rate.

1. IP Address Initialization Request Message (User board -> GS11-EI module):

When the user chooses to use the serial port (UART) to set the IP address and configuration, the initialization request message must be sent in the following format:

Byte	EtherNet/IP to user-defined protocol
0	Message Length (Bytes): This length must always be 17 bytes (in hexadecimal) which includes all following bytes from 2 through 18. This length does not include the check sum byte. High-byte first.
1	
2	DHCP Flag: Default value is 0. When the user sets GS11-EI via UART to use DHCP to assign the IP address, the value of this byte is 1 (See *Note)
3	IP Configuration Mode: 0: Static Configuration 1: DHCP
4	IP Address: High-byte first
5	
6	
7	
8	Subnet Mask: High-byte first
9	
10	
11	
12	Default Gateway Address: High-byte first
13	
14	
15	
16	Reserved: Always 0
17	Reserved: Always 0
18	Reserved: Always 0
19	Check Sum: Byte 0+byte 1+...+byte 18

***Note:**

When setting the GS11-EI module via UART to use DHCP to assign the IP address, the user board should first send the IP Address Initialization message through UART (the value of Byte 2 must be set to 1).

For example: The user board sends the following message to the GS11-EI:

00 11 01 01 00 00 00 00 00 00 00 00 00 00 00 00 13.

If the GS11-EI module does not receive an IP address from the DHCP Server on the network, it will send 0x2E to the user board each second.

If the DHCP Server assigns an IP address to the GS11-EI module, then the GS11-EI will send a message which contains the IP address, the subnet mask, and the default gateway to the user board.

For example: The GS11-EI sends the following message to the user board:

0C C0 A8 00 BB FF FF FF 00 C0 A8 00 01 95.

The 0x0C is the header and indicates that the message is 12 bytes long. It is followed by 4 bytes for the IP Address (192.168.0.187), 4 bytes for the Subnet Mask (255.255.255.0), 4 bytes for the Default Gateway (192.168.0.1), and the last byte represents the checksum.

When setting the GS11-EI module IP address via UART to use a static configuration, the user board should send the IP Address Initialization message through UART (the value of Byte 2 must be set to 0),

For example: The user board sends the following message to the GS11-EI:

00 11 00 00 C0 A8 00 0A FF FF FF 00 C0 A8 00 01 00 00 00 E9.

The 0x0011 is the header and indicates that the message is 17 bytes long. It is followed by 4 bytes for the IP Address (192.168.0.10), 4 bytes for the Subnet Mask (255.255.255.0), 4 bytes for the Default Gateway (192.168.0.1), 3 bytes for the reserved data (0x000000), and the last byte represents the checksum.

and then the module will send the following message to the user board.

2. Initialization Response Message (GS11-EI module -> User board):

Byte	Successful Response	Error Response
0	Data Length: 2	Data Length: 2
1	0	Error Code: (not 0)
2	0	Extra Error Code
3	Check Sum: 0x02	Check Sum: Byte 0+byte 1+byte 2

Note: Extra error code is always 0xFF

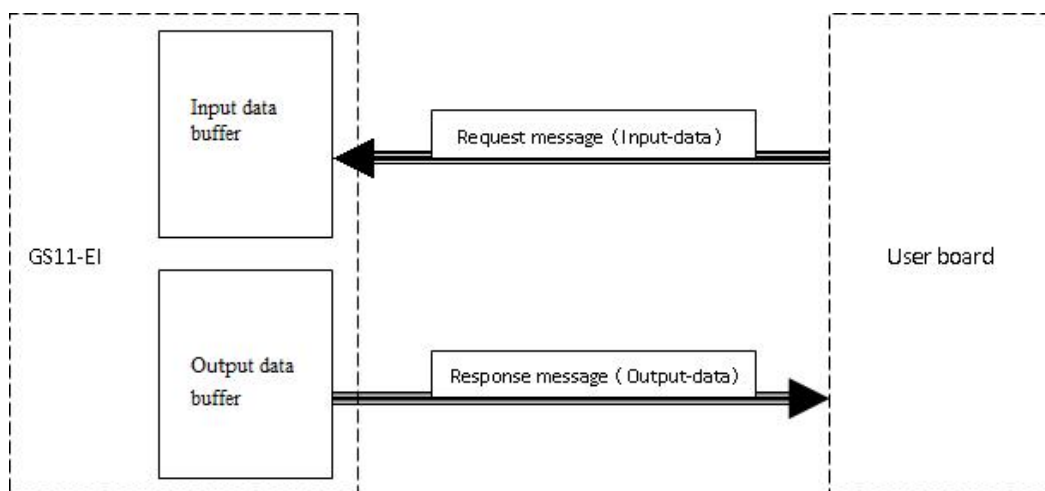
3. Response Message Error Codes:

Index	Error Code	Explanation
0	1	Check Sum Error
1	2	Data Length Error
2	3	IP configuration mode does not exist.

4.5 UART Message Protocol

Communication direction: The User Board (host) is the communication initiator, and the GS11-EI module sends a response back.

The request messages contain input data, and the response messages contain output data. The communication process is as follows:



1. Request Message (User board -> GS11-EI module):

Byte	Description
0	Message Length (Bytes): This length includes all following bytes except the check sum byte. High-byte first.
1	
2	Input data: High-byte first.
...	
n	
n+1	Check Sum: Byte 0+byte 1+...+byte n

2. Response Message (GS11-EI module -> User board):

Byte	Successful Response	Byte	Error Response
0	Message Length (Bytes): Includes all following bytes except the check sum byte. High-byte first. Output Data: High-byte first.	0	0x80
1		1	Data Length: 2
2		2	Error Code
...		3	Extra Error Code
n			
n+1	Check Sum: Byte 0+byte 1+...+byte n	4	Check Sum: Byte 0+byte 1+byte 2+byte3

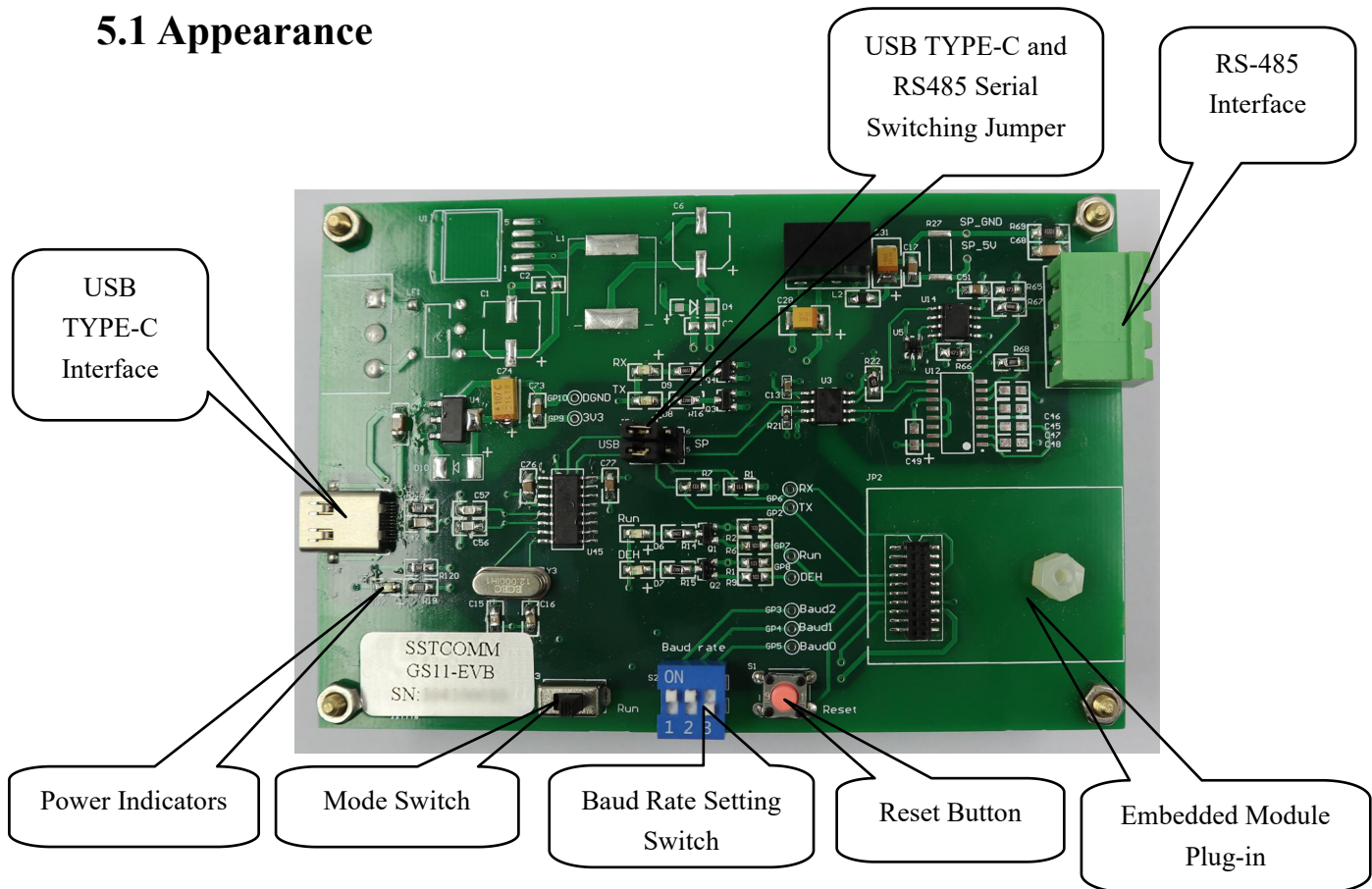
Note: Extra error code is always 0xFF.

3. Response Message Error Codes:

Index	Error code	Description
0	1	Check Sum Error
1	2	Data Length Error

5 Evaluation Board

5.1 Appearance

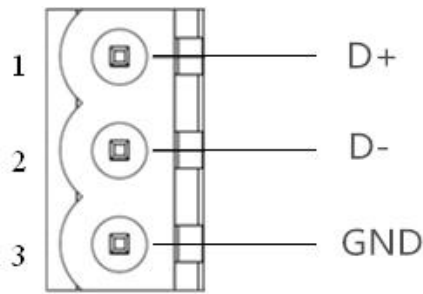


5.2 Function

5.2.1 RS485 Interface

The EV board uses a three-pin pluggable terminal for RS-485:

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



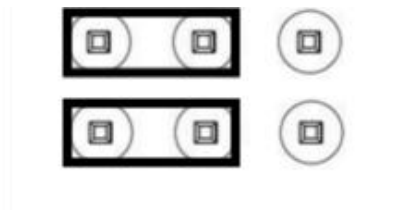
5.2.2 USB TYPE-C Interface

1. Support USB power supply;
2. Support Serial communication, can be a communication port.

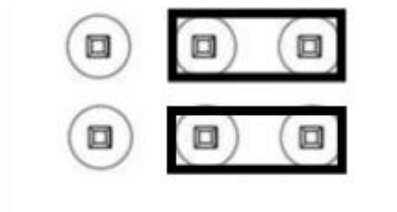
5.2.3 Serial Switching Jumper

The interface switching jumper is located in the middle of the evaluation board; users can switch USB TYPE-C communication or serial communication according to actual needs.

1. When the jumper is connected to the middle two pins and the left two pins, the evaluation board uses USB TYPE-C for communication.

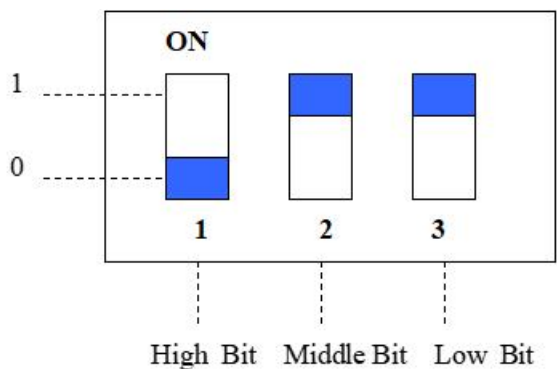


2. When the jumper is connected to the middle two pins and the right two pins, the evaluation board uses RS-485 for communication.



5.2.4 Baud Rate Setting Switch

The 3-bit DIP switch on the development board is used to set the serial (UART) baud rate, as shown below:

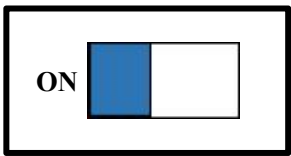


The corresponding baud rates are defined as follows:

Index	High bit	Middle bit	Low bit	Corresponding Baud Rate (bps)
0	0	0	0	2400
1	0	0	1	4800
2	0	1	0	9600
3	0	1	1	19200
4	1	0	0	38400
5	1	0	1	57600
6	1	1	0	115200
7	1	1	1	230400

The baud rate showing in the picture is 19200bps.

5.2.5 Mode Switch



The left side of the DIP switch is the mode switching switch. When this bit is “ON”, the module is in firmware update state (unable to communicate normally), and the module will start up with default IP configuration.

IP address: 192.168.0.11

Subnet mask: 255.255.255.0

Default gateway: 192.168.0.1

5.2.6 Reset Button

The button on the development board is the reset button, which is used to manually reset GS11-EI through clicking once.

5.2.7 LED Indicators

There are five indicators on the evaluation board, and the description is as follows:

Index	Name	Description
0	Power	Power Indicator (Orange): <u>On:</u> Power on. <u>Off:</u> Power off.
1	TX	GS11-EI UART Transmit Indicator (Green):. <u>Blinking:</u> GS11-EI is transmitting data through UART. <u>Off:</u> GS11-EI is not transmitting data through UART.
2	RX	GS11-EI UART Receive Indicator (Green):. <u>Blinking:</u> GS11-EI is receiving data through UART. <u>Off:</u> GS11-EI is not receiving data through UART.
3	Run	GS11-EI Status Indicator (Green): <u>On:</u> In run status. <u>Off:</u> In start-up status.
4	DataExch	GS11-EI Data Exchange Indicator (Green): <u>On:</u> In data exchange status. <u>Off:</u> Not in data exchange status.

5.3 Wiring

Take USB power supply and serial communication as an example, the wiring is shown in the figure.



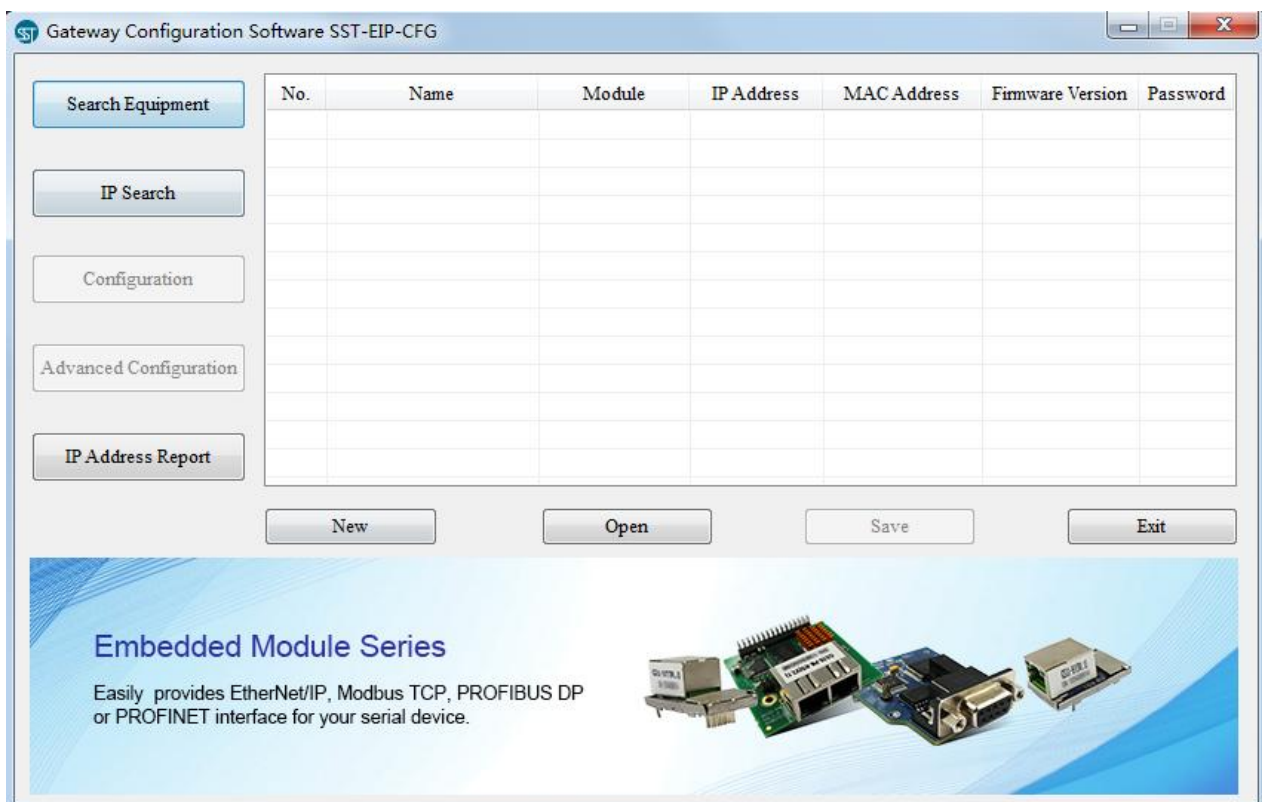
Note: The serial interface switching jumper is connected to the middle two pins and the left two pins.

6 Configuration Software

Download the configuration software SST-EIP-CFG on www.SSTAutomation.com and install. Follow the prompts to complete the installation. Then open the configuration software and finish the configuration of GS11-EI.

6.1 SST-EIP-CFG Introduction

SST-EIP-CFG is a product based on Windows platform, and is used to configure parameters of GS11-EI, Double click the icon to run the SST-EIP-CFG and its main window will appear as below:



6.2 Search Equipment

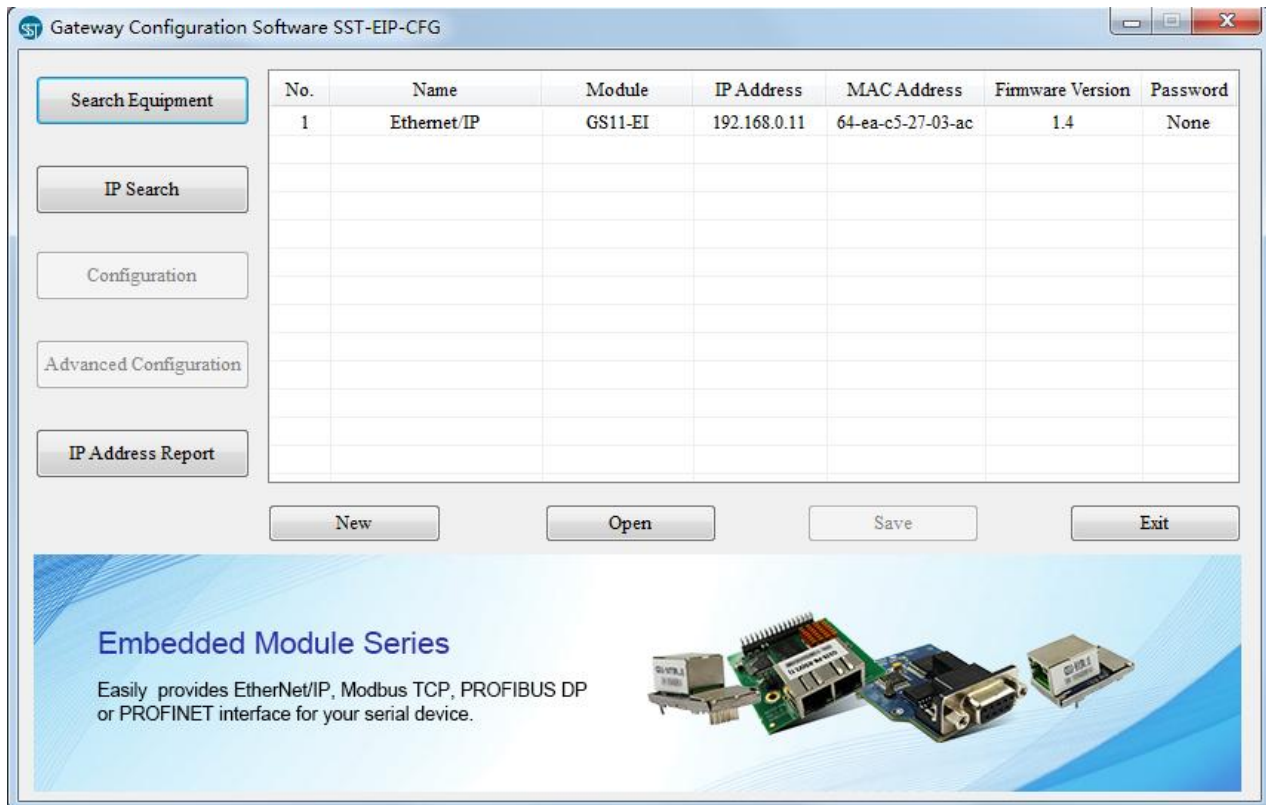
Before configuring the parameters of GS11-EI, the user needs to search the equipment. Click the "Search

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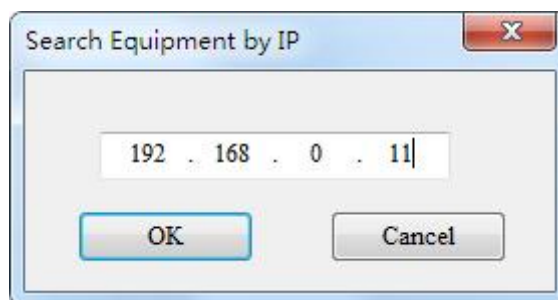
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Equipment" button in the main window, SST-EIP-CFG will automatically list all of the GS11-EI on the network, as shown below.



6.3 IP Search

When user just wants to search a known IP address device on the network, click “IP Search” button in the main window, and there will be popping up a dialog box: Fill in the IP address you want to search in the window and click OK.



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The SST-EIP-CFG will list all searched equipment(s) in the table, as shown below.



6.4 Configuration

The Configuration window is used to set user parameters relating to the GS11-EI module's Ethernet settings. The IP address can be set through DHCP or static configuration (to set the IP address through UART, the "Setting the IP address via host interface(UART)" option must be enabled through the Advanced Configuration window. See [Chapter 6.5](#)). The GS11-EI module supports setting a user password to protect the configuration data from being modified.

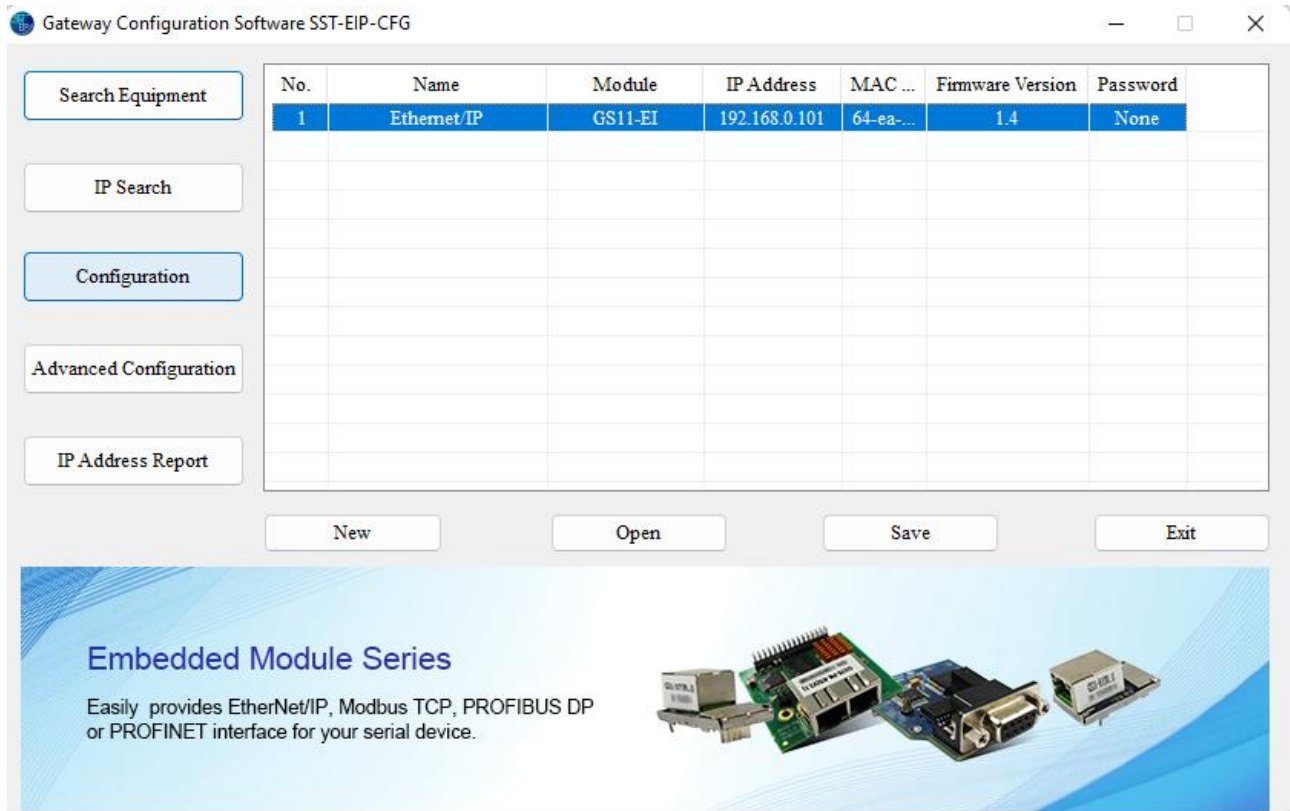
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In the Configuration interface, users can configure the following options: Ethernet, Password, and IP Address Report.

To open the Configuration window, select the device to be configured in the main window and click the “Configuration” button.



6.4.1 Ethernet

➤ Ethernet Parameters:

The screenshot shows a 'Configuration' dialog box with three tabs: 'Ethernet', 'Password', and 'IP Address Report'. The 'Ethernet' tab is active. It contains the following fields:

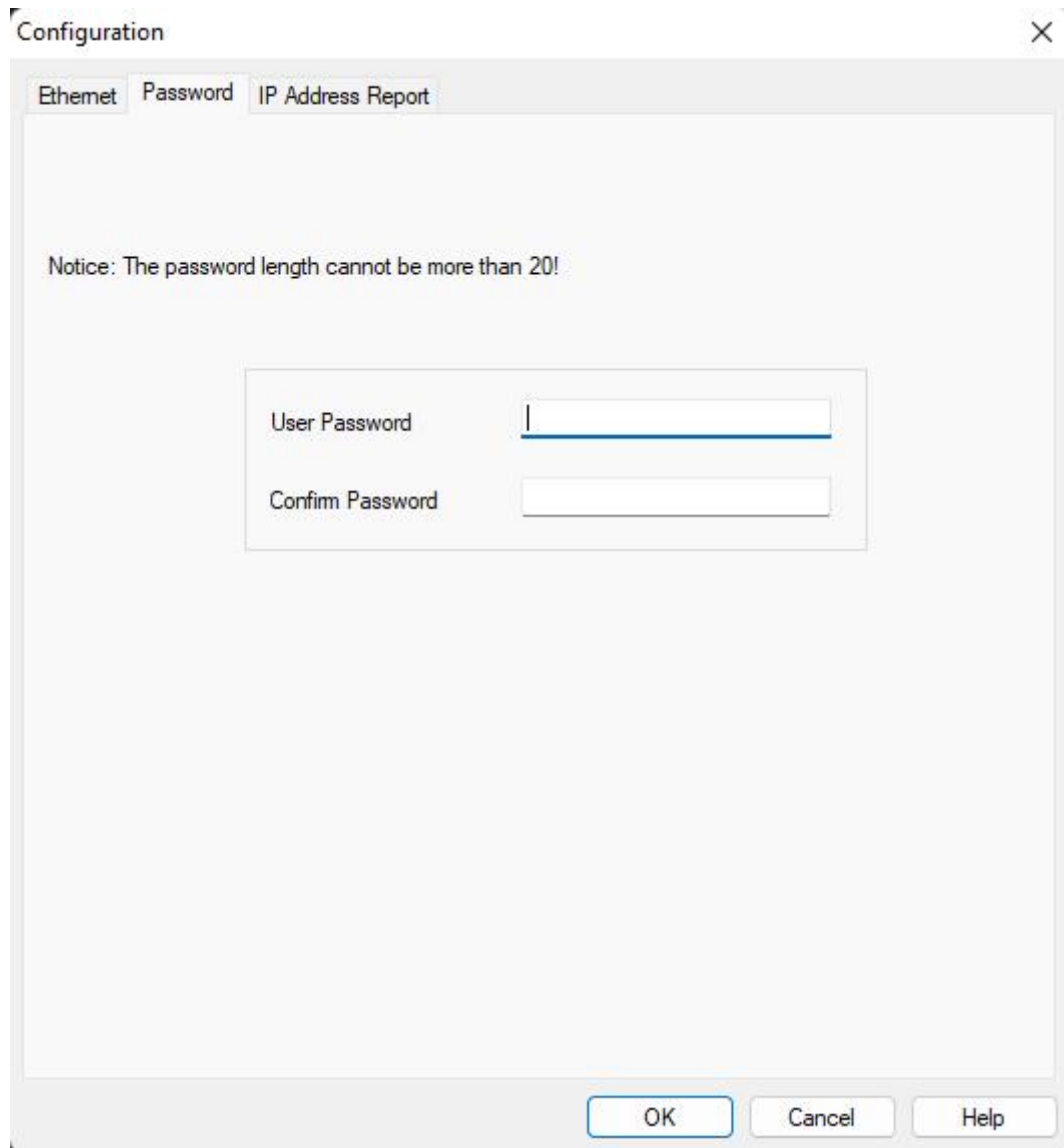
Parameter	Value
Assign IP Mode	DHCP
IP Address	192 . 168 . 0 . 15
Subnet Mask	255 . 255 . 255 . 0
Default Gateway	192 . 168 . 0 . 1
DNS1	0 . 0 . 0 . 0
DNS2	0 . 0 . 0 . 0

At the bottom of the dialog box are three buttons: 'OK', 'Cancel', and 'Help'.

- **Assign IP Mode:** Set the device's IP address configuration mode, Static or DHCP.
- **IP Address:** Set the device's IP address.
- **Subnet Mask:** Set the subnet mask of the device.
- **Default Gateway:** Set the default gateway address of the network.
- **DNS1:** Currently not supported.
- **DNS2:** Currently not supported.

6.4.2 Password

➤ Password Setup:



The screenshot shows a 'Configuration' dialog box with three tabs: 'Ethernet', 'Password', and 'IP Address Report'. The 'Password' tab is selected. Inside the dialog, there is a notice: 'Notice: The password length cannot be more than 20!'. Below the notice, there are two input fields: 'User Password' and 'Confirm Password'. The 'User Password' field has a blue underline. At the bottom of the dialog, there are three buttons: 'OK', 'Cancel', and 'Help'.

- **User Password:** Refers to the password that the user needs to enter when clicking the "Configuration" button on the main screen. Once the user password is set, the user needs to enter this password every time when configuring SST-EIP-CFG for user parameters. It is recommended not to set this password, as this password is for users.

6.4.3 IP Address Report Parameters

➤ IP Address Report:

The IP Address Report function is used to identify the GS11-EI on the network by sending a UDP packet that reports its current IP address, subnet mask, and default gateway to a port of the specified IP address device. Users can enable this function by clicking on the "Enable" check box in the IP Address Report tab of the Configuration window.

The screenshot shows a 'Configuration' window with three tabs: 'Ethernet', 'Password', and 'IP Address Report'. The 'IP Address Report' tab is active. Inside the window, there is a 'Configuration' section with the following settings:

- ☒ Enable
- Auto Report To: 192 . 168 . 0 . 100 : 16800 (1-65535)
- Auto Report Period: 10 s (1-7200)

At the bottom of the window are three buttons: 'OK', 'Cancel', and 'Help'.



After this function is enabled, the user will need to set the following parameters:

- **Auto Report To:** Set the IP address and Port Number of the remote device.
- **Auto Report Period:** Set the Auto Report Period to the remote device.

For detailed instructions on how to use the IP Search Function, see [Chapter 6.6](#).

6.5 Advanced Configuration

The Advanced Configuration window is used to set the GS11-EI module settings such as UART IP address configuration, EtherNet/IP assembly instance data sizes, and device identification parameters. The GS11-EI module supports setting an administrator password to protect the advanced configuration data from being modified.

In the Advanced Configuration interface, users can configure the following options: Ethernet, Password, IP Address Report, and Advanced Parameters.

To open the Advanced Configuration window, select the device to be configured in the main window and click the "Advanced Configuration" button.



6.5.1 Ethernet

➤ Ethernet Parameters:

Advanced Configuration

Ethernet Password IP Address Report Advanced Parameters

Notice: The name length cannot be more than 20!

Network Name Ethernet/IP

Assign IP Mode DHCP

IP Address 192 . 168 . 0 . 15

Subnet Mask 255 . 255 . 255 . 0

Default Gateway 192 . 168 . 0 . 1

DNS1 0 . 0 . 0 . 0

DNS2 0 . 0 . 0 . 0

OK Cancel Help

- **Network Name:** The name is used to identify the GS11-EI module on the network, it can also be the name of the device's model.
- **Assign IP Mode:** Set the device's IP address configuration mode, Static or DHCP.
- **IP Address:** Set the device's IP address.
- **Subnet Mask:** Set the subnet mask of the device.

- **Default Gateway:** Set the default gateway address of the network.
- **DNS1:** Currently not supported.
- **DNS2:** Currently not supported.

6.5.2 Password

➤ Password Setup:

The screenshot shows a software window titled 'Advanced Configuration' with a close button (X) in the top right corner. Inside the window, there are four tabs: 'Ethernet', 'Password', 'IP Address Report', and 'Advanced Parameters'. The 'Password' tab is currently selected. Below the tabs, a notice states: 'Notice: The password length cannot be more than 20!'. There are two main sections for password entry, each enclosed in a light gray box. The first section contains 'User Password' and 'Confirm Password' labels next to their respective input fields. The second section contains 'Admin Password' and 'Confirm Password' labels next to their respective input fields. At the bottom of the dialog, there are three buttons: 'OK', 'Cancel', and 'Help'.

- **User Password:** Refers to the password that the user needs to enter when clicking the "Configuration" button on the main screen. After the user password is set, the user needs to enter this password when configuring SST-EIP-CFG for user parameters. It is recommended not to set this password, as this password is for users.
- **Admin Password:** Refers to the password that the administrator needs to enter when clicking the "Advanced Configuration" button on the main screen. After the admin password is set, the administrator needs to enter this password when configuring SST-EIP-CFG for advanced parameters. It is recommended that the administrator set this password after the product setup is complete since it protects the advanced parameters from being modified by other users.

6.5.3 IP Address Report Parameters

➤ IP Address Report:

The IP Address Report function is used to identify the GS11-EI on the network by sending a UDP packet that reports its current IP address, subnet mask, and default gateway to a port of the specified IP address device. Users can enable this function by clicking on the "Enable" check box in the IP Address Report tab of the Advanced Configuration window.

The screenshot shows a software window titled "Advanced Configuration" with a close button (X) in the top right corner. Inside the window, there are four tabs: "Ethernet", "Password", "IP Address Report", and "Advanced Parameters". The "IP Address Report" tab is currently selected. Below the tabs is a large rectangular area labeled "Configuration". Inside this area, there is a checkbox labeled "Enable" which is checked. Below the checkbox, there are two rows of configuration fields. The first row is labeled "Auto Report To" and contains two input fields: the first is a dotted IP address field with "192", "168", "0", and "100" entered, followed by a colon and a port number field with "16800" entered. Below the port number field is the text "(1-65535)". The second row is labeled "Auto Report Period" and contains a numeric input field with "10" entered, followed by the letter "s". Below the numeric field is the text "(1-7200)". At the bottom right of the window, there are three buttons: "OK", "Cancel", and "Help".

After this function is enabled, the user will need to set the following parameters:

- **Auto Report To:** Set the IP address and Port Number of the remote device.
- **Auto Report Period:** Set the Auto Report Period to the remote device.

For detailed instructions on how to use the IP Search Function, see [Chapter 6.6](#).

6.5.4 Advanced Parameters

➤ Advanced Parameters:

Advanced Configuration

Ethernet Password IP Address Report **Advanced Parameters**

How to Set the Module's IP Address

☒ Setting the IP address via software SST-EIP-CFG

☐ Setting the IP address via the host interface(UART)

Ethernet/IP Connection Parameters (0~256)

Assembly Instance		
102 (Input):	64	+4(bytes)
101 (Output):	64	(bytes)
103(Configuration):	0	(bytes)

Assembly Instance		
112 (Input):	128	+4(bytes)
111 (Output):	128	(bytes)
113(Configuration):	0	(bytes)

Assembly Instance		
122 (Input):	256	+4(bytes)
121 (Output):	256	(bytes)
123(Configuration):	0	(bytes)

Ethernet/IP Equipment Parameters

VendCode: 1 (1~65535) ProdCode: 2035 (1~65535)

OK Cancel Help

How to Set the Module's IP Address:

- **Setting the IP address via software SST-EIP-CFG:** The users use the SST software to configure network parameters (user parameter configuration).
- **Setting the IP address via host interface (UART):** The user board sets the IP address and other parameters through UART. The user board sets parameters such as the IP address by sending an initialization request message. See [Chapter 4.4](#).

- The GS11-EI supports 3 sets of EtherNet/IP assembly instances. Each set of assembly instances has an input and output. The number of input and output bytes can be any value from 0 to 256 bytes. (All three sets of assembly instances will share the same memory buffer and will store the same data)

Note: The size of the message length for the Request Messages sent through UART in [Chapter 4.5](#) must match the number of Input bytes of the largest Assembly Instance.

- Supports changing VendCode and ProdCode.

6.6 IP Address Report Function

The IP Address Report function is used to identify the GS11-EI on the network by sending a UDP packet that reports its current IP address, subnet mask, and default gateway to a port of the specified IP address device. Users can enable this function by following the instructions in [Chapter 6.4.3](#). To open the IP Address Report window, click on the "IP Address Report" button in the main screen of the configuration software SST-EIP-CFG.



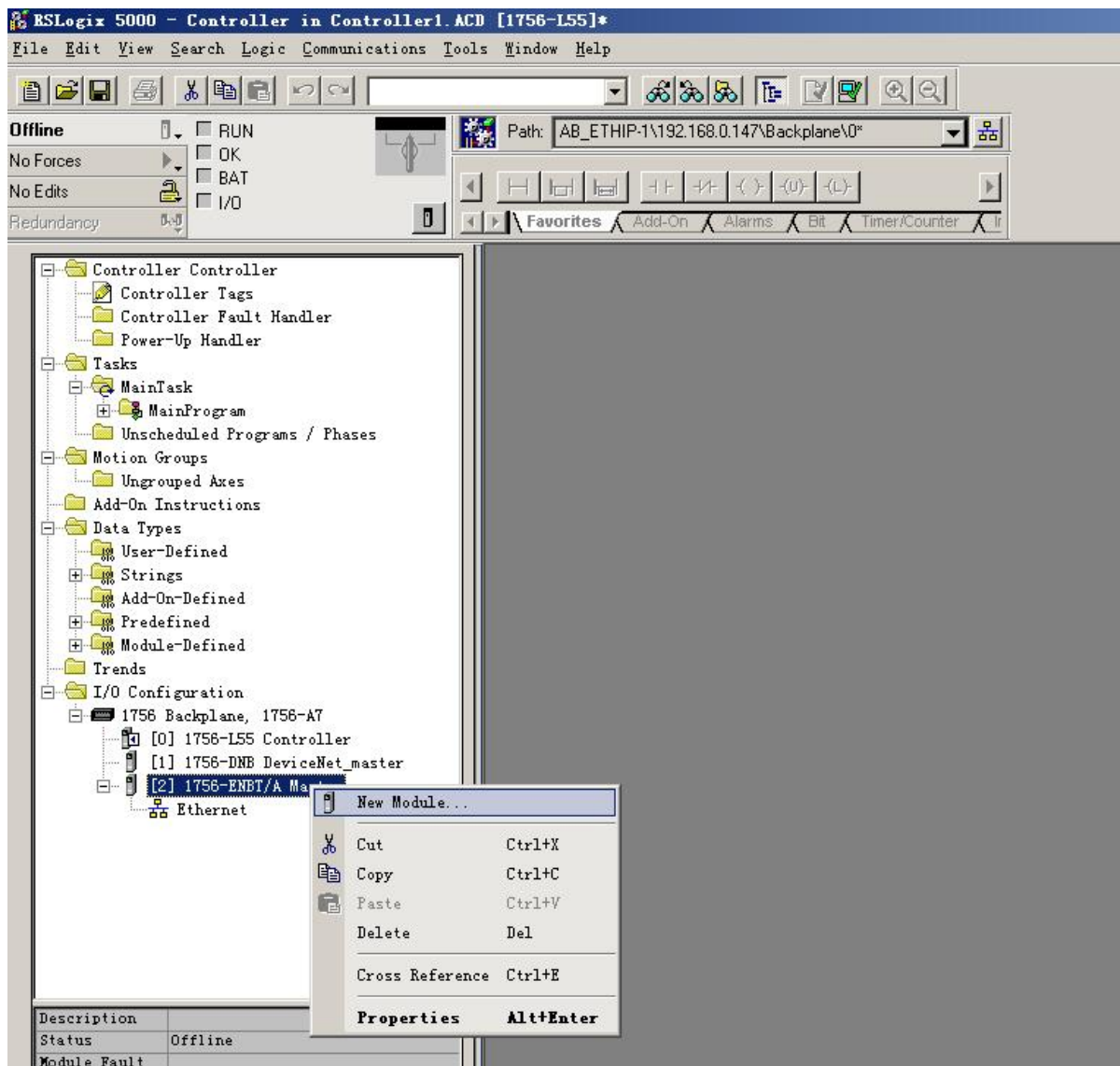
[illegible]

Appendix: How to Read and Write I/O Data

There are 2 ways to read and write I/O data.

Use I/O Method to Read and Write Data (Recommended)

The following uses RSLogix 5000 as an example to explain how to use I/O method to read and write I/O data. Right-click on the EtherNet IP Scanner module and choose "New Module...", shown as follows:

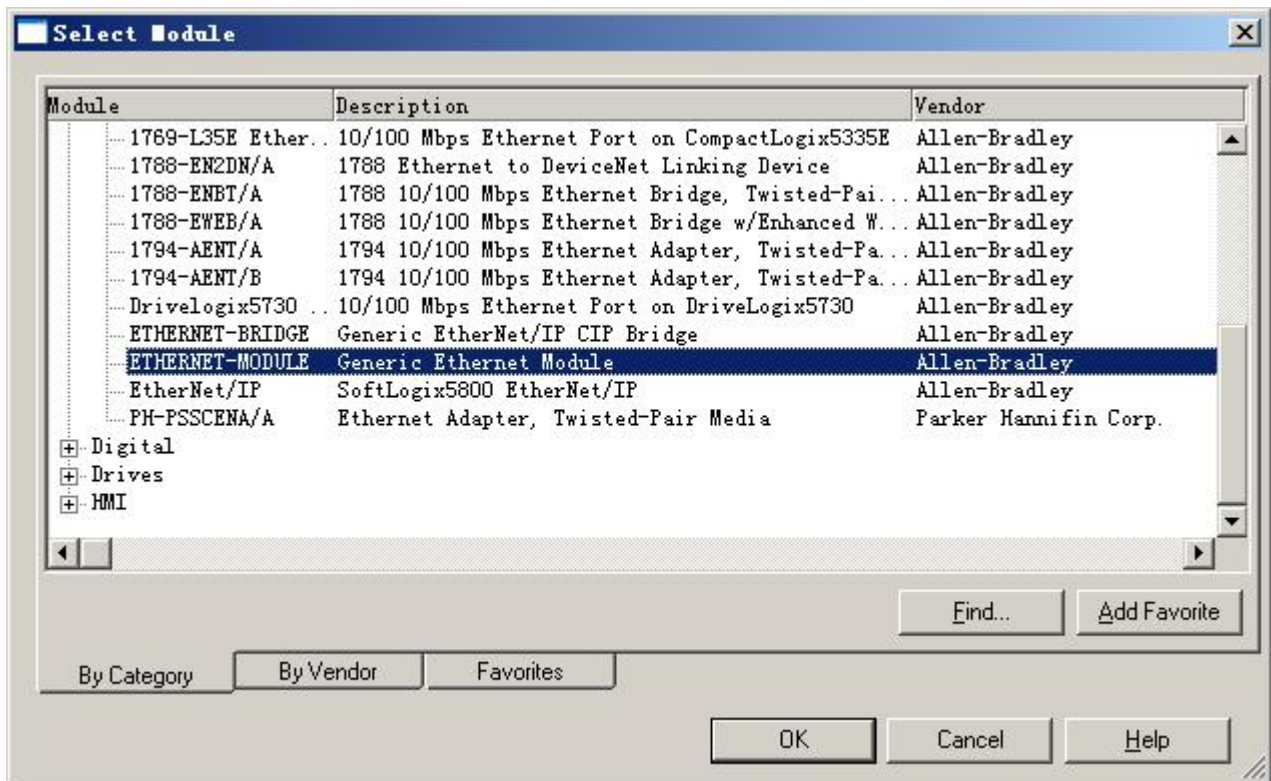


In the pop out module selection window, click on the "+" in front of "Communications" to expand, then select "ETHERNET-MODULE" and click "OK", shown as follows:

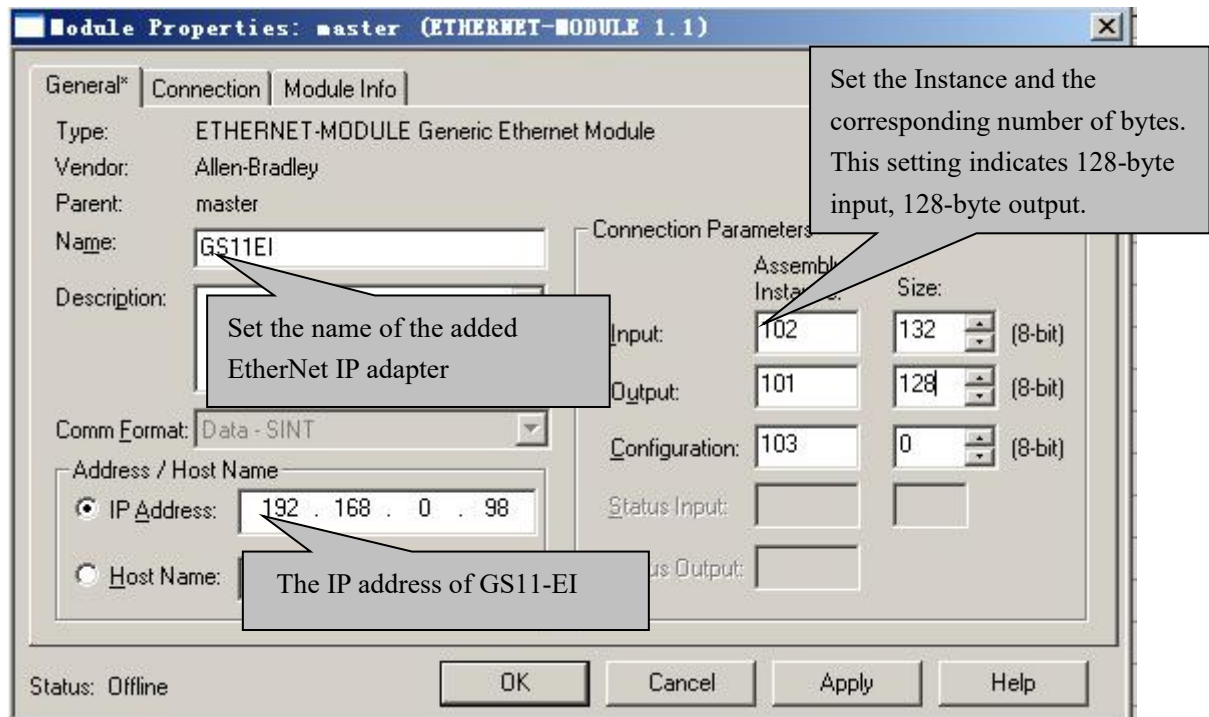
GS11-EI

Embedded EtherNet/IP Module

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Set the related information of GS11-EI in the pop out window, as shown below.



The module information that needs to be set in the above figure includes:

Name: Name the added EtherNet IP slave module (GS11-EI module)

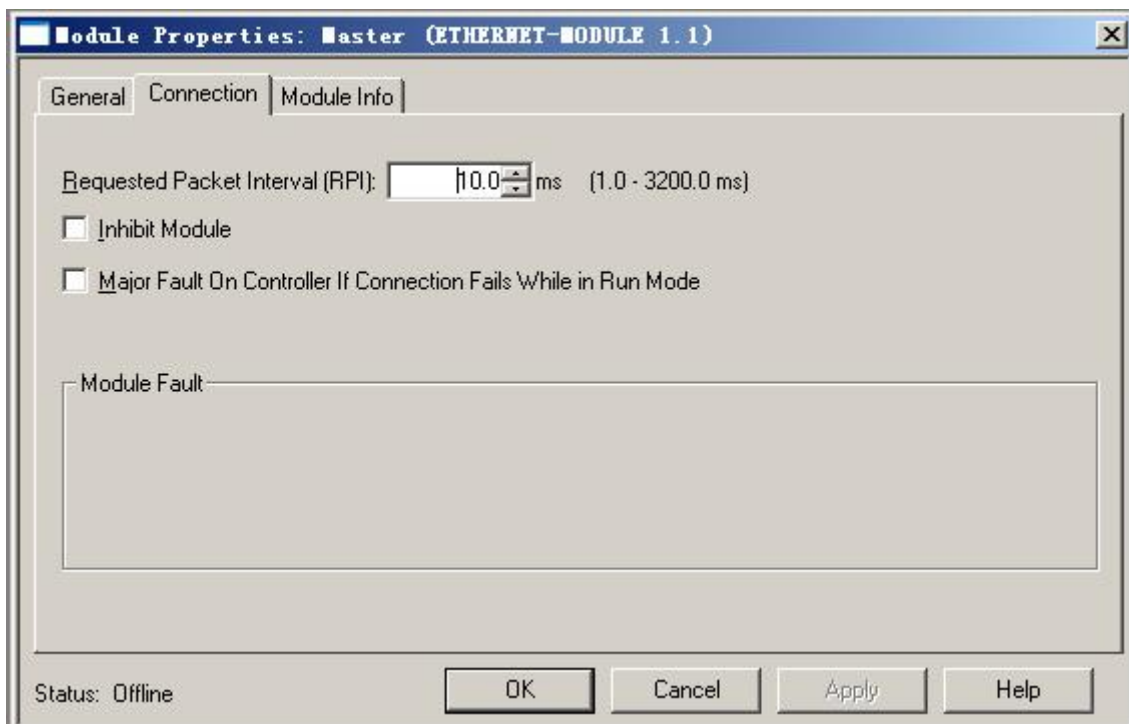
Comm Format: Set the data type. User can choose to set the data type to DINT, INT, SINT, REAL, and so on. This setting cannot be changed after confirmation. If you need to change the data type, you can create a new module.

IP Address: Set the IP address of the EtherNet IP adapter module need to be connected, it is also the GS11-EI's IP address.

Connection Parameters: Set the connection parameters used in the communication. For the connection parameters supported by the GS11-EI, see the previous chapter.

Note: The size of "Size" set in the above figure (the number of bytes set) should be consistent with the number of input and output bytes corresponding to the instance described in the previous chapter.

Click "OK" to set the polling interval of the master station in the pop out window. The default is 10ms, as shown below:

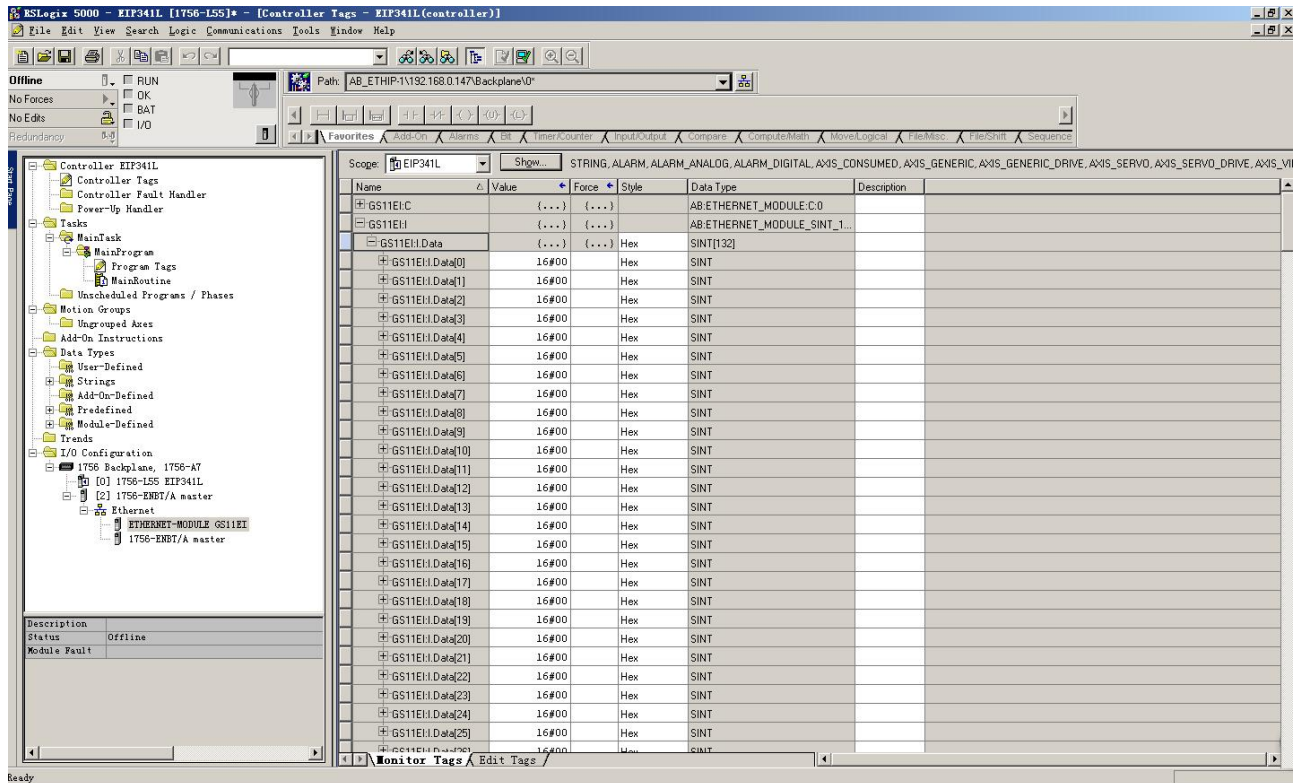


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After setting the master polling interval, click "OK" to save. Double-click "Controller Tags". In the pop out window, click "GS11EI: O", as shown below:



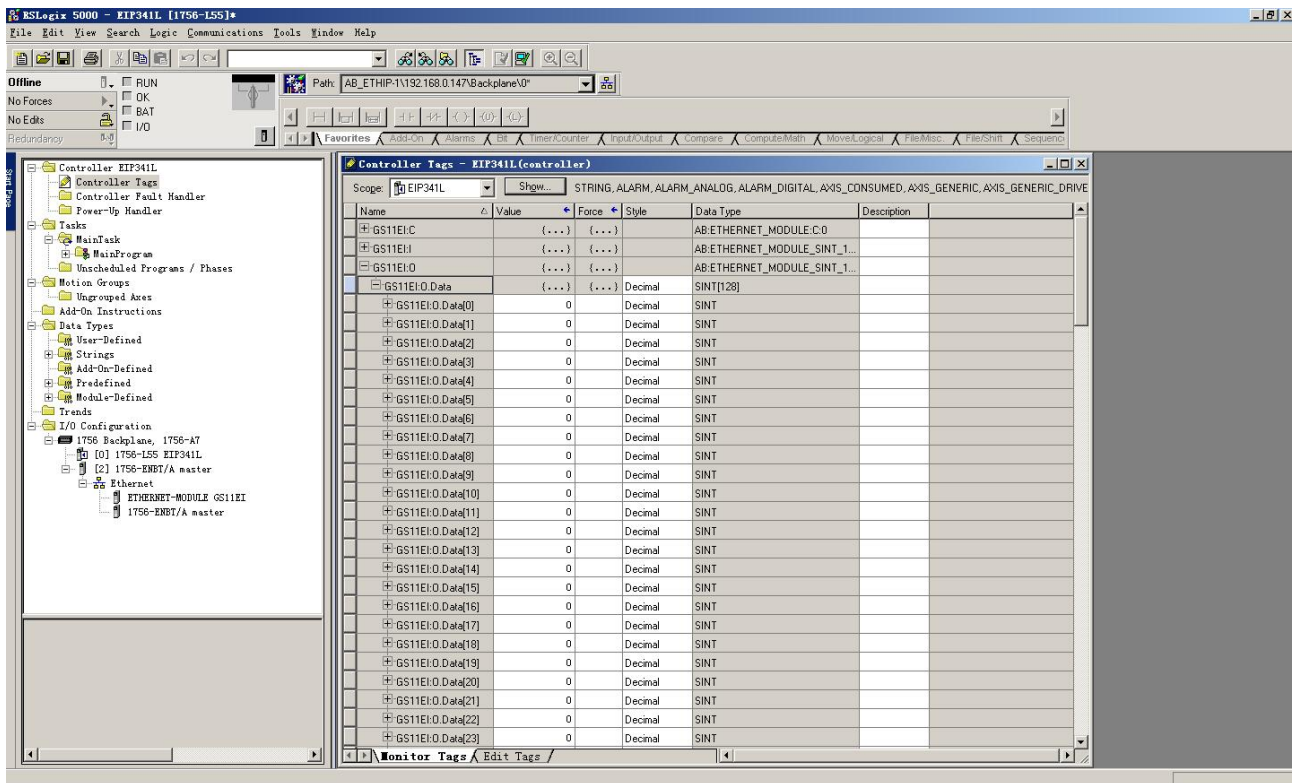
In the figure above, GS11EI:O.Data [0]~GS11EI:O.Data [127] is the corresponding output data address of the added GS11-EI module in the master station.

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Click on "GS11EI: I", as shown below:



In the figure above, the 4 bytes corresponding to GS11EI:I.Data [0] is the real time frame header of EtherNet/IP adapter station.

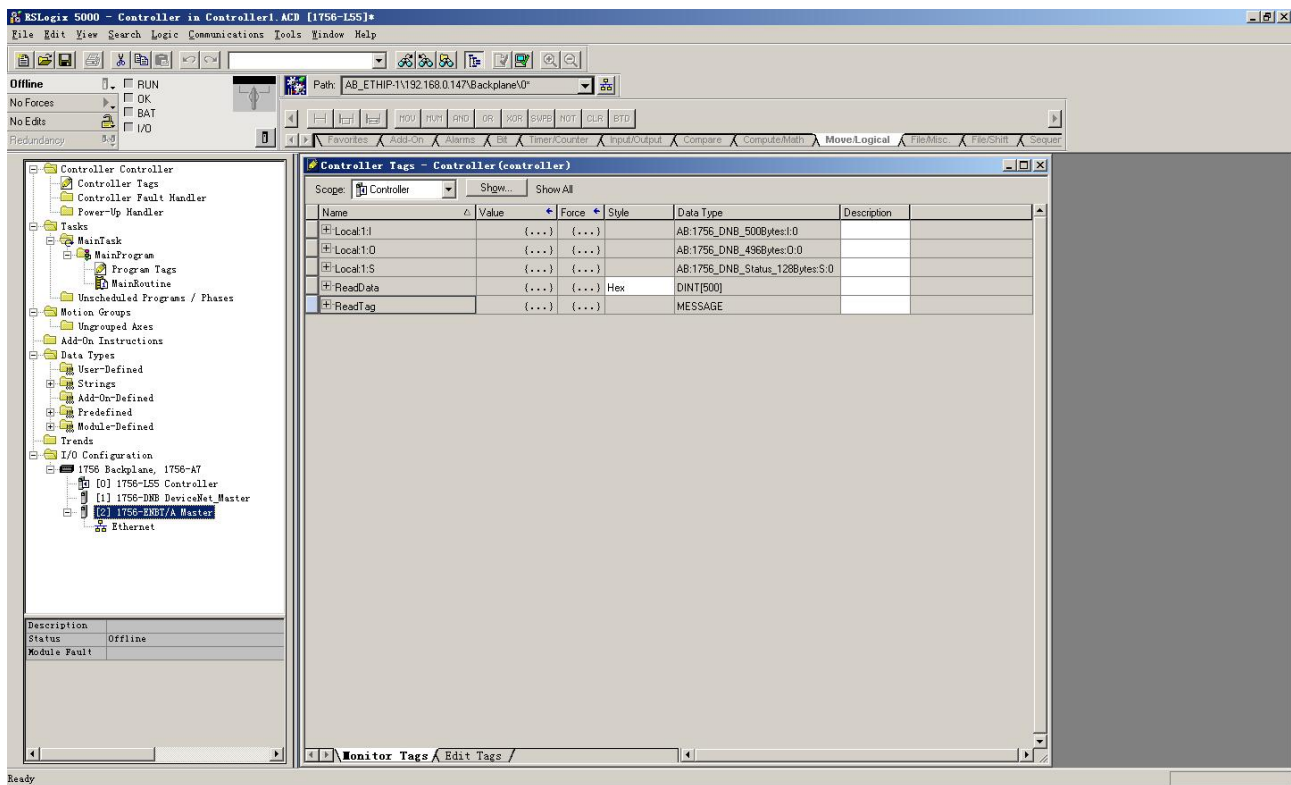
GS11EI: I.Data[1]~GS11EI: I.Data[127] is the corresponding input data address of the added GS11EI module in the master station.

Use MSG Method to Read and Write Data

The following uses RSLogix 5000 as an example to explain how to use MSG to read and write I/O data.

Read I/O Data

Create a new project and be in "Offline" mode. Add two new tags "ReadTag" and "ReadData" under "Controller Tags", and define the type of "ReadTag" as "MESSAGE" and define the type of "ReadData" as "DINT[500]":

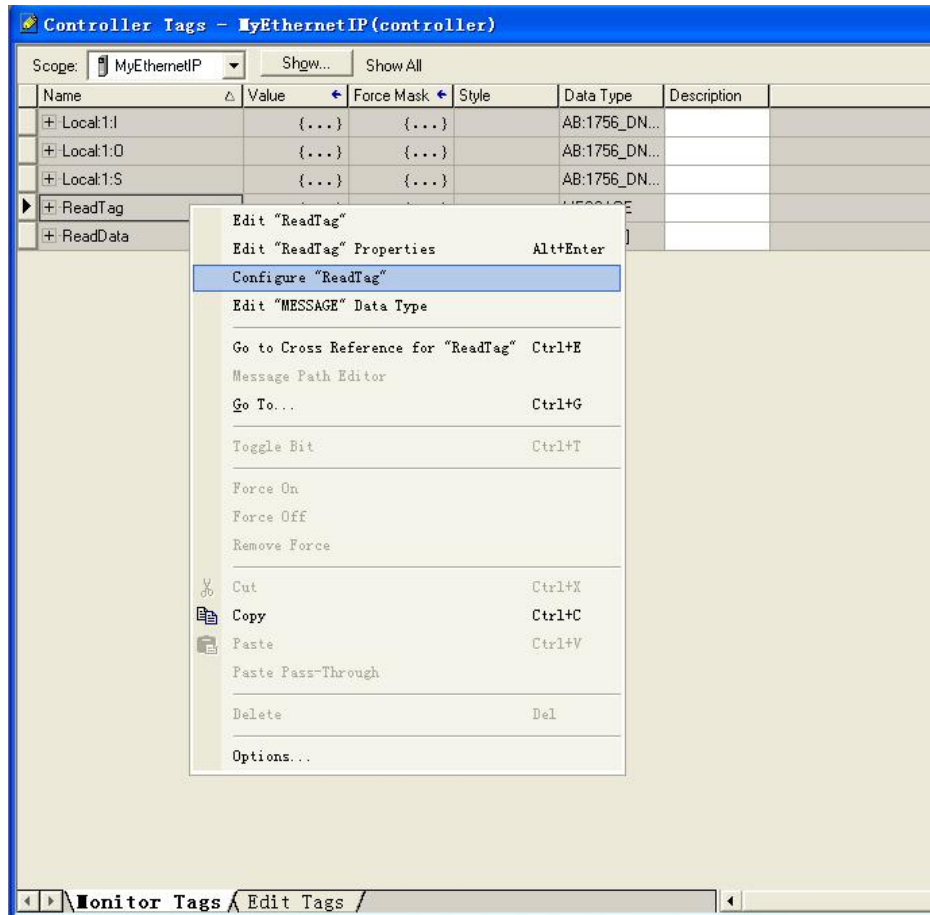


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Right-click on "ReadTag" and select "Configure "ReadTag"":



In the new pop-out window, finish the settings as below:

Message Type: CIP Generic

Service Type: select "Get Attribute Single", at this point, the corresponding Service Code becomes to "e (Hex)"

Class: 4 (Hex)

Instance: 102 (64Bytes), 112 (128Bytes), 122 (256Bytes) can be set.

Attribute: 3 (Hex)

Destination: Select the "ReadData" tab. At this point, the read data will be saved in this tab.

GS11-EI Embedded EtherNet/IP Module User Manual

Message Configuration - ReadTag

Configuration* | Communication | Tag

Message Type: CIP Generic

Service Type: Get Attribute Single

Source Element:

Source Length: 0 (Bytes)

Service Code: e (Hex) Class: 4 (Hex) Destination: ReadData

Instance: 102 Attribute: 3 (Hex)

New Tag...

☐ Enable ☐ Enable Waiting ☐ Start ☒ Done Done 0

☐ Error Code: Extended Error ☐ Timed Out

Error
Error

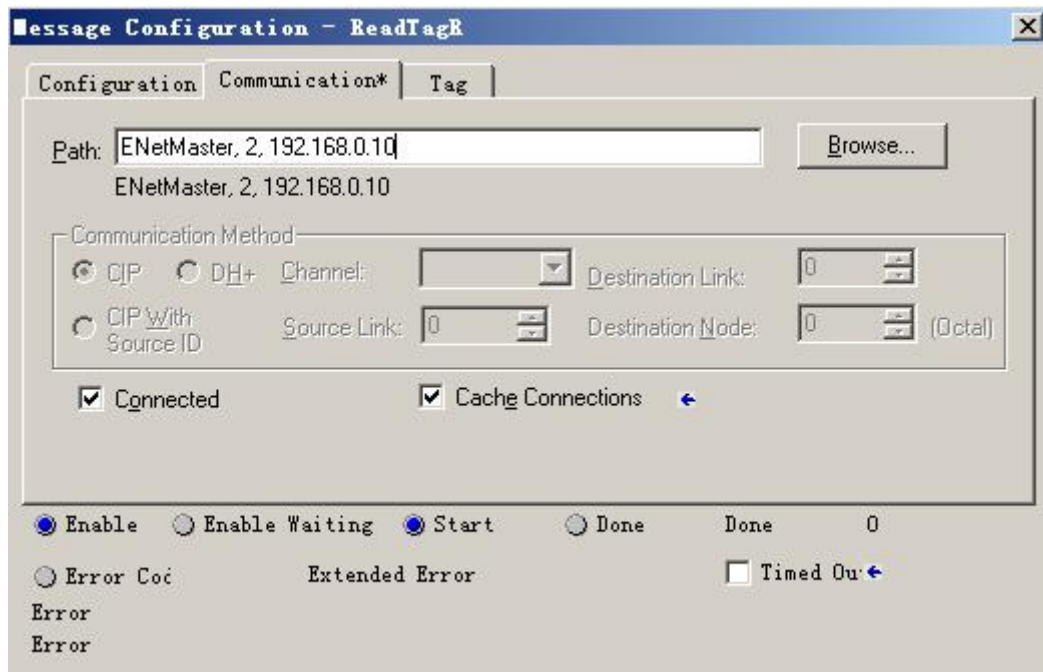
Select the "Communication" tab. In the space after Path, enter the path which corresponding to the connected EtherNet/IP slave station. The format of the path is: the EtherNet/IP master name, the slot number where the EtherNet/IP master resides, and the connected EtherNet/IP address. After the path is set up, click "Apply" and "Confirm", shown as follows.

In this example, the name of EtherNet/IP master is "Master", the EtherNet/IP master station is in the slot number "2", and the connected EtherNet/IP slave (GS11-EI) has the IP address "192.168.0.10".

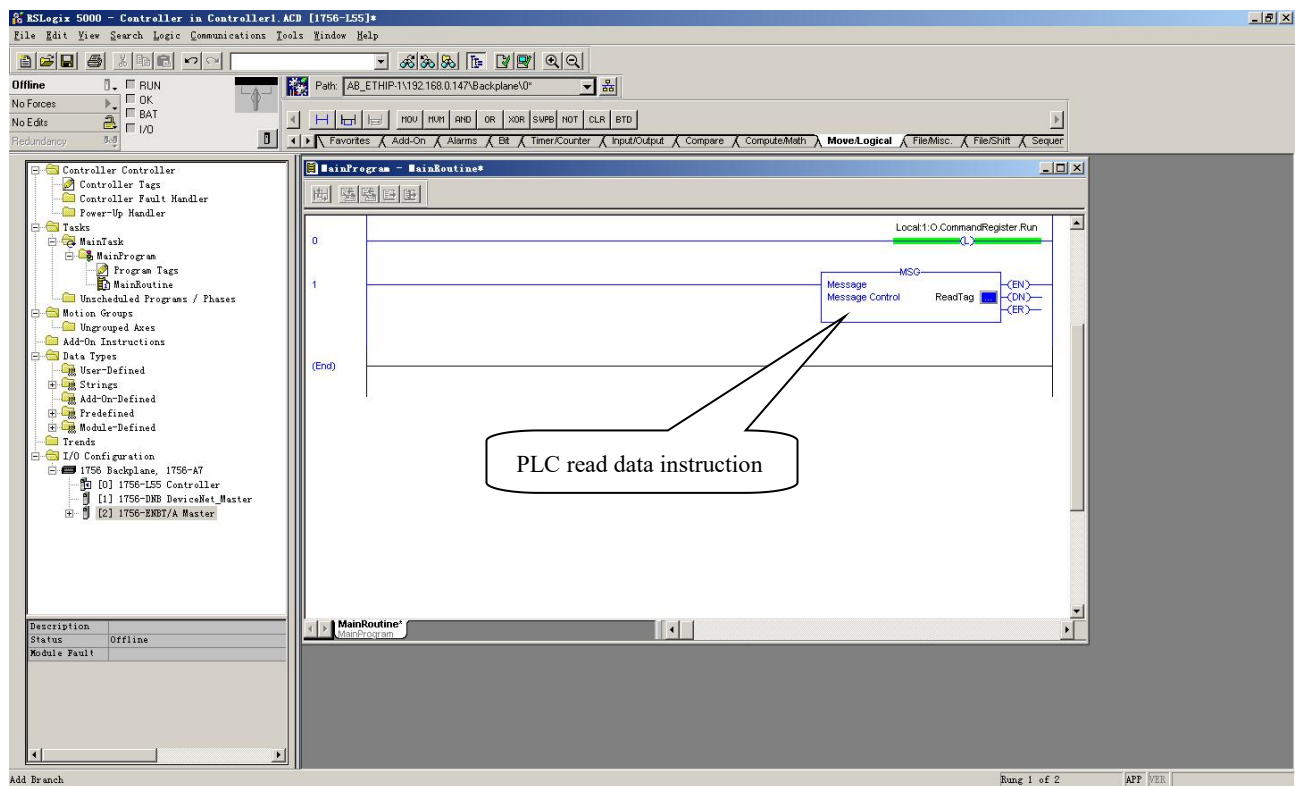
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Add a "MSG" instruction to "MainRoutine" under "MainProgram" and select "ReadTag" as "Message Control", as shown below.



This is a simple instruction that can send a read request. In a normal program, some logical commands need to be

GS11-EI

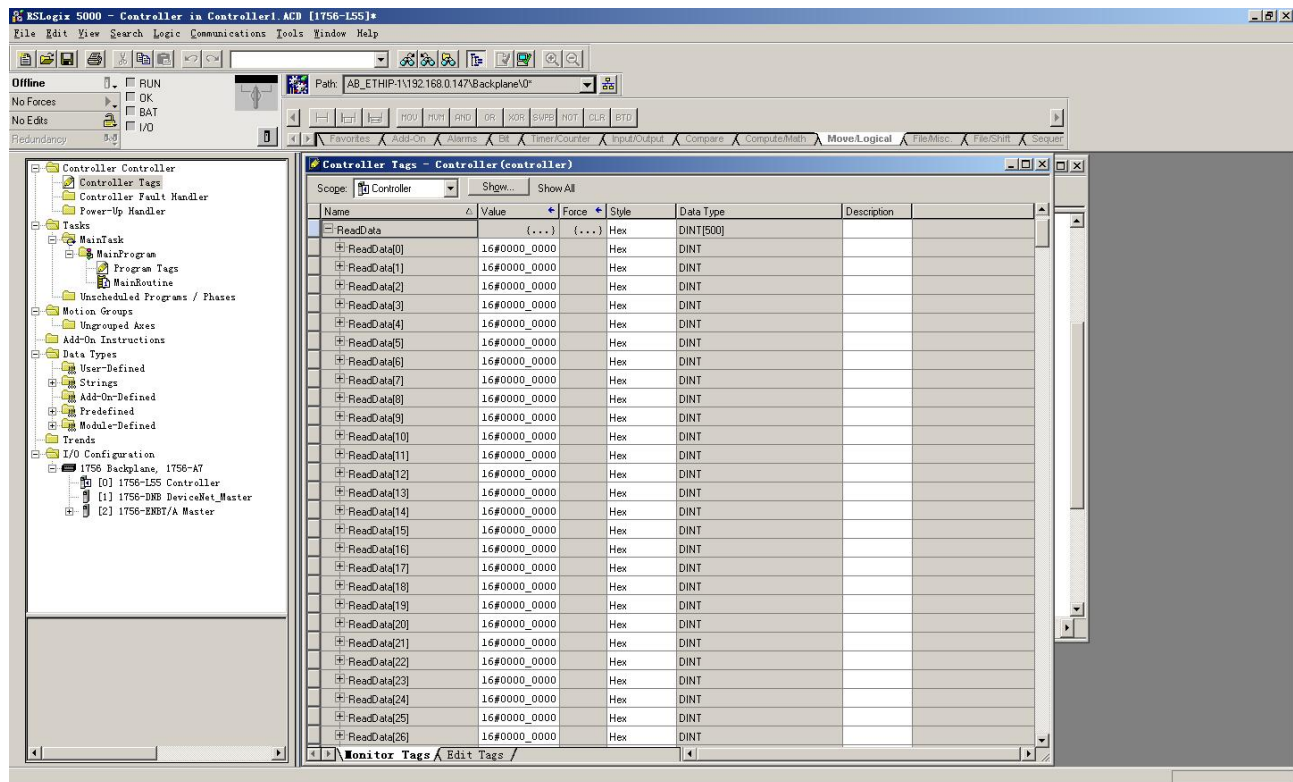
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added to trigger this instruction. For details on this instruction, refer to RSLogix5000.

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

Click on "Control Tags" and select "Monitor Tags" to expand "ReadData", as shown below. The data stored at the starting address ReadData[0] is the data of the user board which is read by the PLC via the gateway GS11-EI.



Write I/O Data

Go to the "Offline" mode, add two new tags "WriteTag" and "WriteData" under "Controller Tags", and define the type of "WriteTag" as "MESSAGE", also the type of "WriteData" as "DINT[500]":

New Tag

Name: WriteData

Description:

Usage: <normal>

Type: Base

Alias For:

Data Type: DINT[500]

Scope: Controller

Style: Hex

☐ Open Configuration

New Tag

Name: WriteTag

Description:

Usage: <normal>

Type: Base

Alias For:

Data Type: MESSAGE

Scope: Controller

Style:

☐ Open MESSAGE Configuration

RSLogix 5000 - Controller in Controller1.ACD [1756-155]*

File Edit View Search Logic Communications Tools Window Help

Path: AB_ETHIP:1\192.168.0.14\BackplaneV0*

Offline RUN

No Forces OK

No Edits BAT

Redundancy 3-2 I/O

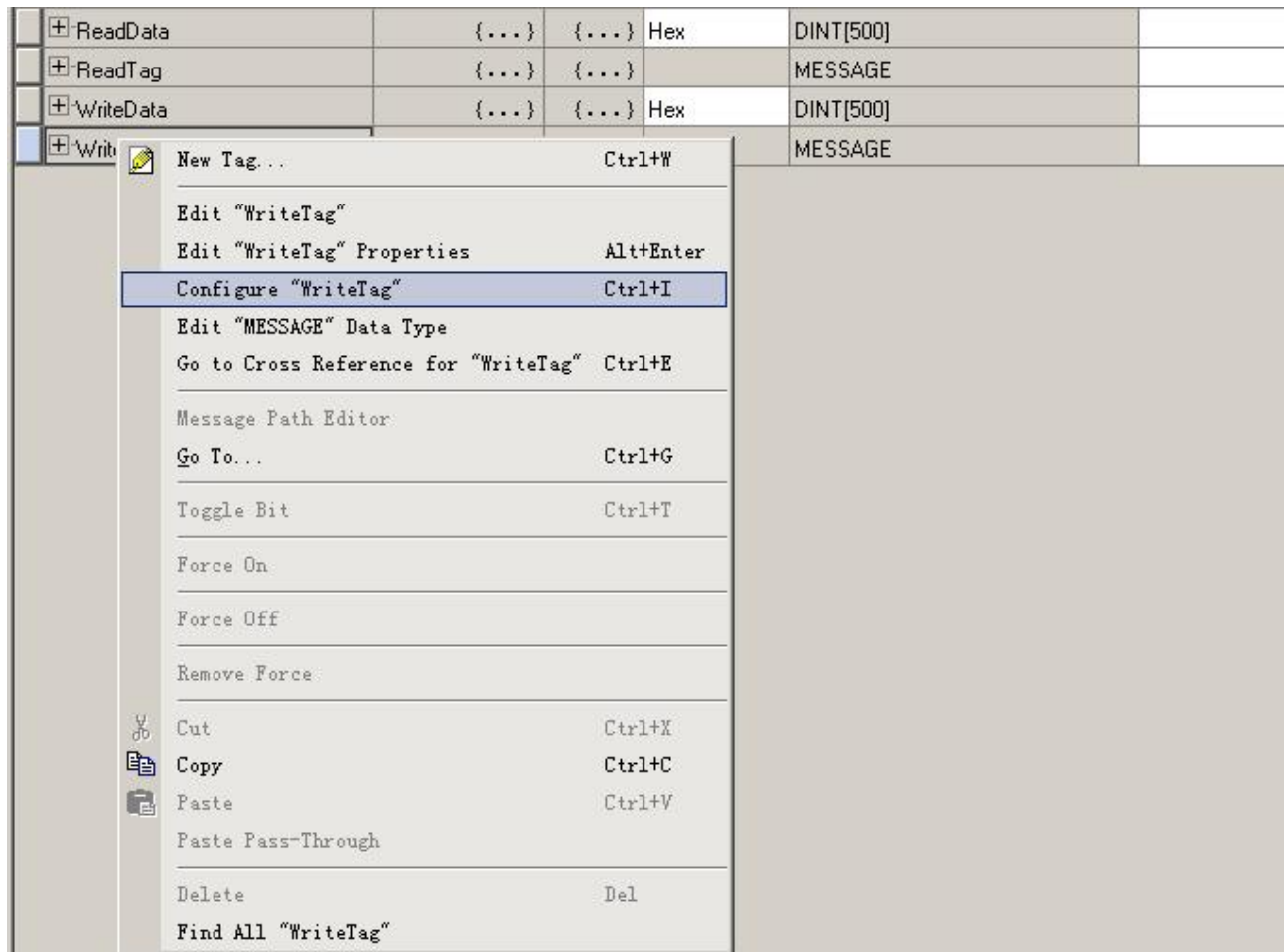
Controller Tags - Controller (controller)

Scope: Controller Show Show All

Name	Value	Force	Style	Data Type	Description
Local1:1	(...)	(...)		AB:1756_DNB_500Bytes:1:0	
Local1:0	(...)	(...)		AB:1756_DNB_496Bytes:0:0	
Local1:5	(...)	(...)		AB:1756_DNB_Status_128Bytes:5:0	
ReadData	(...)	(...)	Hex	DINT[500]	
ReadTag	(...)	(...)		MESSAGE	
WriteData	(...)	(...)	Hex	DINT[500]	
WriteData[0]	16#0000_0000		Hex	DINT	
WriteData[1]	16#0000_0000		Hex	DINT	
WriteData[2]	16#0000_0000		Hex	DINT	
WriteData[3]	16#0000_0000		Hex	DINT	
WriteData[4]	16#0000_0000		Hex	DINT	
WriteData[5]	16#0000_0000		Hex	DINT	
WriteData[6]	16#0000_0000		Hex	DINT	
WriteData[7]	16#0000_0000		Hex	DINT	
WriteData[8]	16#0000_0000		Hex	DINT	
WriteData[9]	16#0000_0000		Hex	DINT	
WriteData[10]	16#0000_0000		Hex	DINT	
WriteData[11]	16#0000_0000		Hex	DINT	
WriteData[12]	16#0000_0000		Hex	DINT	
WriteData[13]	16#0000_0000		Hex	DINT	
WriteData[14]	16#0000_0000		Hex	DINT	
WriteData[15]	16#0000_0000		Hex	DINT	
WriteData[16]	16#0000_0000		Hex	DINT	
WriteData[17]	16#0000_0000		Hex	DINT	
WriteData[18]	16#0000_0000		Hex	DINT	
WriteData[19]	16#0000_0000		Hex	DINT	
WriteData[20]	16#0000_0000		Hex	DINT	
WriteData[21]	16#0000_0000		Hex	DINT	

Monitor Tags Edit Tags

Go to the "Monitor Tags" page, input some data into the address writeData[0] under "WriteData" tab. The data will be sent out by the PLC to the GS11-EI first, then to the user board by using the configured write command.



In the new pop-out window, finish the settings as below:

Message Type: CIP Generic

Service Type: select "Get Attribute Single", at this point, the corresponding Service Code becomes to "10(Hex)"

Class: 4 (Hex)

Instance: 101 (64Bytes), 111 (128Bytes), 121 (256Bytes) can be set

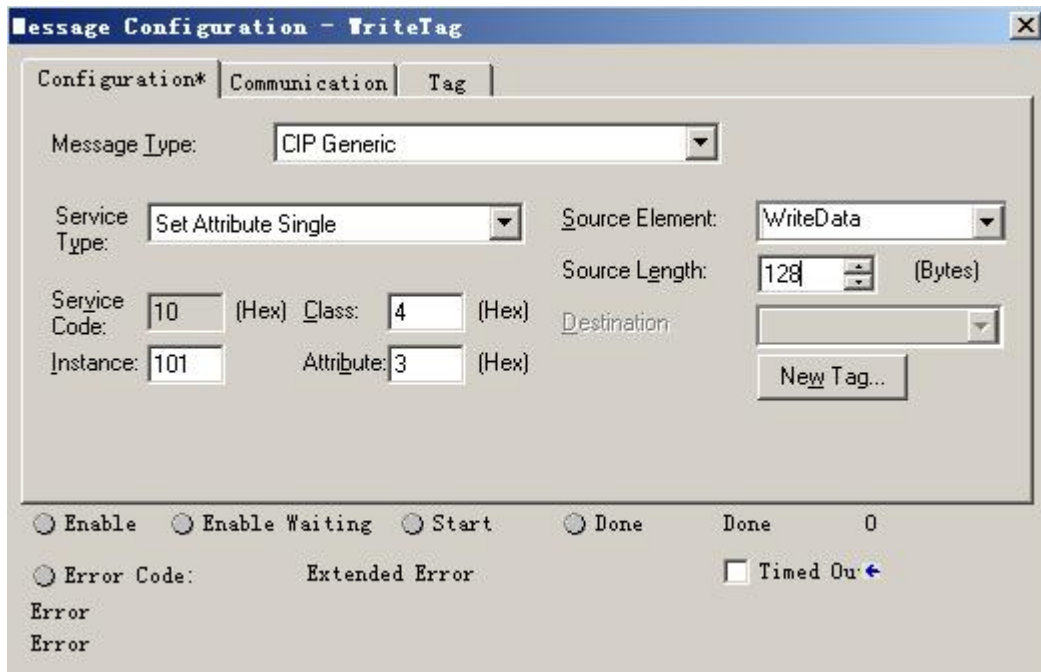
Attribute: 3 (Hex)

Source Element: Select the "WriteData" tab. It represents the data used in the "WriteData" tab as PLC output data.

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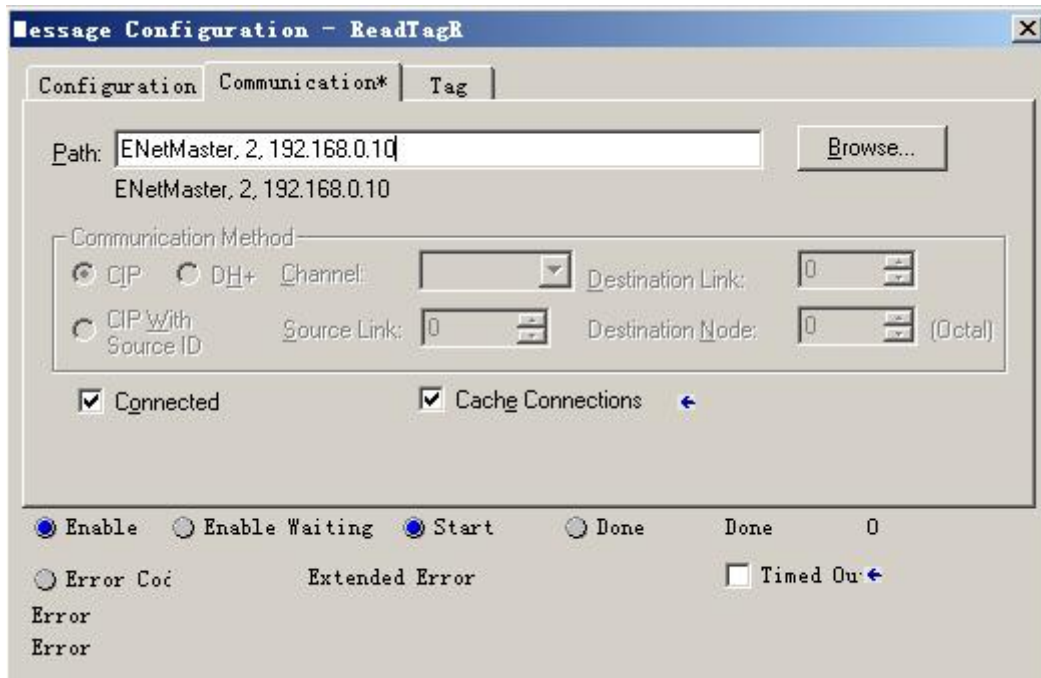
Source Length: With the unit of byte, this value should be less than or equal to the number of bytes represented by the currently selected instance.

Destination: Select the "ReadData" tab. At this point, the read data will be saved in this tab.



Select the "Communication" tab. In the space after Path, enter the path which corresponding to the connected EtherNet/IP slave station. The format of the path is: the EtherNet/IP master name, the slot number where the EtherNet/IP master resides, and the connected EtherNet/IP address. After the path is set up, click "Apply" and "Confirm", shown as follows.

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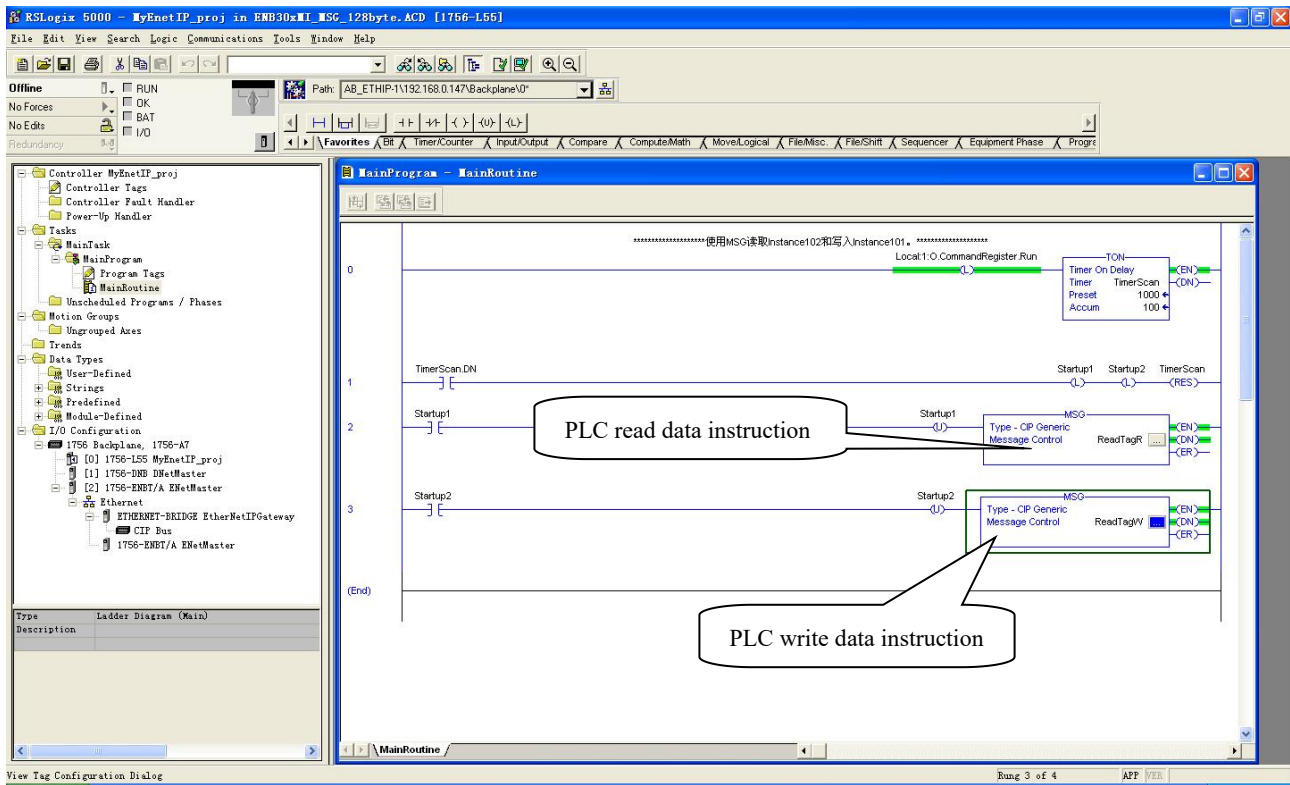
In this example, the EtherNet/IP master station name is "Master", the EtherNet/IP master station is in the slot number "2", and the connected EtherNet/IP slave (GS11-EI) has the IP address "192.168.0.10". The IP address of the GS11-EI is downloaded to the module via software SST-EIP-CFG.

Add a "MSG" instruction to "MainRoutine" under "MainProgram" and select "WriteTag" as "Message Control", shown as follows.

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Download the PLC program to the PLC and put the PLC into the "Online" state. The data in "WriteData" will be sent to the user board via the GS11-EI (EtherNet/IP Slave station) by the PLC module.