HART / EtherNet/IP Gateway GT200-HT-EI

User Manual

V 1.3

Rev D







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Important Information

Warning

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

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

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1 Product Overview

1.1 Product Function

GT200-HT-EI is a gateway that can provide a seamless connection between HART and EtherNet/IP. It can connect HART slave devices to an EtherNet/IP network and realize bi-directional data exchange easily. The HART side can be configured as a primary or secondary master, and the EtherNet/IP side works as a slave.

1.2 Product Features

- Easy to use: Users only need to refer to the product manual and application instances and can realize data communication of a gateway in a short time according to the requirements of the configuration.
- Powerful functionality: Support fast acquisition of the HART slave address and modification, single-point mode of coexistence of HART communication and 4~20mA data acquisition, HART side supports the primary master and the secondary master.
- Multi debugging functions: The configuration software SST-HI-CFG can provide a visual display of data exchange as well as HART command diagnostics and communication debugging functions that greatly facilitates user communication tests.

1.3 Technical Specifications

- [1] EtherNet/IP network is independent of HART network.
- [2] Ethernet 10/100M self-adaptive.
- [3] IP address conflict detection.
- [4] Supports ODVA standard EtherNet/IP communication protocol in slave mode.
- [5] Used as a primary or a secondary HART master.
- [6] Supports single-point and multi-point mode at the HART side.
- [7] Under single-point mode, supports data burst operation from slave.
- [8] Supports one HART-channel, under multi-point mode, supports connecting at most 13 HART slaves with



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gateway internal resistor and supports connecting 15 HART slaves with an external resistor (250 Ohm).

- [9] Supports all commands of the HART 6 protocol.
- [10] Each HART command can be configured for change-of-state output, polling output, initialization output or disable output.
- [11] Supports up to 127 HART commands, HART output data buffer is up to 1000 bytes, and the input data buffer is up to 1600 bytes.
- [12] Supports an internal or external HART series resistor.
- [13] Max input and output bytes of EtherNet/IP:

Max input bytes: 256 bytes.

Max output bytes: 256 bytes.

- [14] Power: 24VDC (11V~30V), 70mA (24VDC).
- [15] Operating temperature: -40 °F~140 °F(-40 °C~60 °C). Humidity: 5%~ 95% (without condensation).
- [16] Dimensions (W*H*D): 1.0 in * 4.0 in * 3.6 in (25 mm * 100 mm * 90 mm).
- [17] Installation: 35mm DIN RAIL.
- [18] Protection Level: IP20.

1.4 Related Products

Related products include:

- ► GT200-HT-RS
- ➢ GT200-HT-MT
- ➢ GT200-3HT-MT
- ➢ GT200-3HT-RS
- ➢ GT100-EI-RS
- ➢ GT200-EI-2RS485

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

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1.5 Revision History

Revision	Date	Chapter	Description
V1.0, Rev A	9/29/2017	Chapter 2 Add configuration notes into chapter	
			Hardware and software description revised.
V1.0, Rev B	4/20/2020	Chapter 6	Part modifications for chapter 6.
V1.3	8/9/2021	ALL	New release for updated product version.
V1.3, Rev A	8/24/2021	Chapter 2.7, 4.2	Revised some mistakes.
V1.3, Rev B	07/01/2022	Chapter 5	Add HART Common Commands (ID 1 and
			ID 3) to this section.
V1.3, Rev C	8/2/2022	PART	Add two wire and four wire multi-drop
			wiring and replace software screenshot.
V1.3, Rev D	8/9/2022	Chapter 1.1, 1.3, 1.4,	Revised some mistakes. Corrected figure in
		2.5, 2.7, 4.1, 4.3,	chapter 2.5.
		5.2.2.3, 5.2.2.4, 5.2.3,	
		6.1, 8.1	





2 Hardware Descriptions

2.1 Product Appearance



Note: The pictures are for reference only. The product appearance is subject to the actual product.

2.2 LED Indicators

Indicator	State	Description
ENS	Red off	IP address initialization is normal.
	Red blinking	DHCP
CNIC	Croop on	EtherNet/IP connection is established.
5115	Green on	Communication is normal.
	Green blinking	EtherNet/IP connection is not established.
TV	Green blinking	HART data sending
	OFF	No data sending
DV	Green blinking	HART data receiving
КЛ	OFF	No data receiving





2.3 Button

The button is located at the top of the product and used to update the firmware.

Action	Description
Hold then power on	Bootload state to update firmware.

2.4 Configuration Switch

The configuration switches are located at the top of the product, Bit 1 is the function bit and Bit 2 is the mode bit.



Function (Bit 1)	Mode (Bit 2)	Mode	Description
Off	Off	Run mode	Allows configuration and communication.
On	Off	Dahua mada	Allows configuration, communication and
On	Oli	Debug mode	debugging.
Off	On On	Configuration mode	IP address is fixed at 192.168.0.11. Allows
UII		Configuration mode	configuration. Prohibits communication.
On		Dun modo	Allows communication. Prohibits
On		Kun mode	configuration and debugging.

Note: To apply mode switching, please restart the gateway.

2.5 Internal Series Resistor Switch

The GT200-HT-EI has an internal series resistor (270 Ohm /2 W) required for the HART channel. This allows up to 13 HART instruments to be connected. When the power of the series resistor is more than 2W, you must use an external series resistor (250 Ohm /3 W) which allows the gateway to be connected to up to 15 HART instruments.



Switch to ON, using the internal series resistor

Switch to OFF, using the external series resistor



2.6 Interface

2.6.1 Power Interface



Pin	Description
1	Power GND
2	NC (Not Connected)
3	24V+, DC

2.6.2 Ethernet Interface

The Ethernet interface uses RJ45 interface, follows the IEEE802.3u 100BASE-T standard, 10/100M adaptive,. its pin (standard Ethernet signal) is defined as below:



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

2.6.3 HART Interface



Pin	Description
1	Connected to HART signal +
2	Connected to HART signal -
3	NC (Not connected)





2.7 Topology of GT200-HT-EI and HART Instruments

Notes:

- 1. It is recommended to use the separate power supply for the HART instruments and the GT200-HT-EI, to ensure stable communication.
- 2. To improve the communication efficiency of the field bus, it is recommended not to configure empty nodes or useless commands in the SST-HI-CFG.
- 3. If there are two or more HART instruments connected in the same network, their HART LOOP wires should be connected parallel with each other.



When using the internal resistor

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Options when using an external resistor





2.7.1 Multi-drop Wiring

The following is the two wire and four wire multi-drop wiring.

Two wire:



Four wire:







3 Hardware Installation

3.1 Machine Dimension

Size (width * height * depth):

1.0 in * 4.0 in * 3.6 in (25 mm * 100 mm * 90 mm)



3.2 Installation Method





4 Quick Start Guide

4.1 Connection

- Make sure the GT200-HT-EI is in the appropriate operating mode that allows for configuration. It is
 recommended to set the gateway to configuration mode (configuration switches Bit 1 OFF and Bit 2 ON)
 then the IP of the gateway will be fixed at 192.168.0.10.
- 2. Connect the GT200-HT-EI to the computer by Ethernet cable.
- 3. Connect the HART instruments and the power supply. Refer to the topology displayed on <u>chapter 2.7</u>.
- 4. Power on the gateway and run the SST-HI-CFG software to start the configuration process.

4.2 Configuration

The following steps give an example configuration process, but tailor your configuration to your project needs.

The GT200-HT-EI is connected with a HART instrument which supports HART protocol V5 in Multi-drop mode,

configured with the HART commands 01, 03 and 06.

For more details of the software SST-HI-CFG, please refer to chapter 5.

1. Run the SST-HI-CFG software installed on the computer. Click "Upload" on the toolbar and scan available gateways in the network. Select the gateway and click "Sign In" to upload the configuration.

No.	Model	IP Address	MAC Add	ress
1	GT200-HT-EI	192.168.0.11		
•		m		
	•	[]		
51	gn In	Refresh		Cancel
earch	completed			

Note: Make sure that the GT200-HT-EI and your computer are in the same network segment.



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If you can't discover any gateways, please test the network connection first. Please refer to the note "How to

Use the Ping Command" located on our Support page on the sstautomation.com website

The first time the GT200-HT-EI is used, the uploaded configuration will be a default configuration created by

SST Automation. You can change the parameters based on the default configuration or create a new project.

The following steps introduce how to configure for a new project.

2. Select "Ethernet" on the left, and set the Ethernet parameters.

SST-	HI-CFG																	x
File(F)	Config(E)	Fool Vie	ew(⊻) Help	o(H)														
					<u>L</u>	Ē	Ĵ	⊾				Ţ	=	<u></u>	۲			
New	Save	Open	AddNode	e DelNode	AddCmd	DelCmd	Upload	Download	l AutoMap	Conflict	Export	Memory	Diagnose	Debug	Scan			
12-1				Type of Pro	tocol							Et	herNet/IP					
2	Ememer U Change	1		Assign IP M	lode							D	HCP					
- 33	Flatt Channe	1		IP Address								19	2.168.0.10					
				Subnet Mas	k							25	5.255.255.	0				
				Default Gate	eway							19	2.168.0.1					
				DNS1								0.	0.0.0					
				DNS2								0.	0.0.0					
				VendCode								1						

3. Select "HartChannel0" on the left and set the HART channel parameters. As shown below, the GT200-HT-EI

is configured as the secondary master and using the point-to-point mode.

SST-HI-CFG				
File(E) Config(E) Tool(I) View(V) He	slp(H)			
	T 🛱 🛱 🗘			
New Save Open AddNo	de DelNode AddCmd DelCmd Upload Dov	ad AutoMap Conflict Export Memory	Diagnose Debug Scan	
* Ethernet	HART Master Type HART Network Command Retransmission Times Polling Delay Between Polls Response Timeout	Prin Poi 3 Ena 256 256	imary Master oint to Point aable 56 56	

4. Add a node (chapter 5.2.2.2). In point-to-point mode, the address of the HART instrument is fixed at 0.

and the second s																	331-11-010	10 10 10
🕤 SST-	HI-CFG																	
File(F)	Config(E)	Tool Vi	ew(V) Help	(H)														
					<u>_</u>	<u>E</u>	Ĺ	J.	88		1	Ţ		<u></u>	Ø			
New	Save	Open	AddNode	DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memory	Diagnose	Debug	Scan			
-	Ethernet		×	Hart Slave	Address							0						
- 3	Hart Chanr	el																





5. Add HART commands (chapter 5.2.2.3).

🕤 SST-HI-CFG	
File(F) Config(E) Tool(T) View(V) Help(H)	
Image: New Save Open AddINode DelNode AddCmd DelCmd Upload	上 題 個 這 🖵 巨 😳 🞯 Download AutoMap Conflict Export Memory Diagnose Debug Scan
K Ethernet Hart Channel Server Node(0)	Select the command Command D1 Command D2 Command D2 Command D3 Command D3 Command D3 Command D4 Command D4 Command D4 Command D10 Command D10 Command D11 Command D11 Command D12 Command D14 Command D14 Command D14 Command D14 Command D12 Command D12 Command D14 Command D14 Command D12 Command D12 Command D12 Command D14 Command

6. Configure the commands (chapter <u>5.2.2.4</u>, <u>5.2.2.7</u>). According to HART universal command specifications, the command 00 has no request with 12-byte response, the command 03 has no request with 24-byte response, and the command 06 has 2-byte request with 2-byte response. The request data of the GT200-HT-EI includes an extra 2-byte status, so the receiving data length is 2-bytes more than the actual response.

After inputting the sending and receiving data length, click "AutoMap" on the toolbar to automatically map the data to the EtherNet/IP side (chapter <u>5.2.4</u>). You can also map the data manually.

The configuration of the HART commands are shown below:

					<u>L</u>	<u>F</u>	ſ	.↓				Ţ		<u></u>	۲	
New	Save	Open	AddNoo	le DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memory	Diagnose	Debug	Scan	
Ett	hernet art Channel Node(1) Comma Comma Comma	and ID0 and ID3 and ID6	x	Configuration Mode of On Memory Stat EtherNet/IP Length of So Length of So Memory Stat EtherNet/IP	n Mode tiputting Cor- arting Addre Starting Ad ending Data ending Data arting Addre Starting Ad	mmands ss of Send dress of S (BYTE) (WORD) ss of Rece dress of R	ing Data ending Da iving Data eceiving D	ta				Bi Po 30 0 0 0 0 0 0	asic olling 000			
				Length of R Length of R Command I	eceiving Dat eceiving Dat ndex	a (BYTE) a (WORE))					14 7 0	•			



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SST-HI-CFG	
File(E) Config(E) Tool(I) View(V) H	ebt
New Save Open oddNr	de Delland Helland Deventeed Autoban Conflict Expost Memory Diagnose Delva Scan
Hew Save Open Addite	te de la construir de construir de la construir de la construir de la construir de la construir de construir de construir de la construir de l
	Configuration Mode Basic
Hart Channel	Mode of Outputting Commands Polling
	Memory Starting Address of Sending Data 3000
Command ID0	EtherNetIP Starting Address of Sending Data 0
Command ID3	Length of Sending Data (BY1E) 0
Command ID6	Length of Sending Data (WORD) 0
TO TRANSPORTATION OF CONTRACTORS AND	Memory Starting Address of Receiving Data 14
	EtherNetIP Starting Address of Receiving Data 14
	Length of Receiving Data (BY1B) 20
	Length of Receiving Data (WORD) 13
	Command Index 1
	II
File(E) Config(E) Tool(T) View(V) H	ebt)
New Save Open AddNo	de DelNade AddCmd DelCmd Upload Download AutoMap Conflict Export Memory Diagnose Debug Scan
*	
- Sternet	Configuration Mode Basic
- Hart Channel	Node of Outputting Commands Poling
- Se Node(1)	Memory Starting Address of Sending Data 5000
- Command ID0	Emerine Line Starting Address of Sending Data 0
- Command ID3	Length of Senang Data (BTLE) 2 Length of Senang Data (BTLE) 1
Command ID6	Length of Senang Data (WOKD) 1
	Avenory starting Address or Receiving Data 40 Edwards Bisching Address or Receiving Data 40
	Emeriver IP Starting Address of Receiving Data 40
	Ledge 01 Receiving Joad (2) 112/ 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Comment Index

- 7. Check the mapping address in the Conflict Detection window (chapter <u>5.2.3</u>).
- Download the configuration. Click "Download" on the toolbar, select the gateway you want to download to and click "Sign In".

Note: The GT200-HT-EI will apply the new configuration after gateway restart. After downloading, the software will ask to restart the GT200-HT-EI. You can also power off then power on the GT200-HT-EI to restart the gateway.

9. Test the communication.





4.3 Test Communication

In this example, the EIPScan Test Tool is used to simulate the EtherNet/IP scanner. The configuration is the same with that in <u>chapter 4.2</u>. The SST-HI-CFG software provides debug and monitor tools (chapter <u>5.2.7</u>, <u>5.2.8</u>, <u>5.2.9</u>). For more EtherNet/IP connection details, refer to <u>chapter 7</u> and <u>chapter 8</u>.

- Set the configuration switch to Bit 1 ON and Bit 2 OFF (debug mode). Restart the GT200-HT-EI to apply the mode switching.
- 2. Click "Diagnose" on the toolbar and upload the configuration. Check the request and response status in the diagnose window.

12		50.50 M			
- HartChannel0	Item	Value		Item	Value
	System State machine	WAITACK	(iii) Node(0)	Command ID0	Response correct
	Request times	91		Command ID3	Response correct
	Response times	37		Command ID6	Response correct
	Error times	0			
peration			Operation		
Refrech	Reset	Stop updating	Refresh	Reset	Stop updating
iteliesh			Kenesn		p up using

Select a node and double click on a command to check the data. For example, double click on HART

command 03:

Item	Value					
Communication_Status	Success					
Response Code	NoErr					
 Primary Variable Current	3.800000					
Primary Variable Units Code	Degrees Celsius					
Primary Variable	934.996826					
Secondary Variable Units	Degrees Celsius					
Secondary Variable	25.000000					
Tertiary Variable Units Code	(null)					
Tertiary Variable	100.000000					
4th Variable Units Code	(null)					
4th Variable	0.000000					



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3. After confirming the data in diagnose window, click "Memory" on the toolbar and sign in the GT200-HT-EI.

Check the data bytes and mapping address.

The input data in the Memory data window corresponds to the input at EtherNet/IP side. The output data corresponds to the output at EtherNet/IP side.

Note: The first 4 bytes in the EtherNet/IP input area is the gateway status.

Save																				-	
Save	Addr	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	1	15			
	0000	00	00	FE	11	0A	05	05	05	01	0E	CE	00	09	26	01)	00	•		
	0016	40	80	00	00	20	44	69	CO	26	20	41	C8	00	00	0)	42			
	0032	C8	00	00	00	00	00	00	00	00	00	02	00	00	00	01)	00			
	0048	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01)	00			
Stop	0064																		•		
tout data																					
ilput until	Addr	00	01	02	03	04	05	06	07	08	09	10	11	12	13	1	4	15			
Save	3000	02	00	00	00	00	00	00	00	00	00	00	00	00	00	0	5	00	•		
	3016	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01)	00			
Load	3032	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01)	00			
	3048	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01)	00			
Send	3064																		-		
Stop	File	Viev	v Re	quest	I/O	Stac	k De	evice /	IO M	odule	Help)									
		,	EI	PSca	n Tesi	Tool														1	
		-	H0	50 192		0.131		_				DI 10	0.140	• •	12						
		H	art to	=theri		Gatev	vay-0 -⊕€	Jonne ●	Ction I	nstand	20 I, H → → 7 6										
				1	-		0	* 13 12 * (• G• G	*0*0	•		0	G	*						
	 			(3000			Income and Address														
				192.1	68.0.4	2															
	01	00	00 0	192.1	68.0.4	2 ie 11	0a (05 05	05	01 00	e ce	00 0	9 26	00	00 4	0 80	00	00	20	44	69
	01 bf	00 e4	00 0 20 4:	192.1 0 00 1 c8	68.0.4	2 ie 11 0 00	0a (42 (05 05 c8 00	05 00	01 0e 00 00	e ce 0 00	00 0	9 26	00	00 4 02 0	0 80	00	00	20 00	44 00	69 00





5 Software Instructions

5.1 Software Interface Description

SST-HI-CFG is a configuration software based on the Windows platform, and is used to configure HART series products.

products.

The following describes how to use the software SST-HI-CFG to configure the product GT200-HT-EI. You may also check the software user manual to get detailed usage.

Run the software and enter the main interface of software:

SST-HI-CFG													
File Config Tool View Help			1		J]								
			Menu Bar		Title Bar								
New Save Open Addin	ade Delivode Adduma a ma Opioad Da	while Autowap Conflict	F	iose scan									
Ethernet	Type of Protocol		EtherNet	/IP									
HART Channel	Assign IP Mode		Manually	Assign									
B-& Node(0)	IP Address Subact Mark Too	Bor	192.168	255.0									
Command ID0	Default Gateway	JI Dal	192.168	0.1									
Command ID3	DNS1		0.0.0.0										
mand ID6	DNS2	0.0.0.0											
VendCode 1 Network Settings interface Parameter Settings interface Parameter Settings interface Comment field: Explain the function of the composition settings													
* The fieldbus type connected to the	gateway		the confi	guration options									
Info Nevr													

Tool Bar:

Toolbar interface shown as follow:

			T		<u>C</u>		<u>1</u>	Ł				Ţ		~	Ø
New	Save	Open	AddNode	DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memory	Diagnose	Debug	Scan

The function from left to right is: New, Save, Open, AddNode, DelNode, AddCmd, DelCmd, Upload, Download, AutoMap, Conflict, Export, Memory, Diagnose, Debug and Slave Scan.



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New: Create a new configuration file.



Save: Save the configuration file.



Open: Open the configuration file.



AddNode: Add a HART slave node.



DelNode: Delete a HART slave node.



AddCmd: Add a HART command.

DelCmd: Delete a HART command.





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



Download: Download the configuration file to the gateway.



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



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



Export: Output current configuration to the local hard disk and save as an Excel spreadsheet form.



Memory: Show the data exchange inside of the gateway.



Diagnose: This function analyzes the operating condition of fieldbus devices.



Debug: This function sends any request frame to the Hart fieldbus and shows the response information received in HART.





5.2 Software Function Description

5.2.1 Configure the Ethernet

In the device view interface, click Ethernet and the configuration interface will be shown as below:

SST-HI-CFG		
File(E) Config(E) Tool(I) View(V) H	Help단	
New Save Open AddNo	ode DelNode AddCmd DelCmd Upload Download AutoMap Conflict Export Memory Diagnose Debug Scan	
	Type of Protocol EtherNet/IP	
	Assign IP Mode DHCP	
	IP Address 192.168.0.10	
	Subnet Mask 255.255.250	
	Default Gateway 192.168.0.1	
	DNS1 0.0.0	
	DNS2 0.0.0	
	VendCode 1	
* Assign IP Mode: Manually Assign, I	DHCP	
Info News		

Configurable items include: Assign IP Mode, IP Address, Subnet Mask, and Gateway Address.

Assign IP Mode: Manual Assign, DHCP

IP Address: Set the IP address of the device

Subnet Mask: Set the subnet mask of GT200-HT-EI.Gateway Address: Set the gateway address of the device

5.2.2 Configure the HART Fieldbus

5.2.2.1 Set the Parameters of HART Channel

Click the HartChannel0 in the tree view and the configuration section will appear on the right:



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SST SST	HI-CFG																	
File(F)	Config(E)	Tool() Vi	ew(V) He	lp(H)														
C					1	므	1	.↓	88		1	Ģ		~	Ø			
New	Save	Open	AddNod	e DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memor	y Diagnose	Debug	Scan			
	Ethernet		×	HART Mas	ter Type							I	Primary Mast	er				
	Hart Chan	nel		HART Netv	vork							1	Multipoint					
100				Command F	Retransmissi	on Times							3					
				Polling	T. 11							ł	Inable					
				Delay Betw	een Polls								250					
				Response I	meout								.50					
				-														
× Tin	e waiting for	r the respon	se from sl	ave after the	gateway tran	nsmitting co	mmands: 2	56~65535	ms.									
	Nour																	
	<u></u>																	

HART Master: Primary master, Secondary master

HART Networks: Select the networks mode as single or multiple points, under the single point the gateway can only communicate with the slave device whose address is 0

Retries: Select the number of retransmission commands, ranging from 0 to 5

Polling: Determines if the polling function will be used, "Enable" means that the polling function will be enabled.

Delay between polls: Set the time of the polling command (The time interval from a command to send to start the

next command) with the range of $256 \sim 65535 \text{ms}$

Response timeout: Set the maximum time that the gateway waits for the slave device to respond, ranging from 256 to 65535 ms

5.2.2.2 Add a Node

Select the"HartChannel0", Right click the mouse and select "Add Node" in the pop-up menu.





Click the added node, set the slave address in the right configuration plate, and please notice that the HART

channel can only be equipped with one slave node which address is 0 when configured in the single point mode.

🕤 SST-	HI-CFG															x
File(F)	Config(E)	Tool() Vi	ew(V) Help	H												-
					<u></u>	<u>L</u>	1	4			X	Ţ		<u></u>	۲	
New	Save	Open	AddNode	DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memory	Diagnose	Debug	Scan	
	T.4 .		×H	IART Mas	ter Type							F	rimary Maste	er		_
- 23	Ethernet	-	H	IART Net	work							N	Iultipoint			
	Hart Chann	el	C	ommand I	Retransmissi	on Times						3				
			P	olling								E	nable			
			D	elay Betw	een Polls							2	56			
			R	esponse T	imeout							2	56			

Note: When configured node numbers are more than the actual connected devices, the redundant node will lead to the longer time of polling circle. so, it is recommended that configured node numbers should be the same as actual devices.

5.2.2.3 Add HART Commands

Select the "Node (x)", Right click the mouse and click "Add Command".

Ethernet HART Chan Node(1)	inel
	Add Node
	Delete Node
	Add Command
	Delete Command
	Copy Node
	Paste Node

Choose the command you want in the popup menu, and then click "OK" to exit:



User Manual

Command list:		Selected command:
Command ID1	*	Command ID0
Command ID2		Command ID3
Command ID4		Command ID6
Command ID5		
Command ID7	2	·>]
Command ID8		
Command ID9		
Command ID10		
Command ID11	_	
Command ID12	<	<
Command ID13		
Command ID14		
Command ID15	-	
Write Polling addr This is a data link command writes th which is used to c and provide the D	ress: layer man he Polling control the evice ID.	agement command. This address to the device, Primary Variable AO outpu

Note: The same command can only be configured once in one node.

%HART Common Commands

Note: The front two bytes of the actual response data is the status info of the device. The data after that two bytes is the

device response data.

Command 1 (Command ID1): Read Primary Variable

Return primary variable value in float data type.

Request: None

Response:

Byte	Description
Byte 0	Primary Variable Units
Byte 1-4	Primary Variable

Please check the picture of the SST configuration software below:

User Manual

New	Save	Open	Add Node	Del Node	Add Cmd	Del Cmd	1 Upload	↓ Download	AutoMap	Conflict	Export	Memory	Diagnose	Debug	₩ Mode Switch	
Field Fi	lbus mel1 ode(0) (Command (Command	ID3 ID1	Configuration Mode of Ou Memory Sta Modbus Re Length of So Memory Sta Modbus Re Length of R Length of R Length of R	on Mode ttputting Co arting Addr gister Start ending Data arting Addr gister Start ecciving D ecciving D ndex	ommands ess of Senci ing Address a (BYTE) a (WORD) ess of Reco ing Address ata (BYTE ata (WORI	ling Data s of Sendin eiving Data s of Receiv) D)	g Data			Basic Polling 3000 1500 0 0 0 7 4 1	2					<u>_</u>

As the request is: "None", the user should fill "0" for the section "Length of Sending Data (BYTE)"

The "Length of Receiving Data (BYTE)" will be 7, which is the sum of 2 status bytes and 5 device response bytes.

Command 3 (Command ID 3): Read Dynamic Variable and Primary Variable Current

Read primary variable current and four (at most) pre-defined dynamic variables. The primary variable current always matches the AO output current of the device. A second, third and fourth variable is defined for each device type, E.g. The second variable is the sensor temperature, etc.

Request: None

Response:

Byte	Description
Byte 0-3	Primary Variable Loop Current (units of milli-amperes)
Byte 4	Primary Variable Units Code
Byte 5-8	Primary Variable
Byte 9	Secondary Variable Units Code
Byte 10-13	Secondary Variable
Byte 14	Tertiary Variable Units Code
Byte 15-18	Tertiary Variable
Byte 19	Quaternary Variable Units Code
Byte 20-23	Quaternary Variable

Please check the picture of the SST configuration software below:



G7 HA	200-HT-EI RT/EtherNet/IP Gateway	
Us	er Manual	
New Save Op	n Add Node Del Node Add Cmd Del Cmd Upload Download AutoMap Conflict Export Memory Diagnose Debug Mode Switch	
Fieldbus Channell Souther Southern Command ID3	** Configuration Mode Basic Mode of Outputting Commands Polling Memory Starting Address of Sending Data 3000 Modbus Register Starting Address of Sending Data 1500 Length of Sending Data (BYTE) 0 Length of Sending Data (WORD) 0 Memory Starting Address of Receiving Data 0 Memory Starting Address of Receiving Data 0 Length of Sending Data (WORD) 0 Memory Starting Address of Receiving Data 0 Length of Receiving Data (BYTE) 26 Length of Receiving Data (WORD) 13 Command Index 0	

As the request is: "None", the user should fill "0" for the section "Length of Sending Data (BYTE)"

The "Length of Receiving Data (BYTE)" will be 26, which is the sum of 2 status bytes and 24 device response bytes If the user does not need to map all the variables to the Modbus TCP registers. Please follow the guide below to switch to the "Advanced Configuration Mode", then click the "Configuration" button. Only select the variable(s) needed, in this case, only the "Primary Variable" and the "Secondary Variable" are selected.More details for Advanced Configuration Mode, please refer to <u>chapter 5.2.2.7</u>.

Notes: Selected variables are listed in the left table. Variables corresponding to the bytes are listed in the table above.

Gateway Configuration Softw	vare SST-HE-CFG									-	×
File(E) Config(E) Tool(T) Vi	ew(<u>V</u>) Help(<u>H</u>)										
New Save Open	Add Node Del Node Add Cmd	다. Del Cmd U	⊥ ⊥ Jpload Download	E AutoMap	Conflict	Export	E Memory	Diagnose	E Debug	₩ Mode Switch	
Command configuration mc Basic: the configuration mc Advanced: the data correspondence	Configuration Mode Mode of Outputting Commands Memory Starting Address of Ser Modbus Register Starting Addre Length of Sending Data (BYTE) Length of Sending Data (DORD Memory Starting Address of Rec Modbus Register Starting Addre Length of Receiving Data (WOR Command Index Command Index det address of this command, a conding to this command is segmen	ding Data ss of Sending D () ceiving Data ss of Receiving () D) D) data data (correspondent) ted, You can se	Data 5 Data 10 Data	ained; red part;	Basic Basic Advanc 1500 0 0 0 0 0 26 13 0	ed					
Info News											V

User Manual

	onliguration					×
Mapping				R	tesponse data	
Bytes	Memory Address	Starting Address	Byte swap	•	Command Status	
5-8	0	0	Register swap		Byte0-3	
10-13	0	0	Register swap	_	Byte4	
					Byte9	
					Byte14	
					Byte19	
					Byte20-23	
					•	
				-		
Primary Varial	ple					

5.2.2.4 Configure HART Commands

Click the command number in the tree view. You will see the configuration plate on the right:

SST-I	HI-CFG																	
File(F)	Config(E)	Tool	View()	V) Help	(H)													
		C	3			<u>C1</u>	<u>C</u> 2	Ţ	4				Ţ		<u>⊷</u>	Ø		
New	Save	Ope	en A	ddNode	DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memory	Diagnose	Debug	Scan		
	Ethernet Hart Chan P Node(1 P Node(2 Cor Cor Cor	nel .) 2) nmand II nmand II	20 23 26	× C M E L L L N E L L L L	Configuration Mode of Ou Memory Sta EtherNet/IP Length of Se Memory Sta EtherNet/IP Length of Re Length of Re	n Mode tiputting Co rting Addre Starting Ad ending Data ending Data rting Addre Starting Ad ecciving Da ecciving Da	mmands ess of Send (dress of S (BYTE) (WORD) ess of Rece (dress of R ta (BYTE) ta (WORD	ing Data ending Da iving Data eceiving D	ta lata				Ba Po 30 0 0 0 0 0 14 7	sic lling 00				
					Command Ir	ndex							0					

Configuration Mode: Basic and Advanced (optional), "Basic" is shown as above. For the "Advanced" configuration please refer to <u>chapter 5.2.2.7</u>.

Mode of outputting command: You choose the execution way of the command, change-of-state, polling output,

Initialization output and disable output.

Change-of-state output: Execute this command once as data buffer of HART changes

Polling output: This order is put in the polling list, executed periodically

Initialization output: Execute the command only once when power is on.

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Disable output: The command will not be sent.

Memory starting address of sending data: Set the memory starting address of output data by this command, the range is 3000~3999

The register starting address of sending data: The property is automatically calculated by the gateway, used for register addressing.

Sending data length (byte): Used to set the length of output data by this command.

Sending data length (word): The property is automatically calculated by the gateway, used for user checking output data length, 1 word=2 byte

Memory starting address of receiving data: Set the memory address of input data by this command. The response data only includes data area of the HART frame.

The register starting address of receiving data: The property is automatically calculated by the gateway, used for register addressing

Receiving data length (byte): Set the length of input data by this command.

Receiving data length (word): The property is automatically calculated by the gateway, used for user checking output data length conveniently, 1 word=2 byte.

Command index: The property is automatically calculated by the configuration software, it indicates the index in the configured command list this command belongs to.

5.2.2.5 Delete Commands

Select the command that needs to be deleted, Right click the mouse and click "Delete Command". The menu command in the toolbar can also accomplish the same action.

5.2.2.6 Delete Nodes

Select the node needed to be deleted, Right click the mouse and click "Delete Node". The menu command in the toolbar can also accomplish the same action.

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5.2.2.7 Advanced Options to Configure HART Commands

When using the HART command configuration, sometimes users want to get only one part of the data from one command. For example, for No.1 HART command. The float value of the main variable is only needed, so there is no need to get the units of the main variable, therefore the advanced option should be used. The advanced options is the execution of the "segment mapping function". It cuts the response data of the HART command and isolates a segment of the data. Users can get any part of the data they want.

Below is the interface of the Advanced Options:

SST-HI-	CFG															
File Conf	ig Tool	View Help	0													
			1		<u></u>	<u>C</u>	Ĺ	4	88			Ţ		Ø		
New	Save	Open	AddNod	e DelNode	AddCmd	DelCmd	Upload	Download	AutoMap	Conflict	Export	Memory	Diagnose	Scan		
-				Configuratio	n Mode							A	dvanced			
Ett	iernet			Mode of Ou	tputting Co	mmands						Po	olling			
E 👷 HA	ART Cham	nel		Memory Sta	arting Addre	ess of Send	ing Data					30	000			
- &	Node(1)			EtherNet/IP	Starting Ad	Idress of S	ending Dat	a				30	000			
÷ 🖧	Node(2)			Length of Se	ending Data	(BYTE)						0				
	Comn	nand ID0		Length of Se	ending Data	(WORD)						0				
ļ	Comn	nand ID3		Configuratio	n of Receiv	ing Data									Configuration	
L.	Comn	nand ID6		Command I	ndex							1				
	-															

The below is the example of the No.3 HART command, this will demonstrate how to use the "Segment Mapping" function. We can see the "configuration" button next to the "receive data project configuration" once the configuration mode is set to "Advanced", click it:

User Manual

lapping add	ress				Response data
Bytes	Memory Address	EtherNet/IP Start Addre	Byte swap		Command Status
)-3	0	0	Register swap		Byte4
5-8	0	0	Register swap		Byte9
10-13	0	0	Register swap		Byte14
15-18	0	0	Register swap		Byte19
20-23	0	0	Register swap		
				-	
Delete: Selec data block of	t the data block on the lock o	eft and press the Delete k	ey or double-click t	the	

There are many parts in the "response data". For example, "Command Status" means the communication status and relevant code of the HART response command, "Byte0-3" means byte 0 to 3 of the data area of the HART response command, and so on. Note: Information of these bytes is based on the Universal Hart Command Specifications.

In the above example, "Byte5-8" represents the Primary Variable and can be seen in a small description in the bottom left area.

Bytes: Response bytes of "Response Data"

Memory Address: Assigned memory address which this byte is located in the memory buffer area of the

GT200-HT-EI

EtherNet/IP register address: The relevant EtherNet/IP register address of the "Memory Address".

Note: This address is not a single address.

Choose "Byte0-3" and "Byte4", then click auto mapping, as shown below:



User Manual

Mapping addr	ress				Response data
Bytes	Memory Address	EtherNet/IP Start Addre	Byte swap		Command Status
0-3	0	0	Register swap		Byte5-8
4	0	0	No swap		Byte9
					Byte10-13
					Byte14
					Byte15-18
					Byte19
					Byte20-23
				_	
-					
Primary Varia	ble				

Close the dialog box, download the configuration into the GT200-HT-EI.

5.2.3 Conflict Detection

Conflict detection is used to check the distribution condition of the input and output data of all commands stored

in the memory.



Click the

Conflict icon and this will show the conflict detection interface as follow:

User Manual



The left side of the tree view is the configuration commands. The right side of the tree view is the data memory address including the receive data storage address and the send data storage. The top side is the memory distribution of the HART channel sending data. The bottom side is the memory distribution of the HART channel receiving data. When one memory unit is configured with two commands or more, the memory unit will display a red color. When the distributed memory exceeds the defined scale of gateway, the exceeding part will display a yellow color. The white color area represents usable memory. The Green color area indicates occupied memory. Clicking on a command, the distribution chart shown in blue, will show the storage location of input/output data.

5.2.4 Auto Mapping

AutoMap will automatically distribute the memory with no conflict according to the input/output bytes number set by the users' commands.

You should set the correct input/output bytes for each commands, then click the



icon and select



"yes" in the popup menu.

User Manual			
SST-HI-CFG			
Really want to calcula	te the mapping address automatically?		

5.2.5 Upload Configuration

Open the software "SST-HI-CFG", Click on the upload icon Upload, Select the gateway you used in the pop-up dialog box, and click "OK", then "upload data", if it shows "upload successful", then the configuration file has been uploaded to the SST-HI-CFG.

£

No.	Model	IP Address	MAC Address
1	GT200-HT-EI	192.168.0.11	
		III	
		IN ETTEST	Cancel
earch c	completed	Kenesn	Cancel
earch c	completed	Kenesii	Cancel
arch c	completed	Kenesii	Cancel
oad Cl	ick "Upload	d" to upload co	onfiguration



5.2.6 Download Configuration

5	
	100
	Ľ.
D	

Click the icon **Download**. it will download the configuration into the gateway.

5.2.7 Memory Data Display

Show the data exchange inside of the gateway, users can use this function to debug the HART fieldbus in the absence of the EtherNet/IP side. Steps are as follows:

- Ensure that the GT200-HT-EI's function bit of configuration switch is in the ON state and the mode bit of configuration switch is in the OFF state, restart the gateway. Then the GT200-HT-EI is in the debug mode.
- 2) Use a network line to connect the GT200-HT-EI's RJ-45 port and a computer.
- 3) Open the software "SST-HI-CFG", Click "Tool—Show Memory Data" or click on the icon choose the correct gateway in the device scanning window, interface is as follows:



User Manual

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08
 | 09
 | 10
 | 11 | 12
 | 13 | 14 | 15
 | |
|------|---|--|---|--|--|---|--|---
--
--|--

--

--|---|--|--|
| 0000 | 00 | 00 | FE | 11 | 0A | 05 | 05 | 05 | 01
 | OE
 | CE
 | 00 | 09
 | 26 | 00 | 00
 | • |
| 0016 | 40 | 73 | 33 | 33 | 20 | 44 | 69 | CO | 35
 | 20
 | 41
 | C8 | 00
 | 00 | 00 | 42
 | |
| 0032 | C8 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | |
| 0048 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | Ξ. |
| 0064 | | 1 | | - | | | | | 1
 |
 |
 | - |
 | | |
 | • |
| 3000 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | |
| 3000 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | _ |
| 3030 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | _ |
| 3048 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | - |
| 2040 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00
 | 00
 | 00
 | 00 | 00
 | 00 | 00 | 00
 | - |
| 3064 | | | | | | | | |
 |
 |
 | |
 | | |
 | 1000000 |
| | 0000
0016
0032
0048
0064
30064
3000
3016
3032
3048 | 0000 00 0016 40 0032 C8 0048 00 0064 - Addr 00 3000 00 3016 00 3028 00 3048 00 | 0000 00 00 0016 40 73 0032 C8 00 0048 00 00 0064 - - Addr 00 01 3000 00 00 3016 00 00 3022 00 00 3032 00 00 | 0000 00 00 FE 0016 40 73 33 0032 C8 00 00 0048 00 00 00 0064 - - - Addr 00 01 02 3000 00 00 00 3016 00 00 00 3022 00 00 00 3048 00 00 00 | 0000 00 00 FE 11 0016 40 73 33 33 0032 C8 00 00 00 0048 00 00 00 00 0064 - - - - Addr 00 01 02 03 3000 00 00 00 00 3016 00 00 00 00 3048 00 00 00 00 | 0000 00 FE 11 0A 0016 40 73 33 33 20 0032 C8 00 00 00 00 0048 00 00 00 00 00 0064 - - - - Addr 00 01 02 03 04 3000 00 00 00 00 00 3016 00 00 00 00 00 3032 00 00 00 00 00 3048 00 00 00 00 00 | 0000 00 00 FE 11 0A 05 0016 40 73 33 33 20 44 0032 C8 00 00 00 00 00 00 0048 00 00 00 00 00 00 00 0064 - - - - - - - Addr 00 01 02 03 04 05 3000 00 00 00 00 00 00 3016 00 00 00 00 00 00 00 3032 00 00 00 00 00 00 00 3048 00 00 00 00 00 00 00 | 0000 00 00 FE 11 0A 05 05 0016 40 73 33 33 20 44 69 0032 C8 00 00 00 00 00 00 00 0048 00 00 00 00 00 00 00 00 0064 - - - - - - - - Addr 00 01 02 03 04 05 06 3000 00 00 00 00 00 00 00 3016 00 00 00 00 00 00 00 00 3022 00 00 00 00 00 00 00 00 3032 00 00 00 00 00 00 00 00 | 0000 00 00 FE 11 0A 05 05 05 0016 40 73 33 33 20 44 69 C0 0032 C8 00 00 00 00 00 00 00 00 0048 00 <t< td=""><td>0000 00 00 FE 11 0A 05 05 01 0016 40 73 33 33 20 44 69 C0 35 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 05 01 0E 0016 40 73 33 33 20 44 69 C0 35 20 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 0016 40 73 33 33 20 44 69 C0 35 20 41 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00</td><td>0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00</td><td>0000 00 Vector Vector</td></td<></td></td<></td></td<></td></td<></td></td<></td></t<> | 0000 00 00 FE 11 0A 05 05 01 0016 40 73 33 33 20 44 69 C0 35 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 05 01 0E 0016 40 73 33 33 20 44 69 C0 35 20 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 0016 40 73 33 33 20 44 69 C0 35 20 41 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00</td><td>0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00</td><td>0000 00 Vector Vector</td></td<></td></td<></td></td<></td></td<></td></td<> | 0000 00 00 FE 11 0A 05 05 05 01 0E 0016 40 73 33 33 20 44 69 C0 35 20 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 0016 40 73 33 33 20 44 69 C0 35 20 41 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00</td><td>0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00</td><td>0000 00 Vector Vector</td></td<></td></td<></td></td<></td></td<> | 0000 00 00 FE 11 0A 05 05 01 0E CE 0016 40 73 33 33 20 44 69 C0 35 20 41 0032 C8 00 <td< td=""><td>0000 00 00 FE 11 0A 05 05 01 0E CE 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00</td><td>0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00</td><td>0000 00 Vector Vector</td></td<></td></td<></td></td<> | 0000 00 00 FE 11 0A 05 05 01 0E CE 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00</td><td>0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00</td><td>0000 00 Vector Vector</td></td<></td></td<> | 0000 00 FE 11 0A 05 05 01 0E CE 00 09 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 0032 C8 00 <td< td=""><td>0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00</td><td>0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00</td><td>0000 00 Vector Vector</td></td<> | 0000 00 FE 11 0A 05 05 01 0E CE 00 09 26 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 | 0000 00 Vector FE 11 0A 05 05 01 0E CE 00 09 26 00 0016 40 73 33 33 20 44 69 C0 35 20 41 C8 00 00 00 00 0032 C8 00 | 0000 00 Vector Vector |

As is shown in the table, upper table shows the memory distribution of the HART input data, the lower table shows the output data. When you need to change the output data, click the "stop" button first, then change the related data or load the already saved data table. Then click the "sending data".

5.2.8 Diagnose

Through this function, users will know which device is not communicating. The execution condition of configured commands, data transmission of the gateway and the displays of certain command's operating steps are as follows:

 Ensure that the GT200-HT-EI's function bit of configuration switch is in the ON state and the mode bit of configuration switch is in the OFF state, restart the gateway. GT200-HT-EI is in the debug mode.
 Use a network line to connect the GT200-HT-EI's RJ-45 port and a computer , Open the software "SST-HI-CFG",

		1	
		1	
-	_	Q	
	E		

click "Tool—Diagnose" or click on the icon Diagnose, the software first pop up one dialog box to choose the gateway and click "OK".

2. Enter the interface of diagnose

Manual Diagnose		
HartChannel0	Item	Value
Node(2)	System State machine	WAITACK
	Request times	186
	Response times	164
	Error times	.0
Operation		

Click on the "HartChannel0" in this interface, it will show the status of the HART fieldbus part on the right. Press the "Refresh" button, this will update the data once. Click on "Periodically refresh", to have the software update the data every 500ms.

3. Click Node(x), it is shown as below

HartChannel0	Item	Value
Node(2)	Command ID0	Response correct
	Command ID3	Response correct
	Command ID6	Response correct
Operation		
Defende	Reset	Stop undating



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It shows the response status of the configured commands.

Click "Refresh" this will refresh these command status, "Periodically refresh" will refresh the command status once.

4. Double clicking the commands will show their command information, command 03 can start data input.

	Item	Value
	Communication_Status	Success
	Response Code	NoErr
	Primary Variable Current	3.800000
	Primary Variable Units Code	Degrees Celsius
	Primary Variable	935.001282
	Secondary Variable Units	Degrees Celsius
	Secondary Variable	25.000000
	Tertiary Variable Units Code	(null)
	Tertiary Variable	100.000000
n	4th Variable Units Code	(null)
	4th Variable	0.000000

Click the "Refresh" button to update the data. Note: The "Edit" button doesn't work in the Read-only command.

	Item	Value
	Communication_Status	Success
dit	Response Code	NoErr
	Short Addr	0
	Current Mode	0
fresh		
	-	
	1	





Click the value or attribute you want to change and click "Edit" to execute this operation of write command.

5.2.9 Debug Assistant

The Ethernet generic debugging feature can send any message to the HART and monitor the data received from the gateway on the HART. Steps are as follows:

1. Ensure that the GT200-HT-EI's function bit of configuration switch is in the ON state and the mode bit of

configuration switch is in the OFF state, restart the gateway. Now GT200-HT-EI is in the debug mode.

2. Use a network line to connect the GT200-HT-EI's RJ-45 port and a computer, Open the software

Serial Debug				
Head:		Auto-send	Send	
Data:		Auto-send period(ms) 500	Clear	
Check:	Checksum	Pause show		

In this interface, clicking "Auto-send" or "Send" will combine data head, data, and check code into one frame and send it out. The data that the gateway receives from the HART fieldbus will be shown in the blank place below. The Checksum button only checks part of the data. Here is an example.

er Ma	anual	
erial Debu	9	
Head: Data:	FF FF FF FF FF 02 00 00 00	Auto-send Send Auto-send period(ms) 500 Clear
Check:	02 Check	ksum Pause show
FF FF FF	FF FF 06 00 00 0E 00 00 FE 11 0A 0	15 05 05 01 0E CE 00 09 26 06

5.2.10 Slave Scan

The slave scan function can help users to check the HART slave address and modify the slave address. The operation steps are:

1) Dial the configuration switch of GT200-HT-EI to 1ON 2OF, which will set the gateway into debug mode.

2) Use a network line to connect GT200-HT-EI to a computer, open SST-HI-CFG software, click

0

"Tool->Slave Scan" or click icon Scan, the software will pop up a dialog box to choose the scanned

gateway and click "OK", as shown below:





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Scan range: () to	15				
Slave address	Long	addr	ess	Compa	ny ID	
0	11-0	A-00-	09-26	17		-
						-
						-
	8			-		-
						-
						-
						-
						-
	-					
			44	1	2	
The scan is comp	lete!		Ste	op	Start	t

Click "Start" in "Slave Scan" interface, it will show the short address, long address and ID of HART slave devices which are connected to the gateway.

Move to the relevant device and right click it, and click "Modify slave address" will show the "Modify slave address" interface, input the address you want to change in the "Modified to" text.

Scan ra	ange:	0 t	0	15			
Slave	address	s Lor	ng a	addre	ss	Company ID	
0 11-0A			-0A-	-00-0	9-26	17	_
	Modi	fy Slav	ve ad	dress	6		
	Cance	-					_
L	Carrie		_			-	_
							_
Modi	ify Slave A	ddres	s				3





After modification, the HART slave address has been modified, the gateway must be restarted.



5.2.11 Conversion Tools

ŗ

In the "Tools" menu, there are two practical tools: They are used to switch between IEEE754 and PACKED

ASCII conveniently.

ncomp	ressed data		Compressed dat	a	
	TECH	*	=>	C8	
SCII		÷.	Hex		
FFF	754 floating poin				x
IEEE Si	754 floating poin ngle precision floa	t conversion	4 bytes he	x data	X



6 Working Principle

6.1 Data Exchange

Data exchange between HART and EtherNet/IP via GT200-HT-EI is established based on "mapping". There are two data buffer areas in the GT200-HT-EI: One is the EtherNet/IP network input buffer and the other is the EtherNet/IP network output buffer. The received data from the HART instruments will be mapped to the input buffer for the EtherNet/IP scanner reading. The output data from EtherNet/IP scanner will be mapped to the output buffer, then the GT200-HT-EI will write the output data to the HART instruments.

For more details and examples, please refer to chapter 4.3, 5.2.3 and 5.2.4.











6.2 Flowchart of Executing One HART Command





7 EtherNet/IP Connection Parameters

Connection parameters the adapter provides are as below:

Data Size Parameters	64 Bytes	128 Bytes	256 Bytes	
Input Instance	102	112	122	
Output Instance	101	111	121	
Configuration Instance	103	113	123	

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

Take configuration parameters of RSLogix5000 as an example:

Type: Vendor: -	ETHERNET-MODULE Ger Allen-Bradley	eric Ethernet Module			
Parent:	ENetIPMaster	Connection Pa	arameters		
Na <u>m</u> e: Description:	GT200HTEI		Assembly Instance:	Size:	
<u>-</u>			122	65 📩	(32-bit)
		Output:	121	64 🛨	(32-bit)
Comm <u>F</u> orm	at: Data - DINT Host Name	<u>C</u> onfiguration	n: 123	0 .	(8-bit)
IP Add	dress: 192 . 168 . 0	. 11 <u>S</u> tatus Input:			
	Name:	Status Outpu	ut:		





8 How to Read/Write I/O Data

The following RSLogix 5000 example will describe how to read/write I/O data.

8.1 Read/Write Data by IO Messaging (Recommend)

Right click on EtherNet/IP scanner module, click "New Module", as shown below:



In the pop-up dialog box, unfold "+" before "Communications", choose "ETHERNET-MODULE", click "OK", as shown below:



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odure	Descript	tion	Vendor	
		Mbps Ethernet Port on Com hernet to DeviceNet Linki /100 Mbps Ethernet Bridge /100 Mbps Ethernet Bridge /100 Mbps Ethernet Adapte /100 Mbps Ethernet Adapte Mbps Ethernet Port on Dri EtherNet/IP CIP Bridge Ethernet Module ix5800 EtherNet/IP t Adapter, Twisted-Pair M	<pre>upactLogix5335E Allen-Bradley .ng Device Allen-Bradley ., Twisted-Pai Allen-Bradley er, Twisted-Pa Allen-Bradley er, Twisted-Pa Allen-Bradley er, Twisted-Pa Allen-Bradley .veLogix5730 Allen-Bradley Allen-Bradley Allen-Bradley Media Parker Mannifin Cor</pre>	p.
			Eind Add	Favorite

Configure relevant information in the pop-up window, as shown below:

■odule Properties: Scanner (ETHERHET	-MODULE 1.	1)	×
General Connection Module Info			
Type: ETHERNET-MODULE Generic Ethern Vendor: Allen-Bradley Parent: Scapper	net Module	Set Commun Please refer to	ication Parameters. o chapter 7.
Name: SSTGateway	Connection	n Parameters Assembly Instance:	Size:
Set the name.	<u>I</u> nput: O <u>u</u> tput:	112	33 + (32-bit) 32 + (32-bit)
Comm Eormat: Data - DINT	<u>C</u> onfigur	ation: 113	10 🛨 (8-bit)
	<u>Status In</u>	put:	
IP address of the	ne SST gatev	vay.	
Status: Offline OK	Cano	cel Appl	Help

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

Name: Name the added EtherNet/IP adapter module

Comm Format: Configure data types. Users can choose data types as DINT, INT, SINT and REAL, etc. After



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confirmation, this cannot be changed. If you want to change data types, you can create a new module.

IP Address: Set the IP address of the EtherNet/IP adapter module (IP address of GT200-HT-EI, configured by the

software SST-HI-CFG)

Connection Parameters: Set Connection parameters during communication. Please refer to chapter 7

Note: "Size" (configured bytes) in the above picture should be consistent with the relevant input and output

bytes of Instance in the above chapter.

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

■odule Properties: ■as	ster (ETHERNET-MODVLE 1.1)	×
General Connection Module Ir	Info	1
Bequested Packet Interval (RPI)	1): 10.0 🛨 ms (1.0 - 3200.0 ms)	
Major Fault On Controller If C	Connection Fails While in Run Mode	
Module Fault		
Status: Offline	OK Cancel Apply	Help

After setting this interval, click "OK" to save. Double click "Controller Tags", unfold "SSTGateway: O", as shown below:



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ESESLogix 5000 - Controller in GT100EIES.ACM File Edit View Search Logic Communications To	[1756-L55]* 1s findow Help	×
	- KKK I I 22 QQ	
Offline 🗍 🗸 🗏 RUN	Path: <none> 도 불</none>	
No Forces		
No Edits		
Hedundancy 👓	Favorites & Add-On & Alarms & Bit & Timer/Counter & Input/Output & Compare & Compute/Math	Move/Logical A File/Misc. A File/Shift
- Power-Up Handler	Controller Tags - Controller (controller)	
	Scope: To Controller V Show Unused, STRING, ALARM, ALARM_ANALOG, ALARM_DIGITA	L, AXIS_CONSUMED, AXIS_GENERIC, A
- A MainTask	Name A Alias For Base Tag Data Tune Shile Description	
Program Tags	ESSTGalewayC ABETHERN	
MainRoutine	E-SSTGaleward AB:FTHERN	
Unscheduled Frograms / Phases	Constant International DINT/331 Decimal	
Ungrouped Axes		
- Add-On Instructions	DINT/221 Derimal	
🖻 🔄 Data Types	History Date (0)	
User-Defined	DINI Decimal	-
Add-On-Defined	DINT Decimal	
🕀 🕞 Predefined	Lt SSTGateway:0.Data[2] DINT Decimal	-
😟 🚟 Module-Defined	DINT Decimal	
Trends	DINT Decimal	
I/O Configuration	SSTGateway:0.Data[5] DINT Decimal	
- 1150 Backplane, 1150-Al	DINT Decimal	
E- [1] 1756-ENBT/A Scanner	± SSTGateway:0.Data[7] DINT Decimal	
Ethernet	F:SSTGatewarD Data[8]	
ETHERNET-MODULE SSTGateway	T - CCT Gateway 0. Distance 0.	
III 1756-ENBT/A Scanner	▼ Monitor Tags \Edit Tags	
Create Output Energize instruction		1.

In the picture above, SSTGateway:O.Data [0] ~SSTGateway:O.Data [31] is the corresponding output data address

of the SST Gateway module in scanner.

Unfold "SSTGateway: I", as shown below:

2 RSLogix 5000 - Controller in GT100EIRS. ACD [1756-L	55] *							_0×
file fait flew Search Logic Communications Tools Winds	w neip		21					
	<u>- 68 68 68 E</u>		치					
Offline 0. RUN Path:	<none></none>		- **					
No Forces								
No Edits		J)(L)-						
Redundancy 5.0 F	worites 🖌 Add-On 👗 Alarms	🖌 Bit 👗 Timer/C	ounter 🔏 Inj	out/Output 🔏 Ci	ompare 🖌 C	ompute/Math 🔏 N	love/Logical 🖌 Fi	le/Misc. 🖌 File/Shift
Remandle Mandlan	Controller Tags - Contr	oller (contro	ller)					
		Show	LOTDU				was conclude	
🖻 🤕 MainTask	Scope: I Controller	sngw	inused, 51 Hir	NG, ALAHM, ALA	HM_ANALUG	I, ALAHM_DIGITAI	., AXIS_CONSUME	D, AXIS_GENERIC, A
🖻 🕞 MainProgram	Name 🛆	Alias For 8	Base Tag	Data Type	Style	Description		
Program Tags	±-SSTGateway:C			AB:ETHERN				
i Mainkoutine	⊡-SSTGateway:I			AB:ETHERN				
- Motion Groups	E-SSTGateway: .Data			DINT[33]	Decimal			
- Durgrouped Axes	+ SSTGateward Data[0]			DINT	Decimal			
Add-On Instructions	+-SSTG steward Data[1]			DINT	Decimal	_		
🖻 📹 Data Types		7		DINT	Decima			
Station	SSTGateway:I.Data[2]			DINT	Decimal			
Add-On-Defined	#"SSTGateway:I.Data[3]			DINI	Decimal	-		
H G Predefined	SSTGateway:I.Data[4]	S		DINT	Decimal	-		
🕀 🙀 Module-Defined	±-SSTGateway:I.Data[5]			DINT	Decimal			
Trends	SSTGateway:I.Data[6]			DINT	Decimal			
- I/O Configuration	SSTGateway:I.Data[7]			DINT	Decimal			
□ □ 1756 Backplane, 1756-Af	+-SSTGateway:I.Data[8]			DINT	Decimal			
- 1 [1] 1756-ENBT/A Scanner	±-SSTGateway1 Data[9]			DINT	Decimal			
E Hernet	+ SSTG ateman Data[10]	10 S		DINT	Decimal			
ETHERNET-MODULE SSTGateway	T-CCTC abarray Data[10]			DINT	Desimal			
1756-ENBT/A Scanner	Monitor Tags ↓Edi	t Tags/			1			
Enter a tag name								

In the above picture, the first 4 bytes of SSTGateway: I. Data [0] are the status bytes. SSTGateway:I.Data [1] ~SSTGateway: I. Data [32] are the input data from the SST Gateway.



8.2 Read/Write Data by MSG

8.2.1 Read Data

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



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





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					<u>_ ×</u>
Monit	or "ReadTag"				
New T	ag which aliases "ReadTag"				
Edit '	"ReadTag" Properties	Alt+Enter			
Confi	gure "ReadTag"	Ctrl+I			
Edit	"MESSAGE" Data Type				
📙 Go to	Cross Reference for "ReadTag"	Ctrl+E			
1-0			are 🖌 Co	ompute/Math 🔏 Ma	ove/Logical 🔏 File/Misc. 🔏 File/Shift 💡
Find J	All "ReadTag"				
Messa;	ge Fath Editor				
ontr <u>G</u> o To.	• •	Ctrl+G	M_ANALOO	G, ALARM_DIGITAI	L, AXIS_CONSUMED, AXIS_GENERIC, A
X Cut		Ctrl+X	itule	Description	1
RS B Copy		Ctrl+C	2.0		
DC FR Paste		Ctr1+V			
no Poste	Pass-Through	0	-		
HS	1 433 TH OLEA		-		
a Delet	2	Del	lex	_	1
-	1	MESSAGE			
	Monit New Tr Lit Confi Edit Go to Go to Find J Messa Go To Messa Go To Messa Go To Cut RIS Copy Paste RIS Delet	Monitor "ReadTag" New Tag which aliases "ReadTag" Edit "ReadTag" Properties Configure "ReadTag" F dit "MESSAGE" Data Type Go to Cross Reference for "ReadTag" Find All "ReadTag" Message Path Editor Go To Cut. IRS Copy RS Paste Pass=Through Delete	Monitor "ReadTag" New Tag which aliases "ReadTag" Edit "ReadTag" Properties Alt+Enter Configure "ReadTag" Ctrl+I Edit "MESSAGE" Data Type Go to Cross Reference for "ReadTag" Ctrl+E Find All "ReadTag" Message Path Editor Go To Ctrl+G Cott Cott Copy Ctrl+C Paste Pass=Through Delete Del MESSADE	Monitor "ReadTag" Rew Tag which aliases "ReadTag" Edit "ReadTag" Ctrl+T Edit "MESSAGE" Data Type Go to Cross Reference for "ReadTag" Ctrl+E Find All "ReadTag" Message Path Editor Go To Ctrl+G Message Path Editor Copy Ctrl+C Res Paste Ctrl+V Res Paste Pass-Through Delete Del MESSADE MESSADE	Monitor "ReadTag" New Tag which aliases "ReadTag" Edit "ReadTag" Troperties Alt+Enter Configure "ReadTag" Ctrl+I Edit "MESSAGE" Data Type Go to Cross Reference for "ReadTag" Ctrl+E Find All "ReadTag" Message Path Editor Go To Ctrl+G Message Path Editor Go To Ctrl+G Copy Ctrl+C RS Copy Ctrl+C RS Paste Pass-Through Delete MessAge

In the new pop-up window, some parameters need to be set as below:

- Message Type: CIP Generic
- Service Type: Select "Get Attribute Single", now, relevant service code will become "e (Hex)"
- Class: 4 (Hex)
- > Instance: Please refer to chapter 7 EtherNet/IP Connection Parameters Set
- > Attribute: 3 (Hex)
- > Destination: Select "ReadData" label, now, the data that has been received will be saved in this tag

ssage Configuration - ReadTag	
Configuration* Communication Tag	
Message Type: CIP Generic	•
Service Get Attribute Single	Source Element:
Service Code: e (Hex) Class: 4 (Hex) Instance: 102 Attribute: 3 (Hex)	Destination ReadData ▼
)Enable 🔘 Enable Waiting 🔘 Start	🔾 Done Done O
) Error Code: Extended Error	Timed Ou 🕈
rror	

Choose "Communication" label, input the relevant path of connecting EtherNet/IP adapter in the blank space



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behind the Path, the path format is: EthetNet IP hostname, EtherNet/IP scanner slot No., IP address of EtherNet/IP adapter, after setting the path, click "Apply", "Confirm". As is shown below:

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

ath: Scanner,2,192	.168.0.10		Br	owse
Scanner,2,192.	168.0.10			
Communication Met CIP CD <u>H</u> +	hod Channel:	Destination	Link: 0	÷
C CIP <u>₩</u> ith Source ID	Source Link: 0	Destination	Node: 0	👘 (Octal)
Connected	🔽 Ca	ch <u>e</u> Connections 🛛 🔶		

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

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This is a simple command which can send a read request, it still needs to add some logic commands to trigger this command in the common program. For more detailed information, please refer to RSLogix5000.

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

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



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A RSLogix 5000 - Controller in Controller1.	ACD [1756-155]*						
File guit fies gearen gogie gommanteations I	toors mindow werp		51				
	<u>_</u> & & & &	ste kara	치				
Offline	Path: AB_ETHIP-1\192.168.0.	147\Backplane\0*	- **				
No Forces		1 1 1 1	1 1 1				
No Edits 🔒 🗆 1/0		AND OR XOR SWEB NO	IT CLR BTD			<u>></u>	
Redundancy 5.0	Favorites & Add-On & A	Narms 🔏 Bit 🤾 Timer/Cou	inter 🔏 Input/Outj	out 🔏 Compare 🔏 Comput	e/Math \lambda Move/Logical 🔨 File/Misc.	File/Shift Sequer	
	Controller Tags - Con	atroller (controller)					
- Z Controller Tags	Scope: Pr Controller	Show Show Al	1				
Controller Fault Handler	Name	())(ship () [50	van 6 Stulo	Data Tupa	Description		
- Tasks	- RandData			DINITISOD	Description		
E - C MainTask	TreadData[0]	16#0000_0000	Hey	DINT			
- 🍜 MainProgram	TheadData[0]	16#0000_0000	Hau	DINT			
MainRoutine	TreauData[1]	16#0000_0000	Hou	DINT			
- 🗁 Unscheduled Programs / Phases	TreauData[2]	16#0000_0000	Hou	DINT			
😑 🔄 Motion Groups	TreadData[J]	16#0000_0000	Here	DINT			
Add-On Instructions	TreadData[4]	16#0000_0000	Hey	DINT			
😑 😁 Data Types	TreadData[5]	16#0000_0000	Hey	DINT			
User-Defined	T:BeadData[7]	16#0000_0000	Hey	DINT			
Add-On-Defined	T:BeadData[8]	16#0000_0000	Hey	DINT			
🕑 🛄 Predefined	T:BeadData[9]	16#0000_0000	Hey	DINT			
H Module-Defined	TiBeadData[10]	16#0000_0000	Hey	DINT			
I/O Configuration	+ BeadData[11]	16#0000_0000	Hex	DINT			
🖻 📾 1756 Backplane, 1756-A7	TiBeadData[12]	16#0000_0000	Hex	DINT			
[] [0] 1756-L55 Controller	#BeadData[13]	16#0000 0000	Hex	DINT			
= [2] 1756-ENBT/A Master	± BeadData[14]	16#0000 0000	Hex	DINT			
	±BeadData[15]	16#0000 0000	Hex	DINT			
	+ BeadData[16]	16#0000 0000	Hex	DINT			
	± BeadData[17]	16#0000 0000	Hex	DINT			
	E BeadData[18]	16#0000 0000	Hex	DINT			
	± BeadData[19]	16#0000 0000	Hex	DINT			
	- BeadData[20]	16#0000 0000	Hex	DINT			
	E ReadData[21]	16#0000 0000	Hex	DINT			
	E ReadData[22]	16#0000_0000	Hex	DINT			
	□	16#0000_0000	Hex	DINT			
	E ReadData[24]	16#0000_0000	Hex	DINT			
	E ReadData[25]	16#0000_0000	Hex	DINT			
	🗄 🗄 ReadData[26]	16#0000_0000	Hex	DINT		-	
	I I I I I I I I I I I I I I I I I I I	dit Tags /	1 ² .		a		
	18						

8.2.2 Write Data

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

Hew Tag		×	New Tag	The subscription of the su	×
<u>N</u> ame:	WriteData	ОК	<u>N</u> ame:	WriteTag	ОК
Description:	A	Cancel	Description:		Cancel
		Help			Help
	*			<u>v</u>	
<u>U</u> sage:	<normal></normal>		<u>U</u> sage:	<normal></normal>	
Typ <u>e</u> :	Base 💽 Connection		Typ <u>e</u> :	Base Connection	
Alias <u>F</u> or:			Alias <u>F</u> or:	×.	
Data <u>T</u> ype:	DINT[500]		Data <u>T</u> ype:	MESSAGE	
<u>S</u> cope:	Controller		<u>S</u> cope:	🔁 Controller 💌	
St <u>v</u> le:	Hex		Style:		
C Open Cor	nfiguration		Den ME	SSAGE Configuration	

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🐕 ESLogix 5000 - Controller in Controller1. A	CD [1756-L55]*						X
<u>File Edit Yiew Search Logic Communications Too</u>	ols <u>M</u> indow Help						
	• & & &	<u> 29</u> 22					
Offline 🗍 🗸 🗆 RUN	Path: AB_ETHIP-1\192.168.0.14	I7\Backplane\0*	**				
No Forces							
No Edits	I H H H FAL FAC CI	OP FLL AVE SRT STD SIZ	E CPS			<u>}</u>	
Redundancy Rg	Favorites Alarms Bit	🕻 Timer/Counter 🔏 Input/Outp	at 🖌 Compa	are 🖌 ComputeMath 👗 Move/Logical 🕽	File/Misc. File/Shift (Se	equencer 🗶 Equir	
Controllor Controllor	Controller Tags - Cont:	roller (controller)				- D X	
Controller Tags	Cannan Pro Cambrallan	Show Chan All					
- Controller Fault Handler	Scope. Bill controller	Show All					
Power-Up Handler	Name	△ Value Force	Style	Data Type	Description	^ _	
- A MainTask	± Local:1:1	{}		AB:1756_DNB_500Bytes:1:0			
😑 🕞 MainProgram	E-Local:1:0	()		AB:1756_DNB_496Bytes:0:0			
- Program Tags	E:Local:1:S	{}		AB:1756_DNB_Status_128Bytes:S:0			
MainKoutine		{}	Hex	DINT[500]			
- Motion Groups	± ReadTag	{}		MESSAGE			
- C Ungrouped Axes	- WriteData	() ()	Hex	DINT[500]			
Add-On Instructions	TwriteData[0]	16#0000_0000	Hex	DINT			
User-Defined	WriteData[1]	16#0000_0000	Hex	DINT			
🕀 🙀 Strings	TwriteData[2]	16#0000_0000	Hex	DINT			
- 🧱 Add-On-Defined	TwriteData[3]	16#0000_0000	Hex	DINT			
Predefined	WriteData[4]	16#0000_0000	Hex	DINT			
- Irends	WriteData[5]	16#0000_0000	Hex	DINT			
🖻 😁 I/O Configuration	WriteData[6]	16#0000_0000	Hex	DINT			
1756 Backplane, 1756-A7	WriteData[7]	16#0000_0000	Hex	DINT			
[1] 1756-DNB DeviceNet Master	1 WriteData[8]	16#0000_0000	Hex	DINT			
H- 9 [2] 1756-ENBT/A Master	WriteData[9]	16#0000_0000	Hex	DINT			
	WriteData[10]	16#0000_0000	Hex	DINT			
	WriteData[11]	16#0000_0000	Hex	DINT			
	TwriteData[12]	16#0000_0000	Hex	DINT			
	TriteData[13]	16#0000_0000	Hex	DINT			
	TwriteData[14]	16#0000_0000	Hex	DINT			
	TriteData[15]	16#0000_0000	Hex	DINT			
	TwriteData[16]	16#0000_0000	Hex	DINT			
	TwriteData[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		T	
	Initor Tags (Ed:	it Tags /	1		l. de		
Enter a tag name	10						

Enter the "Monitor Tags" interface. input some data beginning from address WriteData[0] in the "WriteData" tag. There, data will be outputted to SST Gateway.

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

Us	er Manual					
ReadData		{}	{}	Hex	DINT[500]	
ReadTag		{}	{}		MESSAGE	
E-WriteData		{}	{}	Hex	DINT[500]	
writi 📝	New Tag	New Tag Ctrl+W			MESSAGE	
	Fdit "WriteTer"					
	Edit "WriteTag" Pro	operties	Alt	+Enter		
	Configure "WriteTag" Ctrl+I					
	Edit "MESSAGE" Data Type					
	Go to Cross Reference for "WriteTag" Ctrl+E					
	Message Path Editor					
	<u>G</u> o To		Ctr	1+G		
	Toggle Bit		Ctr	1+T		
	Force On					
	Force Off					
	Remove Force					
*	Cut		Ctr	1+X		
Ē	Сору		Ctr	1+C		
B	Paste		Ctr	1+V		
	Paste Pass-Through					
	Delete		Del			
		w.				

In the new pop-up window, there are variables that need configuration as shown below:

- Message Type: CIP Generic
- Service Type: Select "Set Attribute Single", now, relevant Service Code will become "10 (Hex)"
- Class: 4 (Hex)
- > Instance: Please refer to chapter 7 EtherNet/IP Connection Parameters Set
- > Attribute: 3 (Hex)
- Source Element: Select "WriteData" tag, it indicates the data in the "WriteData" tag will become the data PLC outputs
- Source Length: Use byte as unit, this value should be less than or equal to the current selecting bytes which Instance represents

essage Configuration - TriteTag		
Configuration* Communication Tag Message Type: CIP Generic Service Set Attribute Single • Service 10 (Hex) Class: 4 (Hex) Instance: 101 Attribute: 3 (Hex)	Source Element: WriteData Source Length: 128 🐳 (Bytes Destination New Tag	• •) •
) Enable) Enable Waiting) Start	🔾 Done Done O	

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

						-
Path:	Scanner,2,	192.168.0.10			<u>B</u> I	rowse
	Scanner,2,1	92.168.0.10				
Con C	munication M CIP CD CIP <u>W</u> ith Source ID	Aethod <u>H</u> + _Channel: _ <u>S</u> ource Link		Destination Lin	nk: 0 ode: 0	T T T T (Octal)
Γ	C <u>o</u> nnected		🔽 Cach <u>e</u> (Connections 🔶		
		ahle Waiting	O Start	O Done	Done	0
) Engl	ole 🔘 En			0.000		

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

Add a "MSG" command in the "MainRoutine" under the "MainProgram" and choose "WriteTag" as the "Message



User Manual

Control", as shown below:



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

