Universal Serial / PROFIBUS DP Gateway
GT200-DP-RS

User Manual

V7.1

SST Automation

E-mail: support@sstautomation.com

www.SSTAutomation.com

Important Information

Warning

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Technical Support Contact Information

www.sstautomation.com

www.sstcomm.com

Email: support@sstautomation.com

Table of Content

1 Product Overview

1.1 Product Function

The gateway GT200-DP-RS enables data to establish communication between the serial port and PROFIBUS DP (PROFIBUS DP master such as Siemens PLC). At the same time it can remotely obtain real-time I / O data, status and other information of the connected PLC and serial device via docking cloud platforms such as bokaiyun to achieve remote monitoring. The gateway can connect multiple devices with Modbus/RS-485/RS-232 interface with PROFIBUS DP, meaning that Modbus/RS-485/RS-232 network devices can be converted to PROFIBUS DP network devices.

1.2 Product Features

- Wide Application: Any devices with RS-485/RS-232 can be connected to PROFIBUS DP network through GT200-DP-RS. For example Variable-frequency Drive with Modbus protocol interface, Motor starting protector, transmitters.
- Easy to use: Users don't need to know more knowledge about PROFIBUS and Modbus, and they can configure the gateway according to the user manual in a short time without complex programming.
- Transparent communication: Users can refer to mapping relations between PROFIBUS DP data area and Modbus data area to realize the transparent data communication between PROFIBUS DP and Modbus.
- Convenient configuration: Using a USB Type-C interface, the USB can power the gateway independently.
- Device management: Users can check the status of fieldbus communication-related devices anytime and anywhere through a browser.

1.3 Technical Specifications

[1] Acts as a PROFIBUS DP slave.

- Supports PROFIBUS DPV0.

- PROFIBUS DP slave interface supports automatic baud rate detection. Maximum baud rate is 12Mbps.
- Maximum Input data: 244 Bytes
- Maximum Output data: 244 Bytes
- Max Input Bytes + Output Bytes ≤488Bytes

[2] Supports Modbus master, Modbus slave, or Universal modes in serial interface. Supports transparent data transmission between PROFIBUS DP PLC and serial devices.

[3] Serial interface: one RS-485 and one RS-232, half-duplex. Supported baud rates: 300, 600, 1200, 2400, 4800, 9600, 19.2 K, 38.4K, 57.6K and 115.2K bps. Parity: None, Odd, Even, Mark and Space.

[4] As a Modbus master, supports 01, 02, 03, 04, 05, 06, 15 and 16 function codes.

- Supports monitoring status of Modbus slave(s).
- Supports clearing data or keeping the data when the input data is abnormal.
- Supports command retries when response timeout.

[5] As a Modbus slave, supports 01, 02, 03, 04, 05, 06, 15 and 16 function codes.

[6] Supports two configuration modes:

- Uses SST-MPG-CFG software to configure the GT200-DP-RS (Software Configuration mode):

  Supports up to 100 Modbus commands. Function codes 03H and 04H support “Word / Byte mapping”. The high-byte or low-byte mapping of the registers provides effective utilization of the PROFIBUS DP input-byte.

  Support monitoring status of Modbus slave; Support clearing data or keep the last data when input-data is abnormal; Support re-transmitting data when response is timeout;

- Use DP Integrated software to configure the GT200-DP-RS (DP Integrated Configuration mode):

  Supports up to 48 Modbus commands.

  Supports command sending control and capturing exception codes.

  Support monitoring status of Modbus slave; Support clearing data or keep the last data when input-data is abnormal; Support re-transmitting data when response is timeout;

[7] In universal mode, supports the control mode of character timeout and frame length (number of character). Supports periodically sending.

[8] In the configuration state, when the USB Type-C is connected, the RS232 interface cannot be used as a

configuration interface. When the Type-C is disconnected, the RS232 interface can be used as a configuration interface.

[9] IoT interface supports remote device monitoring, allowing for the retrieval of real-time I/O data, status data, and device information remotely.

[10] When the interface for device communication is RS485, the IoT interface uses RS232; when the interface for device communication is RS232, the IoT interface uses RS485.

[11] The IoT interface is active during operating and debugging states, but inactive during the configuration state.

[12] The IoT interface communication parameters are 115200-8-N-1, using Modbus RTU protocol as the remote monitoring communication protocol, with the PROFIBUS DP address serving as the Modbus slave address. It supports function code 04H, corresponding to the 3X area.

[13] Power: 24VDC (9V-30V), 120mA.

[14] Operating temperature: -4°F-140°F (-20°C-60°C). Humidity: 5%- 95% (non-condensing).

[15] Dimensions (W*H*D): 0.98 in*3.94 in *3.54 in (25mm*100mm*90mm);.

[16] Installation: 35mm DIN RAIL.

[17] Protection Level: IP20.

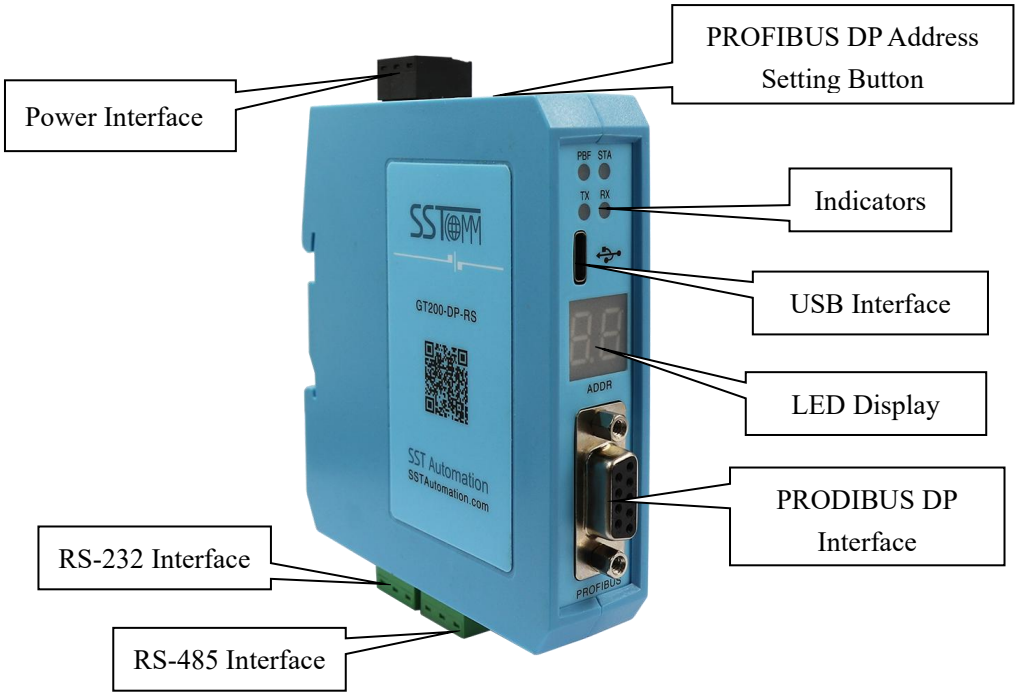
[18] In accordance with EMC test standard.

1.4 Revision History

Revision	Date	Chapter	Description
V7.1	10/15/2024	ALL	Updated software configuration screenshot. Revised some mistakes.
V6.1, Rev B	09/19/2022	ALL	Updated software configuration screenshot. Revised some mistakes.
V6.1, Rev A	08/20/2021	ALL	Revised technical details. New quick start guide and chapters. revised.
V6.1	08/11/2020	ALL	New Release

2 Hardware Descriptions

2.1 Product Appearance



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

2.2 Indicators

Indicators	State	Description
PBF	Red On	PROFIBUS DP communication failed.
	OFF	Communication is normal.
STA	Green Flashing	Transferring data in PROFIBUS DP network.
	OFF	No data is transferred in PROFIBUS DP network.
TX	Green Flashing	Sending data from RS-485/232 interface.
	OFF	No data is sent from RS-485232 interface.
RX	Green Flashing	Receiving data in RS-485/232 interface.
	OFF	No data is received in RS-485/232 interface.

2.3 LED Display

The LED display is located in the front of the product. Please refer to chapter 2.4 to change DP address and operating mode.

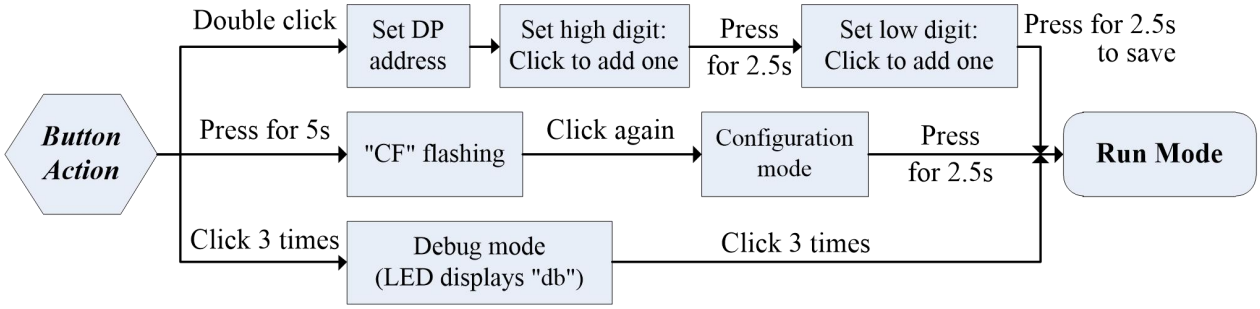
LED Display	Description
CF	Configuration mode.
db	Debug mode.
Jumps between a number and "-P"	Run mode. The number is the GT200-DP-RS's PROFIBUS DP address. "-P" indicates that the GT200-DP-RS is in the "DP Integrated Configuration" mode allowing all the parameters in the PROFIBUS DP integrated configuration software, such as the STEP7 (chapter 4.2.2) and TIA Portal to be configured.
Jumps between a number and "-U"	Run mode. The number is the GT200-DP-RS's PROFIBUS DP address. "-U" indicates that the GT200-DP-RS is in the "Software Configuration" mode and is configured through the SST-MPG-CFG software (chapter 4.2.1).

Note: In Software Configuration mode (LED displays "-U"):

1. If the GT200-DP-RS is configured via USB cable, it will automatically switch to configuration mode.
2. If it's configured via RS-232 interface, the GT200-DP-RS should switch to configuration mode manually. See chapter 2.4 for how to switch mode.

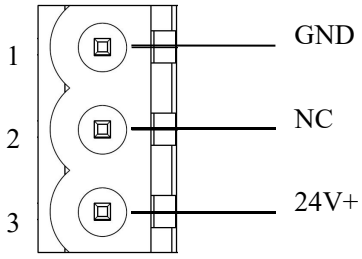
2.4 DP Address and Mode Setting Button

The DP address and mode setting button is located on the front panel of the GT200-DP-RS. It's used to set the PROFIBUS DP address and operating mode.



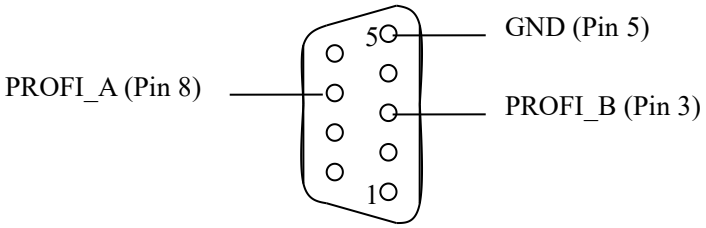
2.5 Interface

2.5.1 Power Interface



Pin	Description
1	GND
2	Not connected
3	24V DC +

2.5.2 PROFIBUS DP Interface



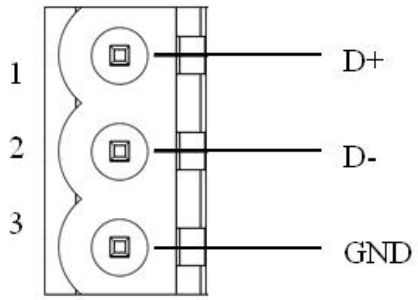
PROFIBUS DP interface uses DB9 male-connector, and the pins are defined as follow:

Pin	Description
3	PROFI_B, Data+
4	RTS (Request to send)
5	GND
6	+5 V for terminating resistors
8	PROFI_A, Data-
Others	Not connected

Note: It's recommended to use the standard PROFIBUS DP connector. The PROFI_B (Pin 3), PROFI_A (Pin 8) and the shield GND must be connected.

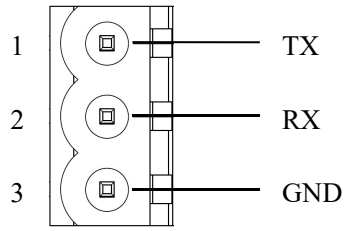
The RTS (Pin 4) is used to determine the transmission direction. The +5 V (Pin 6) and GND (Pin 5) are used for terminating resistors, and can also be used supply to fiber optic transceivers. The maximum output current of pin 5 and pin6 is 80mA.

2.5.3 RS-485 Interface



Pin	Function
1	D-, RS-485 Transmit Negative
2	D+, RS-485 Transmit Positive
3	GSD

2.5.4 RS-232 Interface

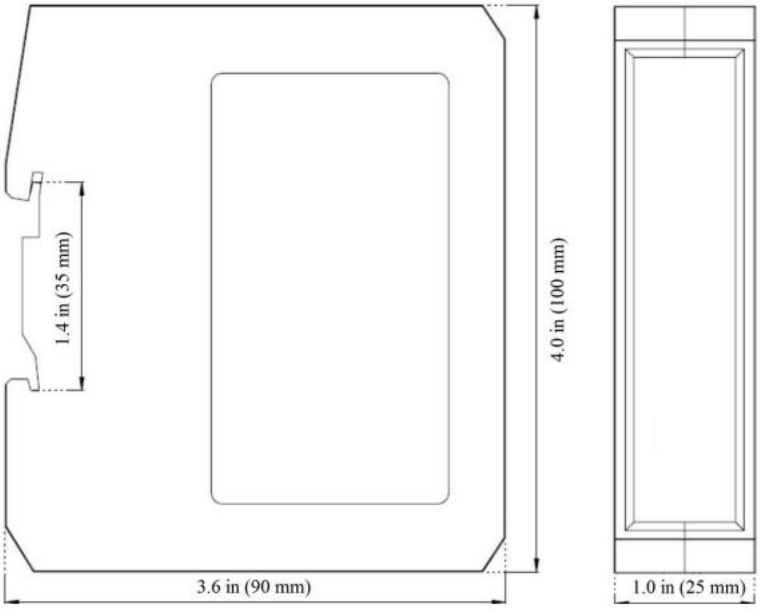


Pin	Description
1	TX, connected to user's device RS-232 RX
2	RX, connected to user's device RS-232 TX
3	GND, connected to user's device RS-232 GND

3 Hardware Installation

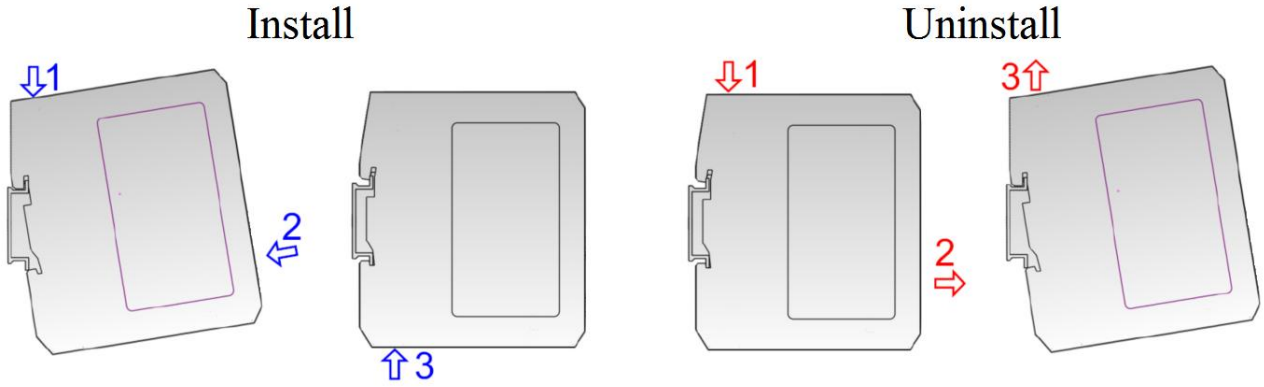
3.1 Mechanical Dimensions

Size: 1 in*4 in *3.6 in (25mm*100mm*90mm);



3.2 Installation Method

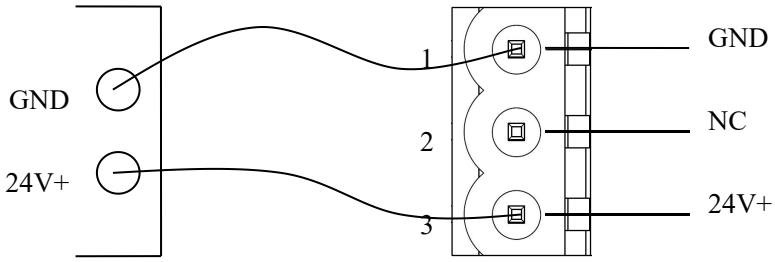
Using 1.38 in (35mm) DIN RAIL.



4 Quick Start Guide

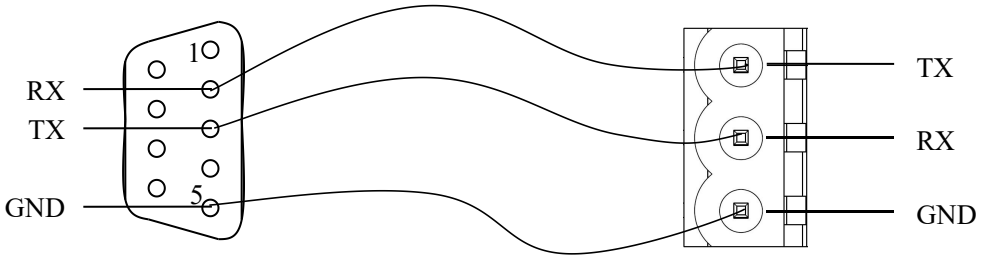
4.1 Connection

1. Connect to the power supply.



DC power: +24V　　Power interface of gateway

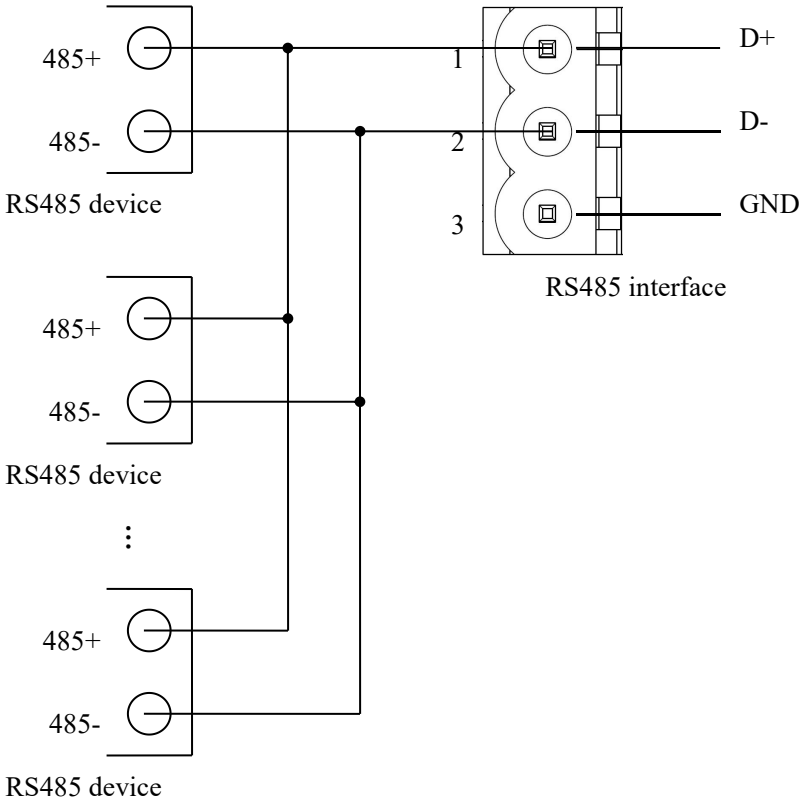
2. Connect to the computer. You can use USB or RS-232 interface to configure the GT200-DP-RS. If you use the RS-232 interface, the connections are as shown below:



RS-232 Interface of Computer　　RS-232 Interface of GT200-DP-RS

3. Connect to the serial devices. You can also connect the serial devices after you finish the configuration.

The GT200-DP-RS is able to connect with RS-485 devices. When using multi-point connection, to prevent the reflection and obstruction of signal, it's suggested to connect the terminal resistor (120Ω, 1/2W) parallel with the 2 data wires at both end of the network.



4. Connect to PROFIBUS DP PLC or control system. It's suggested to use the standard PROFIBUS DP connector, referring to chapter 2.5.2.

4.2 Configuration

GT200-DP-RS V7.1 and higher versions support two configuration modes: DP Integrated Configuration mode and Software Configuration mode.

The Software Configuration mode allows user to configure the GT200-DP-RS in SST-MPG-CFG software.

The DP Integrated Configuration mode allows user to configure all parameters of the GT200-DP-RS in PROFIBUS integrated configuration software, such as STEP7 or TIA Portal.

Before starting the configuration, please check the configuration mode of the GT200-DP-RS.

4.2.1 Configure by SST-MPG-CFG Software

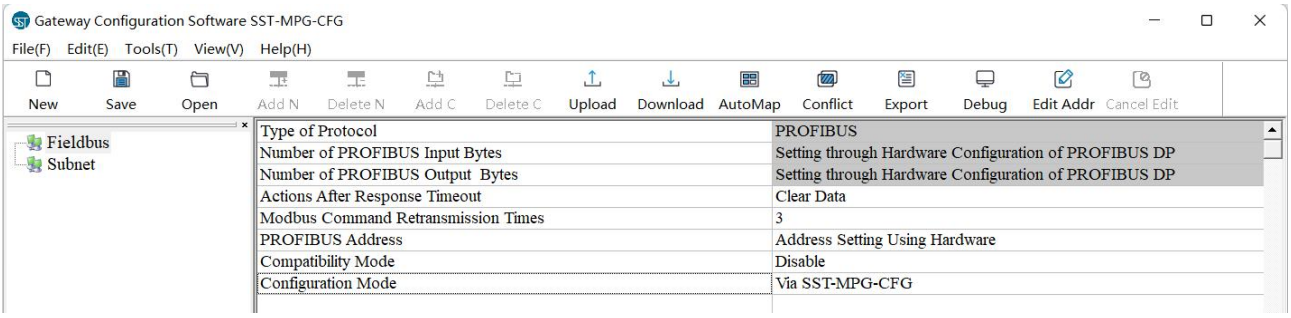
Reference the image below the step. In this example, the SST-MPG-CFG is of V2.1.6.

1. Download, install, and run the configuration software, SST-MPG-CFG, which can be found on the GT200-DP-RS product page at sstautomation.com.
2. Click the upload button on the tool bar. The Upload Configuration will pop up, in this window select the GT200-DP-RS gateway you wish to configure and click “Upload”.

   Note: This will upload the default configuration in the software, this is also how you can edit your configuration after downloading your configuration to the gateway. If you cannot find the gateway, check your connections.

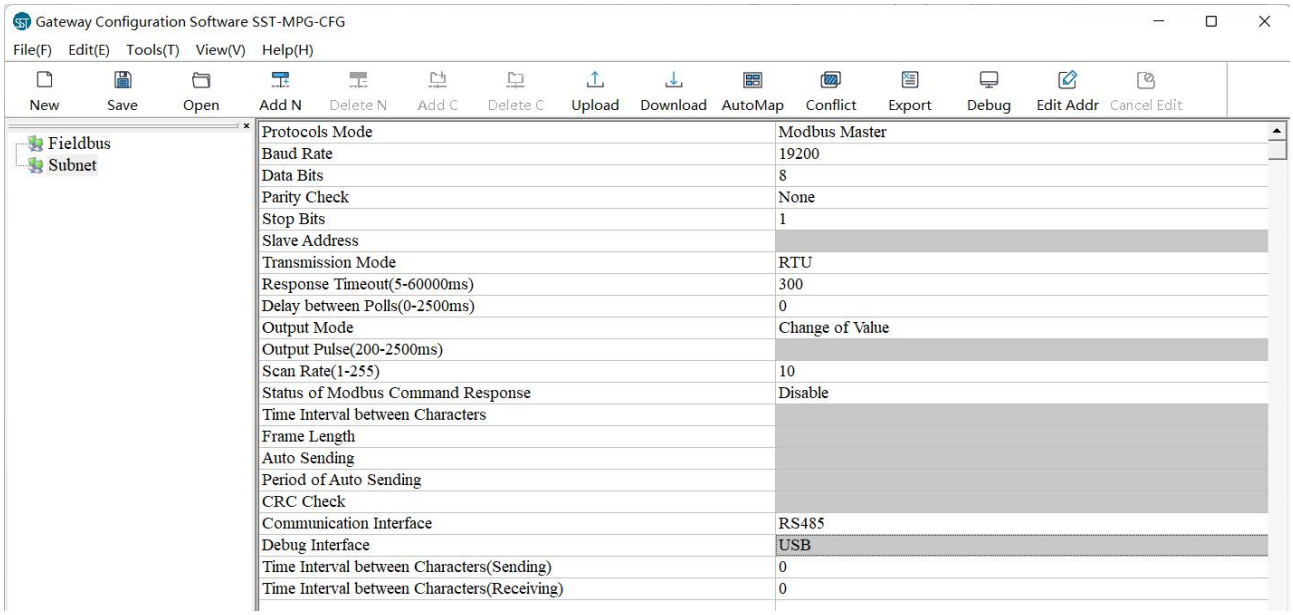
3. Click “Field Bus” located in the Equipment Section. Configure the parameters to meet the needs of your project. Ensure that the PROFIBUS address matches your device’s address.

   Note: If you select “Address setting using hardware” for PROFIBUS address, the PROFIBUS address is set by Setting Button on the GT200-DP-RS (chapter 2.4). For more details of the PRODIBUS address, please see chapter 6.4.1.

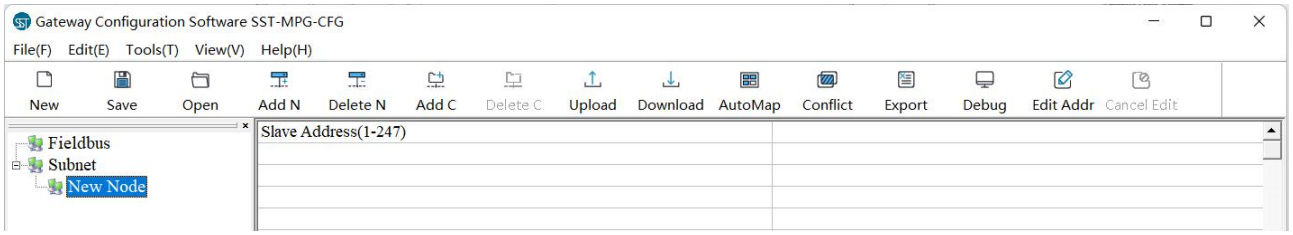


4. Click “Subnet” located in the Equipment Section. Configure the parameters located in the Configuration Section to meet the needs of your project.

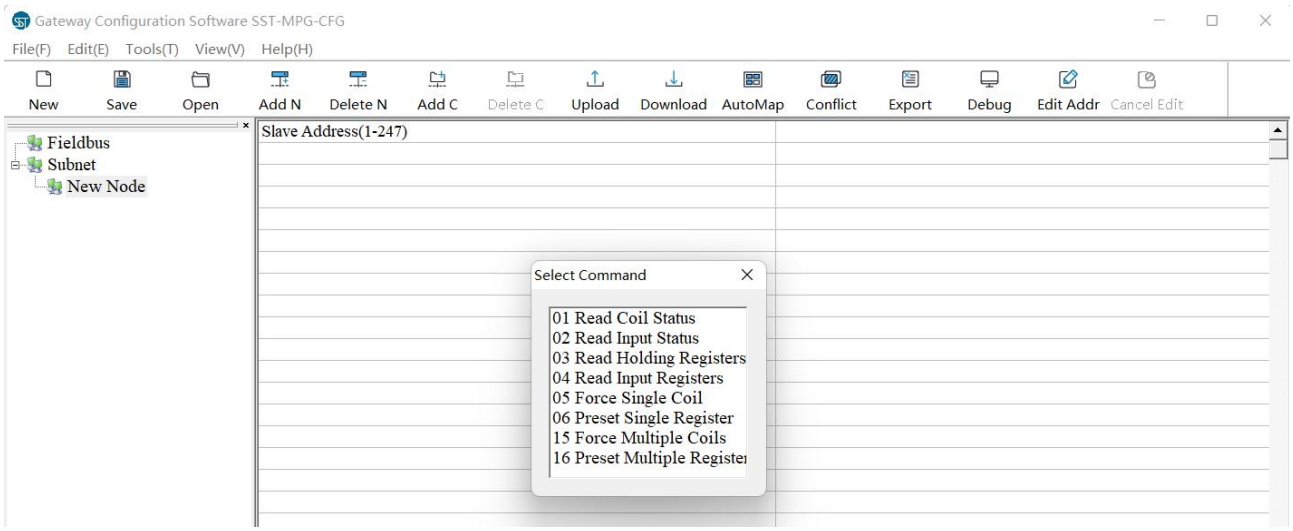
   Note: These parameters must match project device settings to ensure communication through our gateway.



5. Right Click “Subnet” and Select “Add Node”. Click the newly created node and configure the Slave Address parameter.

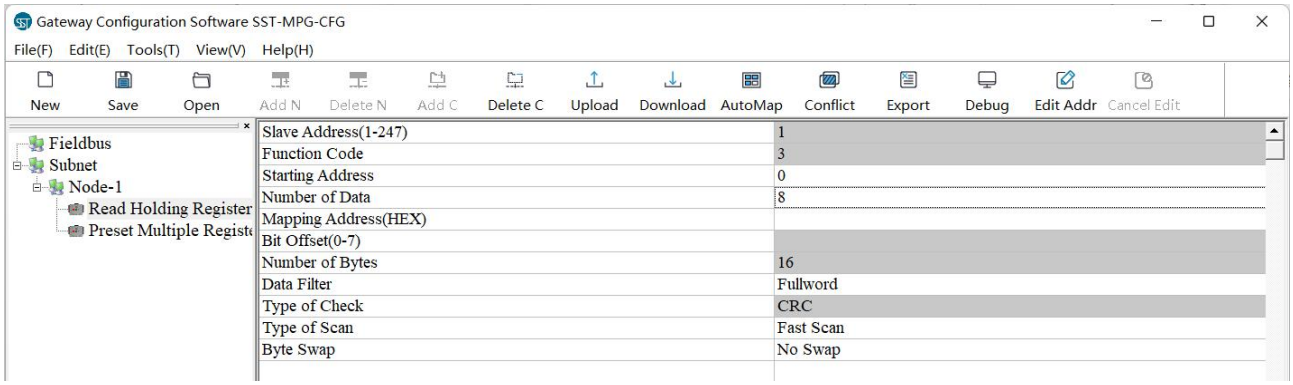


6. Right click a node and select “Add Command”. In the Select Command window, double click the command you wish to add.



7. Click the Command you wish to configure and configure the parameters in the Configuration Section to meet

the needs of your project.



8. Once the "Fieldbus", "Subnet", Node(s), and Command(s) are configured, click "AutoMap" icon on the toolbar to map the Modbus data to the PROFIBUS DP network. Then check the mapping address in Conflict Detection window.

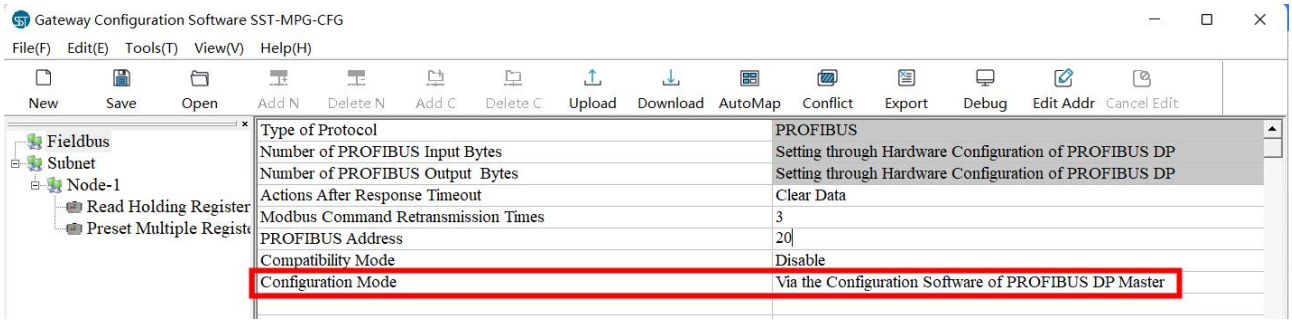
9. Click "Download" to download your configurations into the GT200-DP-RS.

Note: The GT200-DP-RS will apply the new configuration after entering Run mode. After downloading, the software will ask to switch mode. You can also switch mode manually by setting button, referring to chapter 2.4.

4.2.2 Configure by STEP7 (PROFIBUS Integrated Configuration Software)

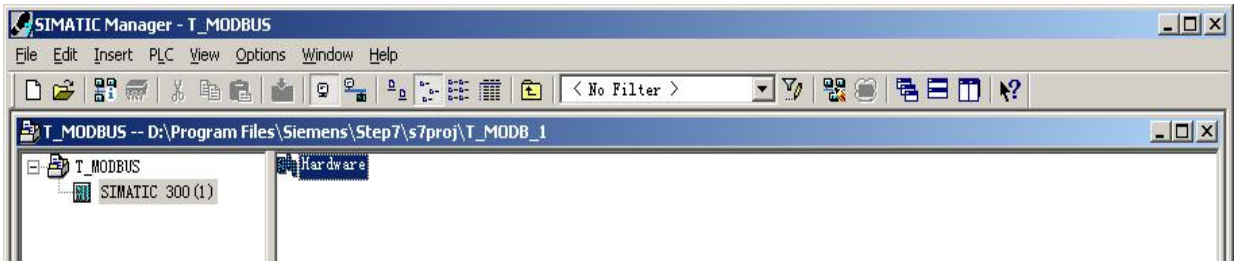
The DP Integrated Configuration mode allows users to configure the GT200-DP-RS in PROFIBUS integrated configuration software, such as STEP7 or TIA Portal.

To apply this mode, please change the configuration mode of the GT200-DP-RS in SST-MPG-CFG software to "via PROFIBUS DP Integrated Configuration Software" and download the configuration. The LED should display "-P" that indicates the GT200-DP-RS is in DP Integrated Configuration mode.

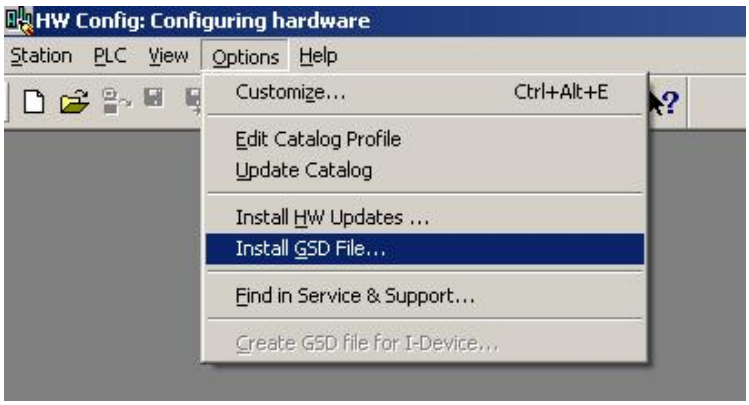


The following steps give an example of the STEP7 configuration process.

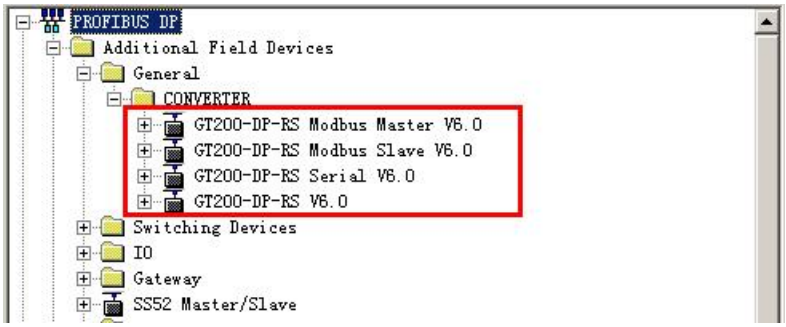
1. Double click on the “Hardware” to open the hardware configuration window of your project.



2. Register the GSD file. On the top menu bar, select “Options” >> “Install DSG File...” and install the GSD files of GT200-DP-RS. For detailed description of the GSD files, please see chapter 7.



The installed GSD files are in the corresponding folder.

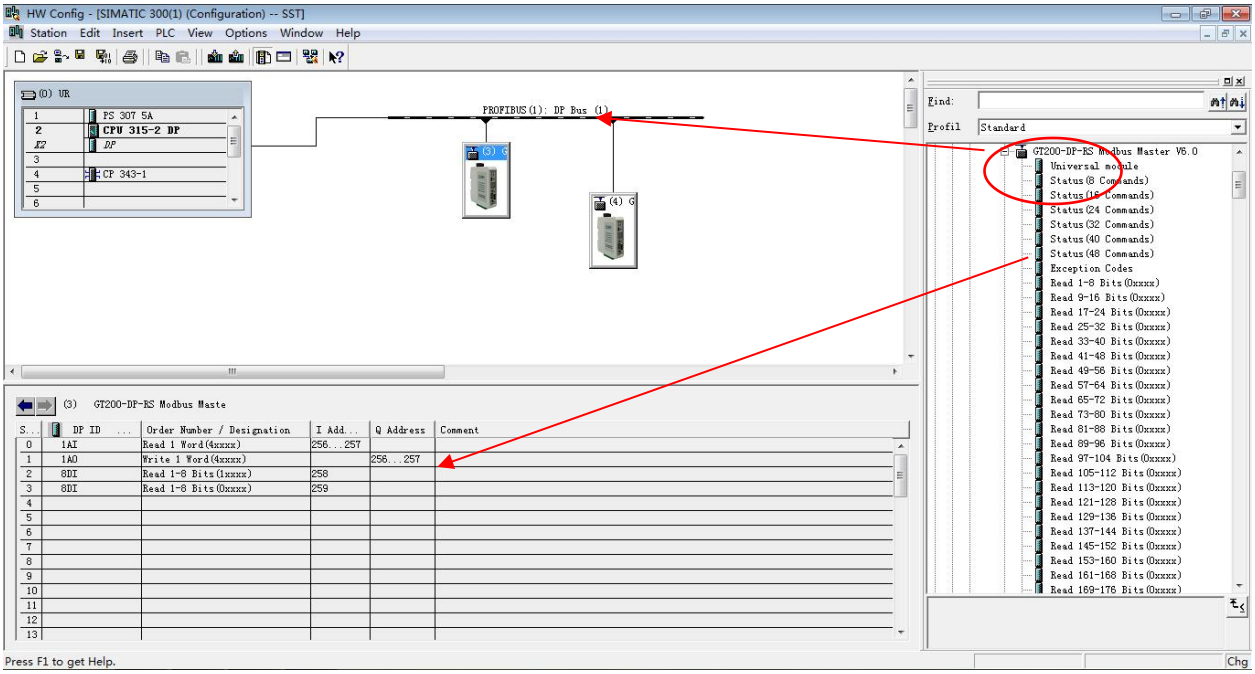


3. Add the GT200-DP-RS to the PROFIBUS DP bus. Drag the device and modules in the catalog to the DP bus,

as shown below.

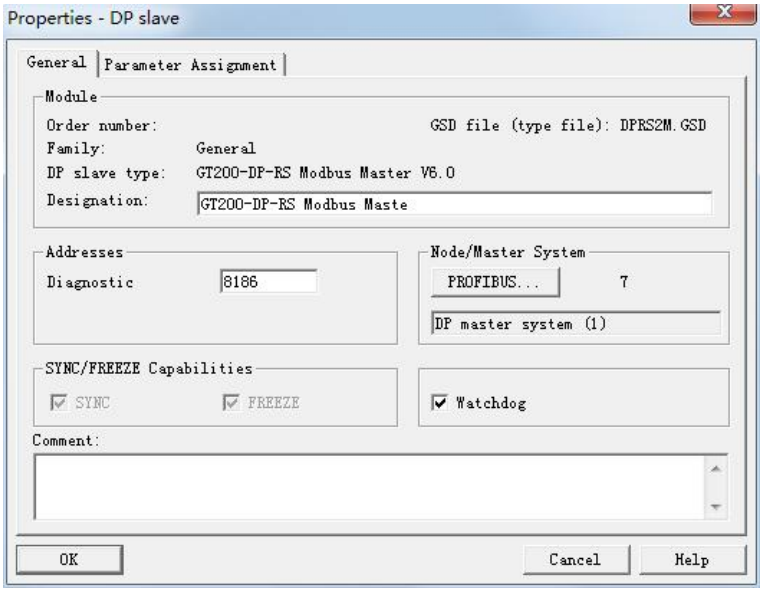
Note:

In the "DP Integrated Configuration" mode, you should use "GT200-DP-RS Modbus Master/Modbus Slave/Serial Vx.x" device. The "GT200-DP-RS Vx.x"device is used for "Software Configuration" mode (chapter 4.2.1).

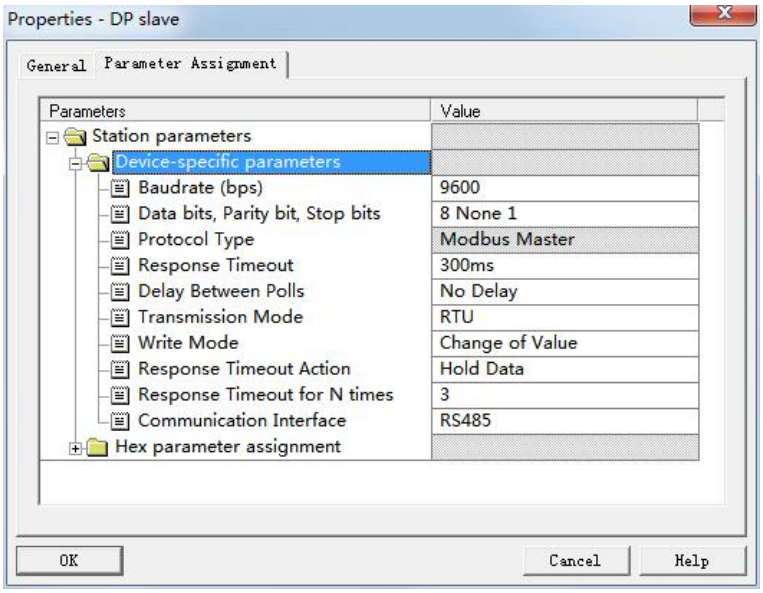


4. The following steps introduce how to configure the GT200-DP-RS as a Modbus Master. The device is "GT200-DP-RS Modbus Master V6.0".

(1) Double click on a GT200-DP-RS device to open its properties window. In "General" window, Set the DP parameters.



In “Parameter Assignment” window, set the Modbus parameters. The communication interface will use these parameters to establish communication with Modbus serial devices.

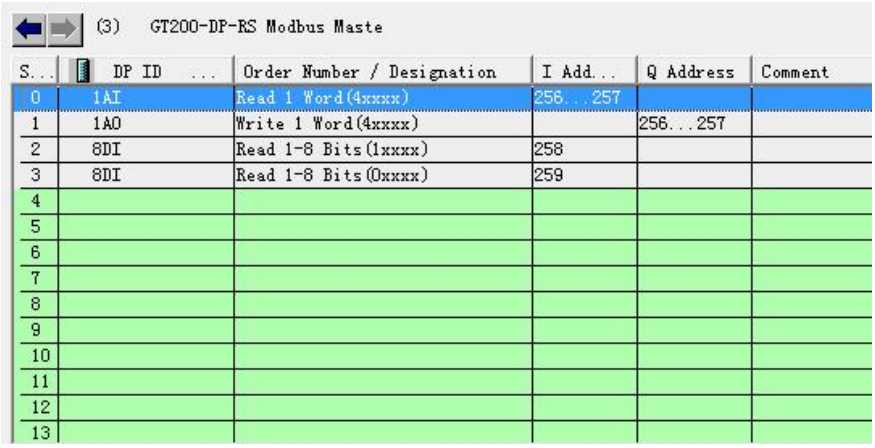


After you finish the DP slave configuration, click “OK”.

(2) Add modules to the device.

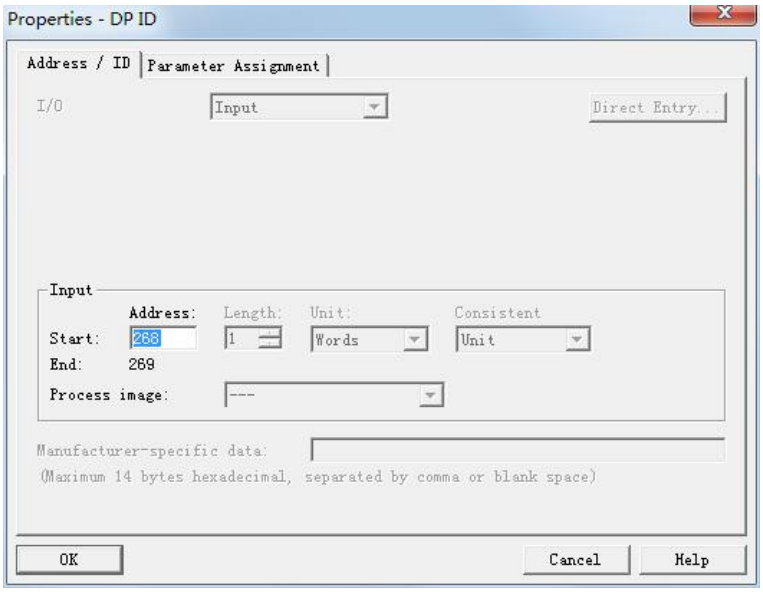
Select the GT200-DP-RS device on the DP bus, then double click on the modules you want to add to in the catalog. The added module is on the slot of the GT200-DP-RS device. Please select the appropriate modules according to the address area you want to read/write.

Note: The max number of modules is 48. Maximum input byte: 244. Maximum output bytes: 244.

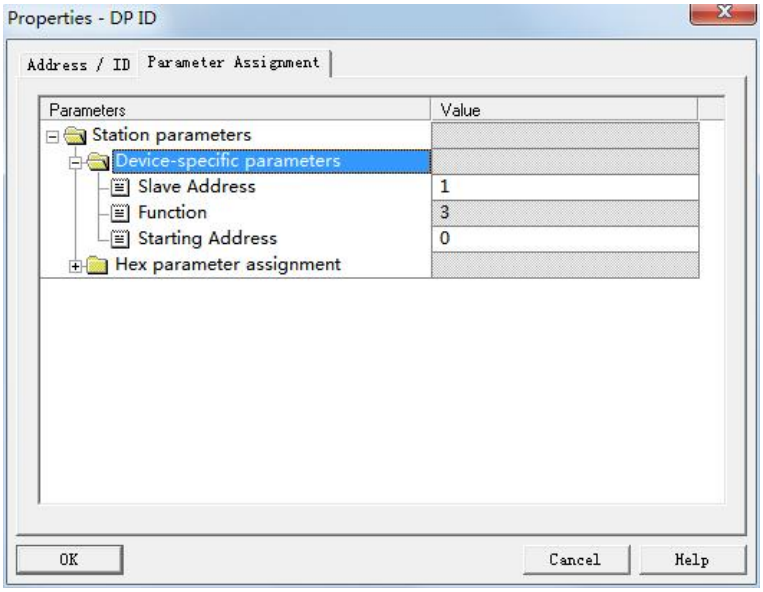


(3) Configure the module parameters. Double click on a module to open the parameters window.

For example, for the module “Read 1 Word (4xxxx)”, set the DP Input address in the “Address / ID” .



Then set the Modbus parameters in the “Parameter Assignment” window, referring to the Modbus function code specifications.



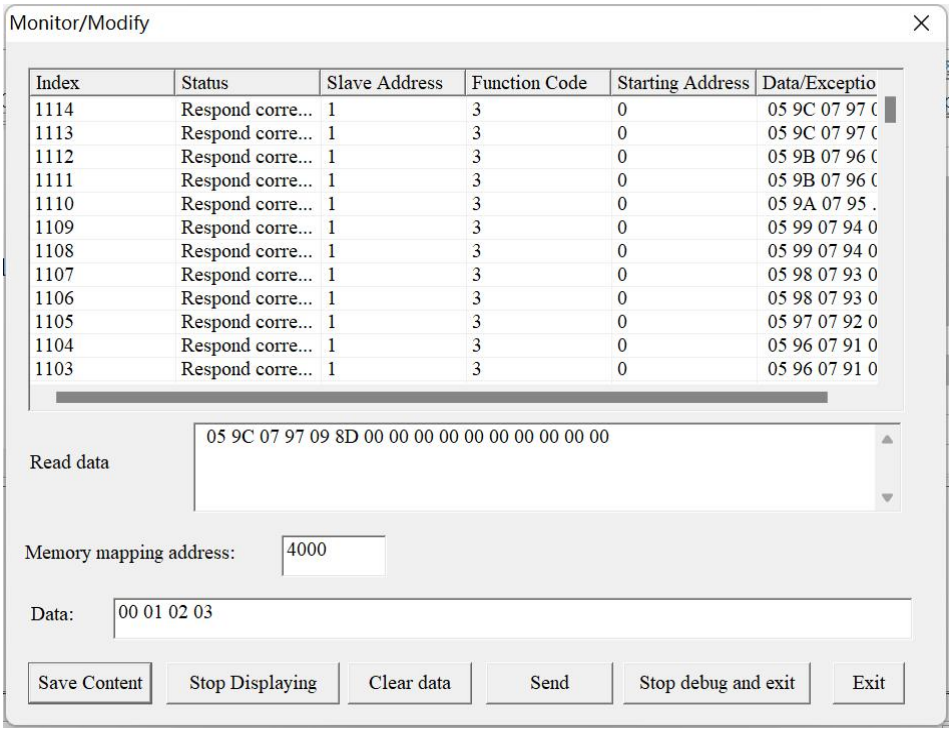
After you finish the configuration, click “OK”.

5. Compile and download the configuration to the PROFIBUS DP PLC.

4.3 Debug

The SST-MPG-CFG software provides debug function that allows user quickly monitor data communication through GT200-DP-RS. For more details, please refer to chapter 6.9.

Note: Under "Software Configuration" mode (LED displays "-U"), the GT200-DP-RS supports debugging without DP master. Under "DP Integrated Configuration" mode (LED displays "-P"), the debug function is supported when the GT200-DP-RS is connecting with DP master.

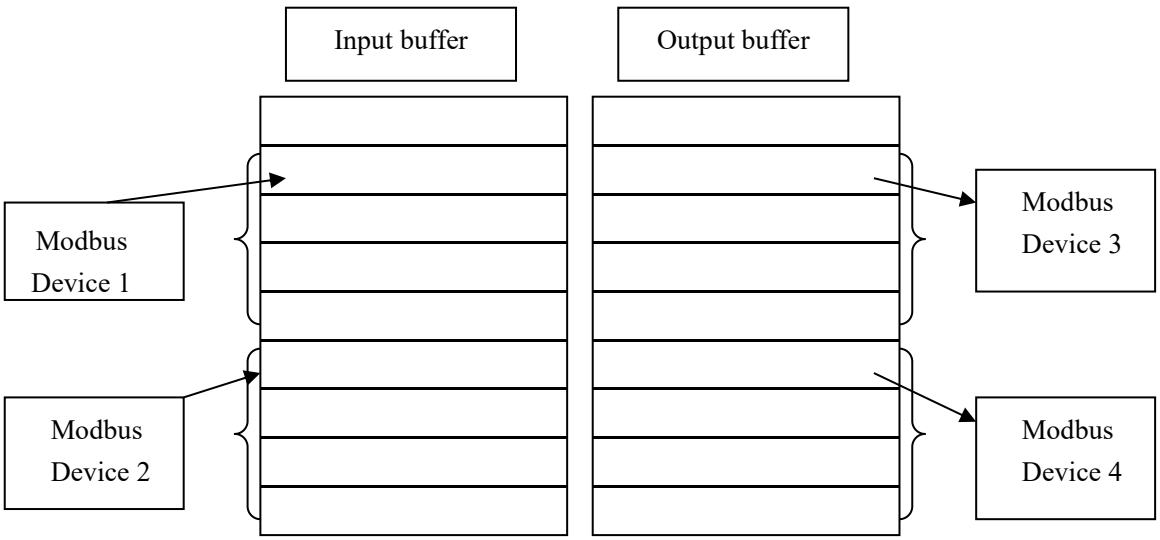


5 Working Principle

The GT200-DP-RS has an input buffer and an output buffer. The data transmission between serial devices and PROFIBUS DP master through GT200-DP-RS is established by mapping address.

5.1 As Modbus Master

The data conversion between Modbus and PROFIBUS of GT200-DP-RS is established by mapping. GT200-DP-RS has two data buffers, one is PROFIBUS network input buffer; the other is PROFIBUS network output buffer. Command ID 1, 2, 3 and 4 of Modbus puts the data read from Modbus slave station into network input buffer for reading by PROFIBUS network; Command ID 5, 6, 15 and 16 of Modbus write the data from network output buffer into Modbus slave station.

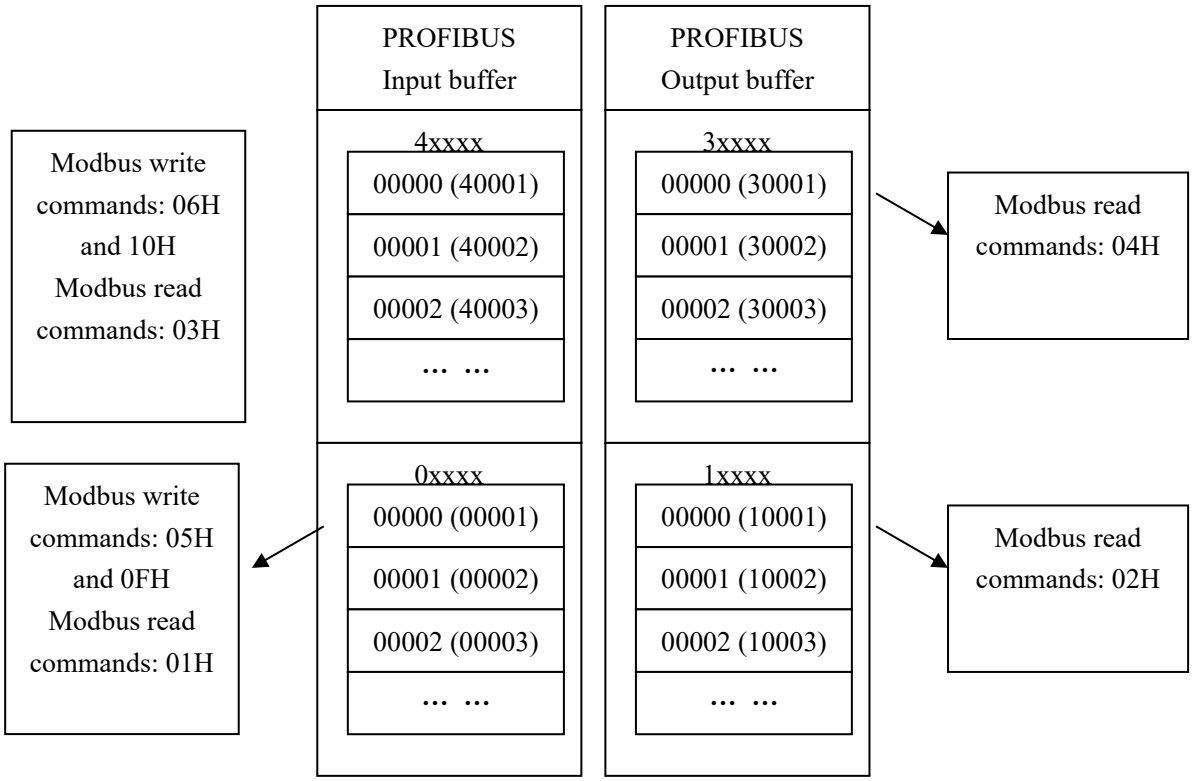


Support 01H, 02H, 03H, 04H, 05H, 06H, 0FH, 10H function codes, when using “DP Hardware Configuration”, users can configure 48 Modbus commands Module. When using “Software Configuration”, users can configure at most 100 Modbus commands in the software SST-MPG-CFG.

5.2 As Modbus Slave

The data conversion between Modbus of GT200-DP-RS Modbus Slave and PROFIBUS is established by

mapping relation. GT200-DP-RS has two data buffers, one is PROFIBUS network input buffer, and the other is PROFIBUS network output buffer. Network input and output buffers are relative to PROFIBUS. Modbus write-register commands write data into network input buffer for PROFIBUS network reading. Modbus read-register commands data from network output buffer, and transmit to Modbus master device through response messages.



Support Modbus register address area 3 (3xxxx), area 4 (4xxxx), area 0 (0xxxx) and area 1 (1xxxx); and area 3 supports 04H function code; area 4 supports 03H, 06H, and 10H function codes; area 0 supports 01H, 05H, and 0FH function codes; 1 area supports 02H function code.

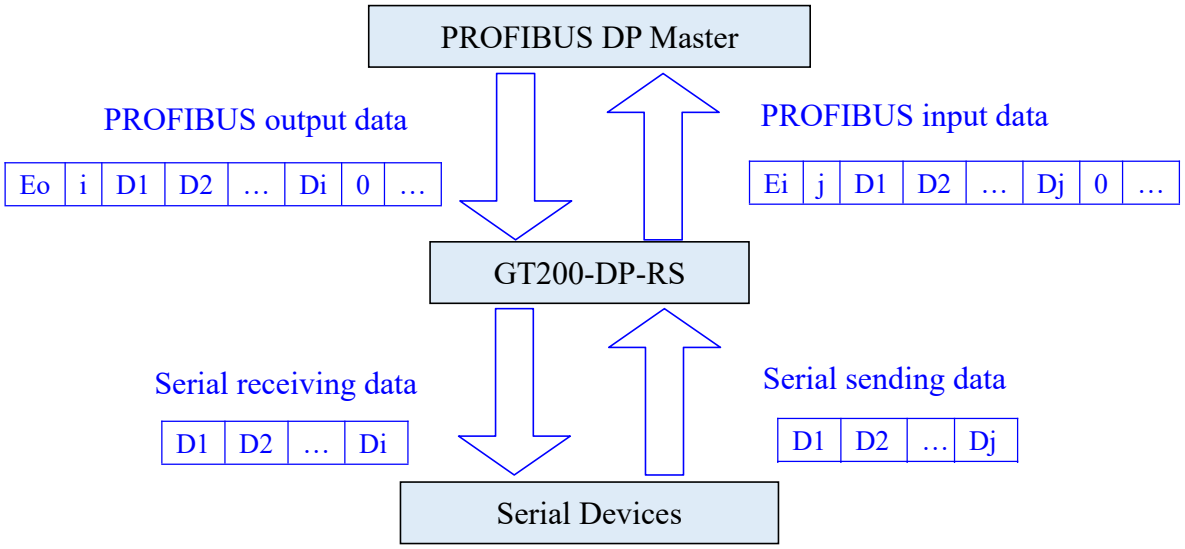
PROFIBUS DP input buffer being relative to Modbus side is Modbus master output, mapping to Modbus holding registers 4xxxx (10H and 06H commands are used to write data, 03H command is used to read back data) and loops 0xxxx (0FH and 05H commands are used to write data, 01H command is used to read back data).

PROFIBUS DP output buffet being relative to Modbus side is Modbus master input, mapping to Modbus input registers 3xxxx (04H command is used to read data) and input bits 1xxxx (02H command is used to read data).

5.3 Universal Mode

5.3.1 Data Exchange

The GT200-DP-RS supports universal serial protocol that allows PROFIBUS DP master to communicate with user's serial devices of customized protocol.



"Eo" / "Ei" is the transaction number of the data frame.

"i" / "j" is the data length of the data frame.

"D1"-"Di" / "D1"-"Dj" are data being transmitted.

5.3.2 Data Frame Format

Transaction number	**Data length**	**Data**	**"00" to fill empty bytes**
XX **(1 byte)**	*N* **(1 byte)**	*1A 2B ...* **(N bytes)**	*00 00 ...* **(M bytes, M ≥ 0)**

Transaction number: For output frame, the transaction number should add 1 to trigger the output. For input frame, when receiving a new frame, the transaction number will automatically add 1.

Data length: The length of data included in this frame.

Data: The data being transmitted.

"00" to fill empty bytes: The M bytes of "00" are used to fill the empty if the output data is shorter then the PROFIBUS DP module length (for example, when sending only 4 bytes with an 8-byte output module, the left (8-4) bytes are filled with "00").

Note:

1. The data of the frame are in hexadecimal.
2. For output frame, the transaction number must be changed to trigger the output. Otherwise the data won't be sent to serial devices.
3. The data length of PROFIBUS DP output module should be at least (N+2) bytes.
4. (N+M+2) should be equal to the length of PROFIBUS DP output module data length.
5. In DP Integrated Configuration mode, if disable the "Input Data Effective Length", the Data length value (N) is fixed "11".

Example:

When using an 8-byte output module, output 3-byte data "01 02 03". The last transaction number is 0.

The current output frame should be:

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

When using an 8-byte input module, receive 4-byte data "03 04 05 06". The last transaction number is 2.

The received frame is:

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

5.4 Data Mapping in Software Configuration Mode

In the "Software Configuration" mode, the data mapping address can be manually configured. The data mapping relationship between GT200-DP-RS buffer and PROFIBUS DP is shown below. The address N and M (or X and Y) can be discontinuous numbers.

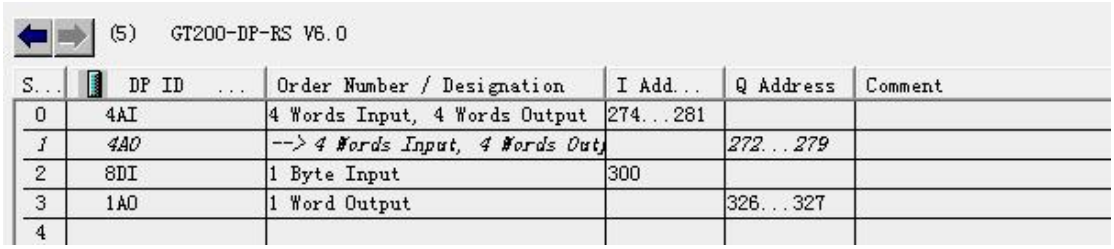
PROFIBUS DP Input Address		GT200-DP-RS Input Buffer
Module 1	N	0000H
	N+1	0001H
Module 2	M	0002H
	M+1	0003H
	M+2	0004H
	M+3	0005H
...	...	...

PROFIBUS DP Output Address		GT200-DP-RS Output Buffer
Module 3	X	4000H
	X+1	4001H
	X+2	4002H
	X+3	4003H
Module 4	Y	4004H
	Y+1	4005H
...	...	...

For example, in STEP7, add the following modules on the slot. The I address corresponds to input buffer data and the Q address corresponds to output buffer.

The IB274-281 corresponds to 0000H-0007H of GT200-DP-RS input buffer. The IB300 of next input module corresponds to 0008H.

The QB272-QB279 can corresponds to 4000H-4007H of GT200-DP-RS output buffer. The QB326-327 of next output module corresponds to 4009H-400AH.



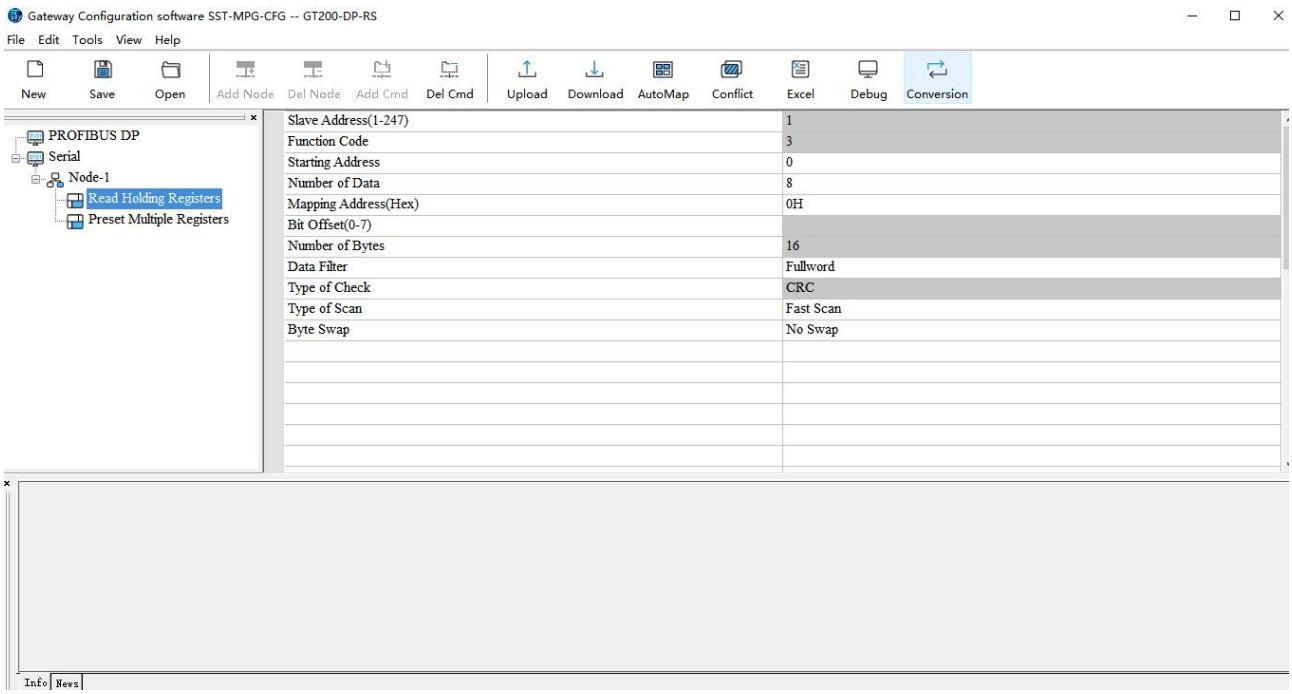
6 SST-MPG-CFG Software Instructions

The SST-MPG-CFG software is used to configure the GT200-DP-RS gateway and is available for download at www.sstautomation.com/Download1/.

6.1 Notes before Configuring

SST-MPG-CFG is a product based on the Windows platform, and it can set related parameters and commands of Modbus and PROFIBUS DP through the GT200-DP-RS.

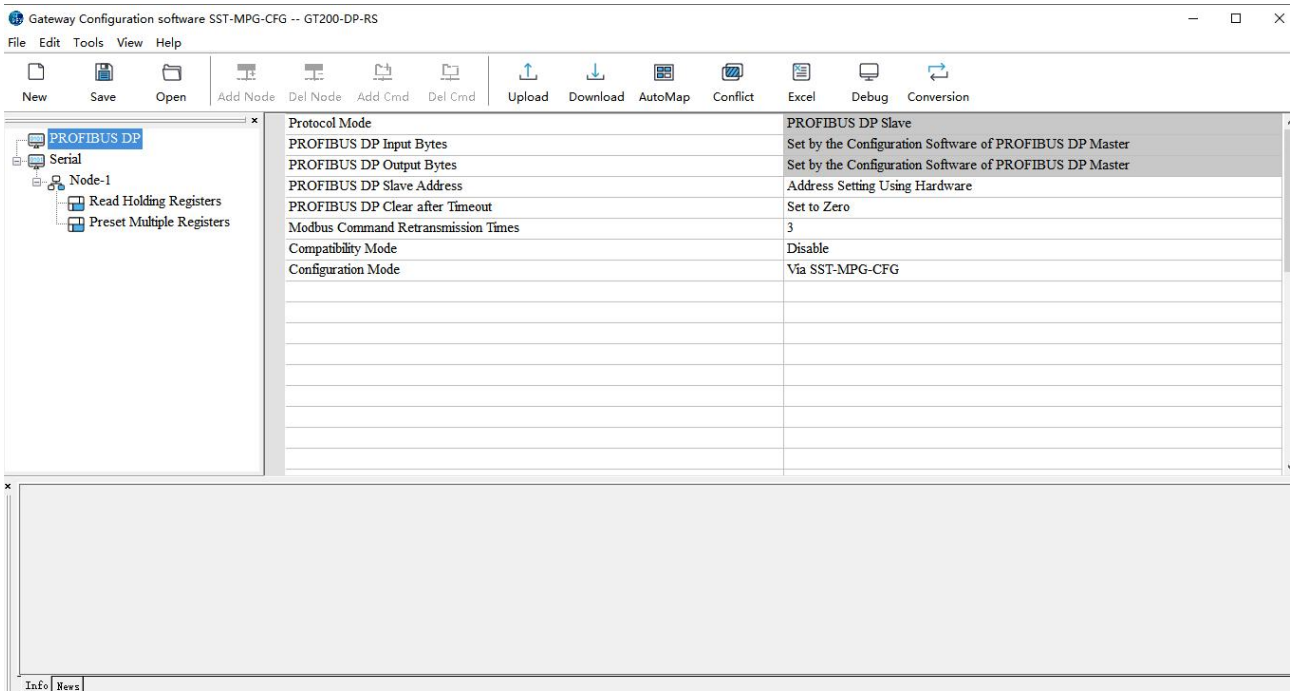
Double-click the icon to enter the configuration interface:



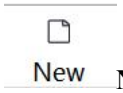
6.2 User Interface

The SST-MPG-CFG interface includes a title bar, menu bar, toolbar, status bar, equipment section, configuration section and notes section.

Note: All the gray parts in the software cannot be modified.

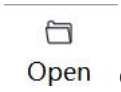


Toolbar is shown as below:



New: Create a new configuration project

Save: Save the current configuration



Open: Open a configuration project

Add Nodes: Add a Modbus slave node

Delete Nodes: Delete a Modbus slave node

Add Commands: Add a Modbus command

Delete Commands: Delete a Modbus command

Upload Configuration: Read the configuration from the module and show it in the software

Download Configuration: Download the configuration from the software to the module

Calculate Mapping Address: Calculating mapping address automatically

Conflict Detection: Detect whether there is conflict in memory data buffer of the gateway

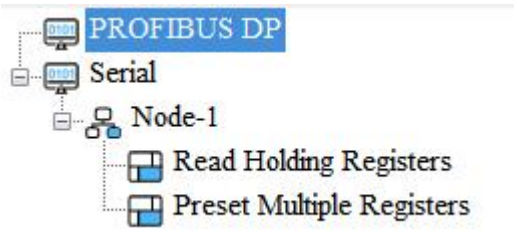
Export EXCEL: Export the current configuration to local hard disk and save it as .xls file

Debug: For debugging Modbus communications, and defining the network fault

Conversion: Used for configuration parameter conversion between GT100-DP-RS and GT200-DP-RS.

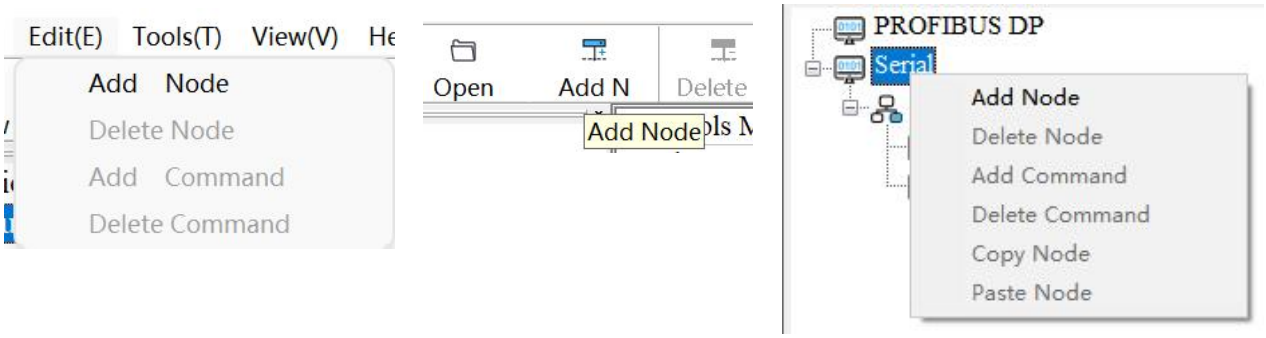
6.3 The Operation of Equipment View

6.3.1 Equipment View Interface



6.3.2 Operation Mode of Equipment View

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

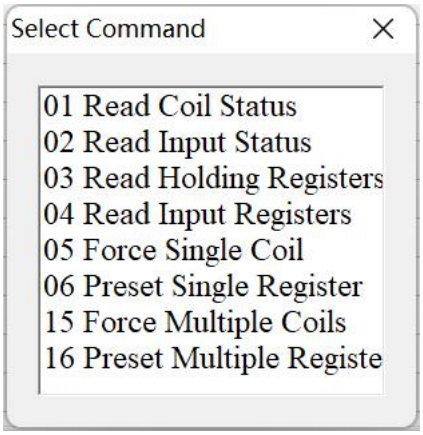


6.3.3 Operation Types of Equipment View

1. **Add nodes:** Right click on subnet or existing nodes, and then perform the operation of adding a new node. Then there will be a new node named "new node" under subnet.
2. **Delete nodes:** Right click on the node to be deleted, and then perform the operation of deleting the node. The node and all its commands will be deleted.
3. **Add commands:** Right click on the node, and then perform the operation of adding command to add a command for the node. The dialog box will be shown as follow:

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

   Select the command: Double click the command



4. **Delete commands:** Right-click on the command and then perform the operation of deleting the command.
5. **Rename nodes:** Left click on the node to be renamed, and then the edit status will be shown and you can rename it.
6. **Copy node:** Left click on the existing node, choose the node and execute the operation of copying nodes (include all commands under the node)

7. **Paste node:** Left click and choose any existing node, execute the operation of pasting the node. Then under the subnet tree you can see a new node (include all commands under the node). Parameters of the new node is the default setting, therefore it needs to be reset.

6.4 The Operation of Configuration View

6.4.1 Interface of Fieldbus Configuration View

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

Protocol Mode: PROFIBUS, cannot be modified.

PROFIBUS DP Input Bytes: Set in PROFIBUS DP master configuration software, cannot be modified.

PROFIBUS DP Output Bytes: Set in PROFIBUS DP master configuration software, cannot be modified.

PROFIBUS DP Slave Address: There are two options: "Address Setting Using Hardware" and "Enter Address Value."

Selecting "Address Setting Using Hardware" allows you to set the PROFIBUS DP slave address using the buttons on the GT200-DP-RS hardware product; Selecting "Enter Address Value" allows you to enter a value here to set the PROFIBUS DP slave address for the gateway via configuration download. The address range that can be entered is 0 to 99.

PROFIBUS DP Clear after Timeout: Set to Zero or Keep data can be selected.

Set to Zero: When a Modbus read command fails to receive the correct response for two consecutive times, the PROFIBUS DP input data corresponding to this read command will be cleared. Default is "Set to Zero".

Keep: Keep the last data.

Note: This function is only valid in Modbus Master mode.

Modbus Command Retransmission Times: 2 to 254 can be selected.

When the Modbus command response is wrong, set the number of retransmissions of the command.

Compatibility Mode: There are two options, "Disable" and "Enable", with the default set to "Disable."

Disable: Support GSD files of GT200-DP-RS V6.0 and above.

Enable: Support GSD files of GT200-DP-RS V5.x and below.

Configuration Mode: There are two choices, with the default set to "Via SST-MPG-CFG": use SST-MPG-CFG configuration software to set all configuration parameters for the gateway; Selecting "Via the Configuration Software of PROFIBUS DP Master" the parameters in the configuration software are only valid for "PROFIBUS Address","Compatibility Mode" and "Configuration Mode", and other parameters use the configuration of the PROFIBUS DP master station configuration.

PROFIBUS DP Input Valid Data Length: Enable, Disable. The default is Disable. (It's valid when Protocols Mode is set to User Config)

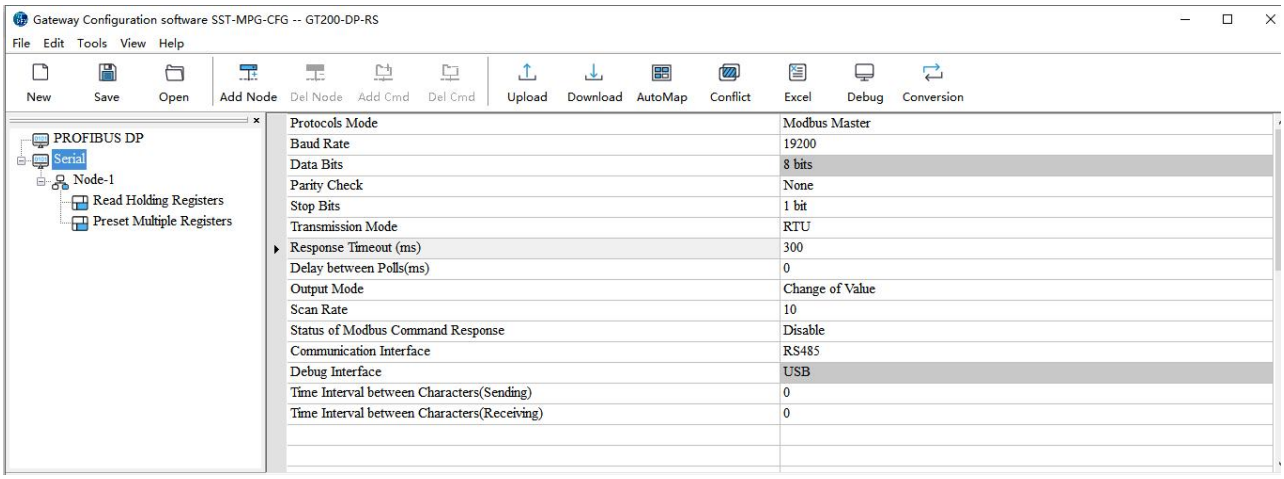
6.4.2 Interface of Subnet Configuration View

1. Choose Modbus Master in protocol type

Configurable parameters are shown as follows:

Baud Rate, Data Bits, Parity Check, Stop bit, Transmission mode, Response timeout, Delay between Polls, Output Mode, Scan Rate, Status of Modbus Command Response, Communication interface, Time Interval between Character(Sending) and Time Interval between Character(Receiving).

Interface of configuration view is shown as below:



Baud Rate: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200bps optional

Data bits: 8

Parity Check: none, odd, even, mark and space optional

Stop bits: 1, 2

Transmission mode: RTU, ASCII optional

Response timeout: When the Modbus master send commands, the time waiting for response from the slave, the range is 5-60000ms.

Delay between polls: After one Modbus command has been sent and has received correct response, the delay time before next command being sent, the range is: 0 - 2500ms.The actual polling delay time is the input value divided by 10, rounded down, and then multiplied by 10, with the unit in ms. For example, if the input value is 9, the actual polling delay time is 0 ms; if the input value is 15, the actual polling delay time is 10 ms.

Output Mode:

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

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

Forbidden: Prohibit outputting Modbus write command.

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

Scan rate: Ratio of slow scan and fast scan. If the fast scan command sends 10 times, slow scan command sends 1 time.

Status of Modbus Command Response: disable, 1byte, 2bytes, 3bytes, 4bytes, 5bytes, 6bytes, 7bytes, 8bytes, 9bytes, 10bytes, 11bytes, 12bytes and 13bytes can be selected. They locate in the first several bytes of PROFIBUS input data and show the status of Modbus commands. The bit 0 of the first byte shows the status of the first Modbus command and six bytes can show all status of 48 commands. The value of status is 0, when the communication is OK and the value is 1.

Communication interface: There are RS-232 and RS-485 to be selected.

Time interval between Characters (Sending): Serial port of GT200-DP-RS will send every byte according to the time interval. The range of value is 0 to 60000, and the unit is 0.1ms. If the value is 100, then the time interval is 100* 0.1 ms =10ms. (Note: The time interval does not contain/cover the frame interval of Modbus protocol)

Time interval between Characters (Receiving): Serial port of GT200-DP-RS will use this time interval as the judge receiving end basis. The range of value is 0 to 60000, and the unit is 0.1ms. If the value is 100, then the time interval is 100* 0.1 ms =10ms. (Note: The time interval does not contain/cover the frame interval of Modbus protocol)

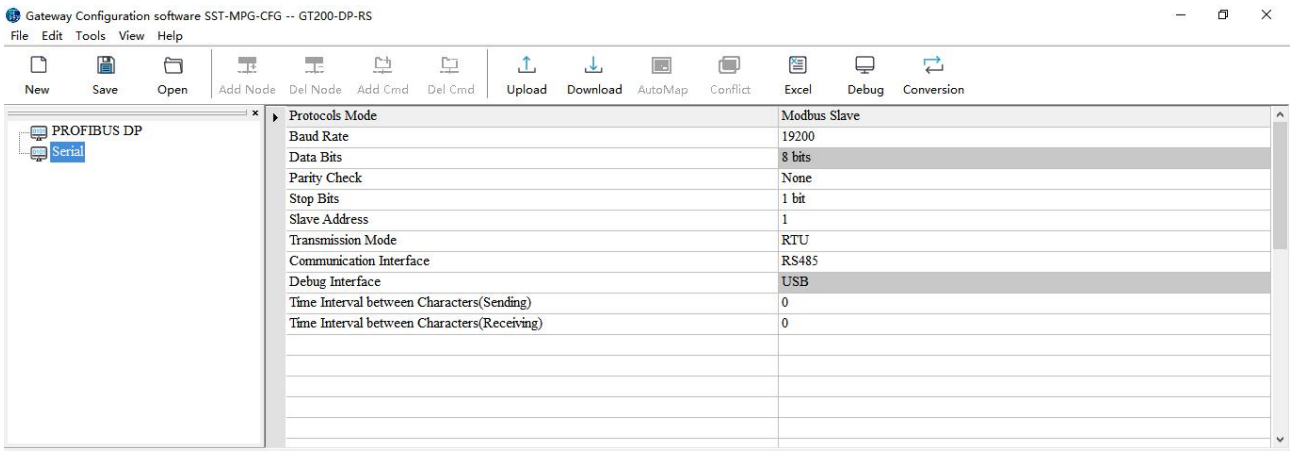
Note: The reference time of gateway receiving data and broking frame: Time interval between characters (Receiving) + 3.5 character time of Modbus protocol. Make sure that the response wait time is greater than time interval between characters + 3.5 character time.

2. Choose Modbus Slave in protocos mode

Configurable parameters are shown as follows:

Baud Rate, Data Bits, Parity Check, Stops Bits, Slave Address, Transmission Mode, Communication Interface, Time interval between Character (Sending) and Time Interval between Character (Receiving).

Interface of configuration view is shown as follow:



Baud Rate: 300, 600, 1200, 2400,4800, 9600, 19200, 38400, 57600 and 115200bps optional.

Data Bits: 8

Parity Check: none, odd, even, mark and space optional

Stop Bits: 1, 2

Slave Address: range is 0-247.

Transmission Mode: RTU, ASCII

Communication Interface: There are RS-232 and RS-485 to be selected.

Time interval between Characters (Sending): Serial port of GT200-DP-RS will send every byte according

to the time interval. The range of value is 0 to 60000, and the unit is 0.1ms. If the value is 100, then the time interval is 100* 0.1 ms =10ms. (Note: The time interval does not contain/cover the frame interval of Modbus protocol)

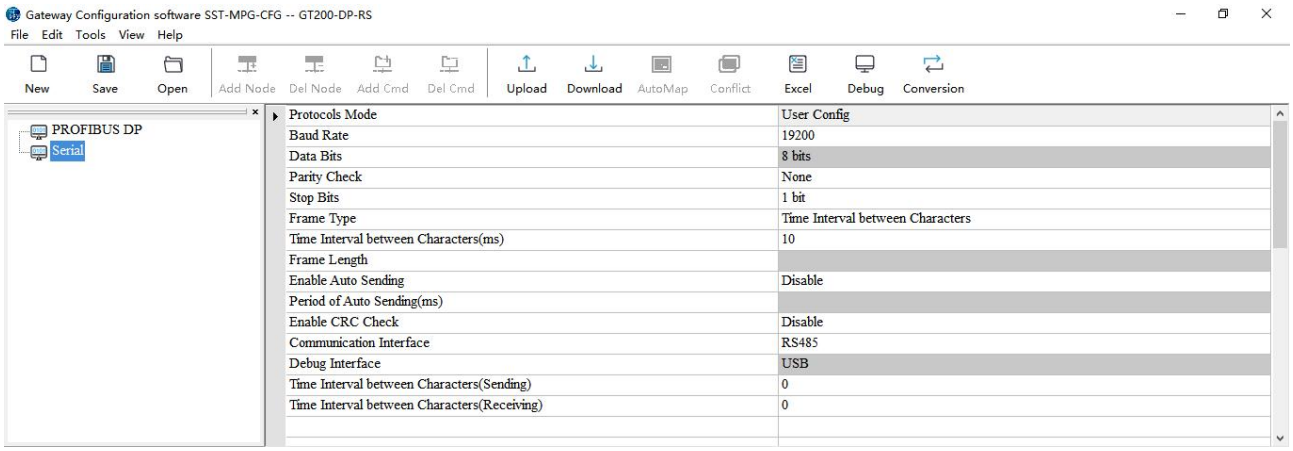
Time interval between Characters (Receiving): Serial port of GT200-DP-RS will use this time interval as the judge receiving end basis. The range of value is 0 to 60000, and the unit is 0.1ms. If the value is 100, then the time interval is 100* 0.1 ms =10ms. (Note: The time interval does not contain/cover the frame interval of Modbus protocol)

3. Choosing User Config in protocos mode:

Configurable parameters are shown as follows:

Baud Rate, Data Bits, Parity Check, Check Bit, Stop Bits, Frame Type, Time interval between Characters, Frame Length, Enable Auto Sending, Period of Auto Sending, Enable CRC Check, Communication Interface, Time interval between Character (Sending) and Time interval between Character (Receiving).

Interface of configuration view is shown as follows:



Baud Rate: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200bps optional

Data Bits: 8

Parity Check: none, odd, even, mark and space optional

Stop Bits: 1, 2

Frame Type: Time Interval between Characters, Frame length optional

Time interval between characters: It is maximum time interval between characters and used to decide whether a frame is terminated or not. User input, the default is 10, and the range is 10 - 60000ms.

Frame Length: User input, the default is 111 and the range is 1 - 243, only valid when the frame type is frame length.

Enable Auto Sending: There are Enable and Disable to be selected.

Period of Auto Sending: User input, the default is 1000 and the range is 10 - 60000ms, only valid when the Enable Auto Sending is Enabled

Enable CRC Check: Enable, Disable optional

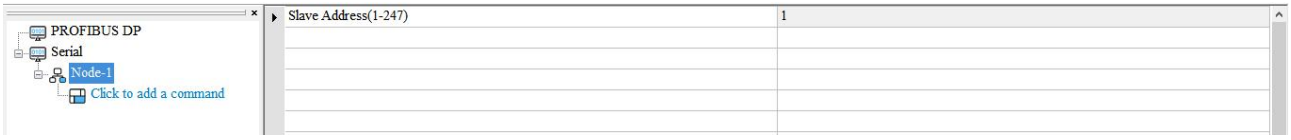
Communication Interface: RS-232, RS-485 optional.

Time interval between Characters (Sending): Serial port of GT200-DP-RS will send every byte according to the time interval. The range of value is 0 to 60000, and the unit is 0.1ms. If the value is 100, then the time interval is 100* 0.1 ms =10ms. (Note: The time interval does not contain/cover the frame interval of Modbus protocol)

Time interval between Characters (Receiving): Serial port of GT200-DP-RS will use this time interval as the judge receiving end basis. The range of value is 0 to 60000, and the unit is 0.1ms. If the value is 100, then the time interval is 100* 0.1 ms =10ms. (Note: The time interval does not contain/cover the frame interval of Modbus protocol)

6.4.3 Interface of Node Configuration View

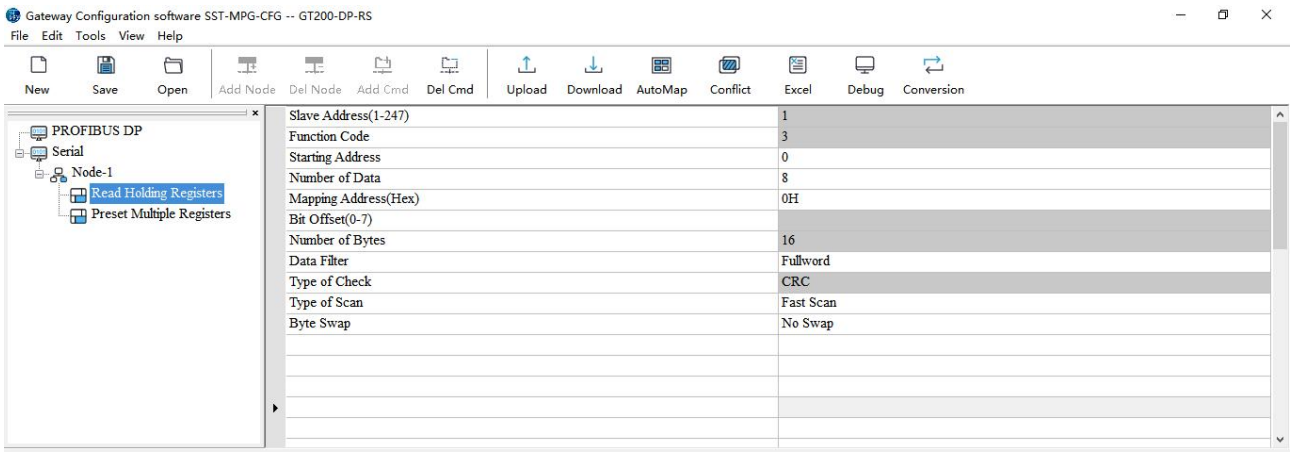
When the protocol type of the Serial is "Modbus Master", in the interface of device view, left click a node and then the configuration interface will appear as shown as follow:



In this window, you can modify the Modbus slave node address in the configuration view interface.

6.4.4 Interface of Command Configuration View

In the interface of device view, left click a command and then the configuration interface window shown as follows:

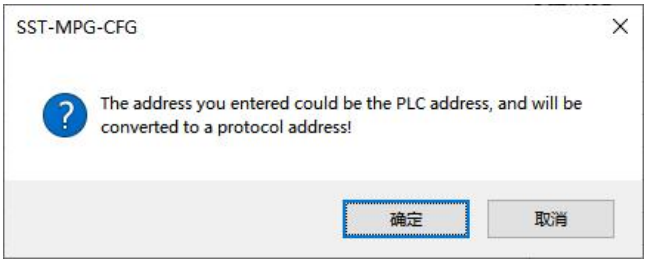


Configurable parameters are shown as follows:

Starting Address, Number of Data, Mapping Address (HEX), Bit Offset (0-7), Data Filter, Type of Scan, Byte Swap.

Starting Address: The starting address of register or switching value or loop and so on in Modbus slave and the range is 0-65535.

Notes: This address in SST-MPG-CFG is protocol address, when users input PLC address, it will pop up the below dialog box after entering. After clicking OK, the PLC address users input will be converted into protocol address.



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

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

Number of Data: number of register/switching value/coil in Modbus slave

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

The address range of data mapping in the module memory:

Read command: 0x0000- 0x00F3

Write command: 0x6000 - 0x60F3

When write command is used exchanging locally, it also can use: 0x0000 - 0x00F3

Mapping bit (0 - 7): For the bit operation commands, the position range of start-bit byte is 0 - 7

Data filter: There are three kinds of types: full word, high byte, low byte. Every register has two bytes. Full word mapping is taking two bytes of register into gateway memory buffer; High byte mapping is taking the high byte of register into gateway memory buffer; Low byte mapping is taking the low byte of register into gateway memory buffer.

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

Byte Swap: There are three kinds of types: no swap, double-byte swap and four-byte swap. Modbus function code 03H, 04H, 06H and 10H support different byte swap types.

6.5 Conflict Detection

For the detection of whether there exists conflict of "the starting address of memory mapping".

6.5.1 Operation of Command List

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

6.5.2 Operation of Memory Mapping Area

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

Input-mapping address: 0x0000 - 0x003F;

Output-mapping address: 0x6000 - 0x603F.

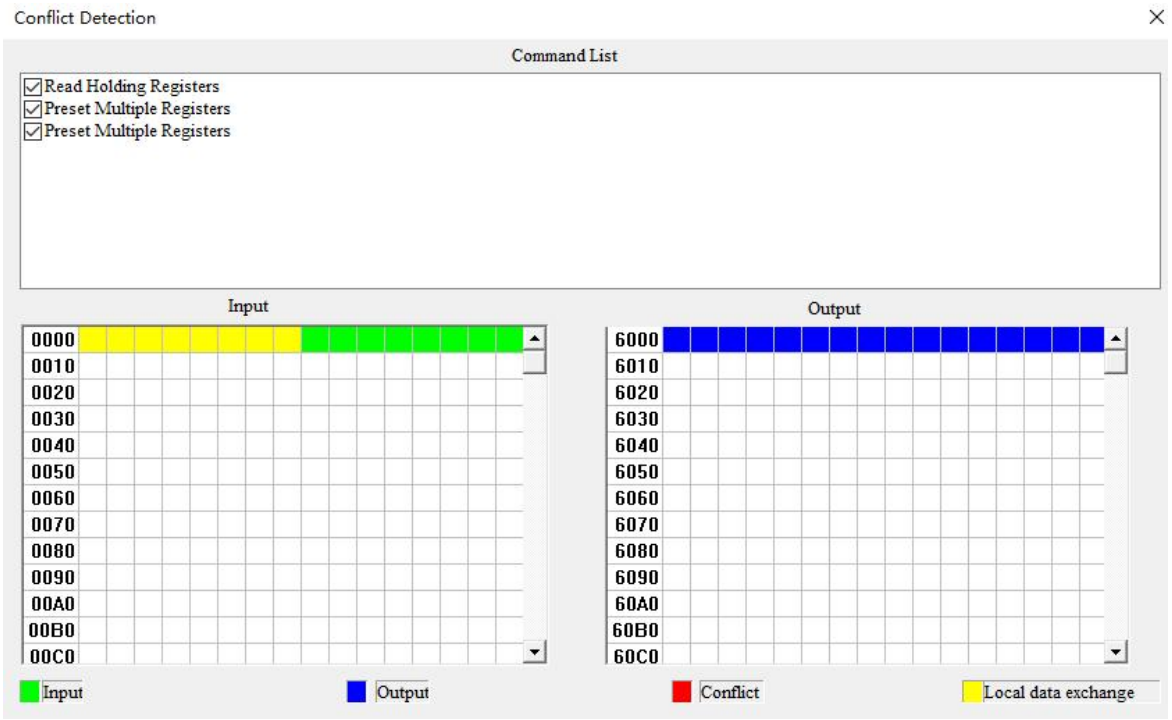
Each box represents a byte address.

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

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

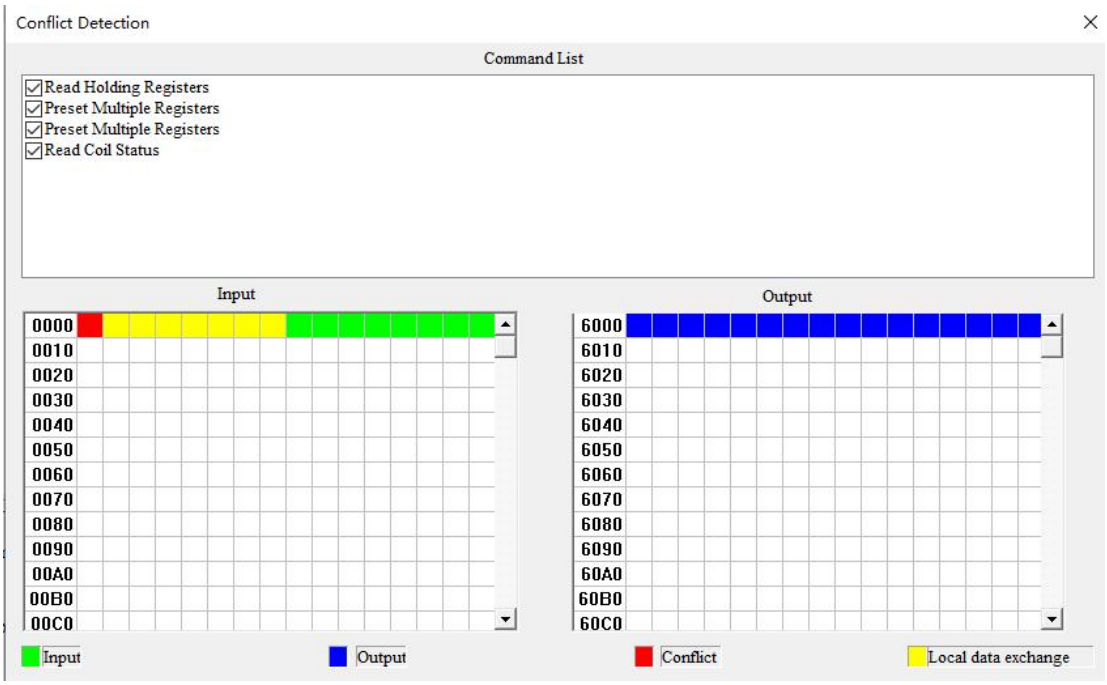
Blue: When the address mapping area is located in the output area; no conflict.

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



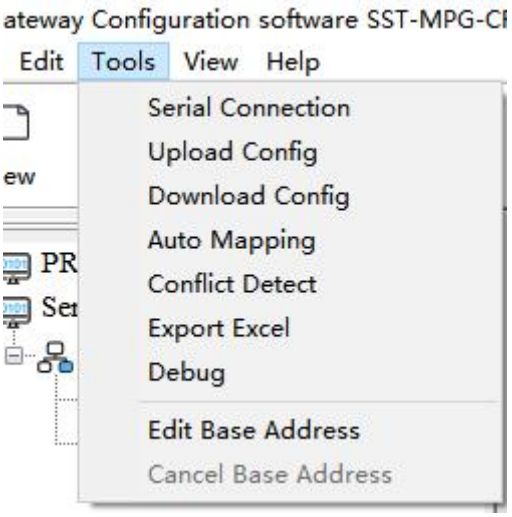
For bit operation commands, the meanings of above shows are also applicable.

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



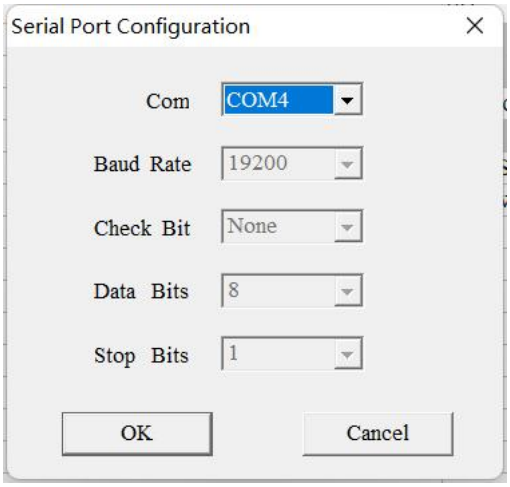
6.6 Hardware Communication

Hardware communications' menu items are shown as follows:



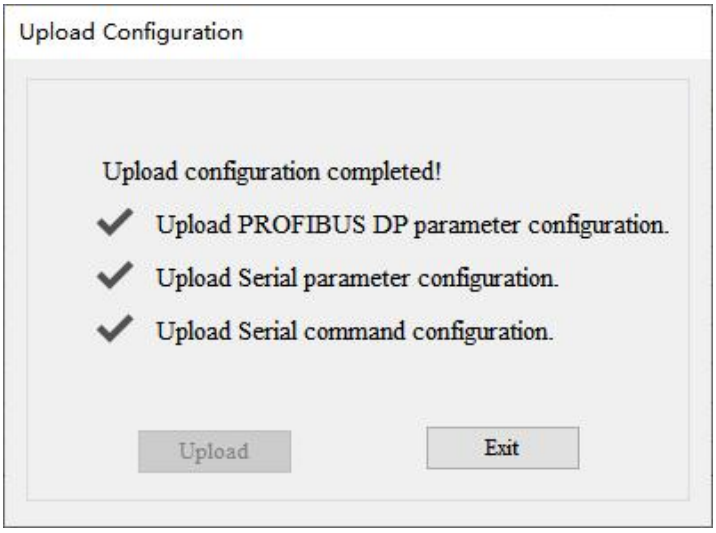
6.6.1 Serial Configuration

The software automatically scans the available serial port of the system, and the available serial can be shown in the serial list. After modifying all the items, press "OK" to save your settings.



6.6.2 Upload Configuration

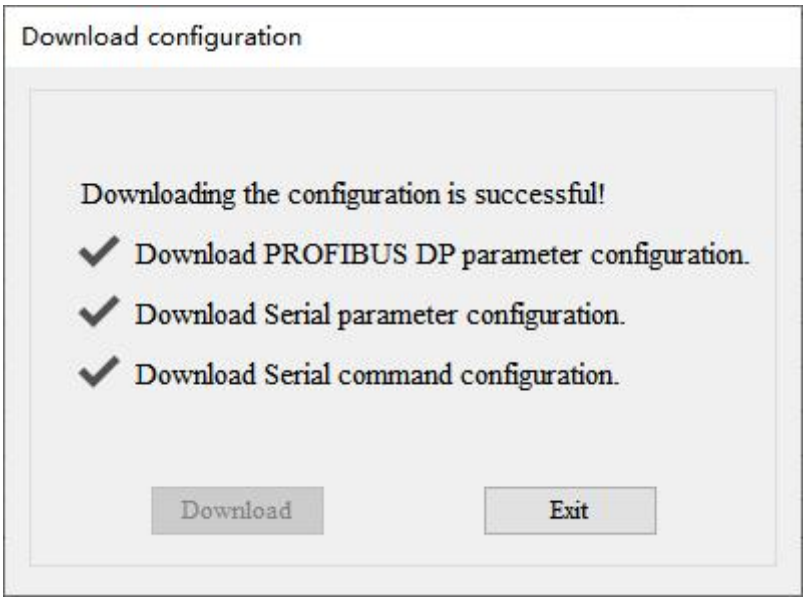
Choose upload configuration, upload the gateway configuration information from the device to the software, the display interface is shown as follows:



Note: Before uploading the configuration, please check whether the "serial port configuration" is the available port.

6.6.3 Download Configuration

Choose download configuration, download the reconfigured gateway information to the gateway, the display interface is shown as follows:



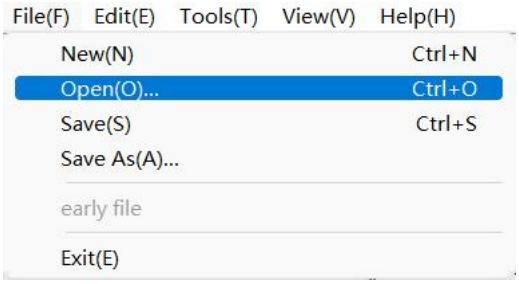
Note:

1. Before downloading the configuration, please check whether the "serial port configuration" is the available port.
2. Before downloading the configuration, make sure that all configurations have been completed.

6.7 Load and Save Configuration

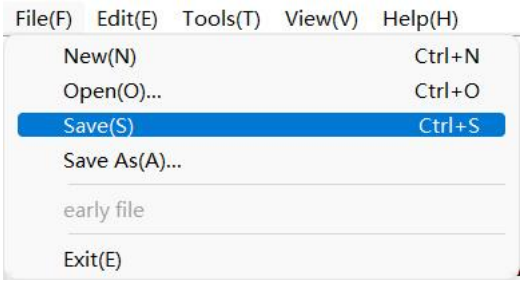
6.7.1 Load Configuration Project

Choosing "Open" can save a project.



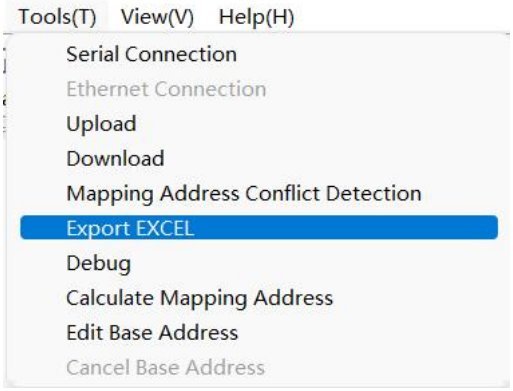
6.7.2 Save Configuration Project

Choosing "Save" can open a saved project before.



6.8 Export EXCEL

The Excel document helps users to examine the configuration.

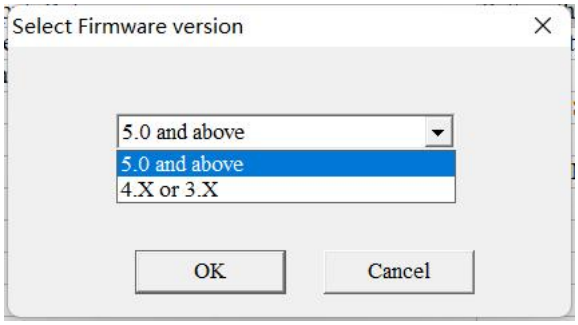


6.9 Debug

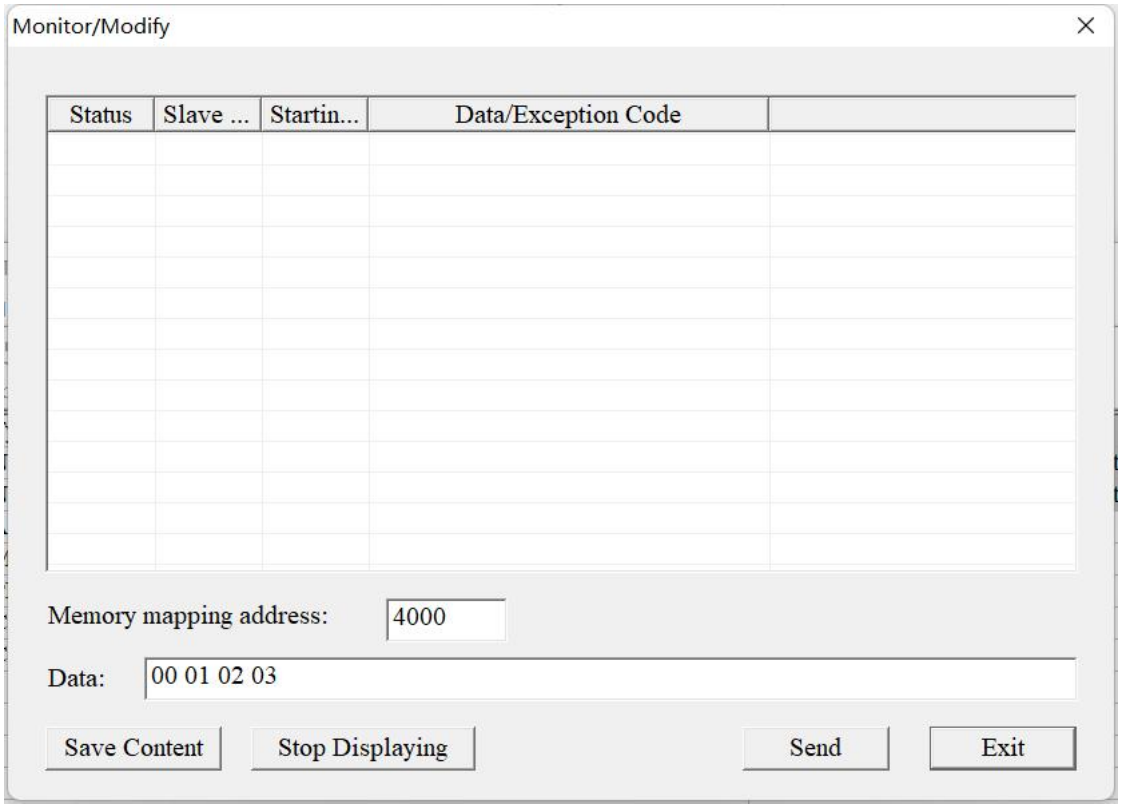
This function is for debugging Modbus network communications, the interface is shown as follows:

Click the Debug button will show up the firmware select dialog box, choose the matched version:

Note: Make sure to set the gateway to debug mode. (Chapter 2.4)



6.9.1 Debug Interface of 4.X or 3.X



Firmware Version of 4.X or 3.X only supports debug function in the protocol of "Modbus Master"

Status: Shows communication state with slave: response ok, response timeout, response abnormal and response error

Slave Address: Slave address in the configuration file (HEX)

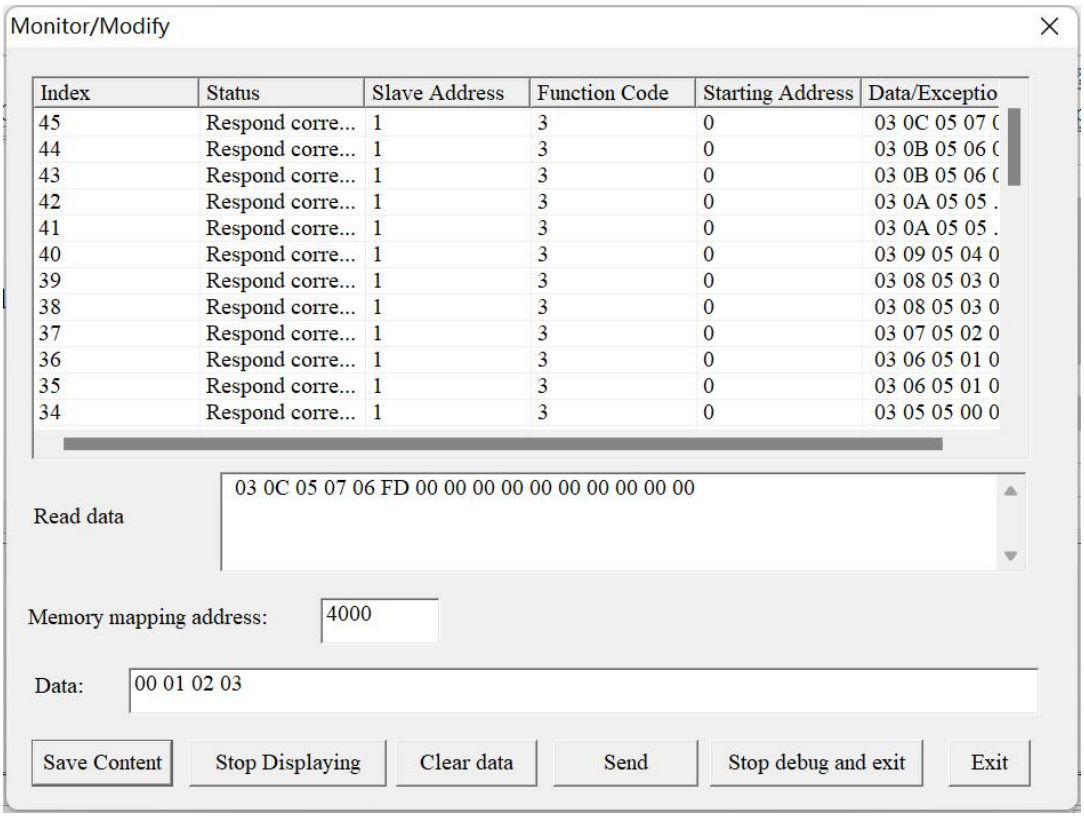
Starting Address: "Modbus register starting address" (HEX) in the configuration file

Data/Exception Code: Display the slave data or exception code (HEX)

Memory mapping address: Starting address of data writing in the gateway

Data: Data writing into the gateway

6.9.2 Debug Interface of 5.x and above



Status: Shows communication state with slave: respond correctly, response timeout, respond abnormally and response error

Slave Address: Slave address in the configuration file (only master, HEX)

Function Code (Command): Modbus command in the configuration file (only master, HEX)

Starting Address:"Modbus register starting address" (HEX) in the configuration file (only master, HEX)

Data/Exception Code: Display the slave data or exception code (HEX)

Notes: When the gateway is configured as a Modbus master, it will show the slave address, function code and the starting address.

Read Data: Show the latest read data (HEX)

Memory mapping address: Starting address of data writing in the gateway

Data: Data writing into the gateway

When users want to fill in the correct "memory mapping address" and "data", you can click the "send" button to

send the package out.

Save Content/Stop Saving: The software supports saving the data to a local disk. When the saving is complete, users need to click "Stop Saving" to save it.

Stop Displaying/Continue to Display: The software supports dynamic or static data debugging.

Clear Data: Click this button to clear the data in the debug interface.

Stop debug and exit: Click the button or the exit button to close the debug interface.

Exit: Force quit.

7 GSD File Instructions

GT200-DP-RS V7.X version has four GSD files:

For Software Configuration mode, the corresponding GSD file is **DPRS2V60A.GSD**.

For DP Integrated Configuration mode, it has three GSD files. Please select the appropriate GSD file according to the actual application.

DPRS2V60M.GSD - Modbus master

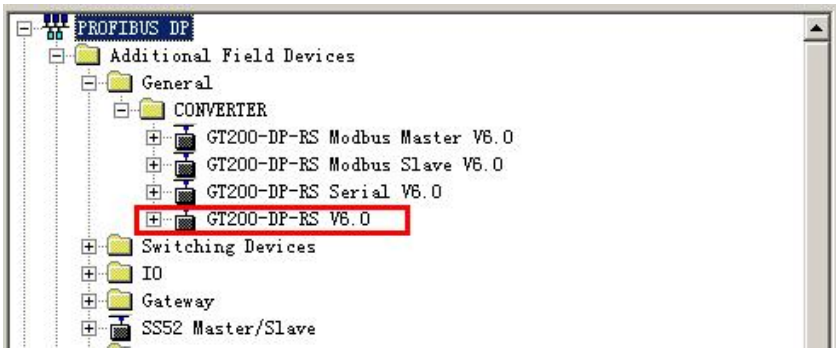
DPRS2V60S.GSD - Modbus slave

DPRS2V60T.GSD - Universal mode

The following chapters introduce the GSD files in STEP7. For how to import GSD files, please refer to the appropriate documents of the PROFIBUS integrated software.

7.1 DPRS2A.GSD

In the "Software Configuration" mode, the parameters of GT200-DP-RS are configured in SST-MPG-CFG software. In the PROFIBUS DP system, user needs to configure the PROFIBUS DP input/output modules. The corresponding GSD file is **DPRS2A.GSD** with the device name "GT200-DP-RS V6.0".



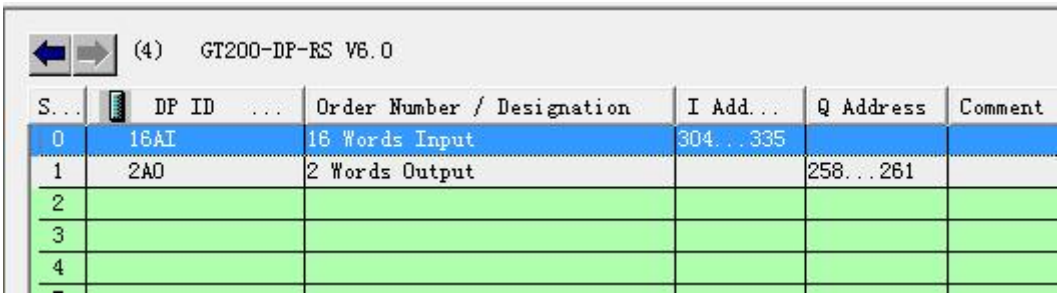
The supported modules are as follows:

Module	Integrity
N Words Input, *M* Words Output	word
1 Byte Input	byte
N Word Input	word
N Words Input Consistent	length
1 Byte Output	byte
N Word Output	word
N Words Output Consistent	length

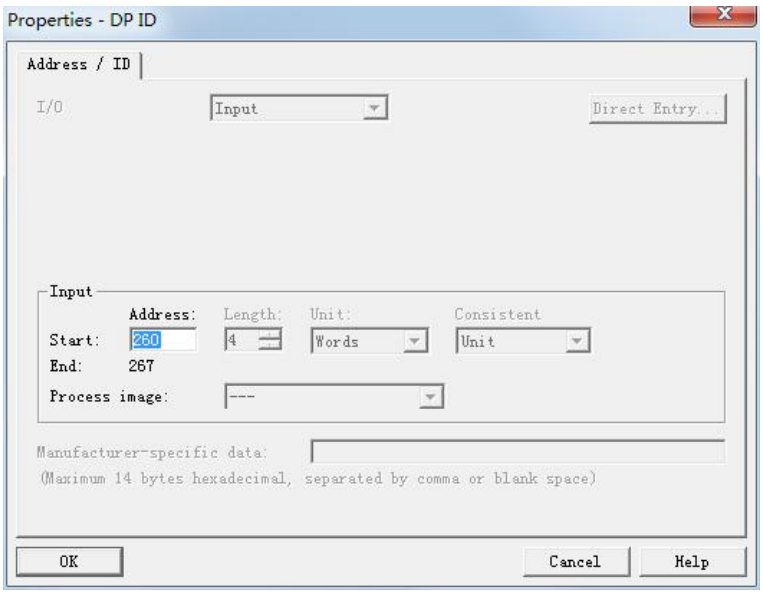
Note:

1. N and M are integers. Please refer to the GSD file or Appendix for complete details.
2. The consistent module is of length integrity.

The modules on the slot can be configured the I/Q (input/output) address, which are the data stored address in the PLC.

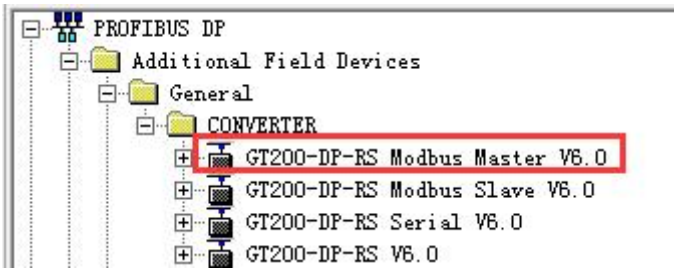


Open the properties window of a module to set the address.



7.2 DPRS2M.GSD

In the "DP Integrated Configuration" mode, if user wants to configure the GT200-DP-RS as a Modbus Master, the corresponding GSD file is **DPRS2M.GSD** with the device name "GT200-DP-RS Modbus Master V6.0".



The GT200-DP-RS supports Modbus function codes 01, 02, 03, 04, 05, 06, 15 and 16 acting as a Modbus Master, and provides 3 type of functional modules. The supported modules are shown below:

Module	Modbus Function Code
Read *N* - *M* Bits (0xxxx)	01
Read *N* - *M* Bits (1xxxx)	02
Read *N* Word(s) (3xxxx)	04
Read *N* Word(s) (3xxxx) Consistent	04
Read *N* Word(s) (4xxxx)	03
Read *N* Word(s) (4xxxx) Consistent	03
Write *N* - *M* Bits (0xxxx)	05/15
Write *N* Word(s) (4xxxx)	06/16
Write *N* Word(s) (4xxxx) Consistent	06/16
Control (*N* Commands)	-
Status (*N* Commands)	-
Exception Codes	-

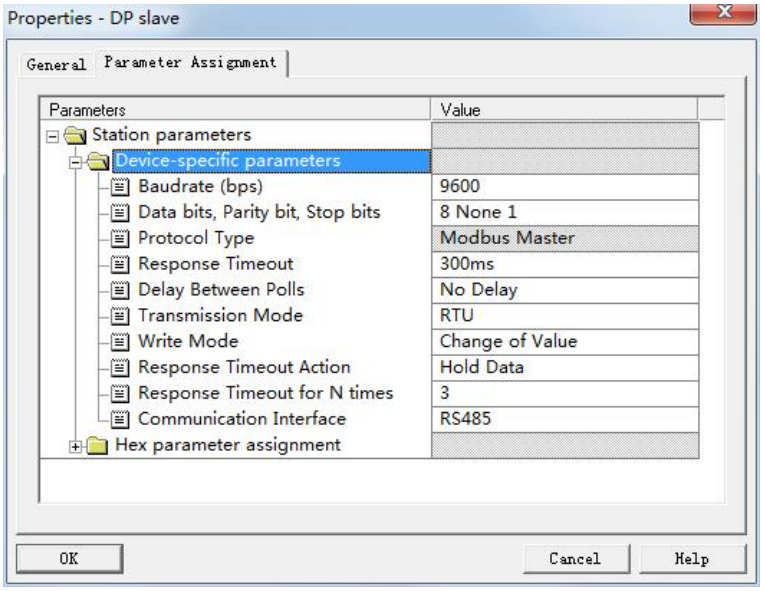
Note:

1. N and M are integers. Please refer to the GSD file for complete details.
2. The consistent module is of length integrity.

7.2.1 Basic Modules

✧ **PROFIBUS DP Slave Properties**

The configurable properties of the GT200-DP-RS are shown below:



Baud Rate (bps): 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps can be selected.

Data bits, Parity bit, Stop bits: 8 None 1, 8 Odd 1, 8 Even 1, 8 Mark 1, 8 Space 1 and 8 None 2 can be selected.

Protocol Type: It depends on the device type (GSD file). For "GT200-DP-RS Modbus Master V6.0" device, it acts as a Modbus Master.

Response Timeout: Time to wait for response from Modbus Slave after Modbus Master sends a command. It is available when "Protocol Type" is Modbus Master. 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1500, 2000, 3000, 4000, 5000ms can be selected.

Delay Between Polls: Delay time between the last response (or response timeout) and the new command. It is available when "Protocol Type" is Modbus Master. No Delay, 50, 100, 150, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1500, 2000ms can be selected.

Transmission Mode: RTU and ASCII can be selected.

Write Mode: Set output mode, Change of value or Cycle can be selected.

Response Timeout Action: When the gateway doesn't receive the response within the time set in "Response Timeout".

Clear: Sets the response data in the input buffer to zero.

Hold: The data in the input buffer remains the same.

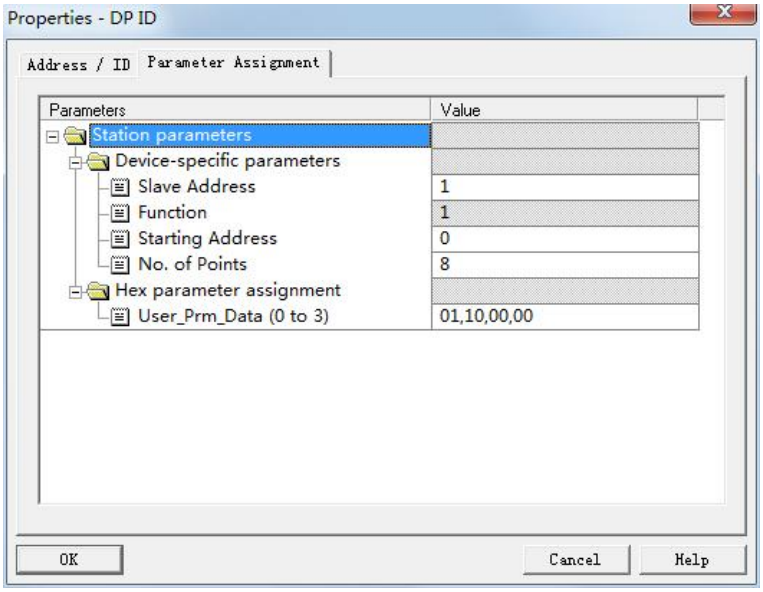
Response Timeout for N times: The number of retries to send the command when response error. Range: 2-254. The default value is 3.

Communication Interface: RS485 and RS232 can be selected, the default is RS485.

✧ **Module Properties**

According to the Modbus address and read/write command, add the appropriate modules for the GT200-DP-RS device.

For example, the configurable parameters of the "Read1-8 Bits (0xxxx)" module is shown below:



Slave address: Modbus slave address inquired by this command.

Function: Function code of the command.

Starting Address: Register/Coil/Status starting address. Range: 0-655335.

No. of Points: Number of data. Configurable only for modules that of function code 01, 02, 15.

7.2.2 Functional Modules

The GT200-DP-RS provides three types of advanced functional modules: Control Module, Status Module and

Exception Module.

✧ **Control Module**

As a Modbus master, the GT200-DP-RS has a functional module "Control Module" to control whether to send the Modbus commands.

Note: Without control module, the Modbus commands are sent automatically, according to the "Delay between Polls" and "Write Mode" of the GT200-DP-RS device properties in chapter 7.2.1.

Control Module	Number of Commands Controlled	Length of Control Bytes
Control (8 Commands)	8	1 byte
Control (16 Commands)	16	2 bytes
Control (24 Commands)	24	3 bytes
Control (32 Commands)	32	4 bytes
Control (40 Commands)	40	5 bytes
Control (48 Commands)	48	6 bytes

The control module should be added above the command modules to be controlled. The commands above the control module or exceeds the range are not controlled by the control module.

Each bit of the control module corresponds to the controlling state of a command below.

Value of Bit	Control Bit Description
0	Disable the command.
1	Enable the command.

For example:

(6) GT200-DP-RS Modbus Maste

S...	DP ID ...	Order Number / Designation	I Add...	Q Address	Comment
1	24DI	Read 17-24 Bits (0xxxx)	0...2		
2	129	Control (8 Commands)		0	
3	2AO	Write 2 Words (4xxxx)		264...267	
4	8DO	Write 1-8 Bits (0xxxx)		1	
5	1AI	Read 1 Word (3xxxx)	256...257		
6	2AI	Read 2 Words (3xxxx)	324...327		
7	2AI	Read 2 Words (3xxxx)	328...331		
8	2AI	Read 2 Words (4xxxx)	332...335		
9	16DI	Read 9-16 Bits (0xxxx)	3...4		
10	4AO	Write 4 Words (4xxxx)		268...275	
11	2AO	Write 2 Words (4xxxx)		276...279	

Add a "Control (8 Commands)" module above some commands. Only the commands on the slot 3 to slot 10 will be controlled by this module. Assume that the data value of this control module is "87" in HEX, which is "10000111" in binary. Then the commands on slot 3, 4, 5 and 10 are enabled, while the commands on slot 6, 7, 8 and 9 are disabled. The commands on slot 1 and 11 are always enabled.

✧ **Status Module**

As a Modbus master, the GT200-DP-RS has a functional module "Status Module" to indicate the status of the Modbus commands.

Status Module	Number of Commands Monitored	Length of Status Bytes
Status (8 Commands)	8	1 byte
Status (16 Commands)	16	2 bytes
Status (24 Commands)	24	3 bytes
Status (32 Commands)	32	4 bytes
Status (40 Commands)	40	5 bytes
Status (48 Commands)	48	6 bytes

The status module should be added above the command modules to be monitored. The commands above the control module or exceeds the range are not monitored.

Each bit of the status module corresponds to the status of a command below.

Value of Bit	Status Bit Description
0	Response correct.
1	Response error or timeout.

Note: When the GT200-DP-RS does not get the correct response of a command, it will retry to send the command. After 3 retries and the response is still incorrect, the status bit will change to "0".

For example:

(6) GT200-DP-RS Modbus Maste

S...	DP ID ...	Order Number / Designation	I Add...	Q Address	Comment
1	16DI	Read 9-16 Bits(0xxxx)	0...1		
2	16DI	Read 9-16 Bits(1xxxx)	3...4		
3	65	Status(8 Commands)	2		
4	24DI	Read 17-24 Bits(1xxxx)	5...7		
5	4AI	Read 4 Words(4xxxx)	324...331		
6	7AI	Read 7 Words(4xxxx)	332...345		
7	16DO	Write 9-16 Bits(0xxxx)		0...1	
8	2AO	Write 2 Words(4xxxx)		264...267	
9	4AO	Write 4 Words(4xxxx)		268...275	
10	1AI	Read 1 Word(4xxxx)	256...257		
11	3AI	Read 3 Words(4xxxx)	346...351		
12	8DI	Read 1-8 Bits(1xxxx)	8		

Add a "Status (8 Commands)" module above some commands. Only the commands on the slot 4 to slot 11 will be monitored by this module. If the value of this status module is "DE" in HEX ("11011110" in binary), the commands on slot 4 and 9 respond error, while the commands on slot 5, 6, 7, 8, 10 and 11 respond correctly. The status of commands on slot 1, 2 and 12 are unknown.

✧ Exception Codes

The Exception Codes module is a 1-word module, able to give the exception codes of up to 48 commands. The bytes of the exception codes are defined below.

High Byte	Low Byte
Command index	Error code

The data values are defined as below.

High Byte Value	Description
0x00-0x2F	Index of command with correct response.
0x80-0xAF	Index of command with incorrect response. The actual index is (N - 0x80).

Low Byte Value	Description
0x00	Response correct.
0xFF	Timeout.
Others	Modbus exception code. Please see appropriate documentations.

Note:

1. The index counts beginning at the first command module under the exception codes module.
2. If the command responds error, the index of this command will add 0x80. For example, a command with index 0x12 when responding correctly, has the index 0x92 (= 0x12 + 0x80) when it responds error.
3. The value keeps updating. Exception codes of different commands take turns displaying.

For example:

(7) GT200-DP-RS Modbus Maste

S...	DP ID ...	Order Number / Designation	I Add...	Q Address	Comment
1	8DI	Read 1-8 Bits(0xxxx)	9		
2	1AI	Read 1 Word(4xxxx)	258...259		
3	65	Exception Codes	352...353		
4	2AI	Read 2 Words(4xxxx)	354...357		
5	4AI	Read 4 Words(4xxxx)	358...365		
6	2AI	Read 2 Words(3xxxx)	366...369		
7	2AI	Read 2 Words(3xxxx)	370...373		
8	3AI	Read 3 Words(3xxxx)	374...379		
9	2AO	Write 2 Words(4xxxx)		276...279	
10	2AO	Write 2 Words(4xxxx)		280...283	
11	16DO	Write 9-16 Bits(0xxxx)		2...3	
12	8DO	Write 1-8 Bits(0xxxx)		4	
13	2AI	Read 2 Words(3xxxx)	380...383		
14	1AI	Read 1 Word(3xxxx)	384...385		

Add a “Exception Codes” module above some commands in slot 3. This exception modules only gives error codes of the commands under slot 3 (from slot 4 to the end). If this exception codes gives value “01 00” “82 01” and “8A FF”, which means that:

1. “01 00” - The command on slot 5 (2th command under the exception code module) responds correctly.
2. “82 01” - The command on slot 6 (3th command under the exception code module) responds error and the exception code is “01”. According to the Modbus exception codes, the error is “illegal function”.
3. “8A FF” - The command on slot 14 (11th command under the exception code module) responds timeout. It does not get any response.

7.3 DPRS2S.GSD

In the “DP Integrated Configuration” mode, if user wants to configure the GT200-DP-RS as a Modbus Slave, the corresponding GSD file is **DPRS2S.GSD** with the device name “GT200-DP-RS Modbus Slave V6.0”.

When the GT200-DP-RS acts as a Modbus slave, users can create the memory for the Modbus coils, status and registers.The GT200-DP-RS provides a functional module “Status” that counts the correct inquiry and response.

The supported modules are shown below:

Module	Modbus Address
N Bits Input (0xxxx)	Coil status (0x)
N Bits Output (1xxxx)	Input status (1x)
N Word(s) Input (4xxx)	Holding register (4x)
N Word(s) Input (4xxx) Consistent	Holding register (4x)
N Word(s) Output (3xxx)	Input register (3x)
N Word(s) Output (3xxx) Consistent	Input register (3x)
Status	-

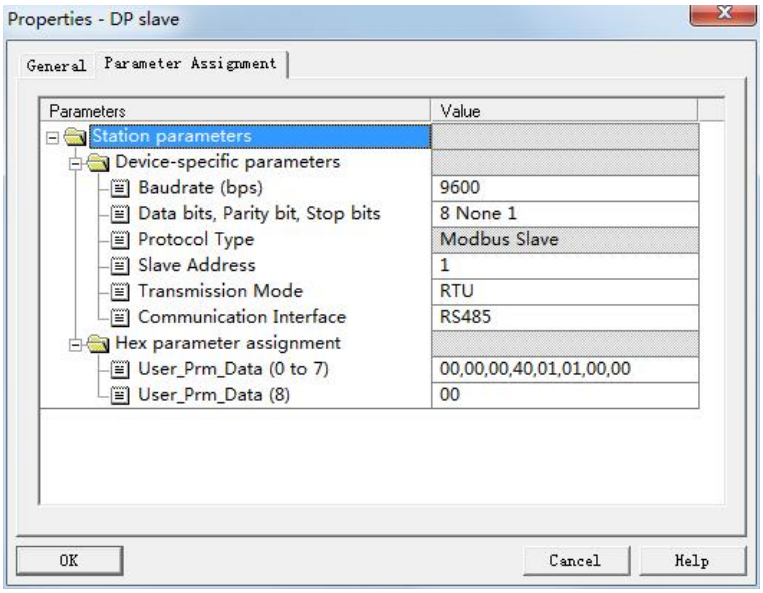
Note:

1. N is integer. Please refer to the GSD file for complete details.
2. User's Modbus master can regard the GT200-DP-RS as a normal Modbus slave device.

7.3.1 Basic Modules

✧ **PROFIBUS DP Slave Properties**

The configurable properties of the GT200-DP-RS are shown below:



Baud Rate (bps): Configure serial baud rate, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps can be selected.

Data bits, Parity bit, Stop bits: 8 None 1, 8 Odd 1, 8 Even 1, 8 Mark 1, 8 Space 1 and 8 None 2 can be selected.

Protocol Type: It depends on the device type (GSD file). For "GT200-DP-RS Modbus Slave V6.0" device, it acts

as a Modbus Slave.

Slave Address: When Protocol Type is Modbus Slave, configure the slave address of GT200-DP-RS. Range: 1-247.

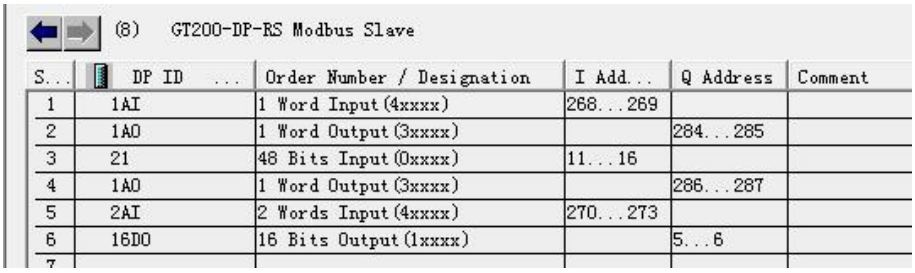
Transmission Mode: RTU or ASCII can be selected.

Communication Interfaces: RS458 and RS232 can be selected, the default is RS485.

✧ **Module Properties**

Add appropriate modules of different Modbus memory address. The Modbus coil/status/register address begins at 0 (base0) or 1 (base 1), and begins at the first module. The following modules of same address area continue the address. Users can edit the DP input/output address of these modules.

For example:



Add some modules on the slot. The first module "1 Word Input (4xxxx)" creates a 1-word memory of 4x Holding Register, with 4x0001 address. The Modbus address of GT200-DP-RS with the configuration in above figure is:

Module	Modbus Address Area	Address (base 1)
1 Word Input (4xxxx)	4x Holding Register	4x0001
1 Word Output (3xxxx)	3x Input Register	3x0001
48 Bits Input (0xxxx)	0x Coil Status	0x0001-0x0048
1 Word Output (3xxxx)	3x Input Register	3x0002
2 Word Input (4xxxx)	4x Holding Register	4x0002-4x0003
16 Bits Output (1xxxx)	1x Input Status	0x0001-0x0016

7.3.2 Functional Modules

✧ **Stats Module**

The Status Module is a 1-byte module that counts the correct inquiry and response. When the GT200-DP-RS acts

as a Modbus slave, once it receives an inquiry and can respond correctly, the value of the Status Module will add one. The Status Module can be added to any slot and counts for all the commands. The counter will be reset when reaching 0xFF.

For example:

(8) GT200-DP-RS Modbus Slave

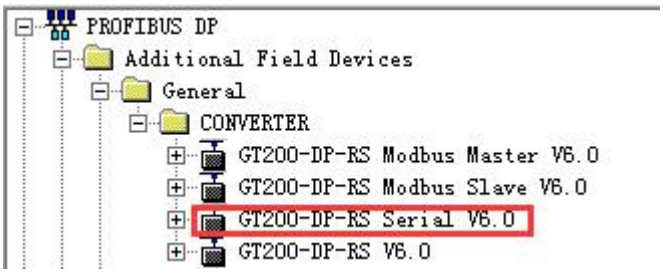
S...	DP ID ...	Order Number / Designation	I Add...	Q Address	Comment
1	1AO	1 Word Output (3xxxx)		284...285	
2	1AO	1 Word Output (3xxxx)		286...287	
3	2AI	2 Words Input (4xxxx)	270...273		
4	65	Status	17		
5	16DO	16 Bits Output (1xxxx)		5...6	
6	16DI	16 Bits Input (0xxxx)	18...19		
7	5AI	5 Words Input (4xxxx)	274...283		
8					

Add a Status Module. Assume that its value is “C6” now. If the user’s Modbus master uses function code 04 to inquiry the 3x0001 input register, the GT200-DP-RS is able to respond correctly then the value of status module will change to “C7”. If the Modbus master inquiry the 3x1000 register which is an illegal address for the GT200-DP-RS with the configuration in above figure, the value of status module won’t change.

7.4 DPRS2T.GSD

In the “DP Integrated Configuration” mode, if user wants to transmit universal serial data by GT200-DP-RS, the corresponding GSD file is **DPRS2T.GSD** with the device name “GT200-DP-RS Serial V6.0”.

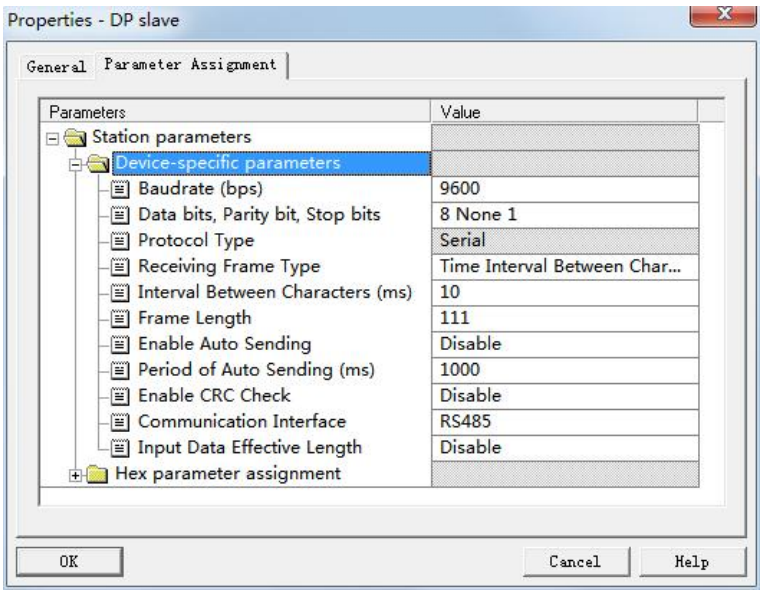
Note: Please see chapter 5.3 for working principle of universal serial mode.



The supported modules are the same with that of **DPRS2A.GSD**. Please refer to the GSD file or Appendix for complete details.

✧ **PROFIBUS DP Slave Properties**

The configurable properties of GT200-DP-RS are shown below:



Baud Rate (bps): Configure serial baud rate, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps can be selected.

Data Bits，Parity Bit，Stop Bits: 8 None 1, 8 Odd 1, 8 Even 1, 8 Mark 1, 8 Space 1, 8 None 2 Optional.

Protocol Type: It depends on the device type (GSD file). For "GT200-DP-RS Serial V6.0" device, it acts as a Serial device.

Receiving Frame Type: "Time Interval Between Characters" (character timeout) and "Frame Length" (number of characters) optional. Select the way to capture the data frames.

Time Interval Between Characters: Breaks the frames according to the time interval between characters.

Frame Length: Breaks the frames according to the data length (number of characters).

Interval Between Characters (ms): The time interval between characters. When selecting "Time Interval Between Characters" in Receiving Frame Type, if the interval time between characters exceeds the set time, the data received before are regarded as a a frame.

Frame Length: The number of characters in a frame. When selecting "Frame Length" in Receiving Frame Type, every data of the set length are regarded as a frame.

Enable Auto Sending: If enable, the output data will be sent automatically according to the Period of Auto Sending. If disable, the output data is sent according to the working principle in chapter 5.3.

Period of Auto Sending (ms): The period to send output data when enabling Auto Sending.

Enable CRC Check: Enable and Disable optional. If enable, it adds the CRC check bytes for the output data. When receiving data, it checks the CRC and filters the CRC bytes of correct frames.

Communication Interface: RS485 and RS232 optional.

Input Data Effective Length: The input data length. If enable, the received frame indicates the data length in "Data length" (see chapter 5.3.2). If disable, the related value is fixed "11".

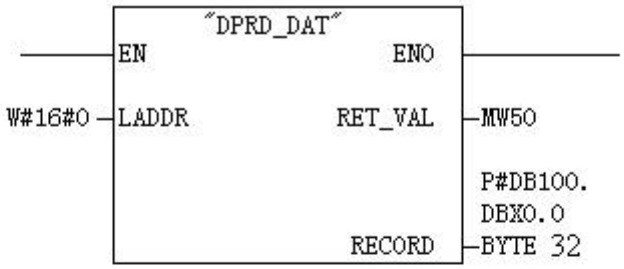
Appendix: PROFIBUS DP Modules

The supported PROFIBUS DP modules of **DPRS2A.GSD** and **DPRS2T.GSD** are shown below.

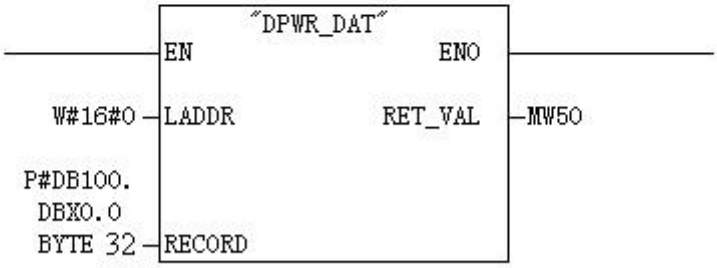
Module	Integrity
4 Words Input, 4 Words Output	Word Integrity
8 Words Input, 8 Words Output	Word Integrity
24 Words Input, 24 Words Output	Word Integrity
56 Words Input, 56 Words Output	Word Integrity
1 Byte Input	Byte
1 Word Input	Word Integrity
2 Word Input	Word Integrity
4 Word Input	Word Integrity
8 Word Input	Word Integrity
16 Word Input	Word Integrity
32 Word Input	Word Integrity
64 Word Input	Word Integrity
2 Word Input Consistent	Length Integrity
4 Word Input Consistent	Length Integrity
8 Word Input Consistent	Length Integrity
16 Word Input Consistent	Length Integrity
1 Byte Output	Byte Integrity
1 Word Output	Word Integrity
2 Word Output	Word Integrity
4 Word Output	Word Integrity
8 Word Output	Word Integrity
16 Word Output	Word Integrity
32 Word Output	Word Integrity
64 Word Output	Word Integrity
2 Word Output Consistent	Length Integrity
4 Word Output Consistent	Length Integrity
8 Word Output Consistent	Length Integrity
16 Word Output Consistent	Length Integrity

For the data modules of word/byte integrity, the data can be used by the “MOVE” command in STEP7 or other general programs.

For the data modules of length integrity, the data should be compressed and sent. In STEP, it mainly uses “SFC 14” and “SFC 15”. Please refer to the appropriate documents of the PROFIBUS DP PLC program.


"DPRD_DAT"
EN
ENO
W#16#0
LADDR
RET_VAL
MW50
P#DB100.
DBX0.0
RECORD
BYTE 32

SFC14


"DPWR_DAT"
EN
ENO
W#16#0
LADDR
RET_VAL
MW50
P#DB100.
DBX0.0
BYTE 32
RECORD

SFC15