# Modbus/DeviceNet Gateway GT200-DN-RS

User Manual REV 1.4







E-mail: SUPPORT@SSTCOMM.COM

WWW.SSTCOMM.COM

User Manual

# Catalog

1 About This Document	4
1.1 General	4
1.2 Important User Information	4
1.3 Terms	4
2 Product Overview	5
2.1 Product Function	5
2.2 Product Features	
2.3 Technical Specification	5
2.4 Attention.	7
2.5 Related Products	7
3 Product Appearance	
3.1 Indicators	8
3.2 Status Setting Switches and LED	9
3.2.1 Status Setting Switches	9
3.2.2 Setting Switches of DeviceNet Address	
3.2.3 LED	
3.3 Communication Interface	
3.3.1 Modbus Interface	
3.3.2 DeviceNet Interface	
4 Use Method	
4.1 Quick Start Guide	
4.2 Hardware Wiring	14
4.3 Software Configuration	
4.4 Run	
4.4.1 Data Exchange Mode	14
4.4.2 Terminal Resistor	
5 Software Instructions	
5.1 Notes before Configuration	
5.2 User Interface	
5.3 Device View Operation	
5.3.1 Device View Interface	
5.3.2 Operation Mode	
5.3.3 Operation Types	
5.4 Configuration View Operation	
5.4.1 Interface of Fieldbus Configuration	
5.4.2 Interface of Subnet Configuration	
5.4.3 Interface of Node Configuration	
5.4.4 Interface of Command Configuration	
5.4.5 Comment Interface	



# GT200-DN-RS Modbus/DeviceNet Gateway User Manual

5.5 Conflict Detection	
5.5.1 Operation of Command List	
5.5.2 Operation of Memory Mapping Area	
5.6 Hardware Communication	
5.6.1 Serial Configuration	
5.6.2 Upload Configuration	
5.6.3 Download Configuration	
5.7 Load and Save Configuration	
5.7.1 Load Configuration Project	
5.7.2 Save Configuration Project	
5.8 Export Excel File	
5.9 Monitor I/O Data	
6 Installation	
6.1 Machine Dimension	
6.2 Installation	
7 Instructions of DeviceNet I/O and parameters	
7.1 I/O Configuration	
7.2 DeviceNet Parameters	
7.3 DeviceNet Network Configuration Instructions	





# **1 About This Document**

#### 1.1 General

This document describes every parameter of the gateway GT200-DN-RS and provides using methods and some announcements that help users use the gateway. Please read this document carefully before using the gateway.

For further information, documentation etc., please visit the SSTCOMM website: http://www.sstcomm.com.

#### **1.2 Important User Information**

The data and examples in this manual cannot be copied without authorization. SSTCOMM maybe upgrades the product without notifying users.

**SSTORM** is the registered trade mark of SSTCOMM Automation.

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

#### 1.3 Terms

DeviceNet: DeviceNet protocol

RS-485/RS-232: Hardware specifications of serial interface

Modbus: MODICOM Modbus Protocol PI-MBUS-300 Rev.J



# **2** Product Overview

#### **2.1 Product Function**

The gateway can connect multiple devices with Modbus (RS-485/RS-232) interface to DeviceNet network. It acts as a master at the side of Modbus network, and a slave at the side of DeviceNet network. It supports RS-485 and RS-232 at the serial interface. Comparing with other products, GT200-DN-RS adds the debugging function, which makes the application so convenient in industrial field. RS-485 interface is used for communication while RS-232 interface is used to debug, and RS-232 interface is used for communication while RS-232 interface is the special interface of configuration mode.

GT200-DN-RS works through the data mapping between networks, mapping Modbus parameters to DeviceNet I/O data.

#### **2.2 Product Features**

- Acts as a DeviceNet slave: Group 2 Only Slave.
- Support all the baudrate which accords with the DeviceNet protocol, and support sensing baud rate automatically function.
- Acts as a Modbus master, and support the 1, 2, 3, 4, 5, 6, 15, 16 function codes.
- ▶ The range of input-voltage is 8~30V, and the standard working voltage is 24VDC.
- ➢ Free configuration software SST-MD-CFG.
- Support the debugging without PLC.

#### 2.3 Technical Specification

[1] Communication rate:

- > DeviceNet interface supports: 125kbit/s, 250kbit/s, and 500kbit/s;
- The default parameters of Modbus interface are 19200bps, 8 bits, no parity, 1 stop bit;
   The Modbus baud rate: 300, 600, 1200, 2400, 9600, 19200, 38400, 57600, 115200bps;

[2] DeviceNet topology:

#### GT200-DN-RS Modbus/DeviceNet Gateway User Manual

#### Trunk lines

Thick cable and thin cable both can be used to build the trunk lines. When the thick cable and thin cable are mixed to build the trunk lines, the longest cable length can be calculated through the following formulas:

Lthick+5*Lthin=500m	125kbit/s
$L_{thick}$ +2.5* $L_{thin}$ =250m	250kbit/s
Lthick+Lthin=100m	500kbit/s

Here L<sub>thick</sub> is the length of thick cable, and L<sub>thin</sub> is the length of thin cable.

> Drop lines

The length of drop lines is the distance from tap of the trunk lines to the transceiver of every device, and it should be less than 6m. The length of drop lines is related to baud rate, and the longest length with different baud rate shows in Table1.

Baud Rate	Length of Cable
125kbit/s	156m
250kbit/s	78m
500kbit/s	39m

- [3] Working mode: DeviceNet interface only support: Group 2 Only Slave;
- [4] Working environment:
  - Relative Humidity: 5% to 95% (No condensing)
  - > Temperature:  $-4^{\circ}F \sim 140^{\circ}F (-20^{\circ}C \sim 60^{\circ}C)$
  - Pollution level: 3
- [5] EMC testing standard compliant;
- [6] Power: 24VDC (11V~30V), maximum 80mA (24V);

Within the module, it uses DC to DC conversion, and the conversion efficiency is not less than 70%;

[7] External dimension (W\*H\*D): 1.57 in\*4.92 in\*4.33 in (40mm\*125mm\*110mm).



#### GT200-DN-RS Modbus/DeviceNet Gateway User Manual

#### 2.4 Attention

- To prevent stress, prevent module panel damage;
- To prevent bump, module may damage internal components;
- Power supply voltage control in the prospectus, within the scope of the requirements to burn module;
- To prevent water, water module will affect the normal work;
- Please check the wiring, before any wrong or short circuit.

#### **2.5 Related Products**

There are other products: GT200-DP-RS, GT200-DP-DN and so on.

If you want to get more information about these products, please visit the SSTCOMM website: http://www.sstcomm.com.





# **3 Product Appearance**



Note: This picture is only for reference, the product appearance should take the material object as a standard.

#### 3.1 Indicators

The explanation of indicators show as Table 2, Table3 and Table4:

 Table 2-Indicators of Module Status (MS)

Indicators	Description
Off	No power supply or broken indicators
Always Green	Work normally
Green blinking	Not correctly configured
Red blinking	Recoverable faults, Modbus communication faults (such as not find the slave station)
Always Red	Unrecoverable faults



#### **User Manual**

Red-Green blinking

Self-testing is ongoing

#### Table 3-Indicators of DeviceNet network Status (NS)

Indicators	Description	
Off	The repetitive MAC ID detection is not successful or no power supply	
Green blinking	The devices are online but there are not connections established	
Always Green	The devices are online and there are connections established	
Red blinking	One or more I/O connections have been timeout	
	The device detects unrecoverable faults and cannot communicate, such as	
Always Ked	there is repetitive DeviceNet address on net.	

Table 4-Indicators of Serial interface Status (TX, RX)

Indicators	Status	Description
RX (Green)	Blinking	Serial port is receiving data
	Off	Serial port is not receiving data
TX (Red)	Blinking	Serial port is sending data
	Off	Serial port is not sending data

#### **3.2 Status Setting Switches and LED**

#### 3.2.1 Status Setting Switches

Status setting switches have three functions:

1) Modify DeviceNet baud rate

2) Set working mode: Configuration and run mode are optional. At the status of configuration, the LED shows "CF".

3) Set debugging: Debug and normal mode are optional. GT200-DN-RS has the function of debugging, and it provides users with easy way for debugging Modbus network data communications. At the status of debugging, the LED shows "db".

Note: The priority of configuration mode is higher than debugging. When configuring the gateway, the debug



switch should be dialed to normal. When debugging the gateway, mode switch should be dialed to run.

Status setting switches are below the product:



	4 3	2	1
	Baud rate	Mode	Debug
1	00:125K	Configuration	Debug
	01:250K		
0	10:500K	Run	Normal
	11: Automatic		

**Note**: If you reset the status switches, you should restart GT200-DN-RS (power off and power on) to make the settings take effect.

#### 3.2.2 Setting Switches of DeviceNet Address



According to the above, the DeviceNet address is calculated as follow:

**DeviceNet address =**  $(A \times 10) + (B \times 1)$ 

#### 3.2.3 LED

The main contents of LED include: current baud rate (only show at startup), current DeviceNet address (show at running)





#### 3.3 Communication Interface

#### **3.3.1 Modbus Interface**

Modbus interface use open 3 pin pluggable terminal, users could accord to the panel instruction to wire:



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

RS-485 interface



Pin	Function
1	RX, connect to RX of user's device RS-232
2	TX, connect to TX of user's device RS-232
3	GND, connect to GND of user's device RS-232

RS-232 interface





#### **3.3.2 DeviceNet Interface**

5-pin connector:



Shielding

Open 5-pin connector at the side of DeviceNet:



Pin	Wiring
1	GND(24V)
2	CAN-
3	shielding
4	CAN+
5	+24V





### 4 Use Method

#### 4.1 Quick Start Guide

1. Setting DeviceNet address manually

Before connecting DeviceNet master, sets DeviceNet address by moving code switch at the gateway's side. The range of DeviceNet effective address is 0 to 63. The calculation method of DeviceNet address is shown at chapter 3.2.2 of the document. To supply power to this module, the LED displays blinking "bT", and then shows "12" or "25" or "50", respectively indicates "125K", "250K", "500K".Finally, it shows the DeviceNet address you have set. When baud rate is set to automatically baudrate sensing state, if there is no other CAN node on the network to send data, it shows "bT".

**Note:** When using DIP switch to modify the DeviceNet address, restart the gateway to take the new address effect. 2. In the configuration mode, set DeviceNet address, Modbus parameters and commands through gateway configuration software SST-MD-CFG.

The method of entering configuration mode is: Dial the mode setting switch to "1", and power on the module, the module can enter the configuration mode. Then connect with SST-MD-CFG for configuration. After configuration, restart the gateway to run normally.

**Note**: RS-232 interface is specialized configuration interface, in configuration mode, please pay attention to the wiring exactly.

3. Setting DeviceNet baud rate manually

Set DeviceNet baud rate manually though the baud rate setting switches below the gateway, baud rate setting switches have four combinations, respectively indicate 125K, 250K, 500K, automatically sensing baud rate. See chapter 3.2.1 of the document.

4. Connect Modbus interface and DeviceNet interface accurately and checkup the wiring.

5. Power on, the module enter the run mode. Before powering on, you should dial the mode setting switch to running status, debugging setting switch to normal.





#### 4.2 Hardware Wiring

1. In accordance with the third chapter about DeviceNet interface instructions, wire every pin of 5-pin terminal exactly, no power on at this time.

- 2. In accordance with the third chapter about Modbus interface, properly wiring.
- 3. Checkup all wiring.
- 4. Power on the module, the module enter run mode. Pay attention to settings of mode switch and debug switch.

#### 4.3 Software Configuration

Users connect GT200-DN-RS gateway to PC. Set gateway's Modbus parameters, commands, and DeviceNet parameters through gateway configuration software-SST-MD-CFG. Before powering on the gateway, you should dial the mode setting switch to "1", make the gateway be at the status of configuration.

See SST-MD-CFG Software configuration instruction.

#### 4.4 Run

#### 4.4.1 Data Exchange Mode

The data exchange between GT200-DN-RS Modbus and DeviceNet is established by "mapping". GT200-DN-RS has two data buffers, one is DeviceNet network input buffer, and the other is DeviceNet network output buffer. Modbus read commands read the data and then write the data into input buffer for DeviceNet network reading. Modbus write commands get data from network output buffer, and then output the data to Modbus devices by writing commands.



**User Manual** 



Users can configure 48 commands at most, and can use a Modbus command to read a serial Modbus registers.

- ✤ Note 1: If there is something wrong with Modbus communication, DeviceNet I/O data cannot be effectively collected, and the data got through I/O scanning is zero.
- Note 2: When DeviceNet interface of GT200-DN-RS receives network output-data, Modbus interface will send writing-commands. That is to say that after DeviceNet master station sending data, Modbus interface of GT200-DN-RS will send writing-commands, and transmit data to Modbus slave devices. If AB's PLC is in programming mode, there will be no the network output-data.
- Note 3: During the configuration of GT200-DN-RS, when polling mode of output commands is set to "Change of State", the function of the local data exchange cannot be used.

Local data exchange: Configure writing-commands to input-area (0000~3FF0)

#### 4.4.2 Terminal Resistor

DeviceNet network requires a 1200hm terminal resistor respectively at the two farthest terminals of the network. Modbus requires terminal resistors too. GT200-DN-RS has a terminal resistor at the side of Modbus interface; users only need add a 1200hm terminal resistor at the other side of the Modbus network.





# **5** Software Instructions

#### **5.1 Notes before Configuration**

SST-MD-CFG is software which bases on Windows platform, and used to configure the gateway GT200-DN-RS.. Users could set Modbus and fieldbus parameters and commands.

This document introduces the using method of GT200-DN-RS.

After installed, double-click on the icon and enter into Configuration interface.

💥 Gateway Configuration Soft	ware SST-ED-CFG	
File(F) Edit(E) Tool(T) Help(H)		
🗋 🖬 🖬 🗑 🖉 🗙 📥 📥		
Device	Configuration	
Fieldbus	Type of Protocol	DeviceNet
Subnet	DeviceNet Address(0~63)	0
	DeviceNet Baud rate	Automatic Listener
	Size of DeviceNet Input Buffer	64
	Size of DeviceNet Output Buffer	64
Ready	3	Digital

#### 5.2 User Interface

The interface of SST-MD-CFG includes: Title bar, Menu bar, Toolbar, Status bar, Device plate, Configuration plate and Comment plate.

**Remark:** In this software, all the gray parts can't be modified.



#### **User Manual**

evice	Configuration	Iviend Bal	Intle Bar
Device plate: Users of operation objects, inv Fieldbus, Subnet, and and commands	Can select cluding d adding nodes	-63) et lagut Buffer et Output Buffer	DeviceNet 0 Automatic Listener 64 64 Configuration plate: Input configuration parameters, gray parts cannot be changed
			Comment plate: Explain th function of the configuration options

Toolbar:

Toolbar is shown as below:



The function of Toolbar: New, Open, Save, Add Node, Delete Node, Add Command, Delete Command, Upload, Download, Conflict Detection, Auto Mapping, Export EXCEL and Monitor I/O Data..

DNew: Create a new configuration project

Gen: Open a configuration project

Save: Save current configuration

Add node: Add a node for Modbus master

Delete node: Delete a node for Modbus master

Add command: Add a Modbus command

X Delete command: Delete a Modbus command

#### GT200-DN-RS Modbus/DeviceNet Gateway User Manual

<sup>1</sup>Upload: Read the configuration information from the module and shown in the software

Download: Download the configuration file to the gateway

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

Auto Mapping: Used to automatically calculate the mapped memory address without conflict by each command

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

P Monitor I/O Data: Monitor the gateway memory buffer data

#### **5.3 Device View Operation**

#### 5.3.1 Device View Interface



#### 5.3.2 Operation Mode

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





#### **5.3.3 Operation Types**

 Add node operation: Right-click on subnet or existed nodes, and then you can add a new node named "new node" under subnet.

2) Delete node operation: Right-click on the node to be deleted, and then you can delete the node. The node and its all commands will be deleted.

3) Add command operation: Right-click on the node, and then you can add a command for the node. The commands dialog box is shown as follow:

Currently, GT200-DN-RS supports the commands: 01, 02, 03, 04, 05, 06, 15 and 16 commands

Select the command: Double click on the command



**User Manual** 

01.0	Pood Coll Status
UZ F	kead Input Status
103 F	Read Holding Registers
04 F	Read Input Register
05 F	Force Single Coil
06 F	Preset Sinale Register
07 F	Read Exception Status
08.0	Diagnostics
11 F	Fetch Comm Event Ctr
12 6	Fetch Comm Event Log
121	Program Controllor
	Poll Controller
141	
15 F	-orce Multiple Colls
16 F	Preset Multiple Registers

4) Delete command operation: Right-click on the command and then you can delete 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.

#### **5.4 Configuration View Operation**

#### 5.4.1 Interface of Fieldbus Configuration

In the device view, click on "fieldbus", the configuration view is shown as follows:

Configurable items include: size of DeviceNet input buffer, size of DeviceNet output buffer and DeviceNet address.

Size of DeviceNet input buffer: There are 8, 16, 32, 64, 96, 128 and 160 to be selected.

Size of DeviceNet output buffer: There are 8, 16, 32, 64, 96 and 112 to be selected.

Note: The sum of input buffer and output buffer must be less than 240. (Expect 240). If the size of input buffer is 160, the size of output buffer is at most 64. If the size of output buffer is 112, the size of input buffer is at most 96, or the configuration didn't work.



#### User Manual

* Cateway Configuration So	ftmare SST-ID-CBC		
File(R) Edit(R) Teal(T) Halm(H)	Iteale JJI-an Cry		
	Configuration	The second start	
Fieldbus	Type of Protocol	DeviceNet	
Subnet	DeviceNet Address(U~03)	U	
	DeviceNet Baud rate	Automatic Listener	
	Size of DeviceNet Input Buffer	10	
	Size of DeviceNet Output Buffer	8	
		16	
		32	
		96	
	Deviceivet input bytes, GT100-DIN-RS input byte	es: 8, 16, 32, 64 and 96 optional	
Ready			Digital

#### **5.4.2 Interface of Subnet Configuration**

The protocol type is Modbus Master, and configurable parameters are shown as follows:

Modbus communication baud rate, data bits, check bit, Stop bits, transmission mode, response timeout, delay

between polls, output mode, scan rate and communication interface.

Interface of configuration view is shown as follow:



#### **User Manual**

💥 Gateway Configuration Soft	ware SST-ID-CFG		
File(F) Edit(E) Tool(I) Help(H)			
🗋 🚅 🔜 赌 🗑 🗶 古 古	🤐 🛅 🔁 💭		
Device	Configuration		
Fieldbus	Protocols Select	Modbus Master	
Subnet	Baud Rate	19200	
	Data Bits	8	
	Check Bit	None	
	Stop Bits	1	
	Address		
	Transmission Mode	RTU	
	Response Timeout(5~60000ms)	300	
	Delay between Polls(0~2500ms)	0	
	Output Mode	Change of Value	
	Output Pulse(200~2500ms)		
	Scan Rate(1~255)	10	
	Communication Interface	RS485	
	Debug Interface	RS232	
	1	,1	
P	]		
Ready		Digits	al //

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

Data Bits: 8 bits

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

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

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

**Response Timeout:** After the Modbus master sending commands, the time waiting for response from the slaves, the range is 300~60000ms.

Delay between Polls: After a command of Modbus having been sent and having received correct response,

the time before next command being sent, the range is:  $0 \sim 2500$ ms.

Output Mode: There are three types of output command: Cycle, Forbidden and Change of Value.

Cycle: same as Modbus read command output way, start scan output according to scan rate

Forbidden: disable output of Modbus write command

Change of Value: when the output data change, the write command will be sent and stop to output when receiving the right response



#### GT200-DN-RS Modbus/DeviceNet Gateway User Manual

**Scan Rate:** Scan Rate is the ratio of fast scan cycle to slow scan cycle. If this parameter value is set to 10 then every fast scan command will be sent 10 times and those slow scan commands will be sent once.

**Communication Interface:** Choose RS584 or RS232 as a communication interface.

#### **5.4.3 Interface of Node Configuration**

When the subset protocol is "Modbus master", in the interface of device view, left-click on a node, the configuration interface is shown as follow, and you can set slave address in the interface:

💥 Gateway Configuration Soft	ware SST-ID-CFG	
File(F) Edit(E) Tool(T) Help(H)		
🗅 🗃 🖬 🕌 🖼 🛎 🗄	22 10 10 10 10 10 10 10 10 10 10 10 10 10	
Device	Configuration	
Fieldbus	Slave address (0~247)	
🖻 Subnet		
New node		
Ready	*	Uppercase Digital //

#### 5.4.4 Interface of Command Configuration

In the interface of device view, left-click on a command, the configuration interface is shown as follow:



#### **User Manual**

💥 Gateway Configuration Soft	ware SST-ID-CFG			
File(F) Edit(E) Tool(T) Help(H)				
🗋 🗃 🖬 🗑 🐨 🗙 占 占	2 🖻 🔁			
Device	Configuration			
Fieldbus	Slave address (0~247)	1		
🗄 Subnet	Function Code	3		
🖻 Node-1	Starting Address			
Read Holding Registers	Number of Data			
	Mapping Address (HEX)			
	Mapping Bit (0~7)			
	Number of Bytes			
	Byte Swap	no swap		
	Type of Check	CRC		
	Type of Scan	Fast Scan		
		6 - 1	_	
	There are three types: no swap, double-byte swap, four-byte swap. The here and a final fin			
	The byte order of Modbus is the most significant byte (MBB) first, that of DeviceNet is the least significant byte first.			
	posers may need to swap the byte order to ge	e die right value.		
J	]			
Ready		Digital	11	

**Starting Address:** the starting address of the register/switching value/coil in Modbus salve device, the range of the parameter value is 0 to 65535.

Number of Data: The number of register/switching value/coil of 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: 0x0002 ~ 0x009F

Write command:  $0x4000 \sim 0x406F$ 

When write commands are used as local data exchange, they also can use:  $0x0000 \sim 0x006F$ 

Mapping Bit (0 ~ 7): For the bit operation commands, the position of start-bit in a byte, and the range is:  $0 \sim$ 

7.

**Byte Swap:** There are three kinds of types: "no swap", "double-byte swap" and "four-byte swap". Modbus byte sequence is that the Most Significant Byte (MSB) has the highest priority. DeviceNet byte sequence is that the Least Significant Byte (LSB) has the highest priority. For example, if a Modbus register value is 0x1234, the DeviceNet value is 0x3412 when not using "double-byte swap". Users should exchange the sequence of bytes so as to get right value. Usually, selecting "double-byte swap" is OK. If users use two continuous Modbus registers to



express a four-byte value, they can use "four-byte swap", maybe it will achieve.

Type of Scan: There are two ways, fast scan and slow scan. Every Modbus command can be set to fast scan

or slow scan. The gateway will send Modbus command according to the "Scan Rate". Slow scan is fast scan

multiples scan rate. (Configure it in the interface of subnet configuration interface)

#### **5.4.5 Comment Interface**

Notes view displays the explanation of configuration items. For example the notes that show how to

configure the starting address of memory mapping is shown as follow:

```
Data mapping in the module memory address range
Read command: 0x0002~0x009F
Write command: 0x4000~0x406F
Input 0 for Modbus address mapping command status, if N number of the command does not respond, the byte is N
Input 1 for Modbus address mapping node status, if M number of the command does not respond, the byte is M
Write command as a local data exchange can also use the area : 0x0000~0x006F
Users can also click on the "Calculate Mapping Address "to let the software calculate
```

#### **5.5 Conflict Detection**

For the detection of whether there is collision of "the starting address of memory mapping" or not. If there is

collision then you can modify it quickly. The interface is shown as follow:





#### 5.5.1 Operation of Command List

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

Order list ✓Read Holding Registers ✓Read Input Register ✓Force Multiple Coils ✓Preset Single Register

#### 5.5.2 Operation of Memory Mapping Area

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

Input-mapping address: 0x0002 ~ 0x009F;

Output-mapping address: 0x4000 ~ 0x406F.

Each box represents a byte address.

Green: read command is shown in input mapping area, it will be in green without conflict.

Yellow: Write command: When address mapping area is located in input area, it will be in yellow without

conflict;

Blue: When address mapping area is located in output area, it will be in blue without conflict.

Red: In input area or output area, different command occupied on the same byte, this byte area will be in red.

Input area			Output area	
0000			4000	-
0010			4010	
0020			4020	
0030			4030	_
0040			4040	
0050			4050	
0060			4060	
0070			4070	_
0080			4080	
0090			4090	and a
004.0			404.0	_
Input	Output	Conflict	Local data exchange	

For bit operation commands, the meanings of all colors are also applicable.



#### GT200-DN-RS Modbus/DeviceNet Gateway User Manual

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



#### 5.6 Hardware Communication

Hardware communications' menu items are shown as follow:

Tool (T)Help (H)Serial Connection (P)Ethernet Connection (E)Upload (U)Download (D)Mapping Address Conflict Detection (C)Export EXCEL (L)Monitor I/O Data (S)

#### 5.6.1 Serial Configuration

The software automatically scan the available serial port of system, and the available serial can be shown in

serial list. After modifying the item, pressing "OK" to save your settings.

Note: Apart from the serial port, the other parameters are fixed values: 19200, None, 8, 1.



GT200-DN Modbus/De	<i>T200-DN-RS</i> odbus/DeviceNet Gateway				
User Manual					
	Serial Port Co	nfigurat	ion 🛛 🔀		
	Port		•		
	Baud rate	19200	×		
	Check	None	¥		
	Data bits	8	*		
	Stop Bits	1	×		
	OK		Cancel		

#### 5.6.2 Upload Configuration

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

	Uploading is successful!
$\checkmark$	Uploading DeviceNet parameters configuration
$\checkmark$	Uploading Modbus parameters configuration
$\checkmark$	Uploading Modbus commands configuration

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

#### 5.6.3 Download Configuration

Choose download configuration, download the configuration from software to the gateway, the interface is shown as follows:



# GT200-DN-RS Modbus/DeviceNet Gateway User Manual Download Configuration Downloading is successful! Downloading DeviceNet parameters configuration Downloading Modbus parameters configuration Downloading Modbus commands configuration

Note1: Before downloading the configuration, please check whether the port is the available port.

Note 2: Before downloading the configuration, make sure that all configurations has been completed.

#### 5.7 Load and Save Configuration

#### 5.7.1 Load Configuration Project

Select "Open", you can open the configuration project that you have saved.

File(F)	Edit(E)	Tool ( <u>T</u> )
New (N)	)	Ctrl+N
Open ((	Ctrl+0	
Save (	5)	Ctrl+S
Save J	As ( <u>A</u> )	
Exitû	3)	1

#### 5.7.2 Save Configuration Project

Select "Save" or "Save as", you can save the configuration project with chg as its extension.

File(F)	Edit(E)	Tool (T)
New (N)	New (N)	
Open ( <u>0</u> )		Ctrl+O
Save ( <u>S</u> )		Ctrl+S
Save As ( <u>A</u> )		
Exit(E)		





#### 5.8 Export Excel File

Excel document helps users to examine the configuration related.

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

Save As				2 🛛
Save in: My Recent Documents Desktop My Documents My Computer	My Document	is Naces	+ î	
Mu Network	File name: Save as tupe:	Excel File(" xis)	•	Save Cancel
Places	and an offer	ferrous and read		

Double-click to open the document, and it divided to three parts: "Command List", "Fieldbus", and "Subnet".

Subnet: Modbus subnet parameters. It is shown as follow:

	A	В	C	D	E	F	G	Н	I	J	K	L
1	Serial number	Protocol type	Baud rate	Date bits	Parity check	Stop bit	Slave address	Transmission mode	Response timeout	Delay between polls	Pulse ratio	Scanning ratio
2	1	Modbus master	19200	8	None	1		RTU	300	0		10
3												
4												
5												
~		100										
14 4	H \ Subnet /0;	rder list/Field	1/					<				

Commands list: Modbus command list. It is shown as follow:

A	В	C	D	E	F	G	H	I
Serial number	Slave address	Functional code	Starting address	Data number	Byte number	Mapping address	Bit offset	Scanning cycle
1	3	3 3	1	2		10H		Fast scanning
	1							
-								
	A Serial number 1	A B Serial number Slave address	A B C Serial number Slave address Functional code 1 3 3	A         B         C         D           Serial number         Slave address         Functional code         Starting address           1         3         3         1	A         B         C         D         E           Serial number         Slave address         Functional code         Starting address         Data number           1         3         3         1         2	A         B         C         D         E         F           Serial number         Slave address         Functional code         Starting address         Data number         Byte number           1         3         3         1         2	A         B         C         D         E         F         G           Serial number         Slave address         Functional code         Starting address         Data number         Byte number         Mapping address           1         3         3         1         2         IOH         IOH	A         B         C         D         E         F         G         H           Serial number         Slave address         Functional code         Starting address         Data number         Byte number         Mapping address         Bit offset           1         3         3         1         2         10H         10H         10H           -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -<

Fieldbus: Fieldbus type and relevant parameters. It is shown as follow:



#### **User Manual**

	A	В	С	D	E
1	Protocol type	Address	Communication baud	Input byte	Output byte
2	DeviceNet	5	125K	64	112
3				10000	Charlos C
4					
5					
6					
7					

#### 5.9 Monitor I/O Data

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

Chartera			Data /Wal Constitution and
Status	Slave address	Starting address	Data/Malfunction code
emory map	ping address: 40	00	
lata: 00	01 02 03		

Memory mapping address: Starting address of data writing into the gateway memory

Data: Data writing into the gateway

When Modbus slave has no response or response timeout:



#### **User Manual**

Status	Slave address	Starting address	Data/M 📥
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
Response timeout	1	0	The node
			×
			>
mory mapping addr	ess: 4000		

When Modbus responses are right:

Status	Slave address	Starting address	Data/M 🗠
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	1
Respond correctly	1	0	
Respond correctly	1	0	
Respond correctly	1	0	
¢			2
lemory mapping addr	ess: 4000		

After filling the "Memory mapping address" and "Data" rightly, users can click on "Transmit" button to transmit the packet.

User clicks on the "Save content" button can save the received data to a computer's hard disk.



User Manual

Save As				? 🛛
Save in: My Recent Documents Desktop My Documents	My Docume My Music My Pictures	nts	← È C* III+	
My Network Places	File <u>n</u> ame: Save as <u>t</u> ype:	l .txt		<u>S</u> ave Cancel





# **6** Installation

#### 6.1 Machine Dimension

Size: 1.57 in (width)\*4.92 in (height)\*4.33 in (depth)



#### 6.2 Installation

35mm DIN rail installation



User Manual





# 7 Instructions of DeviceNet I/O and parameters

#### 7.1 I/O Configuration

DeviceNet input-bytes could be configured as 8 bytes, 16 bytes, 32 bytes, 64 bytes, 96 bytes, 128 bytes or

160 bytes.

DeviceNet output-bytes could be configured as 8 bytes, 16 bytes, 32 bytes, 64 bytes, 96 bytes and 112 bytes.

#### 7.2 DeviceNet Parameters

Select the action usir	parameter that you ig the toolbar. Single	want to configure and in	itiate an
📄 🔒 Param	eter	Current Value	
1 🔒 Modbus	_status	1	
2 🗟 Input	bytes	64	
3 🟦 Output	bytes	64	and the second
			- Change
4 Mod_Ou	tput_Ctrl	Uutput of Statu	s citaliț

**Modbus\_Status**: The value shows the status of Modbus communications. If it keeps zero, the Modbus communication is OK. If it is a non-zero value, the communication of the command is failed.

Input bytes: Number of DeviceNet I/O input bytes

Output bytes: Number of DeviceNet I/O output bytes

The parameters of input bytes and output bytes must be the same with the numbers of input/output bytes in



DeviceNet master scanning list of RSNetWorx and so on, or the connection can't be established.

Mod\_Output\_Ctrl: Modbus output control

**Continuous Output** 

Disable Output

Output of Status Change: When the network output data has changed, Modbus commands can be sent.

Note: If the output mode is "Disable Output", though it has configured Modbus output commands, the gateway won't send Modbus output commands.

To ensure securities of output-data, if PLC hasn't effective output-data (For example, PLC in programming mode or DeviceNet device has not been connected), Modbus output commands will not be sent.

This parameter also could be modified through Modbus setting in SST-MD-CFG.

#### 7.3 DeviceNet Network Configuration Instructions

Users need to install the \*.EDS file in the disc to DeviceNet configuration software, then you can configure GT200-DN-RS through network configuration software.

EDS (Electronic Data Sheet) is comprehensive description which supports DeviceNet network function. It equals to equipment's driver of Windows. Users need to install EDS files to DeviceNet network configuration software, such as RsNetWorx and so on, and then the configuration can be going on through network configuration software.

Here we take Rockwell's RsNetWorx for example (edition 4.12.0), and explain how to install. For further details, please refer to the network configuration software instructions.

Step1: Create a new network configuration profile

Step2: Select EDS operation guide, select "Tools" and then "EDS-Wizard", you will see that:



#### User Manual

BindeviceNet - RSNetWorx for De	eviceNet	- 7 🗙
File Edit View Network Device Diagnostics	Icols Help	8 8
@ Q   E 性   ♀ ぉ   ↓   図   醤	EDS Wizard	
	Node Commissioning	
Hardware X	Quick Connect	<u>^</u>
E Category		
AC Drive		
Communication Adapter		
DPI to DeviceNet     DeviceNet to SCANport		
Dodge EZLINK     General Purpose Discrete I/0		
Generic Device		
Human Machine Interface		
CLimit Switch     Wotor Overload		
Motor Starter		
Protoelectric Sensor     Rockwell Automation miscellaned		
GCANport Adapter     Smart MCC		
Decialty I/0		
🗉 🕼 ABB Industrial Systems		
Hettler-Toledo, Inc. Hockwell Automation - Allen-Bra		
Rockwell Automation - Dodge     Rockwell Automation - Electro-		
Rockwell Automation - Reliance		
Kockwell Automation/Sprecher+So     Shanghai Sibotech Automation Co		
		*
	K K K Karan Kar	•
X Message Code   Date   Desc	ription	
11 88		
W K		>
Execute the Electronic Data Sheet installation	wizard. Offlir	e
MallewiceNet - SSUetNeeve	Par Davisallat	
File Edit They Betwork Device Diago	ortice Itals Selp	
8 9 - 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1		
이 이 [ 1 ] 약· 스 수 집 볼		
E DevaceBet	N N	
R Category R C Drive	4	
* S Discode Scapper		
* 11114-428 Peint L/O Semm * 11114-428 Peint D/O Semm	er 😰	
# 1747-526 Scamer Bodule # 1756-565/A		
1761-MET-DAT Device Net 9 1761-MET-DAT Series D De	Inte	
<ul> <li># 11769-ADM Compact L/O Ada <ul> <li>11769-3DM Scameer Module</li> </ul> </li> </ul>	Rockwell Software's EDS Wigard 🔯	
-cu 1770-EFD ES232 Interface = 1771-536 Scamper Module	Welcome to Rockwell Software's	
<ul> <li>IT64-CPCIDS DeviceBet Sc IT64-PCD PCPCIA Interfac</li> </ul>	EDS Wizard	
1784-PCDS Stamper	The HIII Winard allows you to register HIP-based devices	
<ul> <li># 1764-PCIDS DeviceNet Sca and 1788-CWIM Linking Device</li> </ul>	read - weregister a device. - change the graphic images associated with a	
# 1788-5400	- erauta an 250 file from an manoren device.	
1798 DeviceBet Adapter		
Gateway fee TRC		
+ W Rodular DiA 198-DR		
* DPI to DericeNet	To continue shick Bert	
Bodge ETLINE		
* Central Puppose Discrete 1/	Xer(2)> Carol	
<ul> <li>Basan Rathine Interface</li> <li>Inductive Propintly Switch</li> </ul>		
N Reter Overland		
* Photoelectric Sensor		
Rockwell Actomation miscell	Married Landson Andread Andrea	l.
hele .	te a b longer 1 percent and son 1 percent 1	
E production of the second sec		
Kessage Code Date     D0057(010) 2006-3-7 10:0	Description Brd9 Rede charged to online. The online path is JAINEANE2/18, SP-111/Backsieweijig.	





Step3: Select "Next", as follow:



Step4: Register gateway GT200-DN-RS

Shown as above, select "Register an EDS file", as follow:

Please register GT200-DN-RS.EDS file we provided, according to the place where you save EDS file, and select the file.



Step 5: Confirm register file you choose



#### **User Manual**



#### Click "Next" :



Step 6: Select the icon.

Following network configuration software will prompt you the equipment category in equipment storehouse, you may choose icon in this process.



**User Manual** 



Here, the device has successfully registered to the icon library location of configuration software's equipment storehouse.



#### **User Manual**



Then, you should connect gateway GT200-DN-RS to DeviceNet network, click on "SCAN" button of RsNetWorx, or select "Network-Online" in menu bar, your gateway will be scanned by system and identified exactly.

