DeviceNet/PROFINET IO Gateway

GT100-PN-DM

User Manual

V2.0

Rev C

SST Automation

Email: support@sstautomation.com

www.sstautomation.com

Important Information

Warning

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

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

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Technical Support Contact Information

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Catalog

1 Product Overview

1.1 Product Function

The product supports devices with a DeviceNet interface to connect to a PROFINET network. This module is a device on the PROFINET side and a scanner or adapter on the DeviceNet side.

Application examples:

[1] PROFINET device to DeviceNet scanner application

Under the DeviceNet scanner mode, data exchange can be achieved between welder that supports the DeviceNet adapter protocol and Siemens PLC that supports the PROFINET master protocol.
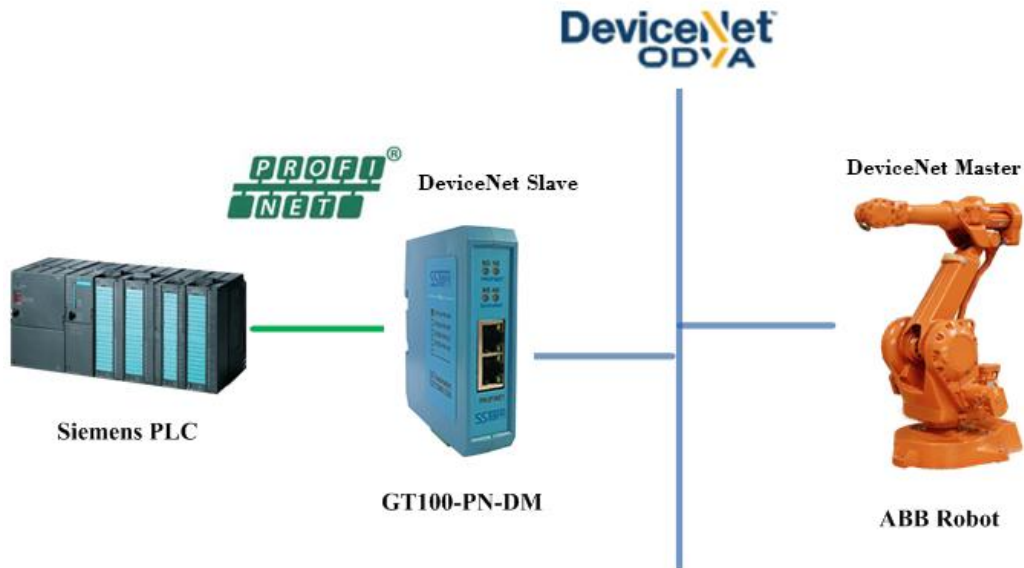

[2] PROFINET device to DeviceNet adapter application

Under the DeviceNet adapter mode, data exchange can be achieved between robots that support the DeviceNet scanner protocol and Siemens PLC that supports the PROFINET master protocol.

1.2 Product Features

➢ Wide application: Support as a DeviceNet scanner to connect a DeviceNet device to the PROFINET network or itself as a DeviceNet and PROFINET device to the two ends of the network. Such as: Robots with DeviceNet interfaces, inverters, motor starting protection devices, intelligent high and low voltage appliances, intelligent field measurement equipment and PLCs, etc., the PROFINET end is connected to PLCs such as Siemens S7-300 / 400/ 1200/ 1500.

➢ Easy configuration: Users don't need to know the technical details of PROFINET and DeviceNet, only refer to this manual and the application cases provided, complete configuration according to requirements, the network can be connected in a short time.

➢ Transparent communication: According to the mapping relationship between PROFINET communication data area and DeviceNet communication data area, users can realize data transparent communication between DeviceNet network and PROFINET network.

1.3 Technical Specifications

[1] DeviceNet supports two working modes: scanner station and adapter station. DeviceNet scanner station supports pre-operation mode and operation mode.

(A) DeviceNet Scanner

➢ Support DeviceNet baud rate: 125K, 250K, 500K.

- ➢ Support reading and writing DeviceNet adapter parameters.

- ➢ Support reading and writing DeviceNet I/O data(polling).

- ➢ Support reading cos commands (COS) (up to 14 bytes).

- ➢ Single DeviceNet adapter maximum support input: 128 bytes. Output: 112 bytes.

- ➢ Support connecting only one DeviceNet adapter, and GT200-PN-DM supports connecting multiple adapter and input timeout clearing and holding function of DeviceNet (optional).

- ➢ DeviceNet supports data no-exchange, two-byte exchange, four-byte exchange.

- ➢ Support reading and writing product information.

(B) DeviceNet adapter

- ➢ Support DeviceNet baud rate: 125K, 250K and 500K.

- ➢ DeviceNet supports up to 224 bytes of input and 224 bytes of output, 8, 16, 32, 96, 48, 64, 112, 72, 160, 192, 224 bytes are optional.

- ➢ DeviceNet supports DeviceNet I / O Poll scanning.

- ➢ DeviceNet supports data no-exchange, two-byte exchange, four-byte exchange.

- ➢ DeviceNet supports input timeout clearing and holding function of DeviceNet (optional).

[2] Support standard RROFINET I/O protocol, support PROFINET Master communication.

[3] PROFINET supports up to 32 slots, the maximum number of input bytes is 384 and the maximum number of output bytes is 384. The length available to the user is limited by the specific PLC and PDU size of the communication module)The length of input and output data blocks set in PROFINET master should be the same as that configured in SST-TD-CFG.

[4] Installation site elevation does not exceed 2000 meters.

[5] Power: 24 VDC (11~30 VDC), 90mA(24VDC).

[6] Operating temperature: -40°F~185°F(-40℃ ~ 85℃). Humidity: 5%~95% (non-condensing).

[7] Built-in electrostatic protection: 15 KV ESD. Communication interface isolation: 3KV.

[8] Dimensions (W*H*D): 1.0 in *4.0 in *3.6 in (25mm*100mm*90mm).

[9] Installation: 1.4 in (35mm) DIN RAIL.

[10] Protection level: IP20. Pollution level: 3.

1.4 Related Products

The related products include: GT200-PN-3RS, GT200-DP-DM etc.

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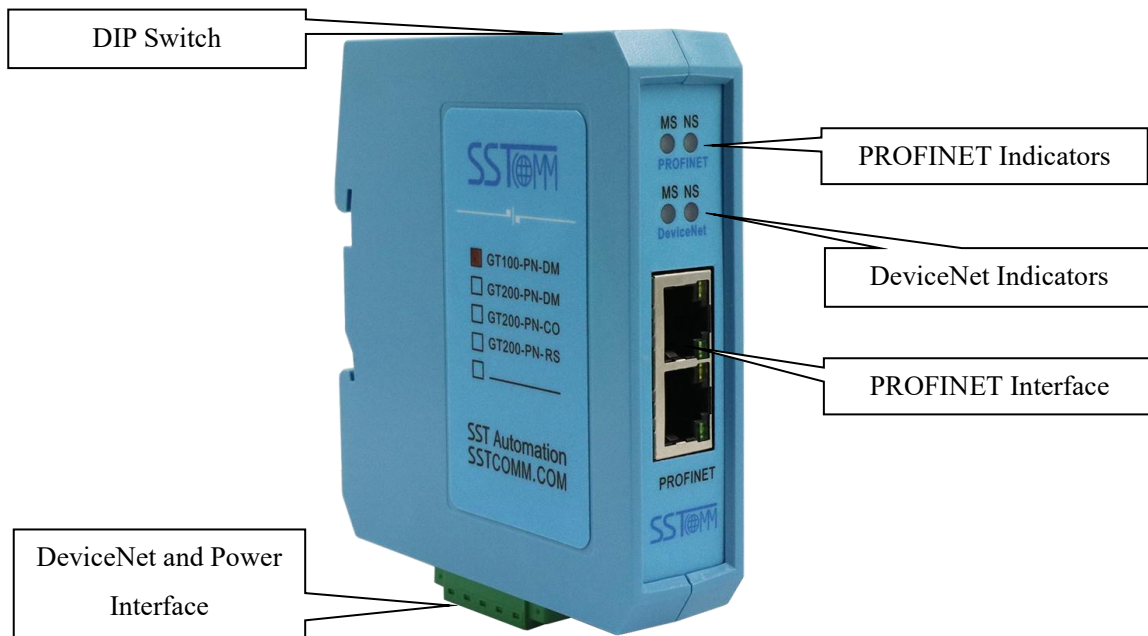
1.5 Revision History

Revision	Date	Chapter	Description
V1.2, Rev A	08/13/2018	ALL	V1.2_Rev A new release, Added "only one DeviceNet adapter station" to product functions. Added application examples, modified main version to product version.
V1.4, Rev A	02/20/2019	Chapter 3	Remove the three-pin power interface, and change the color of the gateway to cyan.
V2.0, Rev A	11/27/2019	ALL	Added DeviceNet adapter configuration mode and description.
V2.0, Rev B	01/10/2022	ALL	Update the format and update software screenshot.
V2.0, Rev C	07/29/2022	PART	New DeviceNet modeling software SST-DNET-COM

2 Hardware Descriptions

2.1 Product Appearance

DIP Switch

PROFINET Indicators

DeviceNet Indicators

PROFINET Interface

DeviceNet and Power Interface

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

2.2 Indicators

1. PROFINET LED Indicators

MS	NS	Description
Always Red	Off	Module is running and initialization has not yet completed.
Always Green	Red blinking	Initialization completed, no connection with PLC. Or in the normal communication with PLC, the network line is pulled out or dropped off.
Always Green	Always Red	No plug-in network cable
Always Green	Always Green	Connect with PLC and communicate normally

2. DeviceNet LED Indicators

(1) DeviceNet Scanner--Pre-operation mode:

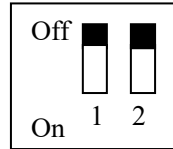| MS	NS	Description
Green blinking	Off	Initialization completed. searching not started yet.
Always Green	Green blinking	The master is online, but no connection has been established with the adapter.
Always Green	Always Green	Connection has been established with adapter.
Always Green	Always Red	Disconnected with adapter.

(2) DeviceNet Scanner--Operation mode:

MS	NS	Description
Always Green	Off	Module is running and initialization has not yet been completed.
Always Green	Green blinking	Initialization completed, The master is online, but no connection has been established with the adapter.
Always Green	Always Green	Connection has been established with adapter.
Always Green	Red blinking	The adapter is disconnected from the scanner.
Always Green	Always Red	There is no adapter on CAN network, Address Duplication Detection Conflict, CAN Network error.

(3) DeviceNet adapter:

MS	NS	Description
Always Green	Off	Module is running and initialization has not yet been completed.
Always Green	Always Red	DeviceNet network error.
Always Green	Red blinking	DeviceNet initialization.
Always Green	Green blinking	Initialization completed, but no connection established.
Always Green	Always Green	DeviceNet connect normally.

## 2.3 DIP Switch

Total 2 bits, function as follows:

Mode(bit 1)	Function(bit 2)	Description
Off	Off	Operation mode(Support SST-TD-CFG configuration)
Off	On	Pre-operation mode(Support SST-TD-CFG configuration)
On	Off	NA
On	On	NA

2.4 Interface

2.4.1 Power and DeviceNet Interface

GT100-PN-DM supplies power through DeviceNet port, DeviceNet and power terminal, as shown below:

Pin	Wiring
1	GND(Power GND)
2	CAN_L
3	SHIELD
4	CAN_H
5	V+(24VDC+)
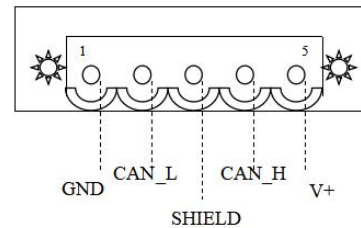
2.4.2 Ethernet Interface

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

Pin	Signal Description
S1	TXD+, Transmit Data+
S2	TXD-, Transmit Data-
S3	RXD+, Receive Data+
S4	Bi-directional Data+
S5	Bi-directional Data-
S6	RXD-, Receive Data-
S7	Bi-directional Data+
S8	Bi-directional Data-
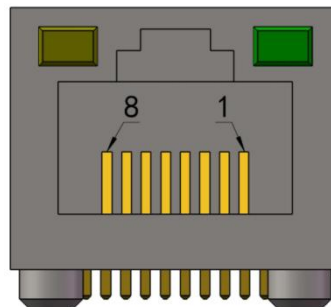
3 Hardware Installation

3.1 Mechanical Dimensions

Size (width * height * depth):

1.0 in * 4.0 in * 3.6 in (25 mm * 100 mm * 90 mm)
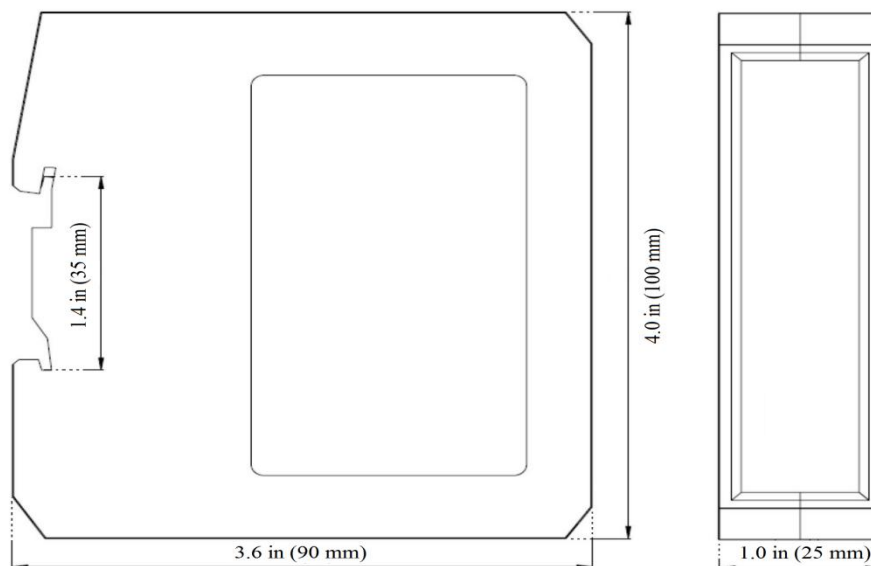
3.2 Installation Method

Using 1.4 in (35mm) DIN RAIL.
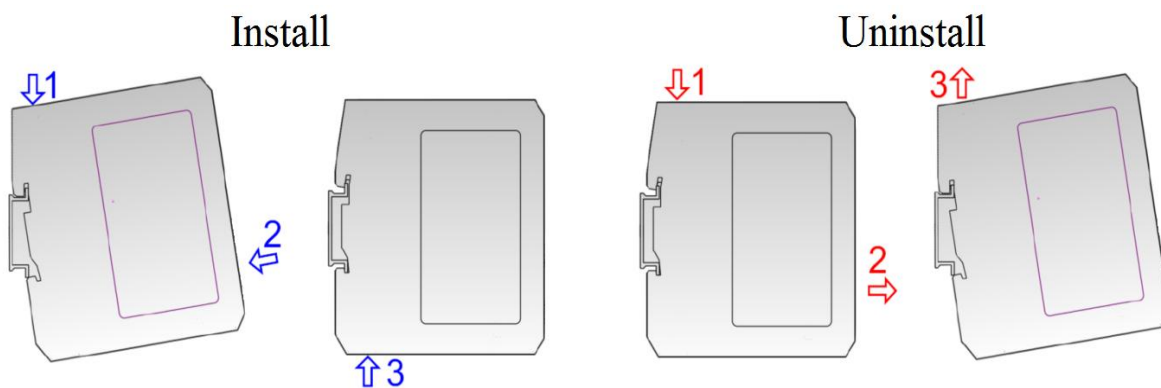
4 Quick Start Guide

4.1 Connection

1. Wiring：See also Chapter2.4.

   (1) Connect the network port of the gateway to the PC with a network cable for downloading the configuration. Another network port can be connected to PROFINET master equipment such as PLC for data communication.

   (2) Connect the DeviceNet port of the gateway to the device for communication and this port supports power supply.

2. Download SST-DNET-COM software from www.sstautomation.com/Download1/ and install it.

3. Download the latest device description file for GT100-PN-DM from www.sstautomation.com/Download1/.

4.2 Configuration

SST-DNET-COM is a software based on Windows platform. SST-TD-CFG is embedded in SST-DNET-COM software. It is used to configure the PROFINET and DeviceNet parameters of GT100-PN-DM.

The gateway supports two modes: Pre-operation mode and Operation mode. Using DIP switch to select mode, please refer to Chapter 2.3 DIP Switch.

   Pre-operation mode: As the DeviceNet scanner station, the gateway can scan and debug adapter devices in this mode.

   Operating mode: The gateway performs data exchange between PROFINET and DeviceNet protocols.

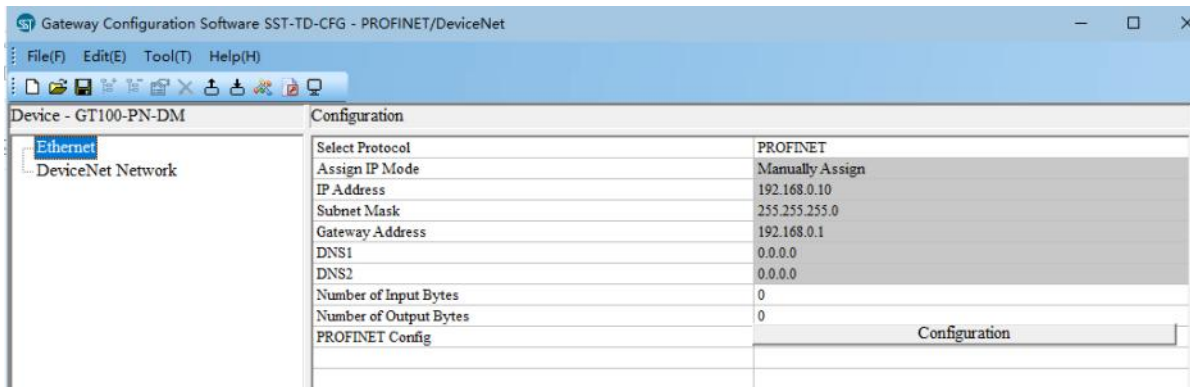   The gateway can upload and download configurations in both modes.

Basic steps when configuring GT100-PN-DM:

1. Please open the SST-DNET-COM software and click the icon " ⬛ "on the toolbar. Open the configuration interface of SST-TD-CFG.
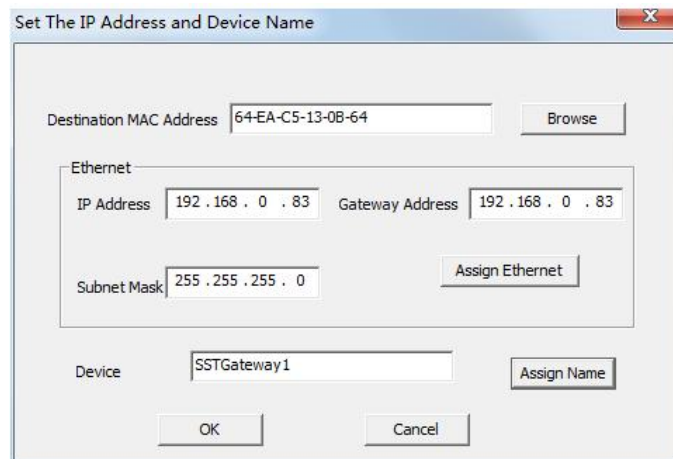
2. Set Ethernet-PROFINET parameters：Also see Chapter5.2.1.

3. If you want to modify the PROFINET device name and IP address. Click "Tool" in the toolbar->"Assign Ethernet Parameters". Click "Browse" in the pop-up box to select the device and click "Sign In". As shown in the figure below, you can modify the IP address and device name at this time, click "OK" to complete the modification.

4. Set DeviceNet network parameters：Also see Chapter5.2.2 and Chapter 5.2.3.

According to the actual needs of users, set the gateway as the DeviceNet scanner or adapter.
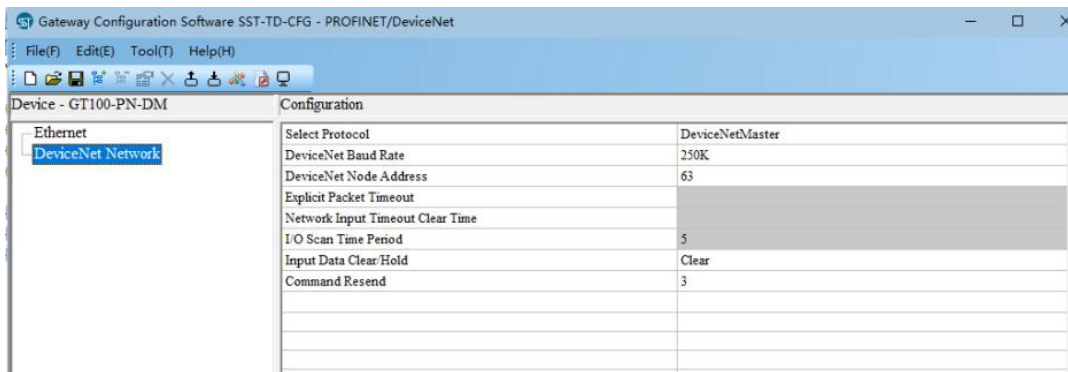
When the gateway serves as the DeviceNet scanner, it connects to the DeviceNet adapter device. You need to know the I/O data length of the adapter device, and then configure GT100-PN-DM in SST-TD-CFG. The user can provide this information directly, or scan the adapter device through SST-DNET-COM software to obtain this information. **Please refer to Chapter6.3 for operation details**.

5. After the configuration is complete, please download the configuration to the gateway. Also see Chapter5.3.1.

6. Install the appropriate device description file in the PROFINET configuration tool.

7. Configure the PROFINET network as required. Make sure that the configuration matches the configuration present in the GT100-PN-DM.

The normal communication between GT100-PN-DM and PLC(PROFINET master station)requires the following three conditions to be met at the same time:

1) The name of the PROFINET device is the same as the device name in the PLC configuration. Also see Chapter5.3.4.

2) The IP address of the PROFINET device is the same as the device IP address in the PLC configuration. Also see Chapter5.3.4.

3) The type and order of the "PROFINET Configuration Module" (configured through GT100-PN-DM) is consistent with the data block configured on the PLC configuration. Also see Chapter5.2.1.

If you encounter any problems during configuration and operation, please send emails to support: support@sstautomation.com.
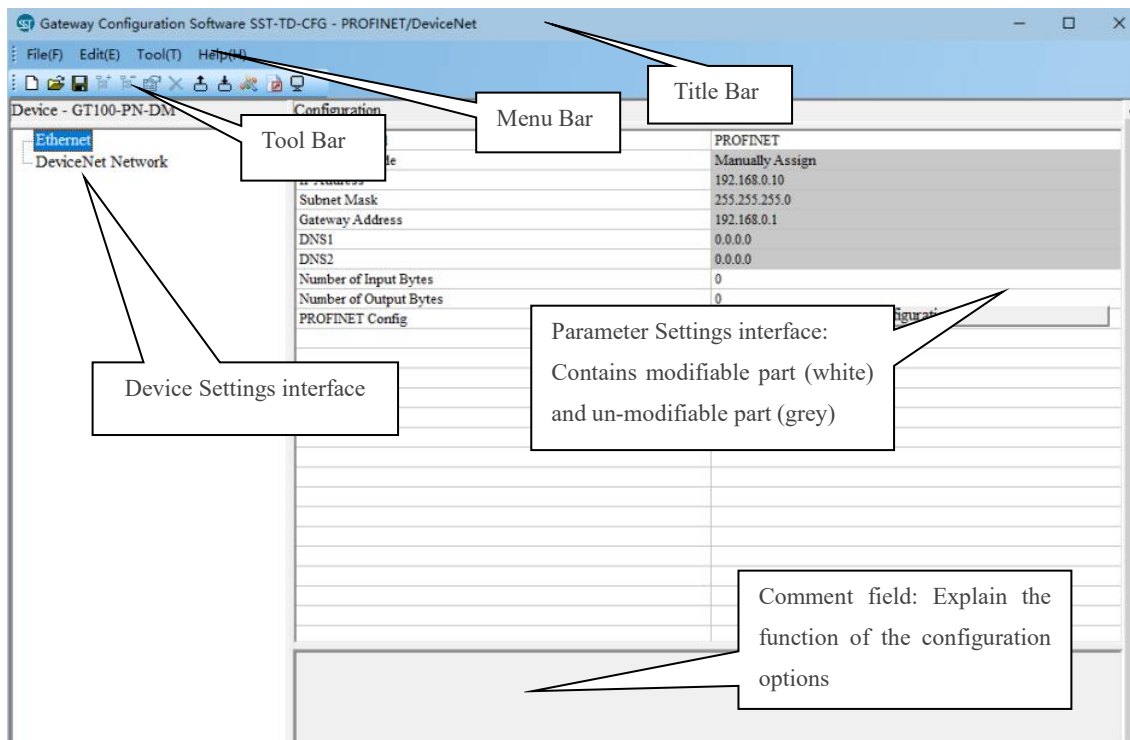
5 SST-TD-CFG Software Instructions

5.1 Software Interface Description

SST-TD-CFG is embedded in SST-DNET-COM software. It is used to configure the PROFINET and DeviceNet parameters of GT100-PN-DM.

Please open the SST-DNET-COM software and click the icon " [icon] "on the toolbar.The following figure pops up:

Click "OK" to pop up the following interface:

Notes: All the gray part in the software can not be changed.

Tool bar interface is shown as below:

The functions from left to right are: New, Open, Save, Add Node, Delete Node, Increase Mapping, Delete Mapping, Upload Configuration, Download Configuration, Automatic calculation of Mapping Address, Document Output, and Monitor.

	New: Create a new configuration file.
	Open: Open a configuration file.
	Save**:** Save the current configuration.
	Add Node: Add a DeviceNet adapter node.
	Delete Node: Delete a DeviceNet adapter node.
	Increase Mapping: Add a mapping type.
	Delete Mapping: Delete a mapping type.
	Upload Configuration: Read configuration information from the module and display it in the software.
	Download Configuration: Download configuration information from the software to the module.
	Automatic calculation of Mapping Address: Calculate the mapped address of the configured mapping type inside the gateway.
	Document Output: Output the current configuration to the local hard disk, save it in . xls file format.
	Monitor: Monitor gateway memory input buffer data.

5.2 Device View

5.2.1 Ethernet Configuration View

The Ethernet configuration interface is shown as below:
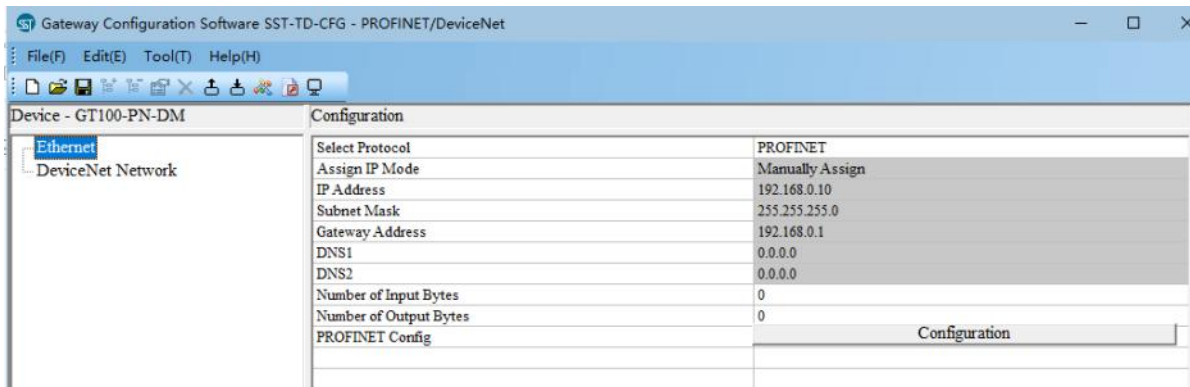
Assign IP Mode: Manually Assign.

IP Address: Set the IP address of GT100-PN-DM. See Chapter5.3.4 for IP address settings.

Subnet Mask: Set the subnet mask.

Gateway Address: Set the gateway address of the LAN where GT100-PN-DM is located.

Number of Input Bytes: Display the length of input data exchanged between GT100-PN-DM and PLC, the length is configured by the PROFINET project dialog.

Number of Output Bytes: Display the length of output data exchanged between GT100-PN-DM and PLC, the length is configured by the PROFINET project dialog.

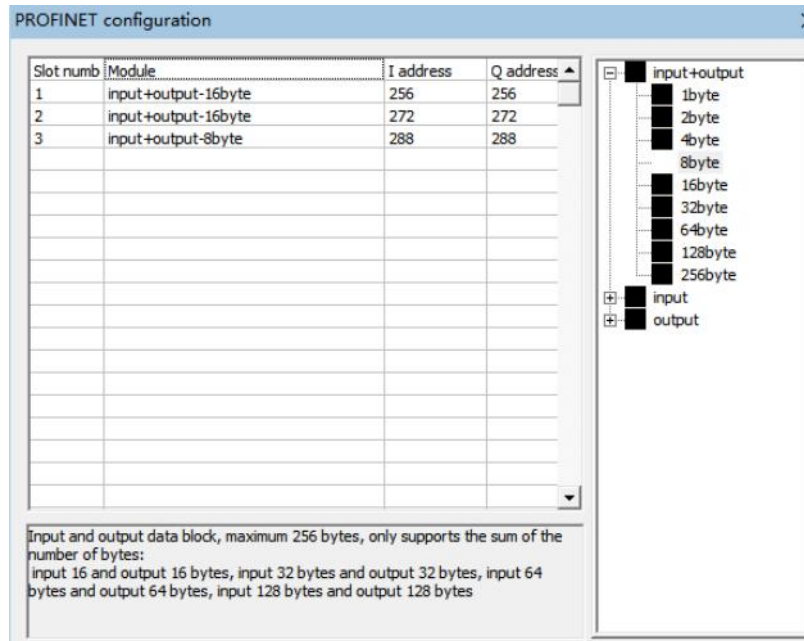**PROFINET Config:** Click to enter the interface for setting the GT100-PN-DM input and output data length.

PROFINET configuration dialog box is shown as below:

It can be seen that the above configuration has a total of three slots, respectively: 16 byte of input and output, 16 byte of input and output, 8 byte of input and output.

As with the modules in the PROFINET master software, you can drag the module from the box on the right into the slot on the left.

Note: The type and order of the "PROFINET Configuration Module" must be consistent with the settings of configuration software of PROFINET Master station.

5.2.2 DeviceNet Network Configuration View-DeviceNet Scanner

1. DeviceNet Scanner configuration view

The configuration view interface is displayed as follows:
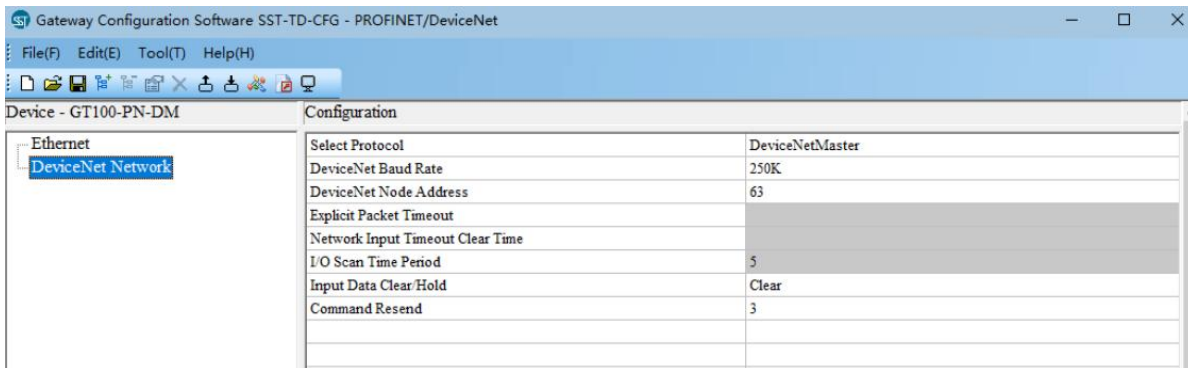
DeviceNet Baud Rate: 125, 250 and 500K bps optional.

DeviceNet Node Address: The node address of the gateway on the DeviceNet network, 0~63 optional.

Explicit Packet Timeout: DeviceNet explicit packet timeout time setting, in units of 10ms, up to 2.5s.

Network Input Timeout Clear Time: DeviceNet network input timeout time setting. If this time value is exceeded, the DeviceNet adapter node does not respond and the corresponding data mapping area is cleared. In units of 10ms, the maximum is 2.5s.

I/O Scan Time Period: DeviceNet network I/O scan cycle, in units of 10ms, up to 500ms.

Input Data Clear/Hold: When the number of DeviceNet command response errors reaches the number of Modbus command retransmissions, the corresponding DeviceNet input data is cleared.

    Clear: DeviceNet input data is cleared.

   Hold: DeviceNet input data keeps the correct data received last time.

Command Resend: DeviceNet command retransmission times. When the Modbus command responds incorrectly, the number of times the command is resent, the input range is 2 to 254, and the default value is 3.

2. Node Configuration

Under the "DeviceNet Scanner" mode, left click on a node and then the configuration interface is shown as below:
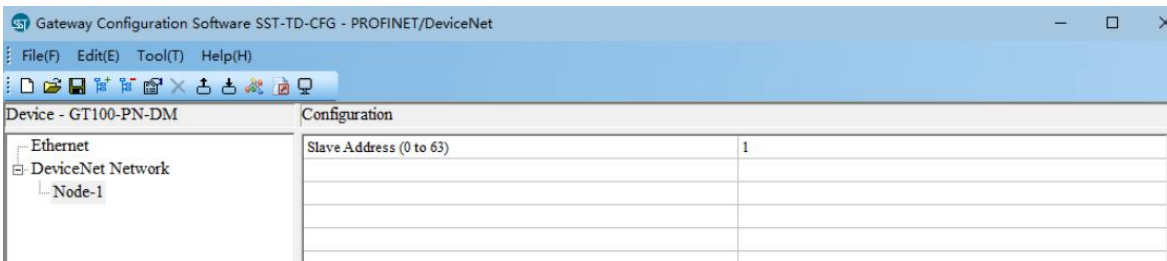
- Parameter Description: DeviceNet adapter address 0~63.

- Instructions: For the DeviceNet scanner device view, the following three modes of operation are supported: Editing Menu, Editing Toolbar and Right-click editing Menu.
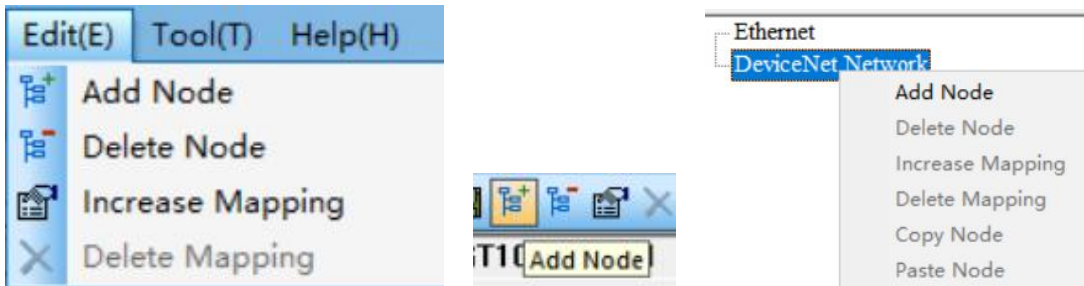
(1) **Add Node:** Right-click on the DeviceNet Network, select the node, and then perform the add node operation. Add a node named "new node" under the DeviceNet Network.

(2) **Delete Node:** Right-click, select the node to be deleted, and then perform the delete node operation. The node and all commands under it are deleted.

Note: GT100-PN-DM only supports one adapter node.

3. Command Configuration

- Current mapping type:

  DeviceNet Polling Input -> ProfiNet Input (General).

  DeviceNet Polling Output <-ProfiNet Output (General).

  DeviceNet Change Input -> ProfiNet Input.

- Instructions: The Mapping type Configuration view supports three types of operation: Edit Menu, Edit Toolbar and Right click edit Menu.

  (1) **Increase Mapping:** Left click on the node, and then perform the operation of adding mapping type to add a mapping type for the node.

  (2) **Delete Mapping:** Right-click, select the mapping type to be deleted, and then perform the delete mapping operation. The map type is deleted.

The configuration view interface is displayed as follow:
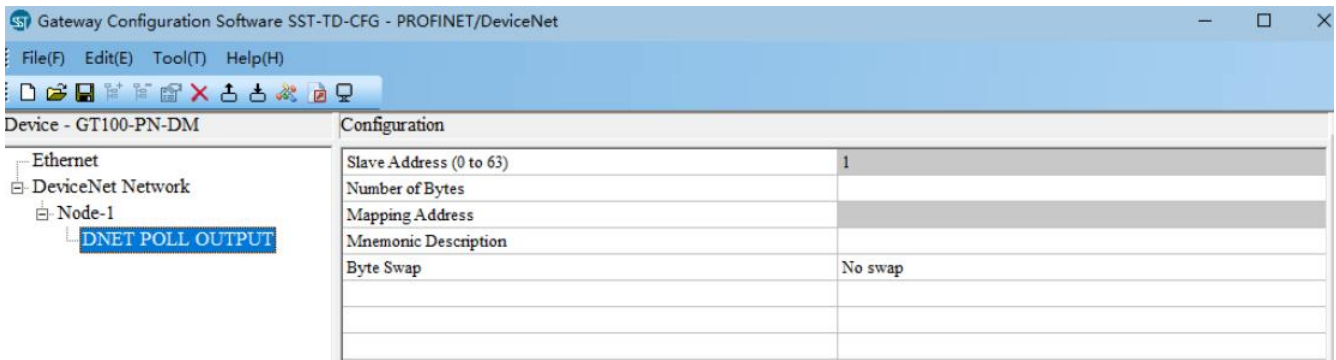
Slave Address: Cannot be changed, the same as node address.

Number of Bytes: Bytes numbers mapped, 1~128 bytes for input bytes and 1~112 bytes for output bytes.

Mapping Address: Memory address mapped to the gateway, starting from 0.

Mnemonic Description: Users can input descriptive notes here, these are not downloaded into gateway.

**Byte Swap**: There are three types: No swap, Two-byte swap, Four-byte swap.

No swap: Data normal transmission.

Two-byte swap: Two bytes exchange in the same register. For example: 12 34. The result after the exchange is 34 12.

Four-byte swap: The four bytes in the register are swapped. For example: 12 34 56 78. The result of the exchange is 78 56 34 12.

5.2.3 DeviceNet Network Configuration View-DeviceNet Adapter

The configuration view interface is displayed as follows:
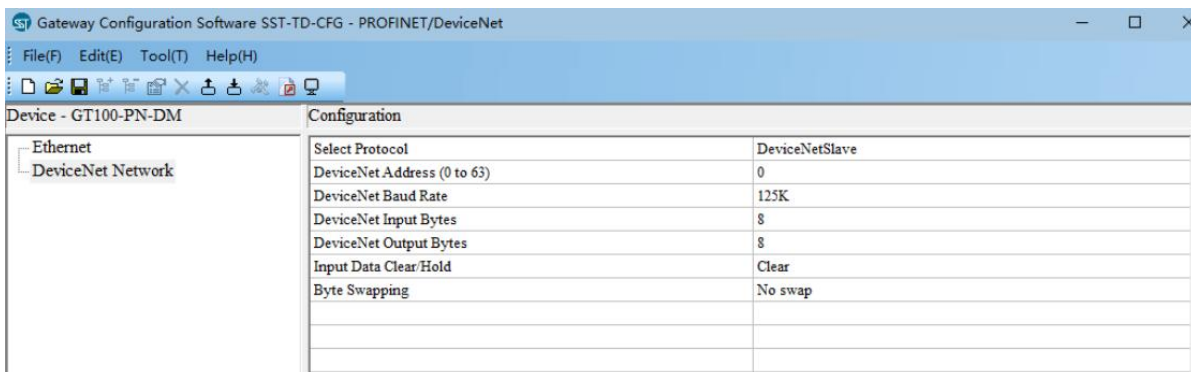
DeviceNet Address: The node address of the gateway on DeviceNet is 0 to 63. The default value is 0.

DeviceNet Baud Rate: 125, 250, 500K bps optional.

DeviceNet Input Bytes: 8, 16, 32, 48, 64, 72, 96, 112, 160, 192, 224 bytes optional.

DeviceNet Output Bytes: 8, 16, 32, 48, 64, 72, 96, 112, 160, 192, 224 bytes optional.

Input Data Clear/Hold: When the number of DeviceNet command response errors reaches the number of Modbus command retransmissions, the corresponding DeviceNet input data is cleared.

Clear: DeviceNet input data is cleared.

Hold: DeviceNet input data keeps the correct data received last time.

Byte swapping: No swap, Two-byte swap, Four-byte swap optional.

No swap: Data normal transmission.

Two-byte swap: Two bytes exchange in the same register. For example: 12 34. The result after the exchange is 34 12.

Four-byte swap: The four bytes in the register are swapped. For example: 12 34 56 78. The result of the exchange is 78 56 34 12.

5.3 Tool

The "Tool" tab on the menu bar contains the following functions:

■ Upload Configuration

■ Download Configuration

■ Recalculate Mapped Address

■ Document Output

■ Assign Ethernet parameters

■ View device information

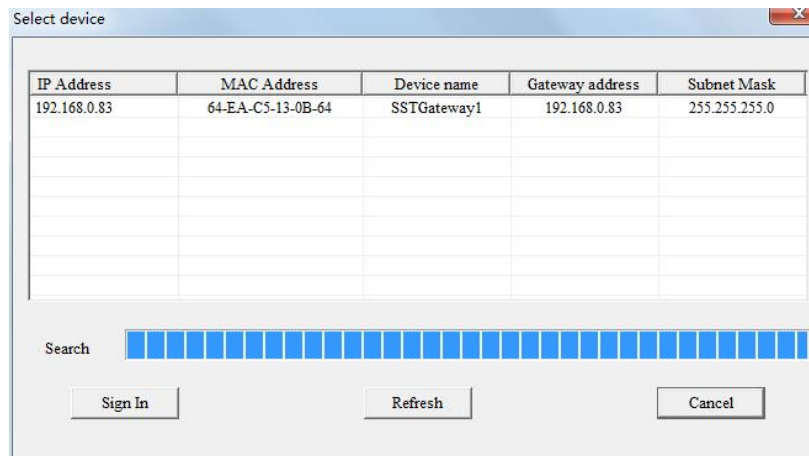# 5.3.1 Upload Configuration and Download Configuration

The gateway upload and download via a network cable.

After configuration, click "Upload Configuration" or "Download Configuration" on the tool bar, it will pop up the following interface:
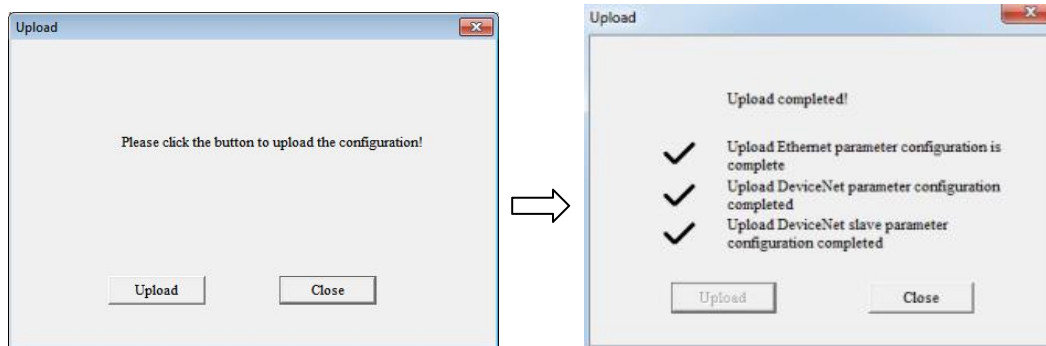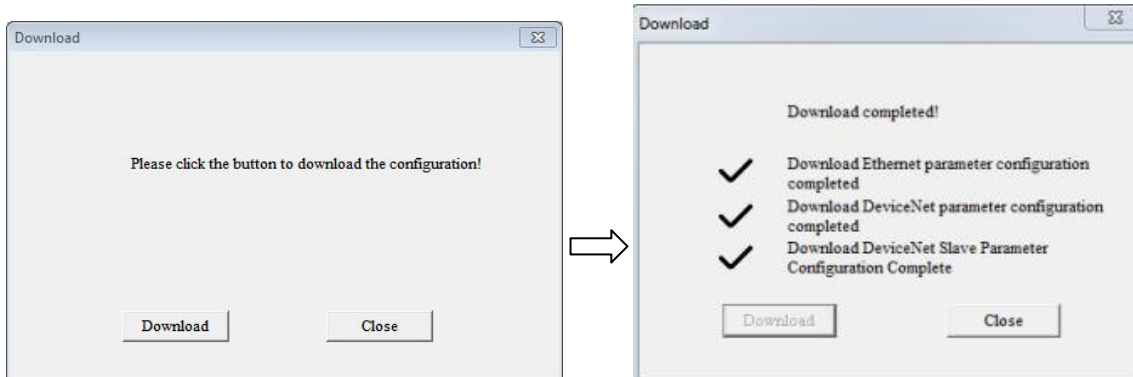
If scanning no device, please click "Refresh". In the above picture, GT100-PN-DM shows, first select the device and click "Sign In".
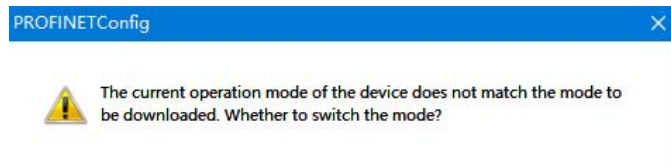
Select "Upload", it will read configurations form the gateway, and the interface is shown as below:

Select "Download", it will download configurations to the gateway, and the interface is shown as below:

When the DeviceNet protocol type selected in the configuration software is not the same with the internal gateway's current operating mode, the configuration software will prompt the need to switch the gateway mode and wait for the gateway to restart to complete the configuration download in the normal mode.

> **PROFINETConfig** ✕
>
> ⚠ The current operation mode of the device does not match the mode to be downloaded. Whether to switch the mode?

Remark: Please confirm the configurations are correct before downloading configurations.

If the gateway cannot be searched:

➢ Please check whether the computer and gateway are in the same network segment. When using the gateway for the first time, the gateway is in the 192.168.0.X network segment.

➢ Please test the network connection first. Please refer to the note "How to Use the Ping Command" located on our Support page on the sstautomation.com website.

5.3.2 Recalculate Mapped Address

Click "Recalculate Mapped Address" to automatically calculate the non-conflicting mapped memory address for each command.
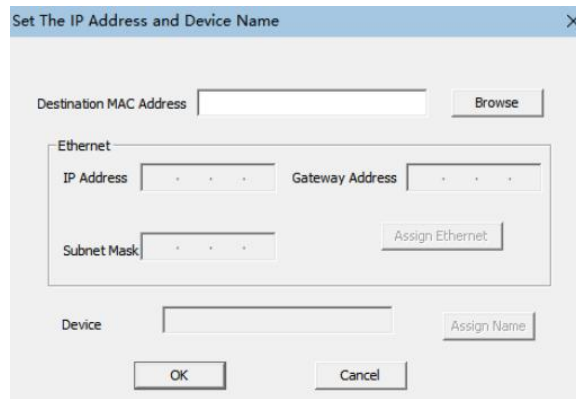
5.3.3 Document Output

Users can use the function to check the gateway configurations.

Click "Document Output", you can save the configuration with . xls as its extension. Please choose the proper location to save.
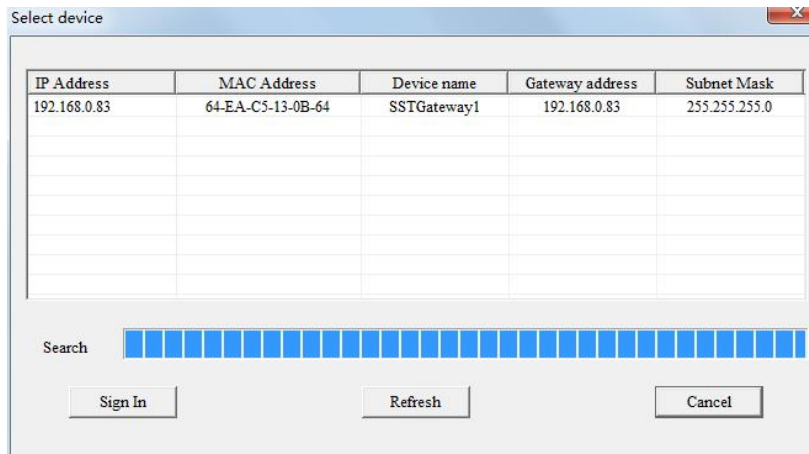
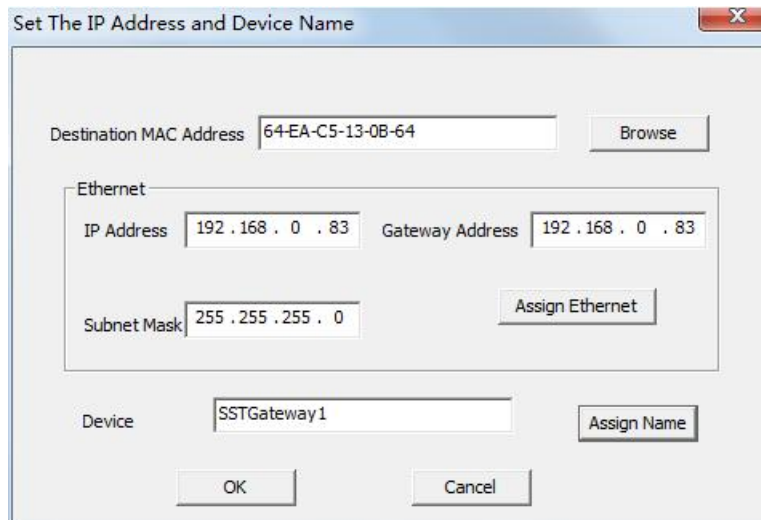# 5.3.4 Assign Ethernet Parameters

1. Scan Devices on LAN

1) Click "Assign Ethernet parameters" will pop up below interface:

2) Click "Browse", the dialog box will be shown as below:

Please select the gateway you want to modify and click "Sign In".You will see the Ethernet information of the device, for example:

"Destination MAC Address" : Shows MAC address of GT100-PN-DM (unmodified).

Notes:

①　Make sure that the GT100-PN-DM and your computer are in the same network segment. When using the gateway for the first time, the gateway is in the 192.168.0.X network segment.

②　If you can't discover any gateways, please test the network connection first. Please refer to the note "How to Use the Ping Command" located on our Support page on the sstautomation.com website.

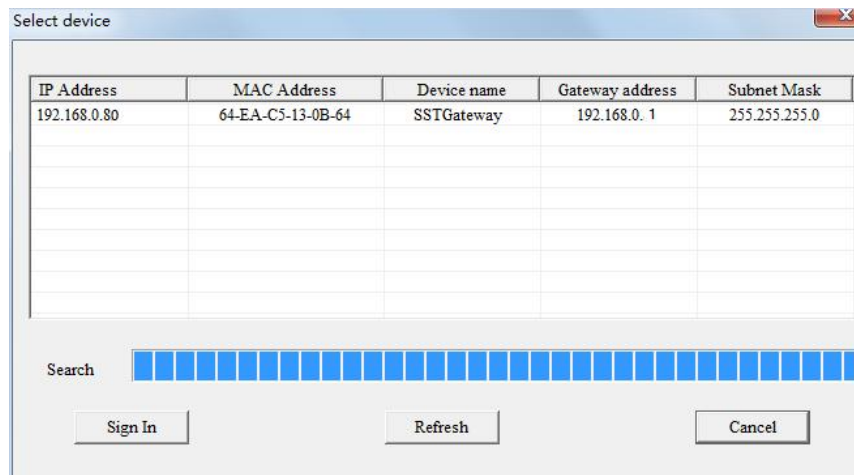## 2.　Set IP Address and Device Name

1)　Example of Ethernet parameter and Device Name setting:

Modify IP Address to "192.168.0.80", Gateway Address to "192.168.0.1" and Subnet Mask to "255.255.255.0". Change Device Name to "SSTGateway" , shown as below:
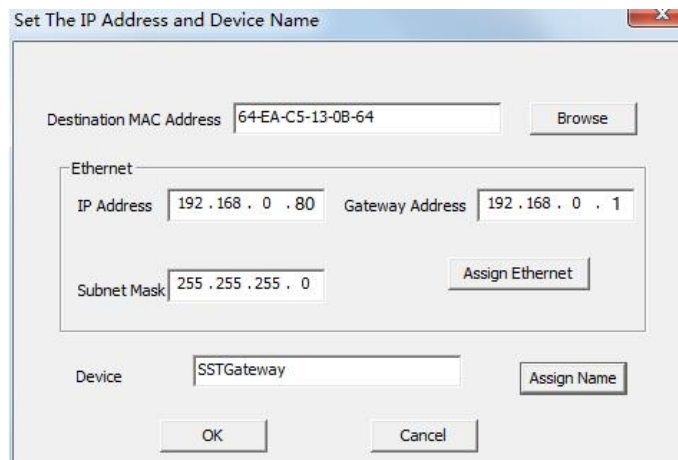
Click "OK" to complete the setting of Ethernet and Device Name.

2)　Click again "Browse" will lead to scanning device again. See below:

You can see that IP Address has been modified "192.168.0.80", Device Name is "SSTGateway".

Note:

■ The IP address and Device Name settings of the gateway here must be consistent with those set in the PROFINET master configuration software.

■ The device name of GT100-PN-DM,which supports only a combination of lowercase letters and numbers, and must begin with a lowercase letter.

The following are legal names: dut28, dut28nn32.

The following are illegal names: 28dut, dut28$, dut28+uu.

3. IP Address Conflict Resolution

According to the specification of PROFINET protocol, acting as a PROFINET device, GT100-PN-DM must obey the rule that there can't be more than 1 PROFINET device which has the same IP address and name on the same LAN when connecting many GT100-PN-DM devices.

If there exits confliction of IP address and device name, users can change IP address and name of GT100-PN-DM according to chapter "Set IP Address and Device Name" and ensure that others IP address and name are different (Notes: after changing is complete, some relevant change should be taken in PLC modeling and users must ensure the IP address and name of GT100-PN-DM is the same with that of PLC modeling).

For example:

When it happens to IP address confliction, IP address, subnet mask and gateway address of GT100-PN-DM will be reset to "0.0.0.0". Now, users can't use "Upload" or "Download" to scan GT100-PN-DM and only use chapter "Scan Devices on LAN" to scan the device, the scanning result is shown as below:
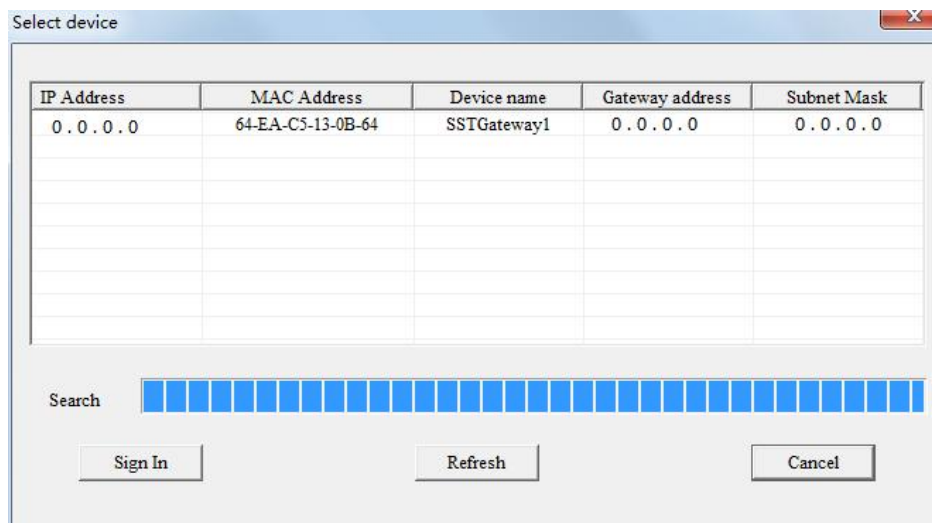
You can see the IP Address is reset to "0.0.0.0", choose the device and Sign In, the dialog box is shown as below:

Set "IP", "Subnet" and "Gateway" to "192.168.0.83", "255.255.255.0" and "192.168.0.1" and you will see the below picture:
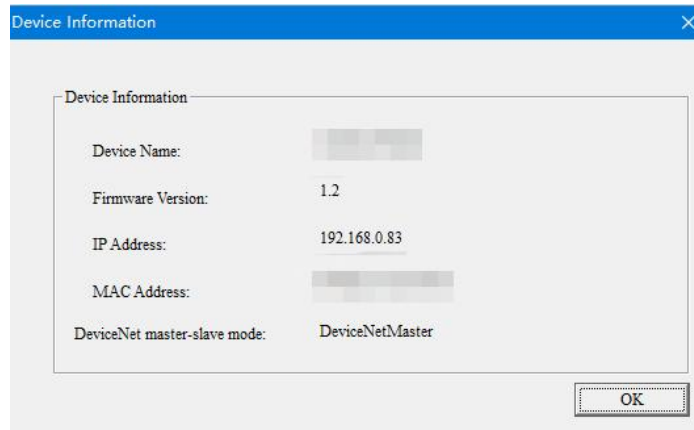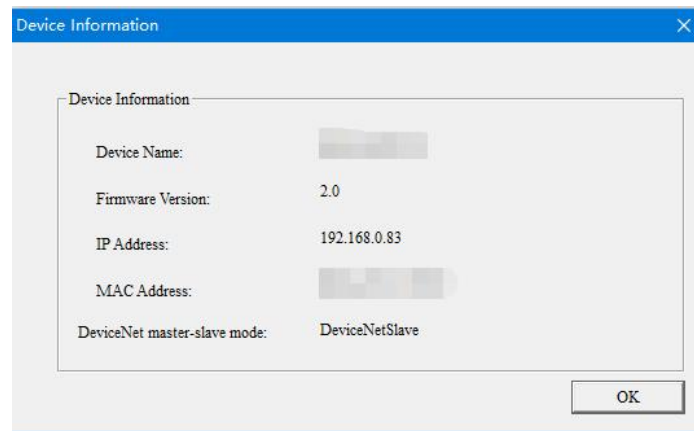

Click "OK".

5.3.5 View Device Information

Click "View Device Information", select the device and click "View", the device information will be shown as below.

(1) DeviceNet Scanner mode:

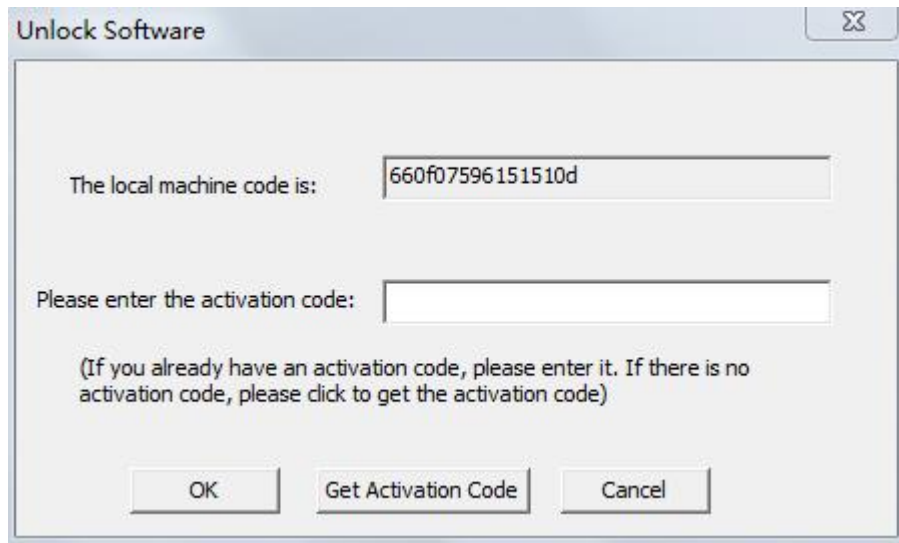(2) DeviceNet Adapter mode:

6 SST-DNET-COM Software Instructions

SST-DNET-COM is a software based on Windows platform. It is a configuration software for configuring DeviceNet protocol devices.

6.1 Software Main Interface

For the first time to use the SST-DNET-COM software, it requires activation code.

Click "Get Activation Code" and it will jump to sstautomation.com for activation.

After installation, double-click the icon to enter the main interface.

You can access SST-DNET-COM software after entering correct activation code.
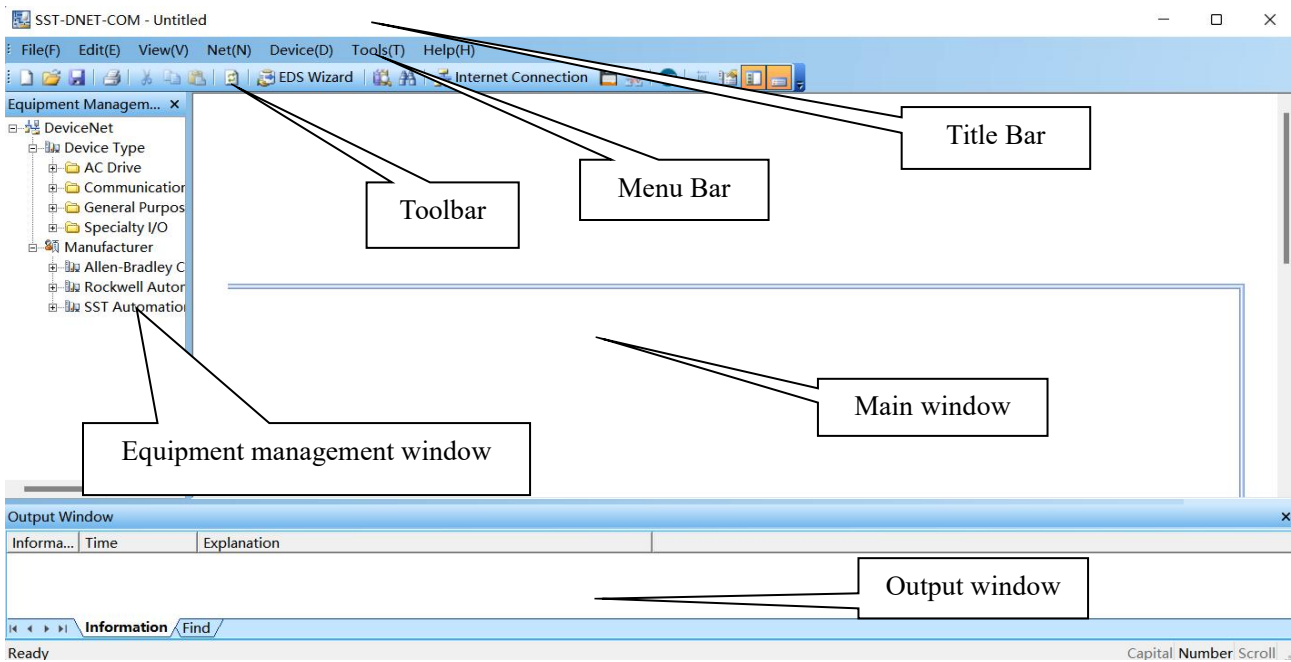
Main window: After establishing the internet connection, display the online device and modify the address and parameters of the device online, check the input and output data. In the offline state, you can view device properties by dragging the device icon to the window.

Equipment management window: Displays registered DeviceNet devices in different ways: device type, manufacture. Under different manufacturers, different devices are displayed separately according to the device type.

Output window: Dynamic display of network scanning information, registered device information, delete device information, etc. display the results of "find devices", "find next".

Toolbar is show:

Functions separately from left to right are: New, Open, Save, Print, Cut, Copy, Paste, Refresh viewport, EDS Wizard, Find devices in the device library, Find next, Internet Connection, One-Click Save, Disconnect, Configure, Send Explicit Message, Property, Device management, Output.

6.2 EDS Registration Wizard

Users can configure different DeviceNet devices by registering new EDS files. You can register a new EDS file in the following three methods: Editing Menu, Editing Toolbar and Right-click editing Menu.
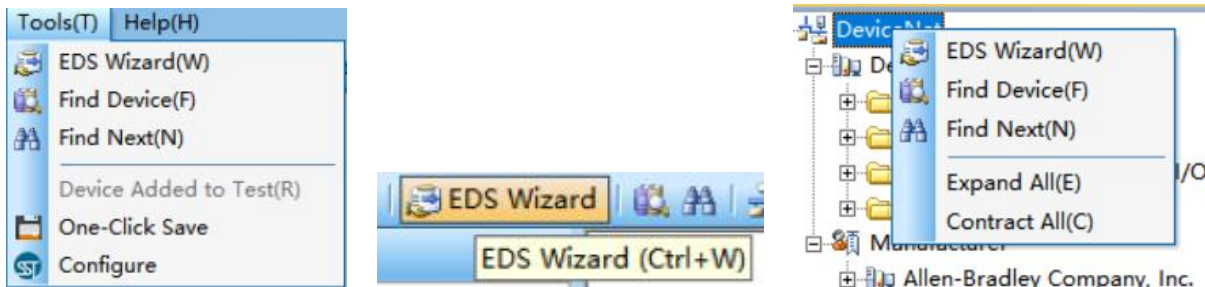
Select "Start"and pop up the following interface:
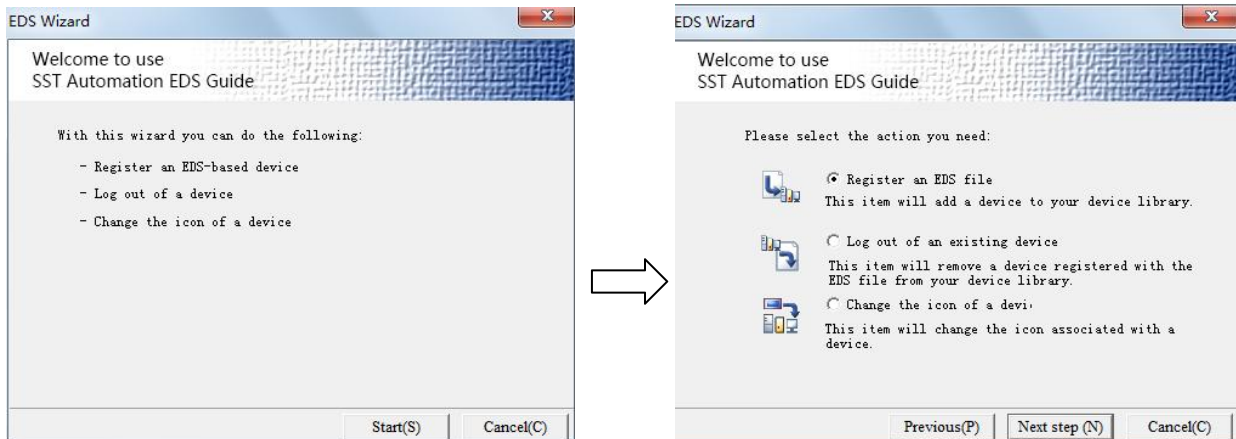
In this interface, users can choose to register an EDS file, log out of an existing device, and change the icon of a device.

Take "Register an EDS file" as an example to introduce the following steps for registering a new EDS file:

After selecting "Register an EDS file", click "Next step" and select the storage path of EDS file you want to register in the pop-up interface, as shown in the figure below:
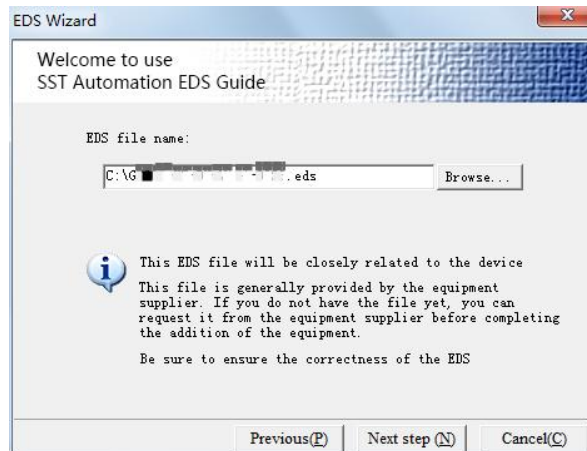
Click "Next step" to pop up the EDS file test report interface. If there is an error in the EDS file, the error message will be displayed in the interface, and there is no "Next step" operation. If there is no error in the file, continue the "Next step" operation, pop-up selection device icon interface as follows:
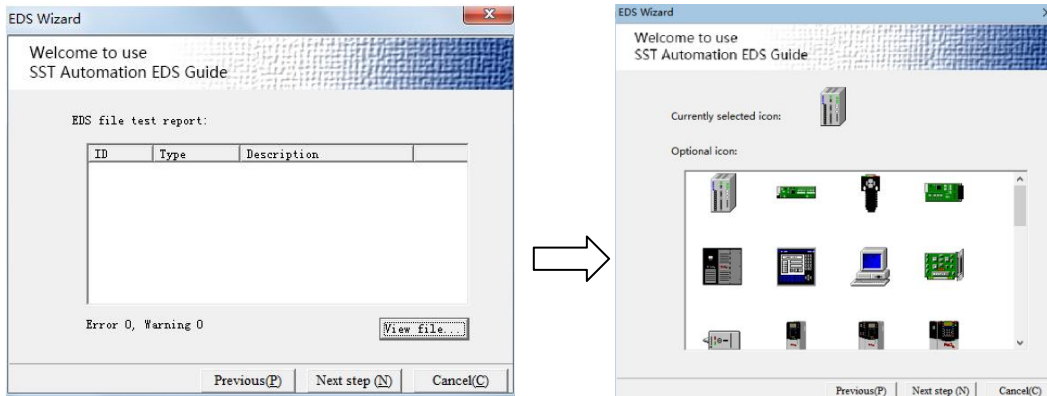
Click "Finish" and the EDS file registration step is over. At this time, you can see the newly registered device in the equipment Management Window.
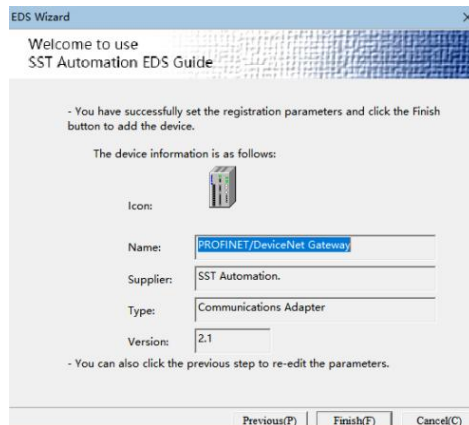
If you want to change EDS file for the same device, please first find the device in the device management library and right click. After logging out, re-register the new EDS file, or complete the logout operation through the EDS operation.

# 6.3 Pre-operation Mode - Scan and Debug DeviceNet Adapter Devices

When the gateway serves as the DeviceNet scanner, it connects to the DeviceNet adapter device. You need to know the I/O data length of the adapter device, and then configure GT100-PN-DM in SST-TD-CFG. The user can provide this information directly, or scan the adapter device through SST-DNET-COM software to obtain this information.

The specific operations are as follows:

(1) First, import the EDS file of the adapter device. See Chapter6.2 for details.

(2) Set GT100-PN-DM's DIP switch "2-ON 1-OFF", put the gateway into"Pre-operation mode".

(3) Connect the network port of the gateway to the PC with a network cable.

(4) The DeviceNet port of GT100-PN-DM and the DeviceNet device of the user are connected to the DeviceNet network. (See Chapter2.4.1)

(5) Power on GT100-PN-DM with power supply 24V.

➢   **Scan DeviceNet Adapter Devices**

(1) Double-click the SST-DNET-COM software. Click toolbar "Internet connection". Select the GT100-PN-DM configuration interface shown as below:
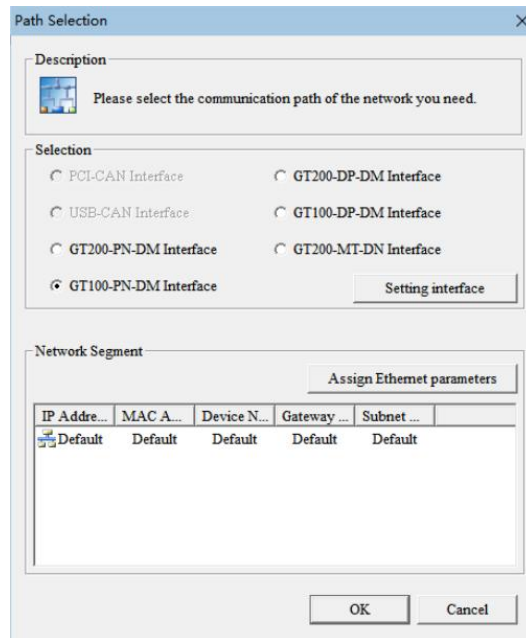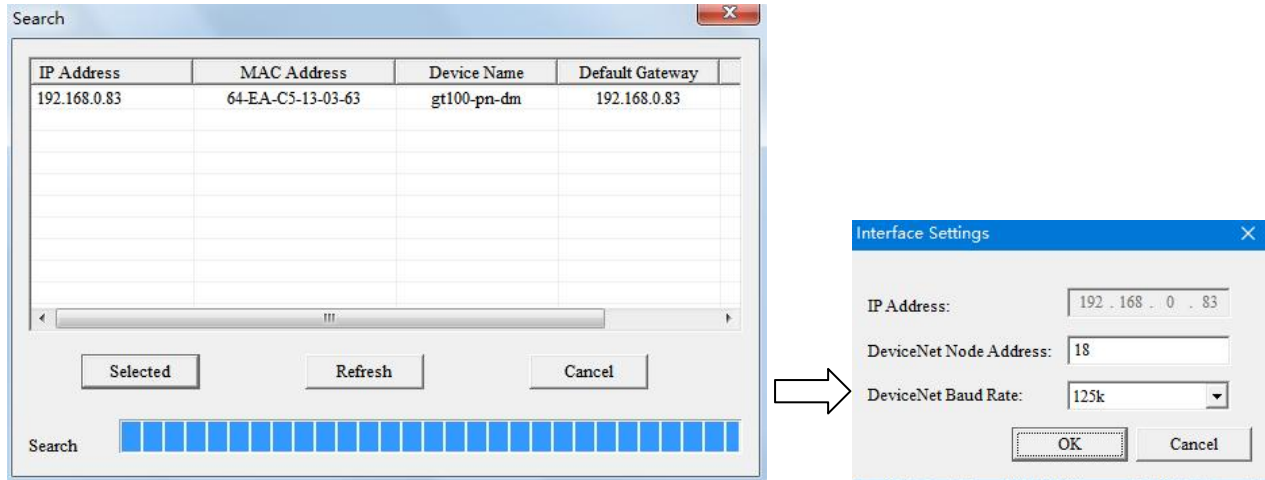
(2) Click the "Setting interface", the software will display the searched device in the list (if no devices are scanned, please click "Refresh"to try again):


Note: The interface settings configuration, "IP address" is the IP of the device selected at the time of search, "DeviceNet Node Address" is the Address of DeviceNet Scanner Module,Set any value between 0 and 63,can't conflict with other node addresses on the bus. "DeviceNet Baud rate" is the baud rate of DeviceNet scanner module. Support　125K, 250K, 500K. Keep Baud rate consistent.

(3) Click "OK" to start scanning for devices on the DeviceNet network.After scanning the adapter devices, as shown blew:
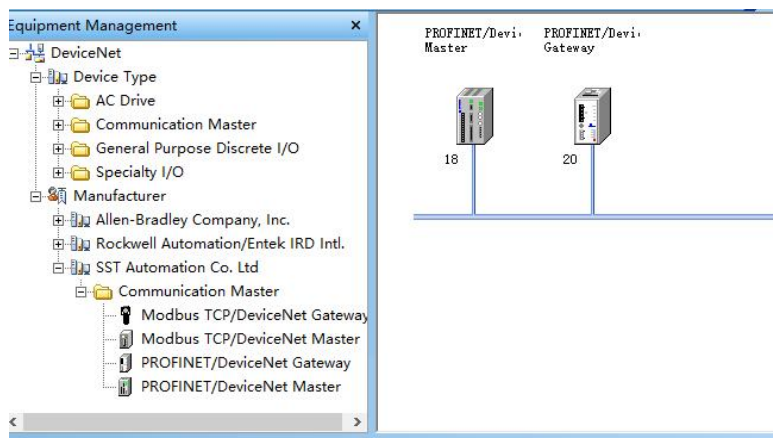

(4) Double click the adapter device module, look the I/O parameter of the adapter devices, as shown blew:
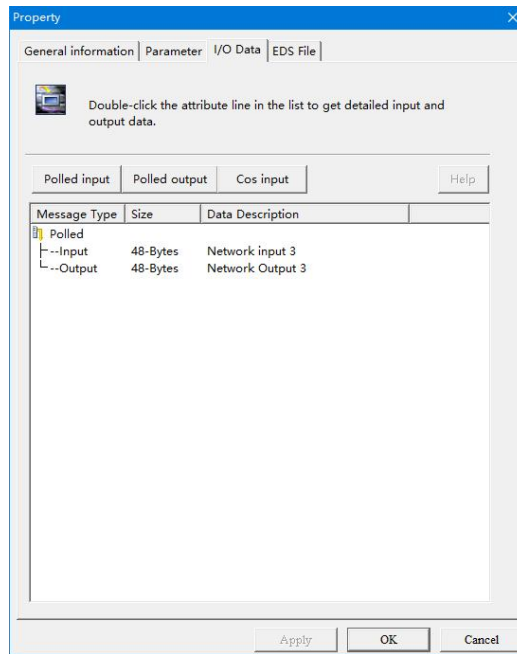
Please record the I/O Data byte length of the DeviceNet adapter device, configure it in GT100-PN-DM.

(5) Double click the GT100-PN-DM module, Pop-up "Property" box. Click"Scan List" .Move desirable device from left to right scan list, double-click to Edit I/O parameters. Set the length of the adapter I/O parameters, Then click ok. Configure the mapped address of input and output data in"Input" and "Output". In"PROFINET Parameter", the input and output block size of PROFINET can be set. The corresponding DeviceNet network parameters can be set in "DeviceNet Parameter" (see Chapter6.4).
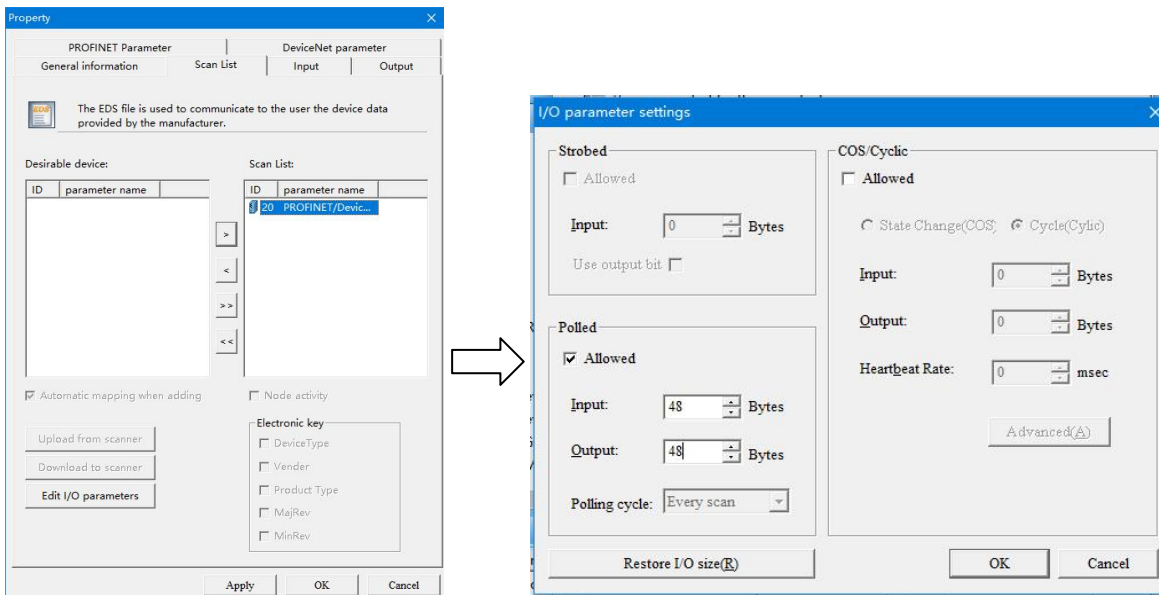
(6) Click"Apply" to save the configured parameters in the GT100-PN-DN. At this time, prompt "Successful application" will pop up. Click"OK" to return to the main interface.
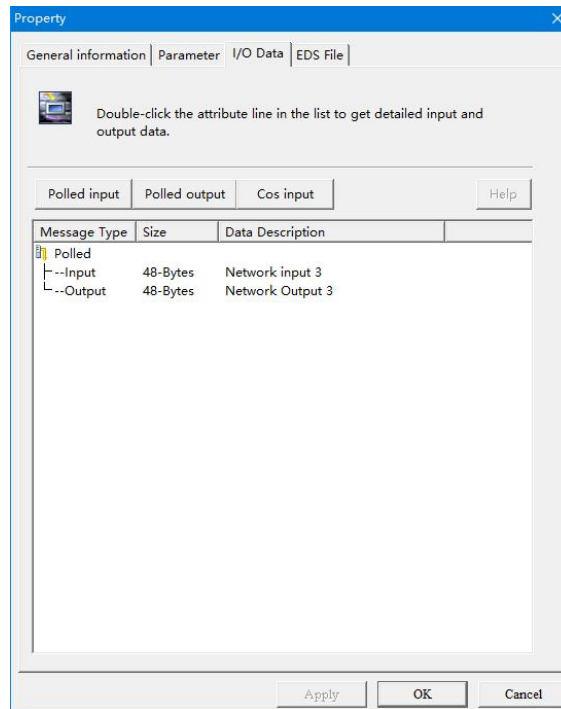
➢ **Debug DeviceNet Adapter Devices**

You can skip this process if you don't need debugging.

(1) Double click the adapter device module.

In"Parameter", you can upload the relevant parameters of the adapter device.

In "I/O Data", click "Polled input/Polled output/Cos input" button, you can read and write data from the DeviceNet adapter station. (See Chapter6.5)

(2) After all operations are completed, click the "Disconnect" button on the toolbar to disconnect the software from the gateway. Set GT100-PN-DM's DIP switch "2-OFF 1-OFF", and power on the gateway again. Put the gateway into "operation mode" and perform data exchange.

6.4 DeviceNet Scanner Module Property Introduction

Double-click the device module on the bus and appear the device property page.

(1) General information

In "General information" options Interface, DeviceNet scanner module address cannot be modified here. It can only

be modified in the interface settings, as specified in this manual, "Device ID" displays the information of the device manufacturer, type, device, sort and version. If you choose to configure GT100-PN-DM, after setting all the parameters, you can click the "Apply" button to download.
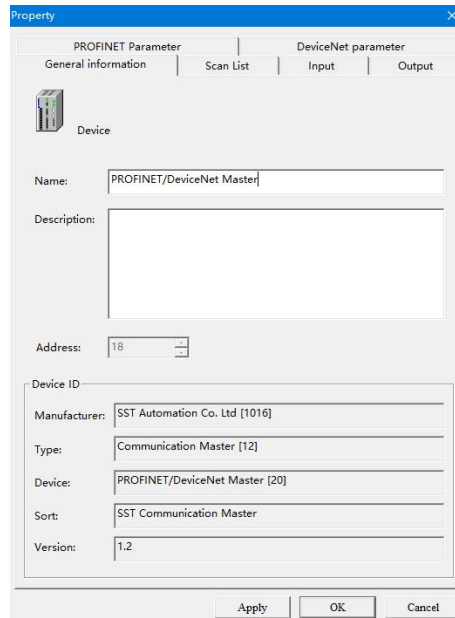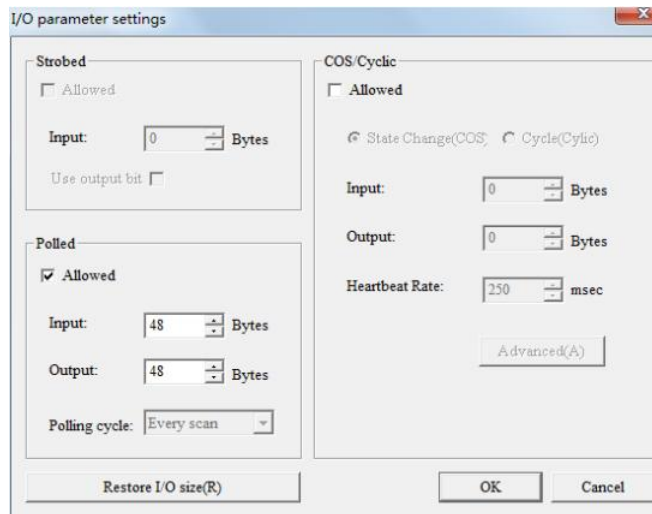

(2)   Scan List

In the "Scan List" option interface, users can select devices to add to the "Scan List" of the master and set its I/O parameters:
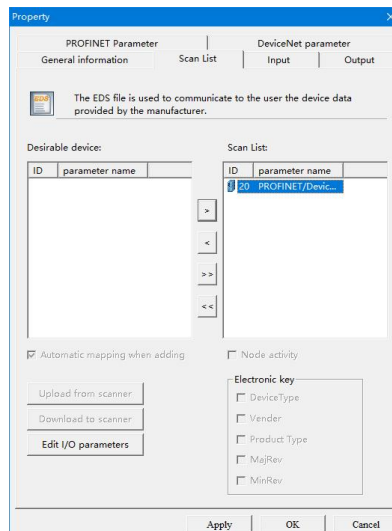

Add adapter station 20 to the master station mapping list, and then select adapter station 20 in the "Scan List". After selecting it, click "Edit I / O parameters". This interface sets the number of input and output bytes of the adapter.

(3)   Input/Output

In the "Input", "Output" options interface. The user can map the address of the device added to the master and select automatic mapping. In the figure below, the "Start" edit box parameter is the starting address of the automatic mapping. The automatic mapping will start with the address set here, where one unit is two bytes, that is, when the "Start" edit box parameter is "1", the automatic mapping will start with the third byte.
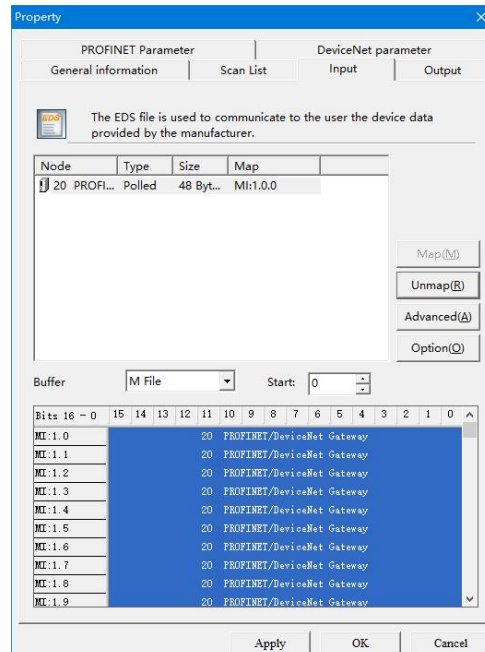
✓   If users need to map manually, they can also click the "Advanced" button to set the starting address in the dialog box shown below.
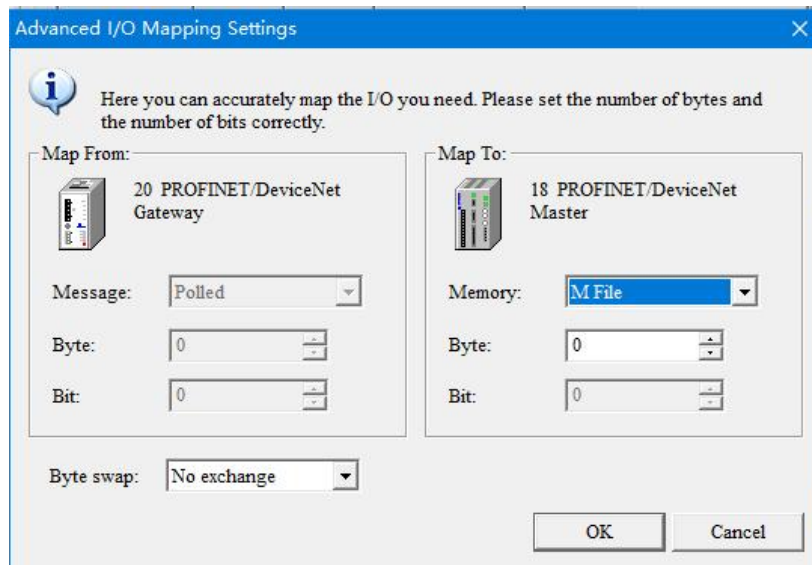
✓ In the advanced settings interface, the user can also set the byte exchange mode of this adapter device. There are three types of byte exchange: No-exchange, Two-byte exchange, and Four-byte exchange. The meanings are as follows:

No-exchange: Data transfer normally.

Two-byte exchange: Two-byte exchange in the same register. For example, the result after 1234 swapping is 3412.

Four-byte exchange: Four-byte exchange in two registers. For example, after 12, 34, 56, 78 swap, the result is 78, 56, 34, 12.

✓ If you need to set the unit that maps the starting address, click "Option" button to set it. As shown in the figure below, "Byte Align" means in one byte and "Word Align" means in two bytes:
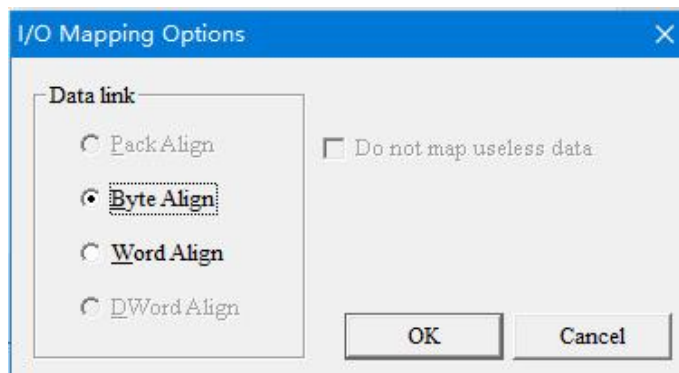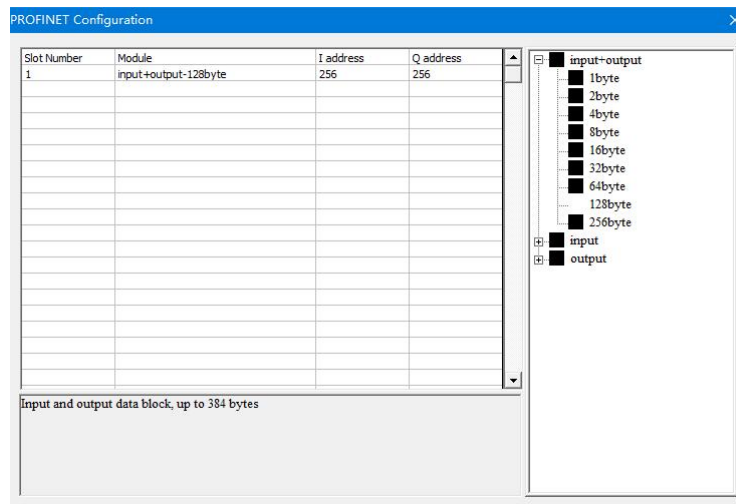
(4)   PROFINET Parameter

In the "PROFINET Parameter" interface, users can set PROFINET parameters:
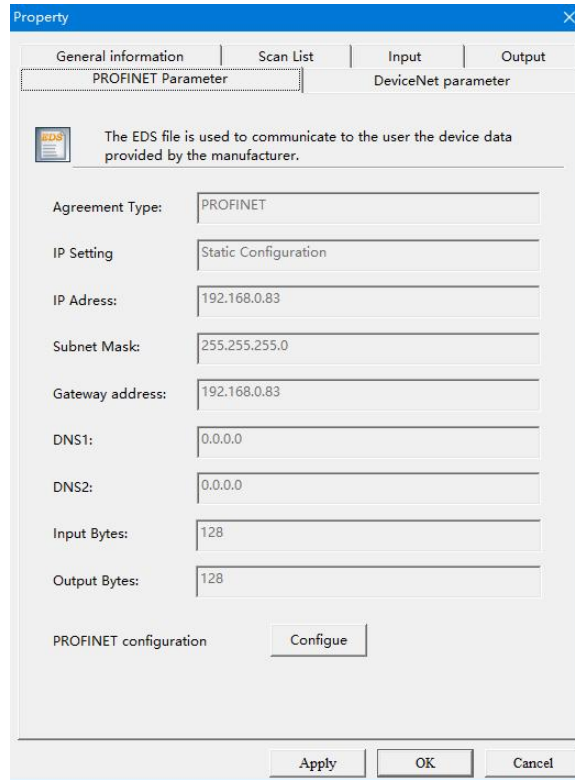
Click "Configure" button to set the input and output maximum number of bytes for the PROFINET master in the pop-up interface. In the interface shown below, you can double-click the tree node to add the number of input/output bytes you need to add:

(5) DeviceNet parameter

In the "DeviceNet parameter" interface, users can set PROFINET parameters.

Input data hold/clear: Whether the corresponding DeviceNet input data is cleared when the number of DeviceNet command response errors reaches the number of DeviceNet command retransmissions.

Clear: DeviceNet input data is cleared.

Hold: DeviceNet input data keep the correct data received last time.

Number of command resends: When DeviceNet command responds incorrectly, the number of the command Resends ranges from 2 to 254 and the default value is 3.
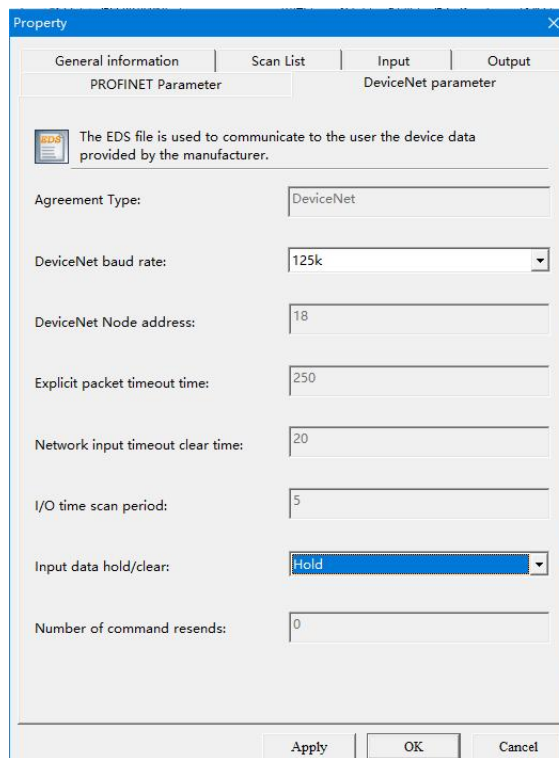

6.5 DeviceNet Adapter Module Property Introduction

Double-click the device module on the bus and appear the device property page.

(1) General information

In the "General information" interface, you can modify the address. After the address needs to be changed successfully, the adapter device of the modified address will restart and the network needs to be reconnected. "Device ID" shows the information of the device manufacturer, type, device, sort and version.
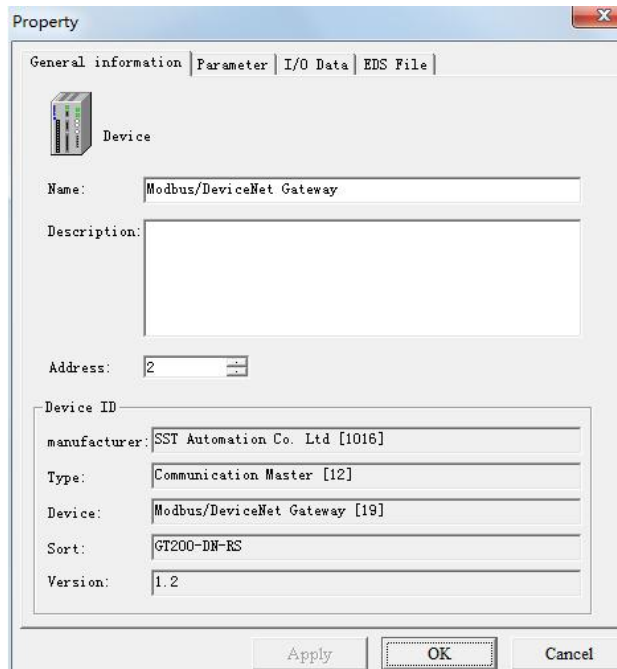
(2) Parameter

In the "Parameter" interface, the user can upload and download the parameters of the device to facilitate online modification of the device parameter values.
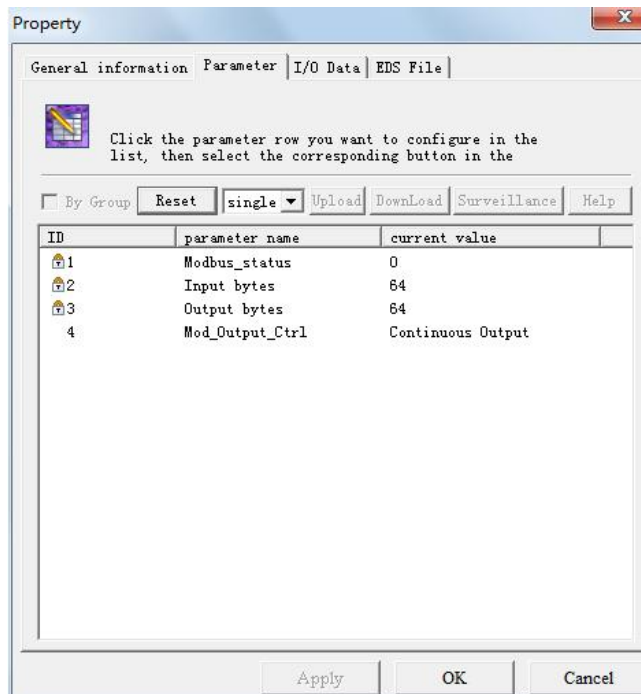

➢ Reset: The "Reset" button can restore the default value of the parameters, and can only "Reset" for a single

parameter.

➢ Upload: The "Upload" button supports single and full parameter operation. After clicking "Upload", the interface will display the actual parameter value of the current online adapter DeviceNet device.

➢ Download: The "Download" button only supports single parameter operation, through which the parameters of online devices can be modified. Whether the parameters support the "Download" operation can be seen from the "ID" number of the interface. If there is an 🔒 icon before the ID , the parameter cannot be modified online by the configuration software. Whether the parameters support online modification is determined by the EDS file that is registered.

➢ The display of the property interface also includes: Parameter ID, parameter name and the current value of the parameter. SST-DNET-COM software supports relevant linear operations on parameters defined in EDS files. The current value shows the result of the operation, and the user can set the relevant operation factor as required.

(3) I/O Data

It is shown in the figure below. After the DeviceNet network device is connected, the byte length of network output and network input is determined. How does the user know the length of the input and output? You can learn from EDS.
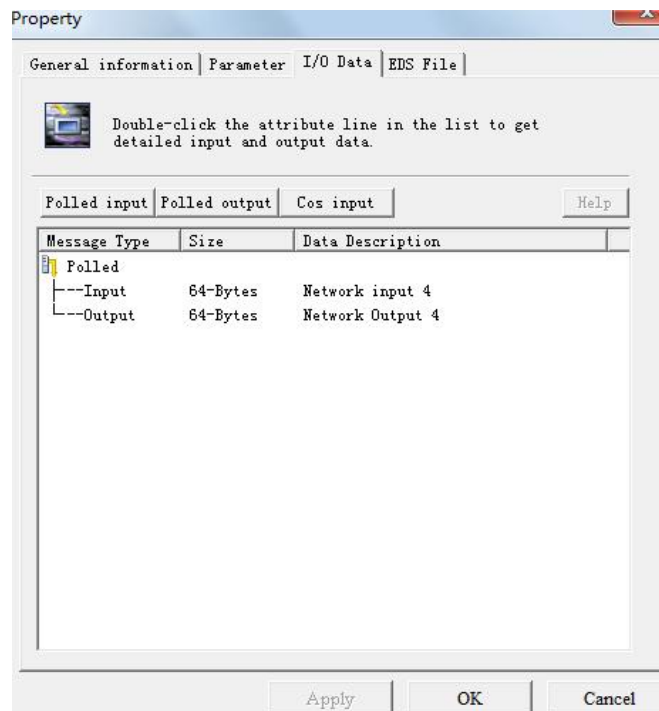

The number of bytes in/out of SST-DNET-COM software can also provide this information.

In the figure above, the input and Output 64-Bytes bytes provided under the "Polled" project are the default input and output data byte lengths.

The maximum number of input bytes supported by SST-DNET-COM software is 128, and the maximum number of output bytes is 112.

**Take "Polled Input" and "Polled Output" as examples:**

    ①   Click the "Polled Input" button, and then click the "Read" button, DeviceNet software will read the network input data. If the user selects the "Continuous reading" check box, SST-DNET-COM software will continuously read the network input data of the field DeviceNet device. As shown in the figure below:
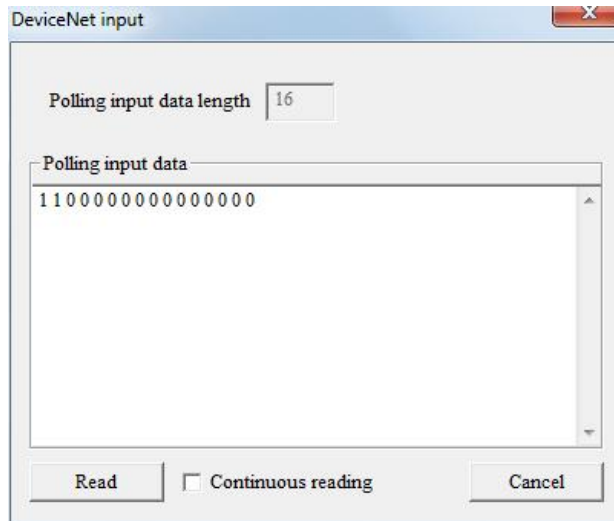
    ②   Similarly, by clicking the "Polled Output" button, users can see the network output data dialog box. The user must type in all the output data, otherwise the output data is incomplete (the number of bytes is incorrect), and the output will not succeed.
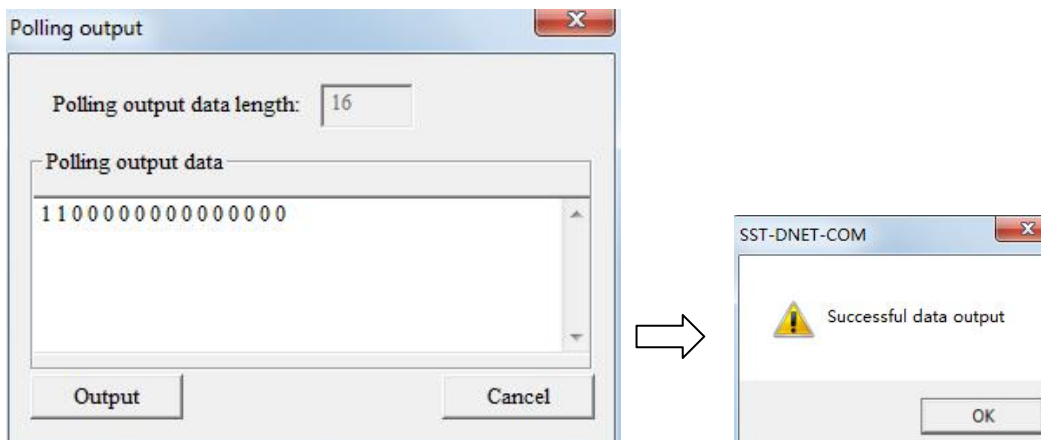

If the output data length is incorrect, it will be displayed:
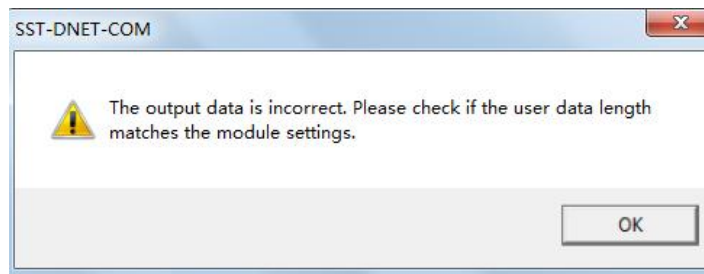
Note that after the address is changed in the general interface, because the device with the modified address will be restarted and the DeviceNet internet connection has been disconnected. At this time, the I/O data input and output operation will not be able to see the data. You need to disconnect SST-DNET-COM's "Internet Connection" and re-establish the internet connection.

6.6 Send the Explicit Message
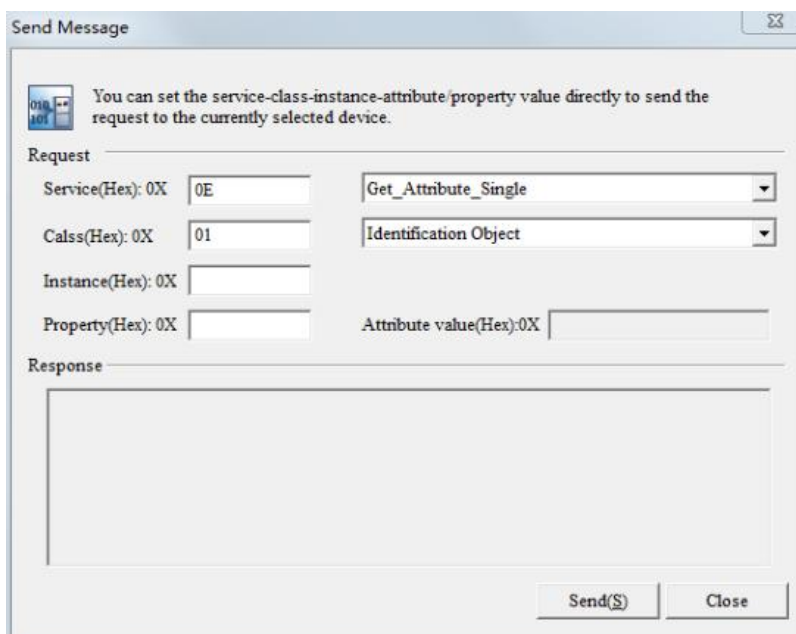
Through explicit message modification, it is the advanced function of DeviceNet network. Users need to have a better understanding of DeviceNet network.

After the device is online, click the right button to "send an explicit message". The interface pops up as shown in the figure above. Users can set and obtain properties to facilitate online debugging of the device.

With this function, users can directly read or set the corresponding parameters of the device without passing through the EDS file of the device.

Service ID, Class ID, Instance ID, Property ID, attribute value data format are hexadecimal, where Class ID and Instance ID can be one or two bytes, bytes and bytes are separated by spaces. All ID are low bytes first, high bytes after.

    Supported Service ID: 0x0E   Get_Attribute_Single   Read parameter attribute values.

                      0x10   Set_Attribute_Single   Write parameter attribute values.

   Supported Class ID: Support standard class ID 0x01-0x27 and custom class.

The corresponding Service ID or Class ID on the left can be determined by selecting the service content or object name on the right. When you are a custom class, you can enter the Class ID directly. At this point, the Class ID is not corresponding to the object on the right, and the manually entered Class ID shall prevail.

7 Working Principle

How the DeviceNet networks work:

The data conversion between GT100-PN-DM's DeviceNet and PROFINET is established through a "mapping" relationship. There are two data buffers in GT100-PN-DM, one is PROFINET network input buffer, and the other is PROFINET network output buffer. The DeviceNet read command writes the read data to the network input buffer for PROFINET network reading. DeviceNet write register commands take data from the network output buffer, and output to the corresponding DeviceNet device through the POLL I / O write command.
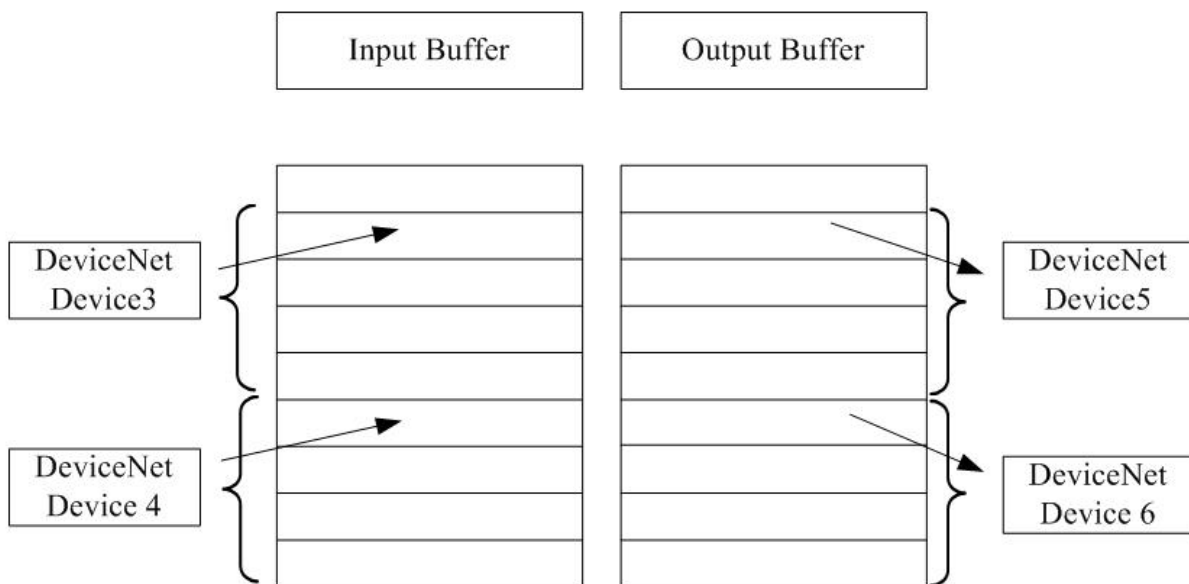
When the DeviceNet port is used as a master station, the module GT100-PN-DM supports only one DeviceNet adapter device.