

DeviceNet/PROFINET Gateway

GT100-PN-DM

User Manual

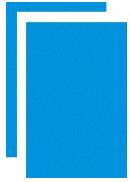
V3.4



SST Automation

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Important Information

Warning

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

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

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Table of Contents

1 Product Overview	1
1.1 Product Function	1
1.2 Product Features	2
1.3 Technical Specifications	2
1.4 Related Products	5
1.5 Revision History	5
2 Hardware Descriptions	6
2.1 Product Appearance	6
2.2 Indicators	7
2.3 Configuration Button	8
2.4 Communication Interface	8
2.4.1 Power and DeviceNet Interface	8
2.4.2 Ethernet Interface	9
3 Hardware Installation	10
3.1 Mechanical Dimensions	10
3.2 Installation Method	10
4 Instructions	11
4.1 Quick Start Guide	11
4.1.1 Pre-operation mode---Scanning Adapter Devices on the DeviceNet Network and Debugging	11
4.1.2 Pre-operation mode---Uploading/Downloading GT100-PN-DM Configuration	17
4.1.3 Operation Mode	19
4.2 SST-DNET-COM Online Configuration (DeviceNet scanner Mode)	20
4.2.1 Note before configuration	20
4.2.2 Software Main Interface	21
4.2.3 Tool Bar	21
4.2.4 DeviceNet Device Network Configuration	22
4.2.5 DeviceNet Network Scanning	27
4.2.6 Device Parameter Modification and I/O Data Testing	29
4.2.7 Sending Explicit Messages	38
4.3 SST-DNET-COM Offline Configuration (DeviceNet scanner Mode)	38
4.4 SST-DNET-COM Offline Configuration (DeviceNet Adapter Mode)	44
5 Working Principle	48

1 Product Overview

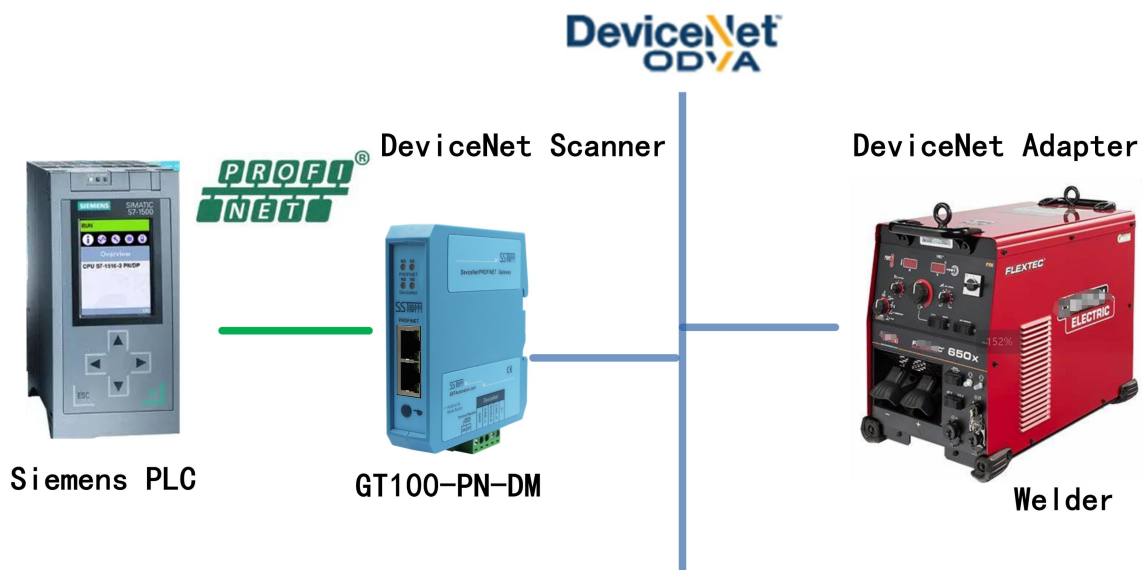
1.1 Product Function

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:

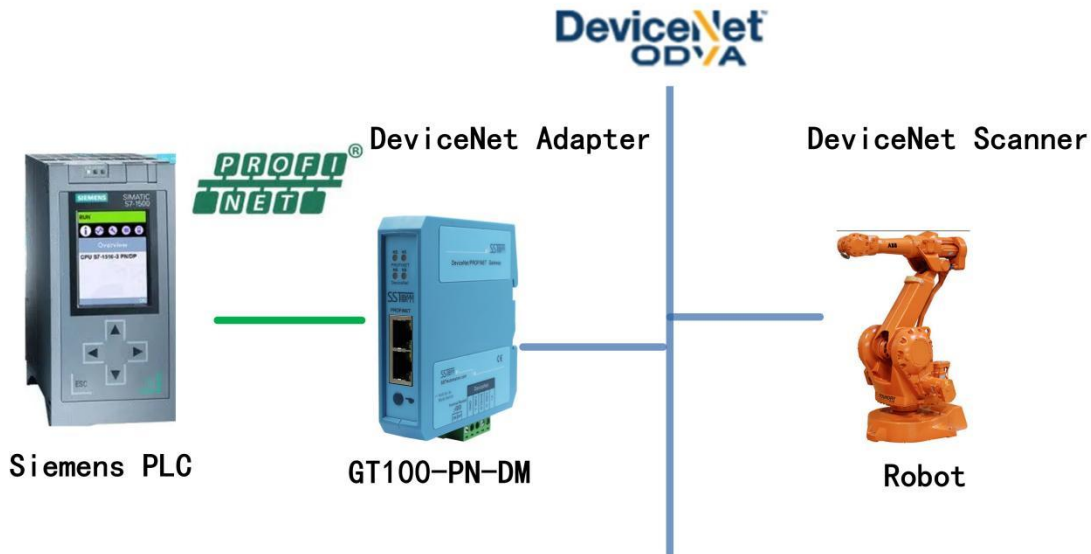
[1] PROFINET device to DeviceNet scanner application

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 scanner 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 scanner 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: 224 bytes. Output: 224 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] Supports standard PROFINET RT and IRT protocols..

[3] PROFINET supports up to 32 slots, with a maximum input byte size of 1440 and a maximum output byte size of 1440 (the usable length is limited by the PDU size of the specific PLC and communication module). The input and output byte lengths can be configured through scanner station software such as TIA Portal or STEP 7.

[4] The supported PROFINET module types are as follows:

- **Input 001 byte**
- **Input 002 bytes**
- **Input 004 bytes**
- **Input 008 bytes**
- **Input 016 bytes**
- **Input 032 bytes**
- **Input 064 bytes**
- **Input 128 bytes**
- **Input 256 bytes**
- **Input 512 bytes**
- **Output 001 byte**
- **Output 002 bytes**
- **Output 004 bytes**
- **Output 008 bytes**

- **Output 016 bytes**
- **Output 032 bytes**
- **Output 064 bytes**
- **Output 128 bytes**
- **Output 256 bytes**
- **Output 512 bytes**
- **Input / Output 001 byte**
- **Input / Output 002 bytes**
- **Input / Output 004 bytes**
- **Input / Output 008bytes**
- **Input / Output 016 bytes**
- **Input / Output 032 bytes**
- **Input / Output 064 bytes**
- **Input / Output 128 bytes**
- **Input / Output 256 bytes**
- **Input / Output 512bytes**

[5] EMC:

- **Electrostatic Discharge (ESD) Immunity**

For non-metallic equipment enclosures, a test voltage of $\pm 8\text{KV}$ is applied using the air gap discharge method.

For metallic equipment enclosures, a test voltage of $\pm 4\text{KV}$ is applied using the air gap discharge method.

- **Radiated Radio Frequency Electromagnetic Field Immunity**

Amplitude-modulated wave with a frequency range of 80 MHz to 1000 MHz and a field strength of 10V/m.

- **Electrical Fast Transient/Burst Immunity**

A maximum test voltage of $\pm 1\text{KV}$ at 5kHz is applied to cables containing CDI communication media.

A maximum test voltage of $\pm 2\text{KV}$ at 5kHz is applied to all other cables and ports.

- **Conducted Immunity to Radio Frequency Induced Disturbances**

Amplitude-modulated wave at 10V rms within the frequency range of 150 kHz to 80 MHz.

- **Emissions**

In accordance with GB4824, Group 1, Class A.

- **Conducted Emissions**

In accordance with GB4824, Group 1, Class A.

[6] Power: 24 VDC (9~30 VDC), 90mA(24VDC).

- [7] Operating temperature: -40°F~158°F(-40°C ~ 70°C). Humidity: 5%~95% (non-condensing).
- [8] Built-in electrostatic protection: 15 KV ESD. Communication interface isolation: 3KV.
- [9] Dimensions (W*H*D): 1.0 in *4.0 in *3.6 in (25mm*100mm*90mm).
- [10] Installation: 1.4 in (35mm) DIN RAIL.
- [11] Protection level: IP20.
- [12] Pollution level: 3.

1.4 Related Products

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

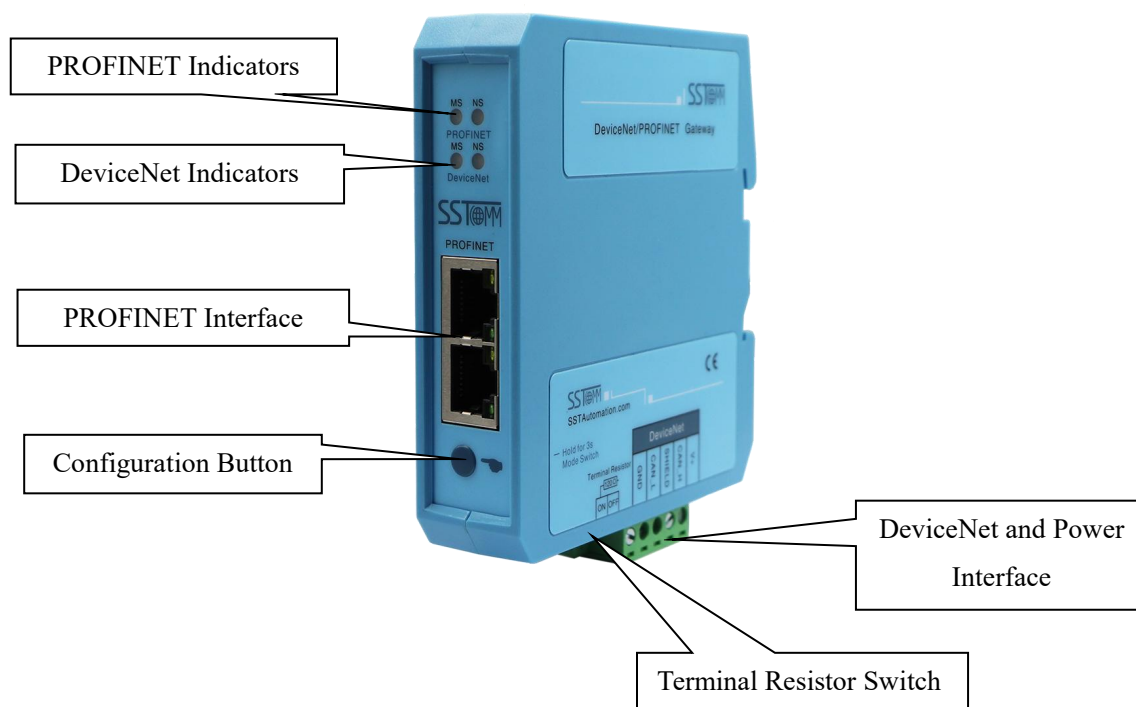
To get more information about related products, please visit SSTCOMM website: www.sstautomation.com.

1.5 Revision History

Revision	Date	Chapter	Description
V3.4	1/5/2025	PART	New DeviceNet modeling software SST-DNET-COM
V2.0, Rev C	07/29/2022	PART	New DeviceNet modeling software SST-DNET-COM
V2.0, Rev B	01/10/2022	ALL	Update the format and update software screenshot.
V2.0, Rev A	11/27/2019	ALL	Added DeviceNet adapter configuration mode and description.
V1.4, Rev A	02/20/2019	Chapter 3	Remove the three-pin power interface, and change the color of the gateway to cyan.
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.

2 Hardware Descriptions

2.1 Product Appearance



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 scanner 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 scanner 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 Configuration Button

After the gateway is started, it enters the operation mode by default. The mode can be switched by pressing the button. After each key operation is successfully recognized, the MS and NS lights on the DeviceNet side will flash orange once. The functions are as follows:

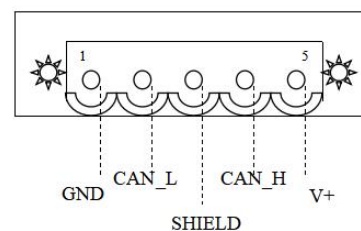
Operation	Function Description	Exit Operation
Press and hold the button for 3 seconds	DeviceNet scanner operation mode switches to operation mode	Press and hold the button again for 3 seconds, the device will exit the operation mode and restart
After double-clicking the button, press and hold for 3 seconds (if there is no action within 10 seconds after double-clicking, the operation will be cancelled)	Reset	After the key operation is successful, the gateway will restart itself and use the default configuration. Default parameters: 192.168.0.83, device name:gt200pnrs
Press and hold the button before powering on	Enter bootloader Mode	Restart the gateway

2.4 Communication Interface

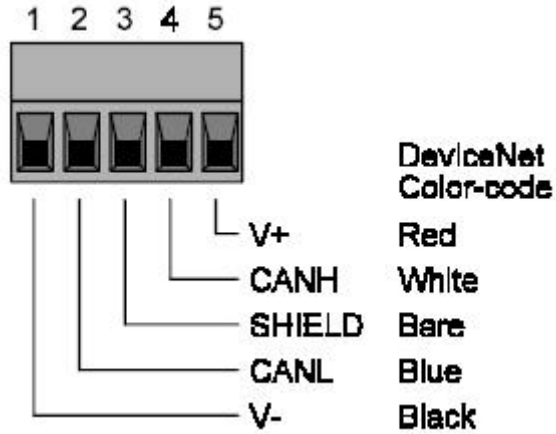
2.4.1 Power and DeviceNet Interface

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+)



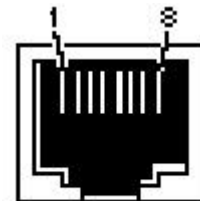
The DeviceNet side uses an open five-core connector:



2.4.2 Ethernet Interface

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

Pin	Signal Description
S1	TXD+, Transmit Data+
S2	TXD-, Transmit Data-
S3	RXD+, Receive Data+
S6	RXD-, Receive Data-
S4,,5,7,8	Reserved



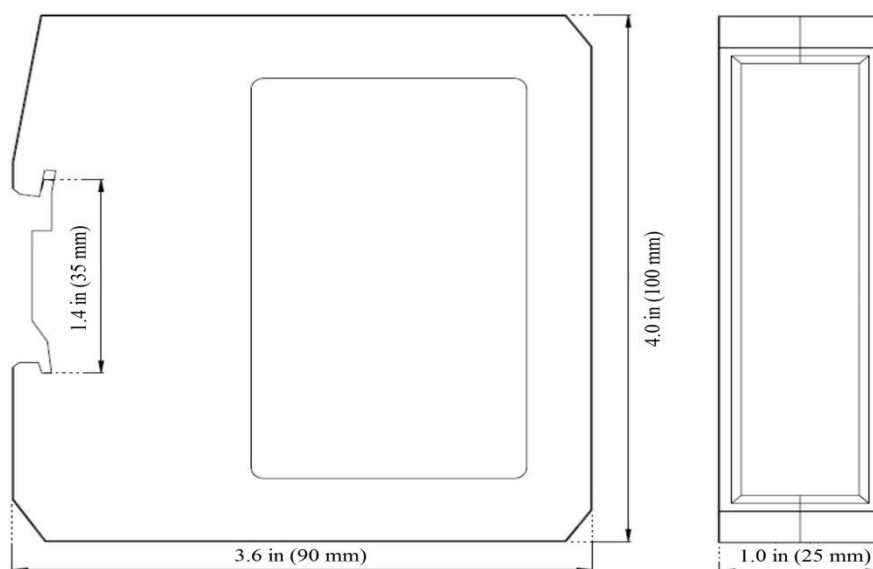
RJ-45 port

3 Hardware Installation

3.1 Mechanical Dimensions

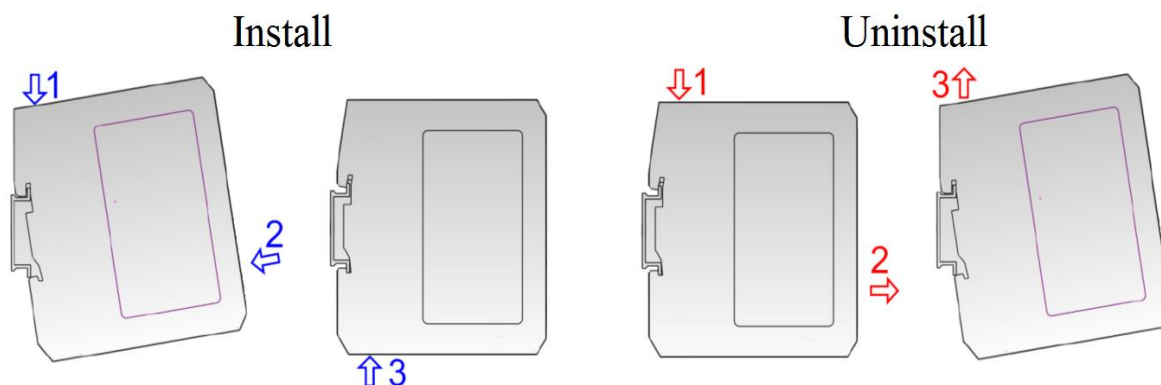
Size (width * height * depth):

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 Instructions

4.1 Quick Start Guide

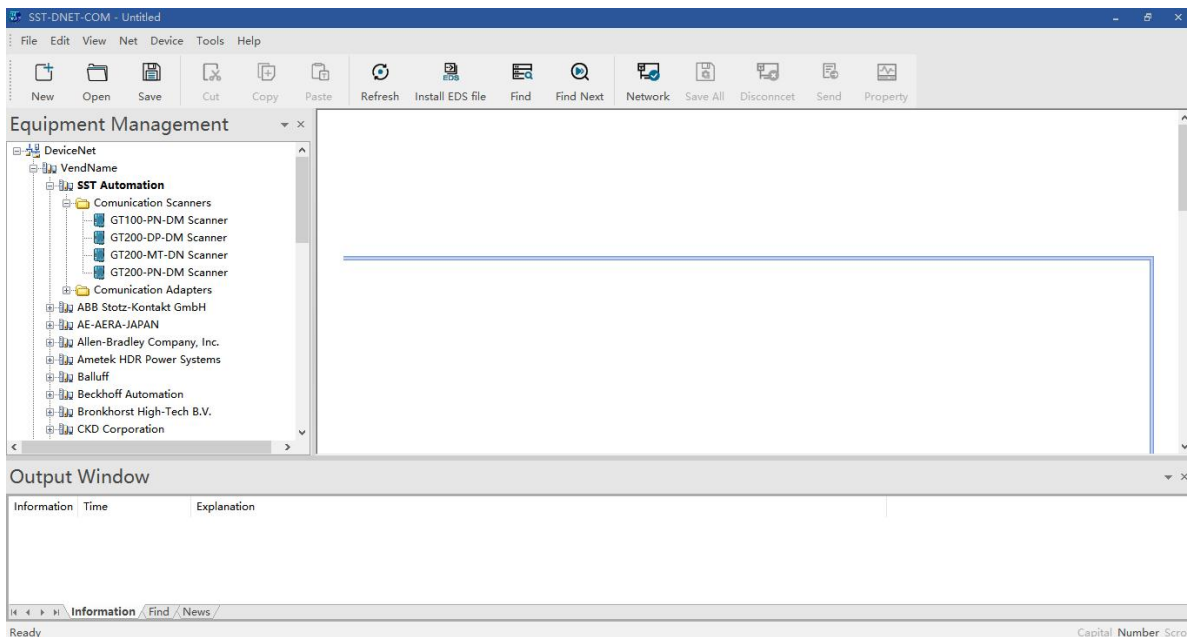
The gateway supports two modes: Pre-operation and operation. Pre-operation mode is used to scan adapter devices in the DeviceNet network, debug or upload/download GT100-PN-DM configuration. Operation mode is used for normal communication. The gateway's Mode can be selected through the configuration button, please refer to Chapter 2.3.

4.1.1 Pre-operation mode---Scanning Adapter Devices on the DeviceNet Network and Debugging

Applicable scene: When the I/O parameters of the adapter in the DeviceNet network are uncertain.

Connect GT100-PN-DM and PC via cable, then power on the gateway. Wait until 4 lights on the gateway are on. Press and hold the button for 3 seconds, release the button when MS and NS indicators on the DeviceNet side flash orange once, indicating switching to operating mode.

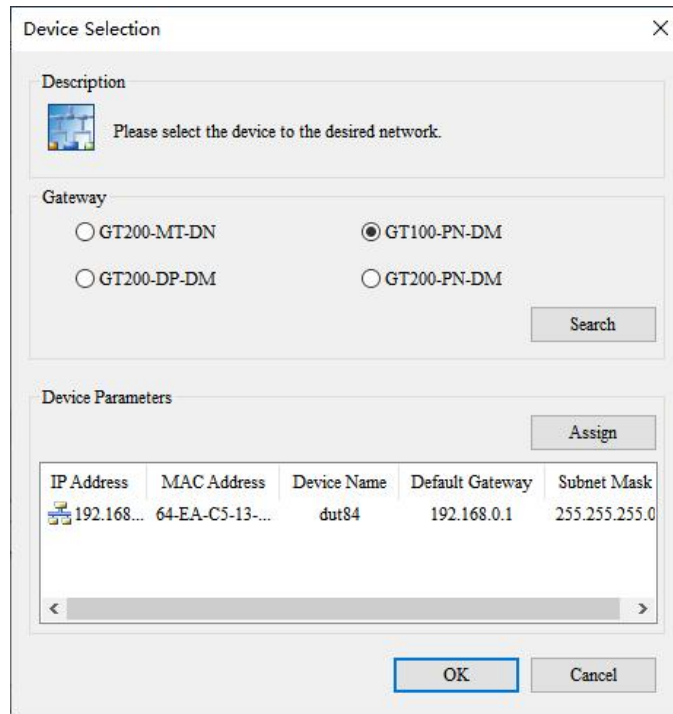
Double-click the SST-DNET-COM software installed on the PC, as shown in the figure below:



1. Click the “Install EDS file” and follow the prompts to import the EDS file of the connected DeviceNet adapter device.

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

2. Click "Network " on the toolbar and select the GT100-PN-DM configuration interface in the following pop-up box.



The "Device Selection" dialog box contains the following sections:

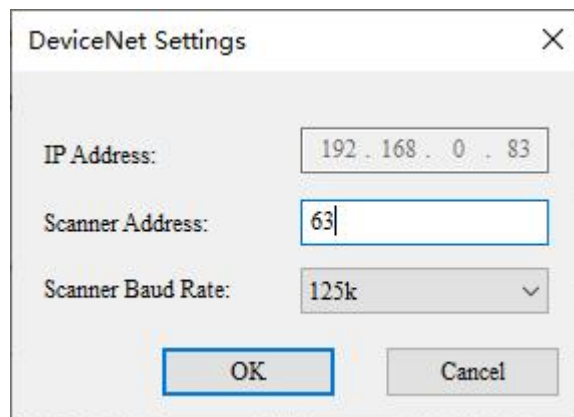
- Description:** A message box with a computer icon and the text "Please select the device to the desired network."
- Gateway:** Four radio buttons for selecting a gateway type: GT200-MT-DN, GT100-PN-DM (selected), GT200-DP-DM, and GT200-PN-DM. A "Search" button is located to the right.
- Device Parameters:** A table listing discovered devices. An "Assign" button is located above the table.

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168...	64-EA-C5-13-...	dut84	192.168.0.1	255.255.255.0

At the bottom of the dialog are "OK" and "Cancel" buttons.

3. Click "Search" and "Search" window will pop up. The software will automatically scan for GT100-PN-DM devices on the network. Select the GT100-PN-DM you want to configure (if the device is not scanned, click "Refresh" to try again), and then Click "Sign In".

4. At this point, the "DeviceNet Settings" window will appear. The IP address is a read-only field, while the Scanner Address and Scanner Baud Rate are configurable fields. The Scanner Address refers to the node address of the GT100-PN-DM on the DeviceNet bus, and the Scanner Baud Rate refers to the baud rate used by the DeviceNet network. After setting the parameters, click "OK."



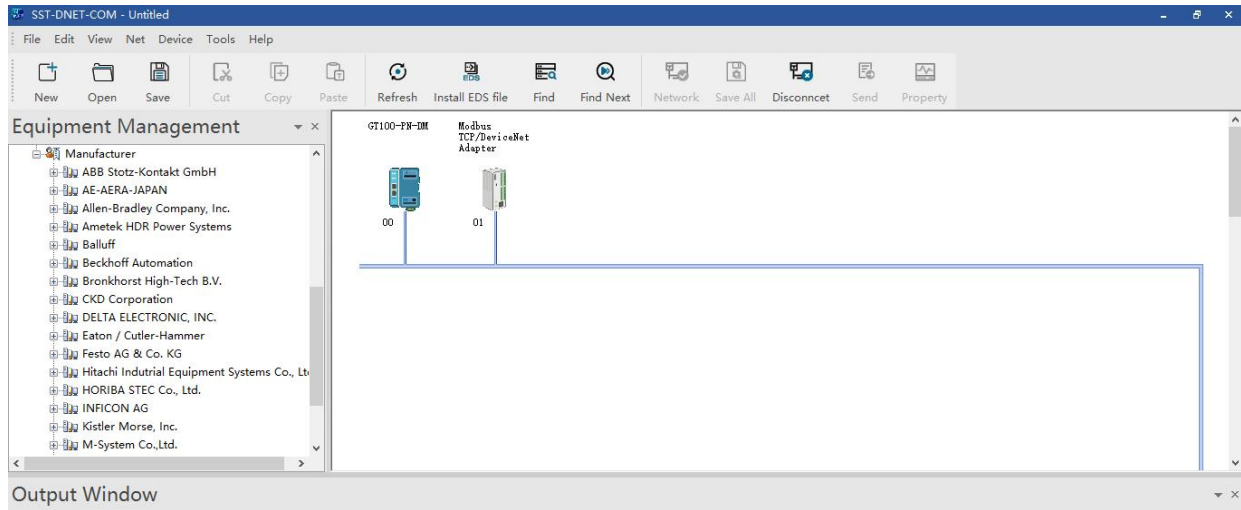
The "DeviceNet Settings" dialog box contains the following fields:

- IP Address:** A read-only text field displaying "192 . 168 . 0 . 83".
- Scanner Address:** A text field with "63" entered.
- Scanner Baud Rate:** A dropdown menu with "125k" selected.

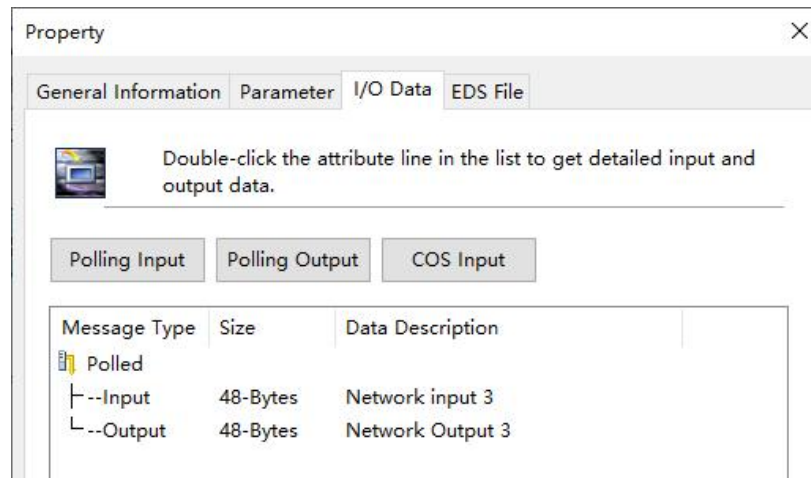
At the bottom are "OK" and "Cancel" buttons.

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

5. Return to the "Path Selection" window and click "OK" to begin scanning the devices on the DeviceNet network.
6. After the adapter devices are scanned, they will appear as shown in the figure below.



7. Double-click on the adapter device to view its I/O Data (the actual input/output byte count of the device may differ from the default values, and you can click on Polling Input and Output to obtain the actual data length), as shown in the figure below:





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GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual

Property

General Information

DeviceNet Parameters

PROFINET Parameters

Scan List

Input

Output

Available Devices:

ID	Device Name
----	-------------

Scan List:

ID	Device Name
1	Modbus TCP/DeviceNet A...

☒ Automatic Mapping When Adding

☐ Node Activity

Upload From Scanner

Download to Scanner

Edit I/O Parameters

Electronic key

☐ DeviceType

☐ MajRev

☐ Vender

☐ MinRev

☐ Product Type

Apply

OK

Cancel

I/O Parameter Settings

Strobed

☐ Allowed

Input: 0 Bytes

Use Output Bit ☐

Polled

☒ Allowed

Input: 64 Bytes

Output: 64 Bytes

Polling Cycle: Every scan

COS/Cyclic

☐ Allowed

☒ State Change(COS) ☐ Cycle(Cylic)

Input: 0 Bytes

Output: 0 Bytes

Heartbeat Rate: 250 msec

Advanced(A)

Restore I/O Size(R)

OK

Cancel

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

Property

General Information PROFINET Parameters

DeviceNet Parameters Scan List **Input** Output



Node	Type	Size	Map
1 Modbus TCP/Device...	Polled	64 Bytes	MI:1.0.0

Map(M)
Unmap(R)
Advanced(A)
Options(O)

Buffer Memory: M File Start: 0

Bits	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MI:1.0																	
MI:1.1																	
MI:1.2																	
MI:1.3																	
MI:1.4																	
MI:1.5																	
MI:1.6																	
MI:1.7																	

Apply OK Cancel

Property

General Information PROFINET Parameters

DeviceNet Parameters Scan List Input **Output**



Node	Type	Size	Map
1 Modbus TCP/Device...	Polled	64 Bytes	MO:1.0.0

Map(M)
Unmap(R)
Advanced(A)
Options(O)

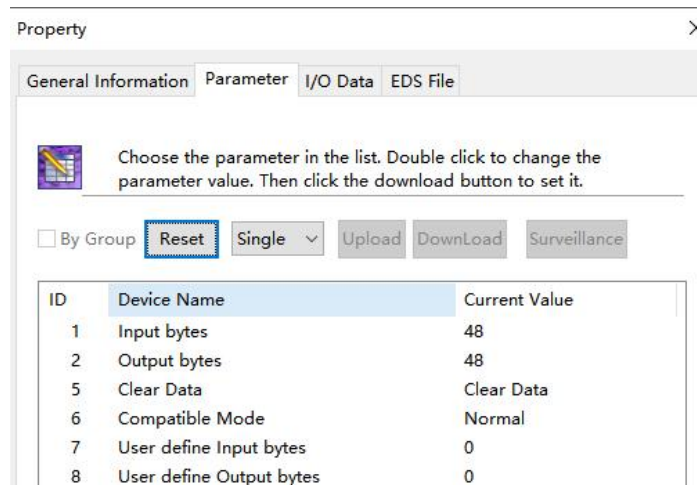
Buffer Memory: M File Start: 0

Bits	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MO:1.0																	
MO:1.1																	
MO:1.2																	
MO:1.3																	
MO:1.4																	
MO:1.5																	
MO:1.6																	
MO:1.7																	

Apply OK Cancel

9. Click "Apply" to save the configured parameters to the GT100-PN-DM. At this point, a prompt window saying "Applied Successfully" will pop up. Click "OK" to return to the main interface.

10. Regarding debugging, if no debugging is required, this step can be skipped. If debugging is needed, double-click the adapter device icon (in this example, node 1). In the "Parameters" section, you can upload the relevant parameters of the adapter device. In the "I/O Data" section, you can perform read and write operations on the adapter's data. (For detailed instructions, refer to section 4.3 SST-DNET-COM Configuration Software.)

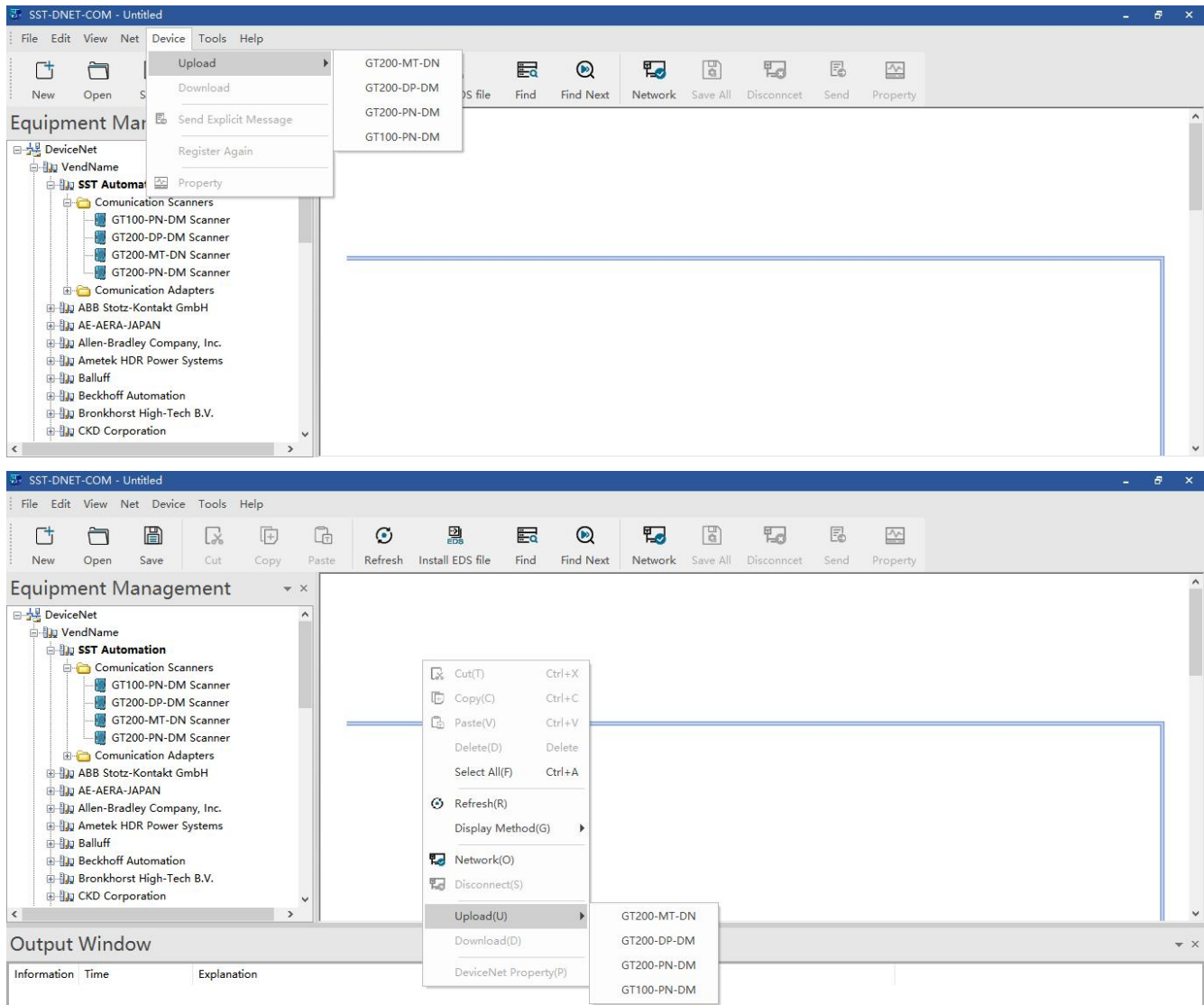


4.1.2 Pre-operation mode---Uploading/Downloading GT100-PN-DM Configuration

Applicable Scenario: To view the existing configuration in the GT100-PN-DM device, confirm the parameters of the adapter devices, and directly set the relevant parameters in SST-DNET-COM before downloading the configuration to GT100-PN-DM device.

1. In SST-DNET-COM menu bar, click "Device," and from the drop-down menu, select "Upload" and choose "GT100-PN-DM," or right-click in the blank area of the configuration interface and select "Upload," then choose "GT100-PN-DM." "Upload" is used to view the configuration stored in GT100-PN-DM, and "Download" is used to download the configured settings into GT100-PN-DM.

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual



2.To modify the device name and IP address on the PROFINET side, click "Network " in the toolbar, then select "Assign ." In the pop-up box, click "Browse" to select the device and click "Sign in," as shown in the figure below. You can now modify the IP address and device name. Click "OK" to complete the modification.

GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual

Search

×

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.83		dut83	192.168.0.83	255.255.255.0

Sign In

Refresh

Cancel

Searching

Set the IP address and device name

×

Destination MAC Address

Browse

Ethernet

IP Address

192 . 168 . 0 . 83

Subnet Mask

255 . 255 . 255 . 0

Default Gateway

192 . 168 . 0 . 83

Device Name

dut83

OK

Cancel

4.1.3 Operation Mode

- 1.Press and hold the button for 3 seconds. When the MS and NS orange LEDs on the DeviceNet side flash once, release the button. This indicates that the gateway has switched from pre-operation mode to operation mode.
- 2.Use a network cable to connect one end to the GT100-PN-DM device and the other end to the PLC or the switch connected to the PLC (please ensure that the configuration has been downloaded to the PLC).
- 3.Connect the GT100-PN-DM to the DeviceNet network.
- 4.Power on the GT100-PN-DM. At this point, the GT100-PN-DM will establish communication with the adapter devices on the DeviceNet network.
- 5.The PROFINET side will establish communication with the PLC. (To determine whether a connection is established, please refer to section 3.2 and check the status of the indicator lights).

For communication between the GT100-PN-DM and the PLC (PROFINET scanner), the following two conditions

must be met simultaneously:

- 1.The name of the GT100-PN-DM must match the device name in the PLC configuration.
- 2.The IP address of the GT100-PN-DM must match the IP address of the device in the PLC configuration.

If you encounter any problems during configuration and operation, please send emails to support: support@sstautomation.com.

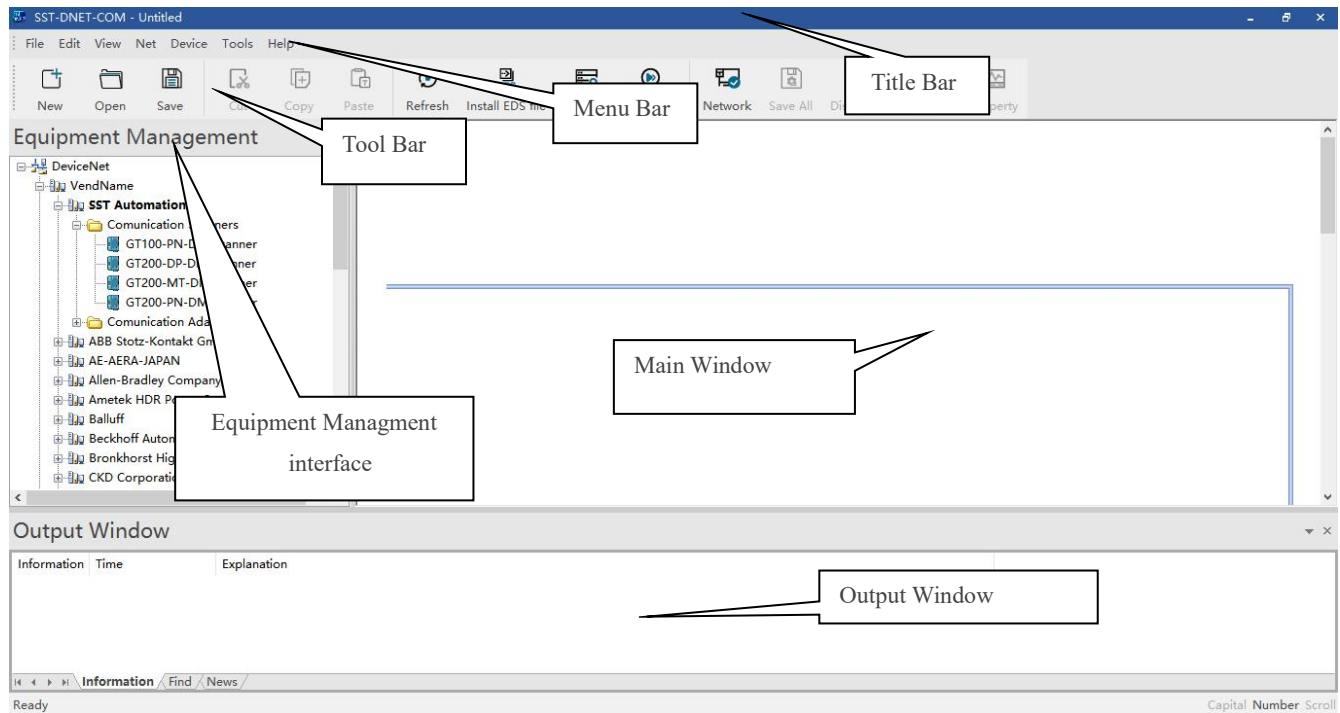
4.2 SST-DNET-COM Online Configuration (DeviceNet scanner Mode)

4.2.1 Note before configuration

Power on the GT100-PN-DM, until 4 lights of the gateway are on, press and hold the button for 3 seconds, on DeviceNet side MS and NS will orange flash once and then release. . The gateway will switch to pre-operation mode, allowing you to configure the I/O parameters of adapter devices on the DeviceNet network using the SST-DNET-COM software.

4.2.2 Software Main Interface

After installing the software, double-click to enter the main interface of the software:



Main Window: After establishing a network connection, the online devices are displayed. You can modify device addresses, parameters, and view input/output data online. In offline mode, by dragging the device icon into this window, you can view device properties.

Equipment Management Window: Displays registered DeviceNet devices, categorized by device type and manufacturer. Under each manufacturer, different devices are further classified by device type.

Output Window: Dynamically displays network scanning information and shows the results of "Find Device" and "Find Next."

4.2.3 Tool Bar

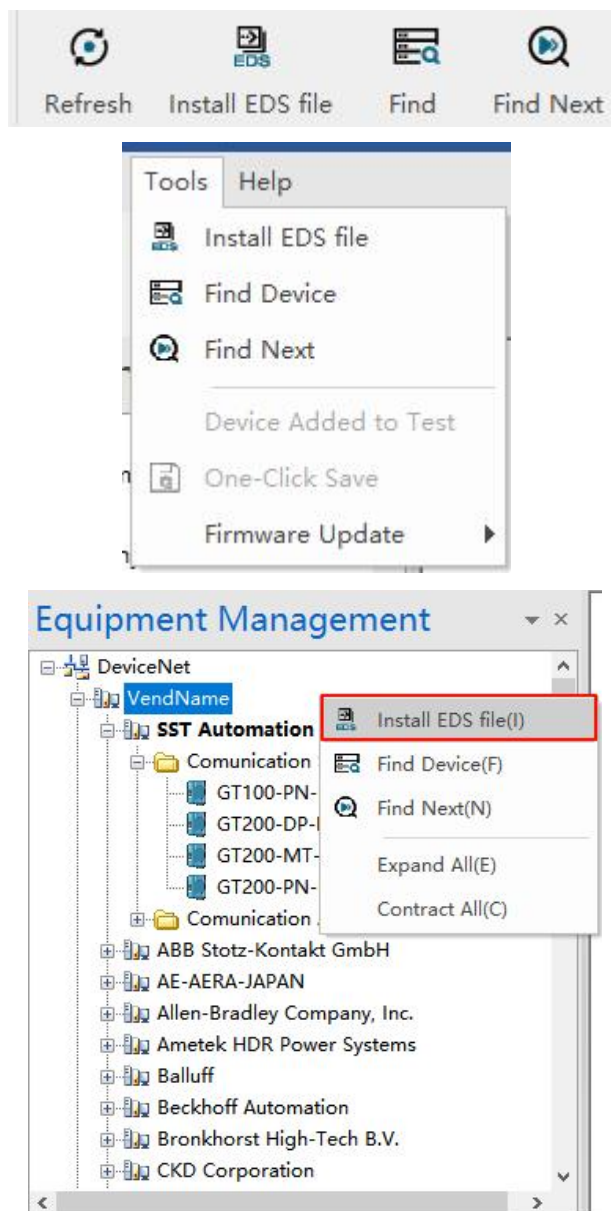


Functions separately from left to right are: New, Save, Open, Copy, Paste, Refresh viewport, Install EDS file, Find devices in the device library, find next, Network Connection, Save All, Disconnect, Send Explicit Message, Property.

4.2.4 DeviceNet Device Network Configuration

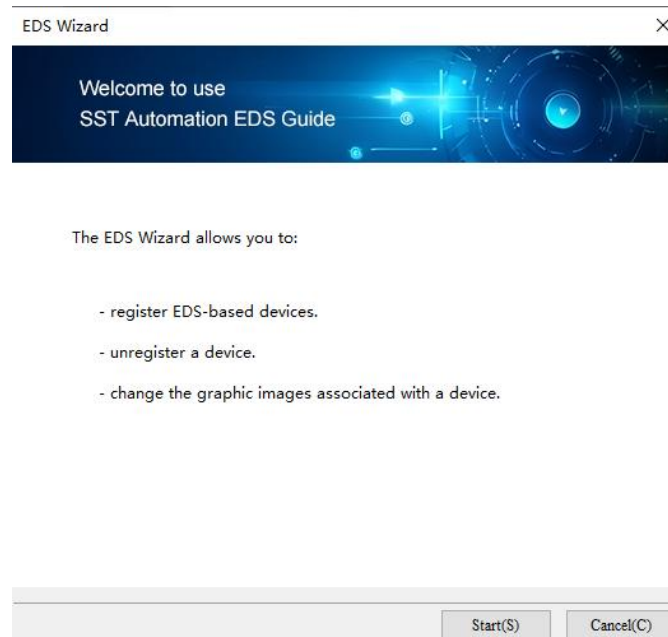
➤ Install EDS file:

Users can configure different DeviceNet devices by registering new EDS files. To register a new EDS file, select "Tools" -> "Install EDS file", or click "Install EDS file" button in the toolbar. Or directly click the right button in the Equipment management window and select "Install EDS file" which will pop up the Install EDS file interface. The three ways are as follows:

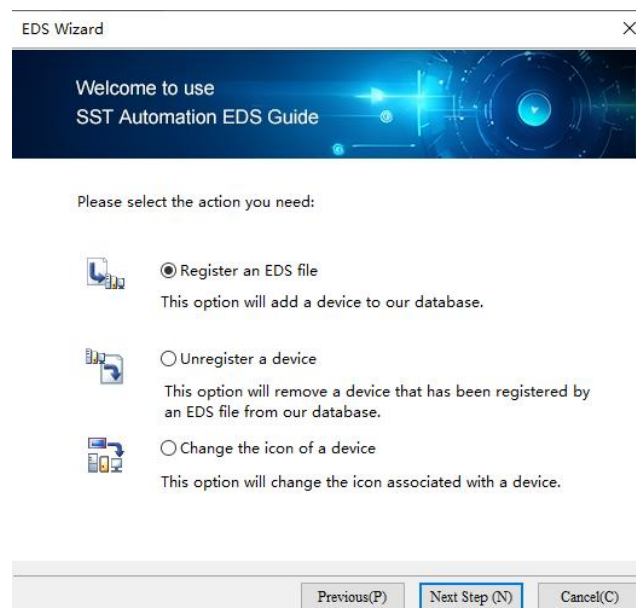


GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

Install EDS file interface is shown in the following figure:



Select "Start "and pop up the following interface:



In this interface, users can choose to Register an EDS file, Unregister a 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:

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

EDS Wizard

Welcome to use
SST Automation EDS Guide

EDS file name:

Browse...

This EDS file will be closely related to the device you are adding.

This file is generally provided by the equipment supplier. If you do not have the file yet, you can request it from the equipment supplier before completing the addition of the equipment.

Be sure to ensure the correctness of the EDS documentation!

Previous(P) Next Step (N) Cancel(C)

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:

EDS Wizard

Welcome to use
SST Automation EDS Guide

EDS file test report:

ID	Type	Description
----	------	-------------

Error 0, Warning 0

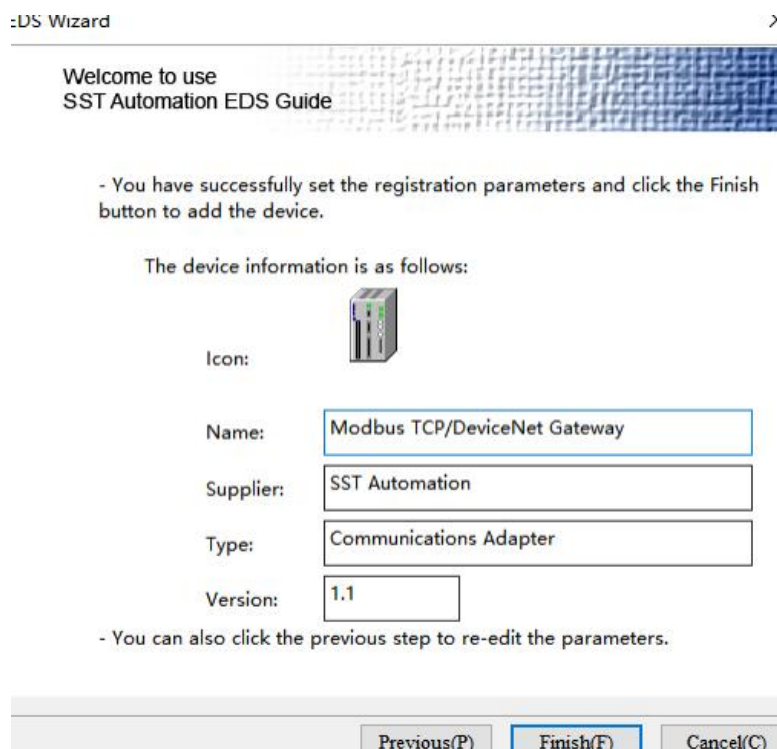
View file...

Previous(P) Next Step (N) Cancel(C)

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual



After selecting a device icon, click "Next Step" to pop up the factory information of the registered device, as shown in the figure below:



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.

➤ PC-DeviceNet Interface Setting

SST-DNET-COM software needs to be used together with the DeviceNet scanner module. First, connect GT100-PN-DM to Ethernet, and then connect GT100-PN-DM's DeviceNet port and user's DeviceNet device to the DeviceNet network. Power Supply of GT100-PN-DM is 24VDC.

Power on After correctly Connecting to Power Supply, until 4 lights of the gateway are on, press and hold the button for 3 seconds, on DeviceNet side MS and NS will orange flash once and then release. The connection of DeviceNet network can be established by "Network" in the menu bar or toolbar. Click "Network" and pop up the path selection interface:

Device Selection

Description
Please select the device to the desired network.

Gateway

☐ GT200-MT-DN ☒ GT100-PN-DM
☐ GT200-DP-DM ☐ GT200-PN-DM

Search

Device Parameters

Assign

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
Default	Default	Default	Default	Default

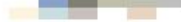
OK **Cancel**

GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual

Search

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.83		dut83	192.168.0.83	255.255.255.0

Online

Refresh

Cancel

Searching

DeviceNet Settings

IP Address:

192 . 168 . 0 . 83

Scanner Address:

0

Scanner Baud Rate:

250k

OK

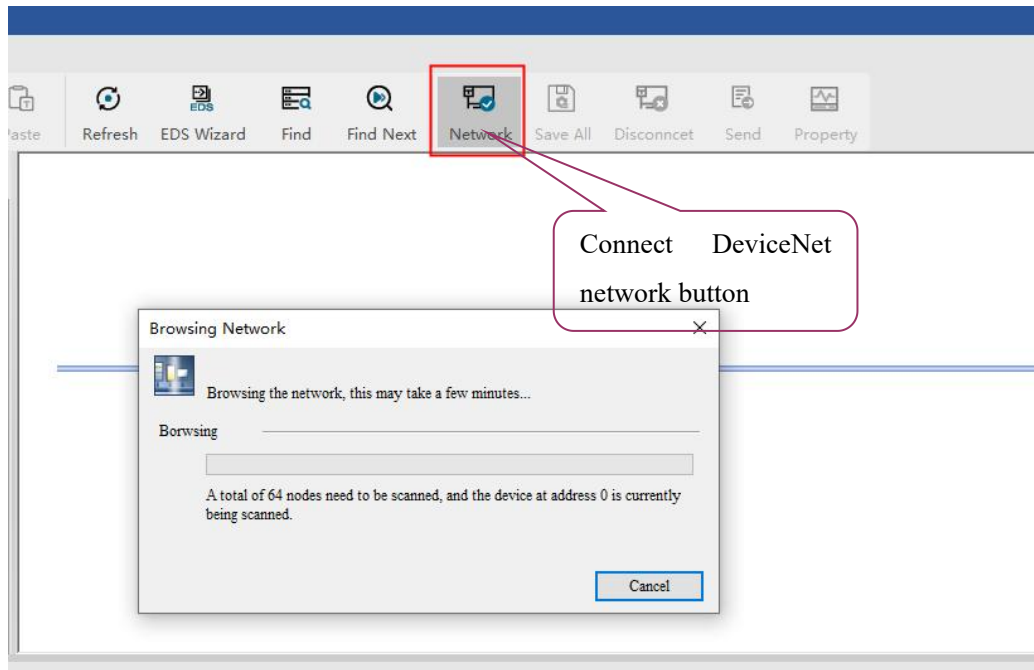
Cancel

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

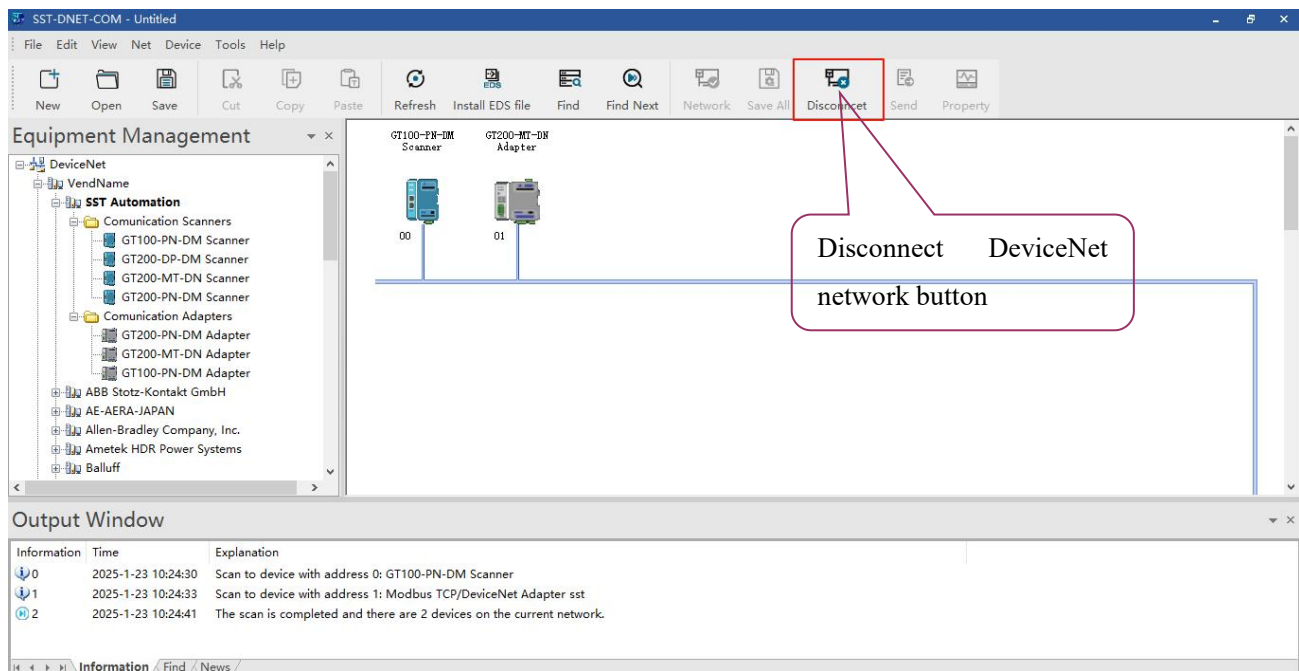
4.2.5 DeviceNet Network Scanning

After the interface is set up, the network scanning interface will pop up:

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual



After powering on, the DeviceNet scanner module will first perform a self-test. When both green LED lights light up, it can start scanning the network. When the DeviceNet network is connected, the user can "Disconnect" through the toolbar button, as shown in the figure below:



4.2.6 Device Parameter Modification and I/O Data Testing

Double-click the scanned network node to display the device properties page.

4.2.6.1 DeviceNet Scanner Module

As shown in the figure below, in the "General information" options interface, the address of the DeviceNet scanner module cannot be modified here and can only be changed in the interface settings. The "Device ID" displays information about the device manufacturer, type, device, sort, and version. If GT100-PN-DM is selected for configuration, once all parameters are set, click the "OK" button to proceed with the download.

Property

DeviceNet Parameters Scan List Input Output

General Information PROFINET Parameters

Device

Name: GT100-PN-DM Scanner

Description:

Address: 0

Device Info

VendName: SST Automation Co.Ltd [1376]

ProdType: Communication Scanners

ProdName: GT100-PN-DM Scanner

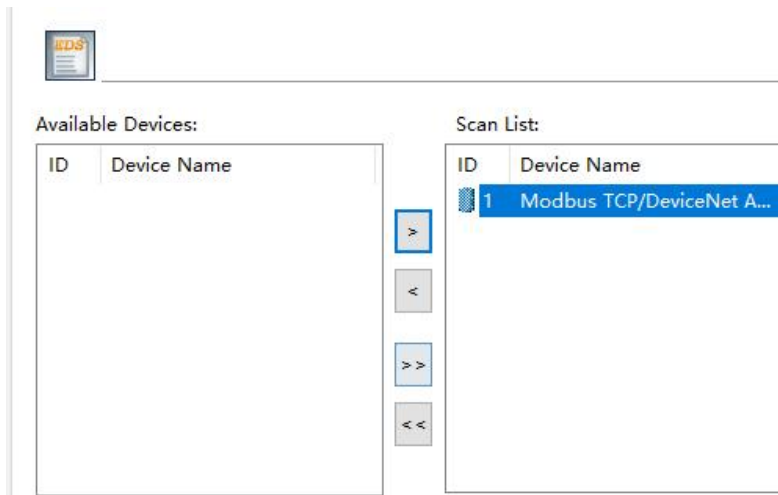
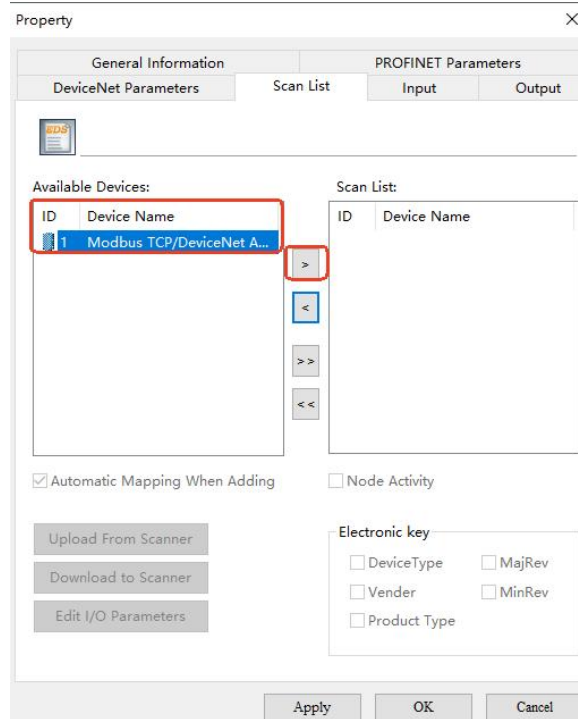
Catalog: GT100-PN-DM

Version: 2.0

Download OK Cancel

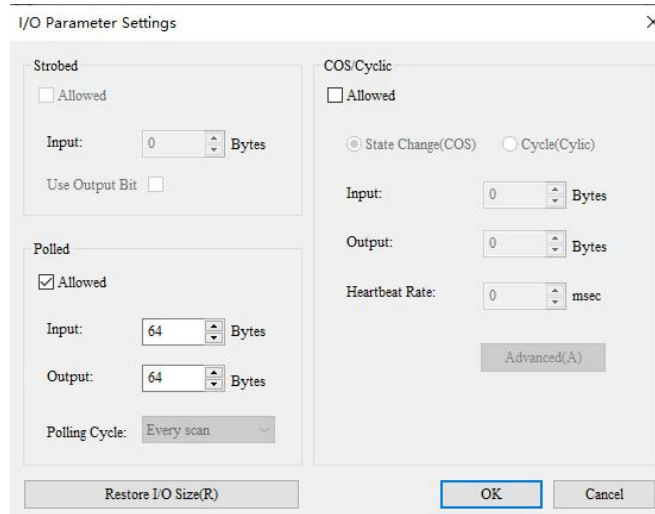
In the "Scan List" options interface, users can add devices to the scanner's "Scan List" and configure their I/O parameters.

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual



Add Adapter 1 to the scanner's mapping list, then select Adapter 1 in the "Scan List." After selection, click "Edit I/O Parameters," which will display the I/O parameters of this adapter. Here, users can set the input/output byte count for the adapter. The input and output byte sizes need to configure the actual data length of the adapter (refer to Section 4.1 for details).

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

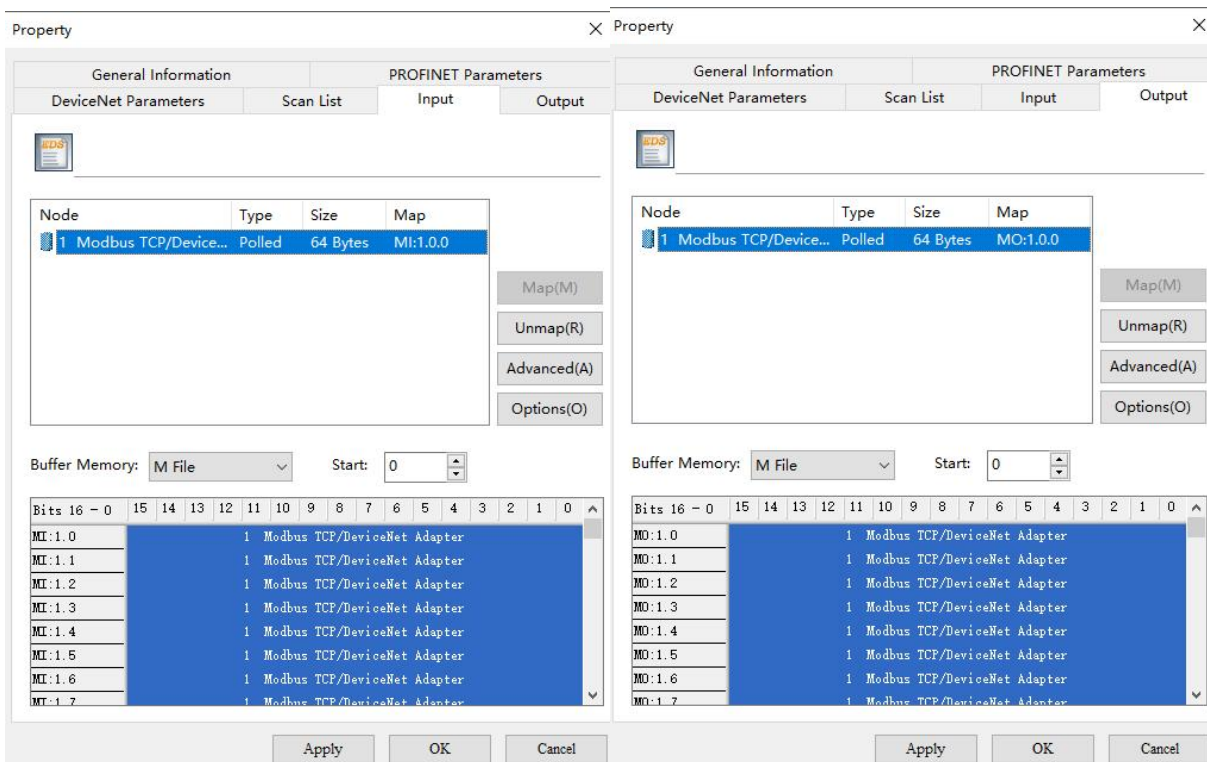


The "I/O Parameter Settings" dialog box contains the following sections:

- Strobed:**
 - ☐ Allowed
 - Input: 0 Bytes
 - Use Output Bit: ☐
- Polled:**
 - ☒ Allowed
 - Input: 64 Bytes
 - Output: 64 Bytes
 - Polling Cycle: Every scan
- COS/Cyclic:**
 - ☐ Allowed
 - ☒ State Change(COS) ☐ Cycle(Cyclic)
 - Input: 0 Bytes
 - Output: 0 Bytes
 - Heartbeat Rate: 0 msec
 - Advanced(A) button

Buttons at the bottom: Restore I/O Size(R), OK, Cancel.

In the "Input" and "Output" options interfaces, users can perform address mapping for devices added to the scanner and can opt for automatic mapping. In the figure below, the "Start" edit box parameter represents the starting address for automatic mapping. When using automatic mapping, it begins at the address set here, with one unit equating to two bytes. Thus, if the "Start" edit box parameter is set to "1," automatic mapping will start from the third byte.



The "Property" dialog boxes show the "PROFINET Parameters" tab with "Input" and "Output" sub-tabs. Both show a table of nodes and a buffer memory mapping table.

Input Dialog:

Node	Type	Size	Map
1 Modbus TCP/Device...	Polled	64 Bytes	MI:1.0.0

Buttons: Map(M), Unmap(R), Advanced(A), Options(O).

Buffer Memory: M File, Start: 0

Bits	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MI:1.0																	
MI:1.1																	
MI:1.2																	
MI:1.3																	
MI:1.4																	
MI:1.5																	
MI:1.6																	
MI:1.7																	

Output Dialog:

Node	Type	Size	Map
1 Modbus TCP/Device...	Polled	64 Bytes	MO:1.0.0

Buttons: Map(M), Unmap(R), Advanced(A), Options(O).

Buffer Memory: M File, Start: 0

Bits	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MO:1.0																	
MO:1.1																	
MO:1.2																	
MO:1.3																	
MO:1.4																	
MO:1.5																	
MO:1.6																	
MO:1.7																	

If users need to perform manual mapping, they can click the "Advanced" button to set the starting address in the dialog window shown below.

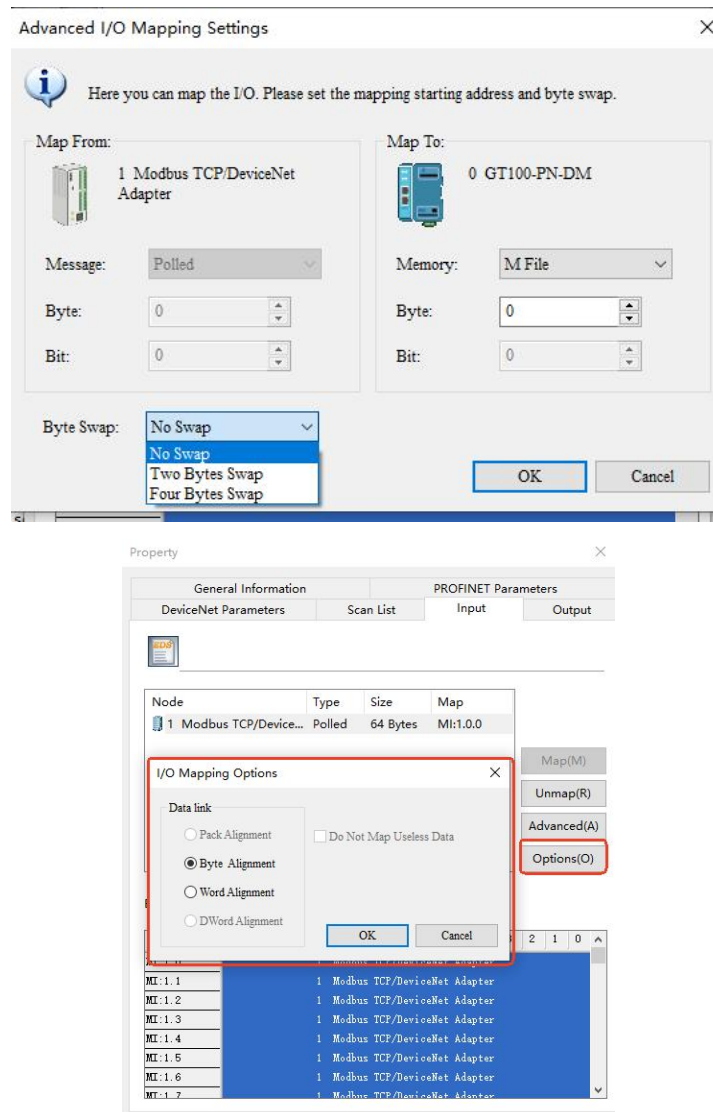
GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

In the advanced settings interface, users can also configure the byte-swapping method for this adapter device. There are three types of byte swapping: No Swap, 2-Byte Swap, and 4-Byte Swap, as defined below:

No Swap: Data is transmitted normally.

2-Byte Swap: Two bytes within the same register are swapped. For example, 12 34 becomes 34 12 after swapping.

4-Byte Swap: Four bytes across two registers are swapped. For example, 12 34 56 78 becomes 78 56 34 12 after swapping.



To set the unit for the mapped starting address in "Advanced I/O Mapping Settings," click the "Options" button. As shown in the figure below, "Byte Align" indicates a unit of one byte, while "Word Align" represents a unit of two bytes.

The input/output data block settings for the PROFINET side are configured in scanner configuration software such as TIA Portal or STEP 7.

In the "DeviceNet Parameters" interface, users can configure DeviceNet parameters. The "Input Data Hold/" option specifies whether corresponding DeviceNet input data is cleared to zero when the number of errors in DeviceNet command responses reaches the retry limit. Selecting "Zero" will clear the DeviceNet input data, while selecting "Hold" will retain the last correctly received data. "Command Retry Count" indicates the number of times a command is resent when there is an error in the DeviceNet command response, with an input range of 2 – 254 and a default value of 3.

The screenshot shows a 'Property' dialog box with a 'DeviceNet Parameters' tab selected. The 'General Information' and 'Modbus TCP Parameters' tabs are also visible. The 'DeviceNet Parameters' tab contains the following fields:

- Agreement Type: DeviceNet Scanner
- DeviceNet Baud Rate: 250k
- DeviceNet Node Address: 0
- Explicit Packet Timeout Time: 250
- Network Input Timeout Clear Time: 20
- I/O Poll Rate: 5
- Input Data Hold/Clear: Clear
- Number of Command Resends: 3
- Status Word: (empty dropdown)

Buttons at the bottom: Apply, OK, Cancel.

I/O Poll Rate: The interval time for sending polling commands, in units of 10 ms, with a range of 1-50.

Status Word Function: When enabled, this monitors the connection status of the DeviceNet device. Once activated, 1 byte is reserved at the beginning of the PROFINET input buffer, with each bit of the 8-byte section indicating online as 0 and offline as 1.

Status Word: When Enabled, this monitors the connection status of the DeviceNet device. Once activated, 1 byte is reserved at the beginning of the PROFINET input buffer, with each bit of the 8-byte section indicating online as 0 and offline as 1.

4.2.6.2 DeviceNet Adapter Module

As shown in the figure below, in the "General Information" options interface, the address can be modified. After a successful address change, the adapter device with the modified address will restart, requiring the network connection to be re-established. The "Device ID" displays information such as the device manufacturer, type, device, Sort and EDS version.

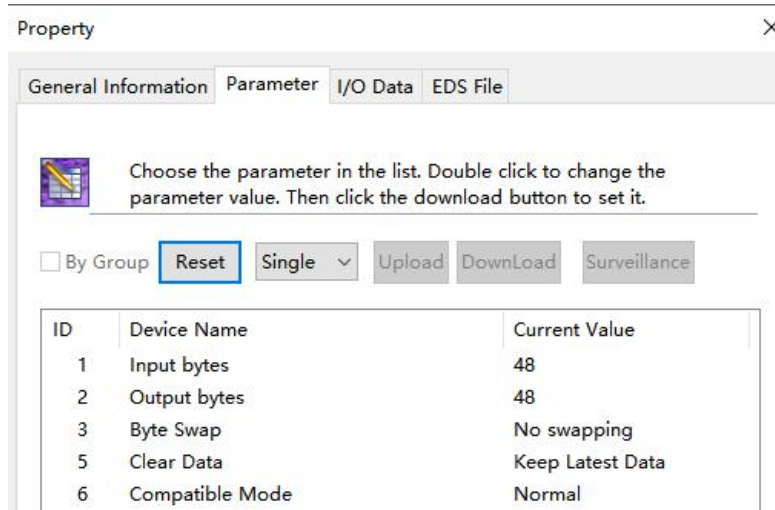
The screenshot shows a 'Property' dialog box with a close button (X) in the top right corner. It has four tabs: 'General Information' (selected), 'Parameter', 'I/O Data', and 'EDS File'. Under 'General Information', there is a 'Device' icon and the following fields:
Name: GT100-PN-DM Gateway
Description: (empty text box)
Address: 1 (with up/down arrows)
Below these is a 'Device ID' section with the following fields:
Manufacturer: SST Automation [1016]
Type: Communications Adapter [12]
Device: GT100-PN-DM Gateway [25]
Sort: GT100-PN-DM
EDS Version: 2.1
At the bottom are three buttons: 'Apply', 'OK' (highlighted with a blue border), and 'Cancel'.

As shown in the figure below, the parameter interface allows users to perform operations such as uploading and downloading parameters, enabling convenient online modification of device parameter values.

GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual



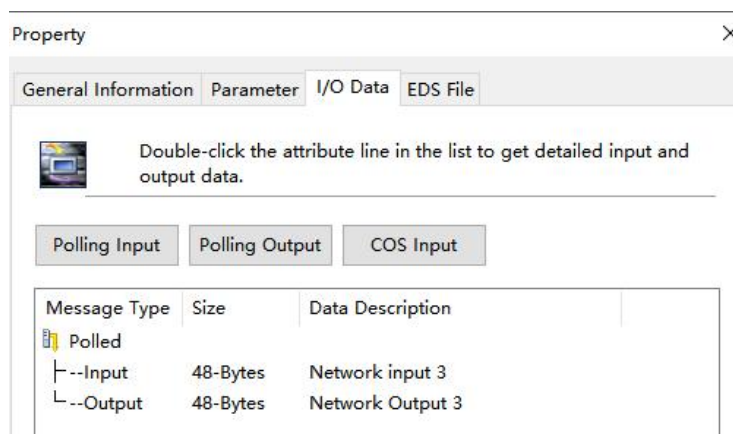
The "Reset" button restores parameters to their default values, but it only applies to individual parameters.

The "Upload" button supports operations for individual or all parameters. After clicking "Upload," the interface displays the actual parameter values of the online DeviceNet adapter device.

The "Download" button only supports individual parameter operations, allowing modification of parameters on online devices. Whether a parameter supports the "Download" operation can be identified by the "ID" number on the interface—parameters with an icon in front of the ID cannot be modified online through the configuration software. Whether a parameter supports online modification is determined by the registered EDS file.

The properties interface also displays the parameter ID, Device name, and current value. SST-DNET-COM software supports relevant linear operations on parameters defined in the EDS file, with the current value showing the calculated result. Users can adjust related operation factors as needed.

As shown in the figure below, in the I/O data interface, once a connection is established for a DeviceNet network device, the byte lengths of network output and input are fixed. How can users determine the input and output length? This information can be found in the EDS file.

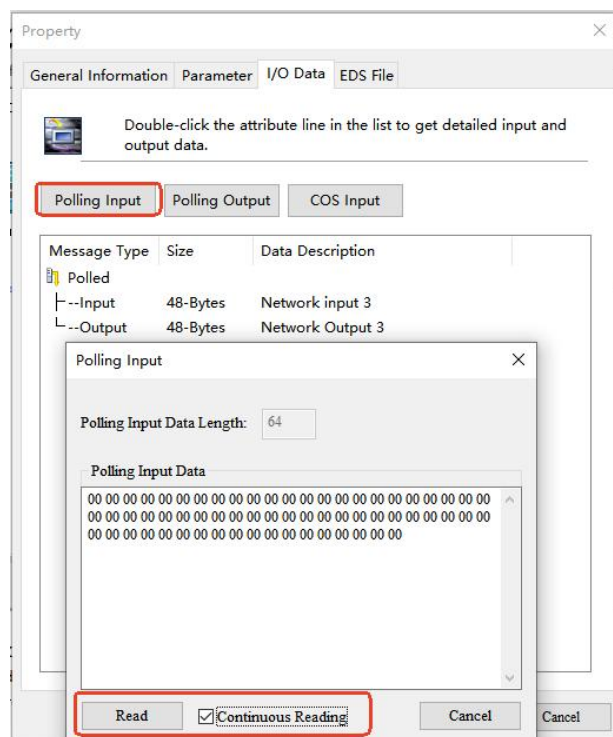


The input/output byte count in SST-DNET-COM software can also provide this information. In the figure above, under the "Polled" section, the provided Input and Output 48-Bytes represent the default input and output data byte length (note that the default and actual lengths may differ).

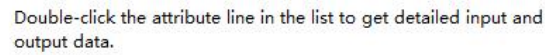
SST-DNET-COM software supports a maximum of 255 input bytes and 255 output bytes.

For example, with "Polling Input" and "Polling Output":

Click the "Polling Input" button, then click the "Read" button, and the DeviceNet software will read the network input data. If the "Continuous Read" checkbox is selected, SST-DNET-COM software will continuously read the network input data from the field DeviceNet device. As shown in the figure below:

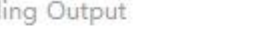


Similarly, by clicking the "Polled Output" button, users can access the network output data dialog. Users must enter the complete output data; otherwise, if the byte count is incorrect, the output will be incomplete and the operation will not be successful.



Polling Input **Polling Output** COS Input

Polling Input Polling Output COS Input



Polling Output

Polling Output Data Length: 64

Polling Output Data

11 22



4.2.7 Sending Explicit Messages

After the device is online, right-click to perform the "Send Explicit Message" operation. The interface that appears is shown in the figure above, where users can perform attribute setting and retrieval operations, facilitating online device debugging.

Using this function, users can directly read or set the corresponding parameters of the device without using the device's EDS file. The Service ID, Class ID, Instance ID, Property ID, and Attribute Value data formats are all in hexadecimal. The Class ID and Instance ID can be one or two bytes, and the bytes are separated by spaces. All IDs are in little-endian order (low byte first, high byte second).

Supported Service IDs:

- 0x0E Get_Attribute_Single: Read parameter attribute value.
- 0x10 Set_Attribute_Single: Write parameter attribute value.

Supported Class IDs: Standard Class IDs from 0x01 to 0x27 and custom classes.

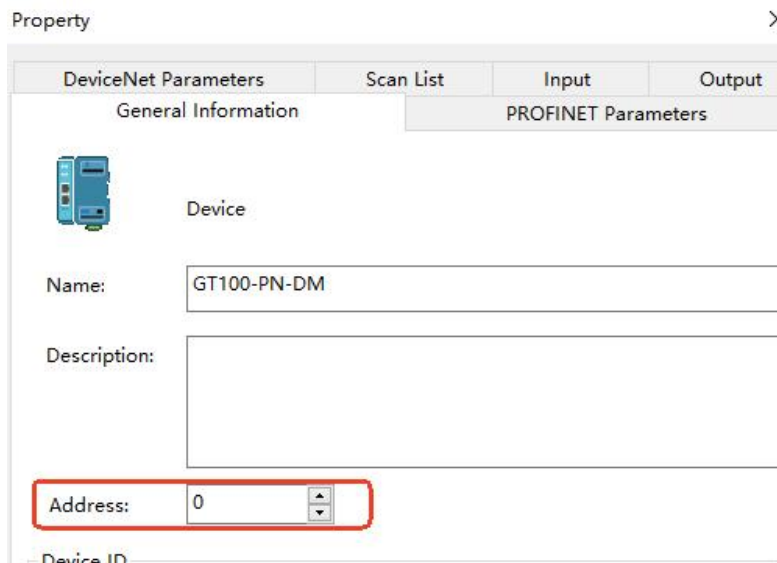
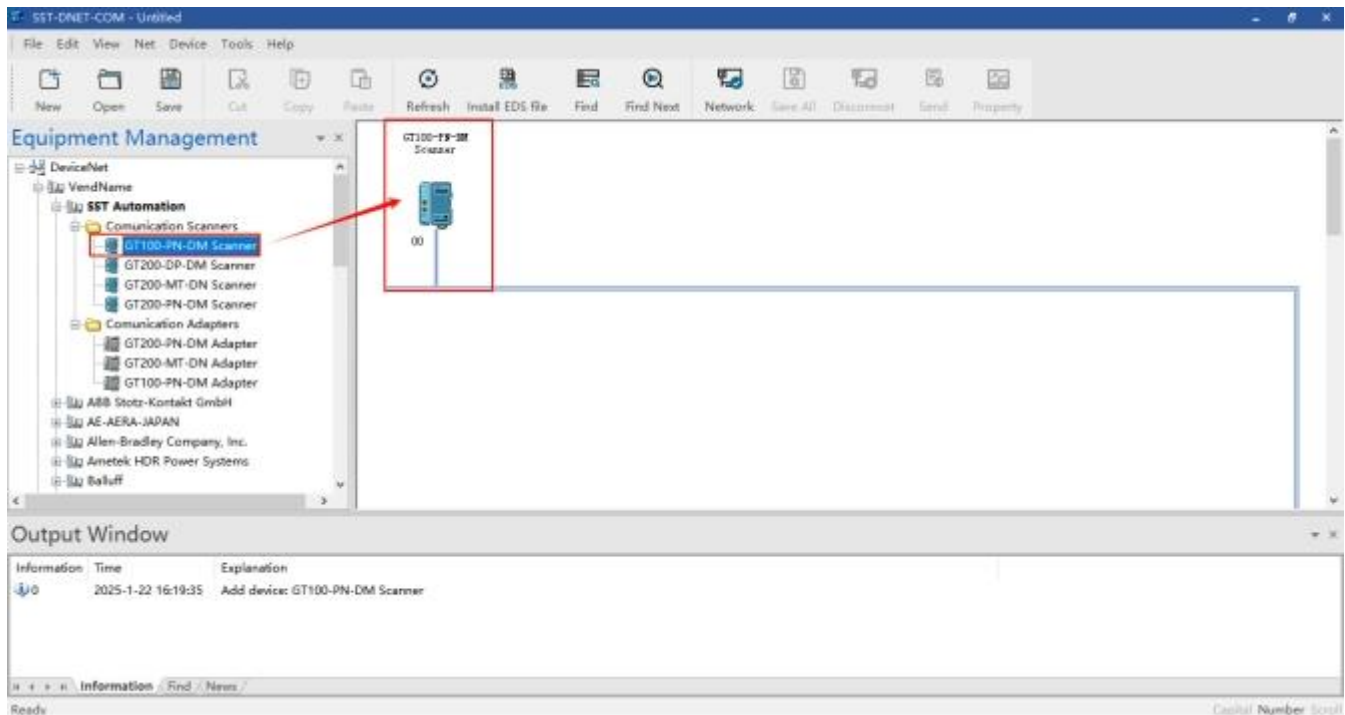
You can select the service content or object name on the right to determine the corresponding Service ID or Class ID on the left. When using a custom class, you can directly input the Class ID, and in this case, the Class ID will not correspond to the object on the right. The manually entered Class ID takes precedence.

4.3 SST-DNET-COM Offline Configuration (DeviceNet scanner Mode)

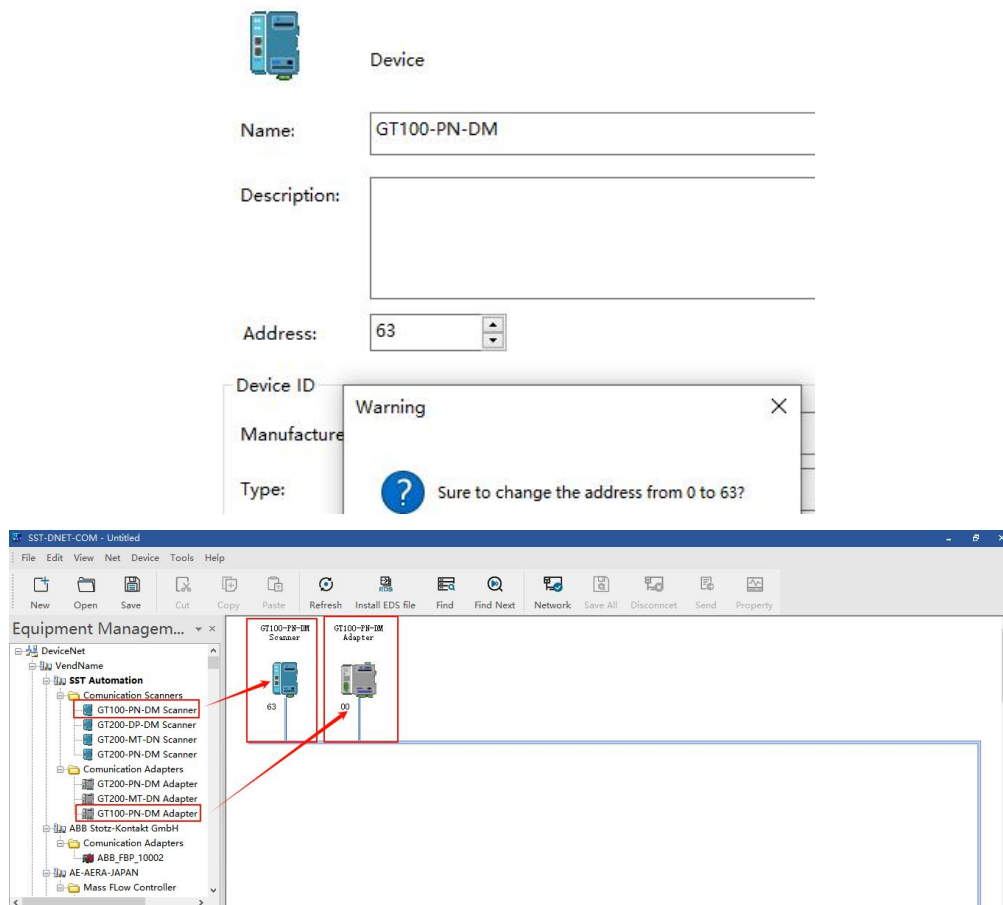
Select "GT100-PN-DM Scanner" from the Equipment management on the left side and drag it to the bus on the right

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

side. Double-click the scanned network node to display the device properties page. You can modify the DeviceNet device address to match the actual address, as shown in the figure below:



GT100-PN-DM DeviceNet/PROFINET Gateway User Manual



Double-click the GT100-PN-DM gateway icon. In the properties interface, click "Scan List." On the available devices side, select the DeviceNet device and move it to the scan list side. Click "Edit I/O Parameters" to set the device's actual I/O data length, as shown in the figure below:

GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

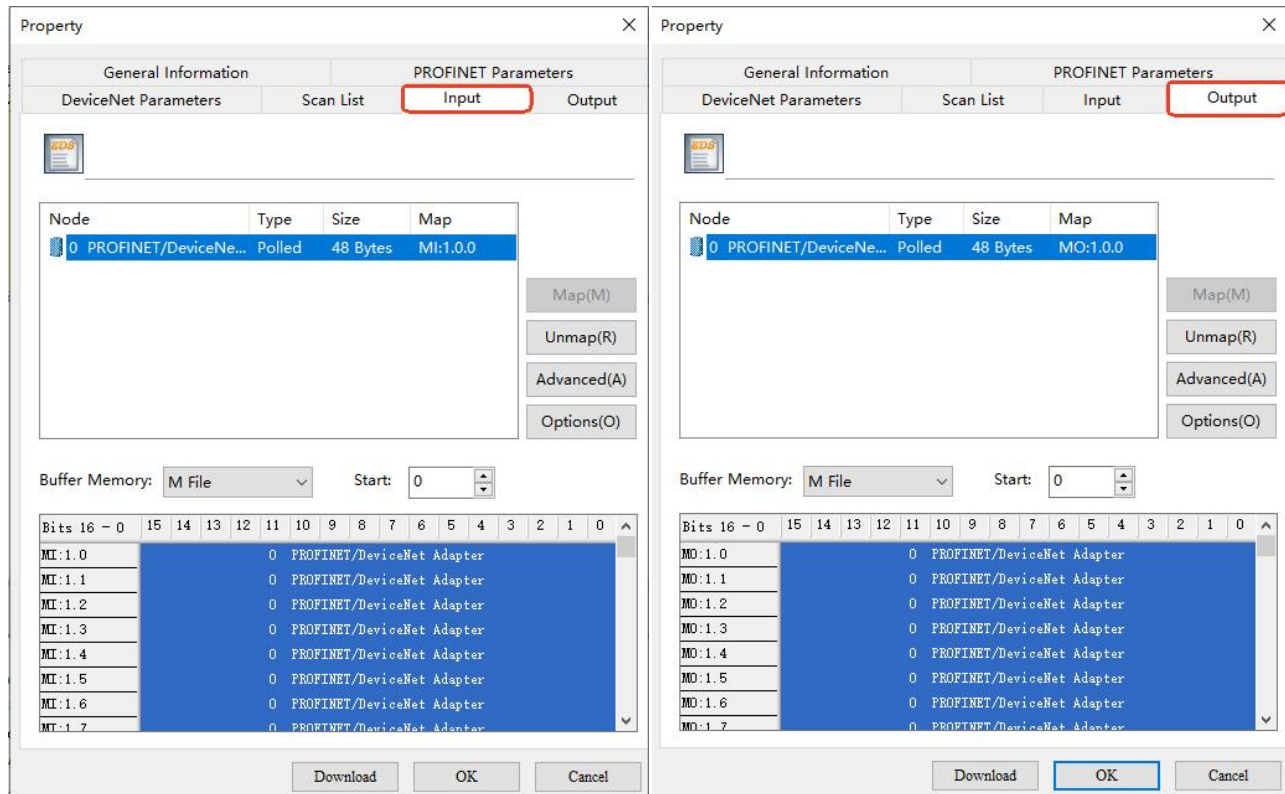
The image shows two screenshots from a software interface. The top screenshot is the 'Property' dialog box, specifically the 'DeviceNet Parameters' tab. It features two lists: 'Available Devices' and 'Scan List'. The 'Scan List' contains one entry with ID '0' and name 'PROFINET/DeviceNet Ada...'. A red box highlights the 'Edit I/O Parameters' button. The bottom screenshot is the 'I/O Parameter Settings' dialog box. It has two sections: 'Strobed' and 'Polled'. The 'Polled' section is highlighted with a red box, showing 'Input: 48 Bytes', 'Output: 48 Bytes', and 'Polling Cycle: Every scan'.

After configuring the DeviceNet device I/O data length, click on the input and output interface to perform data mapping. Select the device and click "Map" to map the input/output data, as shown in the figure below:

GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual



In the "DeviceNet Parameters" interface, users can configure DeviceNet parameters. The "Input Data Hold/Clear" option indicates whether the corresponding DeviceNet input data should be cleared to zero when the number of errors in the DeviceNet command response reaches the command retry count. Selecting "Clear" will clear the DeviceNet input data, while selecting "Hold" will retain the last correctly received data. The "Number of Command Respond" specifies the number of times a command is resent in case of a DeviceNet command response error, with an input range of 2 – 254 and a default value of 3.

GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual

The screenshot shows a 'Property' dialog box with a close button (X) in the top right corner. It has two main tabs: 'General Information' and 'PROFINET Parameters'. Under 'PROFINET Parameters', there are four sub-tabs: 'DeviceNet Parameters', 'Scan List', 'Input', and 'Output'. The 'Input' sub-tab is currently selected. A red rectangular box highlights the following settings in the 'Input' sub-tab:

Parameter	Value
I/O Poll Rate:	5
Input Data Hold/Clear:	Clear
Number of Command Resends:	3
Status Word:	Enable

Other visible settings in the 'Input' sub-tab include:

- Agreement Type: DeviceNet Scanner
- DeviceNet Baud Rate: 250k
- DeviceNet Node Address: 63
- Explicit Packet Timeout Time: 250
- Network Input Timeout Clear Time: 20

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

The PROFINET input/output data block settings are configured in scanner configuration software such as TIA Portal or STEP 7.

After the configuration is complete, click "Download" to download the configuration (it can be downloaded in both commissioning or runtime mode), as shown in the figure below:

GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual

Search

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.83		dut83	192.168.0.83	255.255.255.0

Download

Refresh

Cancel

Searching

SST-DNET-COM



Do you want to download the current configuration?

SST-DNET-COM



Download successfully!

The new configuration will not take effect until the gateway restarts.

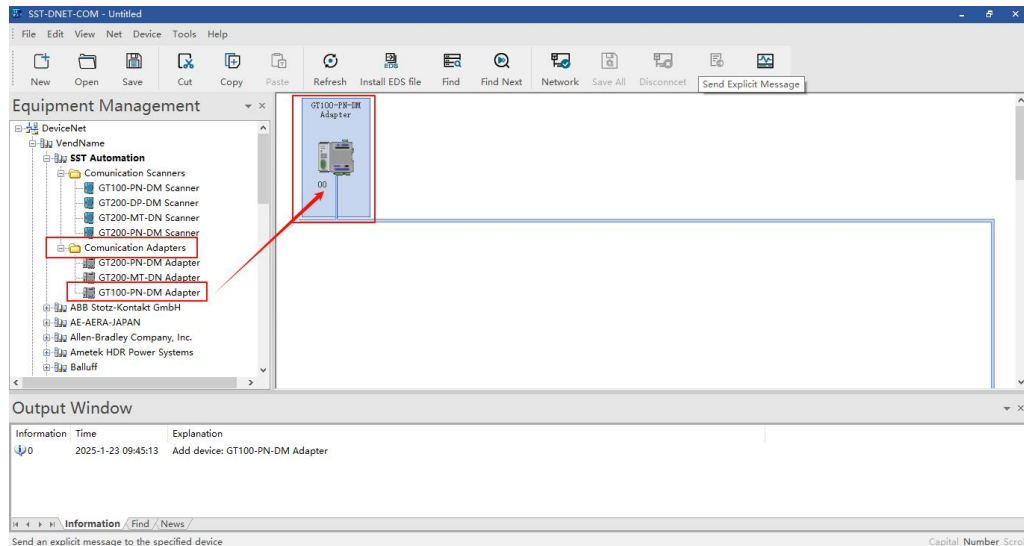
Do you want to restart the gateway remotely?

4.4 SST-DNET-COM Offline Configuration (DeviceNet Adapter Mode)

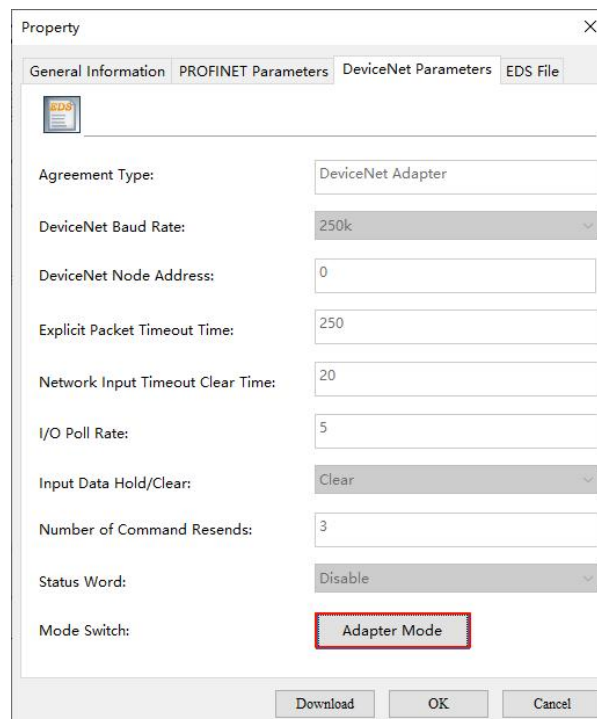
Similarly, to configure the GT100-PN-DM as a adapter mode, select "GT100-PN-DM Adapter" in the "Communication Adapter" section of the Equipment management and drag it into the bus on the right side.

GT100-PN-DM DeviceNet/PROFINET Gateway

User Manual



After Adding the GT100-PN-DM gateway configuration, double-click the GT100-PN-DM icon. In the "DeviceNet Parameters" interface, click "DeviceNet Adapter" to configure the DeviceNet adapter mode. Check the "DeviceNet Adapter Mode" window, set the required input and output byte counts, baud rate, and adapter address. Configure the data byte exchange -- no exchange, two-byte exchange, or four-byte exchange — as well as the input data timeout reset/hold function. After configuring the parameters, click "OK."



GT100-PN-DM DeviceNet/PROFINET Gateway User Manual

DeviceNet Adapter

Polled

Input: 64 Bytes

Output: 64 Bytes

Enable Adapter Mode

OK

Cancel

COS

Input: Bytes

Output: Bytes

Adapter Parameters

Baud Rate: 250k

Address: 0

Functional Parameters

Data Byte Swap: Two Bytes Swap

Network Status Monitoring: Bytes

Input Data Hold/Clear: Clear

The PROFINET input/output data block settings are configured in scanner configuration software such as TIA Portal or STEP 7.

After completing the configuration, click "Download." The proceed with downloading the configuration, as shown in the figure below:

Search

IP Address	MAC Address	Device Name	Default Gateway	Subnet Mask
192.168.0.83	[MAC Address]	dut83	192.168.0.83	255.255.255.0

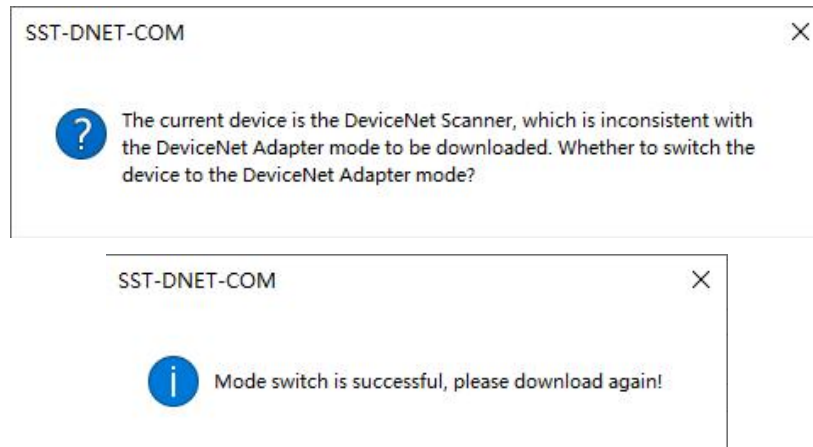
Download Refresh Cancel

Searching [Progress Bar]

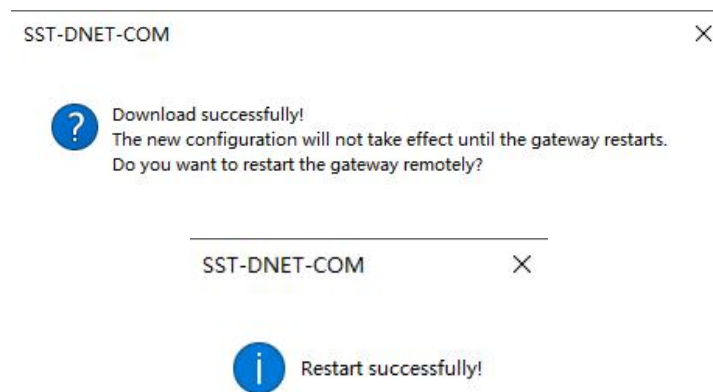
GT100-PN-DM

DeviceNet/PROFINET Gateway

User Manual



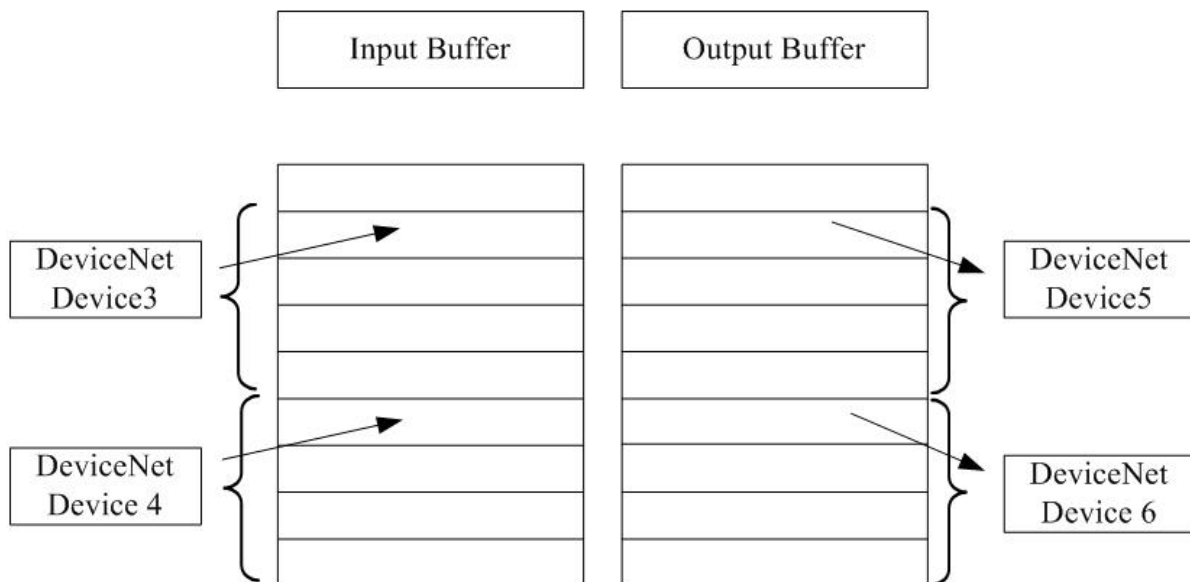
After the mode switch is successful, proceed with downloading the configuration parameters, as shown in the figure below:



5 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 scanner station, the module GT100-PN-DM supports only one DeviceNet adapter device.