DeviceNet/PROFIBUS DP Gateway

GT200-DPM-DN

User Manual

REV 1.2

SST Automation

E-mail: SUPPORT@SSTCOMM.COM

WWW.SSTCOMM.COM

Catalog

1 Product Overview

1.1 Product Function

The gateway GT200-DPM-DN can connect DeviceNet Master with PROFIBUS DP Slave, and establish the communication between them. It supports multiple PROFIBUS slave devices to connect to the DeviceNet network. It acts as a master at the side of PROFIBUS DP and a slave at the side of DeviceNet.

1.2 Product Features

- Wide Application: establish stable connection between PROFIBUS DP network and DeviceNet network. Such as: bi-directional data exchange between Rockwell, Omron DeviceNet master PLC and PROFIBUS DP slave devices.
- Easy to Use: no need to know the detailed technology of PROFIBUS DP and DeviceNet, users just refer to this manual and application examples, finish network configuration and make it work in short time.
- Transparent Communication: users can refer to the mapping relations between PROFIBUS communication data area and DeviceNet data area, then establish transparent transmission between them.

1.2 Technical Specification

[1] PROFIBUS DP/V0 communication capability, in accordance with EN50170 and JB/T 10308.3-2001; Measurement and control of digital data communication in industrial control systems Fieldbus - Part 3: PROFIBUS specification;

[2] 2.5KV photoelectric isolation on PROFIBUS DP interface and DeviceNet interface;

[3] Acts as only server at the side of DeviceNet, and support Poll I/O;

[4] The DeviceNet port supports input bytes 48, 96, 128, 160, 200 and 240 and output bytes 32, 68, 128, 160, 200 and 240;

[5] DeviceNet baud rate: 125K, 250K, 500K, baud rate adaptive;

[6] A plurality of LED status lights indication, easy on-site debugging;

[7] Gateway gets power from DeviceNet, power voltage is DC 11~26V, consumption: <4W;

[8] Temperature: operating -4℉~140℉(-20℃ ~ 60 ℃); Humidity: 5 to 95% (No Condensing);

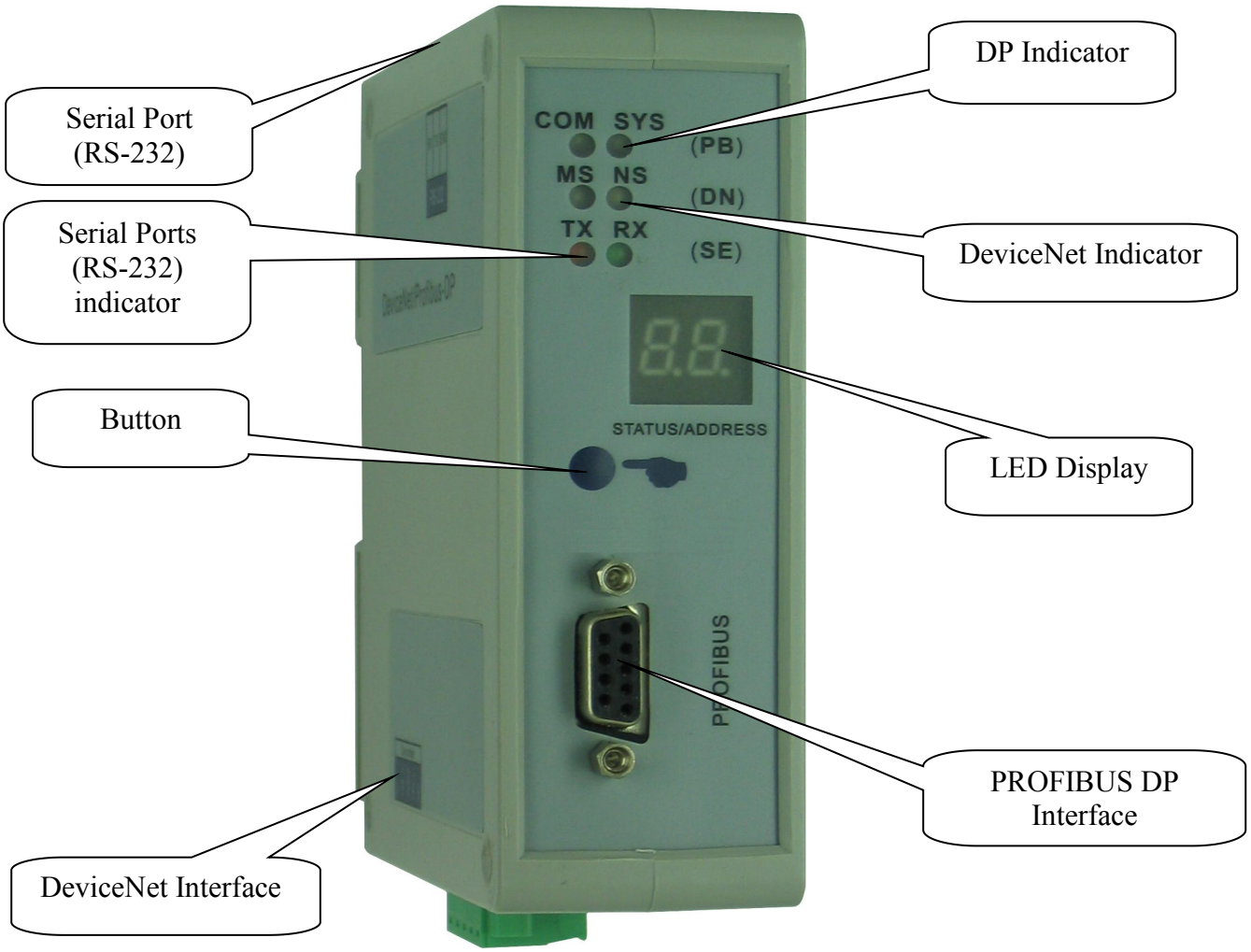
[9] External dimensions (W*H*D): 1.57 in*4.92 in *4.33 in (40mm*125mm*110mm);

[10] Installation: 35mm rail;

[11] Protection Level: IP20;

2 Hardware Descriptions

2.1 Product Appearance



2.2 Indicators

PROFIBUS DP network status lights (COM, SYS)

Indicator state	Description
COM Always Green	GT200-DPM-DN gets DP master token and sends DP packet, communication is normal
COM Green blinking irregularly	GT200-DPM-DN and the other DP master on the network share a token
COM Always Red	At least one DP slave and GT200-DPM-DN communication abnormal or network short-circuit
COM Off	GT200-DPM-DN with no DP configuration or had not got token from the DP network
SYS Red light flashes in 1 Hz	GT200-DPM-DN is in the bootloader process
SYS Red light flashes in 5 Hz	Detected hardware problems
SYS Red blinking irregularly	GT200-DPM-DN DP master card is updating firmware
SYS Always Green	DP communication is normal, GT200-DPM-DN established connection with at least one DP slave
SYS Green blinking with 5 Hz	DP configuration is properly configured, the communication stops or not connected to the master
SYS Green Blinking irregularly	Lost configuration or error after power-on
SYS Off	GT200-DPM-DN power-off or hardware problem

The RS-232 port LED SE (TX, RX)

Indicator state	Description
TX Off	Serial port is not transmitting data
TX Red blinking	Serial port is transmitting data
RX Off	Serial port is not receiving data
RX Green blinking	Serial port is receiving data

DeviceNet module status indicator DN(MS)

Indicator state	Description
Off	May be no power supply or a bad light
Always Green	Work normally
Green blinking	Not properly configured, or in automatic baud rate listening state
Red blinking	Recoverable fault
Always Red	Unrecoverable fault
Red Green blinking	Self-testing is ongoing

DeviceNet Network status indicator DN(NS)

Indicator state	Description
Off	DeviceNet circuit is not powered
Green blinking	Device is online but did not establish the connection
Always Green	The device is online and has established a connection
Red blinking	One or more I/O connections have been timeout
Always Red	The device detects unrecoverable faults and cannot communicate, such as there is repetitive DeviceNet address on net.

2.2 LED Display

The main contents include: LED display DeviceNet address during normal operation, dynamic display the DeviceNet address the high, low and DeviceNet baud rate during configuration.

"12""25" means DeviceNet baud rate is 125K; "25""50" means DeviceNet baud rate is 250K; "AU""Uo" means DeviceNet baud rate is automatic baud rate status.

2.3 Configuration Button

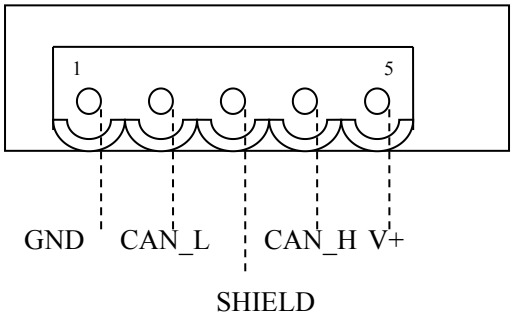
Button is used to set DeviceNet address and DeviceNet baud rate sets as follows:

Long press the button for more than 3s to enter the DeviceNet address setting status, first set DeviceNet address high bit, long press to confirm, and then set low bit. Press and hold the button more than 3s to save the new settings address and enter the DeviceNet baud rate setting state. Click the button, the baud rate switches between 125K, 250K, 500K and Auto. Finally, long press the button for more than 3s to confirm all settings. 15s with no operations are deemed to quit, cancel all the previous changes.

2.4 Interface

2.4.1 DeviceNet Interface

DeviceNet side of the open five-pin connector:



Pin	Wiring
1	GND(24V)
2	CAN_L
3	shielding
4	CAN_H
5	+24V

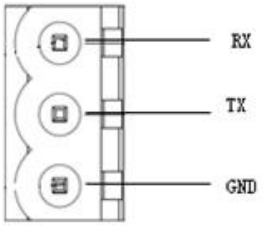
2.4.2 PROFIBUS DP Interface

PROFIBUS DP wiring instructions as shown below:

Pin	Wiring
1	NC (Not connected)
2	NC
3	PROFI_B (Must be connected), Positive
4	RTS
5	GND
6	PROFI_5V
7	NC
8	PROFI_A (Must be connected), negative
9	NC

2.4.3 RS-232 Interface

Configure the port, connect to a computer, GT200-DPM-DN configuration parameters can be modified by the PROFIBUS DP configuration software SyCon**.** See the chapter 5 of configuration steps.



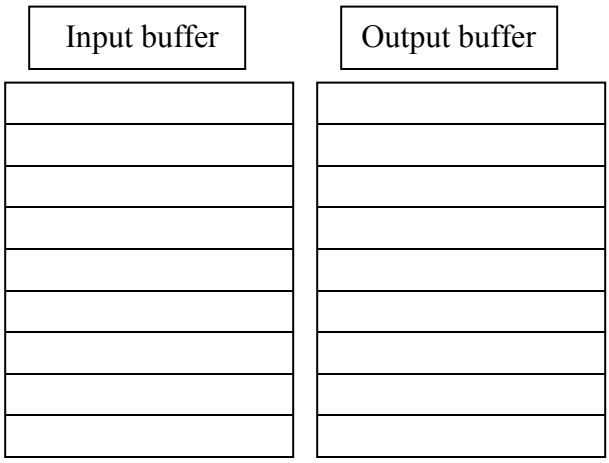
Note: this port RX, TX and GND refers to the PC serial port RX (pin 2), TX (pin 3) and GND (pin 5).

2.4.4 DIP Switch

A total of eight bit DIP switch (standby), bit1 and bit2 must be set to "OFF", bit 3 and bit4 are set to "ON". Bit 5, 6, 7 and 8 are reserved bits, which needs to be set to "OFF" during configuring and communication.

3 Working Principle

By creating the data conversion between the DeviceNet and PROFIBUS DP through mapping, there are two data buffers in the GT200-DPM-DN, one buffer is DeviceNet network input buffer, the other is DeviceNet network output buffer. The gateway will write the data from the PROFIBUS DP slave to the network input buffer , output to the corresponding DeviceNet Master device by POLL I/O write command. At the same time gateway take the data from the network output buffer and write to the PROFIBUS DP slave.



GT200-DPM-DN acts as a DeviceNet node, as well as PROFIBUS DP master node which occupies the node address. After both sides of the network data communication are established, the DP is disconnected from the network, and then the gateway confirm the error and all the data is cleared.

4 Quick Start Guide

The followings are several steps which can help you quickly apply your GT200-DPM-DN:

1) Follow the configuration steps to configure the gateway. For more information, refer to chapter 6.

2) Setting the DeviceNet address and baud rate by the front button of the gateway, you can refer to chapter 2.3.

3) Wiring correctly in accordance with the chapter 2.4 wiring instructions.

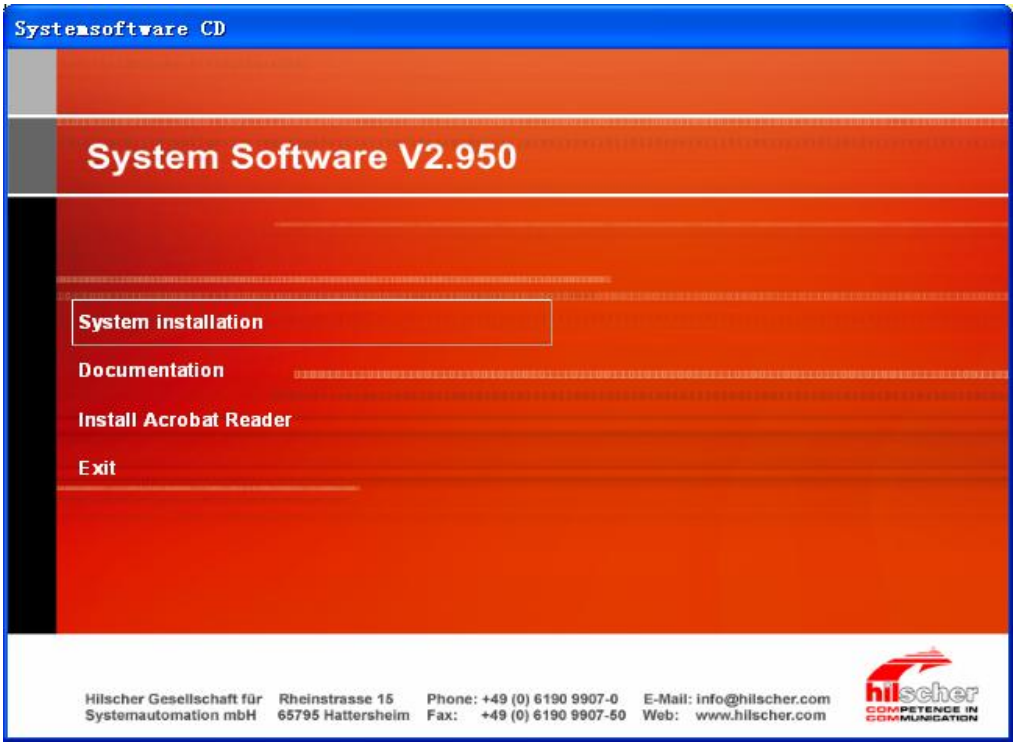
4) Importing EDS file into the DeviceNet configuration software such as RsNetWorx to configure the DeviceNet network. Users can configure the DeviceNet scan command. The DeviceNet data is mapped to PROFIBUS DP. For more information, refer to chapter 6.

5) Importing the GSD file of the PROFIBUS DP slave devices into the PROFIBUS DP configuration software SyCon. Properly select and configure the address of the PROFIBUS DP slave devices and the bytes of the input and output bytes and downloading to the GT200-DPM-DN. You can refer to chapter 5 for detailed information.

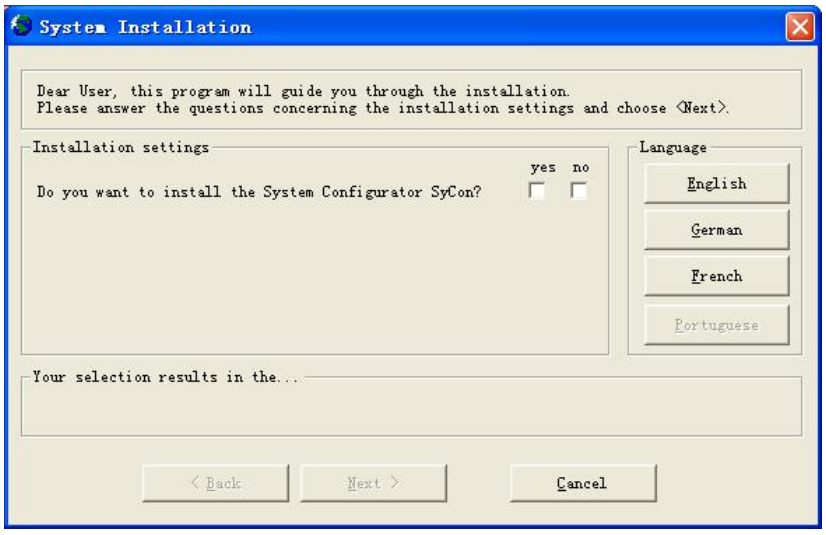
5 PROFIBUS DP Configuration Instructions

The following explains how to use the PROFIBUS DP master station software SyCon to configure the GT200-DPM-DN.

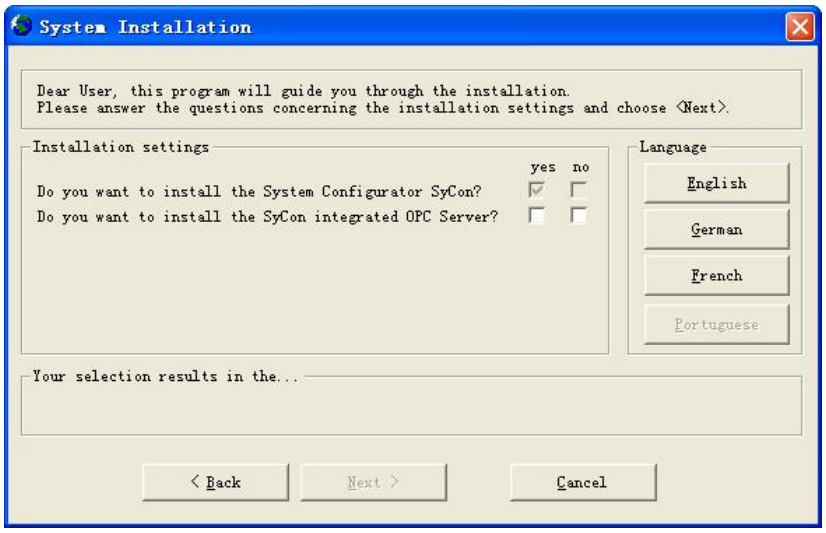
1. Install SyCon software , double click autorun.exe application will pop up the following interface:



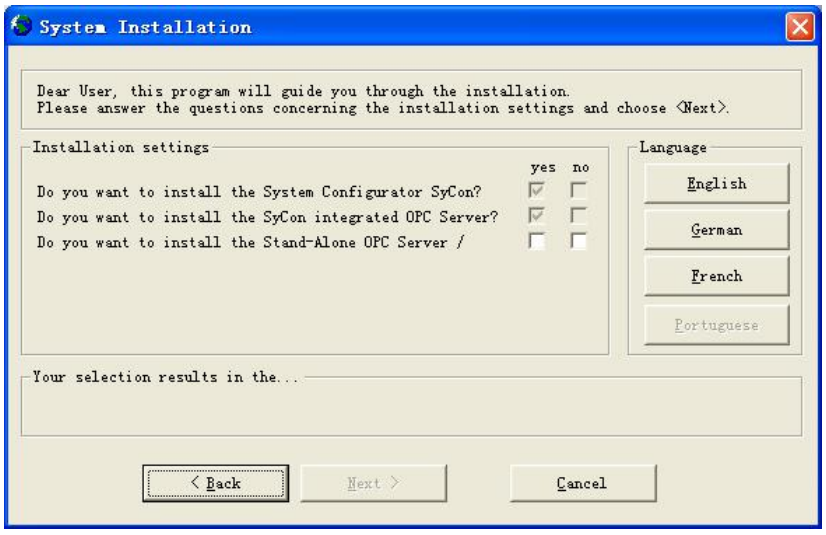
Select "System installation"



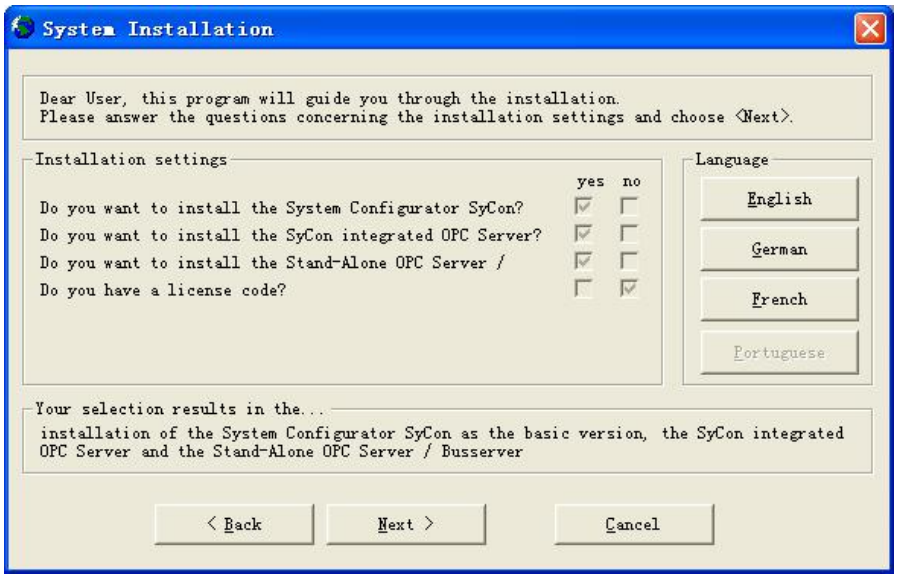
Select "yes"



Select "yes"

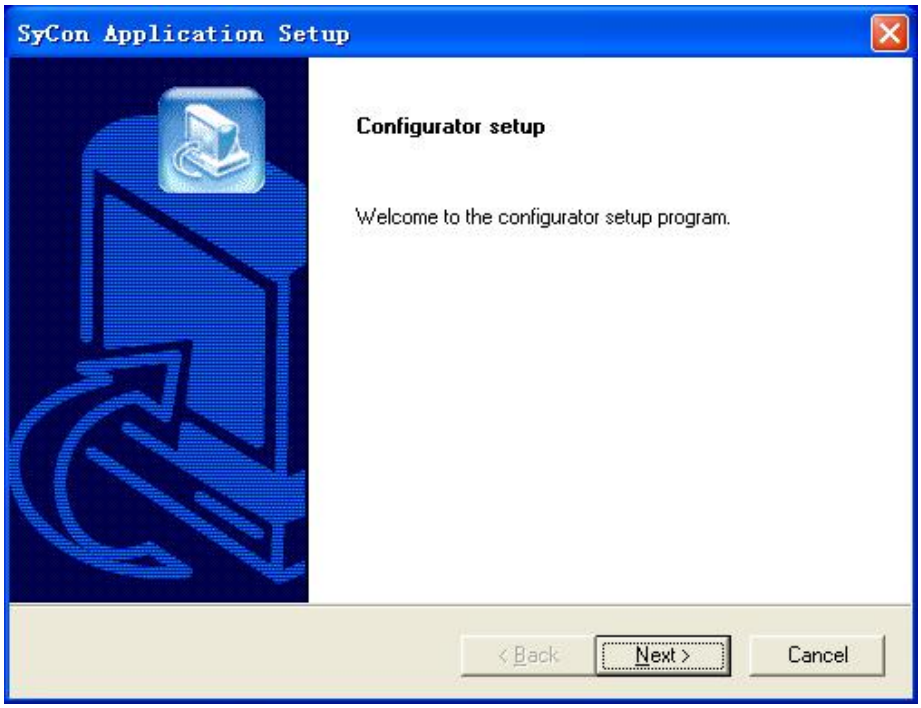


Select "yes"

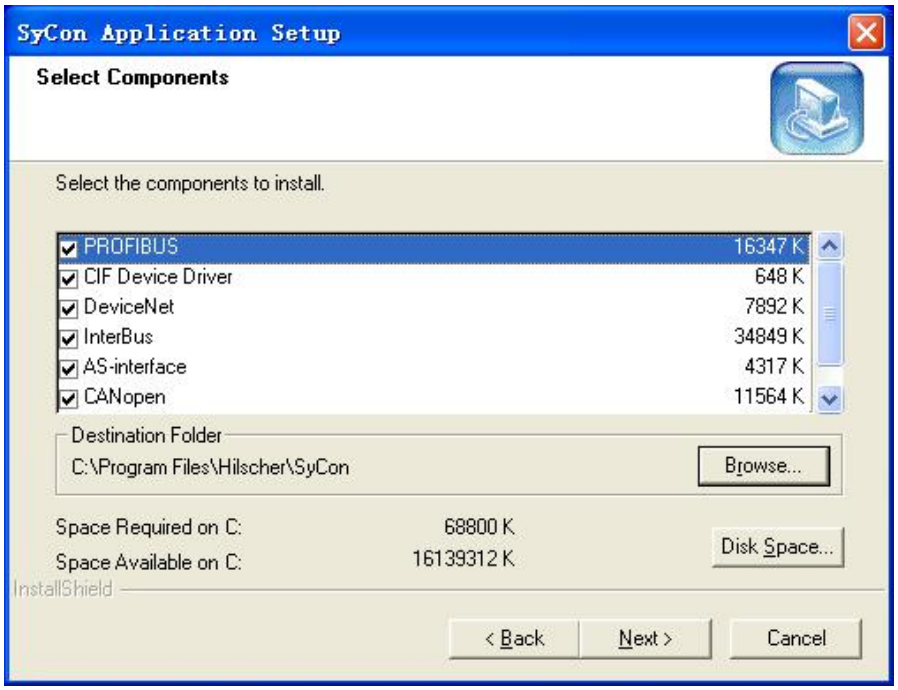


Select "no", Note: After the software is installed, call our technical support and contact us, we will e-mail the serial number to the customer.

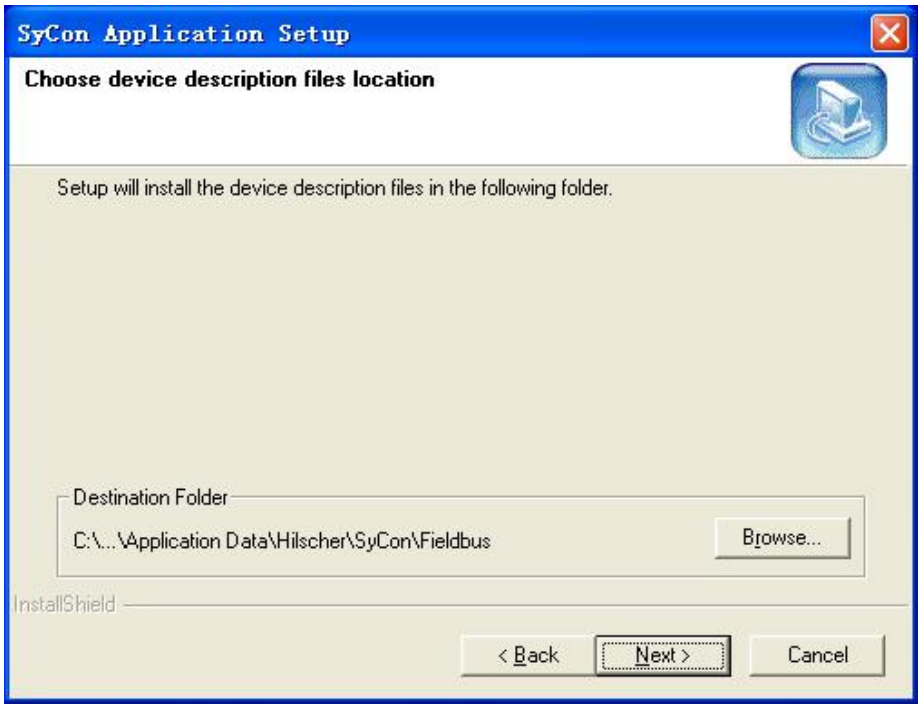
Select "English"



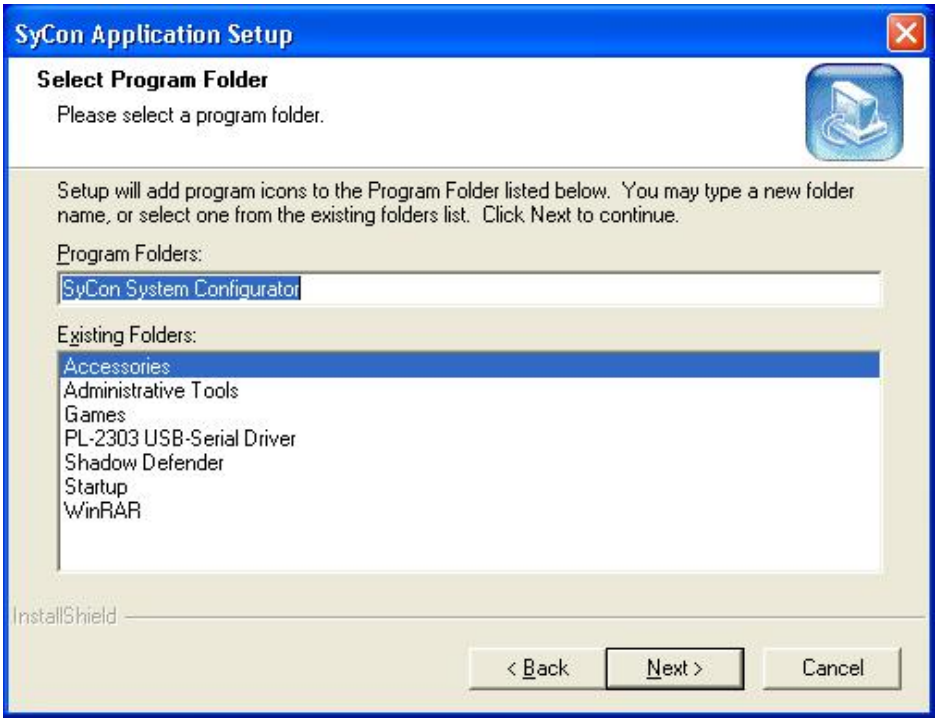
Click "Next"



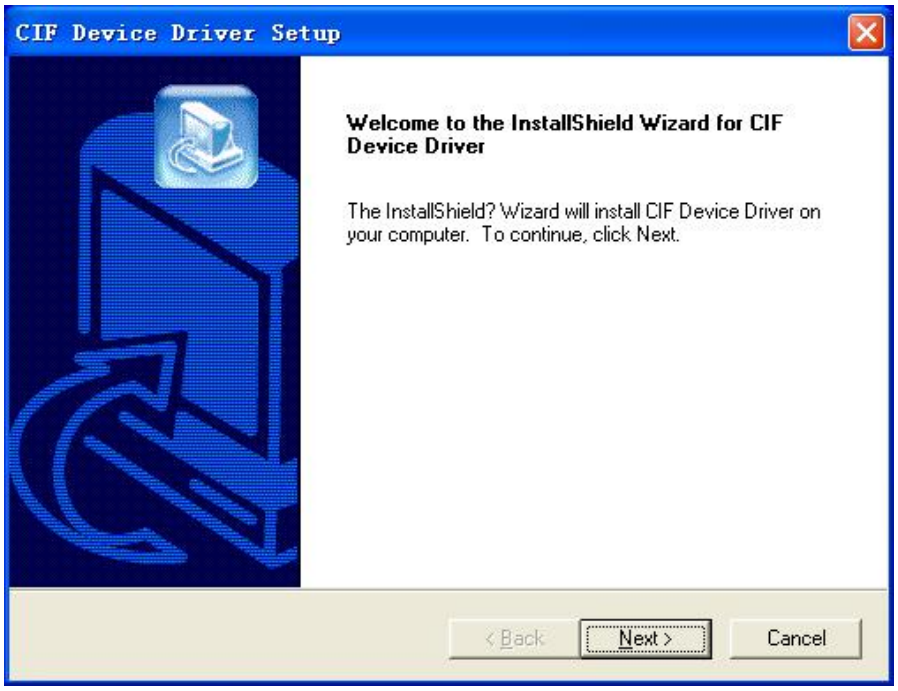
Keep the default value, Click "Next"



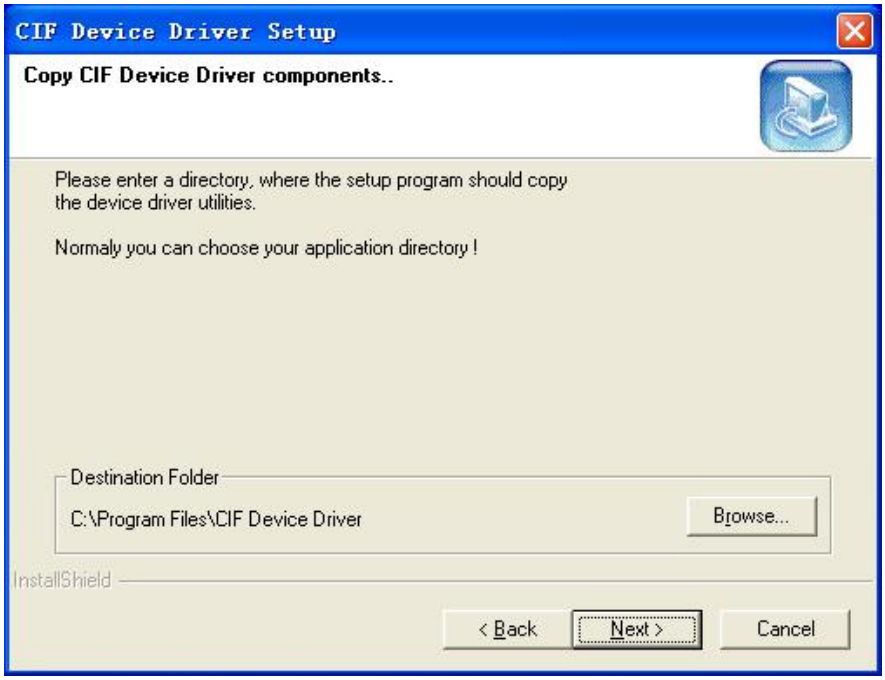
Select the installation path, Click "Next".



Click "Next"

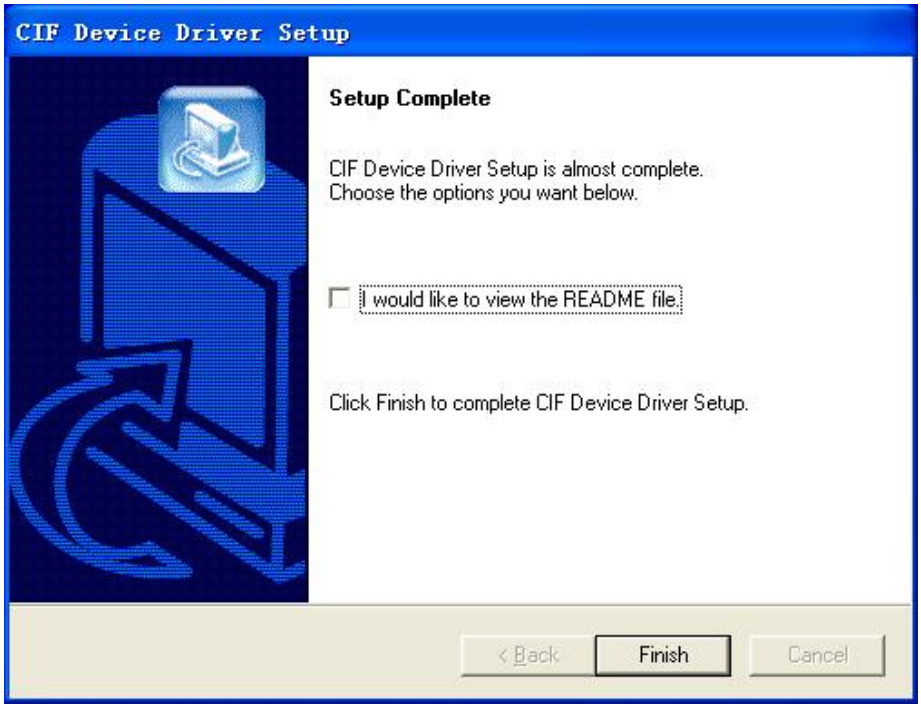


Click "Next"



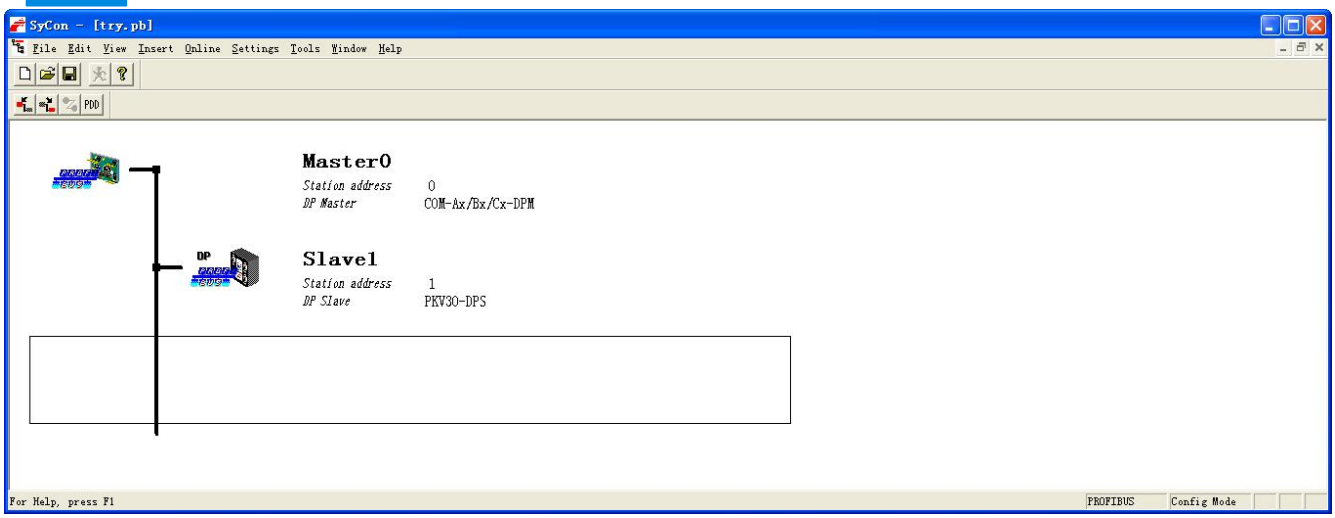
Click "Next"

Click "Next"

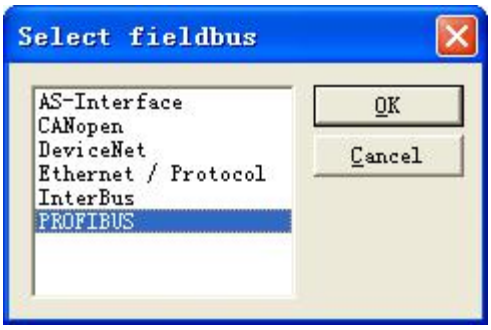


Now the installation is completed.

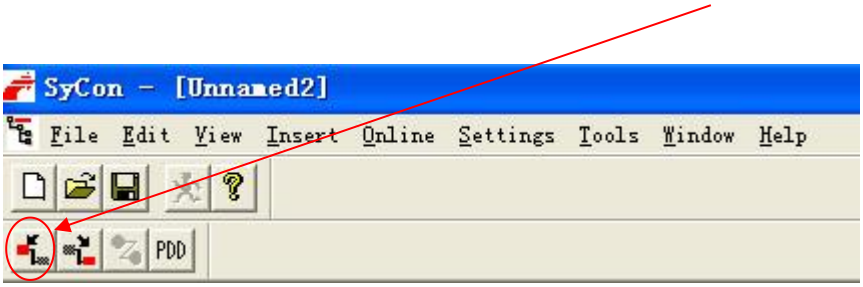
2. Click Start -> All Programs -> Open SyCon System Configurator->SyCon:



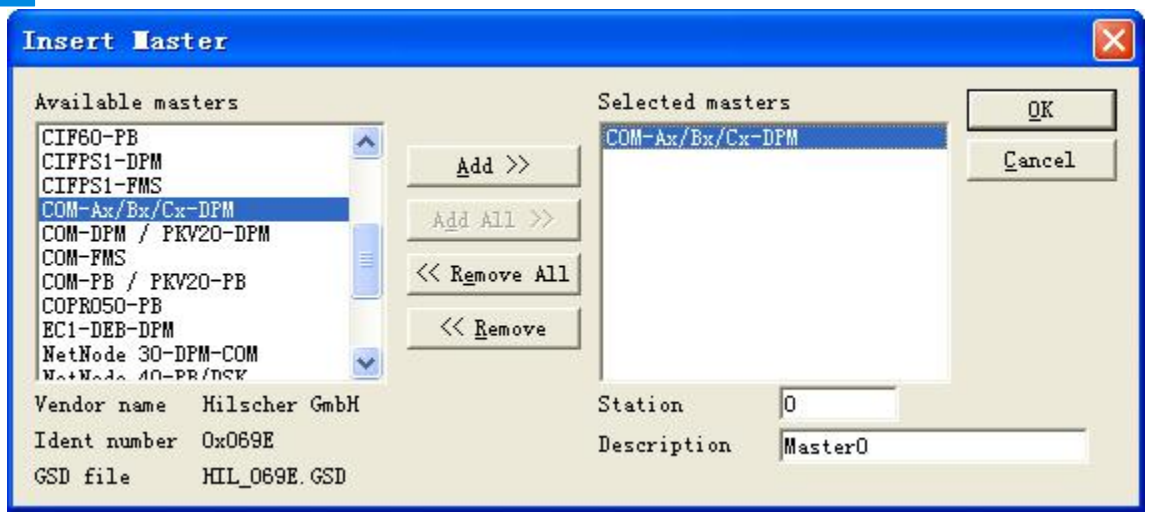
3. Click File-> New, create a new file: select "PROFIBUS", as shown below:



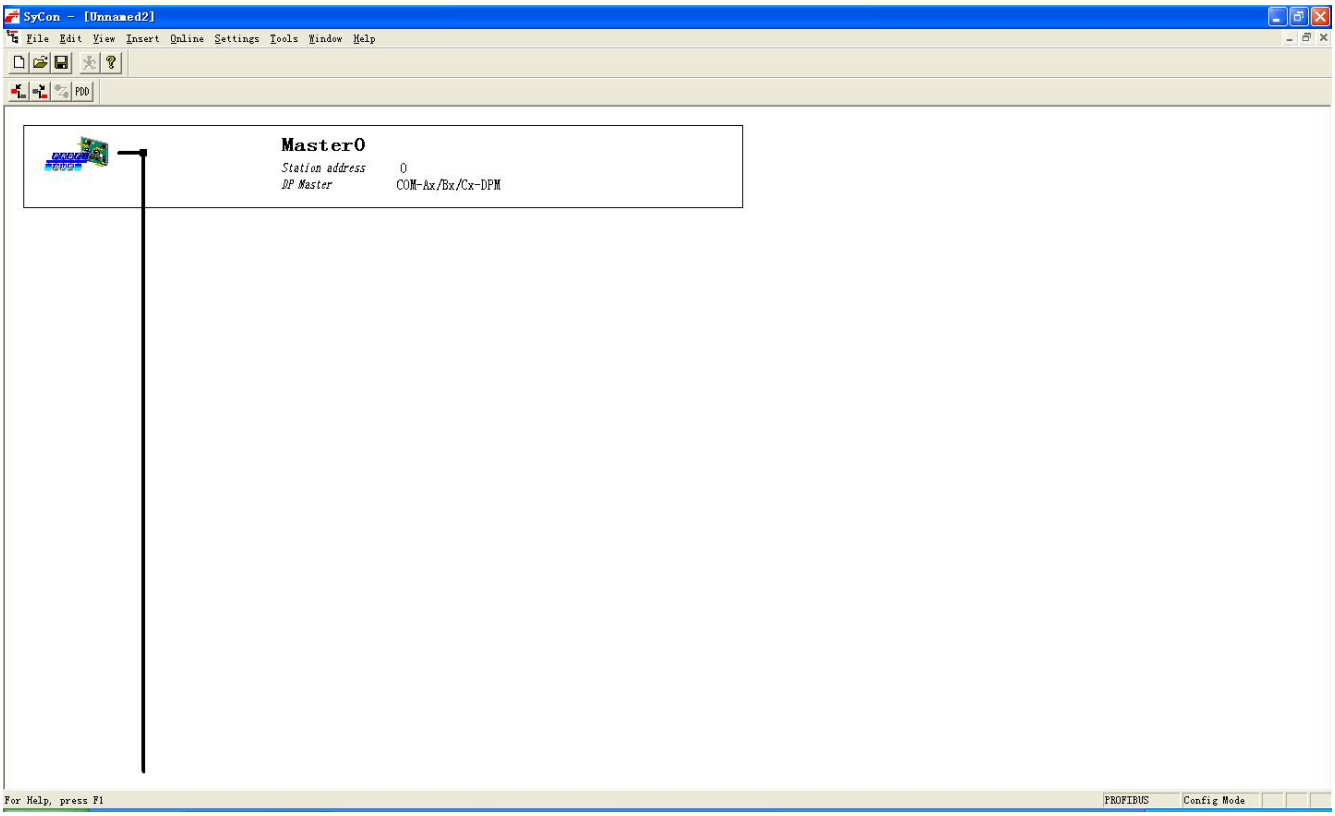
4. Add master: click on the icon in the second line Fieldbus toolbar — Insert master, to add the master :



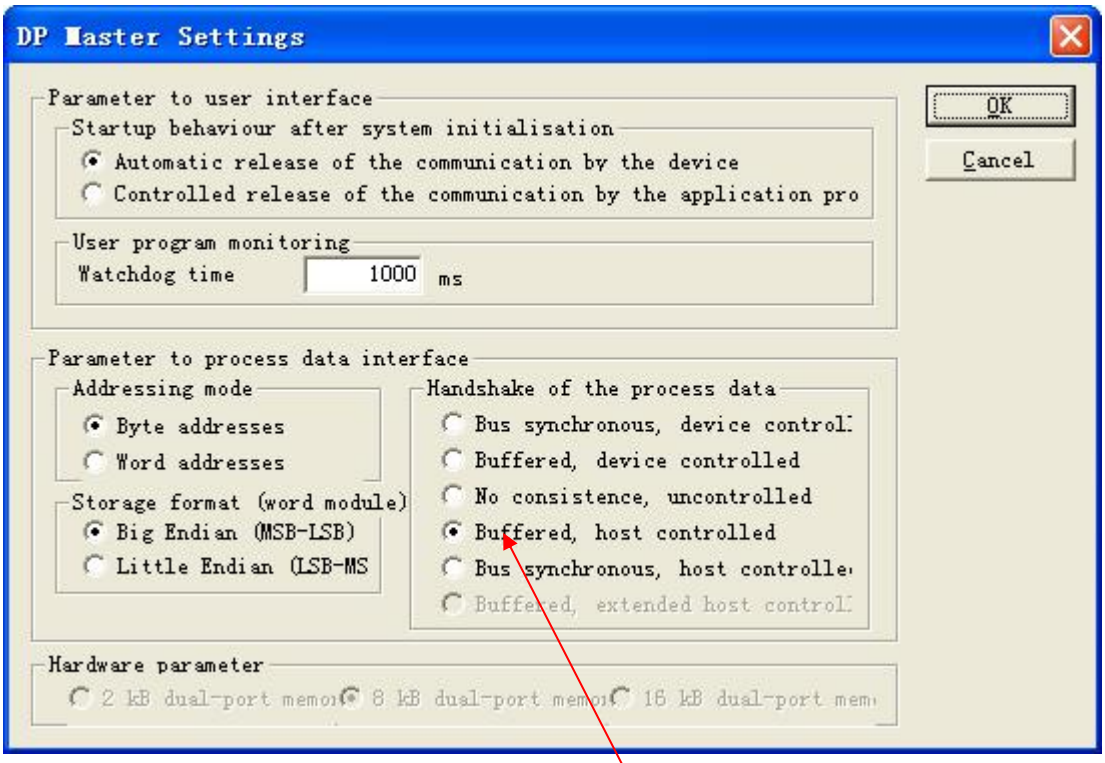
At the bottom of blank interface in the software, mouse will displays "M", Click the left mouse button, pop up the page of "insert master", Select “COM-AX/BX/CX-DMP ", click on the "Add >>":



Click "OK", the master has been added to the bus, as shown in the following figure:



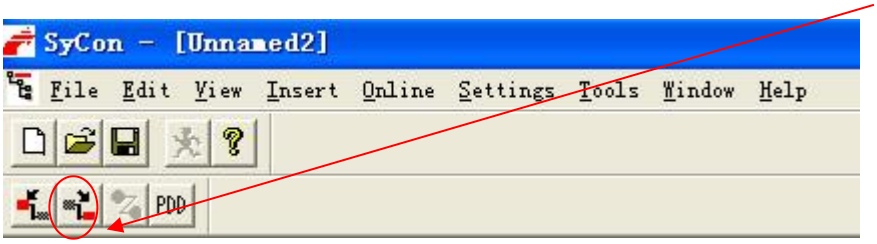
5. Configuring the DP master: right-click the added master, select "Master Setting .....", as shown below:



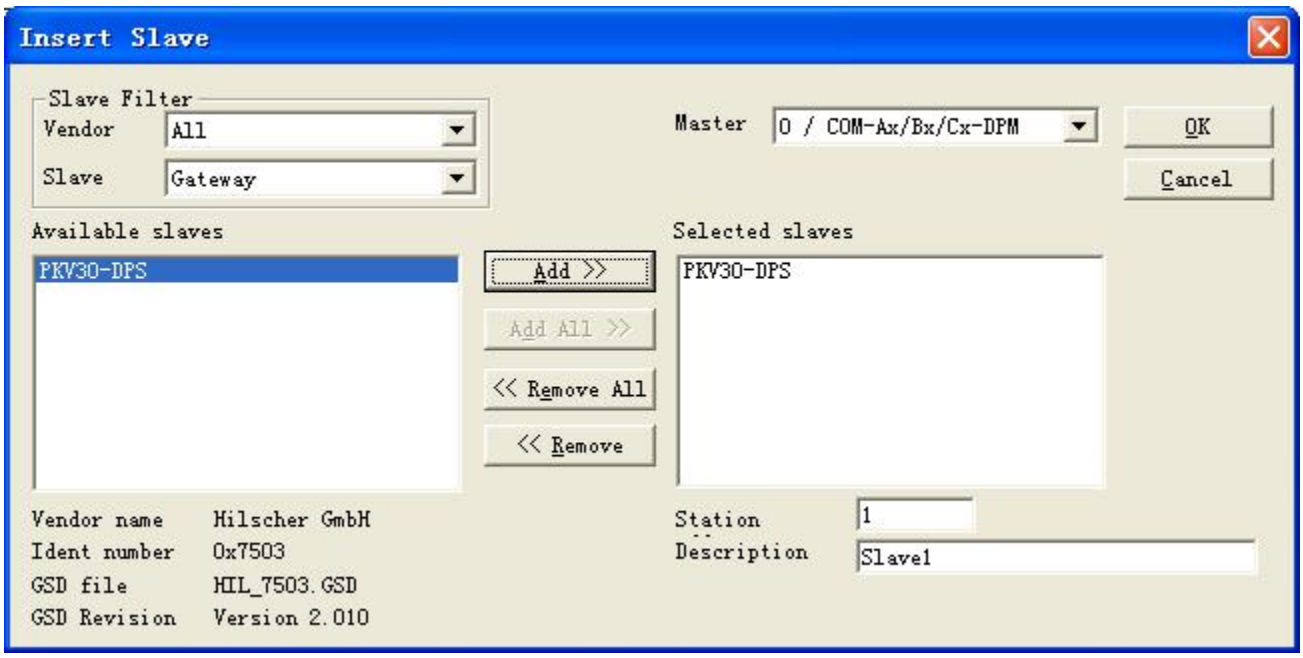
As shown above, the user must select “Buffered, host controlled” under the "Handshake of the process data", about other settings users can set according to the actual requirements.

6. Import GSD files: copy the DP slave GSD file to the system directory under the "System Tray: \ Documents and Settings \ All Users \ Application Data \ Hilscher \ SyCon \ Fieldbus \ PROFIBUS \ GSD". For example, "C: \ Documents and Settings \ All Users \ Application Data \ Hilscher \ SyCon \ Fieldbus \ PROFIBUS \ GSD."
   Note: This folder is hidden, need to be set in the "Tools \ Folder Options-View Properties", and show all hidden files and folders.

7. Add slave: click the second tool in second line of the Fieldbus toolbar — Insert slave, to add the slave :

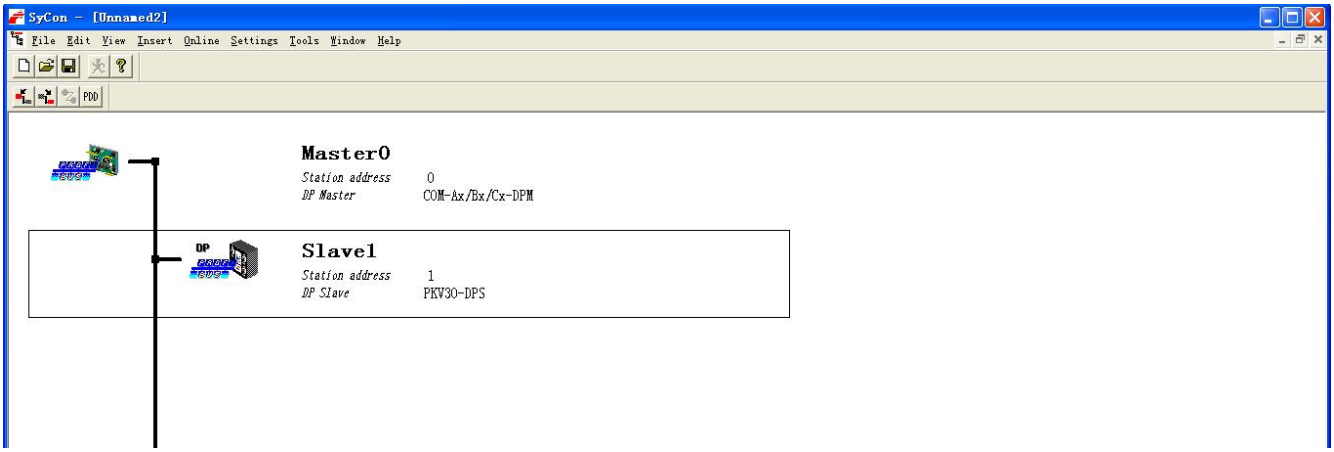


At the bottom of the blank interface of software , mouse will displays "S", Click the left mouse button, pop up the page of "insert slave", Select your slave, click on the" Add >> "(Here using “PKV30-DPS” as an example):

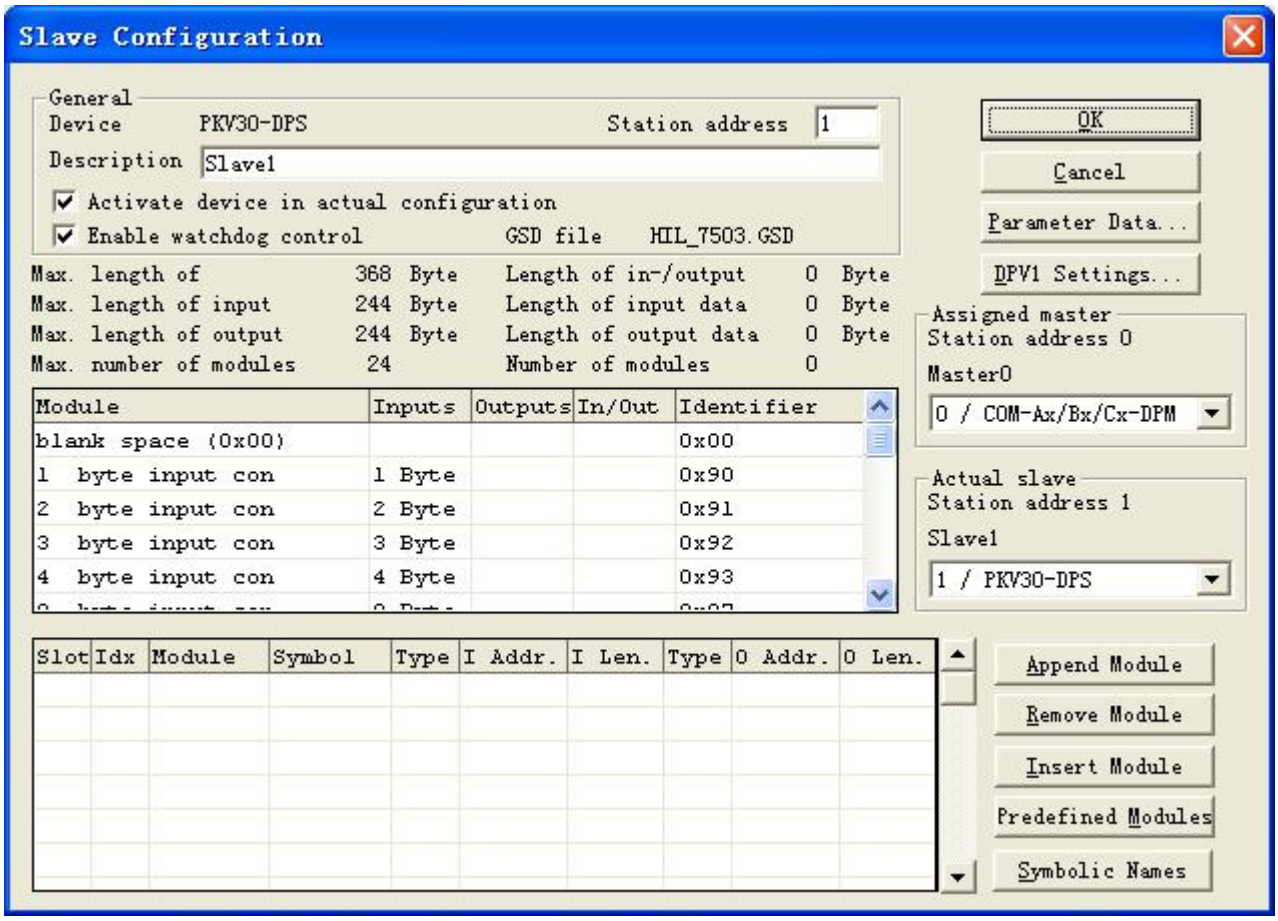


Click "OK", the slave has been added to the bus, as shown in the following figure:

Note: GT200-DPM-DN can connect up to 32 DP slaves.



Double click the slave, the following interface will pop up, correctly set the slave address and DP input and output the number of bytes in this interface:



Click OK to confirm the changes and save.

8. Save the configured project file.

9. Download configuration:

It is the serial port that this product used to configure the DP, in the "Online" menu of the menu bar, select "Download" to download the configuration. The mouse should point to the DP master.

6 DeviceNet Network Configuration Instructions

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

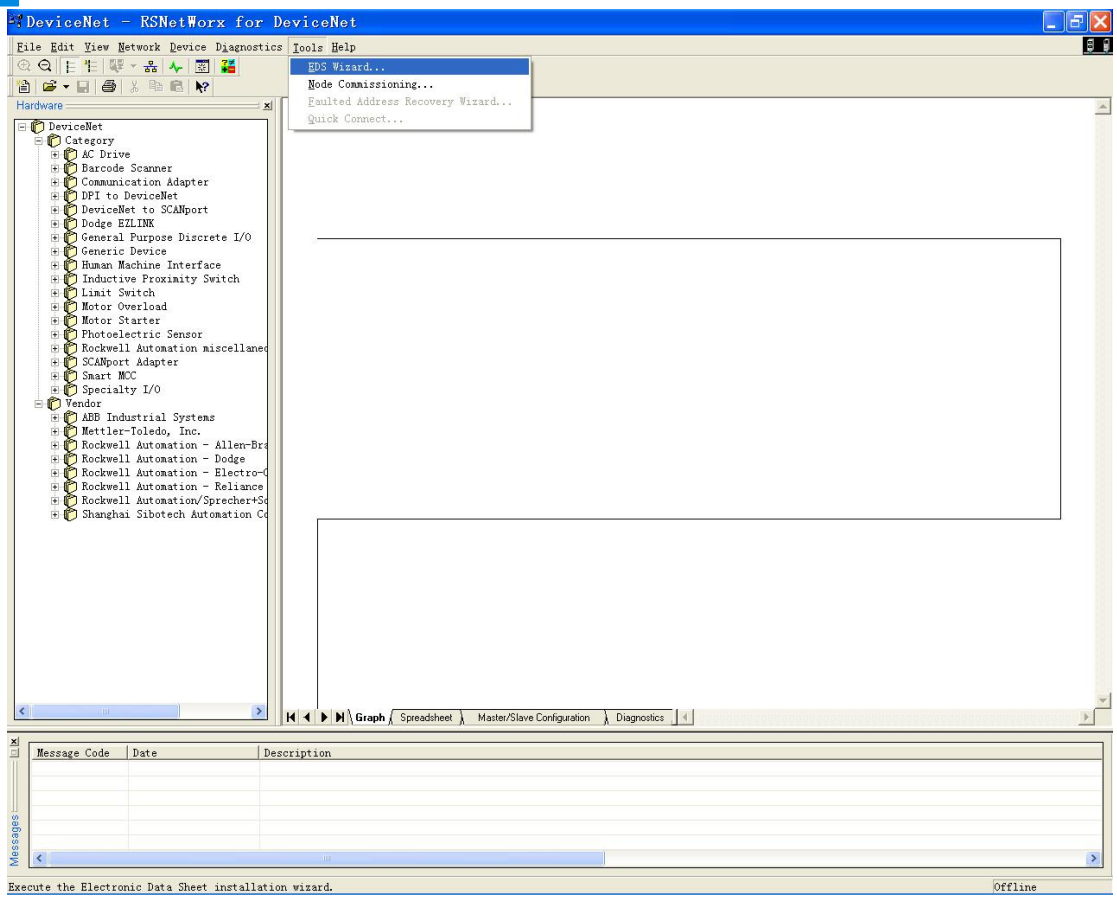
6.1 EDS Register

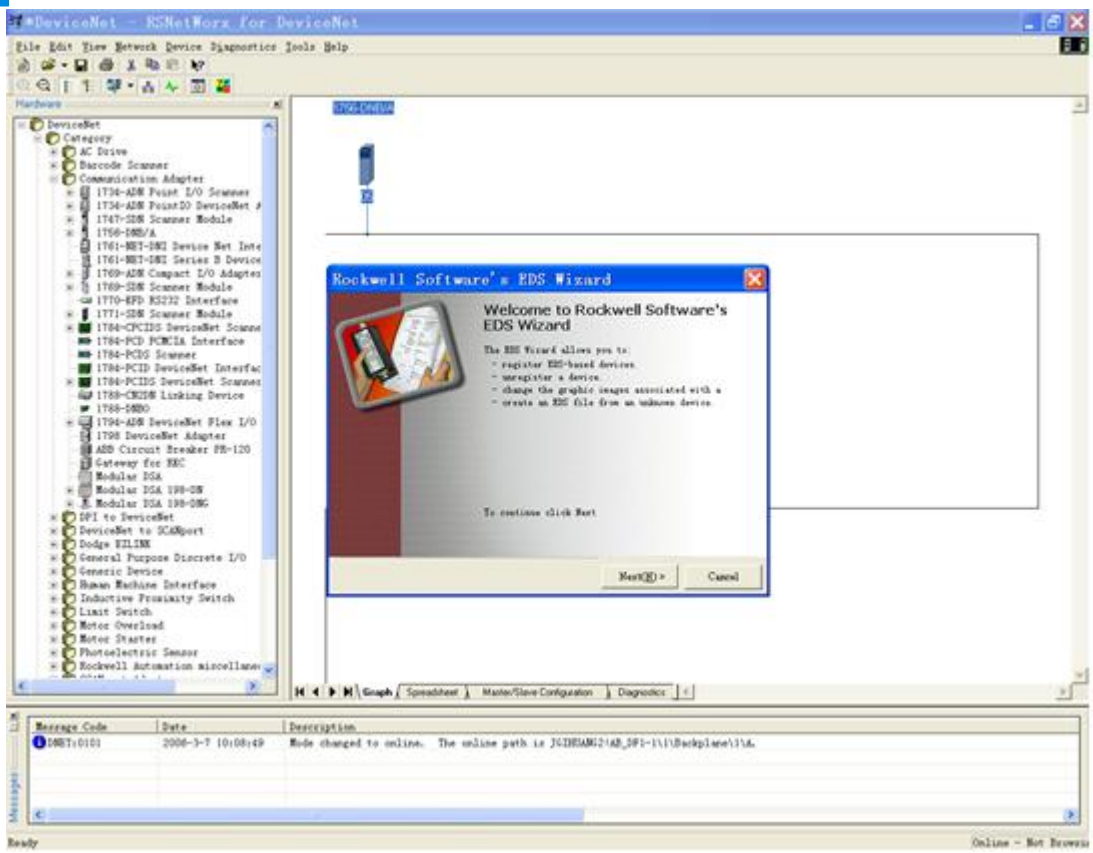
EDS (Electronic Data Sheet) is comprehensive description which supports DeviceNet network function. It equals to equipment's driver of Windows. Users need to install EDS files to DeviceNet network configuration software, such as RsNetWorx and so on, and then the configuration can be going on through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

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

Step1: Create a new network configuration profile

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


DeviceNet - RSNetWorx for DeviceNet
File Edit View Network Device Diagnostics Tools Help
EDS Wizard...
Node Commissioning...
Faulted Address Recovery Wizard...
Quick Connect...
Hardware
DeviceNet
Category
AC Drive
Barcode Scanner
Communication Adapter
DPI to DeviceNet
DeviceNet to SCANport
Dodge EZLINK
General Purpose Discrete I/O
Generic Device
Human Machine Interface
Inductive Proximity Switch
Limit Switch
Motor Overload
Motor Starter
Photoelectric Sensor
Rockwell Automation miscellaneo
SCANport Adapter
Smart MCC
Specialty I/O
Vendor
ABB Industrial Systems
Mettler-Toledo, Inc.
Rockwell Automation - Allen-Bra
Rockwell Automation - Dodge
Rockwell Automation - Electro-C
Rockwell Automation - Reliance
Rockwell Automation/Sprecher+Sc
Shanghai Sibotech Automation Co
Graph
Spreadsheet
Master/Slave Configuration
Diagnostics
Message Code
Date
Description
Messages
Execute the Electronic Data Sheet installation wizard.
Offline

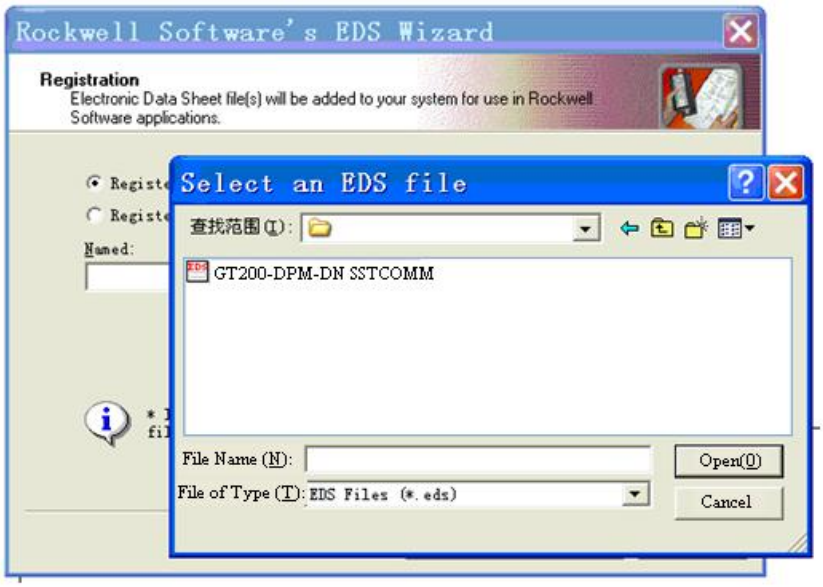


Step3: Select "Next", as follow:

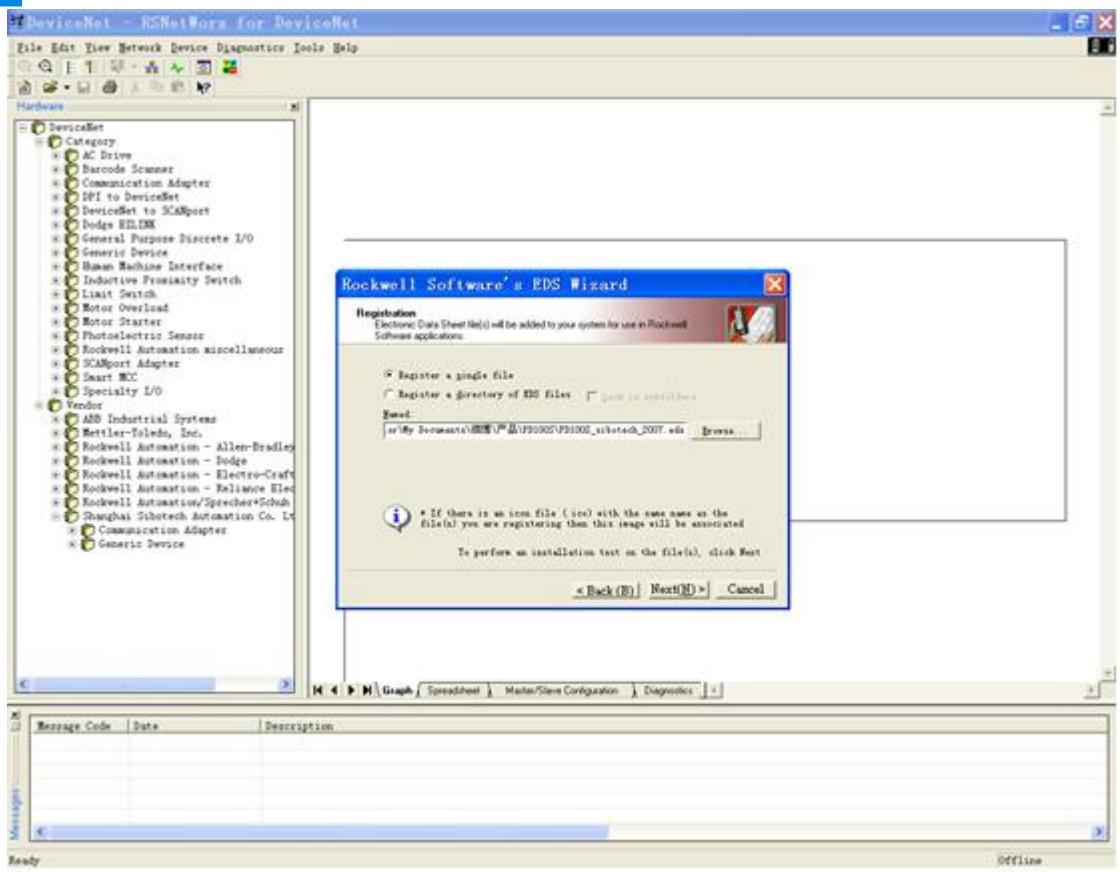
Step4: Install gateway GT200-DPM-DN:

Shown as above, select “Register an EDS file”, as follow:

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



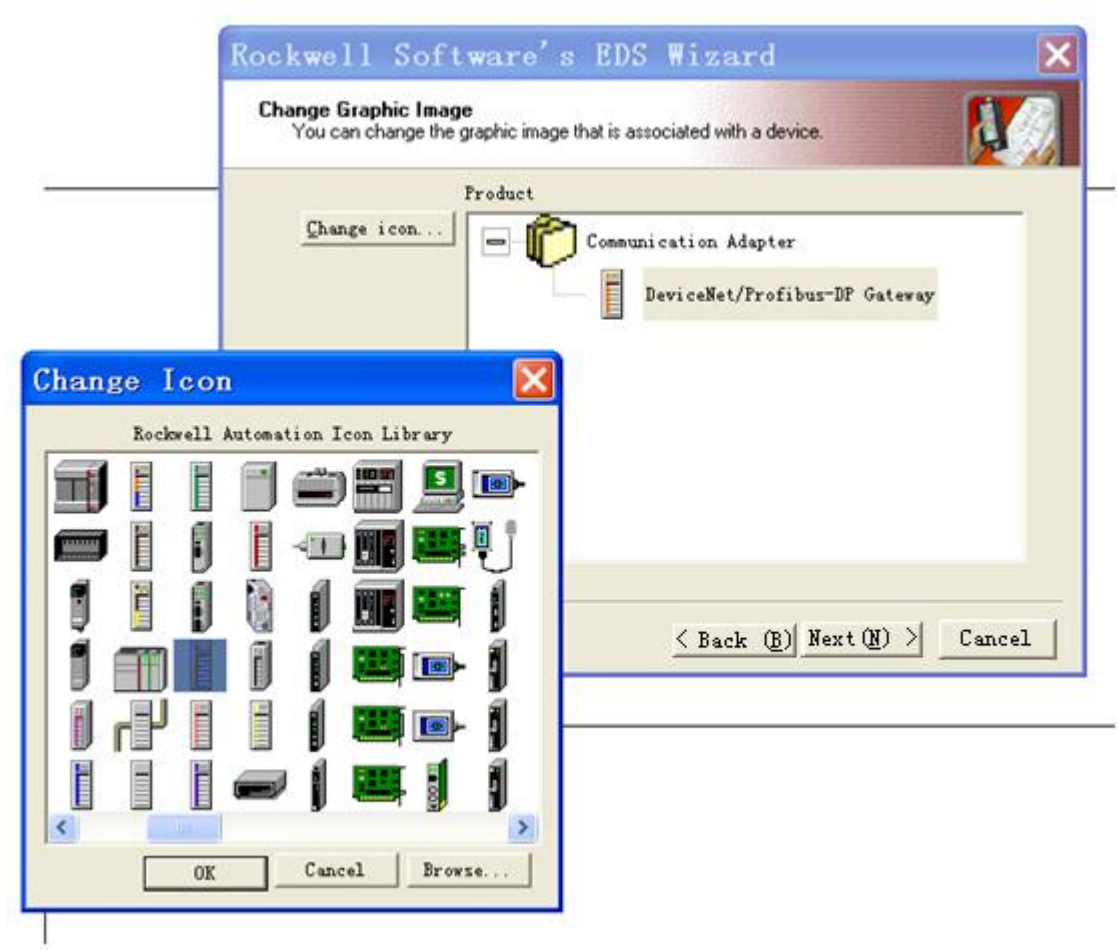
Step 5: Confirm register file you choose



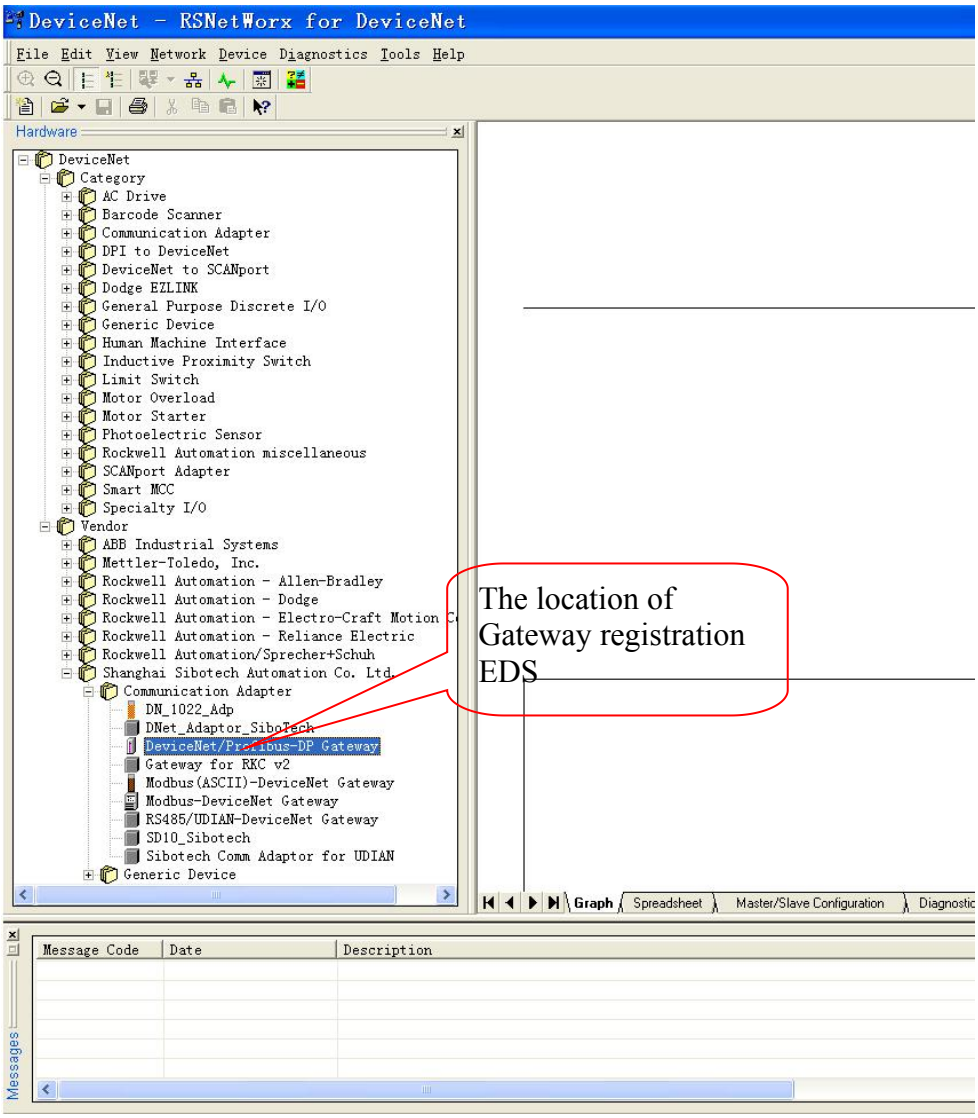
Click "NEXT":

Step 6: Select the icon.

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



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



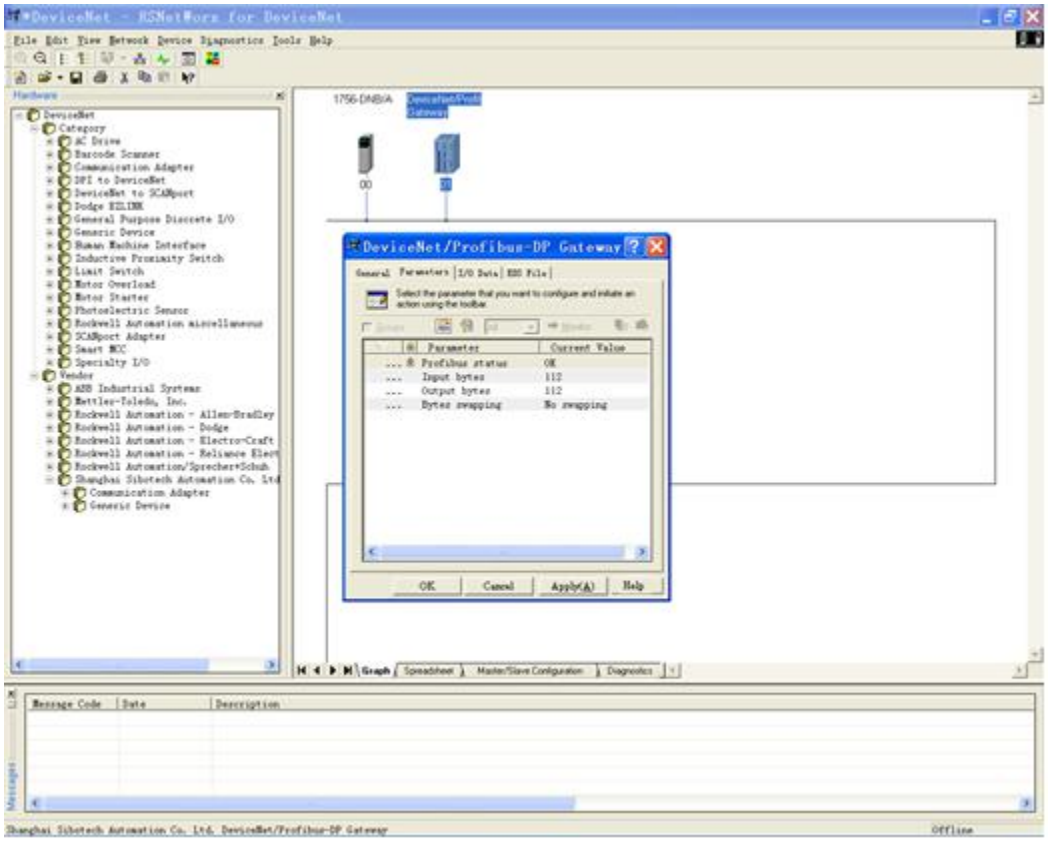
Then, you should connect gateway GT200-DPM-DN to DeviceNet network, click on “SCAN” button of RsNetWorx , or select “Network-Online” in menu bar, your gateway will be scanned by system and identified exactly.

6.2 DeviceNet Parameter Information

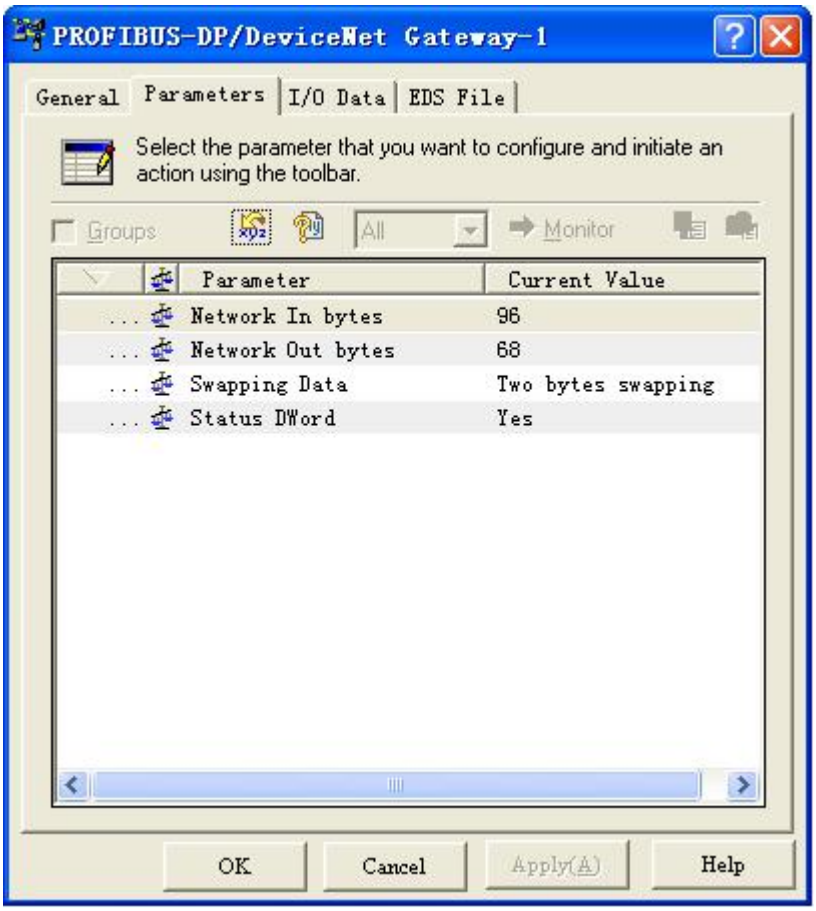
You can configure device Online in the RsNetWorx. Or you can configure device Offline, then go online. For more information, refer to RsNetWorx manual.

The following configuration is in Offline state.

From the Device Library on the left, the "Vendor"—"SST Automation" directory, drag the "DeviceNet / PROFIBUS DP Gateway" to the editing area. Select the address number of the actual device address, and then double-click the device, you will see the following screen:



You can also modify device address in this interface. Click "Parameter" to enter the parameter interface, display the following figure:



This is the DeviceNet parameter screen shot in the RsNetWorx network configuration software.

Network In bytes: This parameter indicates the number of DeviceNet input bytes. Options include 48 bytes, 96 bytes, 128 bytes, 240 bytes. The default setting is 96 bytes.

Network Out bytes: This parameter indicates the number of DeviceNet output bytes. Options include 32 bytes, 68 bytes, 128 bytes, 240 bytes. The default setting is 68 bytes.

Note: Users may need to choose input bytes and output bytes according to the actual requirements. After modification of parameter 1 and 2, the gateway needs to be restarted to take the settings effect. Besides, modify these two parameters, users need to pay attention to set the same parameters to configure the 1756-DNB module DeviceNet Master Module Scan List. And the download will take effect after power-on restart.

Swapping Data: This parameter indicates gateway swapping mode when the data exchanged in the two networks. Options include No swapping, Two bytes swapping, Four bytes swapping. Download the parameters take effect immediately, power-down also can be saved

Status DWord: When you select "Yes", that means that the DeviceNet input area first 4 bytes to store up to 32 PROFIBUS DP slave communication status. Each bit represents a PROFIBUS DP slave communications status. "0" indicates the GT200-DPM-DN and the corresponding PROFIBUS DP Slave Communication exception, "1" indicates that GT200-DPM-DN and the corresponding PROFIBUS DP Slave Communication normal.

6.3 Configure the PLC I/O Scan

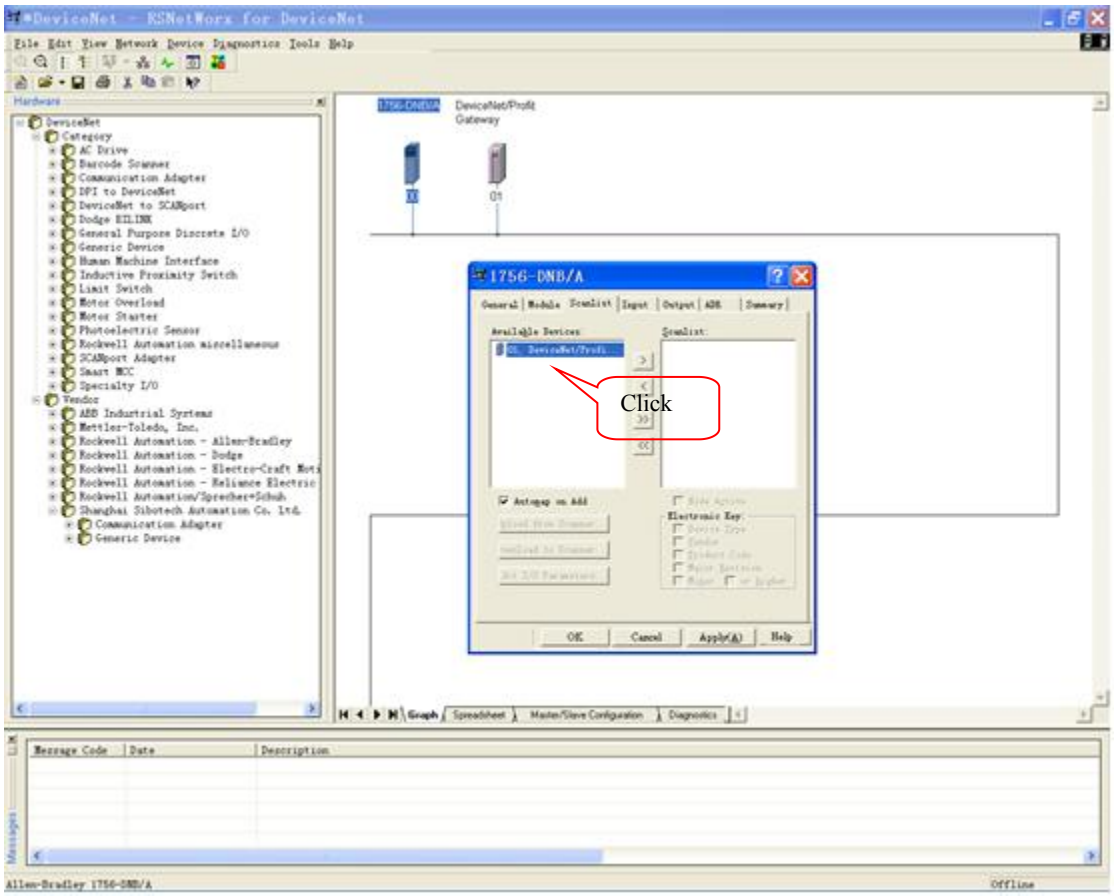
This section briefly describes how to configure the RSLogix 5000 +1756 / DNB I / O scan parameter table by RsNetWorx.

PLC platform: ControlLogix5555- Rockwell

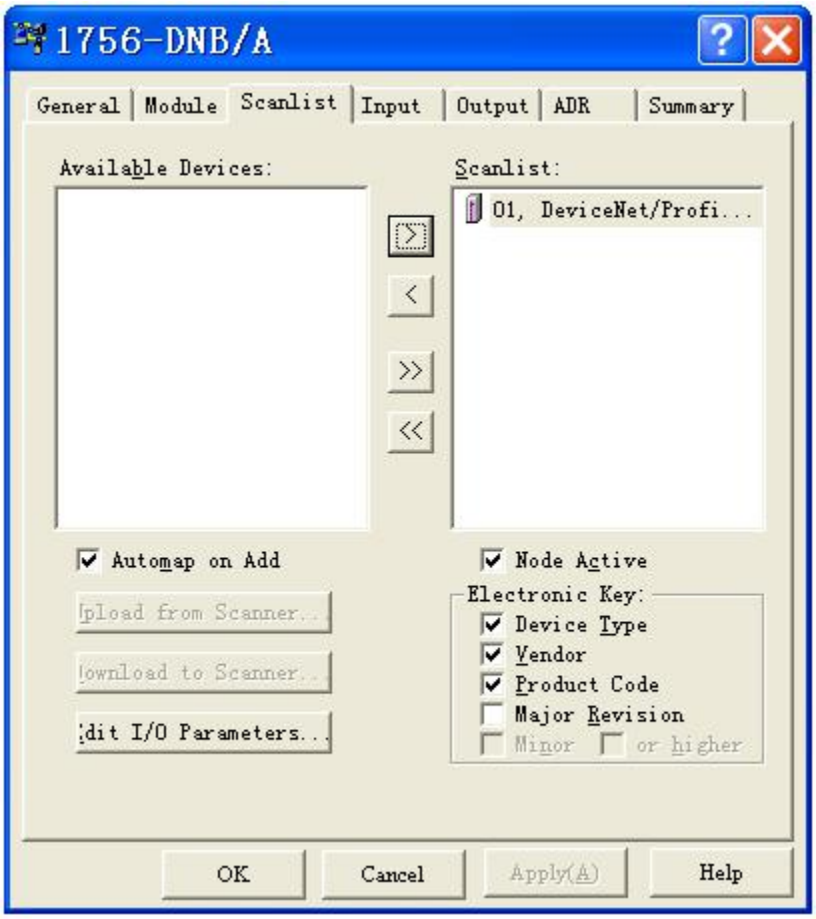
DeviceNet interface cards: 1756DNB

Configuration software: RsNetWorx

Step one: Open the Property Page dialog box of a 1756 DNB , enter the “Scan list” tag page:



Step 2: In the above interface, select the device to join the scan list, and then click the arrow (>) button, and then you can see:

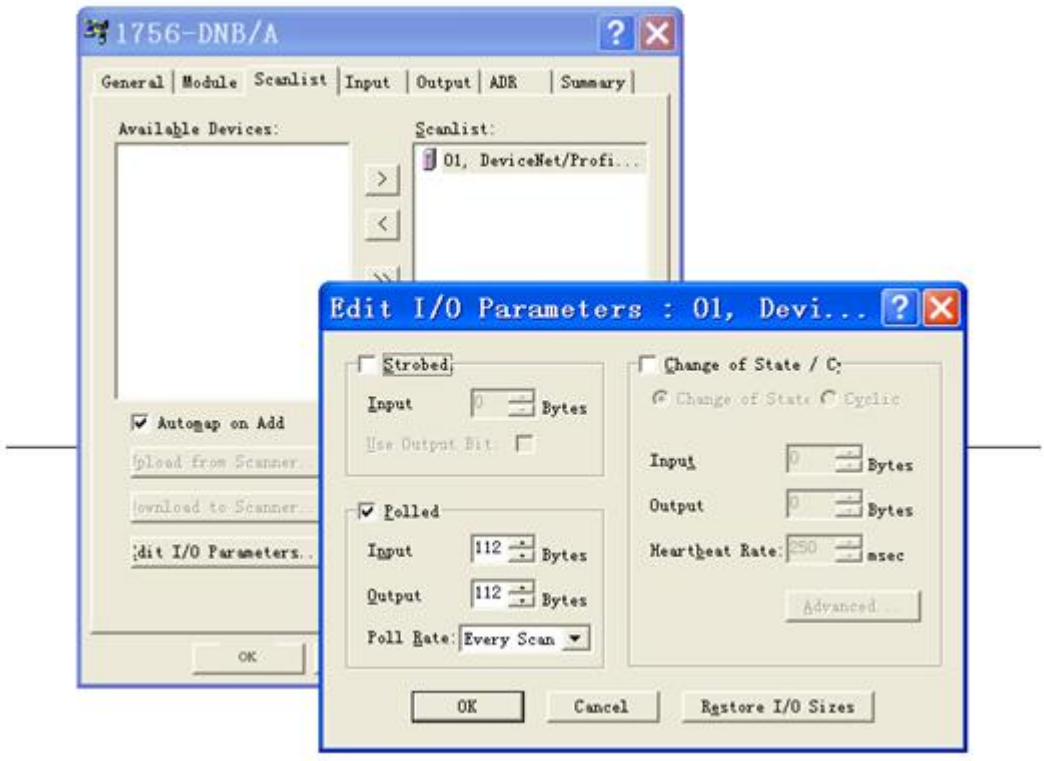


Equipment enters into the 1756-DNB DeviceNet master scan list.

If the customer is to learn how to configure the DeviceNet, you can click on the "Edit I / O Parameters ..." to modify, or according to the default configuration, click OK, all devices are added to the scan list.

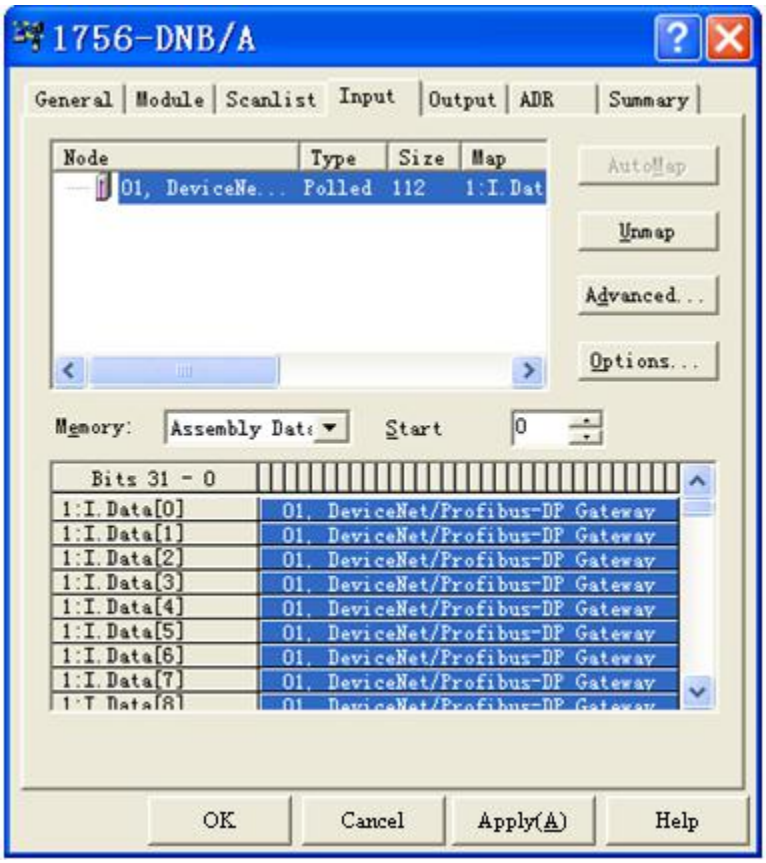
The following figure shows the dialog box that appears after clicking the "Edit I / O Parameters ...", where users can set I / O data input and output trigger mode: polling, sent periodically, at every change. You can also select the input / output byte.

Note: the number of bytes of input and output is a key! PLC / DeviceNet master connection will verify the configuration of input and output bytes and the actual device input and output response the number of bytes, if they are not consistent, it will not be able to establish a DeviceNet I / O connections, and therefore cannot be input and output.



The third step: Make sure the input and output mapping.

Users can view the Input and Output Properties page, here is where device's DeviceNet I / O information on how to set memory data associated with the 1756DNB. Generally choose AuotMap.

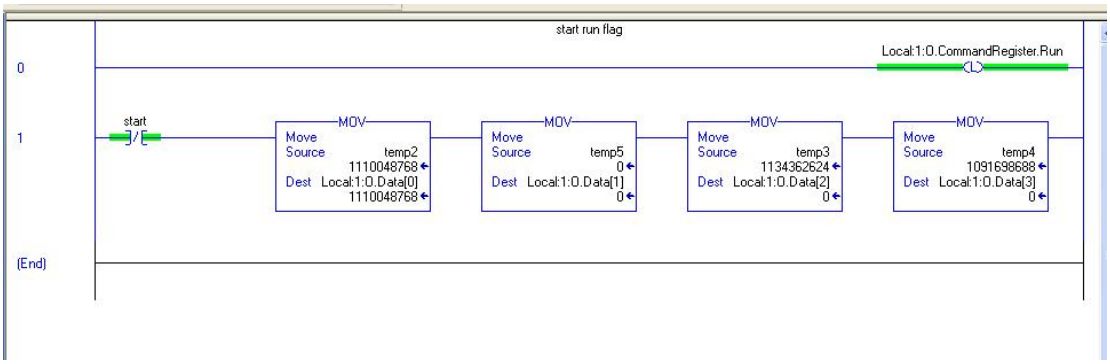


Step 4: Download the appropriate scan list to 1756 DNB. Follow the prompts.

Step 5: Preparation of the corresponding program, download to ControlLogix, PLC state to run. If it is in the programming state, the PLC DeviceNet I / O scan does not output data (IDLE), only input data.

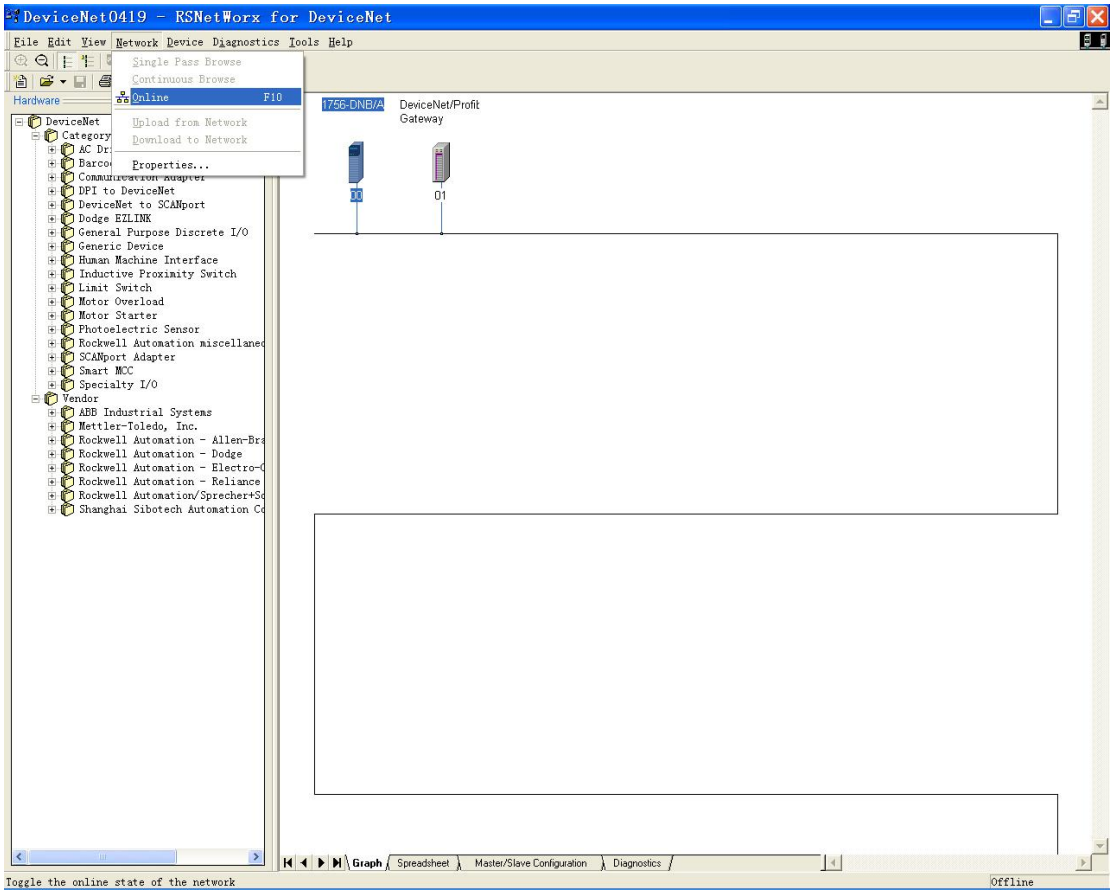
Note: When 1756 DNB is developing PLC program , one run control bit of 1756 DNB should be set to 1. If 1756 DNB module rack is 1, it indicates "Local:1:O.CommandRegister.Run"

Ladder program example:

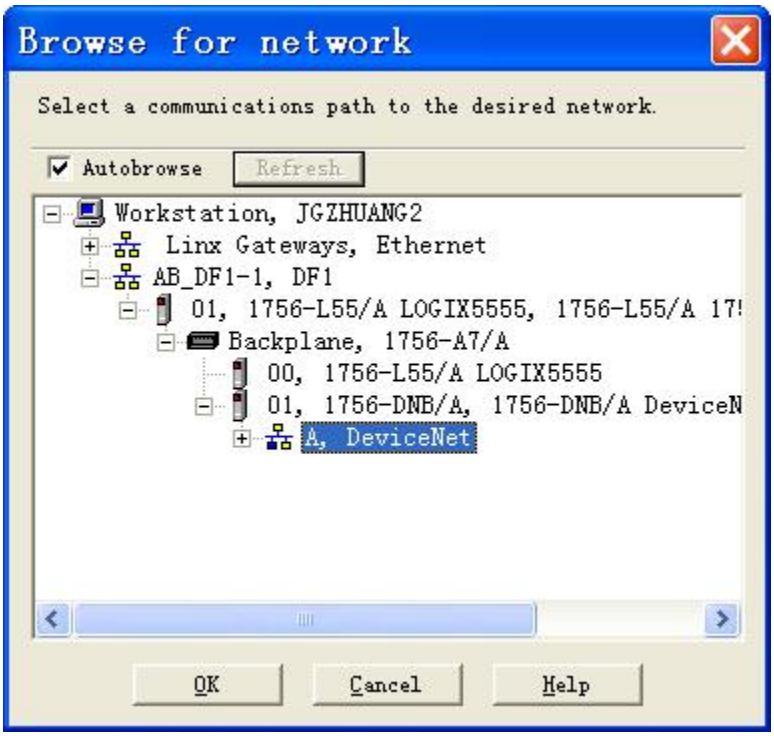


6.4 Select Online Path

From offline to online, users need to select the path.



According to the actual configuration path, the following figure shows the icon with a serial (DF1).

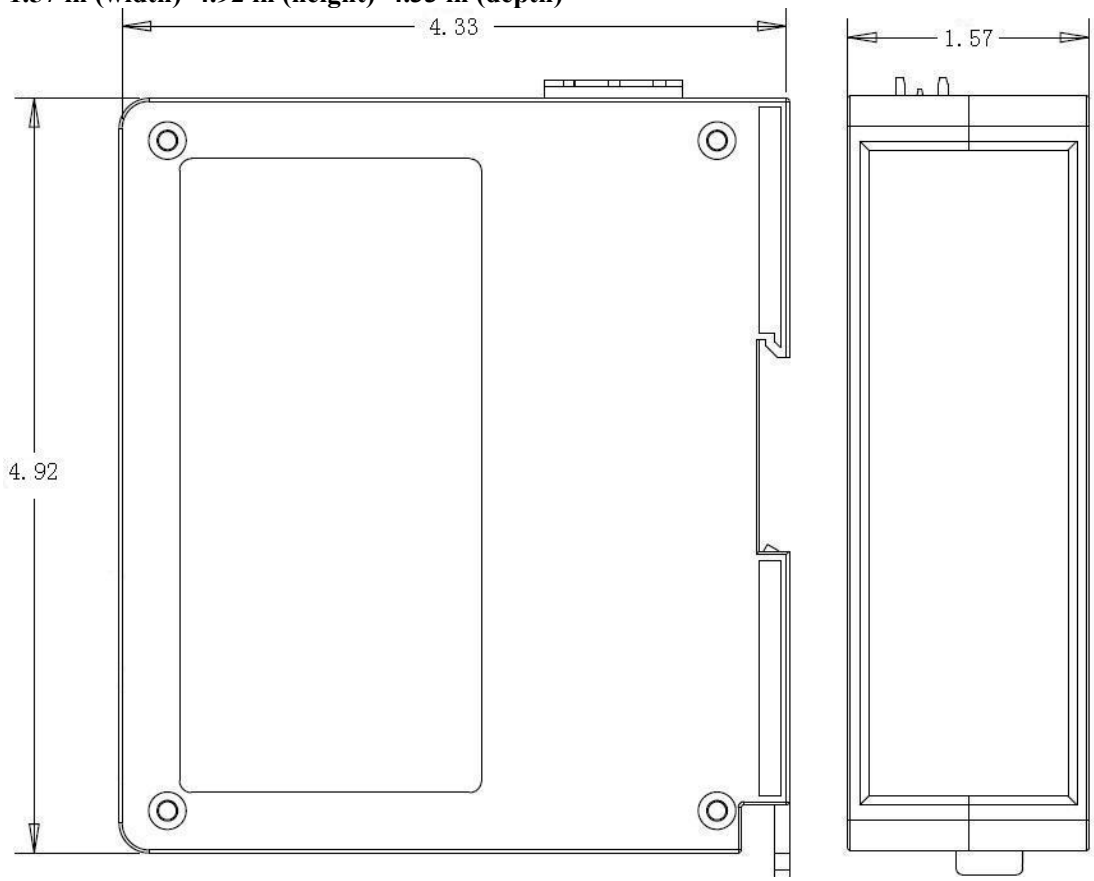


For more information, refer to RsNetWorx manual.

7 Installation

7.1Machine Dimensions

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



7.2 Installation Method

35mm DIN rail mounting