

PROFIBUS Configuration for Moxa MGate 5102-PBM-PN and Siemens S7-300

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Released on December 27, 2013

About Moxa

Moxa manufactures one of the world's leading brands of device networking solutions. Products include serial boards, USB-to-serial hubs, media converters, device servers, embedded computers, Ethernet I/O servers, terminal servers, Modbus gateways, industrial switches, and Ethernet-to-fiber converters. Our products are key components of many networking applications, including industrial automation, manufacturing, POS, and medical treatment facilities.

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1. Introduction

This application note describes how to configure a Moxa MGate gateway as a PROFINET I/O device, a Siemens S7-300 PLC as a PROFINET I/O controller, and a Siemens DT-200M as a PROFIBUS DP slave with eight digital outputs.

2. Applicable products

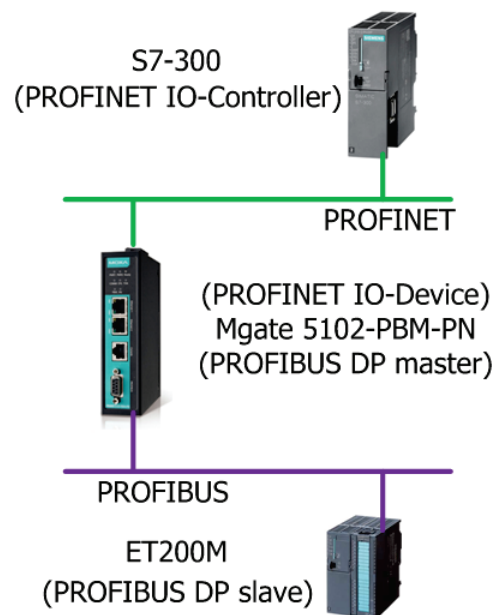
Product Line	Model Name
MGate 5000 series	MGate 5102-PBM-PN, MGate 5102-PBM-PN -T

3. System requirements

Description	Model / File Name	Version
Siemens S7-300 PLC	CPU 315-2 PN/DP Article Number: 6ES7315-2EH14-0AB0	3.2.3
Siemens PLC programming software	SIMATIC STEP 7	5.5 + SP2
Siemens modular I/O station	Siemens ET-200M	
Moxa PROFIBUS DP master to PROFINET gateway	MGate 5102-PBM-PN	1.0
Software utility to configure Moxa device	MGate Manager	1.8

4. System overview

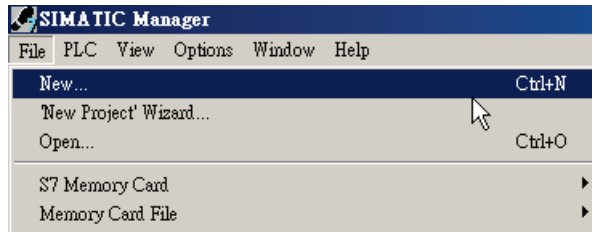
This document will use the MGate 5102-PBM-PN for illustrative purposes in the following system architecture.



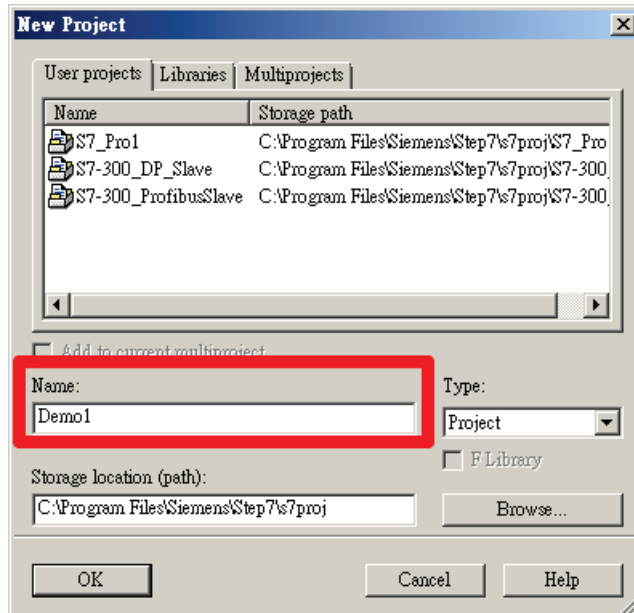
5. PLC configuration

5.1. Create STEP 7 project

5.1.1. Start SIMATIC Manager and create a new project by selecting **File** → **New**.

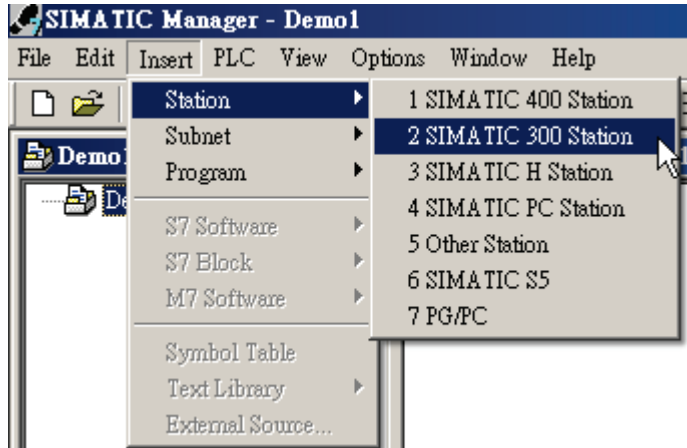


You must assign a name for the project. For this example, enter **Demo1** as the project name.

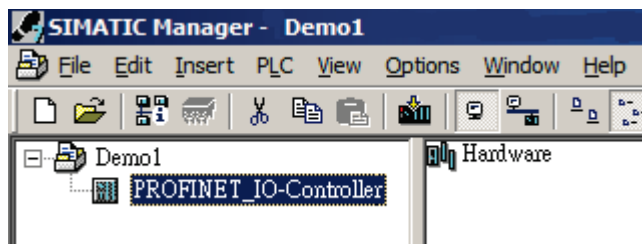


5.2. Create a PROFINET I/O controller

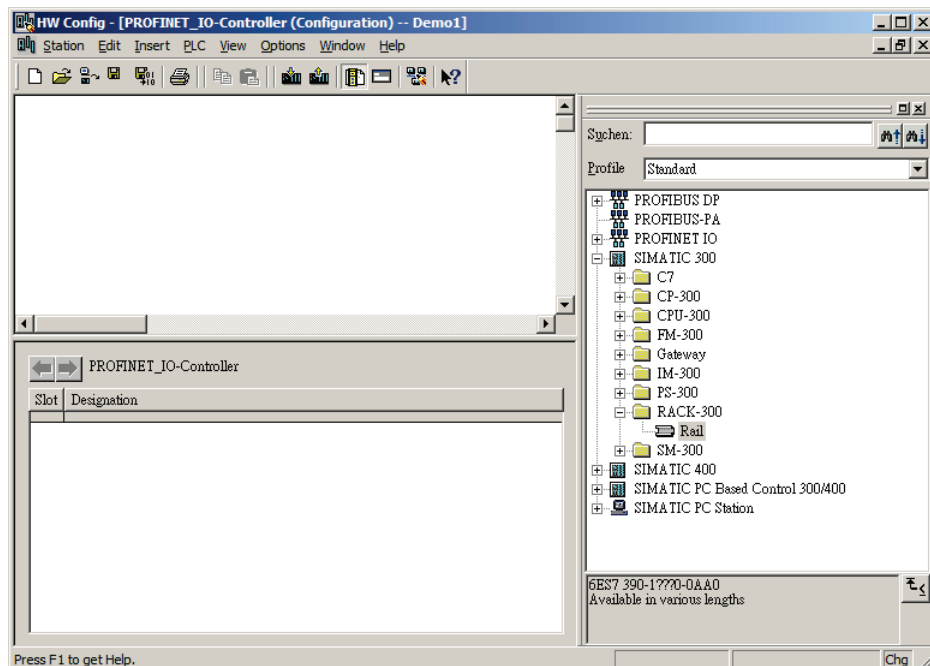
5.2.1. Select **Insert** → **Station** → **2 SIMATIC 300 Station** to insert a SIMATIC 300 Station (i.e., the Siemens S7-300 PLC).



Name the SIMATIC 300 Station as **PROFINET_IO-Controller** and double-click on it to perform additional configurations.

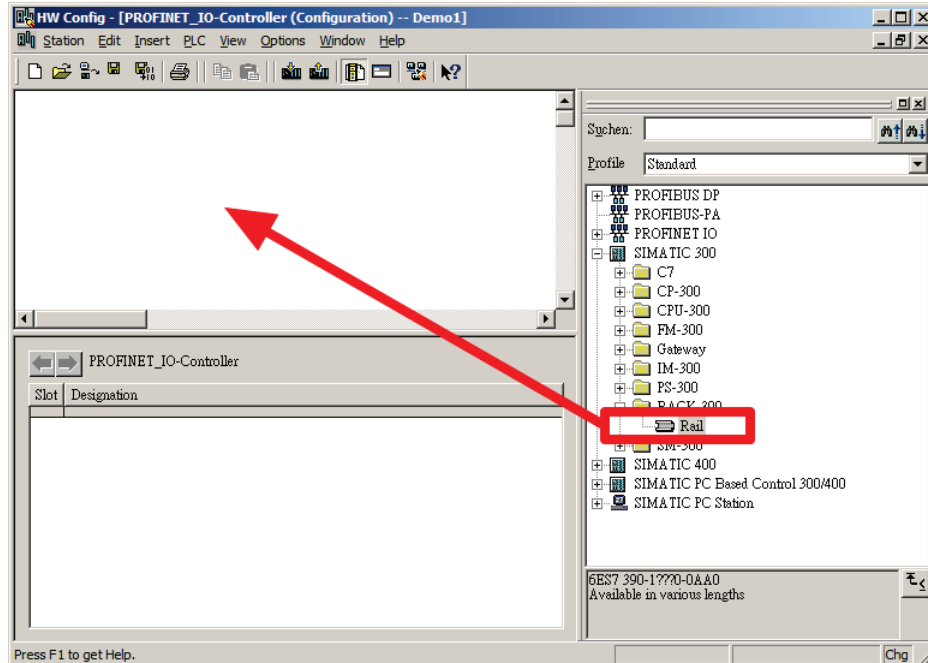


5.2.2. Double-click the **Hardware** icon to open the **HW Config** window.

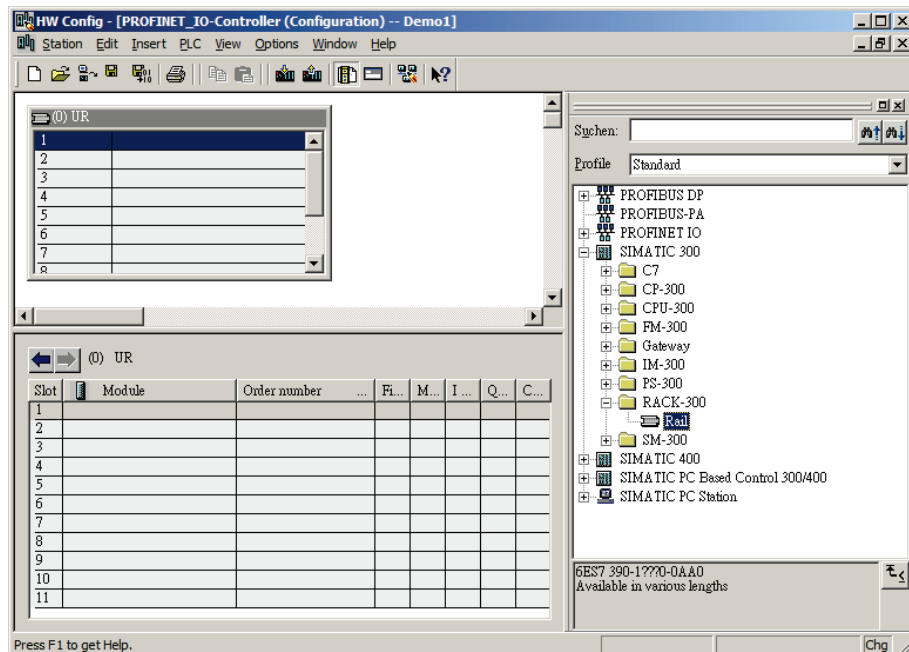


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Drag the **Rail** item located under **SIMATIC 300** → **RACK-300** (in the right-hand hardware catalog panel) to the upper half of the **Station** window, as shown below.

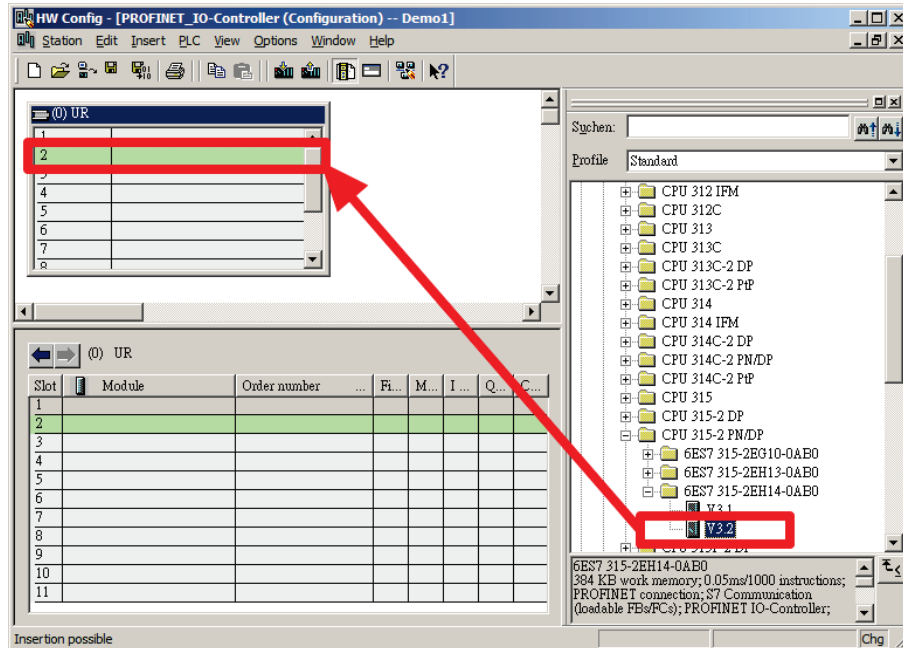


You should see an empty grid in the upper half of Station window as shown below.



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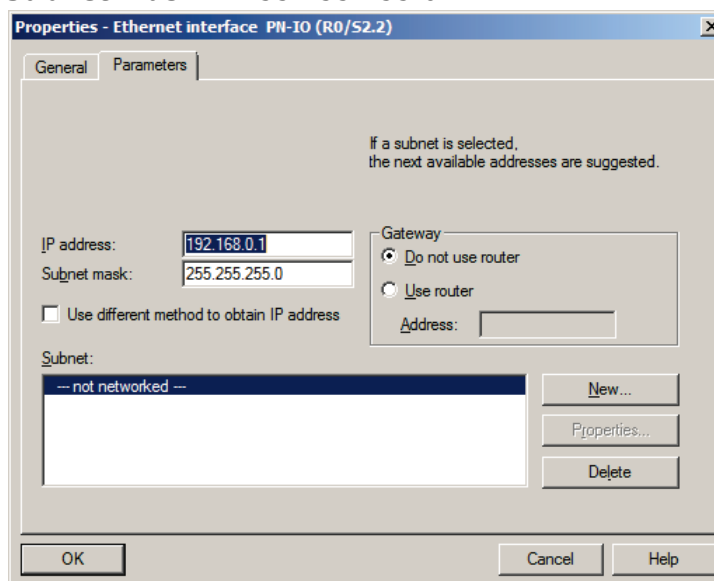
You must add the proper version firmware for the CPU module hardware model. In the figure below, we use **CPU 315-2 PN/DP** as an example. Drag the proper version of the CPU module firmware from the **Hardware Catalog** window on the right and drop it into the empty grid in the **Station** window on the left.



Although you will be prompted to enter the IP address for the CPU module, keep the following default settings.

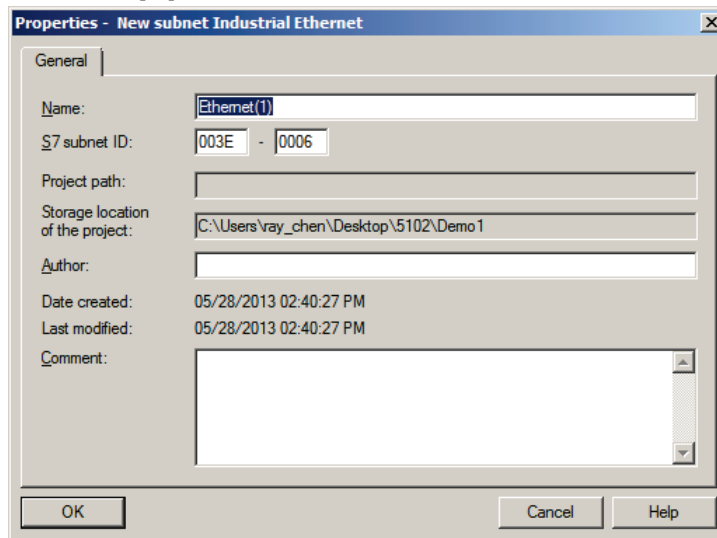
IP address: 192.168.0.1

Subnet mask: 255.255.255.0



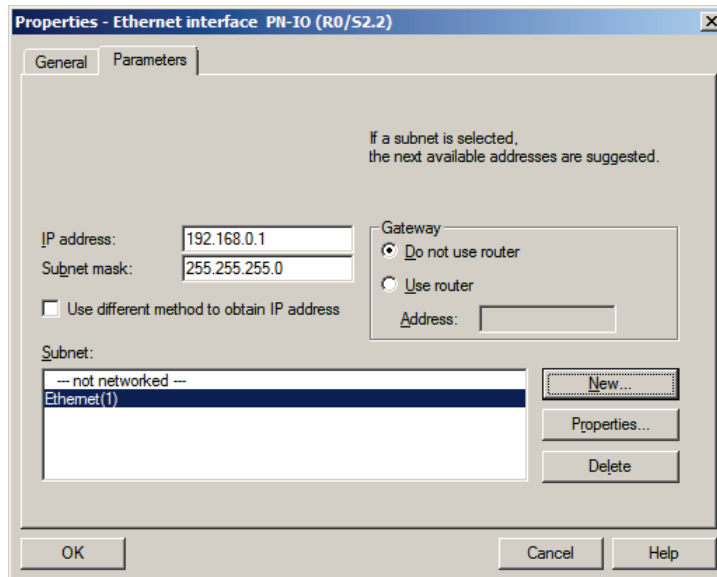
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Click the **New** button to create a PROFINET network. Keep the default name: **Ethernet(1)**.



The screenshot shows a dialog box titled "Properties - New subnet Industrial Ethernet". It has a "General" tab. The "Name" field contains "Ethernet(1)". The "S7 subnet ID" field contains "003E" and "0006". The "Storage location of the project" field contains "C:\Users\ray_chen\Desktop\5102\Demo 1". The "Date created" and "Last modified" fields both show "05/28/2013 02:40:27 PM". There are "OK", "Cancel", and "Help" buttons at the bottom.

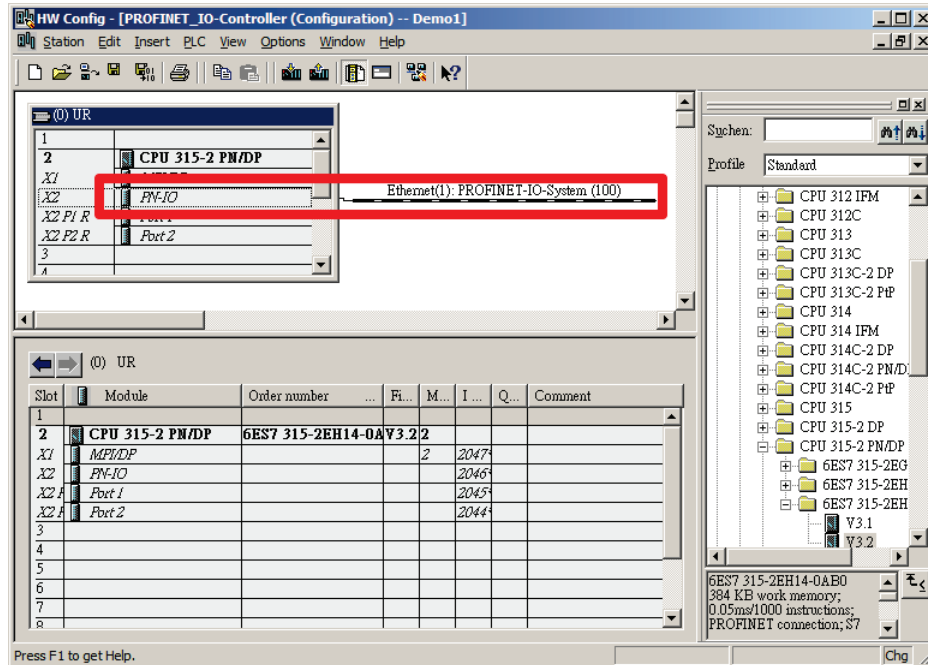
Click the **OK** button. **Ethernet(1)** should appear as a new item in the **Subnet** list box.



The screenshot shows a dialog box titled "Properties - Ethernet interface PN-IO (R0/S2.2)". It has "General" and "Parameters" tabs. The "IP address" field contains "192.168.0.1" and the "Subnet mask" field contains "255.255.255.0". There is a checkbox for "Use different method to obtain IP address" which is unchecked. The "Gateway" section has two radio buttons: "Do not use router" (selected) and "Use router". The "Subnet" list box contains "-- not networked --" and "Ethernet(1)". There are "New...", "Properties...", and "Delete" buttons next to the list box. There are "OK", "Cancel", and "Help" buttons at the bottom.

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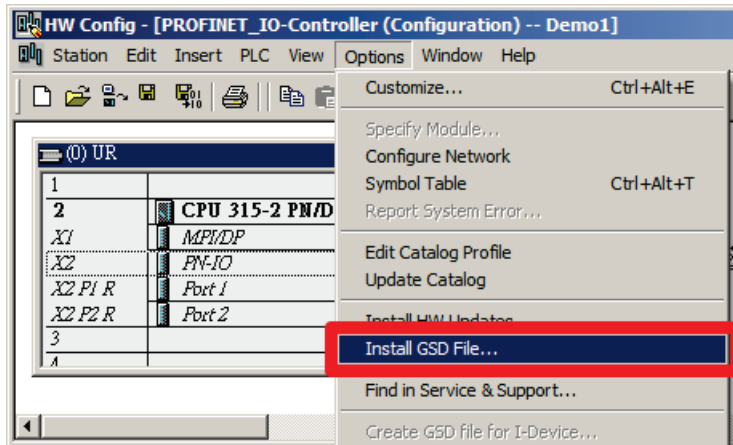
Click the **OK** button to create the **Ethernet(1): PROFINET-IO-System (100)** network.



5.3. Create a PROFINET I/O device

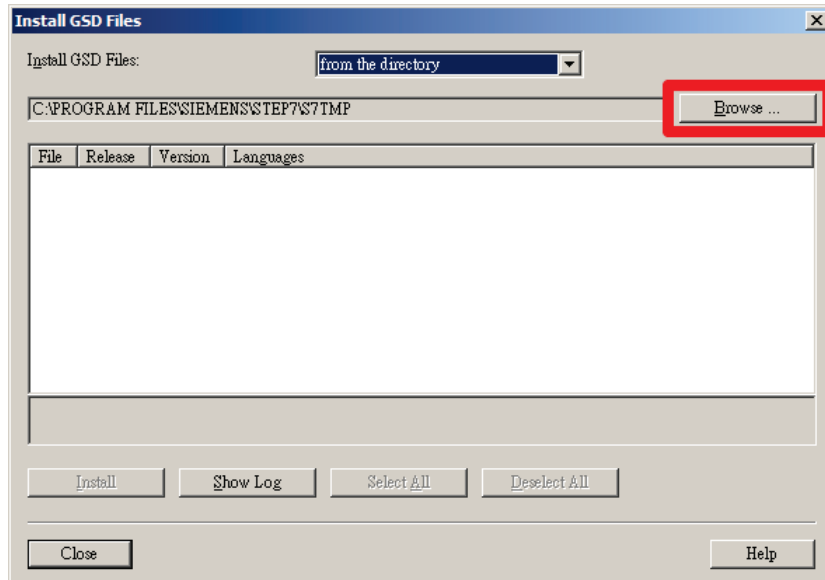
5.3.1. Before adding the MGate 5102-PBM-PN as a PROFINET I/O device, you must first install the GSD file.

5.3.2. Select **Options** → **Install GSD File...**

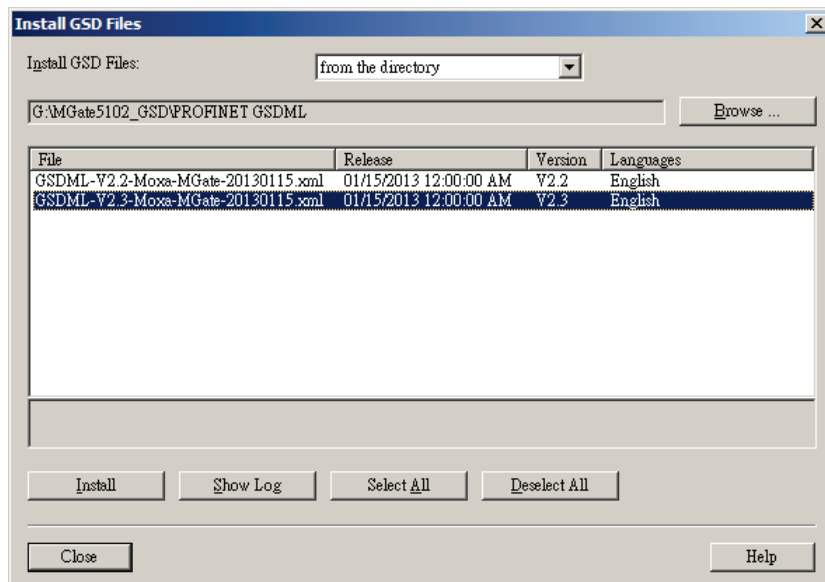


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5.3.3. When the **Install GSD Files** window opens, click the **Browse...** button to select the proper GSD file to install.

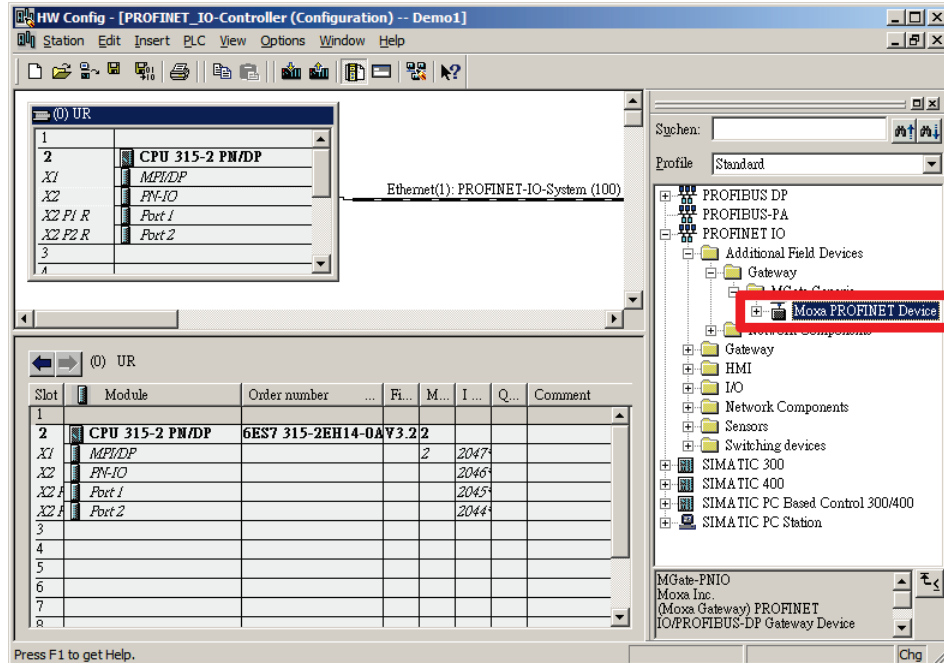


5.3.4. Select V2.3 and click **Install**. If the Step 7 configuration software version is older than 5.4, it may only support GSD files with version 2.2.

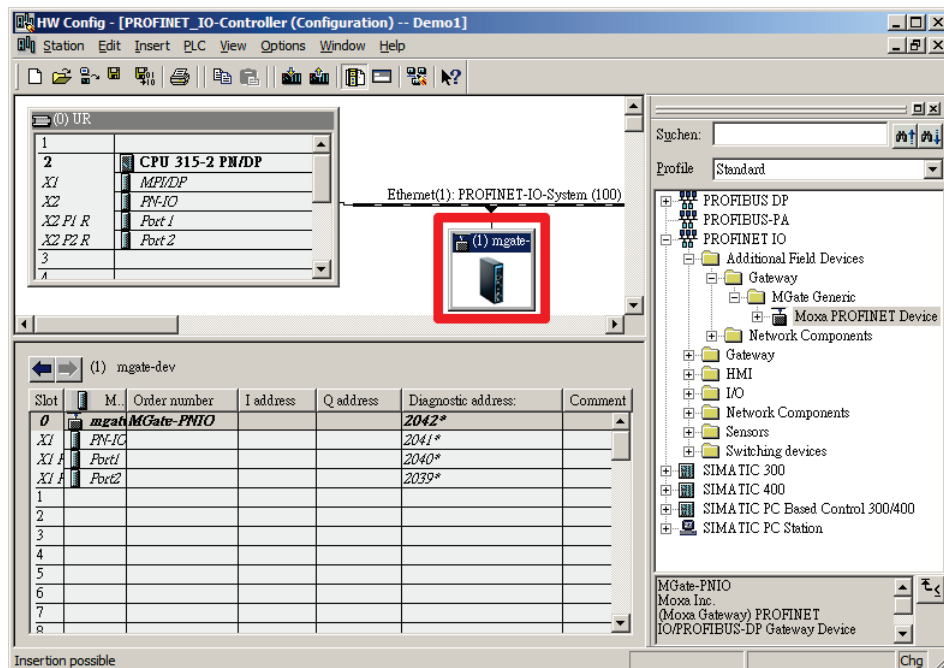


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5.3.5. After installing the GSD file, locate the **Moxa PROFINET Device** under **PROFINET IO** → **Additional Field Devices** → **Gateway** → **MGate Generic**.

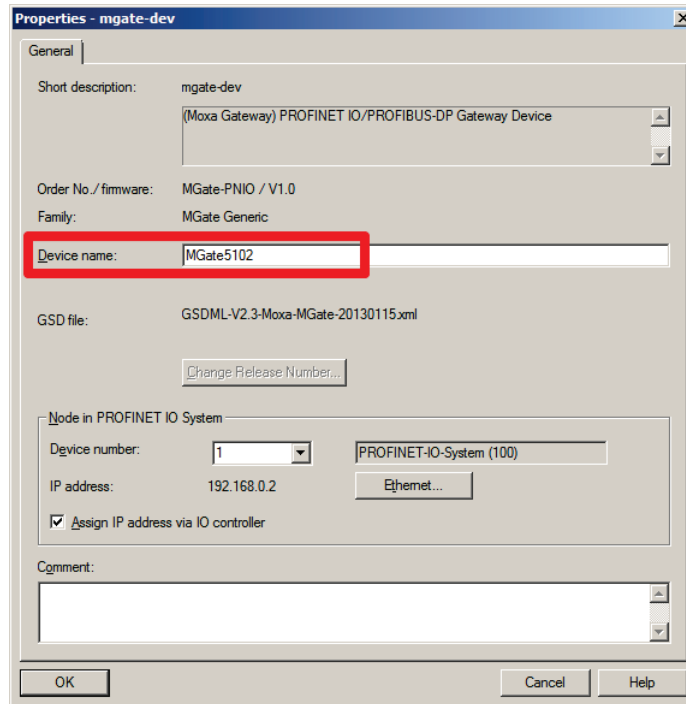


5.3.6. Drag the **Moxa PROFINET Device** to the **Ethernet(1): PROFINET-IO-System (100)** network:



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- 5.3.7. Double-click on the **MGate 5102-PBM-PN** icon to open the **Property** window. Change the **Device name** to **MGate5102**, which should be the same name used to configure the **MGate 5102-PBM-MN** through **MGate Manager** at Step 6.2.3:

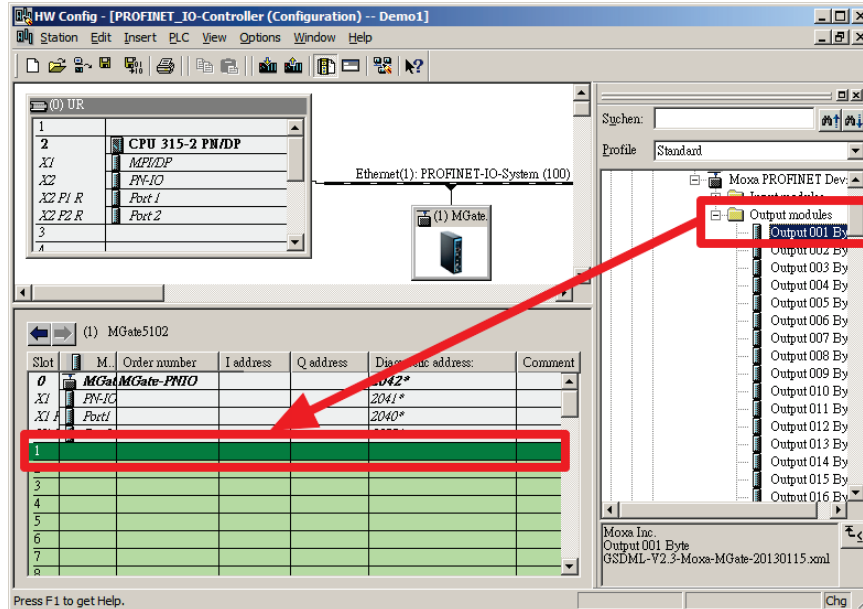


5.4. Create I/O modules

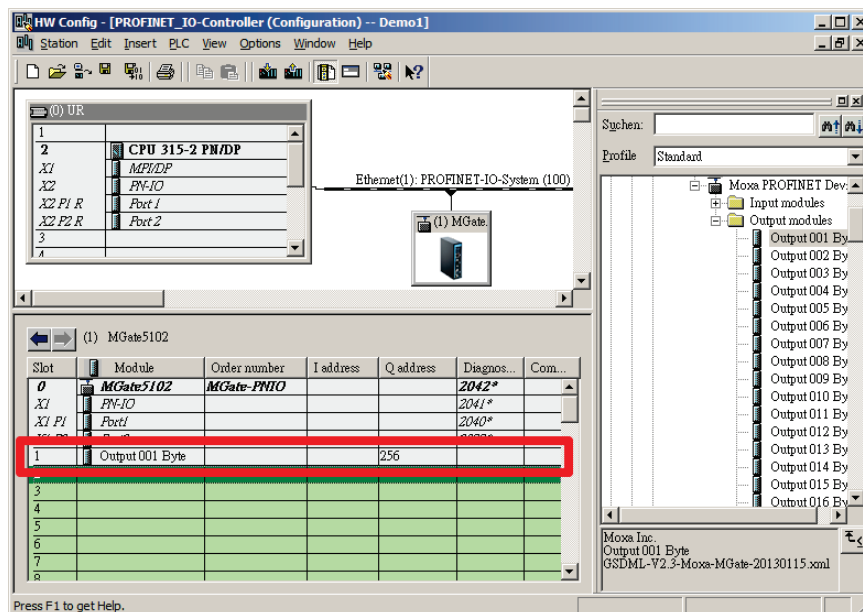
- 5.4.1. Next, you will need to add the I/O module that is connected to the PROFIBUS side of the MGate 5102-PBM-MN. Since we are using a Siemens ET 200M with 8 digital outputs, you should add one byte of DO output to the Moxa PROFINET device.

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5.4.2. Open the Moxa PROFINET device. Locate the **Output 001 Byte** module and then add it to the appropriate slot.

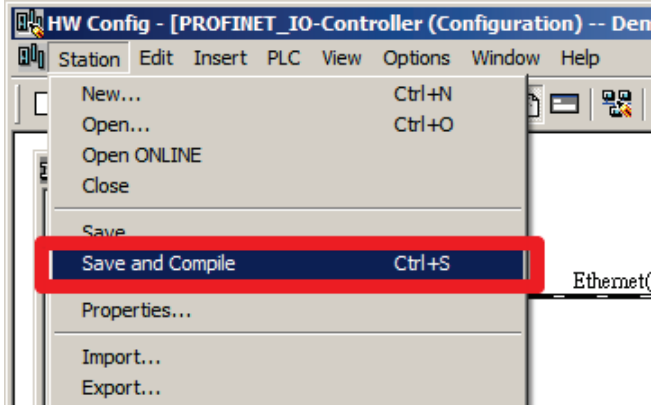


After adding the I/O module, you should see the following configuration:

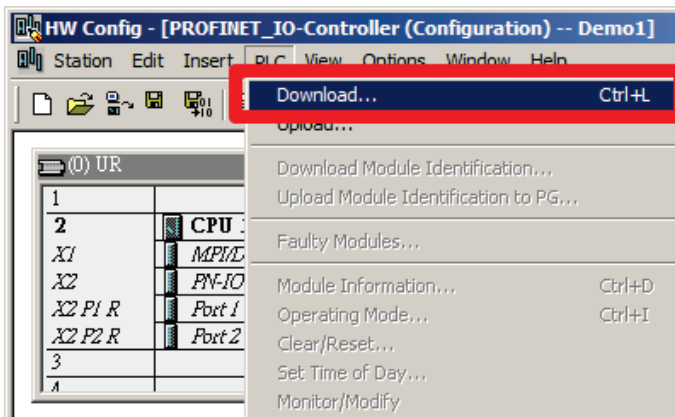


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5.4.3. Select **Station** → **Save and Compile** to save the new settings.



5.4.4. Select **PLC** → **Download** to download all the settings onto the Siemens S7-300.

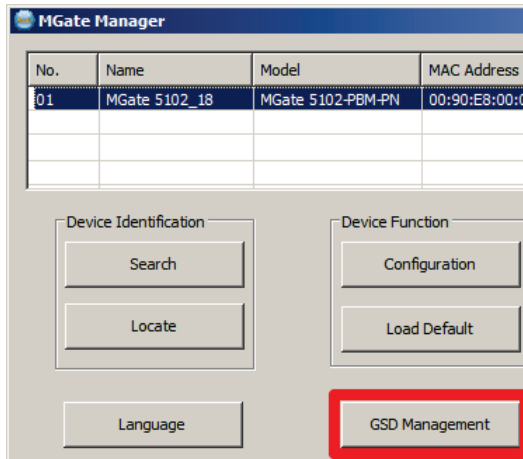


6. Moxa's PROFIBUS device configuration

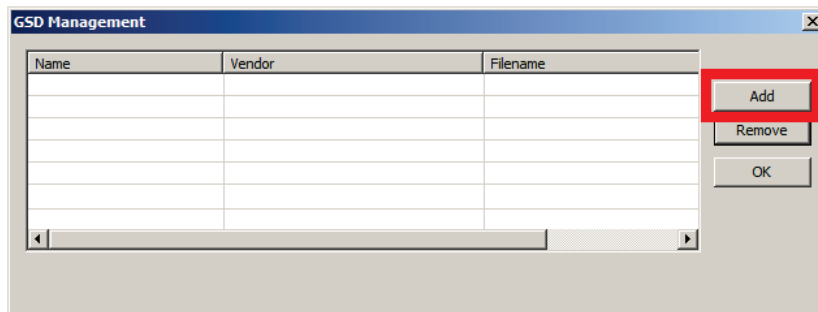
6.1. Install the GSD file

Before configuring the Moxa MGate 5102-PBM-PN, install the GSD file for the PROFIBUS slave device so the MGate 5102-PBM-PN can recognize the device.

6.1.1. Execute MGate Manager and click the **GSD Management** button to install the GSD file.

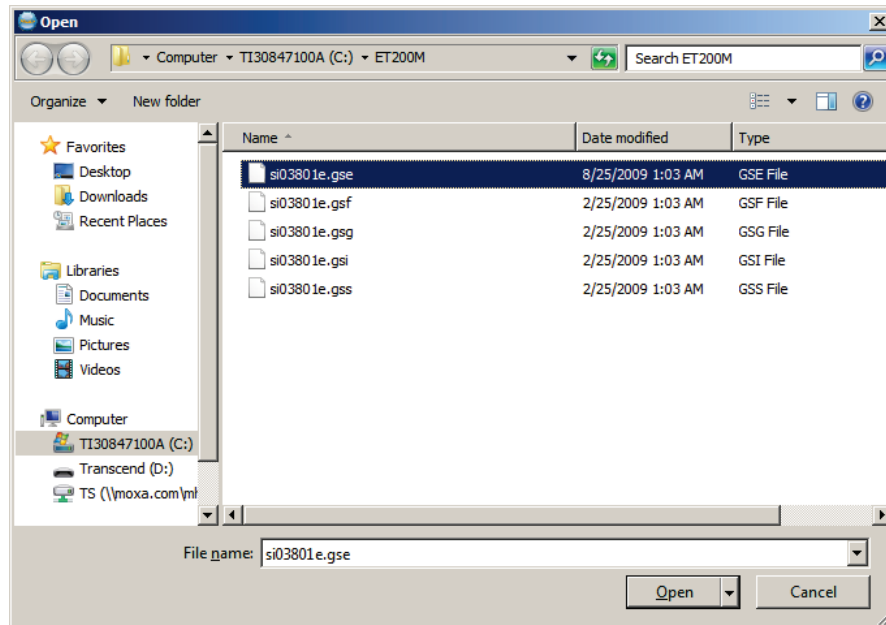


Click the **Add** button to locate the GSD file.



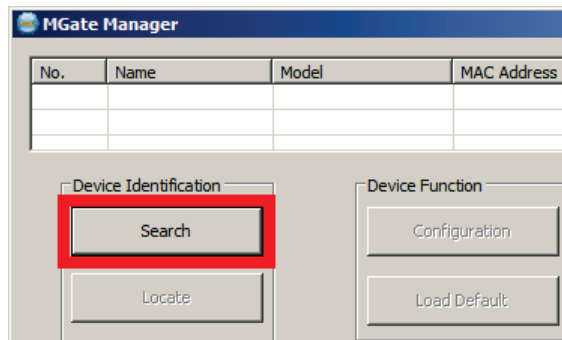
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Select the GSD file and click **Open** to install it.

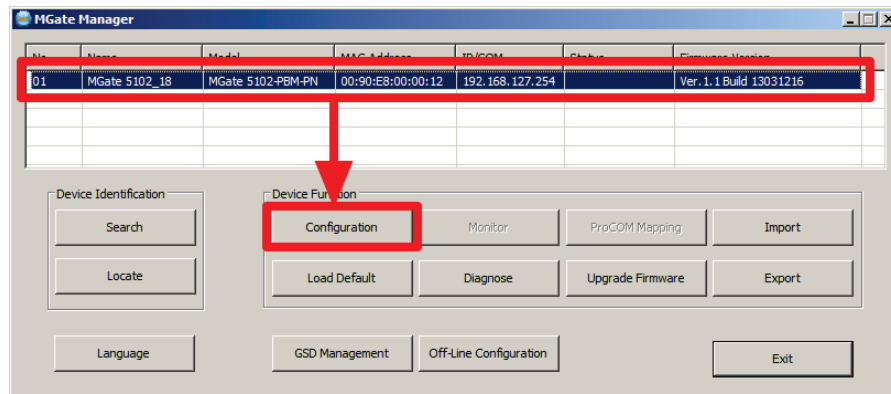


6.2. Device configuration with MGate Manager

6.2.1. Start MGate Manager and **Search** for the Moxa MGate 5102-PBM-PN gateway.

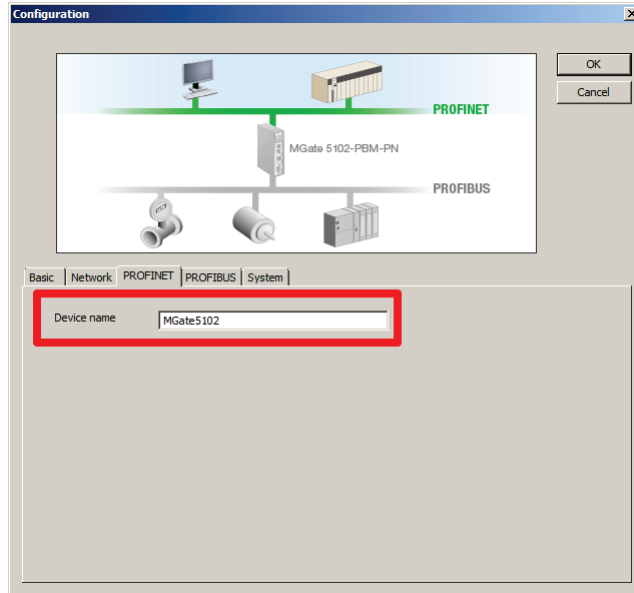


6.2.2. Select the gateway and click **Configuration** to configure settings.

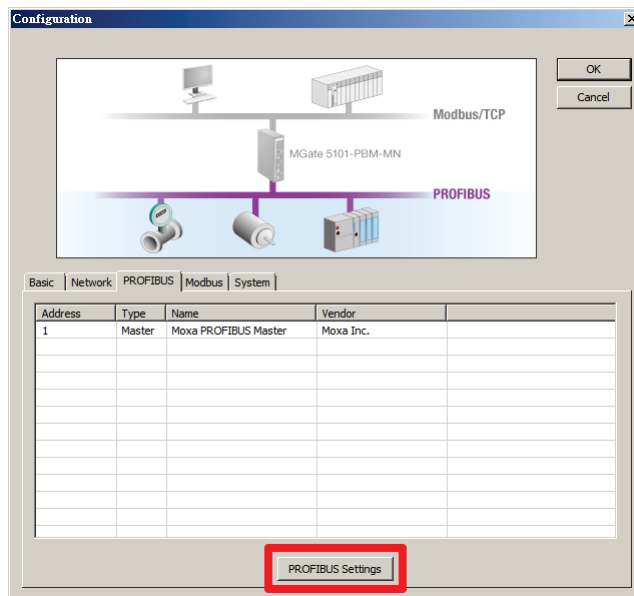


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6.2.3. Select the **PROFINET** tab to configure the **Device Name** with the same name used in Step 5.3.7.

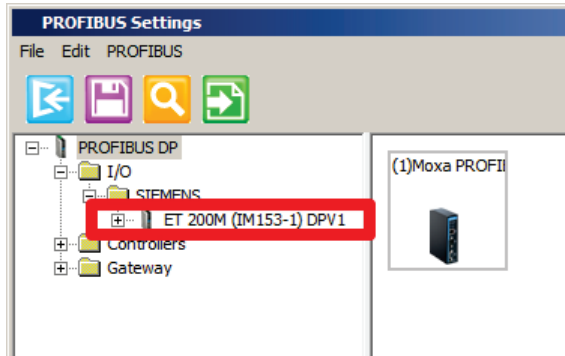


6.2.4. Select the **PROFIBUS** tab and click **PROFIBUS Settings** to start PROFIBUS configuration.

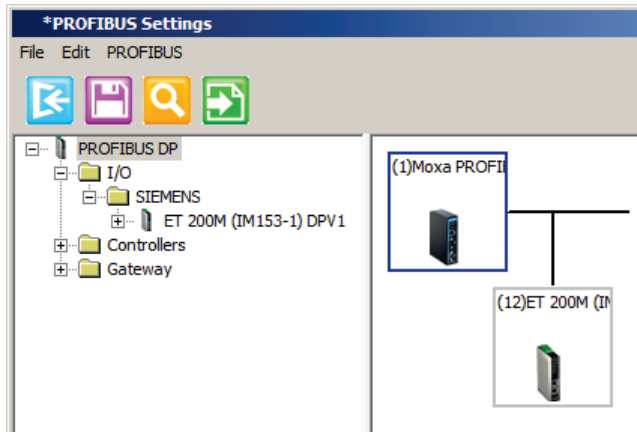


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6.2.5. Since the GSD file for the Siemens ET 200M was already installed, you can retrieve it from **PROFIBUS DP** → **I/O** → **SIEMENS** → **ET 200M (IM153-1) DPV1**.



6.2.6. Drag the **ET 200M** icon to the right window to add it to the PROFIBUS network:



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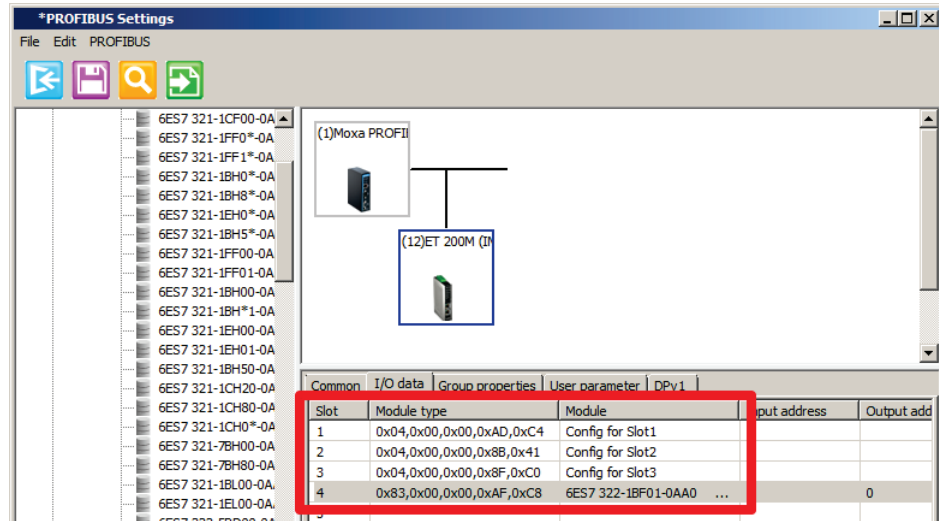
6.2.7. Then select the **ET 200M** icon and add the following modules:

Config for Slot1 (need to be added for ET 200M)

Config for Slot2 (need to be added for ET 200M)

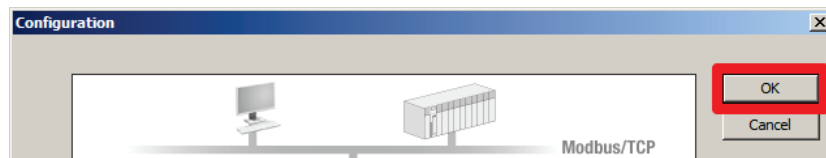
Config for Slot3 (need to be added for ET 200M)

6ES7 322-1BF01-0AA0 8DO (The DO module we using in this example)



Then click **File** → **Save**, **File** → **Exit** to save the PROFIBUS settings.

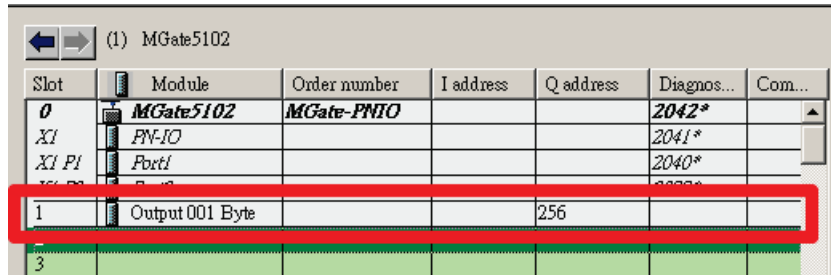
6.2.8. Return to the main window and click the **OK** button to save all the recent modifications and the MGate 5102-PBM-PN will reboot for the changes to take effect.



7. Communication Test

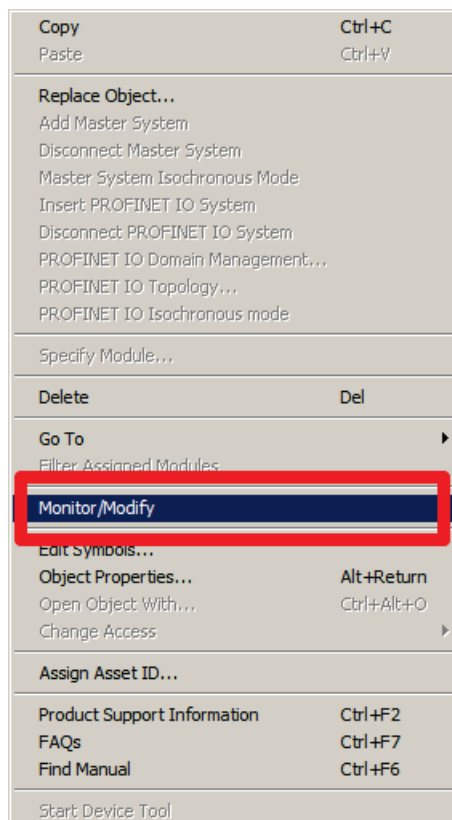
7.1. Monitor / Modify Test

7.1.1. Refer to Step 5.4.2 to configure the I/O modules for the MGate 5102-PBM-PN.



Slot	Module	Order number	I address	Q address	Diagnos...	Com...
0	MGate5102	MGate-PNIO			2042*	
X1	PN-IO				2041*	
X1 PI	Port1				2040*	
X1 PO	Port2				2039*	
1	Output 001 Byte			256		
3						

7.1.2. Right-click on the **Output 001 Byte** module and select **Monitor / Modify** from the drop-down menu.



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7.1.3. On the **Monitor / Modify** properties sheet, enter a value for the **Modify Value** field to see if the change is indicated by the ET 200M DO module:

