

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

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1. Application Description

A. Objective

This document describes how to use Siemens PLC to perform Acyclic Read and Write on MGate 5102-PBM-PN to get PROFIBUS Status Word and Communication List or to set PROFIBUS Control Word.

In this application, the administrator wants to manage MGate 5102-PBM-PN diagnostic information. For example, to get and set PROFIBUS operation mode and to get PROFIBUS Communication List via Siemens PLC.

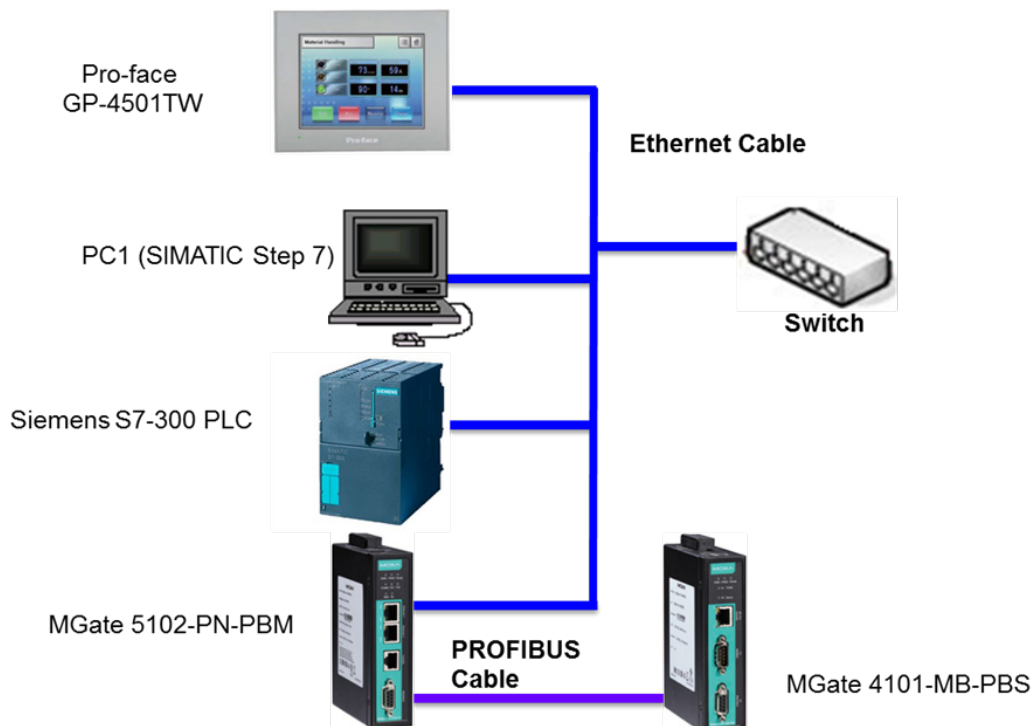
B. Goals

This document shows you how to:

- Use Siemens PLC to do Acyclic Read and Write.
- Get PROFIBUS Status Word and PROFIBUS Communication List from MGate 5102-PBM-PN.
- Set PROFIBUS Control Word from MGate 5102-PBM-PN.

2. System Topology

The following figure shows a system architecture in which **MGate 5102-PBM-PN**, **PC1** (running SIMATIC Step 7), **Siemens S7-300 PLC**, and **Pro-face GP-4501 TW** (a HMI device to control and monitor PLC) are connected to the Ethernet network. MGate 5102-PBM-PN connects to MGate 4101-MB-PBS via a PROFIBUS cable. Pro-face GP-4501TW controls and monitors Siemens S7-300 via Ethernet.



3. Hardware and Software Requirements

3.1. Hardware Requirement

A. Siemens SIMATIC S7-300 PLC:

Processor: **CPU 315-2 PN/DP**

Article Number: **6ES7315-2EH14-0AB0**

Version: **3.2.7**

B. MGate 5102-PBM-PN:

Firmware Version: **V1.2_Build_13083010**

GSDML File: **GSDML-V2.3-Moxa-MGate-20130708.xml**

C. MGate 4101-MB-PBS:

Firmware Version: **Ver1.3_Build_14031018**

GSD File: **MPBS0D80.gsd.**

3.2. Software Requirement

A. SIMATIC Step7:

Siemens PLC Engineering Software by Siemens AG.

Version: **V5.5+SP3**

B. MGate Manager:

Software utility to configure Moxa MGate devices.

Version: **1.10**

C. GP-Pro EX:

Screen editor Utility from Pro-face.

Rev.: **V3.5**

4. Configuration

4.1. Hardware Installation

A. Ethernet Connection

Use Ethernet cables to connect Siemens PLC, MGate 5102-PBM-PN, and Pro-face GP-4501TW to an Ethernet switch.

B. PROFIBUS Connection

Use a PROFIBUS cable to connect MGate 5102-PBM-PN to MGate 4101-MB-PBS.

4.2. Configuring MGate 5102-PBM-PN

Use MGate Manager to configure the following MGate 5102-PBM-PN settings.

A. PROFINET Setting

Set [Device Name] to "mgate-dev".

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B. PROBUS Setting

- Add MGate 4101 to the Slave List with the address 3.
- Set the IO modules as [Slot 1]: "Input 1 Word" and [Slot 2]: "Output 1 Word".

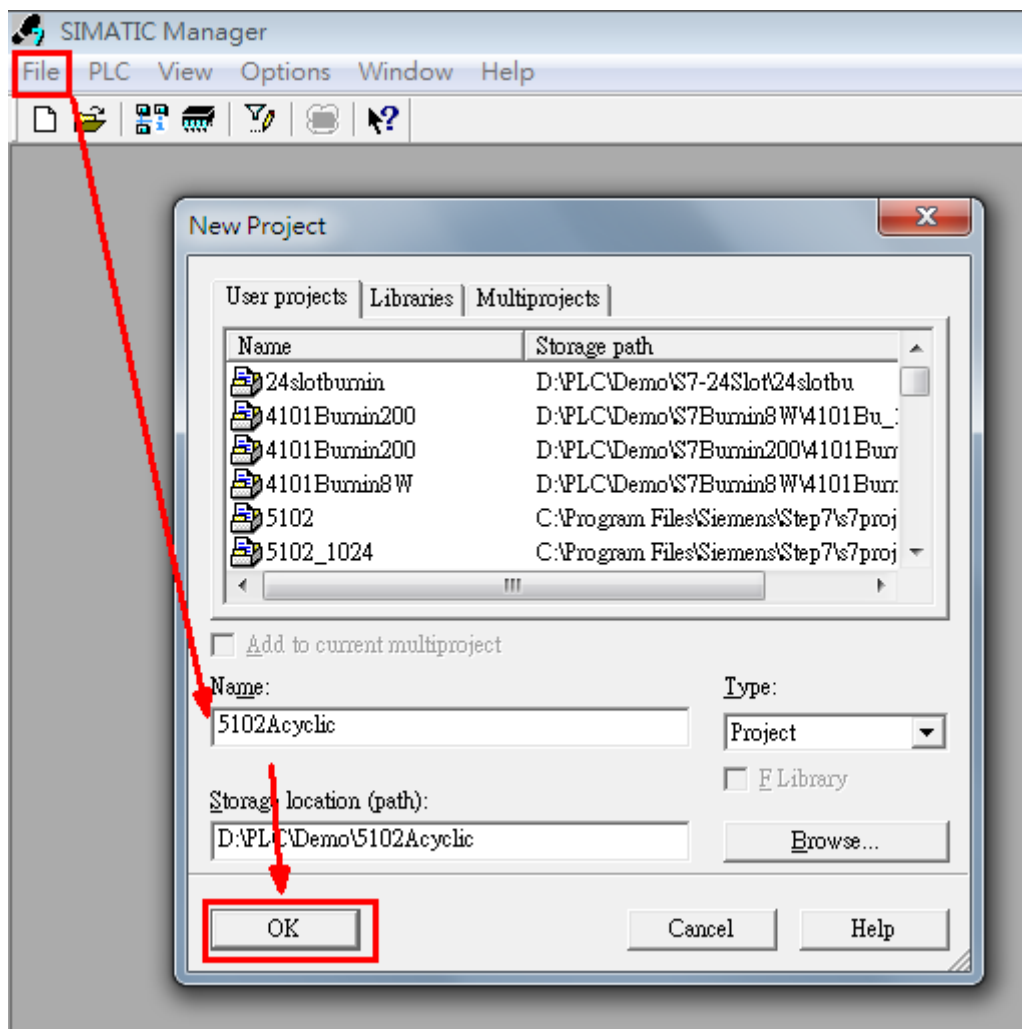
4.3. Configuring MGate 4101-MB-PBS

- On the switch, set the PROFIBUS address as 3.
- In MGate Manager, set the PROFIBUS IO on MGate 4101-MB-PBS to [Slot 1]: "Input 1 Word" and [Slot 2]: "Output 1 Word".

4.4. Configuring Siemens PLC

4.4.1. Creating a STEP 7 Project

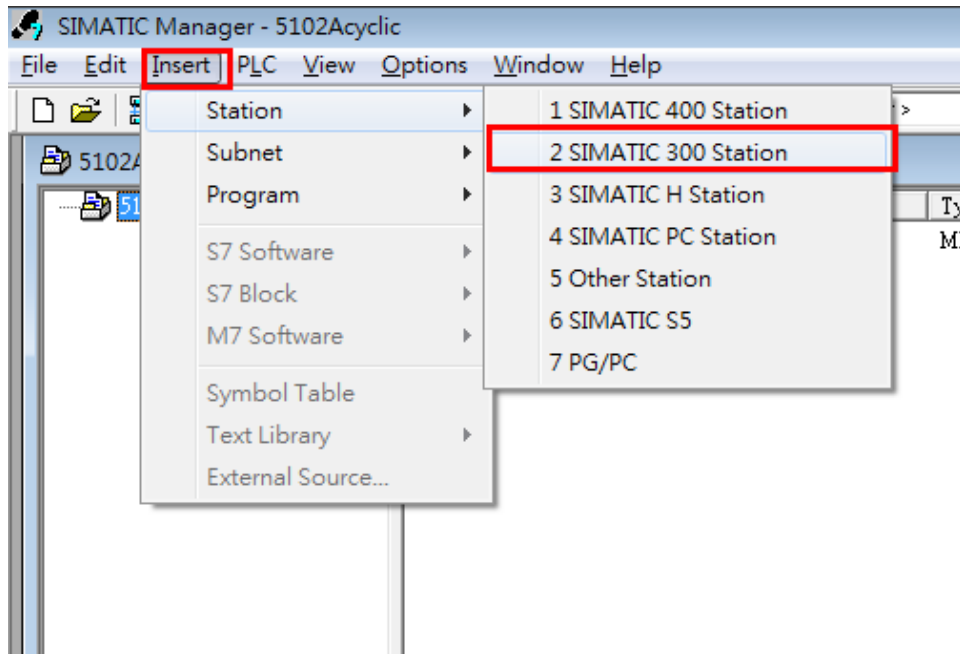
Start SIMATIC Manager and create a new project. Click **File** → **New**. Then, set the project name in the **Name** field and click **OK**.



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4.4.2. Inserting a Station

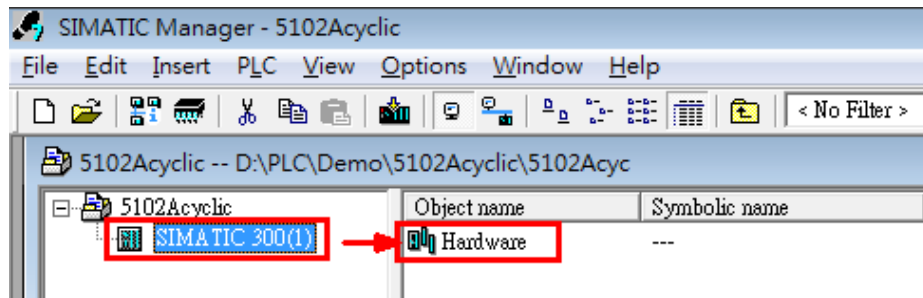
In SIMATIC Manager, click **Insert** → **Station** and select to insert **SIMATIC 300 Station** into the project.



4.4.3. Configuring Hardware

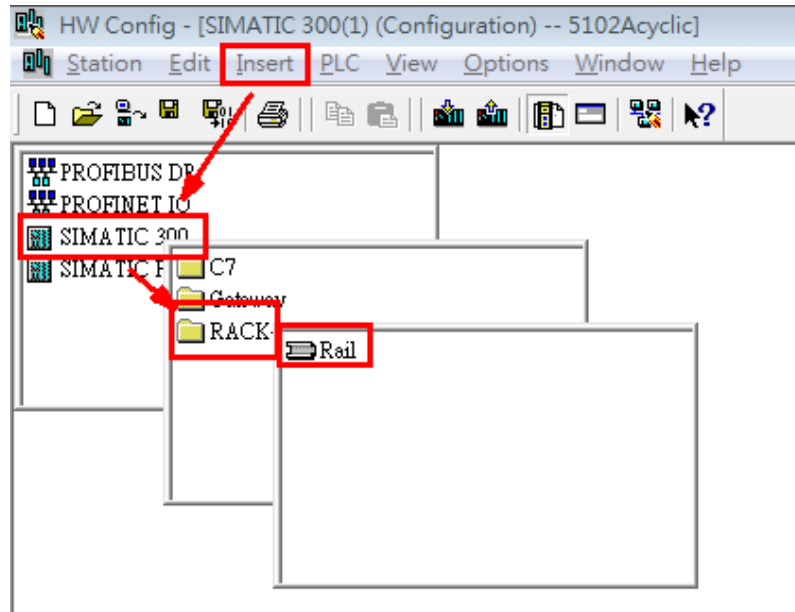
A. Adding a Rack

1. In SIMATIC Manager, double-click **Hardware**.

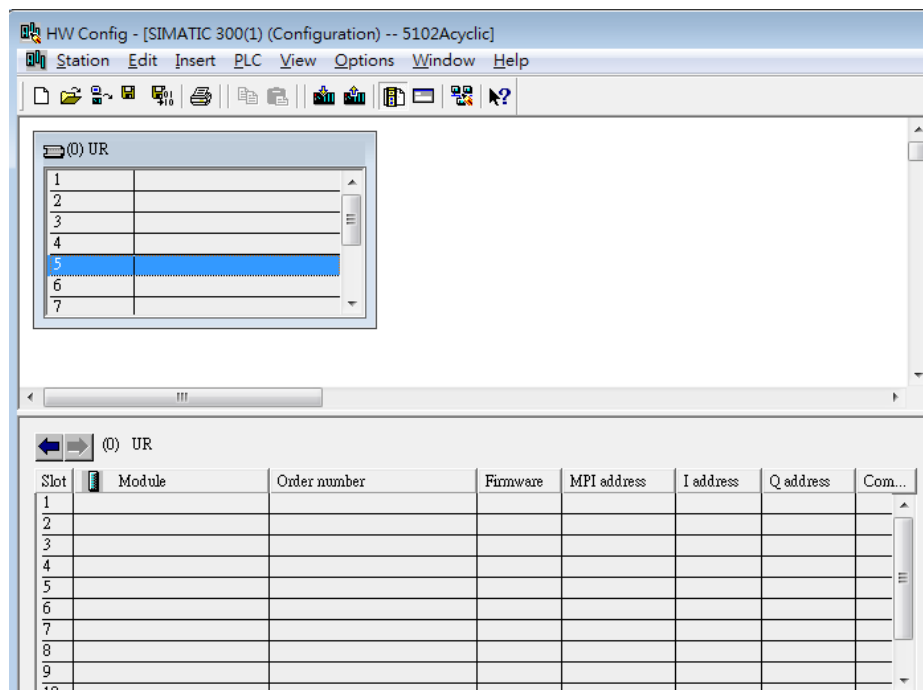


Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

- The **HW Config** screen appears. Click **Insert** → **SIMATIC 300** → **RACK** → **Rail** to insert the rack object.



The following figure shows the HW Config screen after adding the rack object.

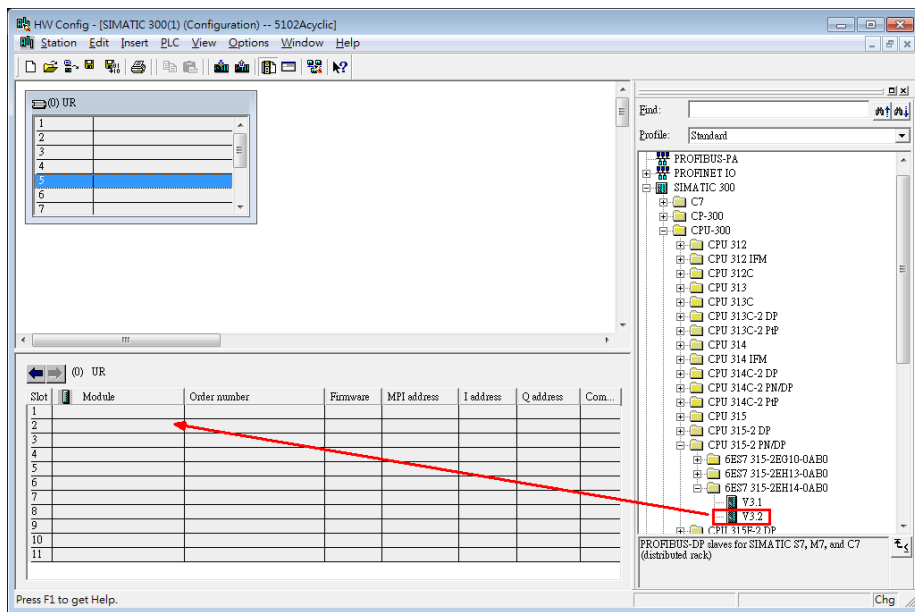


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B. Adding a CPU

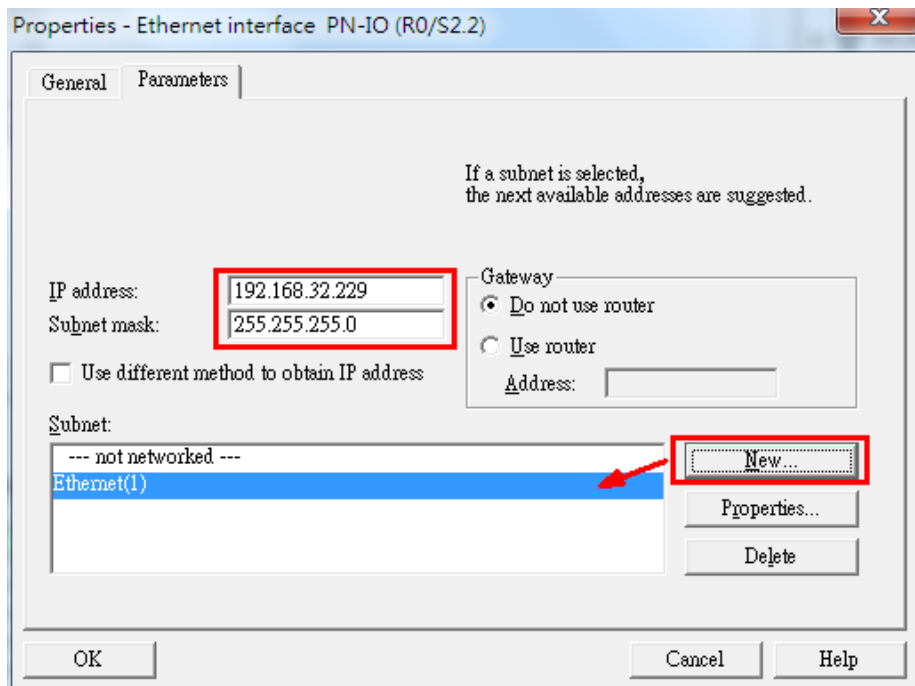
You must add the appropriate CPU module to the STEP7 project based on the actual hardware model. In this example, **CPU 315-2 PN/DP** is the hardware model.

1. In the HW Config screen, drag the selected CPU module to the slot table.



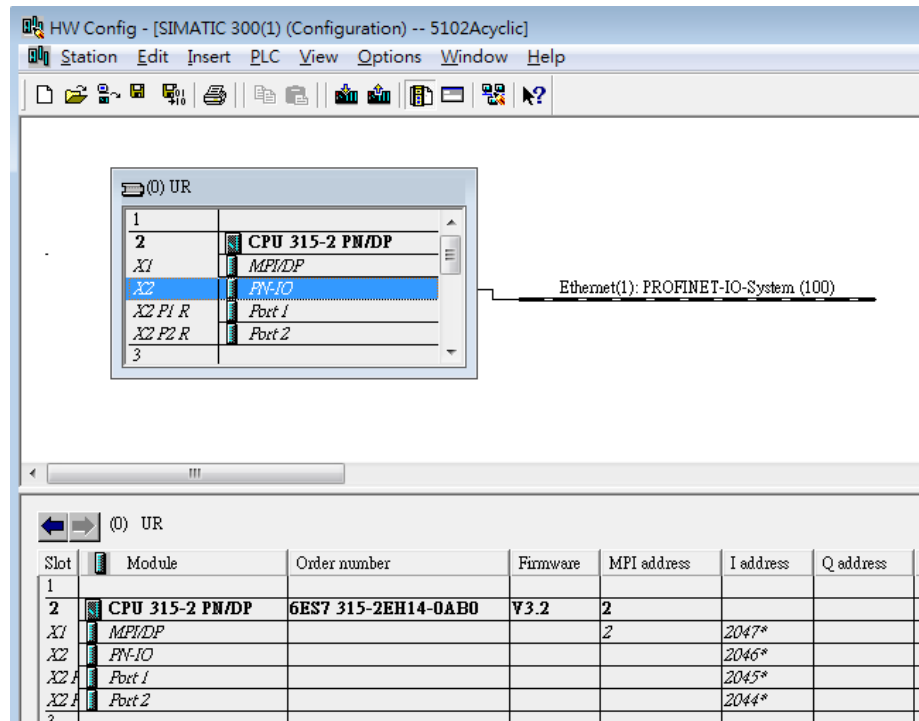
The **Properties-Ethernet interface PN-IO** screen appears.

2. Configure the **IP address** and **Subnet mask** fields for Siemens PLC. Click **New** to add a new subnet as "Ethernet(1)". Then, click **OK**.



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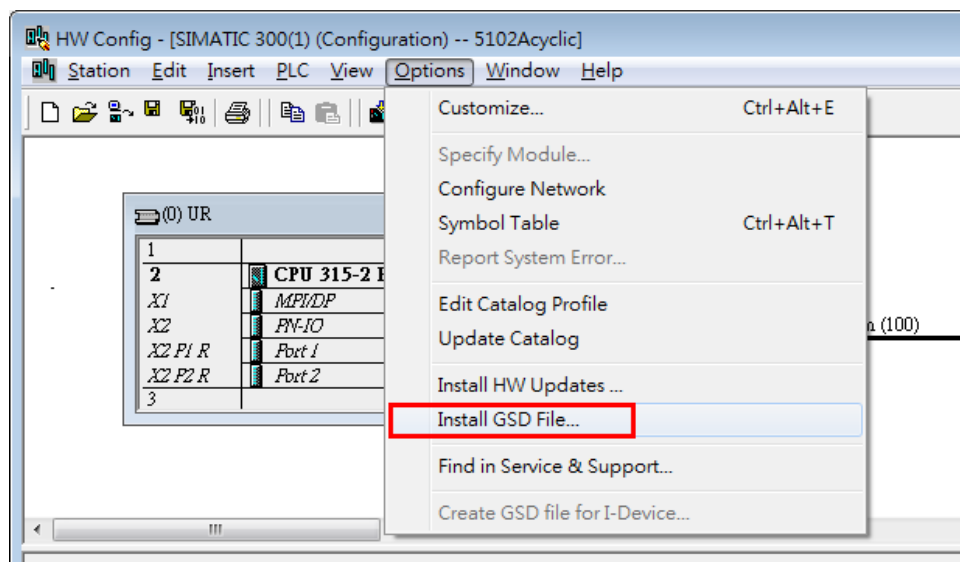
The HW Config screen indicates that the PN-IO interface extends the “Ethernet(1)” network in the topology.



4.4.4. Installing the GSD file

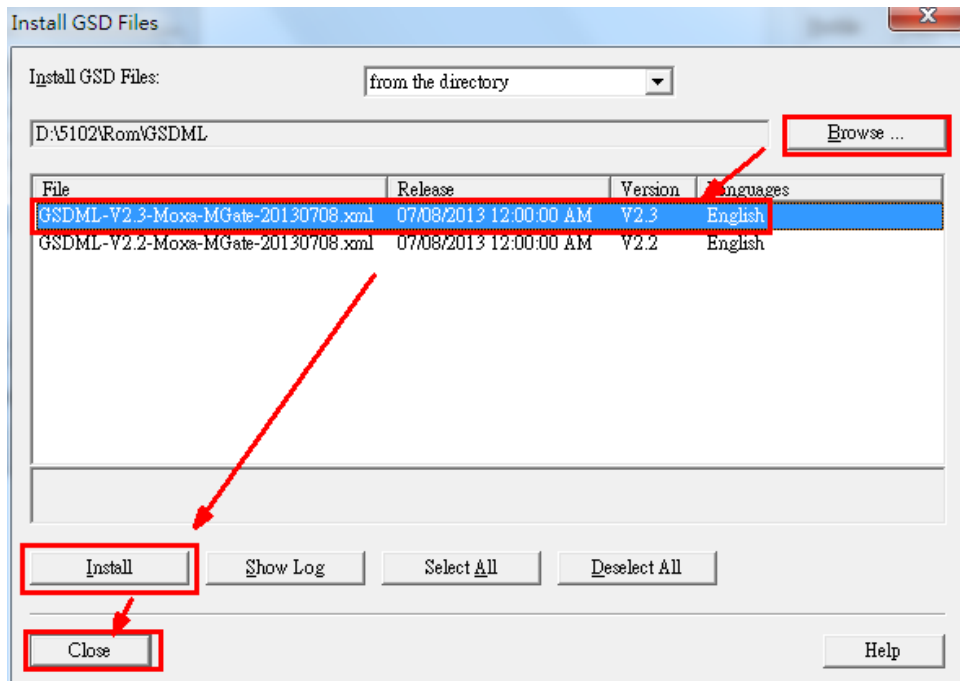
For engineering and configuration purposes, you must the device’s GSDML file through SIMATIC Manager.

A. In the HW Config screen, click **Options** → **Install GSD File**.

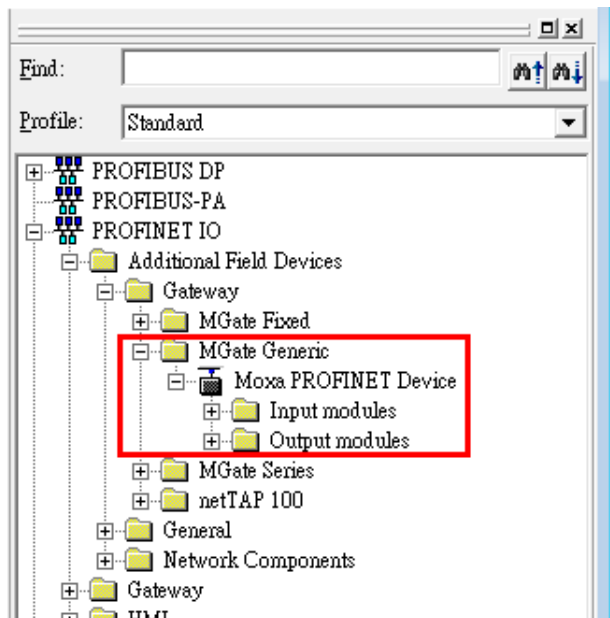


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- B. In the Install GSD Files screen, click **Browse** to navigate to the folder and select the GSDML file for the Moxa PROFINET device. Then, click **Install** and **Close**



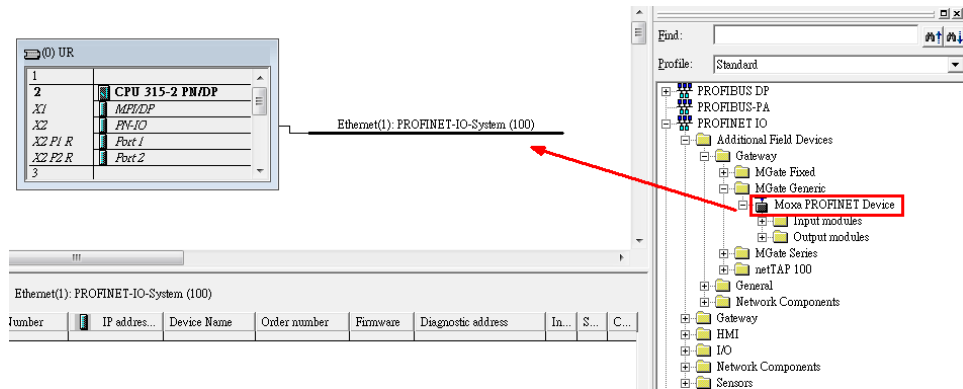
If the GSD file is installed successfully, the system displays **Moxa PROFINET Device** in the the hardware catalog list.



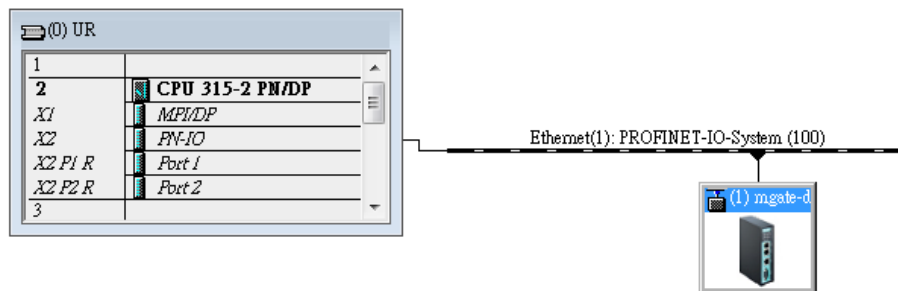
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4.4.5. Configuring the PROFINET IO Device

In the HW Config screen, select and drag **Moxa PROFINET Device** from the hardware catalog list to **PROFINET IO → Additional Field Devices** as shown in the following figure.

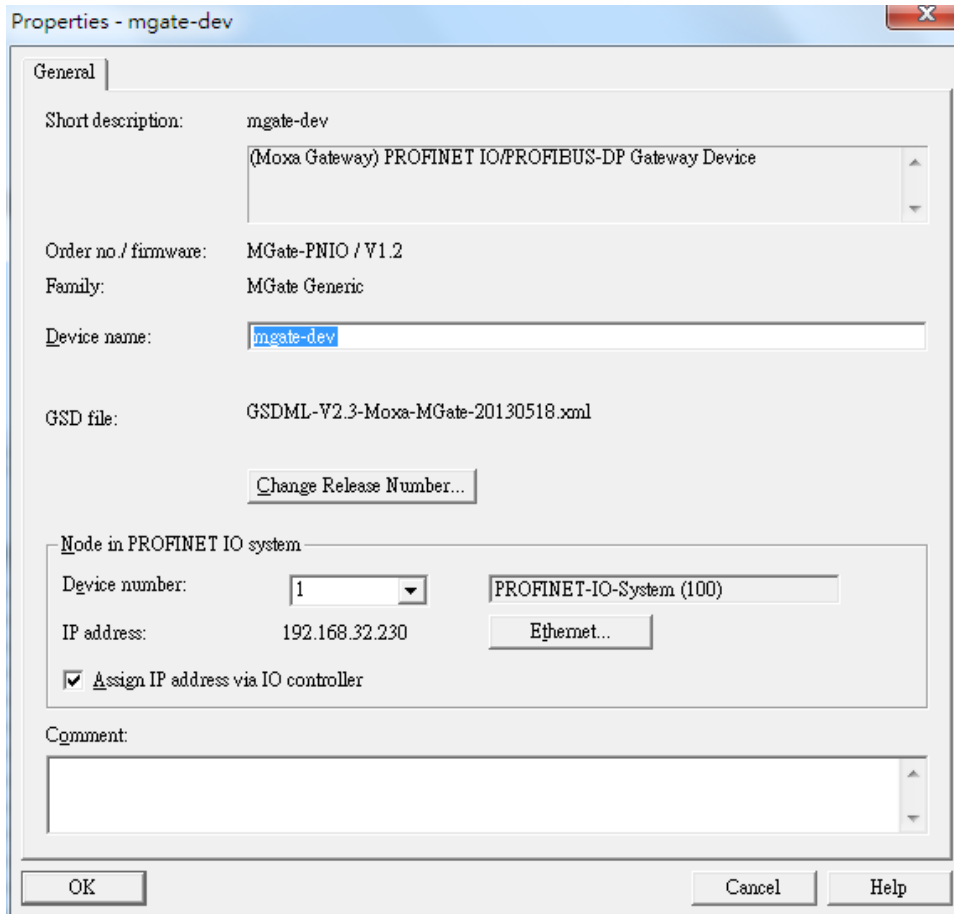


The following figure shows the topology with the Moxa PROFINET Device object graphic.



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You can double-click **"(1)maget-dev"** of Moxa PROFINET Device object to configure its properties.

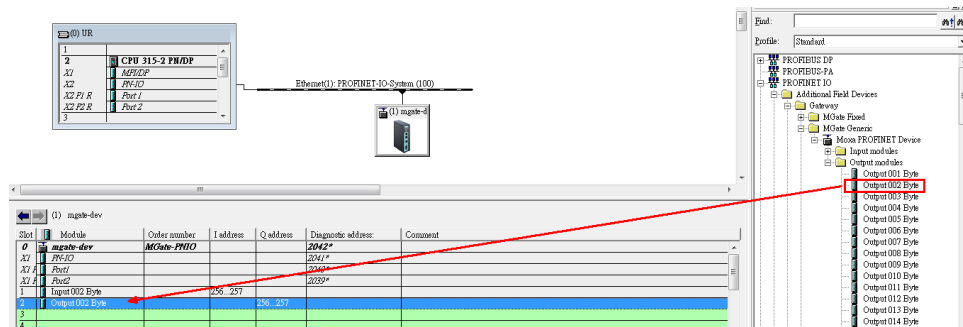


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4.4.6. Configuring I/O Modules

You can configure the selected I/O modules for data exchange with Siemens PLC. You can select the I/O module combinations based on your application. This example uses the **Input 2 Byte** and **Output 2 Byte** IO combination.

- A. Drag the **Input 002 Byte** module from the module list for Moxa PROFINET Device to slot **1**.
- B. Drag the **Output 002 Byte** module to slot **2**.
- C. Save the changes.

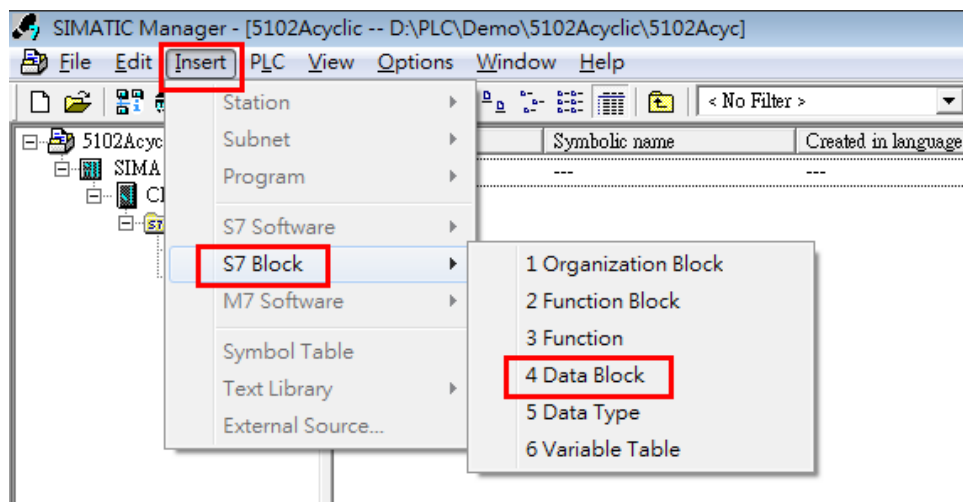


4.5. Configuring Siemens PLC Acyclic Read/Write Operation

4.5.1. Inserting Data Block

You must first add data blocks to configure request and response parameters.

- A. In the SIMATIC Manager screen, click **Insert** → **S7 Block** → **Data Block** to add data blocks.



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- B. In the Properties screen, configure the fields and click **OK** to create two data blocks. Enter the field values as listed in the following table.

Name	DB1	DB2
Symbolic Name	DB_Request	DB_Response

Properties - Data Block

General - Part 1 | General - Part 2 | Calls | Attributes

Name and type: DB1 Shared DB

Symbolic Name: DB_Request

Symbol Comment:

Created in Language: DB

Project path:

Storage location of project: D:\PLC\Demo\5102Acyclic\5102Acyc

Date created: 08/01/2014 02:15:17 PM

Last modified: 08/01/2014 02:15:17 PM

Comment:

OK Cancel Help

Properties - Data Block

General - Part 1 | General - Part 2 | Calls | Attributes

Name and type: DB2 Shared DB

Symbolic Name: DB_Response

Symbol Comment:

Created in Language: DB

Project path:

Storage location of project: D:\PLC\Demo\5102Acyclic\5102Acyc

Date created: 08/01/2014 02:16:20 PM

Last modified: 08/01/2014 02:16:20 PM

Comment:

OK Cancel Help

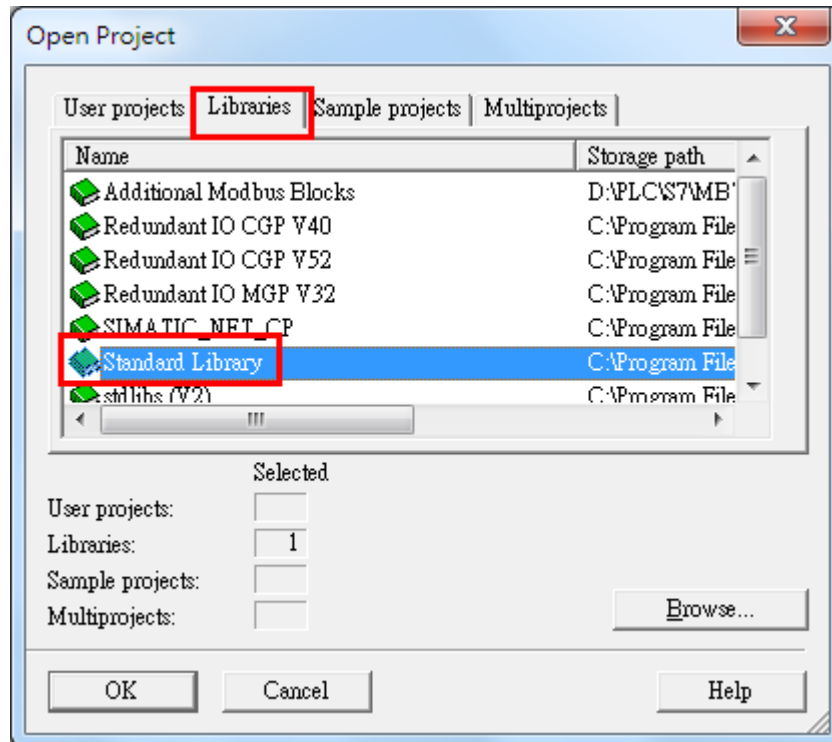
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4.5.2. Copying SFB52 and SFB53

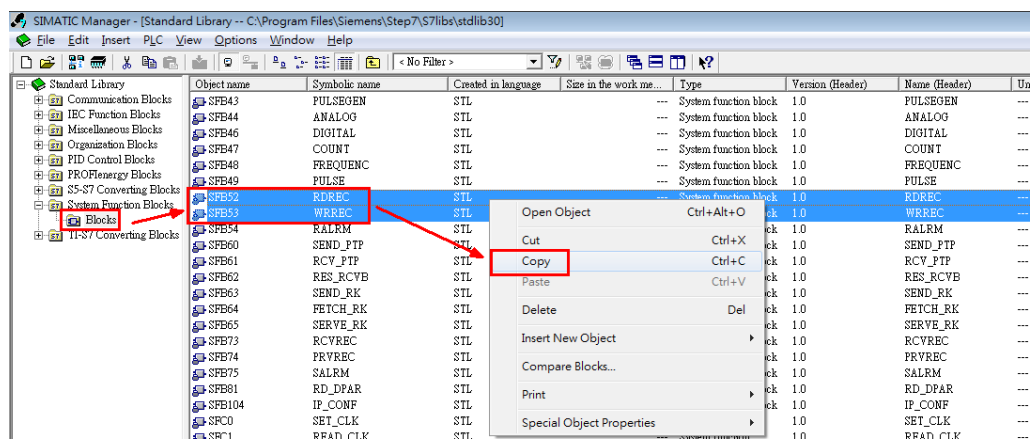
SFB52 and **SFB53** function blocks are used for read and write requests on Siemens PLC.

Complete the following steps to copy these function blocks to your project:

- A. In the SIMATIC Manager screen, click **File** → **Open** and click the **Library** tab.
- B. Select **Standard Library** and click **OK** to open the pre-defined library.



- C. From the Standard Library tree view, click **System Function Blocks** → **Blocks**.
- D. On the right panel, select **SFB52** and **SFB53** and click **Copy** to copy them to your projects.



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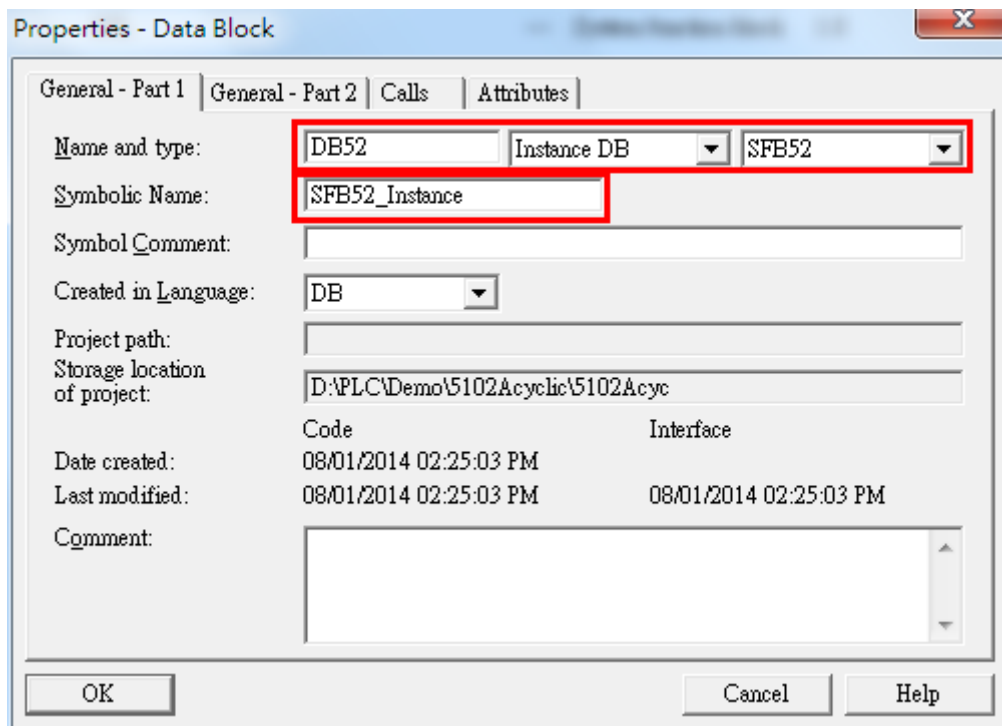
4.5.3. Adding SFB52 and SFB53 Instance DB

Add two data blocks for **SFB52** and **SFB53**. To create the data blocks, configure the fields in the **Properties – Data Block** screen as shown in the following table.

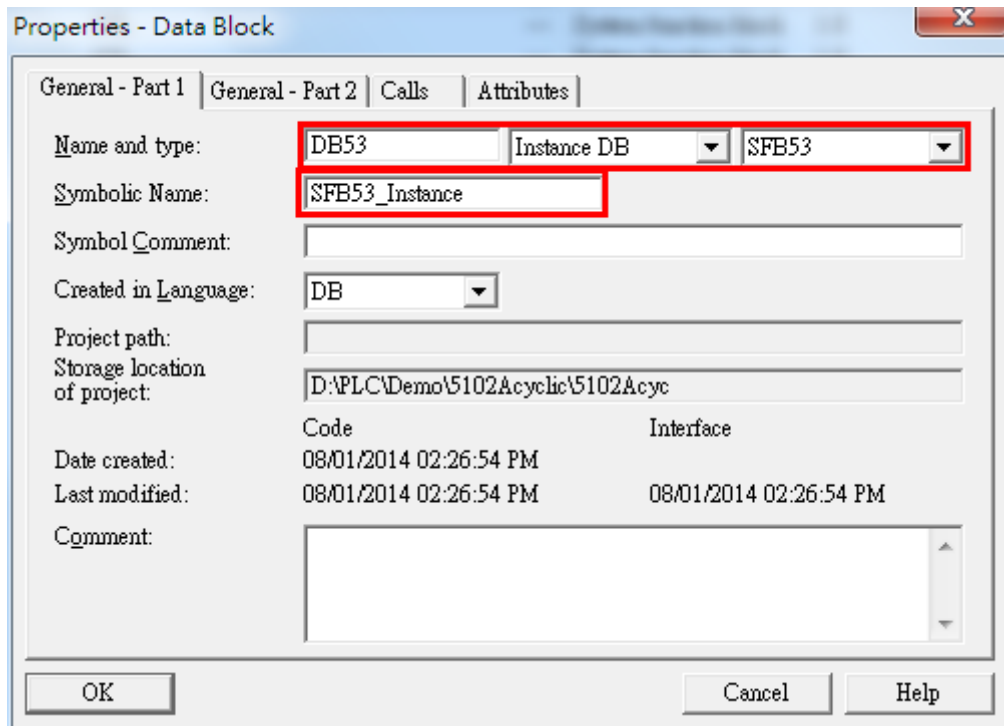
Name and type	DB52 Instance DB SFB52	DB53 Instance DB SFB53
Symbolic Name	SFB52_Instance	SFB53_Instance

For more information on accessing the Properties – Data Block screen, see the **Inserting Data Block** section.

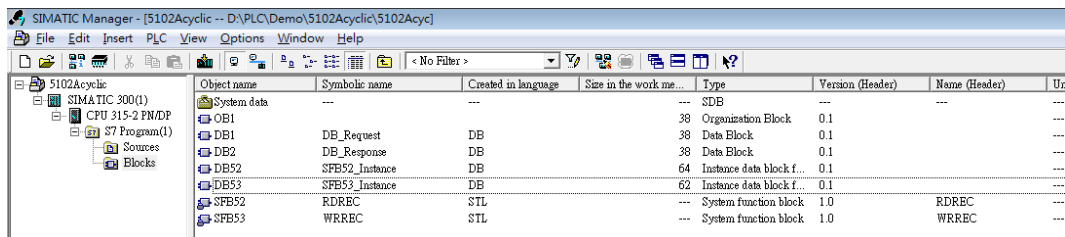
The following figures show the Properties – Data Block screen.



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After adding the two data blocks, the SIMATIC Manager displays the entries as shown in the following figure.



4.5.4. Configuring DB1

Click the **DB1** data block to configure the structure variable as shown in the following figure.

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	ControlWordByte1	BYTE	B#16#0	
+1.0	ControlWordByte2	BYTE	B#16#0	
=2.0		END_STRUCT		

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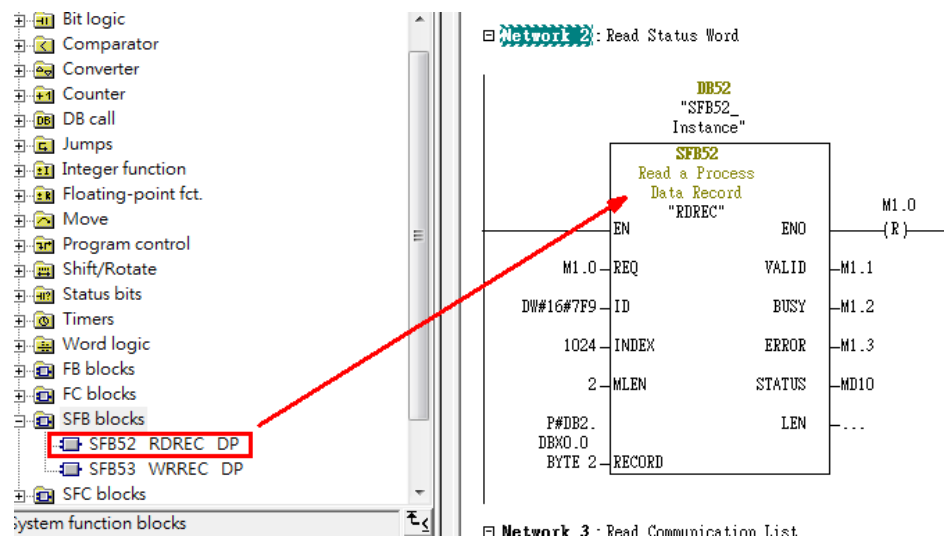
4.5.5. Configuring DB2

Click the **DB2** data block to configure the structure variable as shown in the following figure.

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	StatusWordByte1	BYTE	B#16#0	
+1.0	StatusWordByte2	BYTE	B#16#0	1: Stop, 2: Clear, 3: Operate
+2.0	Slave000007	BYTE	B#16#0	Slave 0-7
+3.0	Slave008015	BYTE	B#16#0	Slave 8-15
+4.0	Slave016023	BYTE	B#16#0	Slave 16-23
+5.0	Slave024031	BYTE	B#16#0	Slave 24-31
+6.0	Slave032039	BYTE	B#16#0	Slave 32-39
+7.0	Slave040047	BYTE	B#16#0	Slave 40-47
+8.0	Slave048055	BYTE	B#16#0	Slave 48-55
+9.0	Slave056063	BYTE	B#16#0	Slave 56-63
+10.0	Slave064071	BYTE	B#16#0	Slave 64-71
+11.0	Slave072079	BYTE	B#16#0	Slave 72-79
+12.0	Slave080087	BYTE	B#16#0	Slave 80-87
+13.0	Slave088095	BYTE	B#16#0	Slave 88-95
+14.0	Slave096103	BYTE	B#16#0	Slave 96-103
+15.0	Slave104111	BYTE	B#16#0	Slave 104-111
+16.0	Slave112119	BYTE	B#16#0	Slave 112-119
+17.0	Slave120125	BYTE	B#16#0	Slave 120-125
=18.0		END_STRUCT		

4.5.6. Programing Acyclic Read to MGate to set getting Status Word

- Insert **Network 2** to program Read Status Word.
- Under **SFB blocks**, drag **SFB52** to **Network 2** and configure the input and output parameters as shown in the following figure.



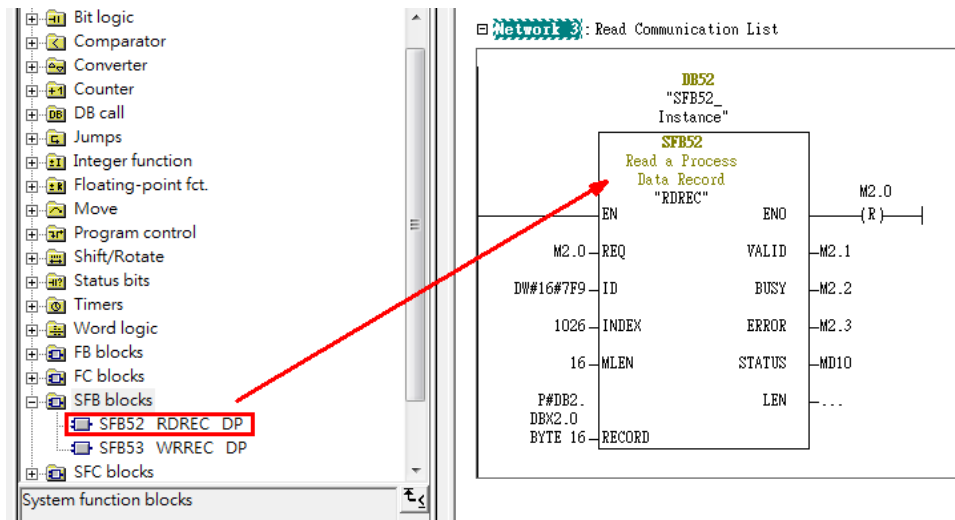
Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

The following describes the parameters.

- **REQ:** The Read request is sent to MGate 5102-PBM-PN using bit memory M1.0. Enter **1** (true) to start the read request. The request should then be ended. Enter **0** (false) to end the request. A Reset Bit logic is used to reset M1.0.
- **VALID:** Bit memory M1.1 indicates whether a new data record was received and valid.
- **BUSY:** Bit memory M1.2 indicates whether the read process is terminated or not.
- **ERROR:** Bit memory M1.3 indicates whether an error has occurred while processing the function.
- **STATUS:** The double-word bit memory MD10 contains an error code. For error descriptions, see "Help on system functions / function blocks".
- **ID:** The PN-IO diagnostic address (for example, "2041"). This address is used for PROFINET acyclic read/write to MGate5102-PBM-PN to perform pre-defined diagnoses.
- **INDEX:** Data record number. For MGate5102-PBM-PN Status Word, the starting address is 1024.
- **MLEN:** Maximum length in bytes of the data record information to be fetched. For MGate5102-PBM-PN Status Word, the length is 2 bytes.
- **RECORD:** Destination area for the read data record. For DB 2 in this example, the starting address is 0 and the address length is 2 bytes.

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

4.5.7. Programing Acyclic Read to MGate to Get the Communication List



The following describes the parameters.

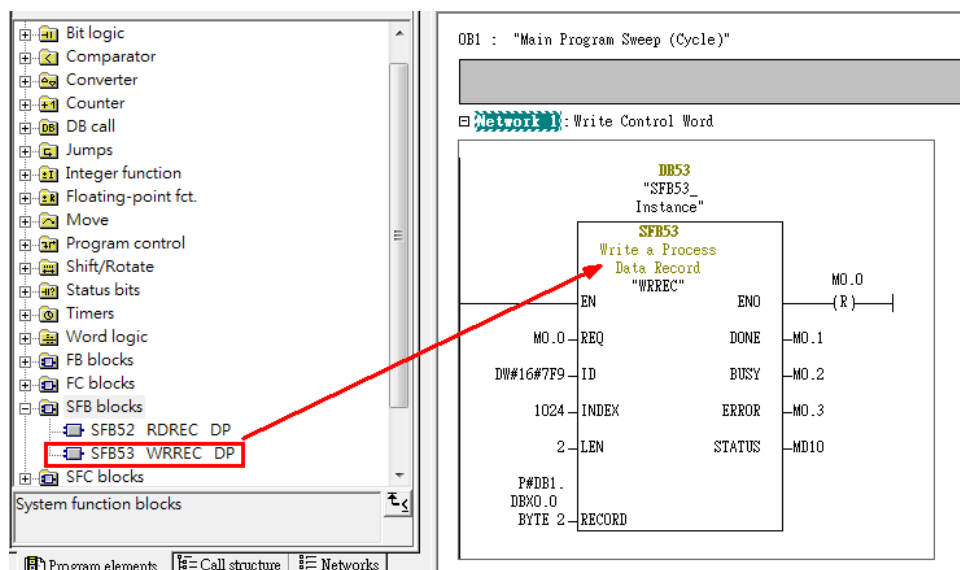
- **REQ:** The Read request is sent to MGate 5102-PBM-PN using bit memory M2.0. Enter **1** (true) to start the read request. The request should then be ended. Send a value of **0** (false) to end the request. A Reset Bit logic is used to reset M2.0.
- **VALID:** Bit memory M2.1 indicates whether a new data record has been received and valid.
- **BUSY:** Bit memory M2.2 indicates whether the read process is terminated or not.
- **ERROR:** Bit memory M2.3 indicates whether an error has occurred while processing the function.
- **STATUS:** The double-word bit memory MD10 contains an error code. For error descriptions, see "Help on system functions / function blocks".
- **ID:** The PN-IO diagnostic address (for example, "2041"). This address is used for PROFINET acyclic read/write to MGate5102-PBM-PN to perform pre-defined diagnoses.
- **INDEX:** Data record number. For MGate5102-PBM-PN Status Word, the starting address is 1024.
- **MLEN:** Maximum length in bytes of the data record information to be fetched. For MGate5102-PBM-PN Communication List, the length is 16 bytes.
- **RECORD:** Destination area for the read data record. For DB 2 in this example, the starting address is 2 and the address length is 16 bytes.

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

4.5.8. Programing Acyclic Write to MGate 5102-PBM-PN to Set Control Word

In SIMATIC Manager, double-click **OB1** under **S7 Program → Blocks**. The **OB1** block is a **Program Cycle Organization Block**. The operating system of the S7 CPU executes OB1 periodically. When OB1 has been executed, the operating system starts it again. Cyclic execution of OB1 is started after the startup has been completed.

- Click **OB1** to edit the program.
- Insert **Network 1** to program Write Control Word.
- Under **SFB blocks**, drag **SFB53** to **Network 1** and configure the input and output parameters as shown in the following figure.



The following describes the parameters.

- **REQ:** The write request ("Write parameter") is sent to MGate 5102-PBM-PN using bit memory M0.0. Enter **1** (true) to start the write request. The request should then be ended. Send a value of **0** (false) to end the request. A Reset Bit logic is used to reset M0.0.
- **DONE:** Bit memory M0.1 indicates whether a data record has been transferred.
- **BUSY:** Bit memory M0.2 indicates whether the write process is terminated or not.
- **ERROR:** Bit memory M0.3 indicates whether an error has occurred while processing the function.
- **STATUS:** The double-word bit memory MD10 contains an error code. For error descriptions, see "Help on system functions / function blocks".

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

- ID: The PN-IO diagnostic address (for example, "2041" as shown in the following figure). This address is used for PROFINET acyclic read/write on MGate5102-PBM-PN to perform pre-defined diagnoses.
- INDEX: Data record number. For MGate5102-PBM-PN Control Word, the starting address is 1024.
- LEN: Length of the fetched data record information. For MGate5102-PBM-PN Control Word in this example, the length is 2 bytes.
- RECORD: Write Out Data Record. For DB 1 , the starting address is 0 and the address length is 2 bytes.

The screenshot displays the SIMATIC Manager interface. At the top, a rack configuration window shows a rack with slots 1 through 3. Slot 1 contains a CPU 315-2 PN/DP, and slot 2 contains an MGate-DEV module. Below this, a network diagram shows the rack connected to an Ethernet network labeled 'Ethernet(1): PROFINET-IO-System (100)'. A red box highlights the MGate-DEV module in the rack, with a red arrow pointing to the diagnostic address table below.

Slot	Module	Order number	I address	Q address	Diagnostic address:	Comment
0	mgate-dev	MGate-PNIO			2042*	
X1	PN-IO				2041*	
X1 P1	Port1				2040*	
X1 P2	Port2				2039*	
1	Input 002 Byte		256...257			
2	Output 002 Byte			256...257		
3						
4						
5						

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

4.6. Creating the Variable Table

In the variable table, you can modify and monitor the connected PLC variables and memory content.

To insert a variable table in the SIMATIC Manager screen, click **Insert → S7 Block → Variable Table**.

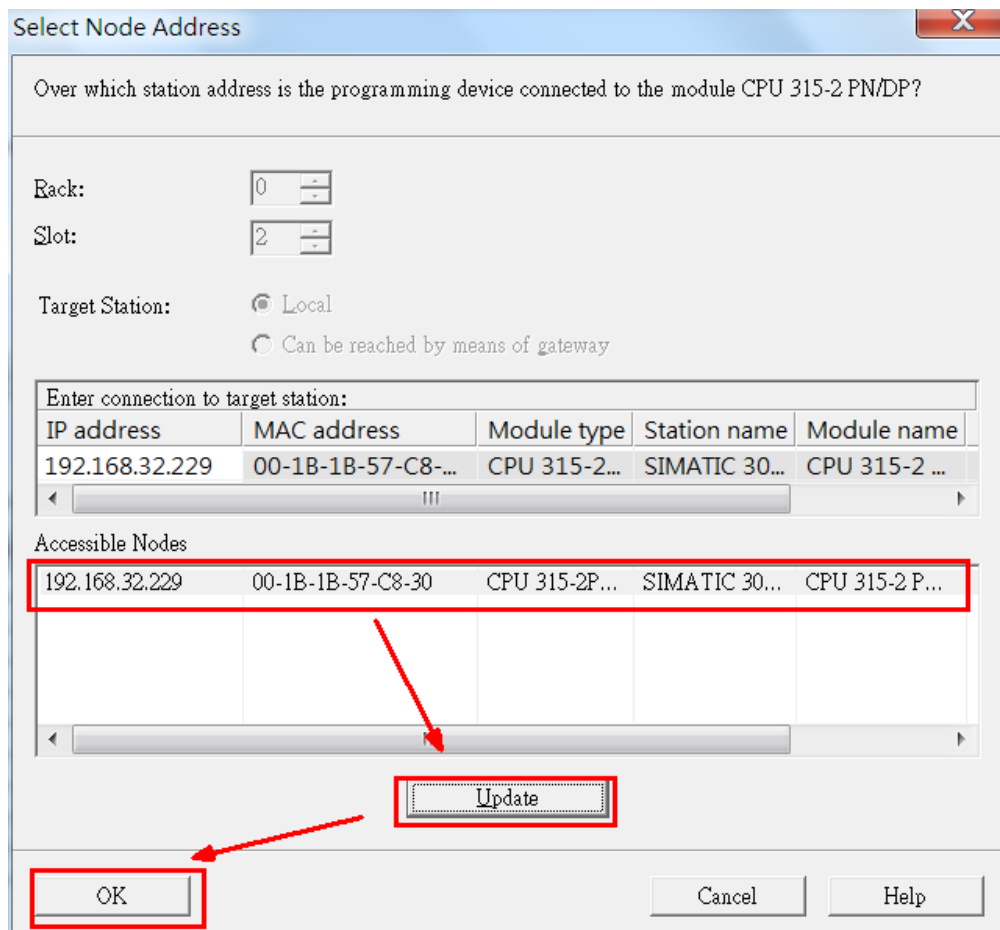
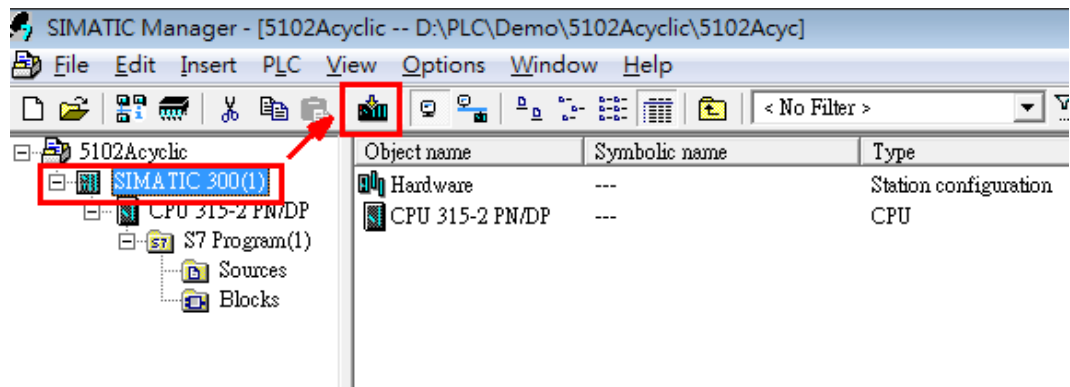
Add the variables as shown in the following figure and save the changes.

	Address	Symbol	Display format	Status value	Modify value
1		//Write "Control Word" Request Trigger			
2	M 0.0		BOOL		
3		//Read "Status Word" Request Trigger			
4	M 1.0		BOOL		
5		//Read "Communication List" Request Trigger			
6	M 2.0		BOOL		
7		//Status Word			
8	DB2.DBW 0		HEX		
9		//Control Word			
10	DB1.DBW 0		HEX		
11		//Communication List			
12	DB2.DBB 2	"DB_Response".Slave000007	HEX		
13	DB2.DBB 3	"DB_Response".Slave008015	HEX		
14	DB2.DBB 4	"DB_Response".Slave016023	HEX		
15	DB2.DBB 5	"DB_Response".Slave024031	HEX		
16	DB2.DBB 6	"DB_Response".Slave032039	HEX		
17	DB2.DBB 7	"DB_Response".Slave040047	HEX		
18	DB2.DBB 8	"DB_Response".Slave048055	HEX		
19	DB2.DBB 9	"DB_Response".Slave056063	HEX		
20	DB2.DBB 10	"DB_Response".Slave064071	HEX		
21	DB2.DBB 11	"DB_Response".Slave072079	HEX		
22	DB2.DBB 12	"DB_Response".Slave080087	HEX		
23	DB2.DBB 13	"DB_Response".Slave088095	HEX		
24	DB2.DBB 14	"DB_Response".Slave096103	HEX		
25	DB2.DBB 15	"DB_Response".Slave104111	HEX		
26	DB2.DBB 16	"DB_Response".Slave112119	HEX		
27	DB2.DBB 17	"DB_Response".Slave120125	HEX		
28					

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4.7. Downloading a Project to PLC

In the SIMATIC Manager screen, click the **Download to Module** icon to download the configuration to **CPU 315-2 PN/DP**.



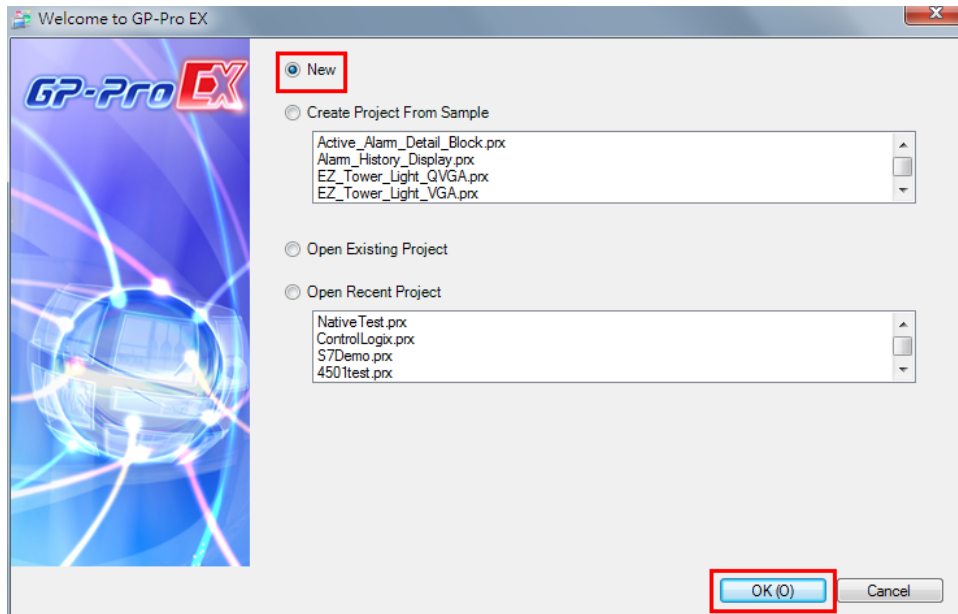
PLC starting communicating with MGate 5102-PBM-PN. The **PN Status** (PROFINET) LED on MGate 5102-PBM-PN turns **steady green** which indicates that the PROFINET status of the device is in **RUN** mode.

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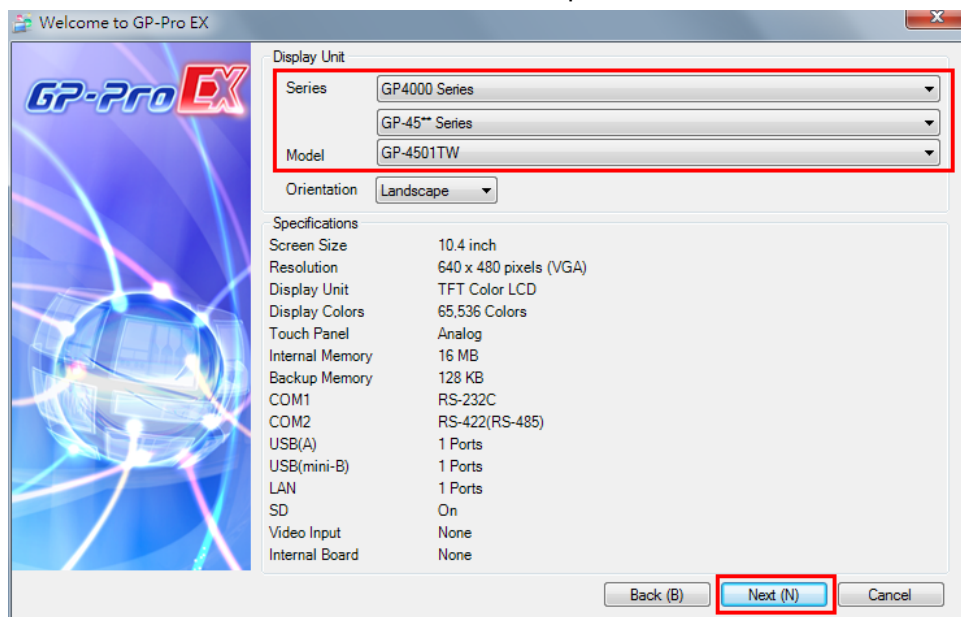
4.8. Configuring GP- Pro EX

4.8.1. Creating a New project

- A. Start the GP-Pro EX application.
- B. The Welcome to GP-Pro EX window appears. Select **New** and click **OK**.



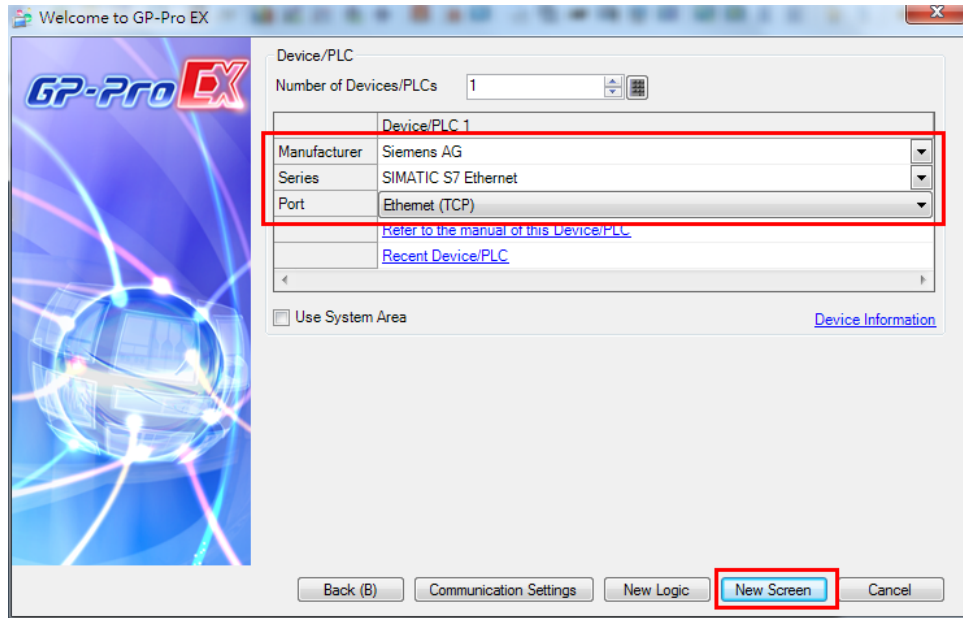
- C. Configure the following **Display Unit** settings and click **Next**.
 - **Series:** Select **GP 4000 Series** and **GP-45** Series** from the drop-down lists.
 - **Model:** Select **GP-4501TW** from the drop-down list.



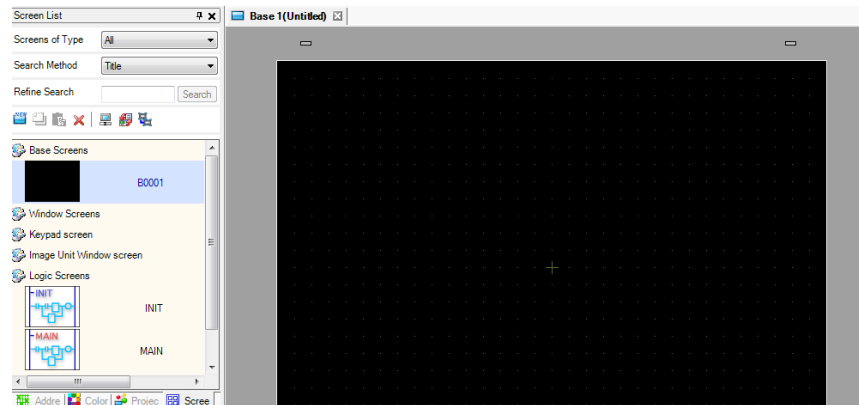
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D. In the Device/PLC screen, configure the following fields and click **New Screen**:

- **Manufacturer:** Select **Siemens AG** from the drop-down list.
- **Series:** Select **SIMATIC S7 Ethernet** from the drop-down list.
- **Port:** Select **Ethernet (TCP)** from the drop down list.



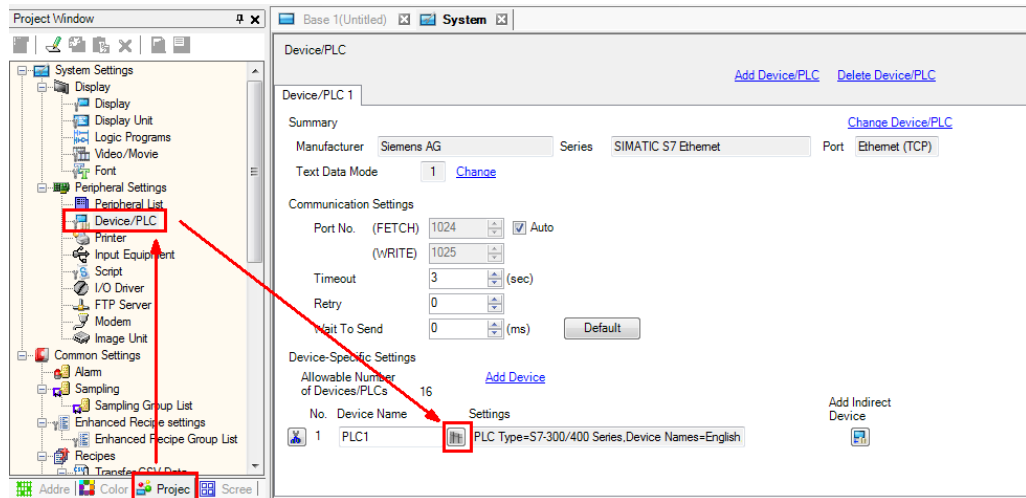
The system closes the Welcome screen and creates a Base Screen as shown in the following figure.



4.8.2. PLC Connection Setup

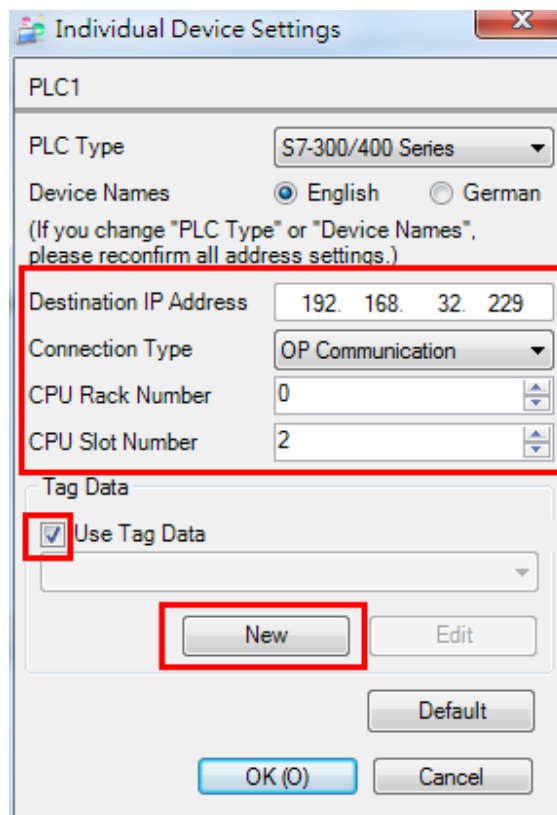
- Click the **Project** tab and select **Device/PLC**.
- In the **Device/PLC 1** configuration area, click the icon next to **PLC1** as indicated in the following figure.

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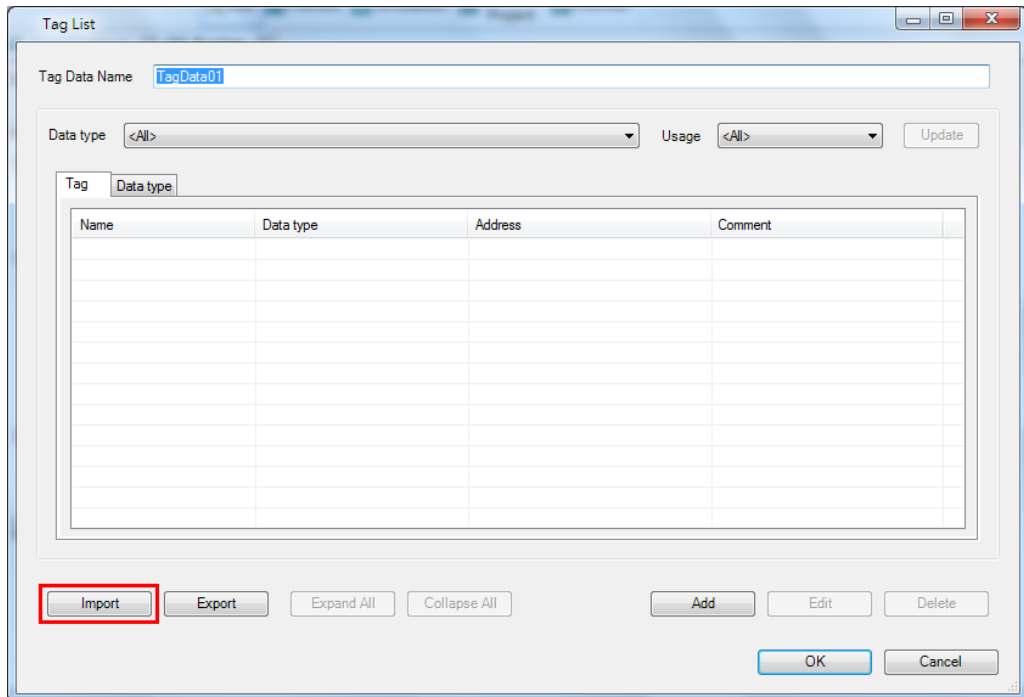
C. In the PCI settings screen, configure the following fields and click **New**:

- **Destination IP Address:** Enter the IP address.
- **Connection Type:** Select **OP Communication** from the drop-down list.
- **CPU Rack Number:** Enter "0".
- **CPU Slot Number:** Enter "2".
- **Use Tag Data:** Select this check box.

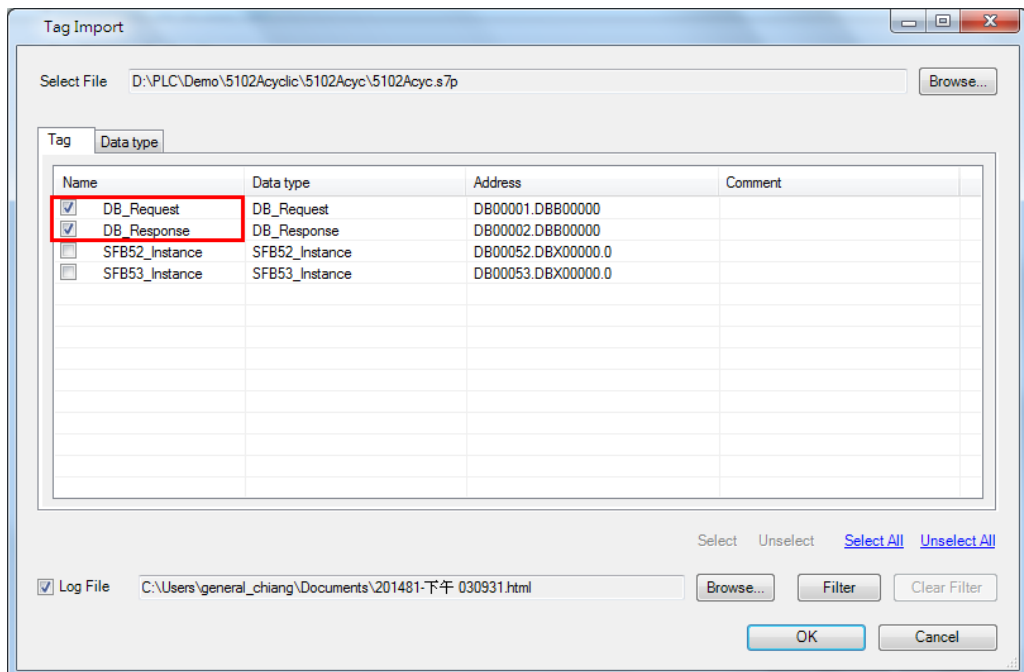


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D. The **Add Tag** screen appears. Click **Import**.

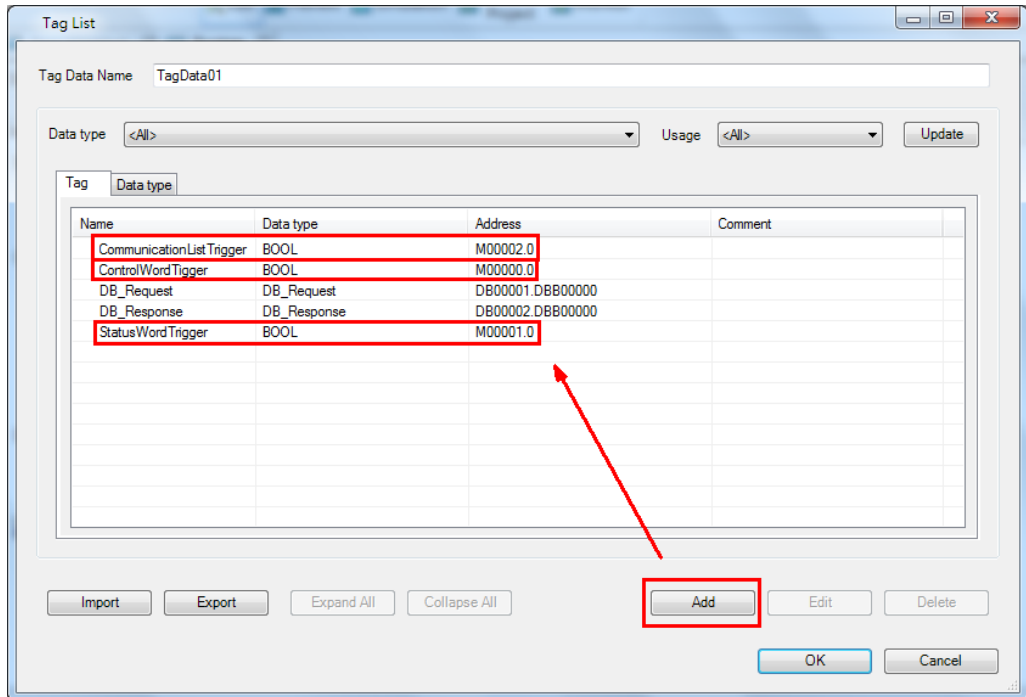


E. In the **Tag Import** screen, select **DB_Request** and **DB_Response**; then, click **OK**.

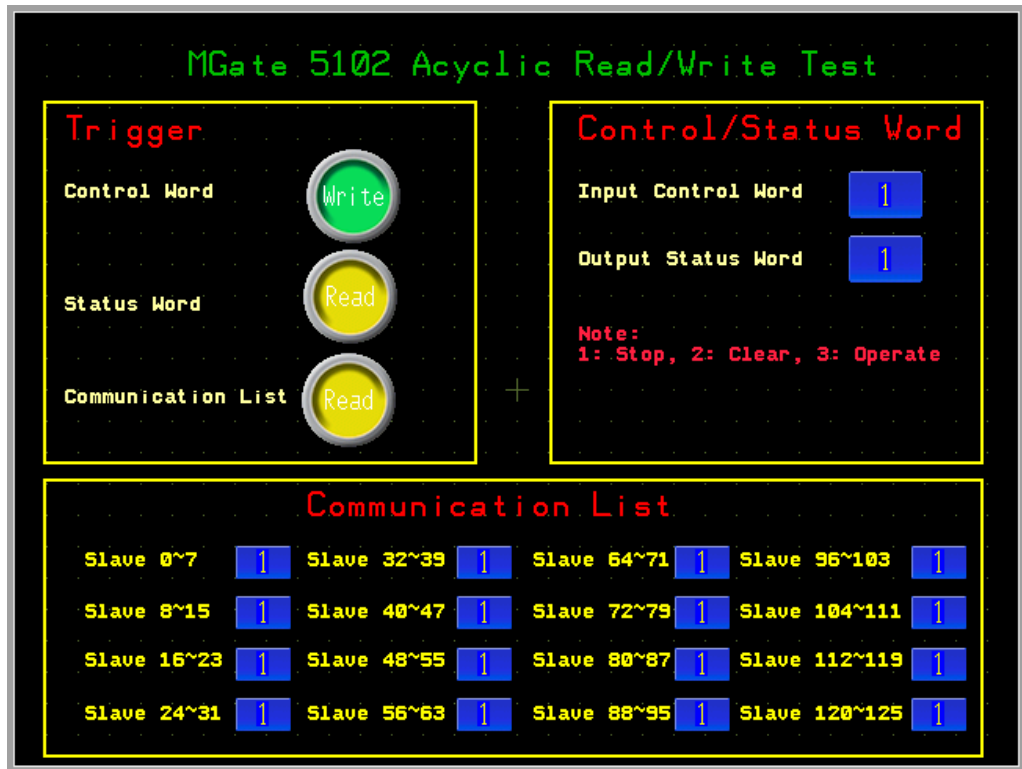


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F. In the **Tag List** screen, click **Add** to add the BOOL tags as shown in the following figure.

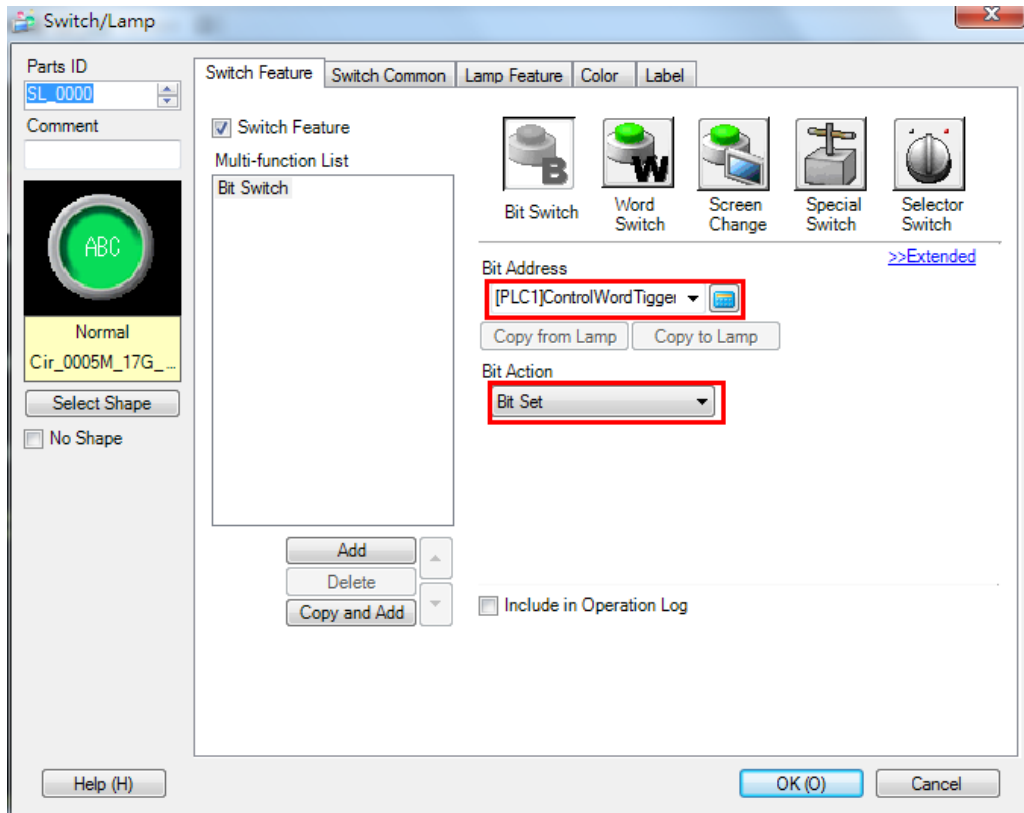


Create a new Screen and insert the parts as shown in the following figure.



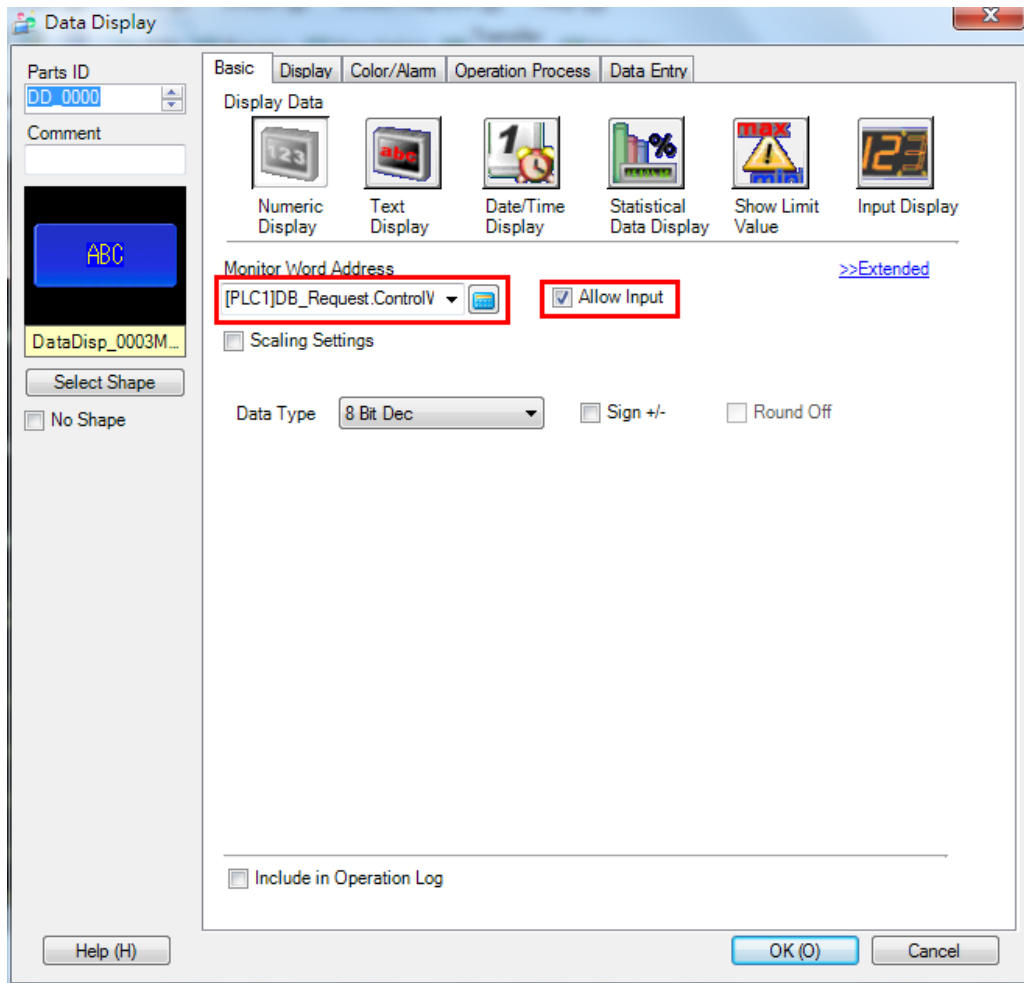
Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

The following figure shows a Control Word/Status Word input box example.



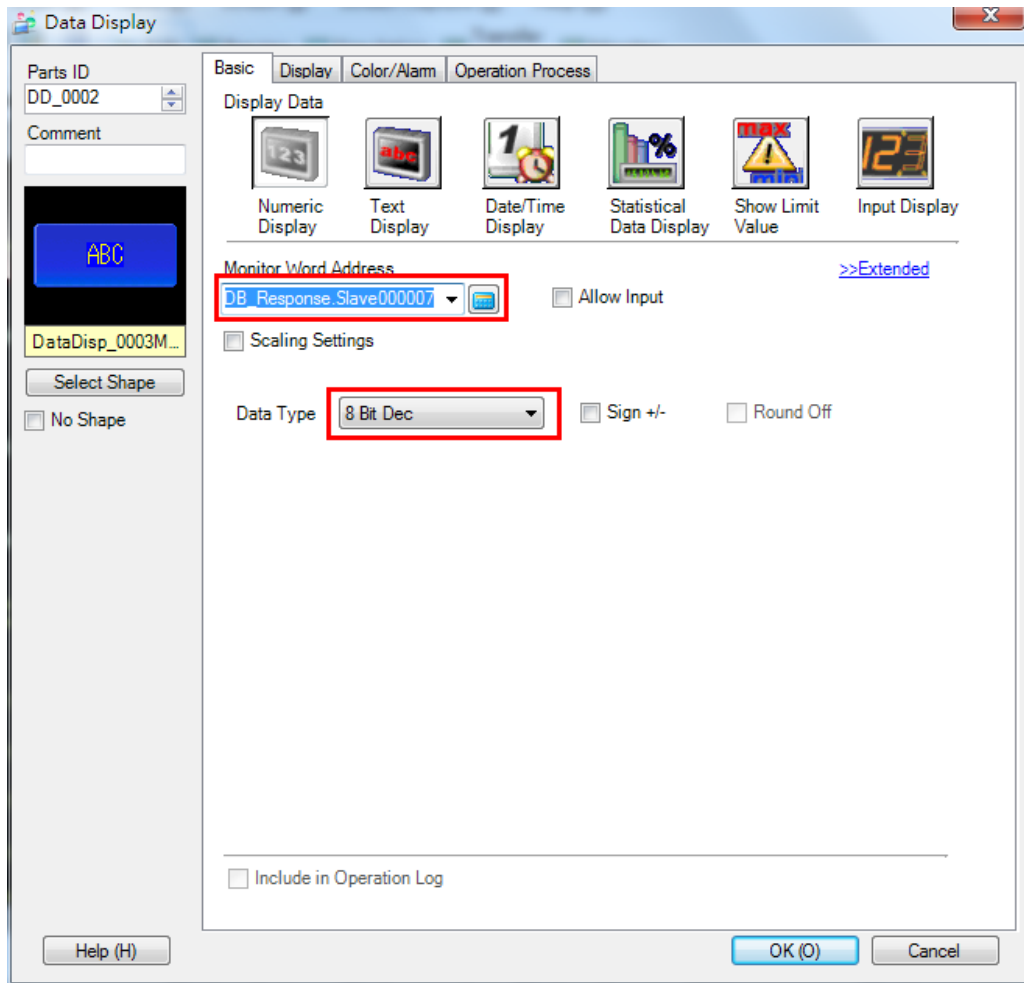
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The following figure shows a Control Word/Status Word input box example.



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The following figure shows a Communication List input box example.

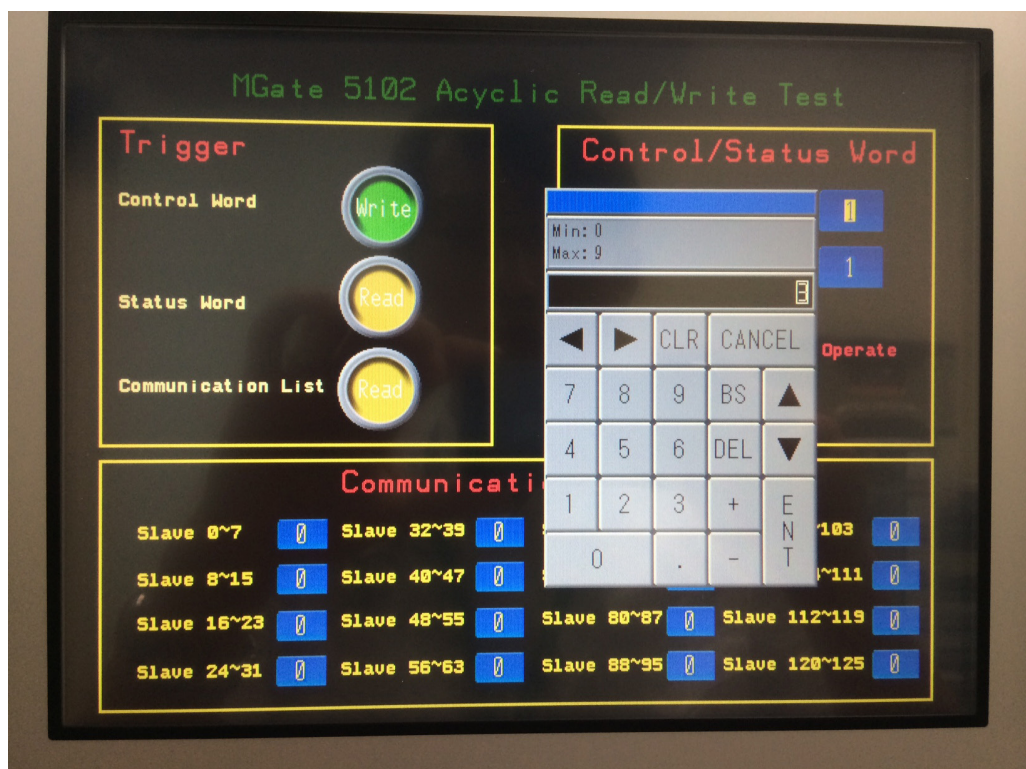


5. Communication Test

5.1. Performing HMI Test

5.1.1. Write Control Word Test

- A. Log in to the MGate 5102-PBM-PN web console. Click **System Management** → **Maintenance** → **PROFIBUS Control** and change the switch operation mode to **Stop**.
- B. In the HMI panel, select the Input Control Word input box and enter **3** on pop-up keypad.



- C. In the HMI panel, click **Control Word Trigger** to set Siemens PLC to send Acyclic Write Command to MGate 5102-PBM-PN.
- D. Log in to the MGate 5102-PBM-PN web console. Click **System Management** → **Maintenance** → **PROFIBUS Control**, the status for the operation mode is **Operate**.

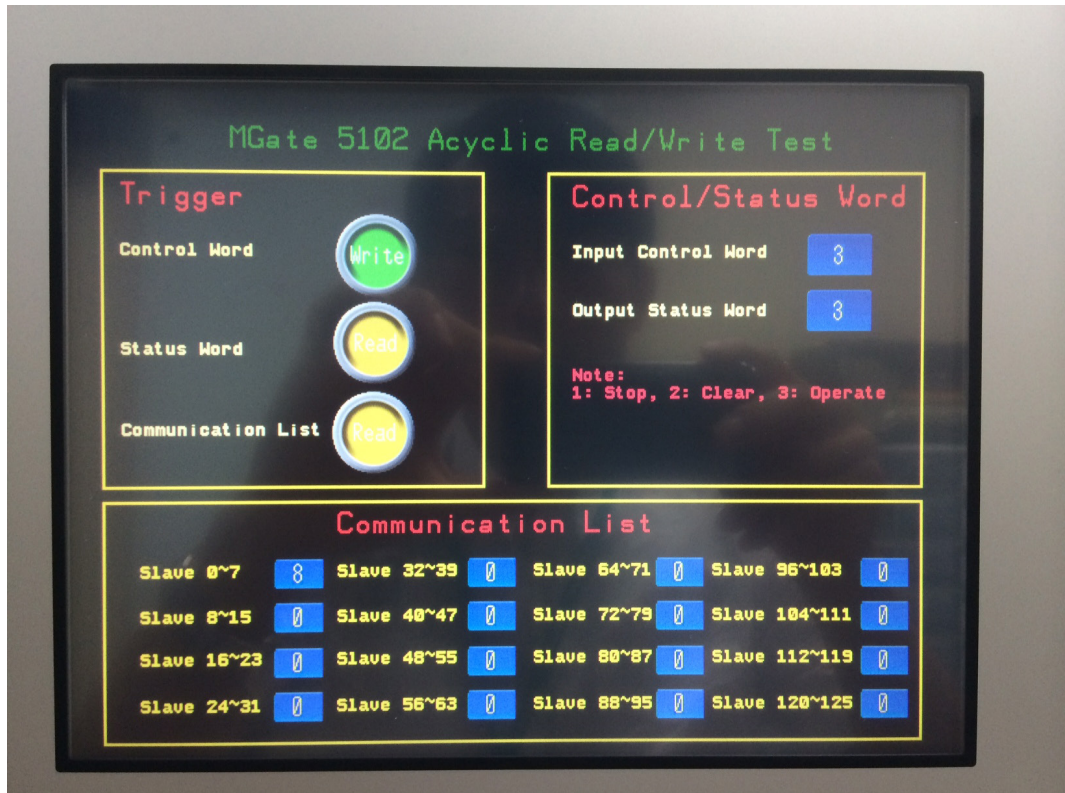
5.1.2. Read Status Word Test

After Test A (**Write Control Word Test**), click **Status Word Trigger** to set Siemens PLC to send Acyclic Read Command to MGate 5102-PBM-PN. The value for the Status Word input box value is updated to **3**.

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

5.1.3. Read Communication List Test

After Test B (**Read Status Word Test**), click **Communication List Trigger** to set Siemens PLC to send Acyclic Read Command to MGate 5102-PBM-PN. The values for Slave 0~7 input boxes should be updated to **8** to indicate that MGate 5102-PBM-PN is exchanging data ("Data_Exchange") with PROFIBUS Slave (at address "3").



Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

5.2. Using the Variable Table

Open the **VAT_1** variable table and click the **Monitor** icon to connect PLC to the monitor variables.

Address	Symbol	Display format	Status value	Modify value
1	//Write "Control Word" Request Trigger			
2	M 0.0	BOOL	false	
3	//Read "Status Word" Request Trigger			
4	M 1.0	BOOL	false	
5	//Read "Communication List" Request Trigger			
6	M 2.0	BOOL	false	
7	//Status Word			
8	DB2.DBW 0	HEX	W#16#0000	
9	//Control Word			
10	DB1.DBW 0	HEX	W#16#0000	
11	//Communication List			
12	DB2.DBB 2 "DB_Response".Slave000007	HEX	B#16#00	
13	DB2.DBB 3 "DB_Response".Slave008015	HEX	B#16#00	
14	DB2.DBB 4 "DB_Response".Slave016023	HEX	B#16#00	
15	DB2.DBB 5 "DB_Response".Slave024031	HEX	B#16#00	
16	DB2.DBB 6 "DB_Response".Slave032039	HEX	B#16#00	
17	DB2.DBB 7 "DB_Response".Slave040047	HEX	B#16#00	
18	DB2.DBB 8 "DB_Response".Slave048055	HEX	B#16#00	
19	DB2.DBB 9 "DB_Response".Slave056063	HEX	B#16#00	
20	DB2.DBB 10 "DB_Response".Slave064071	HEX	B#16#00	
21	DB2.DBB 11 "DB_Response".Slave072079	HEX	B#16#00	
22	DB2.DBB 12 "DB_Response".Slave080087	HEX	B#16#00	
23	DB2.DBB 13 "DB_Response".Slave088095	HEX	B#16#00	
24	DB2.DBB 14 "DB_Response".Slave096103	HEX	B#16#00	
25	DB2.DBB 15 "DB_Response".Slave104111	HEX	B#16#00	
26	DB2.DBB 16 "DB_Response".Slave112119	HEX	B#16#00	
27	DB2.DBB 17 "DB_Response".Slave120125	HEX	B#16#00	
28				

5.2.1. Write Control Word Test

- A. Log in to the MGate 5102-PBM-PN web console. **Click System Management → Maintenance → PROFIBUS Control** and change the operation mode to **Stop**.

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

- B. In the **VAT_1** variable table, set **DB1.DBW 0** to **W#16#0003** and click the **Active Modify Value** icon. The value for the **DB1.DBW 0** status value should be updated to **W#16#0003**.

Address	Symbol	Display format	Status value	Modify value
1	//Write "Control Word" Request Trigger			
2	M 0.0	BOOL	false	
3	//Read "Status Word" Request Trigger			
4	M 1.0	BOOL	false	
5	//Read "Communication List" Request Trigger			
6	M 2.0	BOOL	false	
7	//Status Word			
8	DB2.DBW 0	HEX	W#16#0000	
9	//Control Word			
10	DB1.DBW 0	HEX	W#16#0000	W#16#0003
11	//Communication List			
12	DB2.DBB 2 "DB_Response".Slave000007	HEX	B#16#00	

- C. Set **M 0.0** to **true** and click the **Active Modify Value** icon. This sets Siemens PLC to send Acyclic Write Command to MGate 5102-PBM-PN.

Address	Symbol	Display format	Status value	Modify value
1	//Write "Control Word" Request Trigger			
2	M 0.0	BOOL	false	true
3	//Read "Status Word" Request Trigger			
4	M 1.0	BOOL	false	
5	//Read "Communication List" Request Trigger			
6	M 2.0	BOOL	false	
7	//Status Word			
8	DB2.DBW 0	HEX	W#16#0000	
9	//Control Word			
10	DB1.DBW 0	HEX	W#16#0003	W#16#0003
11	//Communication List			

- D. Log in to the MGate 5102-PBM-PN web console. Click **System Management** → **Maintenance** → **PROFIBUS Control** and the status for the operation mode becomes **Operate**.

Using Siemens S7-300 PLC to Perform Acyclic Read and Write on MGate 5102

5.2.2. Read Status Word Test

After Test A (**Write Control Word Test**), set **M 1.0** to **true**; then, click the **Active Modify Value** icon. This sets Siemens PLC to send Acyclic Read Command to MGate 5102-PBM-PN. The status value of **DB2.DBW 0** should be updated to **W#16#0003**.

The screenshot shows the SIMATIC Manager interface with a table of PLC variables. The 'Modify value' column for M 1.0 is highlighted in red and set to 'true'. A red arrow points from this icon to the 'Status value' column for DB2.DBW 0, which now displays 'W#16#0003'.

Address	Symbol	Display format	Status value	Modify value
1	//Write "Control Word" Request Trigger			
2	M 0.0	BOOL	false	true
3	//Read "Status Word" Request Trigger			
4	M 1.0	BOOL	false	true
5	//Read "Communication List" Request Trigger			
6	M 2.0	BOOL	false	
7	//Status Word			
8	DB2.DBW 0	HEX	W#16#0003	
9	//Control Word			
10	DB1.DBW 0	HEX	W#16#0003	W#16#0003
11	//Communication List			

5.2.3. Read Communication List Test

After Test B, set **M 2.0** to **true**; then, click the **Active Modify Value** icon. This sets Siemens PLC to send Acyclic Read Command to MGate 5102-PBM-PN. The status value of **DB2.DBB 2** should be updated to **B#16#08** to indicate that MGate 5102-PBM-PN is exchanging data ("Data_Exchange") with PROFIBUS Slave at address **3**.

The screenshot shows the SIMATIC Manager interface with a table of PLC variables. The 'Modify value' column for M 2.0 is highlighted in red and set to 'true'. A red arrow points from this icon to the 'Status value' column for DB2.DBB 2, which now displays 'B#16#08'.

Address	Symbol	Display format	Status value	Modify value
1	//Write "Control Word" Request Trigger			
2	M 0.0	BOOL	false	true
3	//Read "Status Word" Request Trigger			
4	M 1.0	BOOL	false	true
5	//Read "Communication List" Request Trigger			
6	M 2.0	BOOL	false	true
7	//Status Word			
8	DB2.DBW 0	HEX	W#15#0003	
9	//Control Word			
10	DB1.DBW 0	HEX	W#16#0003	W#16#0003
11	//Communication List			
12	DB2.DBB 2 "DB_Response".Slave000007	HEX	B#16#08	
13	DB2.DBB 3 "DB_Response".Slave008015	HEX	B#16#00	
14	DB2.DBB 4 "DB_Response".Slave000000	HEX	B#16#00	