Integration Guide
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Micro Motion® Model 5700 Transmitters

PROFINET Siemens PLC Integration Guide

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Process Management

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Contents

Appendices and reference

1 Before you begin

Topics covered in this chapter:

1.1 About this document

This document provides information about how to integrate a Micro Motion Model 5700 Ethernet transmitter communicating with a Siemens Simatic S7-400 PLC using a Simatic Manager project.

The information in this document assumes that users understand:

- Transmitter programming concepts and procedures
- All corporate, local government, and national government safety standards and requirements that guard against data loss, equipment failure, injuries, or death

1.2 Related documentation

You can find all product documentation via the Micro Motion product documentation DVD shipped with the product or at *www.micromotion.com*.

Table 1-1: Additional documentation and resources

Topic	Document
Transmitter installation	*Micro Motion Model 5700 Transmitters Ethernet Installation Manual*
Hazardous area installation	See the approval documentation shipped with the transmitter, or download the appropriate documentation from the Micro Motion web site at *www.micromotion.com*.
Transmitter configuration and use	*Micro Motion Model 5700 Transmitters Ethernet Configuration and Use Manual*
Product Data Sheet	*Micro Motion Model 5700 Product Data Sheet (PDS)*
Modbus configuration	*Modbus Interface Tool (MIT)* — available at *www.micromotion.com*

2 Model 5700 transmitters in Ethernet networks

Topics covered in this chapter:

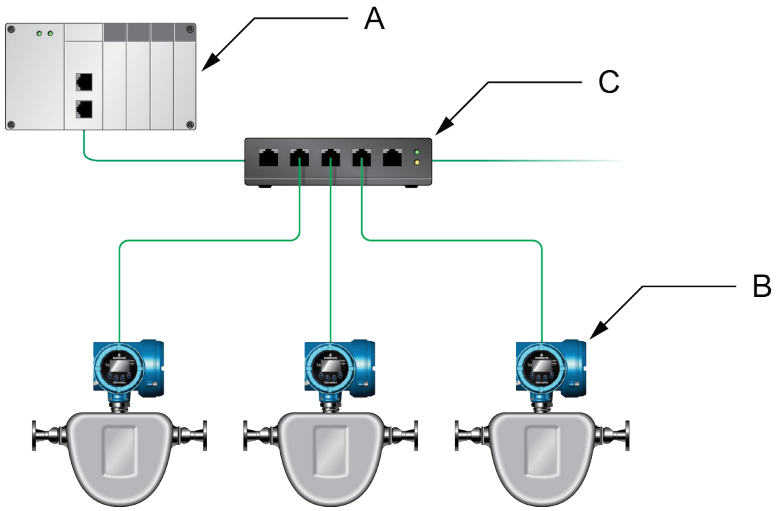
You can install the Model 5700 transmitter in star, ring, or daisy-chain networks using industrial-rated shielded Ethernet cables.

- Make sure that each cable is no longer than 100 meters.
- Connect the Model 5700 transmitter to the host system via a LAN (Local Area Network) and not a WAN (Wide Area Network).
- Follow all network security best practices.

2.1 Star topology

Model 5700 transmitters can be installed in a star network.

Figure 2-1: Model 5700 star network

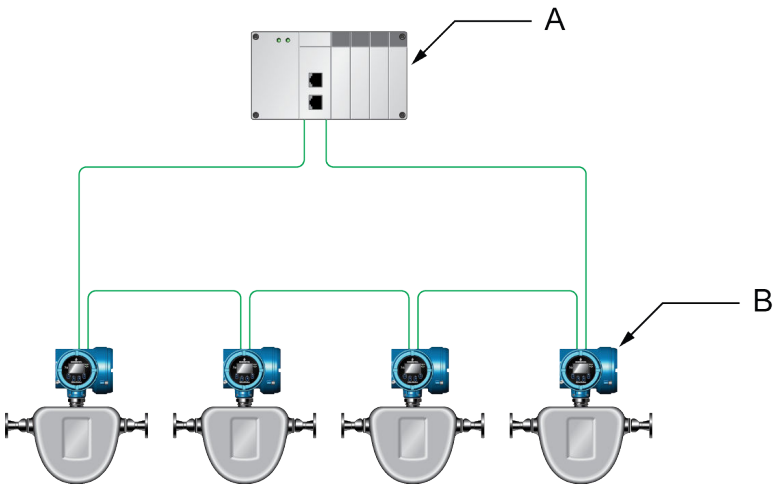


A. Programmable Logic Controller (PLC)
B. Model 5700 with Ethernet output
C. External Ethernet switch

2.2 Ring topology

Model 5700 transmitters can be installed in a ring network.

Figure 2-2: Model 5700 ring network

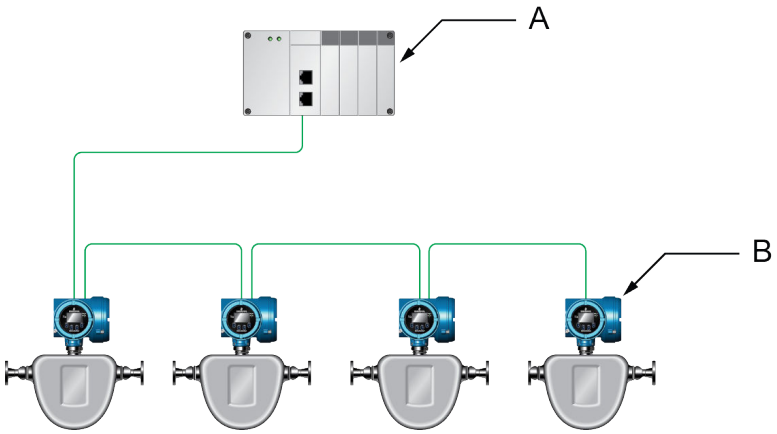


A. Programmable Logic Controller (PLC)
B. Model 5700 with Ethernet output

2.3 Daisy-chain topology

Model 5700 transmitters can be installed in a daisy-chain network.

Figure 2-3: Model 5700 daisy-chain network



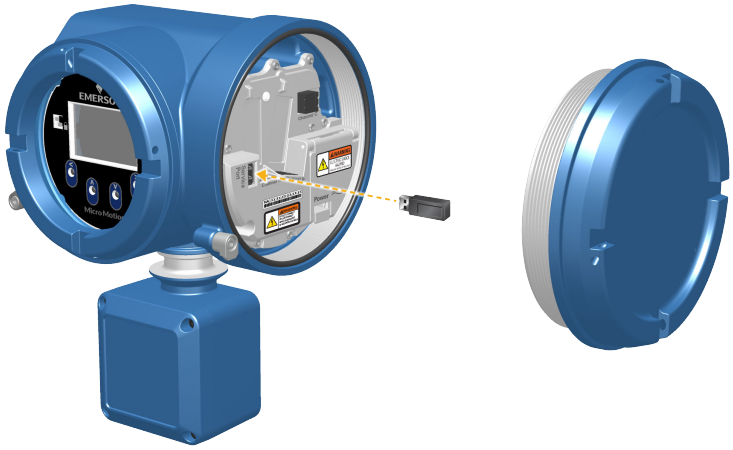
A. Programmable Logic Controller (PLC)
B. Model 5700 with Ethernet output

3 Establish cyclic data

Topics covered in this chapter:

3.1 Install the GSDXML file

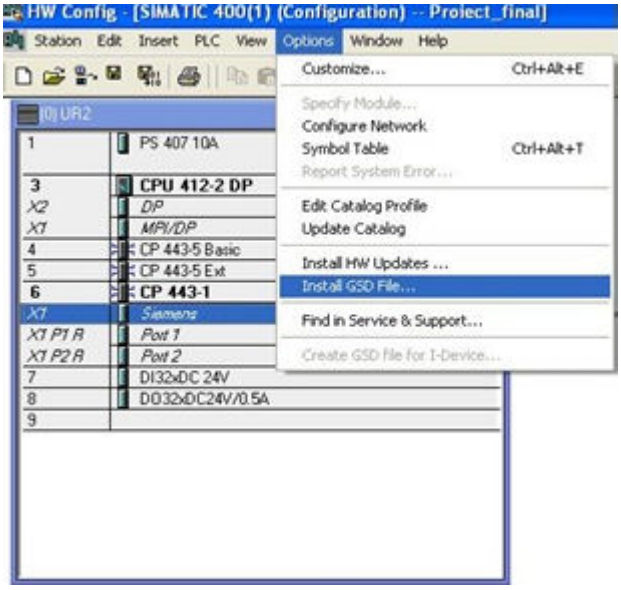
1. Download the GSDXML file using one of the following methods:

Option	Description
Use a USB memory drive	a. Insert a USB memory drive into the Model 5700 Ethernet service port. The service port connection is located under the transmitter cap.  b. From the transmitter display, choose Menu > USB Options > Transmitter > USB Drive > Download Support Files > GSD file. c. Follow the menu to copy the GSDXML file to the USB memory drive. d. Copy the zip file from the USB memory drive to the PC where SIMATIC Manager is installed. e. Unzip the file to a chosen location.
Download the file	a. Download the GSDXML file from the Micro Motion Model 5700 Ethernet product website. b. Unzip the file to a chosen location.

2. To install the Model 5700 PROFINET GSDXML file into your GSD file catalog using the HW config in SIMATIC Manager:

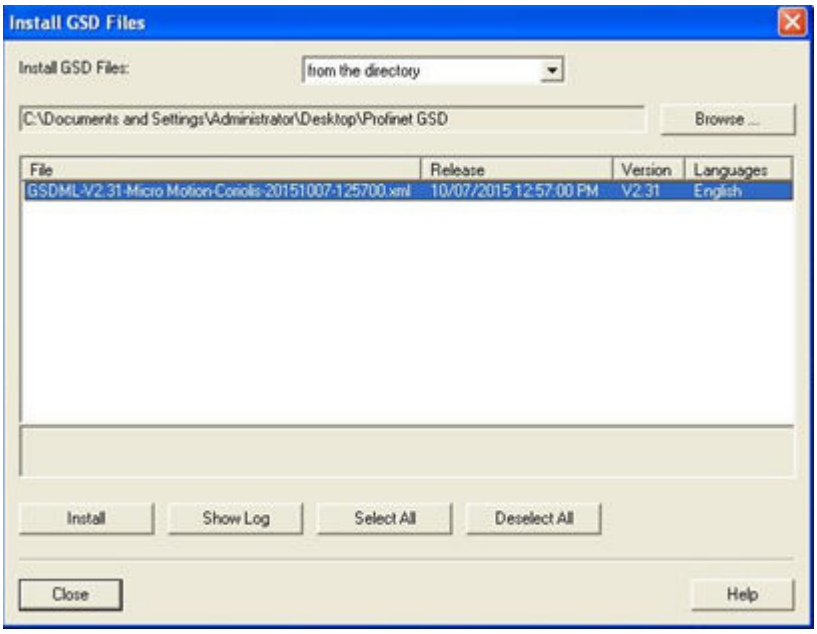
   a. Choose Options > Install GSD File.

Example:



b. Select Install.

c. Choose Update Catalog.



3.2 Create a PROFINET network

1. Configure the primary protocol as PROFINET in the Model 5700 device:

   a. From the transmitter display, choose Device Tools > Configuration > Network Settings.

b. Select Profinet.

2. From SIMATIC Manager, choose File > 'New Project' Wizard.
3. Follow the wizard to select the CPU for your PLC.

   Example: CPU 400

4. In the Component View, click on the CPU.
5. Double-click Connections.

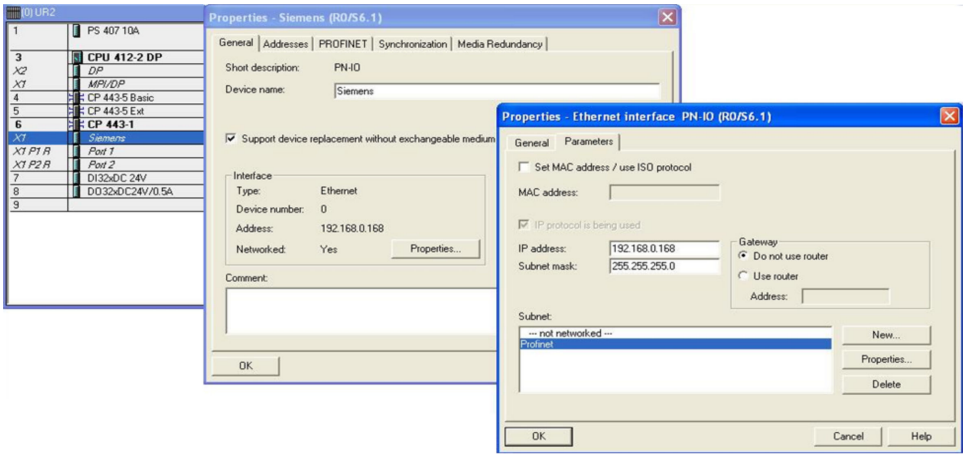
   A graphical representation of the network is displayed.

6. Double-click the CPU icon.

   The HW Config screen is displayed.

7. Double-click the interface, then click Properties.

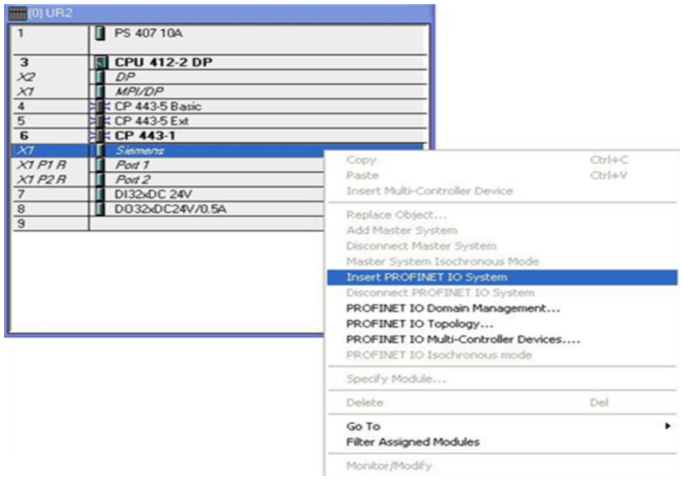
   Example:



   The network settings of the S7 400 PLC Ethernet interface are configured.

8. Right-click on the Ethernet interface, and select Insert PROFINET IO System.

   Example:



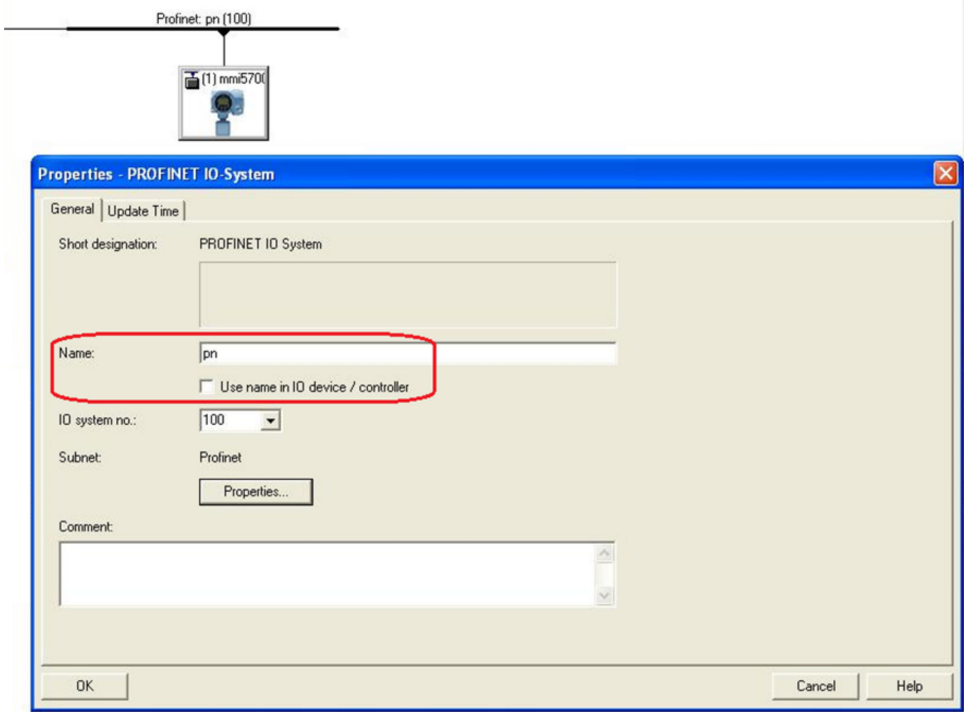
The Ethernet network is created.

9. Double-click on the PROFINET network you just created.

   The Properties menu is displayed.

10. Enter the name of the network.

    Example:

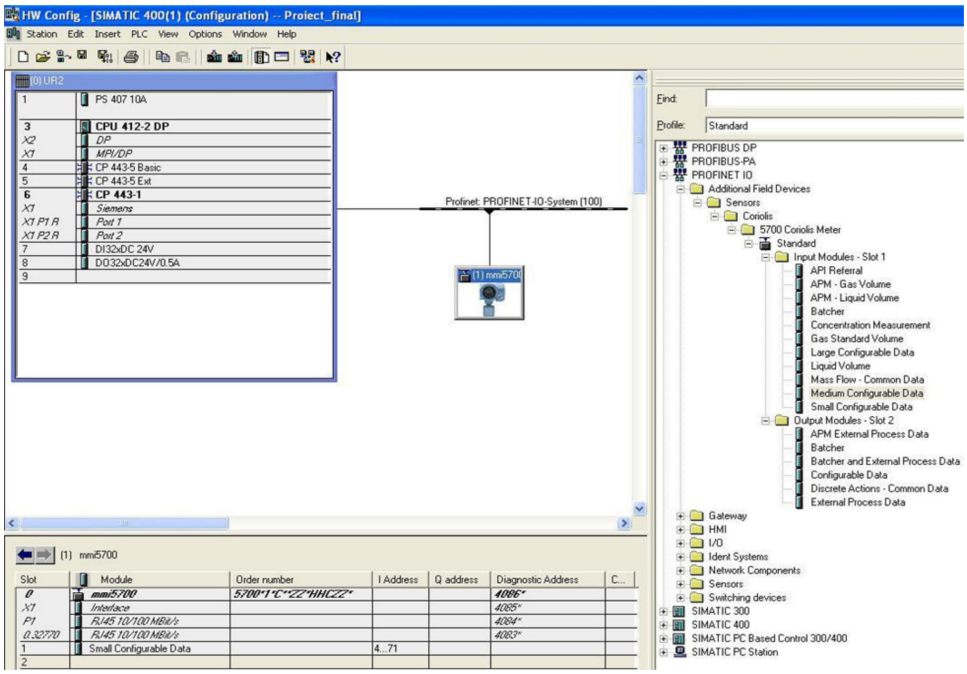


11. (Optional) To use the network name in the IO device and in the controller, check Use the name in IO device/controller.

12. Drag and drop the device called Standard from the GSD file catalog to the Model 5700 Ethernet network.

    The Model 5700 Ethernet network is located at PROFINET IO > Additional Field Devices > Sensors > Coriolis > 5700 Coriolis Meter.

    Example:



13. Double-click on the device to enter the configuration menu.
14. Enter the Device name.

Note

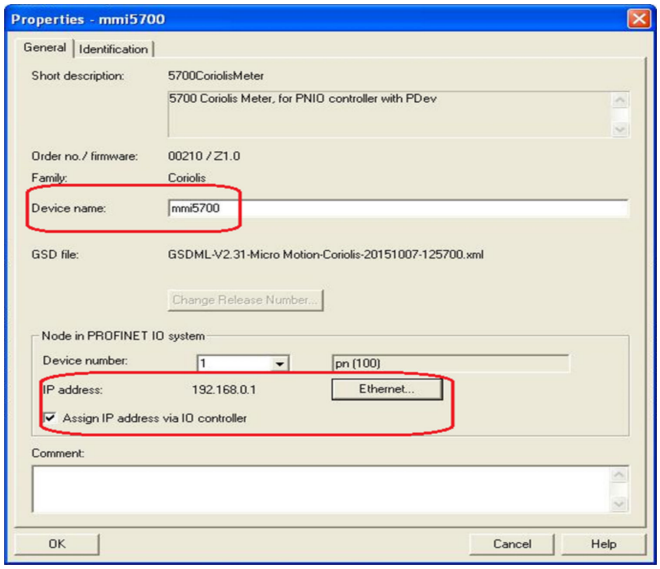
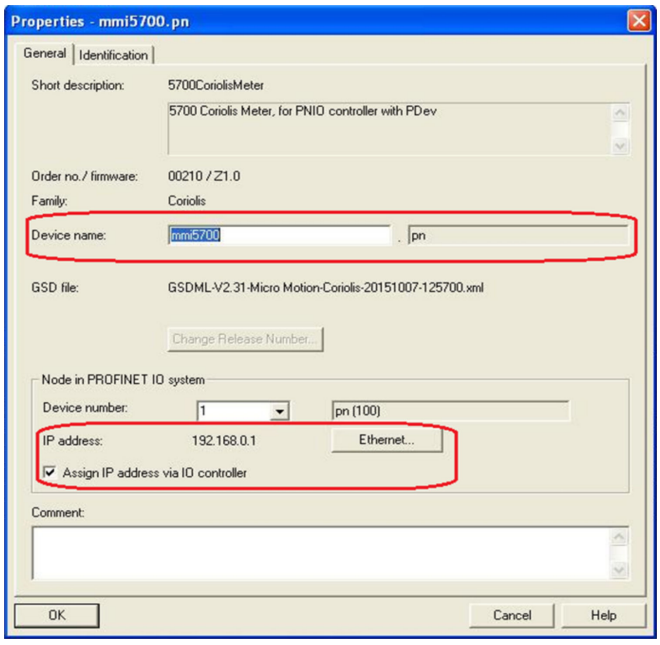
The Device name must:

- Follow all DNS conventions
- Cannot start with a number
- Cannot contain uppercase alpha characters

15. Make the appropriate IP address configuration of the device, and press Ok.

    You can use the Ethernet button if required.

    If the Use name in IO device/controller checkbox is checked in the network properties, then Device name will have the following format: *device_name.network_name*.

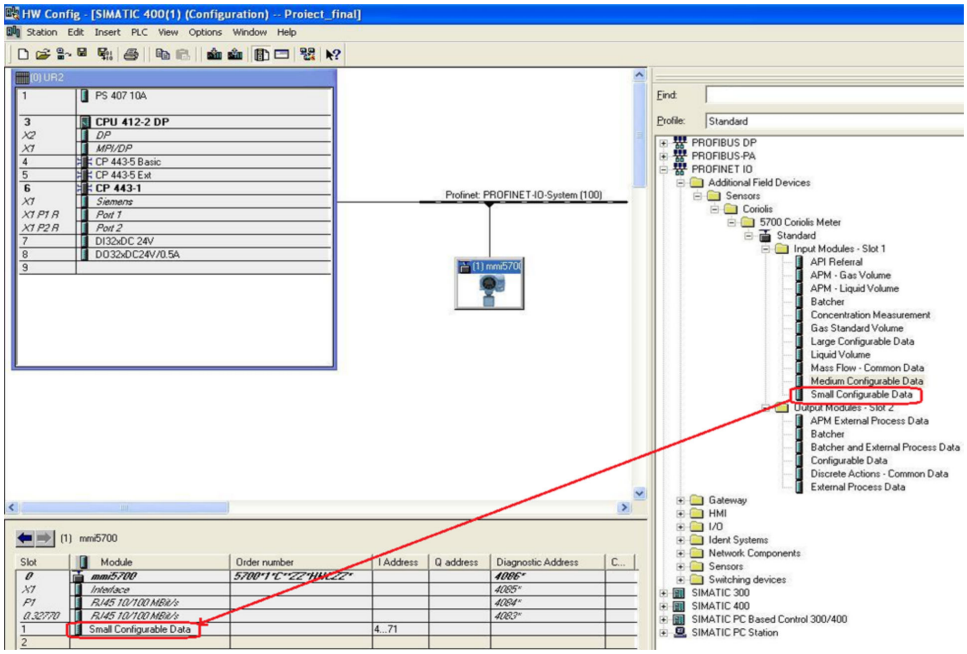
Option	Description
Device name **when the** Use name in IO device/controller **checkbox is unchecked**	
Device name **when the** Use name in IO device/controller **checkbox is checked**	

16. Click on the Model 5700 Ethernet icon to display the HW configuration in the lower screen.
17. From the HW Catalog, drag the input and output slots to one of the following locations:
    - PROFINET IO > Additional Field Devices > Sensors > Coriolis > 5700 Coriolis Meter > Standard > Input Modules – Slot 1
    - PROFINET IO > Additional Field Devices > Sensors > Coriolis > 5700 Coriolis Meter > Standard > Output Modules – Slot 2

Example:

If Empty is selected, delete the slot by right-clicking on the slot, and selecting Delete. For a description of the Input and Output slots, see *Appendix A*.

Example: In this example, Small Configurable Data has been added to Slot 1.

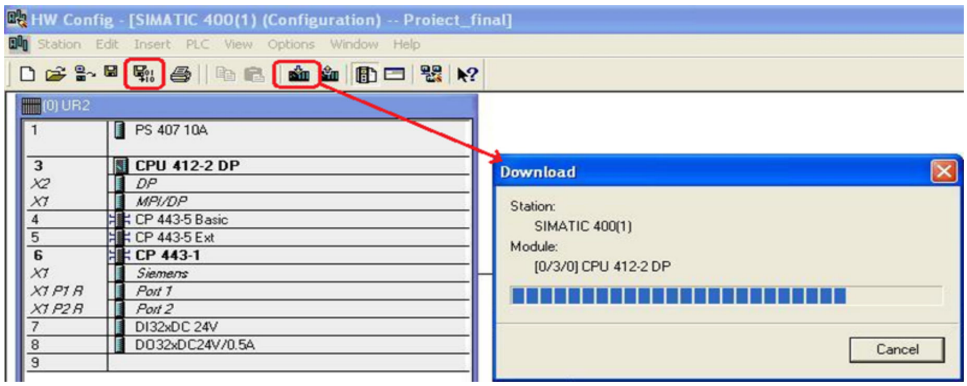


18. Press Save and Compile.
19. Press Download to Module to download the configuration into the CPU module.

Note

The modules configured and downloaded in the HW Config are set in the transmitter. You do not need to set the Input or Output modules on the transmitter first. You can configure the variables in the input data sets using the web server or ProLink III.

Example:



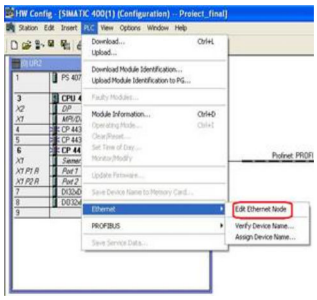
The configuration is downloaded into the CPU module. The PLC should show a red LED bus fault.

3.3 Configure Ethernet IP address and device name

Use this procedure to configure the Ethernet IP address and device name for the Model 5700 Ethernet device.

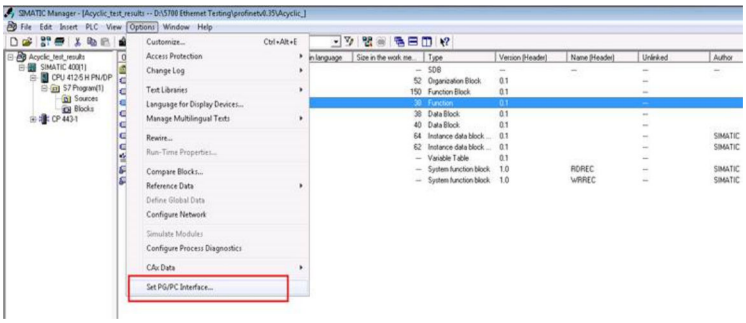
1. Choose PLC > Ethernet > Edit Ethernet Node.

   Example:



2. To configure the programming machine (PG) to PC interface, choose Options > Set PG/PC Interface...

   Example:

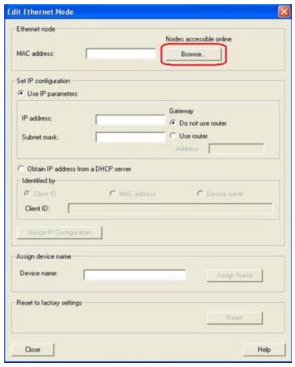


3. Press Browse to find the Model 5700 Ethernet device on the network.

Tip

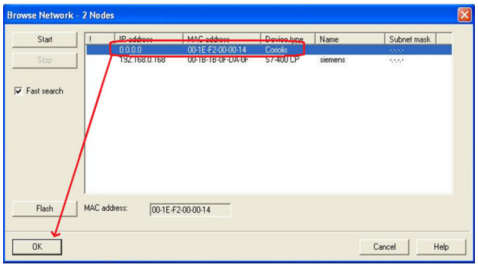
If you cannot find the Model 5700 device, turn off your firewall. Firewalls sometimes prevent SIMATIC Manager from browsing network devices.

Example:



4. Select the device from the list and press Ok.

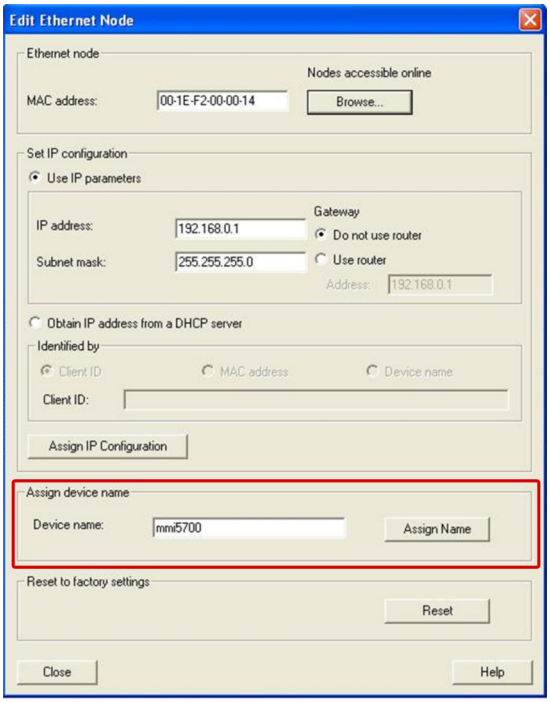
   Example:



5. Fill in the appropriate network settings and press Assign IP Configuration.
6. Fill in the device name and press Assign Name.

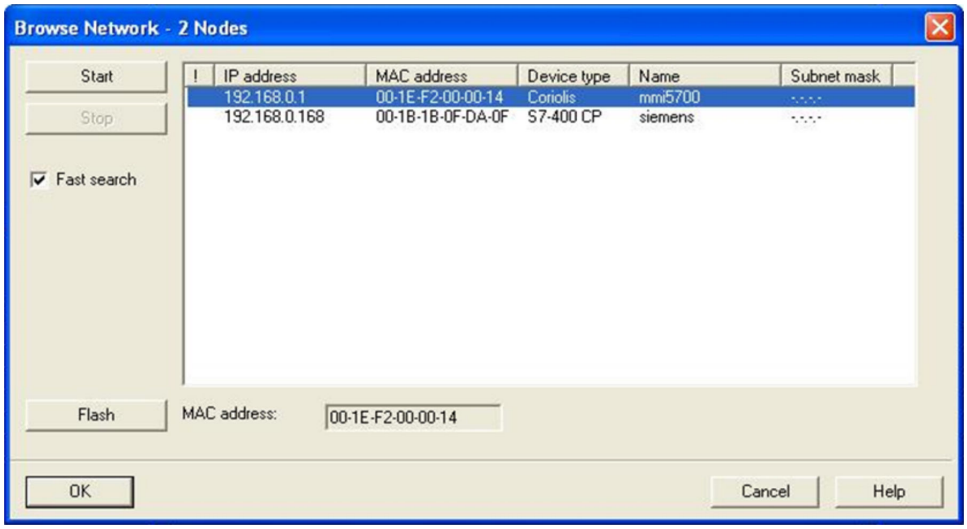
   Make sure the IP configuration and device name are the same as what you configured in *Section 3.2*.

   Example:



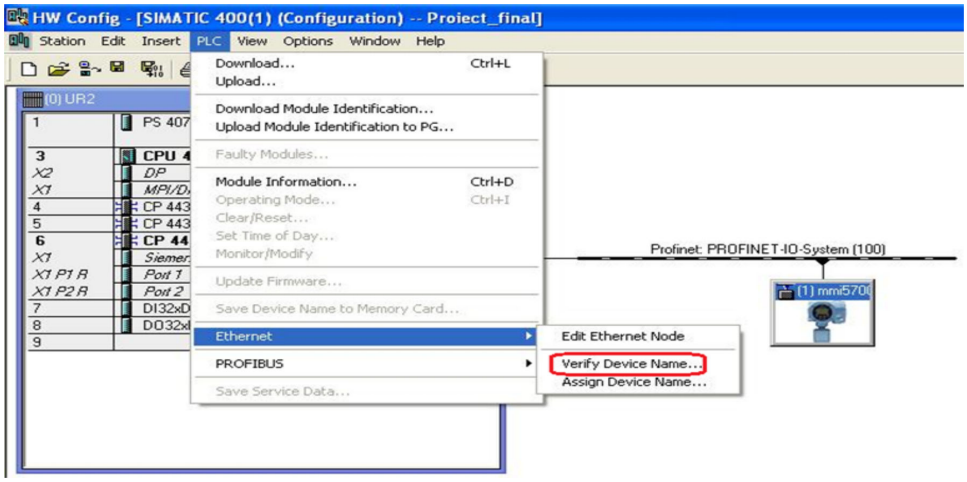
7. Press Browse again to make sure the changes were applied to the device.

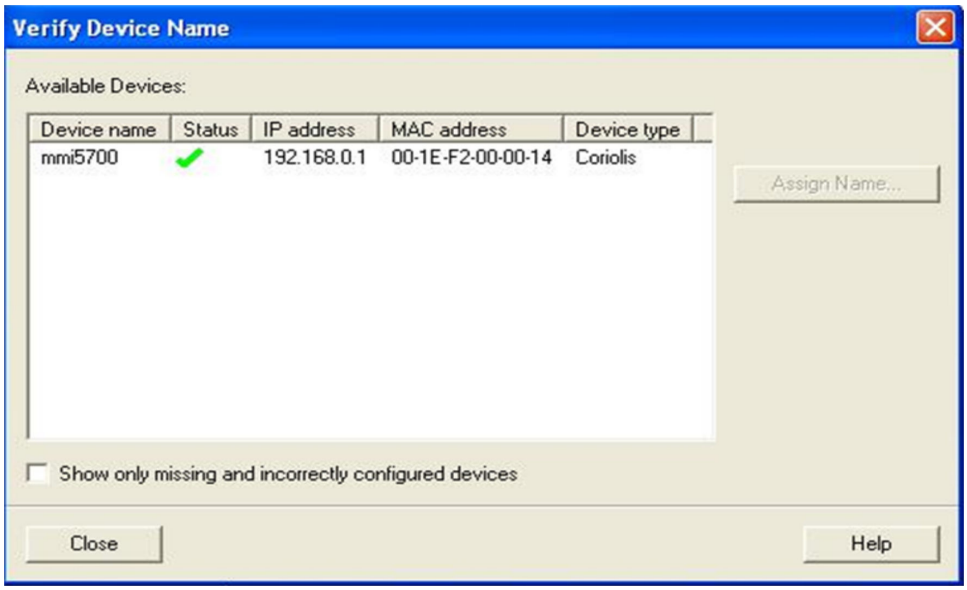
   Example:



8. Choose PLC > Ethernet > Verify Device Name to verify the device name was properly assigned.

   Example:





3.4 Verify communications

1. Verify that the PLC shows no faults (red lights).

   The most likely error will be a Bus Fault (BF LED is red), which means either the Device Name, the IP address, the Input Slot, or the Output Slot between the PLC and the Model 5700 Ethernet transmitter does not match.

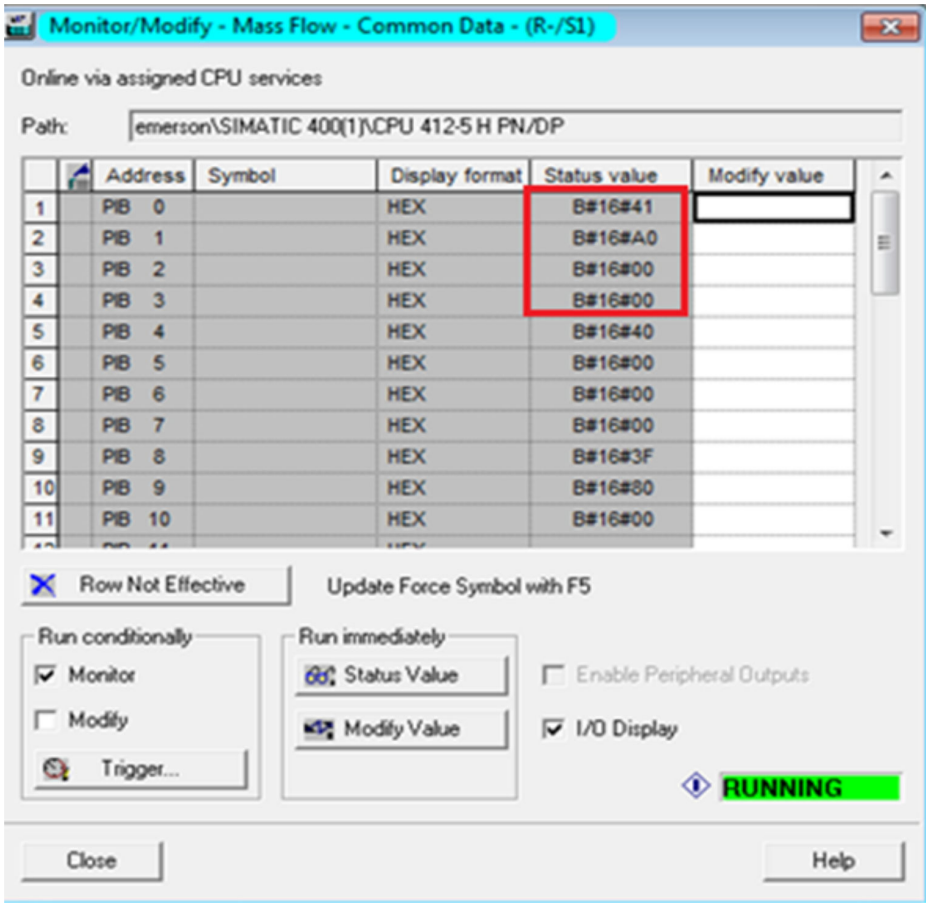
2. To verify you are receiving data:

   a. In the HW Config, click the Model 5700 Ethernet icon.

   b. Right-click on the Input Slot and press Monitor/Modify.

   c. Click the I/O Display box and the Monitor box to see the process variables updating.

   Example:



3. If the transmitter is still not communicating, from the transmitter display, choose Menu > Configuration > Ethernet settings > Primary Protocol > Profinet to verify that PROFINET is the configured primary protocol on the Model 5700 Ethernet transmitter.

3.5 Troubleshooting the PROFINET integration

3.5.1 Cannot download PROFINET into the PLC controller

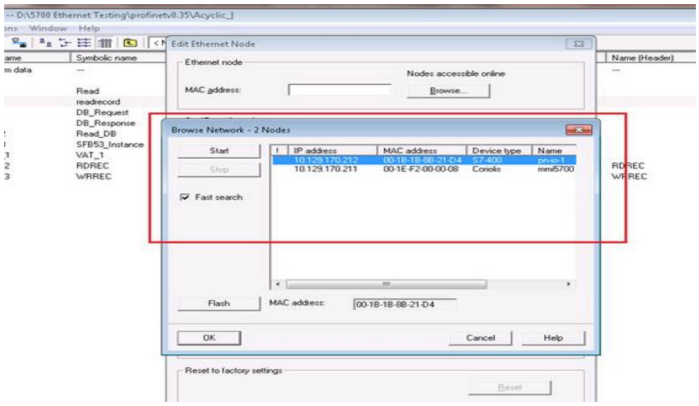
Use the following procedure if you cannot download the PROFINET program into the PLC controller.

1. Choose PLC > Ethernet > Edit Ethernet Node.
2. Select Browse.

   A list of network devices with MAC IDs is displayed.

3. Select the PROFINET controller and press OK.

   Example:


Edit Ethernet Node
Ethernet node
MAC address:
Nodes accessible online
Browse...
Browse Network - 2 Nodes
Start
Stop
Fast search
IP address
MAC address
Device type
Name
10.129.170.212
00-1B-1B-8B-21-D4
S7-400
pnio-1
10.129.170.211
00-1E-F2-00-00-08
Conoks
mm5700
Flash
MAC address:
00-1B-1B-8B-21-D4
OK
Cancel
Help
Reset to factory settings
Reset
Symbolic name
Read
readrecord
DB_Request
DB_Response
Read_DB
SFB53_Instance
VAT_1
RDREC
WRREC
Name (Header)

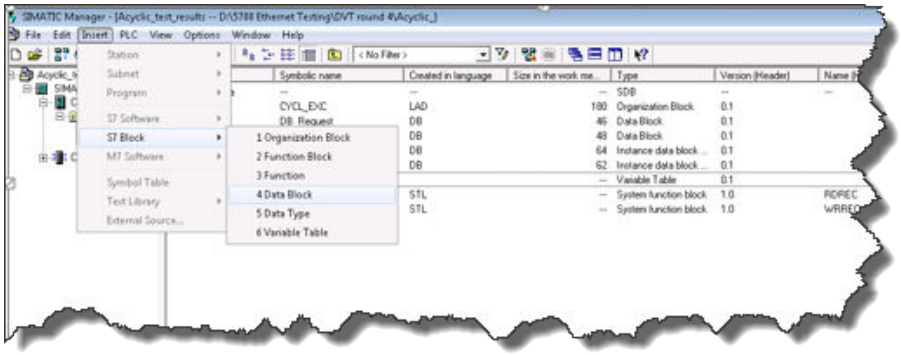
4 Configuring Siemens PLC read/write operation

1. To insert the data blocks:

   You will use the data blocks to configure the request and response parameters on the Siemens PLC.

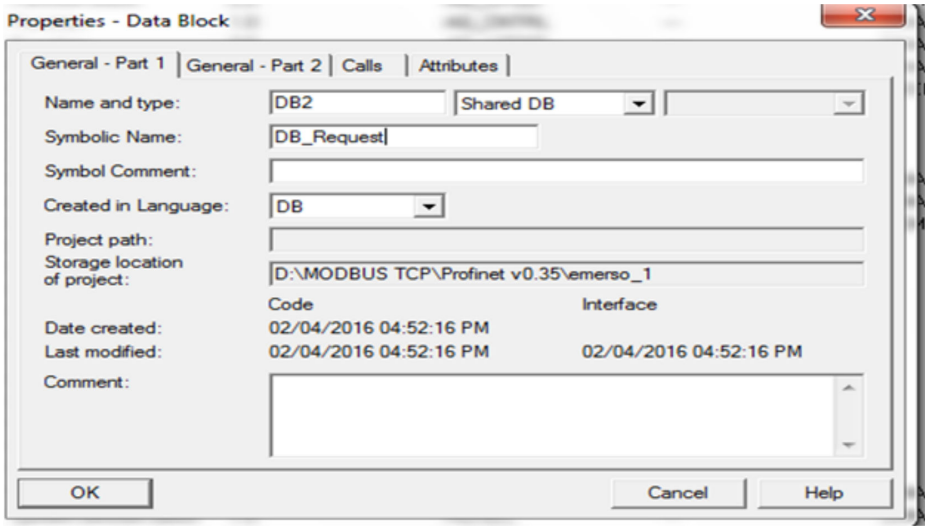
   a. From the SIMATIC Manager screen, select Insert > S7 Block > Data Block.

      Example:



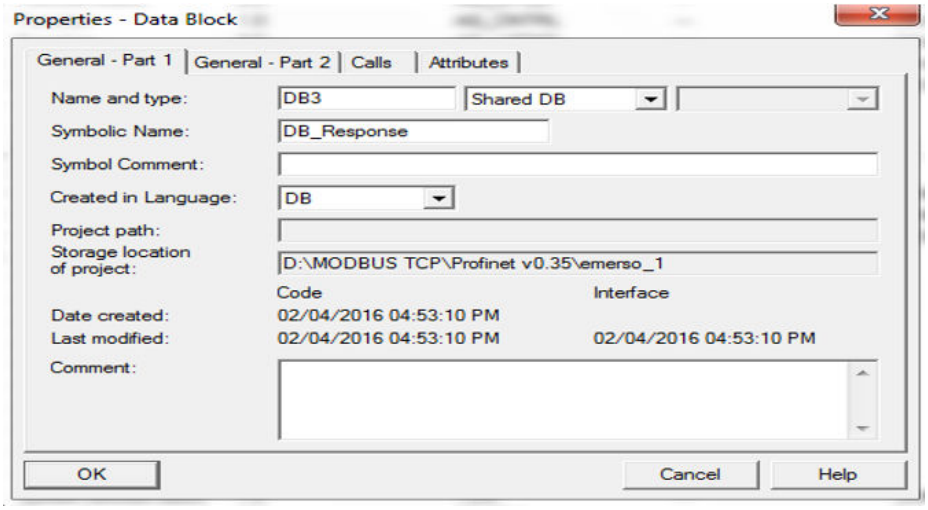
   b. From the Properties screen, enter the values as shown in the following example and select OK.

      Example:



      The first of two data blocks is created.

c. From the Properties screen, enter the values as shown in the following example and select OK.



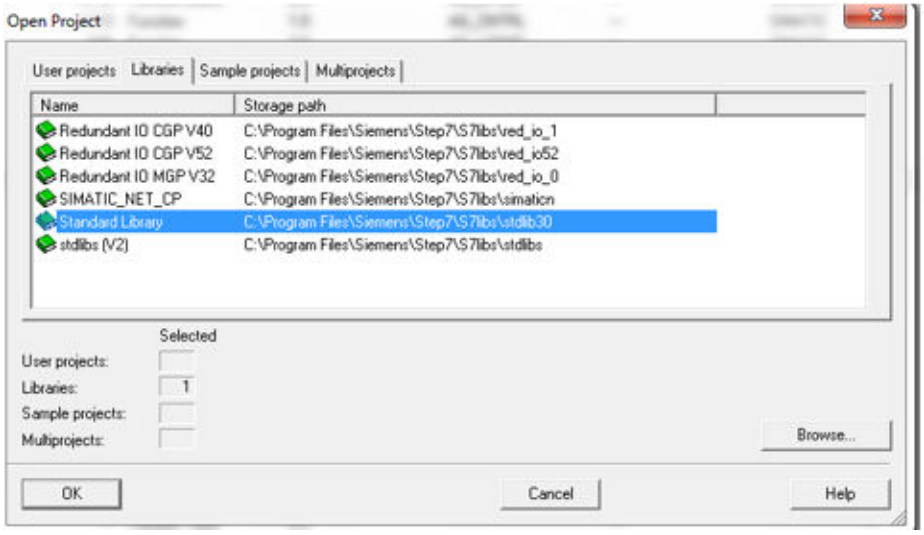
The second of two data blocks is created.

2. To copy the SFB52 and SFB53 data blocks to your project:

a. From the SIMATIC Manager screen, select File > Open and select the Library tab.

b. Select Standard Library and press OK.

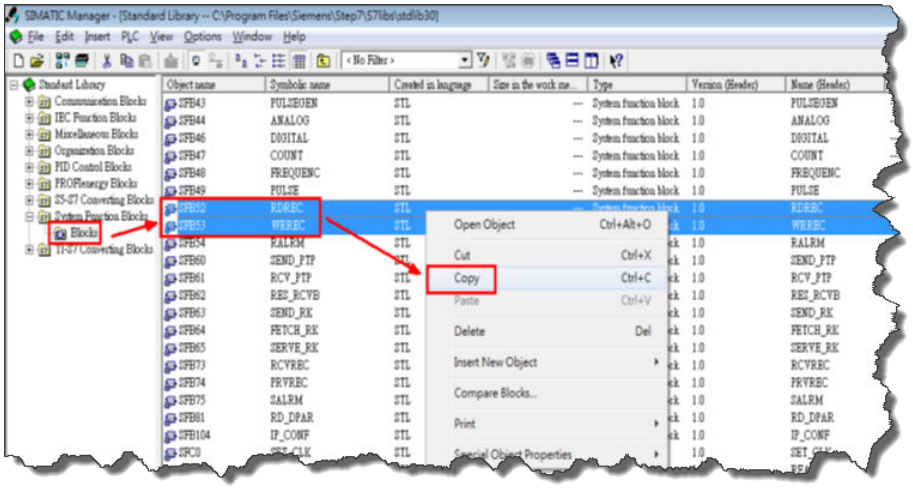
Example:



The pre-defined library opens.

c. From the Standard Library tree view, select System Function Blocks > Blocks.

d. From the right panel, select SFB52 and SFB53, and select Copy.



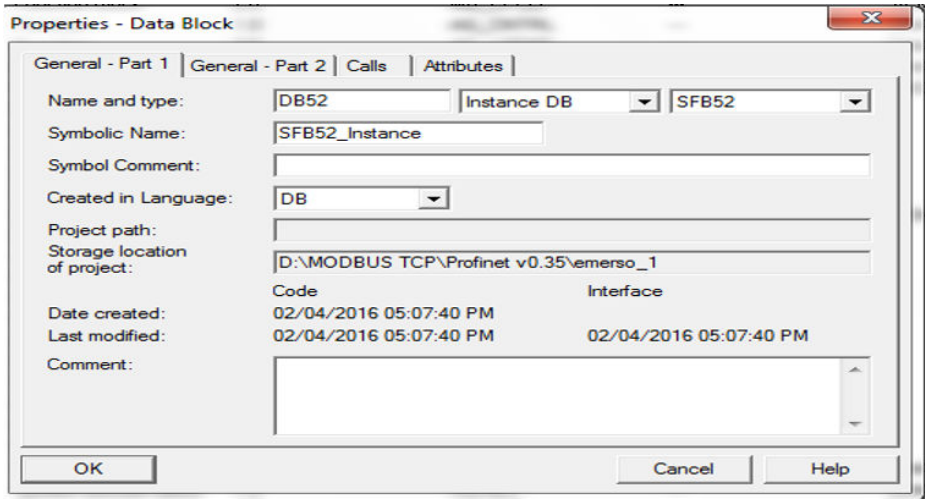
SFB52 and SFB53 are copied to your Projects folder under CPU > S7 Program > Blocks.

3. To add the SFB52 and SFB53 DB instances:

   a. To create the data blocks, choose Insert > S7 Block > Data Block.

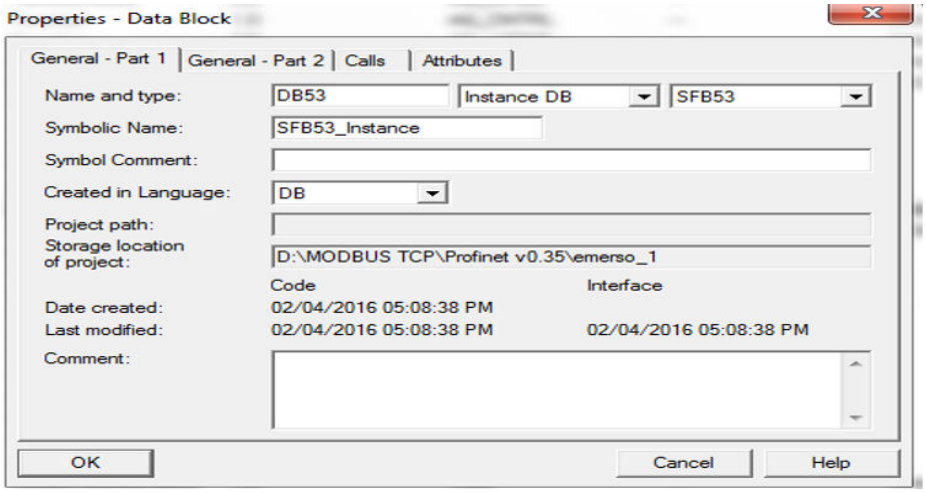
   b. Enter the values as shown in the following example and select OK.

   Example:

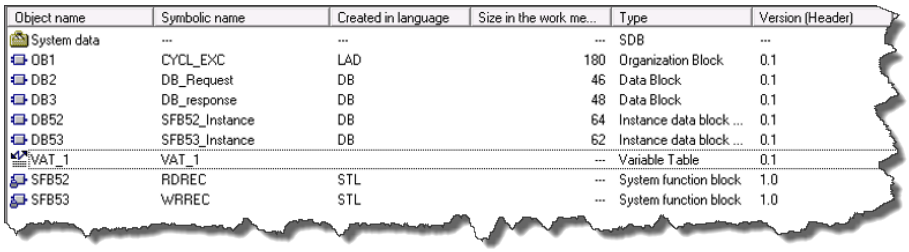


   The first of the two data block DB instances is added.

   c. Enter the values as shown in the following example and select OK.



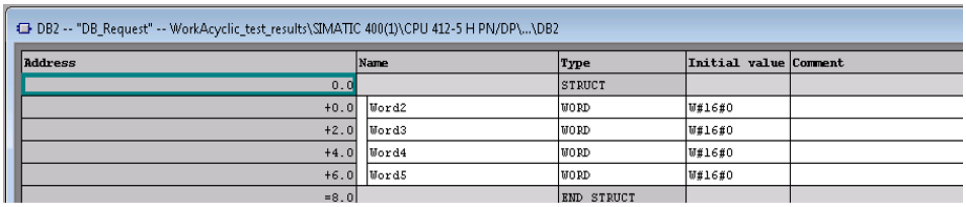
The second of the two data block DB instances is added. The SIMATIC Manager displays the entries.



Object name	Symbolic name	Created in language	Size in the work me...	Type	Version (Header)
System data	---	---	---	SDB	---
OB1	CYCL_EXC	LAD	180	Organization Block	0.1
DB2	DB_Request	DB	46	Data Block	0.1
DB3	DB_response	DB	48	Data Block	0.1
DB52	SFB52_Instance	DB	64	Instance data block ...	0.1
DB53	SFB53_Instance	DB	62	Instance data block ...	0.1
VAT_1	VAT_1		---	Variable Table	0.1
SFB52	RDREC	STL	---	System function block	1.0
SFB53	WRREC	STL	---	System function block	1.0

4. To configure the DB2 Request data block, double-click DB2 Request and enter the values as shown in the following example.

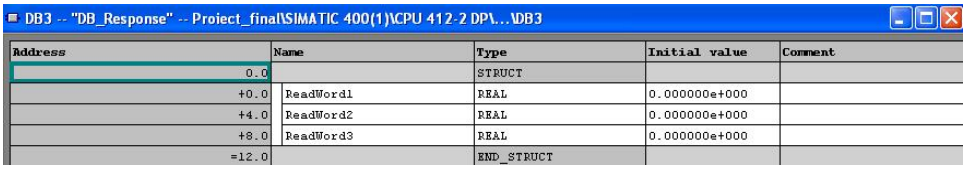
   Example:



Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	Word2	WORD	W#16#0	
+2.0	Word3	WORD	W#16#0	
+4.0	Word4	WORD	W#16#0	
+6.0	Word5	WORD	W#16#0	
=8.0		END_STRUCT		

5. To configure the DB3 Response data block, double-click DB3 Response and enter the values as shown in the following example.

   Example:

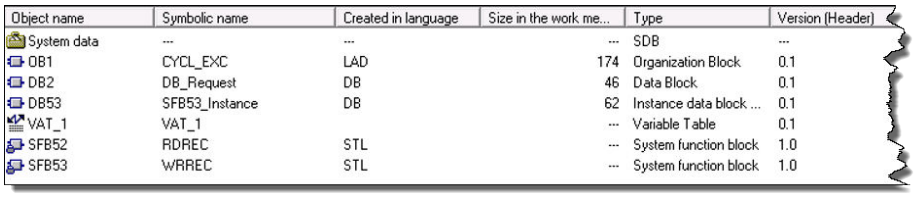


Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	ReadWord1	REAL	0.000000e+000	
+4.0	ReadWord2	REAL	0.000000e+000	
+8.0	ReadWord3	REAL	0.000000e+000	
=12.0		END_STRUCT		

6. To program acyclic read:

a. Double-click OB1.

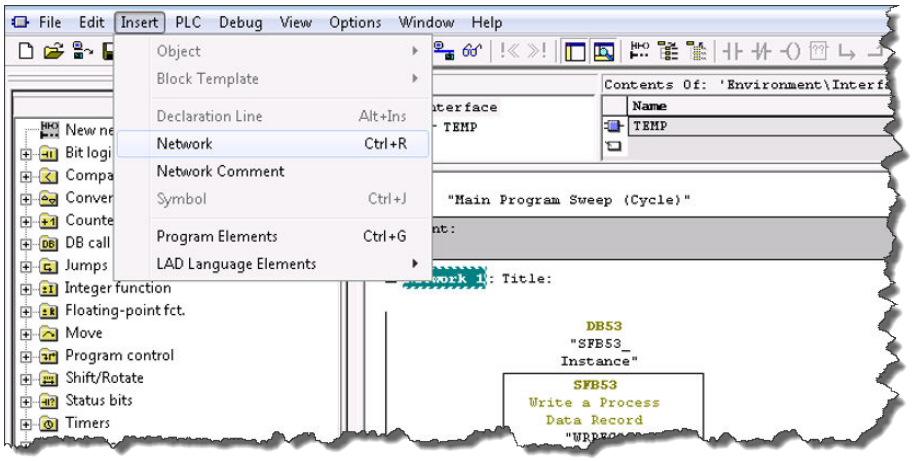
Example:



Object name	Symbolic name	Created in language	Size in the work me...	Type	Version (Header)
System data	---	---	---	SDB	---
OB1	CYCL_EXC	LAD	174	Organization Block	0.1
DB2	DB_Request	DB	46	Data Block	0.1
DB53	SFB53_Instance	DB	62	Instance data block ...	0.1
VAT_1	VAT_1		---	Variable Table	0.1
SFB52	RDREC	STL	---	System function block	1.0
SFB53	WRREC	STL	---	System function block	1.0

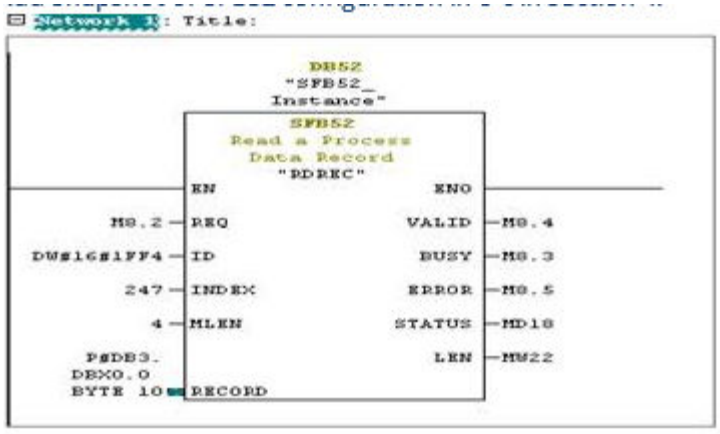
b. Choose Insert > Network.

Example:



c. To configure the input and output parameters, from SFB blocks, drag SFB52 to Network.

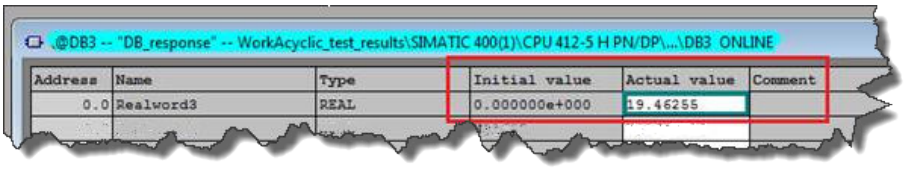
Example:



Parameter	Description
REQ	The Read request is sent to the Model 5700 using bit memory M8.2. You have the following options: • 1 (true) starts the read request. You must end the request. • 0 (false) ends the request. Reset Bit logic is used to reset M8.2.
VALID	Bit memory M8.4 indicates whether a new data record was received and valid.
BUSY	Bit memory M8.3 indicates whether the read process has terminated or not.
ERROR	Bit memory M8.5 indicates whether an error has occurred while processing the function.
STATUS	The double-word bit memory MD18 contains an error code. For error descriptions, see *Help on system functions / function blocks*.
ID	Displays the PN-IO diagnostic address (for example, "8180" = 1FF4 hex). This address is used for PROFINET acyclic read/write to the Model 5700E station to perform pre-defined diagnoses.
INDEX	Displays the data record number (247 – starting Modbus register for mass flow). For the Model 5700, the starting address is 1.
MLEN	The maximum length in bytes of data record information to be fetched.
RECORD	The destination area for the read data record. For DB3 in this example, the starting address is 0 and the address length is two bytes.

d. Read the acyclic parameters displayed in the Actual value field.

Example:



7. To program acyclic write, choose S7 Program > Blocks and double-click OB1.

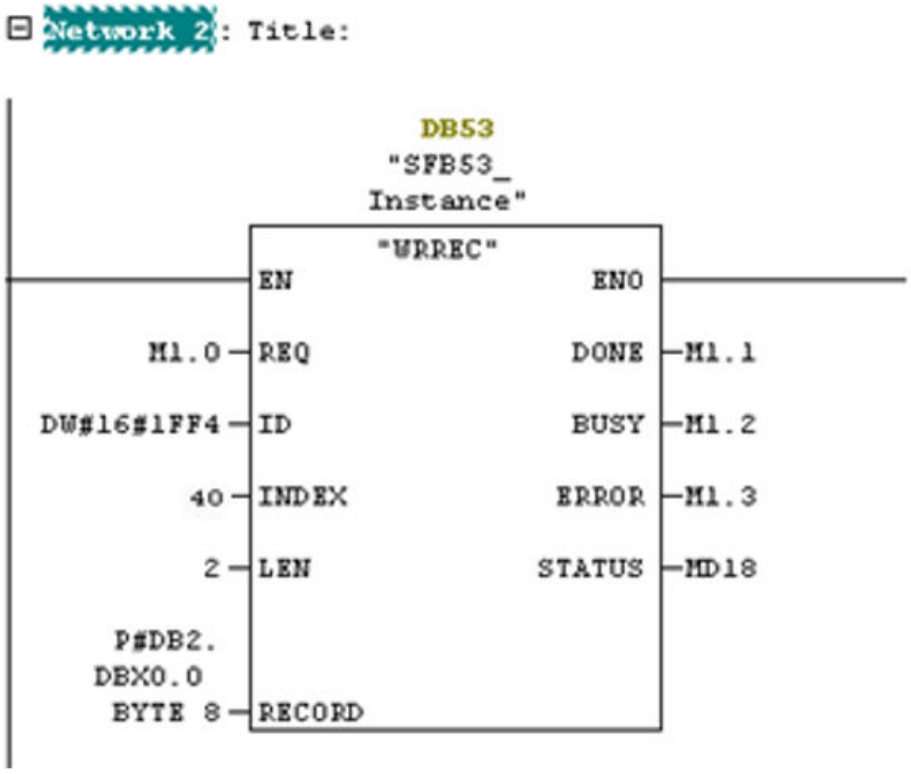
The OB1 block is a Program Cycle Organization Block. The S7 CPU operating system executes OB1 periodically. When OB1 has been executed, the operating system restarts it. Cyclic execution of OB1 is started after the start-up has been completed.

a. To edit the program, select OB1.

b. Choose Insert > Network.

c. From SFB blocks, drag SFB53 to Network and and configure the input and output as shown in the following example.

Example:



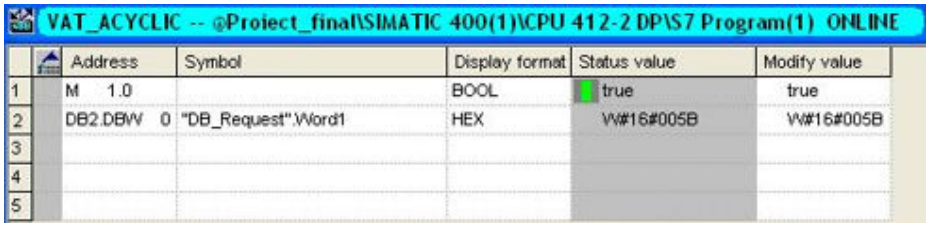
8. To create a variable table:

   Use the variable table to modify and monitor the connected PLC variables and memory content.

   a. From the SIMATIC Manager screen, choose Insert > S7 Block > Variable Table.

   b. Enter the values as shown in the following examples and save your changes.

      Example:



	Address	Symbol	Display format	Status value	Modify value
1	M 1.0		BOOL	true	true
2	DB2.DBW 0	"DB_Request".Word1	HEX	W#16#005B	W#16#005B
3					
4					
5					

      The write request is sent to the Model 5700 using bit memory M1.0.

   c. To start the read request, enter 1 (true) in the Modify value field, right-click, and press Modify.

   d. To end the request, enter 0 (false) in the Modify value field, right-click, and press Modify.

9. To download a project to PLC:

a. From the SIMATIC Manager screen, select the Download to Module icon.

   The configuration is downloaded to your CPU.

b. After the project downloads, open the vat table and make the corresponding M 1.0, 8.2 bits high for read and read/write.

   The read request is sent to the Model 5700 using bit memory M8.2. The write request is sent to the Model 5700 using bit memory M1.0.

c. Go online to read and write acyclic data into the Model 5700 device module.

Appendix A
Input and output slots

Topics covered in this appendix:

A.1 Input slots

Empty

Use the Empty Input slot when no input data is required. Typically for a Model 5700 Ethernet mass flow meter, the Empty Input slot is unused because this meter is a measuring device.

Table A-1: Common input data

Assembly Dword index	Name		Data type
0	Mass Flow		REAL
1	Temperature		REAL
2	Density		REAL
3	Drive Gain		REAL
4	Totalizer 1 (default = Mass Total)		REAL
5	Inventory 1 (default = Mass Inventory)		REAL
6	Status		DWORD
	Severity	• Bit #0 = Immediate Failure • Bit #1 = Last Measure Value Failure • Bit #2 = Function Check • Bit #3 = Out of Specification • Bit #4 = Maintenance Required	
	Counter/Heartbeat (bits 16-32)	The PLC will display the counter/heartbeat as a signed INT, therefore the counter can be negative.	

Table A-1: Common input data *(continued)*

Assembly Dword index	Name		Data type
7	Alert detail	• Bit #0 = Electronics Failure • Bit #1 = Sensor Failed • Bit #2 = Configuration Error • Bit #3 = Core Low Power • Bit #4 = Security Breach • Bit #5 = Sensor-Transmitter	DWORD
	Communications error	• Bit #6 = Tube Not Full • Bit #7 = Extreme Primary Purpose Variable • Bit #8 = Reserved • Bit #9 = Flowmeter Initializing • Bit #10 = Function Check in Progress • Bit #11 = Sensor Being Simulated • Bit #12 = Output Fixed • Bit #13 = Drive Over Range • Bit #14 = Process Aberration • Bit #15 = Discrete Event X Active • Bit #16 = Output Saturated • Bit #17 = Function Check Failed • Bit #18 = Data Loss Possible	
8	Echo Output Data Discrete Actions		DWORD

Table A-2: Liquid volume flow

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9	Volume Flow	REAL
10	Totalizer 2 (default = Volume Total)	REAL
11	Inventory 2 (default = Volume Inventory)	REAL

Table A-3: Gas volume flow

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9	Gas Volume Flow	REAL
10	Totalizer 4 (default = Gas Volume Total)	REAL
11	Inventory 4 (default = Gas Volume Inventory)	REAL

Table A-4: API Referral

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9	Volume Flow	REAL
10	Totalizer 2 (default = Volume Total)	REAL
11	Inventory 2 (default = Volume Inventory)	REAL
12	Corrected Density	REAL
13	Corrected Vol Flow	REAL
14	Totalizer 3 (default = Corrected Vol Total)	REAL
15	Inventory 3 (default = Corrected Vol Inv)	REAL
16	Avg Density	REAL
17	Avg Temperature	REAL
18	CTL	REAL

Table A-5: Concentration Measurement

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9	Volume Flow	REAL
10	Totalizer 2 (default = Volume Total)	REAL
11	Inventory 2 (default = Volume Inventory)	REAL
12	Density at Reference	REAL
13	Std Vol Flow Rate	REAL
14	Totalizer 5 (default = Std Vol Total)	REAL
15	Inventory 5 (default = Std Vol Inv)	REAL

Table A-5: Concentration Measurement *(continued)*

Assembly Dword index	Name	Data type
16	Net Mass Flow Rate	REAL
17	Totalizer 6 (default = Net Mass Total)	REAL
18	Inventory 6 (default = Net Mass Inv)	REAL
19	Net Vol Flow Rate	REAL
20	Totalizer 7 (default = Net Vol Flow Total)	REAL
21	Inventory 7 (default = Net Vol Flow Inv)	REAL
22	Concentration	REAL
23	Density - Fixed SG Units	REAL
24	Density - Fixed Baume Units	REAL

Table A-6: Batcher

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-2*
9–11	Liquid Volume	
12	Batch Total	REAL
13	Overshoot Compensation Value (Reg 1457)	REAL
14	Batch Fill Time	REAL
15	Fill status and diagnostics • Bit #0 - Primary Fill in progress (reg 2495 bit 0) • Bit #1 - Primary AOC training (reg 2495 bit 9) • Bit #2 = Primary Valve (reg 2495 bit 5 • Bit #3 = Undefined • Bit #4 = Undefined • Bit #5 = Undefined • Bit #6 - Fill Start Not Okay (reg 2496 bit 0) • Bit #7 - AOC Flow Rate Too High (reg 2496 bit 1) • Bit #8 - Maximum Fill Time Exceeded (reg 2496 bit 2) • Bit #9 - Slug Flow (reg 2496 bit 3) • Bit #10 - Tube Not Full (reg 2496 bit 4) • Bit #11 - Drive Overrange (reg 2496 bit 5) • Bit #12 - Critical Sensor Failure (reg 2496 bit 6) • Bit #13 - Critical Transmitter Failure (reg 2496 bit 7) • Bit #14 - Density Out of Limits (reg 2496 bit 8) • Bit #15 - Temperature Out of Limits (reg 2496 bit 9) • Bit #16 - Bit #31 for future expansion	DWORD

Table A-7: Small input configurable data set

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9–16	8 configurable slots	REAL *8

Table A-8: Medium input configurable data set

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9–24	16 configurable slots	REAL *16

Table A-9: Large input configurable data set

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9–40	32 configurable slots	REAL *32

Table A-10: Advanced Phase Measurement (APM) – liquid

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9	Volume Flow	REAL
10	Totalizer 2 (default = Volume Total)	REAL
11	Inventory 2 = (default = Volume Inventory)	REAL
12	Gas Void Fraction	REAL
13	Contract Total 1	REAL
14	Contract Total 2	REAL
15	Contract Total 3	REAL
16	Contract Total 4	REAL
17	Net Oil Flow @ Line	REAL
18	Net Water Flow @ Line	REAL
19	Watercut @ Line	REAL

Table A-10: Advanced Phase Measurement (APM) – liquid *(continued)*

Assembly Dword index	Name	Data type
20	Net Oil Total @ Line	REAL
21	Net Water Total @ Line	REAL
22	Density Oil @ Line	REAL
23	Net Oil Flow @ Ref	REAL
24	Net Water Flow @ Ref	REAL
25	Watercut @ Ref	REAL
26	Net Oil Total @ Ref	REAL
27	Net Water Total @ Ref	REAL

Table A-11: Advanced Phase Measurement (APM) – gas volume

Assembly Dword index	Name	Data type
0–8	Mass Flow	See *Table A-1*
9	Gas Volume Flow	REAL
10	Totalizer 4 (default = Gas Volume Total)	REAL
11	Inventory 4 (default = Gas Volume Inventory)	REAL
12	Contract Total 1	REAL
13	Contract Total 2	REAL
14	Contract Total 3	REAL
15	Contract Total 4	REAL
16	Total time mist detected	DWORD
17	APM Status • Bit #0 – TMR Algorithm Active (reg 433 bit 12)(1) • Bit #1 – Bit #15 currently not defined • Bit #16 – Bit #31 for future expansion	DWORD

(1) Do not include the parenthesis in the label

A.2 Output slots

Empty

Use the Empty Input slot when no output data is required. No output data is a typical application and is the default.

Table A-12: Common output data — Discrete actions only

Assembly Dword index	Name	Data type
0	• Bit #0 – Start Sensor Zero (trigger start with a 1, no abort) • Bit #1 – Reset All Process Totals (same as setting bits 2-8)v • Bit #2 – Reset Totalizer 1 (Mass Total by default) • Bit #3 – Reset Totalizer 2 (Volume Total by default) • Bit #4 – Reset Totalizer 3 (PM Ref Vol Total by default) • Bit #5 – Reset Totalizer 4 (GSV Total by default) • Bit #6 – Reset Totalizer 5 (CM Ref Vol Total by default) • Bit #7 – Reset Totalizer 6 (CM Net Mass Total by default) • Bit #8 – Reset Totalizer 7 (CM Net Vol Total by default) • Bit #9 – Start All Totals (trigger start with a 1) • Bit #10 – Stop All Totals (trigger stop with a 1) If both start and stop =1, then totals are stopped • Bit #11 – Start Smart Meter Verification (Continue Measuring Mode only) Trigger start with a 1, no abort • Bit #12 – Reset all Inventory Totals • Bit #13 – Not applicable	DWORD

Table A-13: External process data

Assembly Dword index	Name	Data type
0	Common output data (instance 150 data)	See *Table A-12*
1	External Pressure	REAL
2	External Temperature	REAL

Table A-14: Batcher

Assembly Dword index	Name	Data type
0	Common output data (instance 150 data)	See *Table A-12*
1	Batch Target	REAL

Table A-14: Batcher *(continued)*

Assembly Dword index	Name	Data type
2	Batcher Control – Discrete Actions • Bit #0 – Reserved • Bit #1 – Start Fill • Bit #2 – End Fill • Bit #2 – Pause Fill • Bit #4 – Resume Fill • Bit #5 – Reserved • Bit #6 – Start Training • Bit #7 – Save AOC Calibration • Bit #8 – Bit #31 for future expansion	DWORD
3	Maximum Batch Time (Reg 1305)	REAL

Table A-15: Batcher and external process data

Assembly Dword index	Name	Data type
0–2	External process data (instance 151 data)	See *Table A-12*
3	Batch Target	REAL
4	Batcher Control – Discrete Actions • Bit #0 – Reserved • Bit #1 – Start Fill • Bit #2 – End Fill • Bit #2 – Pause Fill • Bit #4 – Resume Fill • Bit #5 – Reserved (for Clean in Place) • Bit #6 – Start Training • Bit #7 – Save AOC Calibration • Bit #8 – Bit #31 for future expansion	DWORD
5	Maximum Batch Time (Reg 1305)	REAL

Table A-16: Output configurable data

Assembly Dword index	Name	Data type
0	Common output data (instance 150 data)	See *Table A-12*
1	Configurable Slot 1 (Register)	REAL
2	Configurable Slot 2 (Register)	REAL
3	Configurable Slot 3 (Register)	REAL

Table A-16: Output configurable data *(continued)*

Assembly Dword index	Name	Data type
4	Configurable Slot 4 (Register)	REAL
5	Configurable Slot 5 (Register)	WORD
6	Configurable Slot 6 (Register)	WORD
7	Configurable Slot 7 (Register)	WORD
8	Configurable Slot 8 (Register)	WORD
9	Configurable Slot 9 (Coil)	BOOL
10	Configurable Slot 10 (Coil)	BOOL
11	Configurable Slot 11 (Coil)	BOOL
12	Configurable Slot 12 (Coil)	BOOL

Table A-17: Advanced Phase Measurement (APM)

Assembly Dword index	Name	Data type
0	Common output data (instance 150 data)	See *Table A-12*
1	External Pressure	REAL
2	External Temperature	REAL
3	External Water Cut	REAL

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