



People for Process Automation

Version 1.00.00

Integration Tutorial ME01

Mitsubishi Electric MELSEC System Q and PROFIBUS for Water & Wastewater Industry







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1 Document Information

1.1 Purpose and Scope

This document provides a step by step description on how to integrate Endress+Hauser PROFIBUS devices with the Mitsubishi Electric MELSEC Q System. All content of this document is jointly developed, reviewed and approved by Mitsubishi Electric and Endress+Hauser as a common deliverable of Open Integration.

1.2 Document History

This is version 1.00.00 of this document. Version history:

Version	Released	Description
1.00.00	2015-03	Initial version

1.3 Related Documents

Please refer to related documents as listed below:

Document	Description
SD01431S/04/EN/02.15	Reference Topology ME01
SD01433S/04/EN/02.15	Integration Test Summary ME01
SD01434S/04/EN/02.15	List of Tested Devices and Versions ME01

2 Pre-Requisites

Readers of this document should be familiar with related documents as listed in chapter 1.3 and basics on how to work with the Mitsubishi MELSEC Q System and PROFIBUS in general. Please refer to recommended literature as listed in chapter 2.1.

2.1 Recommended Literature

2.1.1 Mitsubishi Electric

Document	Description
sh080483eng	QCPU User's Manual (Hardware Design)
sh080782eng	MELSEC Q Structured Programming Manual
sh080788eng	GX Works2 Beginners Manual





2.1.2 Endress+Hauser

Document	Description
BA00065S	FieldCare Project Tutorial
BA00070S	Fieldgate SFG500 Installation and Commissioning

2.1.3 Other

2.1.3.1 Pepperl+Fuchs

Document	Description
tdoct0835g_eng.pdf	POWERHUB Segment Coupler Manual

2.2 Operable Control System

This document assumes an operable Mitsubishi MELSEC Q System as defined by Reference Topology ME01. Please refer to the manuals listed in chapter 2.1.1 for an explanation on how to use hard- and software provided by Mitsubishi Electric.

2.3 Operable Asset Management System

This document assumes an operable Endress+Hauser PAM System as defined by Reference Topology ME01. Please refer to manuals listed in chapter 2.1.2 for installing of hardware and software provided by Endress+Hauser.

2.4 Operable Field Network Infrastructure

This document assumes an operable PROFIBUS DP / PA field network infrastructure as defined by Reference Topology ME01. Please refer to manuals listed in chapter 2.1.3 for installing of hardware and software provided by other parties.

2.5 Operable Field Devices

This document assumes an operable selection of Endress+Hauser PROFIBUS DP and PROFIBUS PA devices connected via the field network infrastructure, as defined by Reference Topology ME01. Each field device is adequately powered and prepared with unique tag and PROFIBUS address. If required, please refer to individual device manuals for further advice.







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3 Basic Integration

This chapter describes the main workflow for integration of a PROFIBUS network and field devices into the Mitsubishi Electric Melsec Q system by means of GSD. As a result, the cyclic PROFIBUS communication is running and process values with status information are available within the control strategy of the system for further processing.

3.1 System Configuration

3.1.1 New project

• Start the software GX Works.



• Create a new project with the menu "<u>P</u>roject \rightarrow <u>N</u>ew".



• Configure the controller and the programming language.

<u>S</u> eries:	QCPU (Q mode)
<u>T</u> ype:	Q03UDE 💌
Project Type:	Structured Project
anguage.	Use Label



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• Save the project with the menu "Project \rightarrow SaveAs".

<u>P</u> roject		<u>E</u> dit	<u>Find/Replace</u>	<u>C</u> ompile	<u>V</u> iew		
	<u>N</u> ev	w		Ctrl+N			
B	<u>O</u> p	en		Ctrl+O			
	<u>C</u> lo	se		-			
P	<u>S</u> av	e		Ctrl+	s		
	Sav	e <u>A</u> s					

• Fulfill all required fields (Save Location/Workspace Name/Project Name/Title) and click on the button "Save".

Save As	×
Save Location:	
D:\OpenIntegration\	Browse
Workspace/Project List:	
Workspace	
	Luca .
Workspace Name:	MEDI
Project Name:	ME01
<u>T</u> itle:	Open Integration Mitsubishi / Endress + Hauser
	Save
Save as a Single File Format	t Proje <u>c</u> t MELSOFT Navigator does not support this format.

3.1.2 PLC Parameters

• In the project view, double-click on the menu "Parameter \rightarrow PLC Parameter".







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3.1.2.1 PLC Name

• Select the tab "PLC Name", and then configure the field "Label" and optionally the field "Comment".

Q Parameter	Setting										×
PLC Name	PLC System	PLC File	PLC RAS	Boot File	Program	SFC	Device	I/O Assignment	Multiple CPU Setting	Built-in Ethernet Port Setting	1
Label	Q_ME01										
Commer	nt										

3.1.2.2 PLC IP address

- Select the tab "Built-in Ethernet Port Setting".
 - Configure the menu "IP address setting" according to the connected network.
 In this example:
 - The PLC IP address is <u>10.126.104.250</u>
 - The Subnet Mask is <u>255.255.252.0</u>
 - The default Router IP address is <u>10.126.104.1</u>
 - Select the checkbox "Enable online change (FTP, MC Protocol)".

Q Parameter Setting
PLC Name PLC System PLC File PLC RAS Boot File Program SFC Device I/O Assignment Multiple CPU Setting Built-in Ethernet Port Setting
TP Address Setting
Open Setting
Input Format DEC
IP Address 10 126 104 250
Time Setting
Subnet Mask Pattern 255 255 252 0
Defeuls Device ID Address 10 13cl 10d 1
Communication Data Code
Binary Code
C ASCII Code
✓ Enable online change (FTP, MC Protocol)
) Disable direct connection to MELSUP1
Do not respond to search for CPU (Built-in Ethernet port) on network
IP packet transfer setting
IP packet transfer setting
Securitis needed (Default / Changed)
Print Window Print Window Preview Acknowledge XY Assignment Default Check End Cancel





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- Integration Tutorial ME01
 - Click on the button "Check".



3.1.2.3 PLC Hardware Configuration

The PLC slots have to be configured according to the physical setup of modules. In our example we configure this configuration:



• In the "Q Parameter Setting" window, select the tab "I/O Assignment".

Name	e PLC System PLC	C File PLC RAS Boot File	e	Program SFC Device I/O Assignment	Multiple CPU Se	tting	Built-in Ether	net F	Port Setting
./O A:	ssignment(*1)	Туре		Model Name	Points		Start VV		Switch Setting
0	PLC	PLC	Ŧ	Hoder Name	Points	Ŧ	Start XI	H.	
1	0(*-0)	Empty	Ŧ	Empty module	32Points	Ŧ	0000		Detailed Setting
2	1(*-1)		•			-		-	
3	2(*-2)		٠			-			Select PLC type
4	3(*-3)		٠			-			New Module
5	4(*-4)		Ŧ			•			Henriddae
6	5(*-5)		•			-			
7	6(*-6)		•			•		Ŧ	





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Slot 0: Select an empty module as a place holder for a CC Link IE Field module which may be added later:

- Enter the name "Empty module" for the "Model Name".
- As place holder for a CC-link IE Field card:
 - Configure 32Points
 - Enter the Start XY address 0000.
- **Slot I**: Configuration of a PROFIBUS-DP module
 - Click on the button "New Module".
 - Select the module Type "PROFIBUS-DP Module", then the module name "QJ71PB92V".
 - Enter a title in the field "Title", which will be indicated in the Project view.

New Module		×
Module Selection		
Module Type	PROFIBUS-DP Module	•
Module Name	QJ71PB92V 💌	
Mount Position — Base No.	✓ Mounted Slot No. 1 ▲ ↓ XY address 0020 (H) 1 Slot Occupy [32]	<u>A</u> cknowledge I/O Assignment points]
Title setting		
Title	Profibus master slot I/01	
		OK Cancel

- Click on the button "Acknowledge I/O Assignment".
 - Select the Slot 1 (Start XY Address 0020)
 - Click on the button "Setting".

D(*-0)	Empty	Employment			
- Cale		Empty module	32	0000	Г
1(*-1)				0020	
2(*-2)				0030	
3(*-3)				0040	
4(*-4)				0050	
5(*-5)				0060	
5(*-6)				0070	
7(*-7)				0080	
3(*-8)				0090	

- Check settings in the "Mount Position" part:
 - Mounted Slot No. : 1
 - Start XY address : 0020
- Click on the button "OK".





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• Overview of the configuration:

Name	PLC System PLC	C File PLC RAS Boot F	ile	Program SFC Device I/O Assignmen	t Multiple CPU	Setting	Built-in Ether	net P	ort Setting
I/O As	ssianment(*1)								
No.	Slot	Туре		Model Name	Points		Start XY		Switch Setting
0	PLC	PLC	Ŧ			•			
1	0(*-0)	Empty	•	Empty module	32Points	-	0000		Detailed Setting
2	1(*-1)	Intelligent	•	QJ71PB92V	32Points	-	0020		
3	2(*-2)		•			-			Select PLC type
4	3(*-3)		•			-			New Module
5	4(*-4)		٠			+			- New Piodule
6	5(*-5)		•			-		-	
7	6(*-6)		-			-		-	
				•	•				

• Click on the button "End" to close the window.

3.1.3 Connection Destination Configuration

There are two options to download the hardware configuration and the software in the PLC: via USB or Ethernet.

The first download will have to be done with the USB interface because of the IP addresses which are still not set in the PLC.

In this example, the PLC IP address is at first downloaded via USB. Then, it is the Ethernet connection which is used to download the other parts of the project configuration.

3.1.3.1 Connection via USB interface

- Connect the USB cable from the PLC USB port to the engineering station one.
- In the Navigation menu, click on the button "Connection Destination".







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- In the Connection Destination view:
 - Right-click on the connection "connection1" and select the field "Rename".

All Connections					
	Ľ	Add New Data			
		Set as Default Connection			
	Ep.	<u>С</u> ору			
		<u>D</u> elete			
		Rena <u>m</u> e			
		Sort +			
	6	P <u>r</u> operty			

• Enter the connection name "connection_USB".

Connection Destination
📑 🗈 🖏 🖻
Current Connection
Connection_USB

- Double-click on the "connection_USB" connection in order to open the "Transfer Setup" window.
- In the window "Transfer Setup connection_USB, double-click on the PC side I/F icon "Serial USB" text.



• Select the USB device and click on the button "OK".

PC side I/F Serial Setting	×
C RS-232C	ОК
• USB	Cancel

• Double-click on the PLC side I/F icon "PLC Module" text.



• Select the PLC Mode "QCPU (Q mode)" and click on the button "OK".

PLC side I/F De	×	
PLC Mode	QCPU (Q mode)	ОК
		Cancel





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• Double-click on the option text "No specification" in the menu "Other Station Setting" and click on the button "OK".



• Verify default settings

,	5	
Host Station Detailed S	etting	X
Check at Communication Time Retry Times	B0 sec. 0 Times	OK Cancel
 It is not possible to can It may take several min Maximum time is shown Communication time ch 	cel while communicati utes to display the con a as below. leck x 3 x (Retry count	on retrying. mmunication error. : + 1)

• Check the connection between PC and PLC by using the button "Connection Test".



• If successful, following message is displayed.



• Click on the button "OK".





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Transfer Setup connection_USB × Í PC side I/F 8 D NET(II) PLC CC IE Field Q Series Ethernet Serial USB CC-Link NET/10(H) Bus Board Board Board Board Board 4 F Board USB PLC side I/F ļ -R CC IE Cont CC-Link Ethemet CC IE Field <u>C24</u> GOT Head Module NET/10(H) Module Module Module Master/Local Module Module 4 F PLC Mode QCPU (Q mode) Other Station Setting Connection Channel List.. ത തി No Specification Other Station Other Station PLC Direct Coupled Setting (Single Network) (Co-existence Network) Connection Test Retry Times 0 Time Out (Sec.) 30 PLC Type Network Communication Route Detail CC IE Cont NET/10(H) CC IE Field CC-Link C24 Ethernet System Image... 4 F Phone Line Connection (C24)... Co-existence Network Route OK CC IE Cont NET/10(H) CC IE Field Ethernet CC-Link C24 Cancel 4 F Accessing Host Station Multiple CPU Setting Target System-Target PLC Target System Ŧ Not Specified 1 2 3 4

• This is the configured "Transfer Setup connection_USB" window.

• Click on the button "OK" to close the window "Transfer Setup connection_USB".



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3.1.3.2 IP settings configuration download via USB

Download the IP configuration in the PLC.
 →Refer to part **3.4.2** and **3.4.3** to proceed.

Notes :

- Just the part "PLC Module" is downloaded in this step.

3.1.3.3 Connection via Ethernet board

- Connect the Ethernet cable from the PLC port/HUB to the engineering network one.
- In the Navigation menu, click on the button "Connection Destination".
- Create a new connection configuration:
 - Right-click on the connection "connection_USB" and select the option "Add New Data".



• Enter the name of the new connection, ie "connection_Ethernet" and cross the checkbox "Set as Default Connection".

Add New Data	—
Data <u>N</u> ame	
connection_Ethernet	
Set as Default Connection	
0	K Cancel





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o The new connection is displayed in the fields "Current Connection" and "All Connections".

Connection Destination
📑 🗈 🔁 🖻
Current Connection
Connection_Ethernet
All Connections
connection_USB
Connection_Ethernet

- Double-click on the "connection_Ethernet" connection in order to open the "Transfer Setup" window.
- In the window "Transfer Setup connection_Ethernet", double-click on the PC side I/F icon "Ethernet Board" text.



- o MELSOFT Application message is displayed.
- Click on the button "Yes".



Double-click again on the PC side I/F icon "Ethernet Board" text.



• Verify that the TCP protocol is selected:

PC side I/F Ethernet Board Setting	— ×
Network No. 1	ОК
Station No. 1	Cancel
This setting is an assignment for Ethemet board. Please execute the following settings. Network No.: Network No. of Ethemet module set in par Station No.: Station No. that does not overlap on the sa	ameter. me loop.
Network No. and station No. are not necessary for commute	nunication
Communication with Ethemet port of CPU built-in Ethen Communication via GOT Transparent. Communication via IE Field Ethemet adapter.	net.
Protocol TCP -	

• Click on the button "OK".



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• Double-click on the PLC side icon "PLC Module" text.



- Select the PLC Mode "QCPU (Q mode)".
- Select the appropriate Ethernet connection: "Connection via HUB" in this example.
 - Click on the button "Find CPU (Built-in Ethernet port) on Network" to see the defined IP address.
 - Select the IP address <u>10.126.104.250</u> by clicking on the button "Selection IP address Input".

That is the defined PLC IP address in this example, which is defined in the Project view, menu "Parameters \rightarrow PLC parameters \rightarrow Built-in Ethernet Port Setting".

• Click on the button "OK" to close this window.

PLC side I/F Detailed Setting of PLC Module	×
PLC Mode QCPU (Q mode)	ок
C Ethemet Port Direct Connection	Connection via <u>H</u> UB Cancel
* Please select "Connection via HUB" when you use HUB even if the equipments to be communicated is one. The load hangs to the line when "Ethemet Port Direct Connection" is selected with other equipment connected w HUB and it communicates and there is thing that influences the communication of other equipment.	IP Address 10 126 104 250 ith IP Input Format DEC. ▼ C Host Name
IP address CPU Type Label	Comment
1 10.125.104.250 Q030DECPO Q_ME01	
Response Wait Time 2 sec.	w Only PLC Type of Project Selection IP Address Input
Finds CPU (Built in Ethemet port) on the same network. T - No response within a specific time period. - Connected via a router or subnet mask is different. - "Do not respond to search for CPU (Built-in Ethemet por	his cannot be performed when the following happens: t)" is checked in PLC parameter.





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• Double-click on the option text "No specification" in the menu "Other Station Setting".



• Verify default settings and click on the button "OK".

Host Station Detailed Se	tting	— ×-
Check at	30 sec	ОК
Retry Times	0 Time	es Cancel
 It is not possible to cance It may take several minud Maximum time is shown a Communication time che 	el while commu tes to display th as below. ck x 3 x (Retry o	nication retrying. e communication error. count + 1)

• Check the connection between PC and PLC by using the button "Connection <u>Test</u>".



- If successful, following message is displayed.
- Click on the button "OK".





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Transfer Setup	rr			×
PC side I/F	Serial CC IE Cont USB NET/10(H) Board Board	Ethemet <u>CC</u> Board	LE Field Board Q Series Bus	NET(II) PLC Board Board
	Network	No Station N	lo Protocol TCP	
PLC side I/F	PLC CC IE Cont CC-Link Module NET/10(H) Module	Ethemet Module	C24 <u>GOT</u>	CC IE Field Head Module Master/Local Module
	IP Address / Host Name 10.126.104.250		PLC	C Mode QCPU (Q mode)
Other Station		_		Connection Channel List
Setting	No Specification (Single Network)	<u>Other Statio</u> (Co-existence)	<u>n</u> ce Network)	PLC Direct Coupled Setting
	Time Out (Sec.) 30 Retry Times	0		Connection <u>T</u> est
Network Communication Route	CC IE Cont CC IE Field Ethemet	CC-Link	C24	PLC Type Detail
	NET/10(H)		< •	System Image
				Phone Line Connection (C24)
Co-existence Network				ок
Noute	CC IE Cont CC IE Field Ethemet NET/10(H)	CC-Link	C24	Cancel
	Accessing Host Station			
Target System	Multiple CPU Setting Target PLC 1 2 3 4 Target PLC	Target System		

• This is the configured "Transfer Setup connection_Ethernet" window.

• Click on the button "OK" to close the window "Transfer Setup connection_Ethernet".



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3.2 Field Network Configuration

In this part it is explained how to configure the PROFIBUS master interface and how to import a GSD file in the GSD database.

The following example is based on an Endress+Hauser Promag 400 DP flowmeter. The principle is the same for all other devices.

• In the Project view, double-click on the PROFIBUS module menu "0020:QJ71PB92V→Parameter".



• The tab 0020:QJ71PB92V is opened:







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3.2.1 PROFIBUS DP master configuration

• Select the menu "PROFIBUS Configurator Tasks → Setup Tasks → Master Settings...".

Setup Tasks	
Master Settings	
👔 GSD Device Database	
🦻 I/O Mapper	

- In the window "Master Parameters Wizard-Master Settings":
 - Set the Baud rate to 500 kbps(specific for this example).
 - Available Baud rates: 9.6k/19.2k/93.75k/187.5k/500k/1.5M/3M/6M/12M.
 - Set the FDL address to 1 (specific for this example).
 - Select the parameter "Slave watchdog" and "Calculated time".
 - The watchdog time can be configured manually if needed. Unselect the parameter "Calculated time" and indicate the value in the corresponding field.
 - Click on the button "Bus Parameters":
 - The window "Bus Parameter Settings" is displayed.
 - All timing parameters are calculated automatically according to the configured devices.
 - Click on the button "OK".
 - Click on the button "Next".

Master Parameters Wizard - Master Settings		23	Bus Parameter Settings			
			Bus Parameters for 500 Kbp			
			<u>S</u> lot Time (T_sl)	200 [37 - 16383]	0.400000	ms
Name	PROFIBUS Master		<u>m</u> in T_sdr	11 [11 - 1023]	0.022000	ms
Baudrate	500 Kbps Bus Parameters		ma <u>x</u> T_sdr	100 [37 - 1023]	0.200000	— ms
FDL address	1 [0 - 125]		Quiet Time (T_qui)	0 [0 · 127]	0.000000	— ms
Starting I/O number			Setup Time (T_set)	1 [1 - 255]	0.002000	ms
Min slave interval	71 [1 - 65535] * 100 us		Target <u>R</u> ot. Time (T_tr)	3550 [256 - 16777215]	7.100000	ms
Use 'Min. slave interval' for 'Target Token Rot	ation Time (T tr)'		GAP factor	10 [1 - 100]		
Polling timeout	50 [1 - 65535] * 1 ms		<u>H</u> SA	126 [2 - 126]		
			Max retry limit	1 [1 - 7]		
Slave watchdog	4 [1 - 65025] * 10 ms			OK Cancel	D <u>e</u> fau	ult
Estimated bus cycle time	7.074 ms					
Watchdog for time sync.	0 [0 - 65535] * 10 ms	1				
Count 1	all Naut Default	_				
		1				





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• Check the following settings in the window "Master Parameters Wizard - CPU Device Access":

Buffer Devices		ing no ana ala	9.10010 001	
Slave Specific Transfer]	E d <u>i</u> t D	evices	
_	Input	D1000	to	D1000
3 Block <u>T</u> ransfer	Output	D2000	to	D2000
<u>C</u> omm. Trouble Area			to	
E <u>x</u> td. Comm. Trouble Are	a		to	
Sl <u>a</u> ve Status Area			to	
Data Transfer between CPL D C <u>o</u> py Instructions	and master module using Auto <u>R</u> efresh		Consisten	cy
PLC code options Data transfer only Contents of user library: start	C User <u>v</u> ariables of data transfer, global var	(• iables for all DL	All D <u>U</u> Ts JTs	

- Select the option "Slave Specific Transfer".
- "AutoRefresh" and "Consistency" are selected.
- Input address is set to D1000.
- Output address is set to D2000.
- Click on the button "Finish".

Notes:

- The Baud rate has to correspond to this used by all slaves. If the Baud rate doesn't match with one slave, an error will be indicated but only during the compilation of the configuration.
- The settings "Bus Parameters "as watchdog or timing parameters depends on the complete PROFIBUS network configuration.





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3.2.2 GSD file

3.2.2.1 GSD file import

• Select the menu "PROFIBUS Configurator Tasks →Import Tasks→Add GSD File".

Ir	nport Tasks
	Import GX Configurator-DP Project
	Add GSD File
	Import GSD Database

• The browser is opened:

- Indicate the path of the stored GSD file EH3x1562 (specific to the Promag 400 DP device).
- Confirm the import request by clicking on the button "Yes".

MELSOFT GX Configurator-I	OP	23
Add GSD file 'EH	3x1562.GSD' to databa	se?
[Yes N	<u>l</u> o

• If successfully imported, following message is displayed:



The GSD file is now imported in the "Global GSD database" (orange tab).



Project GSD data Global GSD data

Notes:

- The GSD file is imported automatically in the "Project GSD database" when a new slave is added in the PROFIBUS network.





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3.2.2.2 GSD revision installation

The GSD database allows the installation of multiple GSD files revisions but the model name will have to be changed.

- Import the GSD revision file following the same steps as in part "GSD File import".
- The GSD file is not imported but following window is displayed:

onision of Device	103	
The device with ide	ent no. 1562, model name 'Promag 400 DP' and revision	
Plazas aithar calac	+ 'Daplaca' ar change revision ar model name	
Please either selec	t Replace or change revision or model name	
n order to provide	unique identification of the device.	
in order to provide	unique identification of the device.	
in order to provide Revision	Profile 3.02	
in order to provide Revision Model Name	Profile 3.02 Promag 400 DP Rev1	

Change the field "Model Name".
 For example, give the Model Name "Promag 400 Rev1" and click on the button "OK".

• The GSD file is imported in the GSD Database.



3.2.2.3 GSD slave family structure

- The imported device is symbolized with a bitmap in the "Global GSD database".
 - o Select the tab "Global GSD database".
 - o Right-click and select the field "Properties".

PA	
	Add Slave to Project
Project GSD data Global GSD data	Add <u>G</u> SD File <u>I</u> mport GSD Database
	Prop <u>e</u> rties
	Remove <u>T</u> ype





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romag 400 DP	
Vendor	Endress +Hauser
Revision	Profile 3.02
Ident-No. (hex)	0X1562
GSD-/DDB-File	EH3x1562.GSD
Bitmap	
• Normal	
C Diagnostics	-
C Special Function	
Replace Bitmap	
Bitmap-File	1562_N
Slave <u>F</u> amily P	A
-Set Byte Order for	Sateway
C Low byte first	dentsystem
🕂 High byte first (t	PA Big Endean //votoroia)

- Select the bitmap case (Normal/Diagnostics/Special Functions) that need to be changed and click on the button "<u>Replace Bitmap</u>" to look for the appropriate bitmap.
- Click on the button "OK" to close the window.

Notes:

- The bitmap change can only be done in the "Global GSD database".

3.2.3 Field Devices Configuration

- In the menu "Global GSD data", select the Promag 400 DP device in the GSD database.
- Drag and drop it in the "PROFIBUS Network" window".

PROFIBUS Network	Global GSD data
	PA
Add slaves via Drag&Drop from GSD device tree	Promag 400 DP
	Project GSD data Global GSD data

• The slave configuration window is immediately displayed.





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In the "Slave Properties" menu:

- Specify:
 - The name of the slave: PROMAG 400 DP (specific for this example). •
 - The FDL Address : 45 (specific for this example).
 - The parameter "min T sdr" is automatically imported.
- Verify that the checkbox "Slave is active" is crossed. 0
- Click on the button "Next". 0

Model Proma	g 400 DP		Revision	
Vendor Endres	ss+Hauser		Profile 3.02	
Slave Properties				
N <u>a</u> me		Promag	400 DP	
FDL Address		45	[0 - 125]	
<u>m</u> in T_sdr		11	[1 - 255]	
Group identification nu	mber	Grp <u>1</u> Grp <u>2</u> Grp <u>5</u> Grp <u>6</u>	Grp <u>3</u> Grp <u>4</u> Grp <u>7</u> Grp <u>8</u>	
Slave is active		Sync (Output)	Freeze (Input)	
Ignore AutoClear		Initialize slave whe	n failing to respond	
Swap I/O Bytes in	Master			

- The next window shows a configuration example of the module(s). Drag and drop following • modules from the left to the right window:
 - 1 analog input module in slot 1. 0
 - 6 empty modules in slots 2,3,4,5,6,7. 0
 - 1 analog output module in slot 8. 0
 - 1 digital input module in slot 9. 0
 - 1 empty module in slot 10. 0
 - 1 digital output module in slot 11. 0
 - 1 empty module in slot 12. 0
 - Click on the button "Next". 0



Endress+Hauser

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2 Modules installed 12 are possible D usage 7 / 7 byte(s)	Max. Data size Max. I/O sizes	54 byt 39 /	te(s) 15 byte(s)	
Slave User Parameters vailable Slave Modules	Proje	ct Slave Modul	les	× + :
📼 🚥 🛔 Promag 400 DP		😭 45:	Promag 400 DP	
EMPTY_MODULE		1	AI : OUT (Analog Input)	
Al : OUT (Analog Input)		1	EMPTY_MODULE	
🧃 TOTAL		1	EMPTY_MODULE	
SETTOT_TOTAL			EMPTY_MODULE	
SETTOT_MODETOT_TOTAL			EMPTY_MODULE	
AO : SP (Analog Output)			EARTY_MODULE	
DI : OUT (Digital Input)			EMPTY_MODULE	
DO : SP (Digital Output)			AO : SP (Analog Output)	
-			DI : OUT (Digital Input)	
			EMPTY_MODULE	
			DO : SP (Digital Output)	
		í	EMPTY_MODULE	
		-	*	

- The window "Slave User Parameters" is displayed:
 - Select the field "global" (specific for this device).
 - Click on the button "Next".

ilave Parameters Wi	ard - Slave User Parameters	

- The window "DPV1/V2 Slave Parameters" is displayed:
 - The checkbox "DP V1 support <u>enabled</u>" is crossed.
 - Click on the button "Finish".

	Alams
DP V1 support enabled	🔲 Update Alarm
'Fajl Safe' function enabled	Status Alarm
Sla <u>v</u> e-specific check of cfg_data	Manufacturer Specific Alarm
	🔲 Diagnostic Alarm
	Erocess Alarm
	Pull/Plug Alarm





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• The following window is displayed. Click on the button "<u>N</u>o" (This step will be done after the variables declaration).



• The configured slave is now displayed in the PROFIBUS network.



• All configured slave settings can be updated. Right-click on the slave in the PROFIBUS network view and select the option "Slave Settings".

,	
PROFIBUS Network	
□ 1 I/O no.:0x20/FDL:1 'QJ71PB92V'	
🕂 FDL:45 'Promag 400 DP' (Promag 400 DP) [I/O size=7/7 byte	:(s)]
	<u>S</u> lave Settings
	Duplicate Slave
	<u>C</u> hange GSD Type
	<u>R</u> emove Slave





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Notes :

All information related to the module allocations and slot definitions are described in the GSD file.

```
Check the module number definition in the GSD file.
Module = "EMPTY_MODULE" 0x00
EndModule
Module = "AI : OUT (Analog Input)" 0x42,0x84,0x08,0x05
EndModule
Module = "TOTAL " 0x41,0x84,0x85
EndModule
Module = "SETTOT_TOTAL " 0xC1,0x80,0x84,0x85
EndModule
Module = "SETTOT_MODETOT_TOTAL " 0xC1,0x81,0x84,0x85
EndModule
Module = "AO : SP (Analog Output)" 0x82,0x84,0x08,0x05
EndModule
Module = "DI : OUT (Digital Input)" 0x91
EndModule
Module = "DO : SP (Digital Output)" 0xA1
EndModule
```

- Check the module allocation in the GSD file.



Notes:

- A wrong module allocation configuration will not be indicated.
- A wrong configuration can be downloaded in the PLC, but will not be accepted by the field device.







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3.3 Mapping of Process Values and Status to Control Strategy

This part describes how to implement the logic which handles PROFIBUS data.

3.3.1 Library import

All pre-defined functions are saved in libraries, which need at first to be installed into the project.

• In the Navigation menu, click on the button "User Library".



• Select the 1st shortcut in the user library and click on the menu "Install".



- Click on the button "Browse" to look for the library "Profibus_Endress_Hauser".
- Click on the button "OK".

Import Library to Project		×
Library File:		
C:\Users\testadmin\Desktop\Profibus_Endress	_Hauser.sul	Browse
Library <u>N</u> ame:		
Profibus_Endress_Hauser		
	OK	Cancel





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• Message is displayed when the library is installed.

MELSOFT Series GX Works2
The library has been installed.
ОК

- Select the 1st shortcut in the user library and click on the menu "Install".
 - Click on the button "Browse" to look for the library "QJ71PB92V_0020".
 - Click on the button "OK".

Import Library to Project		x
Library File:		
C:\Users\testadmin\Desktop\QJ71PB92V_002	0.sul	Browse
Library <u>N</u> ame:		
QJ71PB92V_0020		
	ОК	Cancel

• Message is displayed when the library is installed.



• Both libraries are now part of the project.









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3.3.2 Create a program

This part describes how to create a program, insert a function block and assign the corresponding variables.

This example describes four function blocks used in the communication between PLC and device:

- Function block reading an analog input called "DP_to_Float_with_Status".
- Function block reading a digital input called "DP_to_Inputs_1xbyte_Stat_1xbyte".
- Function writing an analog output called "Float_to_DP".
- Function writing a digital output called "Outputs_1xbyte_Stat_1xbyte_to_DP".

3.3.2.1 Reading functions

3.3.2.1.1 POU Configuration

• In the Project view, expand the "POU" part.



• Right-click on the program "POU_1" and select the menu "Rename"





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• Enter the new program name "DP_comRead".



Notes:

- The new configuration is written in red because it still has not been compiled.

3.3.2.1.2 Program Setting Configuration

• Expand the menu "Program Setting→No Execution Type".



• Right-click on the task "Task_01" and select the menu "Rename".



• Enter the new name "DP_Task".







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• In the project view, double-click on the menu "Parameter \rightarrow PLC Parameter".

Project
📑 🗈 🕲 🕽 🖌
🖃 🛃 Parameter
🗄 🚯 Network Parameter
CC-Link
Remote Password

- In the "Q Parameter Setting" window, open the tab "Program".
 - o Select the program "MAIN" and click on the button "Insert".
 - Select "Scan" in the field "Execute Type".
 - Click on the button "End".



3.3.2.1.3 Variables declaration

In the following example, variables have been declared in Global and Local type.

• In the Project view, double-click the menu "Global Label \rightarrow Global".



• Declare the required function blocks global variables. For each variable, specify the fields Class, Label Name, data Type and Device.

	Class	Label Name	Data Type		Constant	Device	Address
1	VAR_GLOBAL	Promag400_AI1_startAddress	Word[Signed]	1.1.1		D1250	%MW0.1250
2	VAR_GLOBAL	Promag400_Al1_status	Bit	1		M3250	%MX0.3250
3	VAR_GLOBAL -	Promag400_Al1_value	FLOAT (Single Precision)	1		D3250	%MD0.3250
4	VAR_GLOBAL	Promag400_DI1_startAddress	Word[Signed]			D1252	%MW0.1252
5	VAR_GLOBAL	Promag400_DI1_status	Bit			M3255	%MX0.3255
6	VAR_GLOBAL	Promag400_DI1_value	Word[Signed]	1		D3256	%MW0.3256





• In the Project view, double click the menu "POU \rightarrow Program \rightarrow DP_comRead \rightarrow LocalLabel".



- Declare the required local variables related to the function blocks:
 - The label Promag400_Al1 corresponds to the function block Analog Input.
 - The label Promag400 DI1 corresponds to the function block Digital Input.

	Class		Label Name	Data Type
1	VAR	-	Promag400_AI1	DP_to_Float_with_Status
2	VAR	-	Promag400_DI1	DP_to_Inputs_1xbyte_Stat_1xbyte

3.3.2.1.4 Analog Input function programming

• Double-click on "Program" in the menu "POU→ Program → DP_comRead". This opens the program page.



• Drag and drop the analog input function block "DP_to_Float_with_Status" from the "Function Block" library to the program window.

BP_comRead [PRG] Progra	a	×			٩	۵ 🗸	Element Selection
1								All Parts
•		. (53 S	13	53	53	· _	E- Eunction
					83			E-B Function Block
								COUNTER_FB_M
	•		· ·		23	•	÷	🖹 СТО
		10		•		83		CTD_E
								СТU
	•		21 22	1	2			CTUD
2								CTU_E
		201	80 - 84 8					DP_to_Float_with_Status
	× 2	• C						DP_to_Inputs_1xbyte_Stat_1xbyte




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- Rename the function block with the name "Promag400_Al1" (reference to the defined local variable).
- Assign the defined global variables to the function block.

		Promag400_/	Al1	10	ai ai a		al 81	al al i	81 81				
		DP_to_Float_with	Status	88. 1	a. a. a			a a :			10		*
	TRUE-	Enable	ValueOut_Real		Proma	g400	_AI1	value	81 81	20		201	10
	TRUE-	StartWithWord	ValueOut_Status -		Proma	g400	_AI1	status	1	20	20	23	8
76I	Promag400_Al1_startAddress	ValueIn_StartAddr	1776					10 10 1	81 - 81	20			

Notes:

- The function block parameter "StartWithWord" needs to be set to the state "TRUE" because it is the first input module.
- Analog inputs are coded on 5 bytes (4 bytes data + 1 byte status).

3.3.2.1.5 Digital Input function programming

• Double-click on "Program" in the menu "POU→ Program → DP_comRead". This opens the program page.



• Drag and drop the analog input function block "DP_to_Inputs_1xbyte_Stat_1xbyte" from the "Function Block" library to the program window.

B DP_comRead [PR	G] Progra	X			٩	۵.	Element Selection
1							All Parts
	N N	10	8 8	5		·	E. Sunction
	8 8						E Function Block
							COUNTER_FB_M
	21 21			5.1	•		
	18 18	53	8 8	53		· ·	
			·	×	-		
2	N N	8		83			DP_to_Float_with_Status
	8 8			•	•		DP_to_Inputs_1xbyte_Stat_1xbyte





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- Rename the function block with the name "Promag400_DI1" (reference to the defined local variable).
- Assign the defined global variables to the function block.

	Promag400_DI1	
ананананаддан	DP_to_Inputs_1xbyte_Stat_1xbyte	* * * * * * * * * *
TRUE	Enable Inputs	Promag400_DI1_value
FALSE	StartWithWord Status	Promag400_DI1_status
Promag400_DI1_startAddress	ValueIn_StartAddr	

Notes:

- Digital inputs are coded on 2 bytes (1 byte data + 1 byte status).
- The function block parameter "StartWithWord" needs to be set to the state "FALSE" because of the first module which is an analog input (coded on 5 bytes).

3.3.2.2 Writing functions

3.3.2.2.1 POU Configuration

• In the Project view, expand the "POU" part.



• Right-click on "Program" and select the menu "Add New Data".







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- The following window is displayed.
 - In the field "Data Name", enter the new program name "DP comWrite".
 - Click on the button "OK".

Program Block	-	-
Data Name:	_	
DP comWrite		-
)		
Ladder		
ST	E	1
Structured Ladder/FBD		-
ITI		
<u>R</u> esult Type:		
Inherent Property;		
🗖 Use Macro <u>c</u> ode		
Use MC/MCR		

• The new part "DP_comWrite" has been added.







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3.3.2.2.2 Program Setting Configuration

- Select the menu "DP_comWrite" in the part "POU→Program".
- Drag and drop it in the part "Scan Program→MAIN→DP_Task" in order to be registered in the program.



• The new part is added in the "DP_Task".



3.3.2.2.3 Variables declaration

In the following example, variables have been declared in Global and Local type.

- In the Project view, double click on the field "Global".
 - Declare the required function blocks global variables.
 For each variable, specify the fields Class, Label Name, Data Type and Device.

	Class	Label Name	Data Type		Constant	Device	Address
7	VAR_GLOBAL	Promag400_AO1_startAddress	FLOAT (Single Precision)			D4000	%MD0.4000
8	VAR_GLOBAL -	Promag400_AO1_value	Word[Signed](02)			D5000	%MW0.5000
9	VAR_GLOBAL -	Promag400_DO1_startAddress	Word[Signed]			D4002	%MW0.4002
10	VAR_GLOBAL	Promag400_DO1_value	Word[Signed]	1.12		D5002	%MW0.5002





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• In the Project view, select the menu "POU→Program→DP_comWrite → LocalLabel" to declare following local variables.



- Declare the required local variables related to the function blocks:
 - The label Promag400_AO1 corresponds to the function block Analog Output.
 - The label Promag400_DO1 corresponds to the function block Digital Output.

	Class	Label Name	Data Type
1	VAR 👻	Promag400_AO1	FLOAT_to_DP
2	VAR 👻	Promag400_DO1	Outputs_1xbyte_Stat_1xbyte_to_DP

3.3.2.2.4 Analog Output function programming

• Double-click on "Program" in the menu "POU→ Program → DP_comWrite". This opens the program page.



• Drag and drop the analog output function block "Float_to_DP" from the "Function Block" library to the program window.







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- Rename the function block with the name "Promag400_AO1" (reference to the defined local variable).
- Assign the defined global variables to the function block.

œ	×	÷	\mathcal{D}	\mathcal{D}	$\langle g \rangle$	œ	Ť	Ť			Promag400_AO1	a *	œ	(?)	\mathcal{D}	2	œ	2	2	<u>9</u> 2	œ	œ
2	\otimes	\otimes	(2)	(2)	\otimes	(2)	\otimes	\otimes		(ma	FLOAT_to_DP	22	1	(2)	92	92	190 190	(<u>?</u>)	(9) (9)	<u>(2</u>)	<u>(*)</u>	1
22	\mathcal{D}	\mathfrak{D}	\otimes	\otimes	\mathcal{D}	\otimes	\mathcal{D}	\mathcal{D}	TRUE	Enable	StartValueOut_Word	-	-P	ror	nag	g40	0_	AO	1_)	valu	le[0]
92	R	2	S.	19	19	22	с.	T.	TRUE	StartWithWord		.92	g:	19	92	19	92	12	92	197	9	2
٠F	roi	ma	g4	00_	A	D1_	sta	irtA	ddress —	FloatValueIn			\mathcal{D}	2	2	9	2	2	2	2	2	$^{\circ}$

Notes:

- Analog outputs are coded on 5 bytes (4 bytes data + 1 byte status)
- The index "[0]" needs to be indicated for the variable "Promag400_A01_value".
- The function block parameter "StartWithWord" needs to be set to the state "TRUE" because it is the first output module.

3.3.2.2.5 Digital Output function programming

• Double-click on "Program" in the menu "POU→ Program → DP_comWrite". This opens the program page.





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• Drag and drop the analog output function block "Outputs_1xbyte_Stat_1xbyte_to_DP" from the "Function Block" library to the program window.



- Rename the function block with the name "Promag400_DO1" (reference to the defined local variable).
- Assign the defined global variables to the function block.

રા ના	Promag400_DO1	. 19	•		:0	: s	s .s	•	•
	Outputs_1xbyte_Stat_1xbyte_to_DP	10	:0	:0 :0		e) - e	s •	:0	:0
TRUE— Enable	ValueOut_StartAddr	-	-Pr	oma	g400)_D	01_	valu	le
FALSE StartWithWord		10	:0	10 II	:0	·) ·	6 t)	- 10	:0
Promag400_DO1_startAddress — Inputs		10	:0	19 19	:0	e) - i	9 1 9	:0	-9

Notes:

- Digital outputs are coded on 2 bytes (1 byte data + 1 byte status)
- The function block parameter "StartWithWord" needs to be set to the state "FALSE" because of the first module which is an analog output (coded on 5 bytes).

3.3.3 Specific slave buffer device

This part explains how to address the inputs/outputs addresses to the PROFIBUS slave device.

• In the Project view, double-click on the menu "0020:QJ71PB92V \rightarrow Parameter".



• Select the menu "Setup Tasks→Devices for Slave-Specific Transfer ..." .





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Setup Tasks
Master Settings
🚛 GSD Device Database
🦻 I/O Mapper
Devices for Slave-Specific Transfer

• Following window is displayed:

	I/O Word Size	Input Device	Output Device
Promag 400 DP	4/4		

• Click on the field "Input Device" and set the address D1250.



- In this example, the start address is <u>D1250</u> which corresponds to the global variable "Promag400_AI1_startAddress" assigned to the first configured input module.
- The field is automatically updated according to the amount of configured inputs modules (1 Analog Input + 1 Digital Input in this case).

lave Specific Buffer D	evices		×
Slave name	I/O Word Size	Input Device	Output Device
Promag 400 DP	4/4	D1250-D1253	



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• Click on the field "Output Device" and set the address D5000.

ve Specific Buffer De	vices		E
Slave name	I/O Word Size	Input Device	Output Device
Promag 400 DP	4/4	D1250-D1253	D5000

- In this example, the start address is <u>D5000</u> which corresponds to the global variable "Promag400_AO1_startAddress" assigned to the first configured output module.
- The field is automatically updated according to the amount of configured outputs modules (1 Analog Output + 1 Digital Output in this case).

ave Specific Buffer De	vices		-
Slave name	I/O Word Size	Input Device	Output Device
Promag 400 DP	4/4	D1250-D1253	D5000-D5003

• Click on the button "OK" to close the window.





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3.4 Commissioning of the Control Project

This part describes the POU generation, the program compilation and download.

3.4.1 POU Generation

3.4.1.1 POU Generation steps

This part must be executed as soon as any changes have been done in the Field Network configuration.

• In the Project view, double-click on the PROFIBUS module menu "0020:QJ71PB92V→Parameter".



- The tab 0020:QJ71PB92V is opened.
- Select the menu "PROFIBUS Configurator Tasks \rightarrow Export Tasks \rightarrow POU Generation".



• The following window is displayed:







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- Click on the button "Yes" to execute the task.
- There is no message when the task is finished. The previous window is just closed.

3.4.1.2 POU generated PROFIBUS task

• During the first POU generation, the PROFIBUS tasks of the library "QJ71PB92V_0020" have been assigned automatically in the field "No Execution Type".

• In the project view, double-click on the menu "Parameter \rightarrow PLC Parameter".



- In the "Q Parameter Setting" window, open the tab "Program".
 - Select the program "PROFIBUS" and click on the button "Insert".
 - Select "Scan" in the field "Execute Type".
 - Click on the button "End".

Q Parameter Setting							×
PLC Name PLC System PLC	File PLC RAS Boot F	ile Program SFG	Device I/C	Assignment Multiple Cl	PU Setting Bu	ilt-in Ethernet Port Setting	
⊡ Program		Program Name	Execute Type	Fixed Scan Interval	In Unit	▲	
MAIN	1	MAIN	Scan 👻		-		
Profibus	2	PROFIBUS	Scan 👻		-		
Profibus	2	PROFIBUS	Scan V		•		

• In the Project view, the part PROFIBUS has been moved to "Scan Program".



• These steps need to be done once.





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3.4.2 Program compilation

• Select the menu "Compile \rightarrow Build".

Image: Second	<u>P</u> roject <u>E</u> dit <u>F</u> ind/Replace	<u>C</u> ompile	View	<u>O</u> nline	De <u>b</u> ug	<u>D</u> iagr	nostics
Navigation	: <mark>E E = 🔛 🖼 😤 🐯</mark>	🕫 <u>B</u> ui	ld			F4	
Rebuild All Shift+Alt+E4	Navigation		line Prog	ram Chang	e Shift	+F4	
Project	Project	👼 <u>R</u> et	ouild All	5	Shift+Alt	+F4	

- A "Rebuild All" can be requested to convert and compile all data (programs, structured data, labels, functions, function blocks)
- Click on the button "OK" to continue.



• The compilation results are displayed in the window "Output". In this case, there are 0 Errors and 0 Warnings.

Out	Output								
Rebui	id Ali								
No.	Result	Data Name	Class	Content					
1	Information	-	-	Word device (VAR range) 0 point used					
2	Information	-	-	Bit device (VAR range) 0 point used					
3	Information	-	-	Pointer (VAR range) 0 point used					
4	Information	-	-	Timer (VAR range) 0 point used					
5	Information	-	-	Counter (VAR range) 0 point used					
•									

Rebuild All Completed.Error: 0, Warning: 0

3.4.3 Program Download

• Select the menu "Online \rightarrow Write to PLC".

<u>Project</u> <u>Edit</u> <u>Find/Replace</u> <u>Compile</u> <u>V</u> iew	Online Debug Diagnostics Tool Window
: 🔁 🔳 📰 🞬 🚟 🐨 🌚 🛔	Read from PLC
Navigation	Write to PLC
Project	Verify with PLC





• In the Tab "PLC Module", click on the button "Select <u>All</u>" to cross check all targets.

Online Data Operation								×
Connection Channel List								
Ethernet Board Communication PL	C Module Connection						System Image	e
	d © <u>W</u> rite	⊂ <u>V</u> er	ify	0	elete			
PLC Module 👖 Intellige	ent Function Module	Execution Ta	arget Dati	a(No	/ Yes)			
Title								
💶 Edit Data	Parameter+Program	Select Al	Canc	el All Sel	ections		Option Display Size	
Module Name/D)ata Name	Title	Target	Detail	Last Change	Target Memory	Size	
ME01 Symbolic Information						Program Memory/D	e	
Symbolic Information			✓				18393 Bytes	
- PLC Data						Program Memory/D	e	
- Sa Program (Program File)			V	Detail				E
P_Com			~		2014/11/25 14:01:00		2464 Bytes	
Profibus			~		2014/11/26 10:26:39		2208 Bytes	
🛃 Parameter			V					
PLC/Network/Rem	ote Password/Switch Setti		✓		2014/11/17 16:59:47		836 Bytes	
Intelligent Function	Module (Initial Setting/Aut		✓		2014/11/24 15:19:57		144 Bytes	
Global Device Comme	nt							
COMMENT			◄	Detail	2014/11/17 16:59:47			-
Necessary Setting(No Se	etting / Already Set)	Set if it is need	ded(No	Setting /	Aready Set)			
Writing Size 24.048Bytes					Free Volume Us	se Volume 23.376Bytes	Refresh	1
24,0400,100				_	00,004	20,07009(00	Kerres <u>ri</u>	
Related Eunctions <<						Đ	kecute C	lose
1		Ê	Į	J	Z	I		
Remote Operation Set Clock	PLC User Data W	/rite Title	Forma Memo	t PLC ory	Clear PLC Memory	Arrange PLC Memory		

• In the Tab "Intelligent Function Module", click on the button "Select <u>A</u>ll" to cross check all targets.

Online Data Operation	
- Connection Channel List	
Ethernet Board Communication PLC Module Connection	System Image
Eead C Write C Verify	
PLC Module Intelligent Function Module Execution Target Data(No / Yes)	
Select <u>All</u> Cancel All Selections	Overview
Module Name/Detail Setting Item Name Valid I arget Detail 0020:QJ71PB92V	PROFIBUS-DP Module
Model	Name QJ71PB92V
Start X	Y 0020
Installe	ation Slot 1
Title	Profibus master DPV1
Para Abb Pleas to w of ini para Necessary Setting (No Setting / Already Set) Set if it is needed (No Setting / Already Set)	ameter will be written to flash ROM. A but writing data > use select parameter of PLC module ite auto refresh and switch setting eligent function module meter.
Related Eurctions<<	Execute Close
Remote Operation Set Clock PLC User Data Write Title Format PLC Clear PLC Memory Array Memory M Memory M Memory M	ange PLC Iemory

• Click on the button "<u>Execute</u>".





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• Following window may be displayed. Click on the button "OK".



 When a "Rebuild All" has been executed, following window may be displayed. Click on the button "Yes".



• Warning message is displayed. Click on the button "Yes" to continue.







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• If some programs have already been downloaded in the PLC, following message is displayed. Click on the button "Yes to all".

MELSOF	T Application	×
⚠	Parameter already exists. Are you sure you want to overwrite the existing file?	
	Yes to all No	

• Following warning is displayed during the download. Click on the button "OK" to continue.



• Status message "Write to PLC: Completed" is displayed when the download is completed. Click on the button "Close".

Write to PLC
9/9
100/100%
Intelligent Parameter Write : Completed Program (DP_COM) Write : Completed Program (PROFIBUS) Write : Completed Device Comment (COMMENT) Write : Cancel Device Memory (MAIN) Write : Completed Symbolic Information Write : Completed Write to BIC : Completed
K F
When processing ends, close this window automatically.





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• Click on the button "Yes" to start the CPU.

MELSOFT	Application 🛛 🕅
À	The CPU status is currently STOP. Would you like to perform a remote-RUN?
	Caution: The programmable controller operation status will be changed. Please ensure the system is safe before proceeding.
	<u>Y</u> es <u>N</u> o

• Click on the button "Close" to close the window "Online Data Operation".

Notes:

- It is possible to download separately the part "PLC Module" and "Intelligent Function Module".



- If an error is occurring during the writing as described on the following window:



- 1. Download only the part "PLC module".
- 2. Reset the PLC.
- 3. Download only the part "Intelligent Function Module".





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3.5 Monitoring of Process Values and Status Information

This part describes some tools, which are useful once the PLC is in Run operating mode for checking hardware status or online variables values.

3.5.1 Diagnostics

3.5.1.1 PLC diagnostics

The diagnostic function "PLC Diagnostics" displays the PLC status/errors.

• In the Project view, select the menu "Diagnostics \rightarrow PLC Diagnostics".



• No errors detected in the following window.

	Ethern	iet Board	d Comm	unication PLC Module Con	nection			System Image
	Q03UDE	1odel Na CPU	ame	Operation Status RUN	Switch RUN			
tended from the PLC age.	Error Info	ormation		C. Continuation Error Info		Information C. Covial	Communia	alion Error
MODE -	Current E	Error	suori	Continuation Error mit		Change the window size	and positio	an after error jump
RUN ERR.	PLC	Status	No.	Current Error(Abbreviatio	n) Current Error(Detail)	Year/Month/Day	Time	Error Jump
USER	1		0		No Error			Error Clear
BAL. BOOT	3							
	4							Error Help
	Error His	story(PL	C No.1) Occurrence Ord	er Display Descending 👻	[
	Status	No.	Error	Message(Abbreviation)	Error Message(Detail)	Year/Month/Day	Time	 Error History
		0			No Error			Charal History
								Ljear History
PULL								Error Jump
								Error Help
USB								
								Status Icon Lege
								Major Error
								A Moderate Err
								L User-Specifie
10BASE T/100BASE TX								





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3.5.1.1.1 PLC Remote Operation

The "PLC Remote Operation "window allows the operator to change the PLC operation mode.

• Select the menu "Online \rightarrow Remote Operation(S)".



- The "Remote Operation" window is displayed.
 - Select the requested Operation mode and click on the button "Execute".
 - Click on the button "Close" to close the window.

Remote Operation		×
Q03UDECPU MODE RUN ERR.	Specify Execution Target Currently Specified Station	
BAT. BOOT	Operation PUN STOP PAUSE Latch Clear RESET Remove Memory Card	
PULL	Operation during RUN Device Memory Not Cleared Signal Flow Hold	Execute Close





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3.5.1.1.2 PLC System monitor

The diagnostic function "System Monitor" gives status of all hardware parts of the Mitsubishi environment.

• Select the menu "Diagnostics \rightarrow System Monitor".



• No errors detected in the configured hardware environment.

ystem N	/onitor																—
, - Monitor	r Status	Monitoring	Con	inection	Channel Board C	List	PLC N	Iodul	e Connec	tion					System	n Image	
Main Bi	ase ain Base dr.										Operation to Select Main Base Slot Q03UDECPU Detailed Informati	CPU J	J e ∕₩ Information	Dia	gnostics	_ <u>E</u> rror Hit	story Detail
Base In	formatio	n List			,			odule	Informati	on List	(Main Base)					,	
Base	Module	Base Model Name	Power Supply	Base Type	Slots	Installed Modules	St	atus	Base- Slot	Serie	Model Name	Point	Paramete Type	Point	I/O Address	Network No. Station No.	Master PLC
		Main Base	Exist	Q	5	1			-	-	Power	-	Power	-	-	-	-
		Extension Base 1							CPU	Q	Q03UDECPU	-	CPU	-	-	-	-
		Extension Base2							0-0	-	Empty	-	Empty	32Point	0000	-	-
		Extension Base3							0-1	Q	QJ71PB92V	32Point	Intelli.	32Point	0020	-	-
		Extension Base4							0-2	-	Empty	-	Empty	16Point	0040	-	-
		Extension Base5							0-3	-	Empty	-	Empty	16Point	0050	-	-
		Extension Base6							0-4	-	Empty	-	Empty	16Point	0060	-	-
		Extension Base7															
Overall 1Base 1Module Legend Image: Construct of the second secon																	
Stop M	lonitor										Print Pr	oduct Info	ormation <u>L</u> ist	Syster	n Error <u>H</u> is	tory	Close





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3.5.1.2 PROFIBUS slave diagnostics

Some functions are available to check status of PROFIBUS devices.

• Double-click on the menu "0020:QJ71PB92V \rightarrow Parameter".

Intelligent Function Module
 O020:QJ71PB92V Profibus master DPV1
 Parameter

- The Tab "0020:QJ71PB92V" must be opened in order to display the Diagnostics function in tool menu.
- Select the menu "Tool \rightarrow Diagnostics \rightarrow Slave Status".



• The window "Slave Status" is displayed.





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In this example, the Promag 400 DP has the address 45 and is active.

2 S	lave St	tatus									
0	1	2	3	4	5	6	7	8	9		
10	11	12	13	14	15	16	17	18	19		
20	21	22	23	24	25	26	27	28	29		
30	31	32	33	34	35	36	37	38	39		
40	41	42	43	44	45	46	47	48	49		
50	51	52	53	54	55	56	57	58	59		
60	61	62	63	64	65	66	67	68	69		
70	71	72	73	74	75	76	77	78	79		
80	81	82	83	84	85	86	87	88	89		
90	91	92	93	94	95	96	97	98	99		
100	101	102	103	104	105	106	107	108	109		
110	111	112	113	114	115	116	117	118	119		
120	121	122	123	124	125						
Sla	Slave is inactive						ycle tin	ne (in n	1S)		
Sla	ave has	diag.r	nessage	5		Now 6					
Sla	Slave has link						Min 3				
Sla	Slave has no link						lax 1	1			

• If some errors are detected, open the menu "<u>T</u>ool → Diagnostics → <u>D</u>iagnosis Messages" to see the corresponding messages.

Di <u>ag</u> nostics	Toggle <u>M</u> onitor Mode
PROFIBUS-DP Options	<u>S</u> lave Status
	<u>D</u> iagnosis Messages
	Slave I/O <u>T</u> est
	PLC Autorefresh Settings





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3.5.2 Online monitoring

The online monitoring functions as "Watch" or "Monitoring" are used to check variables in online mode.

3.5.2.1.1 Online variable watch function

• Select the menu "View \rightarrow Docking Window \rightarrow Watch1 to open the Watch window.



• Select the menu "Online \rightarrow Watch \rightarrow Start Watching" to start the function.







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- Add and check the declared variables in the Watch1 window.
 - To add a variable in the Watch1 window:
 - Open the pages "DP_comRead \rightarrow Program" and "DP_comWrite \rightarrow Program".



Right-click on the desired variables and select the menu "Register to Watch".

Modify Value	
Change Value Format	۲
<u>F</u> ind	•
Cross Reference	
Dev <u>i</u> ce List	
Register to Watc <u>h</u>	
Register to Device Batch Replace	
Display Compile Result	

o Added variables in the Watch window

Device/Label	Current Value	Data Type	Class	Device	Address
Promag400_Al1_startAddress	H3047	Word[Signed]	VAR_GLOBAL	D1250	%MW0.1250
Promag400_Al1_value	45304.9023438	FLOAT (Single Precision)	VAR_GLOBAL	D3250	%MD0.3250
Promag400_Al1_status	H01	Bit	VAR_GLOBAL	M3250	%MX0.3250
Promag400_DI1_startAddress	H0180	Word[Signed]	VAR_GLOBAL	D1252	%MW0.1252
Promag400_DI1_value	H0001	Word[Signed]	VAR_GLOBAL	D3256	%MW0.3256
Promag400_DI1_status	H01	Bit	VAR_GLOBAL	M3255	%MX0.3255
Promag400_AO1_startAddress	45.2299995	FLOAT (Single Precision)	VAR_GLOBAL	D4000	%MD0.4000
Promag400_AO1_value		Word[Signed] [3]	VAR_GLOBAL		
[0]	H3442	Word[Signed]		D5000	%MW0.5000
[1]	H85EB	Word[Signed]		D5001	%MW0.5001
[2]	H0080	Word[Signed]		D5002	%MW0.5002
Promag400_DO1_startAddress	H0001	Word[Signed]	VAR_GLOBAL	D4002	%MW0.4002
Promag400_DO1_value	H0180	Word[Signed]	VAR GLOBAL	D5002	%MW0.5002

• Select the menu "Online \rightarrow Watch \rightarrow Stop Watching" to stop the function.





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3.5.2.1.2 Monitoring function

The function "Monitoring" displays the online values directly on the corresponding function block.

• Select "Program" in the menu "DP_Com → DP_communication_EH → DP_comRead". This opens the program page of the function block.



• Select the menu "Online \rightarrow Monitor \rightarrow Start Monitoring" to start the function.







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• Online monitoring for the Input function blocks (AI / DI).

1		Promag400_Al1	
		DP_to_Float_with_Status	
	una al acta a acta acta a acta <mark>TRUE</mark> <mark>Enabl</mark>	ValueOut_Real	Promag400_Al1_Value = 44670.13
	en TRUE <mark>StartW</mark>	ithWord ValueOut_Status	Promag400_Al1_Status
	Promag400_Al1_StartAddress = 16#2E47 Value	n_StartAddr	(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,
2		Promag400_Dl1	
		DP_to_Inputs_1xbyte_Stat_1xbyte	
	en <mark>TRUE</mark> <mark>Enabl</mark> e		InputsPromag400_DI1_value = 16#0001
	FALSE StartW	ithWord	Status Promag400_DI1_status
	Promag400_DI1_startAddress = 16#0180—Value	n_StartAddr	

• Online monitoring for the Output function blocks (AO / DO).

ne e la constant de la constant de la constant de la Promag400 <u>-</u> AO1- e la constant de
FLOAT_to_DP
TRUE — Enable StartValueOut_Word — Promag400_AO1_value[0] = 16#3442
ne en e
See See Promag400_AO1_startAddress = 45.23 FloatValueIn
Descention Dot
Promag400_DOT
Outputs_1xbyte_Stat_1xbyte_to_DP
TRUE Enable ValueOut_StartAddr Promag400_DO1_value = 16#0180
FALSE StartWithWord
Promag400_DO1_startAddress = 16#0001 — Inputs

• To edit an output (AO or DO), right-click on the desired start address variable and select the menu "<u>M</u>odify Value".

Modify Value	
Change Value Format	•
<u>F</u> ind	•
Cross Reference	
Dev <u>i</u> ce List	
Register to Watc <u>h</u>	
Register to Device Batch Replace	
Display Compile Result	





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 Then edit the field "Value" and click on the button "Set".
 The next window shows the example for the analog output start address variable "Promag400_AO1_startAddress".

Promag4	00_AO1_s	tartAddress	•
Data <u>T</u> ype	FLOAT (S	Single Precision)	-
Value	45.23	C DEC	Set
	eult		
xecution Re			
xecution Re	el	Data Type	Setting Value

• Select the menu "Online $\rightarrow M$ onitor \rightarrow Start Monitoring" to stop the function.





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4 Routed Tool Integration

This chapter describes the main workflow for integration of Mitsubishi Electric system components to the Endress+Hauser Plant Asset Management (PAM system) by means of Communication DTMs. As a result, the Endress+Hauser PAM system can access underlying PROFIBUS devices via Mitsubishi Electric Ethernet backbone for device configuration. Please refer to the Integration Test Summary document for known limitations.

4.1 Mitsubishi MX CommDTM-PBDP configuration

• Start the application FieldCare.



• Create a new project:



• Select the menu" Device Operation → Add Device".







• Select the commDTM "MX CommDTM-PBDP" from Mitsubishi and click on the button "OK".

Device	Version	Class	Manufacturer	Protocol
CDI Communication FXA291	V2.02.00 (2014	-	Endress+Hauser	CDI
CDI Communication TCP/IP	V2.02.00 (2014	-	Endress+Hauser	CDI TCP/IP
CDI Communication USB	V2.02.00 (2014	-	Endress+Hauser	CDI USB
CommDTM PROFIBUS DP-V1	V4.0.0.9 (2011		Trebing & Himstedt Prozeßautomation Gmb	PROFIBUS DP-V1
FF H1 CommDTM	V1.5 (2009-08	-	Endress+Hauser, Metso Automation	FDT FIELDBUS FF
FieldConnex Diagnostic Server	V2.1.1.1971 (2		PEPPERL+FUCHS GmbH	FDS Communication
Flow Communication FXA193/291	V3.22.00 (2014	-	Endress+Hauser	ISS
FXA520	V1.05.09 (2011	-	Endress+Hauser	HART
HART Communication	V1.0.49 (2012		CodeWrights GmbH	HART
HART OPC Client	V2.0 (2009-05	-	Endress+Hauser, Metso Automation	HART
IPC (Level, Pressure) FXA193/291	V1.02.17 (2014		Endress+Hauser	IPC
MX CommDTM-PBDP	V3.0 (2011-05		Mitsubishi Electric Europe B.V.	Profibus DP/V1
NXA HART Communication	V1.1.0.911 (20	dtmSpecific	Endress+Hauser	HART
PCP (Readwin) TXU10/FXA291	V1.01.18 (2014	-	Endress+Hauser	PCP
PROFIdtm DPV1	V 2.11(115) (20		Softing Industrial Automation GmbH	Profibus DP/V1
SFGNetwork	V01.01.03 (201	dtmSpecific	Endress+Hauser	SFG5xx

• Select the CommDTM and select the function " $F \rightarrow$ Configuration" in the tool bar.

<u>File Edit View Device Operation</u>	on DTM <u>C</u> atalog	<u>T</u> ools <u>W</u> indow E <u>x</u> tr	ras <u>H</u> elp			
D 🛩 🖬 🥌 🕋 🎒 🗅			u 😫 🥔 I	3 😼 🕺	F	•
Network				Ļ	×	Offline Parameterize
Network Tag	Co Channel	Ad Device type (DTM)	F	Physical Device		Online Parameterize
Host PC					_	Observe
👷 MIX CommDTM-PEDP		MX CommDTM-	PBDP			Configuration
						Diagnosis
						Additional <u>F</u> unctions •
						Channel functions

- In the MX CommDTM-PBDP Tab :
 - Select the field "New" in the menu "Select transfer setup".

MX CommDTM-PBDP (Configuration)						
Select transfer setup	Qn serial 🗨					
Starting <u>I</u> /O Number	Qn serial SystemQ CCLinkIE					
	<new> <rename remove=""></rename></new>					

• Give a new Name to the setup configuration and click on the button "OK".

New Setup	
Name	
OpenIntegration	
Copy Settings from	
<default></default>	_
	OK Cancel





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- Configure following settings:
 - PC side I/F : Ethernet board
 - Connected module : CPU module
 - o Protocol TCP
 - Click on the button "Next".

MX Transfer Setup Wizard - PC side			×
	Please select th PC side VF Communication se Connect module Protocol	e PC side VF Ethernet board Itting CPU module TCP	
Cancel	Back	Next >	

- Configure following settings:
 - Select the PLC side I/F "CPU module".
 - Set the IP address of the PLC: <u>10.126.104.250</u> (specific for this example).
 - Click on the button "Next".

MX Transfer Setup Wizard - PLC side		×
	Please select the PLC side VF PLC side VF CPU module Communication setting Host(IP Address) 10.126.104.250 Find CPU (Built-in Ethernet port) on network	
Cancel	< Back Next >	



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- Configure following settings:
 - Select the station type "Host station".
 - Select the option Connect CPU series "Q".
 - Select the CPU type "Q03UDE".
 - Select the option Multiple CPU "None".
 - Click on the button "Next".

MX Transfer Setup Wizard - Network		
	Please select the Network	
	Station type	Host station
	Connect CPU series	Q 🗸
	CPU type	Q03UDE 💌
	Multiple CPU	None
Cancel	< Back Next >]

• Click on the button "Finish" to validate the configuration.

MX Transfer Setup Wizard - Finished		×
	The Communication wizard has finished collecting information. Press 'Finish' to store the modified settings and to close the wizard. Comment Password	
Cancel	< Back Finish	

- In the MX CommDTM-PBDP Tab:
 - Click on the button "Read from PLC" and select the PROFIBUS master module QJ71PB92V. This will display the Starting I/O Number "20".

Modules in PLC							
	Slot	Starting I/O number	Module Typename				
	00	0x000	QJ71GF11-T2				
	01	0x020	QJ71PB92V				





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• Click on the button "Comm. Test" to verify if the connection is established.

MX CommDTM-PBDP (Configuration) [⊠			
Select transfer setup	Op	penIntegration	•	Configure	Comm. <u>T</u> est
Starting <u>I</u> /O Number	20	D Read from PLC			
	Ethernet				
PC VF	Ethernet	CPU type	Q03UDE		
Protocol	тср	Module type	CPU module		
Time-out	1000 ms	Host(IP Address)	10.126.104.250		
		Multiple CPU	None		

• If successfully, following message is displayed.

MX Com	mDTM-PBDP - Transfer Setup Settings [📧
i	QJ71PB92V module found at starting I/O no. 0x20
	<u></u> ОК]





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4.2 Device DTM configuration

• Right-click on the new inserted CommDTM and select the menu "Add Device".

Network						Ψ×
Network Tag		Co Channel	Ad	Dev	ice type (DTM)	Physical Device
🔜 Host PC						
		4	-		MX CommDTM-PBDP	
	龔	<u>A</u> dd Device				
	R	<u>D</u> elete Device				
		Launch Wizard				

• Select the device you want to connect to, e.g. "Promag/53/DP/V3.06.xx"

Promag / 53 / DP / V3.04.xx	V1.5.147.339 (2014-05-26)	flow	Endress+Hauser	PROFIBUS DP/V1
Promag / 53 / DP / V3.06.xx	V1.5.147.339 (2014-05-26)	flow	Endress+Hauser	PROFIBUS DP/V1
Promag / 53 / PA / V1.00.xxV1.01.xx	V1.5.147.339 (2014-05-26)	flow	Endress+Hauser	PROFIBUS DP/V1

• New device is added in the Network tag.

Network				
Network Tag ∇	Co	Channel	Address	Device type (DTM)
Host PC				
🖻 🗠 🕲 MX CommDTM-PBDP	٩Þ			MX CommDTM-PBDP
🚒 PROMAG / 53 / DP / V3.06.XX	$\triangleleft_{\triangleright}$	master1	0	EII Promag / 53 / DP / V3.06.xx

- Select the CommDTM "MX CommDTM-PBDP":
 - Select the function: "F→Additional Functions→Edit DTM Station Addresses" in the tool bar.

D 🗳 🖬 🎒 🕋 👼 🔍		i 🗊 🔲 🙀 🕵 🖹 🖉	🍢 🌋 💐	F	-	
Network			Ψ×		Offline Parameterize	
Network Tag ∇	Co Channel	Address Device type (DTM)	Physical Dev		Online Parameterize	
Host PC	4.				Observe	
PROMAG / 53 / DP / V3.06.X	X 4⊳ master1	0 607 Promag / 53 / DP / V3.06.xx			Configuration	
					Diagnosis	
					Additional <u>F</u> unctions	Edit DTM Station Addresses
					Channel functions	About MX CommDTM-PBDP
				_		Online Manual

• Select the Promag 53 device.

MX CommDTM-PBDP (Edit DTM Station Addresses)										
Pos	Tag	Name	Version	Station No.						
1	PROMAG / 53 / DP / V3.06.XX	Promag / 53 / DP / V3.06xx	1.5.147.339	0						





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- Update the new FDL address in the field "Station No.", @42 in this example.
- Click on the button "Apply".
- o Click on the button "Close".

1000 D. C	42		~
Station No.:	42	Apply	Close

• The new address is updated in the Address field.



• Right click on the device Promag 53 and select the menu "Connect".



The Promag 53 is now connected (Online mode).







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5 Bypassed Tool Integration

This chapter describes the alternative workflow for commissioning of the Endress+Hauser Plant Asset Management (PAM system) with independent access path via Fieldgate SFG500. As a result, the Endress+Hauser PAM system can access underlying PROFIBUS devices for device configuration and asset health monitoring.

5.1 Fieldgate SFG500 Browser

- Check that the SFG500 is connected to the engineering station network.
- Open the browser and enter the IP address of the SFG500, <u>10.126.104.253</u> (specific for this example).



• The Fieldgate SFG500 main window is displayed. In this view are displayed all detected devices (Masters and slaves).

Fieldgate SFG500 Asset Monitor Endress + Hauser														
Start Network Assets	Events Settings Information								24. Nov 2014 13:07:51 🥅 🚟 Login					
Status PROFIBUS Library	Asset Status PROFIBUS													
HART Library				D	evices: 23	22	8 0	💟 1 🛛 🛕	0 🗇 0	10				
	#000	#001	M002	#003	#004	#005	#006	#007	#008	S009 🔻				
	S010 🔽	#011	S012 🔽	S013 🔽	S014 🔽	S015 🔽	S016 🔽	S017 🔽	S018 🔽	S019 🔽				
	S020 🔽	S021 🔽	S022 🔽	S023 🔽	S024 🔽	S025 🔽	#026	#027	#028	#029				
	#030	#031	#032	#033	#034	#035	#036	#037	#038	#039				
	S040 🔽	S041 🔽	S042 🔽	S043 🔽	S044 🔽	S045 🔽	S046 🔽	#047	#048	#049				
	#050	#051	#052	#053	#054	#055	#056	#057	#058	#059				
	#060	#061	#062	#063	#064	#065	#066	#067	#068	#069				
	#070	#071	#072	#073	#074	#075	#076	#077	#078	#079				
	#080	#081	#082	#083	#084	#085	#086	#087	#088	#089				
	#090	#091	#092	#093	#094	#095	#096	#097	#098	#099				
	#100	#101	#102	#103	#104	#105	#106	#107	#108	#109				
	#110	#111	#112	#113	#114	#115	#116	#117	#118	#119				
	#120	#121	#122	#123	#124	#125	#126							





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• Click on the shortcut "Show list view" to display the connected device types. In this example the Promag 400 DP flowmeter with the FDL address 45 is displayed:

Fieldgate SFG500			Asset Monitor						Endress+Hauser 🖽						
Start Network Assets	Events	Settings	Information						24. Nov 201	4 13:1	7:37 💻 👬	Login			
Status PROFIBUS Library HART Library	Asset PROFIBUS	Status													
				Devices: 2	3	22	😢 0	V 1	<u></u> 0	0	0 🕛 0				
	Slave	🛰 NE10	7 🛣 Tag		~	Device	Туре	🔨 Ven	dor	~	Ident 🔽				
	S044		DP0005			Promag	100 DP	Endre	ess+Hauser		0x1560	*			
	S045	~	DP0006			Promag	400 DP	Endre	ess+Hauser		0x1562				
	S046		DP0007			Promass	100 DP	Endre	ess+Hauser		0x1561	=			
												_			
												11			
												-			
	Details	of Slaver	[\$045] Promag 400 DI	>								•			
		Device Sta	atus: OK												
		00 0C 00 0	1 15 62												
		In cyclic da details	ata exchange with Master M	001											





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5.2 Endress+Hauser DTM SFG500

• Start the application FieldCare.



• Create a new project.



• Select the menu" Device Operation → Add Device".






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• Add the device "SFGNetwork".

🚺 Add New Device				
Device	Version	Class	Manufacturer	Protocol
CDI Communication FXA291	V2.02.00 (2014		Endress+Hauser	CDI
CDI Communication TCP/IP	V2.02.00 (2014		Endress+Hauser	CDI TCP/IP
CDI Communication USB	V2.02.00 (2014		Endress+Hauser	CDI USB
CommDTM PROFIBUS DP-V1	V4.0.0.9 (2011		Trebing & Himstedt ProzeBautomation Gmb	PROFIBUS DP-V1
FF H1 CommDTM	V1.5 (2009-08		Endress+Hauser, Metso Automation	FDT FIELDBUS FF H1
FieldConnex Diagnostic Server	V2.1.1.1971 (2		PEPPERL+FUCHS GmbH	FDS Communication
Flow Communication FXA193/291	V3.22.00 (2014		Endress+Hauser	ISS
FXA520	V1.05.09 (2011		Endress+Hauser	HABT
HART Communication	V1.0.49 (2012		CodeWrights GmbH	HART
HART OPC Client	V2.0 (2009-05		Endress+Hauser, Metso Automation	HART
IPC (Level, Pressure) FXA193/291	V1.02.17 (2014		Endress+Hauser	IPC
MX CommDTM-PBDP	V3.0 (2011-05		Mitsubishi Electric Europe B.V.	Profibus DP/V1
NXA HART Communication	V1.1.0.911 (20	dtmSpecific	Endress+Hauser	HART
PCP (Readwin) TXU10/FXA291	V1.01.18 (2014		Endress+Hauser	PCP
PROFIdtm DPV1	V 2.11(115) (20	•	Softing Industrial Automation GmbH	Profibus DP/V1
SFGNetwork	V01.01.03 (201	dtmSpecific	Endress+Hauser	SFG5xx

• The new device "SFGNetwork" is then implemented in the Network view.

Network		
Network Tag	Co	Channel
📇 Host PC		
SFGNetwork	4⊳	

• Right-click on the SFGNetwork device and select the option "Create Network".



• The Endress+Hauser DTM is then displayed in the Network view. In this example, it is called SFG500_OpenIntegration and has the address 2. Right-click on the DTM and select the option "Create Network". The DTM is then searching all connected devices.

Network							Ψ×
Network Tag ∇	Connection	Channel	Address	Device type (DTM) Phys	ical Device	
📇 Host PC							
	$\triangleleft \triangleright$		0	EII SFGNetwork			
SFG500_Open Integration		SFGNetworkChannel		EH SFG500			
					襲	Add Device	
					32	Delete Device	
						<u>L</u> aunch Wizard	
					诸	Create network	
					÷	Verify network	
					B	<u>G</u> enerate device list	





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All found devices are displayed in the Network window.
In this example, there only is the Promag 400 DP device with the network tag DP0006 and address 45.

Network					Ψ×
Network Tag 🔽	Connection	Channel	Address	Device type (DTM)	Physical Device
🔚 Host PC					
🗖 🗖 💘 SFGNetwark				EH SFGNetwork	
SFG500_OpenIntegration	$ \langle \Phi \rangle $	SFGNetworkChannel	2	El SFG500	
۰۰۰۰۰ 💥 DP0006	4⊳	SFG500Channel	45	E Promag 400 / 5x4C / DP / FW 1.00.zz / Dev.Rev. 1	Promag 400 DP

• Right click on the slave device Promag 400 DP and select the menu "Connect".

Network Tag 🔽	Connection	Channel	Address	Devic	e type (DTM)	
Host PC							
E⊢ & SFGNetwork	$\triangleleft \triangleright$		0	EH SF	FGNetw	ork	
E & SFG500_OpenIntegration	$\triangleleft \triangleright$	SFGNetworkChannel	2	EH SF	FG500		
		SFG500Channel	45	en Pr	or 🏚	<u>A</u> dd Device	Rev.
					32	<u>D</u> elete Device	
						Launch Wizard	
						Device <u>t</u> ype (DTM) info	
					5	<u>C</u> onnect	
					2	Read from device	
					\$	Write to device	

• The Promag 400 DP is now connected (Online mode).

Ne	twork						Ψ×
Net	work Tag 🗸	Connection	Channel	Address	Device type (DTM)		Physical Device
	Host PC						
E	- 🔨 SFGNetwork	$\triangleleft \triangleright$		0	EII SFGNetwork		
	E & SFG500_OpenIntegration	$\triangleleft \triangleright$	SFGNetworkChannel	2	EII SFG500		
	🖳 💑 DP0006	\triangleleft	SFG500Channel	45	🔠 Promag 400 / 5x4C	/ DP / FW 1.00.zz / Dev.Rev. 1	Promag 400 DP

• Select the Promag 400 DP. The online parameters are displayed. Device parameters can be changed in this mode.

DP0006	(Online Parameterize)			
	Device name: Device taq: Status signal: 🔇	Promag 400 DP DP0006		Volume flow: Q 44991.0200 I/h Mass flow: Q 44991.0200 kg/h
	All parameters	🖂 🕅 🗹	1 🔒 1	• 0 0
Menu / V	/ariable		Value	
- C- C-	Promag 400 DP			
PC	Access status tool	ng:	Maint	Instrument health status
E 🗈	Operation			motrament nearth status
📄 🖻 🗎	Setup			
📃 😟 🗋	Diagnostics			
÷.	Expert			ОК





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5.3 Data exchange verification

Online variables have been checked on the control system in the part 3.5.2 "Online monitoring". All these variables can be checked in the device with FieldCare.

• Expand the Expert mode.



• Expand the menu "Expert \rightarrow Analog inputs \rightarrow Analog input 1".

🖹 🦢 🗛	nalog input 1	
P	Tag description:	
···P	Static revision:	57
P	Strategy:	0
P🗖	Alert key:	0
P	Target mode:	Auto
P🗖	Mode block actual:	Auto
P🗖	Mode block permitted:	152
P🗖	Mode block normal:	Auto
P🗖	Alarm summary:	
P🗖	Batch ID:	0
···P	Batch operation:	0
P🗖	Batch phase:	0
P🗖	Batch Recipe Unit Procedure:	0
P🗖	Out value:	45402.2700
P🗖	Out status:	0x80
·P🗖	Out status:	Good





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•		•	•	
b	Discre	ete inputs		
ē 🛛	D	iscrete input 1		
	P🗖	Tag description:		
	P🗖	Static revision:	14	
	P🗖	Strategy:	0	
	P🗖	Alert key:	0	
	P🗖	Target mode:	Auto	
	P🗖	Mode block actual:	Auto	
	P🗖	Mode block permitted:	152	
	P🗖	Mode block normal:	Auto	
	P🗖	Alarm summary:		
	P🗖	Batch ID:	0	
	P🗖	Batch operation:	0	
	P💶	Batch phase:	0	
	P🗖	Batch Recipe Unit Procedure:	0	
	P🗖	Out value:	1	
	P	Out status:	0x80	
	P💶	Out status:	Good	
	P🗖	Channel:	Empty pipe det	
	P🗖	Invert:	Off	
	P	Fail safe type:	Off	
	P🗖	Simulate enabled:	Enable	
	P🗖	Simulate value:	1	
	P🗖	Simulate status:	0x80	

• Expand the menu "Expert \rightarrow Discrete inputs \rightarrow Discrete input 1".

◦ Expand the menu "Expert → Analog outputs → Analog output 1".

b 🗁	Analog	outputs	
ė 🦢	Ana	alog output 1	
	P	Tag description:	
-	P	Static revision:	3
	P	Strategy:	0
	P	Alert key:	0
	P🗖	Target mode:	Auto
	P	Mode block actual:	Auto
	P	Mode block permitted:	186
	P	Mode block normal:	Auto
	P🗖	Alarm summary:	
	P	Batch ID:	0
	P	Batch operation:	0
	P🗖	Batch phase:	0
	P🗖	Batch Recipe Unit Procedure:	0
	P	Set point value:	45.2300
	P	Set point status:	0x80
	P	PV scale lower range:	0.0000
	P🗖	PV scale upper range:	100.0000
	P	Readback value:	45.2300
	P 🗖	Readback status:	0x80
	P	RCAS in value:	0.0000
	P	RCAS in status:	0x18
-	P 🗖	Input channel:	None
	P	Output channel:	External density
	P	Fail safe time:	0
	P	Fail safe type:	Fallback value
	P	RCAS out value:	45.2300
	P	RCAS out status:	0xcc
	P	Position value:	0
	P	Position status:	0
	P	Setpoint deviation:	0.0000
-	P	Simulate enabled:	Disable
	P	Simulate value:	0.0000
	P	Simulate status:	0
	P 🗖	Increase dose:	0
	P	Out value:	45.2300
	P	Out status:	0x80





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) 🗁 🛛 Dis	screte outputs	
🖻 🧁	Discrete output 1	
PC	Tag description:	
PC	Static revision:	8
PC	Strategy:	0
PC	Alert key:	0
PC	Target mode:	Auto
P	Mode block actual:	Auto
P	Mode block permitted:	186
PC	Mode block normal:	Auto
P	Alarm summary:	
P	Batch ID:	0
P	Batch operation:	0
P	Batch phase:	0
P	Batch Recipe Unit Procedure:	0
P	Set point value:	1
P	Set point status:	0x80
P	Out value:	1
P	Out status:	0x80
P	Out status:	Good
P	Readback value:	1
P	Readback status:	0x80
P	RCAS in value:	0
P	RCAS in status:	0x18
PC	Input channel:	None
P	Output channel:	Flow override
P	□ Invert:	Off
P	□ Fail safe time:	0
P	Fail safe type:	Fallback value
PC	RCAS out value:	1
P	RCAS out status:	0xcc
P	□ Simulate enabled:	Disable
P	Simulate value:	0
	□ Simulate status:	0

• Expand the menu "Expert \rightarrow Discrete outputs \rightarrow Discrete output 1".



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