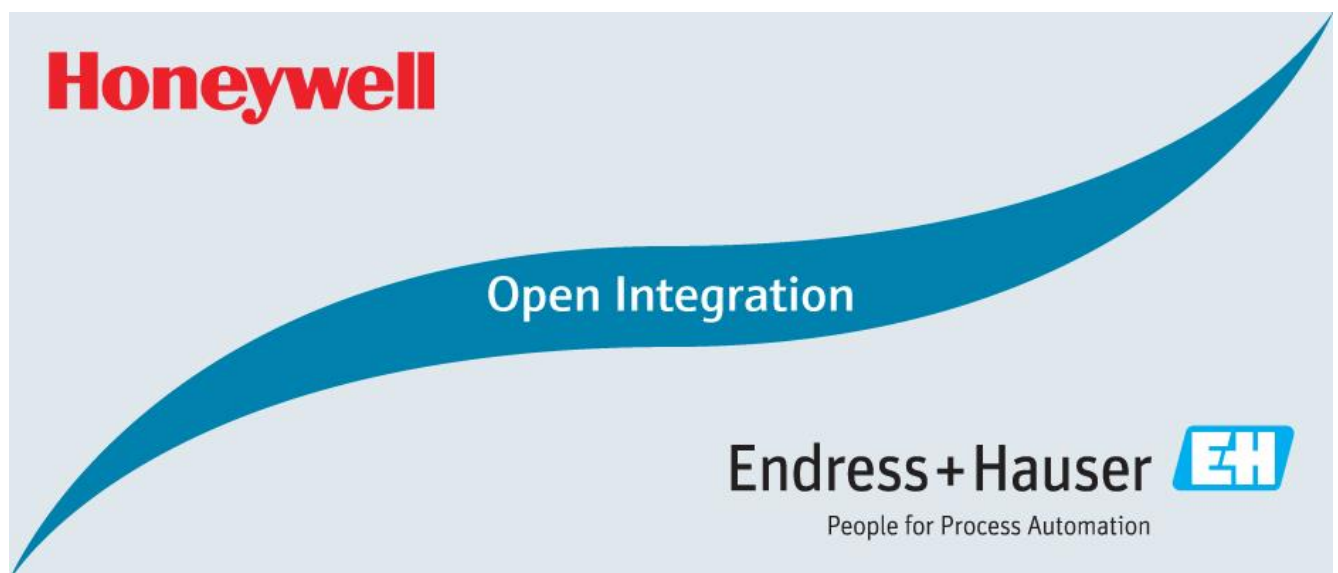


## Integration Tutorial HON01

Honeywell Experion PKS and FOUNDATION Fieldbus for  
Oil & Gas 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 FOUNDATION Fieldbus devices with a Honeywell Experion PKS System. All content of this document is jointly developed, reviewed and approved by Honeywell 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	2017.04	Initial version

### 1.3 Related Documents

Please refer to related documents as listed below:

Document	Description
SD01851S/04/EN/01.17	Reference Topology HON01
SD01853S/04/EN/01.17	Integration Test Summary HON01
SD01854S/04/EN/01.17	List of Tested Devices and Versions HON01

## 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 Honeywell Experion PKS and FOUNDATION Fieldbus in general. Please refer to recommended literature as listed in chapter 2.1.

### 2.1 Recommended Literature

#### 2.1.1 Honeywell

Document	Description
EPDOC-X125	Series C Fieldbus Interface Module User's Guide
EPDOC-XX11	C300 Controller User's Guide
EPDOC-XX19	Control Building User's Guide

### 2.2 Operable Control System

This document assumes an operable Honeywell Experion PKS as defined by Reference Topology HON01. Please refer to the manuals listed in chapter 2.1.1 for an explanation on how to use hard- and software provided by Honeywell.

### 2.3 Operable Asset Management System

This document assumes operable Honeywell Experion FDM software as defined by Reference Topology HON01.

### 2.4 Operable Field Network Infrastructure

This document assumes operable FOUNDATION Fieldbus H1 Segments with Pepperl+Fuchs Power Supply and Segment Protectors or Field Barriers as defined by Reference Topology HON01.

### 2.5 Operable Field Devices

This document assumes an operable selection of FOUNDATION Fieldbus devices, as defined by Reference Topology HON01. Each field device is adequately connected to a FOUNDATION Fieldbus H1 Segment and externally powered if needed. Please refer to the individual device manuals for further advice.

## 3 Basic Integration

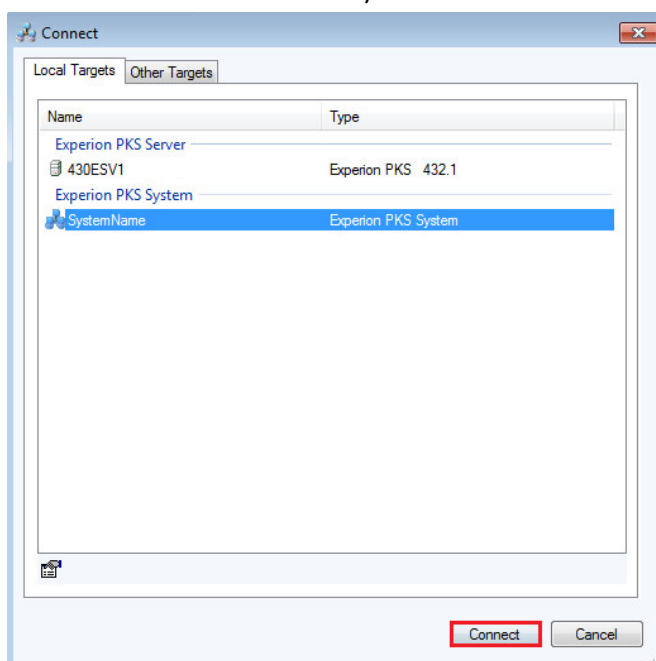
This chapter describes the main workflow for integrating FOUNDATION Fieldbus devices into the Honeywell Experion PKS. As a result, the FOUNDATION Fieldbus communication is running and all device resource and transducer blocks are available within the control strategy of the system for further processing.

### 3.1 New Project

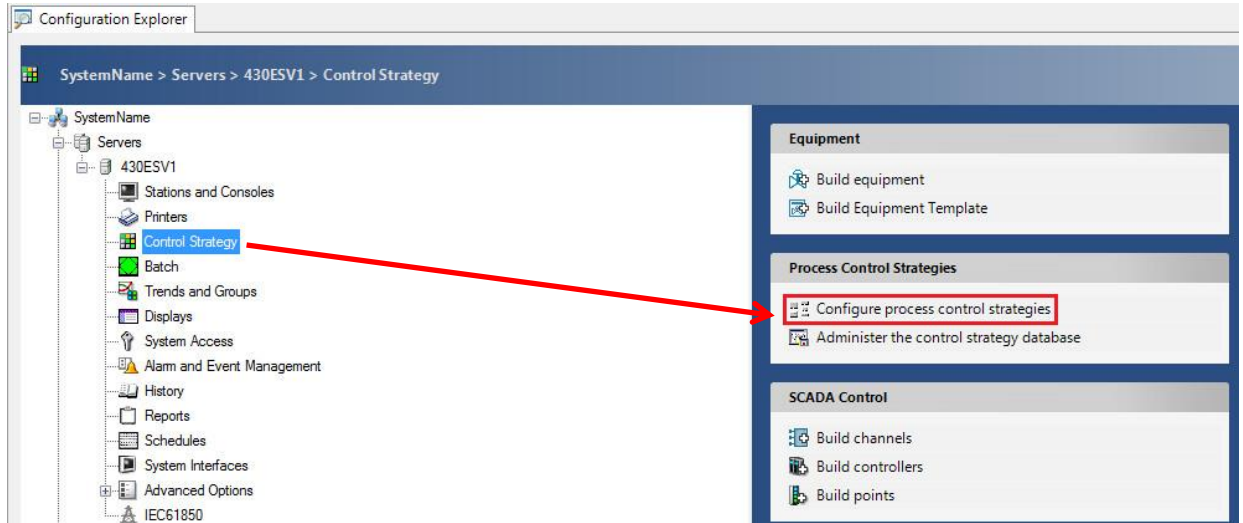
- Start the software Configuration Studio on the Flexstation.



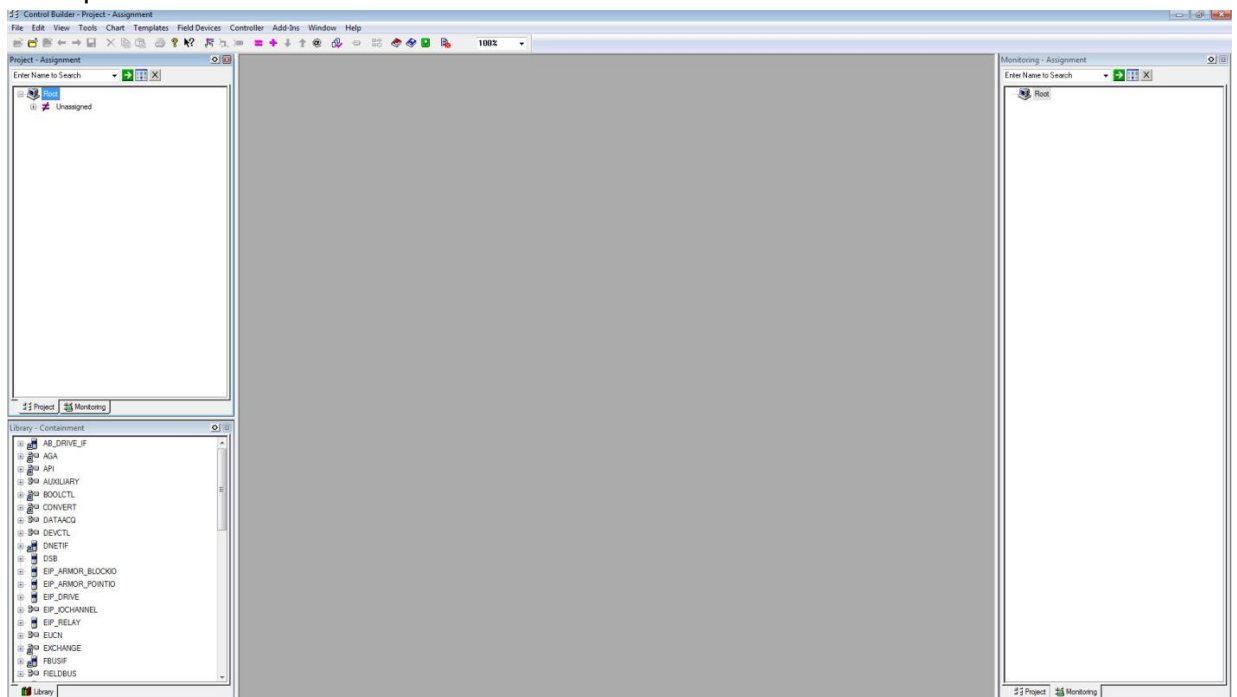
- Select the menu "SystemName" and click on the button "Connect" (Honeywell EPKS System must be connected to the network).



- Select the menu “Control Strategy” and then click on the menu “Configure process control strategies”.



- This opens the Control Builder environment.



## 3.2 System Configuration

This chapter explains how to configure the IP addresses in Control Builder.

- The target is to work with following network:

Component	IP Address
EPKS Server	10.126.93.40
FDM Server	10.126.93.41
Flexstation	10.126.93.42

- By using a redundant C300 Controller, Honeywell conventions state that the primary node has an odd address and that primary/secondary node addresses are subsequent:

Component	IP Address
C300 Primary	10.126.93.43
C300 Secondary	10.126.93.44
FIM4	10.126.93.45

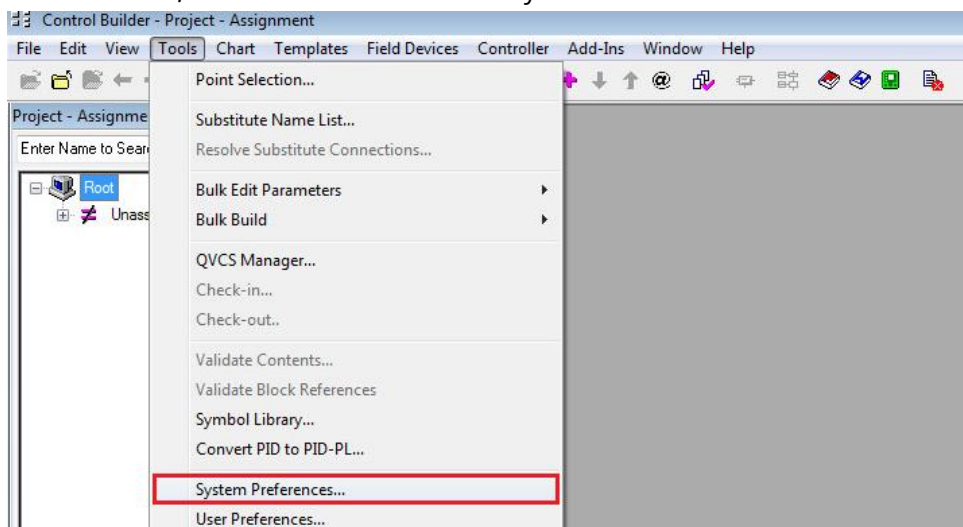
In this example, the primary C300 Controller has the node address 43 and the secondary C300 Controller has the node address 44.

- This tutorial describes the configuration of one C300 controller (node address 43) without redundant C300 module:

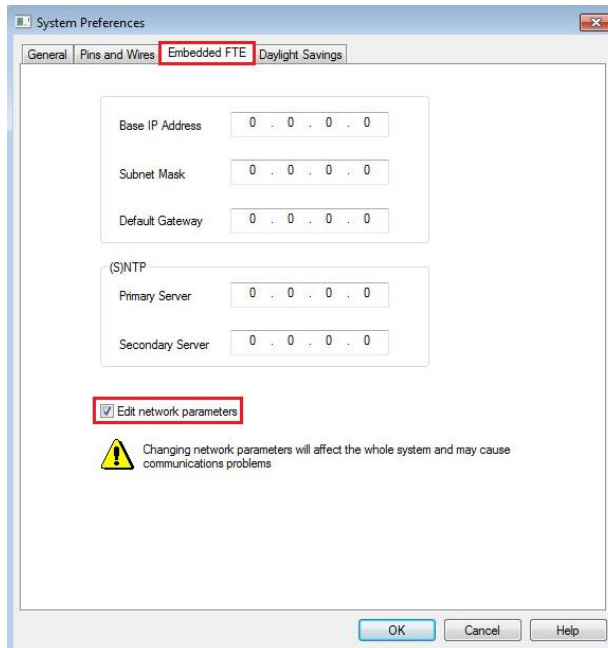
Component	IP Address
C300	10.126.93.43
FIM4	10.126.93.44

### 3.2.1 IP Network Settings

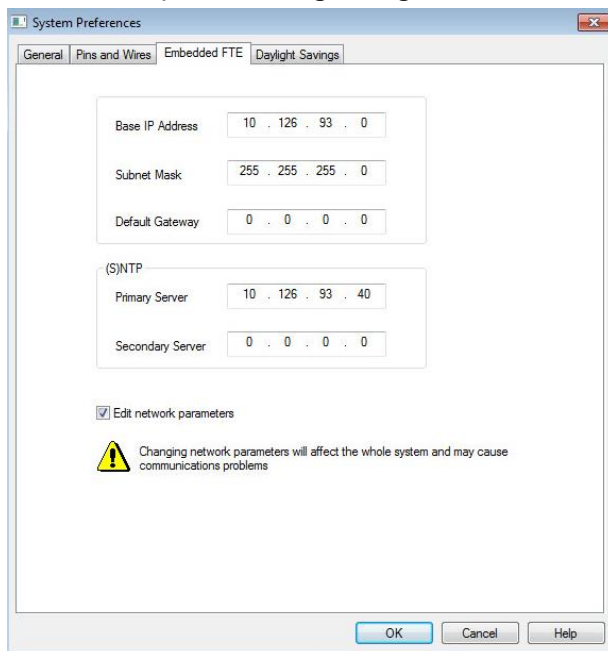
- In the toolbar, select the menu "Tools→ System Preferences".



- Select the tab “Embedded FTE” and enable the “Edit network parameters” checkbox.



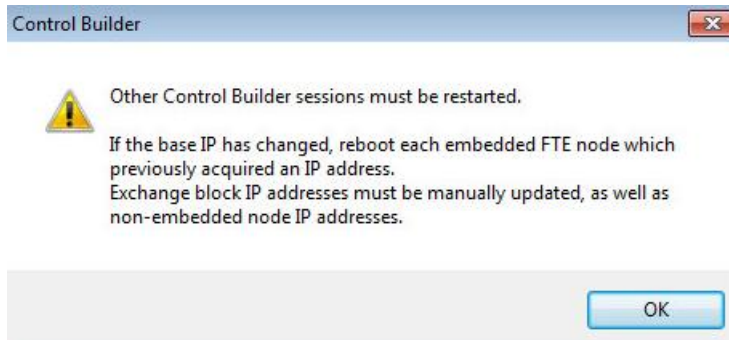
- Edit the network settings according to the corresponding network. In this example, following configuration has been set:



The IP address of the Primary Server (EPKS Server) is 10.126.93.40.

- Click on the button “OK” to continue.

- Following message is displayed. Proceed if required.



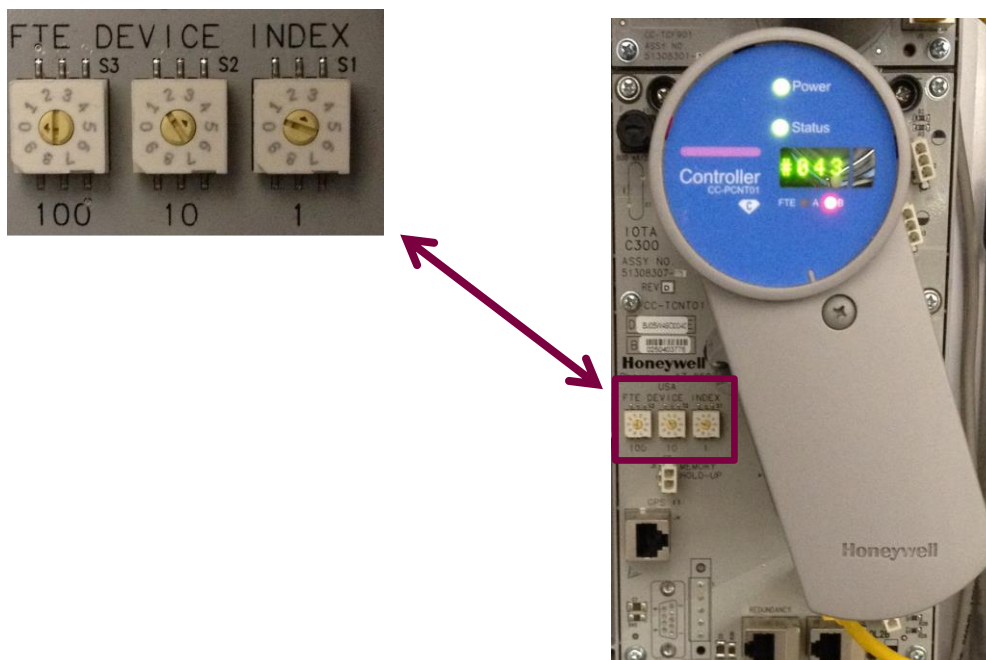
## 3.2.2 Control System

### 3.2.2.1 Firewall

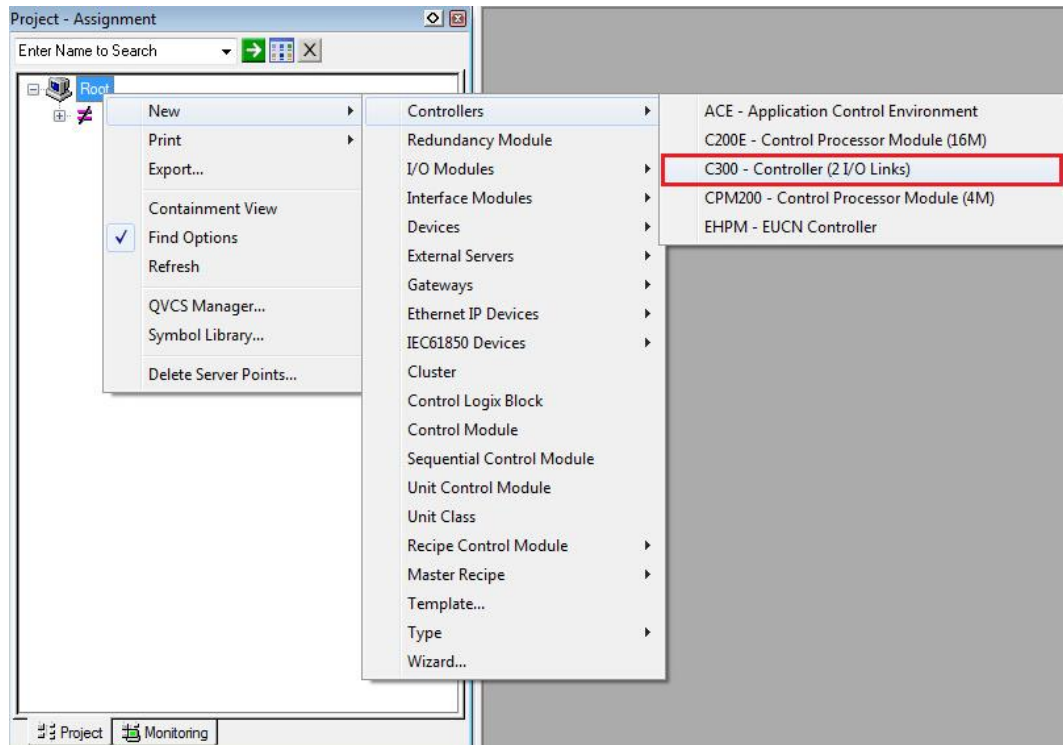
No configuration is needed for this example.

### 3.2.2.2 C300

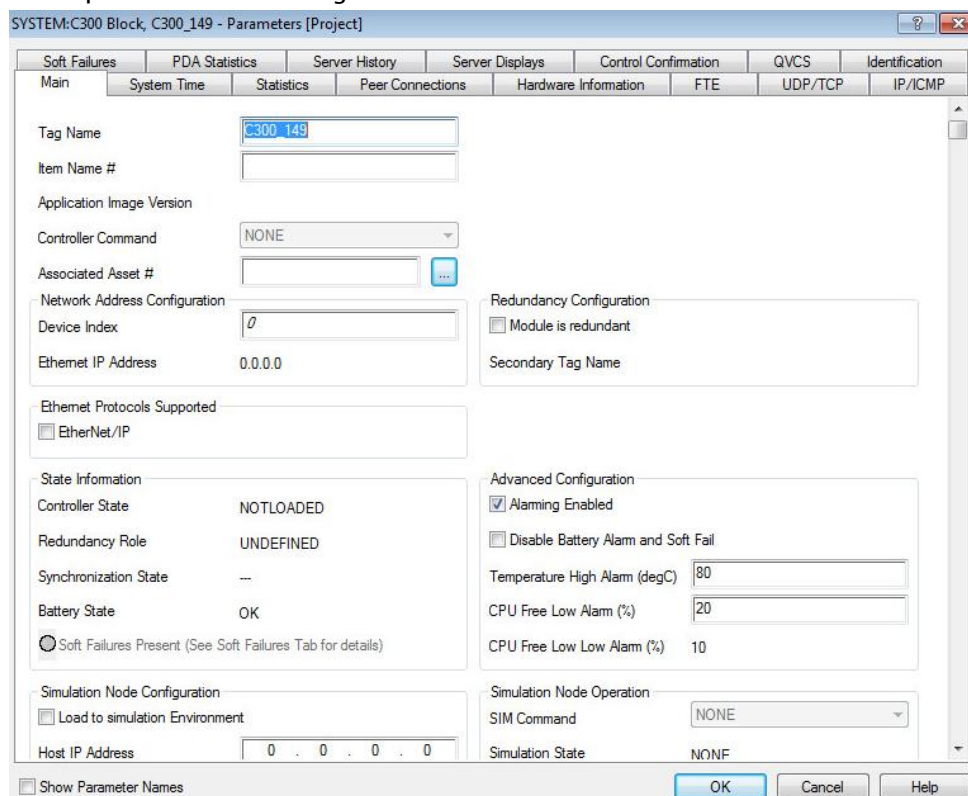
- In our example, the C300 IP address is 10.126.93.43. The last part of this IP address (10.126.93.43) must be configured with a screwdriver on the switches of the C300 card. The first switch is set to "0", the second one to "4" and the last one to "3":



- In the Project-Assignment view, right-click on "Root" and select the option "New→Controllers→C300-Controller(2I/O Links)".

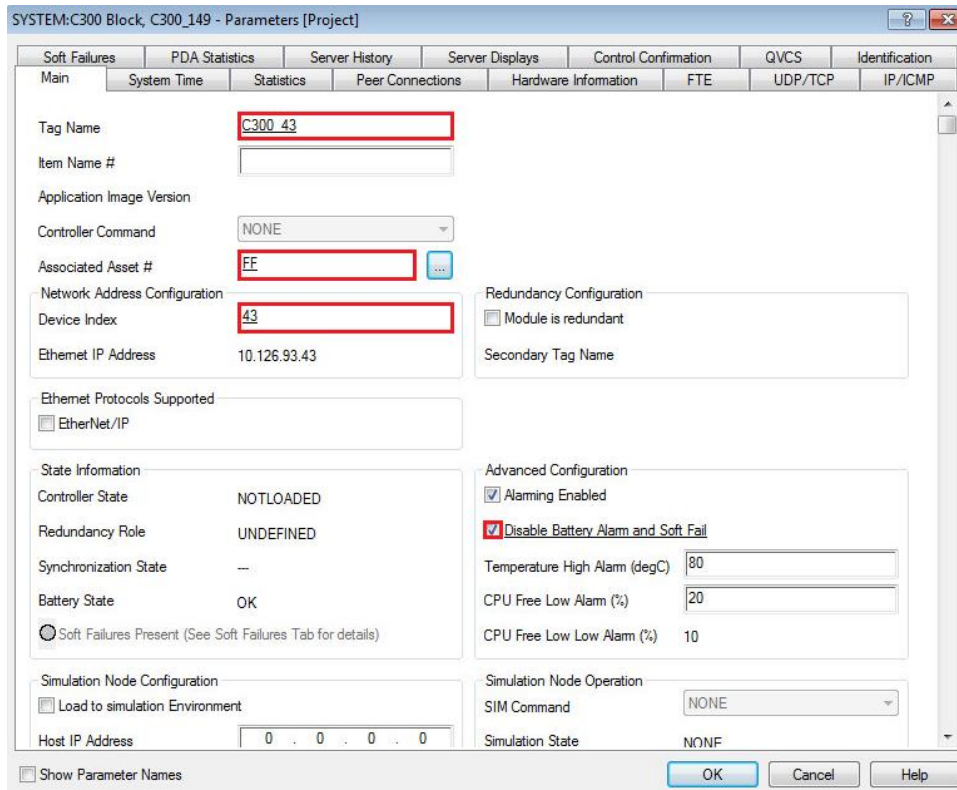


- This opens the C300 configuration window:





- Following settings have been configured:



SYSTEM: C300 Block, C300\_149 - Parameters [Project]

Soft Failures	PDA Statistics	Server History	Server Displays	Control Confirmation	QVCS	Identification
Main	System Time	Statistics	Peer Connections	Hardware Information	FTE	UDP/TCP
IP/ICMP						

Tag Name: **C300\_43**

Item Name #:

Application Image Version:

Controller Command: NONE

Associated Asset #: **FF**

Network Address Configuration

Device Index: **43**

Ethernet IP Address: 10.126.93.43

Ethernet Protocols Supported

☐ EtherNet/IP

Redundancy Configuration

☐ Module is redundant

Secondary Tag Name:

State Information

Controller State: NOTLOADED

Redundancy Role: UNDEFINED

Synchronization State: ---

Battery State: OK

☒ Soft Failures Present (See Soft Failures Tab for details)

Advanced Configuration

☒ Alarming Enabled

☒ Disable Battery Alarm and Soft Fail

Temperature High Alarm (degC): 80

CPU Free Low Alarm (%): 20

CPU Free Low Low Alarm (%): 10

Simulation Node Configuration

☒ Load to simulation Environment

Host IP Address: 0 . 0 . 0 . 0

Simulation Node Operation

SIM Command: NONE

Simulation State: NONE

☐ Show Parameter Names

OK Cancel Help

- In this example,
  - The TAG Name is "C300\_43" (name referring to the IP address).
  - The selected Associated Asset is "FF".
  - The entered Device Index is 43(index referring to the IP address).
  - The option "Battery Alarm and Soft Fail" is disabled.
- Click on the button "OK" to set the configuration.
- The C300 controller is successfully inserted in the project:



- Expand the "FIM\_44" menu and rename all FFLINK modules for a better overview.



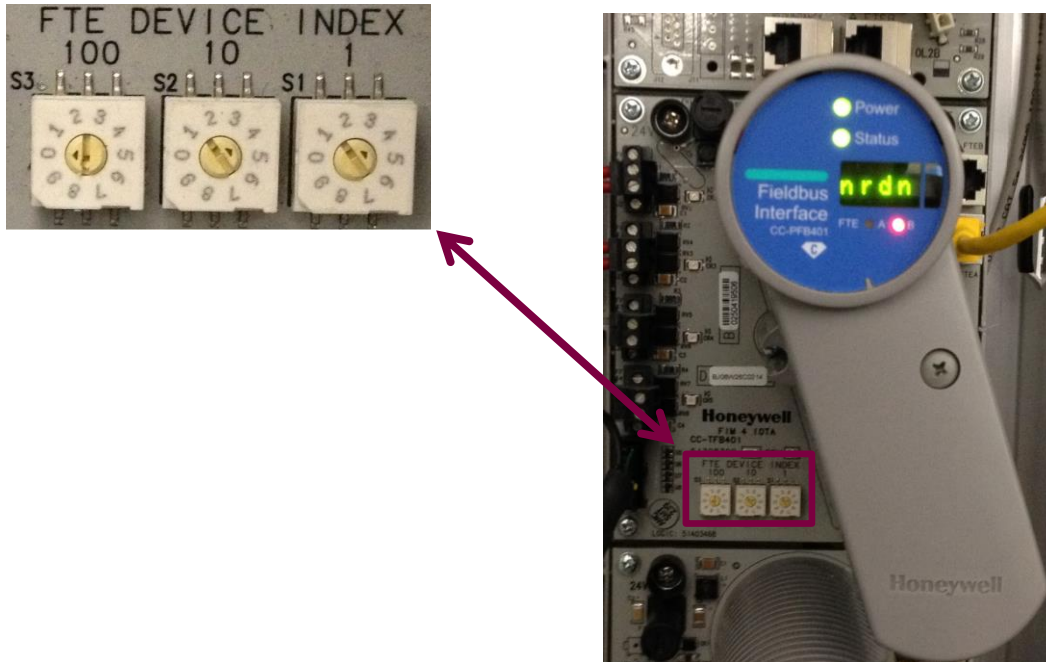
## Remarks about the parameter "Device Index":

- The Device Index value is written in the field and then confirmed with the keyboard touch "Enter". This parameter corresponds to the configured value on the C300 hardware switch. If both values are matching, the field "Ethernet IP Address" is automatically updated.

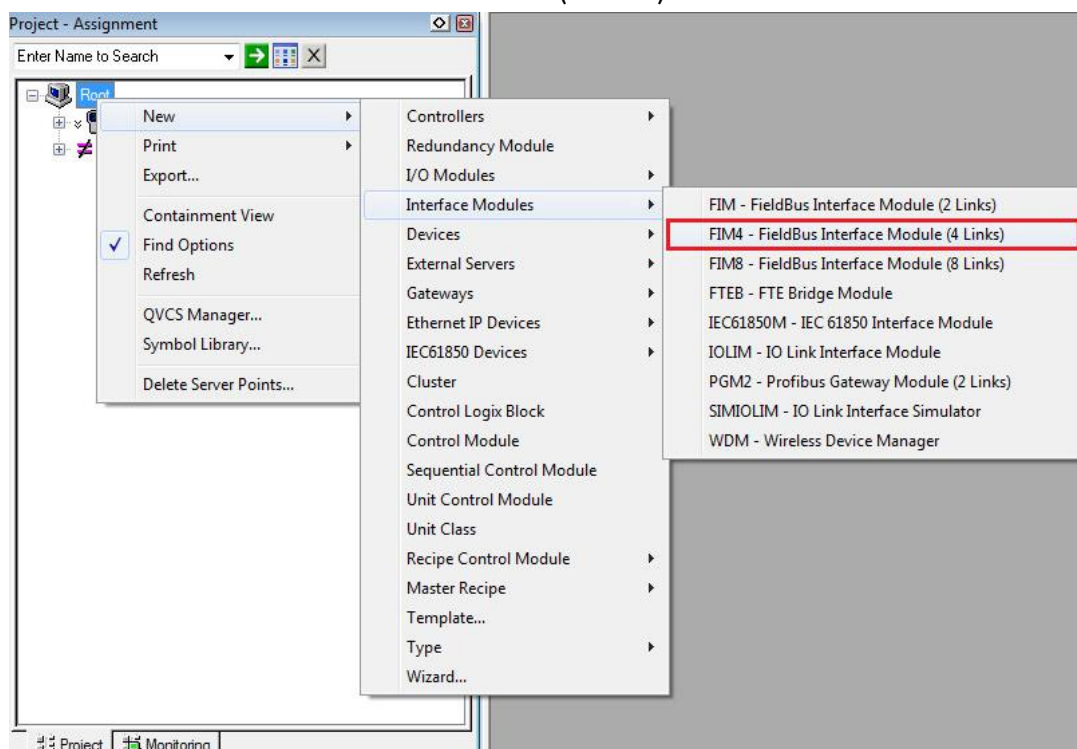
- Otherwise, an error message is displayed.  
In this example, address 44 was written in the field.

### 3.2.2.3 FIM

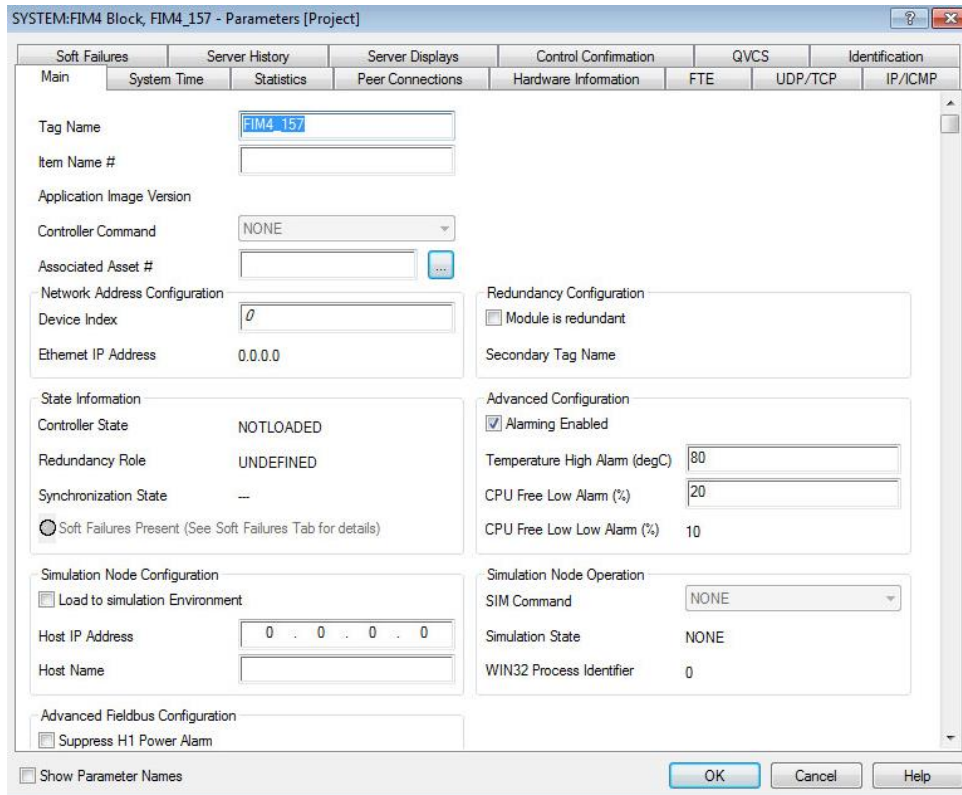
- In our example, the FIM IP address is 10.126.93.44.  
The last part of this IP address (10.126.93.44) must be configured with a screwdriver on the switches of the FIM card. The first switch is set to "0", the second one to "4" and the last one to "4":



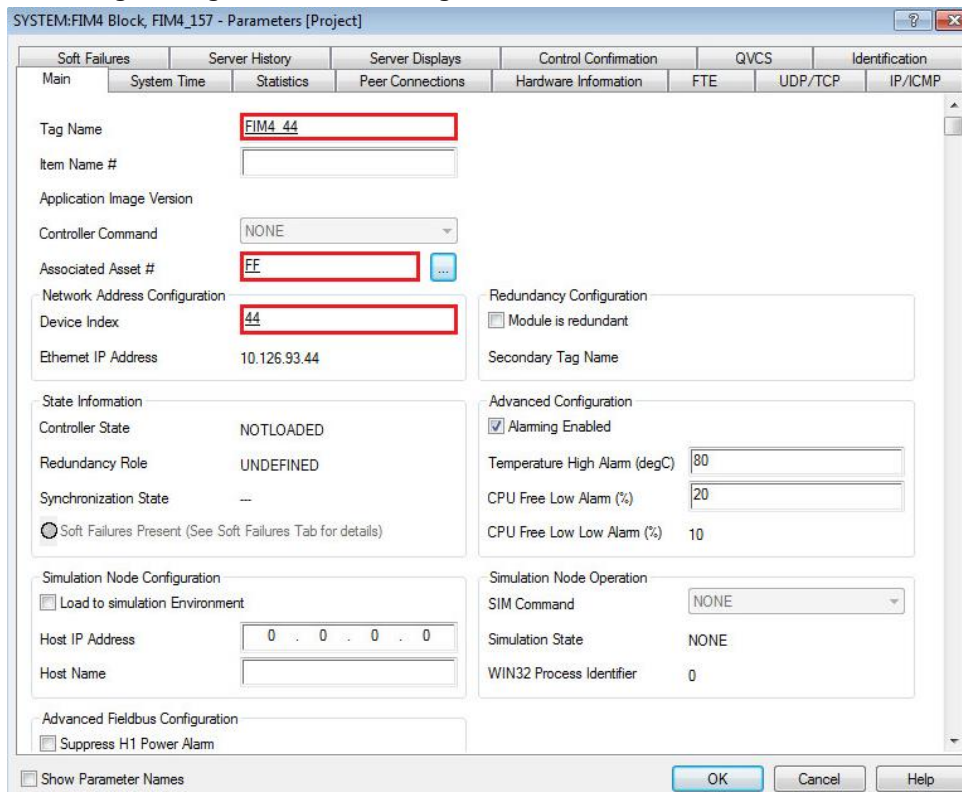
- In the Project-Assignment view, right-click on "Root" and select the option "New→Interface Modules→FIM4-FieldBus Interface Module (4 Links)".



- This opens the FIM configuration window:



- Following settings have been configured:

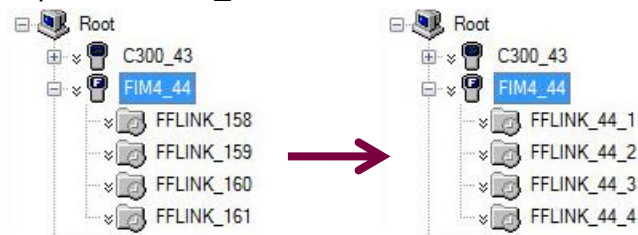


- In this example,
  - The TAG Name is "C300\_43" (name referring to the IP address).
  - The selected Associated Asset is "FF".
  - The entered Device Index is 43(index referring to the IP address).
  - The option "Battery Alarm and Soft Fail" is disabled.
- Click on the button "OK" to set the configuration.

- The FIM module is successfully inserted in the project:



- Expand the "FIM\_44" menu and rename all FFLINK modules for a better overview.



## Remarks about the parameter "Device Index":

- The remarks concerning the parameter "Device Index" in the previous chapter are applicable for the FIM IP address too.

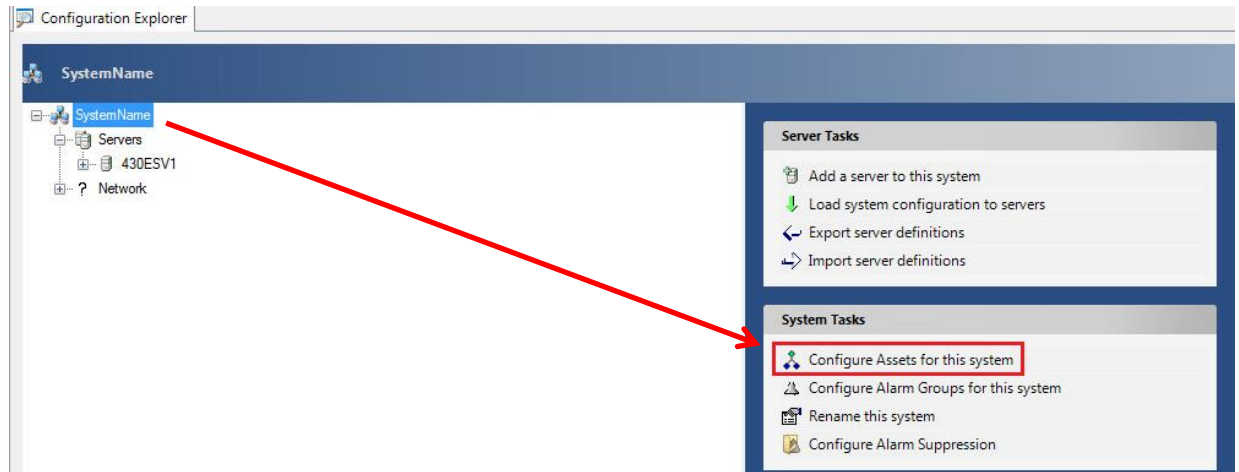
### 3.2.2.4 IP Settings Configuration Download

- Download the IP configuration of the C300 and FIM modules.  
Refer to part 3.6.1 to proceed.

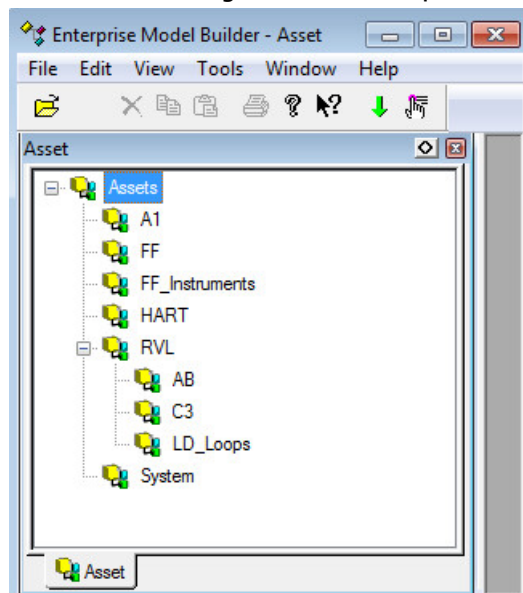
## 3.2.3 Assets Management

Assets are used to fix the scope of responsibilities in a project. These items are mandatory for Control Strategy. This chapter explains how creating the Assets.

- In Configuration Studio, select "SystemName" in the Configuration Explorer and click on the menu "Configure Assets for this system":

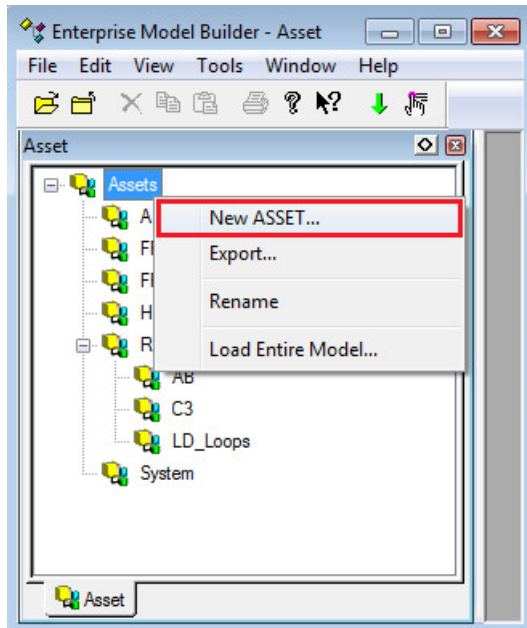


- The Assets management tool is opened and displays configured assets:

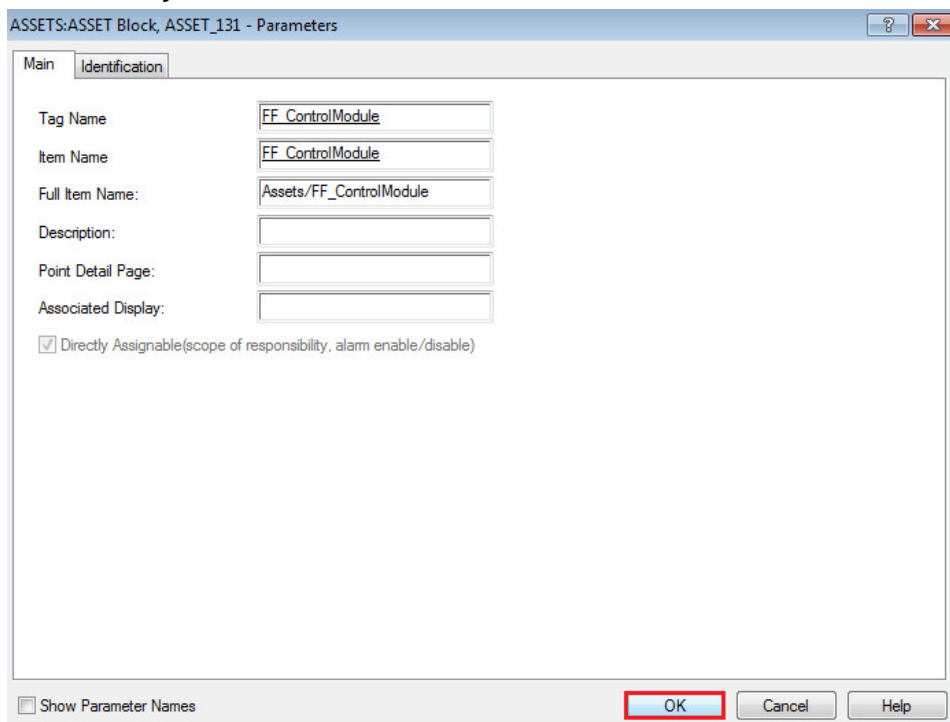




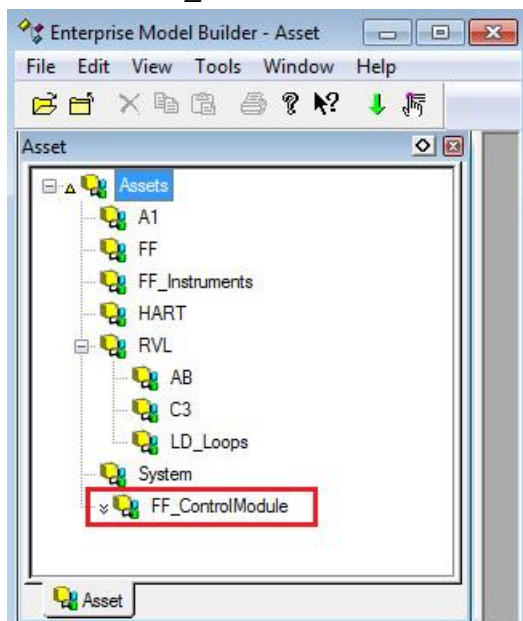
- Right-click on "Assets" and select the menu "New ASSET":



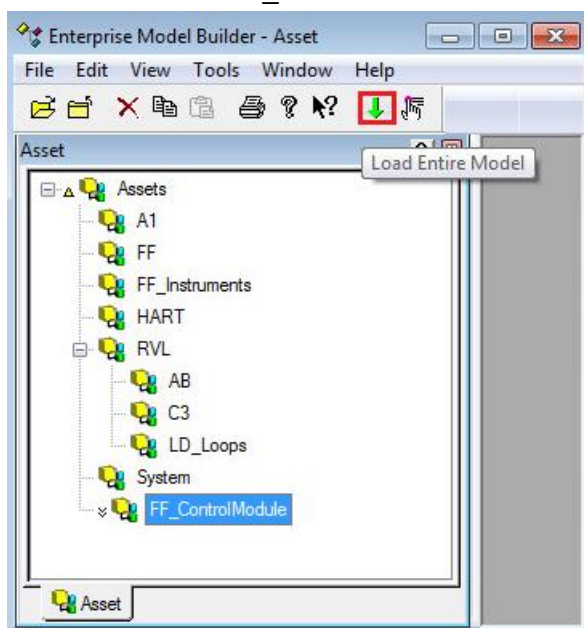
- Configure the Asset "Tag Name" and "Item Name". The parameter "Full Item Name" is refreshed automatically. Click on the button "OK".



- New Asset "FF\_ControlModule" has been inserted:

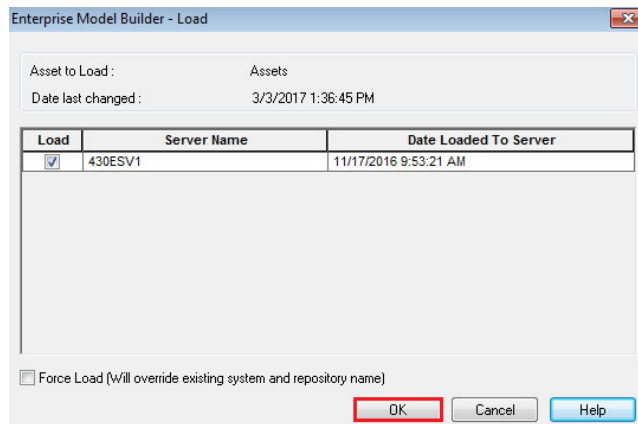


- Select the Assets "FF\_ControlModule" and click on the shortcut button "Load Entire Model":

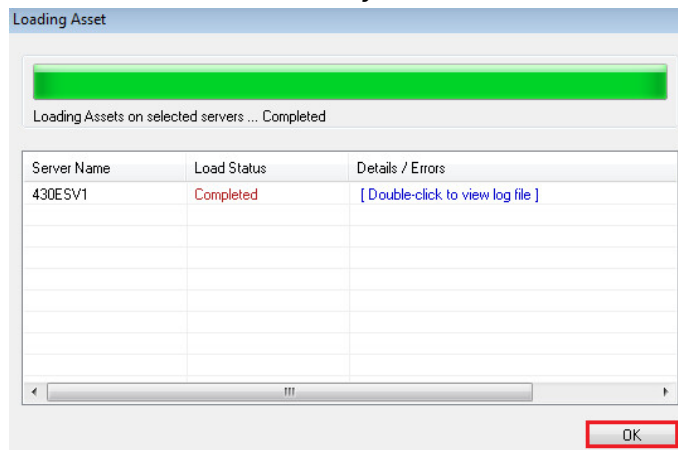




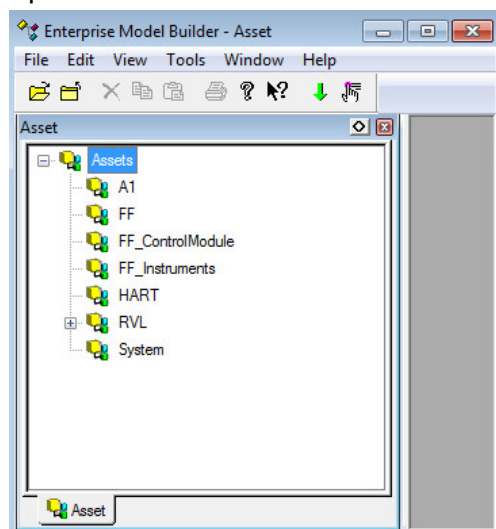
- Click on the button "OK":



- Assets have been successfully loaded. Click on the button "OK".



- Updated Assets:



In this tutorial, the used Assets are "FF" for the Hardware, "FF\_Instruments" for the devices and "FF\_ControlModule" for the control strategy.

## 3.3 Field Network Configuration

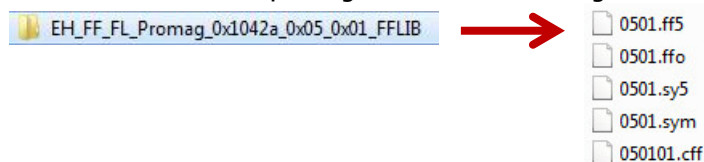
This chapter describes two methods for configuring a field device, either from offline project to Online or from Online to project.

### 3.3.1 Field Devices Library

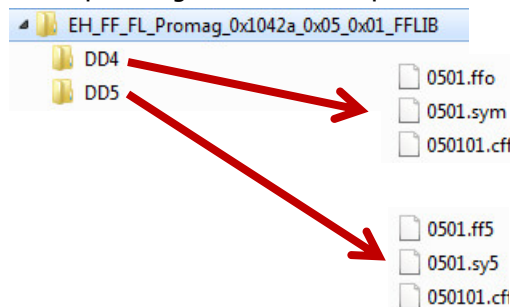
#### 3.3.1.1 General

- The DD package downloaded from Foundation Fieldbus or Endress+Hauser website may contain different DD revision files, which are stored most of the time in the same folder. Control Builder always takes the newest version. Therefore, DD revision files must be separated manually in different folders in order to be able to install all DD in the Control Builder database.

- The following example is specific for the Promag53 FF. The downloaded DD package contains following DD4 and DD5 files:

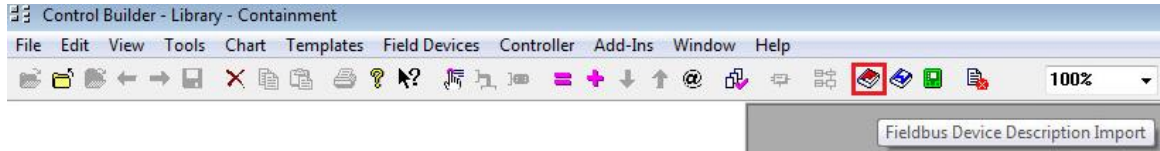


- In order to install the DD4 and DD5 revision, two folders "DD4" and "DD5" are created and the corresponding DD files are separated accordingly. The \*.cff file is used in both DD revisions:

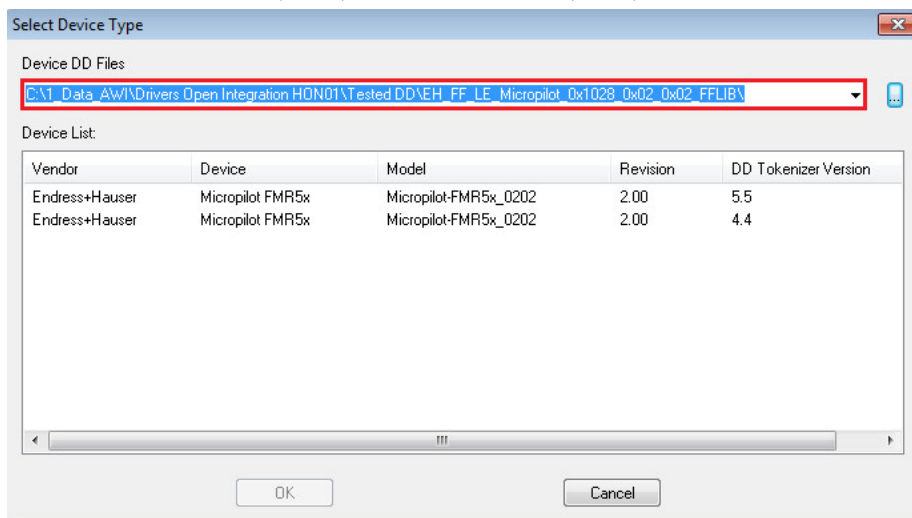


## 3.3.1.2 Device Description DD4

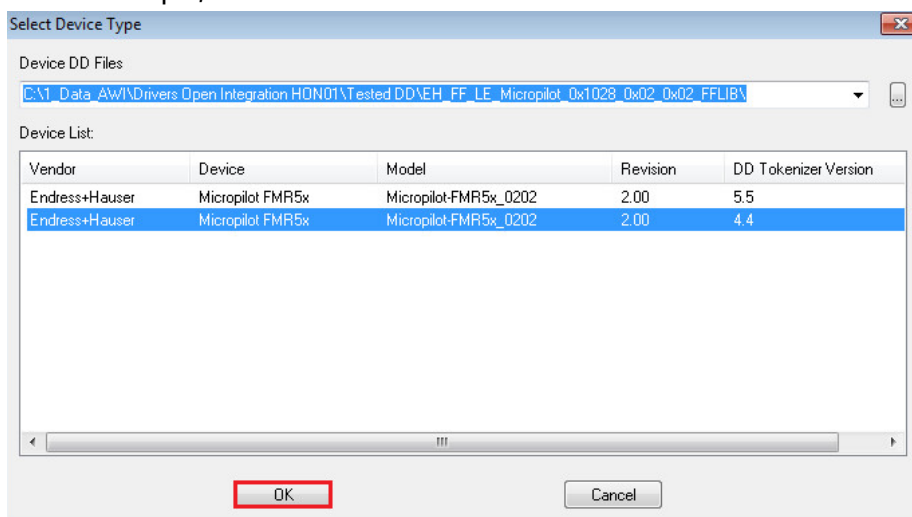
- Click on the shortcut button "Fieldbus Device Description Import":



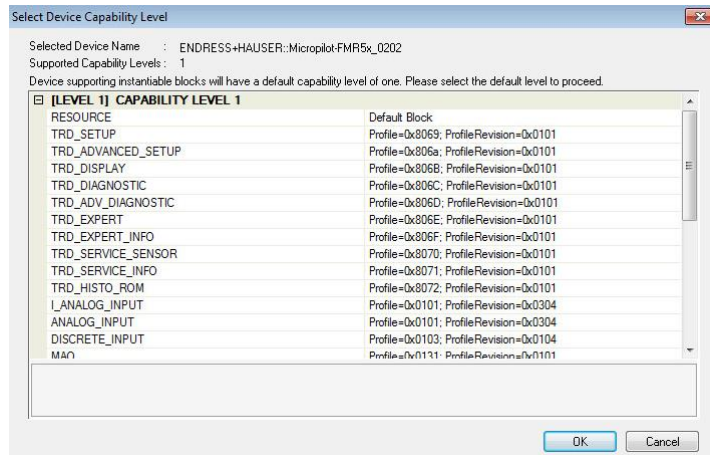
- Select the path on which is located the driver. In this example, there are two Device Description drivers : Revision 4.4 (DD4) and Revision 5.5 (DD5):



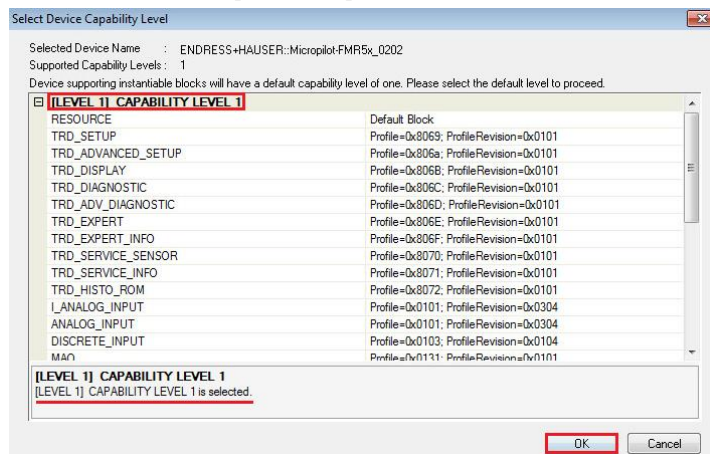
- Select the DD revision that needs to be installed and click on the button "OK". In this example, the DD4 driver is selected.



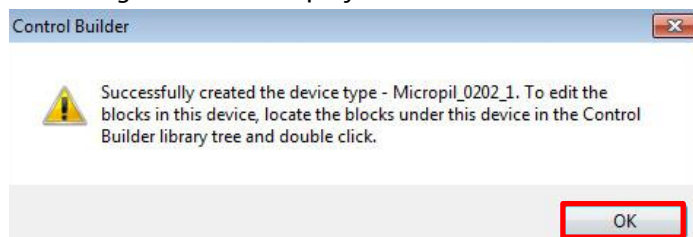
- The window "Device Capability Level" is displayed:



- Click on the field "[LEVEL 1] CAPABILITY LEVEL", then on the button "OK".

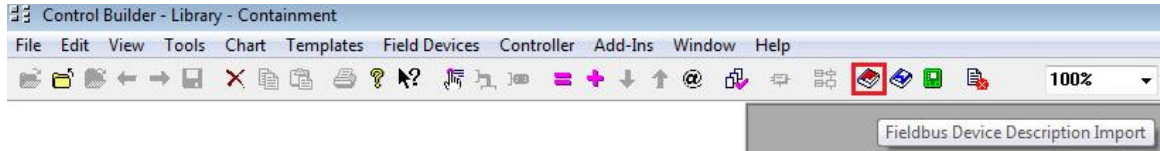


- Following window is displayed. Click on the button "OK":

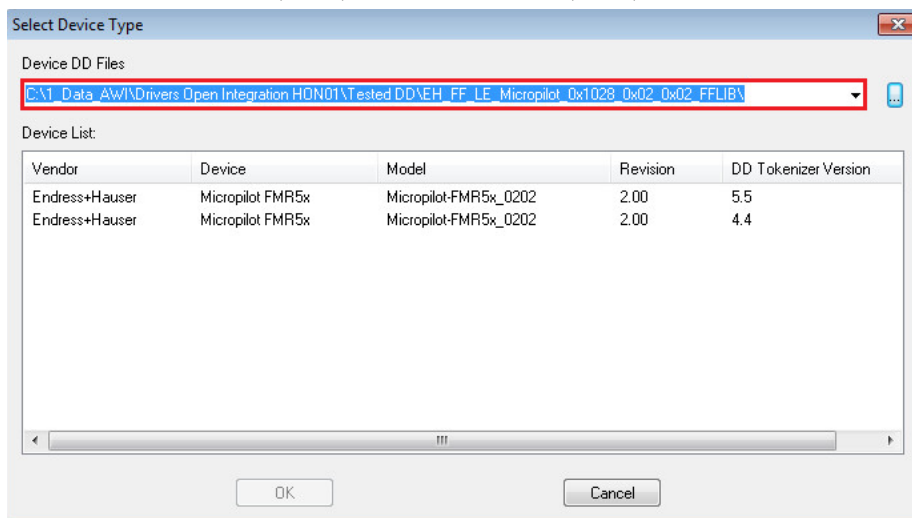


### 3.3.1.3 Device Description DD5

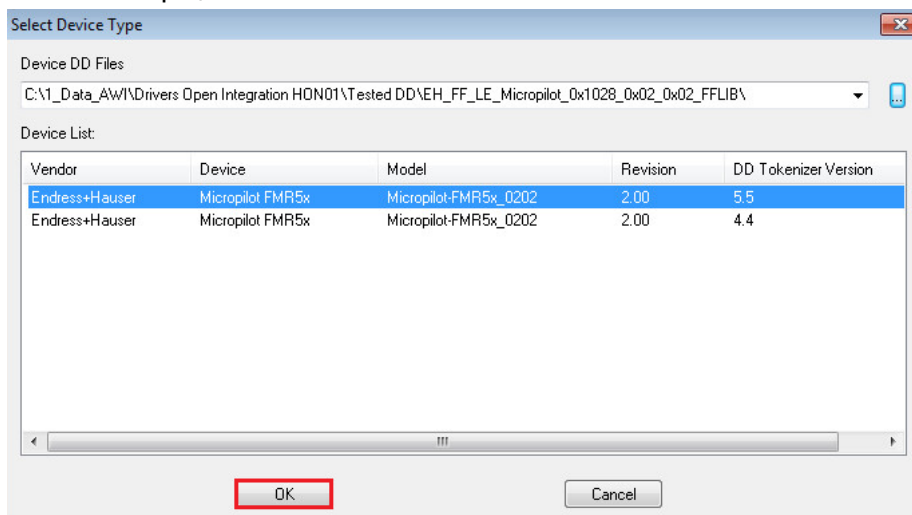
- Click on the shortcut button "Fieldbus Device Description Import":



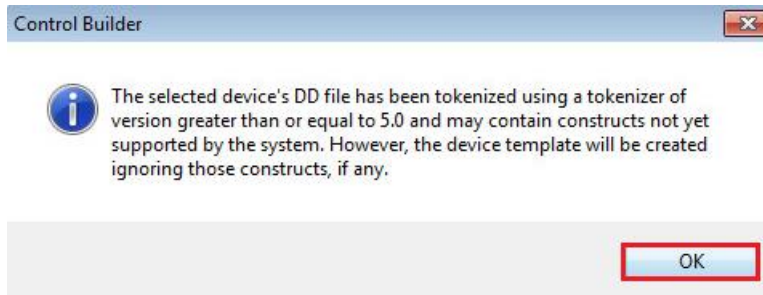
- Select the path on which is located the driver. In this example, there are two Device Description drivers : Revision 4.4 (DD4) and Revision 5.5 (DD5):



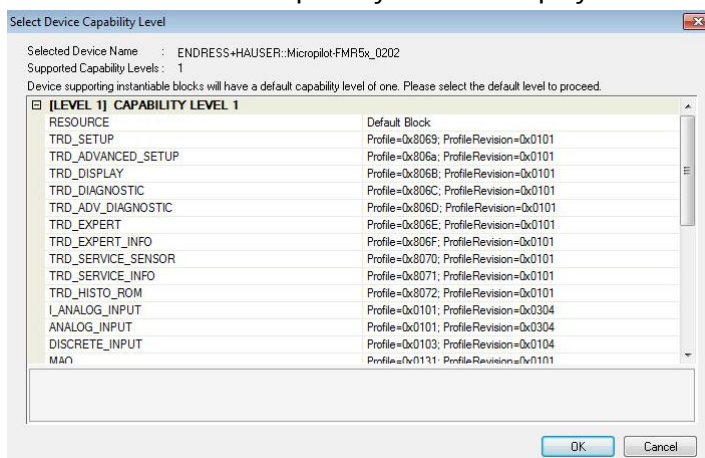
- Select the DD revision that needs to be installed and click on the button "OK". In this example, the DD5 driver is selected.



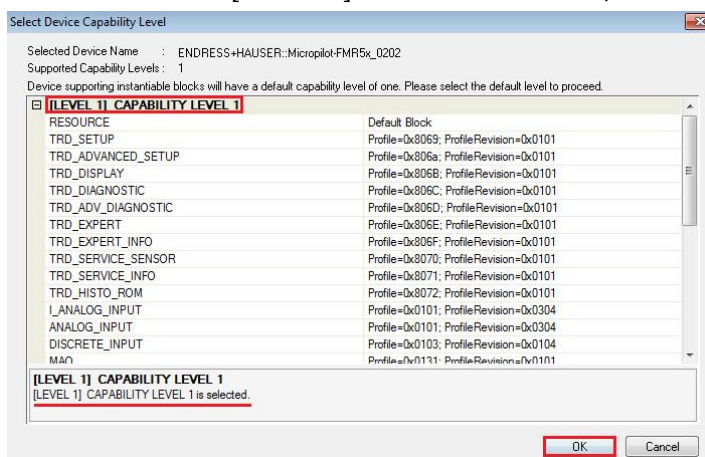
- Following window is displayed. Click on the button "OK".



- The window "Device Capability Level" is displayed:



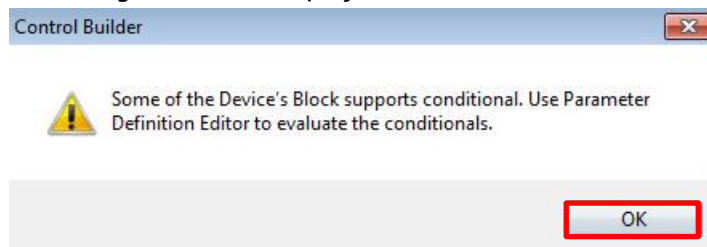
- Click on the field "[LEVEL 1] CAPABILITY LEVEL", then on the button "OK".



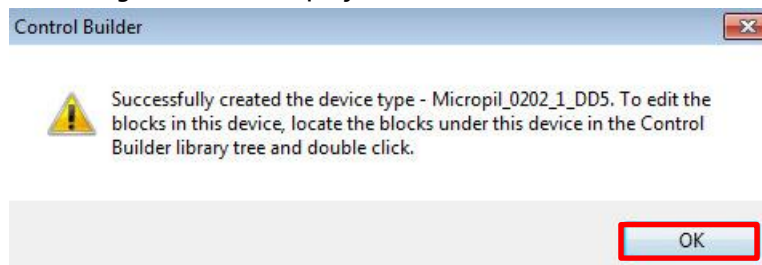
- As the DD4 is already installed, the DD5 can either overwrite the DD4 or be renamed. In this example, the DD has been renamed "Micropilot\_0202\_1\_DD5". Click on the button "Save As" to proceed.



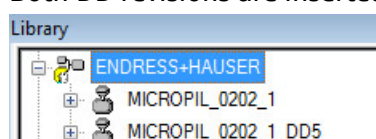
- Following window is displayed. Click on the button "OK".



- Following window is displayed. Click on the button "OK".



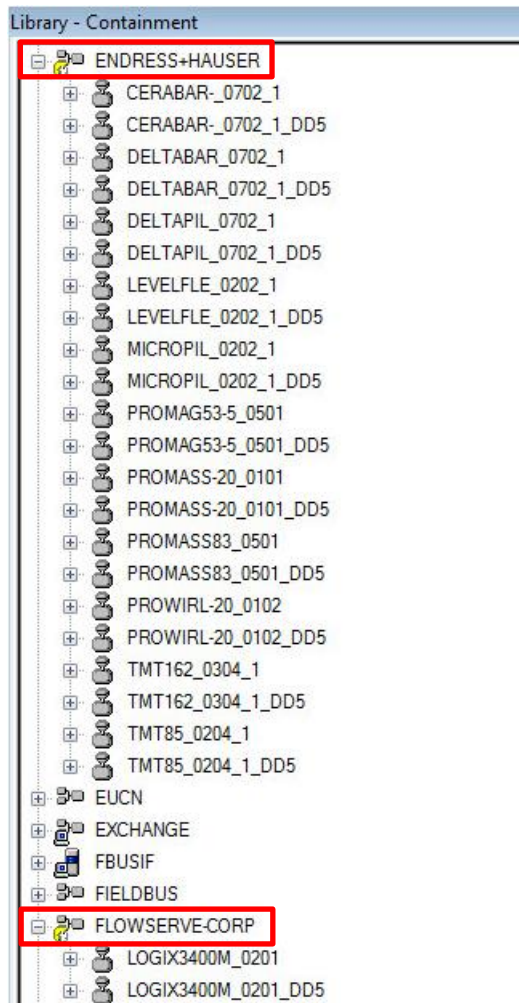
- Both DD revisions are inserted in the Endress+Hauser Library:





### 3.3.1.4 Installed Device Description Drivers

- All devices of the Honeywell topology HON01 have been installed in the Library as done in the previous chapters:



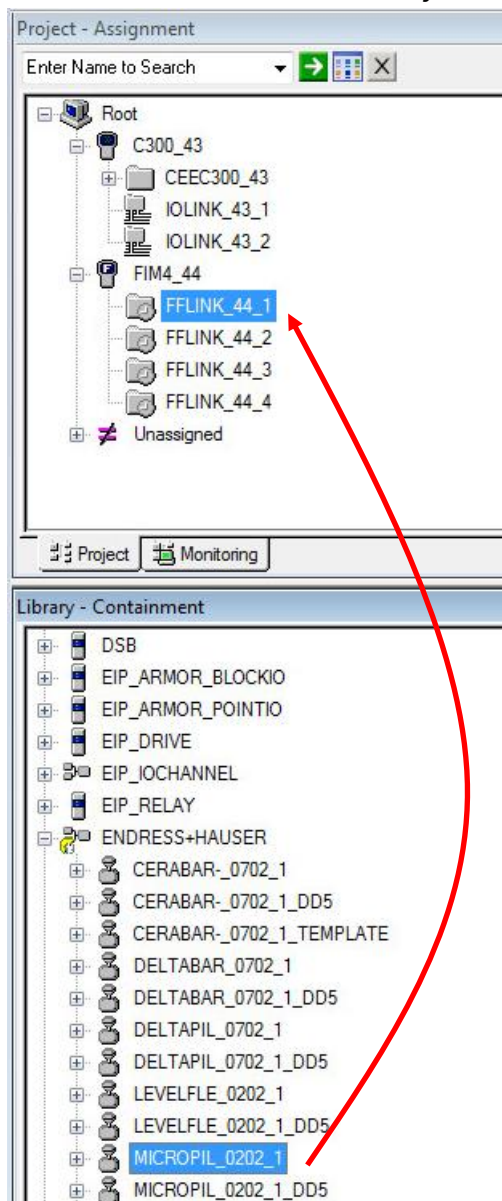


## 3.3.2 Offline Configuration of Field Devices

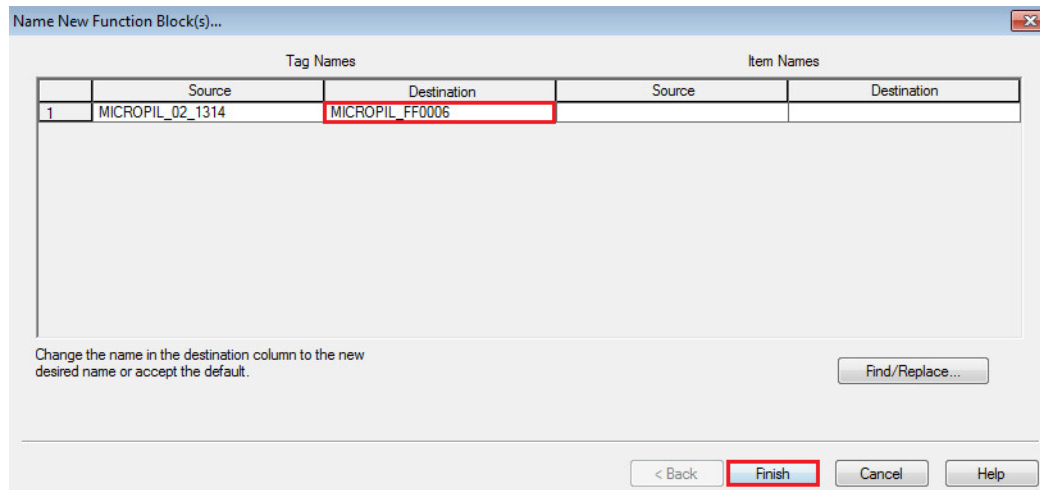
This method consists at first to pre-configure offline the field devices (Bus address, TAG, Asset ...). Then, when the device is installed and ready for commissioning, the prepared configuration can be downloaded to the device. In the following example, the target is to configure the Micropilot with DD4 driver by using this method.

### 3.3.2.1 Device Configuration

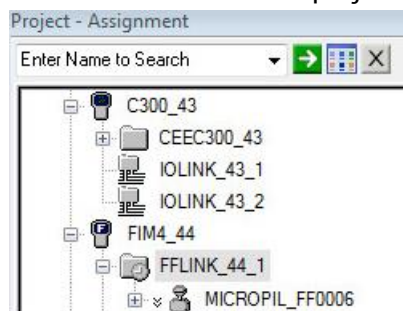
- Select the DD4 driver in the library. Then drag and drop it to the required FIM module.



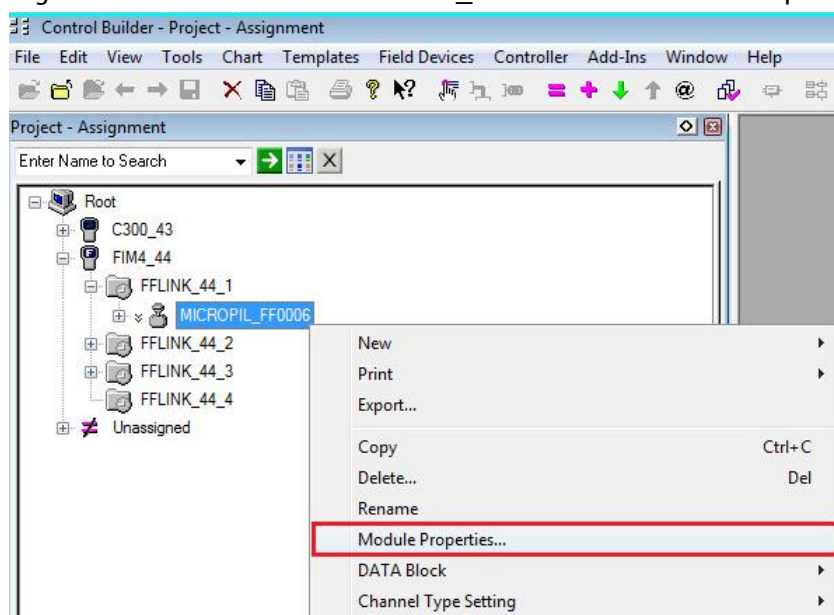
- This opens automatically the following window. Indicate a TAG name, for example "MICROPIL\_FF0006" and click on the button "Finish". Take care only using capital letters without blanks with maximal 32 characters.



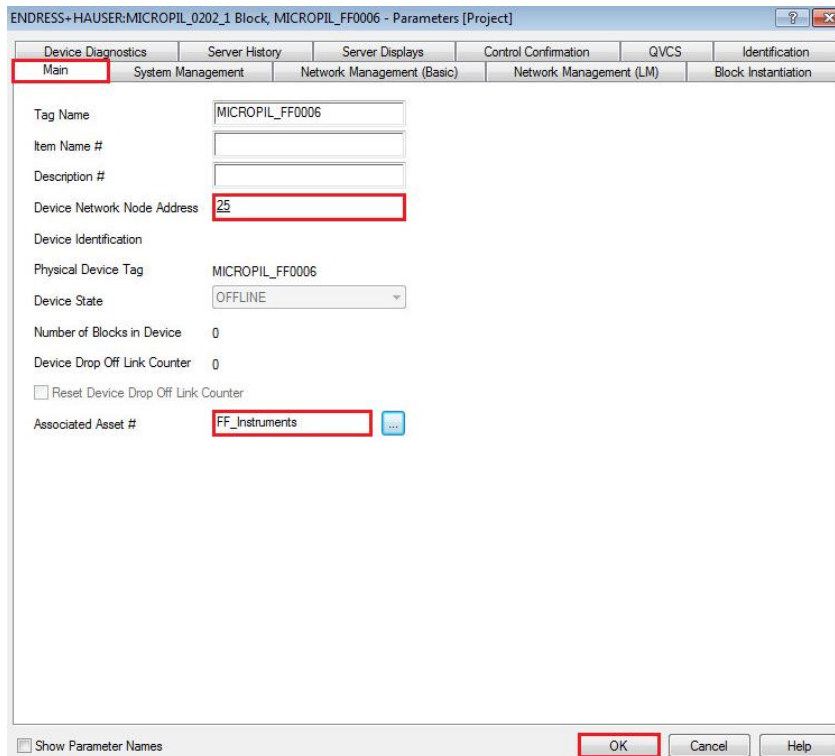
- Device is inserted in the project:



- Right-click on the device "MICROPIL\_FF0006" and select the option "Module Properties".



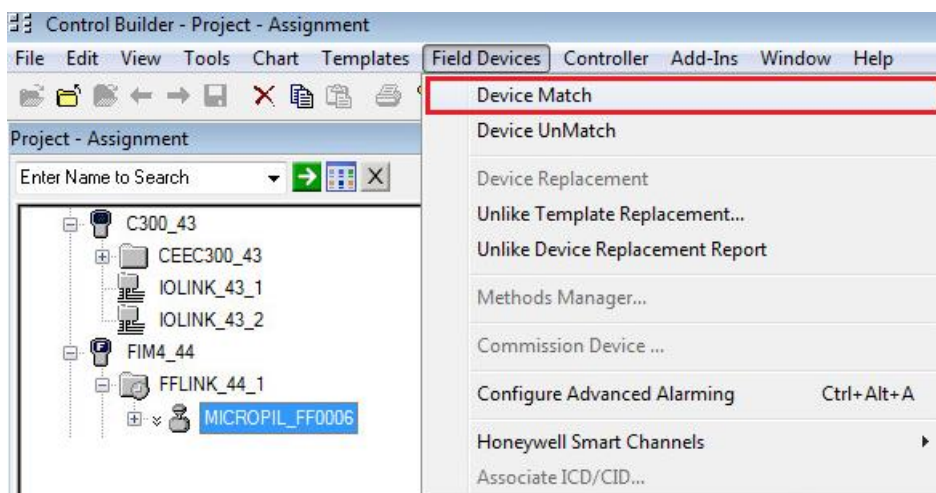
- In the tab “Main”, configure the Device Network Node Address and the Associated Asset #. In this example, the Device Network Node Address is set to 25 and the Associated Asset # is “FF\_Instruments”.



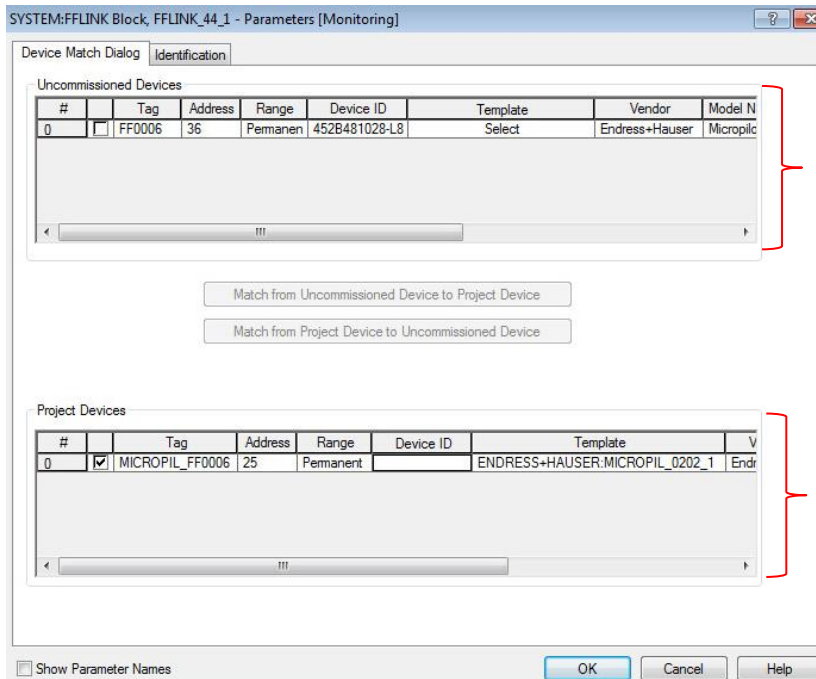
### 3.3.2.2 Device Match

These steps can only be executed when the Fieldbus device is connected to the system.

- Select the device. Then select the menu “Field Devices → Device Match”.



- This opens the "Device Match" configuration window.



SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#	Tag	Address	Range	Device ID	Template	Vendor	Model N
0	FF0006	36	Permanent	452B481028-L8	Select	Endress+Hauser	Micropilc

Match from Uncommissioned Device to Project Device

Match from Project Device to Uncommissioned Device

Project Devices

#	Tag	Address	Range	Device ID	Template	Vendor
0	MICROPIL_FF0006	25	Permanent		ENDRESS+HAUSER.MICROPIL_0202_1	Endr

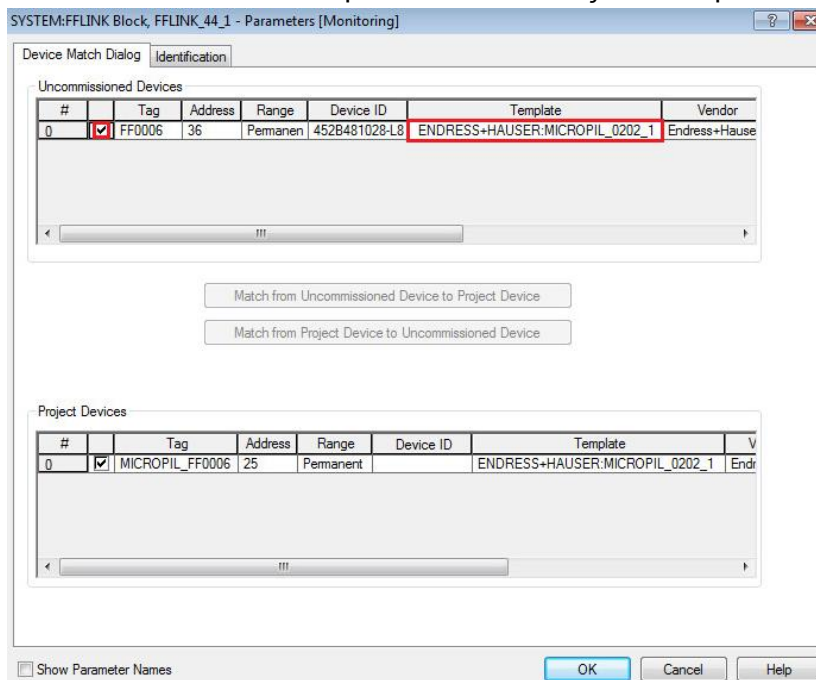
Show Parameter Names

OK Cancel Help

Uncommissioned devices detected on the bus

Configured device in the project

- Select the Checkbox. This updates automatically the Template of the uncommissioned device.



SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#	Tag	Address	Range	Device ID	Template	Vendor
0	FF0006	36	Permanent	452B481028-L8	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+Hauser

Match from Uncommissioned Device to Project Device

Match from Project Device to Uncommissioned Device

Project Devices

#	Tag	Address	Range	Device ID	Template	Vendor
0	MICROPIL_FF0006	25	Permanent		ENDRESS+HAUSER.MICROPIL_0202_1	Endr

Show Parameter Names

OK Cancel Help

- Scroll to the right to check the capability level parameters.

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#	Tag	Address	Model Name	Device Rev	DD Rev	Capability Level	FW Rev
0	<input checked="" type="checkbox"/> FF0006	36	Microplot FMR51	2	1	1	2.00

Match from Uncommissioned Device to Project Device

Match from Project Device to Uncommissioned Device

Project Devices

#	Tag	Address	Vendor	Model Name	Device Rev	DD Rev	Capability Level
0	<input checked="" type="checkbox"/> MICROPIL_FF00	25	Endress+Hauser	Microplot FMR5x	2	1	1

☐ Show Parameter Names

OK Cancel Help

- Unselect and select again the checkbox in order to enable the buttons:

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#	Tag	Address	Range	Device ID	Template	Vendor
0	<input checked="" type="checkbox"/> FF0006	36	Permanen	452B481028-L8	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+

Match from Uncommissioned Device to Project Device

Match from Project Device to Uncommissioned Device

Project Devices

#	Tag	Address	Range	Device ID	Template	Vendor
0	<input checked="" type="checkbox"/> MICROPIL_FF0006	25	Permanen		ENDRESS+HAUSER.MICROPIL_0202_1	Endr

☐ Show Parameter Names

OK Cancel Help

- Click on the button "Match from Project Device to Uncommissioned Device":

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#	Tag	Address	Range	Device ID	Template	Vend
0	FF0006	36	Permanen	452B481028-L8	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+

Match from Uncommissioned Device to Project Device

Match from Project Device to Uncommissioned Device

Project Devices

#	Tag	Address	Range	Device ID	Template	Vend
0	MICROPIL_FF0006	25	Permanen		ENDRESS+HAUSER.MICROPIL_0202_1	Endr

☐ Show Parameter Names

OK Cancel Help

- Click on the button "Continue":

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#	Tag	Address	Range	Device ID	Template	Vend
0	FF0006	36	Permanen	452B481028-L8	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+

Warning

The TAG/Address of the selected Uncommissioned Device will be changed as part of the Device Matching/Replacement process. Do you really want to continue?

Continue

Cancel

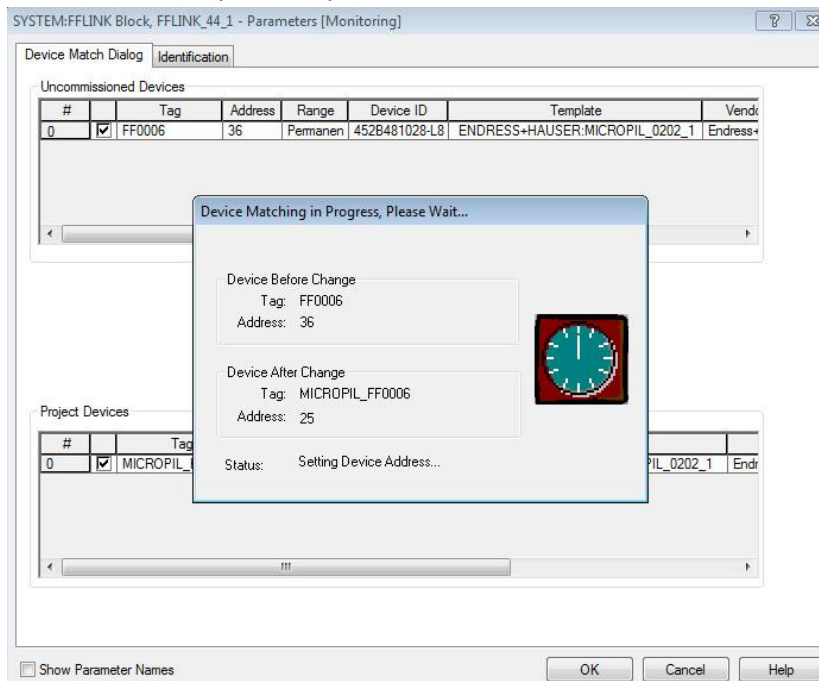
Project De

#	Tag	Address	Range	Device ID	Template	Vend
0						

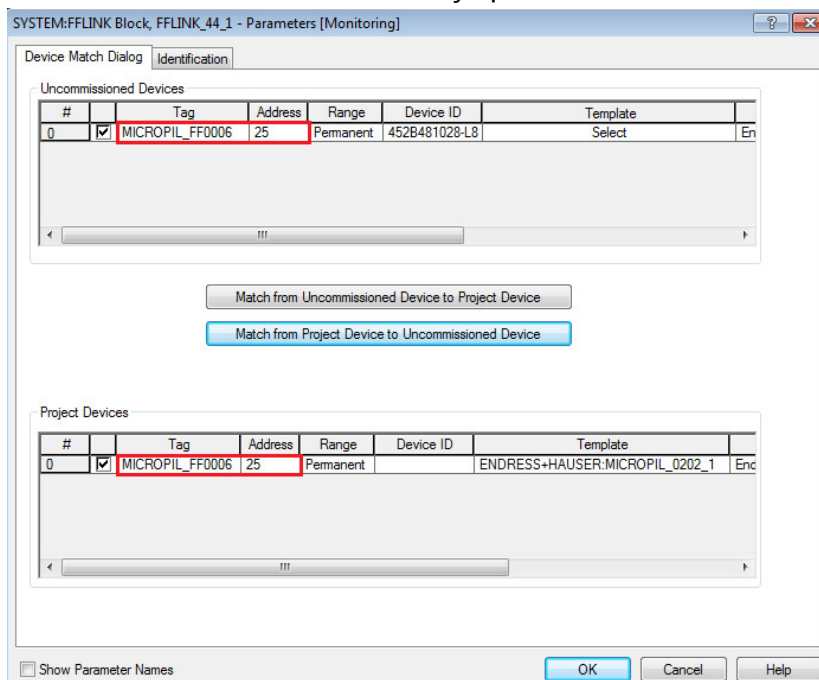
☐ Show Parameter Names

OK Cancel Help

- Device Address update in process:



- TAG and bus address are successfully updated:





- The address and Tag update process has removed the selected template and changed the capability level in the "Uncommissioned device" part. This must be configured again:

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#		Tag	Address	Range	Device ID	Template	
0	<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Permanent	452B481028-L8	Select	En

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#		Tag	Address	Model Name	Device Rev	DD Rev	Capability Level	FW Rev
0	<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	MicroPilot FMR51	2	1	0	2.00

- Unselect and select again the checkbox again. This will update the template:

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#		Tag	Address	Range	Device ID	Template	
0	<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Permanent	452B481028-L8	ENDRESS+HAUSER:MICROPIL_0202_1	En

- The capability level must be changed manually, as indicated:

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#		Tag	Address	Model Name	Device Rev	DD Rev	Capability Level	FW
0	<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	MicroPilot FMR51	2	1	Enter valid Capability Level	2.00



- Change the capability level to "1" in this example and click on the button "OK":

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Device Match Dialog Identification

Uncommissioned Devices

#		Tag	Address	Model Name	Device Rev	DD Rev	Capability Level	FV
0	<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Microplot FMR51	2	1	1	2.0

Match from Uncommissioned Device to Project Device

Match from Project Device to Uncommissioned Device

Project Devices

#		Tag	Address	Manufact	Model Name	Device Rev	DD Rev	Capability Level
0	<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	4533064	Microplot FMR5x	2	1	1

☐ Show Parameter Names

**OK** Cancel Help

- The device configuration is now ready to be downloaded. Refer to chapter 3.6.2.

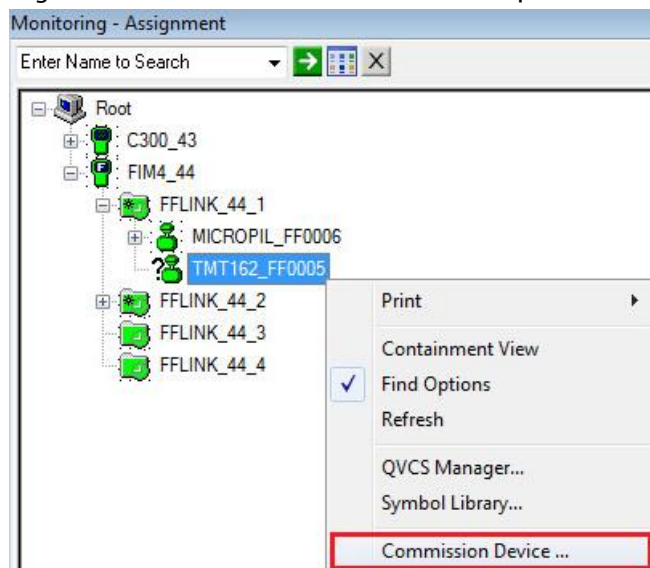
### 3.3.3 Online Upload of Field Devices Configuration

Using the "Online Upload" assumes that the Field Devices already have been configured. When the EPKS System is connected to the Field, the configuration is uploaded from the Field Device to the Control Builder project. In the following example, the target is to configure the iTEMP TMT162 with DD4 driver by using this method.

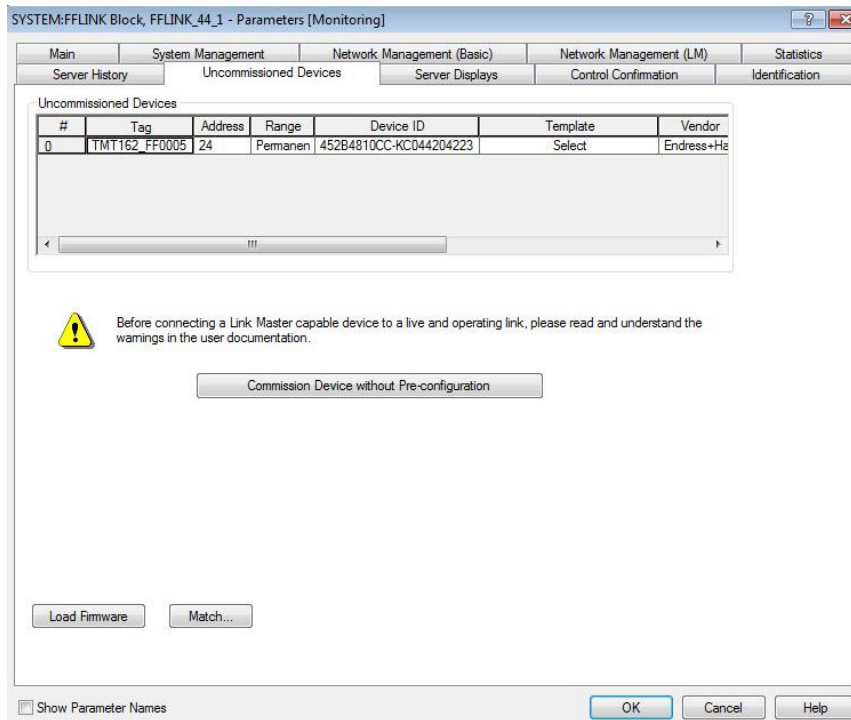
- The device with TAG name "TMT162\_FF0005" appears on the FIM module with the marker "?". This means the device is still not commissioned.



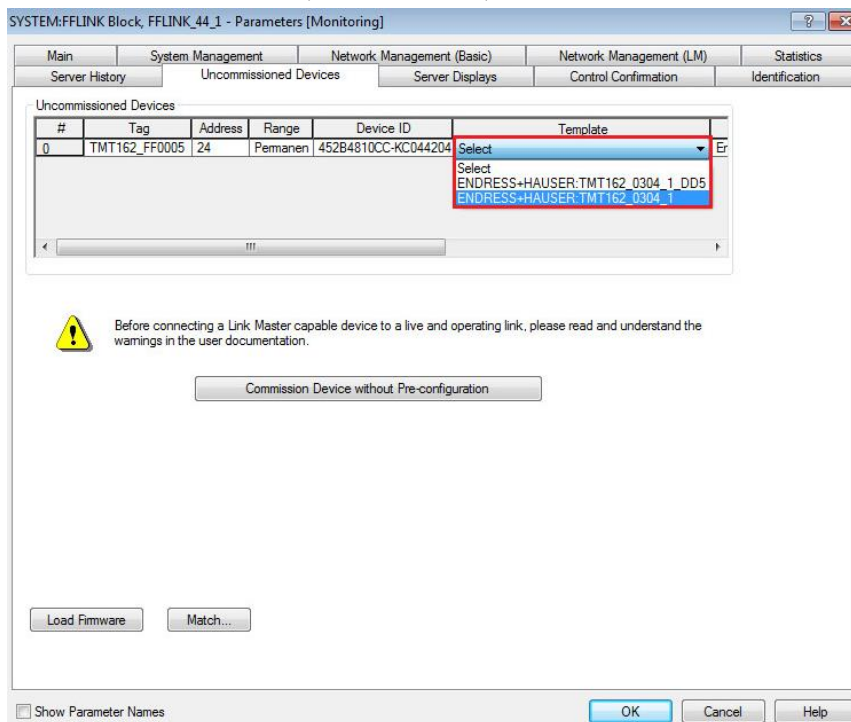
- Right-click on the device and select the option "Commission Device":



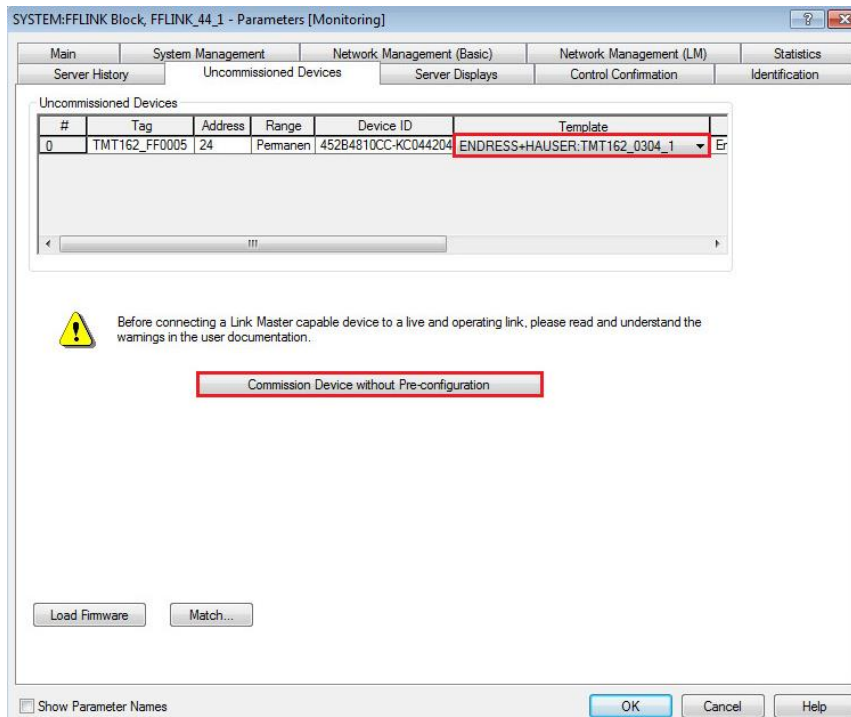
- Uncommissioned field device appears:



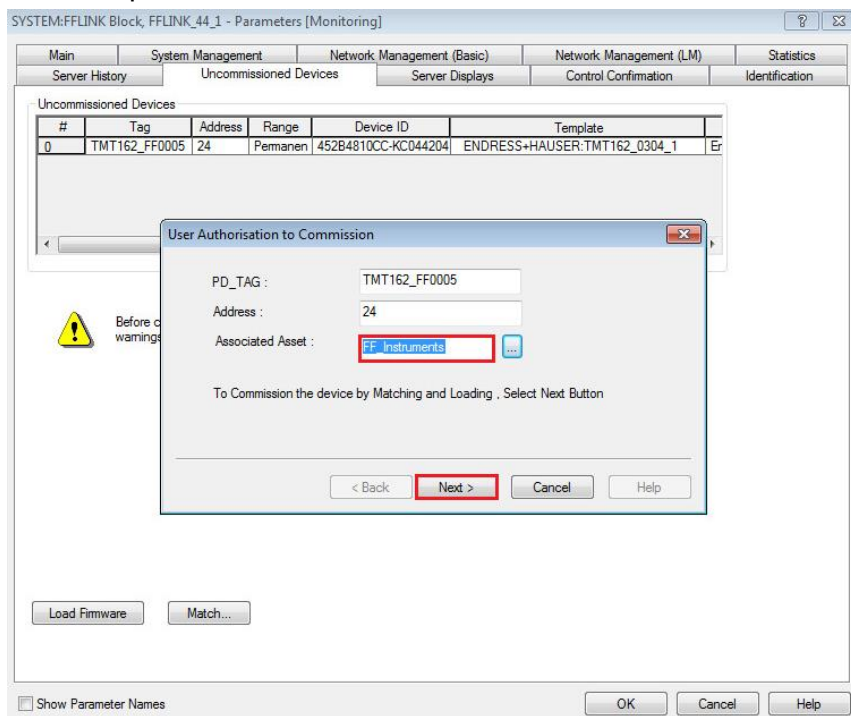
- A Template must be chosen by clicking on the field "Select". In this example, two drivers are installed for this device (DD4 and DD5).



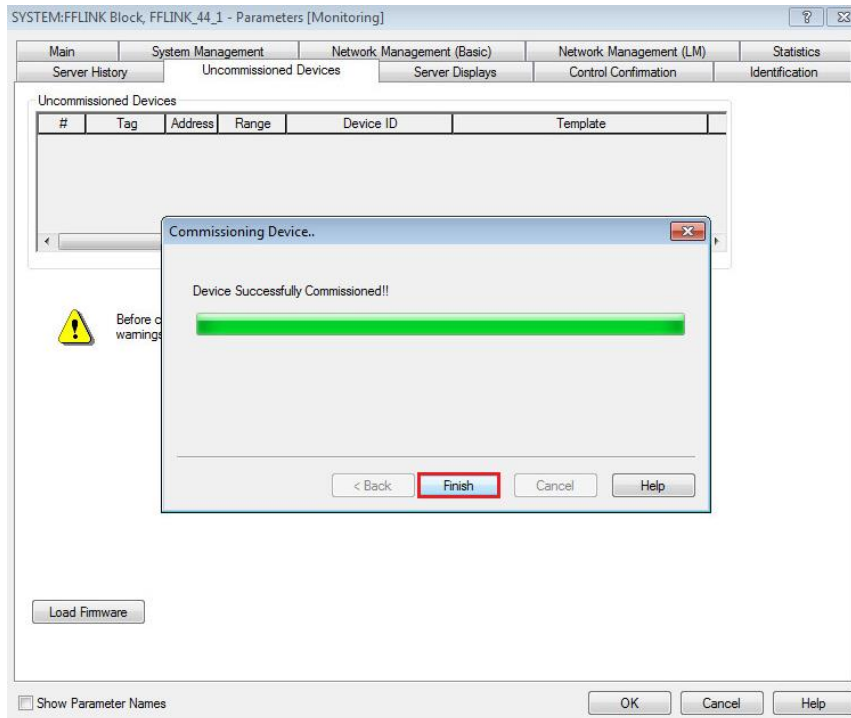
- The Template "ENDRESS+HAUSER:TMT162\_0304\_1" is selected in this example (DD4). Click on the button "Commission Device without Pre-configuration":



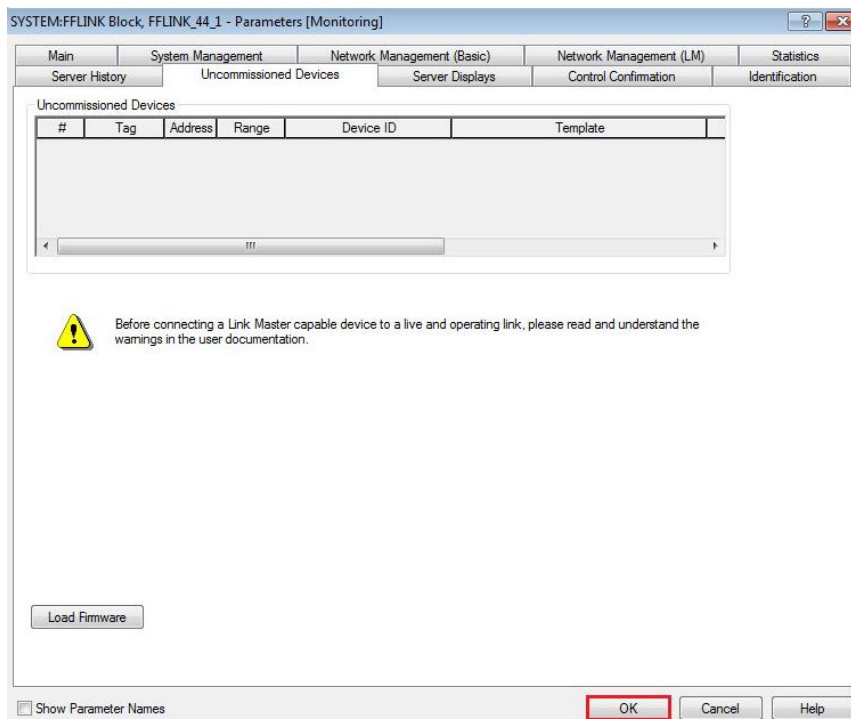
- TAG and address are automatically updated. Indicate the Associated Asset, "FF\_Instruments" in this example and click on the button "Next".



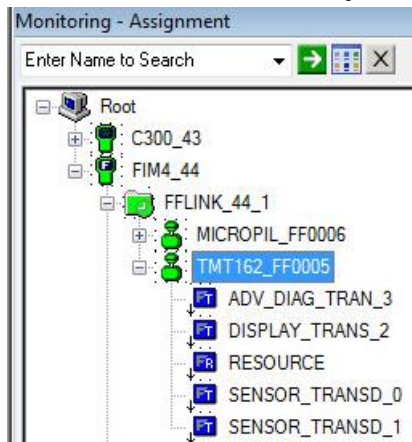
- The device has been successfully commissioned. Click on the button "Finish":



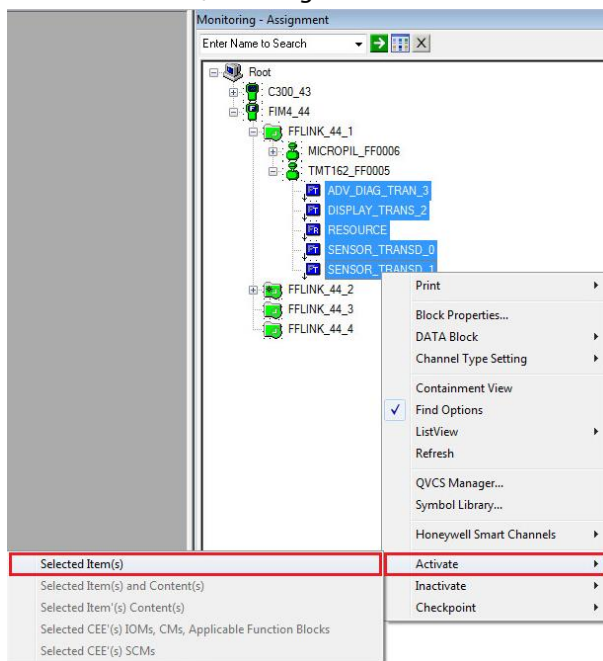
- Click on the button "OK":



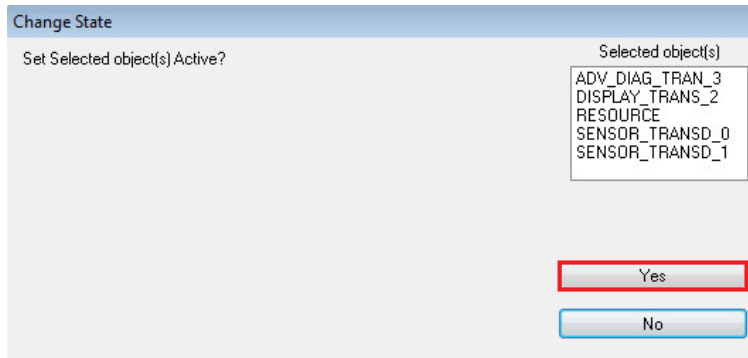
- Device has been successfully commissioned. All blocks are still not activated:



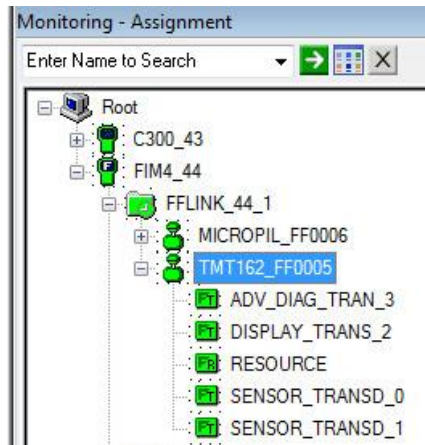
- Select all blocks, then right-click and select the option "Activate → Selected Item(s)":



- Click on the button "Yes":



- All blocks are now activated:

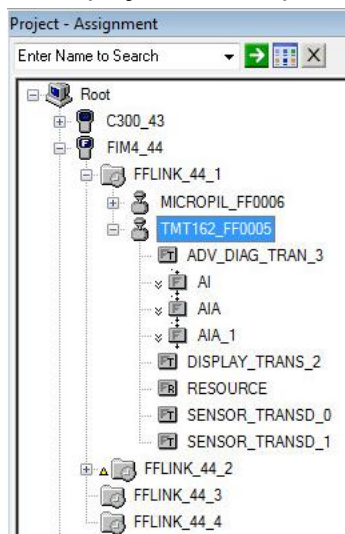


## 3.4 Field Device Configuration

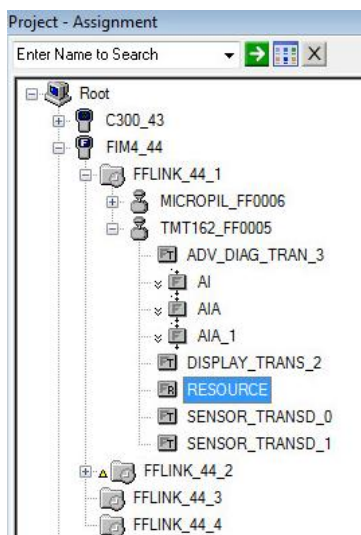
### 3.4.1 General

Device standard parameters in the AI, Resource or Transducer blocks can be changed in the offline project. The following example describes how changing a parameter in the Resource block of the TMT162.

- In the project view, expand view of the device "TMT162\_FF0005".

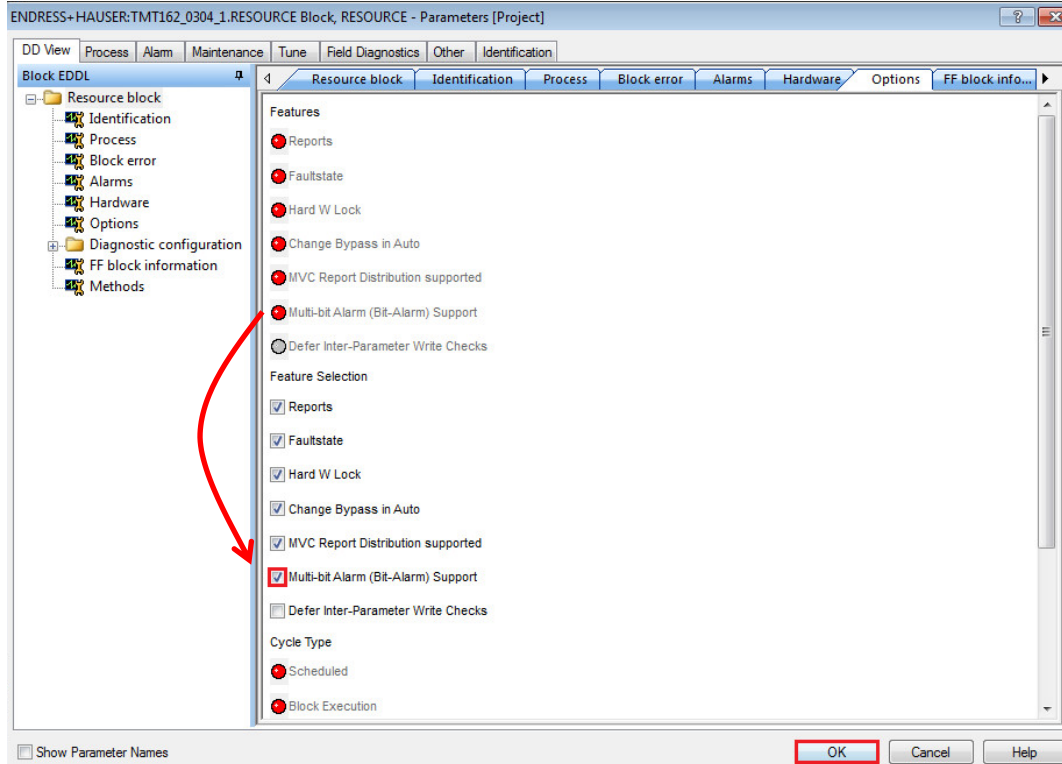


- Double-click on the Resource block:





- Select for example the tab “Options” in the EDDL View and select the option “Multi-bit Alarm(Bit Alarm) Support”. This option can be selected because it is marked is red. Click on the button “OK”:



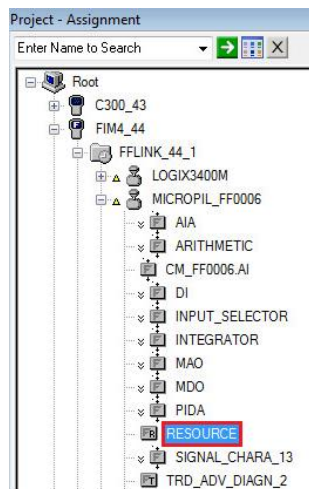
- The changed configuration is now ready to be downloaded. For this example, a “Full Load” is needed for the Resource block. Refer to chapter 3.6.2.

## 3.4.2 Field Diagnostics

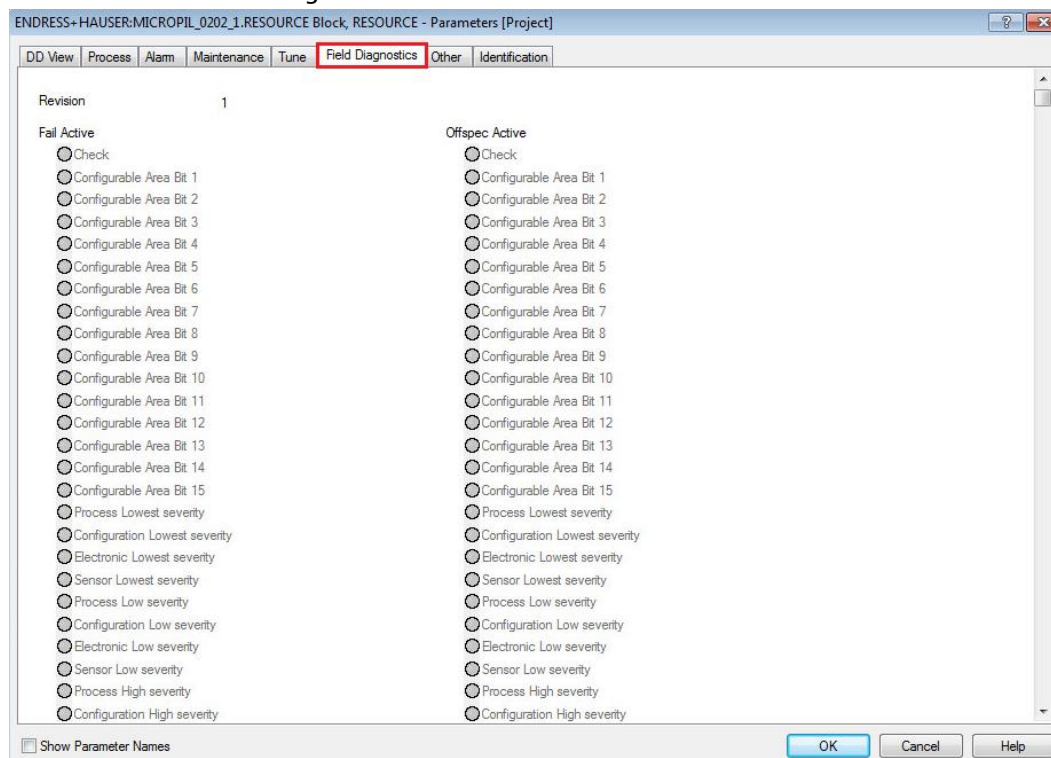
The Field Diagnostics menu contains device diagnostics information classified in four items (Fail, Out of Specification, Maintenance and Check) according to FF-912 specification. Each of these items has 31 bits diagnostics. This feature is part of the device Resource block.

### 3.4.2.1 Overview

- In the Project Assignment view, expand the Micropilot device and double-click on the Resource block:



- Select the tab "Field Diagnostics":



- The Field Diagnostics window is composed of following parts:
  - Diagnostics bits status (Fail Active, Offspec Active, Maintenance Active and Check Active).
  - Diagnostics bits configuration (Fail Map, Offspec Map, Maintenance Map and Check Map).
  - Diagnostics bits enabling/disabling (Fail Mask, Offspec Mask, Maintenance Mask and Check Mask).
  - Diagnostic Alarms unacknowledged type.
  - Fail Priorities.
  - Diagnostics simulation.

### 3.4.2.2 Configuration

Two parts need to be configured, the "Map" ("Fail Map", "Offspec Map", "Maintenance Map" and "Check Map") and the Priority level. Other part of the menu, for example the "Mask" part is optional and depending on the application.

#### Map Configuration

For an Endress+Hauser device, the 31 bits diagnostics are separated in two parts:

- Bits 16 to 31 are standard diagnostics common for all Endress+Hauser devices. The following example displays the standard configuration map of the "Fail Map":

- ☐ Process Lowest severity
- ☐ Configuration Lowest severity
- ☐ Electronic Lowest severity
- ☐ Sensor Lowest severity
- ☐ Process Low severity
- ☐ Configuration Low severity
- ☐ Electronic Low severity
- ☐ Sensor Low severity
- ☐ Process High severity
- ☐ Configuration High severity
- ☐ Electronic High severity
- ☐ Sensor High severity
- ☒ Process Highest severity
- ☒ Configuration Highest severity
- ☒ Electronic Highest severity
- ☒ Sensor Highest severity

- Bits 1 to 15 are device specific configurable diagnostics. The corresponding diagnostics can be configured in the device, either via the transducer diagnostic block (only in Online Monitoring as described in chapter 3.7.4.1) or via the deviceDTM. The workflow via DeviceDTM is described in chapter 4.1.3. The following example shows that bit1 of the "Fail Map" is active:

<input checked="" type="checkbox"/>	Configurable Area Bit 1
<input type="checkbox"/>	Configurable Area Bit 2
<input type="checkbox"/>	Configurable Area Bit 3
<input type="checkbox"/>	Configurable Area Bit 4
<input type="checkbox"/>	Configurable Area Bit 5
<input type="checkbox"/>	Configurable Area Bit 6
<input type="checkbox"/>	Configurable Area Bit 7
<input type="checkbox"/>	Configurable Area Bit 8
<input type="checkbox"/>	Configurable Area Bit 9
<input type="checkbox"/>	Configurable Area Bit 10
<input type="checkbox"/>	Configurable Area Bit 11
<input type="checkbox"/>	Configurable Area Bit 12
<input type="checkbox"/>	Configurable Area Bit 13
<input type="checkbox"/>	Configurable Area Bit 14
<input type="checkbox"/>	Configurable Area Bit 15

- Other "Maps" ("Offspec Map", "Maintenance Map" and "Check Map") can be configured according to this principle.

## Priority Level

- Scroll down to the Priority part. Priorities must be set for "Fail", "Offspec", "Maintenance" and "Check". The priority range is between 1 (Low) and 15 (High).

In the following example, following priorities have been fixed:

Fail Priority	<input type="text" value="15"/>	Offspec Priority	<input type="text" value="5"/>
Maintenance Priority	<input type="text" value="1"/>	Check Priority	<input type="text" value="10"/>

- The device configuration is now ready to be downloaded. Refer to chapter 3.6.2.

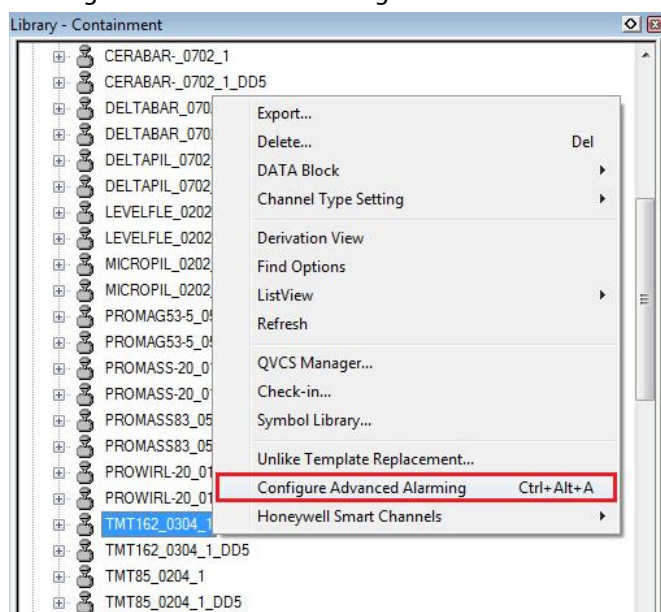
## 3.4.3 Advanced Alarming

Advanced Alarming is a feature provided by Honeywell, which allows the user to configure alarms events directly in the template according to FF-912 specification.

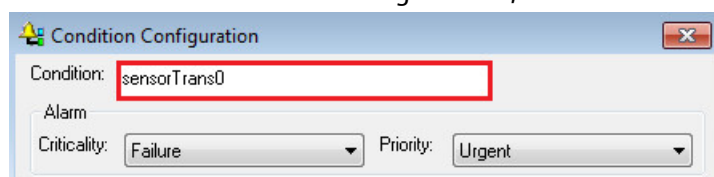
This chapter describes how implementing the Advanced Alarming with the TMT162.

### 3.4.3.1 Event Configuration in the Template

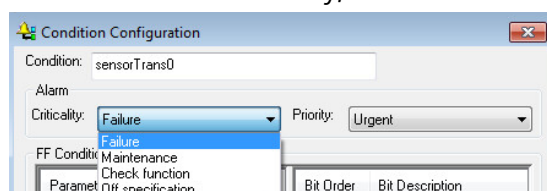
- In the Library, right-click on the used template (DD4 in this example) and select the menu "Configure Advanced Alarming".



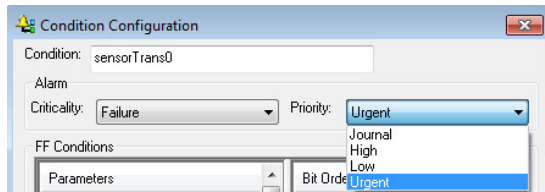
- This opens two windows, "Configure Advanced Alarming Dialog" and "Condition Configuration".
- In the window "Condition Configuration", enter a name for the Condition:



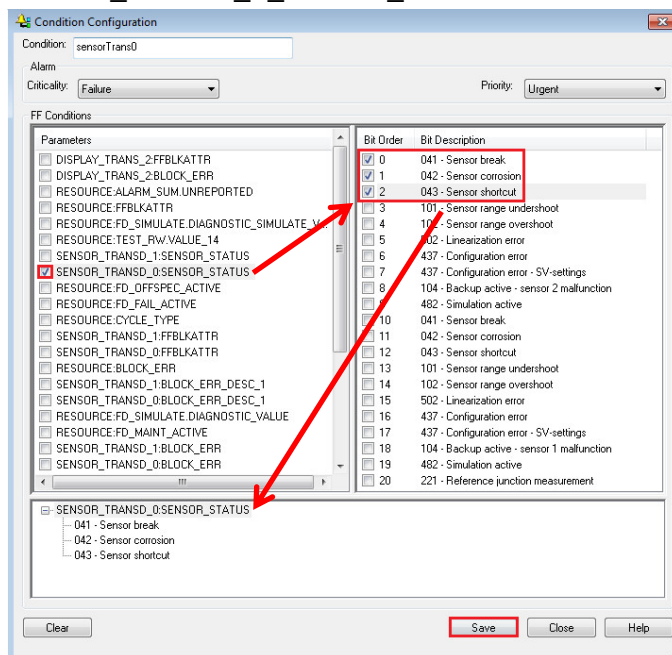
- Select the Alarm Criticality, "Failure" in this example.



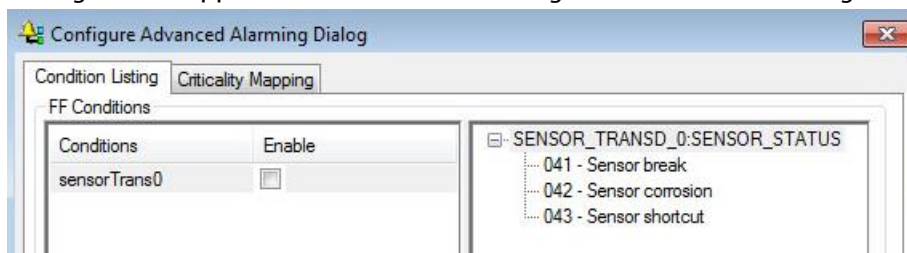
- Select the Alarm Priority, "Urgent" in this example.



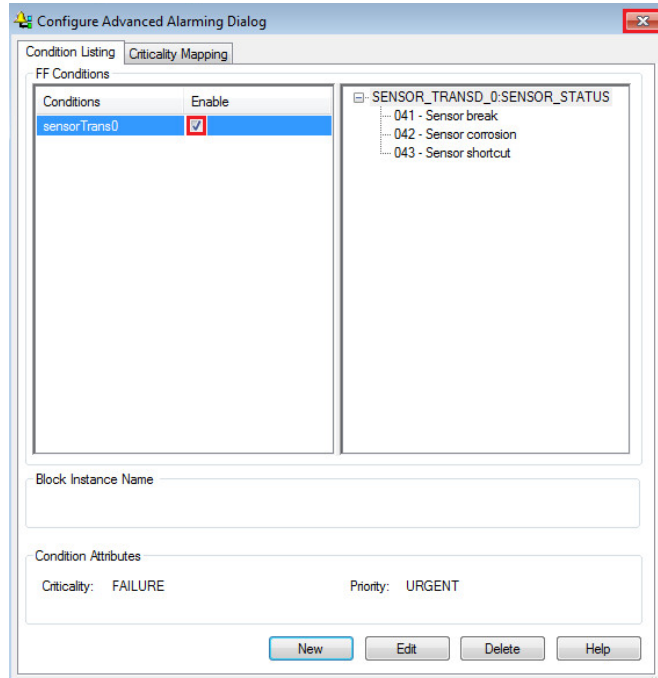
- Select the required conditions and click on the button "Save". In this example, 3 bits from the SENSOR\_TRANSD\_0\_SENSOR\_STATUS are selected:



- Configuration appears in the window "Configure Advanced Alarming Dialog":

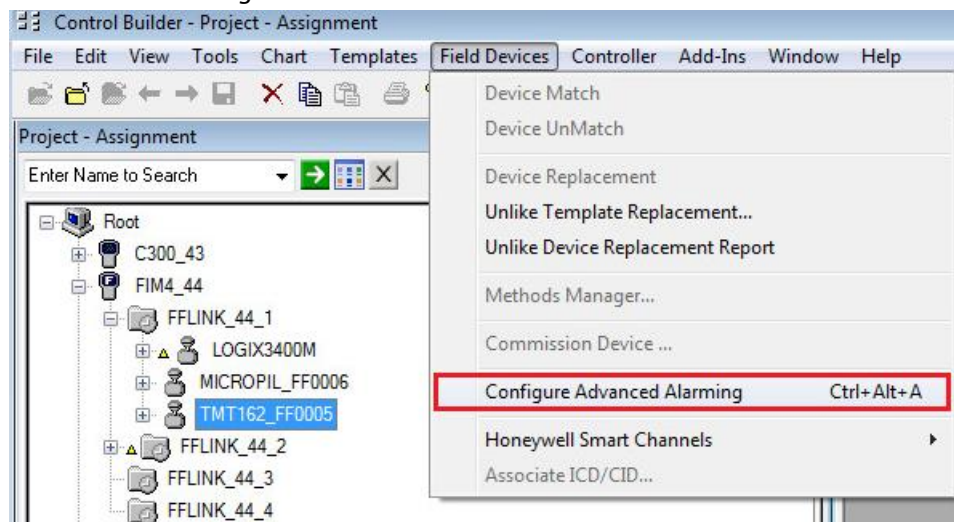


- Enable the condition “sensorTrans0” by clicking in the checkbox and close the window on the top right.



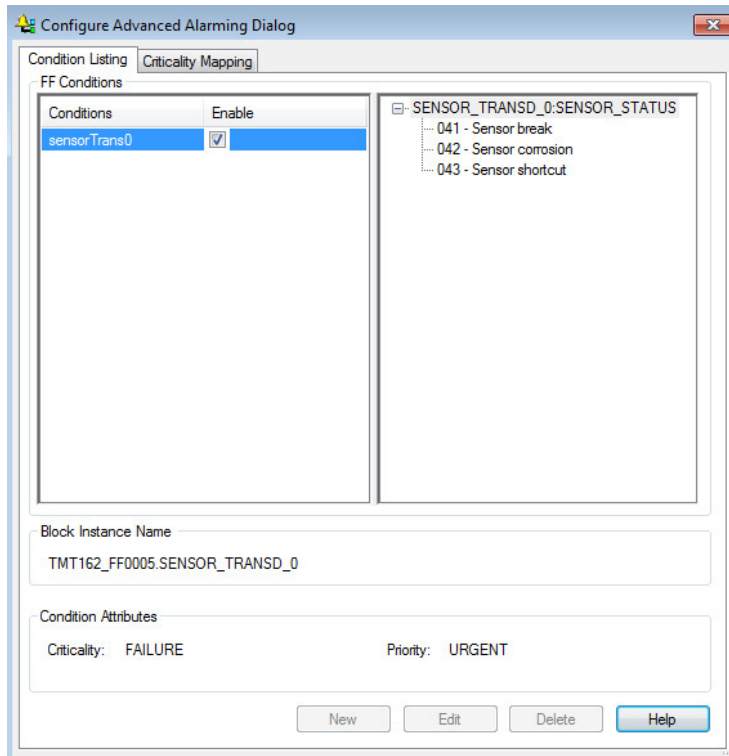
### 3.4.3.2 Event in the Project Template

- Select the device “TMT162\_FF0005”, and then click on the menu “Field Devices→Configure Advanced Alarming”:



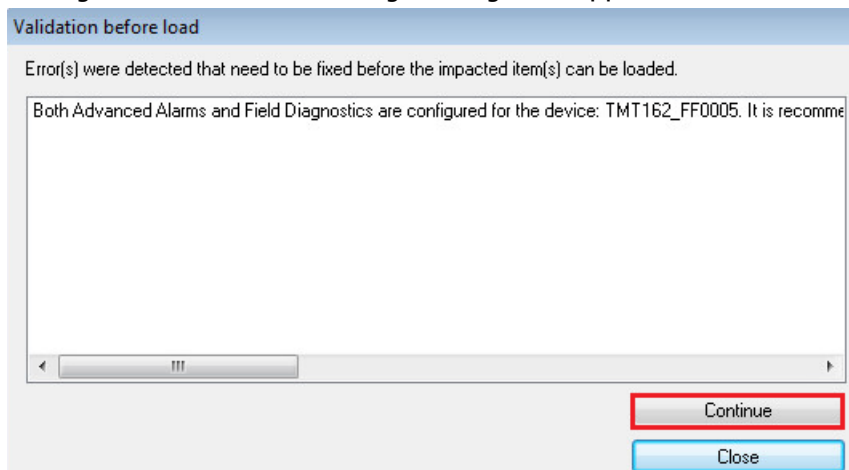


- Alarm conditions are mapped to the device:



- The device configuration is now ready to be downloaded.  
Refer to chapter 3.6.2.

During the download, following message will appear. Click on the button "Continue":

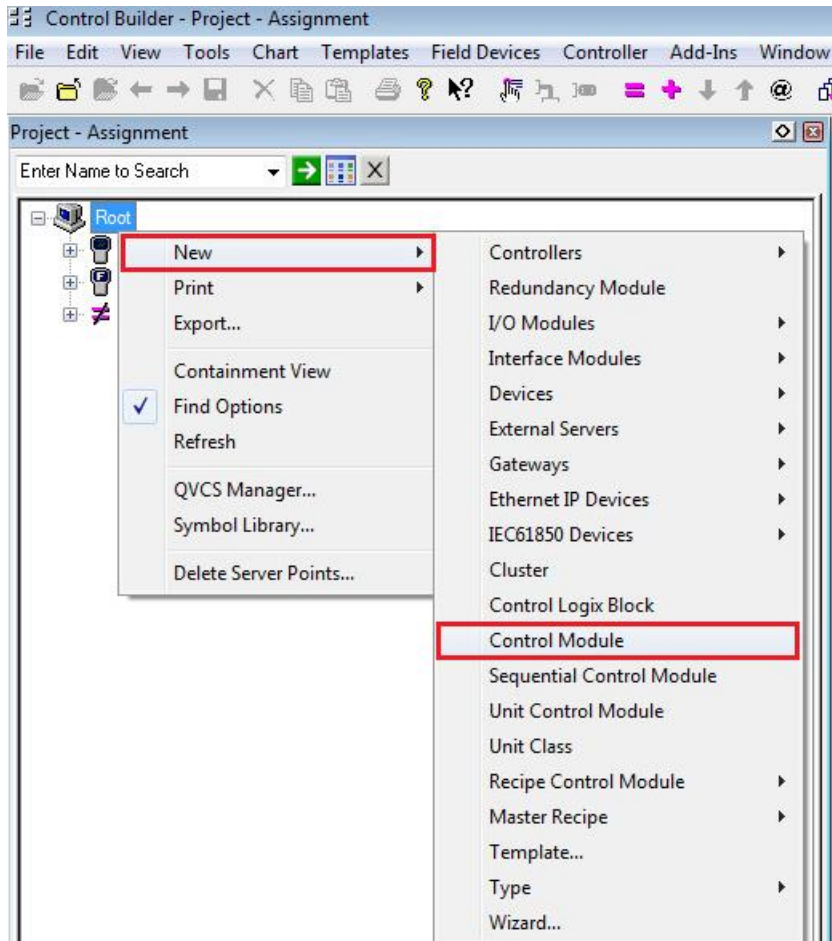


## 3.5 Mapping of Process Values and Status to Control Strategy

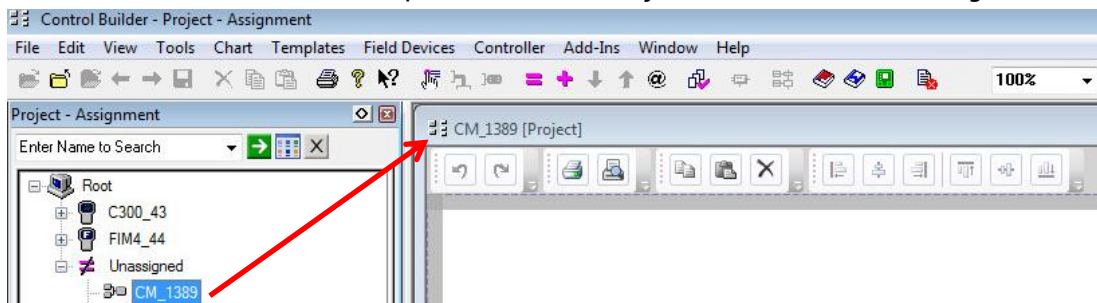
This part explains how to implement an Analog Input function block.

### 3.5.1 Analog Input Function Block Configuration

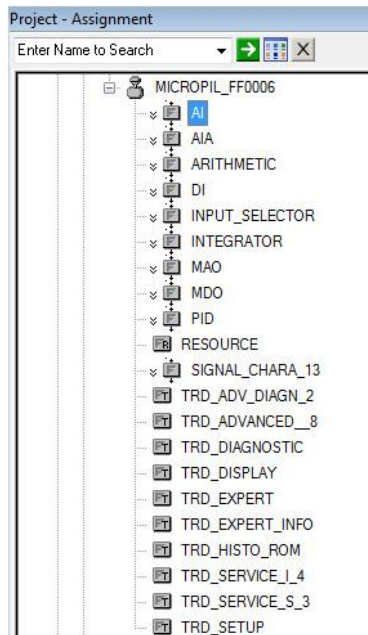
- Right-click on the field "Root" and select the option "New→Control Module":



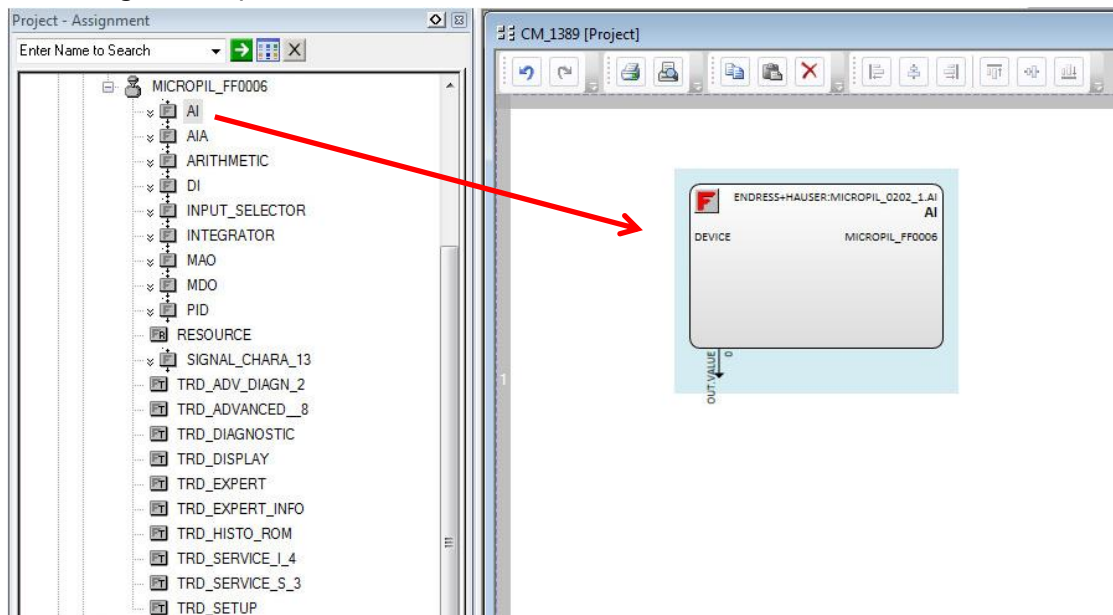
- The created Control Module is opened automatically and saved under "Unassigned":



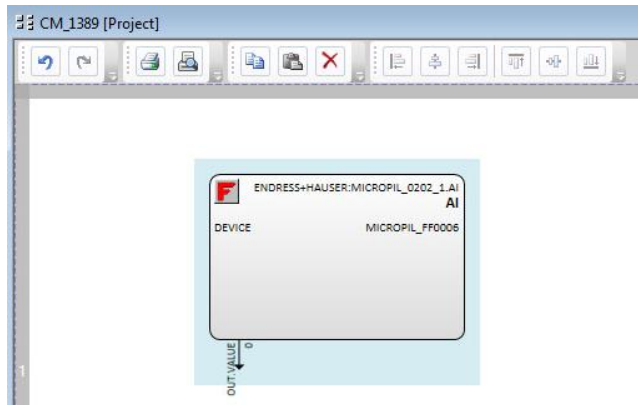
- Expand the "MICROPIL\_FF0006" template and select the function block "AI":



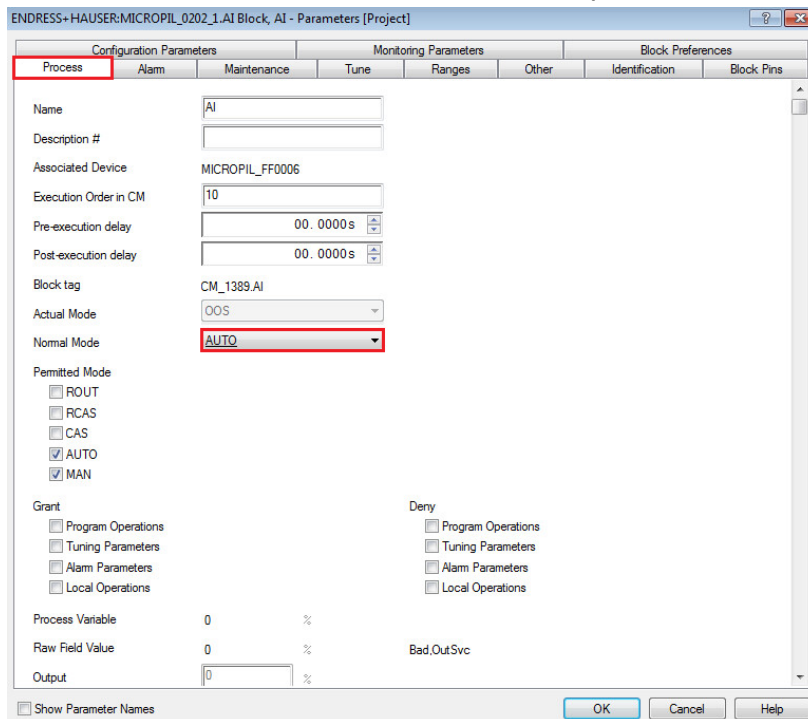
- Then drag and drop it into the Control Module window:



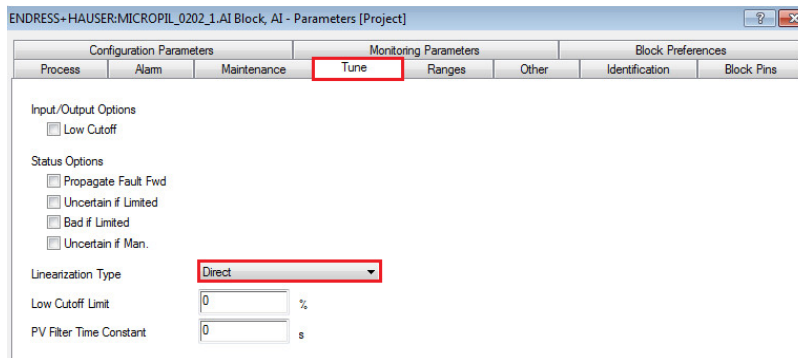
- Double-click on the analog input function block:



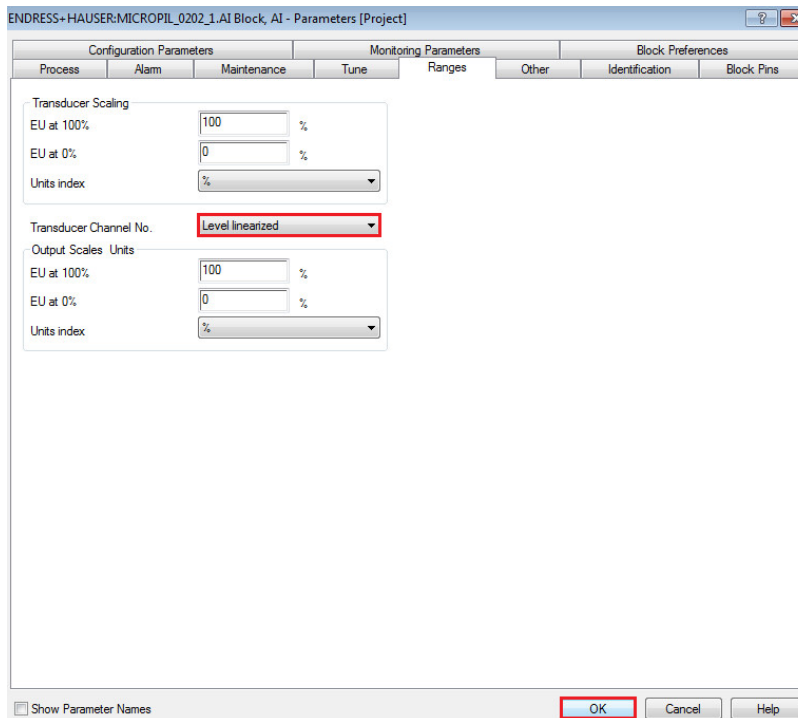
- In the Tab "Process", select the Normal Mode option "AUTO" for this example:



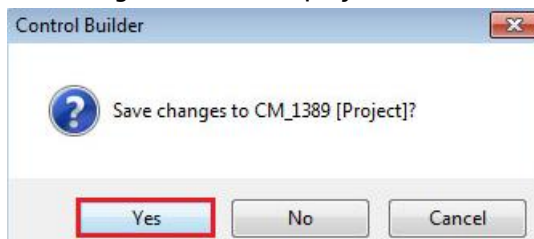
- In the Tab "Tune", select the Linearization Type "Direct" for this example:



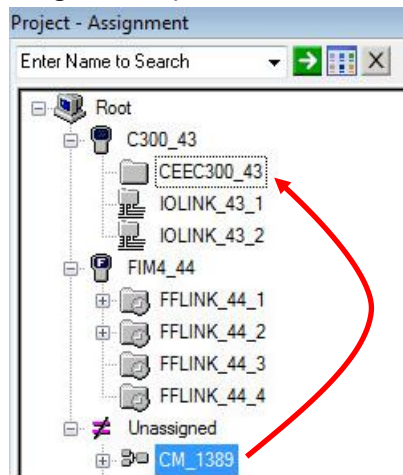
- In the Tab "Ranges", select the Transducer Channel No. "Level linearized" for this example. The Linearization type "Direct" configured previously utilizes the Transducer Scaling "0-100%":



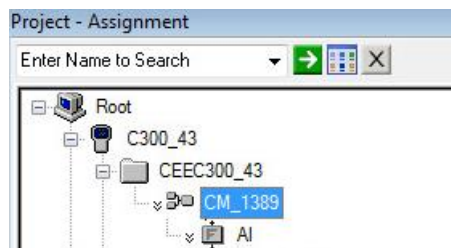
- Close the Control Module window.
- Following window is displayed. Click on the button "Yes":



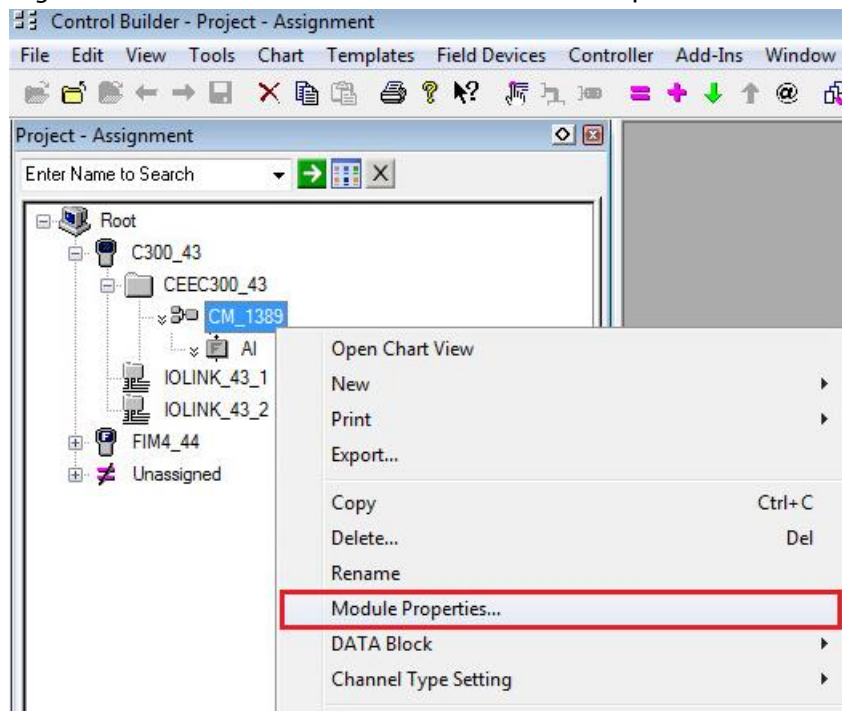
- Drag and drop the control module “CM\_1389” to the CEEC300\_43 object:



- Control Module is moved to the Controller part:



- Right-click on the Control Module and select the option “Module Properties”:



- Configure the Control Module Tag Name as well as the Parent Asset# and click on the button "OK".

SYSTEM:CONTROLMODULE Block, CM\_FF0006 - Parameters [Project]

Projected Parameters | Block Pins | Configuration Parameters | Monitoring Parameters | Block Preferences | Template Defining

Main | Arbitration | Server History | Server Displays | Control Confirmation | QVCS | Identification | Dependencies

Tag Name: CM\_FF0006

Item Name #:

Description #:

Engr Units #:

Keyword #:

Execution Period: DEFAULT

Execution Order in CEE: 10

Execution Phase: -1

CEE Restart Option: ALWAYS COLD

Extend TPS Point: NO

Parent Asset #: FF.ControlModule

Unit Text:

Version: 0.00

Logic Block Initialization Option: PULSE EXPIRED

Alarming

☒ Enable Alarming Option

☐ Journal Only Option

SCM Relationship

SCM Option: NONE

SCM Name:

Mode Attribute Reference:

Fieldbus Specific

Execution Order in LINK: 10

Stale Count: 3

FF Execution Period: 1s

Reload Initialization

Reload Init Delay (exec. cycles): 2

Cur Rel Init Delay (exec. cycles): 0

Initialization Pending: OFF

☐ Show Parameter Names

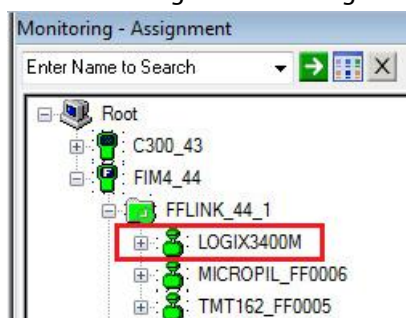
OK Cancel Help

- The Control Module is now ready to be downloaded.  
Refer to chapter 3.6.3.

### 3.5.2 PID Loop with Control in the Field

This chapter explains how to configure a PID Loop by using the PID function block of a field device. In this example, the PID loop is realized between the Micropilot and a Flowserve Digital Positioner Logix 3400MD.

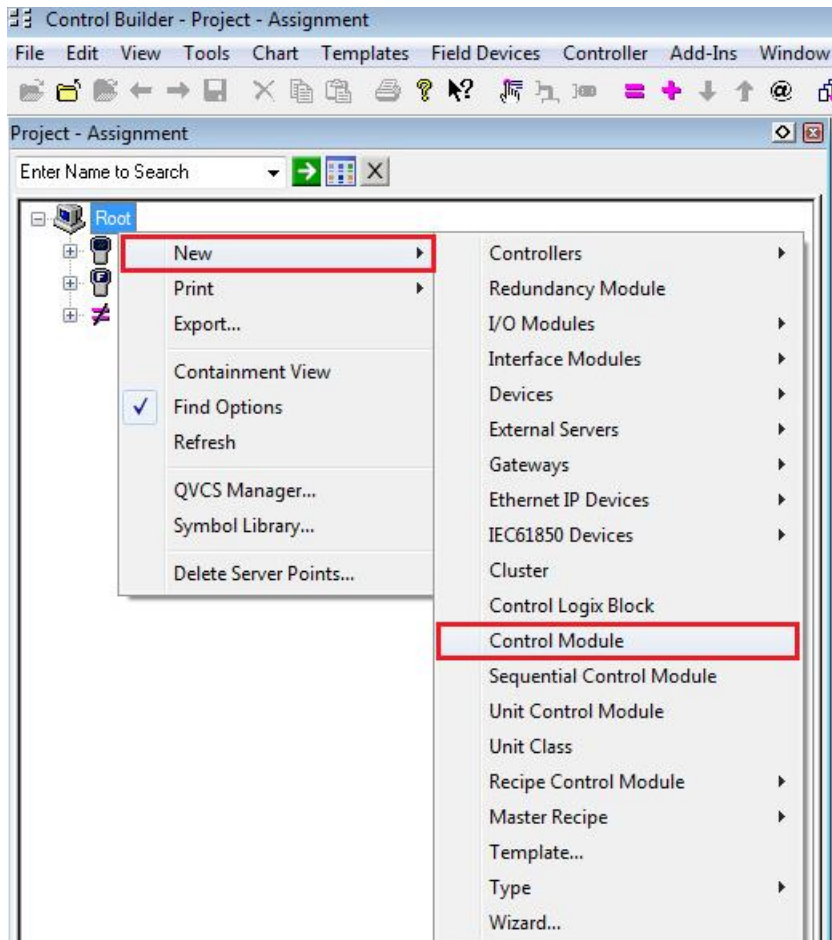
- Flowserve Logix 3400M Digital Positioner has been successfully commissioned:



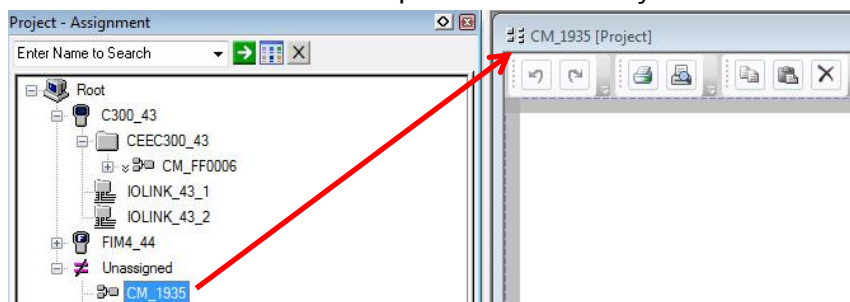


## 3.5.2.1 PID Control Loop Configuration

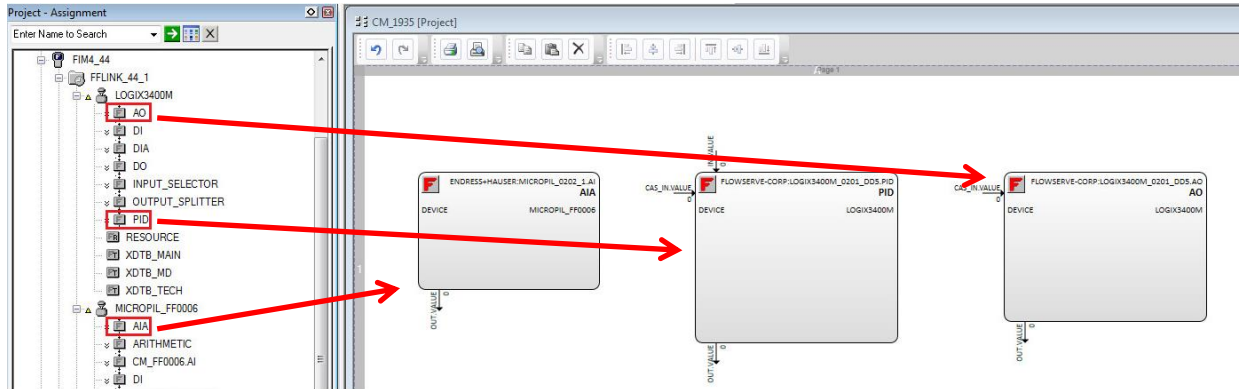
- Create a new Control Module by right-clicking on the field "Root" and select the option "New→Control Module":



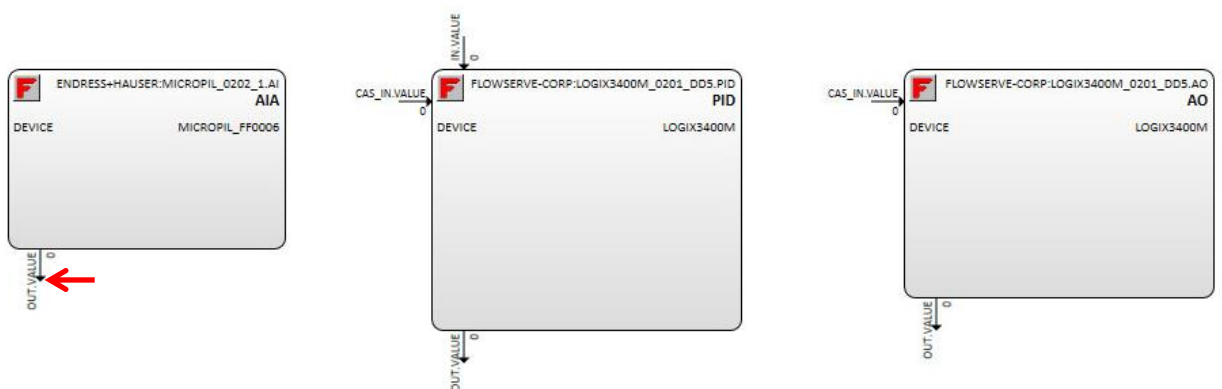
- The created Control Module is opened automatically and saved under "Unassigned":



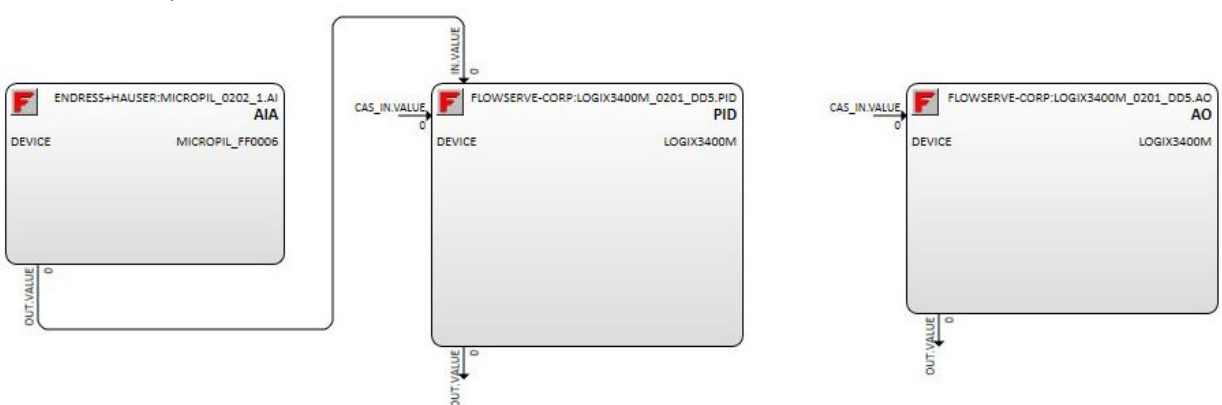
- Drag and drop the analog input AIA function block of the Micropilot and then the PID and analog output function blocks of the Logix3400M:



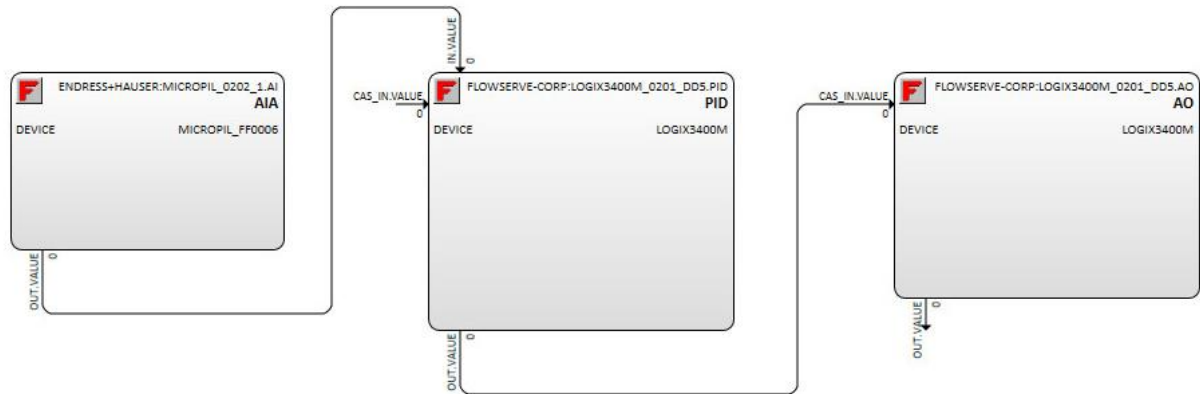
- Double-click on the arrow of the AIA function block parameter "OUT.VALUE":



- Then, link the Micropilot AIA function block parameter "OUT.VALUE" to the Logix3400M PID function block parameter "IN.VALUE":



- Then, link the Micropilot PID function block parameter "OUT.VALUE" to the Logix3400M AO function block parameter "CAS\_IN.VALUE":



### 3.5.2.2 Function Blocks Configuration

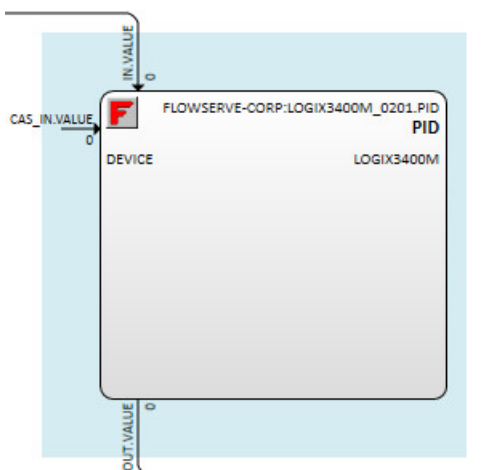
This part describes the configured parameters of the three function blocks used in the PID loop.

#### Endress+Hauser Micropilot function block AIA

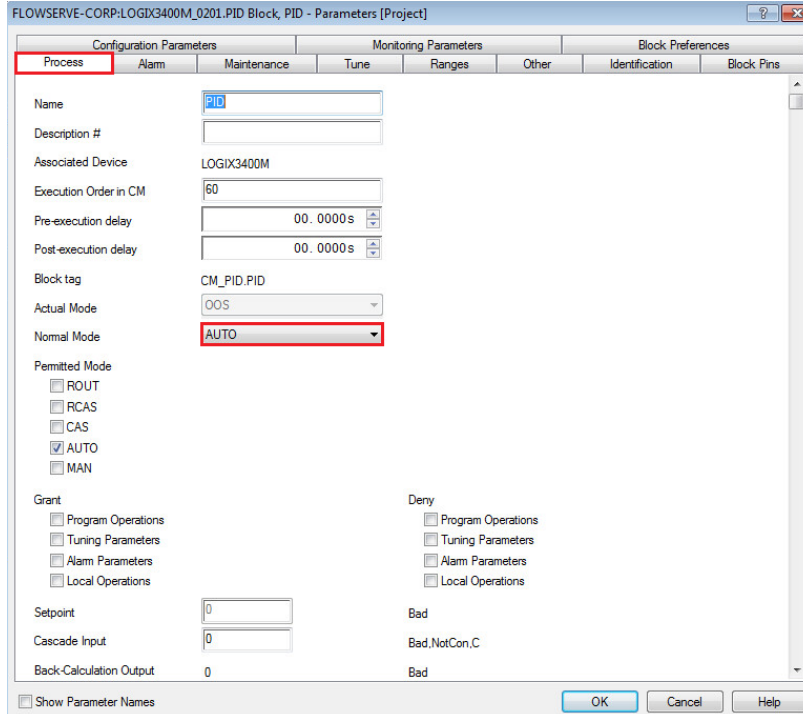
- Configure the Micropilot AIA function block as done in Chapter 3.5.1.

#### Flowserve Logix 3400MD function block PID

- Double-click on the PID block to open corresponding PID parameters:



- In the tab "Process", configure the parameter "Normal Mode". In this example, the Normal Mode is "AUTO":



Configuration Parameters | Monitoring Parameters | Block Preferences

Process | Alarm | Maintenance | Tune | Ranges | Other | Identification | Block Pins

Name: PID

Description #:

Associated Device: LOGIX3400M

Execution Order in CM: 60

Pre-execution delay: 00.0000 s

Post-execution delay: 00.0000 s

Block tag: CM\_PID.PID

Actual Mode: OOS

Normal Mode: **AUTO**

Permitted Mode:

- ☐ ROUT
- ☐ RCAS
- ☐ CAS
- ☒ AUTO
- ☐ MAN

Grant:

- ☐ Program Operations
- ☐ Tuning Parameters
- ☐ Alarm Parameters
- ☐ Local Operations

Deny:

- ☐ Program Operations
- ☐ Tuning Parameters
- ☐ Alarm Parameters
- ☐ Local Operations

Setpoint: 0

Cascade Input: 0

Back-Calculation Output: 0

Bad:

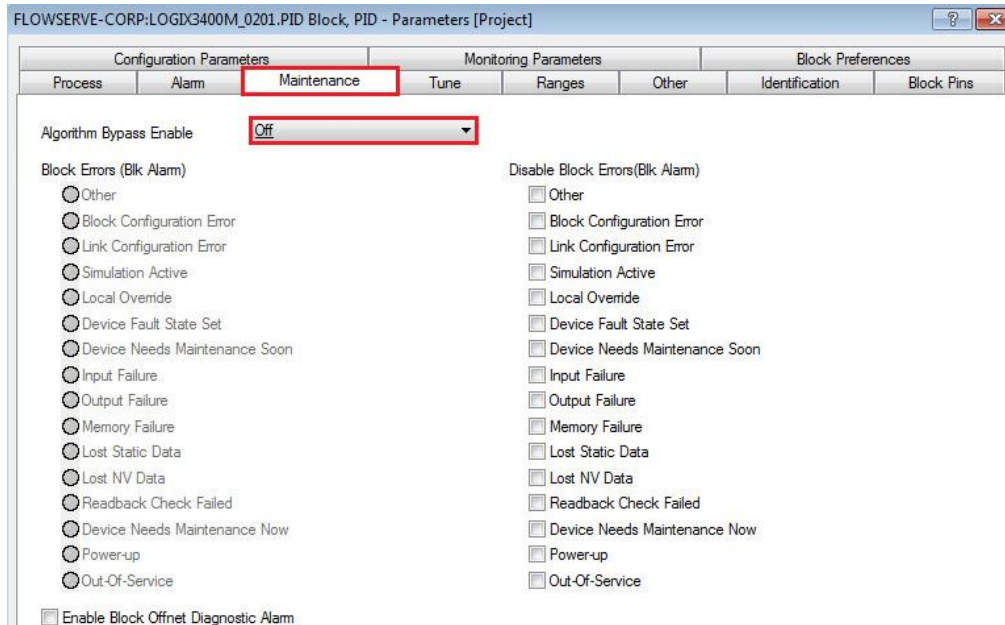
Bad,NotCon,C:

Bad:

☐ Show Parameter Names

OK Cancel Help

- In the tab "Maintenance", select the option "Off" for the Algorithm Bypass Enable:



Configuration Parameters | Monitoring Parameters | Block Preferences

Process | Alarm | **Maintenance** | Tune | Ranges | Other | Identification | Block Pins

Algorithm Bypass Enable: **Off**

Block Errors (Blk Alarm):

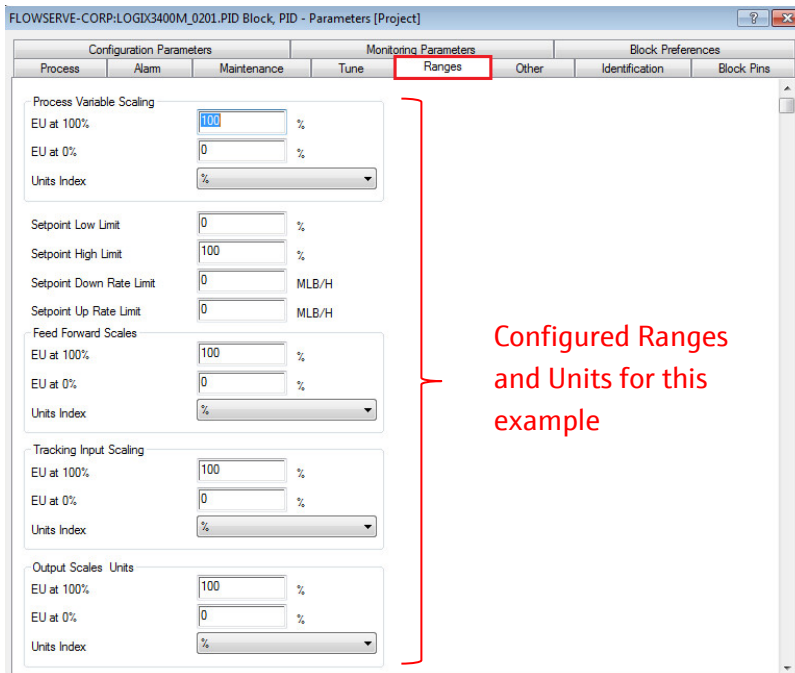
- ☐ Other
- ☐ Block Configuration Error
- ☐ Link Configuration Error
- ☐ Simulation Active
- ☐ Local Override
- ☐ Device Fault State Set
- ☐ Device Needs Maintenance Soon
- ☐ Input Failure
- ☐ Output Failure
- ☐ Memory Failure
- ☐ Lost Static Data
- ☐ Lost NV Data
- ☐ Readback Check Failed
- ☐ Device Needs Maintenance Now
- ☐ Power-up
- ☐ Out-Of-Service

Disable Block Errors(Blk Alarm):

- ☐ Other
- ☐ Block Configuration Error
- ☐ Link Configuration Error
- ☐ Simulation Active
- ☐ Local Override
- ☐ Device Fault State Set
- ☐ Device Needs Maintenance Soon
- ☐ Input Failure
- ☐ Output Failure
- ☐ Memory Failure
- ☐ Lost Static Data
- ☐ Lost NV Data
- ☐ Readback Check Failed
- ☐ Device Needs Maintenance Now
- ☐ Power-up
- ☐ Out-Of-Service

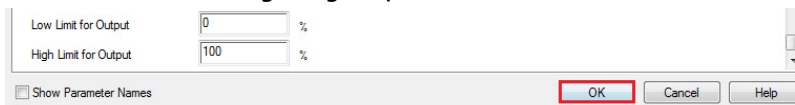
☐ Enable Block Offnet Diagnostic Alarm

- In the tab "Ranges", configure all ranges:



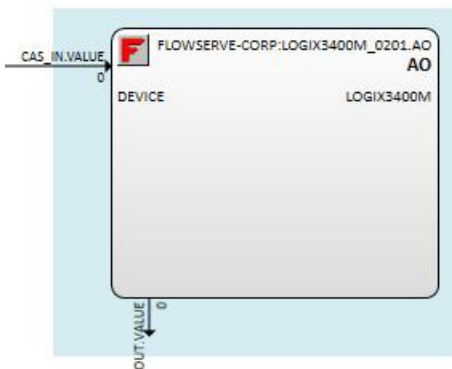
Configured Ranges and Units for this example

- Scroll down for configuring all parameters, then click on the button "OK":

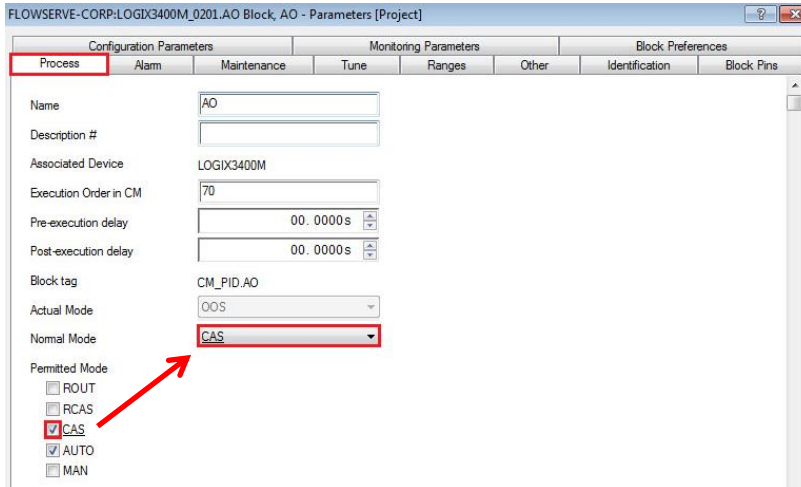


## Flowserve Logix 3400MD function block AO

- Double-click on the function block to open corresponding AO parameters:



- In the tab "Process", select the check box "CAS" and then the Normal Mode parameter "CAS":



FLOWERVE-CORP:LOGIX3400M\_0201.AO Block, AO - Parameters [Project]

Configuration Parameters | Monitoring Parameters | Block Preferences

Process | Alarm | Maintenance | Tune | Ranges | Other | Identification | Block Pins

Name: AO

Description #:

Associated Device: LOGIX3400M

Execution Order in CM: 70

Pre-execution delay: 00.0000 s

Post-execution delay: 00.0000 s

Block tag: CM\_PID.AO

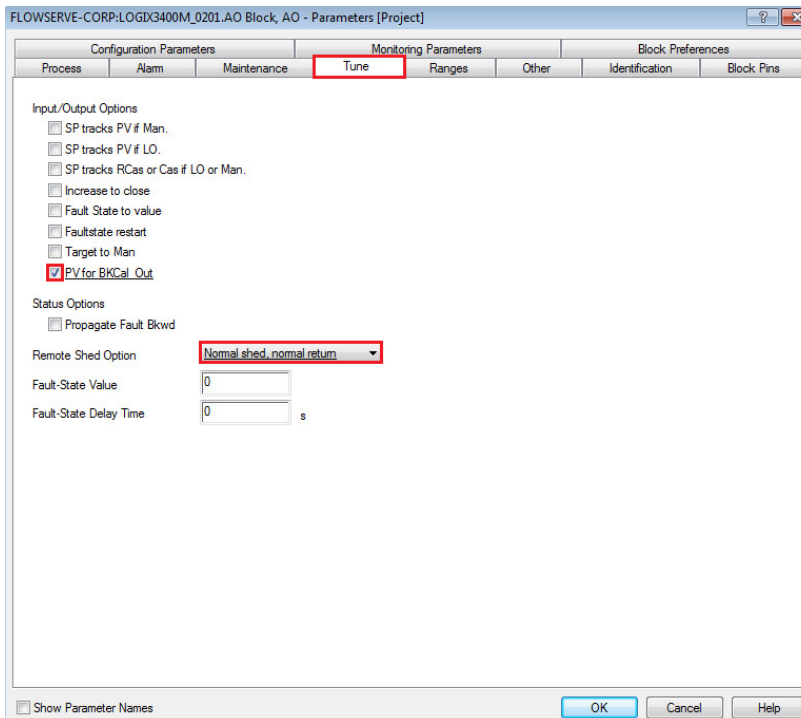
Actual Mode: OOS

Normal Mode: CAS

Permitted Mode

- ☐ ROUT
- ☐ RCAS
- ☒ CAS
- ☒ AUTO
- ☐ MAN

- In the tab "Tune", select the option "PV for BKCal Out" and the Remote Shed Option "Normal shed, normal return":



FLOWERVE-CORP:LOGIX3400M\_0201.AO Block, AO - Parameters [Project]

Configuration Parameters | Monitoring Parameters | Block Preferences

Process | Alarm | Maintenance | Tune | Ranges | Other | Identification | Block Pins

Input/Output Options

- ☐ SP tracks PV if Man.
- ☐ SP tracks PV if LO.
- ☐ SP tracks RCAs or Cas if LO or Man.
- ☐ Increase to close
- ☐ Fault State to value
- ☐ Faultstate restart
- ☐ Target to Man
- ☒ PV for BKCal Out

Status Options

- ☐ Propagate Fault Bkwd

Remote Shed Option: Normal shed, normal return

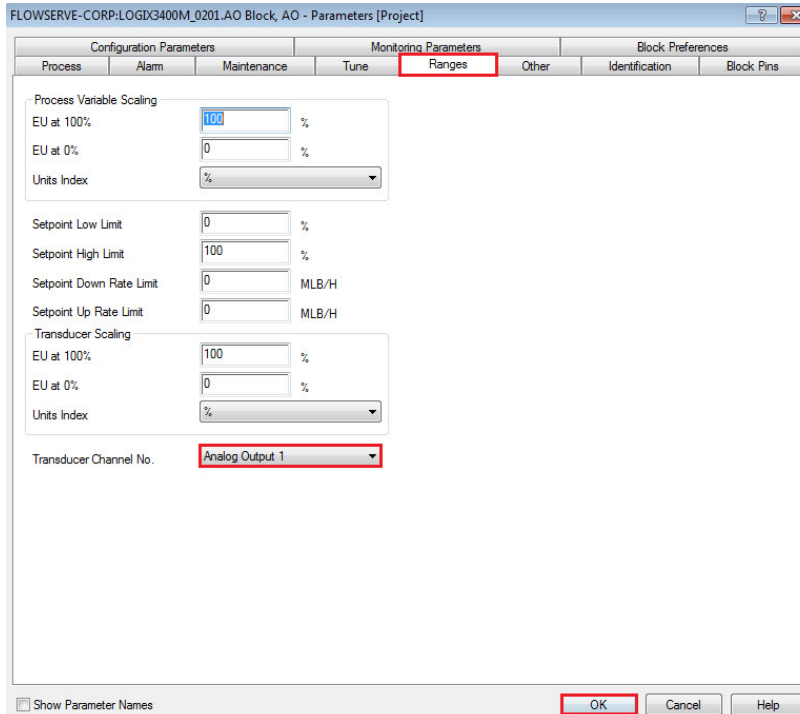
Fault-State Value: 0

Fault-State Delay Time: 0 s

☐ Show Parameter Names

OK Cancel Help

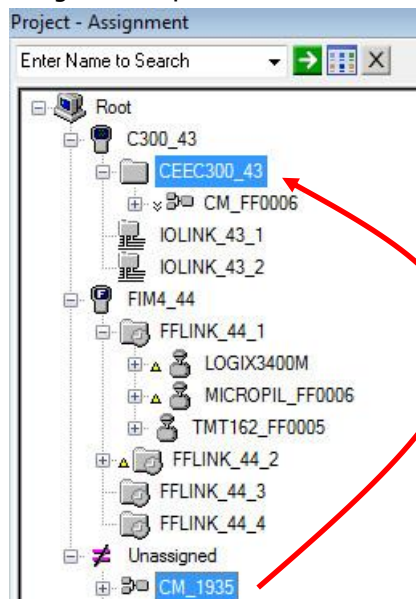
- In the tab "Ranges", configure all ranges as well as the Transducer Channel number "Analog Output 1" and click on the button "OK":



- Close the Control Module and save the changes.

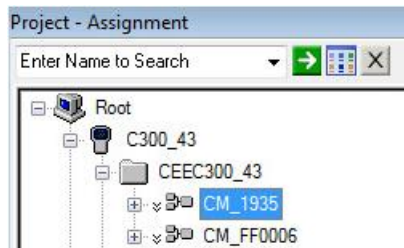
### 3.5.2.3 Control Module Assignment

- Drag and drop the Control Module "CM\_1935" in the Controller:

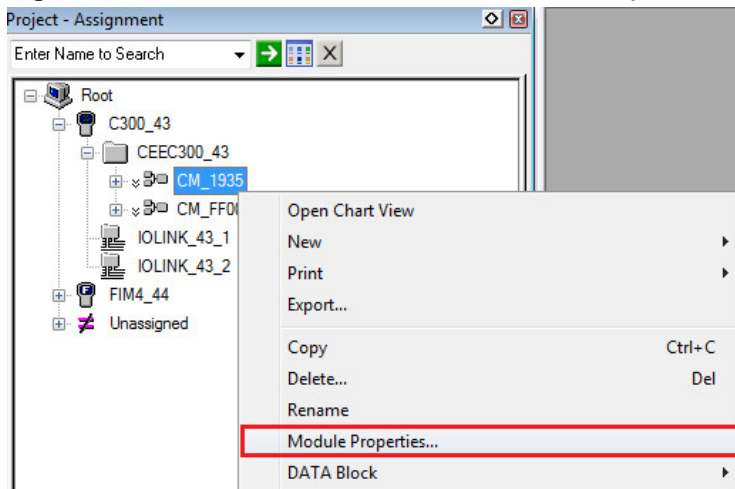




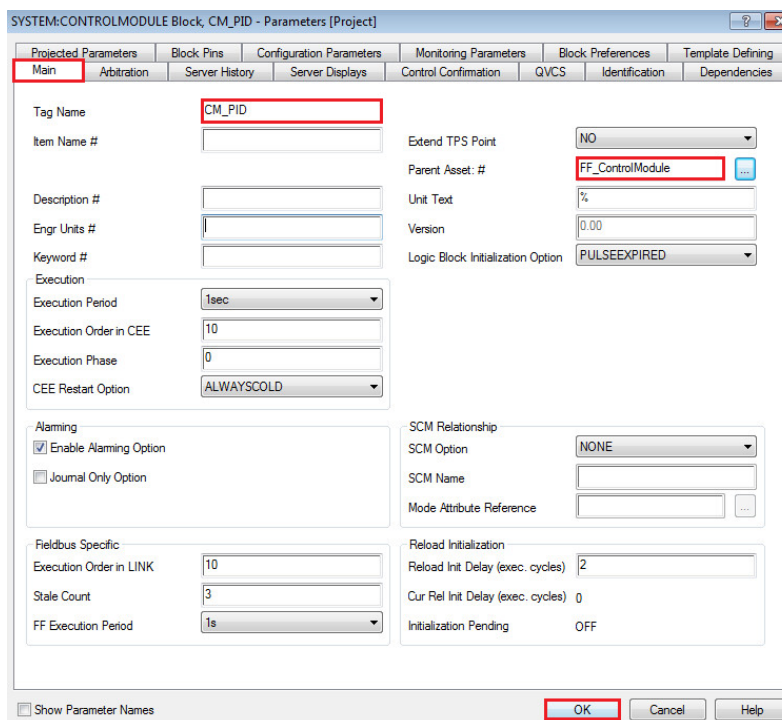
- Control Module is moved to the Controller part:



- Right-click on the Control Module and select the option "Module Properties":



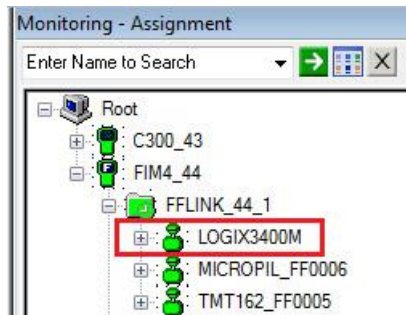
- In the tab "Main", configure the Control Module Tag Name as well as the Parent Asset# and click on the button "OK".



## 3.5.3 Standard PID Loop

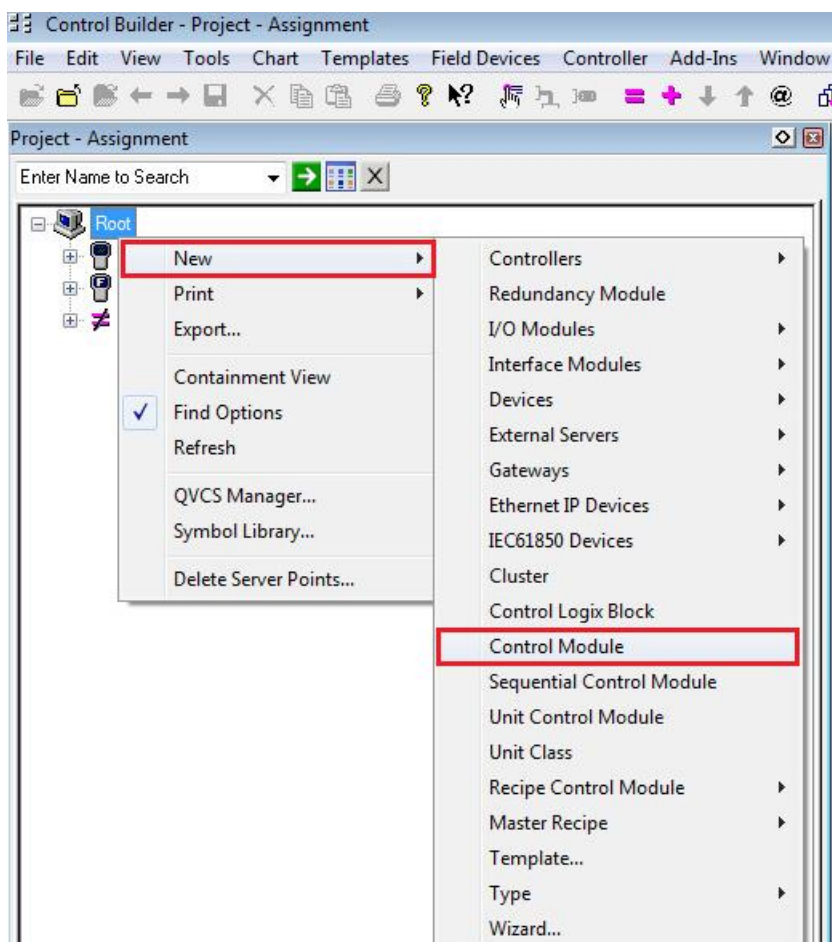
This chapter explains how to configure a PID Loop by using the PID function block of the Honeywell library. In this example, the PID loop is realized between the Micropilot and a Flowserve Digital Positioner Logix 3400MD.

- Flowserve Logix 3400M Digital Positioner has been successfully commissioned:

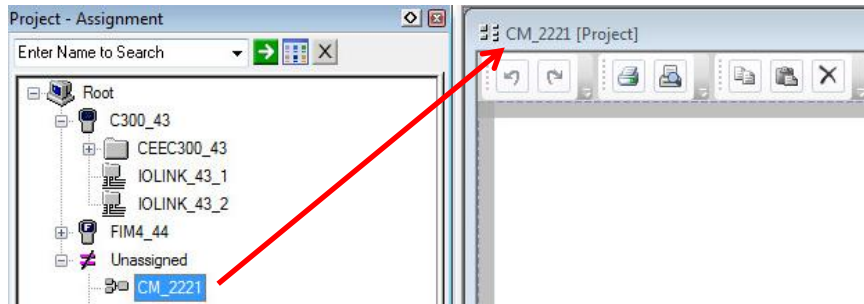


### 3.5.3.1 PID Control Loop Configuration

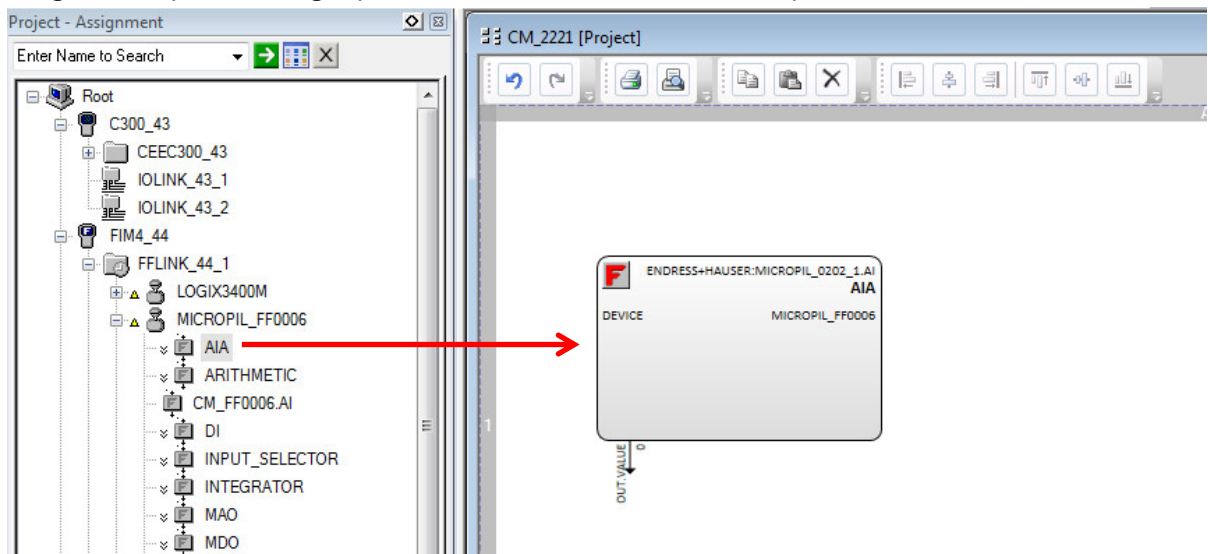
- Create a new Control Module by right-clicking on the field "Root" and select the option "New→Control Module":



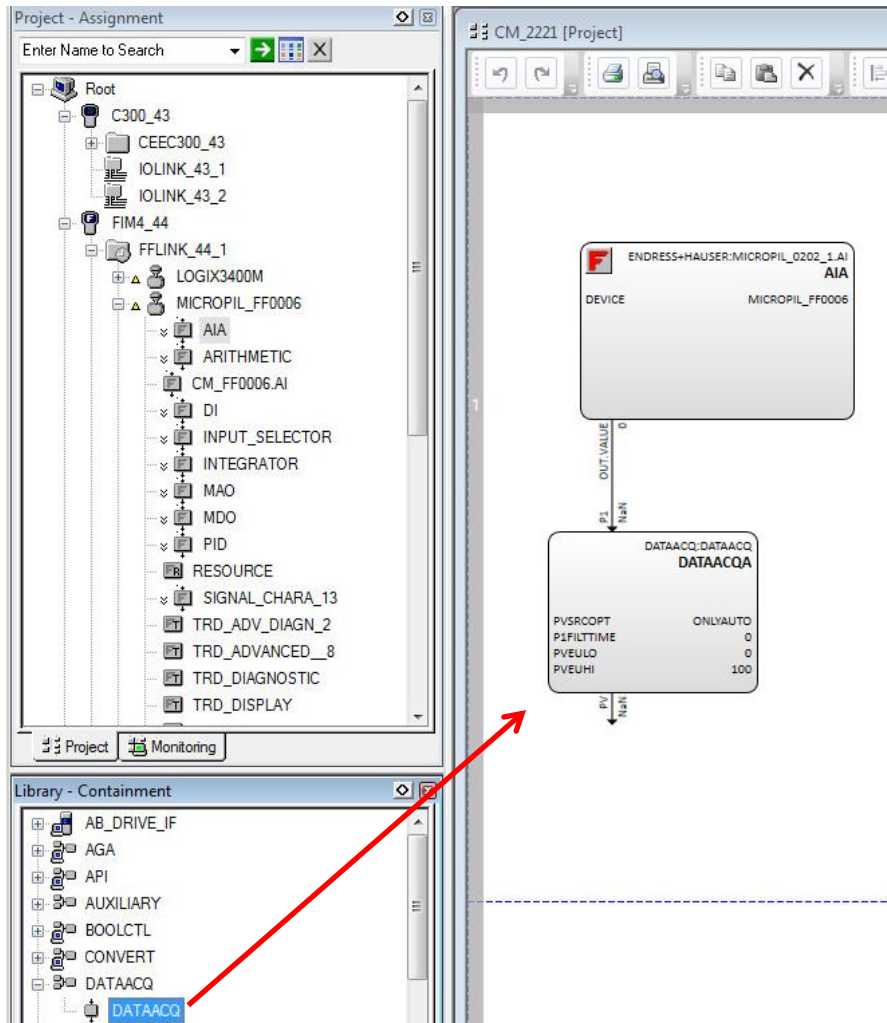
- The created Control Module is opened automatically and saved under "Unassigned":



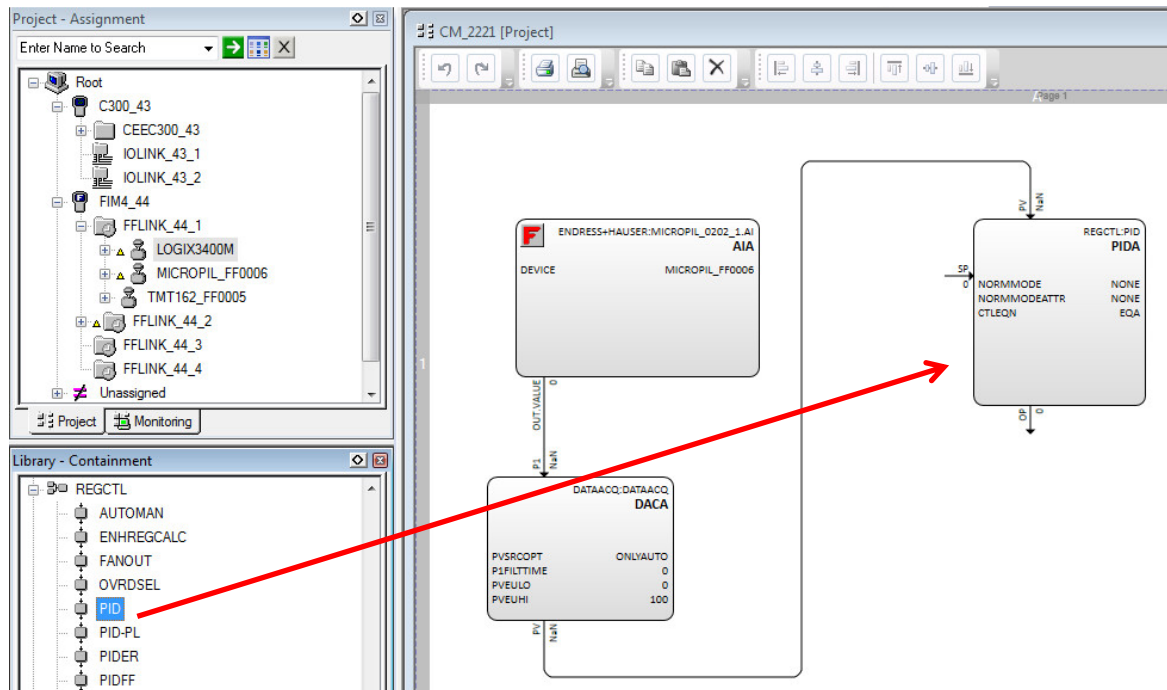
- Drag and drop the analog input AIA function block of the Micropilot:



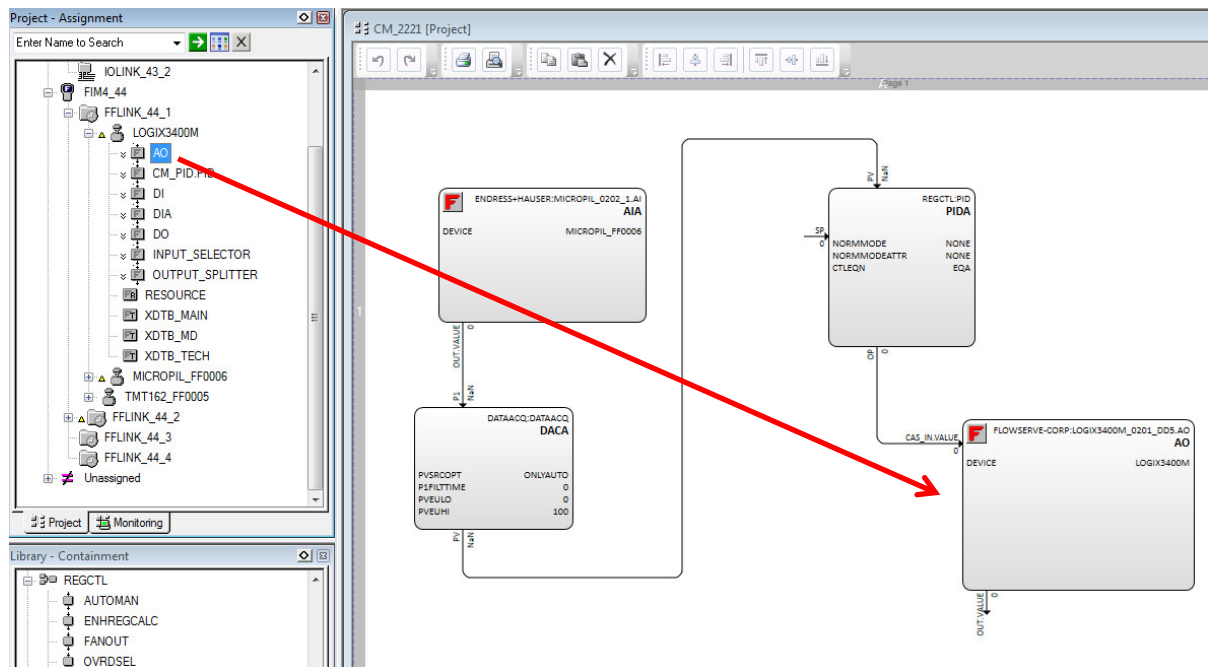
- Drag and drop the DATAACQ function block of the DATAACQ library and connect it to the output of the analog input one:



- Drag and drop the PID function block of the REGCTL library and connect it to the output of the DATAACQ one:



- Drag and drop the Flowserve analog output function block and connect it to the output of the PID one:



## 3.5.3.2 Function Blocks Configuration

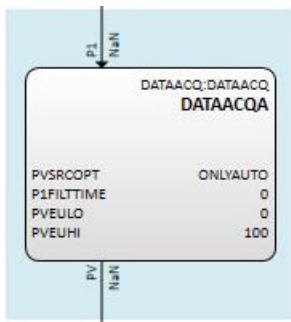
This part describes the configured parameters of the three function blocks used in the PID loop.

### Micropilot function block AIA

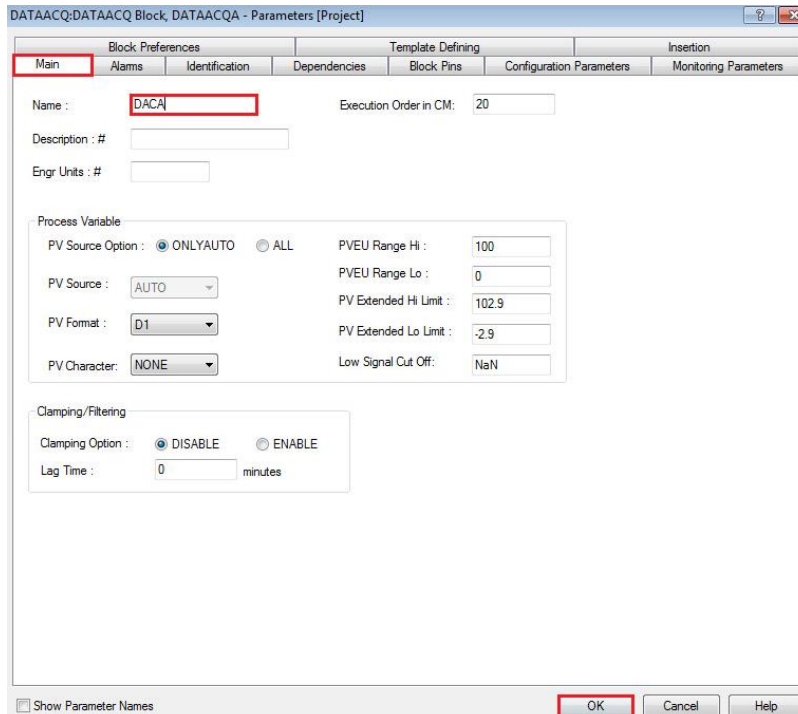
- Configure the Micropilot AIA function block as done in Chapter 3.5.1.

### Standard function block DATAACQA

- Double-click on the DATAACQA function block:

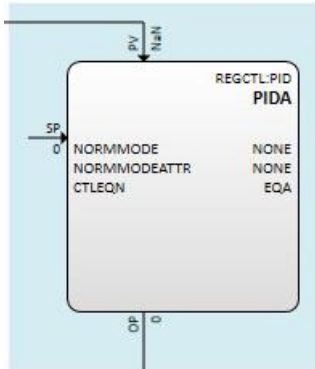


- In the tab "Main", enter the name "DACA" and click on the button "OK":

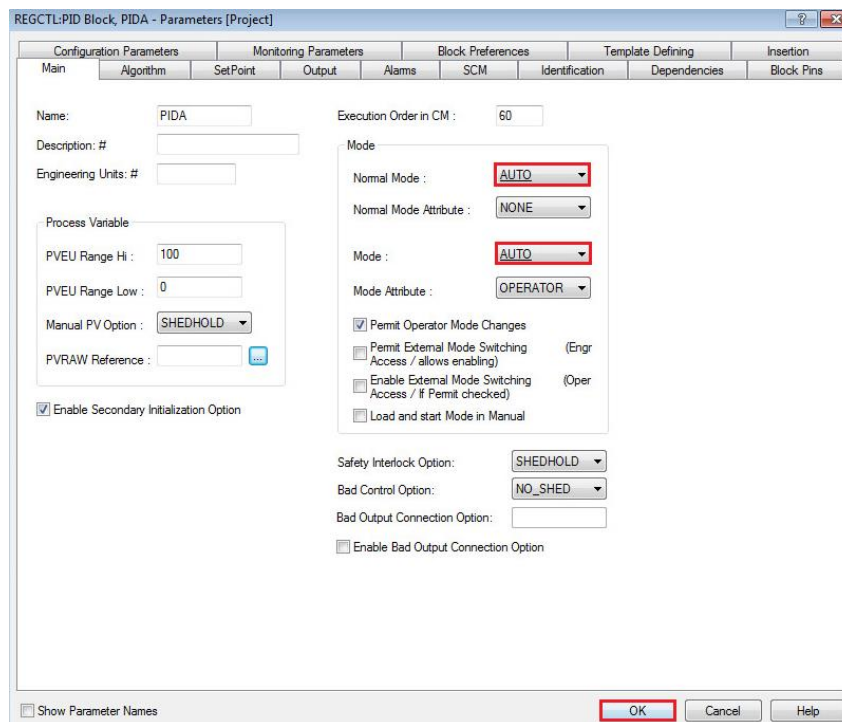


## Standard function block PID

- Double-click on the PIDA function block:



- Double-click on the PIDA function block and change the parameters Normal Mode and Mode on "AUTO". Then click on the button "OK":

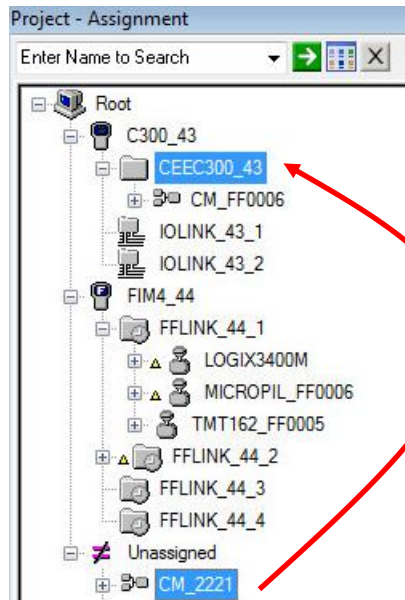


- Close the Control Module and save the changes.

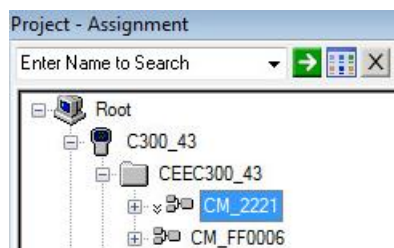


### 3.5.3.3 Control Module Assignment

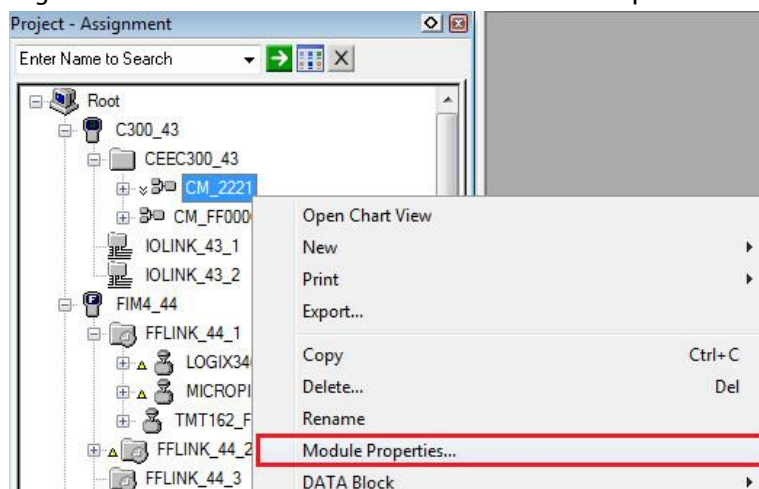
- Drag and drop the Control Module "CM\_2221" in the Controller:



- Control Module is moved to the Controller part:

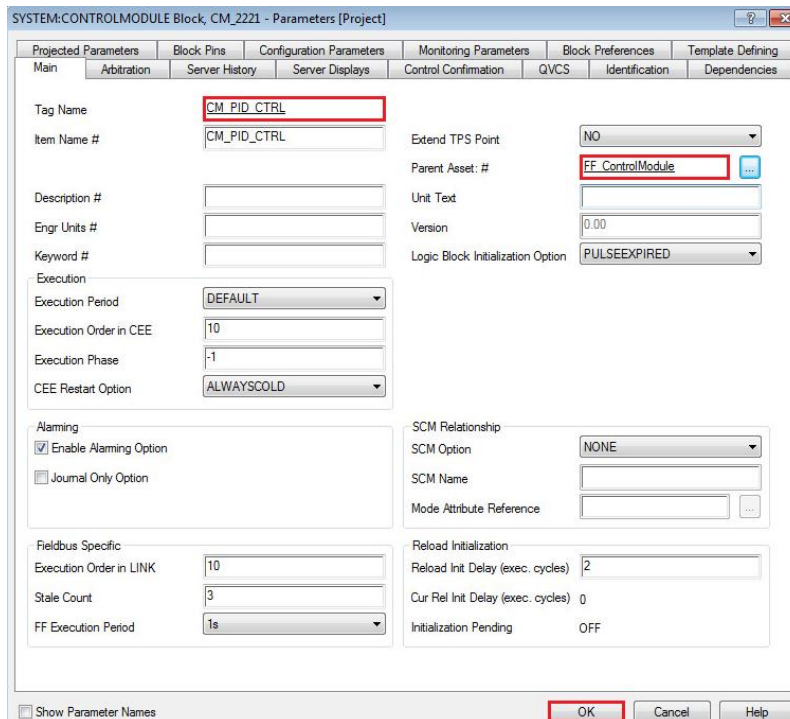


- Right-click on the Control Module and select the option "Module Properties":





- In the tab “Main”, configure the Control Module Tag Name as well as the Parent Asset# and click on the button “OK”.



SYSTEM:CONTROLMODULE Block, CM\_2221 - Parameters [Project]

Projected Parameters | Block Pins | Configuration Parameters | Monitoring Parameters | Block Preferences | Template Defining

Main | Arbitration | Server History | Server Displays | Control Confirmation | QVCS | Identification | Dependencies

Tag Name:

Item Name #:

Extend TPS Point:

Parent Asset: #:

Description #:

Unit Text:

Engr Units #:

Version:

Keyword #:

Logic Block Initialization Option:

Execution

Execution Period:

Execution Order in CEE:

Execution Phase:

CEE Restart Option:

Alarming

☒ Enable Alarming Option

☐ Journal Only Option

SCM Relationship

SCM Option:

SCM Name:

Mode Attribute Reference:

Fieldbus Specific

Execution Order in LINK:

State Count:

FF Execution Period:

Reload Initialization

Reload Init Delay (exec. cycles):

Cur Rel Init Delay (exec. cycles):

Initialization Pending:

☐ Show Parameter Names

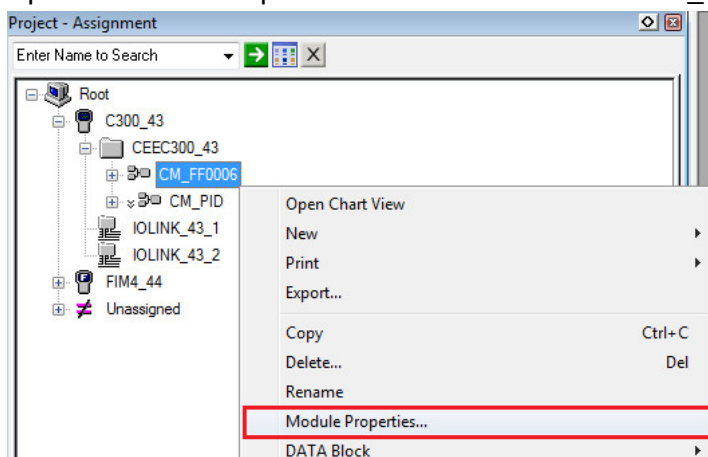
## 3.5.4 Faceplate Configuration

This chapter explains how to assign Honeywell faceplates to Control Modules. These faceplates can be used in the tool “Station”.

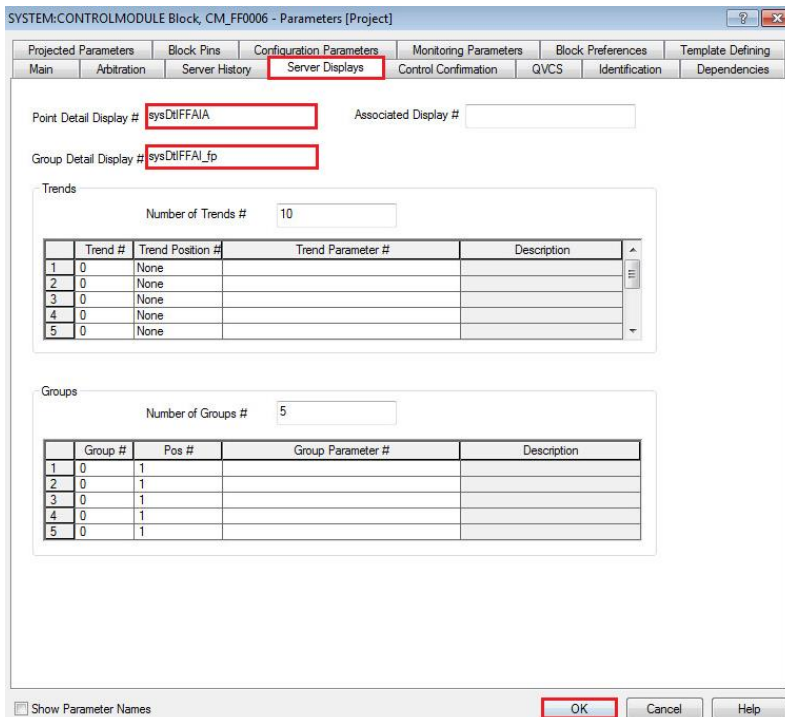
### 3.5.4.1 Analog Input Faceplate

In this example, an analog input faceplate is assigned to the control module “CM\_FF0006” created in chapter 3.5.1.

- Open the menu “Properties” of the control module “CM\_FF0006”.



- Select the tab "Server Displays" and configure the parameters Point Detail Display "sysDtlFFAIA" and Group Detail Display "sysDtlFFAI\_fp" as below. Then click on the button "OK".



SYSTEM:CONTROLMODULE Block, CM\_FF0006 - Parameters [Project]

Projected Parameters   Block Pins   Configuration Parameters   Monitoring Parameters   Block Preferences   Template Defining

Main   Arbitration   Server History   **Server Displays**   Control Confirmation   QVCS   Identification   Dependencies

Point Detail Display #    Associated Display #

Group Detail Display #

Trends

Number of Trends #

Trend #	Trend Position #	Trend Parameter #	Description
1	0	None	
2	0	None	
3	0	None	
4	0	None	
5	0	None	

Groups

Number of Groups #

Group #	Pos #	Group Parameter #	Description
1	0	1	
2	0	1	
3	0	1	
4	0	1	
5	0	1	

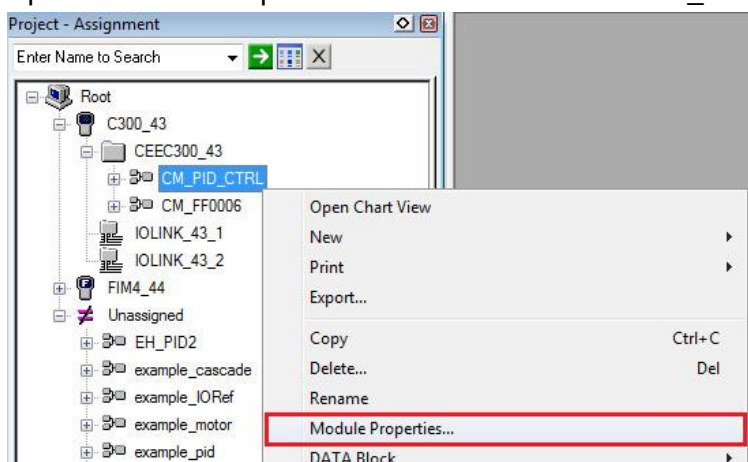
☐ Show Parameter Names   **OK**   Cancel   Help

- Download the control module "CM\_FF0006" as described in chapter 3.6.3.

### 3.5.4.2 PID Faceplate

In this example, a PID faceplate is assigned to the control module "CM\_PID\_CTRL" created in chapter 3.5.2.

- Open the menu "Properties" of the control module "CM\_PID\_CTRL":



- Select the tab "Server Displays" and configure the parameters Point Detail Display "sysDtlPIDA" and Group Detail Display "sysDtlPID\_fp" as below. Then click on the button "OK".

SYSTEM:CONTROLMODULE Block, CM\_PID\_CTRL - Parameters [Project]

Projected Parameters   Block Pins   Configuration Parameters   Monitoring Parameters   Block Preferences   Template Defining

Main   Arbitration   Server History   **Server Displays**   Control Confirmation   QVCS   Identification   Dependencies

Point Detail Display #    Associated Display #

Group Detail Display #

Trends

Number of Trends #

Trend #	Trend Position #	Trend Parameter #	Description
1	0	None	
2	0	None	
3	0	None	
4	0	None	
5	0	None	

Groups

Number of Groups #

Group #	Pos #	Group Parameter #	Description
1	0	1	
2	0	1	
3	0	1	
4	0	1	
5	0	1	

☐ Show Parameter Names

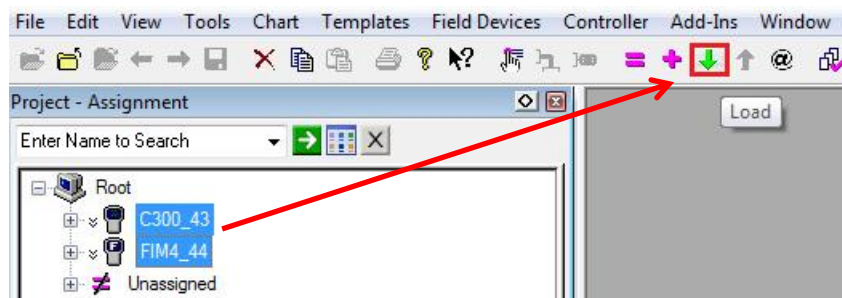
- Download the control module "CM\_PID" as described in chapter 3.6.3.

## 3.6 Commissioning of the Control Project

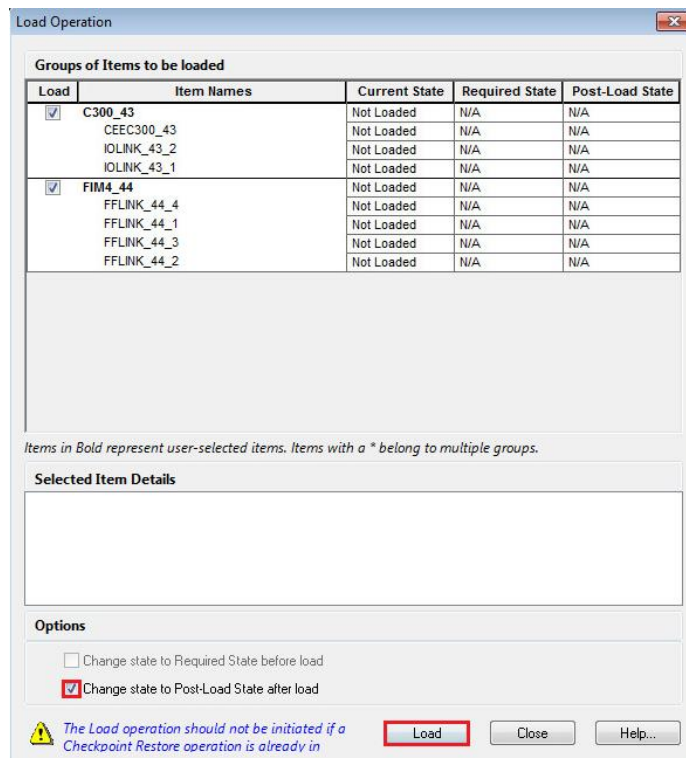
### 3.6.1 First Download

This part concerns the hardware configuration download of the C300 and FIM modules.

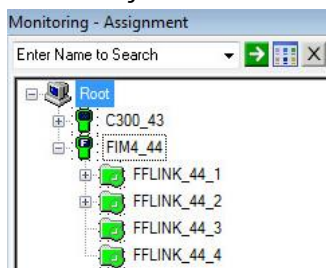
- In the project assignment view, select the C300\_43 and FIM\_44 module, then click on the shortcut button "Load" in the tool bar menu.



- This opens the "Load Operation" window. Select the option "Change state to Post-Load State after Load" and click on the button "Load".



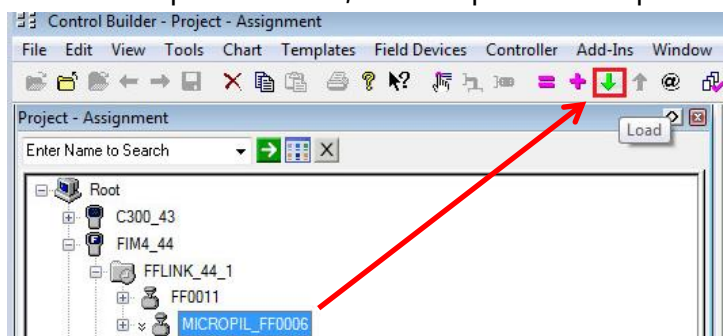
- In the Project Online Monitoring Assignment view, the downloaded configurations are displayed.



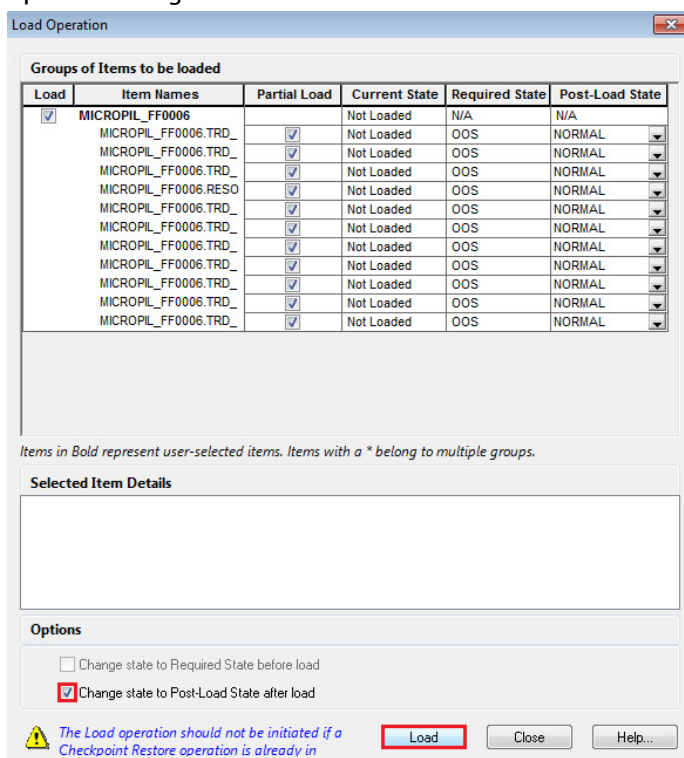
## 3.6.2 Device Configuration Download

This part explains how downloading a device configuration.

- Select the requested device, for example the Micropilot and click on the shortcut button "Load":



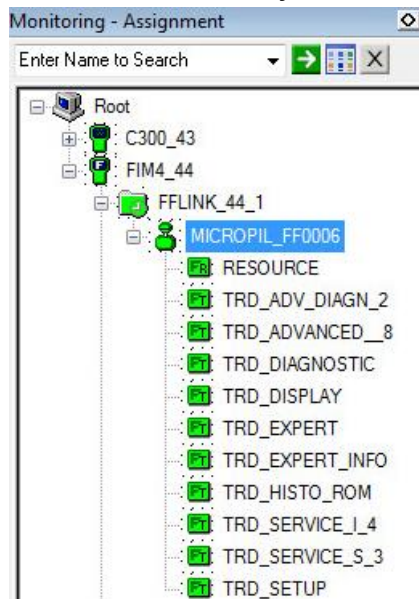
- Partial Load option is automatically selected. Unselect it when a Full Load is required. Select the option "Change state to Post-Load State after load" and click on the button "Load".



The Option "Partial Load" is selected per default.

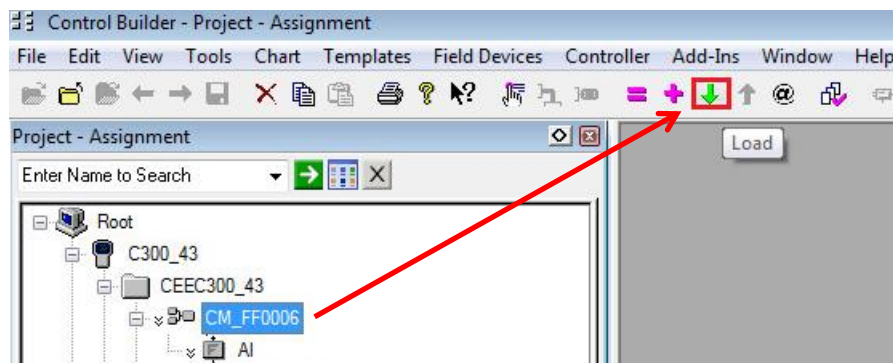
If any changes have been done compared to the standard settings, a "Full Load" will have to be done. Unclick the checkbox to configure a "Full Load".

- Device is automatically connected and all blocks are automatically activated:

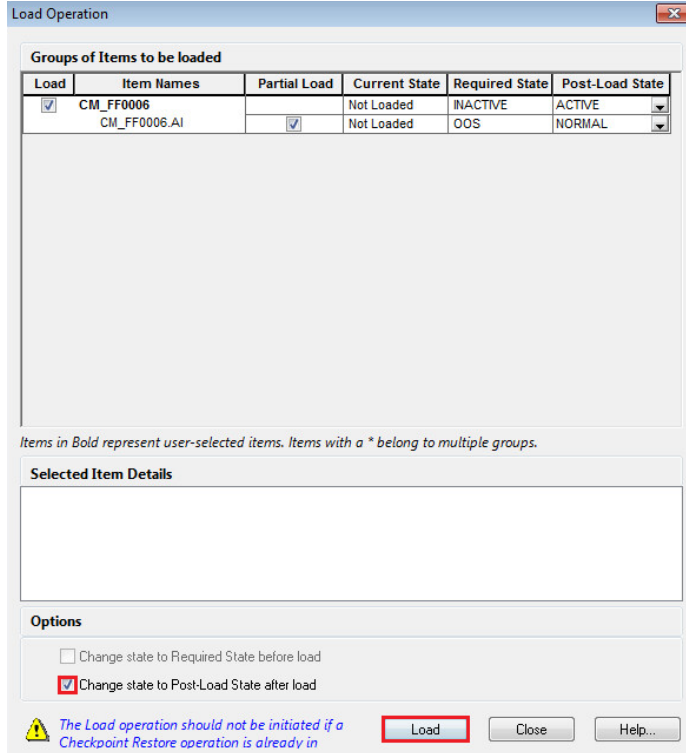


### 3.6.3 Control Module Download

- Select the Control Module and select the shortcut button "Load":



- Partial Load option is automatically selected. Unselect it when a Full Load is required. Select the option "Change state to Post-Load State after load" and click on the button "Load".



**Load Operation**

Load	Item Names	Partial Load	Current State	Required State	Post-Load State
<input checked="" type="checkbox"/>	<b>CM_FF0006</b>		Not Loaded	INACTIVE	ACTIVE
	CM_FF0006.AI	<input checked="" type="checkbox"/>	Not Loaded	OOS	NORMAL


*Items in Bold represent user-selected items. Items with a \* belong to multiple groups.*

**Selected Item Details**

**Options**

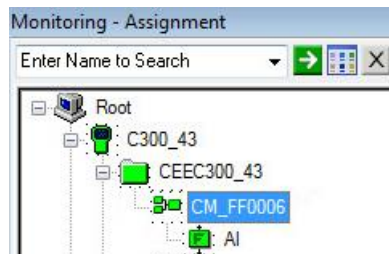
☐ Change state to Required State before load

☒ Change state to Post-Load State after load

 *The Load operation should not be initiated if a Checkpoint Restore operation is already in*

**Load** **Close** **Help...**

- Control Module has been successfully downloaded:

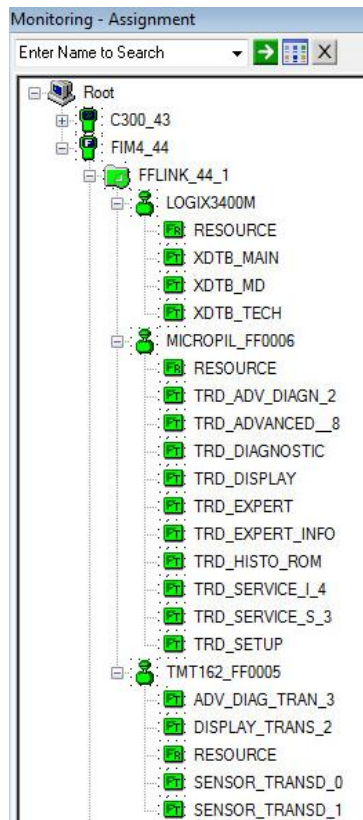




## 3.7 Monitoring of Process Values and Status Information

### 3.7.1 Resource and Transducer blocks

- Device Resource and Transducer blocks are available in the “Monitoring-Assignment” view. A double-click of one block will open the corresponding window:

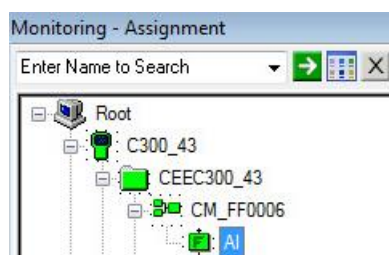


- All devices don't have the same amount of blocks. This is device specific.

### 3.7.2 Control Module

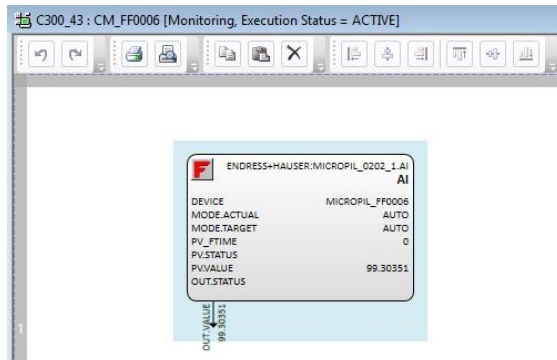
#### 3.7.2.1 Analog Input Function Block

- Double-click on the function “AI” of the Control Module “CM\_FF0006”:



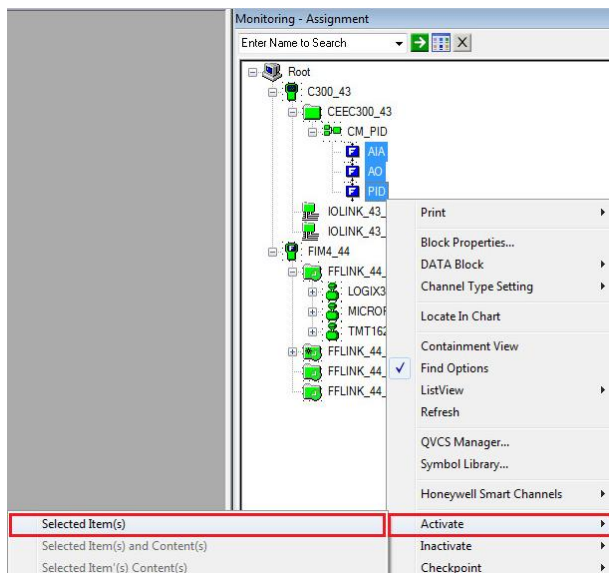


- This opens the Control Module and displays the Online values:

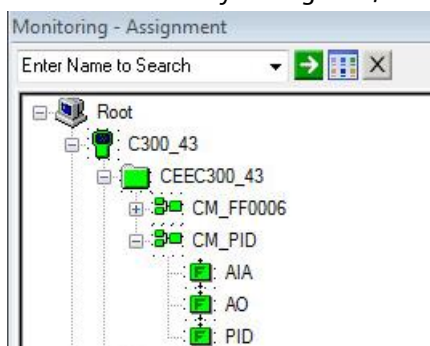


### 3.7.2.2 PID Loop with Control in the Field

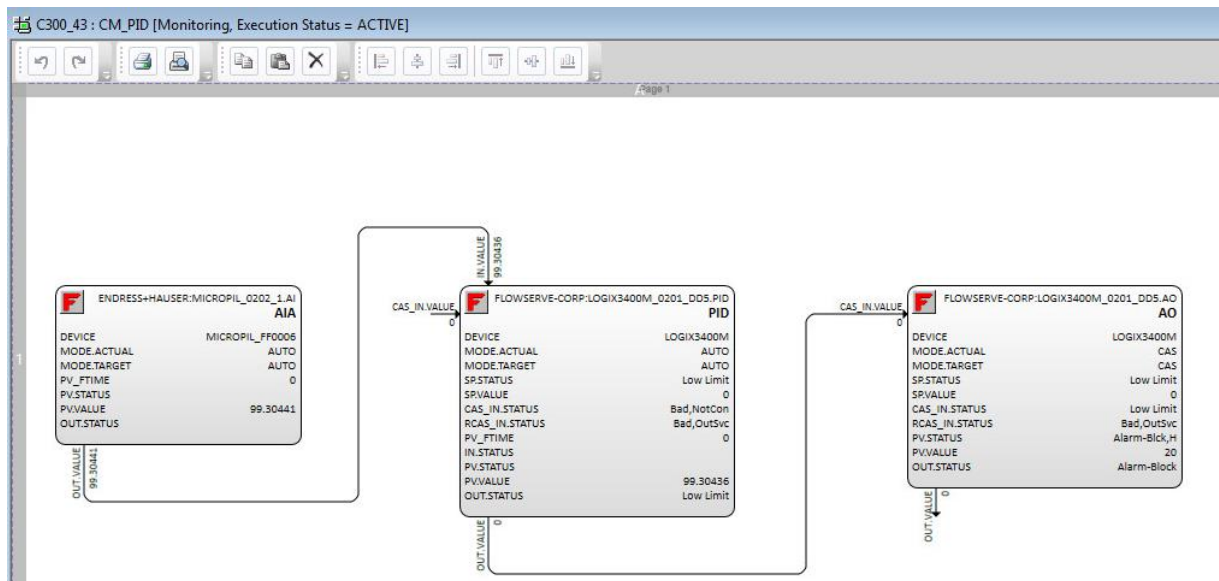
- Activate the three function blocks of the control module "CM\_PID":



- When successfully configured, all function blocks are activated:

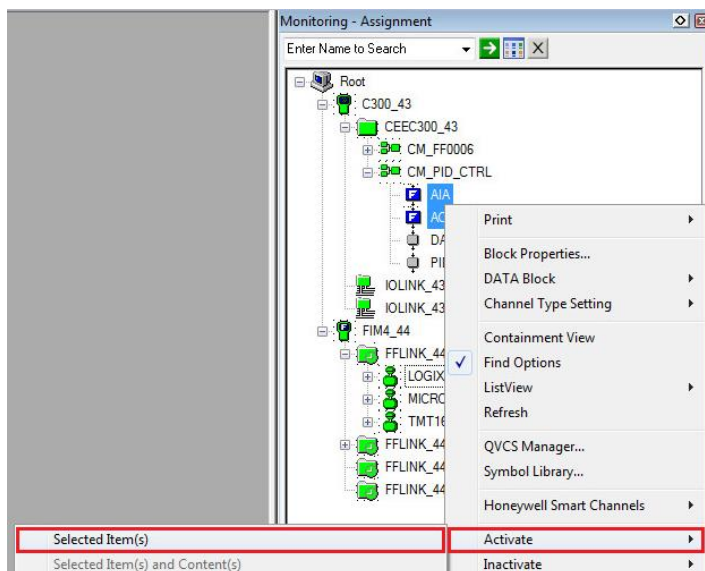


- Control Module in online mode (Simulation activated for the AO):

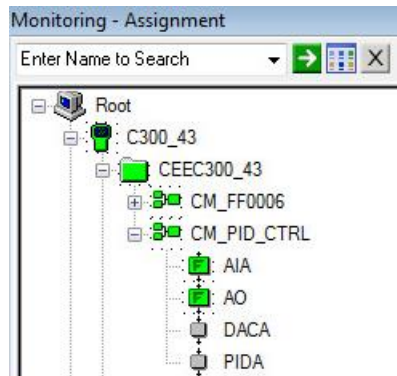


### 3.7.2.3 Standard PID Loop

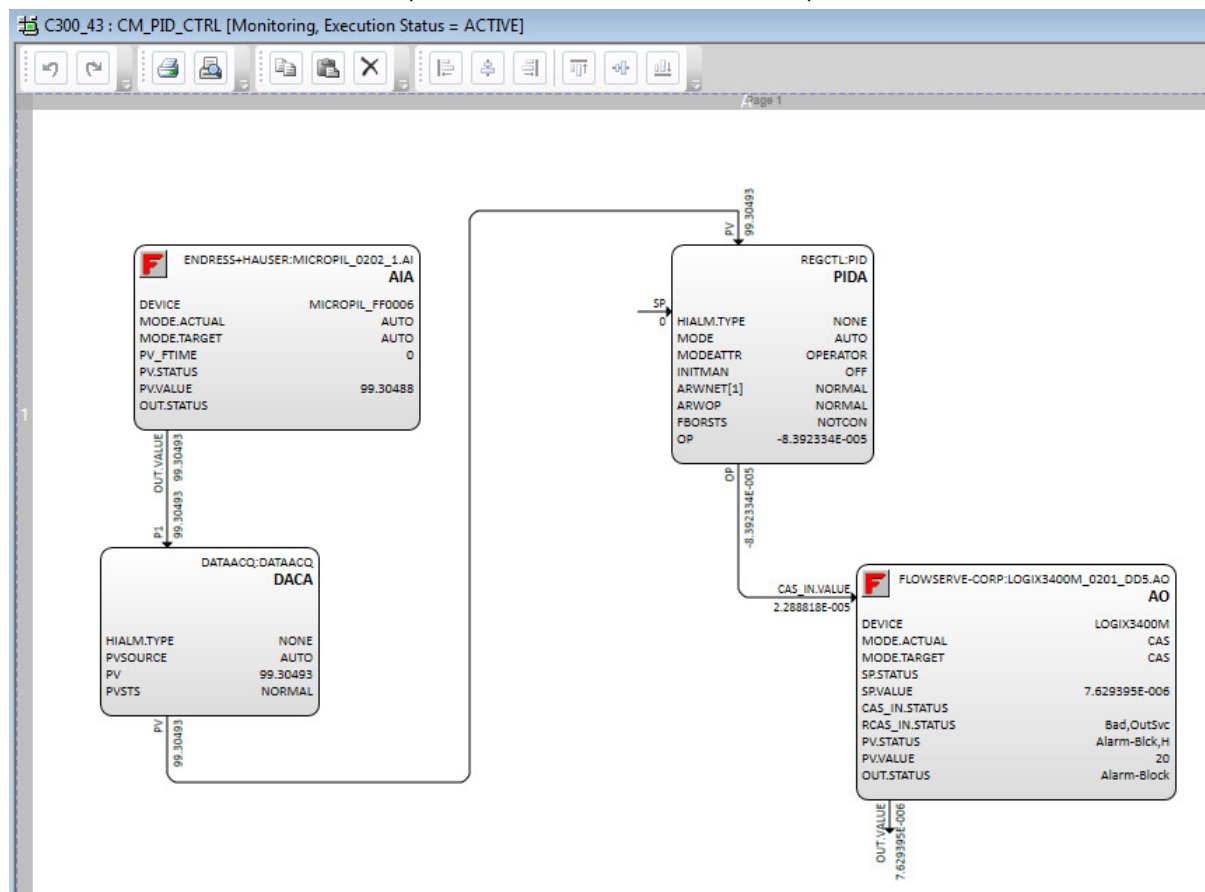
- Activate the three function blocks of the control module "CM\_PID\_CTRL":



- When successfully configured, all field device function blocks are activated (DACA and PIDA are executed in the controller and stay gray):

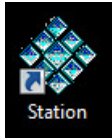


- Control Module in online mode (Simulation activated for the AO)



### 3.7.3 Faceplate Display in Experion Station

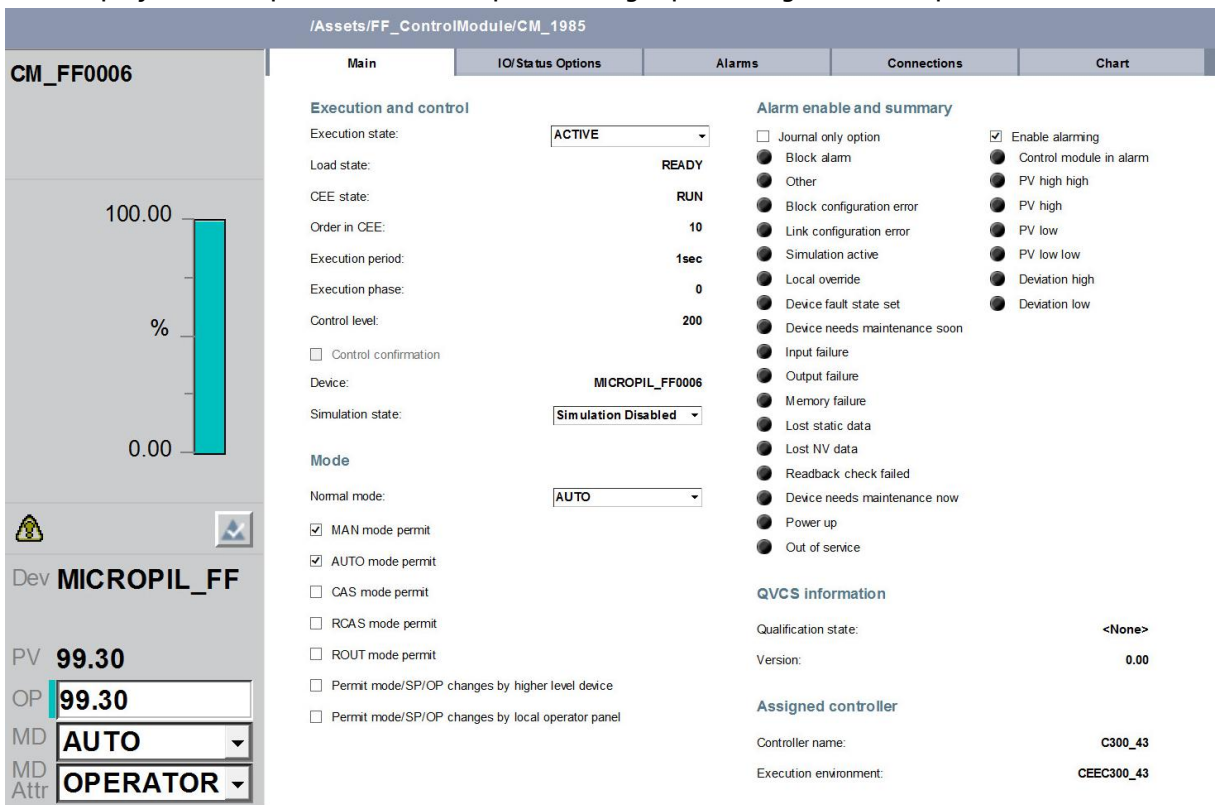
- Start the Experion tool "Station".



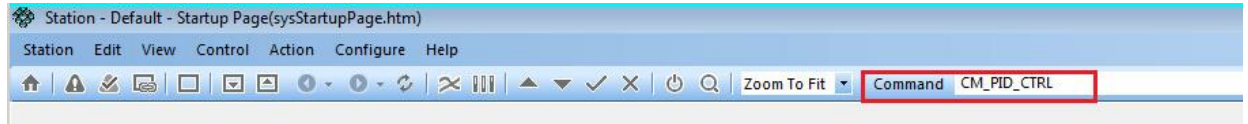
- Enter the manager login mode.
- Enter the control module name "CM\_FF0006" in the browser and click on the keyboard touch "F12":



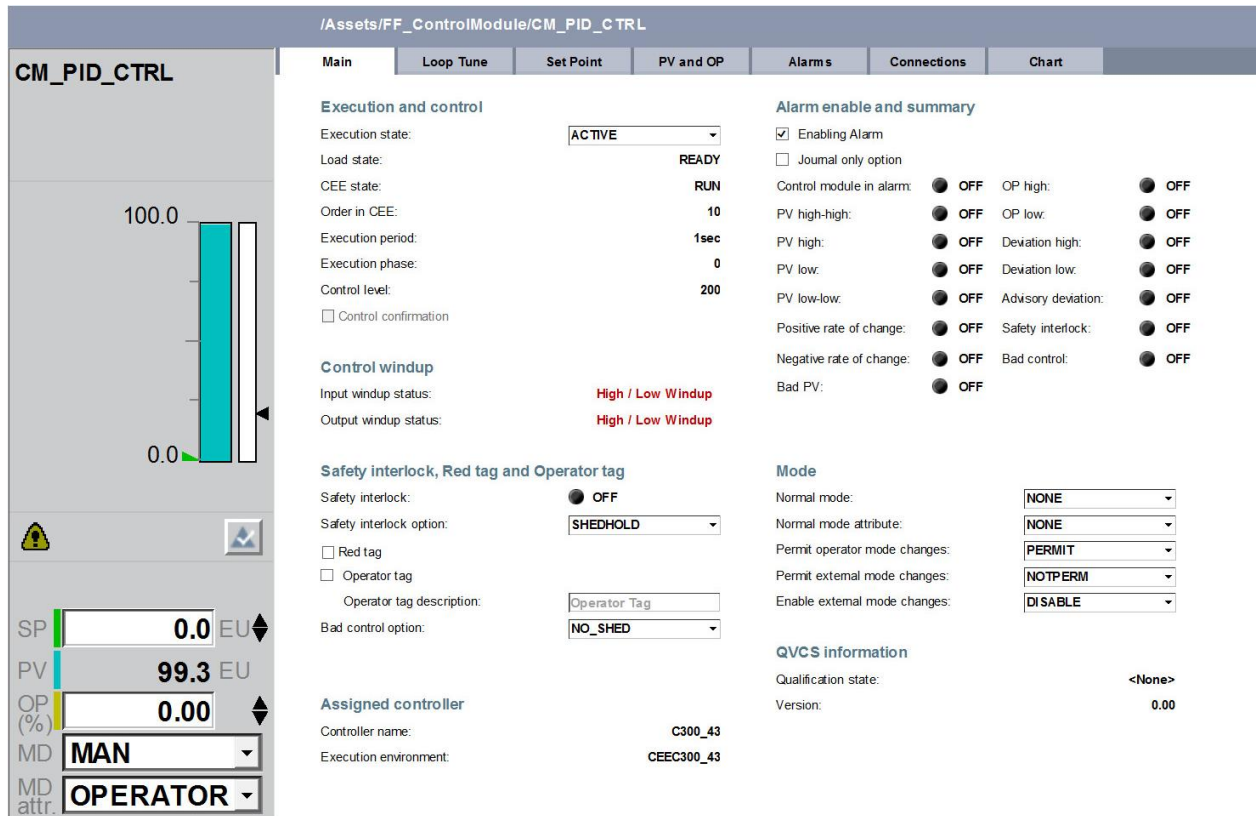
- This displays the faceplate of the Micropilot analog input configured in chapter 3.5.4.1 :



- Enter the control module name "CM\_PID\_CTRL" in the browser and click on the keyboard touch "F12":



- This displays the faceplate of the PID loop configured in chapter 3.5.4.2:

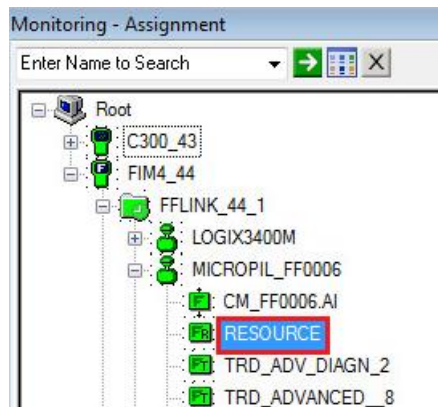


## 3.7.4 Advanced Diagnostics

### 3.7.4.1 Field Diagnostics

Field Diagnostics can be checked in the Resource block.

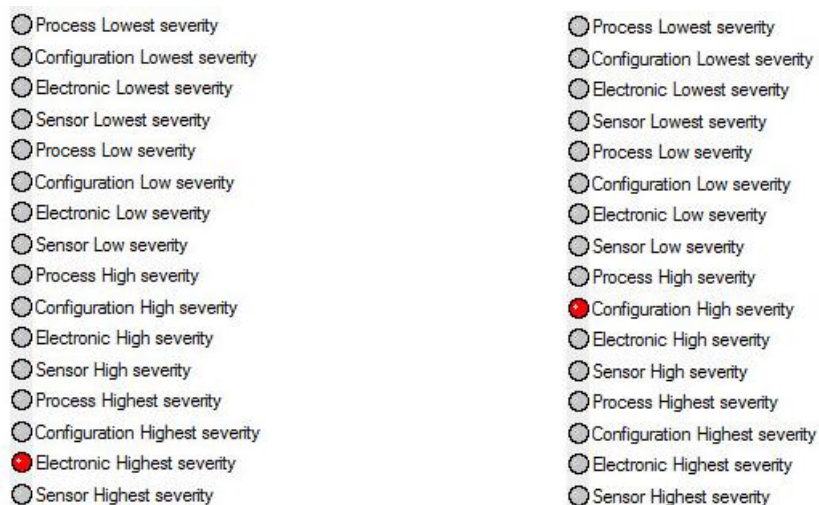
- Double-click on the Resource block of the device "MICROPIL\_FF0006":



- Select the tab "Field Diagnostics":



- Statuses are displayed on the top part of the menu. When the circle color is red, the event is active (gray is inactive).  
In this example, the event "Electronic Highest severity" of the "Failure Map" is active as well as the "Configuration High severity" of the "Check Map". (Event "Main Electronic Failure" is simulated in DeviceDTM, see chapter 4.1.3.3):





- Configured configuration bit 1 in offline is marked:

ENDRESS+HAUSER:MICROPIL\_0202\_1.RESOURCE Block, RESOURCE - Parameters [Monitoring]

DD View Process Alarm Maintenance Tune Field Diagnostics Other Identification

☐ Process High severity  
☐ Configuration High severity  
☐ Electronic High severity  
☐ Sensor High severity  
☐ Process Highest severity  
☐ Configuration Highest severity  
☐ Electronic Highest severity  
☐ Sensor Highest severity

Fail Map

☐ Check  
☒ Configurable Area Bit 1  
☐ Configurable Area Bit 2

☐ Process High severity  
☐ Configuration High severity  
☐ Electronic High severity  
☐ Sensor High severity  
☐ Process Highest severity  
☐ Configuration Highest severity  
☐ Electronic Highest severity  
☐ Sensor Highest severity

Offspec Map

☐ Check  
☐ Configurable Area Bit 1  
☐ Configurable Area Bit 2

- Corresponding Bit1 alarm can be set in the transducer diagnostic block. Double-click on the block "TRD\_DIAGNOSTIC":

Monitoring - Assignment

Enter Name to Search

Root

- C300\_43
  - FIM4\_44
    - FFLINK\_44\_1
      - LOGIX3400M
        - MICROPIL\_FF0006
          - RESOURCE
            - TRD\_ADV\_DIAGN\_2
            - TRD\_ADVANCED\_8
            - TRD\_DIAGNOSTIC
            - TRD\_DISPLAY
            - TRD\_EXPERT
            - TRD\_EXPERT\_INFO
            - TRD\_HISTO\_ROM

- Select the tab "Other3". Bit 1 can be configured here.

ENDRESS+HAUSER:MICROPIL\_0202\_1.TRD\_DIAGNOSTIC Block, TRD\_DIAGNOSTIC - Parameters [Monitoring]

DD View Process Alarm Maintenance Other Other2 Other3 Identification

CA

Configurable Area Bit 1 941 Echo lost

Configurable Area Bit 2 Not used

Configurable Area Bit 3 941 Echo lost

Configurable Area Bit 4 942 In safety distance

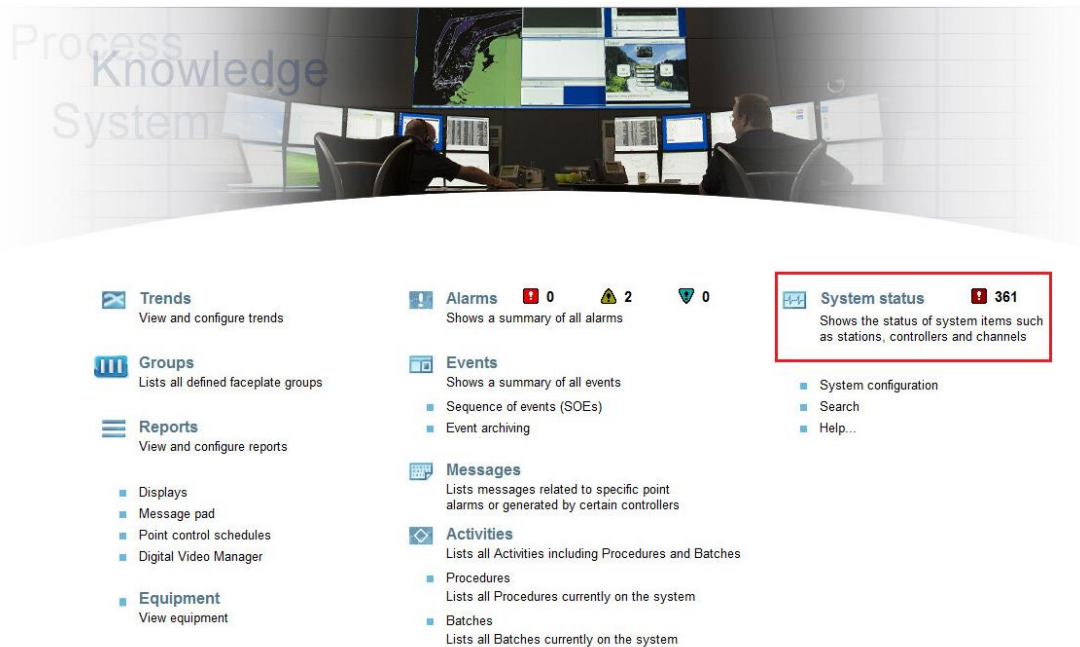
Configurable Area Bit 5 950 Advanced diagnostic 1 occurred

Configurable Area Bit 6 950 Advanced diagnostic 2 occurred

Configurable Area Bit 7 Not used

## 3.7.4.2 Alarm Supervision in Station

- Click on the menu "System status" (In this example, the user level is "Manager"):



- Select for example the FFLINK\_44\_1 to display all events of this FIM module:



- Current alarms of the FIM module FFLINK\_44\_1 are displayed:

System Status						
Location		View: (all alarms) * v				
Date & Time	Location Tag	Source	Condition	Priority	Description	
3/7/2017 15:42:53	FFLINK_44_1	TMT162_FF0005	DIAG	U 00	sensorTrans0	
3/7/2017 15:42:24	FFLINK_44_1	TMT162_FF0005	InFail	H 00		
3/7/2017 15:42:24	FFLINK_44_1	TMT162_FF0005	Unspec	H 00		
3/7/2017 14:04:25	FFLINK_44_1	MICROPIL_FF0006	Check Fnc	U 15		
3/7/2017 14:04:25	FFLINK_44_1	MICROPIL_FF0006	Failure	U 15		
3/6/2017 23:32:04	FIM4_44	FFLINK_44_1	DIAG	H 00	H1 Link Power Failure	
3/3/2017 8:50:01	FFLINK_44_1	LOGIX3400M	SimAct	H 00		
3/3/2017 8:49:43	FFLINK_44_1	LOGIX3400M	MntNow	H 00		



- Advanced Alarming (TMT162\_FF0005)

The configured Advanced Alarm in chapter 3.4.3 is displayed.

Alarm Details	
General	Comments
Acknowledged:	False
Category Name:	System Alarm
Changed Time:	3/7/2017 15:42:53
Condition:	DIAG
Count:	1
Criticality:	Failure
Description:	sensorTrans0
Disabled:	False
DSA Connection Name:	CDA
DSA Server Name:	Localhost
EE Code:	4098

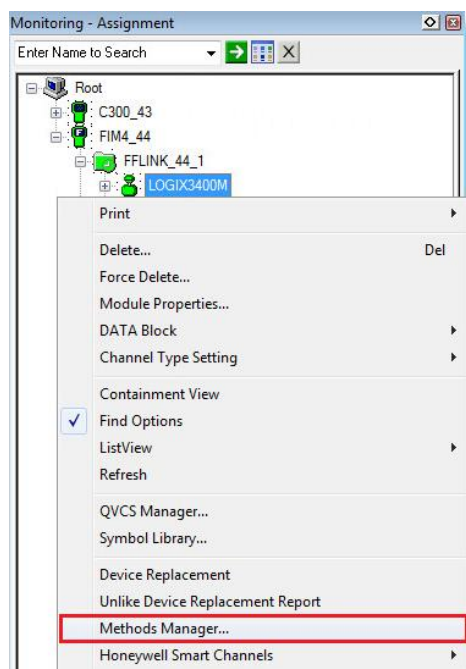
- Field Diagnostics (MICROPIL\_FF0006)

The simulated failure event ("Main Electronic Failure" in DeviceDTM, see chapter 4.1.3.3) is indicated as well. However, the corresponding text Description is missing.

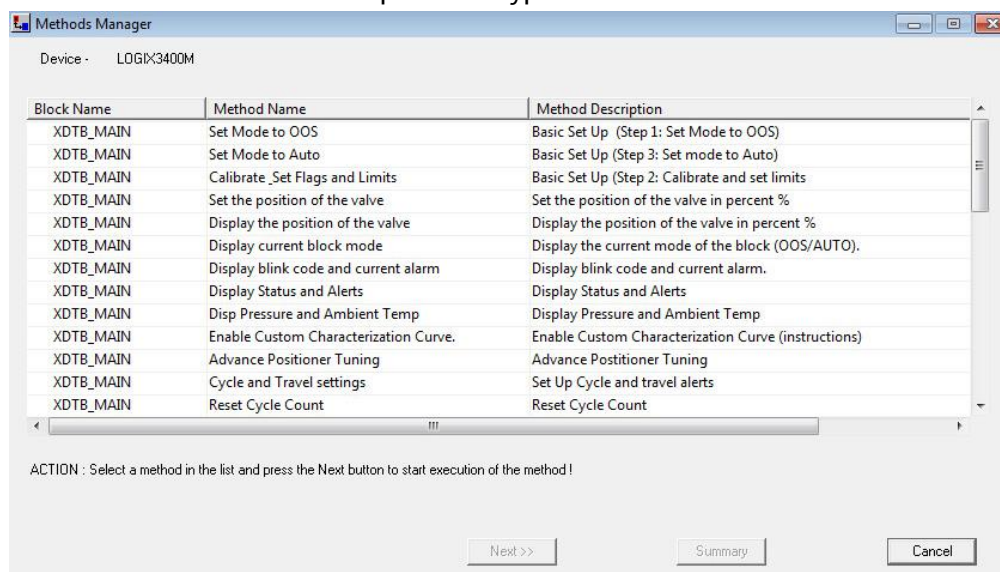
## 3.7.5 Methods

Methods are used for helping user configuring devices. The following example explains how using a method for the Flowserve Digital Positioner Logix 3400MD.

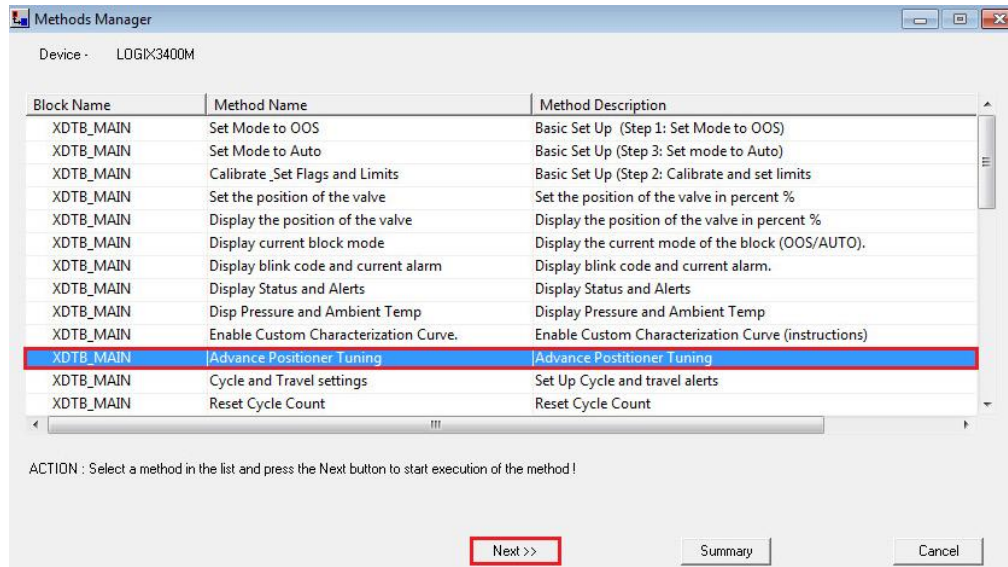
- Right-click on the Logix 3400Md and select the menu "Methods Manager" to display available methods:



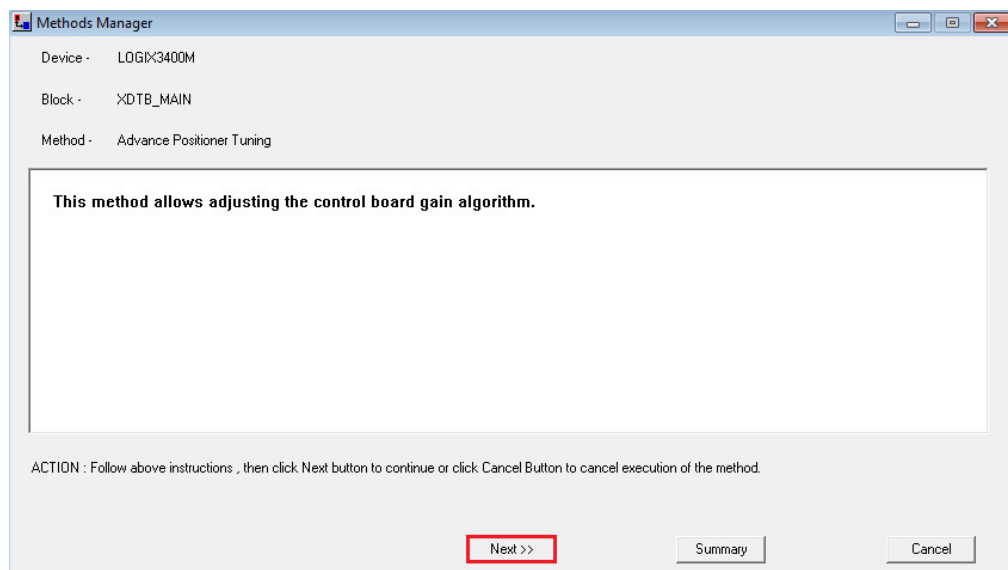
- Available methods are sorted per block type:



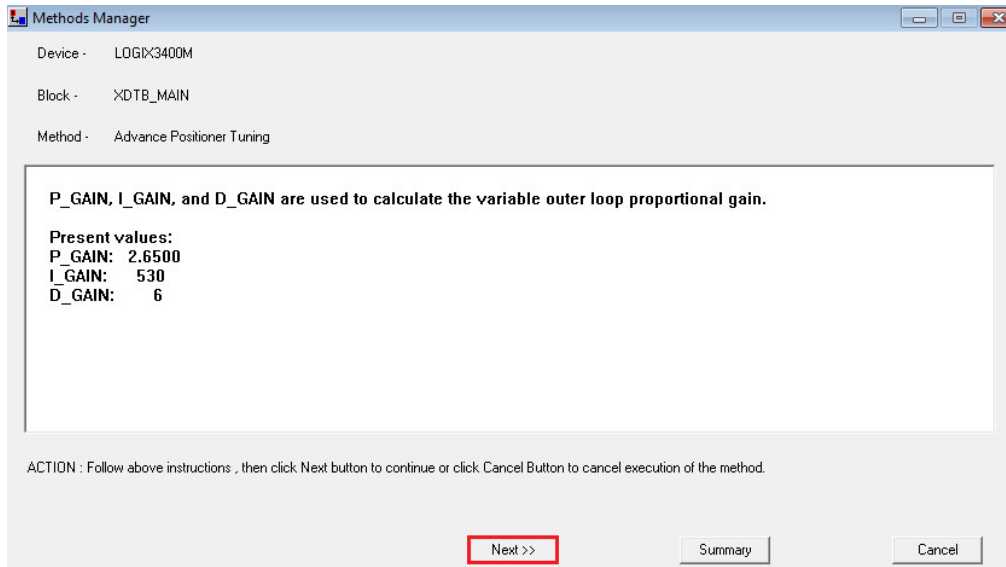
- Select for example the method "Advance Positioner Tuning" and click on the button "Next>>":



- Click on the button "Next>>":



- Click on the button "Next>>":



Methods Manager

Device - LOGIX3400M

Block - XDTB\_MAIN

Method - Advance Positioner Tuning

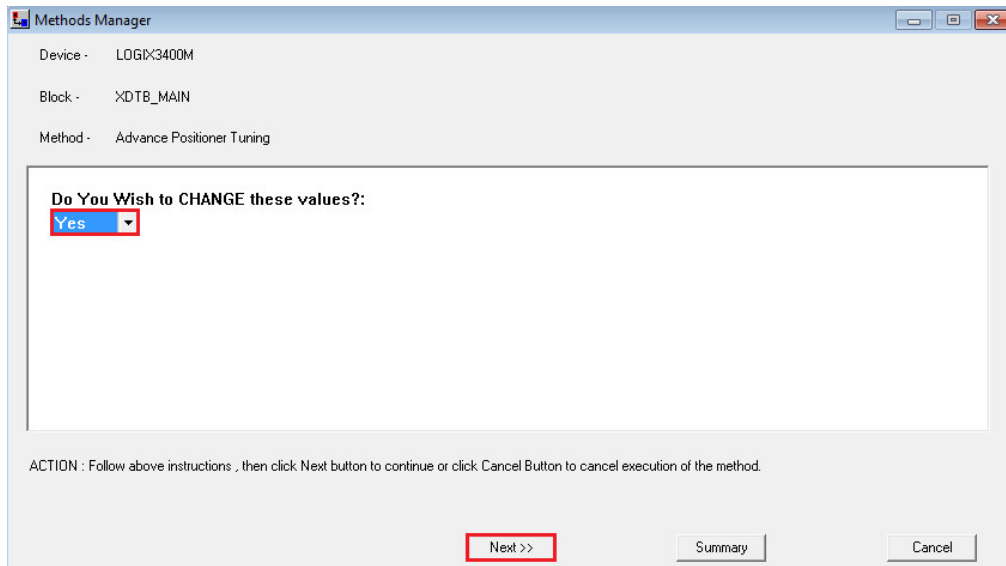
P\_GAIN, I\_GAIN, and D\_GAIN are used to calculate the variable outer loop proportional gain.

Present values:  
P\_GAIN: 2.6500  
I\_GAIN: 530  
D\_GAIN: 6

ACTION : Follow above instructions , then click Next button to continue or click Cancel Button to cancel execution of the method.

Next >> Summary Cancel

- Select the option "Yes" for changing values and click on the button "Next>>":



Methods Manager

Device - LOGIX3400M

Block - XDTB\_MAIN

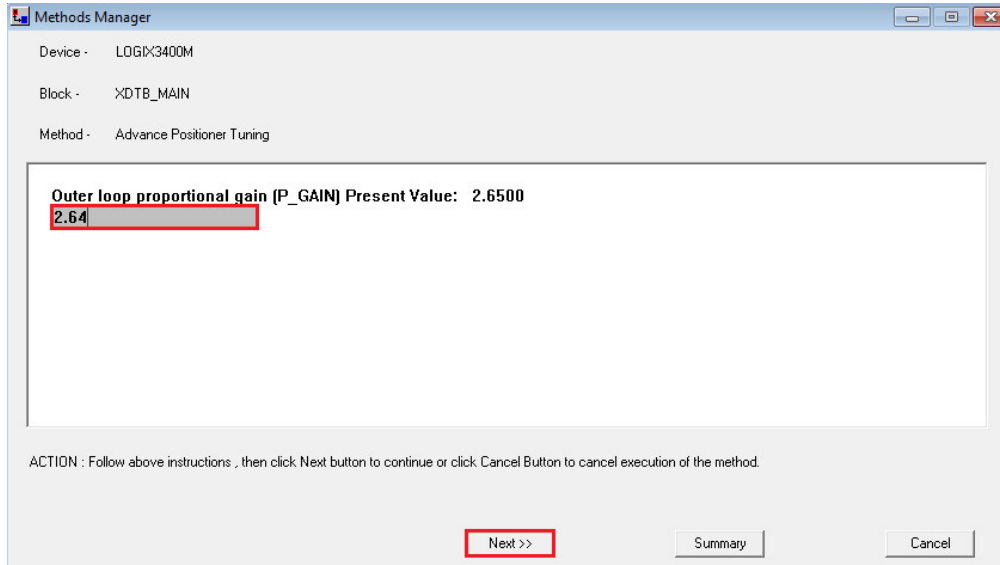
Method - Advance Positioner Tuning

Do You Wish to CHANGE these values?:  
Yes

ACTION : Follow above instructions , then click Next button to continue or click Cancel Button to cancel execution of the method.

Next >> Summary Cancel

- Modify the first value in the field, for example 2.64 and click on the button "Next>>":



Methods Manager

Device - LOGIX3400M

Block - XDTB\_MAIN

Method - Advance Positioner Tuning

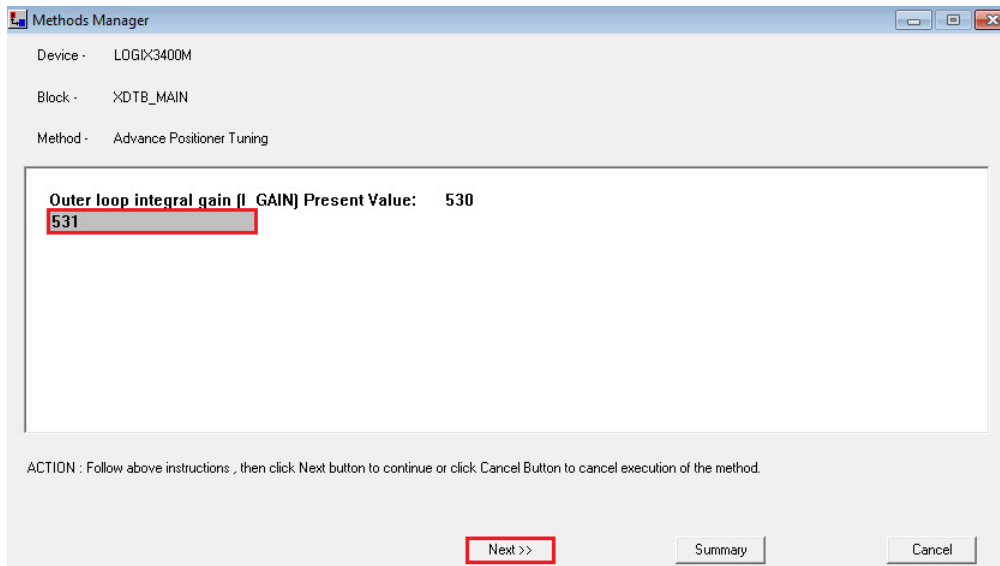
Outer loop proportional gain (P\_GAIN) Present Value: 2.6500

2.64

ACTION : Follow above instructions , then click Next button to continue or click Cancel Button to cancel execution of the method.

Next >> Summary Cancel

- Modify the second value in the field, for example 531 and click on the button "Next>>":



Methods Manager

Device - LOGIX3400M

Block - XDTB\_MAIN

Method - Advance Positioner Tuning

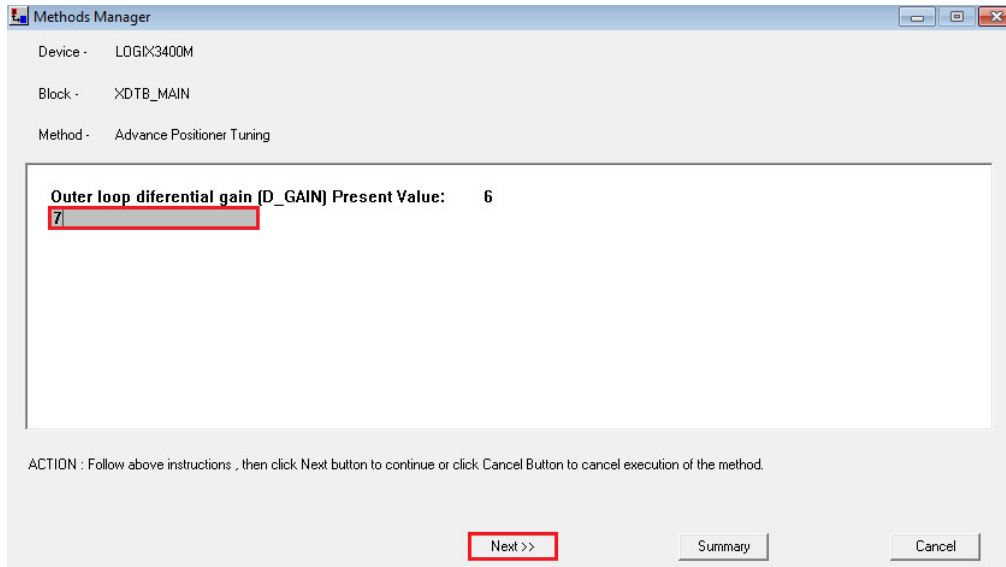
Outer loop integral gain (I\_GAIN) Present Value: 530

531

ACTION : Follow above instructions , then click Next button to continue or click Cancel Button to cancel execution of the method.

Next >> Summary Cancel

- Modify the third value in the field, for example 7 and click on the button “Next>>”:



Methods Manager

Device - LOGIX3400M

Block - XDTB\_MAIN

Method - Advance Positioner Tuning

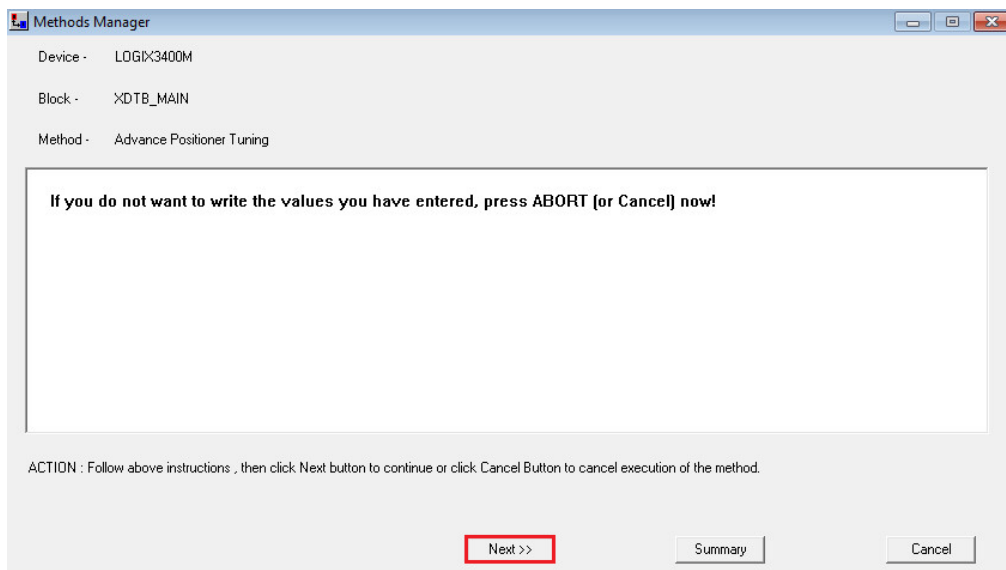
Outer loop differential gain [D\_GAIN] Present Value: 6

7

ACTION : Follow above instructions , then click Next button to continue or click Cancel Button to cancel execution of the method.

Next >> Summary Cancel

Click on the button “Next>>” to save the values:



Methods Manager

Device - LOGIX3400M

Block - XDTB\_MAIN

Method - Advance Positioner Tuning

If you do not want to write the values you have entered, press ABORT (or Cancel) now!

ACTION : Follow above instructions , then click Next button to continue or click Cancel Button to cancel execution of the method.

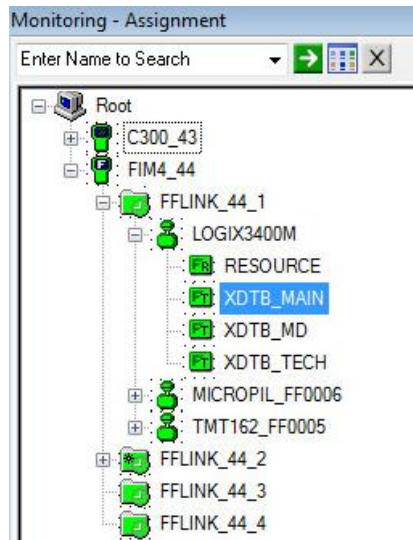
Next >> Summary Cancel

- Then go back ro the menu “Show Methods List” or close the window.

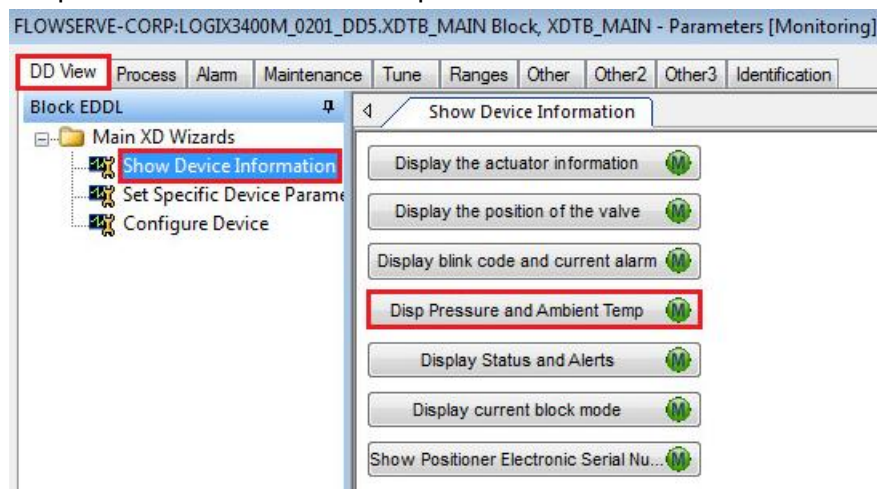


Show Methods List Summary Close

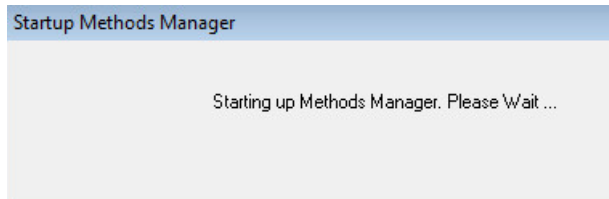
- Methods can be opened directly in the blocks (This is Device specific and depending on the DD revision). Double-click on the Resource block of the Logix 3400MD:



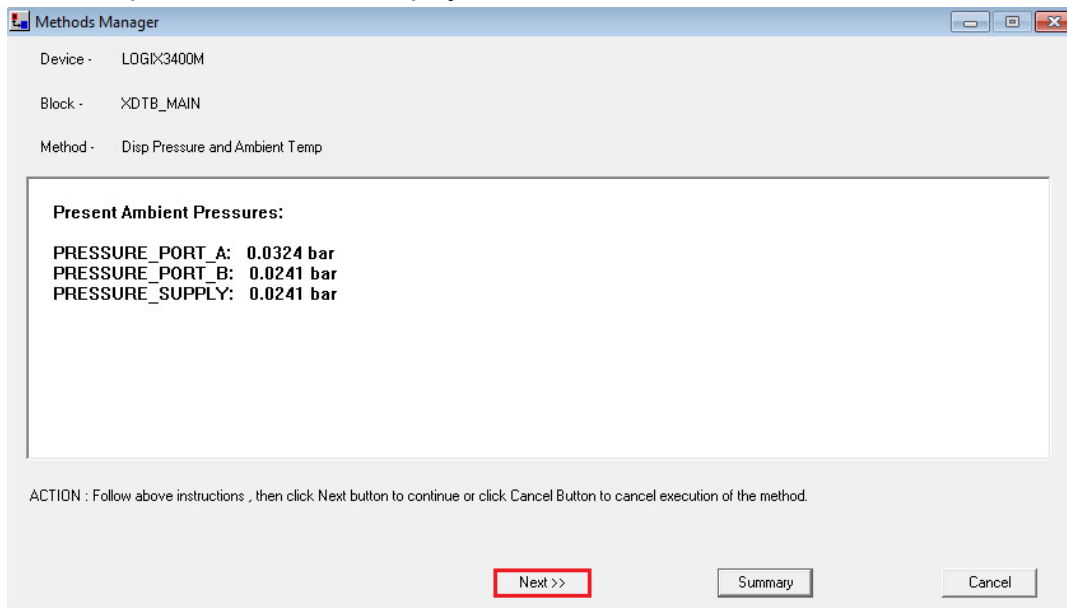
- In the DD View, select the Main XD Wizards "Show Device Information" and select the method "Disp Pressure and Ambient Temp":



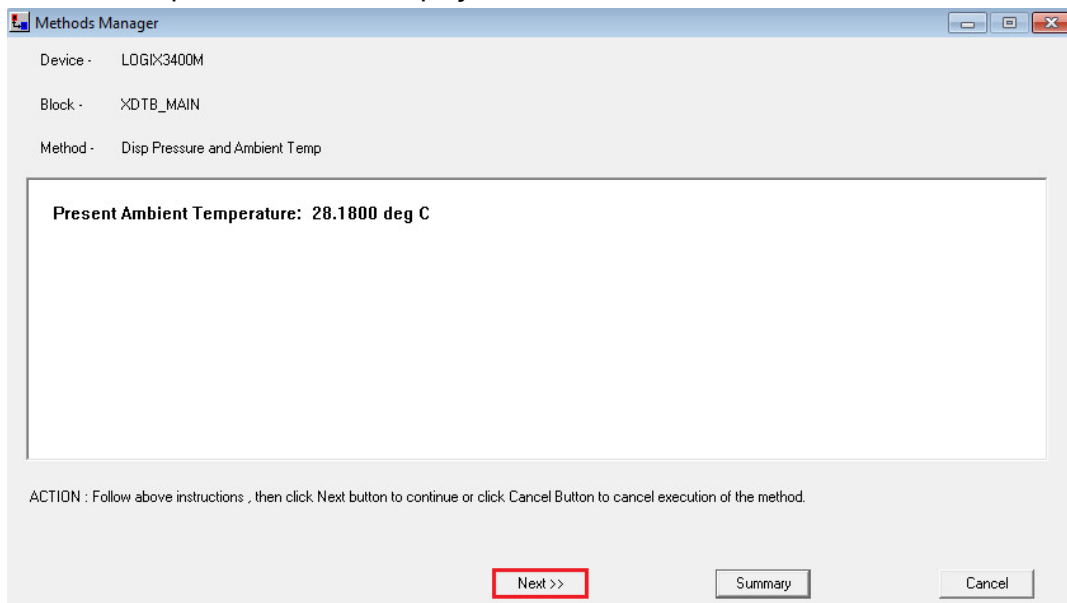
- This starts the Methods Manager:



- Available pressure values are displayed. Click on the button "Next" to continue:

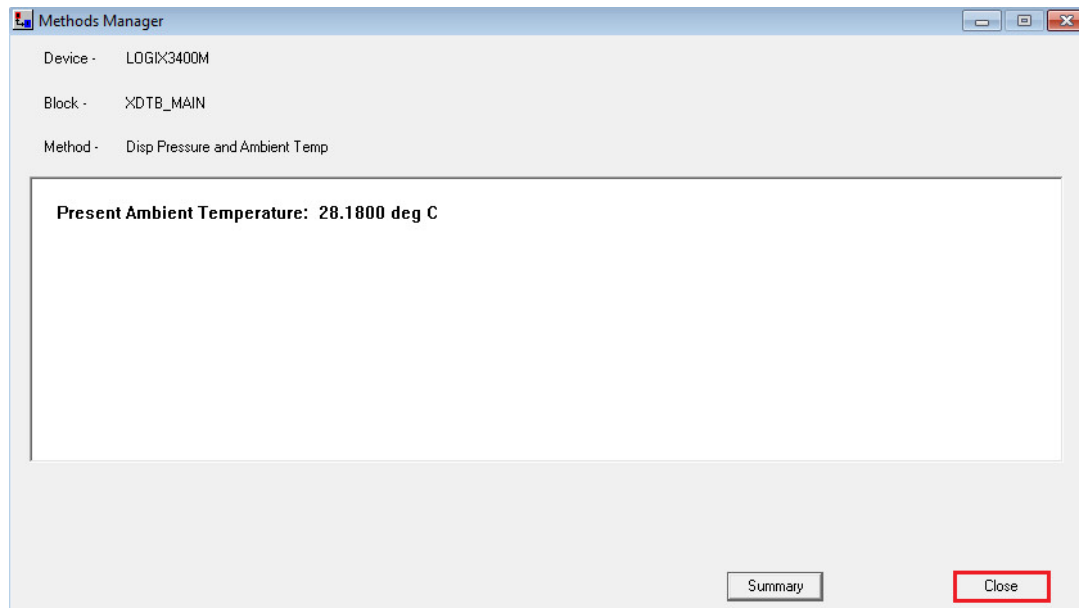


- Ambient temperature value is displayed. Click on the button "Next" to continue:



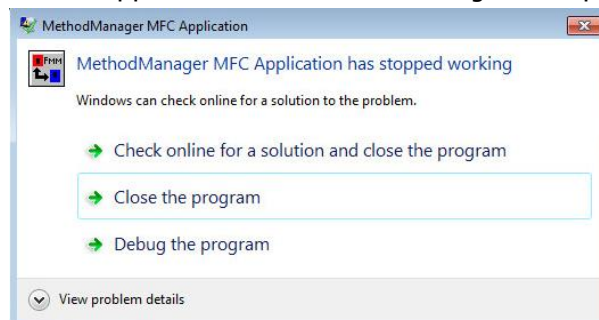


- Then click on the button close.

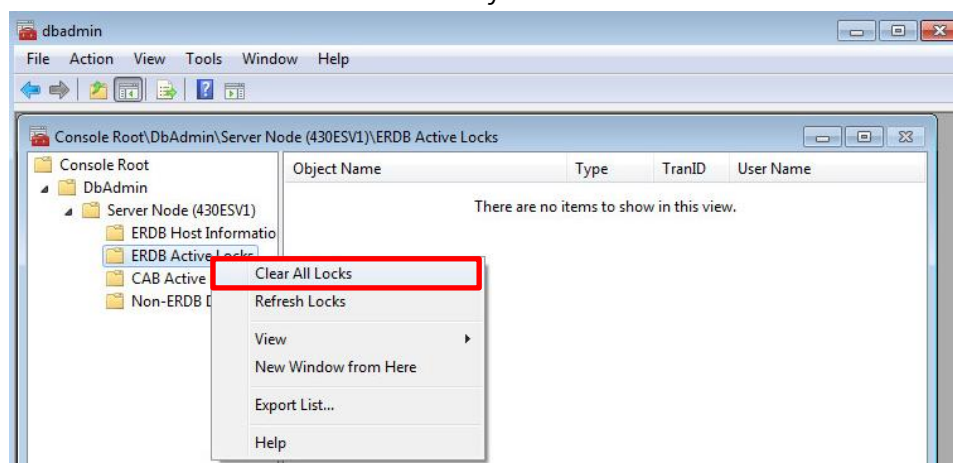


## Remarks

- It can happen that the Method Manager is stopping working:



- In that case, Locks must be deleted first in the admin database. Otherwise Methods cannot be used anymore.

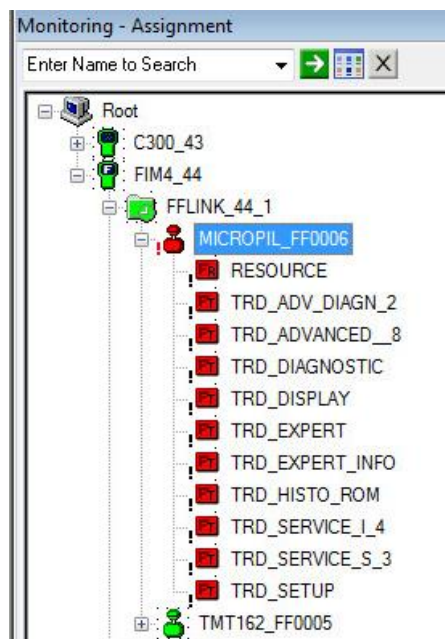


## 3.8 Device Replacement

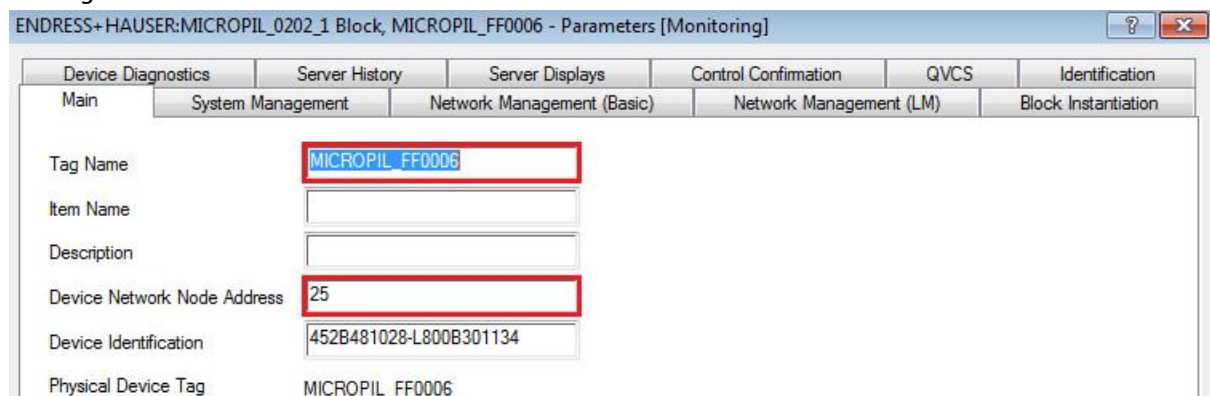
This chapter describes how replacing a defect device with another device having the same device type and device revision.

### 3.8.1 Device Failure

- A device failure is detected on the FIM module:



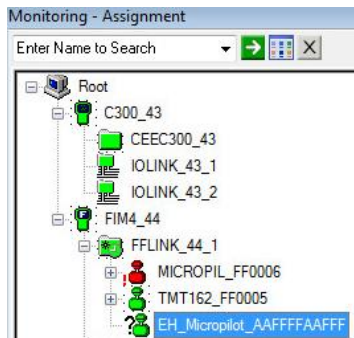
- Two important settings are required for a device replacement, the Tag Name and the Device Network Node Address.
- Double-click on the failed device "MICROPIL\_FF0006" in the Monitoring view to display both settings:



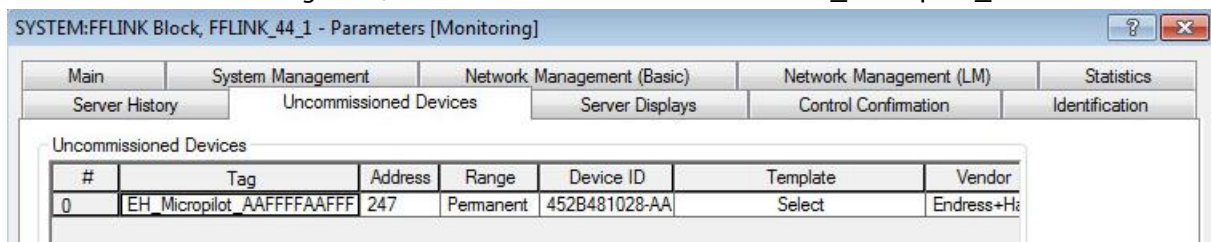
- It is recommended to configure Device Network Node Address and the Tag Name for the replacement device accordingly before using the "Device Replacement Wizard".

## 3.8.2 New Device Address and Tag Configuration

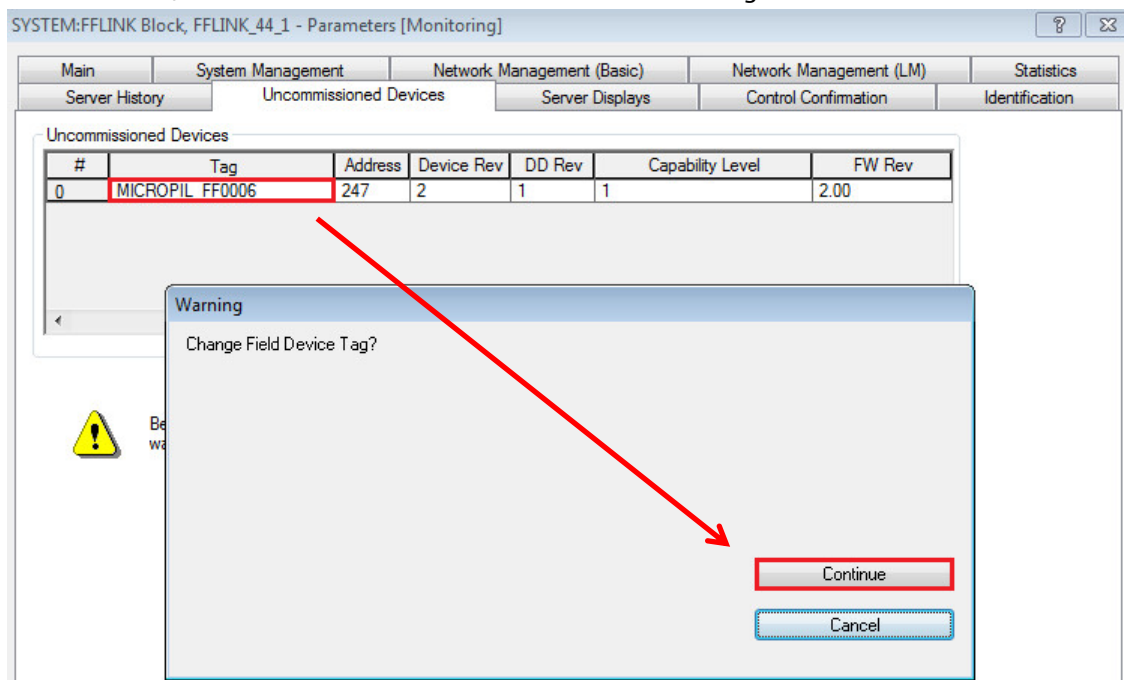
- Disconnect the defect device in the field and replace it with the new device.
- The new device is detected in the monitoring view:



- Tag name and bus address of the new device have to correspond to these of the defect device. In the Online Monitoring view, double-click on the new device "EH\_Micropilot\_AAFFFAAFF":



- Change the Tag name to this of the defect device, "MICROPIL\_FF0006" in this case and click on "Enter". Then, click on the button "Continue" of the "Warning" window.



- Tag name has been successfully updated:

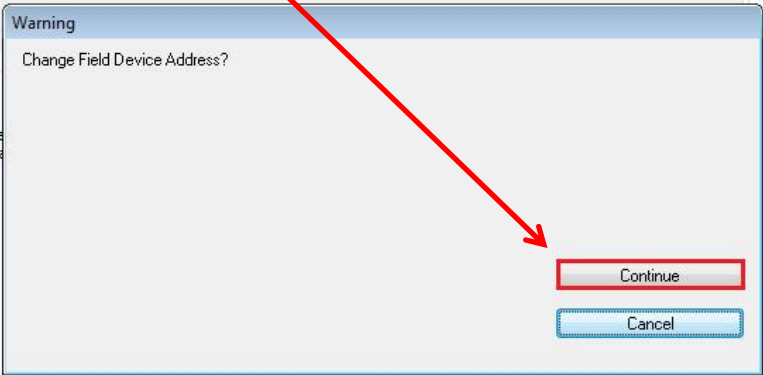
SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Main		System Management		Network Management (Basic)		Network Management (LM)		Statistics	
Server History		Uncommissioned Devices		Server Displays		Control Confirmation		Identification	
Uncommissioned Devices									
#	Tag	Address	Device Rev	DD Rev	Capability Level	FW Rev			
0	MICROPIL_FF0006	247	2	1	1	2.00			

- Change the bus address to this of the defect device, "25" in this case and click on "Enter". Then, click on the button "Continue" of the "Warning" window.

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Main		System Management		Network Management (Basic)		Network Management (LM)		Statistics	
Server History		Uncommissioned Devices		Server Displays		Control Confirmation		Identification	
Uncommissioned Devices									
#	Tag	Address	Device Rev	DD Rev	Capability Level	FW Rev			
0	MICROPIL_FF0006	25	2	1	0	2.00			



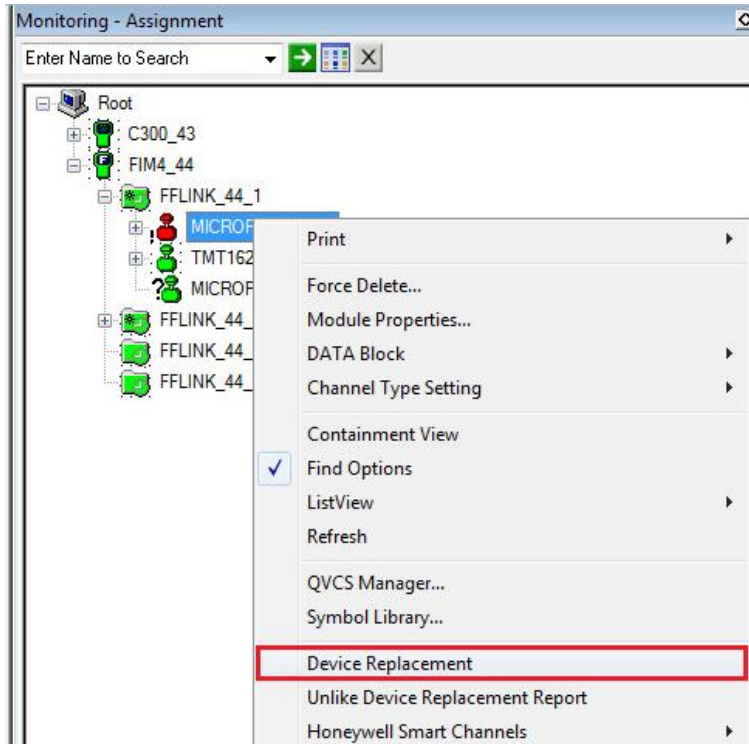
- Updated bus address and tag name:

SYSTEM:FFLINK Block, FFLINK\_44\_1 - Parameters [Monitoring]

Main		System Management		Network Management (Basic)		Network Management (LM)		Statistics	
Server History		Uncommissioned Devices		Server Displays		Control Confirmation		Identification	
Uncommissioned Devices									
#	Tag	Address	Range	Device ID	Template	Vendor			
0	MICROPIL_FF0006	25	Permanent	452B481028-AA	Select	Endress+Ha			

### 3.8.3 Device Replacement Wizard

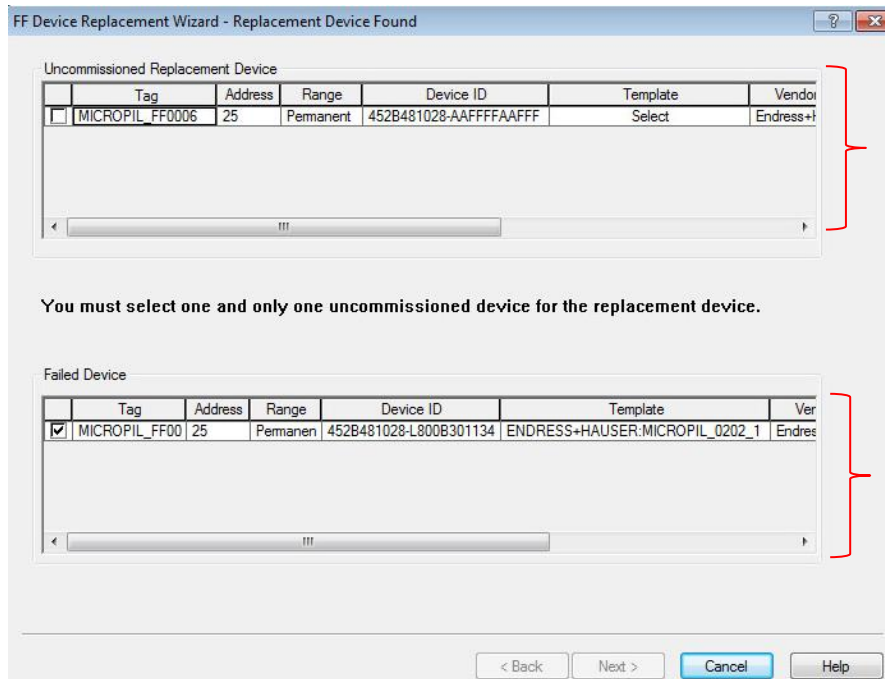
- Right-click on the defect device and select the option "Device Replacement":



- This opens the "FF Device Replacement Wizard" window. Click on the button "Next>" to proceed:



- The replacement device is detected:



FF Device Replacement Wizard - Replacement Device Found

Uncommissioned Replacement Device

	Tag	Address	Range	Device ID	Template	Vendor
<input type="checkbox"/>	MICROPIL_FF0006	25	Permanent	452B481028-AAFFFFFAAFF	Select	Endress+

You must select one and only one uncommissioned device for the replacement device.

Failed Device

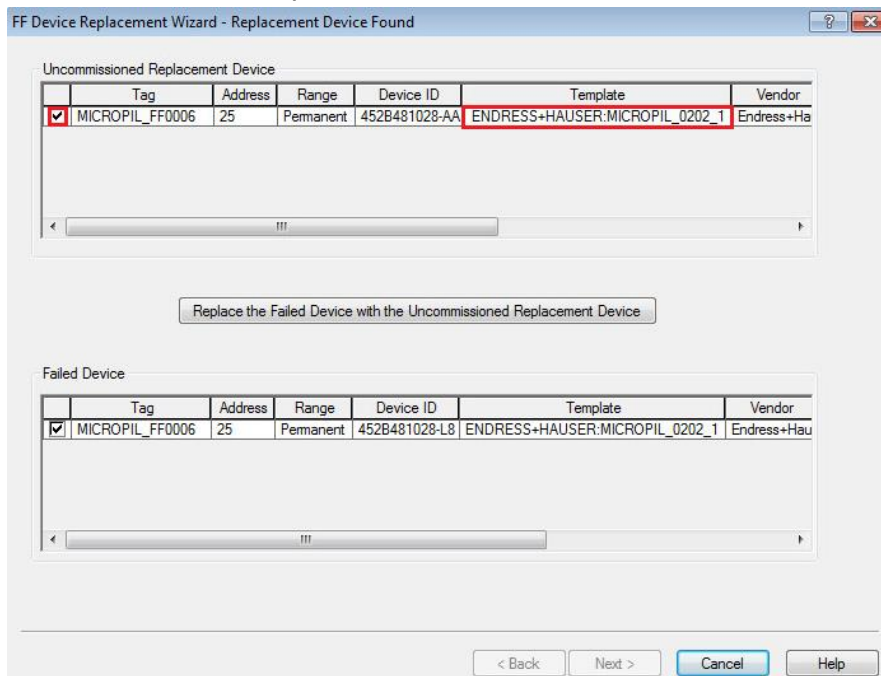
	Tag	Address	Range	Device ID	Template	Vendor
<input checked="" type="checkbox"/>	MICROPIL_FF00	25	Permanent	452B481028-L800B301134	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+

< Back Next > Cancel Help

Replacement Device

Configured device in the project

- Click in the checkbox to select the new device. This selects automatically the project template and enables the button "Replace the Field Device with the Uncommissioned Replacement Device":



FF Device Replacement Wizard - Replacement Device Found

Uncommissioned Replacement Device

	Tag	Address	Range	Device ID	Template	Vendor
<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Permanent	452B481028-AA	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+Ha

Replace the Failed Device with the Uncommissioned Replacement Device

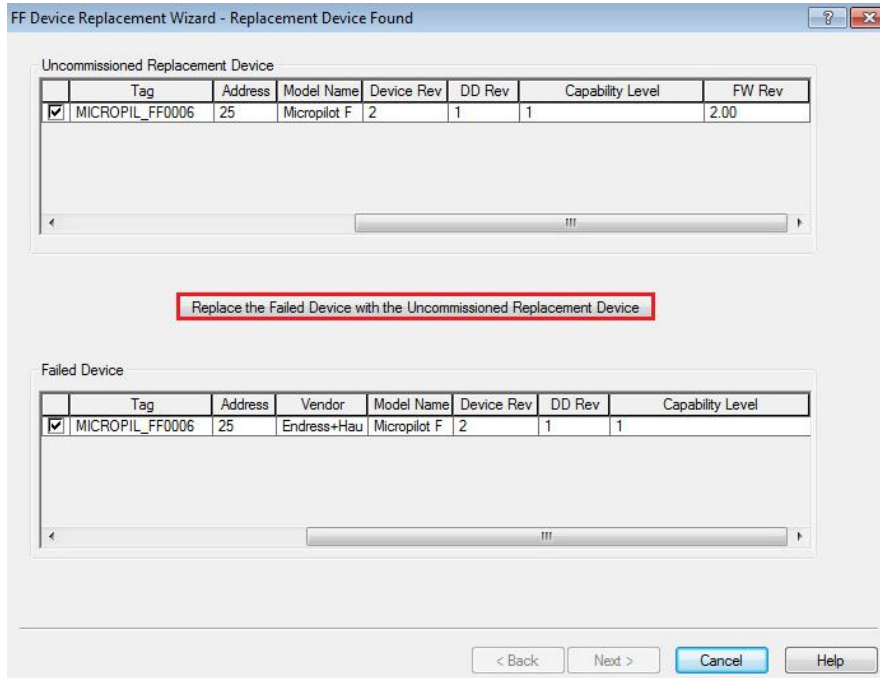
Failed Device

	Tag	Address	Range	Device ID	Template	Vendor
<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Permanent	452B481028-L8	ENDRESS+HAUSER.MICROPIL_0202_1	Endress+Hau

< Back Next > Cancel Help



- Scroll to the right to check the “Capability Level” parameter. Then click on the button “Replace the Field Device with the Uncommissioned Replacement Device”:



FF Device Replacement Wizard - Replacement Device Found

Uncommissioned Replacement Device

	Tag	Address	Model Name	Device Rev	DD Rev	Capability Level	FW Rev
<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Microplot F	2	1	1	2.00

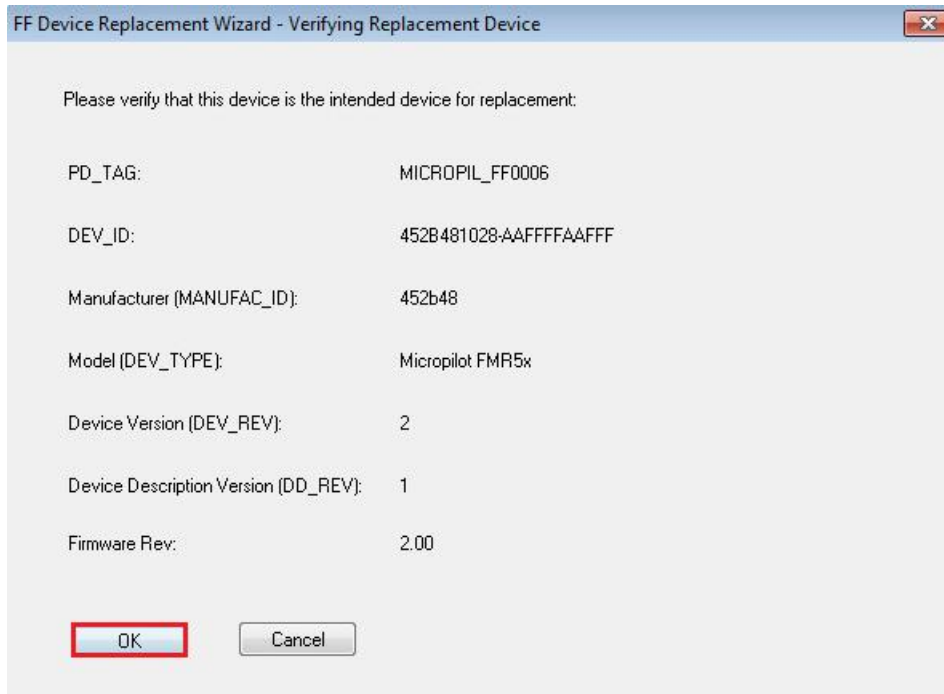
Replace the Failed Device with the Uncommissioned Replacement Device

Failed Device

	Tag	Address	Vendor	Model Name	Device Rev	DD Rev	Capability Level
<input checked="" type="checkbox"/>	MICROPIL_FF0006	25	Endress+Hau	Microplot F	2	1	1

< Back Next > Cancel Help

- Click on the button “OK”:



FF Device Replacement Wizard - Verifying Replacement Device

Please verify that this device is the intended device for replacement:

PD\_TAG: MICROPIL\_FF0006

DEV\_ID: 452B481028-AAFFFFFAFFF

Manufacturer (MANUFAC\_ID): 452b48

Model (DEV\_TYPE): Microplot FMR5x

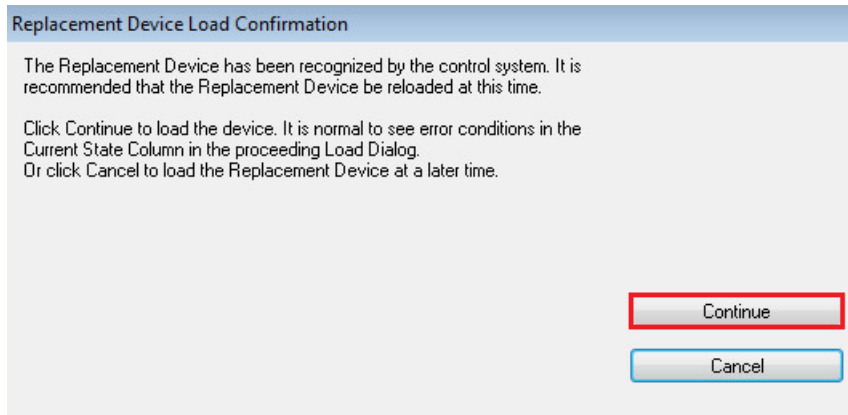
Device Version (DEV\_REV): 2

Device Description Version (DD\_REV): 1

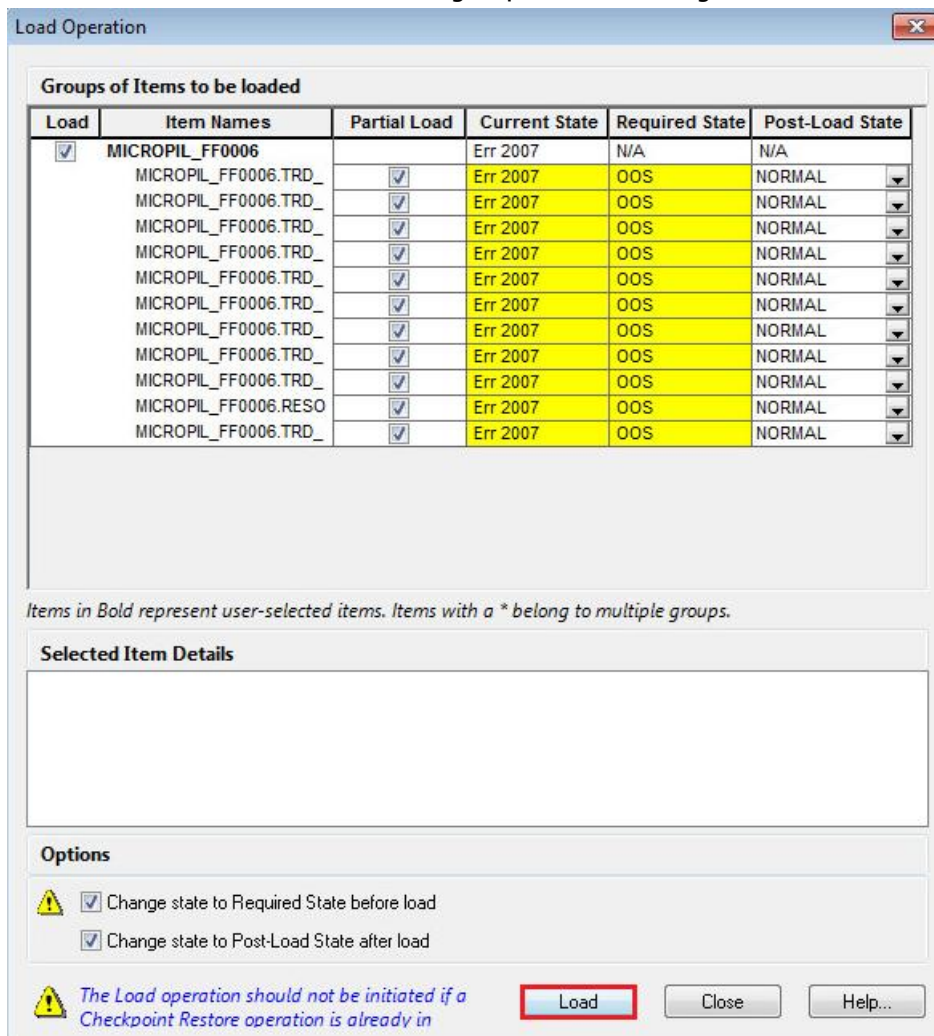
Firmware Rev: 2.00

OK Cancel

- Click on the button "Continue":

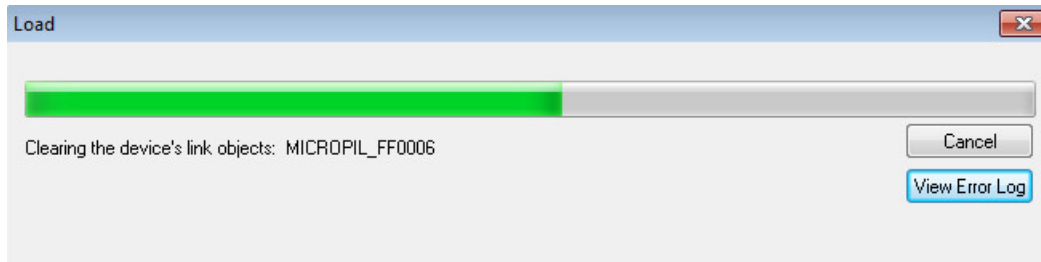


- Click on the button "Load". According to previous message, it is normal to see error conditions:

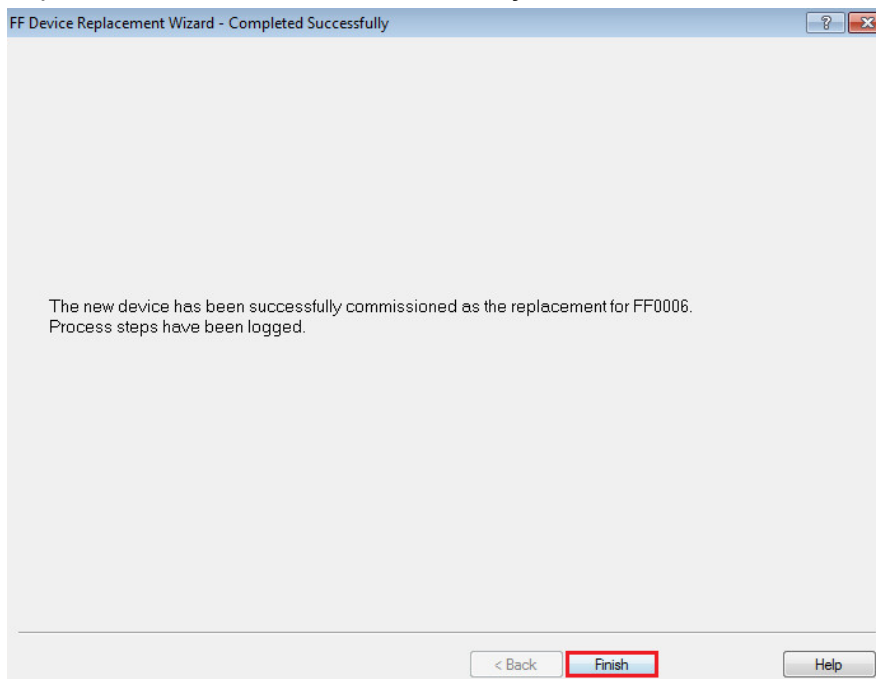




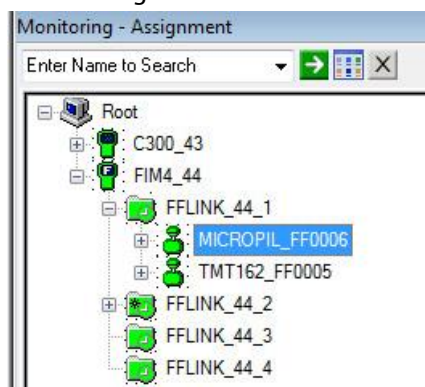
- Load process is running:



- Replacement device has been successfully commissioned. Click on the button "Finish":



- Monitoring view has been automatically updated:



## 4 Advanced Integration

This chapter describes the main workflow for integration of FOUNDATION Fieldbus Endress+Hauser devices into the Honeywell Plant Asset Management by means of DTMs and Device Description (DD). As a result, Endress+Hauser devices can be accessed for configuration and maintenance operations.

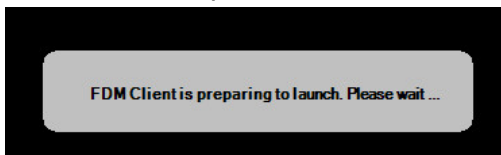
- Start the software FDM Client on the Flexstation:



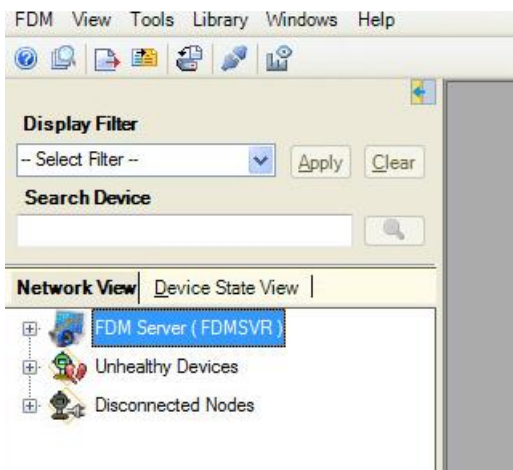
- Click on the button "Login":



- Connection is in process:



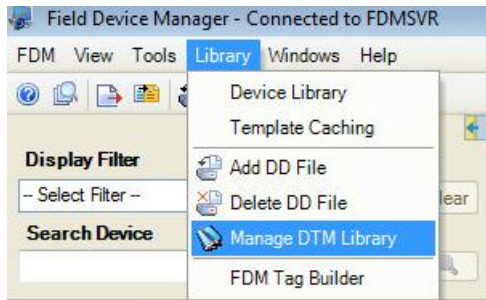
- FDM Flexstation is connected to FDM Server:



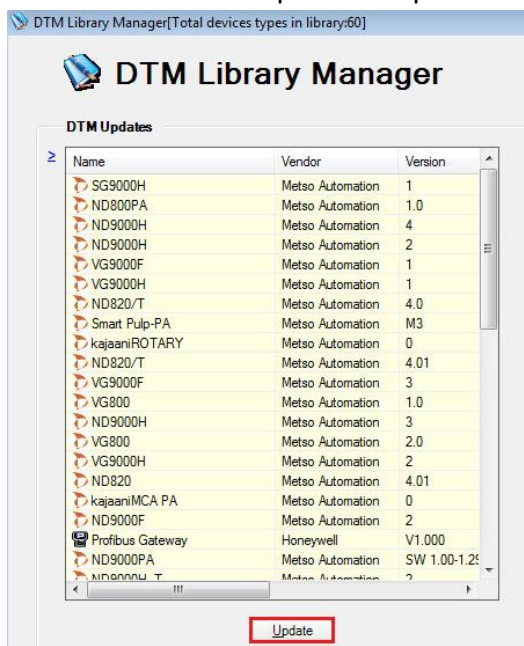
## 4.1 Integration with deviceDTMs

### 4.1.1 DTM Library Management

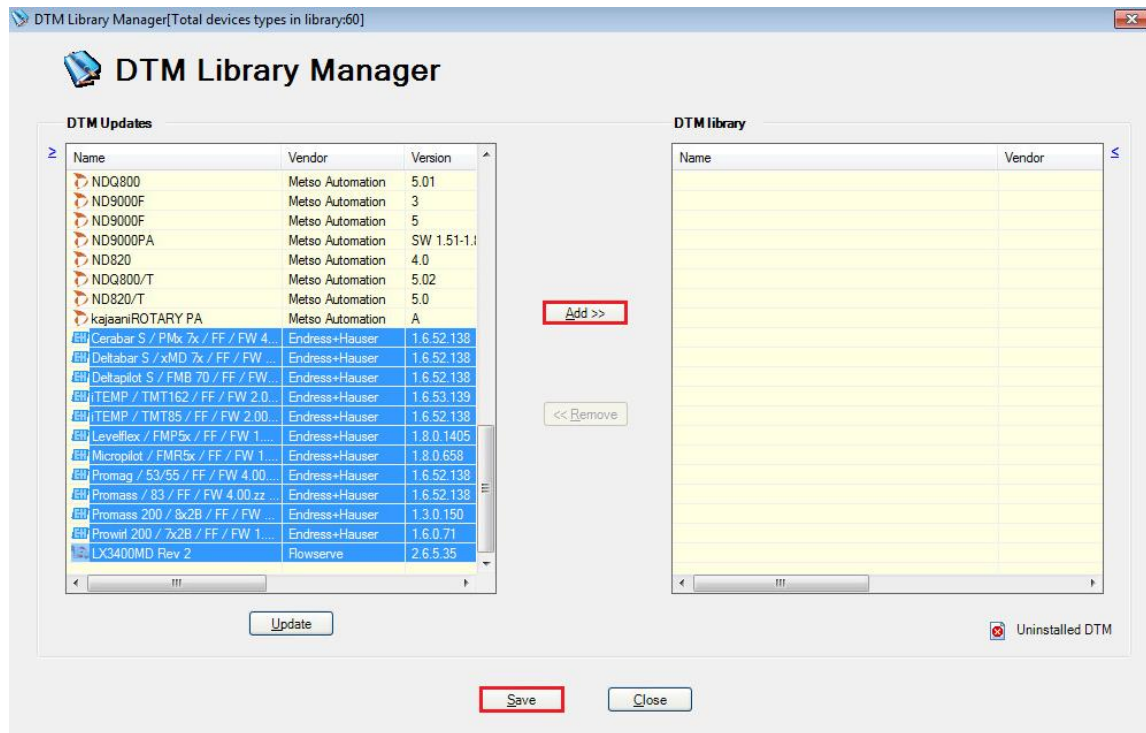
- Install all needed deviceDTMs on the Flexstation.
- Click on the menu "Library→Manage DTM Library".



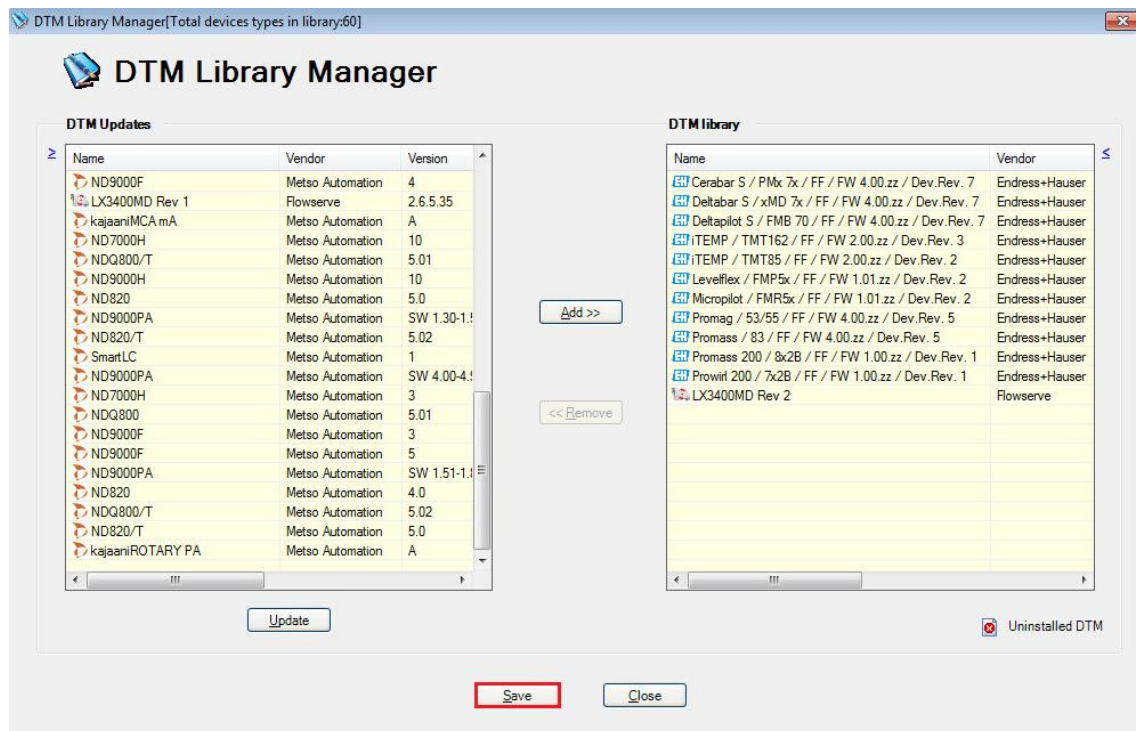
- Click on the button "Update" to update the DTM library:



- Select all needed deviceDTMs and click on the button "Add":

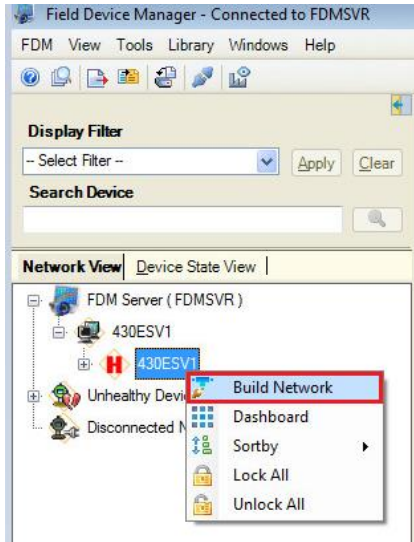


- Click on the button "Save":

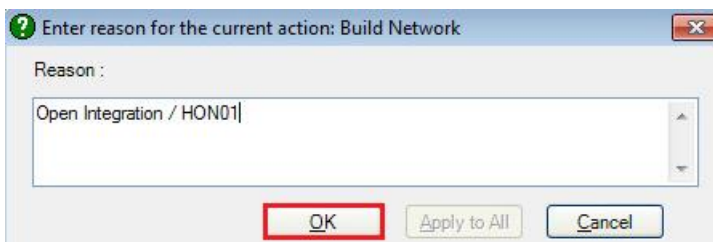


## 4.1.2 DeviceDTM Assignment

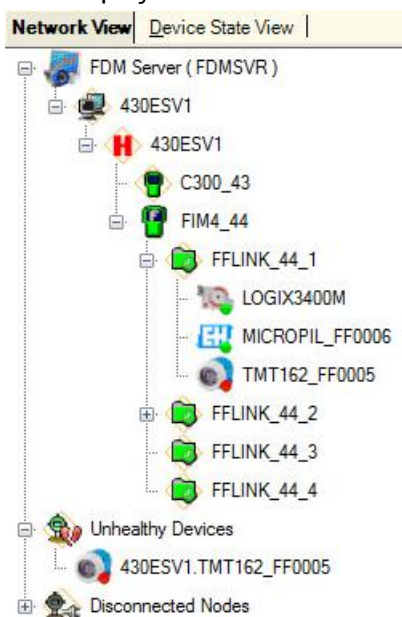
- Right-click on the field "430ESV1" and select the menu "Build Network".



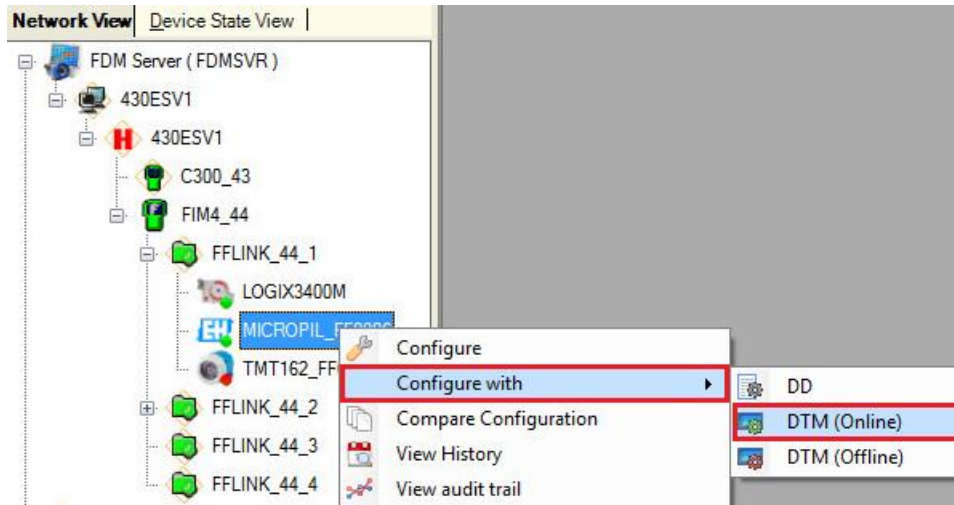
- Indicate a comment and click on the button "OK":



- This displays all connected devices:



- Right-click on the Micropilot and select the option "Configure with→DTM(Online)".

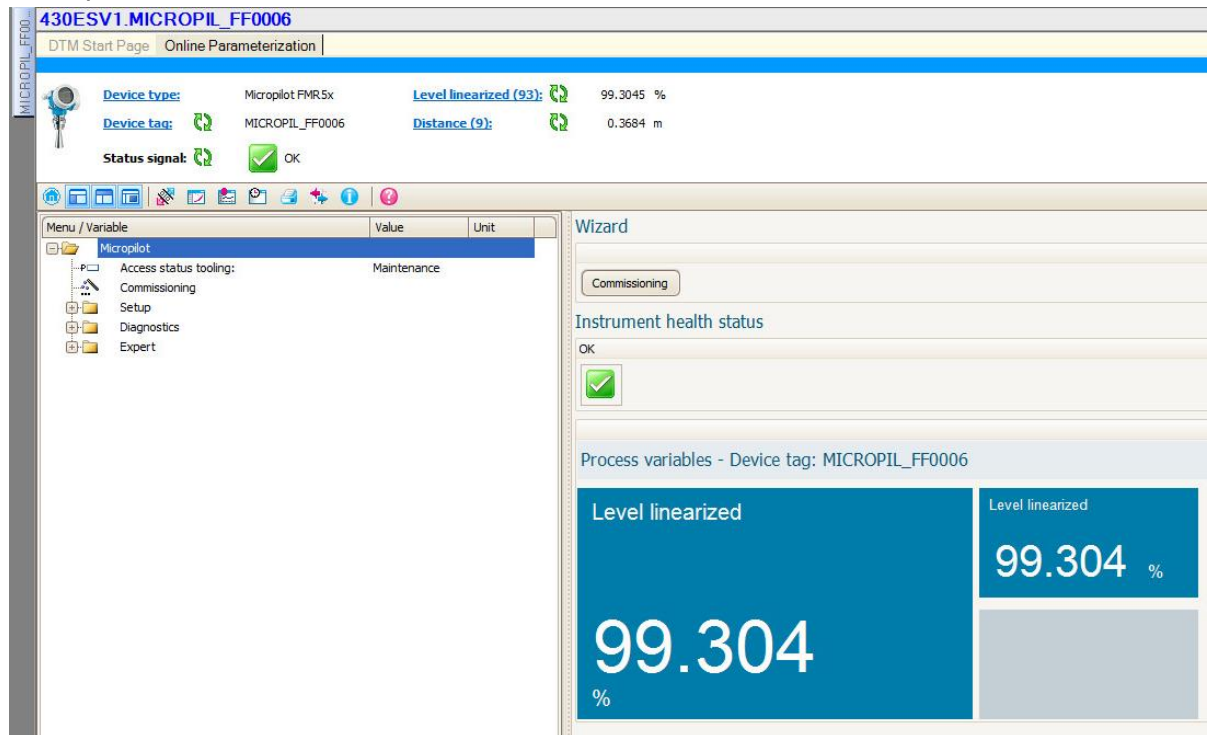


- Click on the menu "Functions→Online Parameterization":





- This opens the DeviceDTM Online Parameterization window:

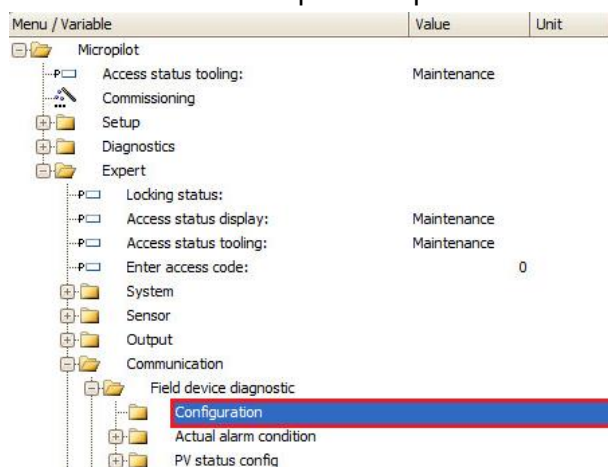


## 4.1.3 Field Diagnostics

This chapter explains where configuring the diagnostics in the DeviceDTM. This part is related to chapter 3.4.2.





### 4.1.3.1 Standard Diagnostics

- Select the menu "Micropilot→Expert→Communication→Field device diagnostic→Configuration":

















- This displays the "Standard Area" of FF-912 diagnostics configuration window. Priorities have already been set in the offline configuration of the Field Diagnostics in chapter 3.4.2:

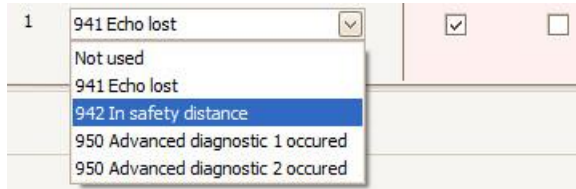
Standard Area		Configurable Area		Status 1	Status 2	Simulation			
		Failure		Function Check		Out Of Specification		Maintenance Required	
									
		Priority	15	Priority	10	Priority	5	Priority	1
Bit#	Diagnostic Event	enable	mask	enable	mask	enable	mask	enable	mask
31	Highest Severity Sensor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Highest Severity Electronic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Highest Severity Configuration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Highest Severity Process	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	High Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	High Severity Electronic	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	High Severity Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	High Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Low Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Low Severity Electronic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Low Severity Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Low Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Lowest Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
18	Lowest Severity Electronic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17	Lowest Severity Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16	Lowest Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### 4.1.3.2 Diagnostics bits 1 to 15 Configuration

- Select the tab "Configurable Area". This displays the "Configurable Area" of FF-912 diagnostics configuration window. The bit1 has been enabled during the offline configuration. The first diagnostic of the device specific diagnostic list has been selected by default:

Standard Area		Configurable Area		Status 1	Status 2	Simulation			
		Failure		Function Check		Out Of Specification		Maintenance Required	
									
		Priority 15  		Priority 10  		Priority 5  		Priority 1  	
Bit#	Diagnostic Event	enable	mask	enable	mask	enable	mask	enable	mask
15	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<div>Not used</div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<div>941 Echo lost</div>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





- Bit1 Diagnostic event can be changed. Click on the "Echo lost" event. All available diagnostics for this device events are displayed:



- Select for example the diagnostic event "In Safety distance". Then click on the button "Apply".

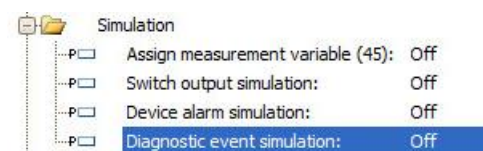


- Configured bit1 in the "Failure Map":

Standard Area		Configurable Area		Status 1	Status 2	Simulation			
		Failure		Function Check		Out Of Specification		Maintenance Required	
									
		Priority	15	Priority	10	Priority	5	Priority	1
		enable	mask	enable	mask	enable	mask	enable	mask
15	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	942 In safety distance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### 4.1.3.3 Diagnostics Event Simulation

- In the DeviceDTM, select the menu "Micropilot→Expert→Diagnostics→Simulation→Diagnostic event simulation":



- Select for example the event "272 Main Electronic Failure":

Device alarm simulation: Off

Diagnostic event simulation: Off

- 252 Modules incompatible
- 261 Electronic modules
- 262 Module connection
- 270 Main electronic failure
- 271 Main electronic failure
- 272 Main electronic failure**
- 273 Main electronic failure

- Press "Enter" to validate.


Device alarm simulation: Off

Diagnostic event simulation:  272 Main electronic failure

- This updates the Namur symbol of the DeviceDTM header.

Device type: Micropilot FMR5x Level linearized (93): 99.3048 %

Device tag: MICROPIL\_FF0006 Distance (9): 0.3684 m

Status signal:  Failure (F)

Menu / Variable Value Unit





Expert

- Locking status: Maintenance
- Access status display: Service
- Access status tooling: Service
- Enter access code: 0

Device alarm simulation: Off

Diagnostic event simulation: 272 Main electronic failure

- Look in the tab "Status" of the diagnostic configuration window (Menu "Micropilot→Expert→Communication→Configuration"). Alarm on bit 30 is active:

Standard Area		Configurable Area	Status 1	Status 2	Simulation
		Failure	Function Check	Out Of Specification	Maintenance Required
					
Bit#	Diagnostic Event	active	active	active	active
31	Highest Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Highest Severity Electronic	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Highest Severity Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Highest Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	High Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	High Severity Electronic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	High Severity Configuration	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	High Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Low Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Low Severity Electronic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Low Severity Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Low Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Lowest Severity Sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Lowest Severity Electronic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Lowest Severity Configuration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Lowest Severity Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

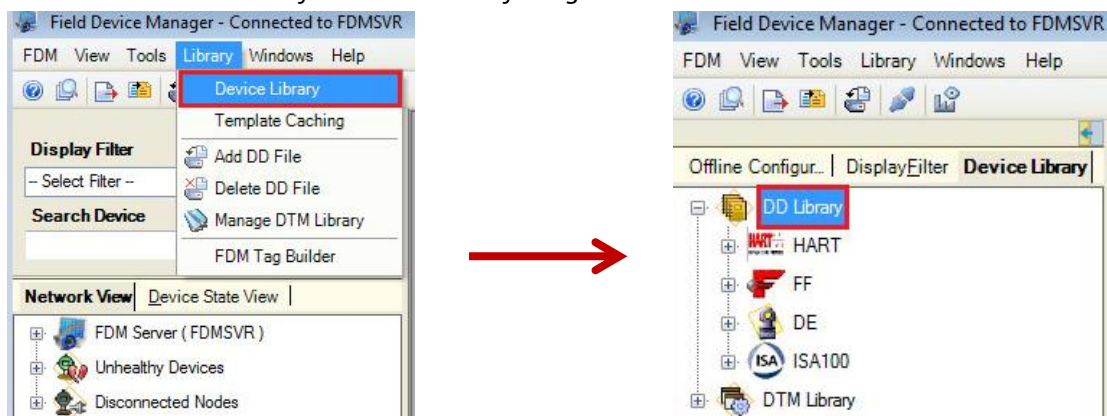
## 4.2 Integration with Device Description (DD)

### 4.2.1 DD Library Management

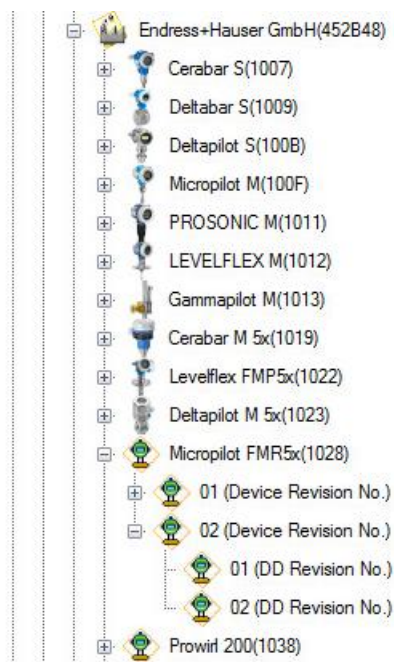
#### 4.2.1.1 Default DD Library

The FDM Library already contains by default installed DDs from different vendors.

- Select the menu "Library→Device Library" to get an overview on the installed DDs:



- Expand the item "FF" and search for "Endress+Hauser". This displays all installed FOUNDATION Fieldbus DDs. Different Device and DD revisions can be installed for a same device:



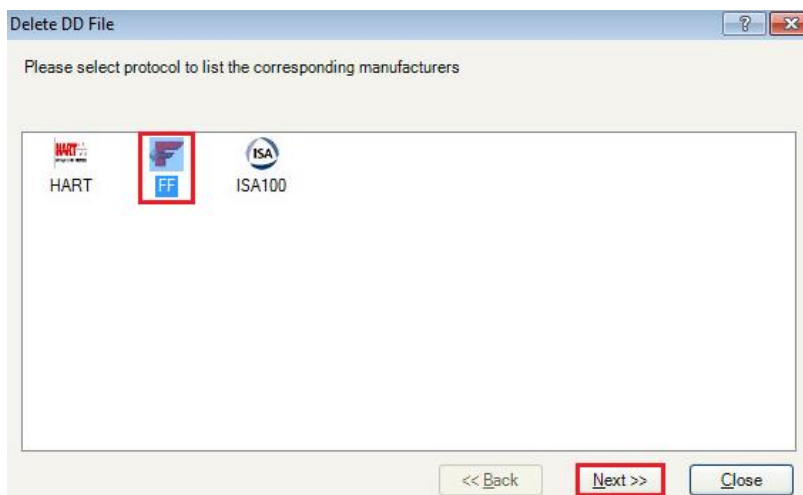
## 4.2.1.2 Delete a DD

This example describes all steps for deleting the "Micropilot FMR5x / Device Revision 2 / DD Revision 2".

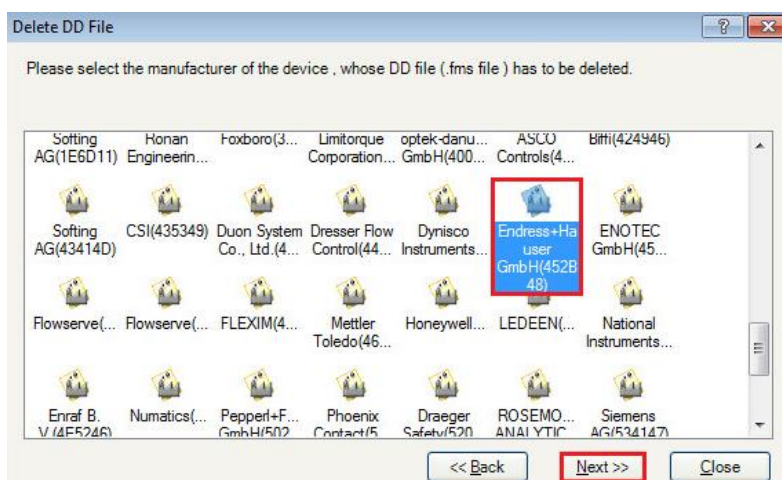
- Select the menu "Library→Delete DD File":



- Select "FF" and click on the button "Next":

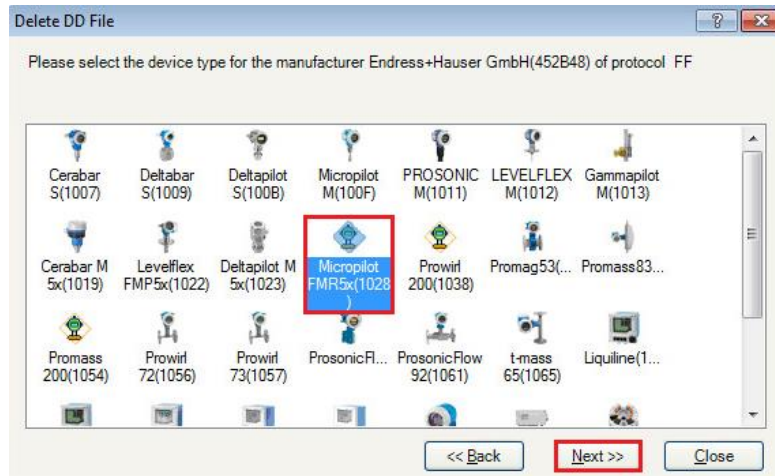


- Select the vendor "Endress+Hauser" and click on the button "Next":

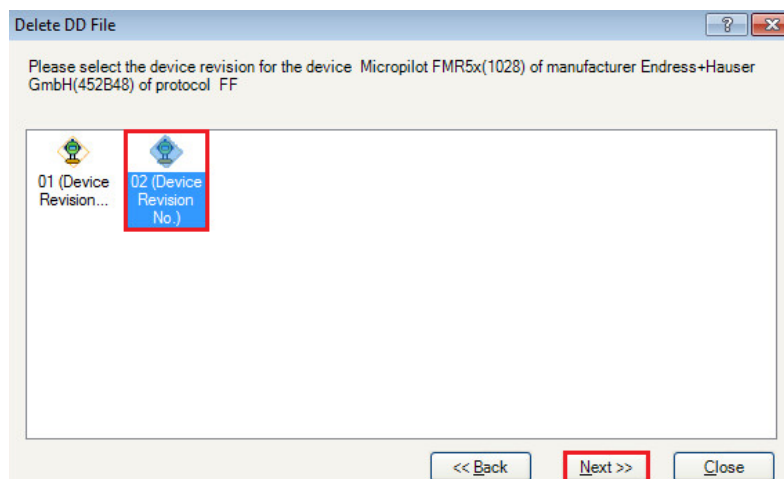




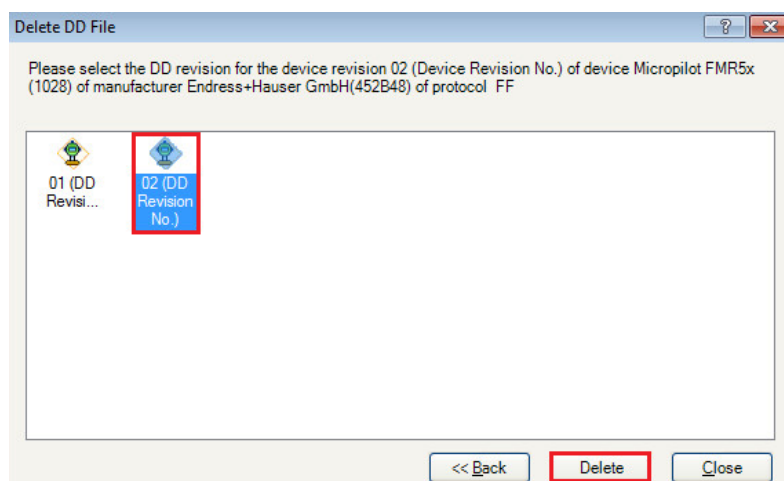
- Select the device "Micropilot FMR5x(1028)" and click on the button "Next":



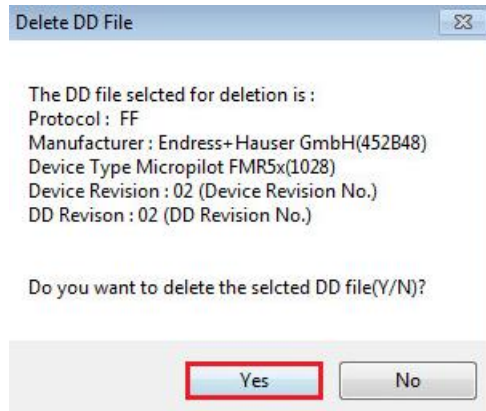
- Select the device revision 2 and click on the button "Next":



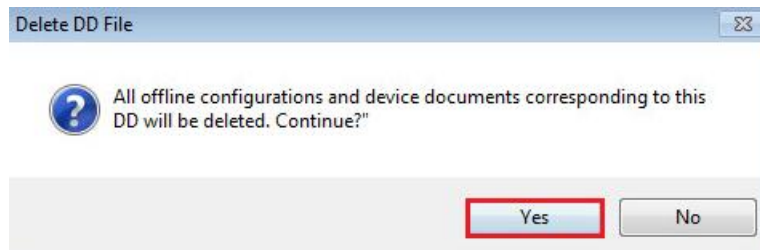
- Select the DD revision 2 and click on the button "Delete":



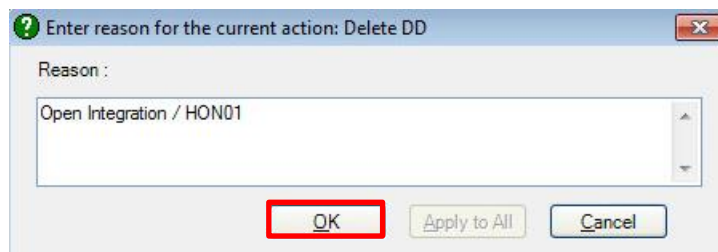
- Click on the button "Yes" to proceed:



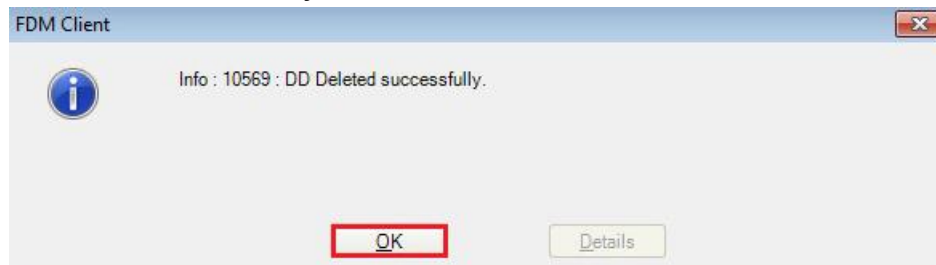
- Click on the button "Yes" to continue:



- Indicate a comment and click on the button "OK":

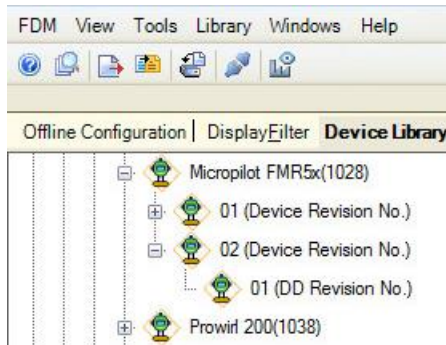


- DD has been successfully deleted. Click on the button "OK":





- DD "Micropilot FMR5x / Dev Rev2 / DD Rev 2" has been removed from the library:



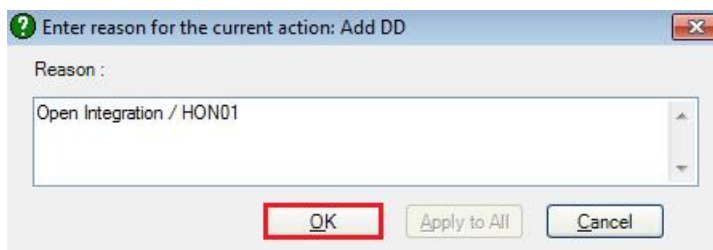
#### 4.2.1.3 Add a DD

This example describes all steps for adding the "Micropilot FMR5x / Device Revision 2 / DD Revision 2".

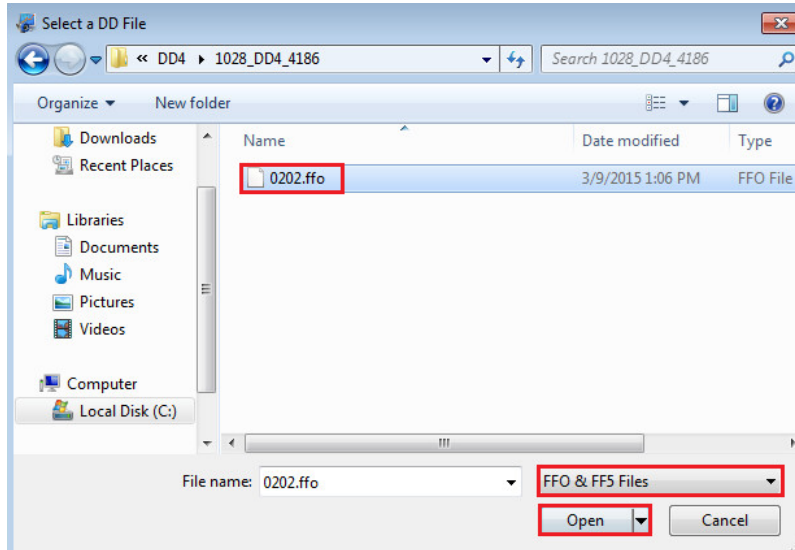
- Select the menu "Library→Add DD File":



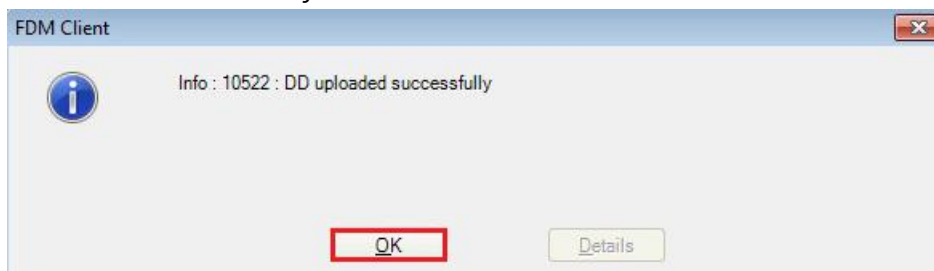
- Indicate a comment and click on the button "OK":



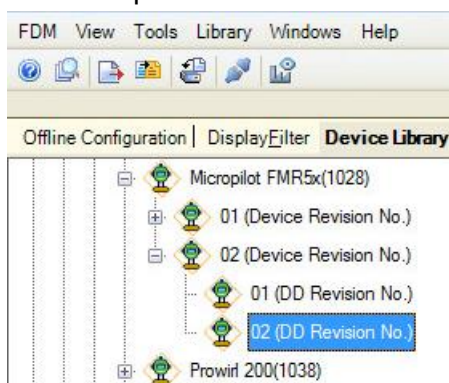
- Browse for the path to the location of the DD to install and click on the button Open. In this example, the DD4 has been selected:



- DD has been successfully installed. Click on the button "OK":

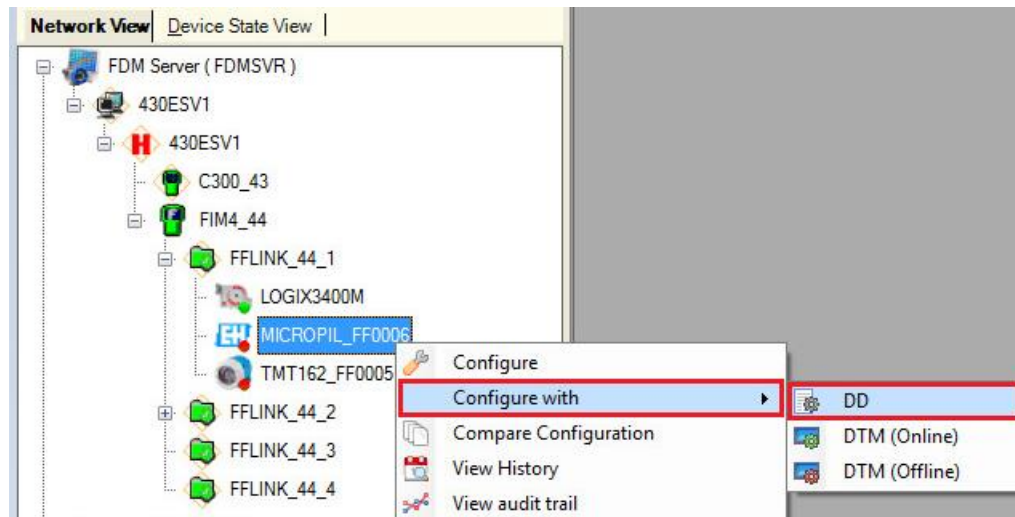


- DD "Micropilot FMR5x / Dev Rev2 / DD Rev 2" has been added in the library:



## 4.2.2 DD Assignment

- In the Network View, right-click on the device "MICROPIL\_FF0006" and select the menu "Configure with→DD":



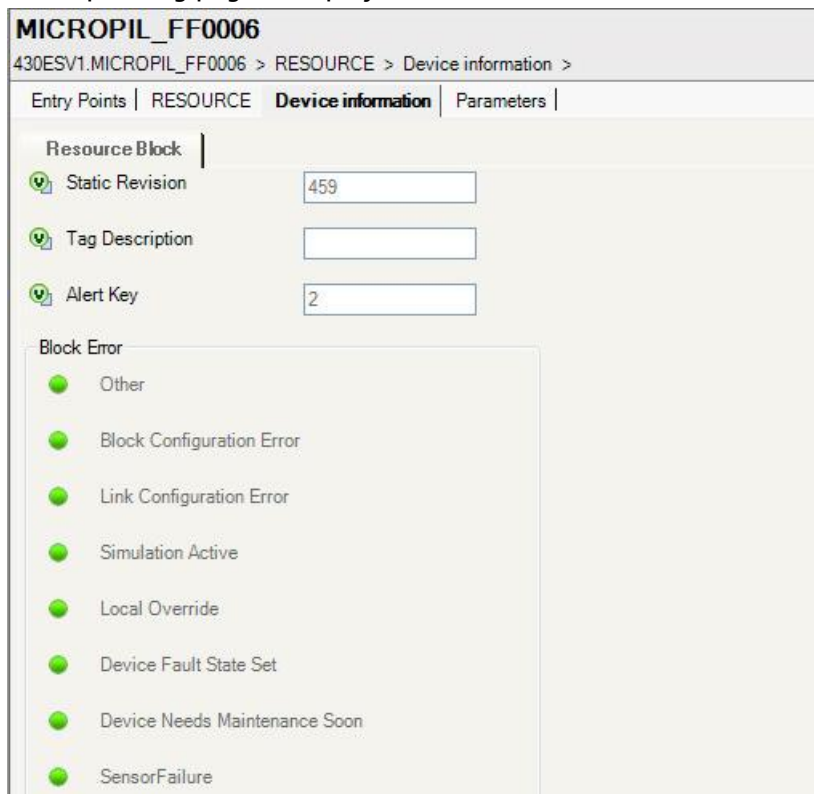
- Open for example the Resource block:



- Click on the button "Device Information":



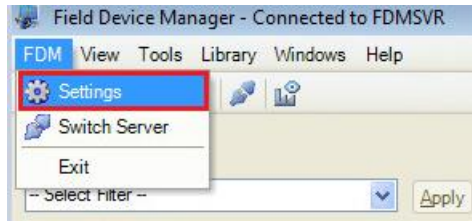
- Corresponding page is displayed:



## 4.3 Device Load Configuration Setting

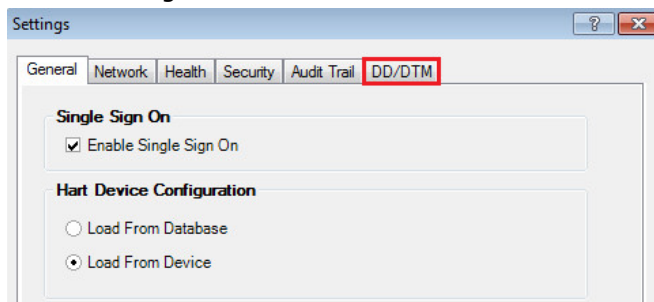
This option allows the user to set the default driver (deviceDTM or DD) used for the device configuration, so that a double click on the device in the Network View will automatically open the corresponding configuration window.

- Select the menu "FDM→Settings":

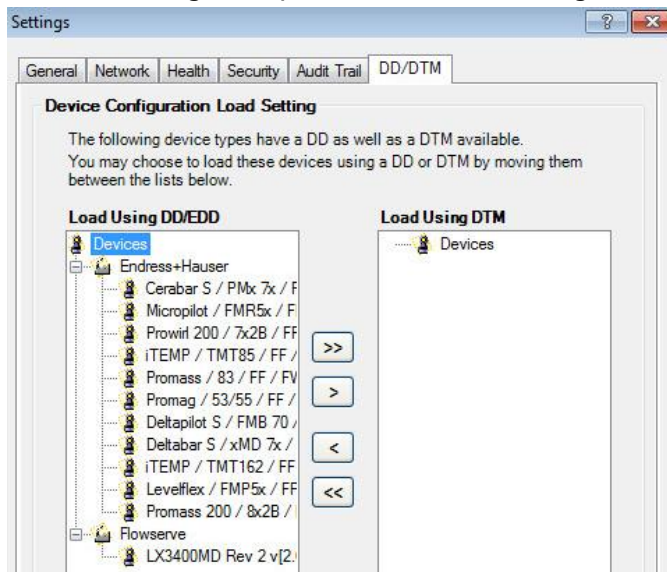


- This opens the window "Settings".

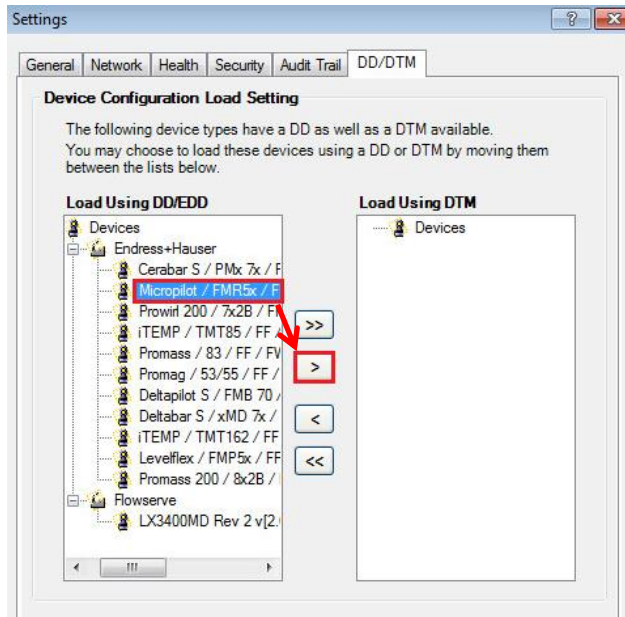
Select the tag "DD/DTM":



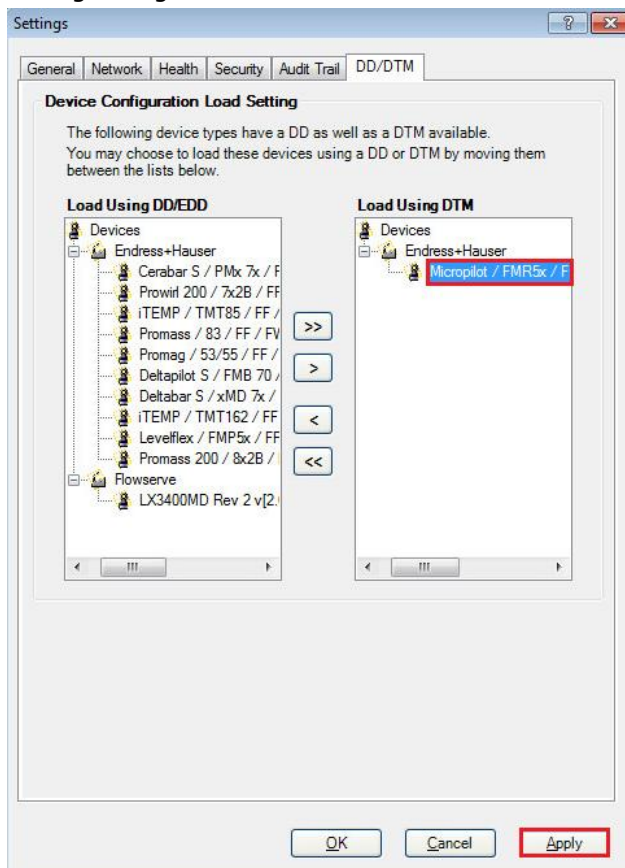
- In the following example, all devices are configured default with option "Load Using DD/EDD":



- Default configuration can be changed. Select the required devices and click on the arrow ">":



- The Micropilot has been moved to the "Load Using DTM" part. Click on the button "Apply" for saving changes and then on the button "OK".



## 5 Specific Integration

This chapter explains how using device configuration templates in the Honeywell Experion PKS. A device configuration template contains all device parameters with recommended values for a specific application.

One significant advantage of using templates is saving time during setup, especially for a large number of devices with the same configuration. In that case, the configuration needs to be done only once and can be re-used for all similar applications.

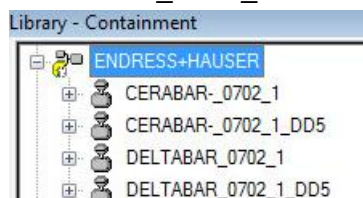
### 5.1 Device Configuration Templates in Control Builder

In Control Builder, a device DD import automatically creates a corresponding device configuration template in the library, which then can be instantiated in the project. We have used such default templates already in chapter 3.3.1.

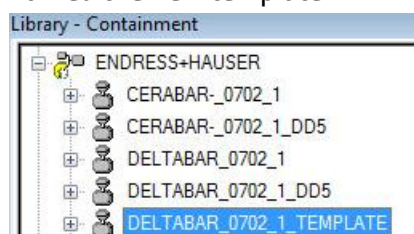
The idea is to copy and modify such default templates to prepare project specific templates for use in reoccurring applications. The following chapters are based on an example with a Deltabar S.

#### 5.1.1 Template Creation

- In the library, two Deltabar S templates already exist, "DELTABAR\_0702\_1" and "DELTABAR\_0702\_DD5":



- Installed templates cannot be duplicated directly by "Save as" in the library. Therefore, the user has to import the desired DD file again and name it adequately. Please refer to chapter 3.3.1 for importing a DD into the library. In this example, we have imported the Deltabar S DD4 file and named the new template "DELTABAR\_0702\_1\_TEMPLATE":





## 5.1.2 Parameters Modification

Device configuration templates can be modified in Control Builder directly or via copy/paste in Excel.

### 5.1.2.1 Parameters Modification in Control Builder

Parameters can be modified in the new template:

- Expand the template "DELTABAR\_0702\_1\_TEMPLATE" and double-click for example on the resource block.

The screenshot shows the 'Library - Containment' pane on the left with the 'DELTABAR\_0702\_1\_TEMPLATE' expanded. The 'RESOURCE' block is highlighted. A red arrow points from the 'RESOURCE' block to a preview window on the right titled 'ENDRESS+HAUSER:DELTABAR\_0702\_1\_TEMPLATE.RESOURCE Block Type'. The preview window shows a table with two rows: 'Standard Parameters' and 'Vendor Parameters'.

- For each resource, transducer or function block, there always are two parts, the "Standard Parameters" and the "Vendor Parameters".

Example of Standard Parameters:

ENDRESS+HAUSER:DELTABAR_0702_1_TEMPLATE.RESOURCE Block Type					
	Parameter name	Parameter description	Parameter index	First dimension array size	Data type
-	Standard Parameters				
1	BLOCK_ERR_DISABLED	Disable Block Errors(Blk Alarm)	65499	0	BITSTRING
2	OFFNETALM_ENABLED	Enable Block Offnet Diagnostic Alarm	65498	0	BOOLEAN
3	CAPABILITY_LEV	Capability Level	42	0	UINT8
4	ST_REV	Static Revision Number	1	0	UINT16
5	TAG_DESC	Block Tag Description	2	0	STRING
6	STRATEGY	Strategy ID (Not Used)	3	0	UINT16

Example of Vendor Parameters:

ENDRESS+HAUSER:DELTABAR_0702_1_TEMPLATE.RESOURCE Block Type					
	Parameter name	Parameter description	Parameter index	First dimension array size	Data type
+	Standard Parameters				
-	Vendor Parameters				
1	COMPATIBILITY_REV	Compatibility Level	43	0	UINT8
2	ENP_VERSION	ENP Version	44	0	STRING
3	DEVICE_TAG	Device Tag	45	0	STRING
4	SERIAL_NUMBER	Serial Number	46	0	STRING
5	ORDER_CODE	Order Code	47	0	STRING
6	FIRMWARE_VERSION	Firmware Version	48	0	STRING

- As an example, we modified here the default values for certain parameters:

	Parameter name	Default value	Configuration load	Access lock	Permission
46	FD_FAIL_PRI	0	LOAD	Engineer	ALARM
47	FD_OFFSPEC_PRI	0	LOAD	Engineer	ALARM
48	FD_MAINT_PRI	0	LOAD	Engineer	ALARM
49	FD_CHECK_PRI	0	LOAD	Engineer	ALARM



	Parameter name	Default value	Configuration load	Access lock	Permission
46	FD_FAIL_PRI	15	LOAD	Engineer	ALARM
47	FD_OFFSPEC_PRI	5	LOAD	Engineer	ALARM
48	FD_MAINT_PRI	1	LOAD	Engineer	ALARM
49	FD_CHECK_PRI	10	LOAD	Engineer	ALARM

- You will be asked for saving the changes when closing the template:



## 5.1.2.2 Parameters Modification in Excel

Templates parameters can be copied and edited in an Excel sheet as well.

- Open for example the Deltabar S resource block:

	Parameter name	Parameter description	Parameter index	First dimension array size	Data type	Minimum value
+	Standard Parameters					
+	Vendor Parameters					

- Select the top left corner and press "CTRL+C" to copy the entire table:

	Parameter name	Parameter description	Parameter index	First dimension array size	Data type	Minimum value
+	Standard Parameters					
+	Vendor Parameters					

- In the Excel table sheet, press "CTRL+V" to paste the copied elements:

	A	B	C	D	E	F	G
1	Standard Parameters						
2	BLOCK_ERR.DISABLED	Disable Block Errors(Blk Alarm)	65499	0	BITSTRING		
3	OFFNETALM_ENABLED	Enable Block Offnet Diagnostic Alarm	65498	0	BOOLEAN		
4	CAPABILITY_LEV	Capability Level	42	0	UINT8		
5	ST_REV	Static Revision Number	1	0	UINT16		
6	TAG_DESC	Block Tag Description	2	0	STRING		
7	STRATEGY	Strategy ID (Not Used)	3	0	UINT16		

- Project specific Parameters can be changed in the Excel sheet and copied back in the template. However the complete Excel sheet cannot be copied and pasted in one step. The content of the "Standard Parameters" and the content of the "Vendor Parameters" must be copied and pasted separately.  
For example, the "Standard Parameters" of the Deltabar S Resource Block contains 92 parameters; this corresponds to lines 2 to 93 in the Excel Sheet. Select these 92 rows in the Excel Sheet and press on "CTRL+C".

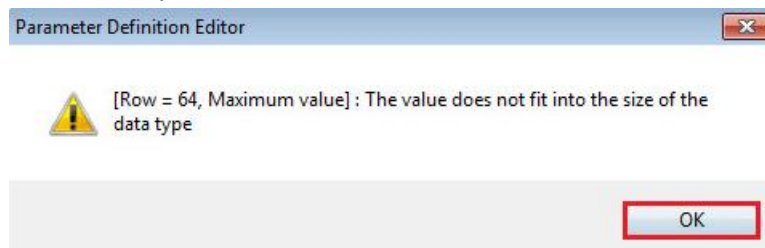
	A	B	C	D	E
1	Standard Parameters				
2	BLOCK_ERR.DISABLED	Disable Block Errors(Blk Alarm)	65499	0	BITSTRING
3	OFFNETALM_ENABLED	Enable Block Offnet Diagnostic Alarm	65498	0	BOOLEAN
4	CAPABILITY_LEV	Capability Level	42	0	UINT8
5	ST_REV	Static Revision Number	1	0	UINT16
6	TAG_DESC	Block Tag Description	2	0	STRING
7	STRATEGY	Strategy ID (Not Used)	3	0	UINT16
8	ALERT_KEY	Alert Key (Not Used)	4	0	UINT8
9	MODE	Block Mode	5	0	ENUM
89	WRITE_ALM.ALARM_STATE	Alarm State	40	0	ENUM
90	WRITE_ALM.TIME_STAMP	Time Stamp	40	0	TIME
91	WRITE_ALM.SUB_CODE	Subcode	40	0	ENUM
92	WRITE_ALM.VALUE	Discrete Value	40	0	ENUM
93	ITK_VER	Interop Test Kit Vers	41	0	UINT16
94	Vendor Parameters	Standard Parameters	Standard Parameters	Standard Parameters	Standard Parameters
95	COMPATIBILITY_REV	Compatibility Level	43	0	UINT8
96	ENP_VERSION	ENP Version	44	0	STRING
97	DEVICE_TAG	Device Tag	45	0	STRING

- In the Control Builder library, select the first parameter row of the template and press "CTRL+V":

ENDRESS+HAUSER:DELTABAR_0702_1_TEMPLATE.RESOURCE Block Type*				
	Parameter name	Parameter description	Parameter index	First dimension array size
-	Standard Parameters			
1	BLOCK_ERR.DISABLED	Disable Block Errors(Blk Alarm)	65499	
2	OFFNETALM_ENABLED	Enable Block Offnet Diagnostic Alarm	65498	
3	CAPABILITY_LEV	Capability Level	42	
4	ST_REV	Static Revision Number	1	

- Control Builder verifies the dataset and if there are no syntax errors, it will automatically accept the changes in the template. In case of syntax errors or inconsistencies, a dialog box displays the issues.

In our example, an error is detected for the Maximum value in row 64:

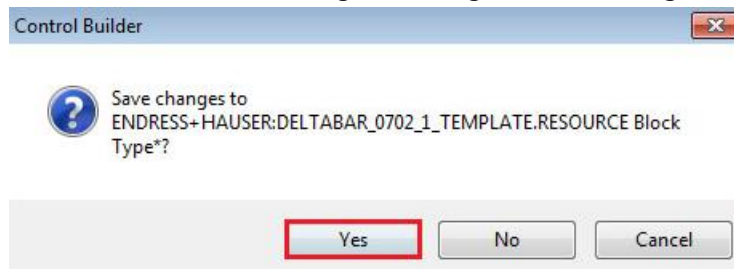


Click on the button "OK" and check which parameter is listed in row 64:

	Parameter name	First	Data type	Minimum value	Maximum value	Size	Default value	Configuration load	Access lock
61	SET_FSTATE	0	ENUM				Off	NOLOAD	Operator
62	CLR_FSTATE	0	ENUM				Off	NOLOAD	Operator
63	MAX_NOTIFY	0	UINT8				4	NOLOAD	ViewOnly
64	LIM_NOTIFY	0	UINT8	0	1000		4	LOAD	Engineer
65	CONFIRM_TIME	0	DELTA TIME	0			100000	LOAD	Engineer
66	WRITE_LOCK	0	ENUM				Unlocked	NOLOAD	Operator

In this example, we see that the Maximum value "1000" does not fit to the Data type "UINT8", which is limited to "255".

- In case of errors, check and modify the corresponding parameters in the Excel sheet and try again to copy and paste the data in the template.
- You will be asked for saving the changes when closing the template:

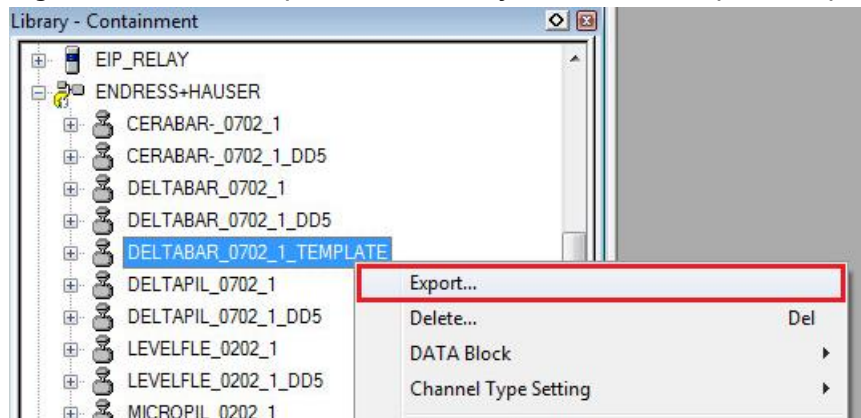


## 5.1.3 Templates Export/Import in Control Builder

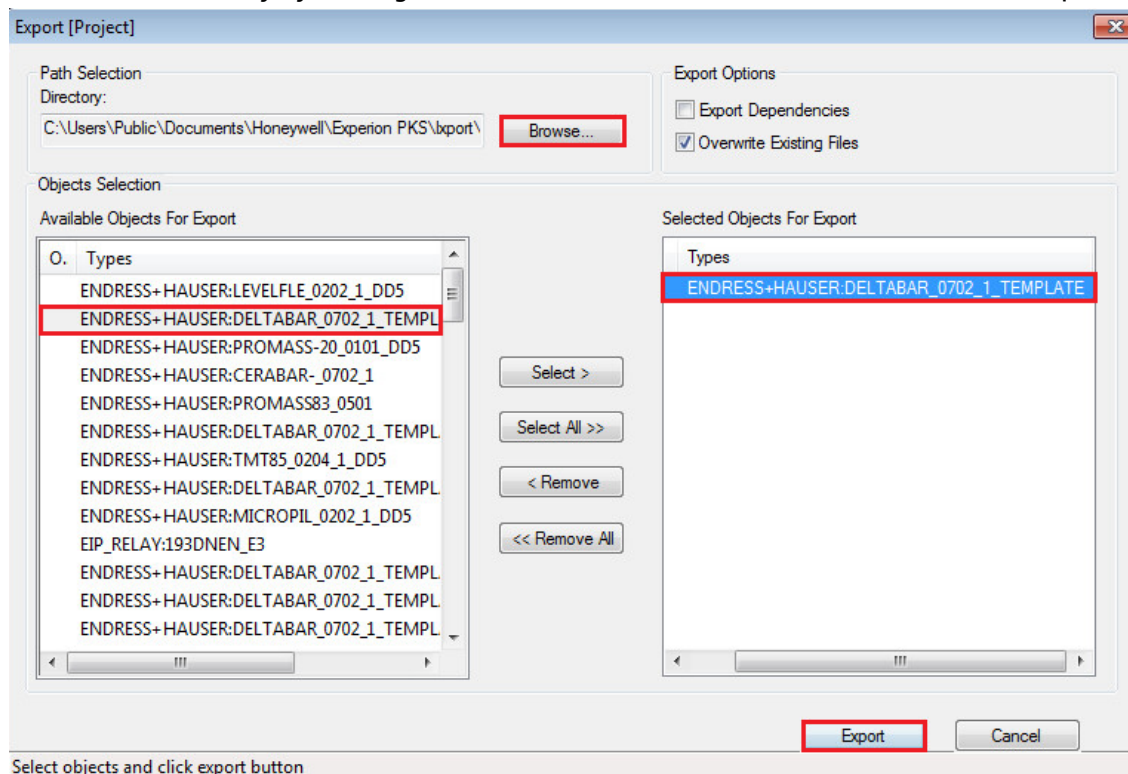
Project specific templates can be exported and imported in an \*.xml format.

### 5.1.3.1 Template Export

- Right-click on the template in the library and select the option "Export":



- Deltabar S template has been automatically selected in the window "Selected Objects For Export". Indicate the directory by clicking on the button "Browse", then click on the button "Export":



- The Export window is closed automatically when the export process is finished.



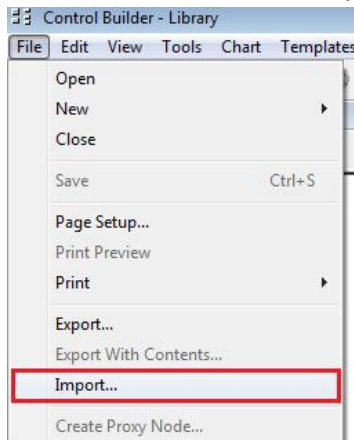
- Template has been successfully exported:

Name	Date modified	Type
 ENDRESS+HAUSER.DELTABAR_0702_1_TEMPLATE	3/31/2017 1:04 PM	File folder
 Export.sl	3/31/2017 1:04 PM	SL File

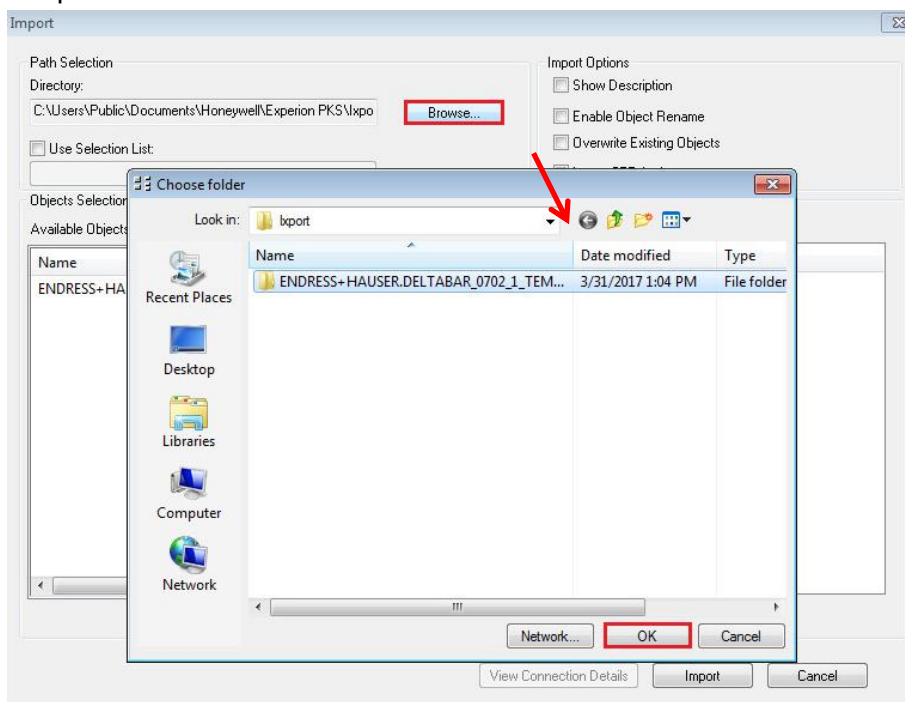
### 5.1.3.2 Template Import

An exported template can be imported in the Control Builder library.

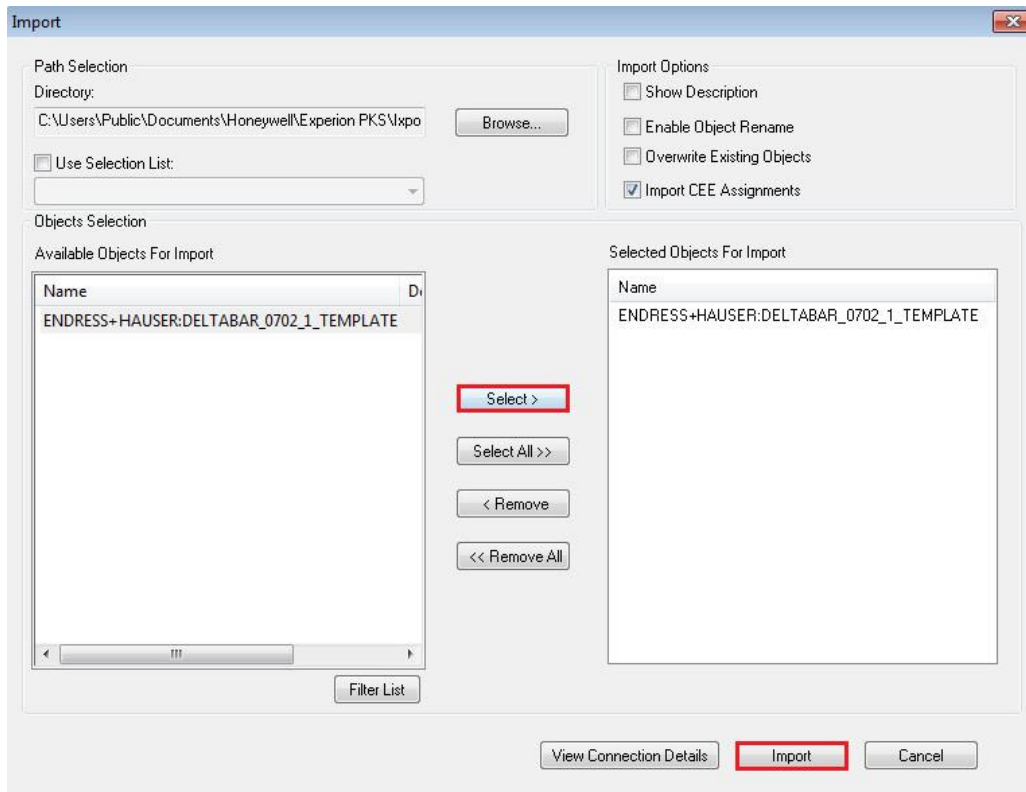
- Select the menu "File → Import":



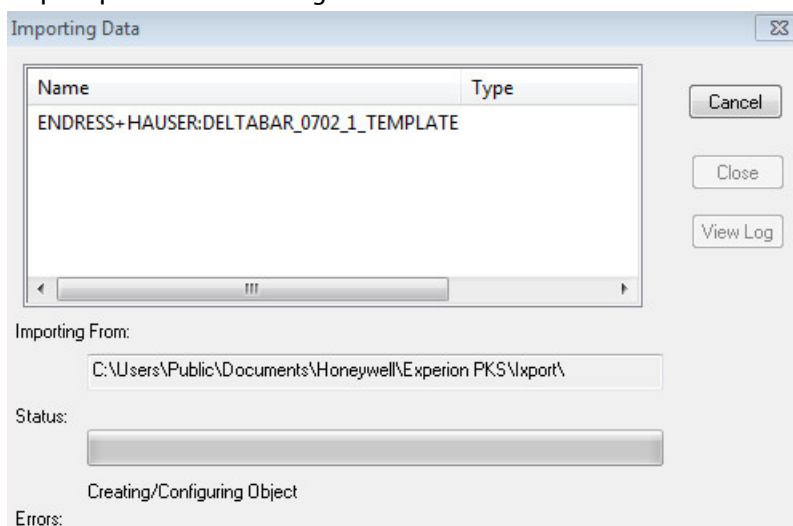
- Click on the button Browse and select the directory where the template is located. Then choose the template and click on the button "OK".



- Click on the button Select to move the template in the window "Selected Objects For Import" and click on the button "Import":



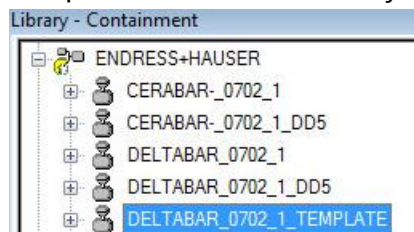
- Import process in running:



- The Import window is closed automatically when the import process is finished.



- Template has been successfully imported:



## 5.2 Endress+Hauser support for Project Specific Templates

Endress+Hauser Field Network Engineering can support you in preparation of project specific templates. Please contact your local Endress+Hauser partner for further details.



[www.endress.com/open-integration](http://www.endress.com/open-integration)

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