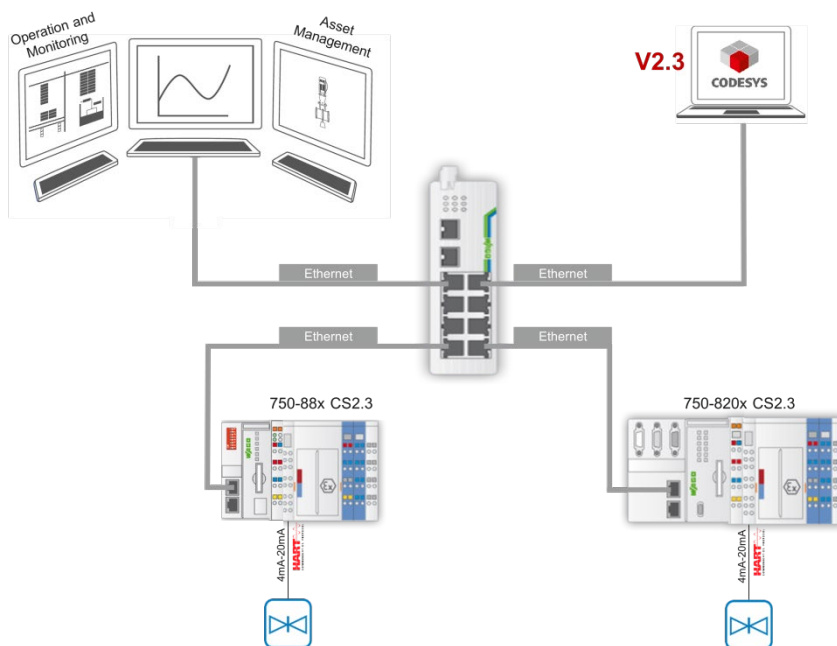


WAGO-I/O-SYSTEM 750



A116120

HART Tool Routing via ETHERNET with 750-820x/750-88x and CODESYS 2.3

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WAGO Kontakttechnik GmbH & Co. KG

Hansastraße 27
D-32423 Minden

Phone: +49 (0) 571/8 87 – 0
Fax: +49 (0) 571/8 87 – 1 69

E-Mail: info@wago.com

Web: www.wago.com

Technical Support

Phone: +49 (0) 571/8 87 – 4 45 55
Fax: +49 (0) 571/8 87 – 84 45 55

E-Mail: support@wago.com

Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

E-Mail: documentation@wago.com

We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

WAGO is a registered trademark of WAGO Verwaltungsgesellschaft mbH.

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1 Notes about this Documentation

1.1 Copyright

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1.2 Symbols

 **DANGER****Personal Injury!**

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **DANGER****Personal Injury Caused by Electric Current!**

Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING****Personal Injury!**

Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION****Personal Injury!**

Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

 **NOTICE****Damage to Property!**

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

NOTICE



Damage to Property Caused by Electrostatic Discharge (ESD)!

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

Note



Important Note!

Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.

Information



Additional Information:

Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

1.3 Number Notation

Table 1: Number Notation

Number Code	Example	Note
Decimal	100	Normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	In quotation marks, nibble separated with dots (.)

1.4 Font Conventions

Table 2: Font Conventions

Font Type	Indicates
<i>italic</i>	Names of paths and data files are marked in italic-type. e.g.: <i>C:\Program Files\WAGO Software</i>
Menu	Menu items are marked in bold letters. e.g.: Save
>	A greater-than sign between two names means the selection of a menu item from a menu. e.g.: File > New
Input	Designation of input or optional fields are marked in bold letters, e.g.: Start of measurement range
"Value"	Input or selective values are marked in inverted commas. e.g.: Enter the value "4 mA" under Start of measurement range .
[Button]	Pushbuttons in dialog boxes are marked with bold letters in square brackets. e.g.: [Input]
[Key]	Keys are marked with bold letters in square brackets. e.g.: [F5]

1.5 Legal Bases

1.5.1 Subject to Changes

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications. WAGO Kontakttechnik GmbH & Co. KG owns all rights arising from the granting of patents or from the legal protection of utility patents. Third-party products are always mentioned without any reference to patent rights. Thus, the existence of such rights cannot be excluded.

1.5.2 Personal Qualifications

The use of the product described in this document is exclusively geared to specialists having qualifications in PLC programming, electrical specialists or persons instructed by electrical specialists who are also familiar with the appropriate current standards.

Moreover, the persons cited here must also be familiar with all of the products cited in this document, along with the operating instructions. They must also be capable of correctly predicting any hazards which may not arise until the products are combined.

WAGO Kontakttechnik GmbH & Co. KG assumes no liability resulting from improper action and damage to WAGO products and third-party products due to non-observance of the information contained in this document.

1.5.3 Limitation of Liability

This documentation describes the use of various hardware and software components in specific example applications. The components may represent products or parts of products from different manufacturers. The respective operating instructions from the manufacturers apply exclusively with regard to intended and safe use of the products. The manufacturers of the respective products are solely responsible for the contents of these instructions.

The sample applications described in this documentation represent concepts, that is, technically feasible application. Whether these concepts can actually be implemented depends on various boundary conditions. For example, different versions of the hardware or software components can require different handling than that described here. Therefore, the descriptions contained in this documentation do not form the basis for assertion of a certain product characteristic.

Responsibility for safe use of a specific software or hardware configuration lies with the party that produces or operates the configuration. This also applies when one of the concepts described in this document was used for implementation of the configuration.

WAGO Kontakttechnik GmbH & Co. KG is not liable for any actual implementation of the concepts.

2 Description

This application note describes how to set up asset management systems, which facilitate simple, efficient configuration of HART field devices.

With the Cerabar PMC51 (Endress+Hauser) as an example, a connection is established from any HART sensor to a WAGO PROFIBUS Controller and a WAGO ETHERNET Fieldbus Coupler. The configuration is made with the asset management software WAGOframe, PACTware und FieldCare.

The field devices are connected via the HART Module (750-482) and “WagoLibHART_05.lib” CODESYS library.

In addition to function blocks for local execution of HART commands, the “WagoLibHART_05.lib” library contains a program that works together with the “WAGO Modbus TCP DTM” and that allows parameterization of the HART sensor from any FDT/DTM frame applications.

After an overview of the components and tools used, Section 3 starts with the relevant preparation. Creation of a PLC program that reads and processes data from the HART sensor cyclically is also explained.

At the end, Section 4 describes the asset management configuration of the HART sensor with the FDT/DTM frame applications “WAGOframe,” “PACTware” and “FieldCare.”

3 Material Used

The application note was created and tested based on the use of the listed components.

3.1 Required Libraries

Table 3: Required Libraries

Library	Description	Version ^{*)}
WagoLibHART_05.lib	Contains function blocks for executing HART commands	1.6.0.0

^{*)} This version was used when the instructions for use were created.

3.2 Devices

Table 4: Devices

Supplier	Quantity	Designation	Item No.	Version ^{*)}
WAGO	1	PLC Controller PFC200	750-8206	FW 03
WAGO	1	PLC controller	750-881	FW 09
WAGO	2	2 AI; 4–20 mA HART	750-482	
WAGO	2	Ex i supply module	750-606	
WAGO	2	2 AI 4-20 mA HART Ex	750-484	
WAGO	2	End module	750-600	
WAGO	1	T ECO 5-port switch	852-111	
Endress+Hauser	1	Cerabar PMC51		

^{*)} This version was used when the instructions for use were created.

3.3 Tools

Designation	Item No.	Version ^{*)}
WAGO-I/O-PRO CAA V2.3	759-333	2.3.9.49
WAGO-I/O-CHECK 3	759-920	3.8.1(01)
WAGOframe	759-370	1.01.00
WAGO ETHERNET Settings	759-316	6.8.2
WAGO HART DTMs, 759-359	(in WagoLib-HART_05.lib)	8.1.224.0
Endress+Hauser device DTMs		2.43.00
Endress+Hauser FieldCare SFE500		2.11.00.2025
VEGA Grieshaber PACTware 5.0		5.0.2.22

^{*)} This version was used when the instructions for use were created.

3.4 Setup

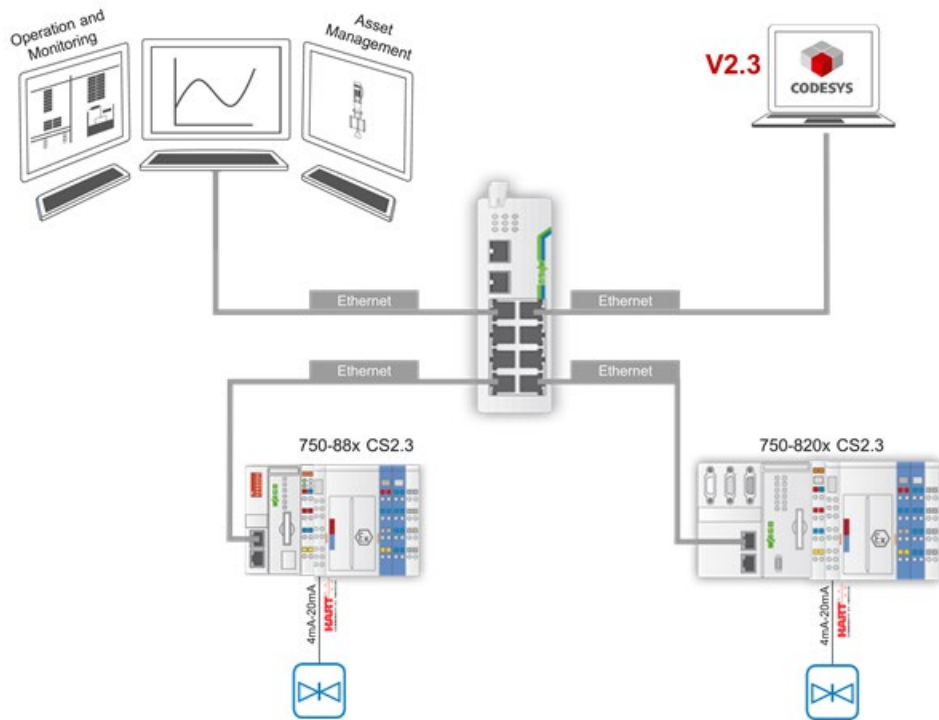


Figure 1: General Structure

Node No. 1:

PFC200 (750-8206) with Modules 750-482, 750-606, 750-484 and End Module (750-600).

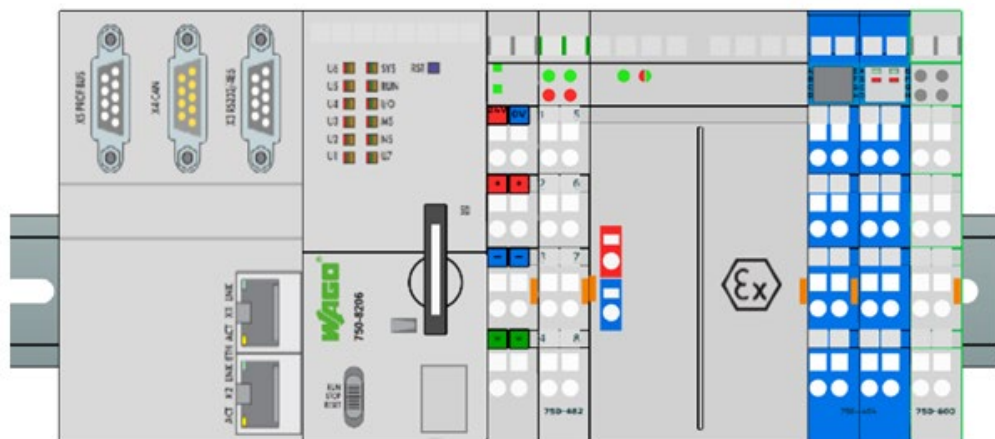


Figure 2: Node 1

Node No. 2:

Controller (750-881) with Modules 750-482, 750-606, 750-484 and End Module (750-600)

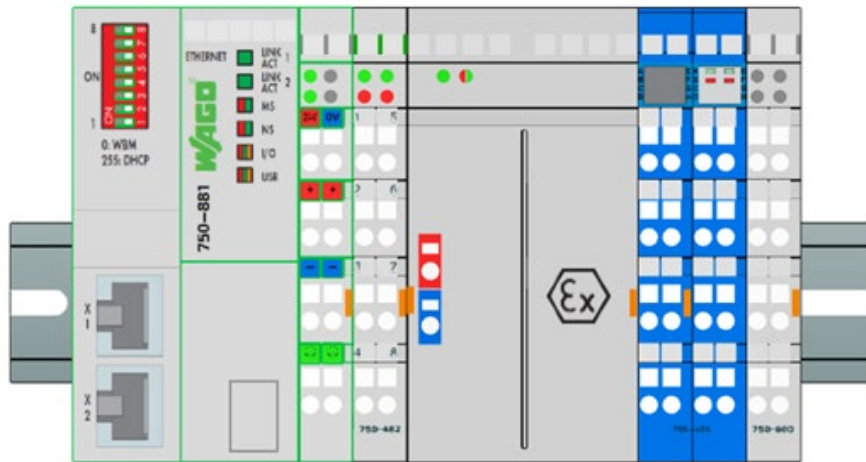


Figure 3: Node 2

4 Parameterization

Most HART device manufacturers use the FDT/DTM standard to configure their devices.

The aim of FDT/DTM is to provide a single application for diagnostics and parameterization of devices from any manufacturer.

Such applications are also called “FDT containers” or “FDT frames.” WAGO has its own FDT frame with “WAGOframe.”

The FDT frame operates with “Device Type Managers” (DTMs). Three groups of DTMs are specified:

- Device DTMs
- Gateway DTMs
- Communication DTMs

The device manufacturers provide “Device DTMs” for their devices, which include the graphical user interface for configuration and diagnostics.

Gateway DTMs function as mediators; e.g., between two bus systems such as HART and Modbus TCP.

A communication DTM provides a protocol-specific driver, e.g., for Modbus TCP

4.1 Preparations

In this section, you will see which preparations are necessary for setting up asset management systems.

1. **Downloading “WagoLibHART_05.lib”**
Open your Internet browser and enter the URL: www.wago.com. Then search for the file “WagoLibHART_05.lib” and download it.

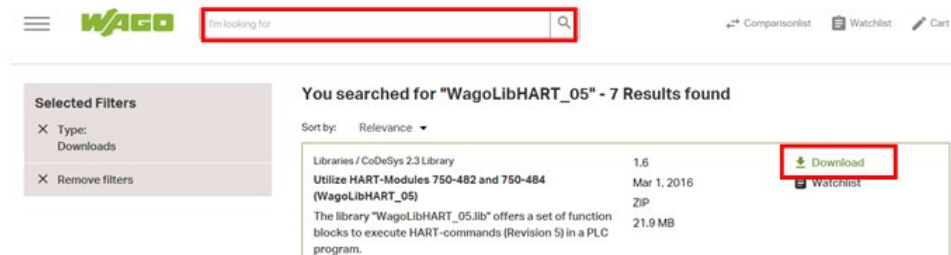


Figure 4: Search for File

2. **Extracting and Moving “WagoLibHART_05.lib”**

In the Explorer, open the directory that contains the downloaded file “WagoLibHART-05.zip” and extract it (e.g., with the program PowerArchiver).

3. **Moving “WagoLibHART_05.lib”**

In the Explorer, open the extracted folder “WagoLibHART-05.” Move the file “WagoLibHART_05.lib” to the other WAGO CODESYS libraries in the directory *C:\Program Files (x86)\WAGO Software\CoDeSys V2.3\Targets\WAGO\Libraries\32_Bit*.

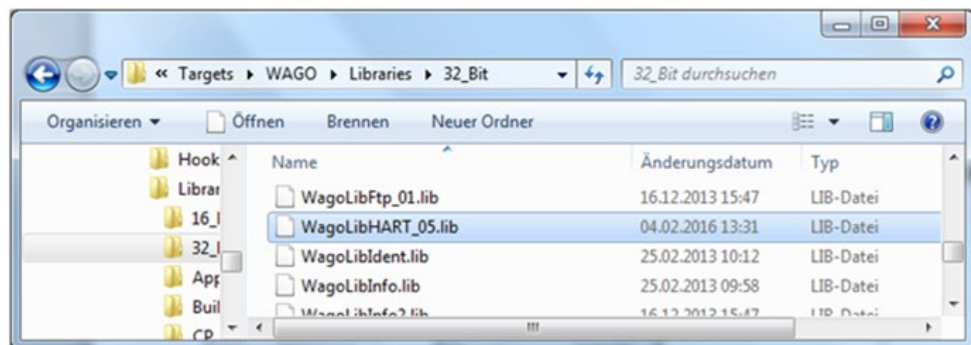


Figure 5: Moving File

4. **Installing the “WAGO HART-DTMs-759-359”**

In the Explorer, open the extracted folder “WagoLibHART-05” and then the folder “WAGO HART-DTMs-759-359.” Install the two applications “WAGO 075x-08xx DTM Setup.exe” and “Wago Modbus TCP DTM Setup.exe.”

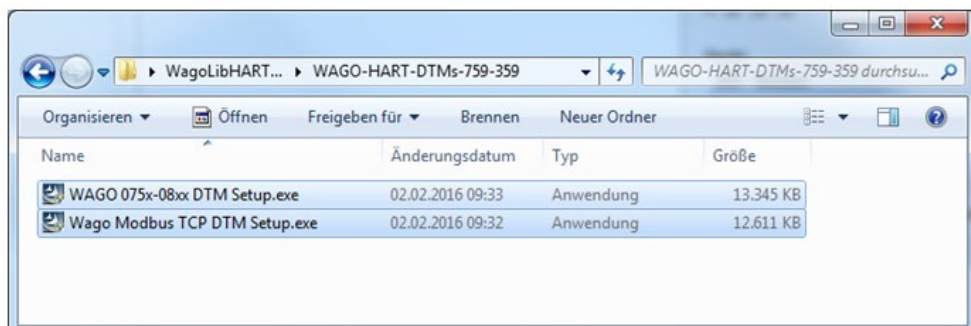


Figure 6: Installation

5. **Downloading the Field Device “DTM Library”**

Each field device requires a “device DTM,” to mediate the later parameterization, commissioning and diagnostics of HART field devices. In

this example, the Cerabar PMC51 is connected (Endress+Hauser HART sensor).

Open your Internet browser; enter the URL: www.software-products.endress.com and register. Then search for the file “*Device DTM Library*” and download it.

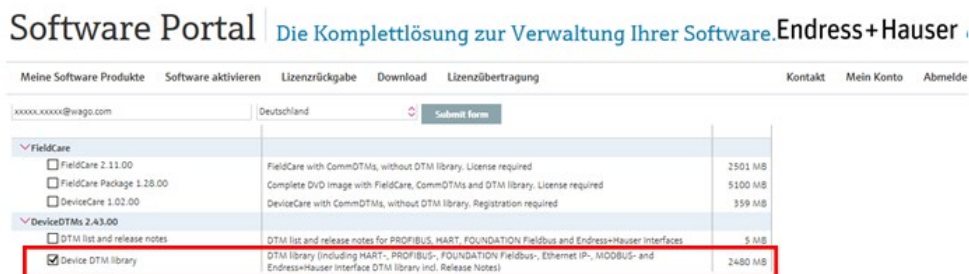


Figure 7: Download File

Information



Note

Although it is only necessary to download one single specific DTM, the search often proves difficult. Thus, downloading the complete “*Device DTM Library*” is recommended.

6. **Extracting the Field Device “*Complete_DTM_library.part1.exe.zip*”**
In the Explorer, open the directory containing Parts 1–3 of downloaded files “*Complete_DTM_library.part1.exe.zip*” and extract them (e.g., with the program PowerArchiver).
7. **Installing the Field Device “*DTM Library*”**
In the Explorer, open the extracted folder “*Complete_DTM_library*” and then the folder “*Single DTM library*.”

Install the application “*Setup.exe*.”

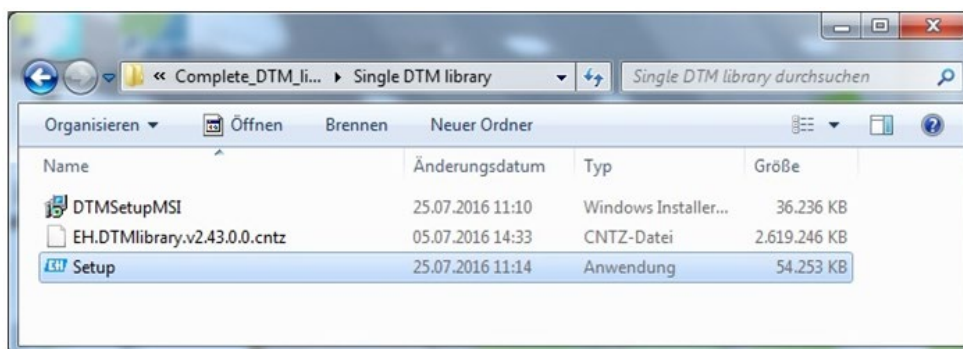


Figure 8: Install Application

4.2 HART Module (750-482 and 750-484) on the WAGO ETHERNET Controller (750-820x)

This section describes how to expand your PLC application with FDT/DTM support using the “*WagoLibHART_05.lib*” library.

If the HART module (750-482) is on a WAGO ETHERNET controller, communication between the FDT frame and controller occurs via the Modbus TCP protocol.

A PLC program that receives the Modbus® requests, extracts the HART commands and forwards them to the HART sensor is required on the ETHERNET controller.

In the FDT frame, a Modbus TCP communication DTM and HART/Modbus TCP gateway DTM are required. Both DTMs are available after “*WagoLibHART_05.lib*” is downloaded.

All necessary steps for integrating the example program are explained in detail below. At the end is a detailed representation of the function blocks (FUP programming language).

1. Setting the Controller IP Address (static)

After commissioning the structure and completing the preparations, connect your WAGO Controller with the USB communication cable. Start the WAGO Software “WAGO-I/O-CHECK 3” and in the menu bar, click **[Settings]** → **[Communication]**, accept the connection **[Serial Connections]** and the connector **[COM4:WAGO USB Cable]**.

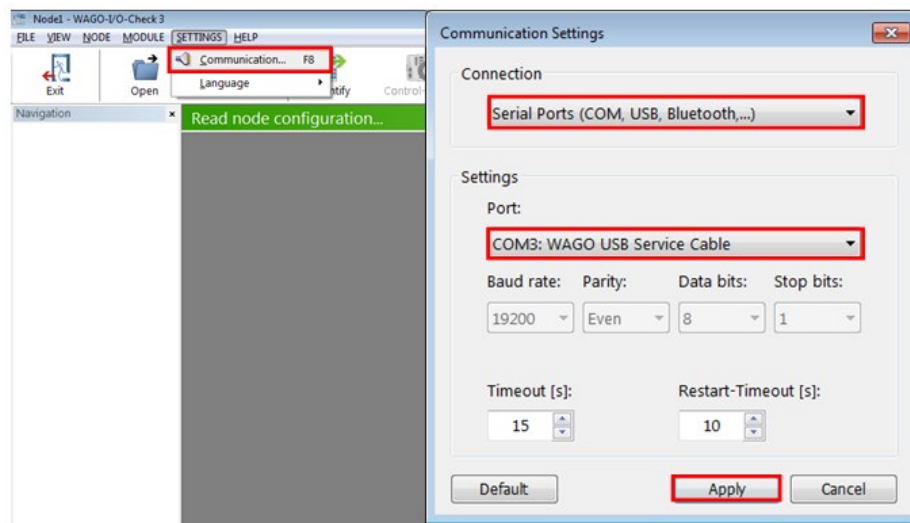


Figure 9: Setting the IP Address

Identify the connected nodes and right-click to open the PFC200 (750-820x) settings.

The WAGO software “ETHERNET Settings” opens. Enter your desired address in the **[Network]** tab under the address source **[Static Configuration]** and under “*IP address.*”

Then write the settings on the controller.

2. Configuring the HART Module (750-482 and 750-484)

Right-click to open the HART module (750-482) settings.
Check the process image variant and set the “2 AI + 6 Byte Mailbox.”
Then click **[Write]** to transfer it.

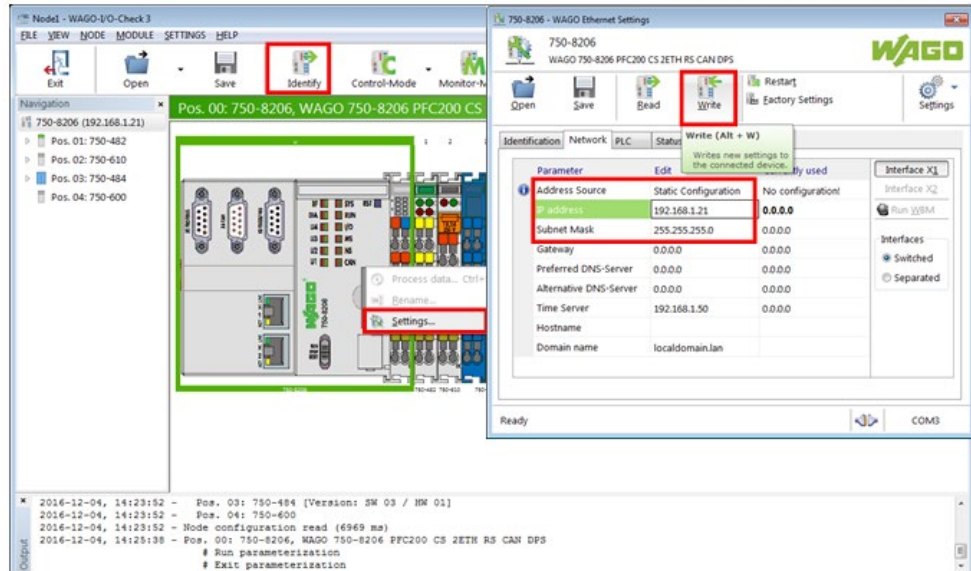


Figure 10: Configuring the HART Module

Repeat the same process for the HART-Module (750-484); set the process image variant to “2 AI + 6 Byte Mailbox” here as well.
The WAGO Software “WAGO-I/O-CHECK 3” can now be closed.

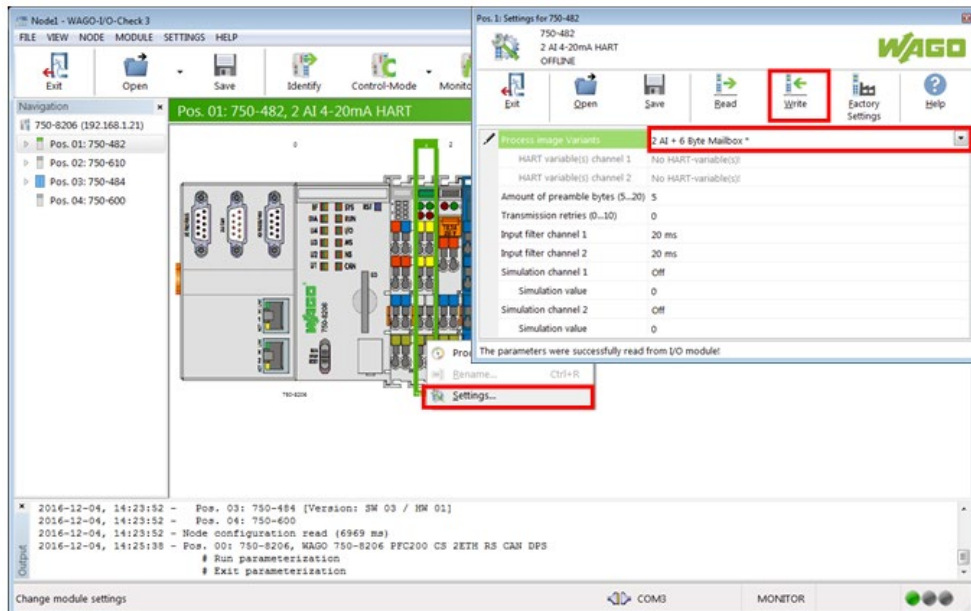


Figure 11: Setting the Process Image Variant

3. Commissioning the Example Program “WagoLibHART05_Example PFC.pro” in CODESYS 2.3

1. Starting from “WagoLibHART05_ExamplePFC.pro”

Open the previously extracted folder “WagoLibHART-05” with an

Explorer and start the CODESYS file
 “WagoLibHART05_ExamplePFC.pro” with a double-click.

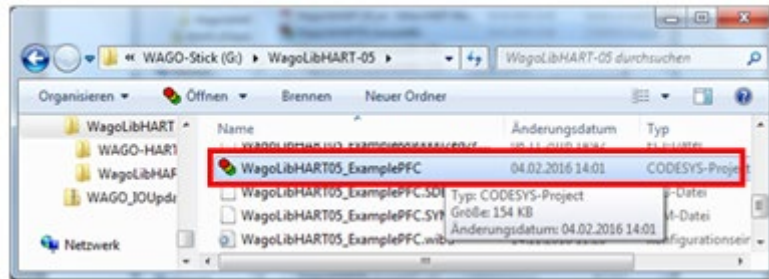


Figure 12: Open Folder

Two successive error messages appear. Confirm the first with **[No]** and the second with **[OK]**.

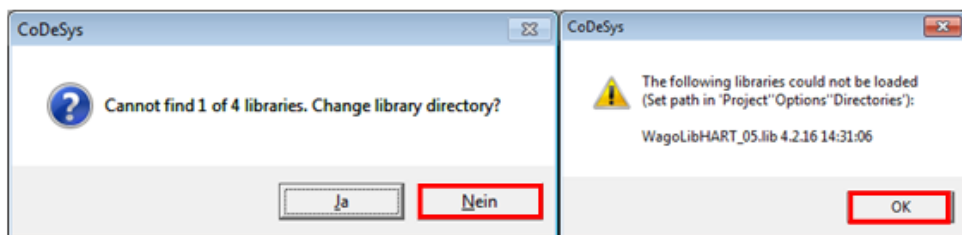


Figure 13: Confirm

2. Deleting the Defective Library

Open the tab **[Resources]** → **[Library Manager]**; the defective library is marked in red.

After marking it, delete it with the **[DEL]** key and confirm the error message with **[Yes]**.

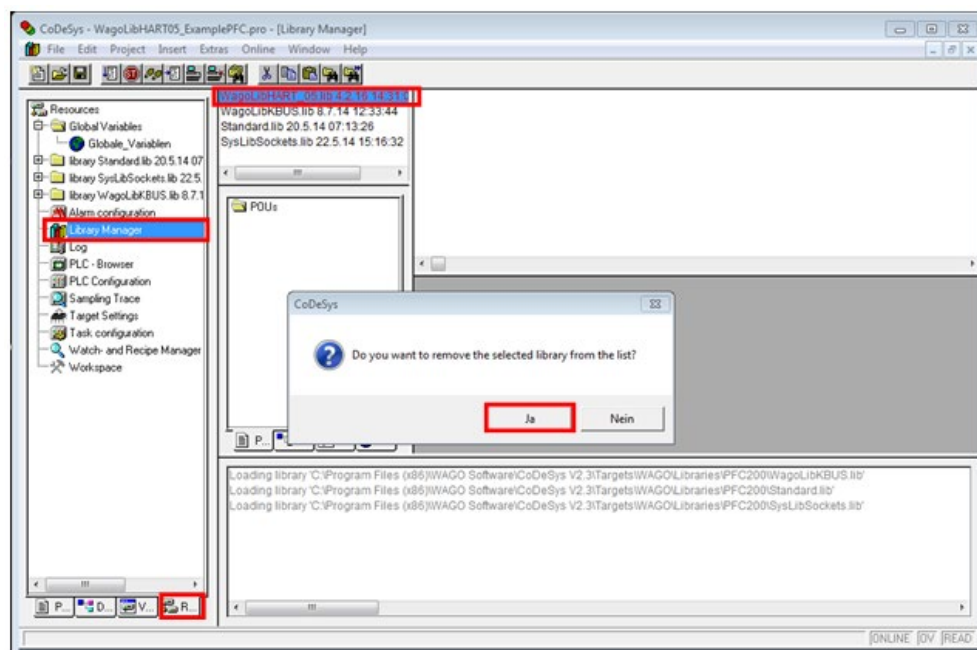


Figure 14: Deleting Library

3. Integrating “WagoLibHART_05.lib“

The missing library “WagoLibHART_05.lib” can be added again with a

right-click under the libraries that are already there.

The file should be under the following path after the preparations:
C:\Program Files (x86)\WAGO Software\CoDeSys V2.3\Targets\WAGO\Libraries\32_Bit.

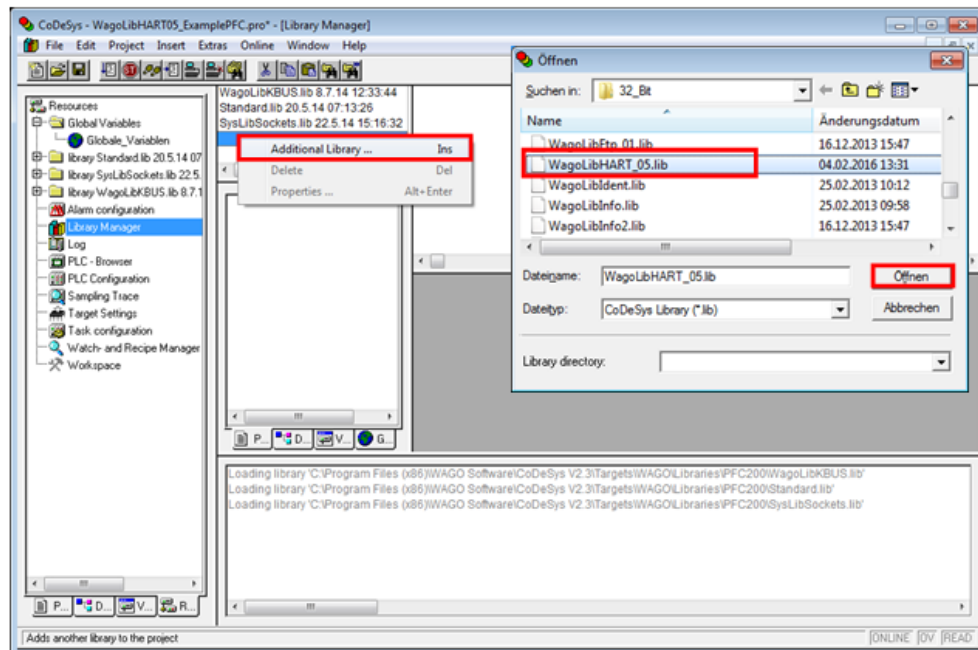


Figure 15: Adding Library

4. Configuring the Target System

The options for configuring the target system are found under menu item **[Target Settings]**.

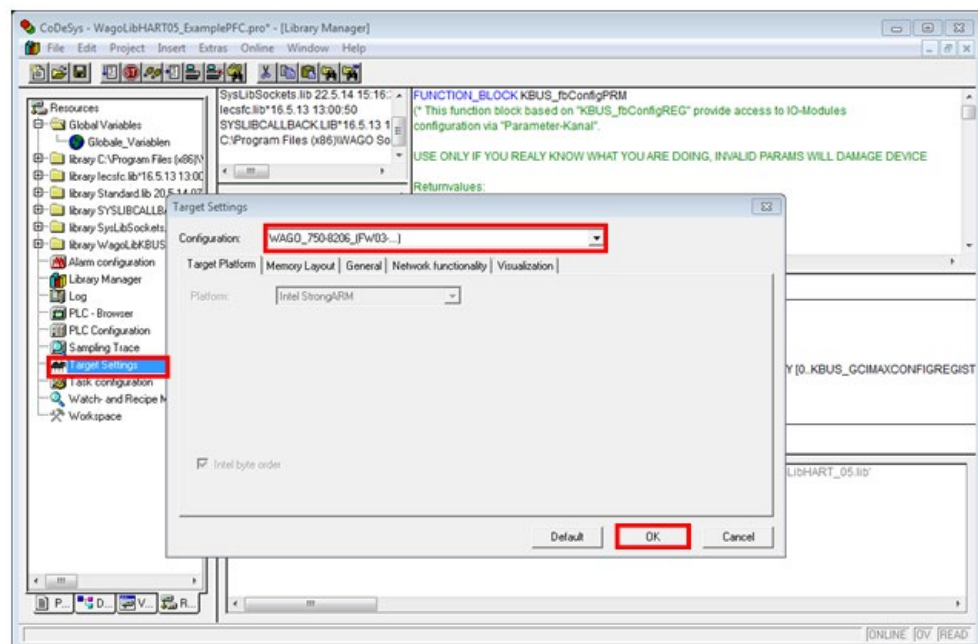


Figure 16: Configuring the Target System

5. Setting the Communication Parameters

In the menu bar, open the section **[Online] → [Communication]**

Parameters]. Create a new **TCP/IP channel (Level 2 Route)** and specify the IP address of your controller and **Port 2455**.

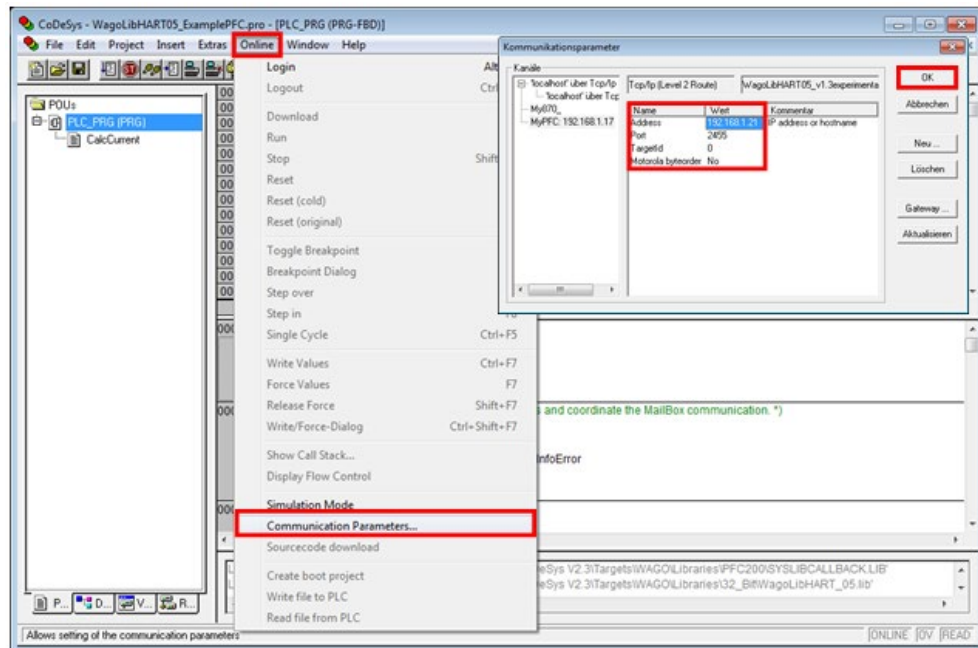


Figure 17: Setting Parameters

6. **Transferring the Program to the Controller and Starting**
To transfer the PLC program, click the **[Login]** button; then start it with the **[Start]** button.

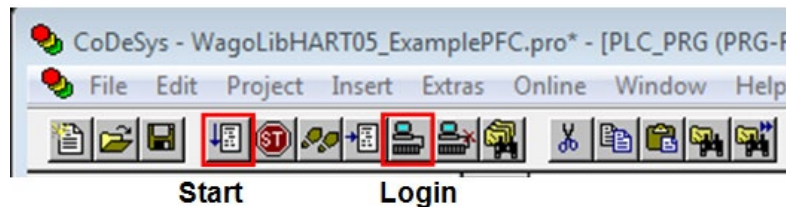


Figure 18: Login and Start

7. **Creating a Boot Project on the Controller**
In the menu bar, open the section **[Online]** → **[Create Boot Project]**. Once the boot project is created, the controller will boot the created project.

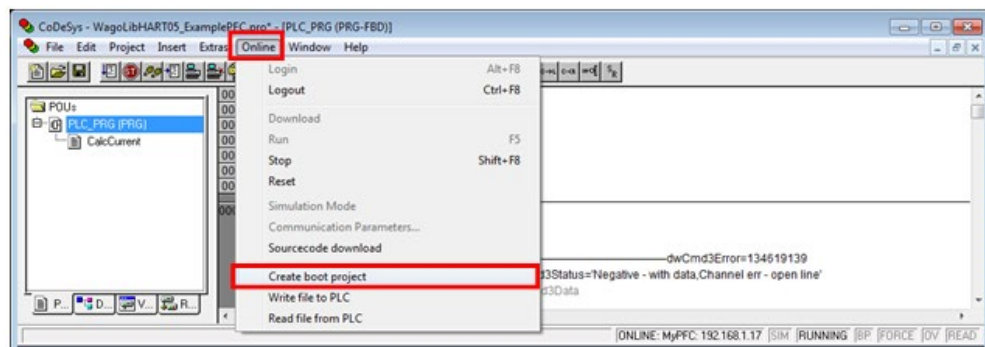


Figure 19: Creating Boot Project

Information



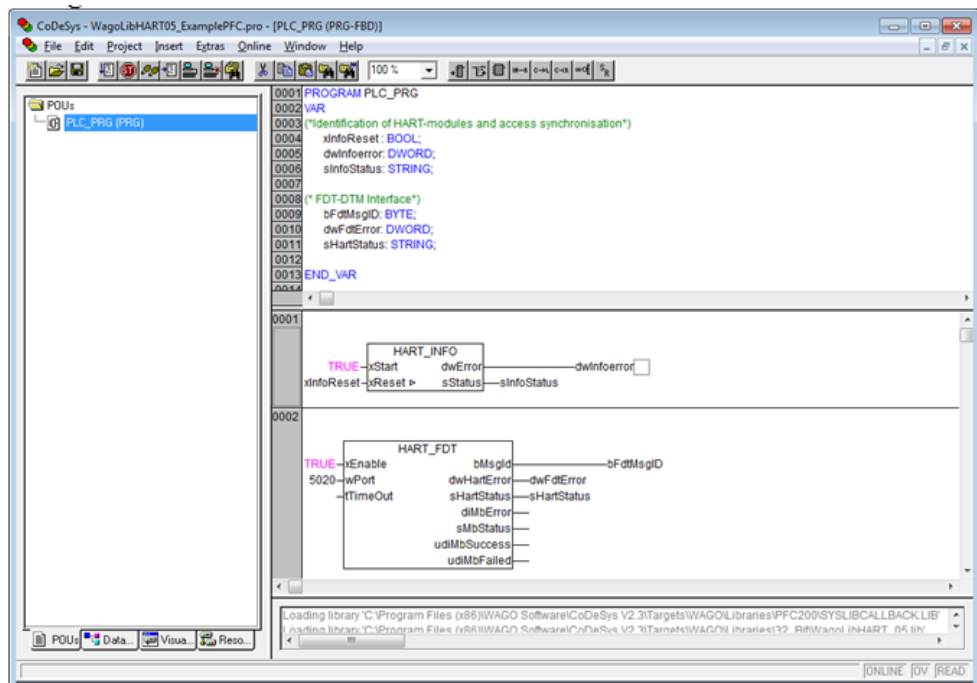
Note

In the example “*WagoLibHART05_Example88x.pro*,” all function blocks from WagoLibHART05 are applied as examples. Their specific uses are presented in the PDF “*WagoLibHART_05_en*.”

4. Reducing the PLC Program to the Minimum Needed for the Asset Management Systems

Essentially, only two function blocks from WagoLibHART05 are required in the PLC program for the communication between the sensor and the asset management software. They receive the Modbus requests, extract the HART commands and forward them to the HART sensor.

Communication between the sensor and the asset management software can take place according to the following value declaration and application of the two function blocks.



The “HART_INFO” program identifies the connected HART sensors and synchronizes execution of the individual HART commands. The “dwError” and “sStatus” outputs show the current status.

The “HART_FDT” program only functions as a Modbus TCP/HART gateway. The input parameter is “tTimeout” can be used to specify when the FDT request is discarded. The “bMsgId” output displays the ID of the FDT request being processed.

Information



Note

If additional local HART commands are executed, then add the required HART_CMD function blocks to the program. For additional information, see the library “*WagoLibHART_05.lib*” or the corresponding manual.

4.3 HART Module (750-482 and 750-484) on the WAGO ETHERNET Controller (750-88x)

This section describes how to expand your PLC application with FDT/DTM support using the “*WagoLibHART_05.lib*” library.

If the HART module (750-482) is on a WAGO ETHERNET controller, communication between the FDT frame and controller occurs via the Modbus TCP protocol.

A PLC program that receives the Modbus® requests, extracts the HART commands and forwards them to the HART sensor is required on the ETHERNET controller.

In the FDT frame, a Modbus TCP communication DTM and HART/Modbus TCP gateway DTM are required. Both DTMs are available “*WagoLibHART_05.lib*” after the download.

All necessary steps for integrating the example program are explained in detail below. At the end is a detailed representation of the function blocks (FUP programming language).

1. Setting the Controller IP Address (static)

After commissioning the structure and completing the preparations, connect your WAGO Controller with the USB communication cable.

Start the WAGO Software “*WAGO-I/O-CHECK 3*” and in the menu bar, click **[Settings]** → **[Communication]**, accept the connection **[Serial Connections]** and the connector **[COM4:WAGO USB Cable]**.

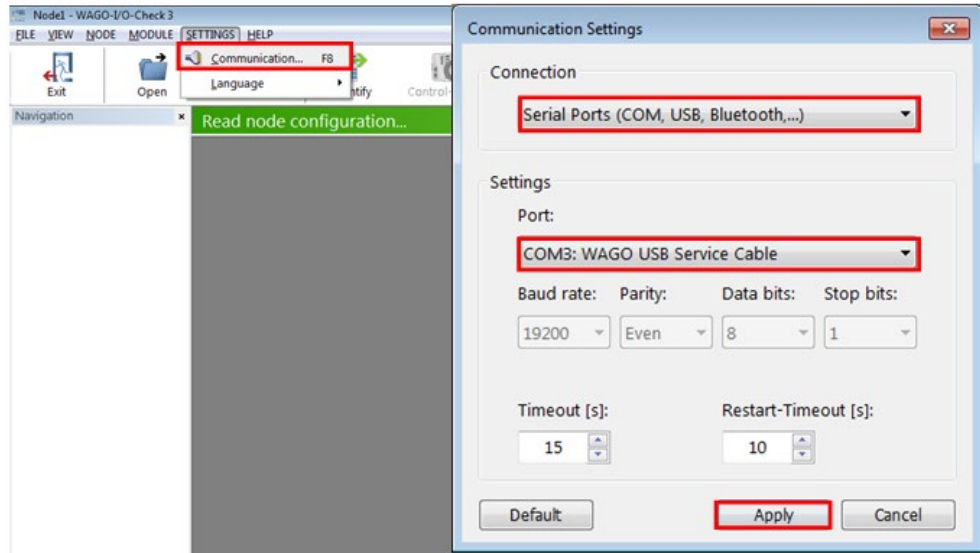


Figure 20: Setting IP Address

Identify the connected nodes and right-click to open the (750-88x) settings.

The WAGO software “ETHERNET Settings” opens. Enter your desired address in the **[Network]** tab under the address source **[Static Configuration]** and under “IP address.” Then write the settings on the controller.

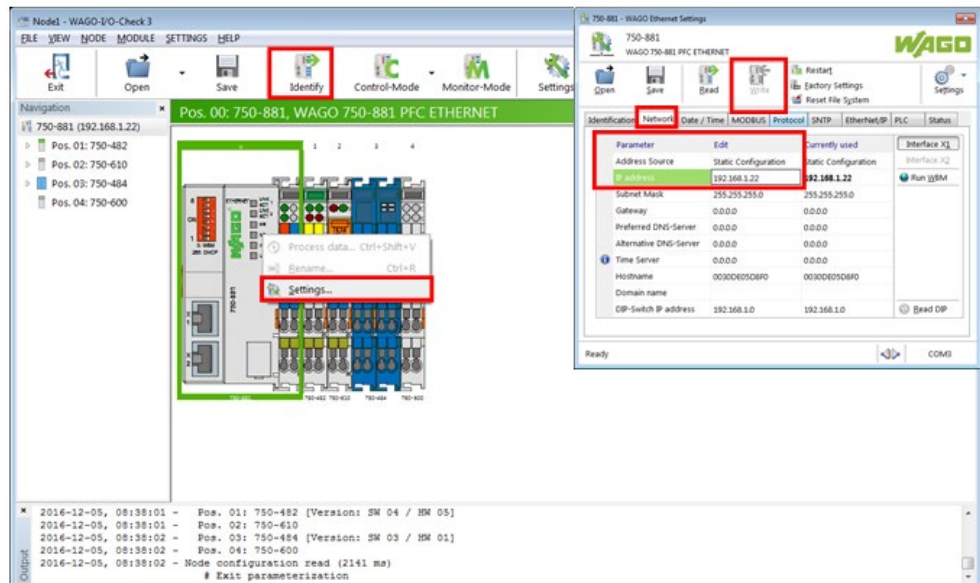


Figure 21: Writing Settings

2. Configuring the HART Module (750-482 and 750-484)

Right-click to open the HART module (750-482) settings.

Check the process image variant and set the “**2 AI + 6 Byte Mailbox.**” Then click **[Write]** to transfer it.

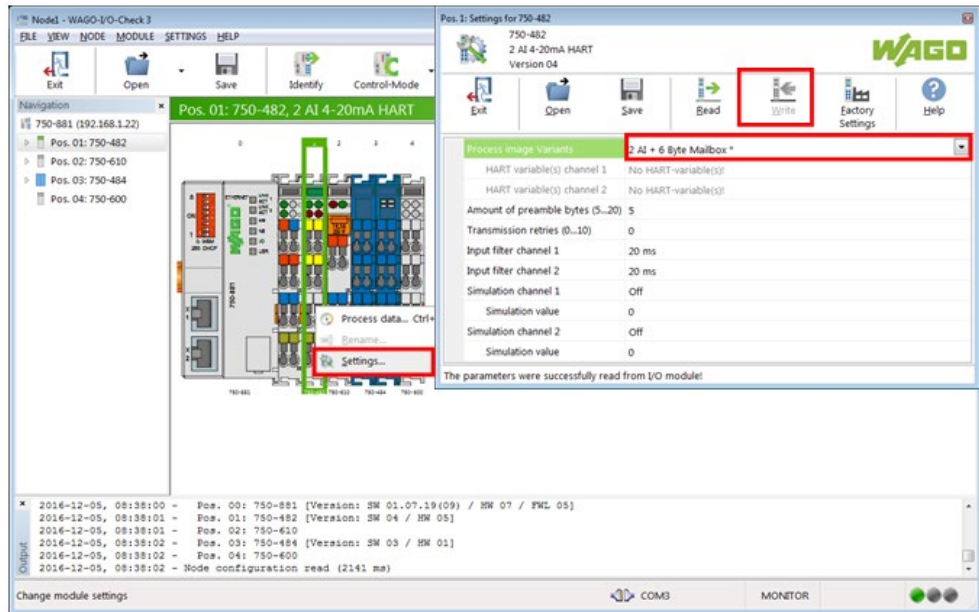


Figure 22: Configuring

Repeat the same process for the HART-Module (750-484); set the process image variant to **“2 AI + 6 Byte Mailbox.”**

The WAGO Software *“WAGO-I/O-CHECK 3”* can now be closed.

3. **Commissioning the Example Program
“WagoLibHART05_Example88x.pro” in CODESYS 2.3**

a. **Starting from “WagoLibHART05_Example88x.pro“**

Open the previously extracted folder *“WagoLibHART-05”* with an Explorer and start the CODESYS file *“WagoLibHART05_Example88x.pro”* with a double-click.

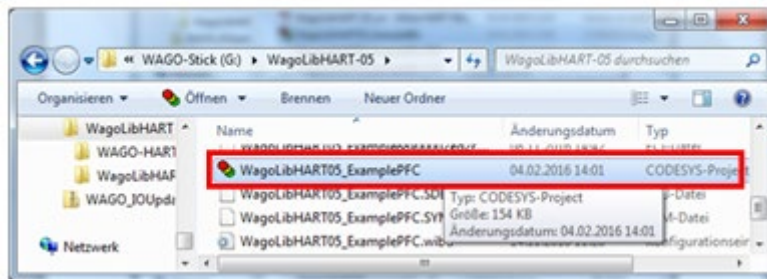


Figure 23: Starting

Two successive error messages appear; confirm the first with **[No]** and the second with **[OK]**.

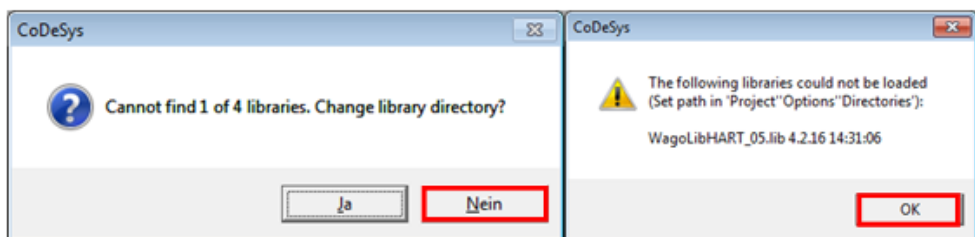


Figure 24: Confirming

b. **Deleting the Defective Library**

Open the tab **[Resources]** → **[Library Manager]**; the defective library is marked in red.

After marking it, delete it with the **[DEL]** key and confirm the error message with **[Yes]**.

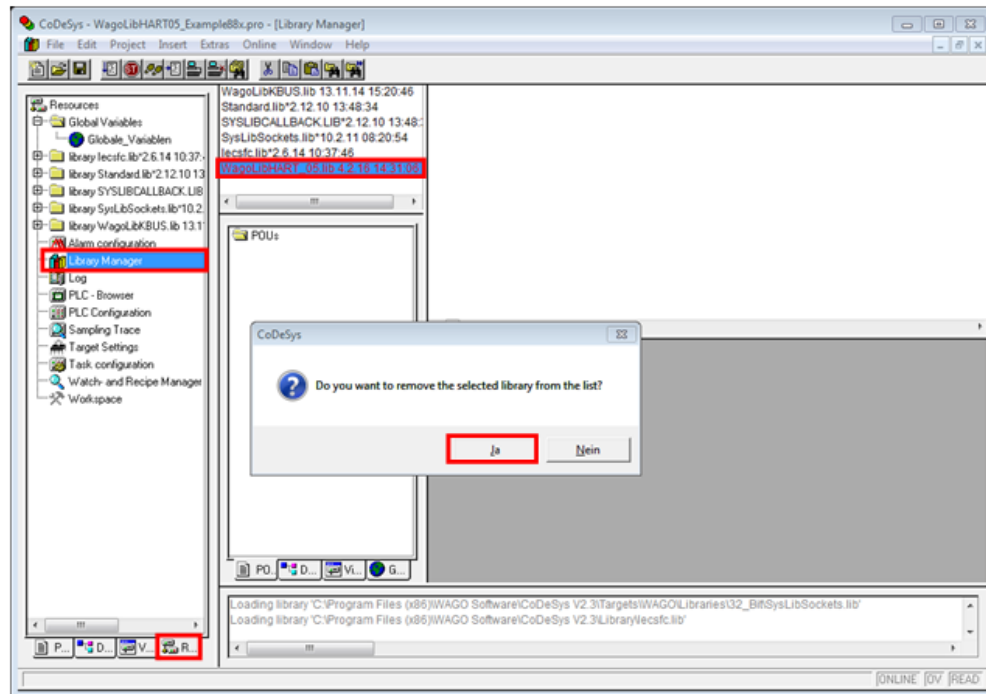


Figure 25: Deleting

c. **Integrating “WagoLibHART_05.lib”**

The missing library “WagoLibHART_05.lib” can be added again with a right-click under the libraries that are already there.

The file should be under the following path after the preparations:

C:\Program Files (x86)\WAGO Software\CoDeSys V2.3\Targets\WAGO\Libraries\32_Bit

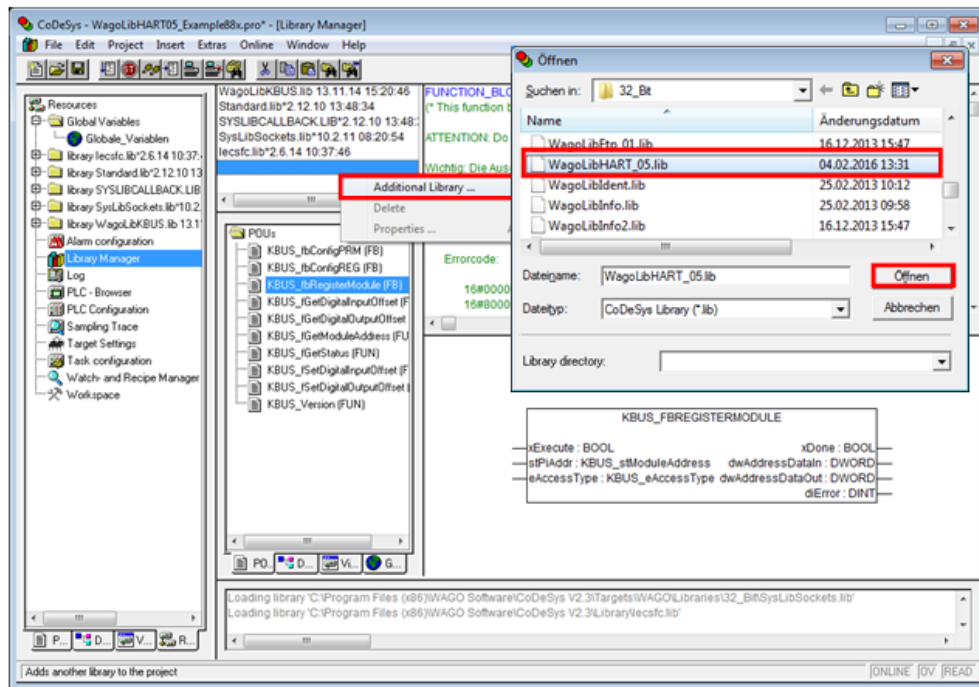


Figure 26: Integrating

d. **Configuring the Target System**

The options for configuring the target system are found under menu item **[Target Settings]**.

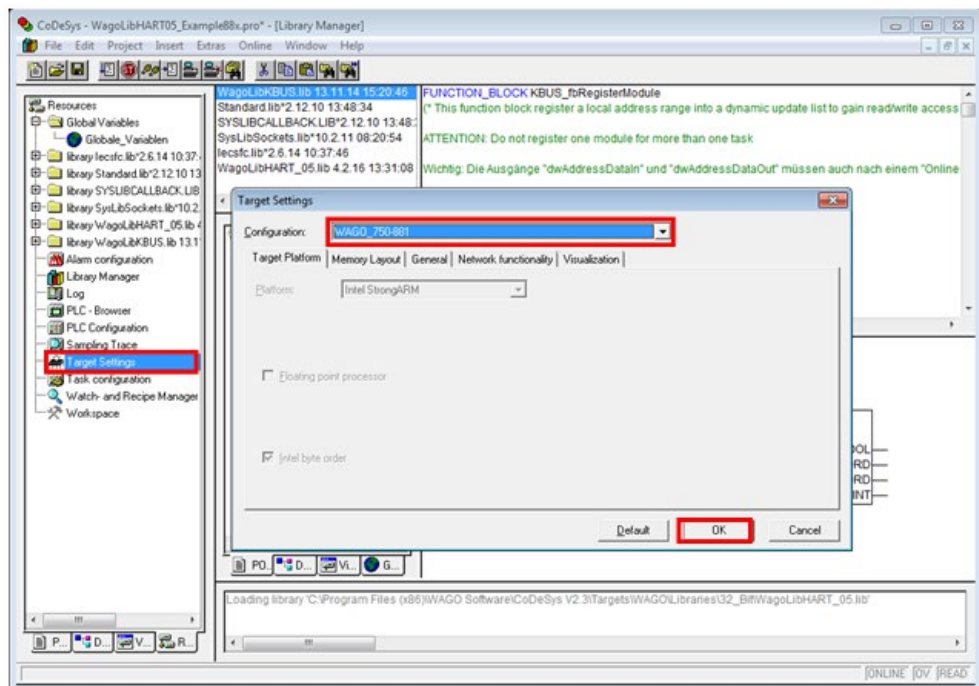


Figure 27: Configuring Target System

e. **Setting the Communication Parameters**

In the menu bar, open the section **[Online] → [Communication Parameters]**. Create a new **TCP/IP channel (Level 2 Route)** and specify the IP address of your controller and Port **2455**

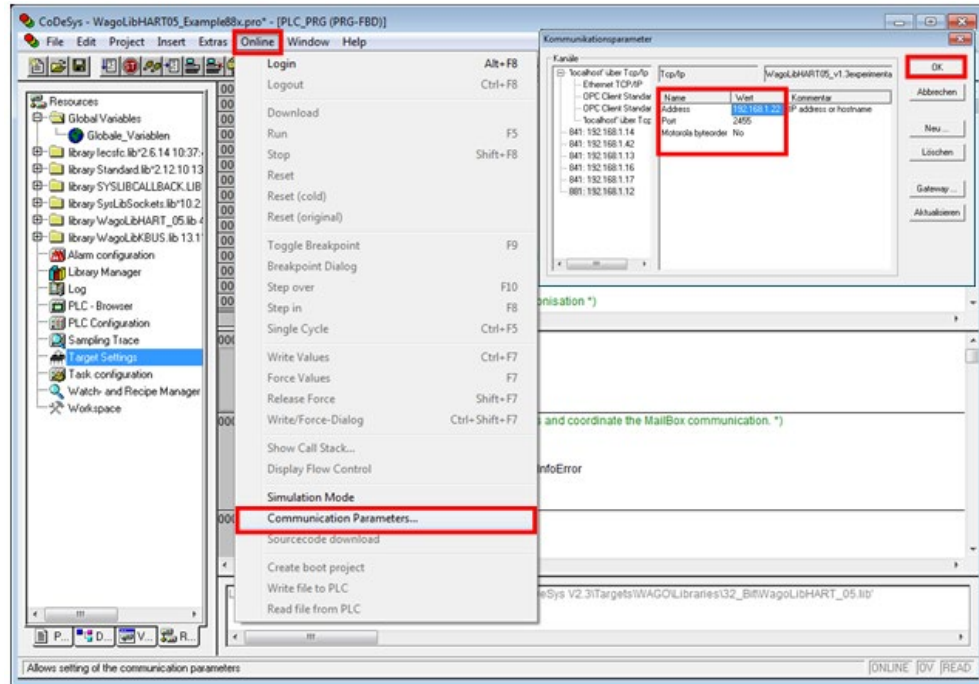


Figure 28: Setting Parameters

- f. **Transferring the Program to the Controller and Starting**
To transfer the PLC program, click the **[Login]** button; then start it with the **[Start]** button

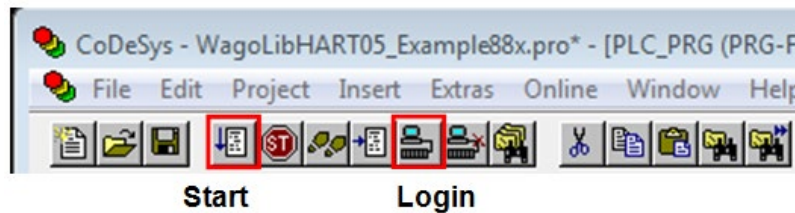


Figure 29: Transferring

- g. **Creating a Boot Project on the Controller**
In the menu bar, open the section **[Online]** → **[Create Boot Project]**. Once the boot project is created, the controller will boot the created project.

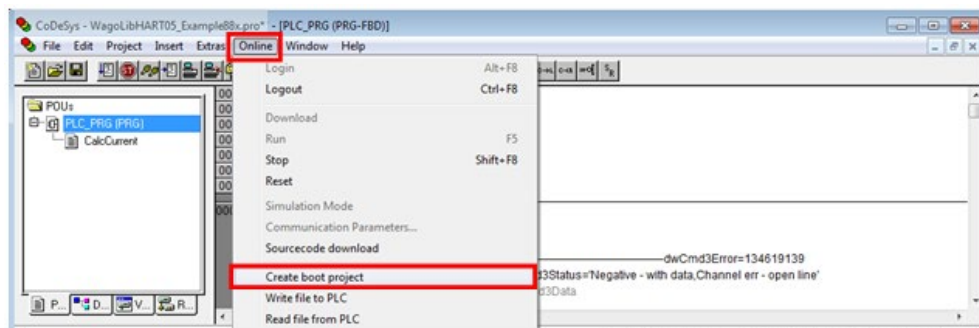


Figure 30: Creating Boot Project

Information



Note

In the example “WagoLibHART05_Example88x.pro,” all function blocks from WagoLibHART05 are applied as examples. Their specific uses are presented in the PDF “WagoLibHART_05_en.”

4. Reducing the PLC Program to the Minimum Needed for the Asset Management Systems

Essentially, only two function blocks from WagoLibHART05 are required in the PLC program for the communication between the sensor and the asset management software. They receive the Modbus requests, extract the HART commands and forward them to the HART sensor.

Communication between the sensor and the asset management software can take place according to the following value declaration and application of the two function blocks.

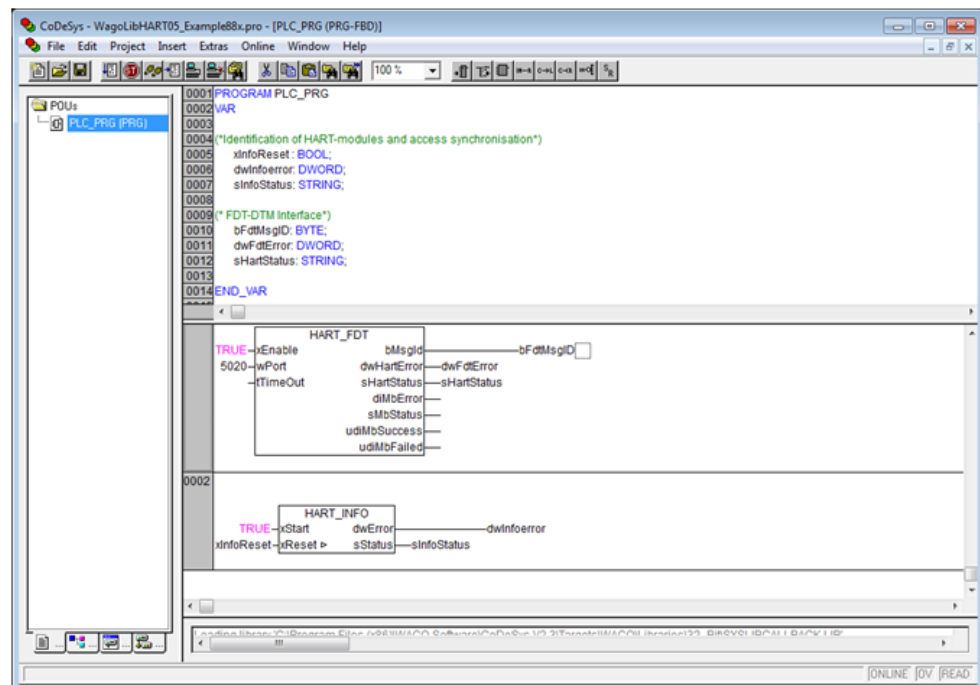


Figure 31: Reducing to the Minimum Needed

The “HART_INFO” program identifies the connected HART sensors and synchronizes execution of the individual HART commands. The “dwError” and “sStatus” outputs show the current status.

The “HART_FDT” program only functions as a Modbus TCP/HART gateway. The input parameter is “tTimeout” can be used to specify when the FDT request is discarded. The “bMsgId” output displays the ID of the FDT request being processed.



Information

Note

If additional local HART commands are executed, then add the required HART_CMD function blocks to the program. For additional information, see the library “*WagoLibHART_05.lib*” or the corresponding manual.

5 Asset Management Configuration

5.1 Asset Management with WAGOframe

WAGOframe is an FDT/DTM frame application for configuration, diagnosis and updating of FDT-compliant field devices.

FDT/DTM is a manufacturer-independent concept for setting of parameters for field devices from different manufacturers using only a single program.

The phrase “Field Device Tool” (FDT) not only represents a concrete program, but also defines the interfaces that a program must deal with in order to cooperate with DTMs from different manufacturers.

A “Device Type Manager” (DTM) groups all the setting options for a field device (including graphic interfaces) into a single program that is executed in an FDT/DTM frame application.

In this section, you will see which settings in WAGOframe are necessary for the HART Tool routing via ETHERNET with the 750-820x or the 750-88x. The instructions apply equally to both project families.

1. Starting WAGOframe

Start the “WAGOframe” program using the icon on the desktop, or via “Start → Programs → WAGO Software → WAGOframe → WAGOframe.”

After starting, you can select either the “Point to Point Mode” or the “Expert Mode.” The “Point to Point Mode” was developed specially for the configuration of simple devices (such as WAGO's *JUMPFLEX*[®]).

Use [**Expert Mode**] to set the WAGO Controller parameters; then click [**Next**].

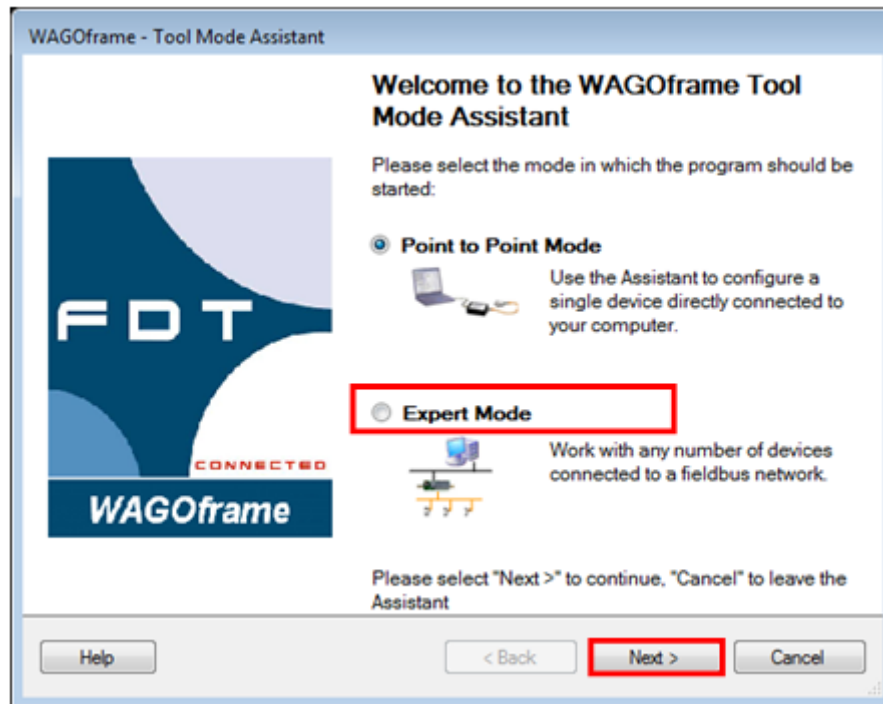


Figure 32: Expert Node

2. Automatically Creating/Updating Device Catalog

If this is the first time you are starting the program, no device catalogs have been created yet; confirm the automatic system with **[Yes]**.

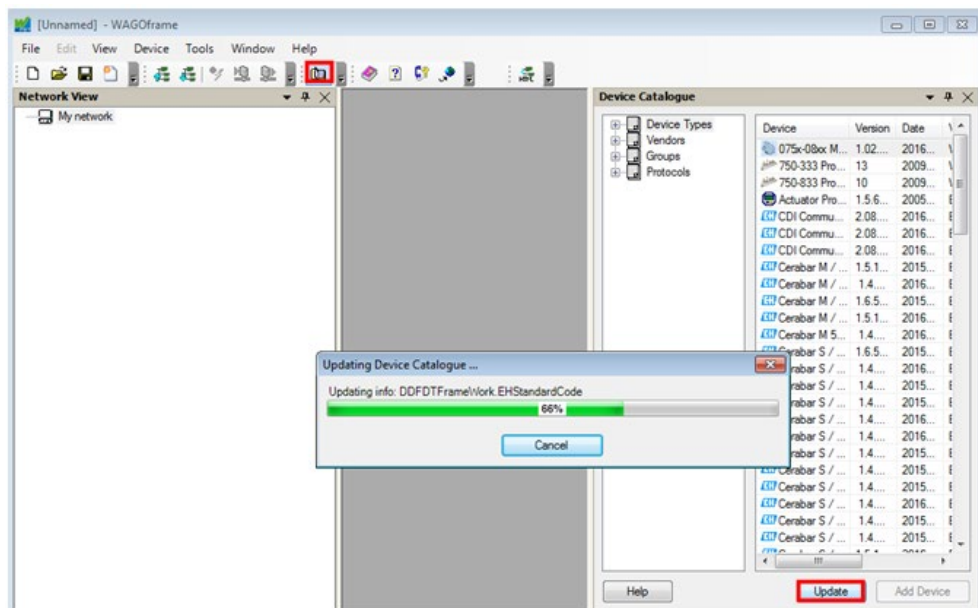


Figure 33: Confirm

If this is not the first time you are starting the program, the question appears after the device catalogs are automatically updated. This is because of the installation of the WAGO communication DTMs and the Endress+Hauser device DTM library during preparations. Confirm the question with **[Yes]**.

3. Adding WAGO Modbus TCP Communication

In the "Network View" window, mark the element **[My Network]** and select

the function **[Add...]** from the background menu (right-click).
A dialog showing all available communication drivers opens. Select **[WAGO Modbus TCP]**.

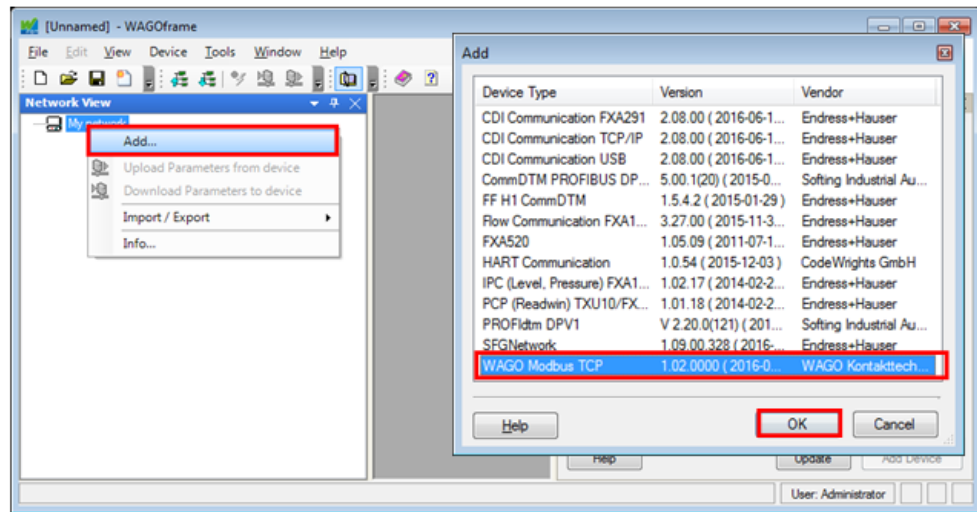


Figure 34: Adding WAGO Modbus TCP Communication

4. **Adding the WAGO HART/Modbus TCP Gateway**

In the “Network View” window, mark the element **[Modbus TCP_ DTM]** and select the function **[Add...]** from the background menu (right-click).
A dialog showing all available gateways opens. Select **[075x-08xx ModbusTCP/H..]**. This is independent of whether you selected a 750-820x or a 750-88x.

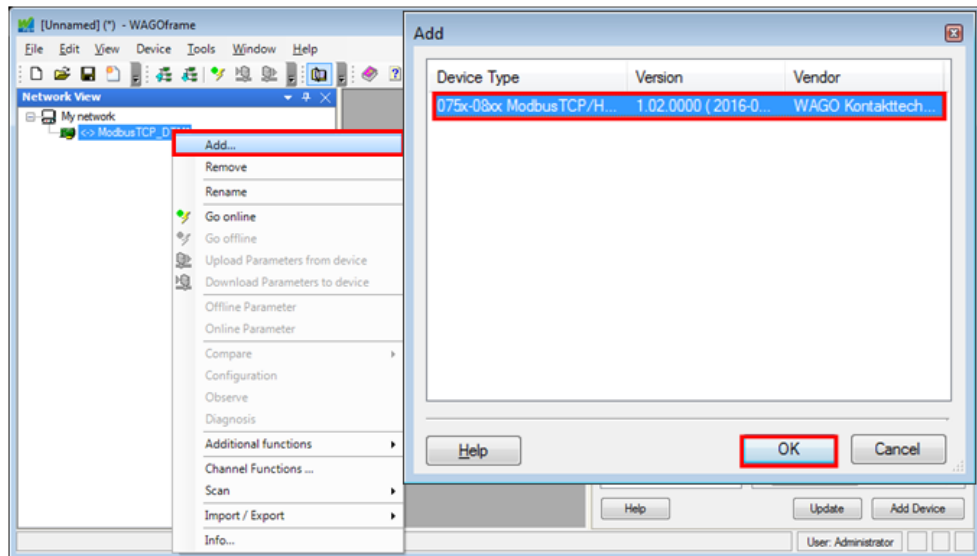


Figure 35: Adding the WAGO HART/Modbus TCP Gateway

5. **Selecting the WAGO HART/Modbus TCP Gateway DTM Parameters**

In the “Network View” window, mark the element **[ModbusCommChannel:0.0.0.0>075x-08xx DTM..]** and select the function **[Offline Parameters]** from the background menu (right-click).

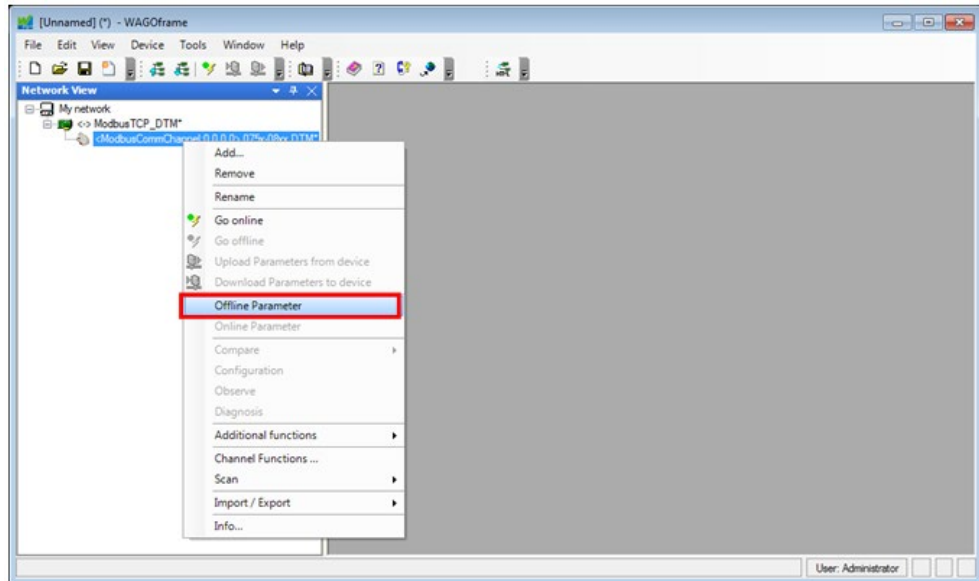


Figure 36: Offline Parameters

The device properties open. Enter the **IP address** of your controller. Check that the port number is set to **5020**. Deactivate the device check while the connection is established.

Also add the third slot for the HART Module (750-484). Save the parameters with **[OK]**.

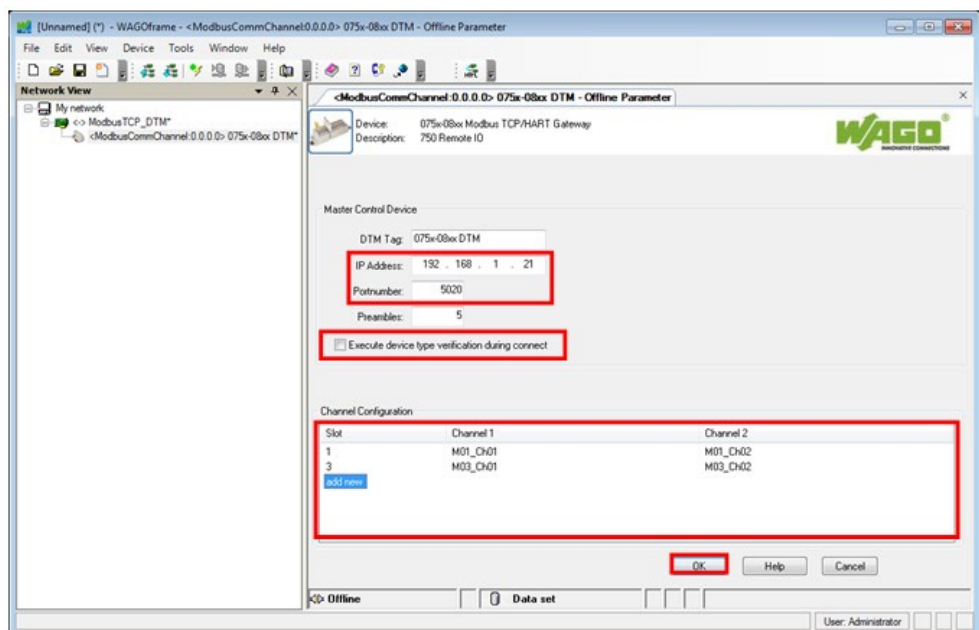


Figure 37: Adding Slot

Information



Note

As soon as you use more than one HART module, the channel configuration must be extended and all slots added (including any that no sensor is connected to).

6. **Adding HART Field Device DTM**

In the “Network View” window, mark the element **[ModbusCommChannel:192.168.1.21>075x-08xx DTM..]** and select the function **[Add...]** from the background menu (right-click). A dialog showing all available device DTMs opens. Now select the HART device you are using.

In this example, the Cerabar PMC51 is connected (Endress+Hauser HART sensor); therefore, **[Cerabar M5x /PMx 5x/V...]** is selected.

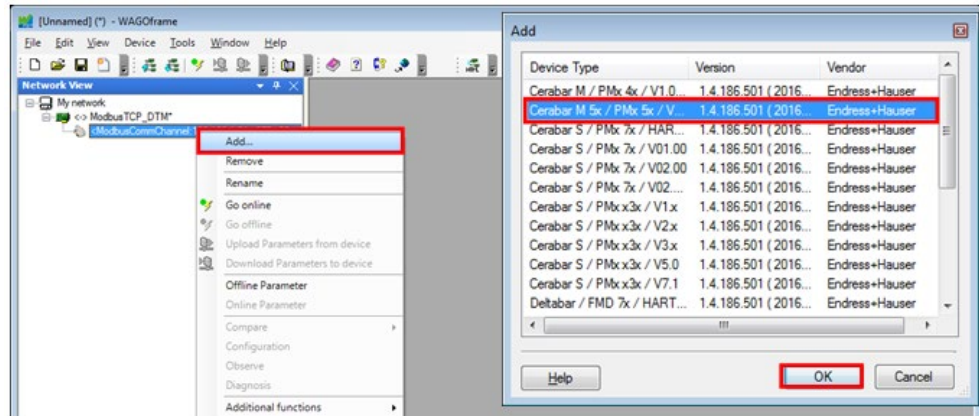


Figure 38: Adding HART Field Device DTM

Next, select the channel your field device is connected to.

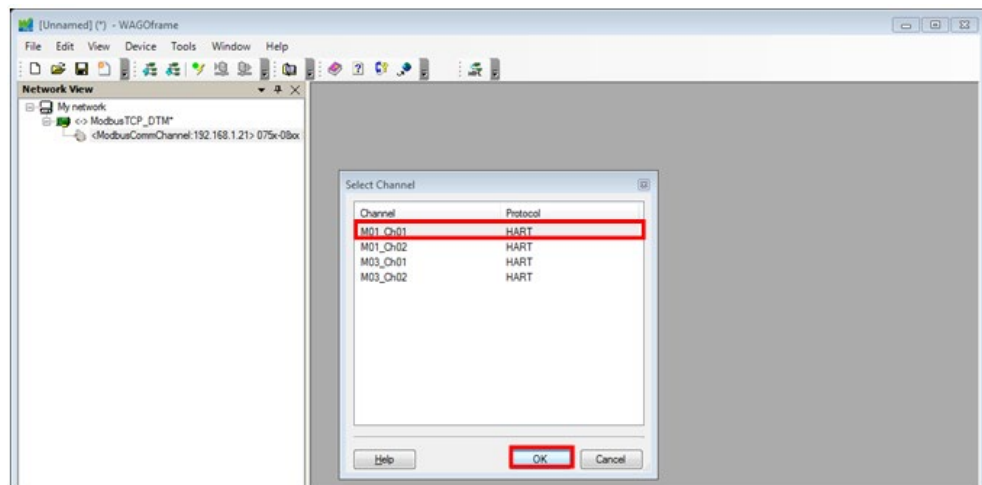


Figure 39: Selecting Channel

Information



Note

- M01_Ch01 → 750-482, HART connection 1
- M01_Ch02 → 750-482, HART connection 2
- M02 → 750-606, Ex i bus supply module**
- M03_Ch01 → 750-484, HART connection 1
- M03_Ch02 → 750-484, HART connection 2

7. Establish connection

In the “Network View” window, mark the element [**M01_Ch01:0**] and select the function [**Connect**] from the background menu (right-click).

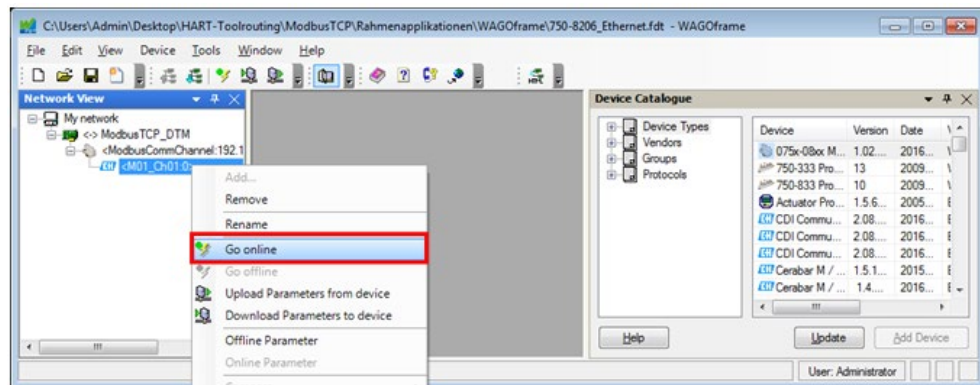


Figure 40: Establish Connection

Information



This completes the setup; now the different functions “Observe, Configuration, Diagnostics” and others can be used at any time.

8. “Observing” HART Sensor Measurement Values

In the “Network View” window, mark the element [**M01_Ch01:0**] and select the function [**Observe**] from the background menu (right-click).

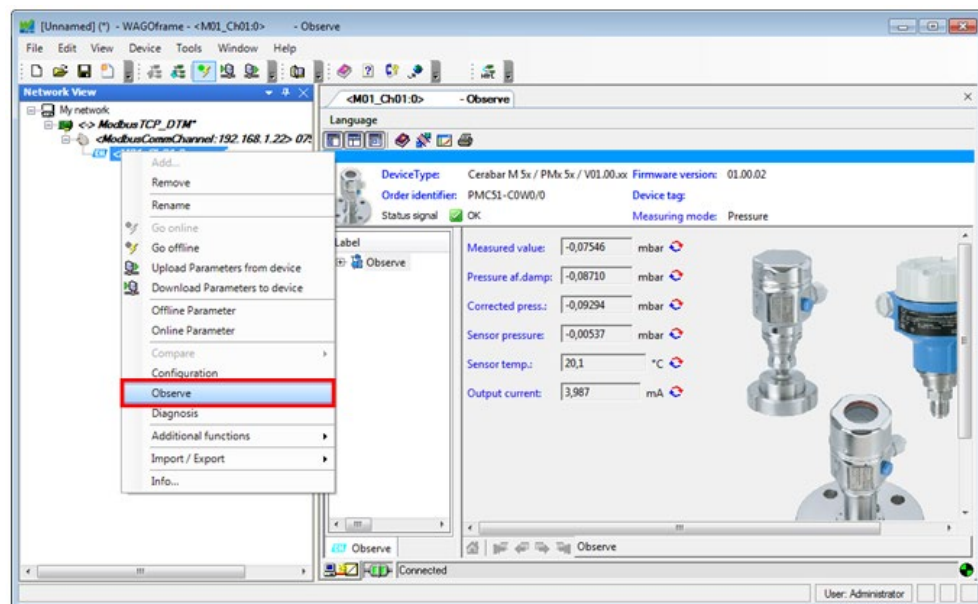


Figure 41: Observing

5.2 Asset Management with PACTware

PACTware is an FDT/DTM frame application for configuration, diagnosis and updating of FDT-compliant field devices.

FDT/DTM is a manufacturer-independent concept for setting of parameters for field devices from different manufacturers using only a single program.

The phrase “Field Device Tool” (FDT) not only represents a concrete program, but also defines the interfaces that a program must deal with in order to cooperate with DTMs from different manufacturers.

A “Device Type Manager” (DTM) groups all the setting options for a field device (including graphic interfaces) into a single program that is executed in an FDT/DTM frame application.

In this section, you will see which settings in PACTware are necessary for the HART Tool routing via ETHERNET with the 750-820x or the 750-88x. The instructions apply equally to both project families.

1. Starting PACTware

Start the “PACTware” program using the icon on the desktop, or via “Start → Programs → PACTware 5.0 → PACTware.”

2. Automatically Creating/Updating Device Catalog

If this is the first time you are starting the program, no device catalogs have been created yet; confirm the automatic system with **[Yes]**.

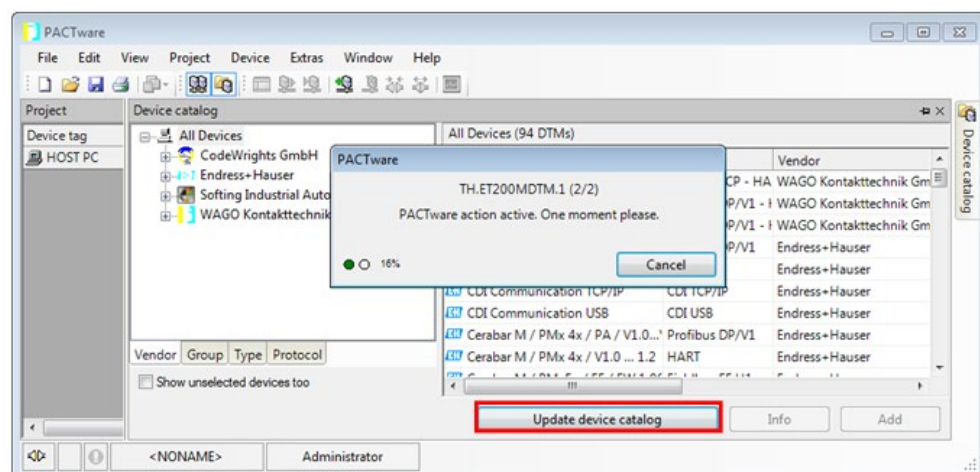


Figure 42: Confirm

If this is not the first time you are starting the program, the question appears after the device catalogs are automatically updated. This is because of the installation of the WAGO communication DTMs and the Endress+Hauser device DTM library during preparations. Confirm the question with **[Yes]**.

3. Adding WAGO Modbus TCP Communication

In the “Project” window, mark the element [HOST PC] and select the function [Add device] from the background menu (right-click).

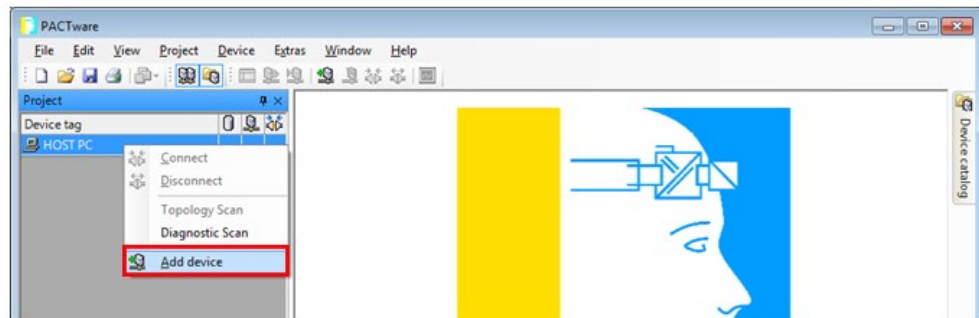


Figure 43: Adding Device

A dialog showing all available communication drivers opens. Select [WAGO Modbus TCP].

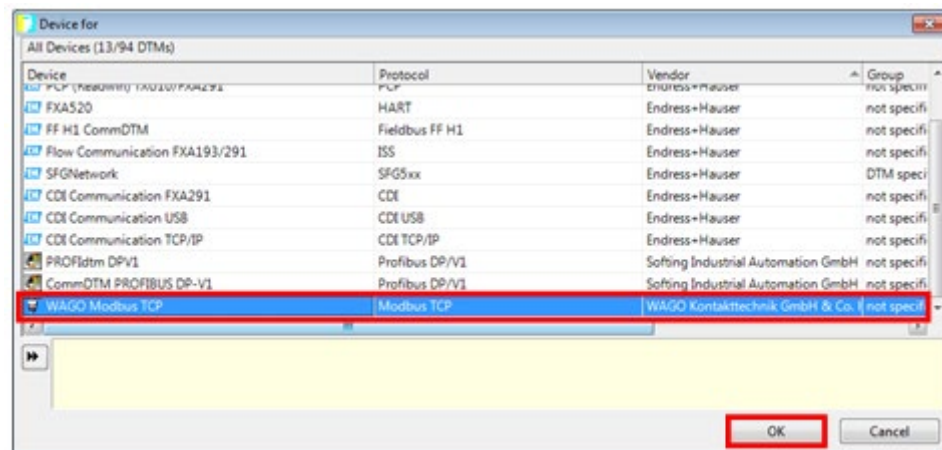


Figure 44: Selection

4. Adding the WAGO HART/Modbus TCP Gateway

In the “Project” window, mark the element [ModbusTCP_DTM] and select the function [Add device] from the background menu (right-click).

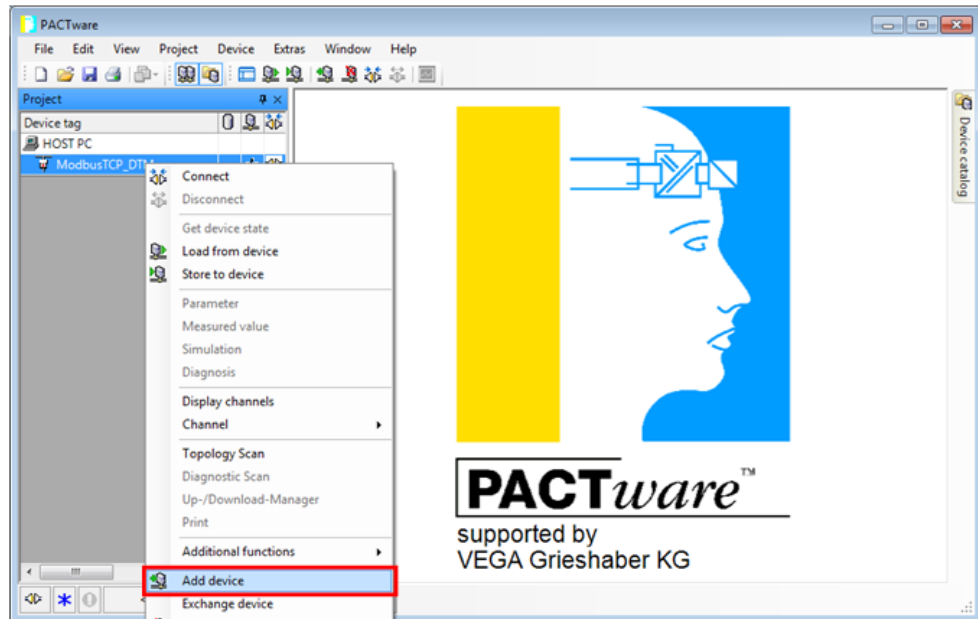


Figure 45: Adding Device

A dialog showing all available gateways opens.

Select **[075x-08xx Modbus TCP/HART Gateway]**. This is independent of whether you selected a 750-820x or a 750-88x.

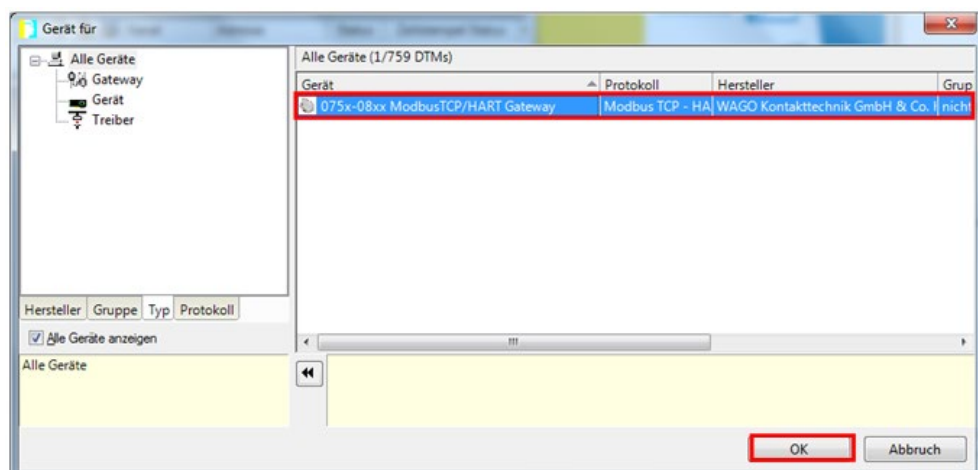


Figure 46: Selection

5. **Setting the WAGO HART/Modbus TCP Gateway DTM Parameters**

In the “Project” window, mark the element **[0750x-08xx DTM]** and select the function **[Parameter]** from the background menu (right-click).

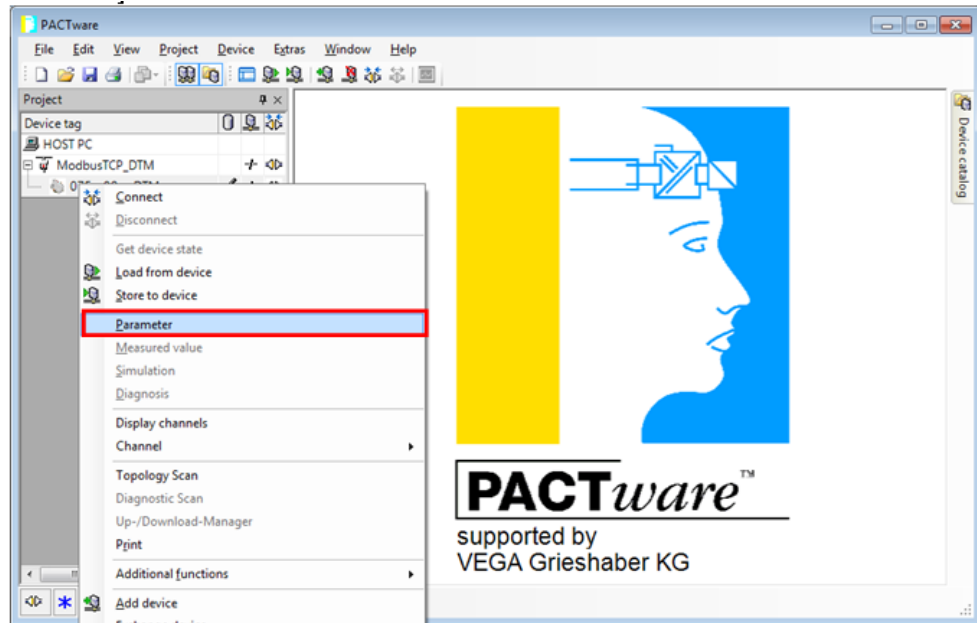


Figure 47: Setting Parameters

The device properties open. Enter the **IP address** of your controller. Check that the port number is set to **5020**.

Deactivate the device check while the connection is established. Also add the third slot for the HART Module (750-484). Save the parameters with **[OK]**.

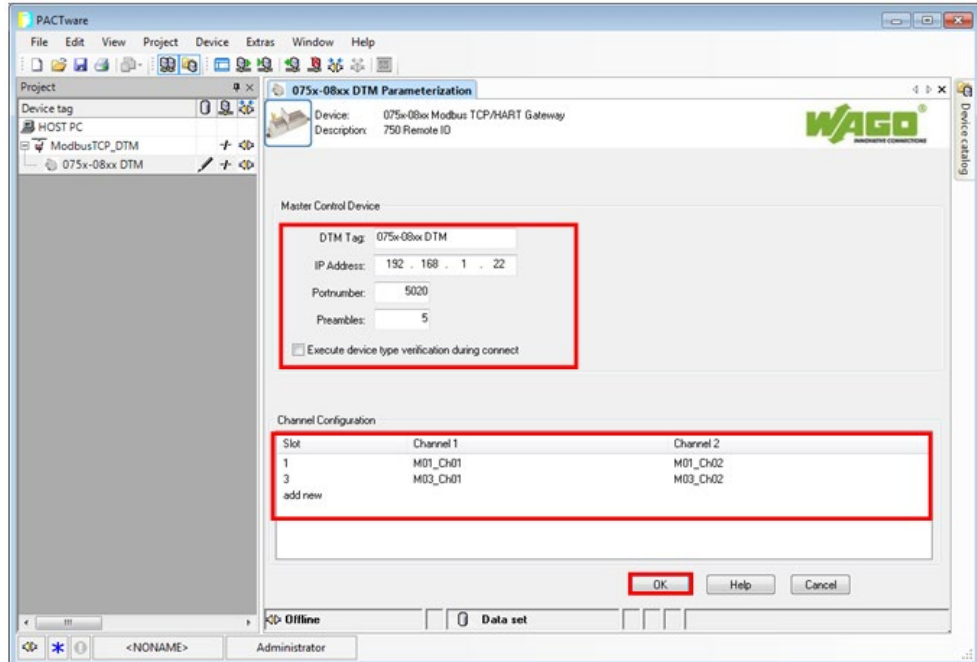


Figure 48: Saving Parameters

Information



Note

As soon as you use more than one HART module, the channel configuration must be extended and all slots added (including any that no sensor is connected to).

6. Adding HART Field Device DTM

In the “Project” window, mark the element **[075x-08xx DTM...]** and select the function **[Add device]** from the background menu (right-click).

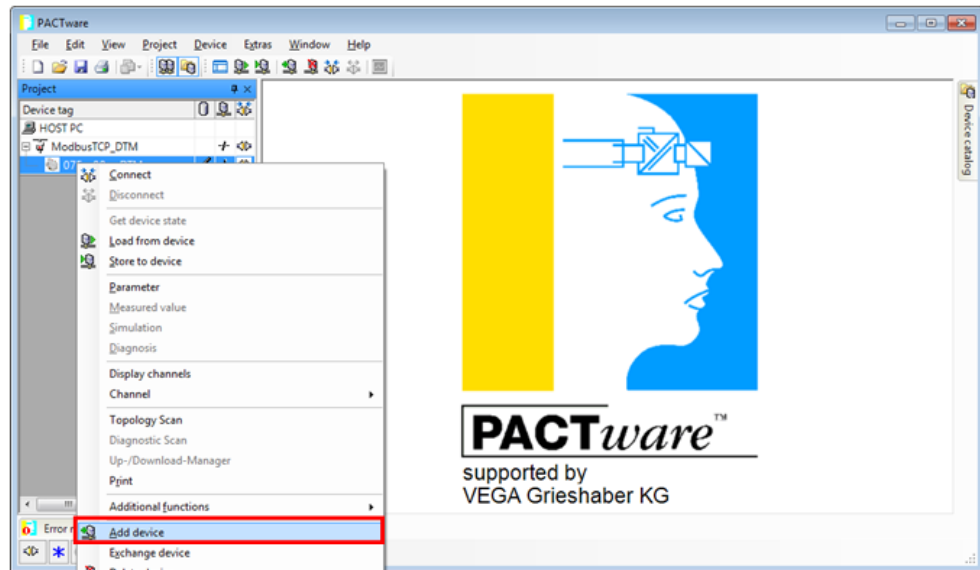


Figure 49: Adding Device

A dialog showing all available device DTMs opens. Now select the HART device you are using.

In this example, the Cerabar PMC51 is connected (Endress+Hauser HART sensor); therefore, **[Cerabar M5x /PMx 5x/V...]** is selected.

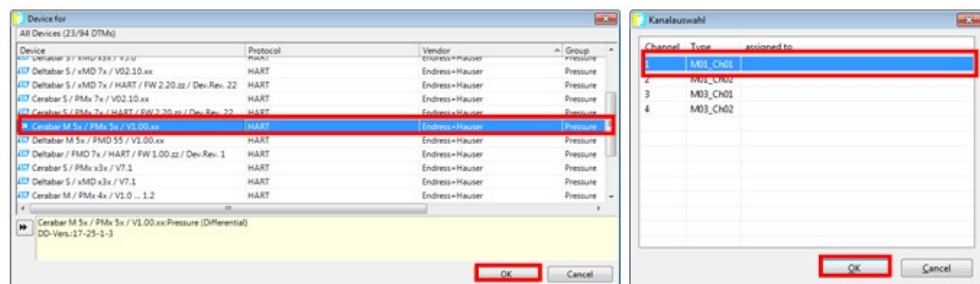


Figure 50: Selection

Next, select the channel your field device is connected to.

Information



Note:

M01_Ch01 → 750-482, HART connection 1

M01_Ch02 → 750-482, HART connection 2

M02 → 750-606, Ex i bus supply module

M03_Ch01 → 750-484, HART connection 1

M03_Ch02 → 750-484, HART connection 2

7. Establish connection

In the “Project” window, mark the element [**M01_Ch01:0**] and select the function [**Connect**] from the background menu (right-click).

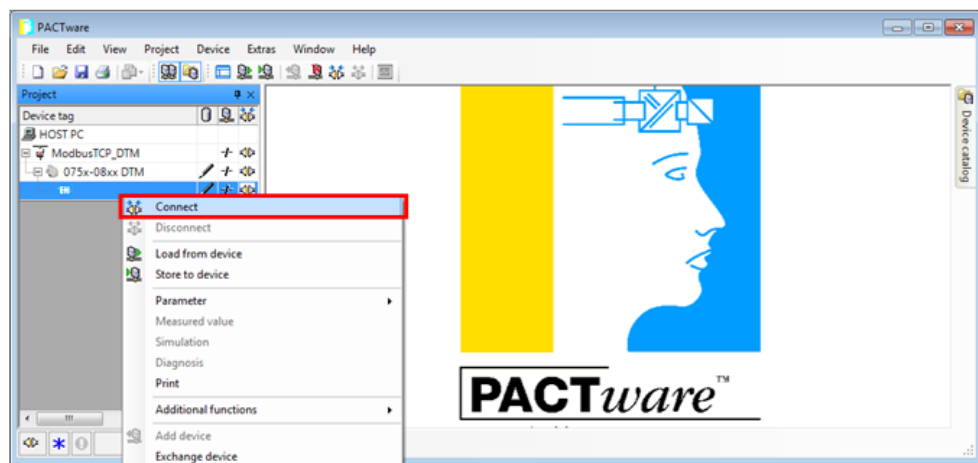


Figure 51: Establish Connection

Information



This completes the setup; now the different functions “Observe, Configuration, Diagnostics” and others can be used at any time.

8. “Observing” HART Sensor Measurement Values

In the “Project” window, mark the element [**M01_Ch01:0**] and select the function [**Measured value**] from the background menu (right-click).

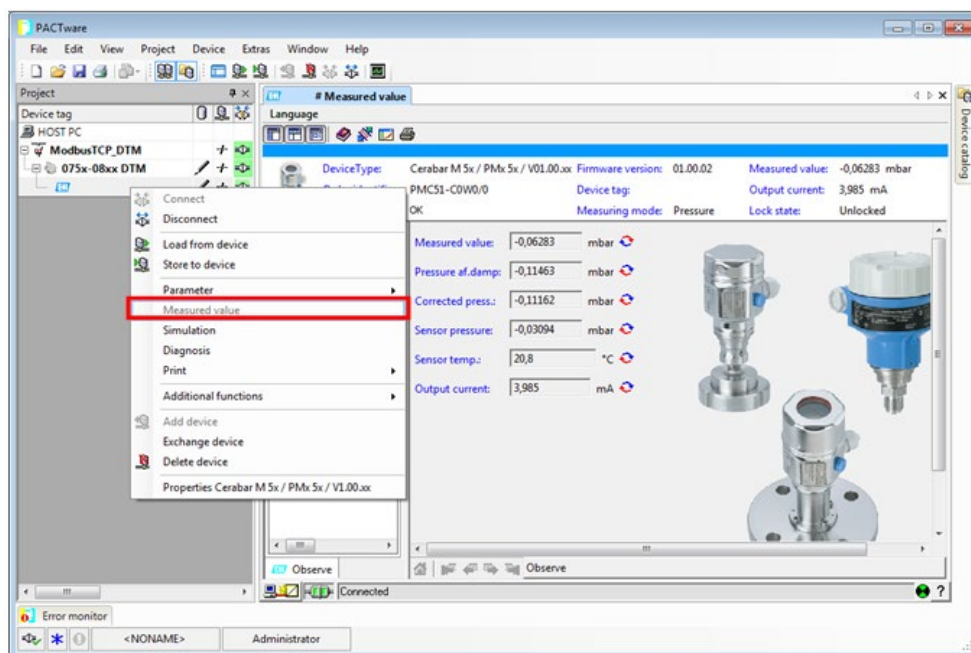


Figure 52: Selecting Function

5.3 Asset Management with FieldCare

FieldCare is an FDT/DTM frame application for configuration, diagnosis and updating of FDT-compliant field devices.

FDT/DTM is a manufacturer-independent concept for setting of parameters for field devices from different manufacturers using only a single program.

The phrase “Field Device Tool” (FDT) not only represents a concrete program, but also defines the interfaces that a program must deal with in order to cooperate with +DTMs from different manufacturers.

A "Device Type Manager"(DTM) groups all the setting options for a field device (including graphic interfaces) into a single program that is executed in an FDT/DTM frame application.

In this section, you will see which settings in FieldCare are necessary for the HART Tool routing via ETHERNET with the 750-820x or the 750-88x. The instructions apply equally to both project families.

1. Starting FieldCare

Start the “FieldCare” program using the icon on the desktop, or via “Start → Programs → Endress+Hauser → FieldCare SFE500 → FieldCare SFE500.”

After the start, you can select between different start options. Select **[Create Project]**.

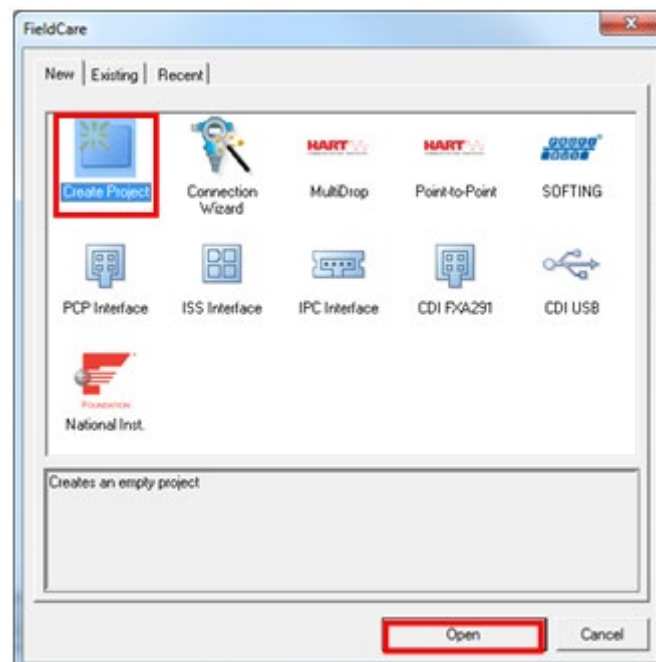


Figure 53: Creating Project

2. Automatically Creating/Updating Device Catalog

If this is the first time you are starting the program, no device catalogs have been created yet; confirm the automatic system with **[Yes]**.

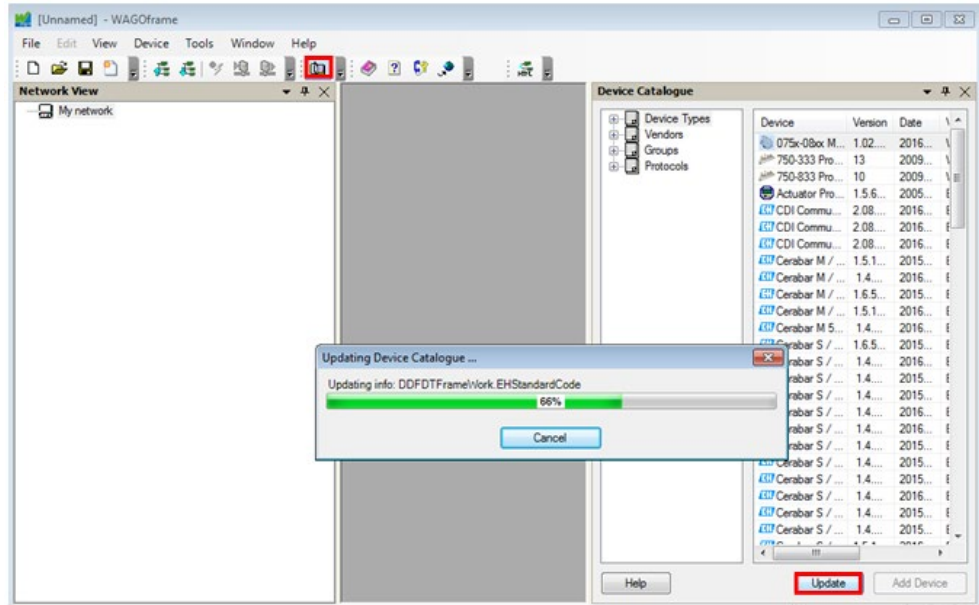


Figure 54: Confirming

If this is not the first time you are starting the program, the question appears after the device catalogs are automatically updated. This is because of the installation of the WAGO communication DTMs and the Endress+Hauser device DTM library during preparations. Confirm the question with **[Yes]**.

3. Adding WAGO Modbus TCP Communication

In the "Network" window, mark the element **[Host PC]** and select the function **[Add Device...]** from the background menu (right-click).

A dialog showing all available communication drivers opens. Select **[WAGO Modbus TCP]**.

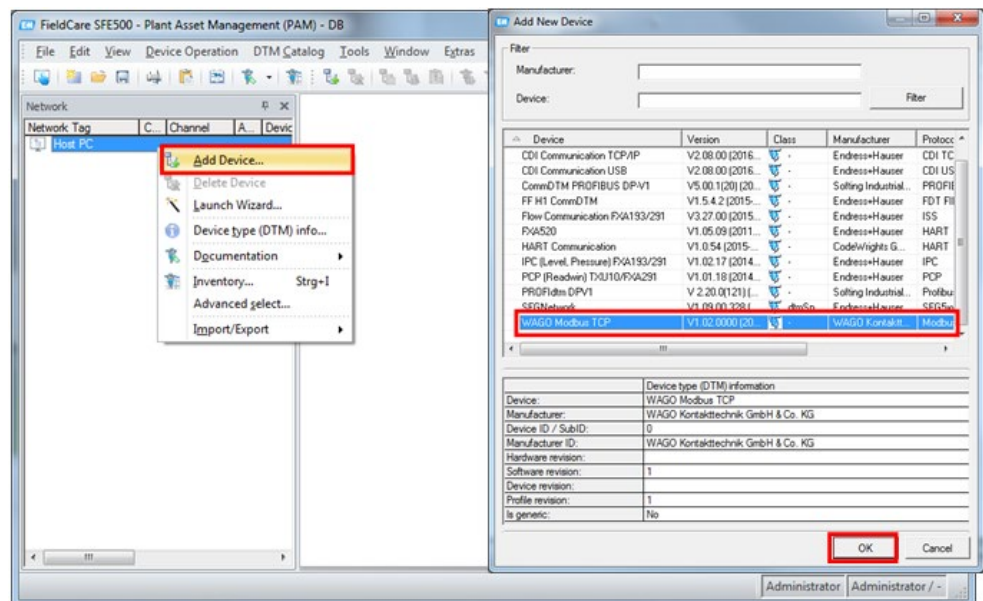


Figure 55: Communication Driver Selection

4. Adding the WAGO HART/Modbus TCP Gateway

In the "Network" window, mark the element **[WAGO-Modbus TCP]** and

select the function **[Add Device...]** from the background menu (right-click).

A dialog showing all available gateways opens. Select **[075x-08xx Modbus TCP/HART Gateway]**. This is independent of whether you selected a 750-820x or a 750-88x.

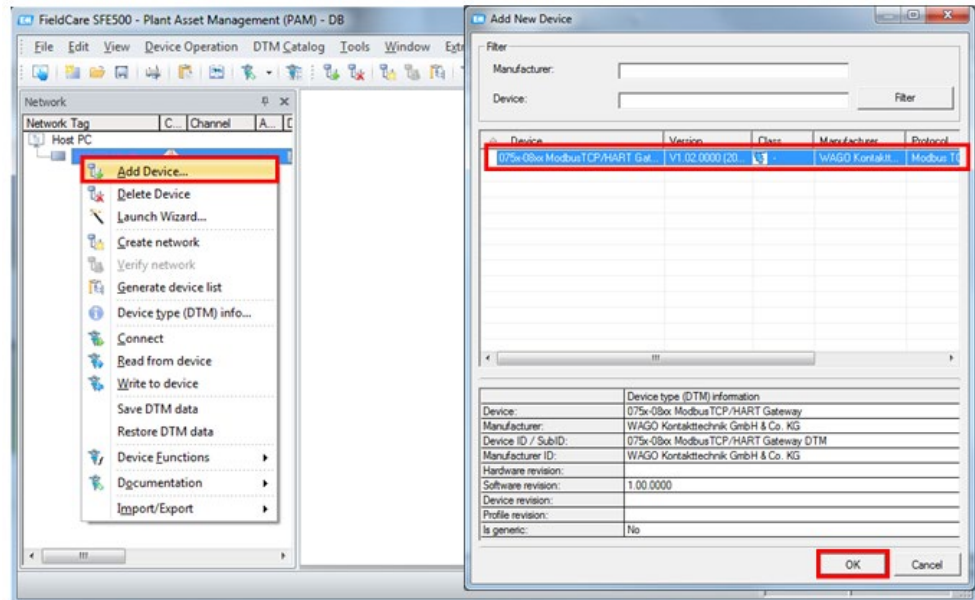


Figure 56: Gateway Selection

5. **Setting the WAGO HART/Modbus TCP Gateway DTM Parameter**
In the “Network” window, mark the element **[0750x-08xx Modbus TCP/HART]** and select the function **[Device Functions] → [Offline Parameters]** from the background menu (right-click).

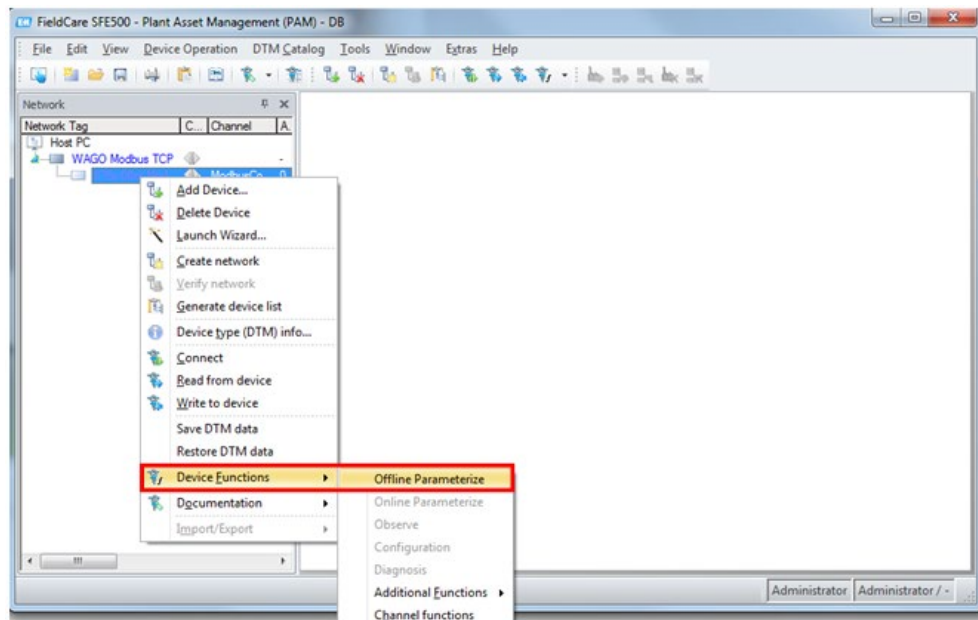


Figure 57: Function Selection

The device properties open. Enter the **IP address** of your controller. Check that the port number is set to **5020**. Deactivate the device check while the connection is established.

Also add the third slot for the HART Module (750-484).
Save the parameters with **[OK]**.

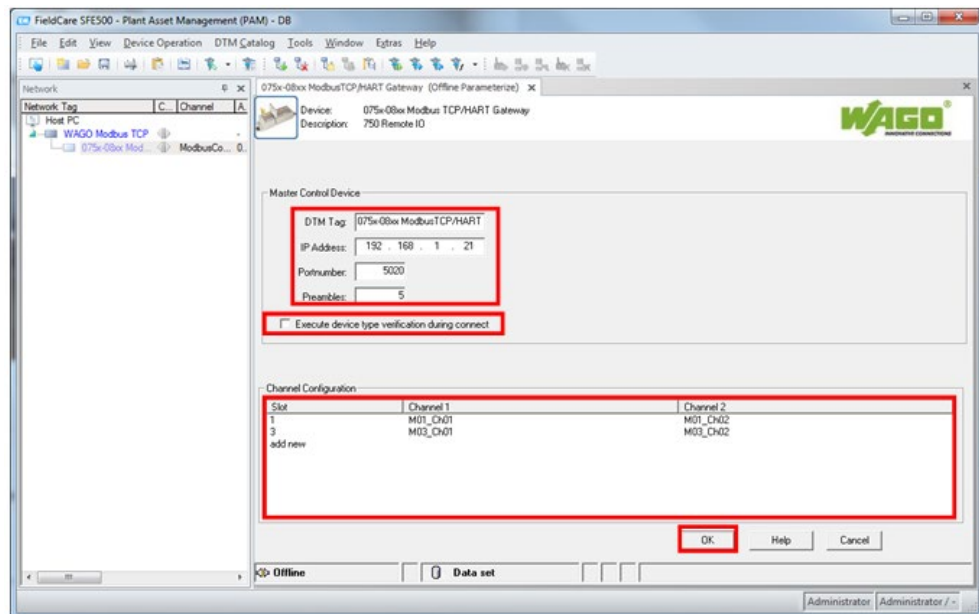


Figure 58: Saving Parameters

Information



Note

As soon as you use more than one HART module, the channel configuration must be extended and all slots added (including any that no sensor is connected to).

6. Adding HART Field Device DTM

In the “Network” window, mark the element **[0750x-08xx Modbus TCP/HART]** and select the function **[Add device]** from the background menu (right-click).

A dialog showing all available device DTMs opens.

Now select the HART device you are using.

In this example, the Cerabar PMC51 is connected (Endress+Hauser HART sensor); therefore, **[Cerabar M5x /PMx 5x/V...]** is selected.

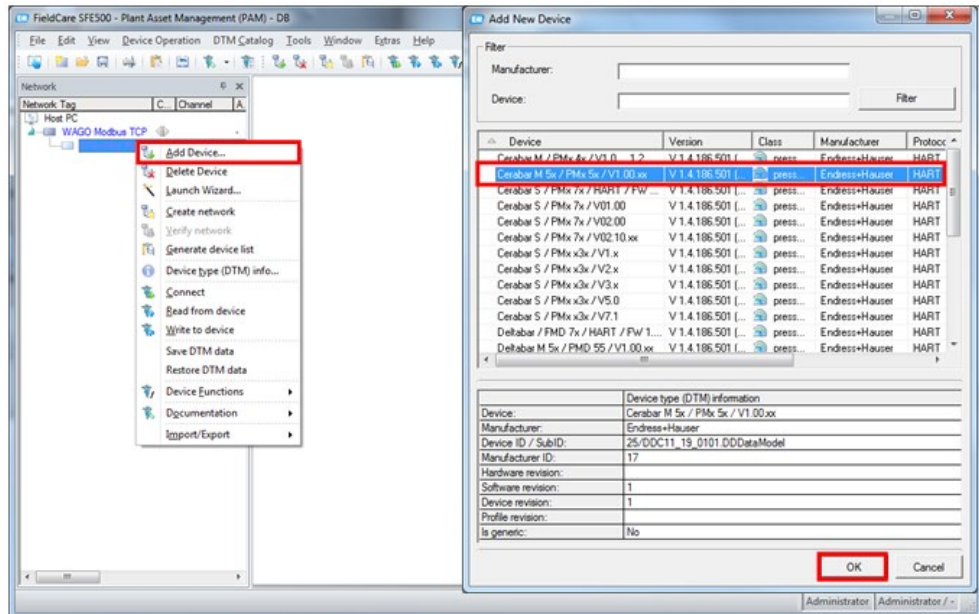


Figure 59: Adding DTM

Next, select the channel your field device is connected to.

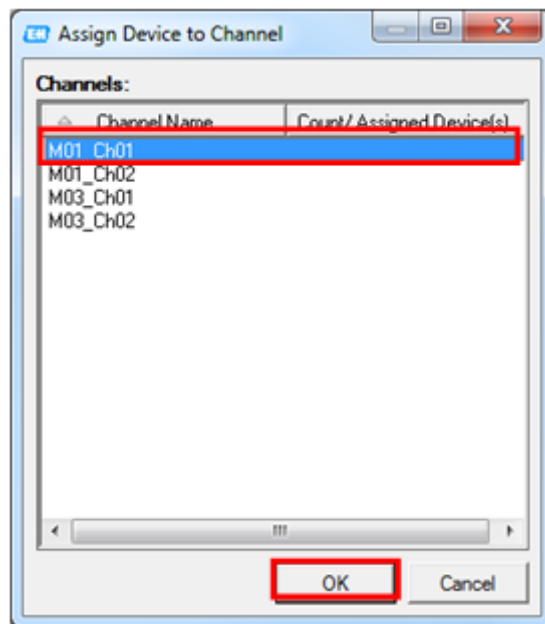


Figure 60: Channel Selection

Information



Note:

- M01_Ch01 → 750-482, HART connection 1
- M01_Ch02 → 750-482, HART connection 2
- M02 → 750-606, Ex i bus supply module**
- M03_Ch01 → 750-484, HART connection 1
- M03_Ch02 → 750-484, HART connection 2

7. **Establish connection**

In the “Network” window, mark the element **[M01_Ch01]** and select the function **[Connect]** from the menu.

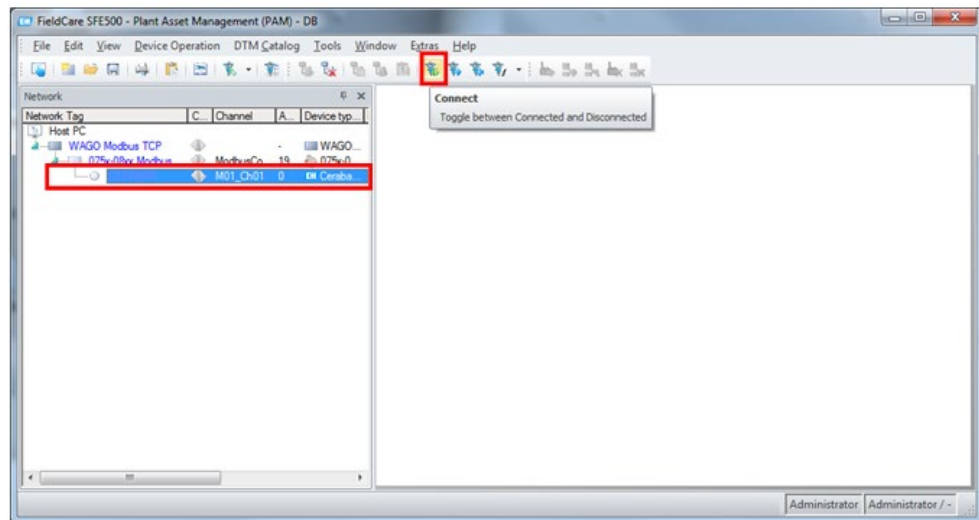


Figure 61: Establish connection

Information



This completes the setup; now the different functions “Observe, Configuration, Diagnostics” and others can be used at any time.

8. **“Observing” HART Sensor Measurement Values**

In the “Network” window, mark the element **[M01_Ch01:0]** and select the function **[Device Functions] → [Observe]** from the background menu (right-click).

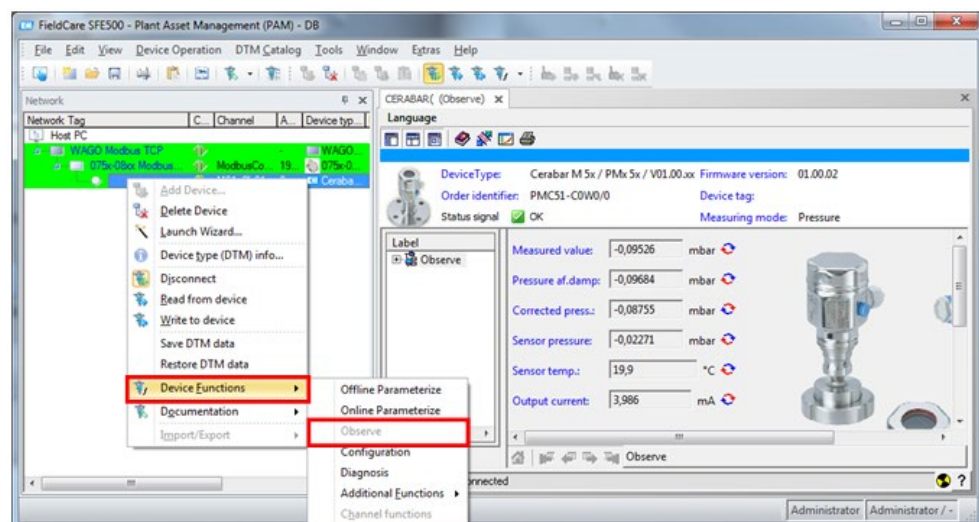


Figure 62: Function Selection

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WAGO Kontakttechnik GmbH & Co. KG
Postfach 2880 • D - 32385 Minden
Hansastraße 27 • D - 32423 Minden
Phone: +49 571 887 – 0
Fax: +49 571 887 – 844169
E-Mail: info@wago.com
Internet: www.wago.com