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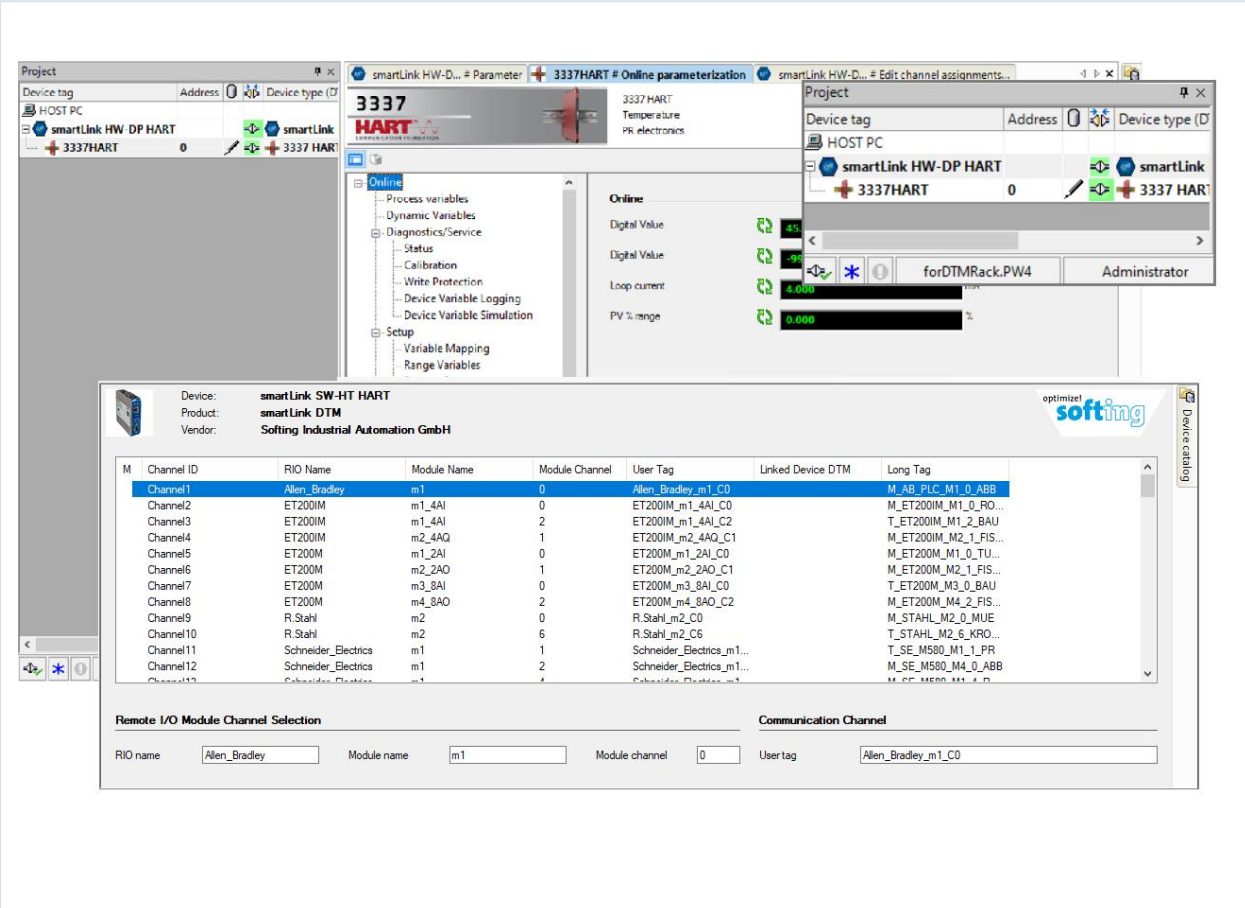
User Guide

# smartLink DTM




Version: EN-052023-1.10

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**Softing Industrial Automation GmbH**

Richard-Reitzner-Allee 6
85540 Haar / Germany
https://industrial.softing.com

+ 49 89 4 56 56-340

info.automation@softing.com
support.automation@softing.com

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# Table of Contents

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# 1 About this guide

## 1.1 Read me first

Please read this guide carefully before using the device to ensure safe and proper use. Softing does not assume any liability for damages due to improper installation or operation of this product.

This document is not warranted to be error-free. The information contained in this document is subject to change without prior notice. To obtain the most current version of this guide, visit the product website.

## 1.2 Target audience

This guide is intended for experienced operation personnel and network specialists responsible for configuring and maintaining field devices in process automation networks. Before installing and operating the smartLink DTM make sure that you have read and fully understood the safety requirements and working instructions in this guide.

## 1.3 Typographic conventions

The following conventions are used throughout Softing customer documentation:

| | |
|---|---|
| Keys, buttons, menu items, commands and other elements involving user interaction are set in bold font and menu sequences are separated by an arrow | Open **Start** → **Control Panel** → **Programs** |
| Buttons from the user interface are enclosed in brackets and set to bold typeface | Press **[Start]** to start the application |
| Coding samples, file extracts and screen output is set in Courier font type | `MaxDlsapAddressSupported=23` |
| Filenames and directories are written in italic | Device description files are located in *C:\<Application name>\delivery\software\Device Description files* |

**CAUTION**

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in damage or injury.

**Note**

This symbol is used to call attention to notable information that should be followed during installation, use, or servicing of this device.

**Hint**

This symbol is used when providing you with helpful user hints.

## 1.4 Document history

| Document version | Changes since last version |
|---|---|
| 1.00 | first version |
| 1.10 | DTM description for smartLink SW-HT added |

## 1.5 Related documentation and videos

See the following links for additional and related product information:

- smartLink HW-DP User Guide
- smartLink SW-HT User Guide

## 1.6 Document feedback

We would like to encourage you to provide feedback and comments to help us improve the documentation. You can write your comments and suggestions to the PDF file using the editing tool in Adobe Reader and email your feedback to support.automation@softing.com.

If you prefer to write your feedback directly as an email, please include the following information with your comments:

- document name
- document version (as shown on cover page)
- page number

# 2 About smartLink DTM

## 2.1 Intended use

The smartLink DTM tool is used to configure, diagnose and maintain HART field devices that are connected to smartLink via Remote I/Os (RIOs). This chapter describes the application scenarios and functionality of this tool including the relevant Field Device Tool (FDT) and HART technologies. Any other use is deemed non-intended use.

## 2.2 Software and functionality

smartLink DTM takes over the entire protocol and device-specific management for communicating with HART devices via the corresponding Softing smartLink.

**Note**

To grant smartLink unrestricted communication with HART devices, you must first activate the optionally available licenses for smartLink and update its firmware to at least version 1.10. For more information see the smartLink HW-DP and smartLink SW-HT user guides.

Using the smartLink DTM you can parameterize and diagnose any number of HART devices. Please note that suitable DeviceDTMs are required to parameterize the devices. These DeviceDTMs are typically provided by the device manufacturer.

The smartLink DTM offers the following functionality:

- Configuration of access parameters for individual smartLink devices.
- Assignment of channels for the HART devices connected to the smartLink.
- Access to HART devices via smartLink.
- Selection of the Remote I/O module channels connecting to HART devices.
- Internationalization (UTF8) and localization for English and German.
- Control of access to critical functions according to the FDT user role concept.
- Logging of audit trail events (must be supported by the FDT frame application).
- Documentation of the smartLink access parameters.

## 2.3 What is a Field Device Tool

The Field Device Tool (FDT) is a standard communication protocol used in industrial automation to communicate with field devices. FDT simplifies and saves time in the commissioning and maintenance of increasingly complex installations which consist of a growing number of field devices from different manufacturers. FDT is a standardized software interface for the configuration, parameterization and handling of intelligent field devices, regardless of the manufacturer and communication protocol. FDT is based on the existing fieldbus technologies and extends them by a fieldbus-independent software interface between the devices and the engineering system. The most diverse automation components from various manufacturers can thus be configured, parameterized and managed using only one engineering system, independently of the protocols or fieldbuses over which the devices communicate. To make the devices easy to commission and handle, FDT defines a wide variety of graphical options for describing and operating the devices. FDT offers different user roles and defines specific access rights, e.g. for maintenance, commissioning, monitoring, etc.

## 2.4 What is a Device Type Manager

The central component of a Field Device Tool (FDT) is the Device Type Manager. Known as DTM, this software component is supplied by a device manufacturer together with the device. It is somewhat like a software driver for a specific printer. It contains all device-specific data, functions and graphical controls. DTMs are used in industrial automation and process control systems to manage communication and configuration of field devices such as sensors, actuators, controllers, and other industrial devices. These devices typically communicate using protocols such as HART (Highway Addressable Remote Transducer), FOUNDATION Fieldbus, PROFIBUS (Process Field Bus), or other industrial communication protocols. A Device Type Manager provides the interface between the field devices and the automation system, allowing for configuration, monitoring, and control of these devices.

There are three types of DTMs:

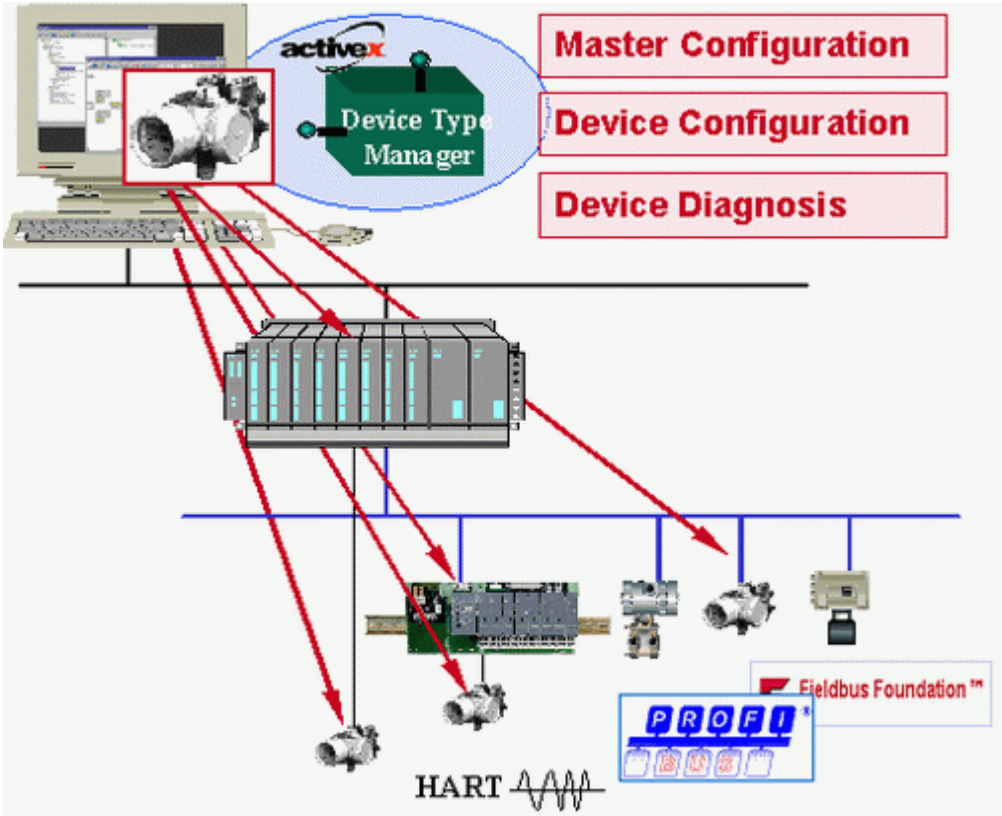
- **DeviceDTM**
  The DeviceDTM is a DTM that represents a specific field device. It contains all the information on configuration, diagnostics and documentation that is distinctive for the device. To make all the desired functions of the device available in the engineering system, the DTM uses the communication services of a CommDTM or GatewayDTM. A DeviceDTM is often simply called a DTM. This should be avoided because the term DTM is a generic term for all kinds of DTMs.

- **CommDTM**
  The CommDTM (communication DTM) is a DTM that represents a communication device, such as a PC interface board, which acts as a master on a fieldbus network. The CommDTM encapsulates all communication-specific aspects, and manages and configures the communication module (e.g. PC interface board).
  To configure and test a device, the relevant DeviceDTM transmits communication requests as XML documents via a COM interface to a communication channel of the CommDTM. A communication channel represents the fieldbus access within a communication device. The communication device may provide one or more communication channels.

- **GatewayDTM**
  A GatewayDTM is a DTM that represents a physical gateway between two fieldbus segments. The fieldbus segments typically differ in the protocol (e.g. HART/PROFIBUS) and/or the physical properties. A GatewayDTM contains functionality that is specific to the bridged communication protocols and to the manufacturer-dependent gateway properties.

  To configure and test a field device on the target segment of the gateway (the segment behind a gateway from the point of view of the fieldbus access), the relevant DeviceDTM transmits communication requests as XML documents via a COM interface to a communication channel of the GatewayDTM. A communication channel represents a path between fieldbus segments within a physical gateway.

  The gateway may provide one or more communication channels. The GatewayDTM transforms the communication requests that are specific to the communication protocol used by the device into communication requests according to the fieldbus access. It then passes them on to the CommDTM. Communication across segment boundaries by using a GatewayDTM is referred to as *nested communication*.




Fieldbus-independent FDT concept

## 2.5 What is a frame application

An FDT (Field Device Tool) frame application is a software that provides a platform or framework for configuring, managing, diagnosing, and monitoring field devices in industrial automation and control systems. It allows you to import device information by accessing the relevant DTMs provided by the device manufacturer. An FDT frame application is the only application within the FDT concept which is implemented as an executable. It is application is responsible for loading and unloading the DTMs, managing and saving data in a project database, managing a device catalog, generating a project documentation, supervising user and access rights, and displaying all user interfaces of the DTMs.

There are a number of FDT frame applications on the market each offering a different user interface structure and visualization. For the sake of consistency, this user guide describes the integration of the smartLink DTM and connection the Softing smartLink instances using the frame application **PACTware**™ .

## 2.6 HART

HART (Highway Addressable Remote Transducer) is a two-way communication protocol designed for field devices in process automation using a 4-20mA analog signal. HART provides digital communication capabilities over the analog current loop by superimposing digital signals on top of the analog signal. It can be used to parameterise, diagnose and poll process values.

The HART protocol implements OSI layers 1 (physical layer), 2 (data link layer) and 7 (application layer). The HART Physical Layer defines the electrical connection between HART devices, typically on twisted copper cables which transmit the 4-20mA analog signal of the device. For transmitting the HART bit stream a high frequency signal is superimposed on the analog signal is using the Continuous Phase Frequency Shift Keying (CPFSK) principle where the bit values of 0 and 1 are represented by different frequencies without causing phase jumps during frequency switching. The data transmission rate is 1200 bps. To synchronize transmitter and receiver preambles are added to the Physical Layer.

The Data Link Layer deals mostly with the structure of the data packets, device addressing, error correction and bus access control. Insofar, HART is a binary byte-oriented master-slave protocol on which bus access is organized by the token-passing method. Device addressing is done either by using a polling address that can be individually assigned to a slave (field device) or by a specific bit address which is a unique identifier permanently set by the device manufacturer. With HART you can have to masters.

The primary master is normally the control system master while the secondary master is used only when required, typically by a temporarily connected hand-held communicator such as the smartLink device. The token-passing protocol communicates between both masters to control the bus access. During normal operation the slaves do not have an active role. They may, however, be used in what is called burst mode communication, a method where the slaves are instructed to continuous burst (broadcast) messages, thereby taking part in the token-passing communication.

The Application Layer handles through a serious of HART commands the generation (master) and processing (slave) of data packets. The HART commands are divided into three categories: The *Universal Commands* which must be supported by all slaves. The *Common Practice Commands* which even optional device manufacturers are encouraged to prioritize them over Device-Specific Commands. The *Device-Specific Commands* which include only device functions implemented by specific manufacturers.

# 3 Installing smartLink DTM

Before you can work with your smartLink you have to install the smartLink DTM. Download the smartLink DTM application from the Download Center or the smartLink HW-DP product page.

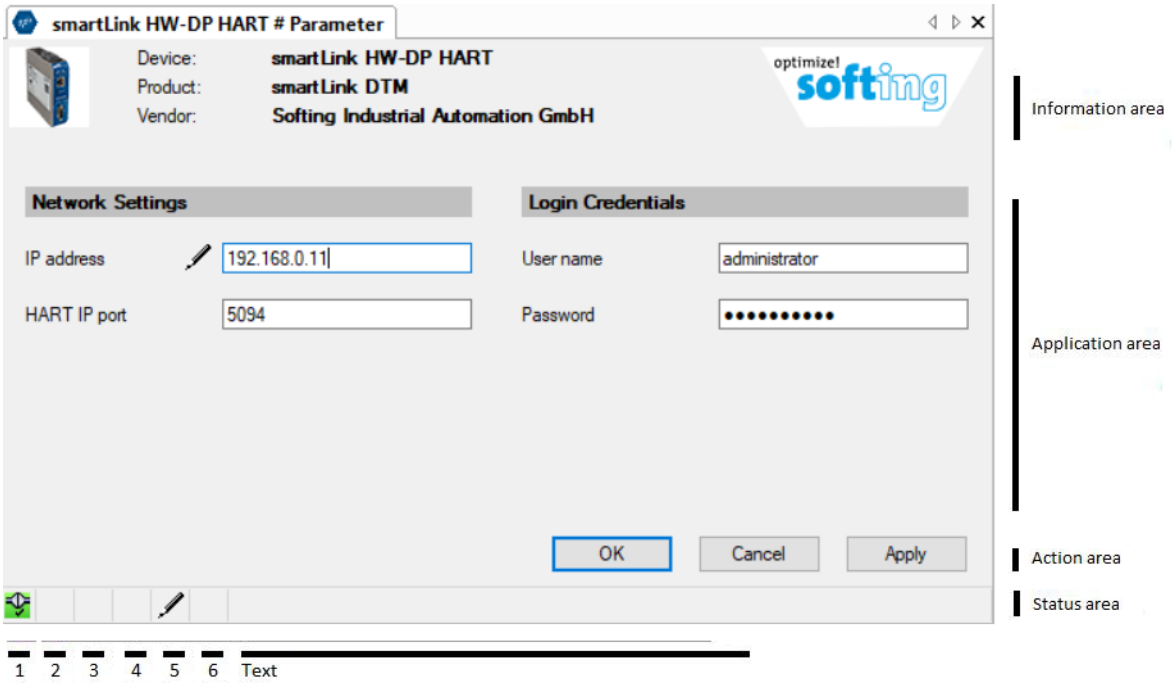
1. Download the latest version of the smartLink DTM.
2. Double-click the **setup.exe** file to start the installation.
3. Select the installation language.
4. Follow the install wizard instructions.

# 4 smartLink DTM user interface explained

The user interface of Softing smartLink DTM follows the basic design according to the FDT style guide. The Chapter gives you a general overview of the smartLink DTM user interface, its windows and functions in the FDT frame application PACTware.

**Note**

For a details on how to connect and configure Softing **smartLink HW-DP** and **smartLink SW-HT** nodes and parameterizing HART RIOs see the next chapter Using smartLink DTM 14.




- The **informations area** shows an image of a smartLink, the corporate logo and the names of the product, the device and the vendor.
- The **application area** shows the operational elements for the tasks that are performed in a user interface.
- The **action area** contains buttons to execute the main actions.
- The **status area** shows general status information about smartLink HART.

The optional navigation area described in the FDT style guide is not included in the smartLink DTM user interface.

## Status symbols

**Field 1** of the status area displays the following DTM status symbols:

The smartLink device is disconnected.

A connection has been established to smartLink and it is inactive. This state occurs only briefly when smartLink DTM is connected and disconnected. When smartLink DTM is connected it changes to an active connection right away. This state does not occur during normal operation.

A connection has been established to smartLink and it is active.

A connection to the smartLink changes from inactive to active.

A connection to the smartLink changes from active to inactive.

A smartLink connection has been disrupted.

**Field 2** of the status area shows the following communication states:

smartLink is currently not communicating.

smartLink is currently communicating.

**Field 3** typically shows the processing state of the instance dataset of the device dataset while field 4 shows if the instance dataset has been modified compare with the device dataset. Both fields are always empty, because smartLink HART does not have any device parameters.

**Field 5** area shows the input state as follows:

The current input values are unchanged and valid.

The current input values have been modified.

The current input values are invalid.

**Field 6** is always empty. It normally shows if the user interface operates in block mode or in direct mode. The smartLink DTM user interface always runs in block mode and this filed has to be empty according to the FDT style guide.

# 5 Using smartLink DTM

In this chapter you will learn how to work with smartLink DTM and read DeviceDTMs in an FDT frame application.

## 5.1 Starting FDT frame application

Like any DTM, smartLink DTM must be loaded into an FDT frame application. The services provided by smartLink DTM for communication with HART devices can be used to read DeviceDTMs running in the same FDT frame application.

The FDT frame applications of different manufacturers prioritize different tasks and objectives. Therefore, the design of the user interface, the functionality provided and the operation may also vary significantly from frame application to frame application. The following sections describes the **PACTware**™ frame application. If you are using a different frame application, consult the related user manual.

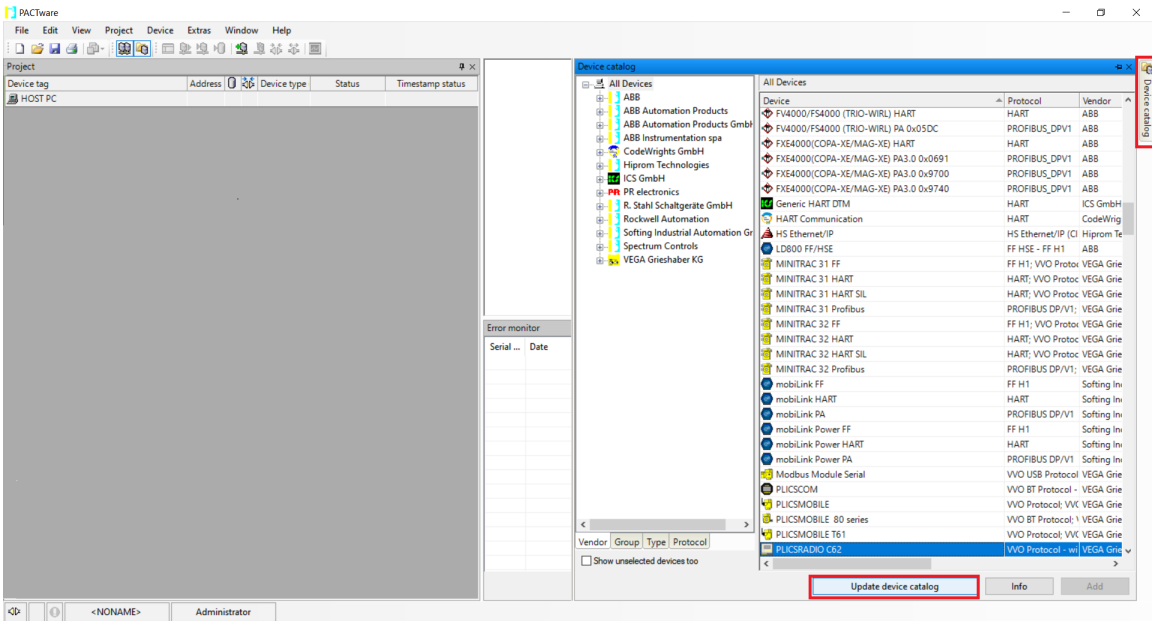
1. Select **Windows Start** → **PACTware 4.1** → **PACTware 4.1** to start the FDT frame application (in this case PACTware).
   With many frame applications you need to log on with your user name and password after initial startup. You may also have to create a new project before you can start adding DTMs.

   **Note**

   The local DTM device catalog is typically updated automatically. If however for whatever reason this is not done automatically you will need to update the device catalog manually.

2. Select **Device catalog** → **Update device catalog** to update the local device DTM to include the smartLink DTM (provided this is not done automatically).

The screenshot below shows the PACTware user interface immediately after startup displaying the device catalog. Remember that you have to update the device catalog after installing new DTMs to inform the frame application of the newly installed DTMs and the devices they support. This process is specific for the frame application you are using. Refer to the user manual of the frame application for the relevant information. If you are using PACTware, click **[Update device catalog]** in the device catalog.



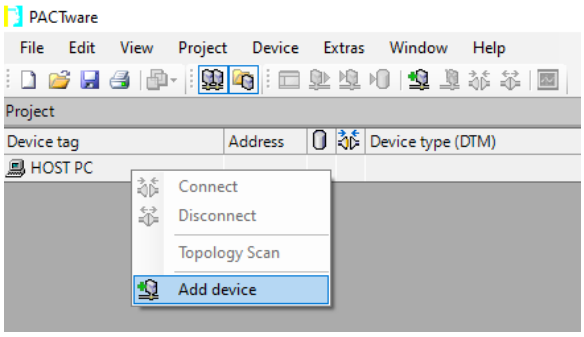

On the left side of the PACTware window you see the project view, which currently contains only the root node of the project. Devices are typically represented in a hierarchical tree structure in the project view of a frame application. The common root of all devices is often a node that represents the overall project instead of a device. The communication devices are shown as child nodes of this root. The field devices are represented as the leaves of the tree. There may be gateways connected between a communication device and field devices.

On the right side of the PACTware window you see the devices that are supported by the installed DTMs. In screenshot above you find various manufacturer listed in the device catalog.

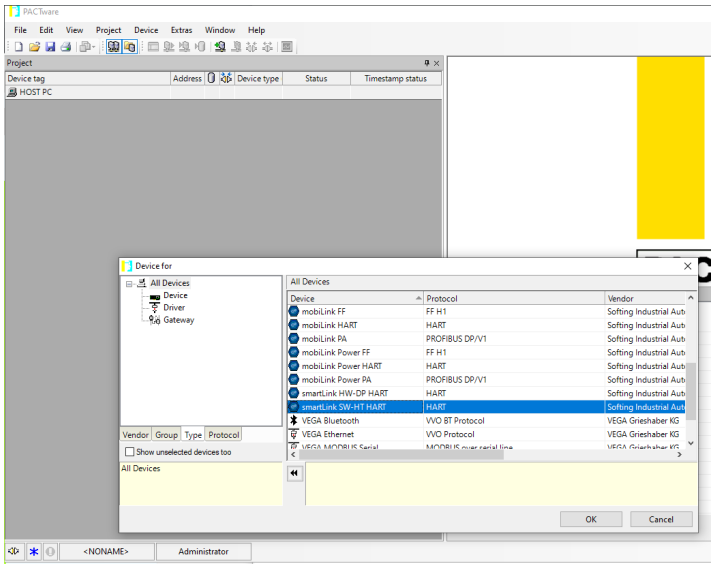
In the next section you will learn how to add a communication DTM for a smartLink to the project.

## 5.2 Adding a smartLink HW-DP or smartLink SW-HT HART

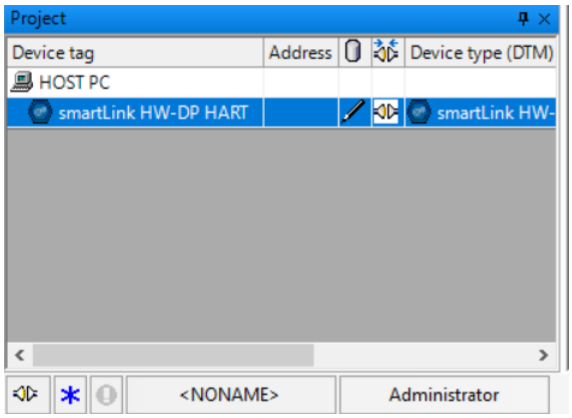
1. Right-click the **HOST PC** bar in the project view to open the context menu.
2. Select **Add device** from the menu.




3. Select a **smartLink** (HW-DP or SW-HT)from the **All Devices** list.



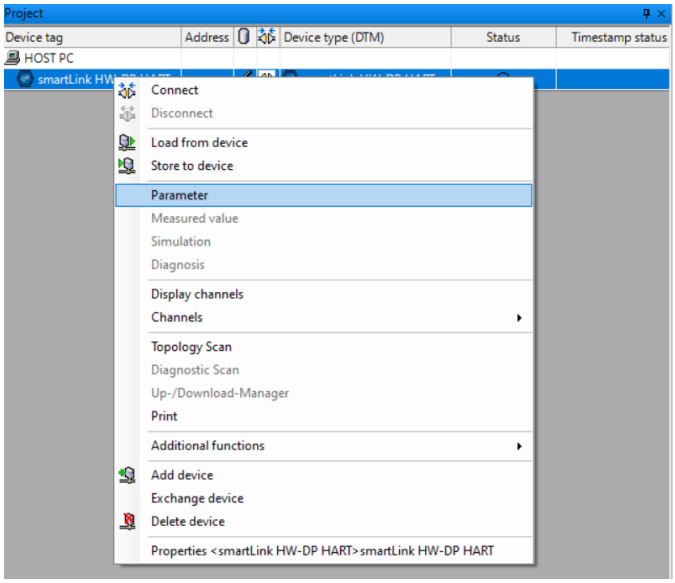

4. Click **[OK]** to add the device to a project.
   The selected smartLink node (HW-DP or SW-HT) appears underneath the Host PC bar. At this point, the online state is **disconnected** ( ).



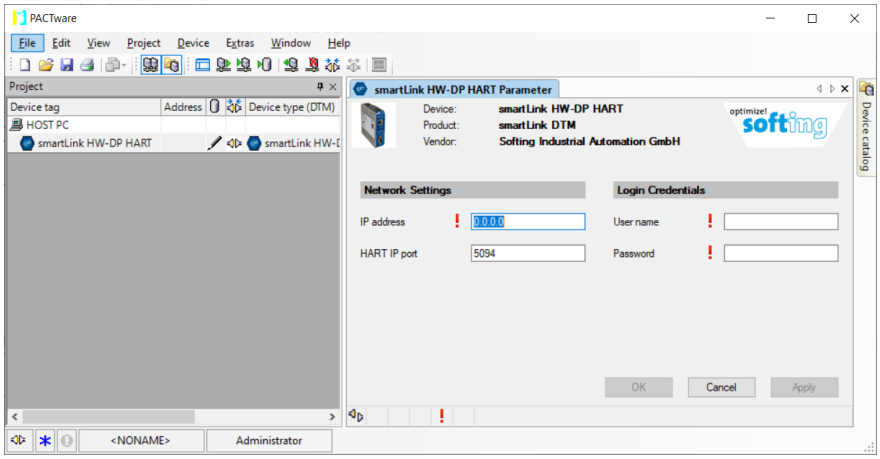
## 5.3 Setting connection parameters

To connect to the smartLink device you must provide an IP address and login credentials. For the HART IP communication you will additionally need to enter a port number on which the smartLink HART IP server is running.

1. Right-click the node **smartLink** instance in the project view.
2. Select **Parameter** from the menu.




3. Enter the **IP address** of the smartLink device, the **port number** of the IP server, as well as the **user name** and **password** of the account to your smartLink.



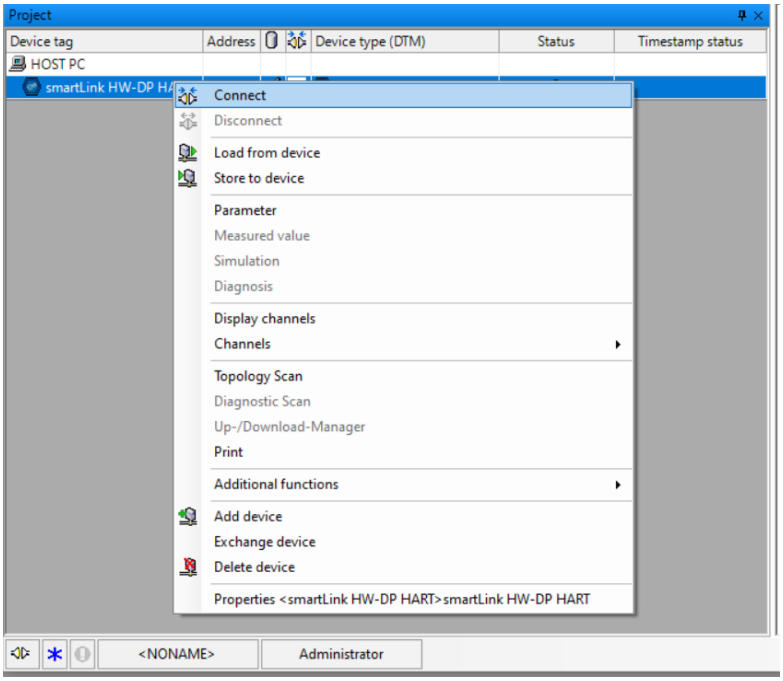

4. Click **[Apply]** to confirm the change.
5. Click **[OK]** to close the interface window

**Note**

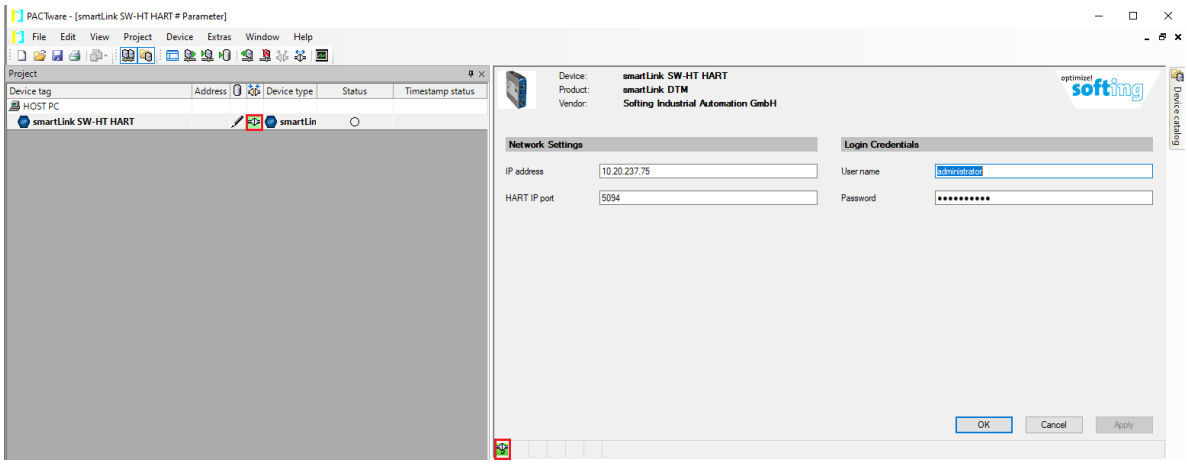
The login password is encrypted and not shown in clear text. The HART IP port must have the same configuration as the smartLink port.

## 5.4 Connecting a smartLink node

1. Right-click the **smartLink** instance.




2. Select **Connect**.
   If the connection is successful, the online state **symbol** change to .



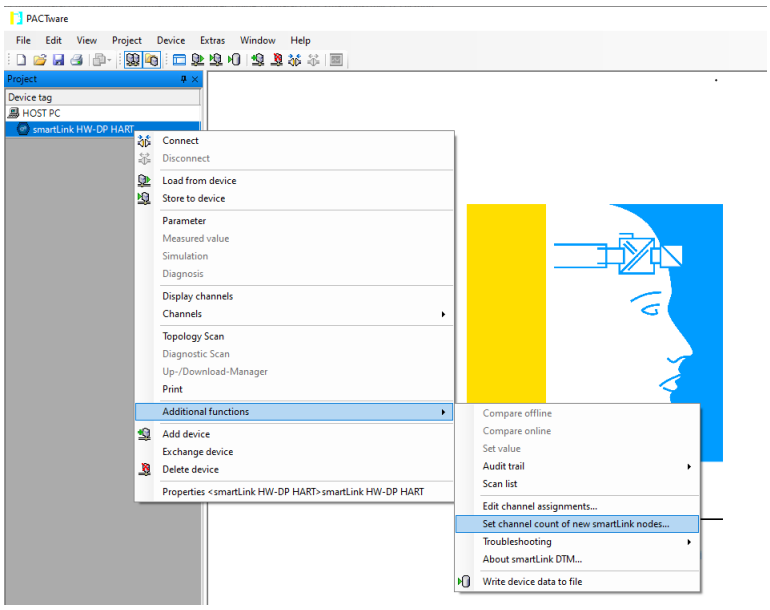

A successful connection is typically displayed in the project view by a symbol next to smartLink. In PACTware this is a closed connector. In the FDT status model a successful connection can be inactive (standby) or active (online). An active connection is displayed in PACTware by a **green** background of the connector symbol. A connection which has been successfully created by smartLink DTM with  smartLink is always shown as being active.

## 5.5 Setting the channel count

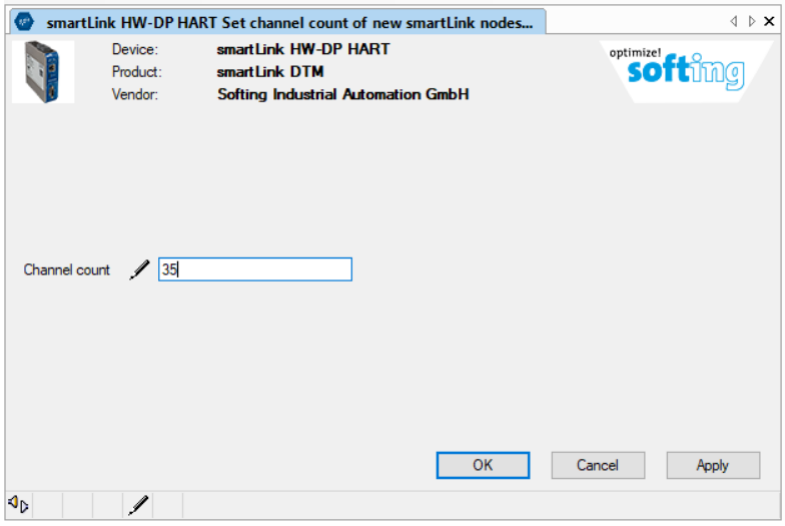
It is recommended that you set a sufficiently high enough channel count for each smartLink instance in the project according to the number of connected HART devices.

Using the function **Set channel count** you can assign any number of 1 to 99 channels to the next smartLink that is added to the project. If you decide to leave the channel count unchanged, the next node added to the project will by default have 100 channels assigned.

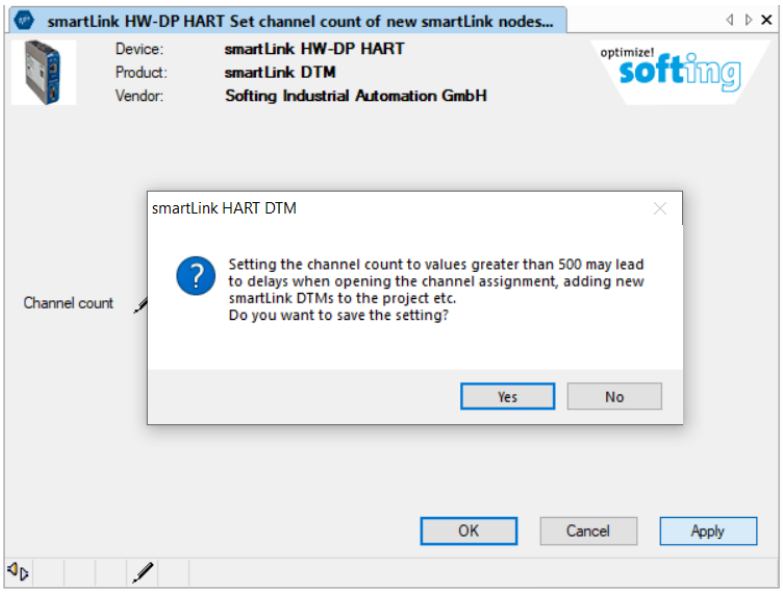
1. Right-click a smartLink node (HW-DP or SW-HT) in the project view.
2. Navigate to **Additional functions → Set channel count of new smartLink nodes...**




3. Set the number of channels for the new **smartLink** node in the **Channel count** field.




4. Click **[Apply]** to confirm the change.
5. Click **[OK]** to close the interface window.




**Note**

The default value for channel count is 100. If a channel count greater than 500 is set, you will see a message box that more channels may lead to delays. Use a reasonable count for the project.

**Note**

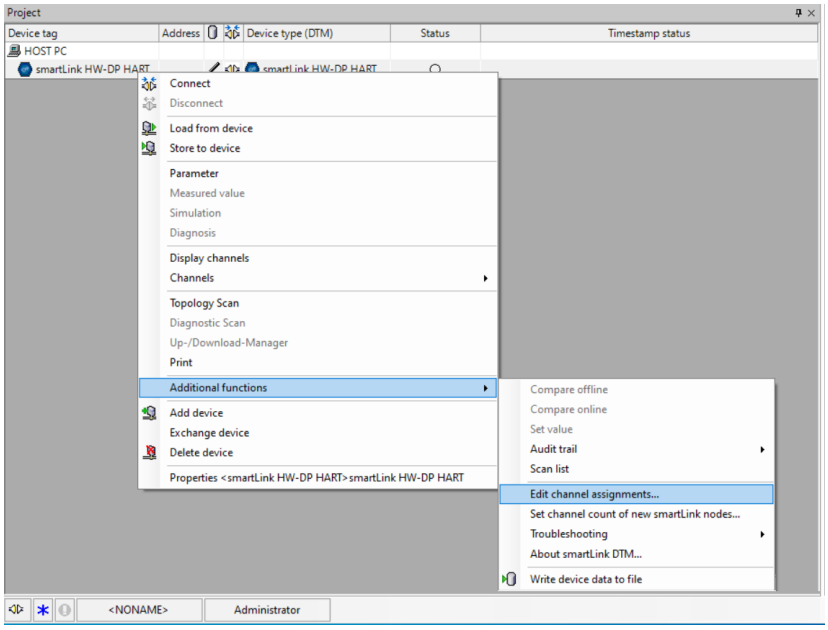
The new channel count will be applied only to the smartLink instance added to the project. The channel count of all existing nodes in the project will remain unchanged.

## 5.6 Assigning a channel

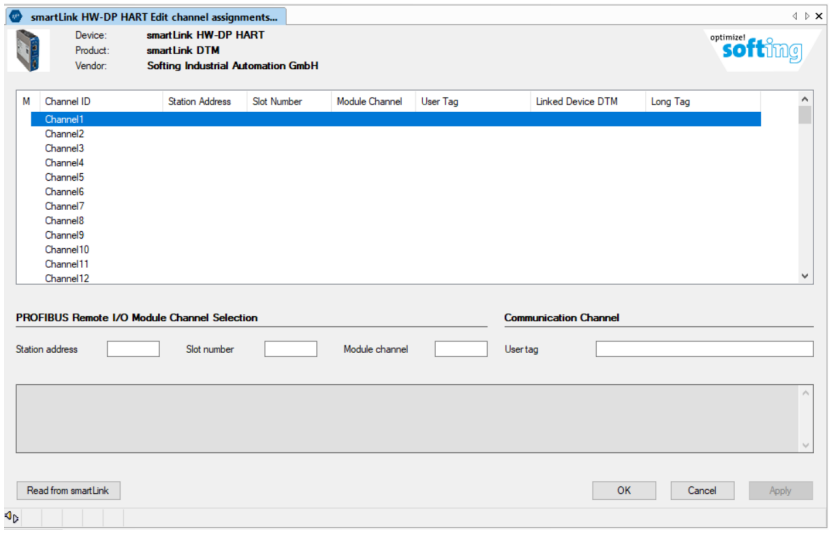
### 5.6.1 smartLink HW-DP HART

In a smartLink HW-DP network configuration, HART devices are connected to PROFIBUS remote IO modules on the PROFIBUS side. smartLink DTM is used to map them with FDT communication channels. For this purpose, smartLink DTM must know the PROFIBUS address information of the HART devices. Using the function Edit channel assignments … this information can be provided.

1. Right-click the node **smartLink HW-DP HART** in the project view.
2. Navigate to **Additional functions → Edit channel assignments...**




The **Edit channel assignments** window is shown.



The top frame of the window shows the FDT channels which you can edit below the table. The first column of the table shows the state of the assignment, which can be one of the input states as described in Section smartLink DTM user interface explained 12. The second column is reserved for the channel ID and cannot be changed. From the third to the fifth column the PROFIBUS parameters Station address, slot number and module channel for the FDT channel are listed.

To change the settings simply select a line in the table and put the values in the edit fields Station address, Slot number and Module channel, where

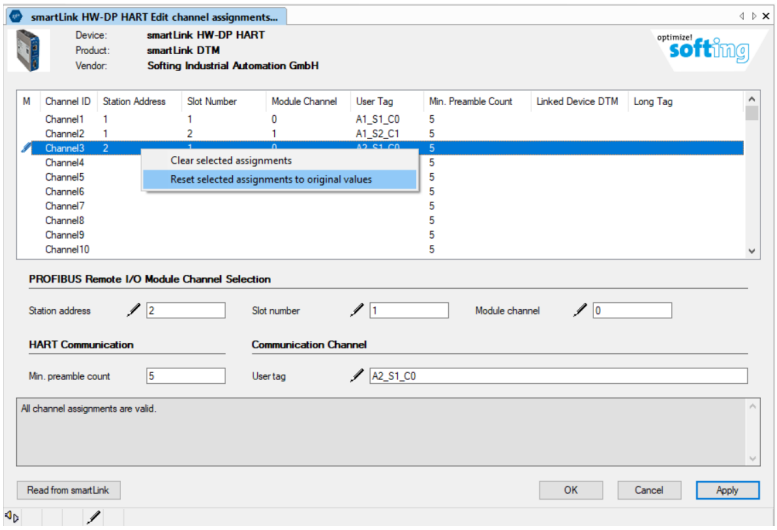
- **Station address**: The station address of the PROFIBUS Remote I/O the HART device is connected to. The valid value is an integer between 0 and 126.
- **Slot number**: The slot number of the PROFIBUS Remote I/O module the HART device is connected to. The valid value is an integer between 0 and 255.
- **Module channel**: The zero-based number of the PROFIBUS Remote I/O module channel the HART device is connected to. The valid value is an integer between 0 and 255.

The sixth column “User Tag” helps you identify the channels. If you do not enter any value in the edit field User tag it will be automatically populated by the three previous parameters in the format Ax_Sy_Cz, where x, y and z are the station address, the slot number and the module channel. You can change this any time by typing your own text in the edit field User tag.

The last two columns provide information for easy configuration: **Linked Device DTM** shows if any device DTM is already inserted in the channel and **Long Tag** column shows the long tag of the HART device in the channel, after the action **[Read from smartLink]** is performed.

- **[Read from smartLink]**
  When you select this function, the PROFIBUS parameters of the available HART devices are read and auto-populated to the table. To run this action the smartLink device must be connected and its IP address, login credentials and the HART IP port must be configured in bus configuration view correctly. However, bear in mind that the smartLink HW-DP HART node in FDT project must be in offline state, as otherwise this button is disabled.
- **[Apply]**
  This confirms the current selected assignments. The values in the table for assignment are checked and saved if valid. In the event of problem with the data a message box is shown.
- **[OK]**
  Applies the settings and closes the interface window.
- **[Cancel]**
  Closes the interface window without applying the settings.

There are two additional actions defined in the context menu of any selected rows in the channel table:




- **Clear selected assignments**: PROFIBUS parameters and User Tag of the assignment will be emptied.
- **Reset selected assignments to original values**: the settings you had prior to your current changes are restored.

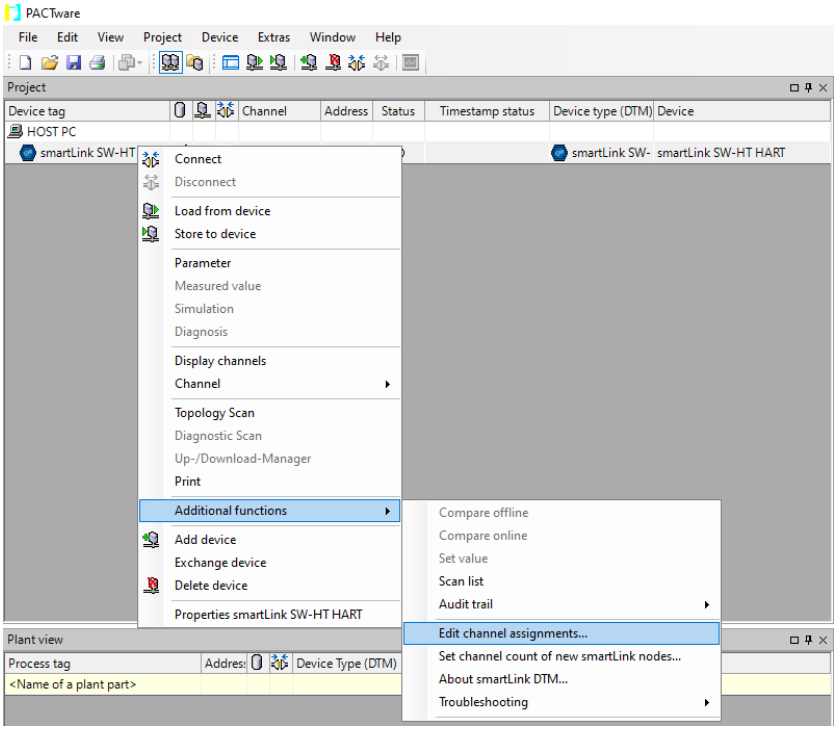
**Note**

To avoid any conflict with on-line operations the assignments can only be changed in offline state.

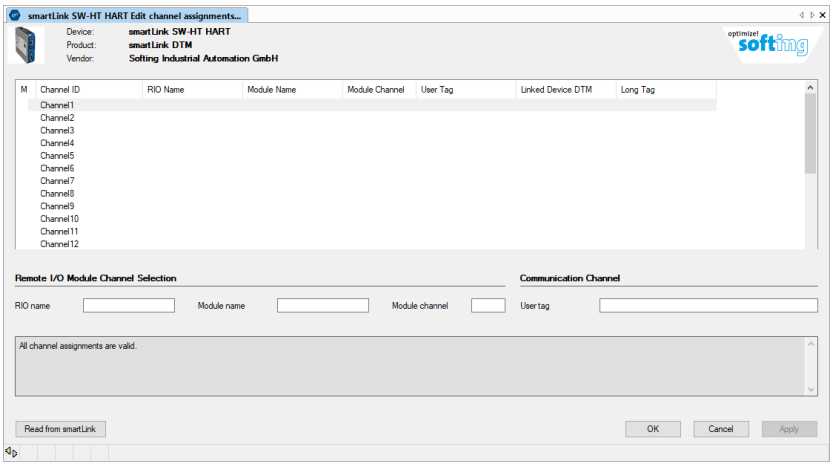
### 5.6.2 smartLink SW-HT HART

smartLink DTM is used to map the remote IO modues (RIOs) with FDT communication channels. For this purpose, smartLink DTM must know the address information of the HART devices. Using the function **Edit channel assignments …** this information can be provided.

1. Right-click the node **smartLink SW-HT HART** in the project view.
2. Navigate to **Additional functions → Edit channel assignments...**




The **Edit channel assignments** window is shown.



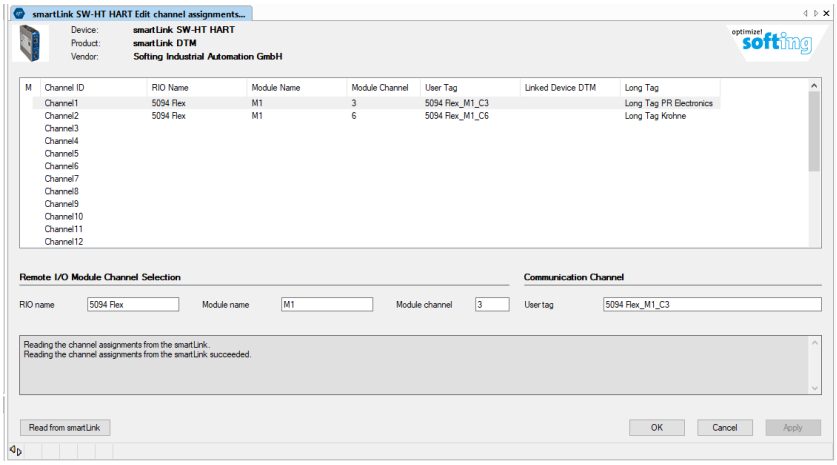

The top frame of the window shows the FDT channels which you can edit below the table. The first column of the table shows the state of the assignment, which can be one of the input states mentioned in Section smartLink DTM user interface explained 12. The second column is reserved for the channel ID and cannot be changed. From the third to the fifth column the parameters RIO Name, Module Name, Module Channel relating to the FDT channel .

To change the settings simply select a line in the table and put the values in the edit fields Station address, Slot number and Module channel, where

- **RIO Name:** The field describes the name the operator defined in the smartLink SW-HT for the Ethernet Remote I/O the HART device is connected to.
- **Module Name**: The field describes the name the operator defined in the smartLink SW-HT of the Ethernet Remote I/O module the HART device is connected to.
- **Module Channel**: The zero-based number of the Ethernet Remote I/O module channel the HART device is connected to. The valid value is an integer between 0 and 255.

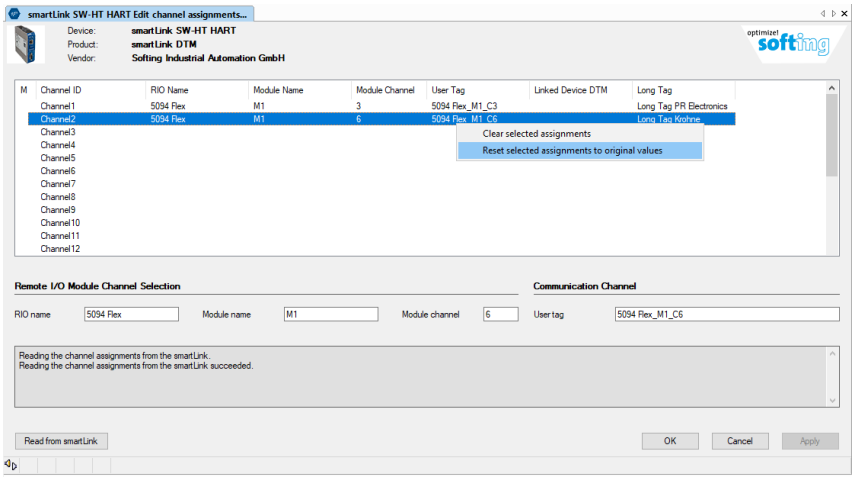
The sixth column **User Tag** helps you identify the channels. If you do not enter any value in the edit field User tag it will be automatically populated by the three previous parameters in the format Ax_Sy_Cz, where x, y and z are the station address, the slot number and the module channel. You can change this any time by typing your own text in the edit field User tag.

The last two columns provide information for easy configuration: **Linked Device DTM** shows if any device DTM is already inserted in the channel and **Long Tag** column shows the long tag of the HART device in the channel, after the action **[Read from smartLink]** is performed.




- **[Read from smartLink]**
  When you select this function the Ethernet parameters of the available HART devices are read and auto-populated to the table. To run this action the smartLink device must be connected and its IP address, login credentials and the HART IP port must be configured in the bus configuration view correctly. However, bear in mind that the smartLink SW-HT HART node in FDT project must be in offline state, as otherwise this button is disabled.
- **[Apply]**
  This confirms the current selected assignments. The values in the table for assignment are checked and saved if valid. In the event of problem with the data a message box is shown.
- **[OK]**
  Applies the settings and closes the interface window.
- **[Cancel]**
  Closes the interface window without applying the settings.

There are two actions defined in the context menu of any selected rows in the channel table:



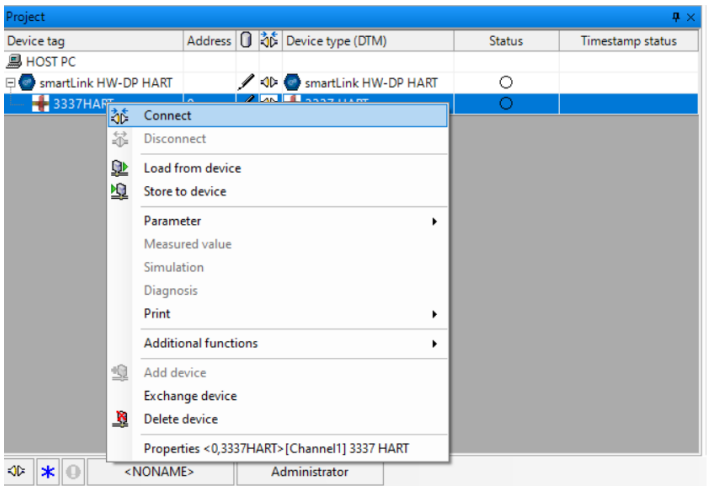

- **Clear selected assignments**: parameters and User Tag of the assignment will be emptied.
- **Reset selected assignments to original values**: the settings you had prior to your current changes are restored.

**Note**

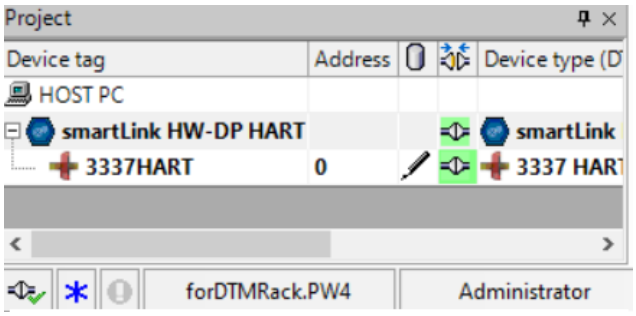
To avoid any conflict with on-line operations the assignments can only be changed in offline state.

## 5.7 Connecting a HART field device

1. Right-click a node of the HART device in the project view. The context menu opens.
2. Select **Connect** in the context menu.




A successful connection is typically displayed in the project view by a symbol next to the device.




You now have access to the connection-related services of the DeviceDTM which typically include:

- Online parameterization
- Upload/download of device parameters
- Device-specific functionality for startup or diagnostic purposes

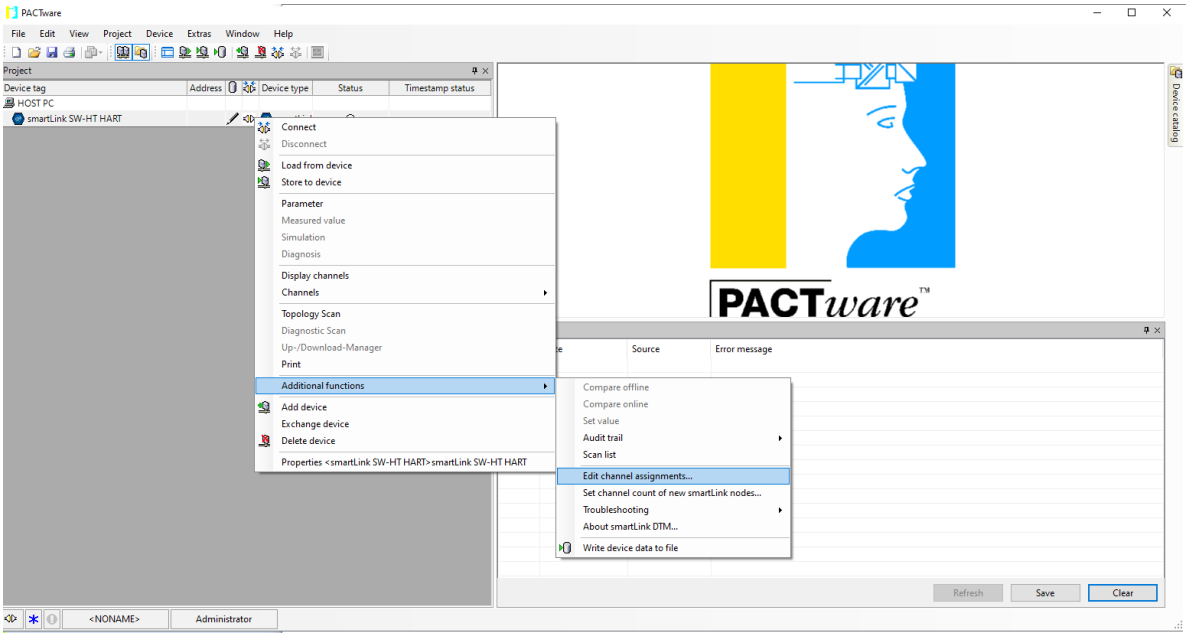
This completes the introduction to smartLink DTM. To work efficiently with smartLink DTM , continue exploring the additional functions. The following Chapter about smartLink DTM user interface describes these functions in detail.

## 5.8 Reading connected smartLink node

In this Chapter you will learn how to scan your smartLink node for connected HART devices (RIOs) and how to access and parameterize these devices.

1. Right-click to **disconnect** ( ) the smartLink to proceed.

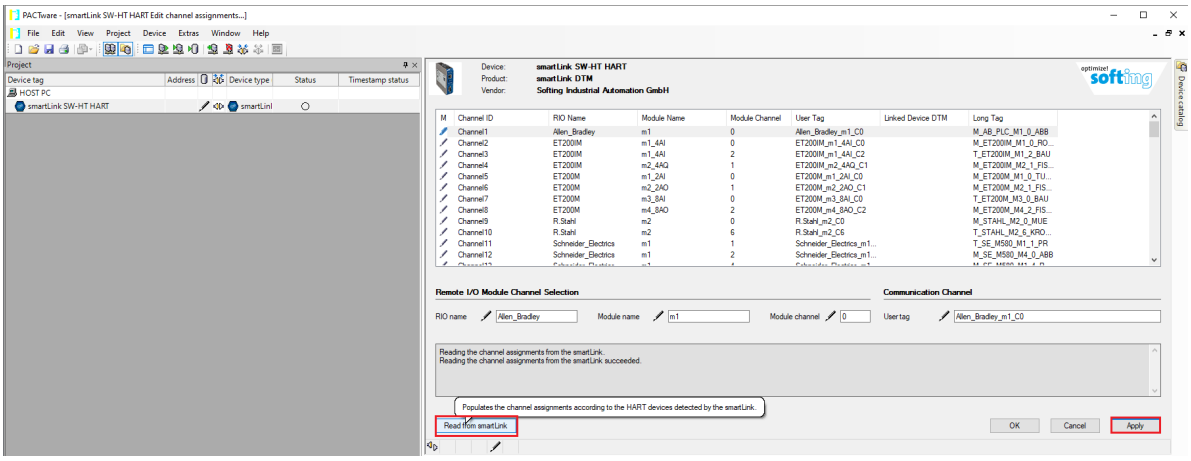
2. Right-click the smartLink instance and select **Additional functions → Edit channel assignments...** This is done to retrieve the RIO configuration data from the connected smartLink device.




3. Click **[Read from smartLink]** and wait for some time to retrieve RIO configuration data from the connected smartLink device (remote IOs, IOModules, Channels). The Remote I/O module channels that are automatically recognized by the smartLink will be read and assigned to the smartLink DTM communication channels.

**Note**

You can also retrieve individual RIOs manually by entering the name in the search fields.

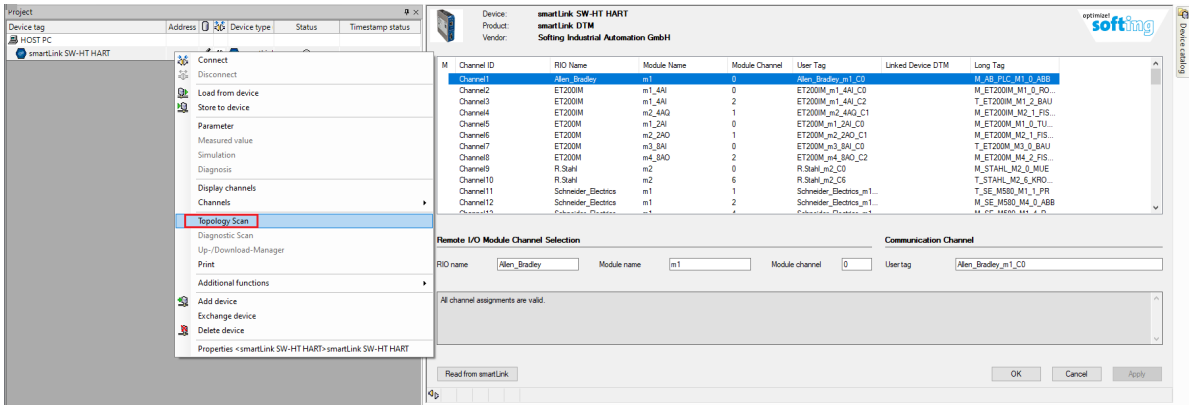


4. Click **[Apply]**.
   The smartLink RIO configuration has been saved to the instance of the smartLink shown in PACTware.

**Note**

You can add a device separately by right-clicking on the smartLink instance and then selecting **Add device** or by using the scan topology.

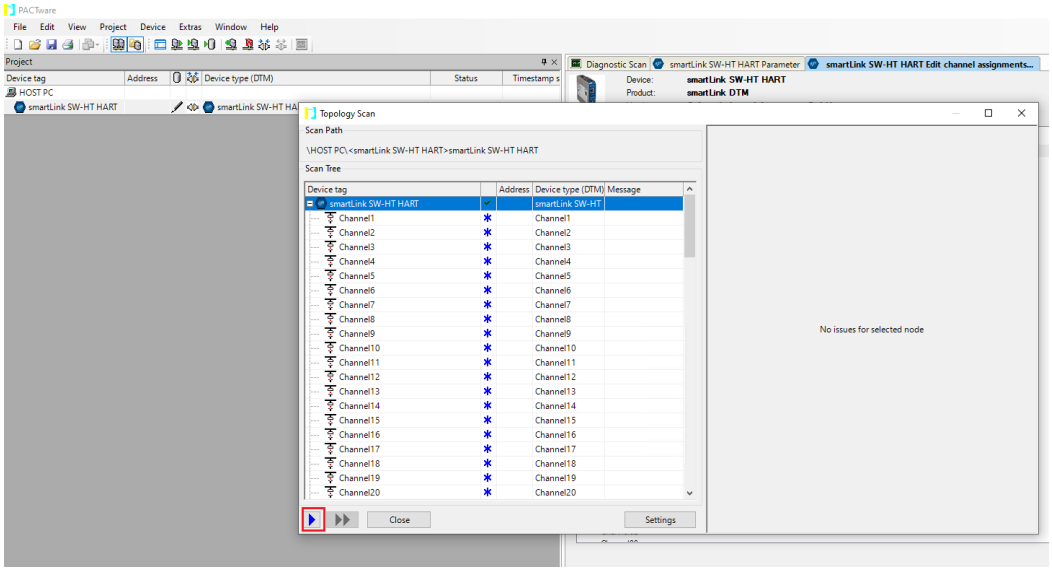
5. Right-click on the **smartLink** instance and select **Scan Topology**.
   The smartLink DTM tool will display the HART devices which are connected to the channels of your smartLink node.



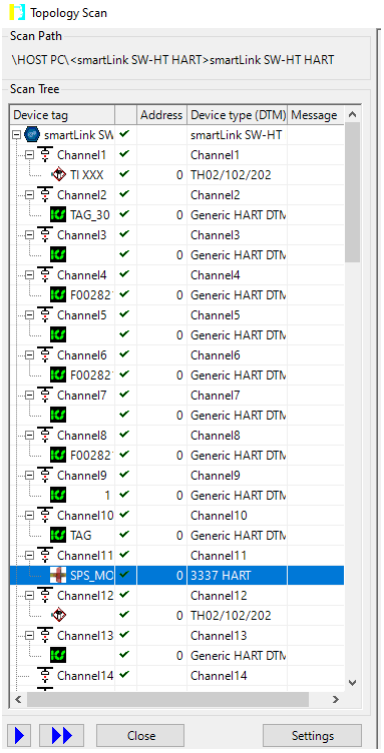

**Note**

If the long tag of the device has been set you can see it in the column Long Tag.

6. Click the run icon to start the scan.

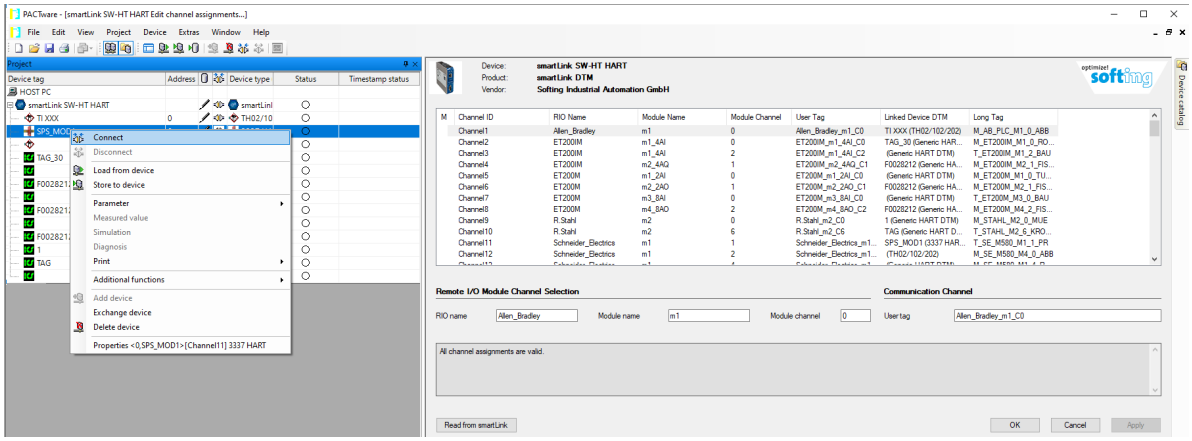



The scan results are shown in the topology **Scan Tree**.

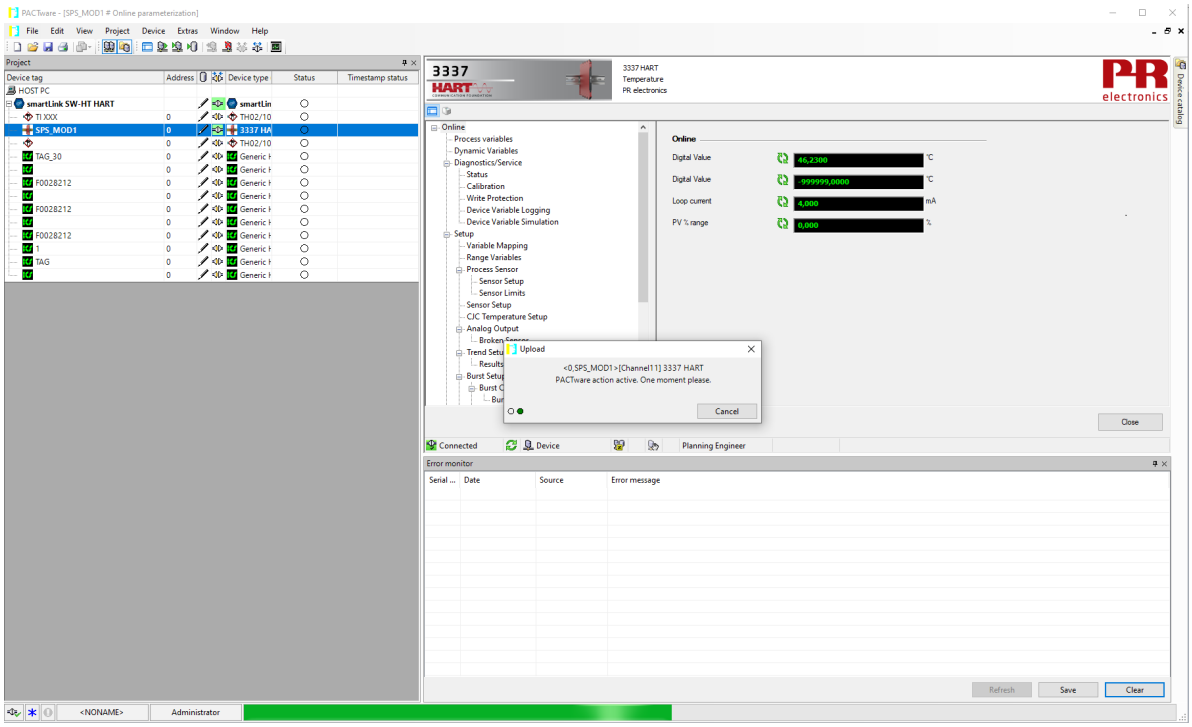



7. Click **[Close]** to hide the scan window.

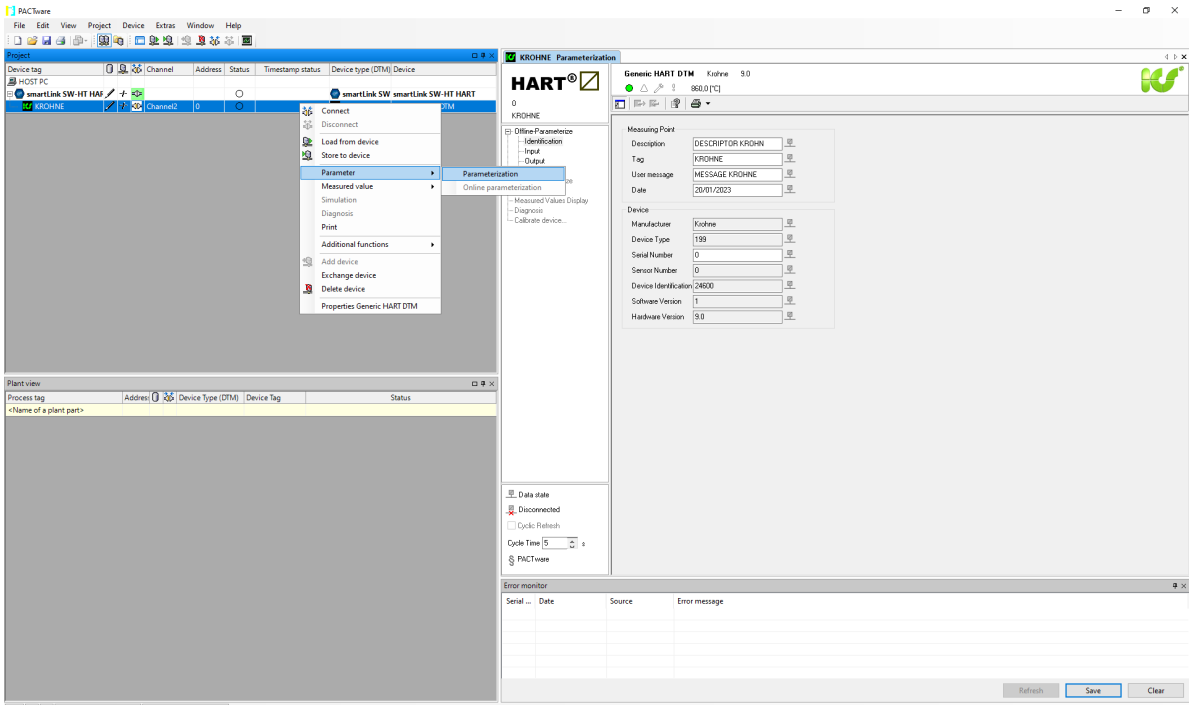
8. Right-click the **HART DTM device** and select **Connect**.




9. Right-click the HART device and select **Load from device** or **Store to device** to load or change HART device parameters.



10. Right-click a connected HART device and select **Parameter → Parameterization** (alternatively double-click) to open the parameter window of the HART device.



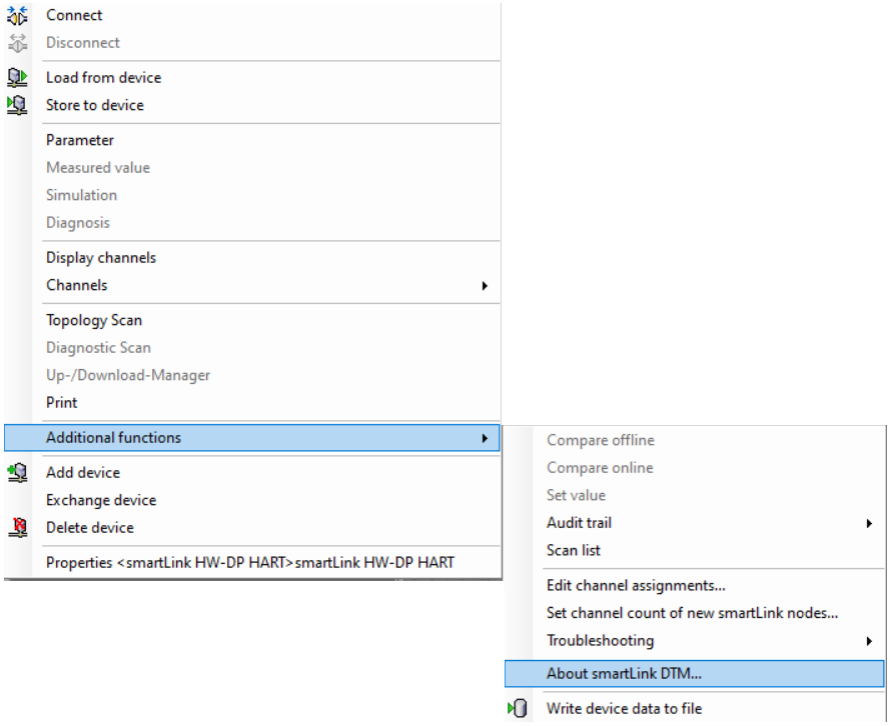
11. Parameterize the HART device and click **[Save]** to store your changes.

## 5.9 Additional user interface menus

### 5.9.1 About smartLink DTM

Select the function **About** smartLink DTM **...** to see product information about smartLink DTM . This function is available for all users.

1. Right-click a smartLink node in the project view.
2. Navigate to **Additional functions** → **About** smartLink DTM **...**

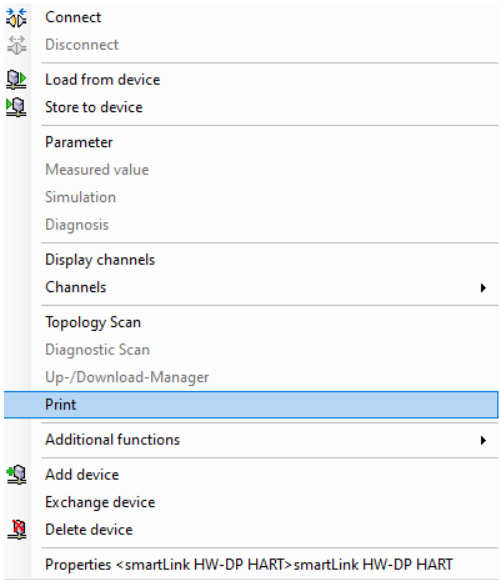


### 5.9.2 Documentation of access parameters

With this function you can generate the documentation of the smartLink bus configuration. This function is available for all users. When you select this function, the documentation is displayed according to the frame application used.

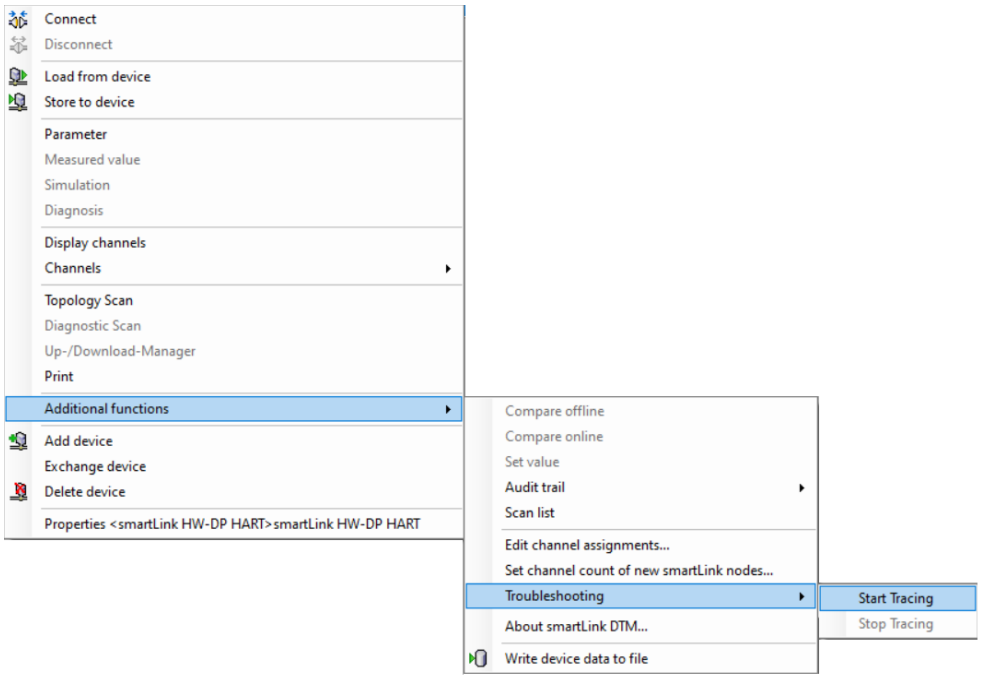
1. Right-click a smartLink HART node in the project view.

2. Navigate to **Additional functions ...**

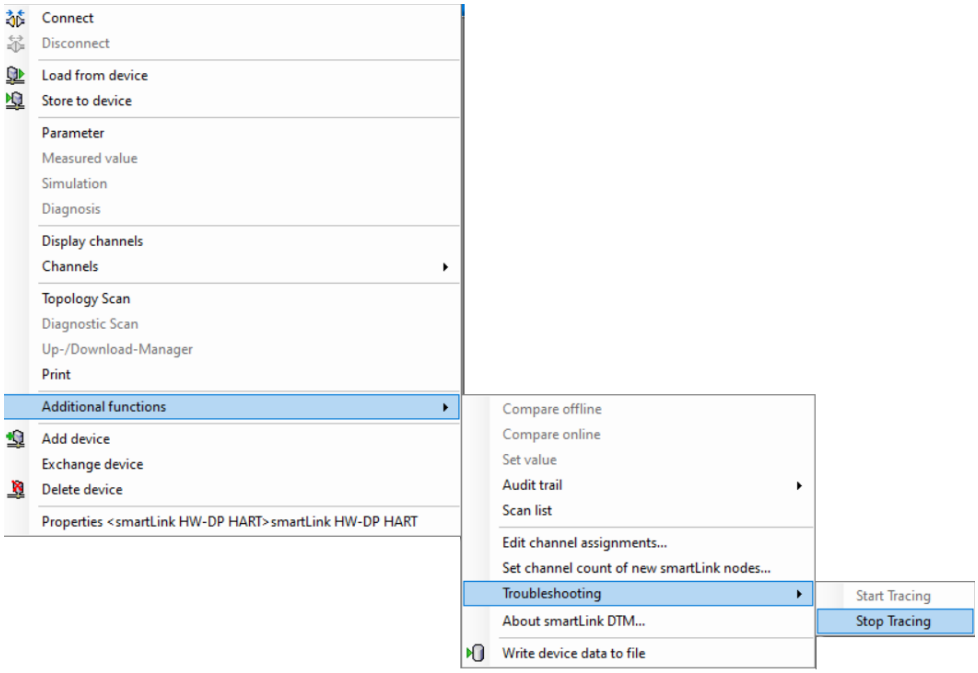


### 5.9.3 Troubleshooting

1. Select **Additional Functions → Troubleshooting → Start Tracing**.




2. Select **Additional Functions → Troubleshooting → Stop Tracing**.




These functions start or stop the tracing of smartLink DTM. When tracing is enabled, the program flow within smartLink DTM and detected error states are written to files. Although this information cannot be easily interpreted by those using smartLink DTM, it is a valuable tool helping Softing Support to detect an error.

If you would like Softing Support to assist you in cases of inexplicable/erroneous behavior, you can help us diagnose the errors by carrying out the following steps in advance.

- Start the tracing with the Start tracing function.
- Repeat the error.
- Stop tracing as soon as possible after the error has occurred using the Stop tracing function.

After performing these steps, you will find the file ***smartLinkDTM.trc*** in the following directory:

- *<User directory>\<username>\AppData\Local\Softing\SMARTLINKdtm\Trace*

Furthermore, locate file ***siadtmbe130.trc*** in the following directory:

- *<User directory>\<username>\AppData\Local\Softing\DTMToolkit\Trace*

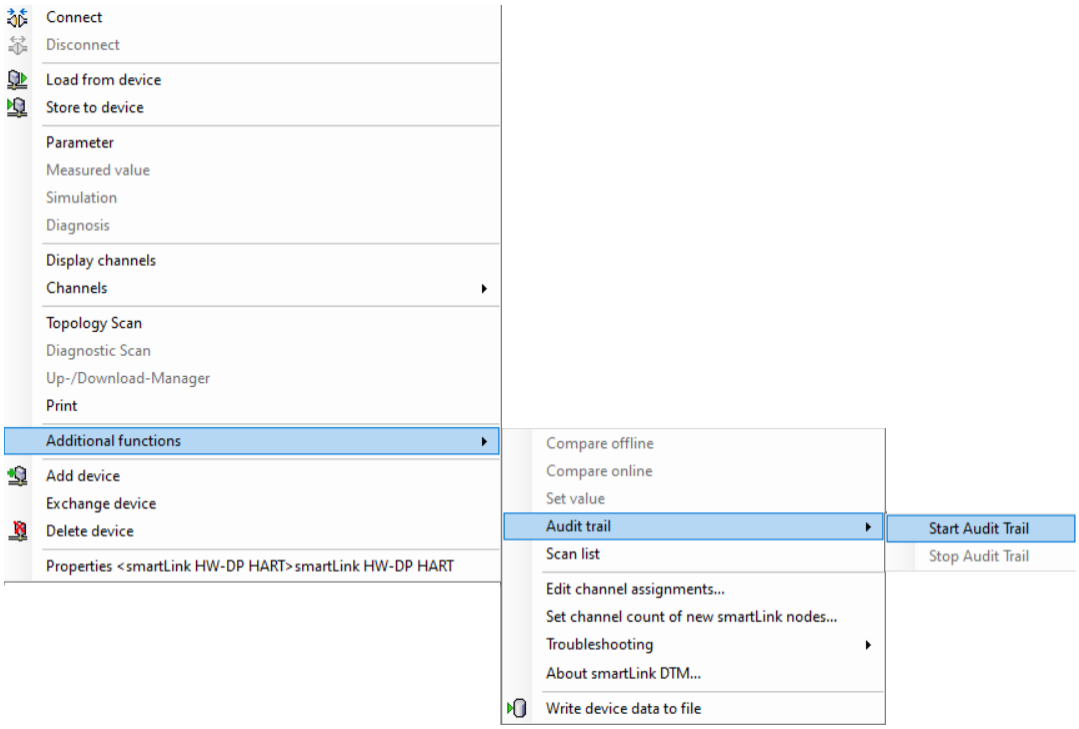
Please email these files to Softing Support (support.automation@softing.com). If you require telephone support, please let us know that you have already created .trc files using the tracing function.

## 5.9.4 Audit trail

With this function your can start and stop logging audit trail events generated by smartLink DTM. To use this function, you must have the **Planning Engineer** or **Administrator** user role.

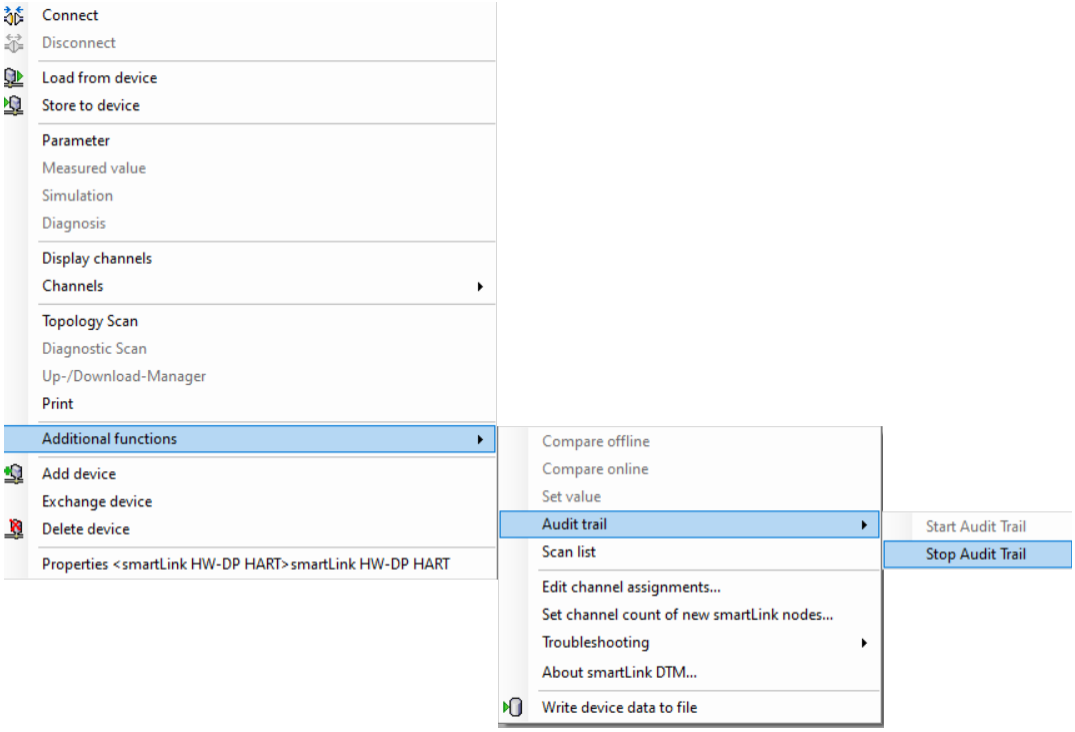
### Start Audit Trail

1. Right-click a smartLink node in the project view..
2. Select **Additional functions → Audit Trail → Start Audit Trail**.



### Stop Audit Trail

Select **Additional functions → Audit Trail → Stop Audit Trail.**




**Note**

The Audit Trail feature needs to be supported by FDT frame application.

The Audit Trail setting is saved in the project folder of the FDT frame application. The setting currently chosen when saving the project is restored when the project is reloaded

smartLink DTM generates audit trail events in the following situations:

- Starting the DTM instance.
- Exiting the DTM instance.
- Prompting for connection.
- Prompting for disconnection.
- Successful connection establishment.
- Failed connection establishment (e.g. due to a communication fault).
- Disconnection on request.
- Disconnection triggered by a communication fault.
- Connection re-establishment after a communication fault has ceased.
- Changing of the smartLink access parameters.

# 6 Troubleshooting

In some frame applications, the window content may be updated incorrectly or not at all when user interfaces are opened or when switching between user interfaces. An error-free update can then usually be triggered by a slight change in the window size.

smartLink DTM communicates with the smartLink via TCP ports 443 (SSL) and 5094 (HART IP) by default. Please make sure that these ports are not blocked by a firewall. The HART IP port 5094 can be changed in the user interface for bus configuration. The changed port number must also be entered in the web interface of the smartLink as an alternate port. Refer to the smartLink operating manual for more information.

Check the following if the smartLink DTM fails to establish a connection to the smartLink:

- IP address of the smartLink is entered in the bus configuration.
- smartLink can be reached via IP. To test this, execute the ping command on the command line with the IP address of the smartLink.
- TCP port 443 and TCP port 5094 (or the TCP port set in the bus configuration for HART IP) are not blocked by a firewall.
- HART IP port that has been changed in the bus configuration is also entered in the smartLink as an alternate port. Refer to the smartLink user guide.
- Login data of a user set up in the smartLink is entered in the bus configuration.
- HART IP server is activated in the smartLink. Refer to the smartLink operating manual.

If the error message *A Remote I/O channel has not been configured for the DTM channel* is displayed during the connection setup of a Device DTM , Remote I/O channel for the DTM channel, to which the Device DTM was added, must still be assigned in the user interface as described in Section **Channel Assignment**.

The long tags of the HART devices displayed in the **Edit channel assignments...** user interface, which are entered by the smartLink when reading the channel assignments, are neither continuously updated nor saved in the project. They are only used for simple identification of a HART device during channel assignment.

**Softing Industrial Automation GmbH**

Richard-Reitzner-Allee 6
85540 Haar / Germany
https://industrial.softing.com

+ 49 89 45 656-340
info.automation@softing.com