

PACTware

Process Automation Configuration Tool

Edition 4.0 FDT 1.2.1

Copyright

© by PACTware Consortium e.V., Karlsruhe, Deutschland.

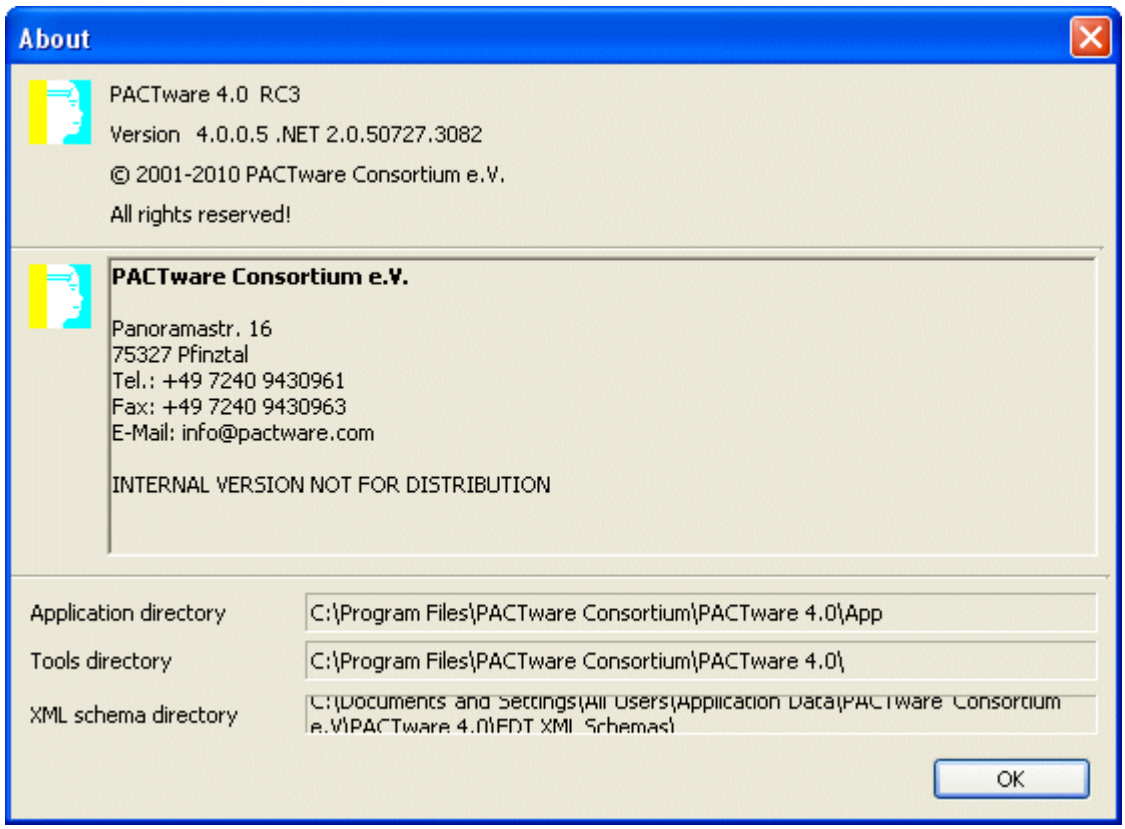
All rights reserved.

Enduser License

The terms of the license agreement are contained in file **PWEULAENG.TXT** of the PACTware installation directory.

Program version

The program version is displayed via menu **Help** using menu item **About..**. Example:



Document history

Version	Date
4.0	13.3.2010

Table of Contents

Copyright 1-1
Table of Contents 1-1
1. Overview 1-1
1.1 Software Requirements 1-2
1.2 Hardware Requirements 1-2
1.3 Install 1-3
1.4 Start 1-4
1.5 Getting Started (Empty Project) 1-6
1.6 Using Project Templates 1-8
1.7 Uninstall 1-9
1.8 Problem report 1-9
2. Main Window 2-1
2.1 Menu bar 2-1
2.2 Toolbar 2-2
2.3 Status bar 2-2
2.4 Operating range 2-3
2.4.1 PACTware Window 2-4
2.4.2 DTM Window 2-7
2.5 Layout Management 2-8
3. Functions 3-1
3.1 Menus 3-1
3.1.1 Menu File 3-1
3.1.2 Menu Edit 3-2
3.1.3 Menu View 3-2
3.1.4 Menu Project 3-3
3.1.5 Menu Device 3-5
3.1.6 Menu Extras 3-7
3.1.7 Menu Window 3-9
3.1.8 Menu Help 3-10
3.2 Context Menu 3-11
3.2.1 Connection between DTM and device 3-11
3.2.2 Data exchange between DTM and device 3-12
3.2.3 Edit device data with a DTM 3-15
3.2.4 Additional Functions 3-16
3.2.5 Add device or delete device 3-18
3.2.6 Device properties 3-18
4. Working with PACTware 4-1
4.1 Generate/Open project 4-2
4.2 Device Catalog 4-4
4.2.1 Working with the Device Catalog 4-4
4.2.2 Administer Device Catalog 4-7
4.3 Project View 4-8
4.3.1 Add DTM 4-10
4.3.2 Delete DTM 4-11
4.3.3 Add part of a project 4-12
4.4 Plant View 4-14
4.5 Edit device 4-16
4.5.1 Parameterize device 4-16
4.5.2 Load from device 4-16

4.5.3 Store to device 4-17
4.5.4 Communication log 4-19
4.5.5 Print device parameters 4-20
4.6 Save project 4-22
4.7 Debug Monitor 4-23
4.8 Error Monitor 4-25
5. PACTware Add-Ins 5-1
5.1 Up/Download Manager Add-In 5-3
5.1.1 Start Add-In 5-3
5.1.2 Edit several field devices 5-4
5.2 Device State Manager Add-In 5-6
5.2.1 Start Add-In 5-6
5.2.2 Editing several field devices 5-7
5.3 Device State Add-In 5-9
5.4 Tool Calling Interface (TCI) Support Add-In 5-11
5.4.1 Use of the Add-In 5-11
6. Glossary 6-1
Index Index-1

1. Overview

PACTware (Process Automation Configuration Tool) is a program designed for the selection of communication-capable field devices from a device catalog and for the combination of the communication structure of projects in a production plant.

In conformity with the FDT Specification 1.2.1 (Field Device Tool Specification) PACTware is a frame application for DTMs (Device Type Manager) which is delivered as configuration software by the field device vendors. DTMs enable the configuration of the field devices and changes of the device parameters. In PACTware configuration and parameter values can be saved to storage devices and printed. PACTware works with DTMs, which were implemented according to the FDT Specification 1.2 or 1.2.1.

Via CommDTM (Communication DTM) the communication with field devices is established using protocols like e.g. HART or Profibus Protocol. **GatewayDTM**s can be inserted between CommDTM and the DTMs of the field devices. They parameterize the functions of Remote I/O Systems or multiplexers. A project can comprise several CommDTMs and such represent complex communication structures in a plant.

A large part of the functionality is realized in PACTware by so-called Add-Ins, which are included in the delivered software pack and can be downloaded as required. To realize special project-related functions, additional Add-Ins can be developed or existing Add-Ins can be extended. The PACTware service pack includes:

- the **Device Catalog** which lists all DTMs installed on the PC,
- the **Project View** which displays the communication structure of a project,
- the **Plant View** which shows the arrangement of the field devices in a plant,
- the **Error Monitor** which records e.g. errors in the communication with field devices and
- the **Debug Monitor** which logs all debug outputs of PACTware.

In addition, PACTware offers Add-Ins which are suitable for processing several field devices within a project. These are

- the **Up/Download Manager Add-In**, which supports loading and storing of parameters to many field devices of a project.
- the **Device State Manager Add-In**, which allows to start and manage a device state scan of all devices of a project.
- the **Device State Add-In**, which allows to display the protocol of the device scan and filter it according to different criteria.
- the **Tool Calling Interface (TCI) Support Add-In** which allows to set up a connection between a parameterization program like e.g. the SIMATIC PDM of the Siemens company and PACTware.

1.1 Software Requirements

PACTware 4.0 runs under the operating systems Windows XP as of Service Pack 1, Windows Vista and Windows 7. The .NET Framework Release 2.0 must be installed. Printing of parameter values of a field device requires the installation of Microsoft Internet Explorer as of Release 4.0.

1.2 Hardware Requirements

PACTware requires 50 MByte hard disk memory and at least 40 MByte main memory. Depending on the complexity of the projects and the applied DTMs the required main memory may be a multiple of this. A computer with Pentium IV 450 MHz processor or higher, XGA graphic card an a Microsoft compatible mouse or similar pointing device is required.

1.3 Install

All running programs must be closed before you install PACTware on your computer. Administrator rights are required to install PACTware to your PC.

The member companies of the PACTware Consortium e.V. usually offer two setups: a minimum setup and a large setup to which manuals as pdf-files for Acrobat Reader as well as the Microsoft .NET 2.0 Framework were added.

The Setup includes the following programs:

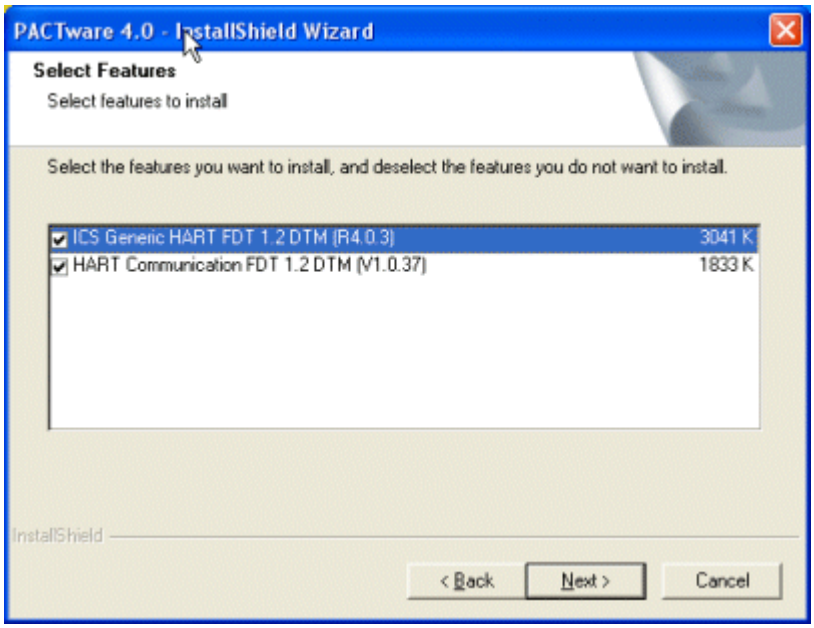
- a program library to read PACTware project files that were written in earlier PACTware releases
- PACTware Release 4.0
- a CommDTM for the HART-Protocol
- a generic HART device-DTM
- online help files for PACTware in several languages

After unzipping the installation file the following files are available:

CWHARTFDTSetup		File Folder	04.03.2010 13:01
IGenHartSetup		File Folder	04.03.2010 13:01
0x040c.ini	7 KB	Configuration Settings	07.04.2004 13:04
0x0407.ini	7 KB	Configuration Settings	15.04.2004 14:24
0x0409.ini	6 KB	Configuration Settings	24.04.2004 17:21
1031.mst	51 KB	MST File	19.01.2010 15:14
1033.mst	20 KB	MST File	19.01.2010 15:14
1036.mst	50 KB	MST File	19.01.2010 15:14
Data1.cab	17.882 KB	WinZip-Datei	19.01.2010 15:14
instmsiw.exe	1.780 KB	Application	11.03.2002 09:06
ISScript10.Msi	877 KB	Windows Installer P...	24.05.2004 18:38
LIESMICH.TXT	8 KB	Text Document	14.01.2010 12:45
MDAC_TYP.EXE	5.439 KB	Application	26.04.2005 09:50
msxml2.msi	650 KB	Windows Installer P...	11.01.2006 15:48
PACTware 4.0.msi	2.108 KB	Windows Installer P...	19.01.2010 15:14
PACTware.bmp	770 KB	Bitmap Image	08.12.2009 16:42
PACTware.ini	1 KB	Configuration Settings	23.01.2007 09:08
PACTware.ver	1 KB	VER File	08.12.2009 16:39
PACTwareResetSettings.reg	1 KB	Registration Entries	19.05.2009 09:37
PWEULAENG.TXT	1 KB	Text Document	07.06.2002 10:18
PWEULAGER.TXT	1 KB	Text Document	07.06.2002 10:17
README.TXT	8 KB	Text Document	14.01.2010 12:47
setup.exe	244 KB	Application	19.01.2010 15:14
Setup.ini	2 KB	Configuration Settings	19.01.2010 15:14

The installation is started by double-clicking **setup.exe**. After selecting the installation language and confirming the license agreement a complete or user-defined setup can be selected.

In the user-defined setup a target directory can be selected for PACTware and a few components can be excluded from the installation.

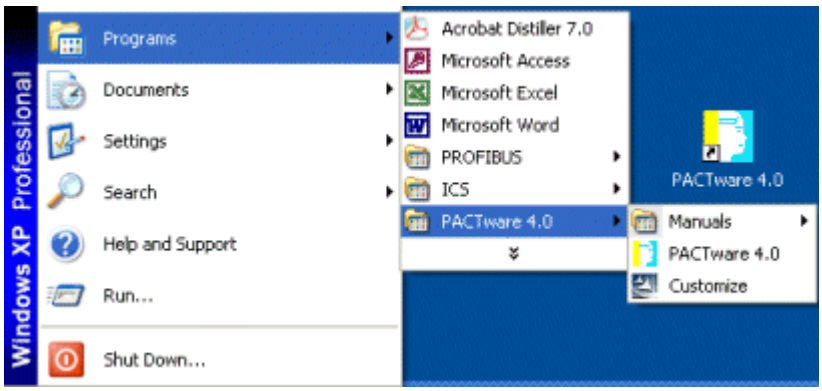


In the further course of the setup PACTware, the selected features and the system components are installed. The features are installed via own setups. The special license terms must be respected.

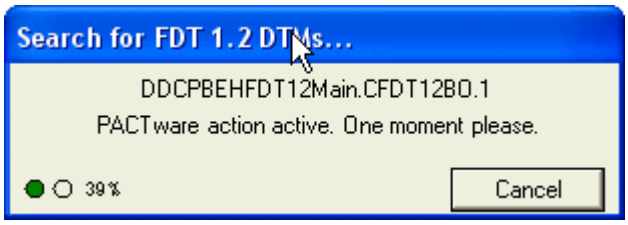
At the end of the PACTware setup, the password valid for a previously installed version of PACTware, can be applied. A program group for all users is entered to the Windows Start menu. A link to start PACTware is stored on the desktop.

1.4 Start

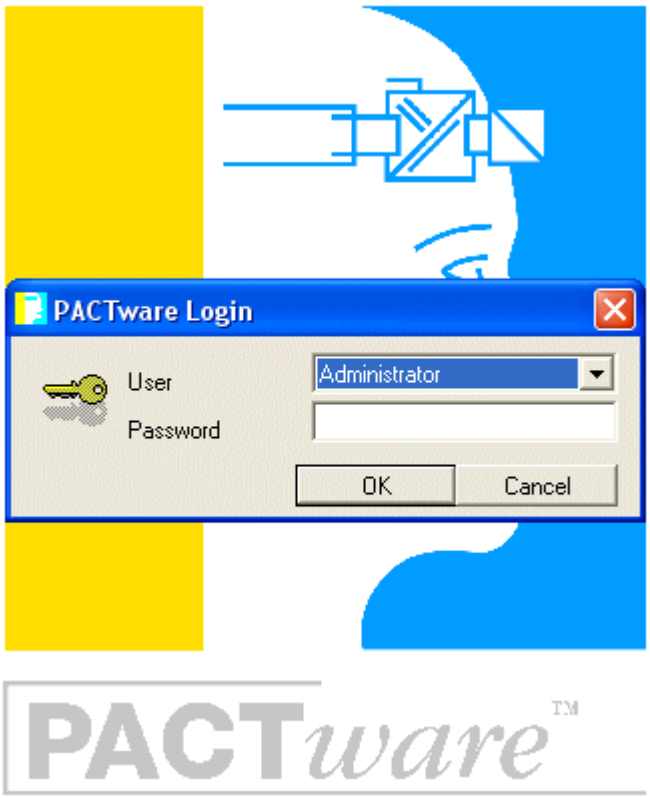
PACTware is started either by a double-click on the link or in the Windows Start menu via <Programs> in the installed program group with the entry PACTware 4.0.



At the initial program start, the device catalog is generated automatically. All DTMs installed on the PC are found and entered to it. The search may take a few minutes when many DTMs were installed.



At the initial program start following the installation PACTware is displayed immediately if the passwords are not applied from an earlier installation. Otherwise a dialog is displayed to which a password must be entered.



It is recommendable to define passwords in menu item **Extras** - **User Administration**.

Before PACTware can be used at least one DTM must be installed.

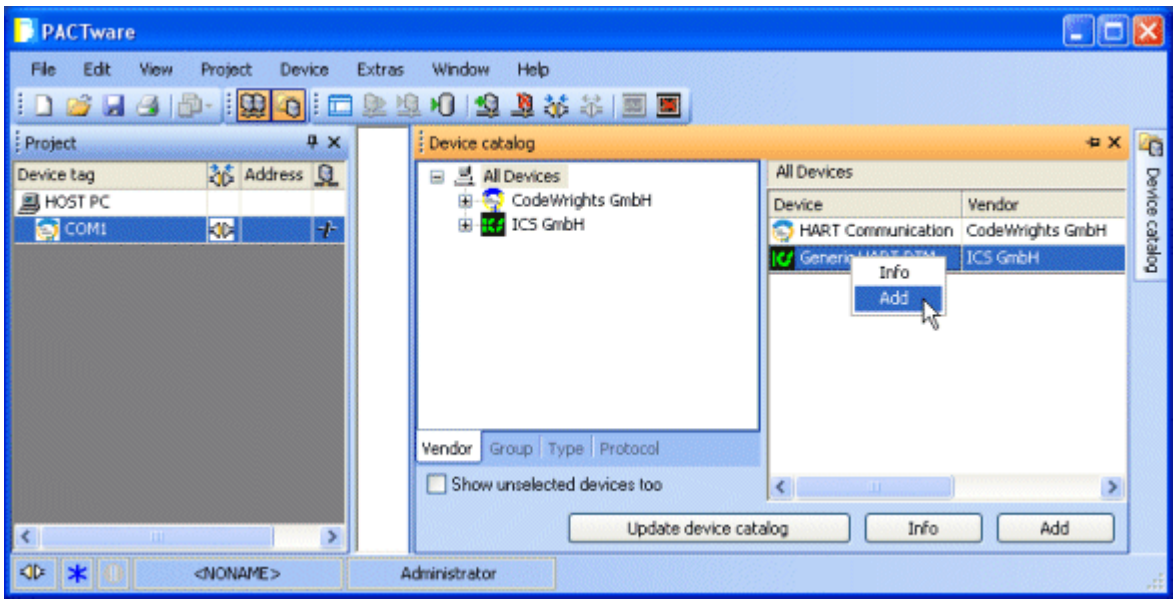
Depending on the program start definition in menu item **Extras** - **Options**, an empty project, a project template or the most recently edited project is opened.

Following the PACTware installation a selection of project templates are displayed that were installed on the PC using PACTware. The following sections describe the different procedures.

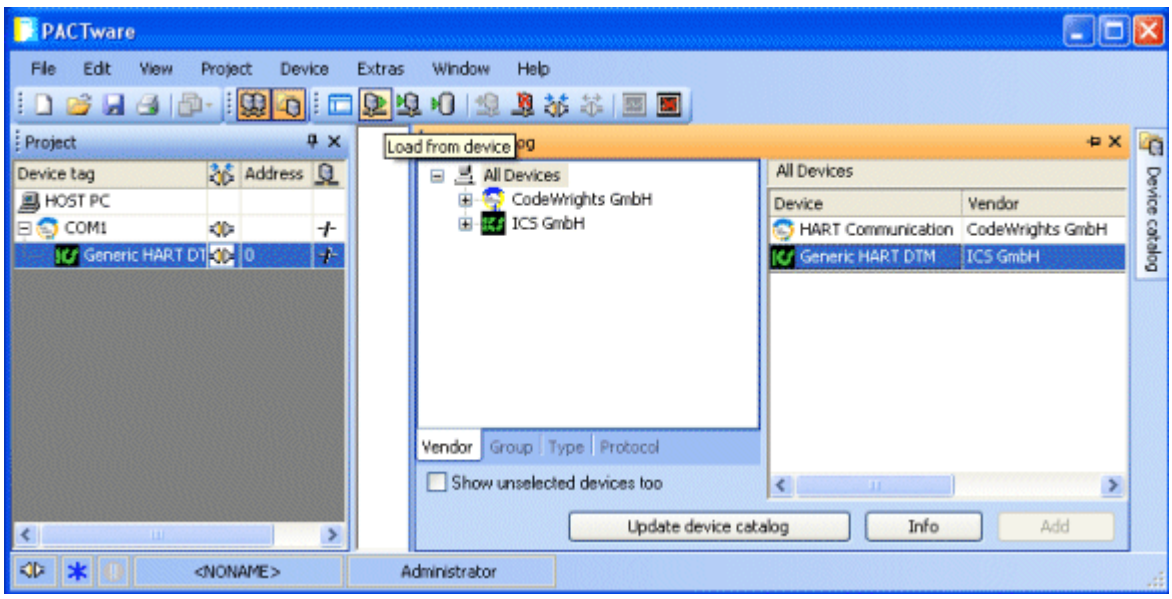
1.5 Getting Started (Empty Project)

A HART-capable field device can be parameterized in few steps using both DTMs contained in the delivered software pack. The field device must therefore be connected to the PC using e.g. a HART Modem.

The project window and the device catalog must be opened:

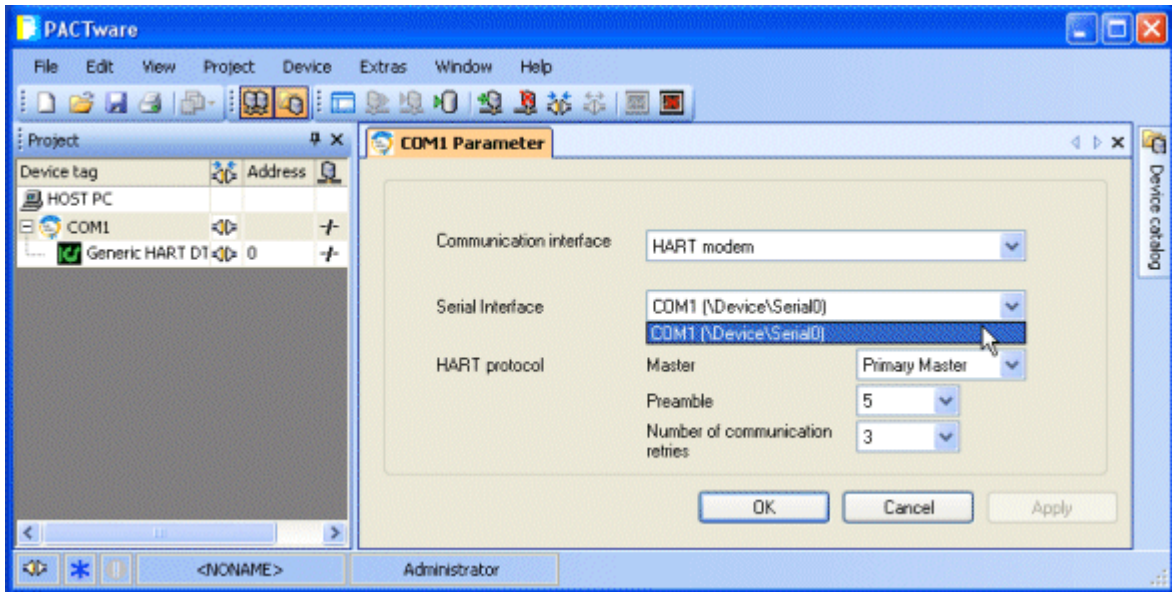


The two DTMs are added from the device catalog to the project in the sequence HART Communication and Generic HART DTM via button **Add**, via menu item **Add** of the DTM context menu or via mouse by drag&drop.

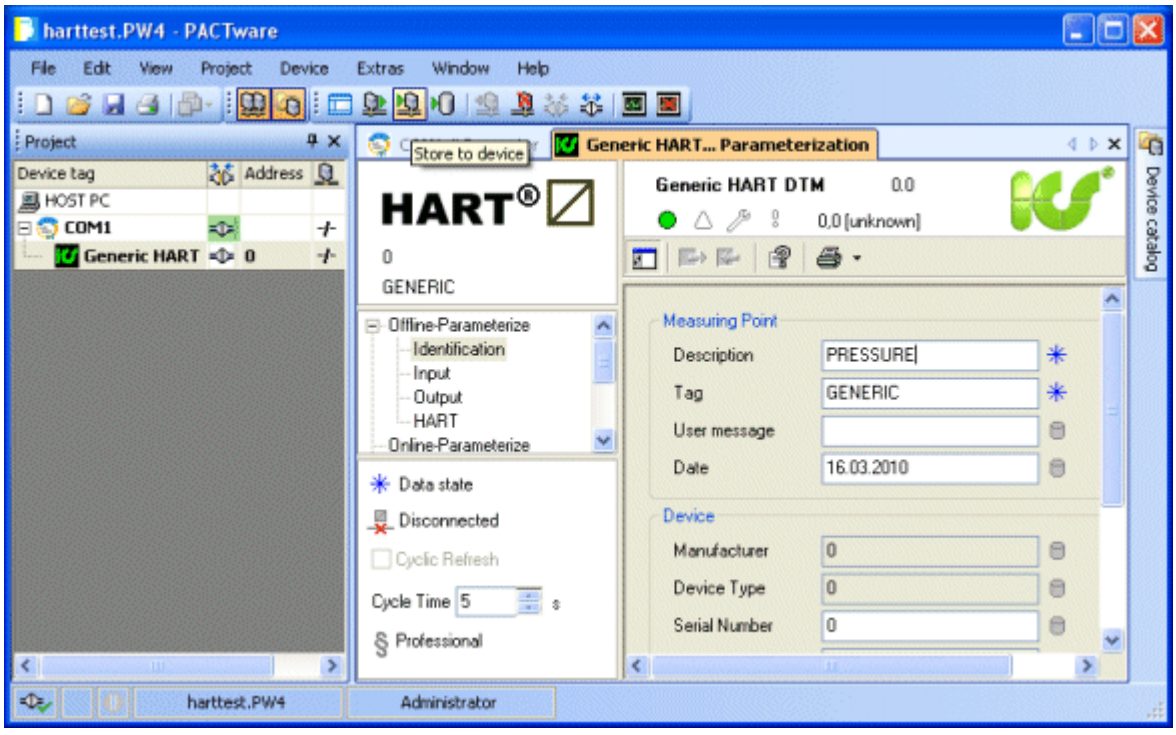


Tool **Load from device** of the **Toolbar** reads data from the field device. A connection to the field device is automatically established.

If no connection can be established, e.g. the address of the COM-interface in the HART Communication DTM must be changed. The parameter page of the DTM must therefore be opened by a double-click on its menu item in the project window.



The parameter page of the Generic HART DTM is also opened by double-clicking its entry in the project window and subsequently displays the values read from the field device.

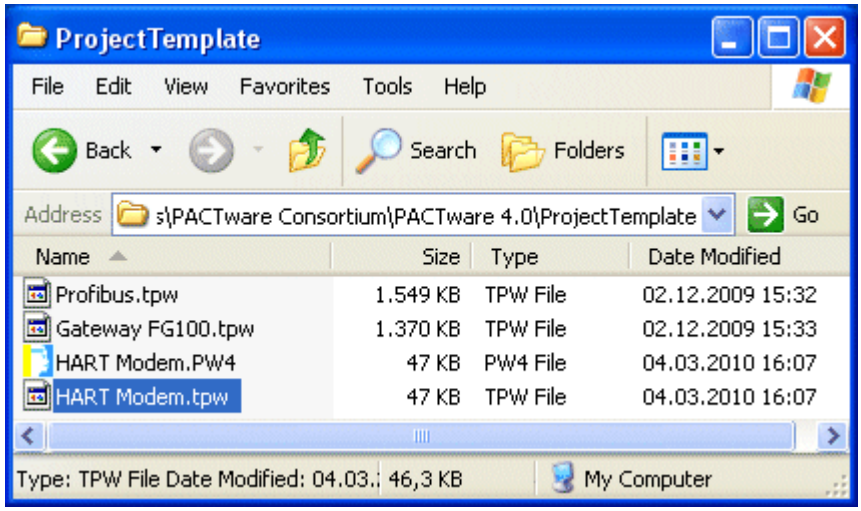


Changed parameters can be stored to the field device by using tool **Store to device**.

1.6 Using Project Templates

After starting PACTware a list of project templates which are contained in directory
...PACTware Consortium\PACTware 4.0\ProjectTemplate
are displayed.

The following example displays three templates with file identifier **tpw**, a project file with identifier **PW4** and the associated selection list offered at the start:



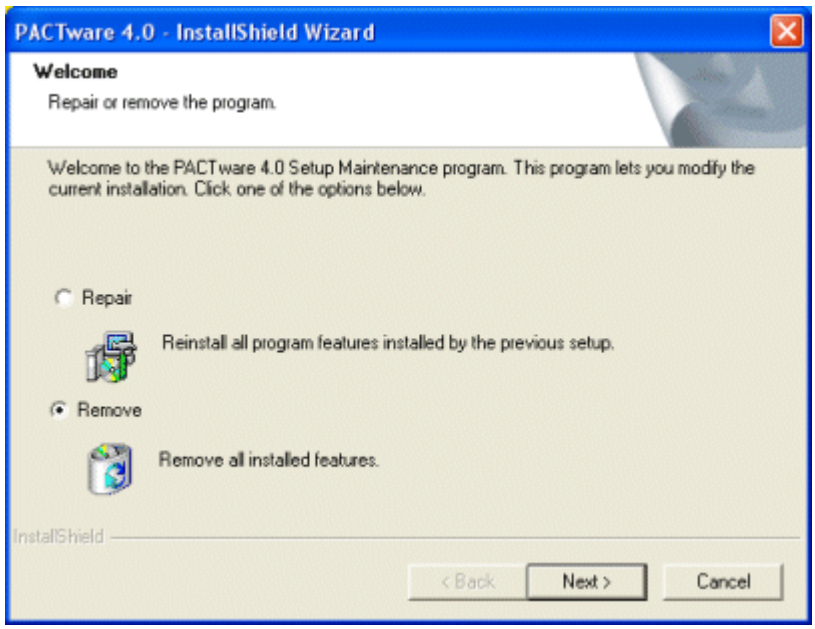


A template is created by providing a saved project file with file identifier **tpw** . At the next PACTware start the project file is entered to the list of templates.

1.7 Uninstall

PACTware is uninstalled via menu item **Customize** in the PACTware 4.0 program group.

The installation program is called via this menu item.



The device catalog, the project files which were edited in PACTware and all installed DTMs remain unchanged.

1.8 Problem report

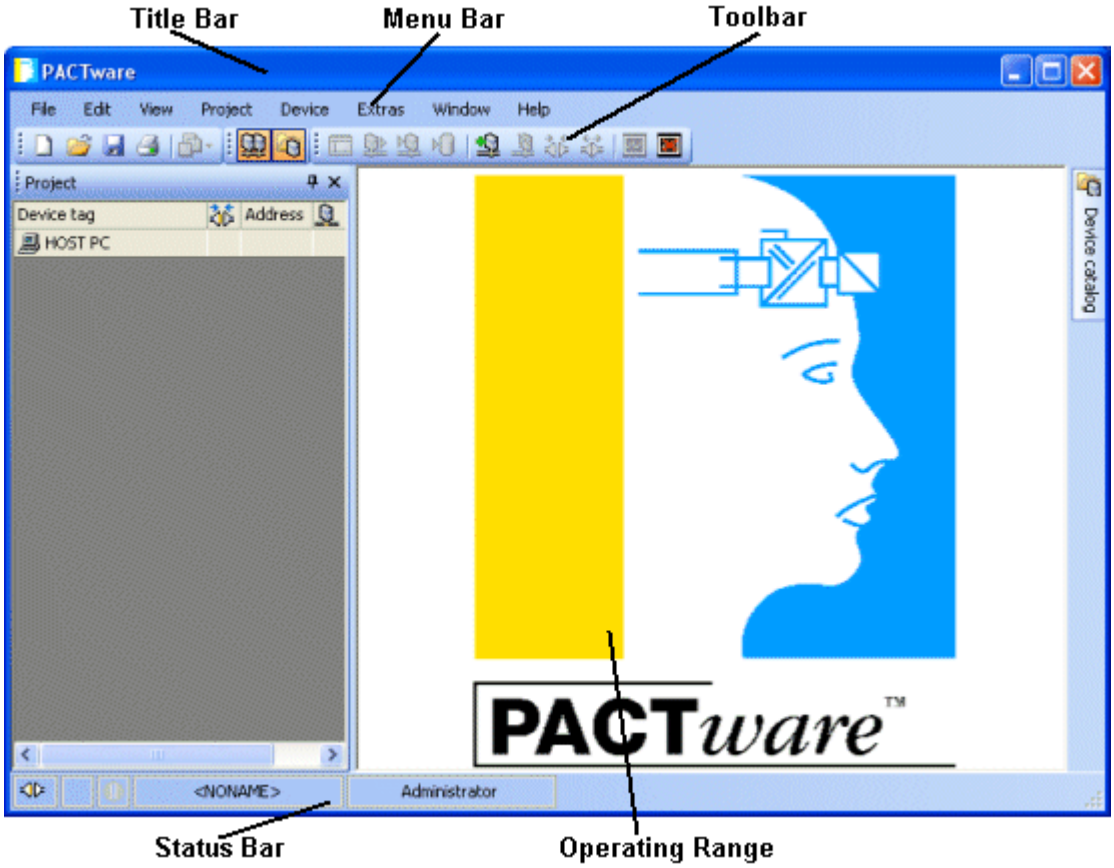
In the event that DTM or PACTware-related problems occur, a hotline is available by e-mail to hotline@pactware.com or by phone 0 180 5 350050 (14 ct./min). Additional support is provided by the vendor who supplied the DTM or PACTware.

Information about suppliers of PACTware are contained in a form which can be called via entry **About...** in **Menu Help**. Information about the DTM is either obtained via menu item **Properties** in the context menu of the DTM in the project structure or via the button **Info** of the device catalog after selecting the associated device from the device catalog.

The problem description must contain information about the operating system on which PACTware runs, the PACTware and DTM program versions. To find a solution, any information about the interactions or the executed functions which lead to the problem are useful. In addition, screenshots are also helpful in the error analysis.

2. Main Window

Following the start **PACTware** displays the main window which consists of 5 components:



2.1 Menu bar

The menu bar contains pull-down menus to start all available program functions. The requested menu item is selected by using the mouse or the corresponding shortcut key (ALT-<letter>).



2.2 Toolbar

Frequently used commands of the menu bar and the project view are contained in three toolbars. The symbols have tooltips which explain the function.

The toolbars can be shown or hidden in **Menu View** - and can be positioned any way within the PACTware window.



The left section contains **Toolbar Project**. It contains tools to create a new project, open an existing project, save or print the current project. The right symbol allows to display profiles that were created for a project (see **Layout Management**).

The center **Toolbar View** contains two symbols to display and hide the project window and the device catalog.

The right **Toolbar Device Data** contains tools to edit DTMs. The left section of this toolbar contains 4 tools:

- for the parameterization of a field device the user interface of a DTM selected in a project is displayed,
- tool **Load from Device** loads all parameters from a field device,
- tool **Store to device** stores them to a field device
- tool **Write device data to file** writes the current parameter set of the DTM to the PACTware database.

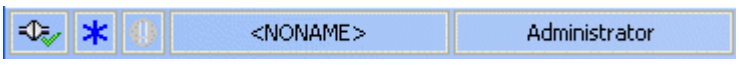
The symbols in the center section have the following meaning starting from left to right:

- enter an additional DTM to the selected position of the project
- delete the selected DTM from the project
- connect the selected DTM and the field device
- disconnect

The right section of this toolbar is finally used to control the **Device State Manager Add-In**.

2.3 Status bar

The status bar contains information about the current status of the edited project.



The displays have the following meaning (from left to right):

- Connected with a **CommDTM**
- Project was changed (identified by an asterisk)
- Error message display: The symbol flashes if the messages have not yet been displayed in the error monitor. A tooltip displays the number of the error messages.
- Name of the project
- Active user role

2.4 Operating range

In the operating range two window types are displayed, which are required for project editing or parameterization of the field devices:

- **PACTware Windows**, which are assigned to the PACTware Add-Ins and
- **DTM Windows**, which are offered by the DTMs.

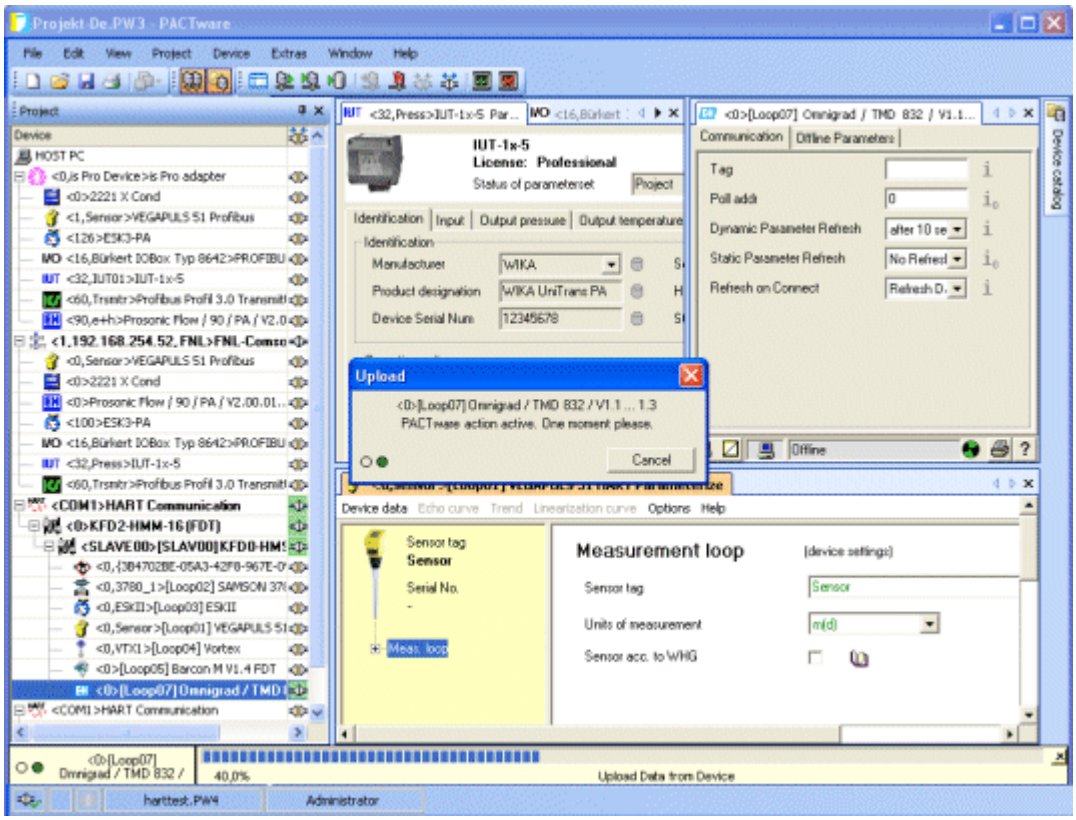
PACTware windows include the device catalog, project view, clipboard, plant view, error monitor and debug monitor.

DTM windows are combined in a group, if they are displayed in "**Tabbed MDI**". Each window contains a tab, to which the name of the DTM and the function displayed in the window is entered (see the following figure).

If "**Classic View**" is selected (see **Menu Window**), a separate window is displayed for each DTM and function (e.g. parameterize, calibrate, display measured values). It can be moved freely, arranged and minimized.

When actions take a long time - like for example **Load from device** - a progress bar is displayed at the lower edge of the operating range. This progress bar must be closed again if the action cannot be terminated.

The following figure shows a complex arrangement of windows while a field device is connected.

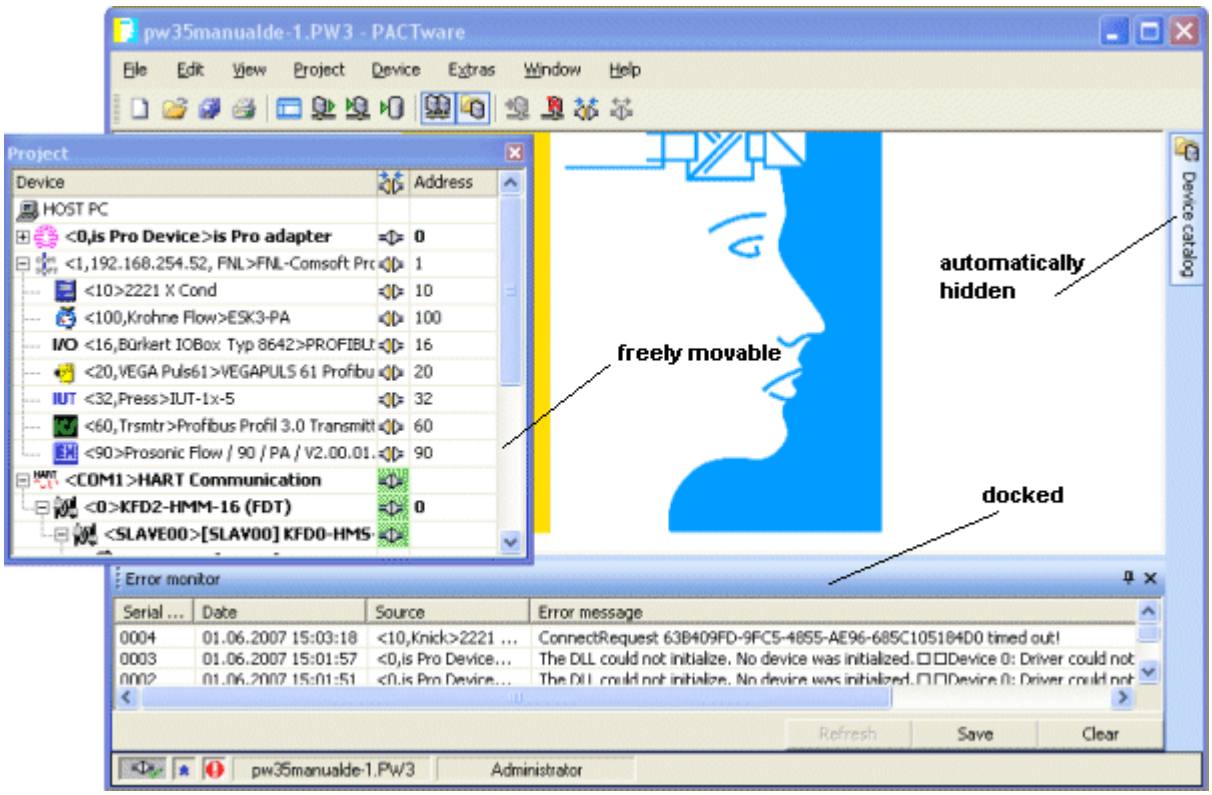


The arrangement of windows can be stored and recreated automatically in case of repeated application (see **Layout Management**).

2.4.1 PACTware Window

PACTware windows can be handled flexibly according to the different use cases. As several windows are in use simultaneously, a most space-saving arrangement which still displays any required information is necessary. The Layout Management supports the user in optimal manner.

PACTware windows can be displayed docked to the main window, automatically hidden and freely movable. The following figure shows all three possibilities:



The project view is contained in a freely movable window, which can be positioned on the desktop independently of the main window.

The device catalog is automatically hidden at the right edge. It is displayed docked, as soon as the cursor glides along the labeled tab and disappears when the cursor is outside the window.

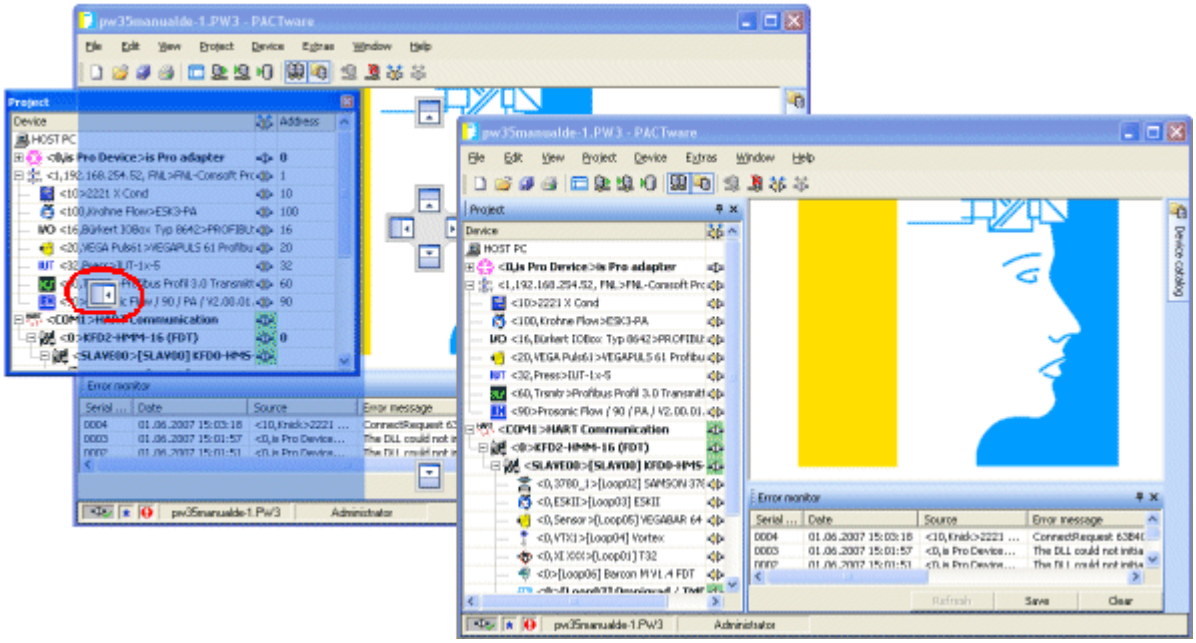
The error monitor is docked onto the main window.



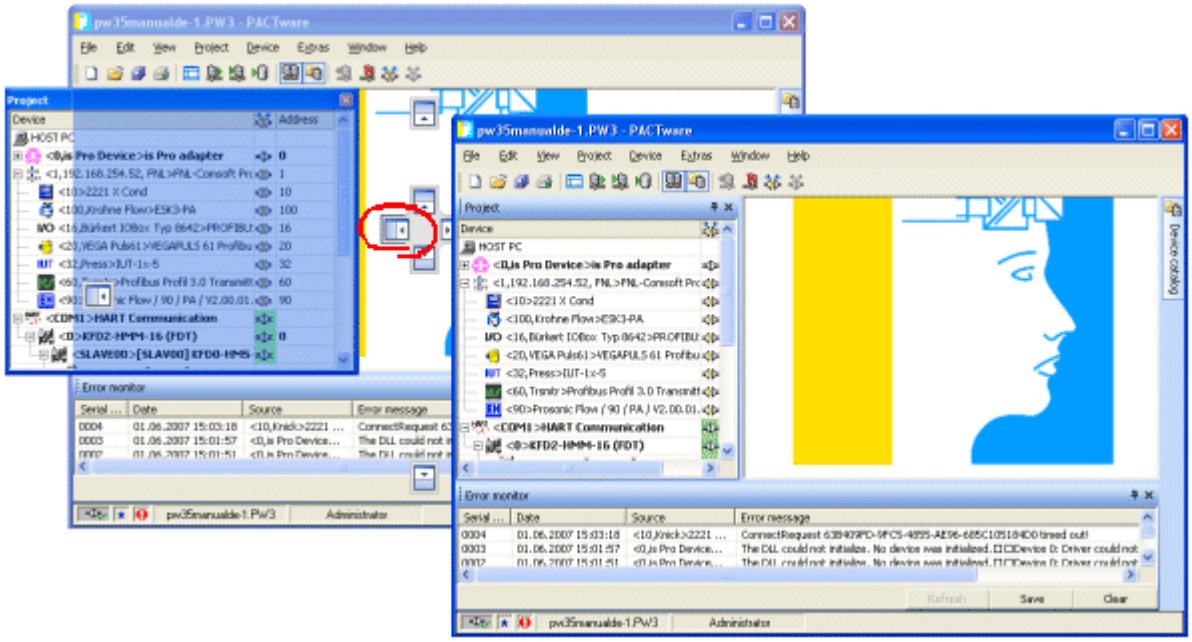
The needle symbol in the title bar of the window allows to switch from docked window to automatically hidden window.

All PACTware windows may have any of the three states. The user is offered visual help to switch between different states and to easily navigate to each new position.

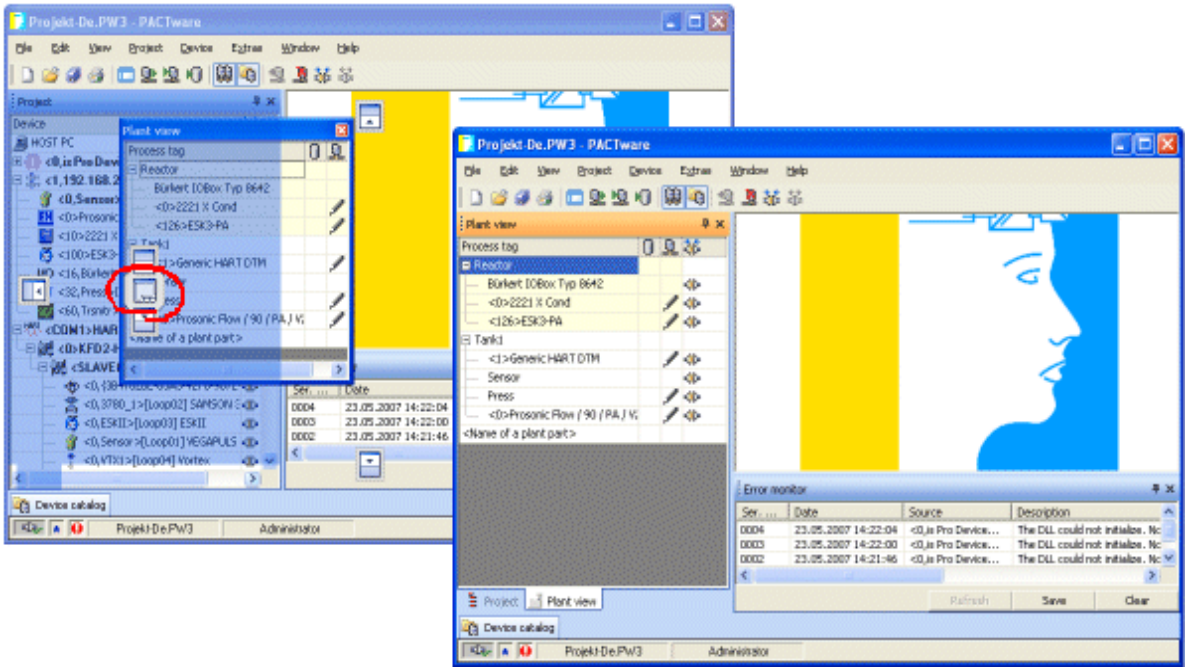
Docking of a freely movable window is displayed in the screenshots below. The target position of the window is displayed in a blue area. The target position is displayed when the cursor reaches one of the arrows (outer left in the figure below).



4 external positions are available which represent docking to the edge of the main window. The 4 internal positions characterize targets within the empty pane between the windows. The following figure shows the alternative docking of the project window.



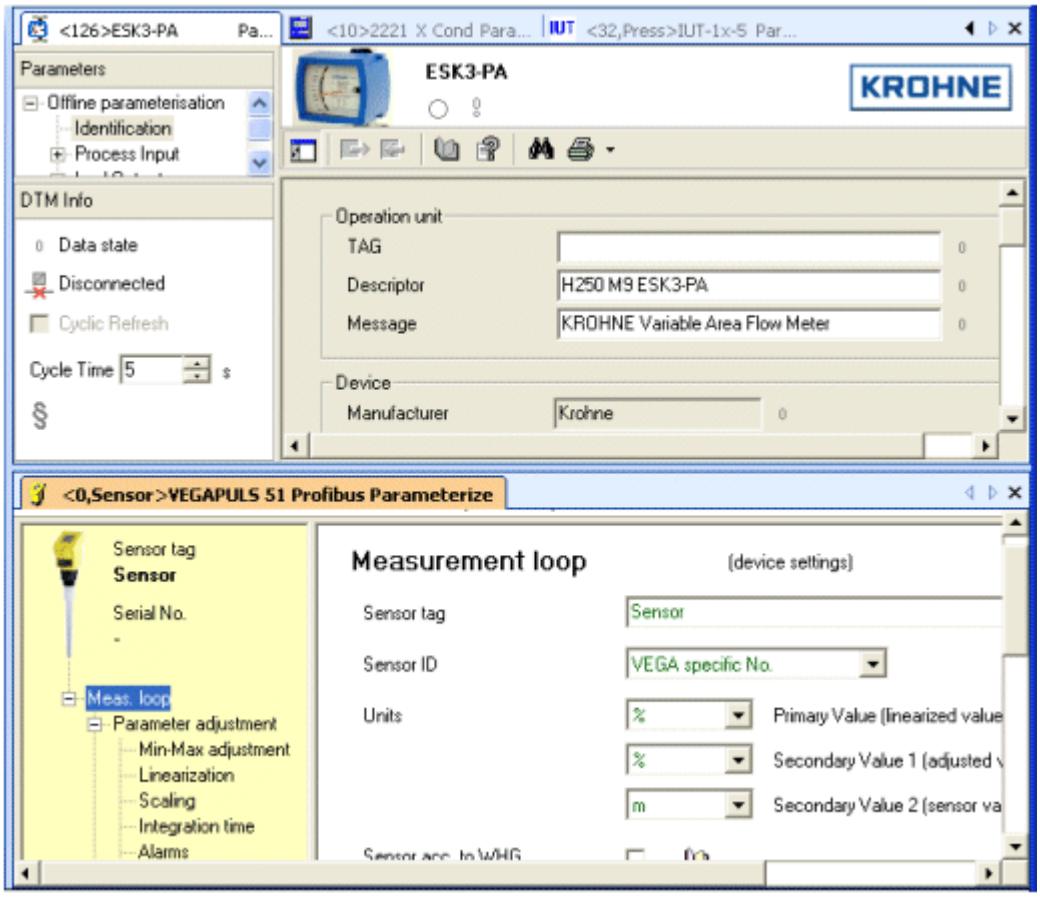
Cascading of several PACTware windows represents another option of a space-saving arrangement. The windows are selectable by a tab at the bottom edge. This layout is suitable for windows of similar content, which are to be displayed alternatively. In the figure, project view and plant view are displayed cascaded.



2.4.2 DTM Window

All DTM windows are combined in a group. The group can consist of several panes containing one or several DTM windows which are each labeled by a tab. Only one window is displayed in each pane.

The tab allows to bring a DTM window to the front.

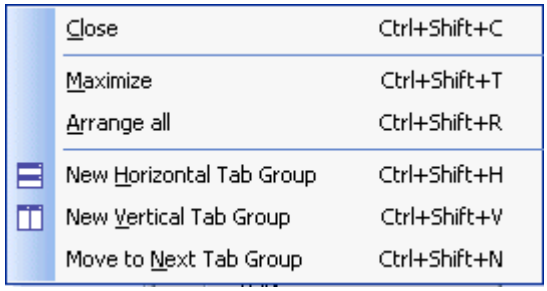




When the number of DTM windows in a pane exceeds the space provided for labeling all tabs, arrows are used for scrolling. Button **x** closes the displayed DTM window.

Each call of a function of the DTM displays a new DTM window. If a window is already open for a function of a DTM, it is switched to the front.

The tabs provide the following context menu for the arrangement of DTM windows:



When a DTM window is displayed maximized, all remaining DTM windows are masked. The arrangement becomes visible again when the maximized display is reduced to regular window size. Menu items **New Horizontal Tab Group** or **New Vertical Tab Group** displays the corresponding DTM window individually in a new line or column of the arrangement.

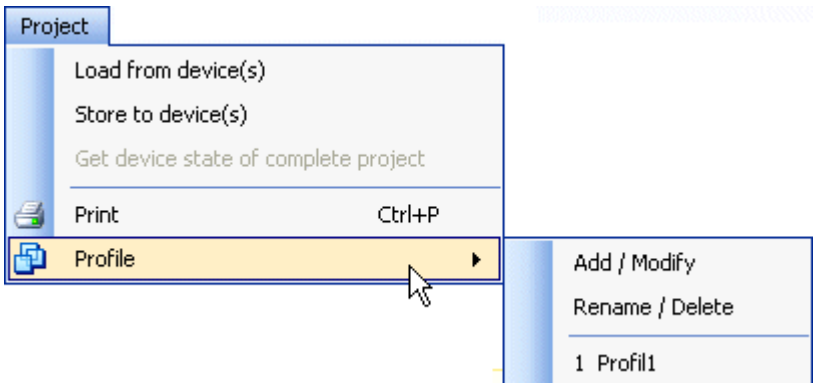
The arrangement of the DTM windows can be changed analog to the PACTware windows by using the mouse. A preview is offered for the displayed target positions as well as for the new position of the edited DTM window.

2.5 Layout Management

The Layout includes the PACTware window as well as the DTM window. The arrangement of all windows and their states can be assigned an own name and be saved as profile. Switching between layouts for different use cases is such possible.

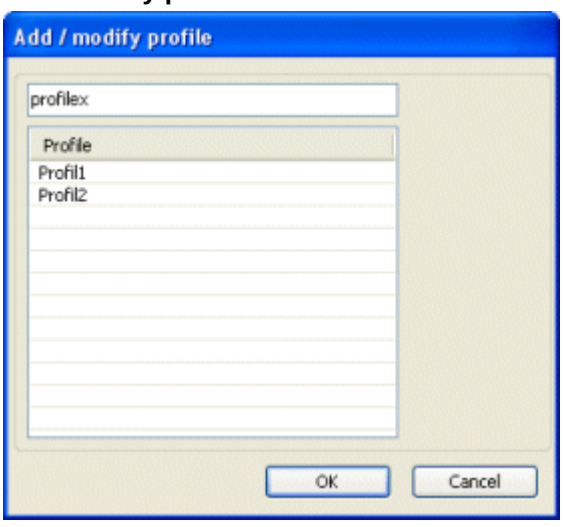
In addition to the graphic layout, the connection status between DTMs and field devices is also saved by the layout management. PACTware can such automatically reproduce a use case by opening a project also in complex plants to e.g. proceed working after an interruption.

The Layout Management is called via menu **Project**.



Every user can add, modify, load or delete profiles within a session.

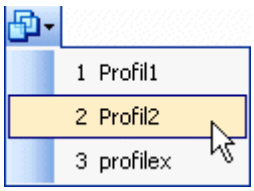
Add/ modify profile



To add a profile to a project, the name of the new profile is entered to the input field of the window. A new profile is created under the specified name by using pushbutton **OK**. The profile contains the layout in the current form.

If modifications of a layout are to be saved, the desired profile must be selected and confirmed via **OK**. The current layout such replaces the previously saved layout. A query prevents inadvertent overwriting.

Load profile

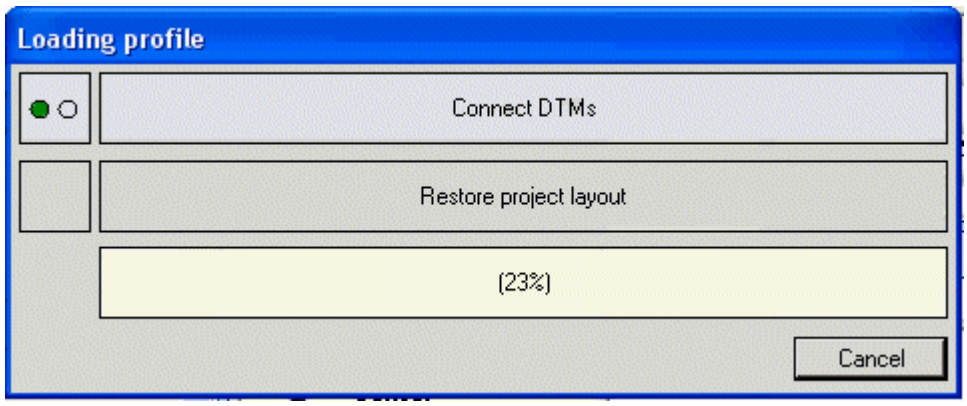


The right tool of **Symbol List Project** allows to open a list of all saved profiles. The requested profile is selected.

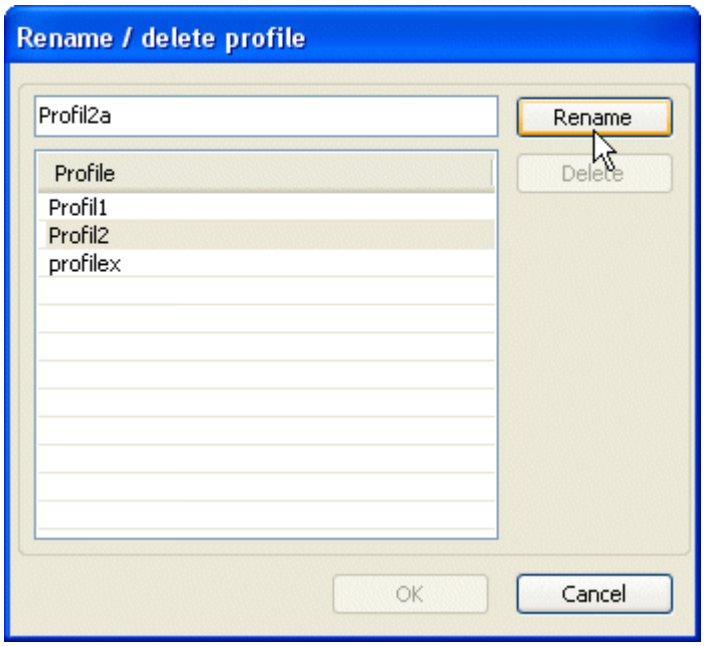
Before the new profile is loaded, all field device connections are closed and all windows of the current project are closed. Subsequently, the project displays the selected profile and the layout with all DTMs and PACTware windows.

If field devices are connected in the loaded profile, they are reconnected when the respective option is set (see **Menu Extras**).

The progress in the buildup of the layout and the connections is displayed in a form.



Rename/delete profile



The name of the selected profile is copied to the input field. If the name is changed, the new name can be accepted by using **Rename**. If the name of a profile is only selected, the profile can be deleted by using **Delete**. The action can be aborted. Profiles are only permanently deleted, when the project is closed and all changes are saved.

The selected profile is marked as deleted. It is, however, only deleted when the project is closed and all modifications are saved.

All profiles are saved including the current project (see **Save project**). To save projects, at least **User Rights** of maintenance or of a planning engineer are required (see **Save as...**).

3. Functions

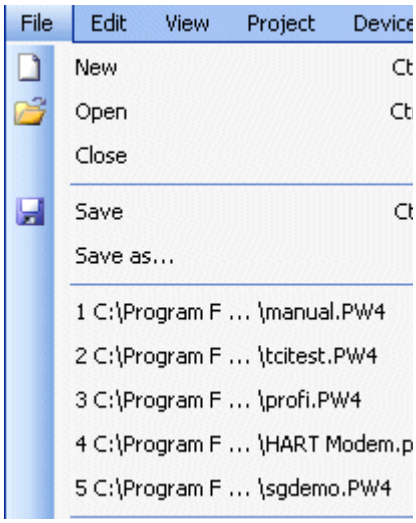
The functions of PACTware relate to project editing, the parameterization and the work with field devices as well as the settings of the program itself.

3.1 Menus

The menus combine all functions of PACTware in groups.



3.1.1 Menu File



Menu **File** contains all functions pertaining to project editing.

New
Creates a new project. The project window is empty. To create a new project the **User Rights** of a planning engineer are required.

Open
Opens a project file. Every user can open a project. Loading a project comes with a progress bar (see **Generate/Open project**).

Close
Closes the currently edited project. If changes are not saved, a dialog window is displayed prompting the user to save them. Each user can close a project.

Save
Saves the current configuration of the project. This function requires the **User Rights** of a planning engineer.

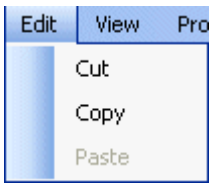
Save as...
Saves the project file under a new name. This function requires the **User Rights** of maintenance.

1 C:\Program F...

A list displays the most recently edited projects. The requested project can be selected and opened directly from this list.

Exit
Exits PACTware. If changes are not saved a dialog is displayed prompting the user to save (see **Save project**) them. Every user may exit PACTware.

3.1.2 Menu Edit



Menu **Edit** contains functions to edit a project.

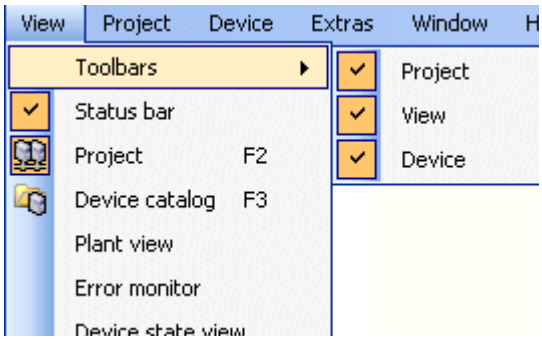
Cut
A DTM or a part of a project which is connected with the selected **CommDTM** or **GatewayDTM** is copied to the PACTware **Clipboard** and removed from the project. This function requires **User Rights** of a planning engineer.

Copy
A DTM or another part of a project which is connected to the selected **CommDTM** is copied to the PACTware Clipboard. This function requires the **User Rights** of a planning engineer.

Paste
The project part or DTM contained in the PACTware Clipboard is pasted to a selected position of the project. This function requires **User Rights** of a planning engineer.

The use of the Clipboard is described in **Add part of a project**.

3.1.3 Menu View



The **Toolbar** and the **Status bar** can be activated and deactivated using menu **View**.

In the **operating range** the **Project View**, the **Device Catalog**, the **Plant View,** the **Error Monitor,** the **Clipboard** and the **Debug Monitor** as well as the windows of additional **Add-Ins** can be displayed and hidden.

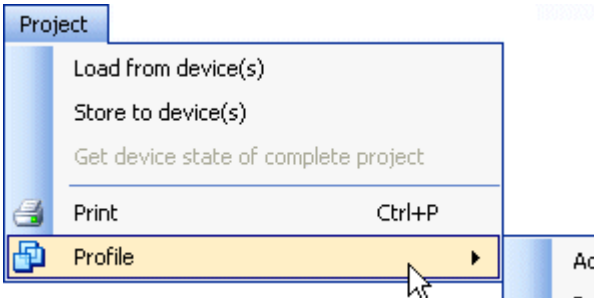
Add-Ins are only displayed if they were loaded. Section **PACTware Add-Ins** describes how to load and unload Add-Ins.

The **Error Monitor** logs all error messages which show DTMs.

The **Device State Add-In** shows the log of the last recording of the device state manager.

The **Debug Monitor** logs events within PACTware and between PACTware and the DTMs.

3.1.4 Menu Project



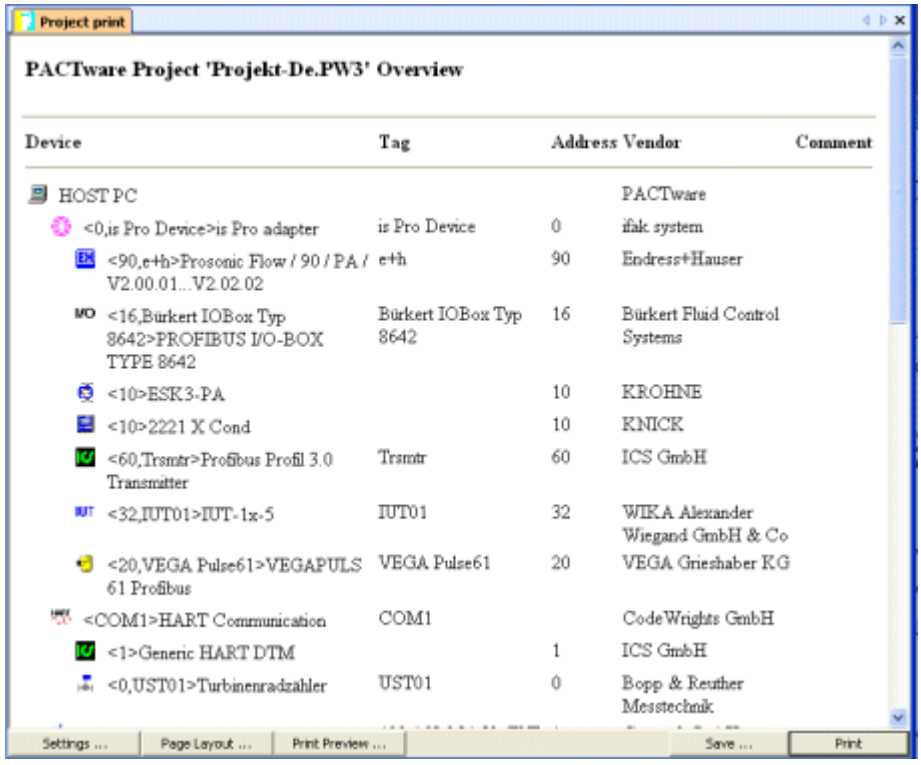
Load from device(s)
The parameters of all field devices contained in the project are read and applied to the project. This function requires maintenance **User Rights**.

PACTware offers the **Up/Download Manager Add-In** and the **Plant View** to load parameters from a selection of field devices.

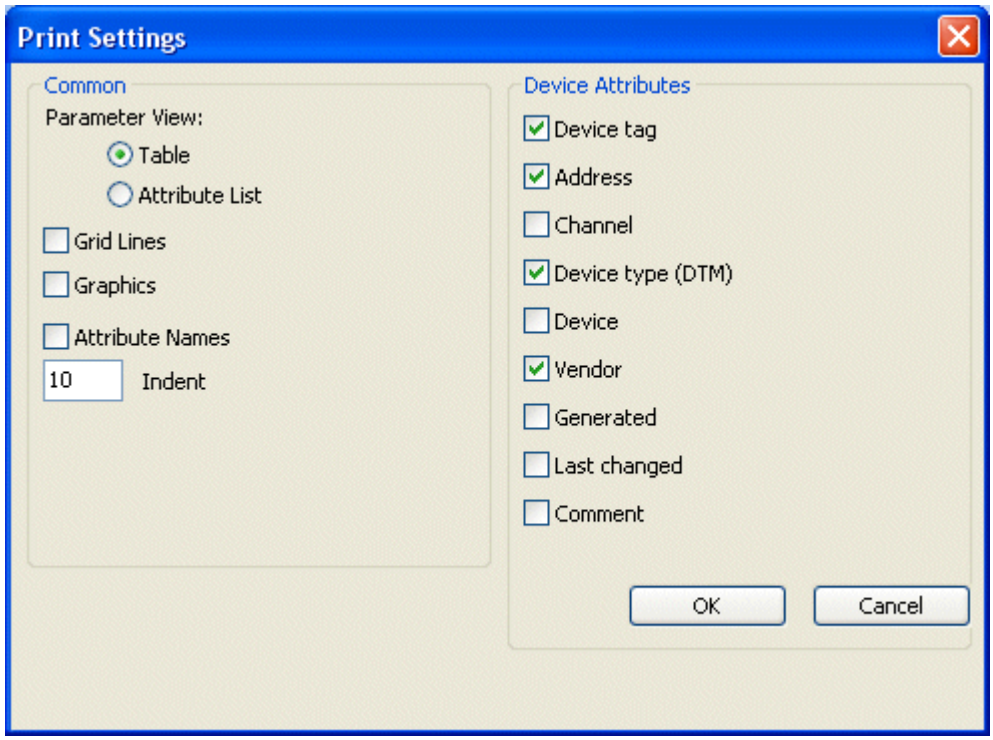
Store to device(s)
This function is similar to function **Load from device(s)**, except that all parameter values of the project are stored to the associated field devices. This function requires **User Rights** of maintenance.

PACTware offers the **Up/Download Manager Add-In** and the **Plant View** to store parameters to a selection of field devices, which are assigned to a selected communication field device (e.g. Remote I/O System or HART-Multiplexer).

Print
Displays the project in a list which is displayed in a preview window. The project can subsequently be output on a printer. Any user may print projects.

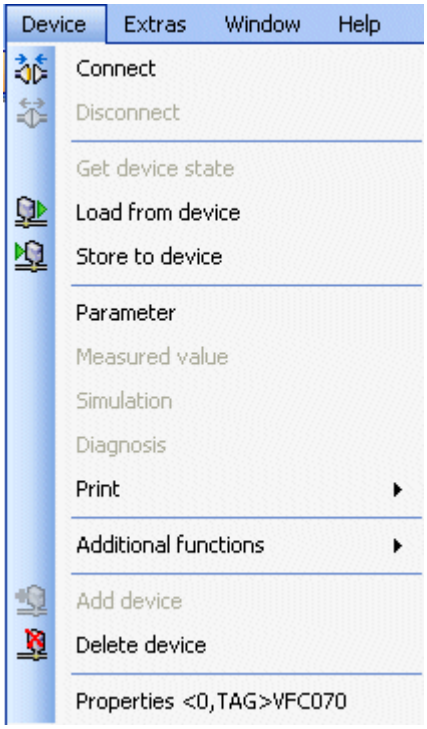


The following dialog is called via button **Settings**. Some parameters can be set to adapt the print layout:



Profile
A new PACTware layout and a new DTM window are defined and stored in this submenu or an existing layout can be changed or deleted (see **Layout Management**).

3.1.5 Menu Device



All functions a **DTM** can execute with field devices, CommDTMs or GatewayDTMs, are contained in menu **Device**. The content of this menu corresponds to the **Context Menu**, which is displayed using the right mouse key for each DTM in a project.

The first two groups of menu items are provided by each DTM. The menu items of the third group are offered by most DTMs. Functions which are generally or temporarily not available in the selected DTM are displayed in gray color.

Special functions of the selected DTM are called via menu item **Additional Functions**. The content of the submenu depends entirely on the functions of the DTM.

The functions Connect/Disconnect, Measured value and Diagnostics, Print and Properties are enabled to all users.

A more detailed description of the functions is contained in section **Context Menu** or in the manuals of the DTMs.

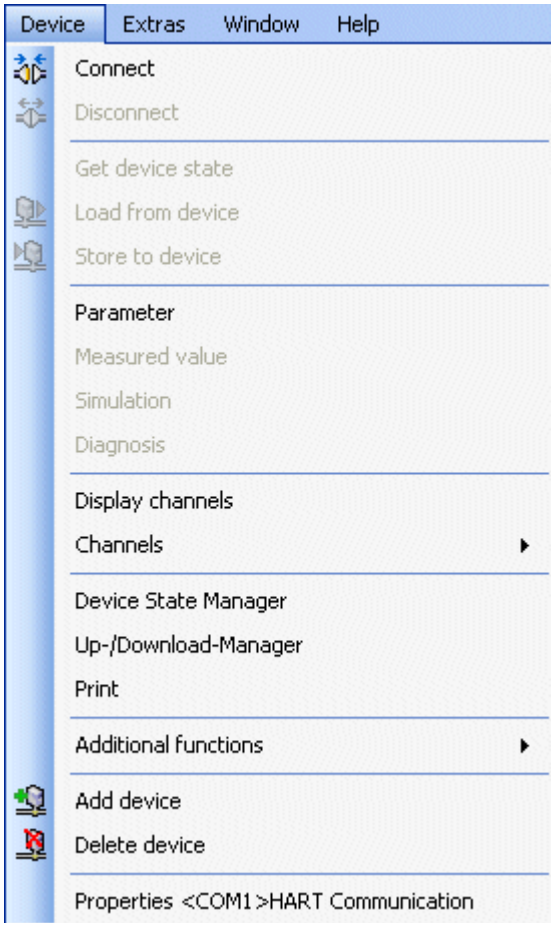
The operator may **Get Device State, Load from Device** and view parameters offline and online. Maintenance staff may in addition change parameters and **Store to device** or **write** to the project file and start a **simulation**.

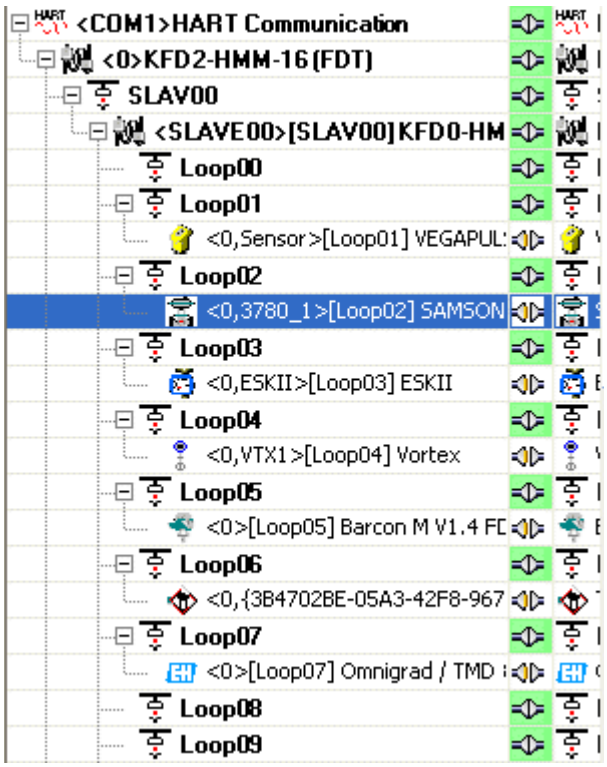
An additional device can be added to the project structure via **Add device**. A catalog of all DTMs is provided which can be used for a communication field device, like e.g. a multiplexer or a communication component like e.g. a Profibus interface connection.

The selected device in a CommDTM or GatewayDTM, also any device connected with it, are deleted from the project via menu item **Delete device**. These functions require **User Rights** of a planning engineer.

Menu item **Properties** displays a form with information about the selected DTM and the field device. The information is entered to the project database.

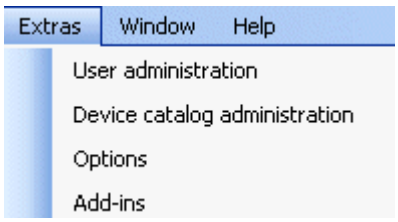
CommDTMs and **GatewayDTM**s offer some additional functions to edit the channels provided by such a DTM. The display of channels supports the selective assignment of DTMs to channels of a GatewayDTM. The project view displays assigned and unassigned channels.





In addition, the **Device State Manager Add-In** and the **Up/Download Manager Add-In** for CommDTMs and **GatewayDTM**s can be called.

3.1.6 Menu Extras

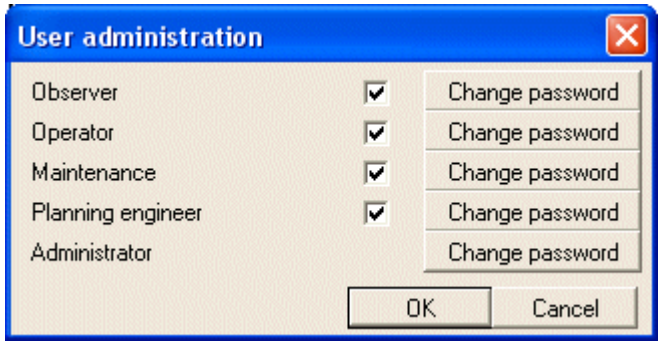


Administrative functions and program settings for PACTware are defined in menu **Extras**.

Passwords of the user roles are edited in the administrative functions; DTMs requested to appear in the **Device Catalog** can be selected and the **Add-Ins** which are to extend PACTware functions are defined.

User Administration

Passwords for the user roles are defined in the **User administration**. Only the administrator may edit the user administration.



The rights of the user roles are detailed in the glossary of the table **User Rights**.

User roles which are selected are available at the PACTware program start.

Button **Change Password** provides a dialog for the entry of a new password. The password must be confirmed in the second line to eliminate spelling mistakes.



Caution: **If an empty password is defined for user role Administrator, no login dialog is displayed at the PACTware program start. The user is automatically logged in as administrator. If a new password is entered for the user role administrator, the Login form is displayed again.**

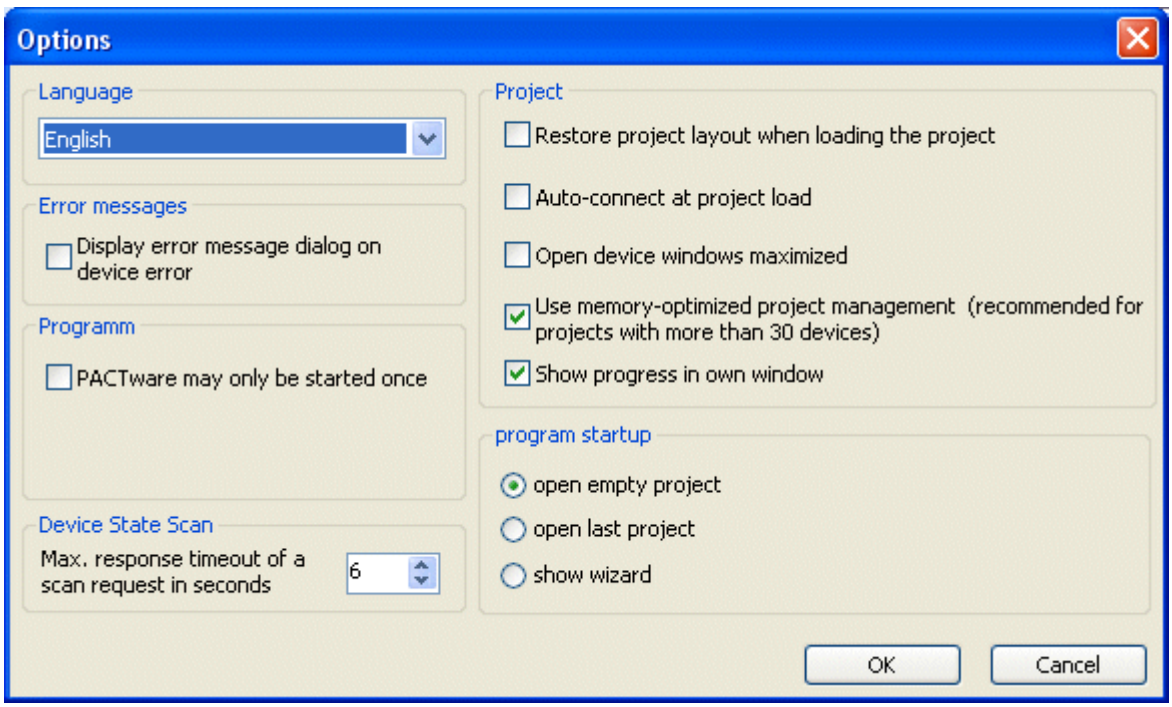
The user administration allows to define up to 5 PACTware user roles on a PC containing different rights to use DTMs.

At the PACTware start, the user can select one of the predefined user roles from the Login Dialog and is requested to enter the corresponding password.



Options

The settings which are entered to dialog **Options** are effective immediately or at the next program start. Every user can set options.



In the event that e.g. the **language** is changed and the dialog is confirmed using **OK,** text will everywhere be displayed in the requested language. This also applies to the user interface of the DTMs if the selected language is supported by the DTM.

PACTware displays a message dialog, when a DTM displays an error and this option is set. When the message dialog is suppressed, the error messages are only collected in the **Error Monitor** and displayed as requested. The error message does not have to be confirmed.

Multiplex PACTware starts are possible on one PC. If e.g. for performance reasons PACTware is to be started only once, this option can be set.

The device state of several devices of a project is managed via the **Device State Manager Add-In**. Option **Device State Scan** allows to define the maximum time span after which a new cycle is started.

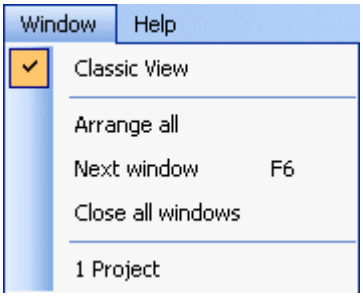
The following default settings can be assigned for working in **Project**s:

- If a layout was stored, it can be rebuilt automatically when a project is opened (see **Layout Management**).
- For repeated parameterization of field devices the connection can be established automatically. When changes to the plant were made like e.g. change of field device address, the connection cannot be reestablished. The project cannot be opened completely.
- If only one field device at a time is in use, the view in the operating range can be reduced to one dialog of a field device.
- In large projects the loading of DTMs is optimized. When a project is opened, not all DTMs are loaded. DTMs which are no longer used are unloaded as soon as a certain memory capacity is reached.
- The progress bar, which is displayed e.g. when loading parameters from a device, can be displayed in an own window in addition to the status line. This window displays information on the presently edited device.

There are 3 options to open projects at the **program start**

- No project is opened. A new project must either be created completely manually or is selected via menu item **Open...** .
- The most recent project that was edited in PACTware is reopened at the start. This option should only be used when PACTware is used repeatedly in succession in the same project and under the same environmental conditions.
- Project templates and wizards are available (see **Using Project Templates**).

3.1.7 Menu Window



Menu **Window** supports the arrangement of **DTM** windows in the operating range.

If option **Classic View** is selected, each function of a DTM is displayed in an own window which can be maximized or minimized.

If this option is not selected, the DTM windows are arranged in **Tabbed MDI** style (see **DTM Window**).

Arrange all in Tabbled MDI style ensures that the same amount of space is divided between all DTM windows.

In classic view an own window is displayed for each DTM function in the default size of the DTM. The windows are displayed cascaded from left top to right bottom.

Arrange all in Tabbed MDI Style allocates the same amount of space to all DTM windows.The classic view shows an own window for each DTM function in the size predefined by the DTM and arranges the windows cascaded from top left to bottom right.

Next window switches from one DTM-window to the next and brings it to the front. All PACTware windows are also selected consecutively.

The operating range is emptied by activating **Close all windows**. PACTware windows and DTM windows are closed.

1Project etc. These menu items allow to display windows selectively.

3.1.8 Menu Help



This documentation is called via the first menu item of the **Help** menu.

Information about the program version and the location of the components of the **PACTware** program are displayed via entry **About** of the **Help** menu.

3.2 Context Menu

A **context menu** is provided for each DTM of the project. It consists of menu items which are predefined by **PACTware** and menu items which are defined by the respective **DTM**. The look of the context menu therefore changes from DTM to DTM.

If a function is inapplicable, the respective entry is displayed in gray color. Functions may become unusable owing to the **User Rights** (User Role or License), the DTM properties or the communication status of the DTM.

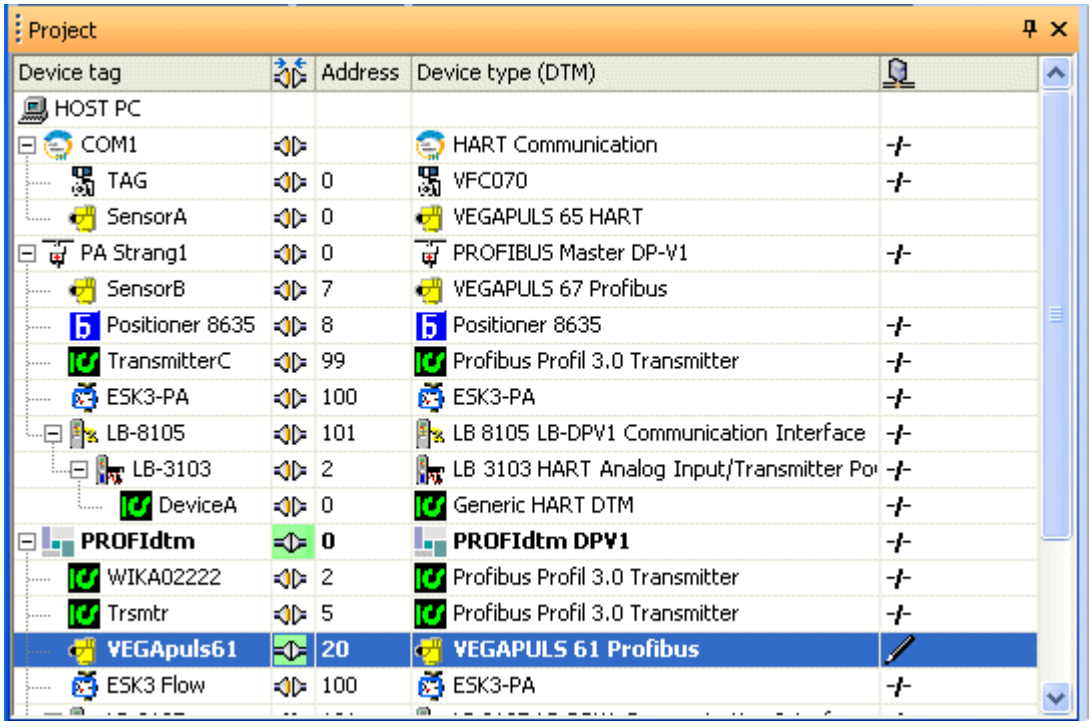
The content of the context menu is identical to **Menu Device**.

3.2.1 Connection between DTM and device

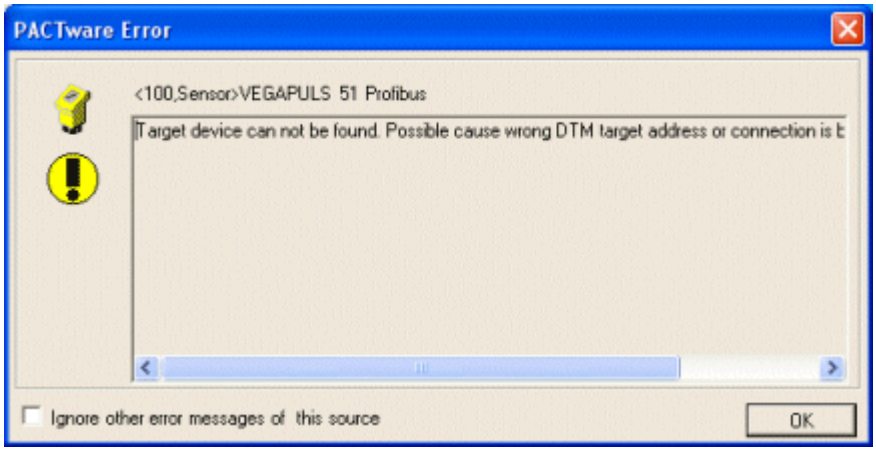
The following two menu items in the context menu are provided by each **DTM**.

Connect

A connection between the DTM and the device is started via the communication channel which is defined in the project. The project window displays all involved DTMs and the **CommDTM** in bold letters. When the connection was successful, the respective icon is displayed.



An error message is displayed when the initial communication with the device was not terminated successfully, because e.g. device and DTM are not compatible.



Disconnect

After using the device, the connection can be disconnected via this function. The connection is disconnected automatically when PACTware is exited.

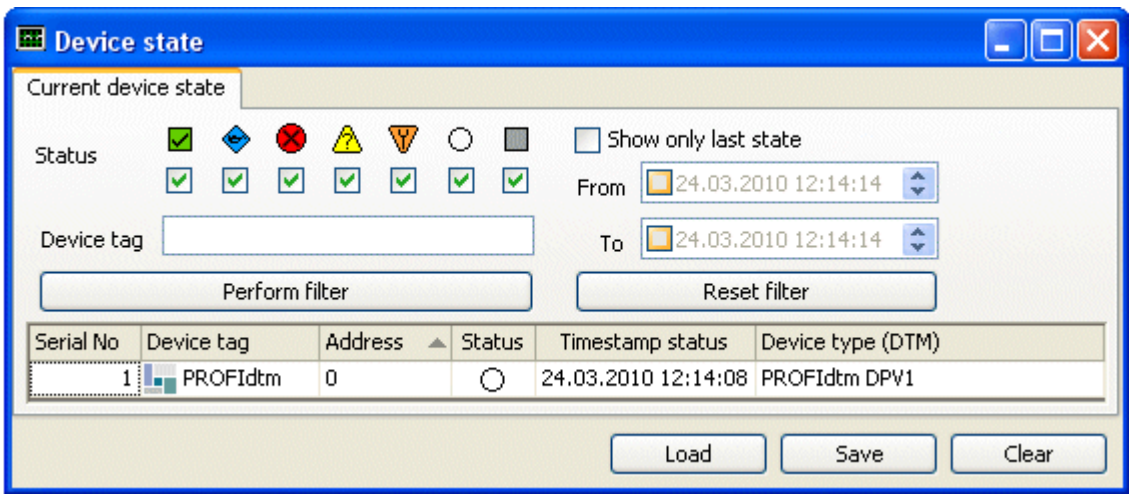
Disconnecting a **CommDTM** or **GatewayDTM** results in a simultaneous disconnection of all connected DTMs.

3.2.2 Data exchange between DTM and device

The following three menu items are provided by each **DTM**. In order to load data from device or to store data to device, the device must be connected.

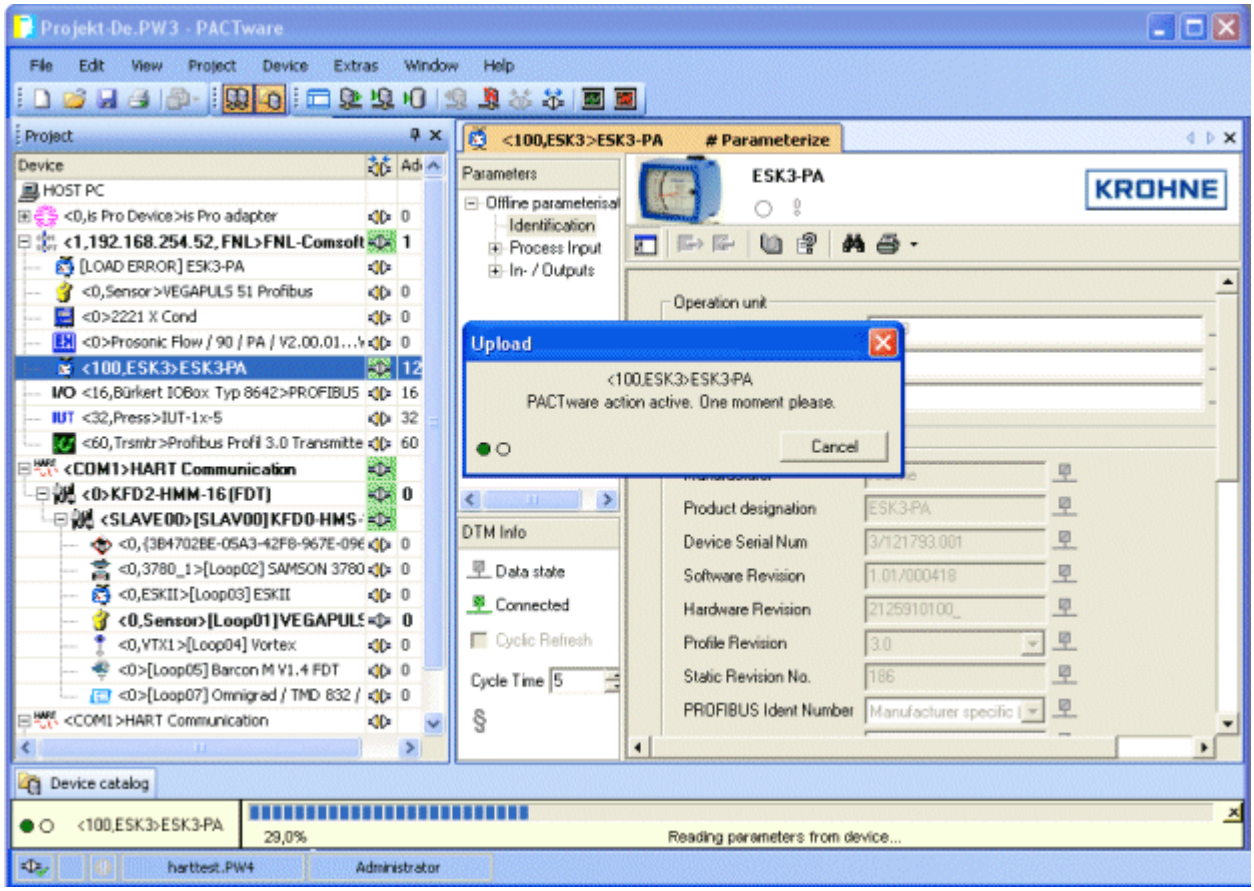
Get device state

If the connection was successful, the device state of the selected device can be read. **Device State Add-In** must be set to display the device state.



Load from device

If DTM and device are successfully connected, the DTM starts to load data from the device. This progess is displayed in a message.

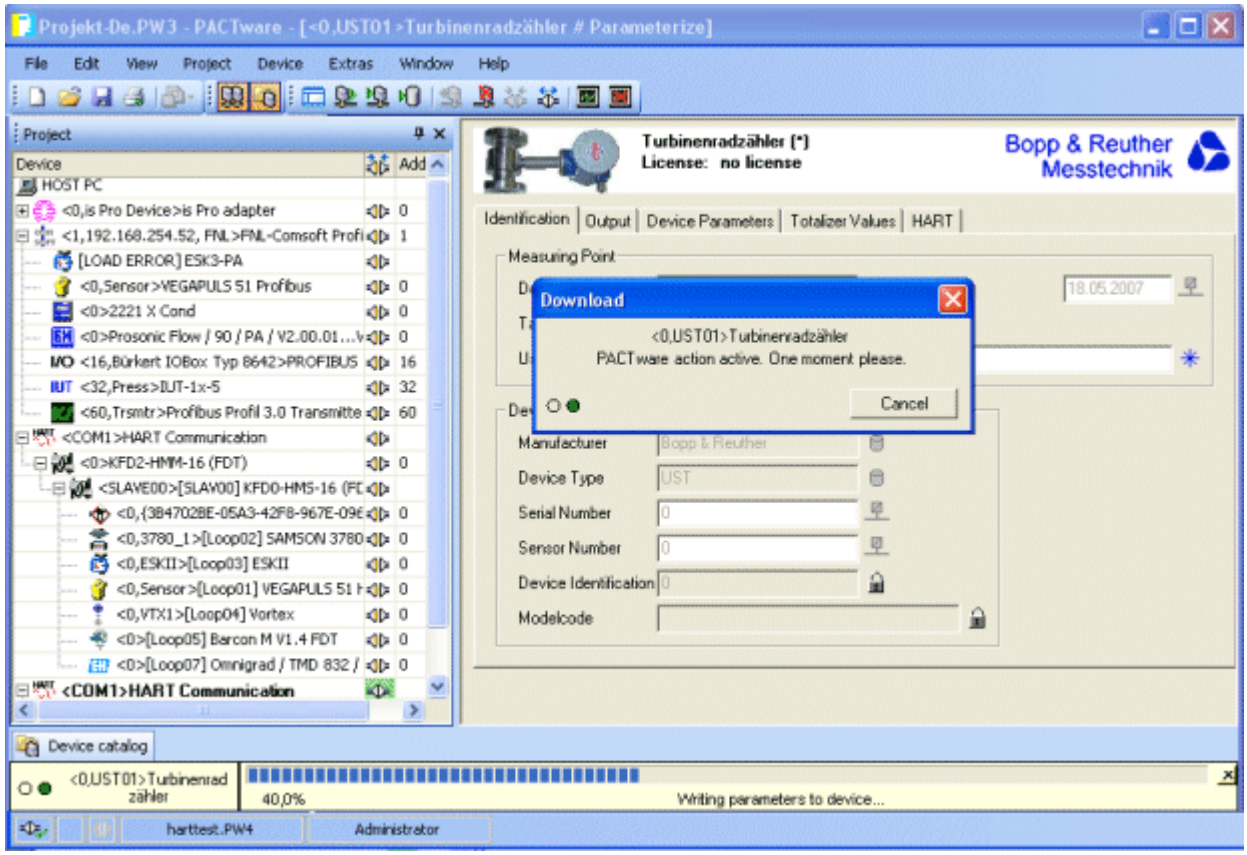


The DTM contains information about the data that is loaded from device. Different data can be loaded depending on the user role. The DTM window displays data that was successfully loaded from the device. It is not necessary to open a DTM window to load data from device.

The **Up/Download Manager Add-In** allows to upload and download data from and to several field devices.

Store to device

If the connection was successful, the DTM starts to store data to device. The progress is displayed in a message.



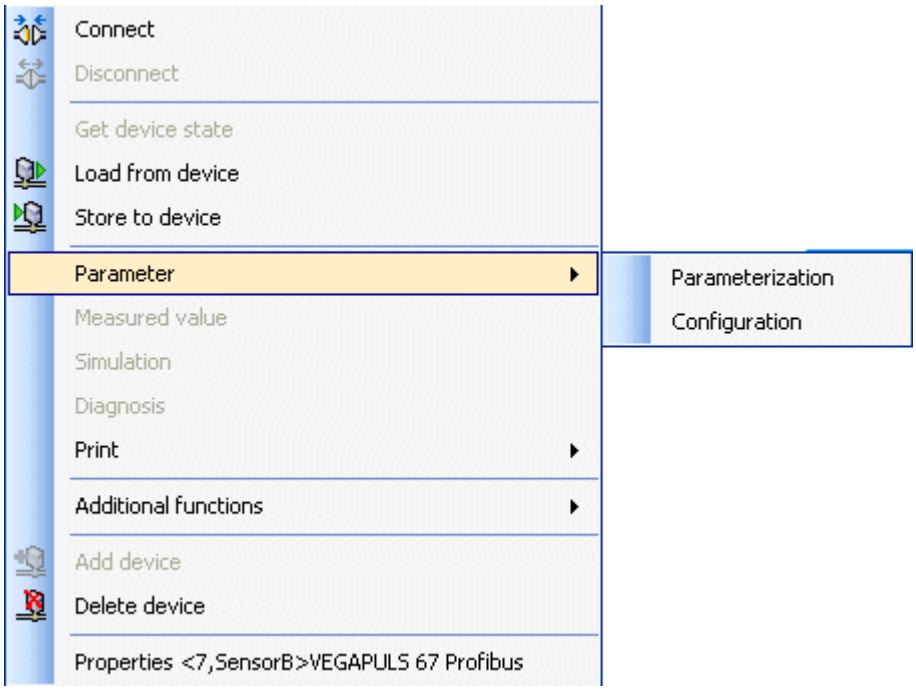
The DTM contains definitions about the data that is loaded from device. Different data can be stored depending on the user role. The DTM window displays data that was successfully loaded from the device.

It is not necessary to open a DTM window to store data to the device.

The **Up/Download Manager Add-In** allows to upload and download data from and to several field devices.

3.2.3 Edit device data with a DTM

The first menu item of this group is provided by each **DTM**. The other menu items are only offered by the DTM if the field device possesses the respective functions or if the DTM supports these functions.



The realization of the supported functions and the look of the displayed dialogs depend on the implementation of the DTM.

Parameterize

A distinction can be made between **Parameterize** and **Online parameterize**. If a connection has been established with a DTM, the online parameterization is automatically displayed otherwise a window for the parameterization of the device is displayed.

In the parameterization all parameters of a device are projected, which can also be defined without a connected device. In this manner, a project with all its devices can already be completed before the system start-up.

The online parameterization changes parameters during the plant operation, e.g. to set control parameters.

Measured value

The display of measured values is performed via a scaled measured value display or also by a trend display if the measured values can be called cyclically.

Simulation

The simulation allows to test a field device during its operation. Given states are set in the field device via DTM in order to detect e.g. malfunctions. A connection to the field device must be active.

Diagnosis

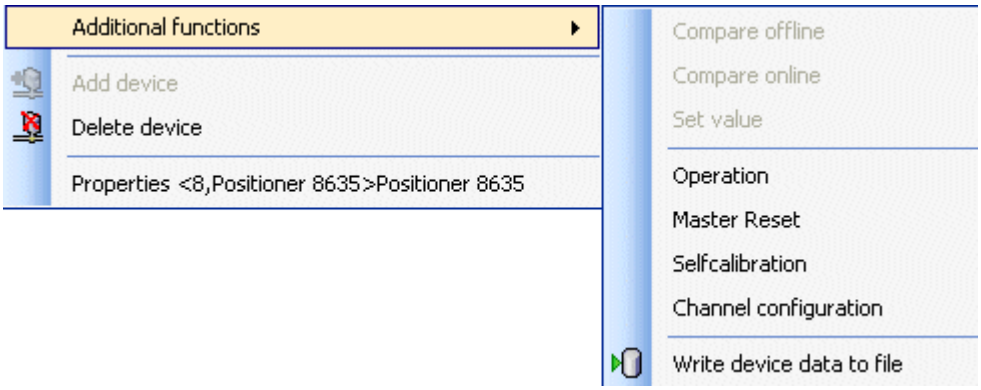
Field devices often provide substantial information on their status. This information can be called and displayed via this menu item. A connection to the field device must be active.

Print

A hard copy is made for predefined functions. Its form can be defined in so-called style sheets. The form of the printout can be defined individually by each DTM. The printout is displayed as preview in a window and can then be output on a printer.

3.2.4 Additional Functions

Menu item **Additional Functions** displays a submenu providing all device-specific functions or functions which are used less frequently. The submenu is DTM-dependent and is divided into several groups.



The first group contains three menu items which are provided for all **DTM**s. These functions are only active when they are supported by the DTMs.

The second group contains all device-specific DTM functions.

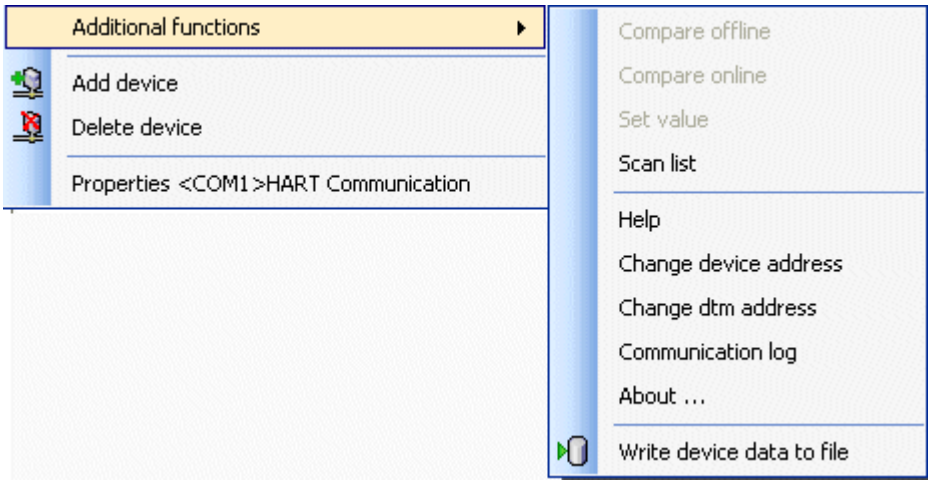
The third group is displayed in the event of a **GatewayDTM**, e.g. which edits a HART-Multiplexer.

The last group of the menu items is mandatory to all DTMs.

Write device data to file

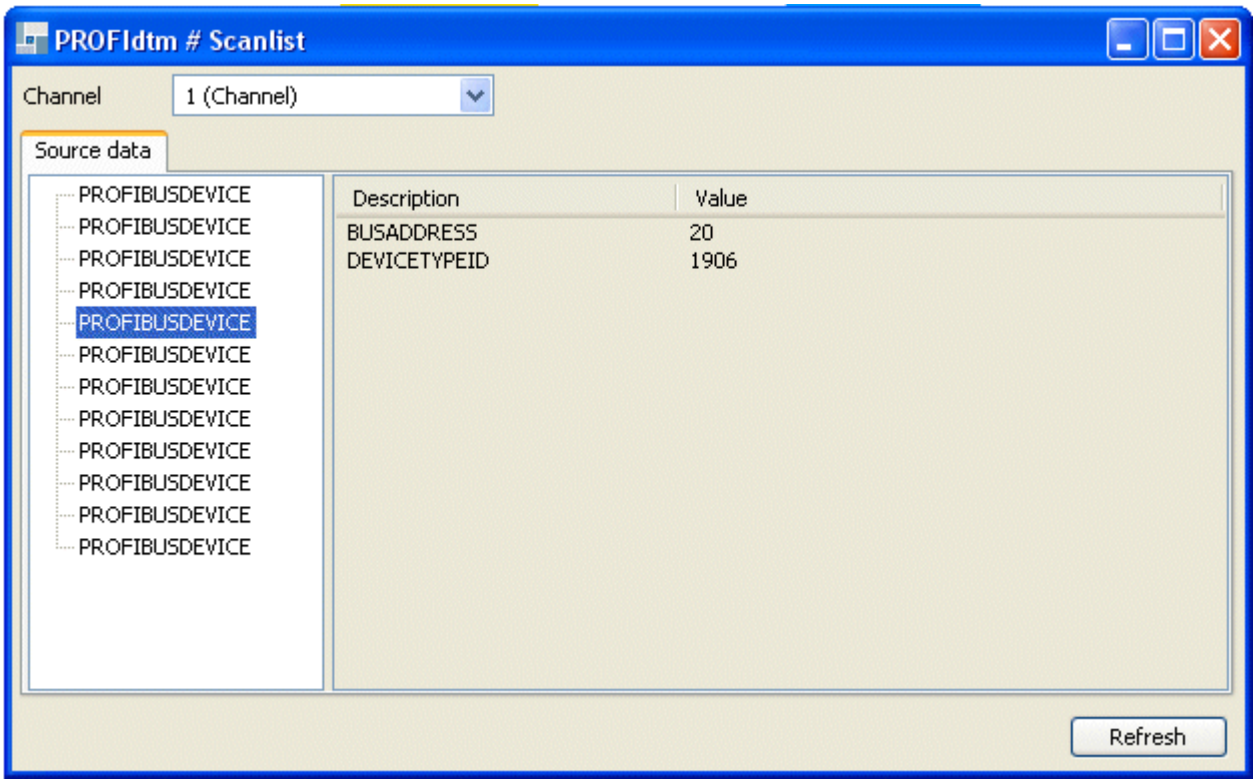
This function allows to save parameter changes which were made using the DTM.

The **Scan list,** a function offered by **CommDTM**s, lists all field devices which are connected to a bus.



The possible number of the connected field devices may vary depending on the bus structure. The scan may therefore take some time.

A window displays all detected field devices.



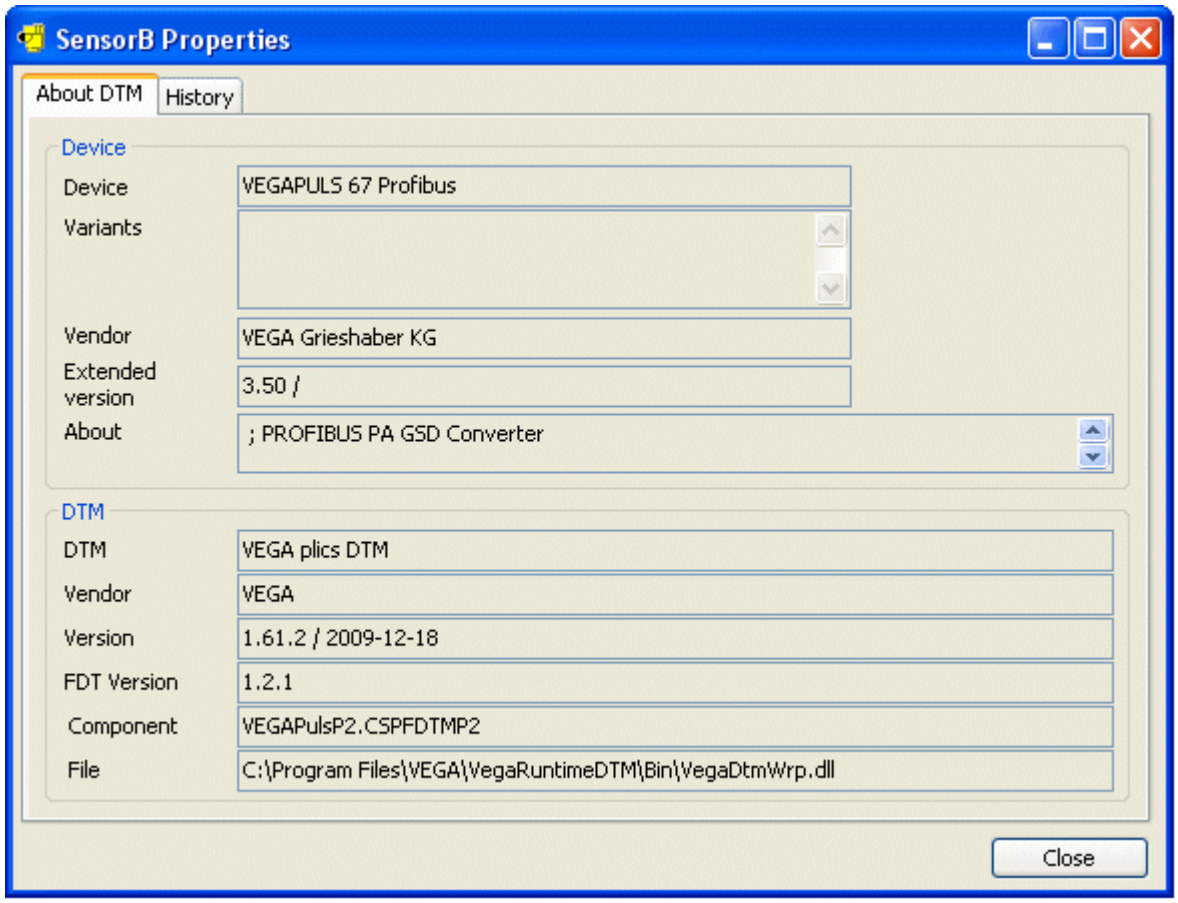
3.2.5 Add device or delete device

These menu items are accessible if at least the user rights of a planning engineer are set and the project structure can be extended at this position or a DTM is selected for deletion. Devices may be added to a **CommDTM**, which implements a protocol or to field devices such as Multiplexers or Remote I/O-Systems. If a CommDTM or **GatewayDTM** is removed, the associated subproject is also deleted.

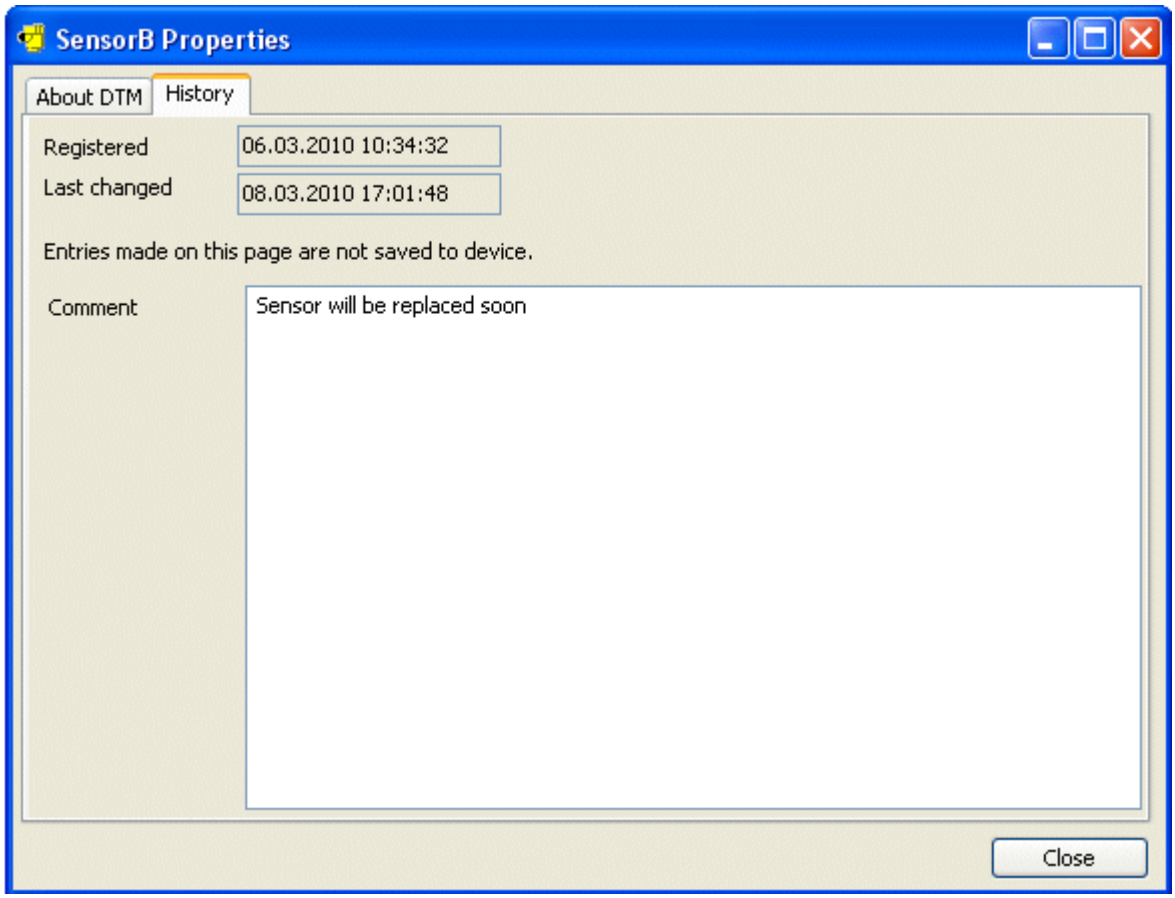
3.2.6 Device properties

Every **DTM** provides information about itself and about the device it can be applied to. The windows provides 2 pages.

The first page contains information on the project entry of the DTM.



The second page contains the history of the DTM instance as well as a comment which is entered to the project database. This comment is displayed in the printout of the project of the respective DTM.



4. Working with PACTware

PACTware is designed for the configuration and parameterization of field devices which are used in an automation system. PACTware allows to configure projects reproducing the structure of the automation system.

In the simplest use case only one field device is connected to a PC via a modem or via a bus coupler. Complex projects can comprise several even different bus systems, connecting multiplexer or remote I/O systems to the PC. Field devices which detect the measured values from the process (sensors) or influence the process sequence (actors) are connected to the multiplexer.

As PACTware is a frame application according to the **FDT** Specification, **DTM**s of different manufacturers and bus systems providing a **CommDTM** can be combined in one project.

With the objective of optimally supporting the user in his work, PACTware contains a **Layout Management** to save the arrangement of the **PACTware Windows** and the **DTM Windows** in profiles. The layout can always be reloaded when continuing an interrupted operation or when changing between use cases.

In addition, a profile contains the status of connections between DTM and field device, such that the connections can also be automatically established when opening a project or when changing to another profile.

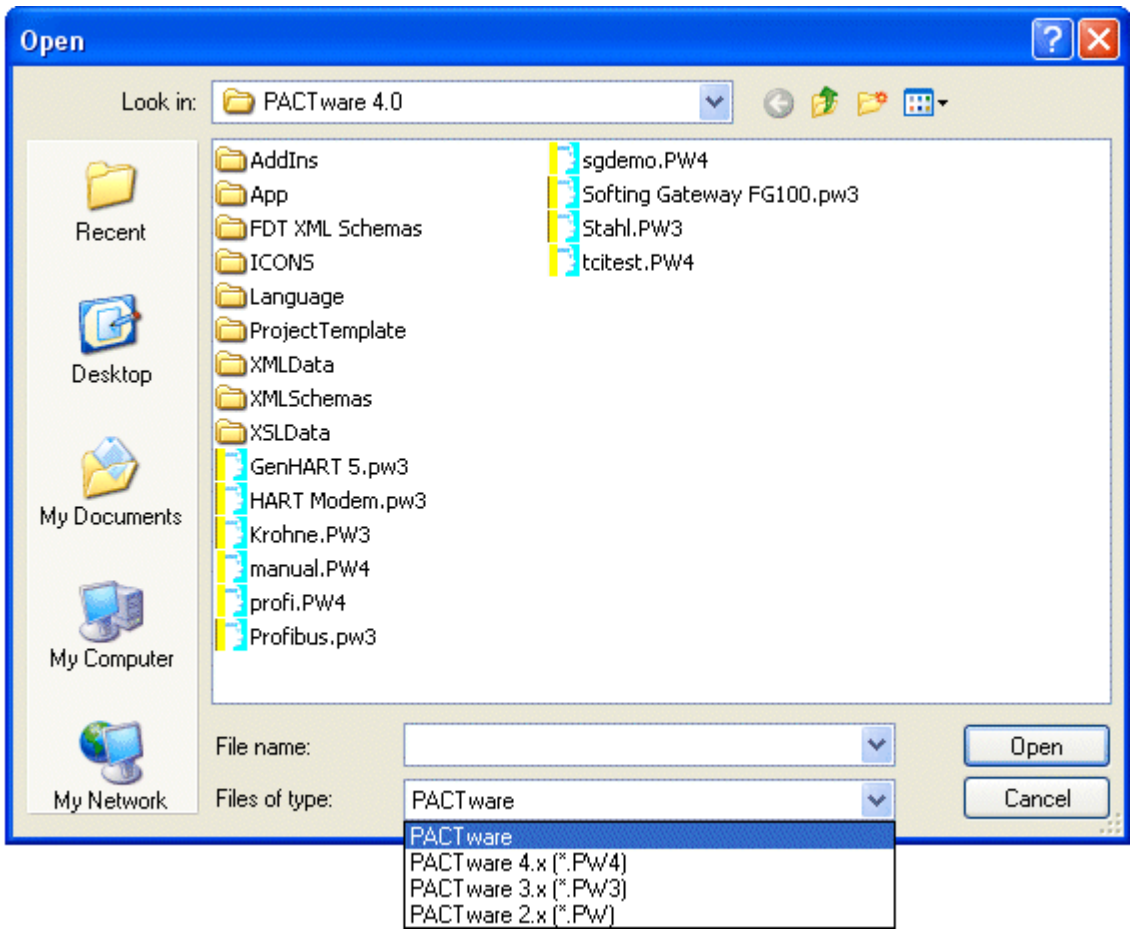
4.1 Generate/Open project

A new project is generated via menu item **New** in menu **file**. The project has no name and only consists of the HOST PC.



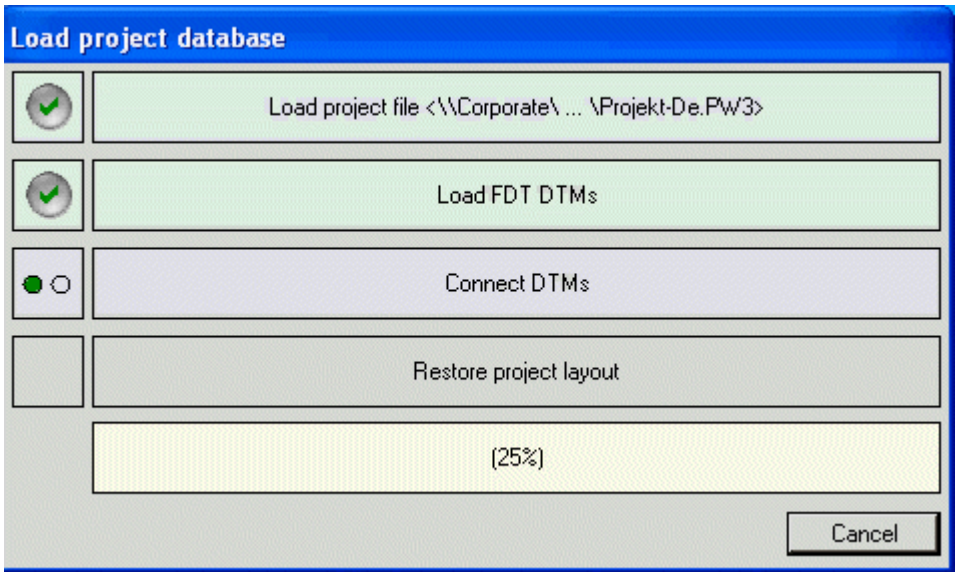
An existing project is either opened via menu item **Open...** in menu **File** or via the adjacent tool icon of the toolbar. A standard selection dialog displays existing projects of data type PW, PW3 and PW4.

Projects saved as PACTware Version 2.4 can be displayed and opened directly in the PW file type. The same applies to projects which are saved as PACTware Versions 3.0, 3.5 and 3.6.



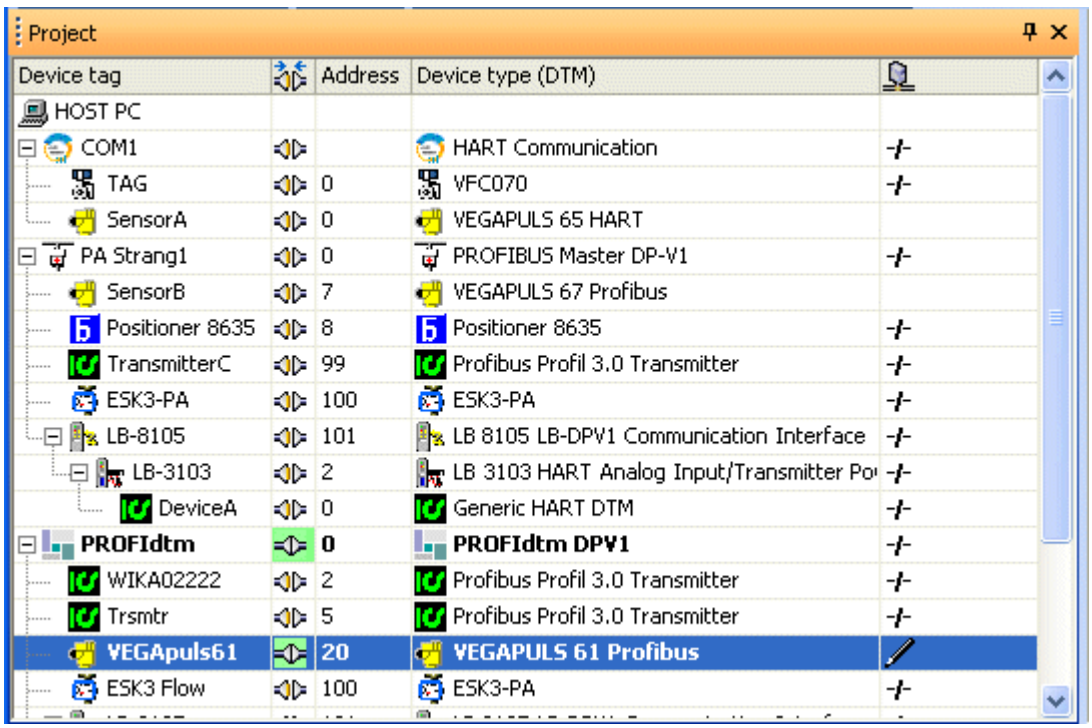
If the list of most recently edited projects contains a project, it can also be opened directly via menu item **File**.

A progress display is opened while the project is opened providing information on the loading phases. If PACTware stops in a phase of the project buildup, the procedure can be canceled.



Dialog **Options** defines whether the steps "Connect DTMs" and "Restore project layout" are to be executed when opening the project.

The project structure is displayed in the project window, the name of the project is displayed in the status bar and in the title bar.

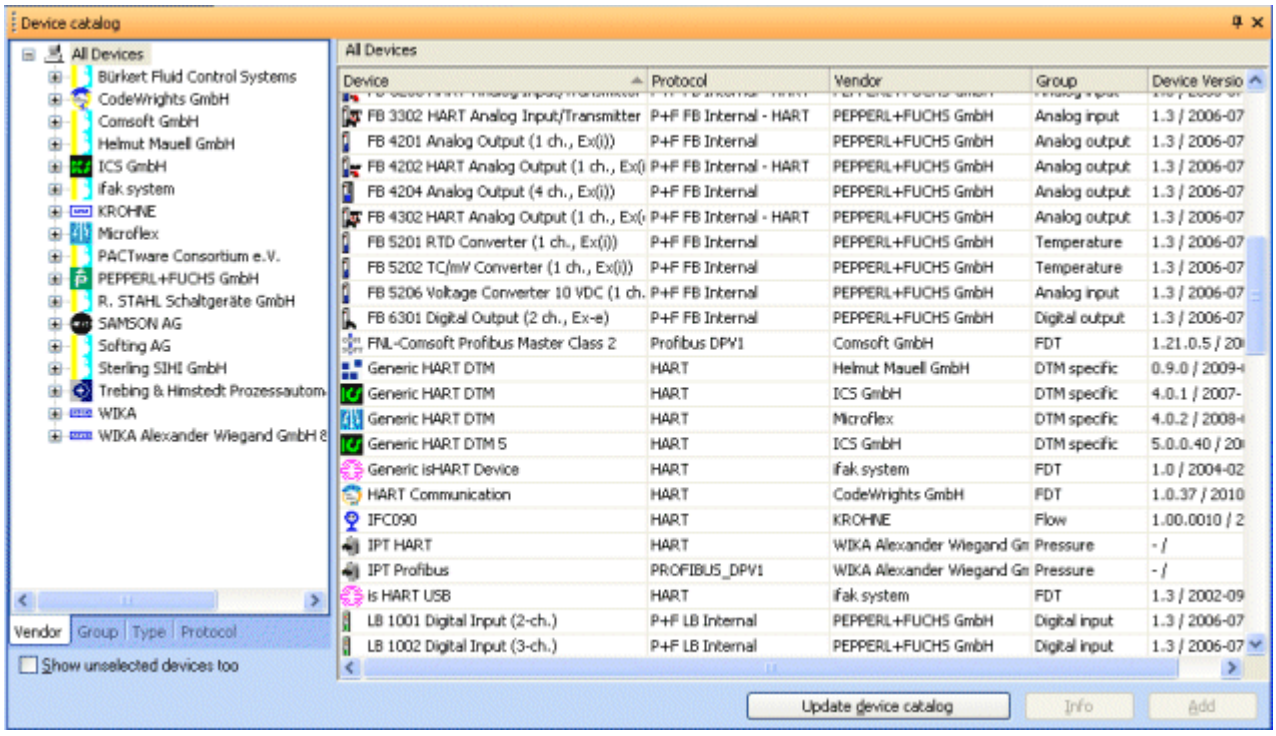


4.2 Device Catalog

The **device catalog** displays all **DTM**s which are available for the configuration of a project. The device catalog can be displayed as follows:

- using function key **F3**
- via menu item **Device catalog** in menu **View**
- using the adjacent icon of toolbar **View**

The device catalog is displayed in a window providing an overview of all DTMs grouped by categories in tree structure on the left and the currently selected DTM group in tabular form on the right. The tree structure can be arranged by vendors, DTM-group, DTM-type and communication protocol.



At the initial display of the device catalog all available DTMs are sorted by vendors.

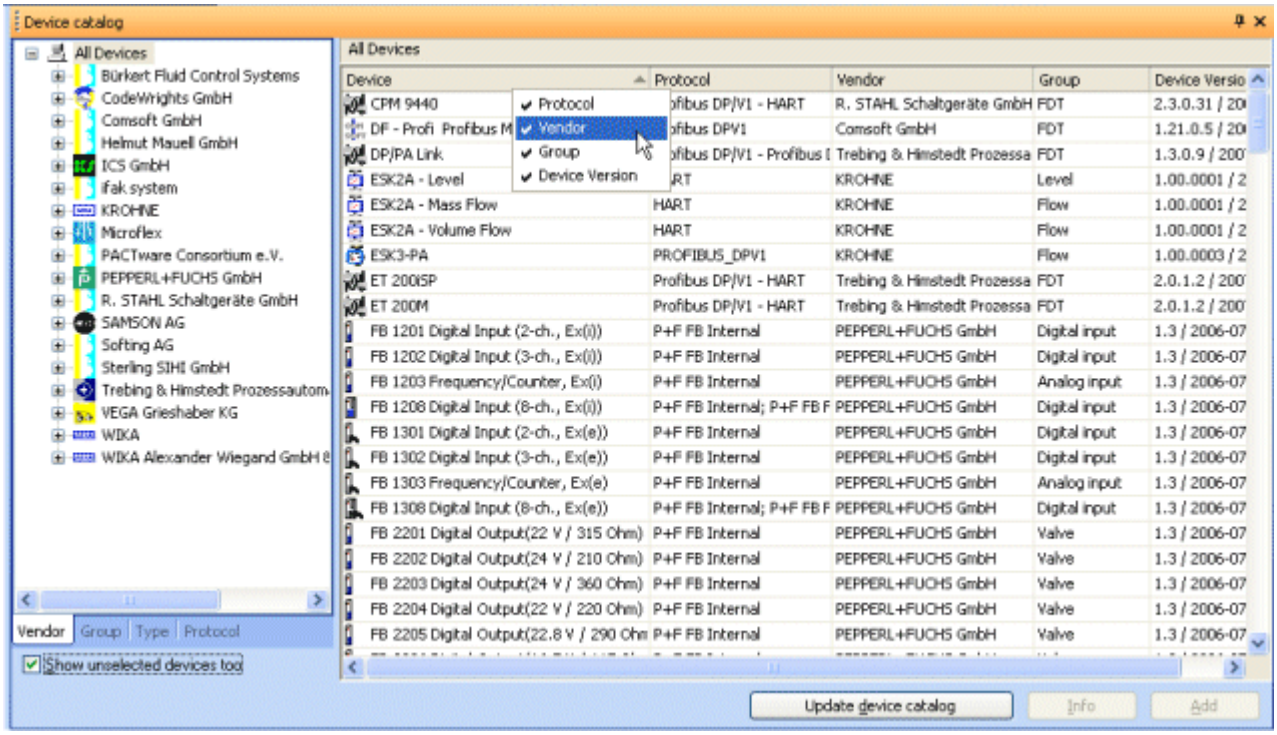
If you press control button **Update device catalog** all DTMs installed on the PC are entered to the device catalog. This instance must always be executed after installing new DTMs or updates of DTMs. This function requires **User Rights** of a planning engineer.

4.2.1 Working with the Device Catalog

The device catalog can be opened permanently as described above or also temporarily via the context menu of a CommDTM if a device is to be added to the project. In this case, the list of all available DTMs is filtered such that only DTMs are listed that can be added to the associated field.

The device catalog is displayed in a modular window, which is closed after selecting the device.

This window comprises several panes. The content of the panes and the operability of the buttons depends on the particular user rights.



The left section of the catalog contains all available devices arranged in tree view according to categories. When selecting a node of the tree, the associated devices or DTMs are displayed in the right section of the catalog.

A distinction is made between the categories

- vendor of a device or DTM
- group e.g. flow, pressure, positioner
- type e.g. device, driver for communication devices
- protocol e.g. HART, Profibus

the categories vendor, group and protocol reappear as columns in the table on the right.

Checkbox **Show all devices** is only available to the administrator who can administer the device catalog.

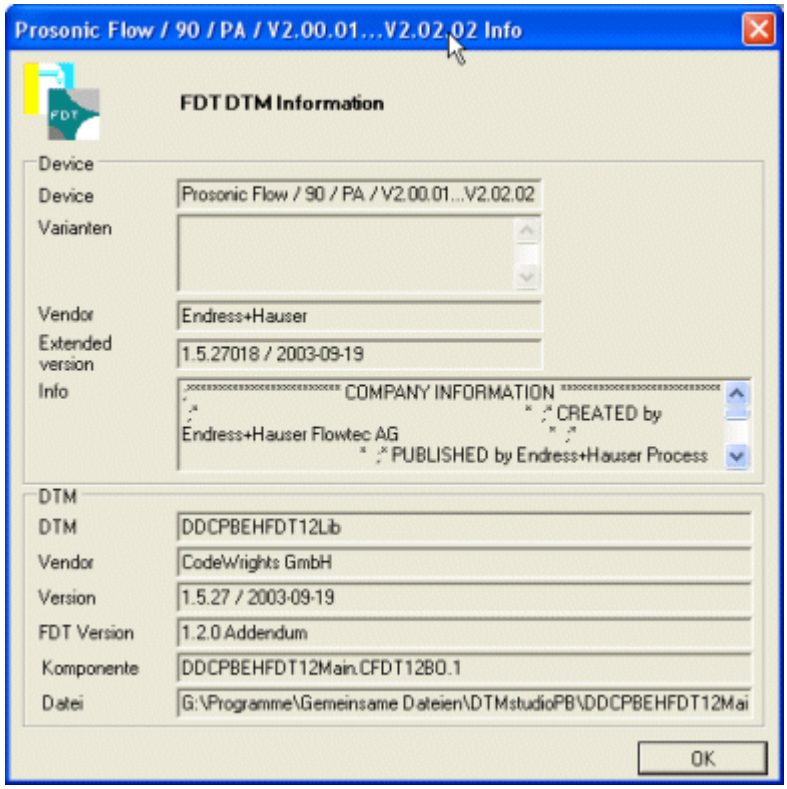


The left pane of the catalog can be masked using this button.

The table in the right window section can be sorted alphabetically by columns. The header in the requested column must therefore be selected. An arrow shows the sort sequence.

Columns can be masked using the context menu. The order of the columns can be changed by drag&drop.

Button **Info** provides information on the currently selected DTM and the device type it works with.



Button **Add** allows to add the selected DTM to the current position of the project structure. This function requires at least **User Rights** of a planning engineer.

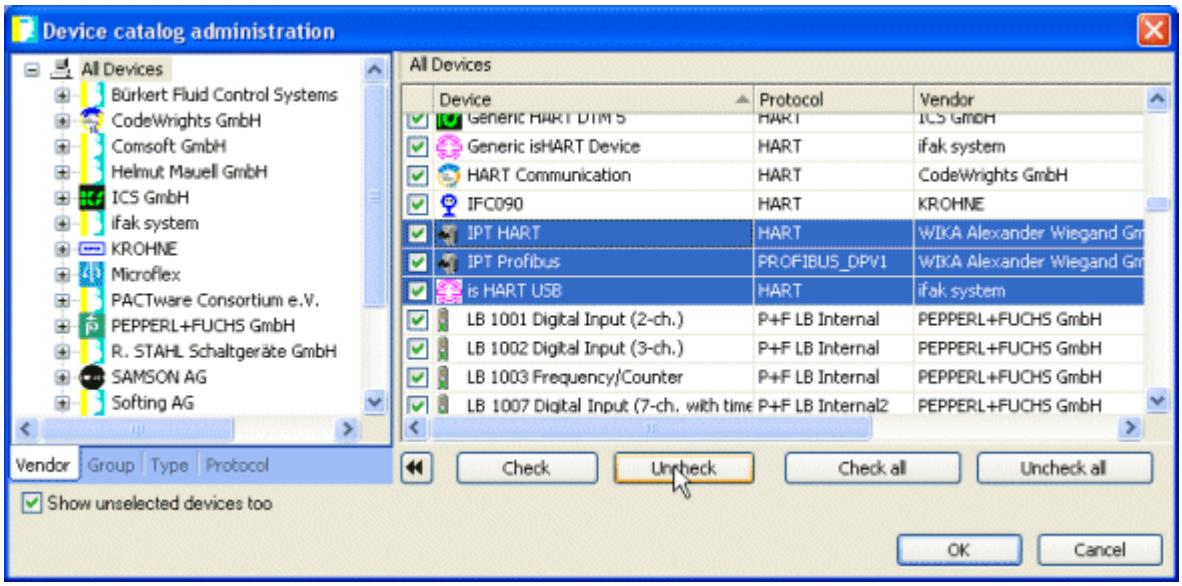
4.2.2 Administer Device Catalog

This function requires administrator **User Rights**.

The device catalog can be clearly arranged by restricting the number of DTMs installed on the PC. All installed DTMs are presented in a window by selecting menu item **Device catalog administration** of menu **Extras**.

DTMs to be displayed in the device catalog can be selected from this window. They are checked.

The user is supported in the selection of the requested DTMs by a number of selection criteria. The DTMs can be selected from the left pane of the catalog, sorted in the table and individually using the mouse or selected in groups. A group is selected using control keys Shift and Ctrl like in the Windows Explorer.



Button **Check** adds DTMs to the selection, button **Uncheck** removes them from the selection.

Check all selects all DTMs which are displayed following **Update device catalog** (see above). **Uncheck all** deselects all.

If the selected DTMs were changed during the administration they are displayed in blue color.

After closing this window the device catalog is reorganized. Subsequently, the reorganized device catalog is visible to all user roles.

4.3 Project View

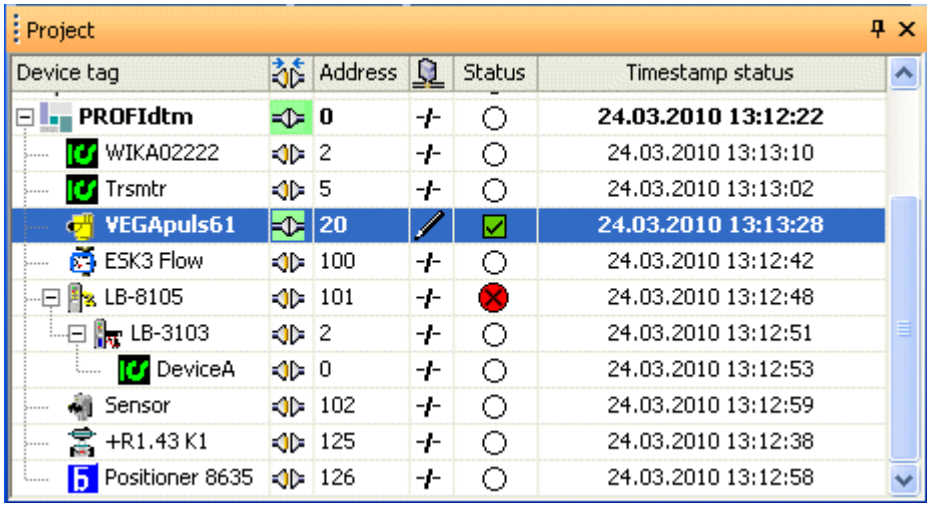
After opening or after creating a new project, its structure can be edited by adding or deleting a **DTM** or by editing parts of the project.

Even if a field device is connected, additional DTMs can be added to the project. When DTMs are to be removed from a project, active connections with the respective DTMs must be disconnected.

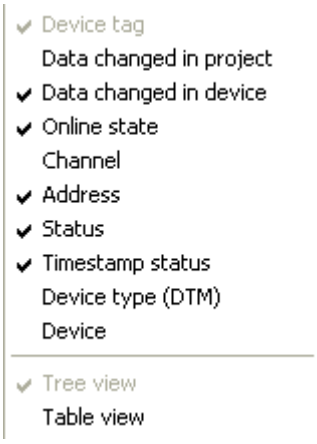
The project window displays the structure of the project with **CommDTM** and field devices. Starting point for the project structure is the HOST PC to which one or several communication modules are connected.

Field devices, remote I/O systems or multiplexers are assigned to the communication modules. The field devices are arranged in the lowest level of the hierarchic project structure.

Every device has a number of properties, providing information on the position in the project and the status of the DTM.



Columns to appear in the display are selected via the context menu of the table. The order of the columns can be changed in the column heading by drag&drop.



Column **Device** is always displayed. This column allows to switch between **Tree view** and **Table view** of the project.

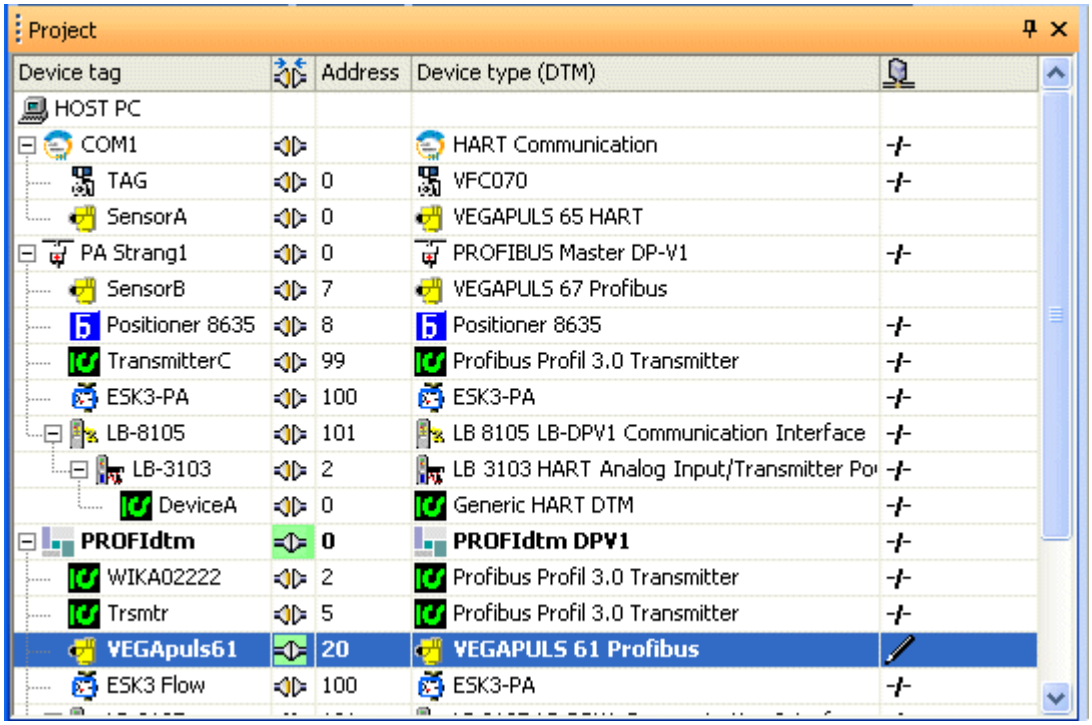
The **Device tag** displays the device description, the **Device type** shows the name of the DTM. Column **Device** displays tag, address and device type.

The state of the dataset is identified by a pen icon when data is changed in the project or in the device. The **Online state** shows if a DTM is connected to device.

Channel and **Address** specify the unambiguous name via which a device can be addressed in the communication structure. In multiplexers or remote I/O gateways a channel name is entered, in bus-oriented communication channels an address number is stated.

The most recent **Online state** of the devices is displayed with a **Time stamp**.

The following figure shows the structure and the connection status of DTMs in a project:.



In column **Device Tag,** a freely selectable designation (so-called tag) of a device of a system is stated. The display of a line in the table identifies the current editing status of the DTM:

- a selected DTM is assigned a blue background
- a DTM, which was edited is assigned a gray background
- a DTM which can execute online functions is displayed bold. The icon in column **Online state** is assigned a green background if DTM and device are connected.

Toolbar Device data contains several tools which are always accessible when they are displayed in color. The icons are used to edit the project and have the following meaning:


Opens the DTM to edit the device data


Adds an additional device DTM to the DTM selected in the project


Deletes the selected DTM from the project structure


Connects the DTM to the device


Disconnects the DTM from the device

4.3.1 Add DTM

First select the position in the project structure to which an additional **DTM** is to be added.

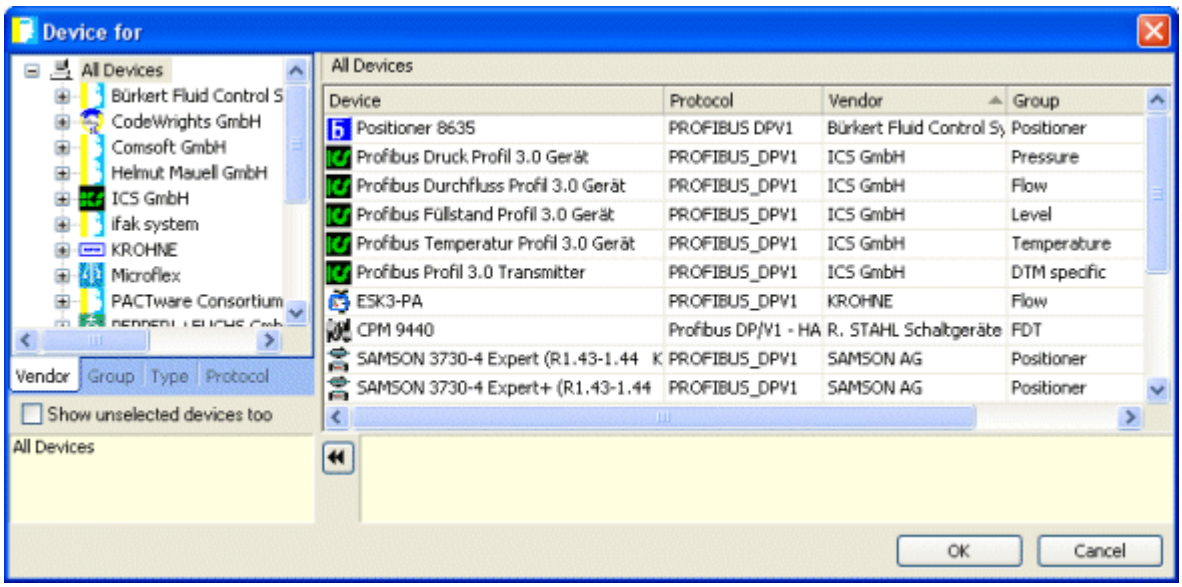
The following options allow to add a DTM to the project:

- by using button **Add** in the device catalog
- by double-clicking on a DTM in the device catalog
- by 'drag and drop' from the device catalog to the project window



- by the adjacent tool icon which is located in the toolbar
- by using menu item **Add device** in the context menu or in the device menu of a DTM

When using one of the latter two options, a list of the admissible DTMs is displayed to select the requested DTM.



Whether a DTM can be added to the selected position of the project structure depends on the following conditions which are verified by **PACTware:**

- the **User Rights**
- the type of DTM, to which a new DTM is to be added.

PACTware verifies that e.g. only DTMs for profibus-capable devices a added to a Profibus **CommDTM** or only DTMs for HART-capable devices are added to a HART-Multiplexer. If that is not the case, an error message is displayed.

4.3.2 Delete DTM

The following options allow to remove a **DTM** from the project structure:



- by using the adjacent tool icon contained in the toolbar
- by using the DEL key on the keyboard
- by using menu item **Delete Device** in the context menu of the DTM

Before a DTM is removed from the project, a query is displayed to avoid an erroneous removal of the DTM.



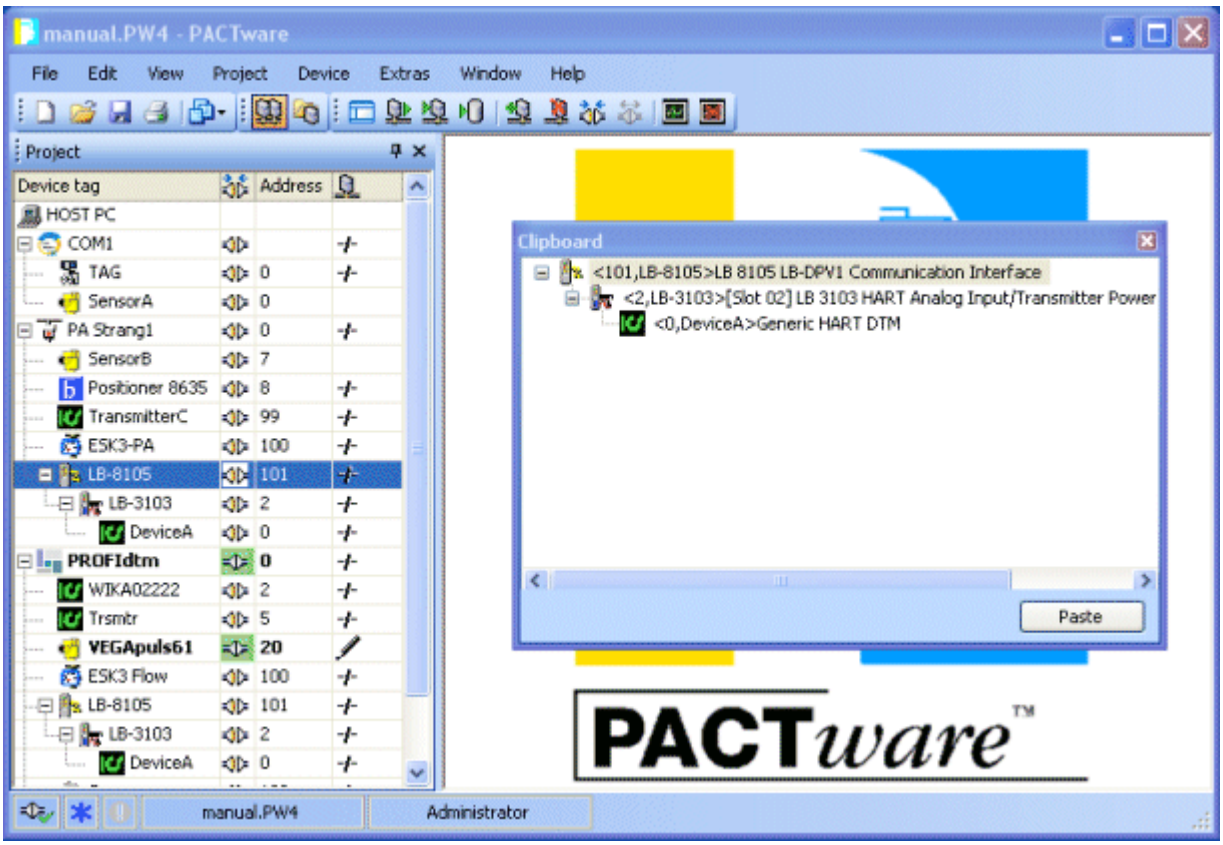
If you delete a **CommDTM** or **GatewayDTM** to which additional DTMs are assigned, the entire project part is deleted.

Caution: PACTware offers no Undo function.

4.3.3 Add part of a project

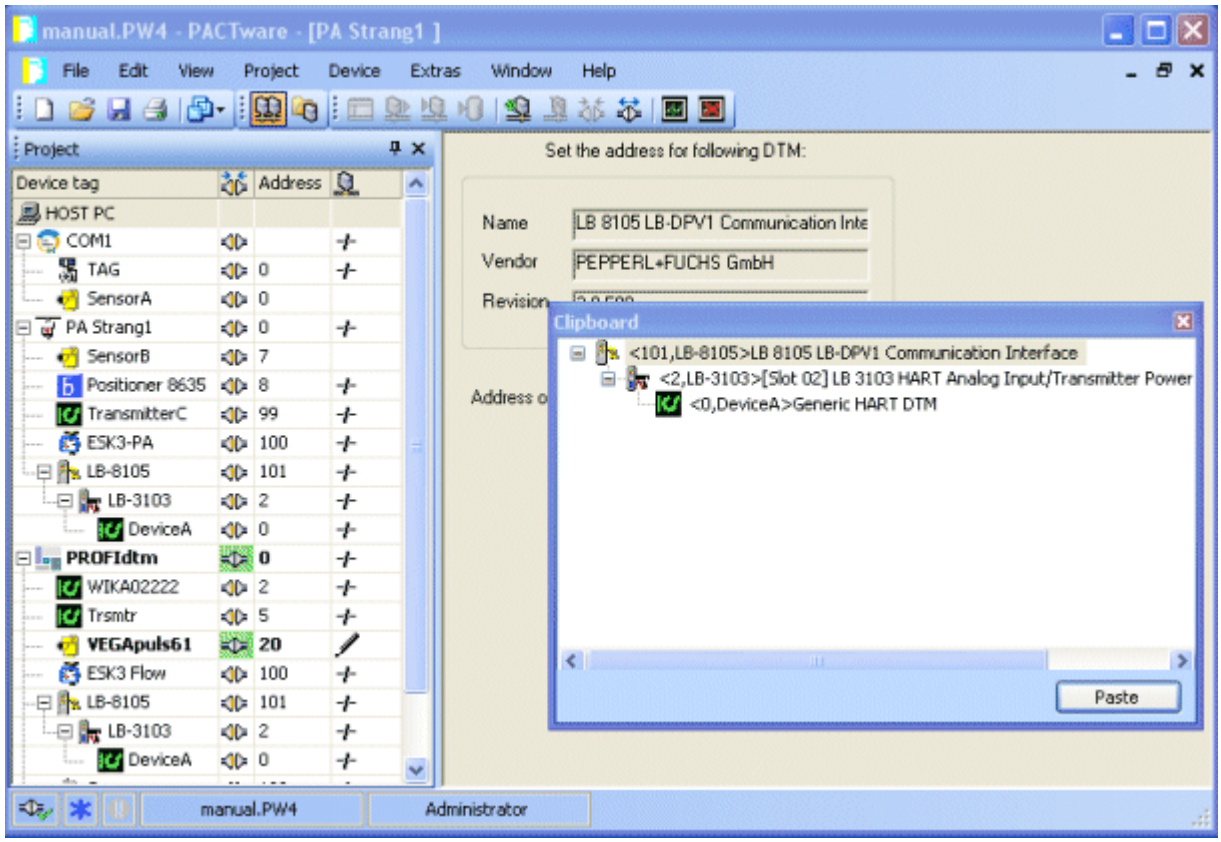
When a project consists of multiple similar parts, the configuration can be accelerated considerably by copying parts of the project.

In the project illustrated below SLAVE00-String was selected. This part project was copied to the **PACTware Clipboard** by using menu item **Copy** of menu **Edit**.



The content of the PACTware Clipboard can now be inserted to a previously designated position of the project by using the **Paste** button of the clipboard window. This function requires the **User Rights** of a planning engineer.

The result created following the selection of the channel can be viewed on the left in the figure below.



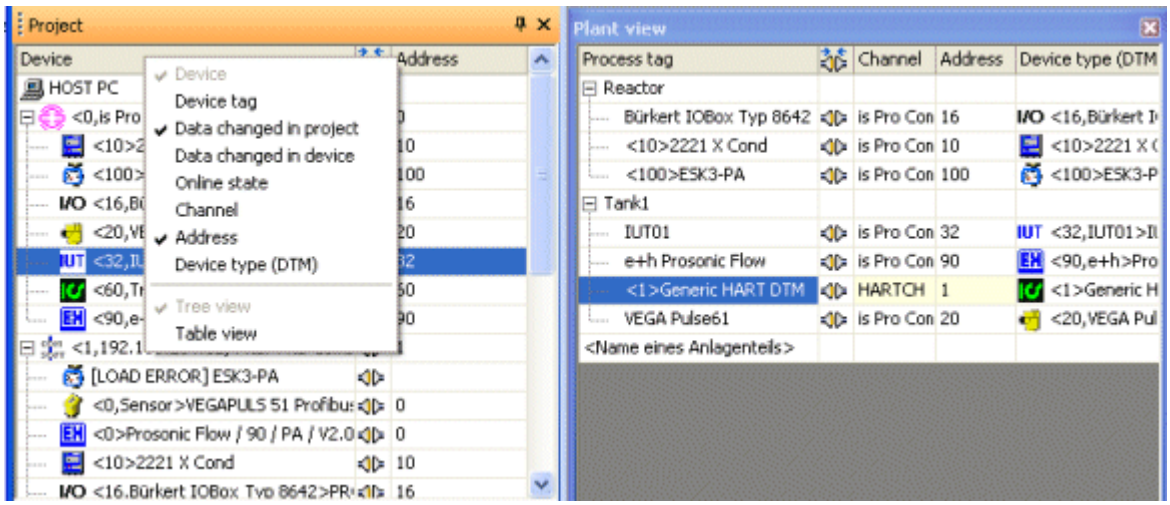
PACTware now checks if the part project can be pasted to the selected position of the project. In the event of an error, the following message may e.g. be displayed:



4.4 Plant View

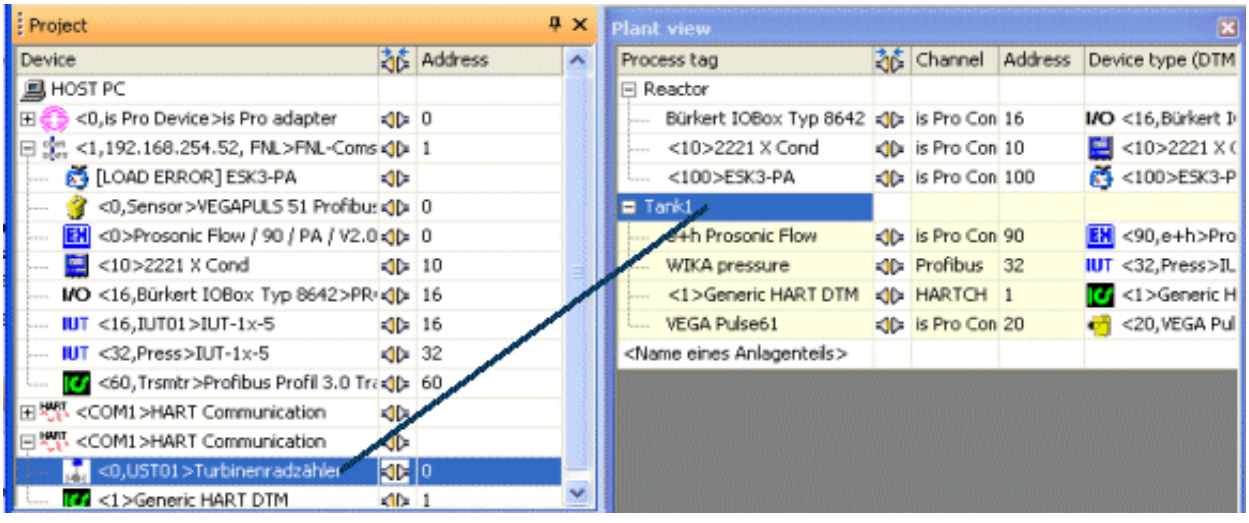
As the project view displays the structure of a plant with regard to the communication between PC and field device, the plant view focuses on the technical aspect of a plant. In the plant view, devices which are listed in the project view are entered redundantly. The plant is structured hierarchically with additionally inserted descriptions.

The layout of the tables of the plant view and the project view are completely identical. Only that of the **Device tag** deviates.



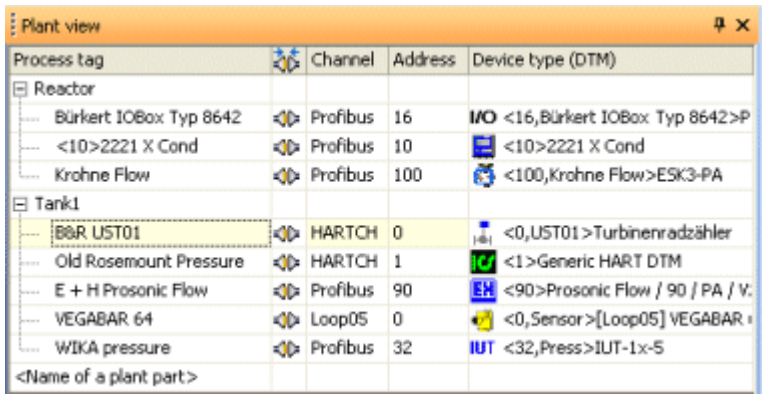
In both views, the columns to appear in the display can be selected separately from the context menu of the table. The order of the columns is changed in the column headers by Drag&Drop.

The plant view of a project is composed of the name of plant parts and DTMs of the project.

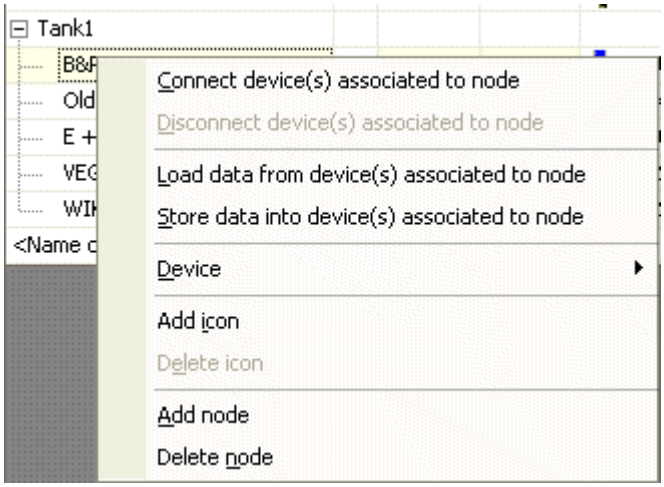


DTMs are copied from the project window to the requested position of the plant view using Drag&Drop. The **Process tag** is initialized by the **Device tag** of the DTM of the project view and can be edited.

In the following figure, **process tag** "TransmitterC" was replaced with "Pressure".



The order of the nodes in the plant view can be changed by Drag&Drop. The hierarchy level of the moved node in the tree remains unchanged if it is moved to a node of the next higher hierarchy level. Otherwise an additional hierarchy level is created.



By using the plant view via the context menu

- a connection with a field device or with a group of field devices can be connected or disconnected
- a device state or data can be loaded from field devices or stored to field devices and
- the device menu can be opened for a stand-alone device.

Icons can be inserted before the **Process tag** to e.g. graphically identify e.g. plant parts.

If a node is added, a new entry is displayed one hierarchy level under the node on which the context menu was opened. The new node contains a tag which is entered using the keyboard. The deletion of a node to which additional nodes are assigned results in the deletion of the entire subtree.

4.5 Edit device

Due to the variety of existing field devices (sensors, actors, remote I/O) a multitude of different DTMs is available providing optimal support to the user in his use cases. All field devices can generally be parameterized "offline" i.e. without connected device. After editing parameters, the modified parameter set can be stored in the project or written to the field device.

DTMs which were implemented in compliance with the Device Type Manager Style Guide or the FDT Group support the user when editing parameter values and point out differences between parameter values in the device and in the project.

4.5.1 Parameterize device

A distinction is made between **Parameterization** and **Online Parameterization**. When a DTM and a field device are connected **Online Parameterization** is automatically displayed, otherwise a window for the parameterization of the device is displayed.

All parameters of a device which can also be defined without a connected device are projected in the parameterization. In this manner, a project with all its devices can already be finalized before the system startup.

The Online Parameterization is used to change parameters during the plant operation, e.g. to set control parameters.

The following options allow to display the parameterization of a device:

- via menu item **Parameterize** in menu **Device data**
- menu item **Parameterize** in the context menu of the DTM
-  via the adjacent toolbox icon
- via a double-click on the DTM name in the project window

The layout of the parameterization window depends on the respective DTM. Depending on the complexity of the DTM the parameters can be displayed in different windows. In this case, following the selection of the parameterization a submenu could be displayed to select the requested window.

4.5.2 Load from device

In order to read parameters from a field device, a connection must be set up. Error messages which are displayed when a connection attempt fails, are **DTM**-dependent.

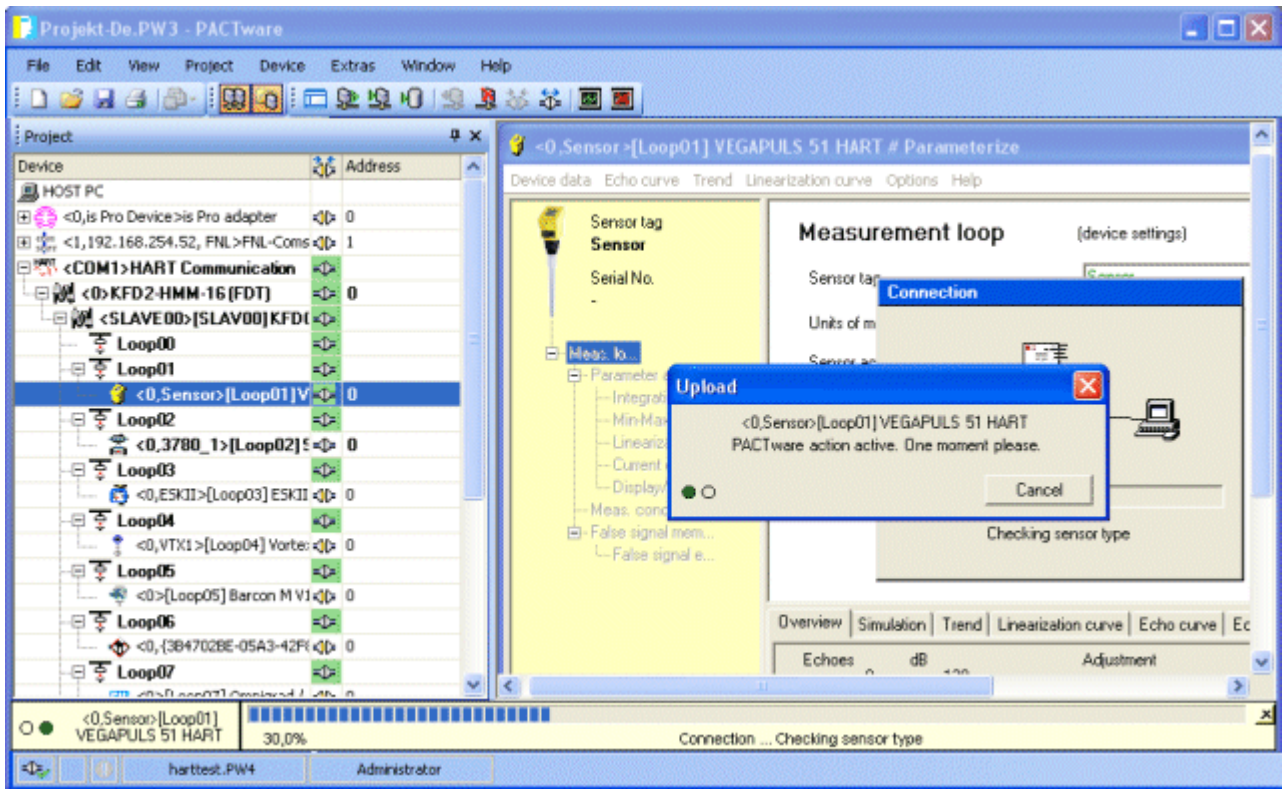
A connection to a field device can be established in the following ways:

- by using menu item **Connect** in menu **Device**
- by using menu item **Connect** in the context menu of a DTM
-  implicitly via the icon **Load from device**
- implicitly by using menu item **Load from device** in menu **Device**
- implicitly by using menu item **Load from device** in the context menu of a DTM

After successfully connecting a field device to a DTM, all DTMs involved in the communication line are displayed in bold characters in the project window. Simultaneously icon "connected" is displayed in the status line and the tools in the toolbar are assigned their respective operating status.

Several field devices can be connected simultaneously.

Loading parameters from a field device is triggered by the associated icon or menu item **Load from device** in menu **device data** or via the context menu of a DTM. The following form is displayed with a progress bar:



If the respective DTM allows to cancel loading, the progress bar must subsequently be closed using the Close button.

4.5.3 Store to device

In order to store parameters to a field device, a connection must be setup. It depends on the **DTM** what type of error messages are displayed to the user when a connection fails.

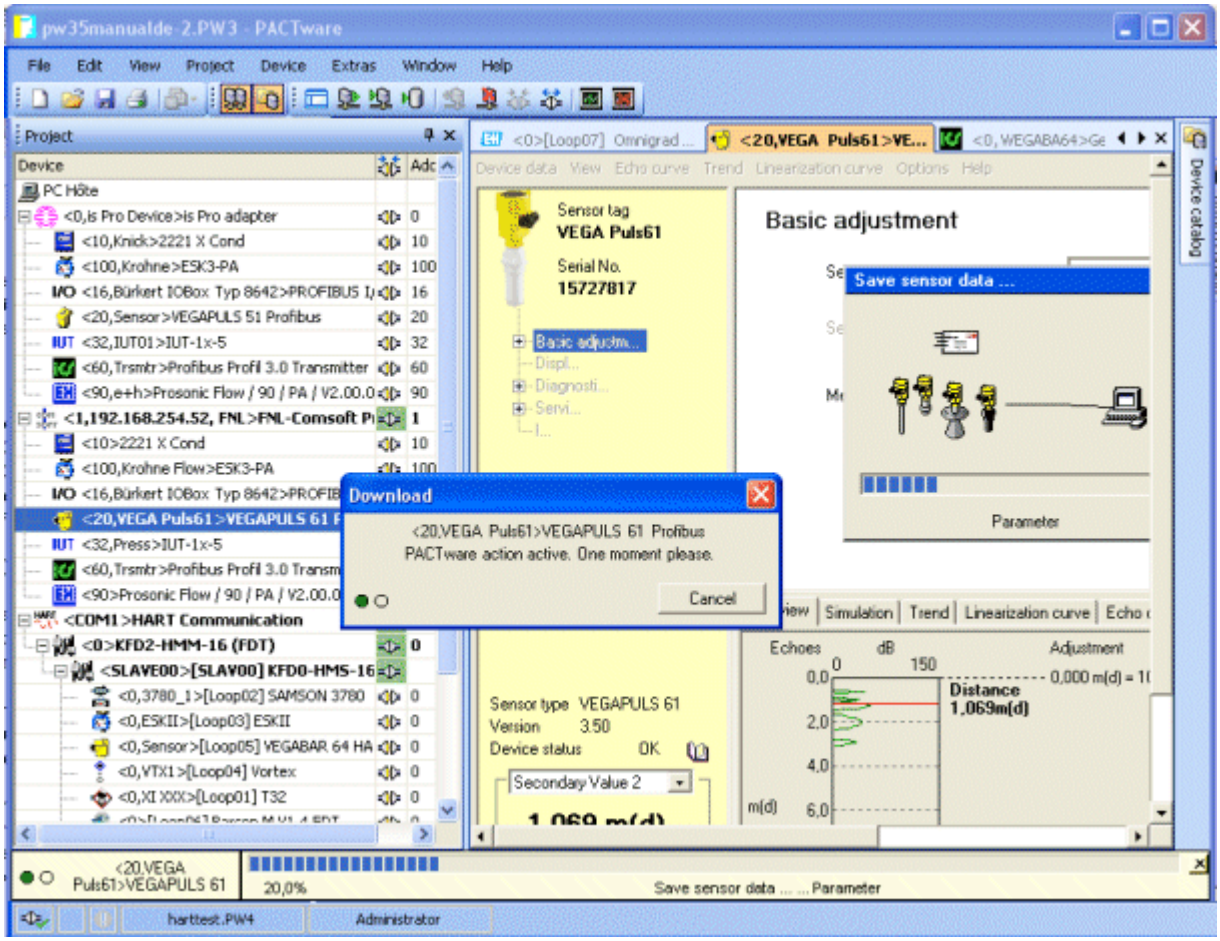
A field device can be connected in the following ways:

- via menu item **Connect** of menu **device**
- via menu item **Connect** of the context menu of a DTM
- implicitly via icon **Store to device**
- implicitly via menu item **Store to device** in menu **Device data**
- implicitly via menu item **Store to device** via the context menu of a DTM

When a field device is connected, all DTMs involved in the communication line are displayed in the project window in bold character. Simultaneously icon "connected" is displayed in the status line and the icons in the toolbar are assigned their respective operating status.

Multiple connections to several field devices can be set up simultaneously.

Parameters are stored to a field device when the corresponding icon of menu item **Store to device** in menu **Device data** or via the context menu of a DTM is activated. The following form is displayed with a progress bar:

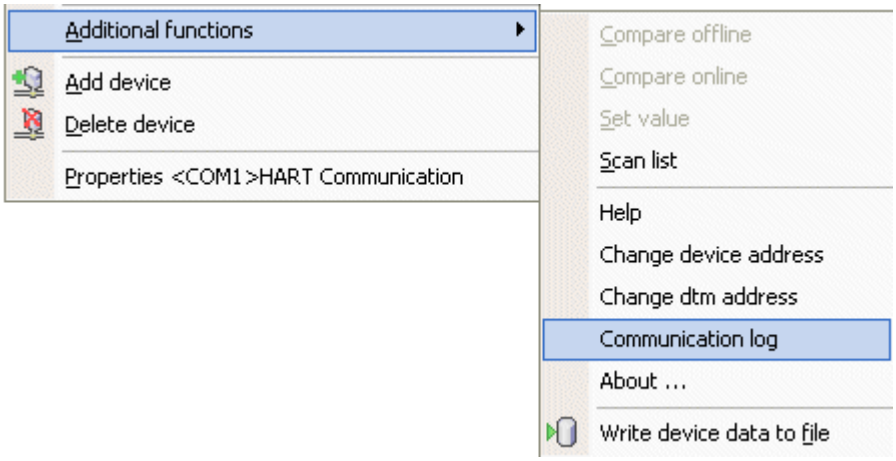


If the DTM allows to cancel the download, the progress bar must subsequently be closed with the close button.

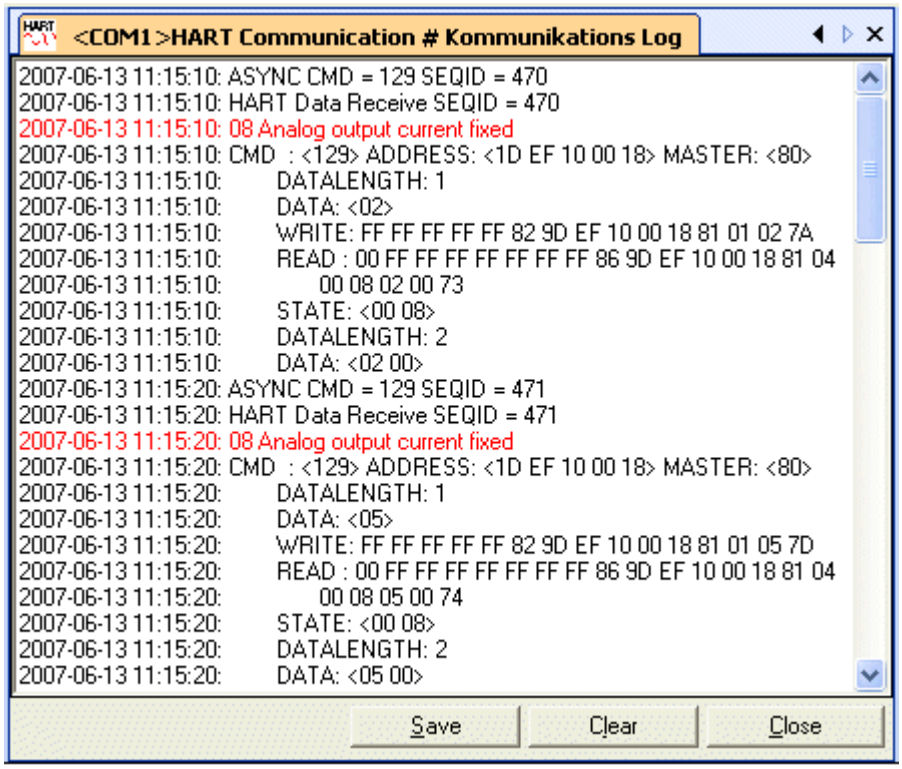
4.5.4 Communication log

CommDTMs like e.g. the HART Communication DTM which are contained in the basic PACTware software pack, include a communication protocol to log the data traffic between DTM and field device.

The log is called via a menu item of the context menu:



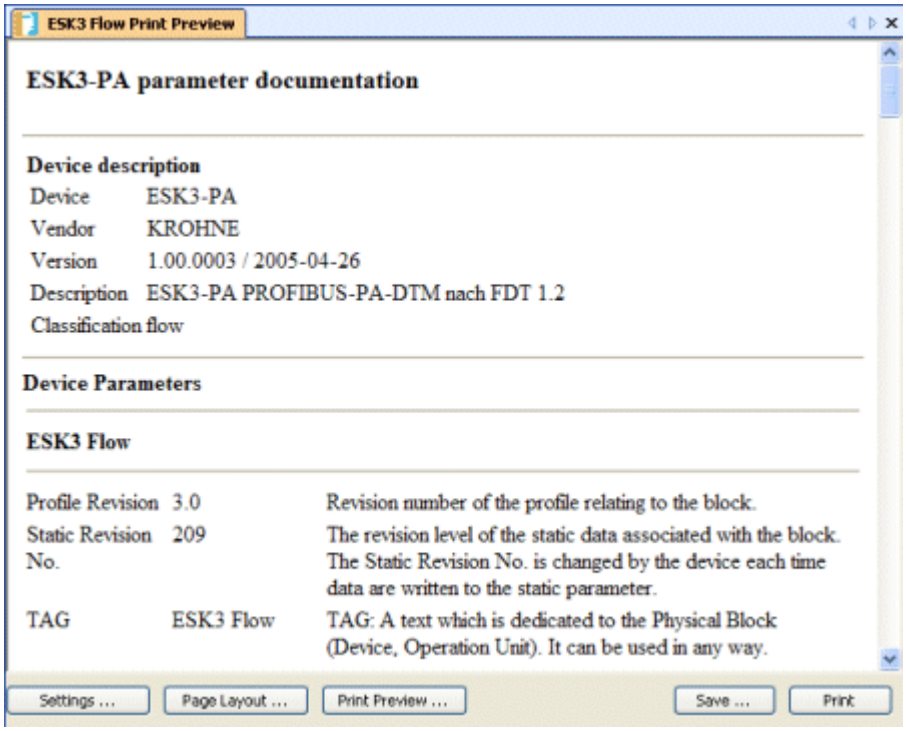
The log is output in a DTM window.



The log can be saved to a file and sent to a specialist for evaluation.

4.5.5 Print device parameters

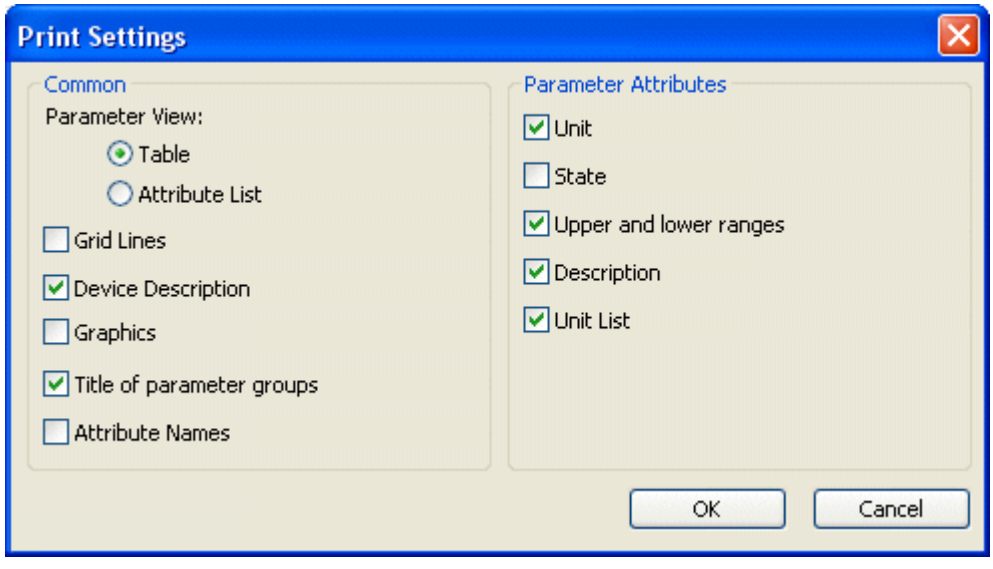
Function **Print** displays all parameters or a subset of the parameters in a DTM window directly displaying the effects of the settings.



The control buttons in the DTM window are available to prepare the parameter print.

Settings

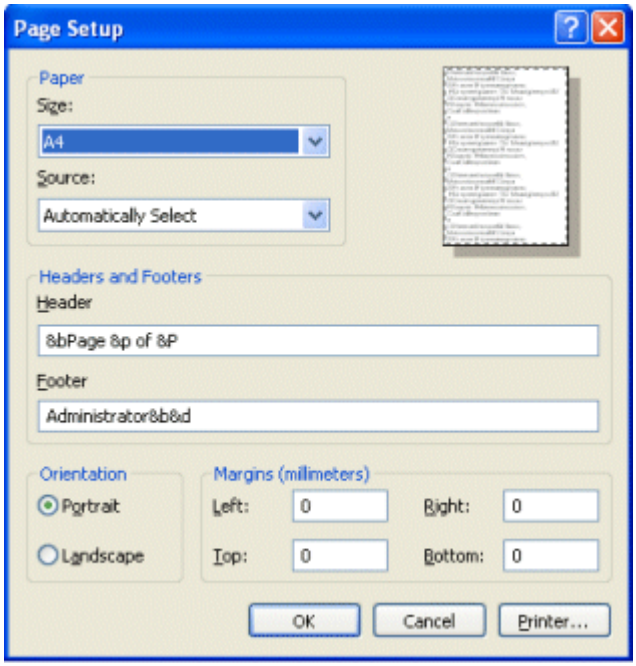
The print of device parameters can be configured in the following dialog:



The defined print settings are applied to print the parameters of all field devices in the same manner such that a standard printout is produced.

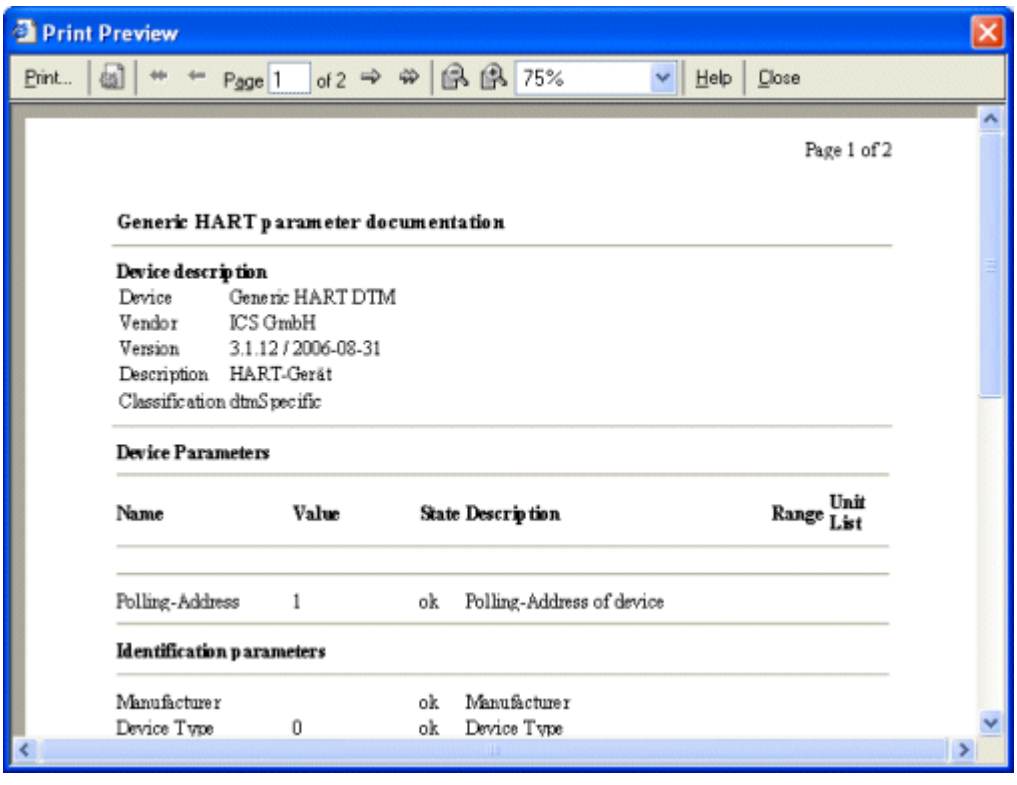
Layout

The page layout is defined using the dialog of the browser (Microsoft Internet Explorer):



Print Preview

The parameter print preview is displayed in a browser window.



The parameter print preview can be saved as text file, HTML-file or can be printed.

4.6 Save project

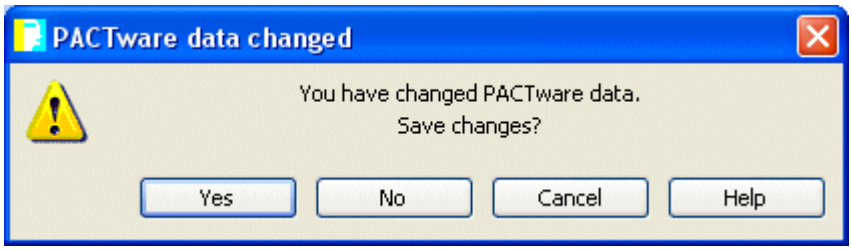


The project can be saved any time via the adjacent icon or the menu items **Save** or **Save as...** in menu **File**.

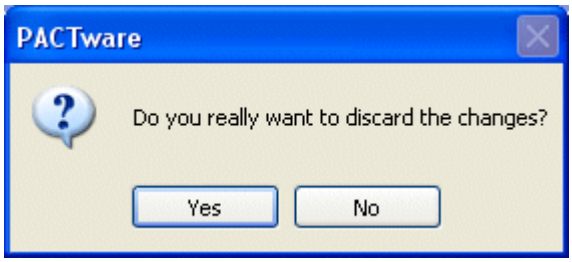
The data of a project comprise 4 categories:

- the project structure
- the values of the device parameters
- the plant view
- the profiles of all layouts of this project

When the project is closed using menu item **Close** in menu **File** or when **PACTware** is exited and if data was changed in one of the categories above, the following query is displayed:



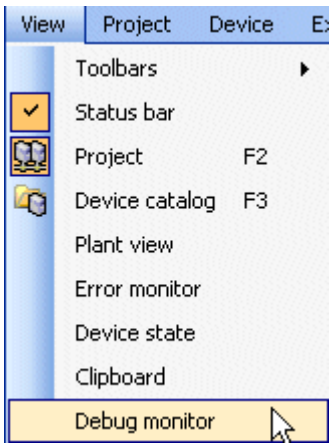
When this query is acknowledged using **No** another query is output for safety reasons:



to avoid erroneous loss of parameter modifications.

4.7 Debug Monitor

The **Debug Monitor** is used for error analysis. PACTware uses this Add-In to document error states and program flows.



The **Debug Monitor** can be displayed via menu **View** when the associated Add-In is loaded. Section **PACTware Add-Ins** describes how to load the Add-In for the debug monitor.

When the Add-In is loaded and the view is displayed, the **Debug Monitor** logs messages in the background which can be viewed in the monitor window. The recordings end when the Add-In is unloaded.

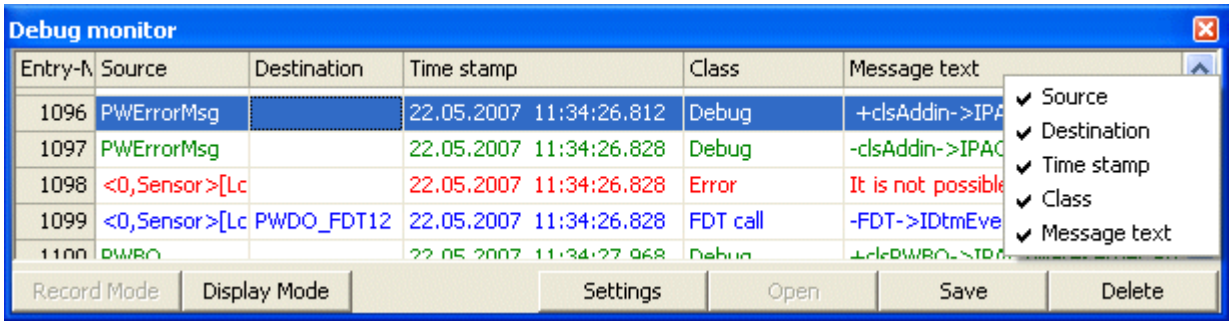
Caution:

This window should only be opened for trouble-shooting. Permanent recording in operated systems is not recommended. The performance of PACTware is reduced by permanent logging.

All messages recorded by the **Debug Monitor** are displayed in a table which contains the source, the target, a time-stamp and a message class in addition to the message text. The order of the columns can be changed by Drag&Drop. The context menu allows to display or mask single columns of the table.

The message classes deviate in color so that they can be distinguished more easily when scrolling messages. The following message classes exist

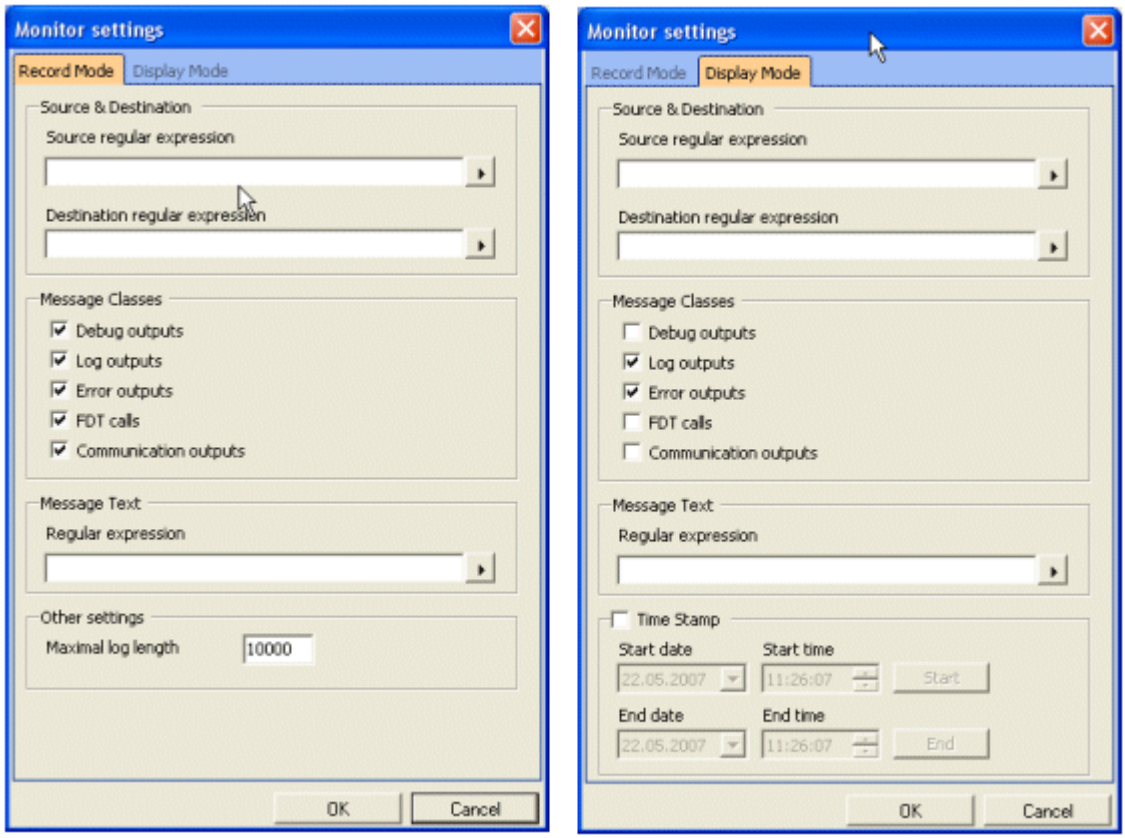
- Error (red)
- Debug (green) to record processes within PACTware
- Trace (black) includes all messages which are output by PACTware components
- FDT call (blue) for FDT communication between PACTware and DTM



In each column of the table messages can be sorted in ascending or descending manner. The entry number shows the entry order of the messages. If messages are filtered, the entry order is interrupted.

Control button **Settings** allows to filter messages in **Recording mode** which are to be stored in the protocol following different criteria. Similarly, a filter in **Display Mode** allows to select messages from the protocol for display in the **Debug Monitor** window. The log is such compressed in many respects. The logged messages are not affected.

The settings of the two independent filters are defined in the following dialogs:



Source, target and message texts can be filtered even more detailed by defining a regular expression. Adjacent to the input field a help for the definition of regular expressions is provided.

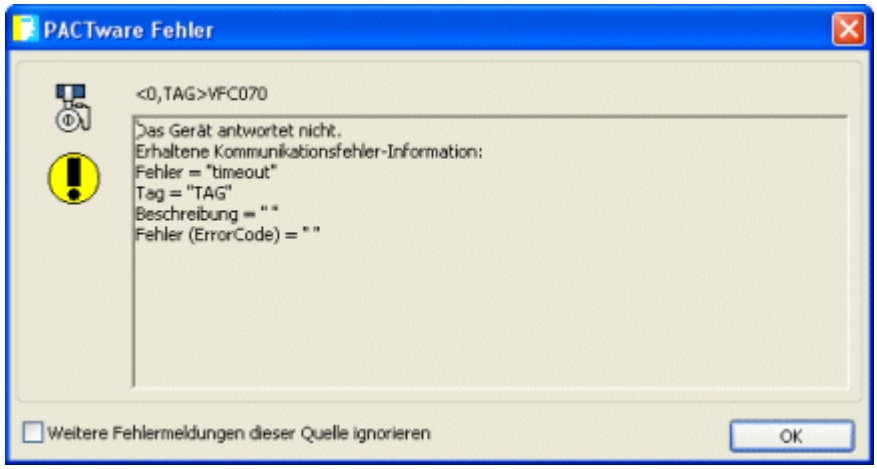
A maximum log length is predefined for the recording mode. The log is defined as ring buffer. In display mode a time interval in the log can also be assigned as display default setting.

The recorded data is saved to a text file using button **Save**. Saved logs are reloaded using **Open** and displayed in the **Debug Monitor**.

Control button **Delete** deletes the messages from the monitor window.

4.8 Error Monitor

If a DTM detects an error when parameterizing a function, an error message is output, as far as the form in menu item Extras - **Options** is not generally deactivated and the Add-In for the error display is loaded.



All error messages output by PACTware and by the DTMs are entered to a list. The list is either displayed via menu item **Error Monitor** in menu **View** or via the context menu of the error display in the status line.

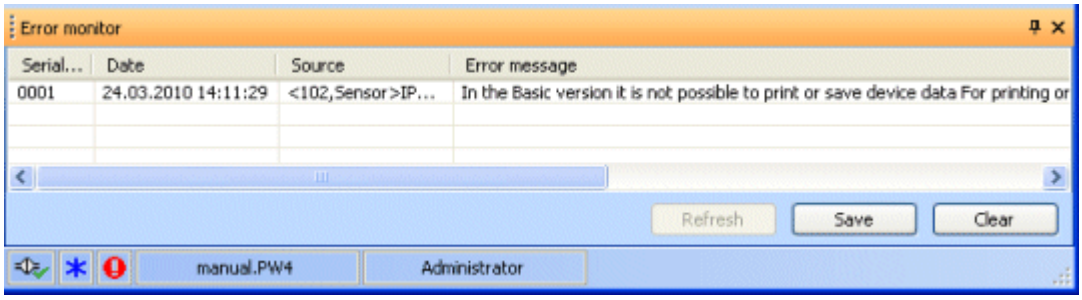


The tooltip of the error display contains the number of the collected messages.



The respective Add-In must be loaded to display the error monitor.

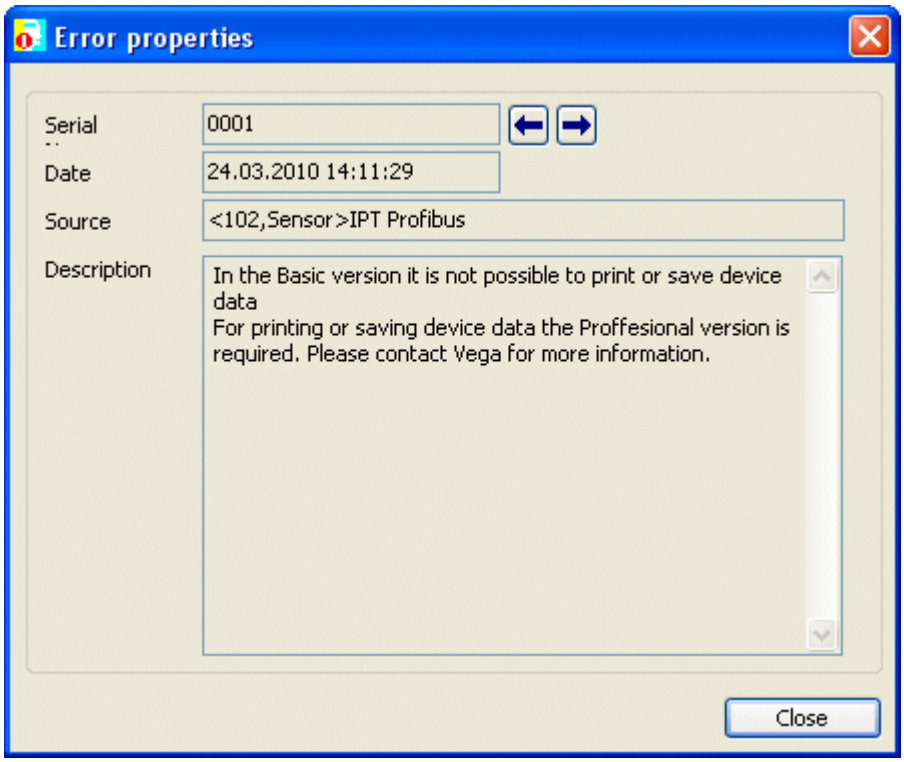
The error monitor displays all error messages which occurred since the start of PACTware or since the last time the error list was acknowledged by using the **Delete** button.



The error list can be sorted in columns by clicking on the heading of one of the four columns. The sorting sequence can be changed by another click on the heading.

A new error is signalled by a flashing exclamation mark in the status bar. At the same time, the number of errors is displayed on the error monitor. Button **Refresh** lists all pending errors in the error monitor. Button **Save** outputs all error messages in a text file.

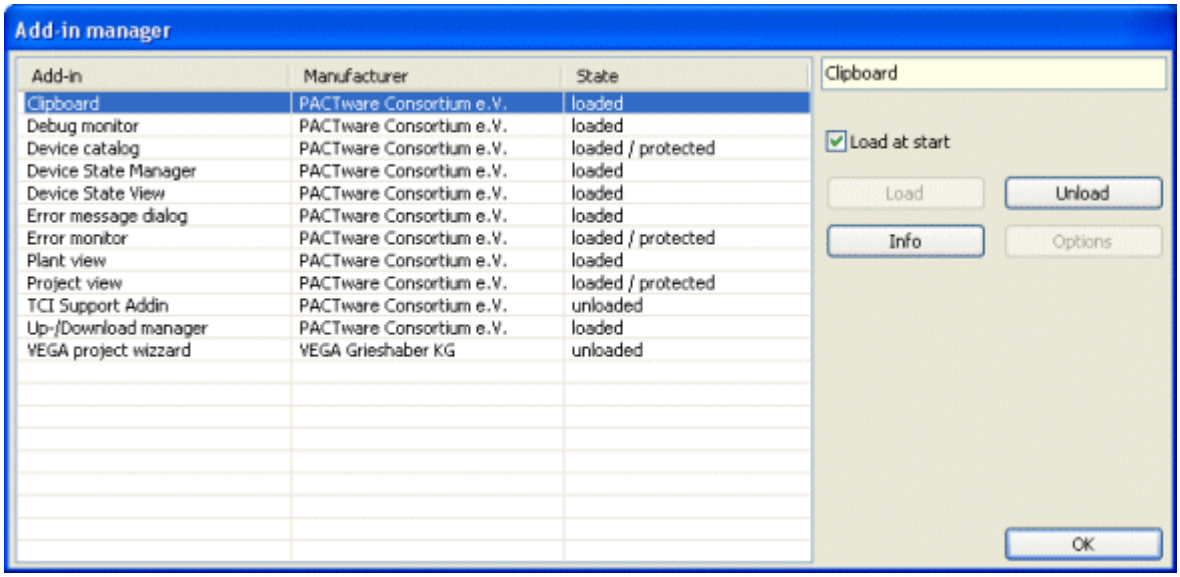
Long error texts can be displayed via a double-click on an error message in the **Error Monitor** using this dialog:



5. PACTware Add-Ins

The functions of PACTware can be modified and extended by so-called Add-Ins. Numerous Add-Ins are contained in the PACTware Setup and installed. Add-Ins can also be installed in addition to the basic program installation. PACTware will recognize and list these Add-Ins at the start.

Menu item **Add-Ins** in menu **Extras** lists and administrates all known Add-Ins. These functions



require Administrator **User Rights**.

The list contains Add-Ins that are included in the PACTware software pack , but also Add-Ins of device vendors. Some Add-Ins must be loaded all the time to ensure that PACTware runs. They are characterized by status loaded/protected.

Functions like e.g. the **Debug-Monitor** are not available when the associated Add-In is not loaded.

While PACTware is running, Add-Ins can be loaded or unloaded. Add-In functions are available immediately after loading the Add-In and are respectively no longer available after unloading. Add-Ins, that should be available after every PACTware start are labeled **Load at start**.

Click the hyperlinks in the following table to read more about Add-Ins:

Name of the Add-In	Description
Clipboard	**Add part of a project**
Debug Monitor	**Debug Monitor**
Device Catalog	**Device Catalog**
Device State Manager	**Device State Manager Add-In**
Device State View	**Device State Add-In**
Error message dialog	**Error Monitor**
Error monitor	**Error Monitor**

Name of the Add-In	Description
Plant view	**Plant View**
Project view	**Project View**
TCI Support AddIn	**Tool Calling Interface (TCI) Support Add-In**
Up-/Download manager	**Up/Download Manager Add-In**

5.1 Up/Download Manager Add-In

Loading parameters from device and storing parameters to several devices can be very time-consuming in large projects with slow communication channels.The user is tied to the PC for the execution of functions of some field devices. Therefore, PACTware offers an Add-In which prepares these tasks and automatically runs them.

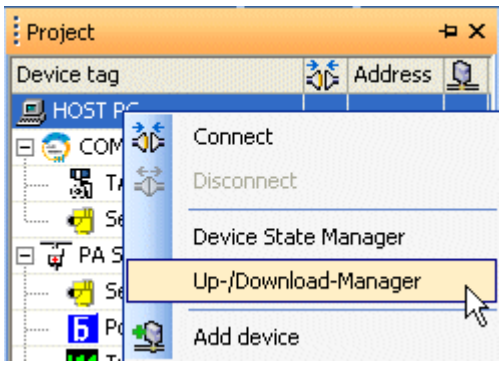
Depending on the task definition it is possible to select a part of the plant, which is e.g. edited via a protocol with corresponding communication devices. The function is then started by the plant part using the Add-In and the user can monitor the clearly arranged result after function run.

If errors occur in the execution, they are ***not*** logged. At the beginning, you must define if you want to continue or if you want to stop in case of execution errors.

Once a triggered function runs, no other operations can be executed in PACTware. PACTware becomes accessible again when the function is cancelled or when it is successfully terminated and the window of the Add-In has been closed.

5.1.1 Start Add-In

Prior to using the Up/Download Manager Add-In, it must be loaded (see **PACTware Add-Ins**). It is started via the context menu of the HOST PC, a **CommDTM** or a **GatewayDTM** window or via the plant view.

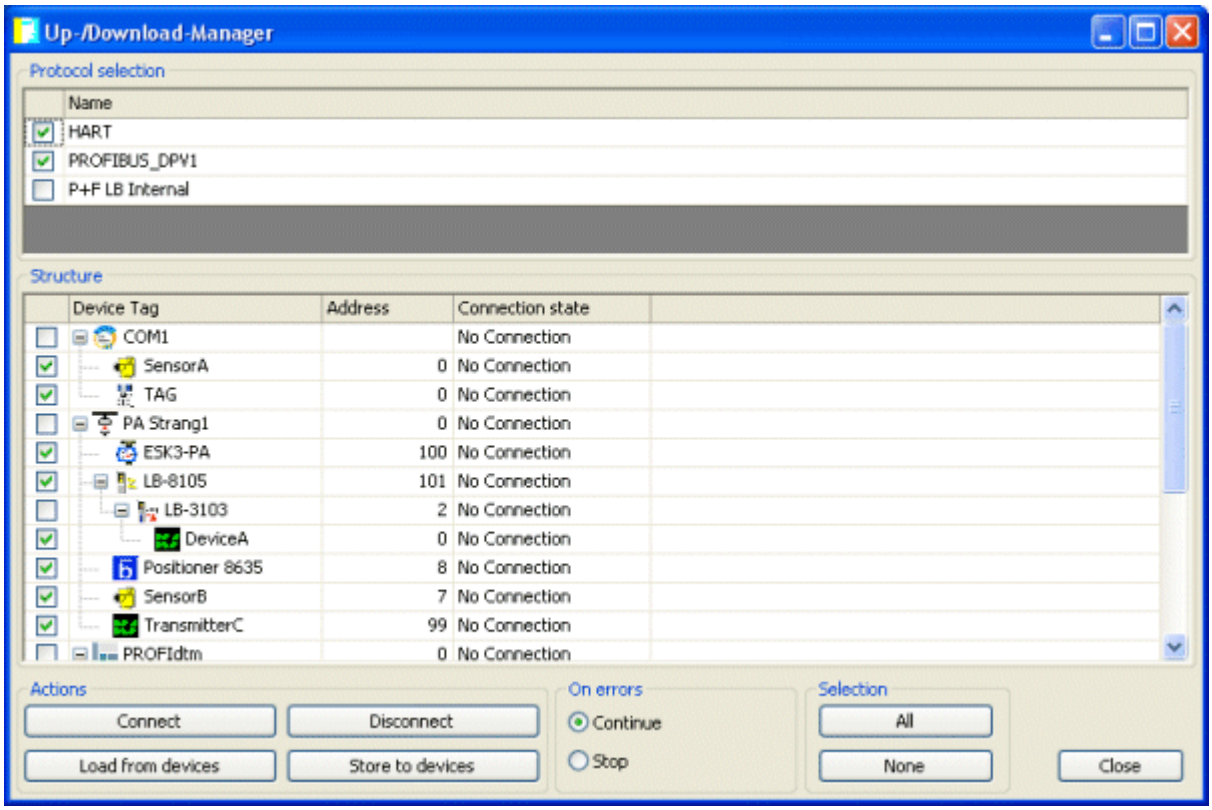


5.1.2 Edit several field devices

Following the start of the Add-In, a window is displayed in which all logs which appear in the project part are listed in the section above and all DTMs pertaining to the entire project or to the respective CommDTM or GatewayDTM from which are Add-In was started are displayed in the table below.

The lower section of the window provides a number of buttons which allow to start functions or to control the behavior in the execution of functions.

According to the protocols selected from the list, all DTMs which support these protocols are selected. The set of selected DTMs can be modified by selecting or deselecting individual DTMs. The control buttons of group **Selection** select all DTMs or no DTM.

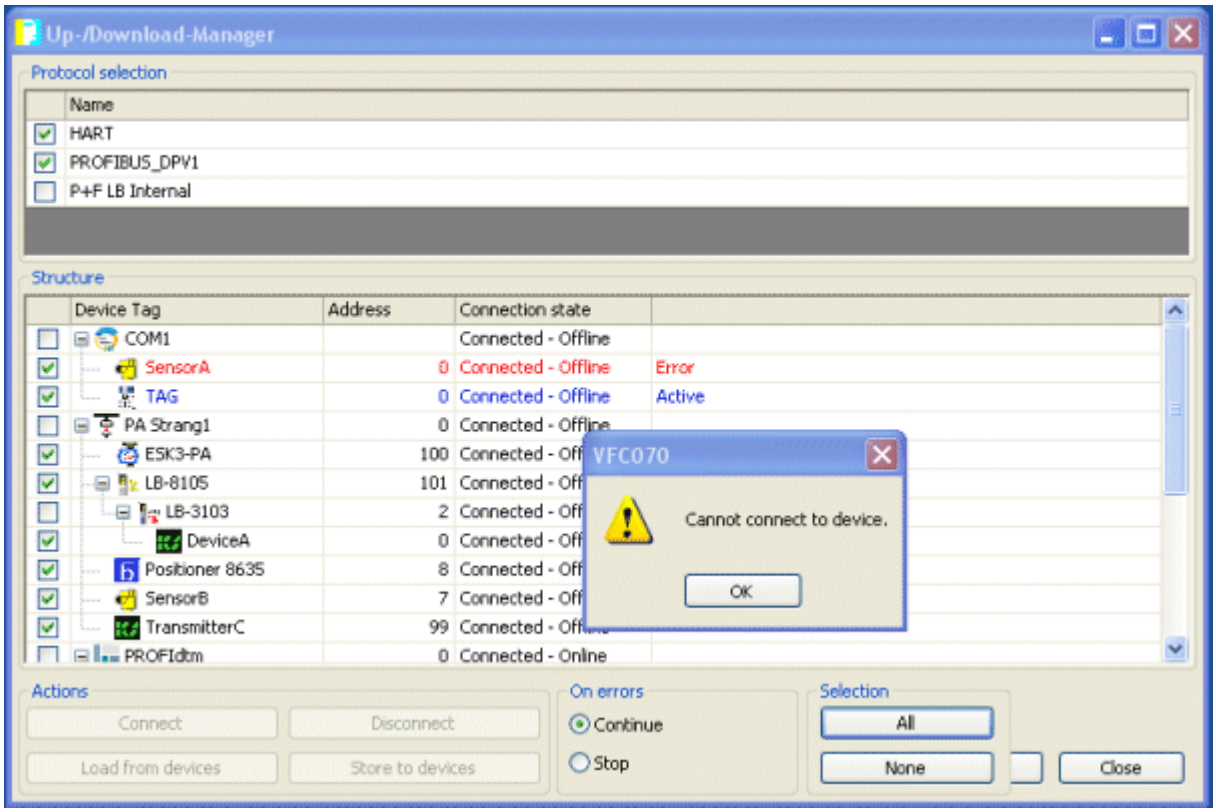


Start the selected function via a control button of group **Actions**. A communication with e.g. all selected DTMs is established.

Any user can connect PACTware with field devices or disconnect the communication. At least operator **User Rights** are required to load data from the field devices. Storing data to a field device requires at least maintenance **User rights**.

When loading data from or storing data to a field device, a connection to a field device is automatically set up if it has not already existed before. The connection is closed again after the field device is edited.

An associated message with changed font color in the table is displayed when a function for a field device has been executed, successfully terminated or if an error occurred.



If an error occurrs, the process can be continued or stopped. In both events displayed error messages must be acknowledged to reoperate the Add-In.

The entire process can be cancelled any time by using control button **Cancel**. A running function with a field device would be terminated first.

The online/offline state between DTMs and field devices is displayed in the Add-In as well as in the project window and in the plant view.

Button **Close** closes the Add-In.

5.2 Device State Manager Add-In

PACTware provides an Add-In for one-time or cyclic scans of a default set of field devices to check the device state of field devices. The result of the exam is displayed in the **Device State Add-In** .

The status values are defined in NAMUR recommendation NE107. The meaning of the values is defined in section **Device State Add-In**.

Note : DTMs that support this function are required for scanning status information .

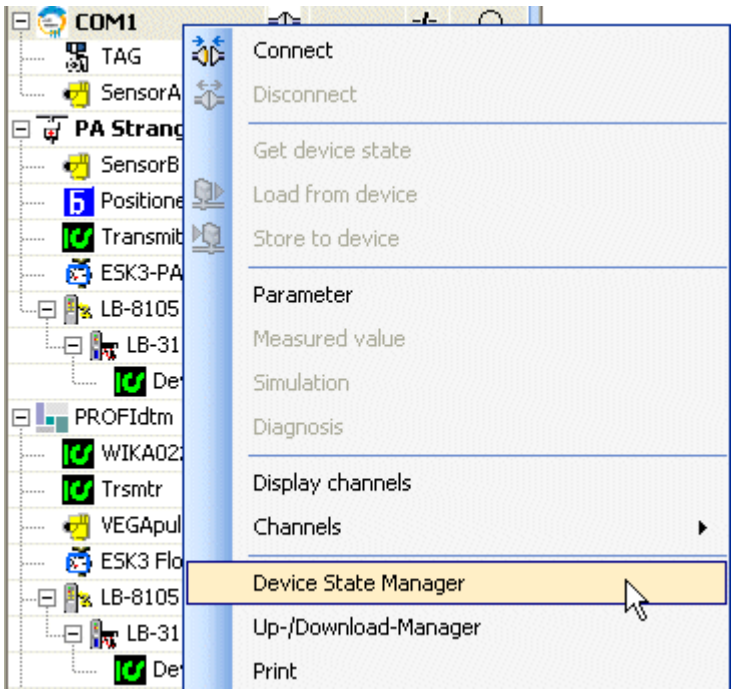
Depending on the task definition, a part of a plant which is e.g. edited via a log with associated communication devices can be selected. The function is then started via the Add-In for the plant part and the user can view the result in clearly arranged form.

If errors occur during the execution, they are ***not*** logged. Only the device state is labeled **Not supported** and the state query is continued with the next field device in sequence.

As long as a function is started and running, no other operations can be executed using PACTware. PACTware only becomes operable when the function is terminated and the Add-In window is closed.

5.2.1 Start Add-In

The Device State Manager Add-In must be loaded before it can be used (see **PACTware Add-Ins**). It is started via the context menu of the HOST PC, via a **CommDTM** or a **GatewayDTM** in project window or in the plant view..



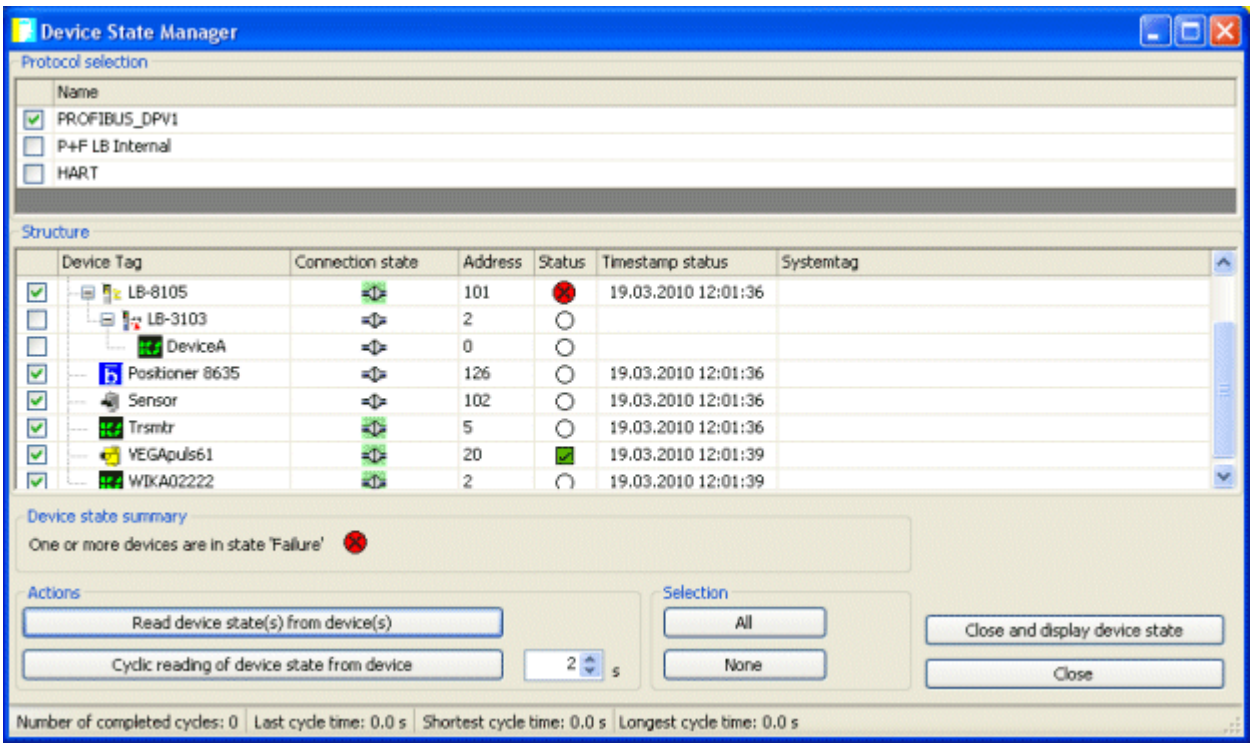
Every user has the user right to start the Device State Manager Add-In.

5.2.2 Editing several field devices

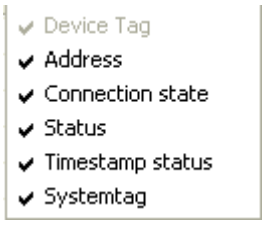
Once launched, a window is displayed listing all logs of the project part in the upper section. The table below shows all DTMs pertaining to the entire project or to the individual **CommDTM** or **GatewayDTM** from which the Add-In was started.

A few control buttons are contained in the bottom part to start functions or to control the behavior when executing functions.

Depending on the selection of the logs in the list, all DTMs which support these logs, are tagged. The selection of the marked DTMs can be changed by tagging or untagging individual DTMs. The control buttons of group **Selection** mark all DTMs or no DTM.



The columns of table **Structure** can be sorted by Drag&Drop or can be shown and hidden via the context menu. For each line a tooltip displays the address, device tag and DTM name.



Column **Device Tag** is always displayed. In addition to the tag, a **Device Tag** also shows the Icon of the DTM and the tree structure within a project.

Address shows the unambiguous name via which a device can be addressed in the communication structure. In multiplexers or remote I/O gateways a channel name or an address is entered, in bus-oriented communication channels it is an address number.

The **Connection state** indicates whether a DTM is connected with a device.

The previously read **Status** of each device is displayed with a **Timestamp**. The same information can also be viewed in the **Project View**.

The **System tag** is always empty.

One-time scan or cyclic scan of the device state of all selected field devices is started via a control button of group **Actions**. A cycle time is predefined for the cyclic readout. The maximum value for a cycle is set in the **Options** dialog in **Menu Extras**. When higher default values are preset, only one cycle is carried out.

After starting the scan cycle a connection with all selected DTMs is established. At the end of the function all connections with all field devices that were not connected before the start are closed.

The status line of the Add-In contains some statistic information about the cyclic course of the device status readout.

5.3 Device State Add-In

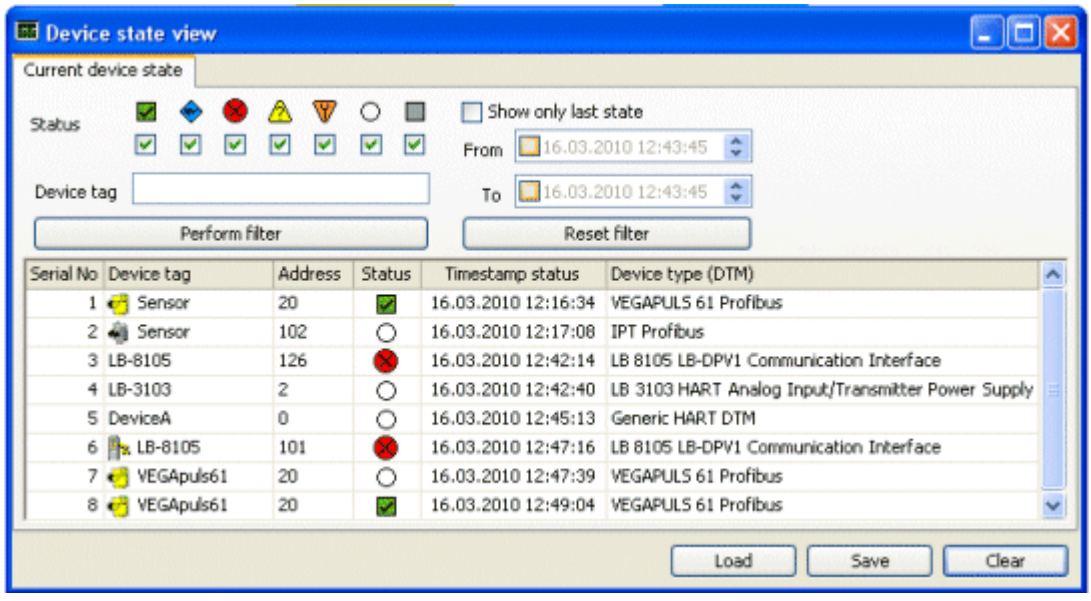
This Add-In displays the current log of the state changes of the most recently recorded state of field devices or a stored log.

The window can be displayed via **Menu View** when the Add-In was loaded.

The device status of one or of several devices can be read in five ways:

- via the **Context Menu** of a device
- via **Menu Device** of a device
- via **Menu Project** for all devices of a project that are currently connected with PACTware
-  by using the adjacent tool icon, that is contained in toolbar **Device Data** for all devices of a project that are currently connected with PACTware
- via the **Device State Manager Add-In** for a selection of devices in a project

While the time stamp of the last readout is logged in the **Project View**, the time stamp of the last state change is displayed in the window of the Device State Add-In. The same device can therefore be listed multiple times when the device state changes multiple times during the recording time.



Large protocols provide filter options for enhanced overview and evaluation. Only e.g. a defined field device can be observed or defined status values are used to create a maintenance plan.

The following status values are defined by NAMUR recommendation NE107:

- Diagnosis active
- Diagnosis passive
- Failure
- Check function
- Outside of specification
- Maintenance required

Status display, when the device status cannot be read from the field device:

- Device status not supported

The columns of the table can be sorted by Drag&Drop and can be shown and hidden via the context menu. A tooltip for each line states the device type. The entries within a column can be sorted alphabetically.

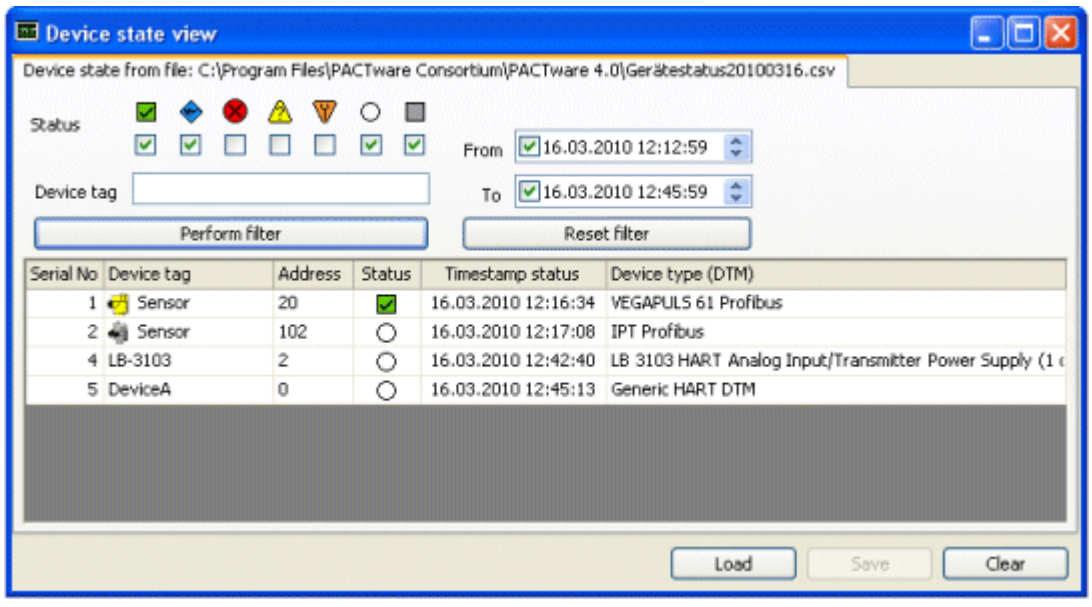


Column **Serial No.** is always displayed. The **Device tag** shows the tag. Status with time stamp can appear multiple times for each device if the status changes within the time.

Address states the unambiguous name via which a device can be addressed in the communication structure. In multiplexers or remote I/O gateways a channel name or an address is stated, in bus-oriented communication channels it is an address number.

The **Device type** designates the name of the DTM. It is also shown as tooltip.

When a stored protocol is loaded, the name of the log file is indicated on the tab of the Add-In.



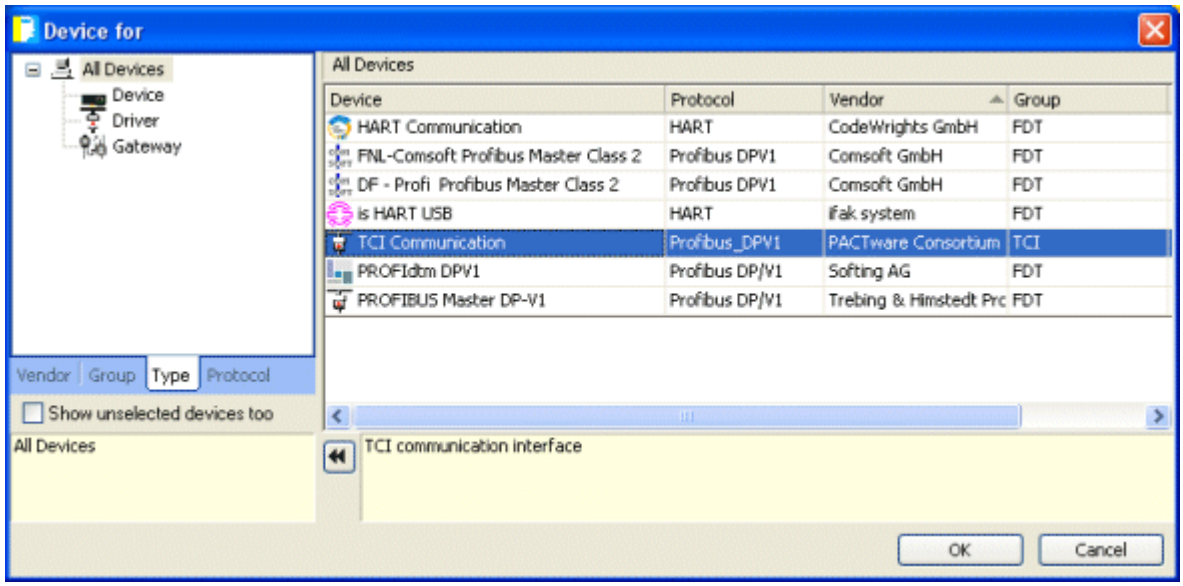
5.4 Tool Calling Interface (TCI) Support Add-In

PACTware can be called by other parameterization programs like the e.g. SIMATIC STEP7 by Siemens. DTMs for the parameterization of field devices can such be used for commissioning and diagnosis of field devices, for which either no EDDL (Electronic Device Description) exist or special functions for the parameterization are not supported by an existing EDDL.

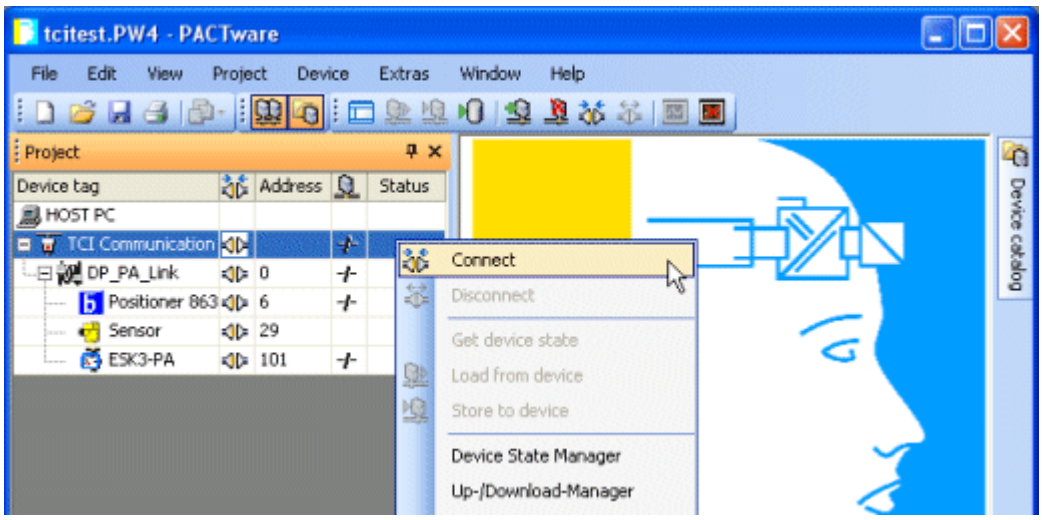
5.4.1 Use of the Add-In

To use the TCI Support Add-In, it must be loaded (see **PACTware Add-Ins**).

The device catalog must subsequently be updated. The TCI communication object is now available to be added to a project like a CommDTM for the Profibus Protocol.



When PACTware is called by a parameterization program, the associated project must be opened and this program must be connected via the TCI CommDTM.



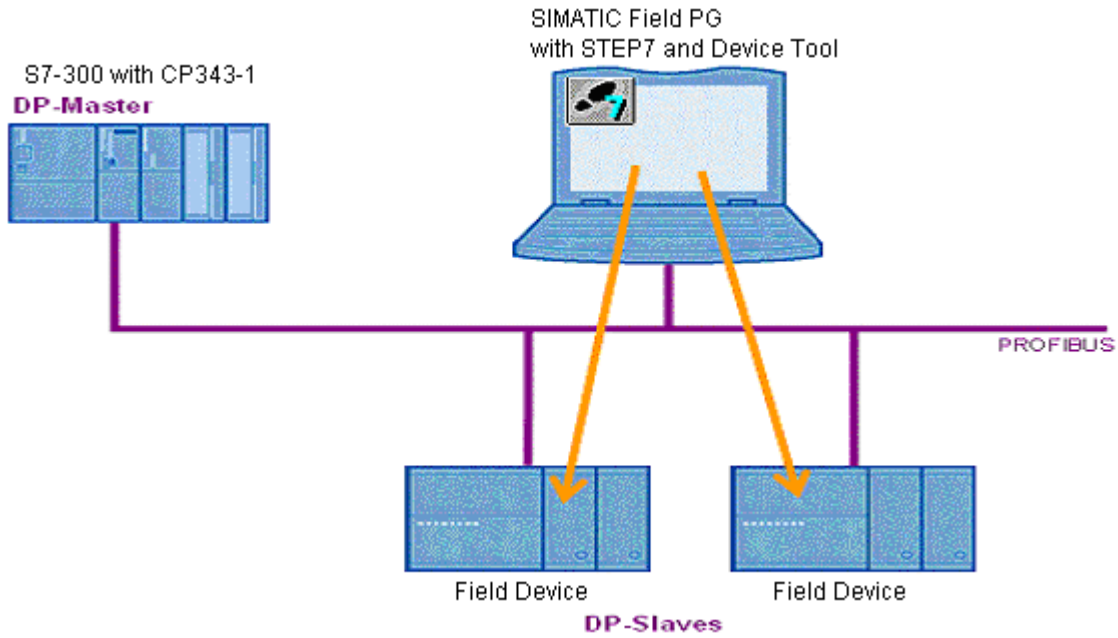
When the connection is established, PACTware can use the infrastructure of the paramterization program as if PACTware would be directly connected to a Profibus communication device.

All field devices can be parameterized this way if the device catalog contains their respective DTMs.

A distinction is generally made between 2 connection types for decentral peripheral devices in a SIMATIC Field PG-Environment that can be parameterized via the TCI Tool Calling Interface:

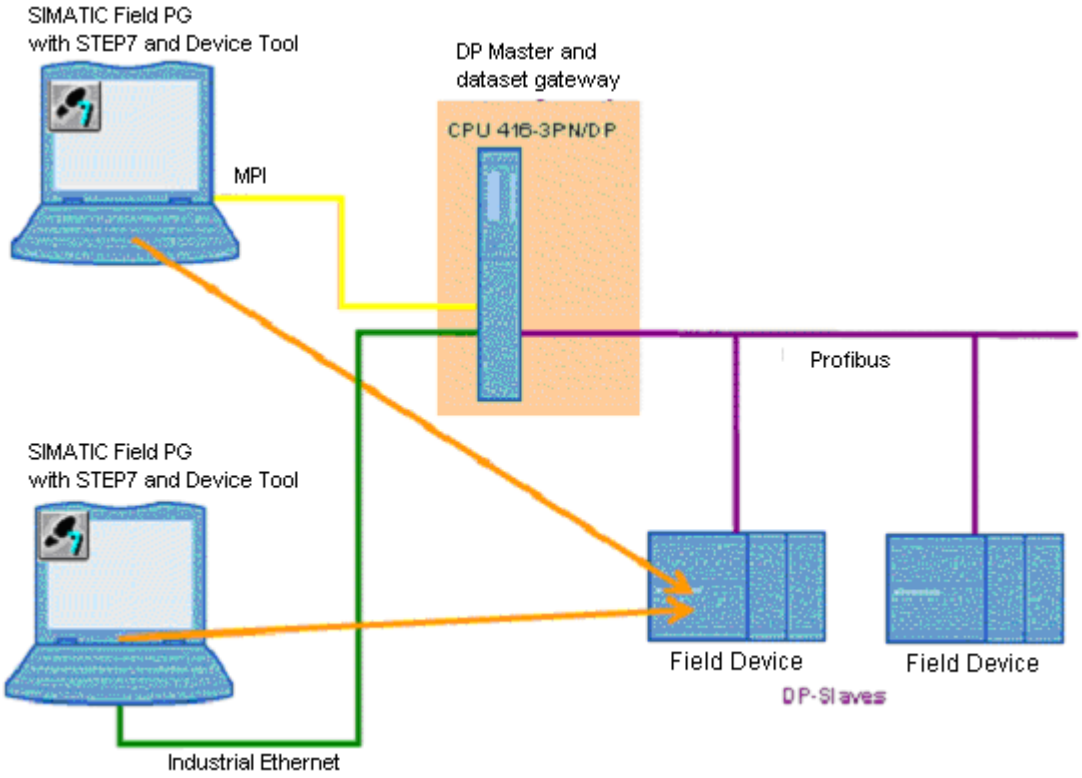
Case A:

SIMATIC Field PG and decentral peripheral devices in the same bus system.



Case B:

Parameterization of the DP-Slaves of MPI / Industrial Ethernet. In this case, the Siemens-CPU must support the data set routing (Data set gateway).



The following components support the dataset routing function and can such be used as dataset gateway:

- IE/PB Link (6GK1411-5AB00, 6GK1411-5AA00)
- CPU 414-3 PN/DP (6ES7414-3EM05-0AB0) as of FW V5.1
- CPU 416-3 PN/DP (6ES7416-3ER05-0AB0) as of FW V5.1
- CPU 416F-3 PN/DP (6ES7416-3FR05-0AB0) as of FW V5.1
- CP443-5 Extended (6GK7443-5DX04-0XE0) as of FW V3.0
- CPU 319-3 PN/DP (6ES7318-3EL00-0AB0) as of FW V2.7
- CPU 319F-3 PN/DP (6ES7318-3FL00-0AB0) as of FW V2.7
- IM151-8 PN/DP (6ES7151-8AB00-0AB0) with DP-Master module (6ES7138-4HA00-0AB0) as of FW V2.7
- IM151-8F PN/DP (6ES7151-8FB00-0AB0) with DP-Master module (6ES7138-4HA00-0AB0) as of FW V2.7

Note : STEP7 V5.4 SP5 is required to use TCI.

6. Glossary

CommDTM

Communication Device Type Manager

A software component which must be provided once for each communication protocol used in a project (e.g. HART, Profibus). All other DTMs of the project structure that are used for field devices, multiplexers or Remote I/O-systems are assigned to CommDTMs.

DTM

Device Type Manager

A Software component that executes the parameterization, configuration, calibration or the test of field devices depending on the individual device type. The DTM may have a graphical interface. A DTM that was developed in accordance with the FDT-specification may be integrated into Engineering Tools, Control Systems or configuration software like PACTware.

The DTM Style Guide of the FDT Group (www.fdt-group.org) describes the design of the user interface and the use of a DTM.

FDT

Field Device Tool

The FDT Specification of the FDT Group (www.fdt-group.org) describes how a DTM communicates with a frame application. All interfaces between DTM and frame application are described in detail.

GatewayDTM

Gateway Device Type Manager

Gateways are a special class of devices. Several field devices can be connected to them. HART Multiplexers or Remote I/O Systems are typical representatives of this device class. Gateways may also contain modules in addition to forwarding of communication protocols. Cascading of gateways is also possible.

PACTware

Process Automation Configuration Tool

Configuration software available as Open Source to every device vendor who is a member of the PACTware Consortium e.V.. For the first time, it is such possible to configure and parameterize all field buses and field devices of a plant regardless of the vendor by using one single engineering tool. The further development of this configuration software is sponsored by the PACTware Consortium e.V.

PACTware is a frame application according to the definition of the FDT Specification.

Tabbed MDI

Windows are combined in a matrix in "Multiple Document Interface" style. Each window has a tab. Only the window selected via the tab becomes is displayed in a set of windows.

Classic View

Windows are displayed in a own window with title bar in "Multiple Document Interface" style. The windows can be minimized or maximized.

User Rights

A differentiation is made between 5 user roles for editing projects, parameterization and configuration of field devices and the user administration:

Observer, Operator, Maintenance, Planning engineer and Administrator.

The following tables lists the actions each user role may execute using PACTware.

Action	Observer	Operator	Mainte-nance	Planning engineer	Adminis-trator
Menu File					
New	-	-	-	X	X
Open...	X	X	X	X	X
Close	X	X	X	X	X
Save	-	-	-	X	X
Save as...	-	-	X	X	X
[last projects]	X	X	X	X	X
Exit	X	X	X	X	X
Menu Edit					
Cut	-	-	-	X	X
Copy	-	-	-	X	X
Paste	-	-	-	X	X
Menu View					
Toolbar	X	X	X	X	X
Status bar	X	X	X	X	X
Project window	X	X	X	X	X
Device catalog	X	X	X	X	X
[Add-In]	X	X	X	X	X
Error monitor	X	X	X	X	X
Clipboard	X	X	X	X	X
Debug Monitor	X	X	X	X	X
Menu Project					
Load from device(s)	-	-	X	X	X
Store to device(s)	-	-	X	X	X
Get device status for complete project	X	X	X	X	X
Print	X	X	X	X	X

Action	Observer	Operator	Mainte-nance	Planning engineer	Adminis-trator
Profile	X	X	X	X	X
Menu Device					
Connect	X	X	X	X	X
Disconnect	X	X	X	X	X
Get device state	X	X	X	X	X
Load from device	-	X	X	X	X
Store to device	-	-	X	X	X
Parameter	-	-	X	X	X
Measured value	X	X	X	X	X
Simulation	-	-	X	X	X
Diagnosis	X	X	X	X	X
Display channels	X	X	X	X	X
Channels	X	X	X	X	X
[Device State Manager]	X	X	X	X	X
[Up-/Download Manager]	-	read only	X	X	X
Print	X	X	X	X	X
--- Compare offline	X	X	X	X	X
--- Compare online	X	X	X	X	X
--- Set value	-	X	X	X	X
--- Write device data to file	-	-	X	X	X
Add device	-	-	-	X	X
Delete device	-	-	-	X	X
Properties	X	X	X	X	X
Menu Extras					
User administration	-	-	-	-	X
Device catalog administration	-	-	-	-	X
Options	X	X	X	X	X
Add-Ins	-	-	-	-	X
Menu Window					
Classic View	X	X	X	X	X

Action	Observer	Operator	Mainte-nance	Planning engineer	Adminis-trator
Arrange all	X	X	X	X	X
Next Window	X	X	X	X	X
Close all windows	X	X	X	X	X
Menu Help					
Contents	X	X	X	X	X
About	X	X	X	X	X

Index

A
About 1-9, 3-10
Add device 3-5, 3-18, 4-6
Add DTM 4-10
Add part of a project 4-12
Add-In 3-7, 4-23, 4-25, 5-1
Add-Ins 3-2
Additional Functions 3-5, 3-16
Arrange windows 3-9
C
Change Password 3-7
Clipboard 3-2, 4-12
Close 3-1, 4-22
Close all windows 3-9
Connect 4-16, 4-17
context menu 3-11
Copy 3-2, 4-12
Cut 3-2
D
Debug Monitor 3-2, 4-23
Delete 4-24
Delete device 3-5, 3-18
Delete DTM 4-11
Device 3-5
Device catalog 3-7
Device catalog administration 4-7
Device properties 3-18
Disconnect 3-12
Display Mode 4-24
E
Edit 3-2
Error Monitor 3-2, 4-25
Exit 3-1
Extras 3-7
F
File 4-2
H
HART Advanced Scan 3-2
Help 3-10
I
Info 4-6
L
language 3-8
Load from device 3-3, 3-5, 4-16
M
Measured value 3-15
N
New 3-1
New project 4-2
Next window 3-9
O
Online Parameterization 4-16
Open 3-1, 4-24
Open project 4-2
Options 3-8
P
Parameterization 4-16
Parameterize 3-15, 4-16
Parameterize online 3-15
Paste 3-2, 4-12
Print 3-3, 3-16
Profil 2-8
Profile 3-4
Project window 3-2
Properties 3-5
R
recording mode 4-24
Refresh Error Monitor 4-26
S
Save 3-1, 4-22, 4-24
Save as... 3-1, 4-22
Settings 4-24
Start simulation 3-5, 3-15
Status bar 3-2
Store to device 3-3, 3-5, 3-14
T
Toolbar 3-2
U
Update device catalog 4-7
User administration 3-7
V
View 3-2, 4-23
W
Window 3-9
Write device data to file 3-16, 4-17