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Reliability

OMNITREND®
Center

Online help - Print copy

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2 User interface setup

This section contains topics on operating and configuring the user interface.

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2.1 Basics: User Interface Structure

The user interface can be shown in two display modes:

- Basic view mode: This does not show any views or only shows a small number of views.
- Advanced view mode: This mode corresponds to the user interface from the previous versions.

> The following section describes the user interface in the **advanced view mode** (Options / User Settings / General).

The main window consists of several sub-windows, which are divided into three groups:

1: Tree view

The Tree view facilitates navigation in the database. It shows the data in a hierarchical layout. Its content adjusts to the selective perspective. The following tree types exist:

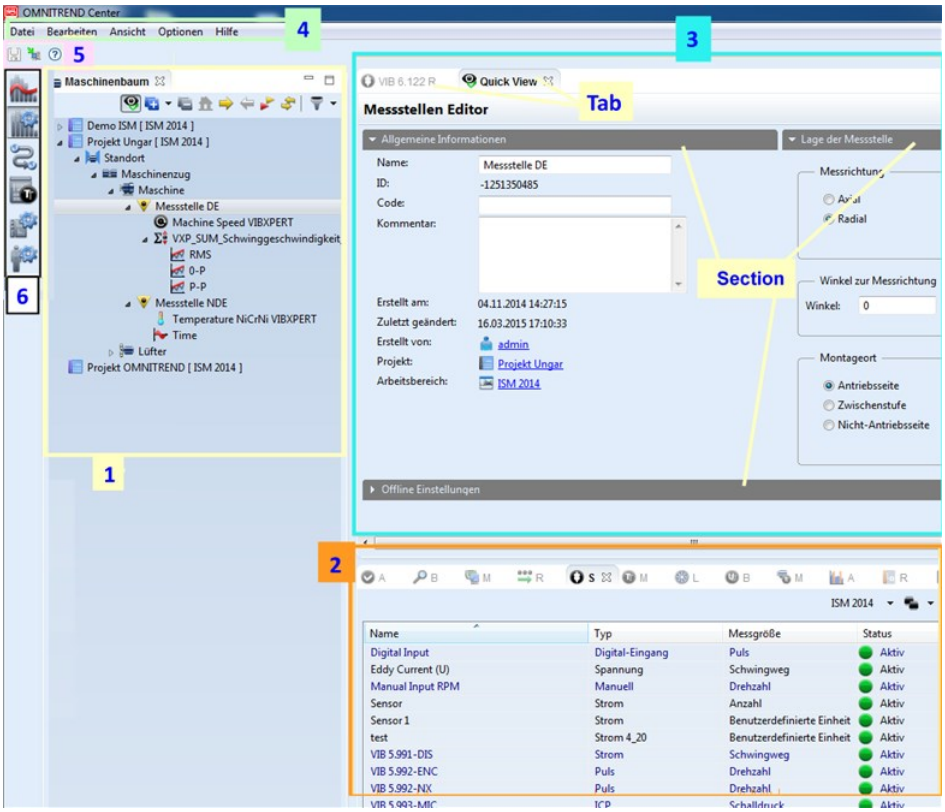
- **Machine tree** in the Configuration, Analysis and Communication perspectives,
- **Master tree** in the Administration perspective,
- **Machine Template tree** in the Machine Templates perspective
- **Reporting tree** in the Report Administration perspective

2: Views

The views provide functions and information required in the selected perspective.

3: Editor

You can edit configuration settings and analyze measurement results in the editor. The contents are structured in sections and tabs for a better overview.



The following operating elements are permanently available in the main tree:

4: Main menu:

Five menus with the following content:

- **File**: Close editors, save configuration settings (in the main toolbar as well), start import wizard, open/close/reject project, exit OMNITREND Center
- **Edit**: Cut, copy, and past of elements in the tree view
- **View**: Reset perspective to standard view and update view
- **Options**: Default settings applicable to the logged-in user.
- **Help**: Start license activation wizard, call up program information, copy log files to desktop, call up online help and dynamic help.

5: Main toolbar:

The buttons to …

- Save configuration settings ,
- Import measurement data from device
- Call up online help .

6: Perspectives

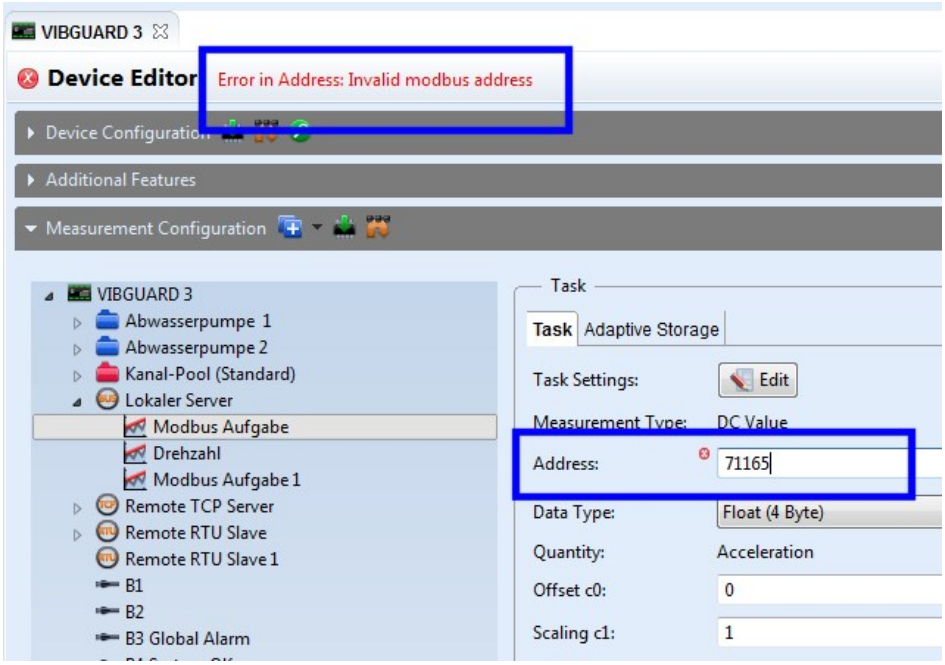
Six buttons for switching the perspective.

Sub-window layout and contents depend on the

- perspective and the
- role of the logged-in user.

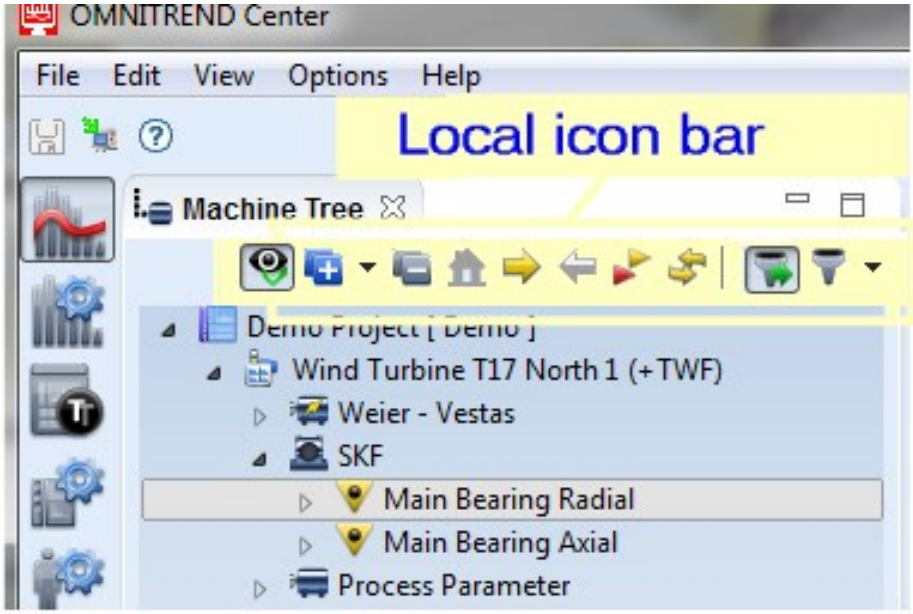
Error messages

Input errors are either displayed via a dialog window or signaled in red font in the header line in the respective editor:


VIBGUARD 3
Device Editor
Error in Address: Invalid modbus address
Device Configuration
Additional Features
Measurement Configuration
VIBGUARD 3
Abwasserpumpe 1
Abwasserpumpe 2
Kanal-Pool (Standard)
Lokaler Server
Modbus Aufgabe
Drehzahl
Modbus Aufgabe 1
Remote TCP Server
Remote RTU Slave
Remote RTU Slave 1
B1
B2
B3 Global Alarm
Task
Task
Adaptive Storage
Task Settings:
Edit
Measurement Type:
DC Value
Address:
71165
Data Type:
Float (4 Byte)
Quantity:
Acceleration
Offset c0:
0
Scaling c1:
1

2.2 Overview of the operating elements

A local toolbar with buttons for content editing can be found in every sub-window.



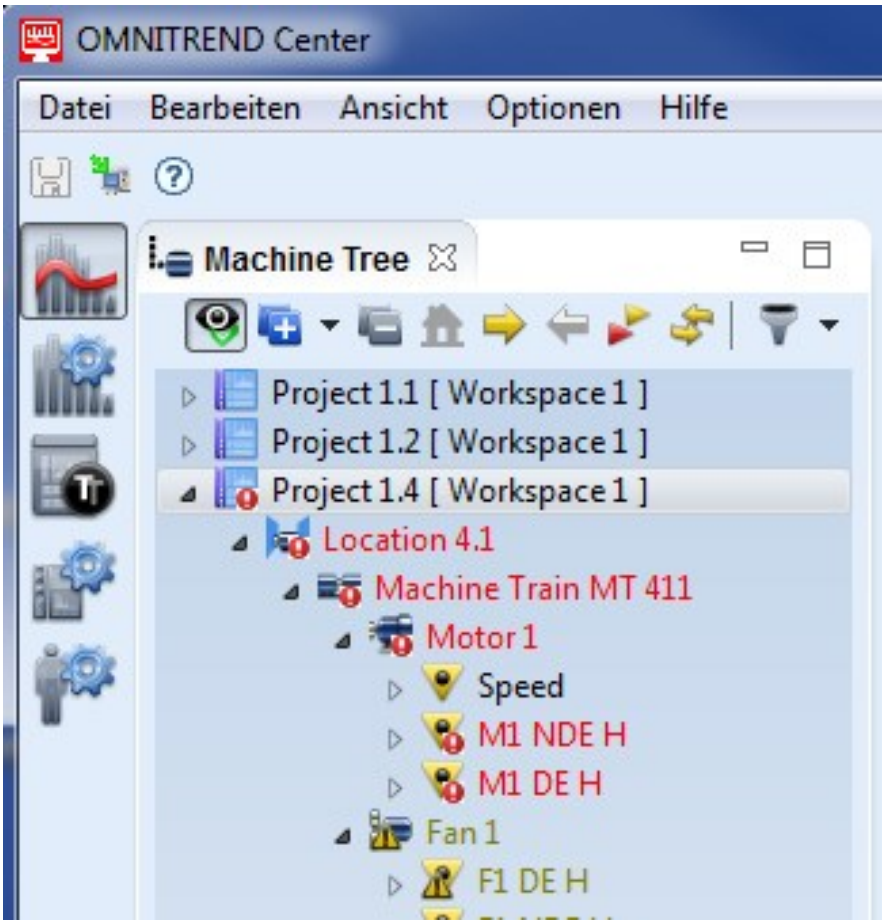
Operating elements in the tree view

- **Quick View**: Dynamic editor window for quick viewing of the selected tree node. Opposite to the static editor window, the content changes, as soon as a different node is selected. Available in the Configuration and Analysis perspectives.
  Quick View on:
  Quick View off:

- **Expand Branch / Collapse Branch**: Here you can individually expand the contents in the marked tree node and/or collapse the entire tree node at the marked level. Click on on the right side of and select the desired hierarchy level or **Expand All** from the menu. The tree nodes outside the marked tree node remain untouched.
  Expand Branch:
  Collapse Branch:

- **Selective Tree View**: Here you can separately display a specific tree node in the tree view. All other tree nodes are hidden. The background color changes in this filtered vie from blue to yellow.
  Show only this branch:
  Show previous tree view:
  Entire tree:

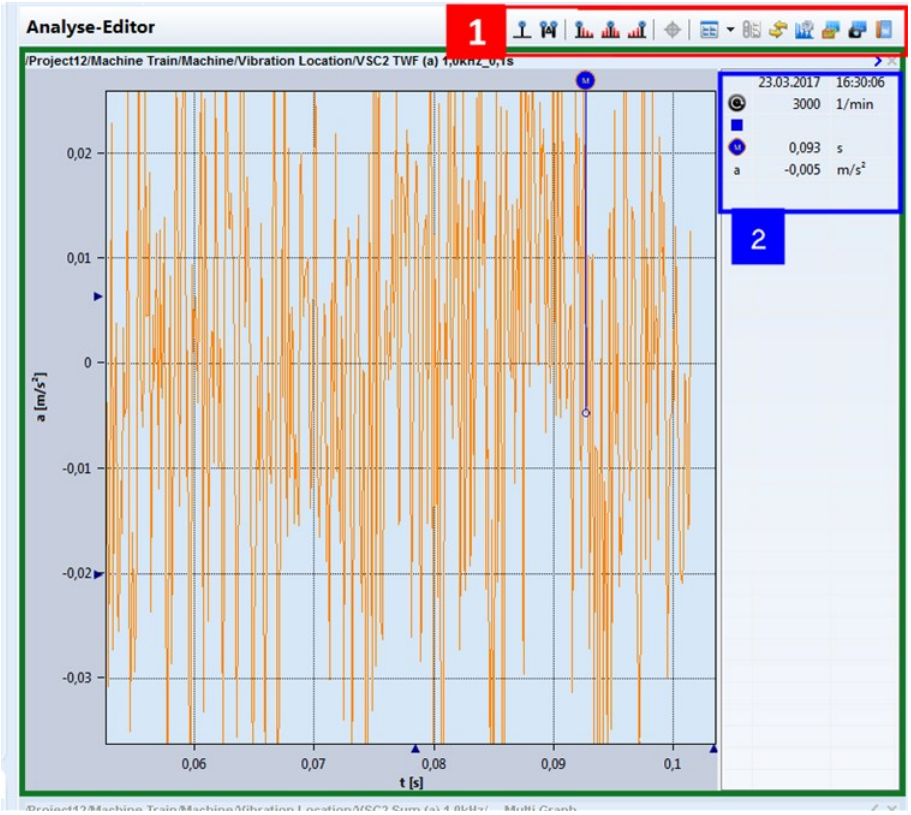
- **Options for Alarm Check**: Here you can activate and configure the Alarm Check function. The measurement data is checked for threshold violations according to defined criteria. The alarm status is color coded in the tree view.
  Call up Alarm Check options



- **Refresh** : Here you can refresh the tree view manually. You can use this function, if several clients access the server at the same time and apply changes to the tree structure (add, delete tree nodes, etc.).
- **Task has measurement data** (Display filter): In the machine tree of the analysis perspective all measurement tasks are displayed by default. Using the **measurement data filter** in the local toolbar, you can hide the measurement tasks for which no measurement data is stored in the database.
- **Filter**: Using the intelligent filter wizard **(Interactive Tree**), you can obtain different information from the tree view data. Click on next to and select an option:
  Filter / Edit: Start filter wizard. If the filter is applied, the background color in the tree view changes from blue to yellow.
  Filter / Delete: Delete filter and deactivate filter application
- **Find**: The input field for the full text search can be found at the bottom of the tree view. The search starts automatically, when you enter the first character. To deactivate the search, delete the search term or click on the eraser icon at the end of the input field.

Operating elements in the analysis editor

In addition to the elements in the local toolbar, two additional operating panels are available in the analysis editor:



1: Local toolbar in the analysis editor

- **Cursor functions**, e.g.
  Here, you activate the cursors that are available for the current graph (e.g., main or delta cursor).
- **Cartesian / Polar Display**
  Here you select the coordinate system for the display of the orbit measurement.
- **Change Multiview**
  If several multi-view diagrams are stored in a hierarchy, you can select them for display here.
- **Link graphs**
  similar graph types[1] for better comparison during analysis.
- **Refresh graphs and restore user preference settings**
  The settings in **Options / User Preferences** are restored and the graphs refreshed in the editor window.
- **Edit session settings of graphs**
  Here you can change the view settings for **every graph type**. The changes apply temporarily for the current session, i.e. until OMNITREND Center is exited.
  To temporarily change the view settings for a **specific graph**, click into the graph using the right mouse button and select **Graph Settings**.
- **Copy diagram to Windows clipboard**
  Take a screenshot of the current diagram and copy it to the Windows clipboard. The diagram can then be pasted directly into any application, such as MS Word.

[1] e.g. time waveforms, spectra

- **Capture screenshot**
  Create a screenshot of the current tab in the analysis editor. You can find the image file (*.png) in the **Clipboard view**, from which you can insert the screenshot into a finding via drag&drop.
- **Graph report**
  Create graph report.

2: Cursor Infobox

As soon as you place a cursor into the graph, the Cursor Infobox appears on the right side of the graph. Here, you can find the coordinates for the main and delta cursor, as well as further measurement parameters, such as speed, RMS value. Click on **>** to hid the Infobox.

> For space reasons, it is not possible to display the coordinates for all shown cursors in the Cursor Infobox. For harmonic, sidebands, or subharmonic cursors, you can find the respective information in the **Cursor view**.

3: Move the zoom window

- Using the mouse, zoom into the graph by drawing a border around the respective area.
- Click on to show a small window on the lower right.
- Use the scroll bars to move the zoom window in the graph.

2.3 Working in the main window

The user interface design follows ergonomic aspects and adjusts automatically to the respective task. This applies to the arrangement of the individual sub-windows (views, editors), as well as the selection of the available functions. An optimized layout is adjusted at the factory for every perspective.

However, you can adjust this standard layout according to your needs:

Newly arrange sub-windows

Drag and drop sub-windows as follows:

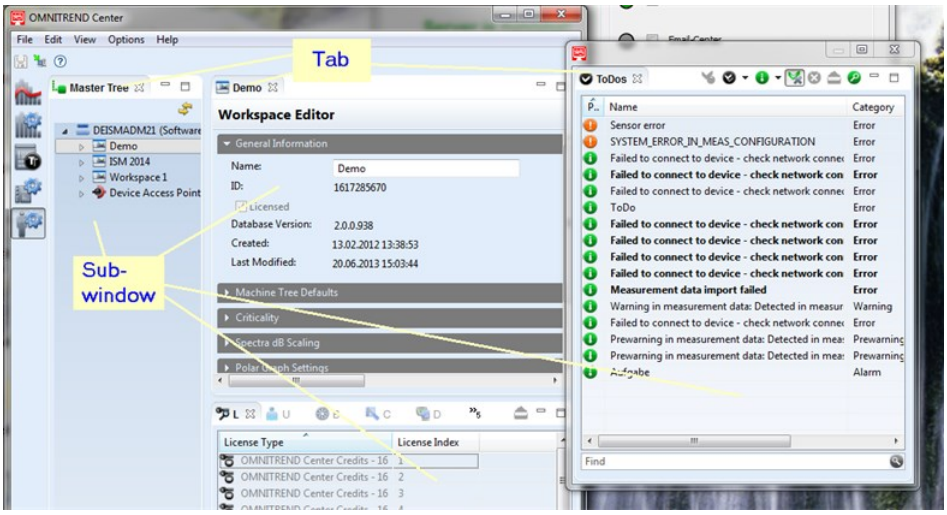
- Using the mouse, click on the respective tab.
- Press and hold the mouse button, while dragging the sub-window to the desired position. You can also drag the sub-window out of the program interface onto a second monitor.
- Release the mouse button.

If the mouse pointer is above a permitted destination location in the main window, a blue frame appears that can be divided horizontally or vertically. Place the mouse pointer into the desired sub-frame and release the mouse button.

Example

Example: Newly arrange sub-windows

The **Task** view is detached from the program window for a better overview. It is available on the Windows desktop as freely movable window.

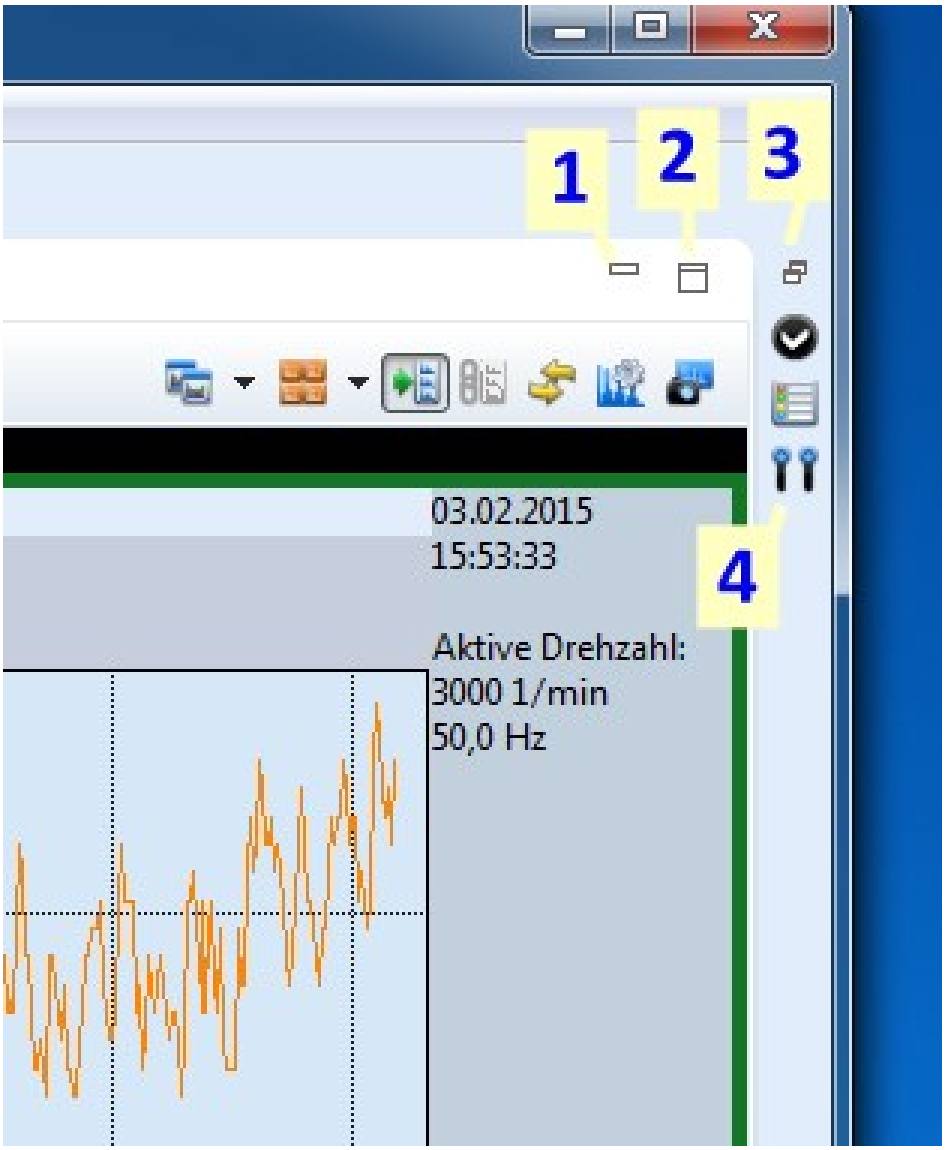


Change window width, window height

- Place the mouse button above the respective window frame so that the mouse pointer appears as double arrow.
- Click and drag the window frame to the desired width and/or height.
- Release the mouse button.

Maximize sub-window (full-screen image)

Use the following functions to enlarge, minimize, and restore individual sub-windows:



- **Minimize**
- **Maximize** (full-screen image); can also be triggered by double-clicking on the tab.
- **Restore** multiple views
- **Restore** the icon view

Hide and show sub-windows

- To **hide**,: Using the right mouse button, click on the respective **tab** and select from the dialog menu:
  - **Close**: Closes the sub-window that you clicked; can also be triggered using the X-icon in the tab.
  - **Close All Others**: Closes all sub-windows, except the window that you clicked
  - **Close All**: Closes all sub-windows in the respective window groups.
- To **show**: Select **View / Reset Perspective** in the main menu.

2.4 Change language

To change the language in OMNITREND Center, proceed as follows:

- In the main menu, select **Options /User Preferences**. The dialog window **User Preferences** appears.
- In the **General** group, select the **language in OMNITREND** (e.g. English)
- Click on **OK**. A prompt to automatically restart the software follows.
- Click on **Yes** if you would like to apply the change immediately.

> Clicking on **No** means that the originally set language remains. The changeover does not take place until the next manual restart of the software.

2.5 Change settings

You can change the following settings in OMNITREND Center:

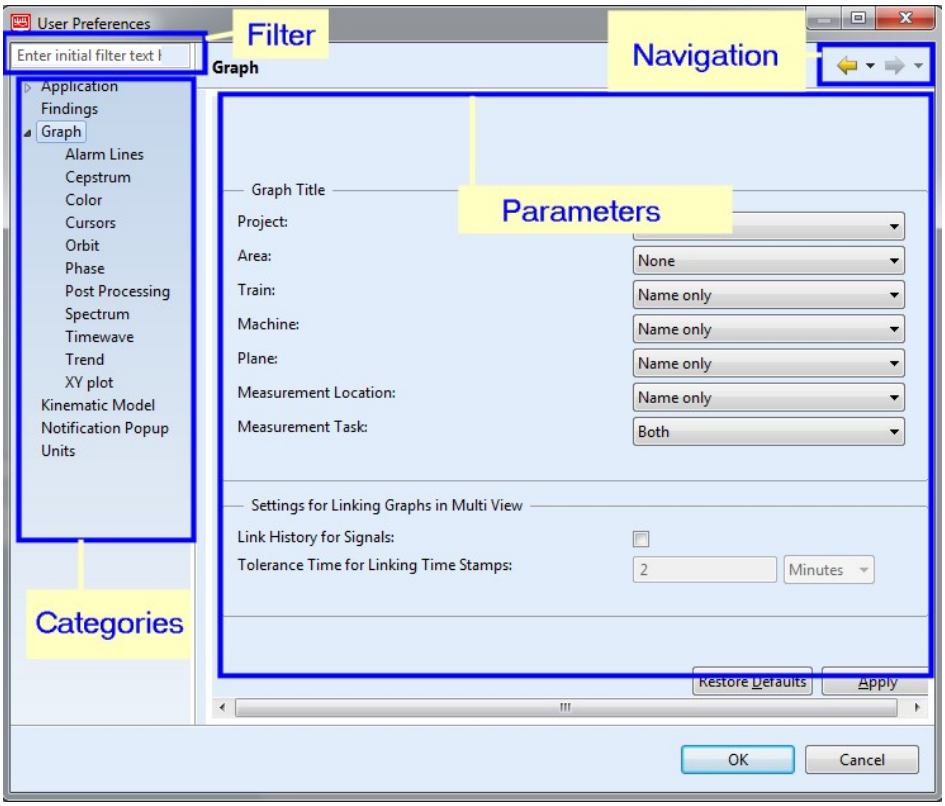
Global settings for the database

The settings for the database are permanently saved and apply to all users logged into the respective database. You can find details regarding the setting options in the "Create database" on page 22 chapter

General user settings

Every user can change the following settings permanently for themselves. The changes apply for the logged in user only. The standard values apply for all other users.

- In the main menu click on **Options / User Preferences**. The following dialog window appears:



The setting options are grouped in **categories** for a better overview.

You can search for categories using the **filter**.

Category **Application**

Confirm Exit When Closing OMNITREND: To prevent exiting the OMNITREND Center by mistake, you can prompt for confirmation of this process.

Synchronize Database Selection in Views: If the client is connected with several databases and you change the database in one view, this change will be automatically synchronized with all other views.

Language in OMNITREND: "Change language" on page 11

Advanced View Mode: Additional views are shown in the user interface.

Single User Memory Settings: OMNITREND Start as single user application. Define the **maximum memory**, OMNITREND may use.

Show Demo Database: When activating the single user application, you can start with a database configured at the factory.

Under **Application / Advanced**, you can find the **Log Level** option: Here you define, which events should be written into the log file by the client.

Category **Findings**

Here you adjust the **minimum size** for images that should be displayed in a finding.

Category **Graph**

Here you can find general setting options for the measurement data view:

Graph Title: Select the information to be shown in the graph title (name, code, both) for every hierarchy.

Settings for Linking Graphs ...: If you show several signals (time waveform, spectrum, ...) in a multi view, you can link the corresponding historical datasets. Define the **tolerance range**, in which the datasets should still be considered simultaneous.

Example:

Link historical signals

You have two measurement tasks (A and B), which both contain several spectra across a comparable time range. You can show the measurement data of both measurement tasks in a multi view. The displayed spectra were measured within the adjusted time range. If you now select a different spectrum in dataset A, the program search in dataset B for a spectrum that is within the adjusted tolerance range and that is time-wise as close as possible to the selected spectrum.

Category **Graph / ....**

Here you can find specific setting options for the measurement data view:

Alarm Lines: Options for showing alarm lines and adjusting axis bounds

Cepstrum / Spectrum: Options for history and scaling

Color: Graph color settings

Cursors: Here you define the number of cursors for every cursor set and define the appearance of the individual cursor families. **Peak Marker** = intersection of cursor and data line. **Peak Snapping**= activate automatic snapping function for cursor.

Orbit: Options for Y-axis scaling, view mode (Cartesian/Polar) and for showing the Keyphasor marks.

Phase: View mode options. Activate the **Unwrap Phase** option to avoid phase jumps in graphs at 0° / 360°.

Post Processing: Here you adjust the options for signal post processing: Number of highest amplitudes in the signal and the number of points for trend curve smoothing and scatter band calculation.

Time waveform: Options for history and scaling. You can show additional **markers** in the graph

Trend: Here you define the time range for a trend and the appearance of the trend curve.

XY Plot: Here you define, how the measurement data points are marked in the graph.

Category **Kinematic model**

Here you define, for which elements in kinematic model the name should be shown. Additional information can be shown for speed converters.

Category **Notification Popup**

Here you define, whether the system should show notification popups.

Category **Units**

Here you define the **Unit System** (Metric - Imperial) and the **unit** used for every measurement quantity, as well as the number of **decimal places**. Click on the respective entry to open the respective selection menu.

Temporary settings for the measurement data view in the analysis editor

You can change the settings for the measurement data view in the analysis editor as follows:

- In the **Editor-Local Toolbar**, click on .
  The **User Preferences** dialog window appears. Here you can change the display settings for **all measurement types**. You can find details in the section above. The changes remain in effect, until you exit the client.

OR

- Using the right mouse button, click on the graph. A dialog menu appears.
  - Select **Graph Settings**.
  - Change the settings as needed.
  - Activate the **Use as Session Settings** option as needed. As a result, the changes apply to all other graphs of the same measurement type as well and remain in effect, until the client is exited.

3 Configuring a database

In this section you will learn how to configure a database in OMNITREND Center.

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3.1 Basics: Basic concept and structure of the OMNITREND Center software

Software components in OMNITREND Center

OMNITREND Center is available as client server or single user application and consists of the following components:

OMNITREND Center Server

The server is the central service program for managing all data. It is permanently available for inquiries from the other software components. Use the **OMNITREND Center Utility** program for server administration.

OMNITREND Center Client

The client is the interface to the user and enables the input of configuration data and measurement data visualization. The client connects to the server for data exchanges. In the single user version, the tasks of the server and client are combined into one software component.

DAP (Device Access Point)

The Device Access Point - DAP[1] - is the interface to the measuring device. When using **mobile measuring devices**, the DAP transfers the measurement configuration (route, machine template) **and** imports the measurement data. When using **stationary online CMSs**, the DAP only transfers the measurement data directly to the CMS. The measurement data is read by **PT Link** and transferred to the server PC via a secure https connection. The measurement data is stored in the file system on the server and transferred to the database by the DAP.

PT Link

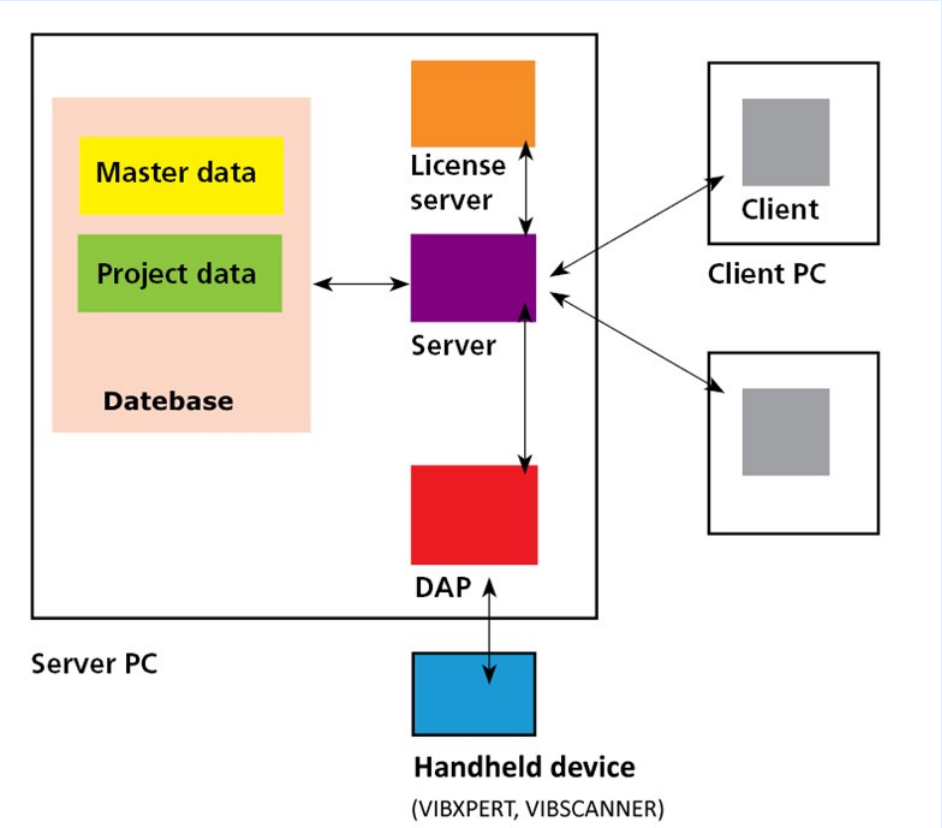
This system is used by one or multiple **VIBGUARDs** for the measurement data import. PT Link establishes a secure connection between the CMS and the server. The measurement data is read at regular intervals (15 minutes) and sent to the server via https protocol. In addition to time-controlled import, it is also possible to trigger the transfer of current measurement data via PT Link.

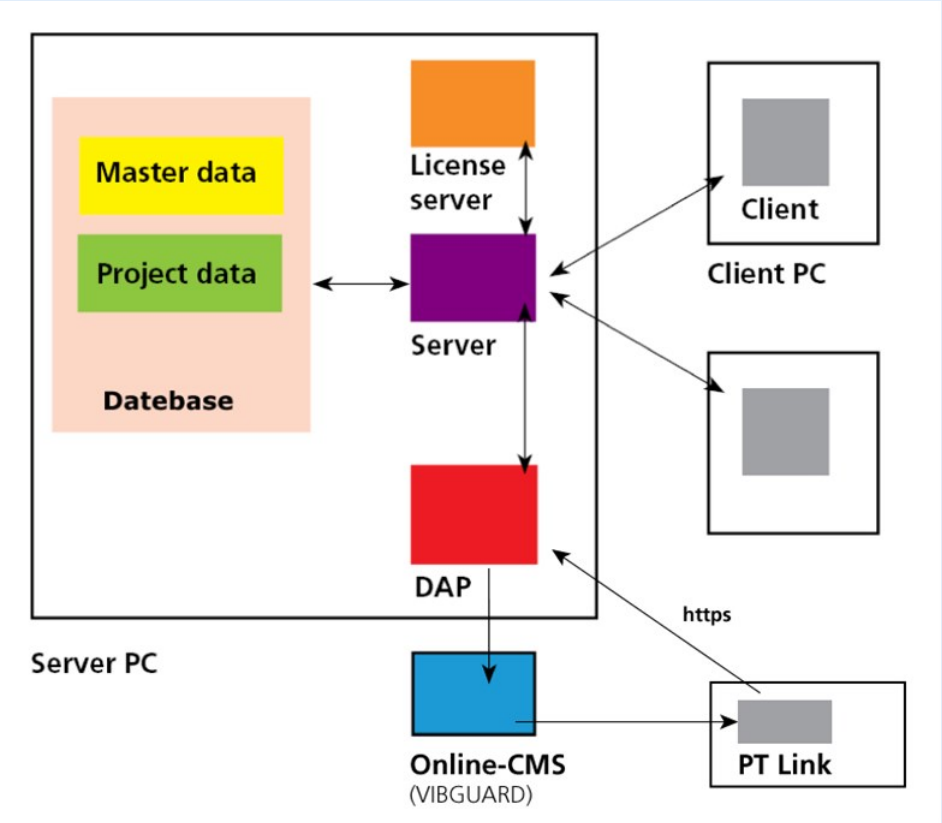
License server

The license server manages the licenses and the logged in users.

[1] Device access point; data transfer interface between measuring devices and server

Example: Scheme of a typical client server installation





How is the data organized in OMNITREND Center?

All data is stored in the **database**. This data can only be accessed via the server. The following data type are differentiated in the database:

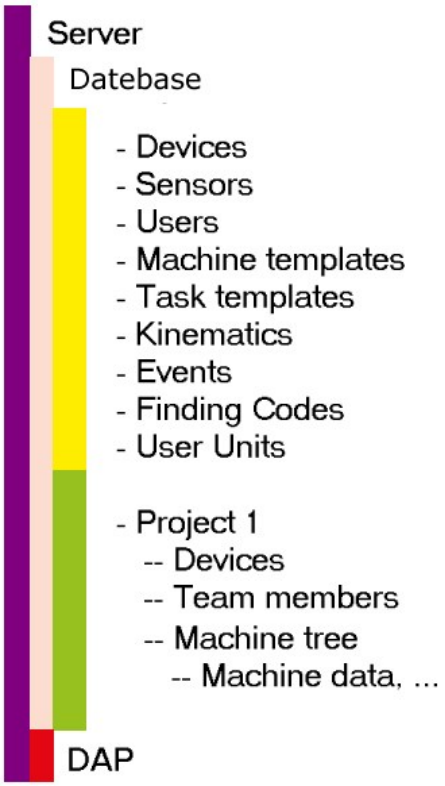
Master data...[1]

Project data...[2]

Based on this division, several projects can share the same master data.

The data structure in the database is illustrated using the **master tree**. Its scope and appearance depends on the **perspective** in the program and the **role** of the logged in user.

The following scheme shows the software components and data types with the color coding from the scheme above.

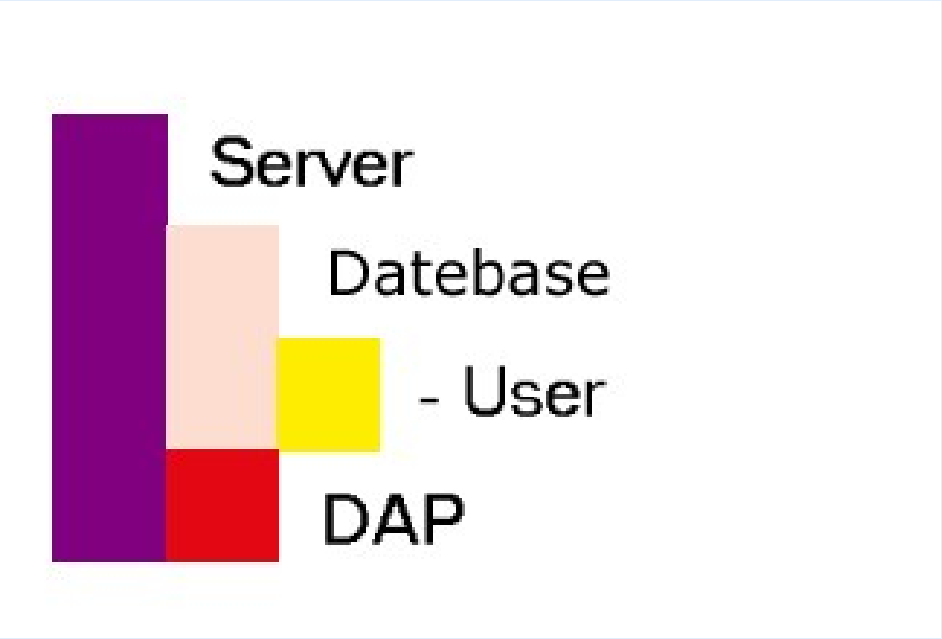


The master tree as central element of the data structure

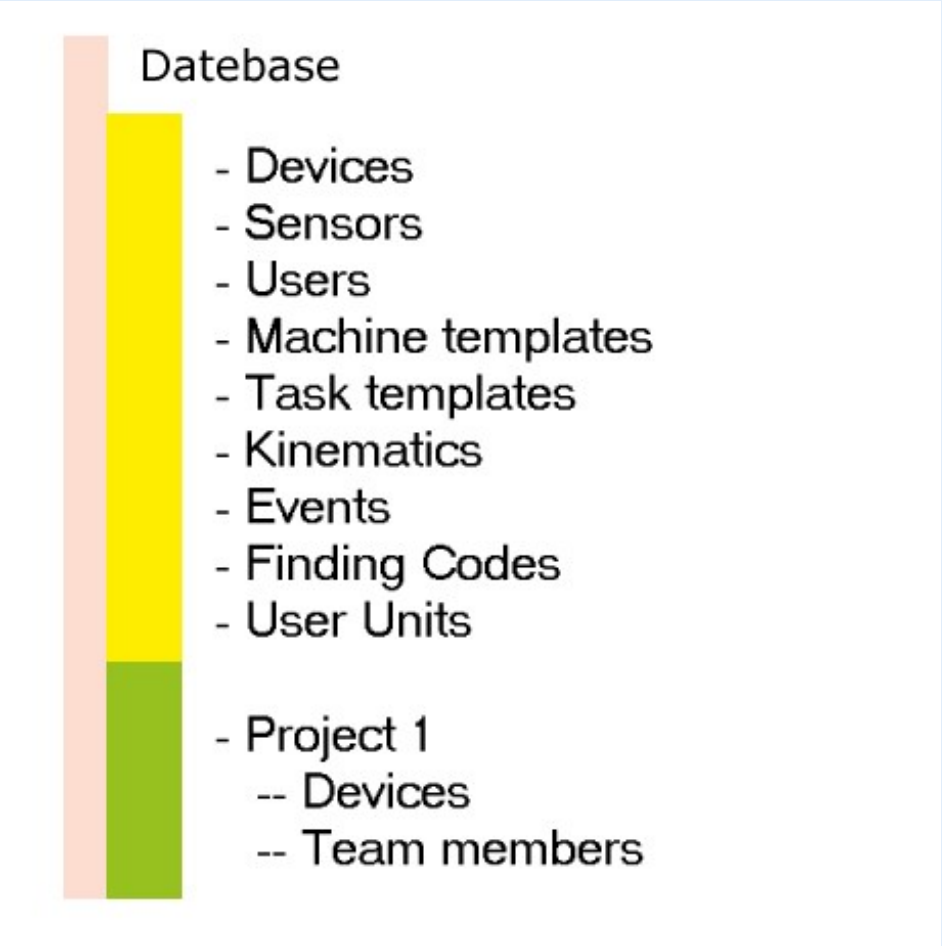
Examples:

[1]: Cross-project data, such as available online devices, users, sensors, task templates, …

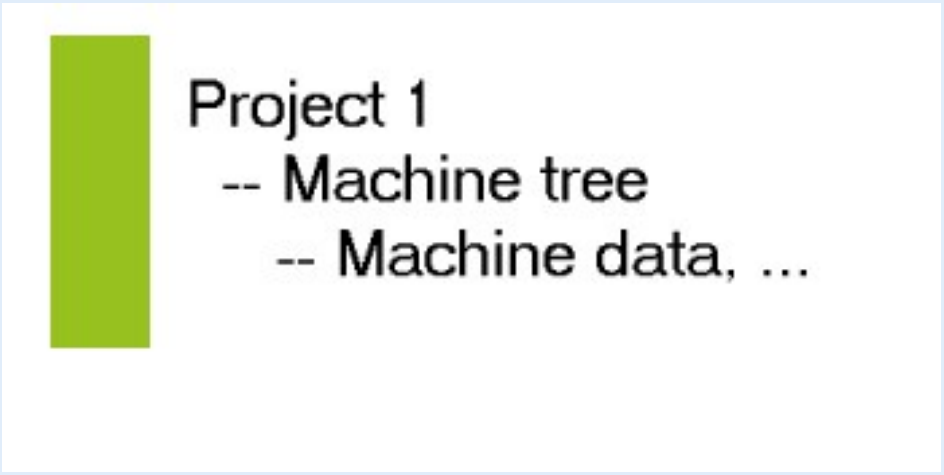
[2]Project-specific data, such as the online device used in a project, members of the project team, machine tree with all relevant machine parameters, measurement data, and attachments.



View of the master tree for the **system administrator** (Administration perspective)



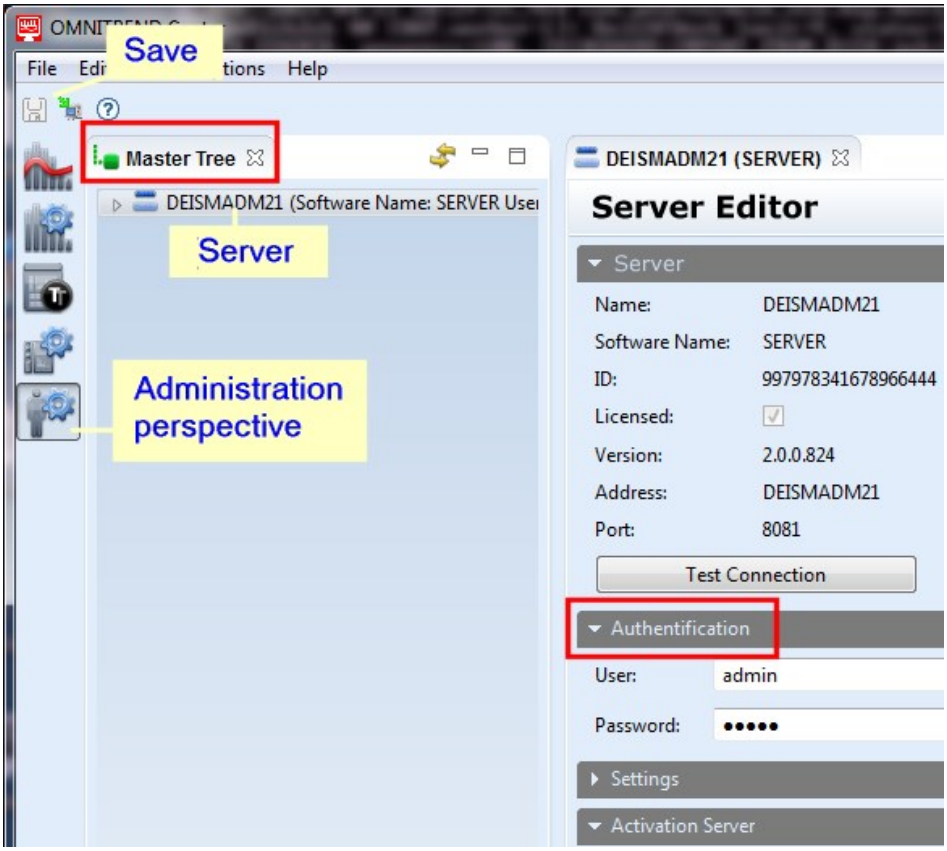
View of the master tree for the **administrator** (Administration perspective)



View of the master tree for the **specialist** (Configuration perspective)

3.2 Login as user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

[1] Grouping of related functions and fields in the Editor window

3.3 Create database

You can **recreate** a database from scratch or **duplicate** a database on the basis of an existing database and carry out the requisite adjustments at a later stage.

You can also connect a database with Live-Asset. OMNITREND Center will send asset information and tasks (including overall values) to the Accelix Data Platform and further to Live-Asset. Trend data, signal data and logs from online devices will be send via PT Link to Live-Asset.

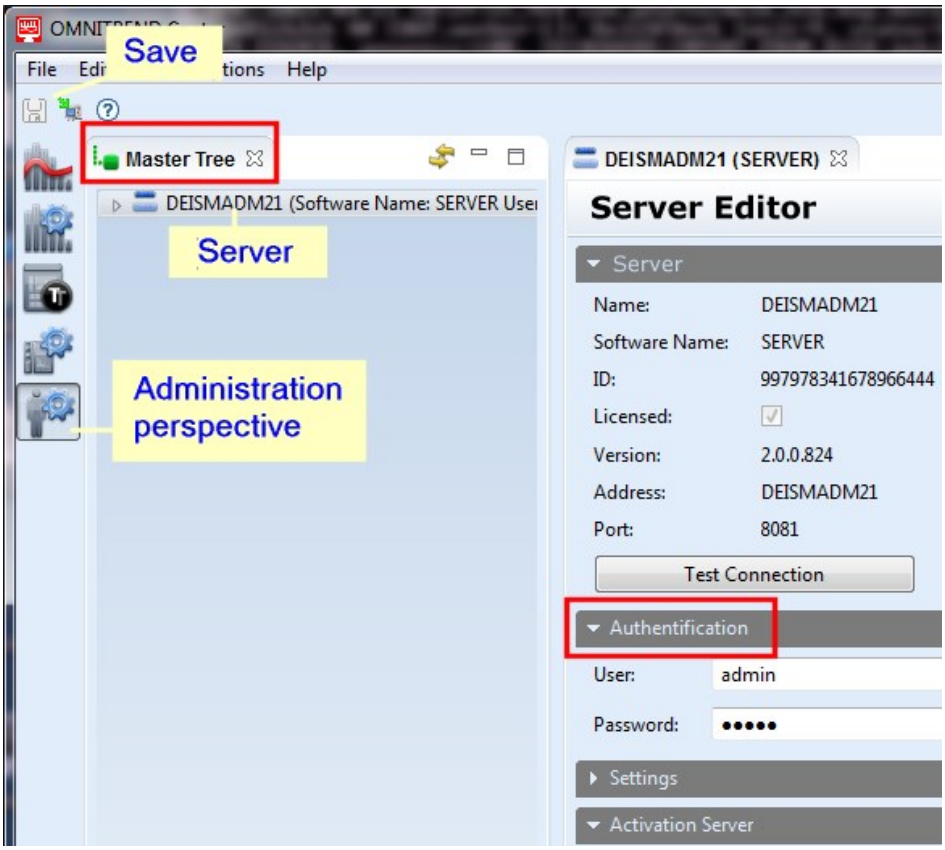
Prerequisite

MS SQL Server database: An empty database needs to be created on the SQL server. You can obtain the requisite connection data from the server administrator: SQL database name, database user, database password, server address.

You must be logged in as **system administrator** to create a database.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



[1]Grouping of related functions and fields in the Editor window

User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To create a database

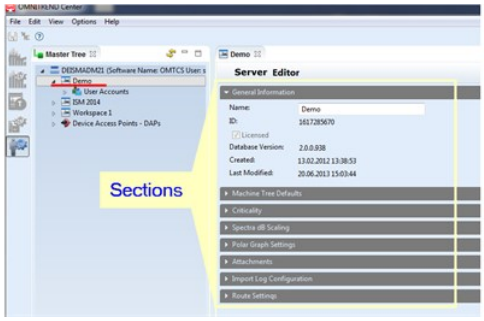
- Switch into the **Administration perspective**.
- Using the **right mouse button**, click on the **server** in the master tree.
- Click on **New Database** in the next dialog menu.
- Select the database type: **HSQLDB** or **MS SQL Server**.
- Depending on the database type, carry out one of the following procedures:
  - **HSQLDB**: Enter a **database name**.
  - **MS SQL Server**: Enter an arbitrary **database name**. Enter the data that you have received from the administrator of the SQL server in the remaining fields: **SQL database name, SQL database user, SQL database password, SQL server (address)**
- Click on **Finish**. With the new database, the **User** node is also created one level lower.

To duplicate a database

- Using the **right mouse button**, click on the respective **database** in the main tree.
- Click on **duplicate database** in the next dialog menu.
- Carry out steps 4 to 6 as described above (starting from "Select the database type...").

The settings for the database are grouped in sections, which can be shown and hidden selectively. They apply globally for all users. Opposite to that, the settings in the **Options/User Preferences** can be individually adjusted for every user.

When the settings are changed, no other client may be connected to the database.



As system administrator or administrator, you can change the following settings.

Section **General Information**

Here you can information, when the database was created and changed. If you would like to change the name later on, enter the name into the "Name" field and save the changes.

Details for SQL server section

Here you can find information about the SQL server as well as a function for measuring the SQL performance indicator.

Section **Machine Tree Defaults**

Here you define the speed that should be used by default for all machines in the machine tree, unless a different speed is specified.

Section **Criticality**:

Here you can adjust the criticality levels with a label selected by you. Click on the "User Defined Label" and enter the new label for the respective criticality level (level 1 = very critical, level 10 = less critical).

Section **Spectra dB Scaling**

Here you enter the reference values, if the amplitude axis should be scaled in a spectrum in decibel (dB).

Section **Polar Graph Settings**

Here you define the 0° degree position and the increasing angle direction in a polar graph.

Section **Attachments**

Here you define the size and number of files that can be enclosed with a finding or task as attachment. For image files, you can set minimum image dimensions.

Section **Import Log**

Here you define, how many log entries should be saved during data import of a route. These entries are used for creating route reports. If the maximum number is exceeded, the FIFO principle will be applied, e.g. the oldest entries will be deleted.

Section **Route Properties**

Here you define for all routes, how much historical measurement data from which time period should be transferred by default together with the corresponding measurement task to the data collector. You can adjust these settings for every route later on in the route editor.

Section **Live-Asset Connection**

To edit the connection with Live-Asset for the first time click **Connect**.

Type in the User name and Password and click **Connect**.

After the initial connection the Edit button can be used re-established the connection.

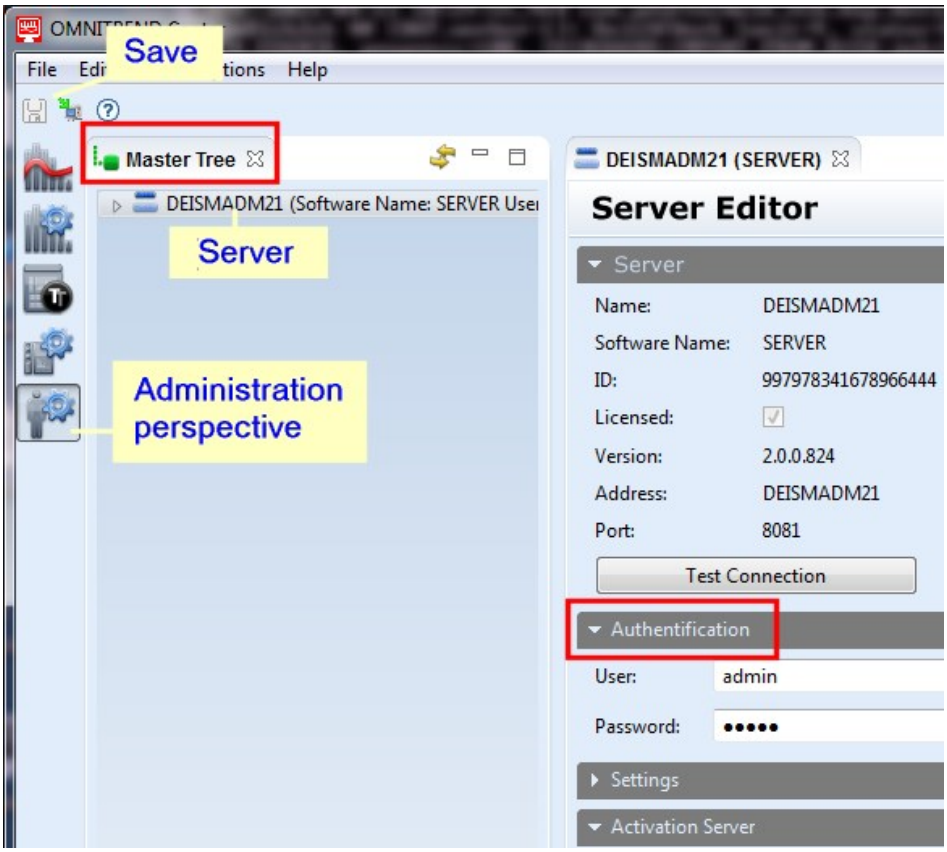
4.1 Create users

Prerequisite

You must be logged in as **system administrator** or **administrator** to create a user.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



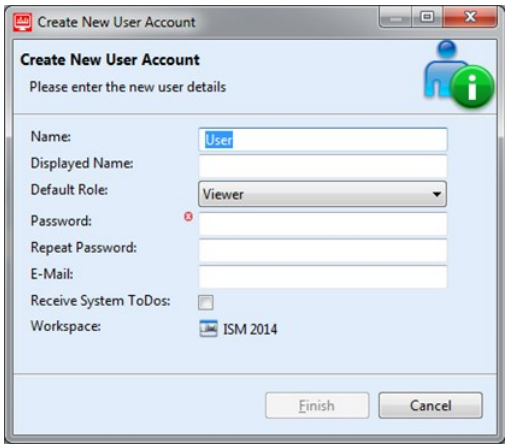
> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To create a new user

- Switch into the **Administration perspective**.
- Open the respective **database** in the master tree.
- Using the right mouse button, click on the **user** node.

[1] Grouping of related functions and fields in the Editor window

- Click on **New** in the next dialog menu. The **Create new user account** dialog window appears.



Enter the user data as follows:

- **Name**: Enter the user name

> Permissible characters are: a-z A-Z 0-9 _ - + . = @ \ / # $ % ~ Impermissible characters: Spaces and all characters not listed.

- **Displayed Name**: Enter the name here that should appear as user name in reports.
- **Default Role**: Define the user role the user should assumed outside of a project. If the user is assigned to a project, the project-specific user role can deviate.
- **Password / Repeat Password**: Enter the password required for logging in to the server.
- **E-Mail**: Enter the e-mail address, under which the user should receive notifications from OMNITREND Center.
- **Receive System ToDos**: Activate this option, if the user should receive system tasks. >

- Click **Finish** to finish. The new user appears in the master tree under the user node.

Video

Basics: User concept

OMNITREND provides in the Client Server version a flexible user administration with the following characteristics:

- The users are managed as **master data** so that every user can be assigned to several projects. This way, the maintenance effort is reduced to a minimum.
- The access rights in the program are controlled via **user roles** that are assigned at the project level. This way, a user can assume different roles in different projects.

Four defined user roles are available in a database:

- **Administrator**
- **Specialist**
- **Operator**
- **Viewer**

The **system administrator** is an additional role for technical administration of the OMNITREND Center software. Within the scope of initial start-up, he sets up the server, the DAP[1], and the database with the users. The system administrator requires no license for his tasks. He has no authorizations within the database.

Example:

	User A	User B	User C
Project 1	Administrator	Specialist	Viewer
Project 2	Operator	Administrator	Viewer

Typical role distribution in a database with several projects and users

[Table: User roles and their rights]

Administrator	Specialist	Operator	Viewer	System Administrator
has the rights of specialist + ...	has the rights of operator + ...	has the rights of viewer + ...		Import server license
Edit users, teams, roles	Edit tree nodes	Copy measurement configurations	Use predefined views	Create users
General administration	Edit templates	Analyze measurement data	Edit server	Create database
Edit projects	Compile measurement configurations	Edit report templates	Open/close projects	Connect database

[1]Device access point; data transfer interface between measuring devices and server

Administrator	Specialist	Operator	Viewer	System Administrator
Manage licenses	Edit setups	Import measurement data (online device)	Create reports	Delete database
Migrate databases	Edit frequency marks	Create findings	Import multi-server license	Migrate databases
Delete Events / ToDos	Edit devices	Create tasks	Disconnect/connect server	Delete Events / ToDos
	Edit sensors		Export measurement data (CSV)	
	Edit events			
	Export/import database			
	Activate/deactivate projects			
	Define reference values/reference signal			

Manage users

Prerequisite

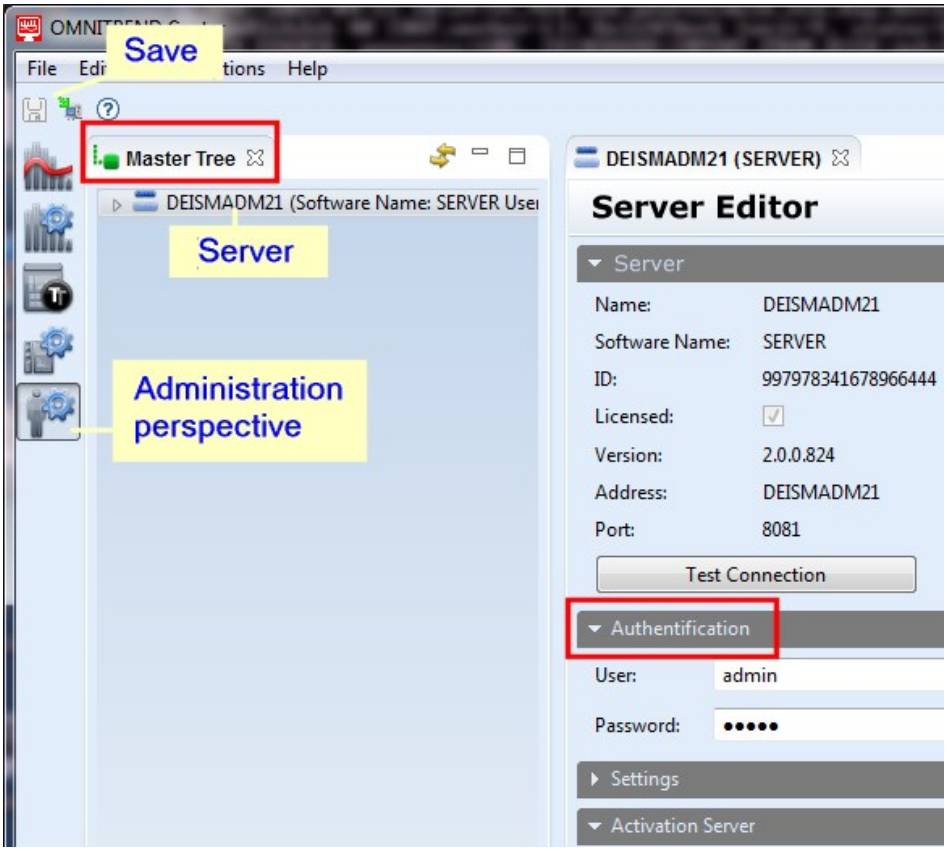
You must be logged in as **administrator** to manage a user.

User not logged in as administrator can only change the following entries in their own user data:

- Displayed name
- E-mail address
- Password

To log in as a user:

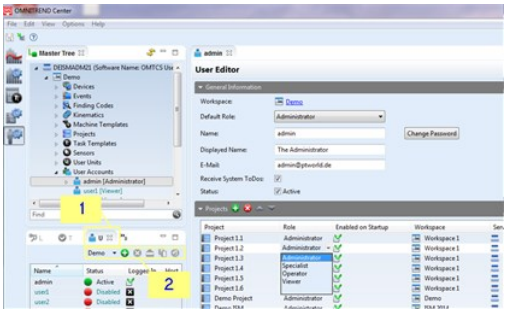
- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

[1]Grouping of related functions and fields in the Editor window

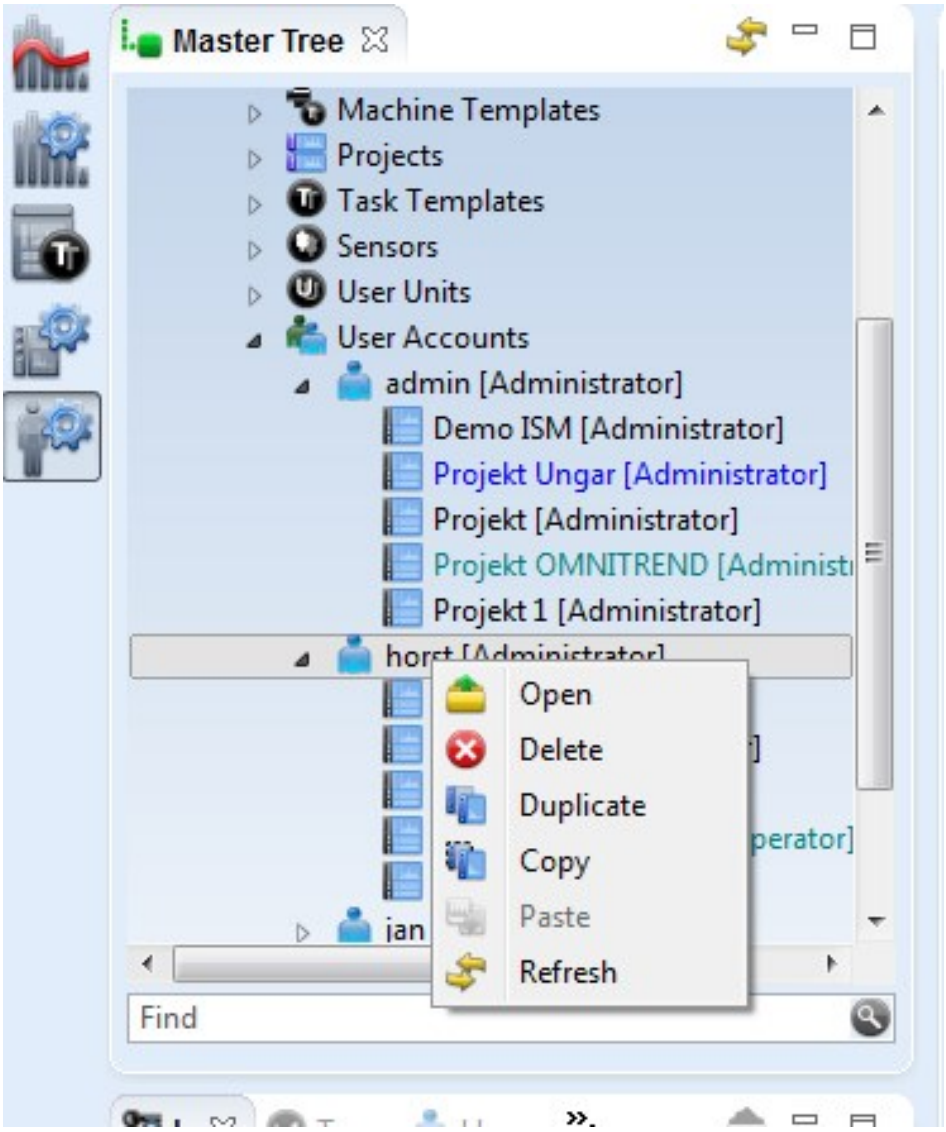
The "User" view (1) displays an overview of all users created in a database. You can find this and further views in the Administration perspective.



Alternative: Managing users via the master tree

Some of the information and functions described in the following paragraph can also be found in the master tree:

- Open the respective **database**.
- Using the right mouse button, click on the **user** you would like to edit and select the desired function in the dialog menu. The tree node under the user indicates the projects, to which the user is assigned, and his respective user role in the projects.



The following edit functions can be found in the toolbar (2):

***Database* selection menu**

The selection menu is only visible, if more than one database was created.

Create new user

- **Name**: Enter the user name

> Permissible characters are: a-z A-Z 0-9 _ - + . = @ \ / # $ % ~ Impermissible characters: Spaces and all characters not listed.

- **Displayed Name**: Enter the name here that should appear as user name in reports.
- **Default Role**: Define the user role the user should assumed outside of a project. If the user is assigned to a project, the project-specific user role can deviate.
- **Password / Repeat Password**: Enter the password required for logging in to the server.

- **E-Mail**: Enter the e-mail address, under which the user should receive notifications from OMNITREND Center.
- **Receive System ToDos**: Activate this option, if the user should receive system tasks. >

Delete user

Select the user(s) to be deleted and confirm with OK.

Edit user data in the user editor

In the user editor, you can change the user data and deactivate and/or reactivate the user status in the **General information** section. Active users only can be assigned to a project.

You can assign projects to the user and define his user role in the respective project in the **Projects** section. For this purpose, click on the entry in the **Role** column to open the selection menu.

> The users are usually assigned to a project during project creation in the project editor. If the project is already configured and a user is newly created, project assignment is easier via the user editor.

Copy user

The copy function simplifies the creation of several users of the same kind.

> Using the drag & drop functions, selected users can be copied across databases and/or across projects within a database.

Logout user

Using this function, you can log out a different logged in user from the program, e.g. if the server must be switched off due to maintenance.

4.2 Create DAP

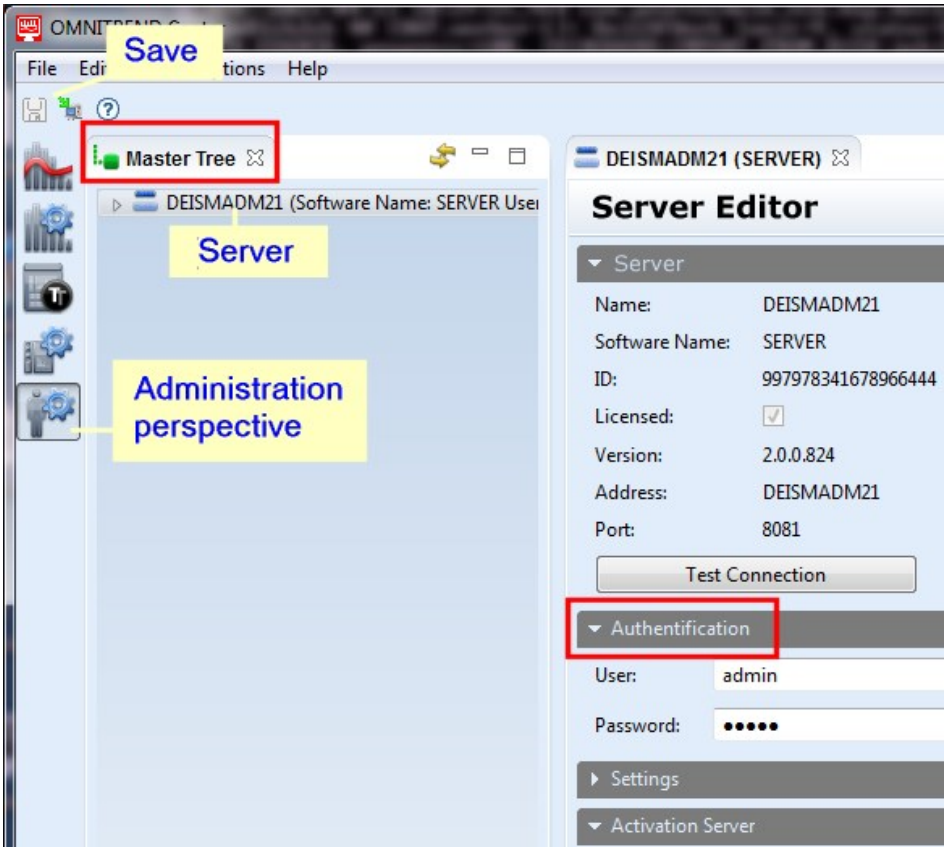
The data is transferred from/to the measuring device via a service program, referred to as the **D**evice **A**cces **P**oint - **DAP**. You can set up one DAP per server.

Prerequisite

You must be logged in as **system administrator** to create a DAP or edit the settings.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To create a new DAP[2]

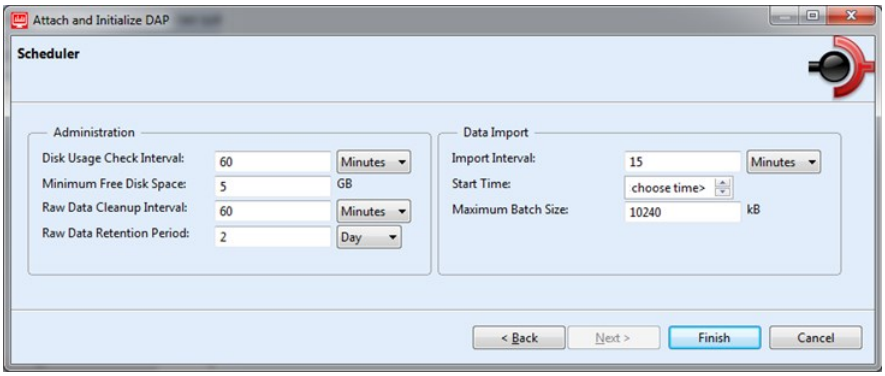
[1] Grouping of related functions and fields in the Editor window

[2] Device access point; data transfer interface between measuring devices and server

- Switch into the Administration perspective.
- Using the right mouse button, click on the **Device Access Points - DAPs** node in the master tree.
- Click on **New** in the next dialog menu. The **Attach and Initialize DAP** dialog window appears.
- Enter the following data:
  - **Name**: DAP designation in the master tree
  - **PC Name or IP Address**: Server on which the DAP is installed.
  - **Port**: Port number through which the DAP can be reached.
- Check the connection to the DAP using **Test Connection**.
- After test completion, click on **Next** to open the next dialog page.
- In the **PC name or IP address** field, enter the server on which the OMNITREND Center server is installed to which the DAP should connect.

If the DAP is installed on the same computer as the server, both addresses will be equal.

- Click on **Next** to open the last dialog page.



- Enter the administration and data import parameters:
  - **Administration / Disk Usage Check Interval**: The DAP checks the disk space available for row data storage at the specified interval.
  - **Administration / Minimum Free Disk Space**: Minimum available disk space for raw data.

    The DAP interrupts the data transfer if the available memory space drops below the specified limit. As a result, the operating system remains stable.

  - **Administration / Raw Data Cleanup Interval**: The unpacked raw data is regularly deleted from the DAP.
  - **Administration / Raw Data Retention Period**: The imported archives with compressed raw data are cashed in the DAP for the specified retention period.
  - **Data Import / Import Interval**: Interval for importing the unpacked raw data (= measurement data) into the database.
  - **Data Import / Start Time**: If you spread the import interval across several hours, you can set a time here, when the DAP should start the import.
  - **Data Import / Maximum Batch Size**: The measurement data is combined into a batch prior to being transferred to the database to optimize data traffic. Using this parameter, you define the maximum batch size.

Change the standard value only, if the data transfer between DAP and server is impacted. This is usually only the case if the database and DAP are installed on different servers.

- Click on **Finish**.
  The new DAP appears in the master tree. You can change the parameters for management and data import later on in the DAP editor.

Checking settings in the DAP Editor

Double-click on the DAP in the main tree to check the settings.

The following **sections** are available in the DAP Editor:

- **DAP location**: Installation location of the DAP (see section above).
- **Server configuration in the DAP:** Server on which the database is located (see section above).
- **Scheduling**: Administration and timing for the data import (see section above).
- **DAP - PT Link login**: Login data for communication between PT Link and DAP. The user name is fixed; only the password can be changed.

Note: If you change the password, you must also change it accordingly in PT Link. Otherwise it is not possible to establish the communication between the two software components. Details of this can be found in the online help for PT Link.

- **Tasks for the data import from the measuring device**: Here you can see the online CMS to which the DAP is assigned as well as the current attributes for the data transfer:
  - **Export** = Setting for the export of the measurement and system configuration to the online CMS: Direct or FTP
  - **Import** = Setting for the import of the measurement data from the online CMS: Direct (via PT Link) or E-Mail Center
  - **Interval** = Time interval for the import of the measurement data into the database

This section is for information only.

4.3 Create hand-held device

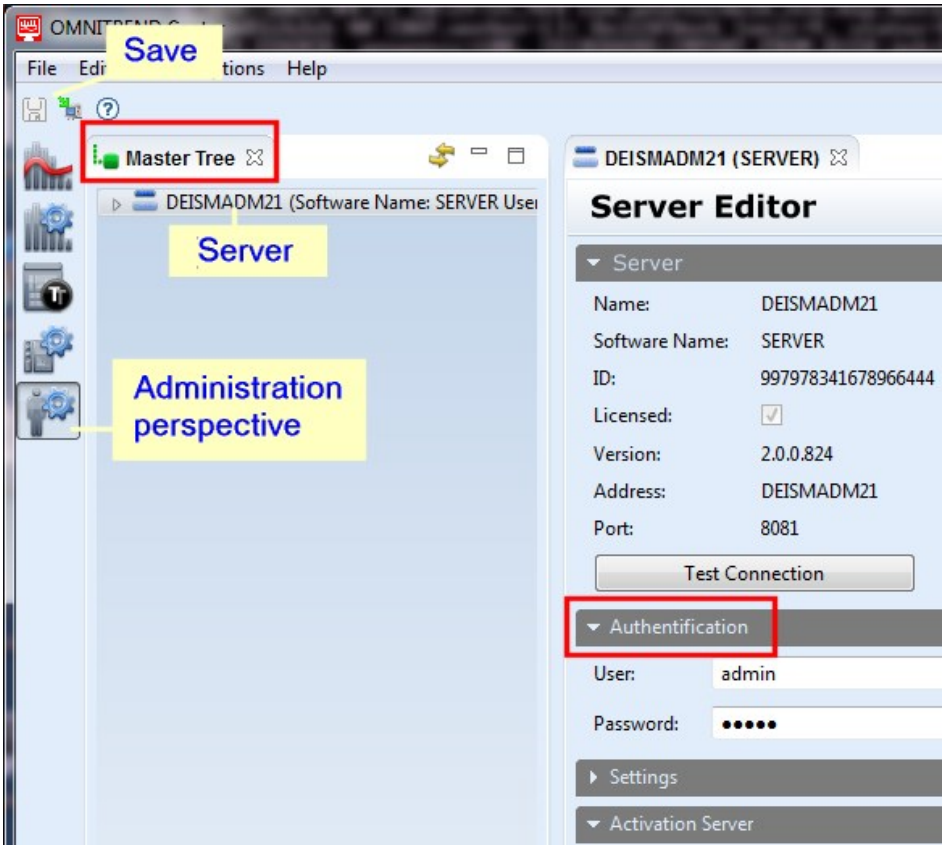
Hand-held devices communicating with OMNITREND Center via an **USB interface** are automatically detected.

Prerequisite

In order to connect and register hand-held devices via **USB**, your role in a project must at least be **user**. The connection via **network** requires at least the **specialist** user role.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To connect a hand-held device via USB interface

[1] Grouping of related functions and fields in the Editor window

- Switch into the **Communication perspective**.
- Open the **Device** view.
- Connect the hand-held device to the client PC via USB cable.
- Click in the toolbar of the view window on **Refresh**. Next, the hand-held device appears in the device list.

Figure 4-1 *Device status*

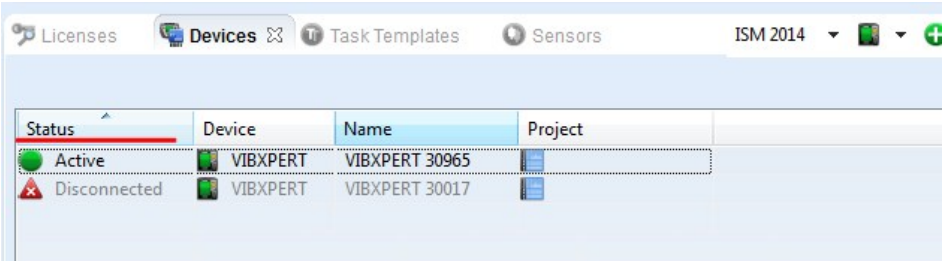


Table 4-1 *Legend*

	"Status" column
Active	Device is connected.
Disconnected	Device is not connected anymore.

The procedure described above can also be executed in the **Administration perspective**. The devices and their status are additionally displayed in the master tree (**Database/Devices/Device Type/Name**)

4.4 Create an online device

Online devices are connected to the server PC via a **network** via TCP-IP. Every online device is manually created in OMNITREND Center in a guided dialog.

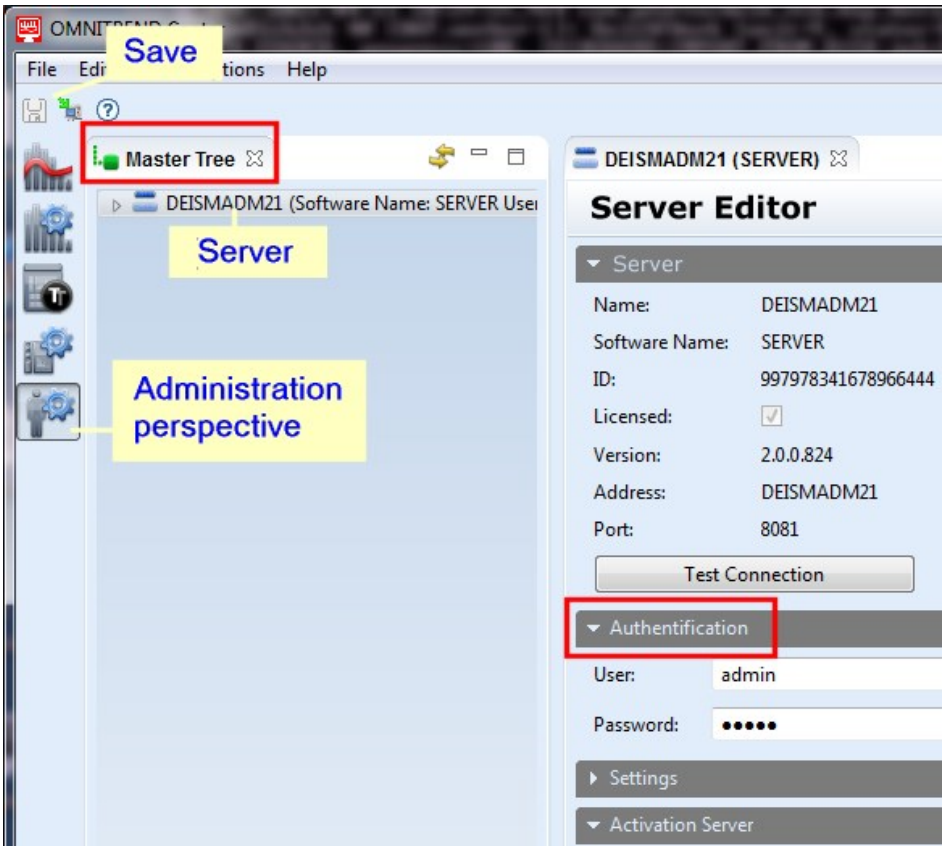
Prerequisites

OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

If you would like to **create** an online device, you must at least be logged into the database with the **specialist** user role.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

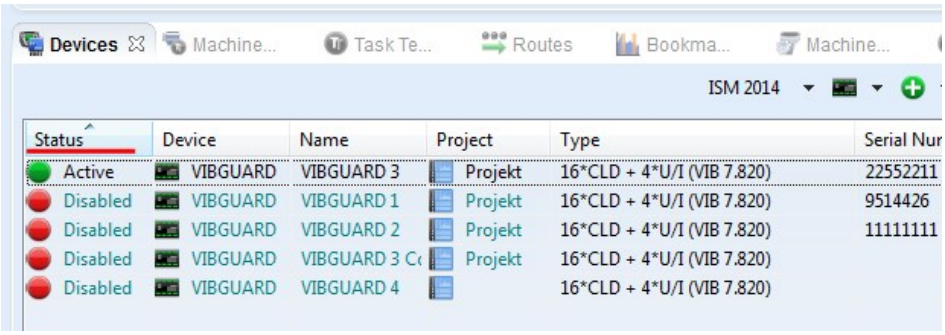
To create an online device

[1] Grouping of related functions and fields in the Editor window

- Switch into the **Configuration perspective**
- Open the **Device** view.
- Select the **database** as needed in the toolbar of the view window.

> The respective pulldown menu only appears, if more than one database was created.

- Click in the toolbar of the view window on **Add New Entry**. A selection menus with the available device types appears.
- Click on the desired **device type** (e.g. VIBGUARD). The **Add New Device** dialog window appears.
- Enter a **name** for the online device and select the **device variant** as needed.
- Click on **Next**.
- For VIBRONET Signalmaster only: [1]
- Enter the **IP address**, under which the online device can be accessed in the network.
- Click on **Next**.
- Select the **DAP**.
- Click on **Finish**. Next, the online device appears in the device list and the device editor opens. Here you can configure, register, and activate the online device.
- To **register** the online device you must read in or manually enter the **serial number** into the device editor:
  - Open the **System Configuration** section in the device editor.
  - Click in the **General** tab onto **Read Serial Number** if the online device can be accessed via the network. Otherwise, click on **Enter Serial Number** and enter the serial number manually.
  - Click on **Finish**.



Legend:

	"Status" column
Active	Online device is activated
Disabled	Online device is deactivated

[1] Adjust the number of multiplexers per string line in the next window and click on **Next**.

Activation of an online CMS is only possible if the system is already registered and assigned to a project. The import of the measurement data from the file system of the server starts with activation according to the time interval set in the DAP. Further details of this can be found under “Related topics” below in section “Activating/deactivating an online CMS”.

The procedure described above can also be executed in the **Administration perspective**. The registered devices and their status are additionally displayed in the master tree (**Database/Devices/Device Type/Name**)

4.5 Configure a device (system configuration)

OMNITREND Center differentiates between two configuration types:

- **Measurement configuration**, contains all relevant settings for executing the measurement tasks (routes for hand-held devices, measurement configuration for online device)
- **System configuration**, comprises all device-specific settings not relevant to the measurement.

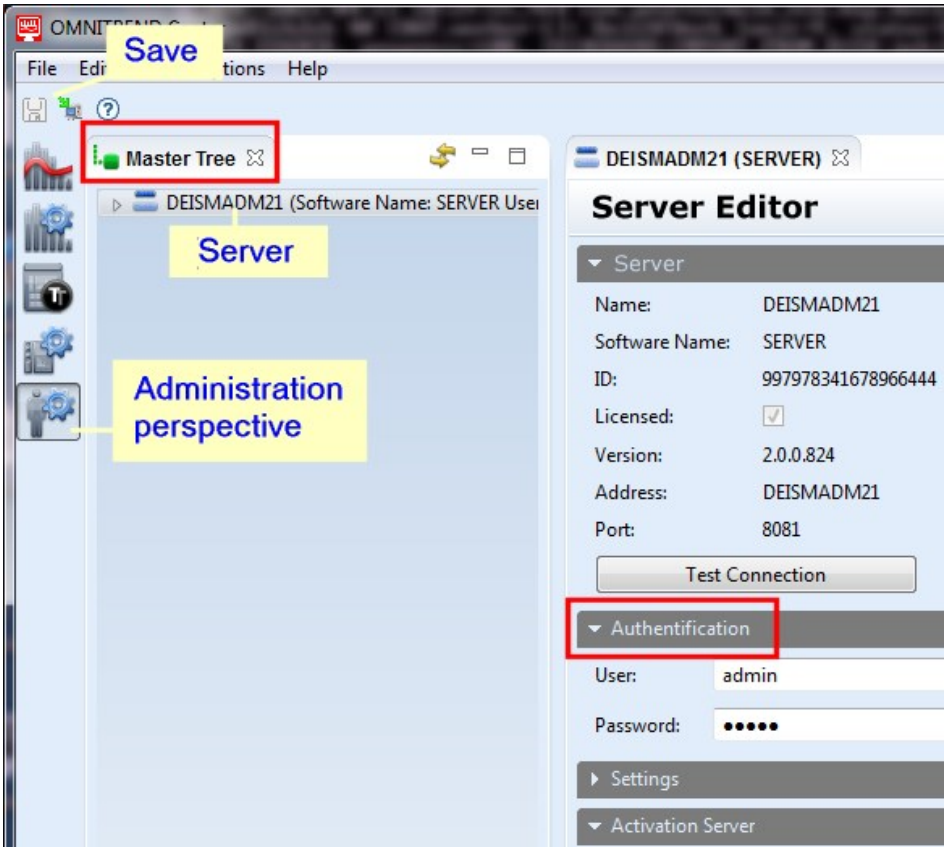
This section discusses the **system configuration** for devices connected via the network. No system configuration is required for hand-held devices connected via USB.

Prerequisite

You must at least have the **specialist** user role for editing the system configuration.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



[1]Grouping of related functions and fields in the Editor window

User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To check and edit the data for a hand-held device

You can edit and display the following data for the measuring device:

- Edit: Device name
- Displays: Serial number, databases, calibration, HW components

- **Open the device editor**
- Switch into the **Communication perspective.**
- Open the **Device** view.
- If needed, select the **database**, in which the device was created and assigned to a project, in the toolbar of the view window.

The respective pulldown menu only appears, if more than one database was created.

- Mark the **device**.
- Click on the toolbar on **Open** to open the device editor.
- Open the **Device Info** section.
  This section contains the following tabs:
  - **General**: Here you can find information about the device (name, serial number) and a list of databases, in which it is created. If the connection status shows "Disconnected", you can establish the connection to the hand-held device using <Connect>.
  - **Details**: Here you can find information regarding device maintenance (calibration, offset compensation) and the device components.
- If you applied changes, click in the main toolbar on **Save** or press CTRL+S. >

To configure an online device

- **Open the device editor**
- Switch into the **Communication perspective.**
- Open the **Device** view.
- If needed, select the **database**, in which the device was created and assigned to a project, in the toolbar of the view window.

The respective pulldown menu only appears, if more than one database was created.

- Mark the **device**.
- Click on the toolbar on **Open** to open the device editor.
- Open the **System Configuration** section.
  By default, this section contains two tabs:

General:

Here you can find information to the online device (name, IP address, serial number, etc.) and the project, to which it is assigned.

- **Status**: Here you can activate and deactivate the online device. Measurement data import starts with the **activation**.
- **Read / Enter Serial Number**: Here you register the online device with its **serial number**

DAP

Here you can change the assigned DAP retroactively.

- Click on **Expand device configuration** to display the extended setting options:

Network

Here you change the communication parameters for the online device. Depending on device type and variant, the following settings are available:

- **TCP/IP**: Address data of the online device in the network.
  Click on **Save** or press CTRL+S to save the changes in the database only.

  Make sure that the IP address in the database and on the online device are the same.

  Click on **Change IP Address** to transfer the changes to the online device. Only after a successful transfer to the online device the changed IP address is saved in the database.
- **DNS Settings**: Here you enter the addresses of the DNS servers.
- **Modbus TCP**: Here you enter the port for communication via Modbus TCP. Define a time limit, starting from which the connection without data traffic is interrupted due to a **timeout**.
- **Login for Device**: Here you enter the login data, using which the DAP should log into the online device during measurement data import. With **Set Default** you apply the data set in the factory.

Modbus RTU:

Here you configure the communication via Modbus RTU. Activate the option to set the following parameters:

- **Modbus RTU – Mode**: Here you select, whether the online device should operate as **master** or **slave**. In slave mode, select the **slave no.** for the online device.
- **Serial Settings**: Here you set the communication parameters for the serial port (**baud rate, parity**).

Communication:

Here you define, how it should be communicated to the online device.

Configuration Export: The system and measurement configuration can be transferred to the online device as follows:

- **Direct**: Communication via DAP
- **Indirect / Path**: The two configuration files (*.xml) are saved in the specified folder. You can then manually import them into the online device using a web browser.
- **Indirect / FTP**: The two configuration files (*.xml) are automatically stored on the specified FTP server. Here you enter the login data, using which OMNITREND CENTER should log into the FTP server.

> The online device regularly connects to the FTP server and retrieves the current files from the server. The time interval and the login data of the online device for the FTP server is set in the Update Service tab.

Import Data: The measurement data can be imported **directly** via the DAP or as e-mail attachment via the **E-Mail Center** module.

> The OMNITREND Center module "E-Mail Center" must be installed and available for importing via e-mail. E-Mailing is configured in the "E-Mail Account" tab.

Forwarding: Activate the **Forwarding** option, if inquiries to the online device are forwarded via a network component (router, proxy, etc.). Provide the IP address of the network component and the port for the online device.

Multiplexer Layout (VIBRONET Signalmaster)

Here you can retroactively change the number of multiplexers in every string or automatically import newly installed multiplexers (**Scan for Multiplexers**)

Time Sync:

The online device can regularly synchronize date and time with a **time server** in the Internet. Enter the server address, the **interval**, and the time of the synchronization.

E-Mail Account:

Here you set up an e-mail account for the online device on a SMTP server, if the measurement data should be sent as e-mail attachment (see the Communication tab).

- **SMTP Settings**: Enter the **address** and **port** of the SMTP server.
  Enter the designation, under which the online device should appear in the e-mail under **Sender Name / Address**.
  Define the maximum size for a measurement data attachment and activate encrypted e-mail transmission (**SSL, Start TLS**) as needed.

  > Note: The subject line of the e-mail is compiled from the database ID and the project ID.

- **SMTP Authentification**: Set the **type** and enter the required login data (**user, password**) for the online device.

E-Mail List:

Enter the recipients for system and status e-mails:

- Click on **Add Recipient** and enter the required data.
- Using **Show all users** or **Show project members**, you can add already created users to the distribution list.
- Activate the requested e-mail type (**status, system**).

> **System E-mails** contain system messages, task, and measurement data. They are intended for the E-Mail Center program module, using which data is transferred in OMNITREND Center. Provide the e-mail account set up in E-Mail Center as inbox for the **system** e-mail type.
>
> **Status E-mails** contain status messages and are intended for users.>

Update Service:

Here you activate data transfer via FTP server in the online device. The online device regularly (**Update Service Settings**) logs into the specified FTP server using the login data (**user, password**) and receives the configuration files stored there (see **Communication** tab).

> Before you can execute this option for the first time, you must transfer the system configuration directly to the online device.

System Properties:

Here you can set the following device-specific properties:

- **Characteristic Value Storage Size**: Here you define the maximum number of characteristic values to be saved.

  > Minimum = 500,000 / Maximum = 8,388,608.

- **Alarm Hold**: The alarm status is held and is only reset after acknowledgment. If the option is deactivated, the alarm status is reset automatically, as soon as the alarm condition is not pending anymore.
- **Signal File Compression**: Saves the measurement data in compressed form to save disk space on the online device.

Operating Mode (VIBGUARD only):

Here you can switch from **standard** to **special** operating mode.

The following particularities apply in **special** operating mode:

- Maximum number of channel sets: 10
- No measurements with Keyphasor (order analysis, phase, orbit, etc.)
- No operating states
- Release for channel sets also possible via digital inputs

- Click on **Save** to save the changes.

To validate the system configuration

You can validate a system configuration, even if the online device is not connected or cannot be reached.

- Click in the **System Configuration** section on **Validate System Configuration**. The valid configuration files are automatically exported into the file system.
- Select the folder, in which the configuration files should be saved.
- Click on **OK**. >

To transfer the system configuration to the online device

You can transfer system and measurement configurations independently from one another to the online device.

- Click in the **System Configuration** section on **Send system configuration to device**.
  Depending on the set communication type (see **Communication** tab), the configuration files are directly transferred to the online device via the DAP or exported into the file system and/or loaded onto a FTP server.

The system configuration is automatically validated. The online device must not be activated to receive a system configuration.

- In the case of an export into the file system, you must manually transfer the configuration files to the online device (e.g. via web frontend on the online device).

Note: For security reasons, configuration files have to be deleted from any data medium after they have been transferred to the online device. For more information contact service or technical support.

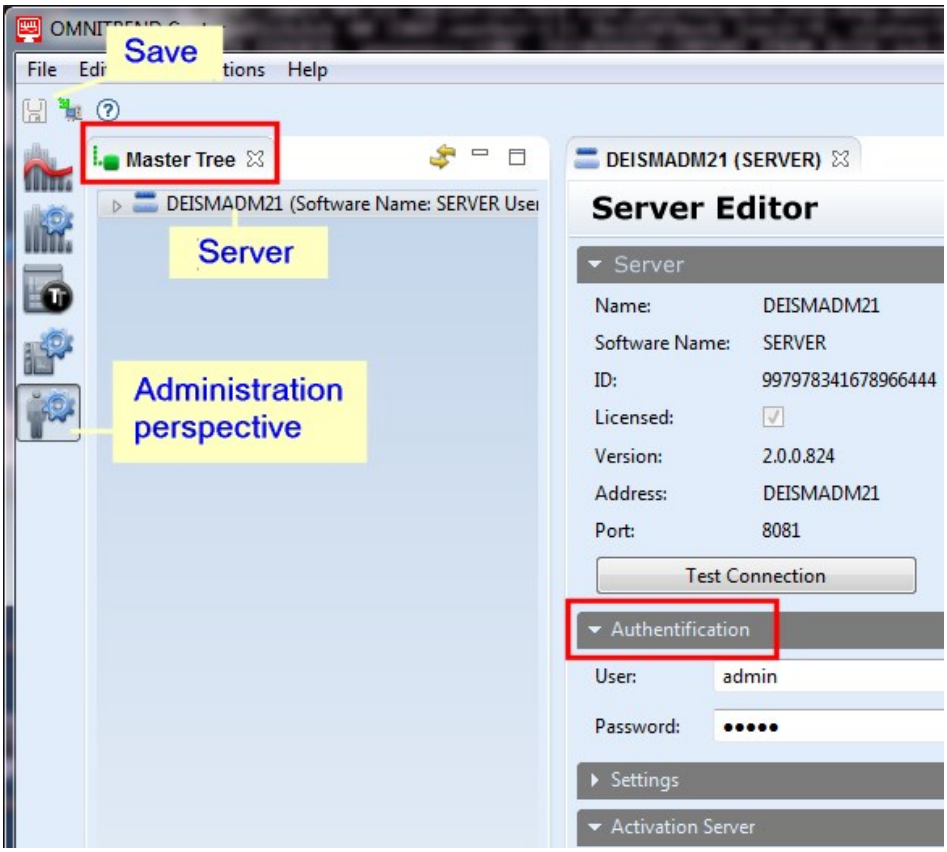
4.6 Create/Delete project

Prerequisite

You must at least have the **administrator** user role for creating a project.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To create a project

- Switch into the **Administration perspective**.
- In the master tree, open the **database**, where you would like to create a new project.

[1]Grouping of related functions and fields in the Editor window

- Using the right mouse button, click on the **Projects** folder. A dialog menu appears.
- Click on **New**. The **Project** dialog window appears, where you adjust the following parameters:
  - **Name**: Project name
  - **Status**: **Active / Inactive**. If a project is deactivated, it is locked for further editing and no measurement data is imported. The status is shown in the master tree using color: *Active project*: Project name appears in black
    Inactive project: Project name appears in blue
  - **Time zone**: Adjust the time zone for the project. Activate automatic switching to daylight saving time as needed.
- Click on **OK** to apply the settings and to close the dialog window. The project editor appears, where you can retroactively edit the parameters.

To delete a project from the database

- Using the right mouse button, click on the project to be deleted. A dialog menu appears.
- Click on **Delete**. The **Please confirm** dialog window appears.
- Click on **OK**.

A project can only be deleted, if no measurement data is available in the project.

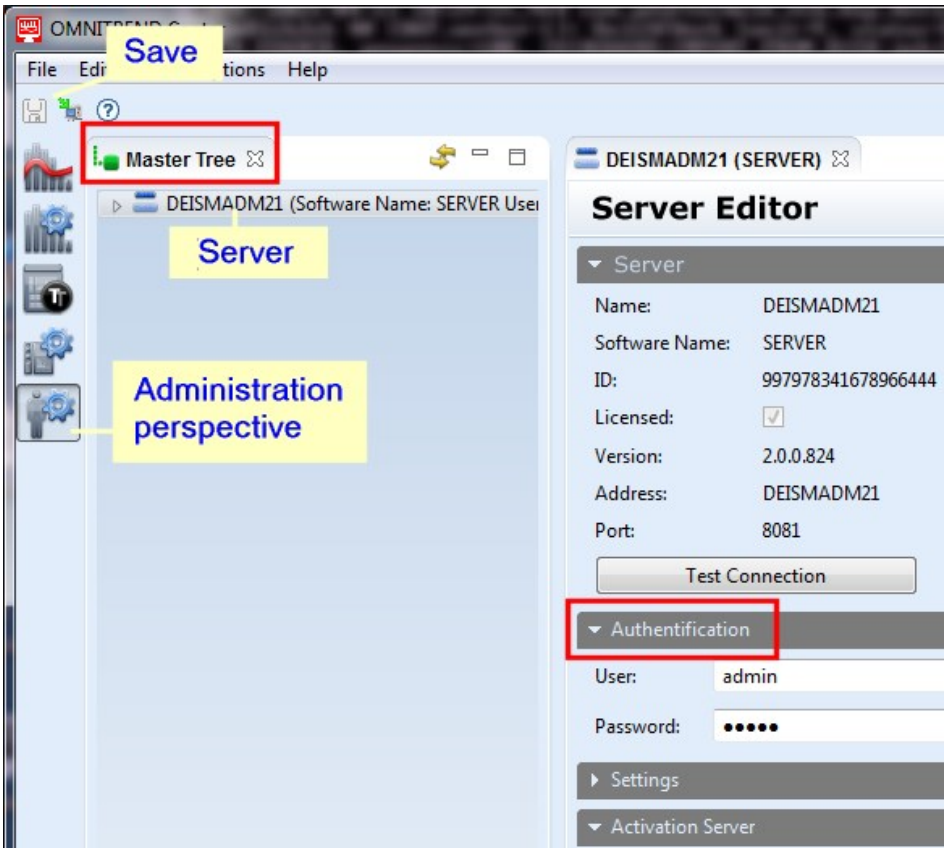
4.7 Create further master data

Prerequisite

You must at least have the **specialist** user role for creating and managing master data.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

In addition to users and devices (hand-held device, online device), you can create and manage the following master data in a database:

User defined units

[1]Grouping of related functions and fields in the Editor window

In addition to the units for the default measurement quantities (e.g. velocity), you can create units for user-defined measurement quantities. User-defined units are important when creating user-defined sensors and when post-processing measurement data.

> The units for the default measurement quantities are managed in the main menu under **Options/User Preferences** in the **Units** section.

To create a user-defined unit

- Open the **Administration perspective**.
- Open the respective database in the master tree.
- Using the right mouse button, click on the **User-Defined Units** master data folder. A dialog menu appears.
- Click on **New**. A dialog window appears.
- Enter a **name** and the **unit** as well as the number of displayed **decimal places**.
- Click on **Finish** to store the new unit in the master data.

> A unit can only be deleted, if no measurement data is available for this unit. If you do not use the unit anymore, deactivate it via the editor. In the master tree, double-click on the unit to open the editor.

User-defined sensor

Every database contains PRÜFTECHNIK sensors by default, whose parameters are fixed and cannot be changed. However, you can duplicate them and adjust the parameters or create your own sensors.

> The sensors are managed in the **Sensor view**.

To create a new sensor

- Open the **Administration perspective**.
- Open the respective database in the master tree.
- Using the right mouse button, click on the **Sensors** master data folder. A dialog menu appears.
- Select **New**. A dialog window appears
- Enter the following parameters:
  - **Name**: Sensor name
  - **Status**: Leave this parameters on "Active".
  - **Type**: Select the sensor type.
  - **Measurement Quantity**: Select the measurement quantity that will be measured with the sensor. The selection depends on the set sensor type.

    > In the case of a **user-defined unit**, an additional dialog window appears, where you define the unit or select an available unit.
- Click on **Next**.
- In the next dialog window, select the **device type**, using which the sensor can be operated.
- Click on **Next**.

- In the next dialog window, enter the sensor **offset** and **sensitivity**.

  Enter the sensor signal at 4 mA and at 20 mA for the "Current 4_20" sensor type.

  Enter the polynomial coefficients of the nonlinear transfer function (a0 … a3) for the "MNS12" sensor type.

- Click on **Next**.
- In the next dialog window, enter the linear **frequency range** and the **resonance frequency** as needed.

  For the **Current**, **Voltage**, **Current 4-20 mA** sensor types, an entry is only required for the "Acceleration", "Velocity", and "Displacement" measurement quantities.

- Click on **Next**.
- In the next dialog window, activate the **Sensor Check** function as needed. This way, you can monitor the sensor function for **Current**, **Voltage**, and **Pulse**-type sensors. Enter the lower and upper limit (**minimum / maximum**) for the sensor signal.
- Click on **Finish** to create the sensor. The sensor editor appears, where you can change all parameters later on except **type** and **measurement quantity**.

Delete / deactivate sensor

You can only **delete** a sensor, if no references to this sensor exist in the database.

If the sensor is assigned to a measurement location or if measurement data exists in the database that was recorded using the sensor, you can **disable** the sensor only. A disabled sensor cannot be selected anymore for measurement tasks. You can only disable PRÜFTECHNIK sensors.

You can find the references to a sensor in the **sensor editor** in the **Referenced Measurement Locations (Online) and Tasks (Offline).** sequence.

To delete a sensor

- Switch into the **Administration perspective**.
- Open the **Database/Sensors** node in the master tree
- Using the right mouse button, click on the respective sensor in the master tree.
- Click on **Delete**.
- Confirm the selection with **OK**.

To disable a sensor

- Switch into the **Administration perspective**.
- Open the **Database/Sensors** node in the master tree
- Double-click on the respective sensor to open the sensor editor.
- Deactivate the **Status** field in the **General Information** section.
- Click on **Save** to save the changes.

Duplicate sensor

You can create a new sensor based on a PRÜFTECHNIK sensor and adjust the sensor parameters.

To duplicate a sensor

- Open the **Administration perspective**.
- Using the right mouse button, click on the respective sensor (**Database/Sensors/Sensor Name**) in the master tree.
- Click on **Duplicate**.
- Double-click on the new sensor to open the sensor editor.
- Change the sensor parameters.
- Click on **Save** to save the changes.

Task template

The measurement is based on a measurement task. It contains all information required by the device for performing a measurement. A measurement task is assigned at the project level within the scope of a measurement configuration.

Measurement tasks are based on task templates, which are maintained in the database as master data. Task templates are device type-specific – i.e, no task template is valid for two device types.

To create a new task template

- Open the **Administration perspective**.

  > The following procedure is described exemplarily in the Administration perspective. You can also create a task template in the Configuration perspective via the **Task Templates** view.

- Open the respective database in the master tree.
- Open the **Task Templates** master data folder.
- Using the right mouse button, click on the device type, for which you would like to create the task templates (e.g. VIBGUARD). A dialog menu appears.
- Select **New**. A dialog window appears.
- Select the **measurement type** and the **measurement quantity**.

  > For the **Trending Spectrum** task template, select the measurement type and the measurement quantity of the underlying trending spectrum in the following dialog window.

- Click on **Next**, to open the next dialog window.
- Enter the parameters into the **measurement setup**.

  > The setting possibilities comprise averaging options, frequency range, signal filter, and depend on device type and measurement type.

- Click on **Next**, to open the next dialog window.
- Change the task template name as needed.
- Click on **Finish**. The task template editor appears, where you can adjust further settings (e.g. alarms, bands, etc.).

  > Thresholds and bands are usually configured during creation of the measurement task. All required information is available in the context of a measurement task only.
  >
  > The "Band Editor and Alarm Editor" topic is discussed in a separate section for better understanding.

However the reverse approach is possible as well: You can also create a task template based on an existing measurement task.

Examples:

- You imported analysis measurement data from a hand-held device and would like to store a measurement task in the database as task template.

- You adjusted some parameters in a measurement task. You would like to create a "new" task template from the "adjusted" measurement task.

To create a task template based on a measurement task

- Open the **Configuration perspective**.
- Using the right mouse button, click on the respective measurement task in the machine tree. A dialog menu appears.
- Move the cursor over **Create** and click on **Task Template**. The **Create new template for measurement task** dialog window appears.
- Enter a name.
- If the measurement task should contain a reference to the new template, activate the respective option.
- Click on **Finish**.

Machine templates

You can use machine templates universally. On the on hand, you can set up a machine tree with many similar machines much faster. On the other hand, you can use a machine template on a hand-held device to measure many similar machines, e.g. within the scope of an acceptance measurement.

> You can find further details in the **Machine Templates** section (hyperlink, see below under "Related Topics").

Finding codes

You can create diagnostic codes and correction codes manually or import them into the database.

To create a diagnostic / correction code

- Open the **Administration perspective**.
- Open the respective database in the master tree.
- Open the **Finding Codes** master data folder.
- Using the right mouse button, click on the respective code category (**diagnostic or correction**). A dialog menu appears.
- Select **New**. A dialog window appears.
- Enter the code and optionally a name and a description.
- Click on **Finish**.

> Within a category, the codes can be randomly arranged to one another (e.g. code > sub-code > ...).

To import a diagnostic / correction code

- In the main menu, click on **File/Import**. A dialog window appears.
- Select the import wizard (e.g. **Findings/Correction Codes**).
- Click on **Next**.
- In the next window, select the database as needed, to which the codes should be imported.
- Specify the folder, in which the CSV files with the codes are stored. Click on **Select Folder**, and navigate to the target folder, or enter the path in the field **Folder**.

  With **Include sub-directories** you will expand the search to include sub-directories. When doing so, note that, depending on the size of the folder structure, the search may take some time.

- Select the file(s) in the field "**Files**".
- Click on **Finish**. The files are imported.
- Confirm the import message with **OK**.

Kinematic models

Kinematic models support you in frequency analyses. They can describe all frequencies occurring in a machine and consider their kinematic dependencies among one another. The resulting characteristic frequencies form the base for the frequency bands for characteristic value monitoring.

The bearing installed in the machine are imported for the kinematic models. The characteristic frequencies of the respective bearings can be calculated based on the manufacturer's information and/or the bearing geometry data. By default, OMNITREND Center provides a comprehensive bearing catalog of renowned manufacturers. You can enter missing bearing types into the master dataset via a guided dialog or by importing a catalog file (*.bif).

To create a roller bearing

- Open the **Administration perspective**.
- Open the respective database in the master tree.
- Open the **Kinematic Models** master data folder.
- Using the right mouse button, click on **Bearings**. A dialog menu appears.
- Select **New**. A dialog window appears.
- Enter the following parameters:
  - **Name**: Designation of the bearing
  - **Type**: Design of the bearing
  - **Geometry known**: The characteristic frequencies result from the bearing geometry data. This data can be found in manufacturers' catalogs.

    If the geometry data is not known, deactivate this option. The characteristic frequencies must be known to enter them in the next window.

  - **Manufacturer / Use existing**: Select the bearing manufacturer, if he is already created in the master data.
  - **Manufacturer / Create new**: Activate this option, if the bearing manufacturer has not been created yet. Enter him here. Note: The bearings are sorted in the master data by manufacturer.
- Click on **Next**.
- Enter the bearing geometry data and/or the characteristic frequencies.

  The calculated characteristic frequencies refer to the speed of the **inner race of the bearing**.

- Click on **Finish**>. The roller bearing editor appears, where you can retroactively change the parameters.

> You can also import bearing data. Follow the procedure described for importing diagnostic / correction codes. Select the **Bearings** import wizard. The bearing catalog file must be in bit format.

You can also copy master data from one database into another database.

To copy master data into another database

- Open the Administration perspective.
- Using the right mouse button, click on the respective element (**Database/Sensors/Sensor Name**) in the master tree.
- Click on **Copy**.
- Open the destination database.
- Using the right mouse button, click on the destination folder (e.g. **Sensors**).
- Click on **Insert** to insert the sensor.

> The procedure can also be performed using the "Drag&Drop" Windows operation. Simply drag the respective element using the mouse from the source folder into the destination folder and drop it there.

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5 Configure project

This section explains how to configure a project.

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5.3 Establish project team 71
5.4 Open/close project 75

5.1 Basics

This section provides basic information about certain topics.

Basics: Working with projects

Projects organize all information relevant to the operating sequence of a condition monitoring project. A project contains the following elements:

- **Devices**: Hand-held devices and/or online devices that deliver measurement data in the project.
- **Measurement configuration**: Parameters for the execution of measurement tasks with the respective device, such as measurement settings, measurement channels, measurement locations, thresholds.
- **Machine data**: Information about the machines and assets to be monitored, such as type, performance data, position data, information regarding machine dynamics (characteristic frequencies)
- **Measurement data**: Measurement results with history and post processing options
- **Project team**: Users working in the project. The access rights are defined via hierarchical user roles.

The **machine and measurement data** is compiled a hierarchical tree structure - the **machine tree** - for a better overview. The simplifies navigation and work in the project.

Working with several projects

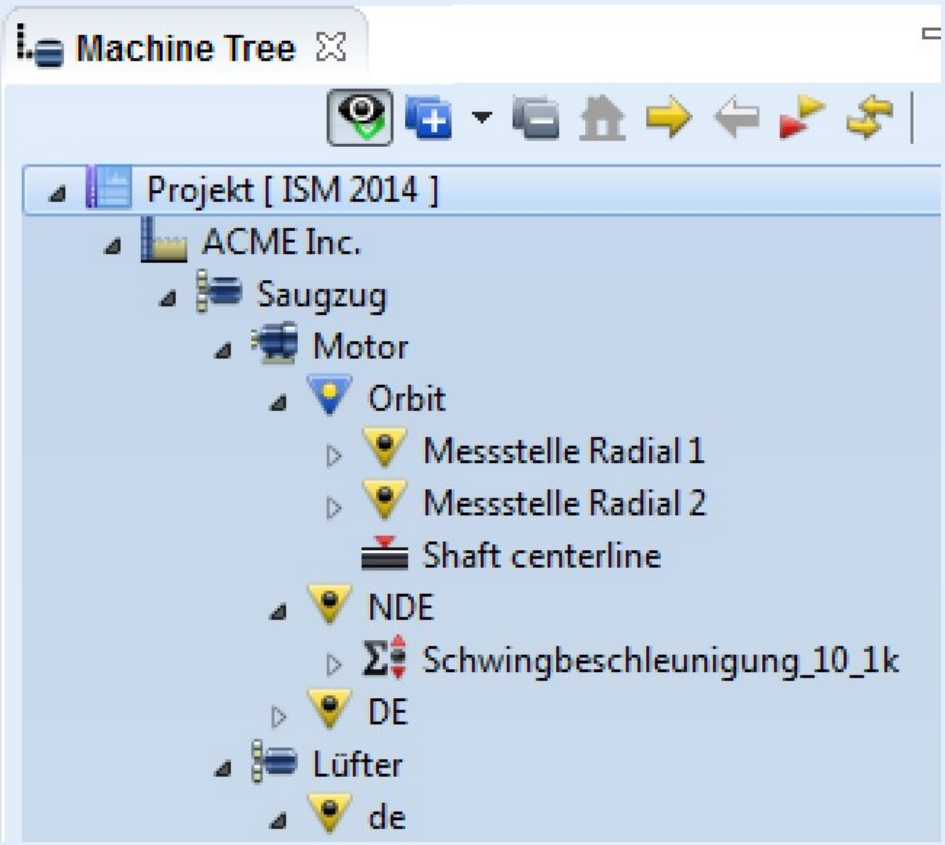
Several projects can be created and managed in a database. When the client application is started, all projects are loaded and displayed by default. This can be beneficial, if you execute actions across projects, such as copying and pasting machine tree elements. If you would like to only see the project you are currently working on, you can close all other projects.

You can use individual devices across projects. However, they can only be actively used in one project at a time. For devices connected to OMNITREND Center via a network, the activation function is used for this purpose. Hand-held devices connected via USB connection are automatically detected and assigned to the respective project during the first data exchange (measurement configuration, measurement data).

Basics - Machine tree

The machine tree is a graphical overview of the monitored asset and contains all machine information relevant for measurement and analysis within the scope of a project. It is displayed on the **Configuration**, **Communication** and **Analysis perspectives**. The machine tree is bound to a project and features a hierarchical structure. The top entry in the machine tree features the **project name**.

Example: Typical structure of a machine tree



Hierarchies in the machine tree: Possible assignments

		Superordinate hierarchy (parent)			
		Location	Machine train	Machine	Measurement location
Sub ordinate hierarchy (child)	Machine train	✓	✗	✗	✗
	Machine	✗	✓	✗	✗
	Measurement location	✓	✓	✓	✗
	Measurement task	✗	✗*	✗*	✓

* only post processing tasks (XY plot)

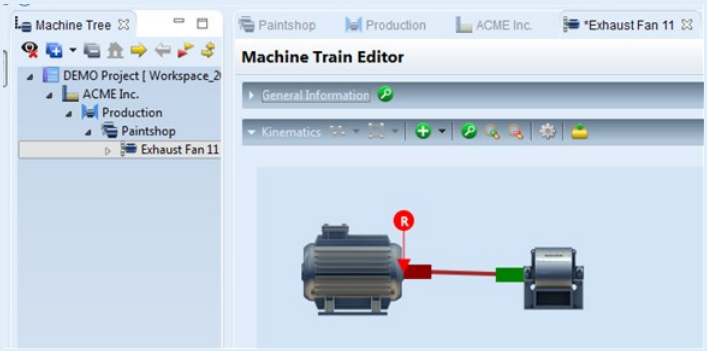
Basics - Machine and machine train

A **machine** is the key element in a project to which all condition monitoring and diagnostics data refers. In practice, however, individual machines are seldom used alone. It is more common to find machine trains in which two or

multiple machines are coupled to each other just like a train. A machine set comprised of multiple machines is therefore also called a **machine train**.

E x a m p l e

Fan-machine sets composed of an E-motor (prime mover) and fan (machine). There is a direct connection established by a coupling.



Kinematic Model

Each machine has characteristic properties in relation to its dynamic vibration behavior. This is due to the design of the machine. Knowledge of the machine kinematics is a decisive factor in a sound analysis of the vibration signals.

Kinematics therefore form the basis for calculation of the characteristic frequencies of a machine. These models make it possible to account for almost any source of a vibration excitation arising in a machine and to calculate the expected frequencies in a spectrum. Examples of vibration exciters: Bearing position, toothing, RPM-harmonic exciter (e.g. imbalance)

When creating a machine in the database, this machine is automatically assigned to an appropriate kinematic model. You need to adapt this model accordingly in the course of the machine configuration. The following analysis and measuring functions are available to you with the configuration of a kinematic model:

- **Identification** of the characteristic machine frequencies in the spectrum by overlaying the calculated frequency markers.
- **Tracking** of speed-dependent characteristic band values and band alarms with the RPM during measurement.
- **Calculation** of the speed at every measurement location based on a reference speed.

Machine type and category

Due to their wide variety and for a better overview, the machines are compiled as **machine types** relating to their design (e.g. pumps, fan, gearbox).

The machine types are, in turn, divided into **four categories** according to their kinematic properties:

- **Simple machines** with only one frequency domain[1], such as motor, pump, fan.
- **Machines with machine speed converter** have two frequency domains such as chain or conveyor drives.
- **Gearbox** with two or more frequency domains such as planetary gear set or multi-stage gearbox.
- **User Defined Machines** in any complexity such as multi-stage control gear

[1]Area of a machine in which the same RPM or rotational frequency occurs.

Basics - Kinematic model

Rotating machines generate numerous vibrations, which can be assigned to the components of the machine using a spectral analysis. The sources of the vibration frequencies to be expected and their inter-dependencies must be known for a reliable **frequency analysis**. Even in simple machines, such as motor-pump train, various and complex vibration causes can exist. A model helps in simplifying the correlations so that necessary calculations can be performed with relatively simple means.

For this purpose, OMNITREND Center offers the so-called "**Kinematic Model**" characterized by the following properties:

- Characteristic Frequency calculation for all machine components
- Bearing frequency import via file or calculation via bearing frequency editor
- speed ratio calculation within a train
- speed ratio calculation within a product line
- Reference speed measurement on site or entry into the software
- Direction of rotation adjustable for shafts
- Conditions consider different switching and operating states
- Influences consider external influences
- Graphical configuration interface

Machine types in the kinematic model

The kinematic model offers predefined models for the most common machine types. These require the adjustment of a few parameters only:

- Simple machines
- Machines with machine speed converter
- Helical gearboxes
- Linear multistage gearboxes
- Planetary gearboxes

For all other machine types, the kinematic model offers freely configurable machine models.

Basic elements in the kinematic model

In addition to the predefined machine types (see above), almost every machine can be emulated with the kinematic model using the following elements:

- **Frequency domain**: Area in a machine with constant speed.
- **Connector**: Element for connecting frequency domains located in different machines.
- **Machine speed converter**: Element for connecting frequency domains in a machine with different speeds.
- **Coupling**: Element for connecting connectors. The speed remains constant via a coupling.

Examples

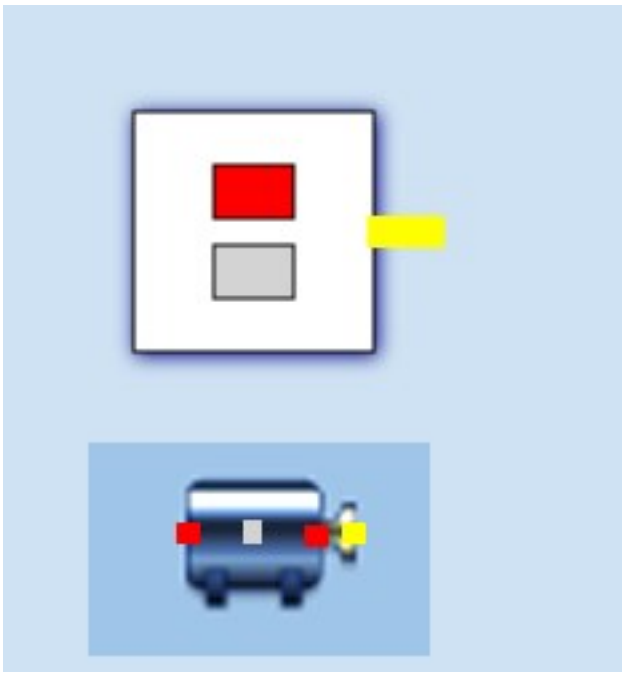
Machines in the kinematic model

In the case of a **simple machine** (motor, pump, rotor, etc.), one domain with constant speed (frequency domain) exists only. Two vibration/frequency sources are distinguished in the kinematic model:

- Shaft bearings
- Other machine components

The later groups speed-resistant and speed-variable frequencies such as electrical humming at 50 Hz and the imbalance vibrations of the 1st-order harmonic of the speed (1x).

This results in the following scheme for a **drive motor**:



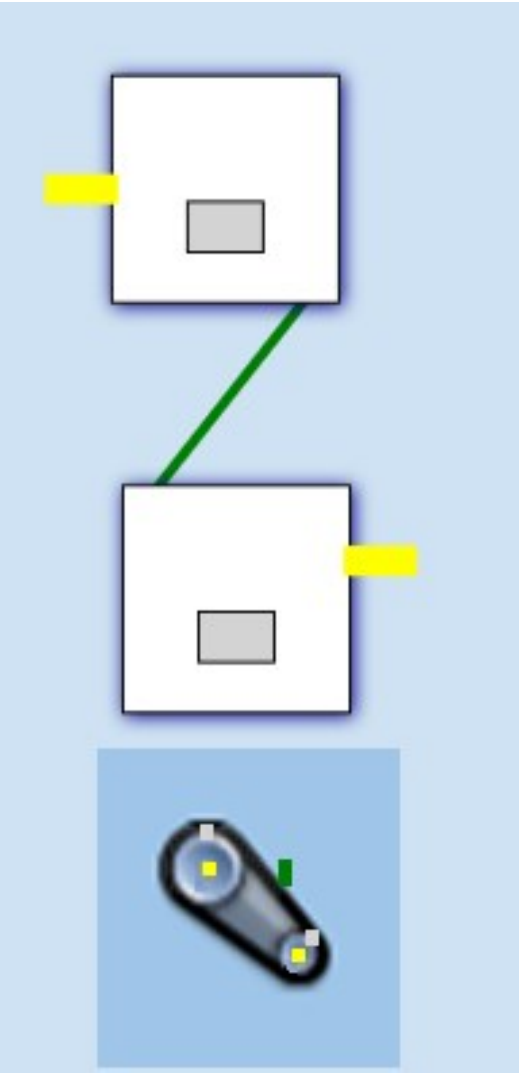
Red: Roller bearing frequencies

Grey: Machine frequencies

Yellow: Connector to the connected machine (pump, fan, etc.)

In the case of a **machine with machine speed converter** (belt/chain drive), two frequency domains exist, one at the input and the output. Both domains are connected with a speed converter (chain, belt). The ratio results from the geometry of the converter components (e.g. pulleys).

For a **belt drive**, the scheme is as follows:



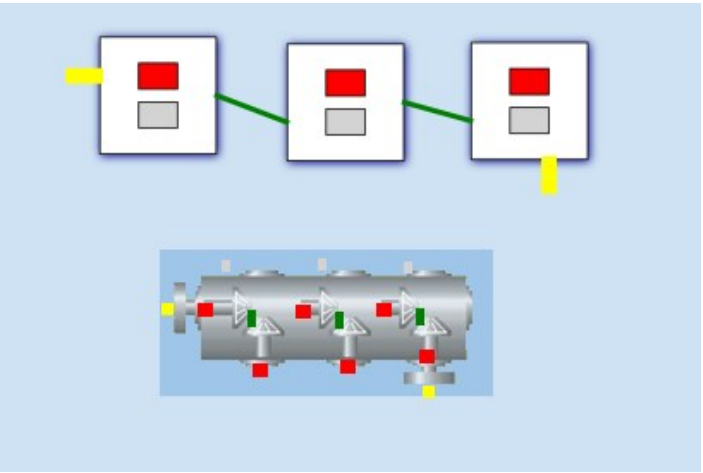
Grey: Belt frequencies

Yellow: Connector for input / output

Green: Speed converter (belt)

At least two frequency domains exist for a **gearbox**: One at the input, one at the output, and several in the intermediate stages depending on the gearbox type. The domains are connected using a speed converter (gears). Their geometry defines the ratio.

This results in the following scheme for a **three-stage helical gearbox**:



Red: Roller bearing frequencies

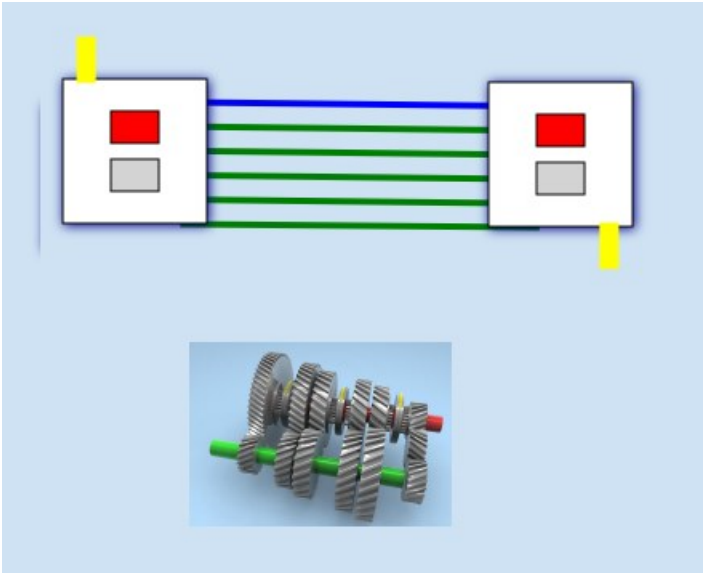
Grey: Gear mesh frequencies

Yellow: Connector for input / output

Green: Speed converter (gears)

Two frequency domains exist in **manual transmissions**, the input and the output speed. The individual gears are mapped in the model using so-called conditions. A speed converter is assigned to every gear, which can be activated or deactivated using the respective condition.

For a **five-gear transmission with reverse gear**, the following scheme applies



Red: Roller bearing frequencies

Grey: Gear mesh frequencies

Yellow: Connector for input / output

Green: Speed converter (gears)

The model elements were not assigned in the real figure for a better overview.

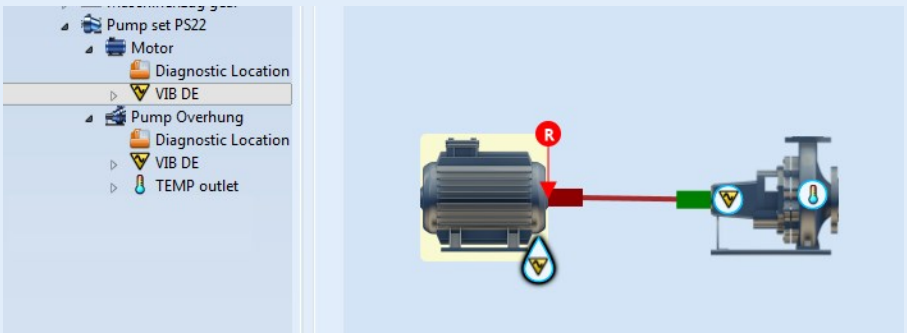
Please note: The forward gears and the reverse gear an be simulated in the model via the rotational direction of the shafts.

Basics - Measurement locations

A **measurement location** marks the location of the measurement on a machine. The measurement locations can be placed on the machine icon at the location of the measurement in the machine train plane in the graphical editor and the measurement direction can be defined if necessary. This positional data is loaded onto the measuring device with a route and is shown graphically on the device upon deviation from the route.

Example

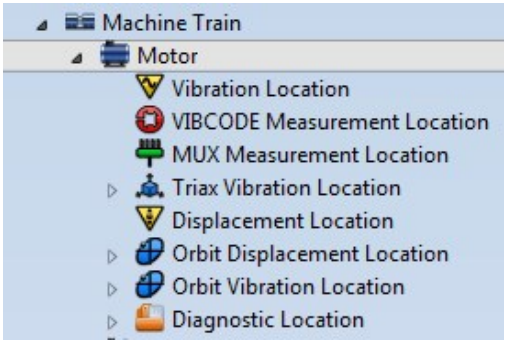
Pump-machine train with **three** measurement locations: The measurement location for vibration on the motor is installed in the lower section on the drive side. The measurement direction is radial. The vibration measurement location is attached in a radial direction on the pump at the same height as the shaft axis. The measurement location for temperature is installed on the pump outlet.



A measurement location contains information about the **measurement type** (vibration, RPM, temperature, etc.), the **sensor type**, and, with regard to vibration measurement locations, the **measurement direction** (radial, axial, horizontal, vertical) if necessary.

Measurement locations for **vibration** also differ in terms of the type of sensor coupling and the application:

- Structure-borne sound / housing vibration with **mobile** or **permanently** installed accelerometer.
- Structure-borne sound / housing vibration with **VIBCODE** sensor
- Structure-borne sound / housing vibration with permanently installed accelerometer and **multiplexer** connection
- Structure-borne sound / housing vibration with **triaxial** vibration sensor; every sensor axis is depicted by a vibration measurement location.
- **Shaft vibration** with a distance sensor
- **Orbit** - shaft vibration with two distance sensors, radially displaced by 90°; every sensor is depicted by a vibration measurement location
- **Orbit** - shaft vibration with two accelerometers, radially displaced by 90°; every sensor is depicted by a vibration measurement location



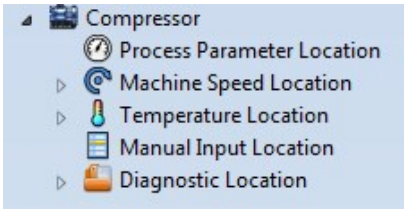
In addition to vibration measurement locations, the following types of measurement locations are available:

Process Parameter - Metrics that can be measured with voltage-supplying or power-supply sensors such as pressure gages

Machine Speed - The RPM can be measured directly at the shaft with a Keyphasor or recorded by means of manual input. A measurement location on the machine train can be defined as the reference measurement location for calculation of the kinematic frequencies.

Temperature - For temperature measurements with a portable data collector.

Manual Input - Information that is recorded in the course of a visual inspection or by taking a reading from a measurement value display



Diagnostic Location

This type of measurement location is intended to be the collection point for measurement tasks that are imported into the database from a portable measuring device and meet the following criteria:

- The measurement task has **not** been measured in the **Route** operating mode
- **No** suitable **measurement location** has been created on the respective machine in the database. Examples: Balance measurement, coastdown, bumptest

The diagnostic location is automatically created with a new machine and cannot be deleted.

Measurement locations away from a machine

In addition to the measurement locations on a machine, measurement locations can also be created on a higher level of hierarchy in order to enable the following measurement tasks for example:

- Vibration measurement on a foundation -> Machine train
- Vibration measurement on piping -> Machine train or location (e.g. factory floor)
- Temperature measurement in a production hall -> Location

Basics - Measurement tasks and task templates

A **measurement task** supplies the measuring device with all requisite information for conducting a measurement. It tells the measuring device, which measurement type (e.g. vibration) with which measurement settings (e.g. averages) and with which sensor the measurement is to be conducted. A measurement task is loaded onto the measuring device with a **route** or **measurement configuration**. Measurement tasks can be exchanged across projects.

A measurement task is generated from a **task template**. Task templates do not contain any sensor information. They are available as master data for projects in the database but can also be exchanged across individual databases. Task templates are created on a device-specific basis in order to optimally account for the metrological properties of the respective device type.

Changes to a task template are **not** transferred to an already existing measurement task. Instead they are documented via versioning.

Creating measurement tasks

Create measurement tasks for **hand-held measuring devices** at a **measurement location** in either the **machine tree** or in the **machine train editor**.

Create measurement tasks for **online device** in the **device editor** in the context of a **measurement configuration**.

Measurement tasks for postprocessing

In addition to measurement tasks that are measured with the measuring device, OMNITREND Center has measurement tasks that are only used in the database:

- **XY plot**: This measurement task links two data sources in a Cartesian coordinate system, such as RPM and overall vibration value RMS. The data sources should be sensibly linked for a meaningful analysis, i.e. measurement data should originate from the same machines.
- **Characteristic band value**: This measurement task calculates a characteristic overall value from a spectral frequency band. The characteristic band value is assigned to the spectrum as a measurement subtask.
- **Signal postprocessing**: This measurement task calculates an FFT spectrum from a time waveform. The spectrum is assigned to the time waveform as a measurement subtask. The calculated results are continuously stored in the database.

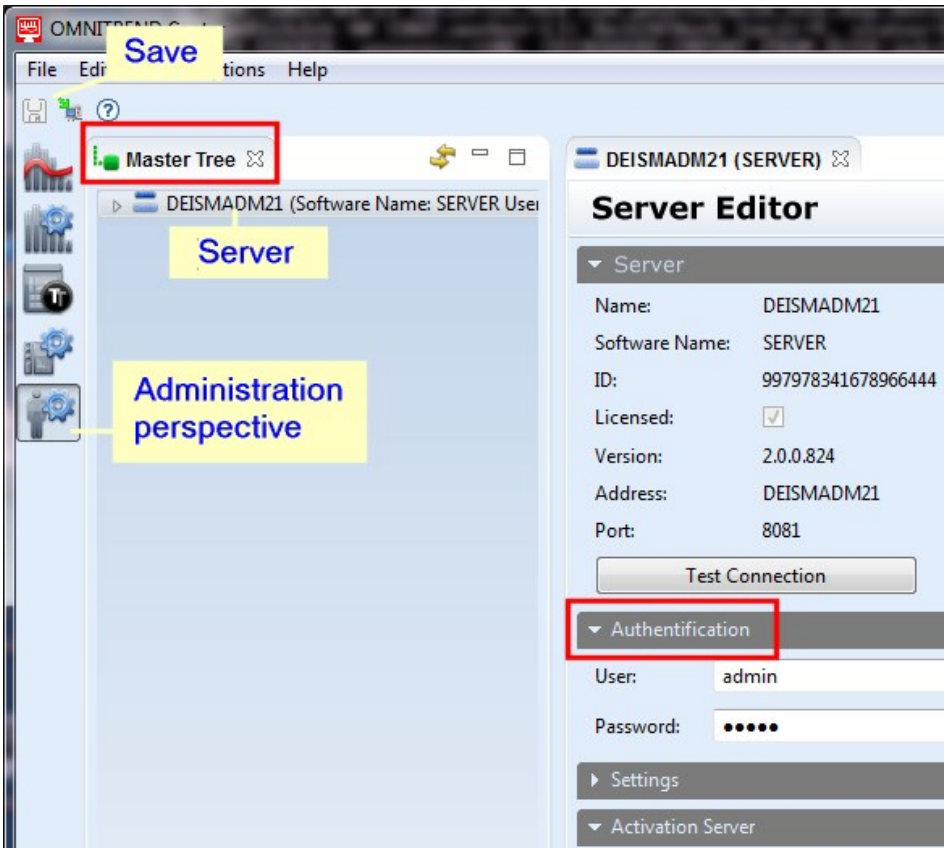
5.2 Assign online device to a project

Prerequisite

You must at least have the **administrator** user role for editing a project.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To assign an online device to the project

> In the case of data collectors, project assignment is automatic on creation of the measurement configuration (route) and/or during measurement data import.

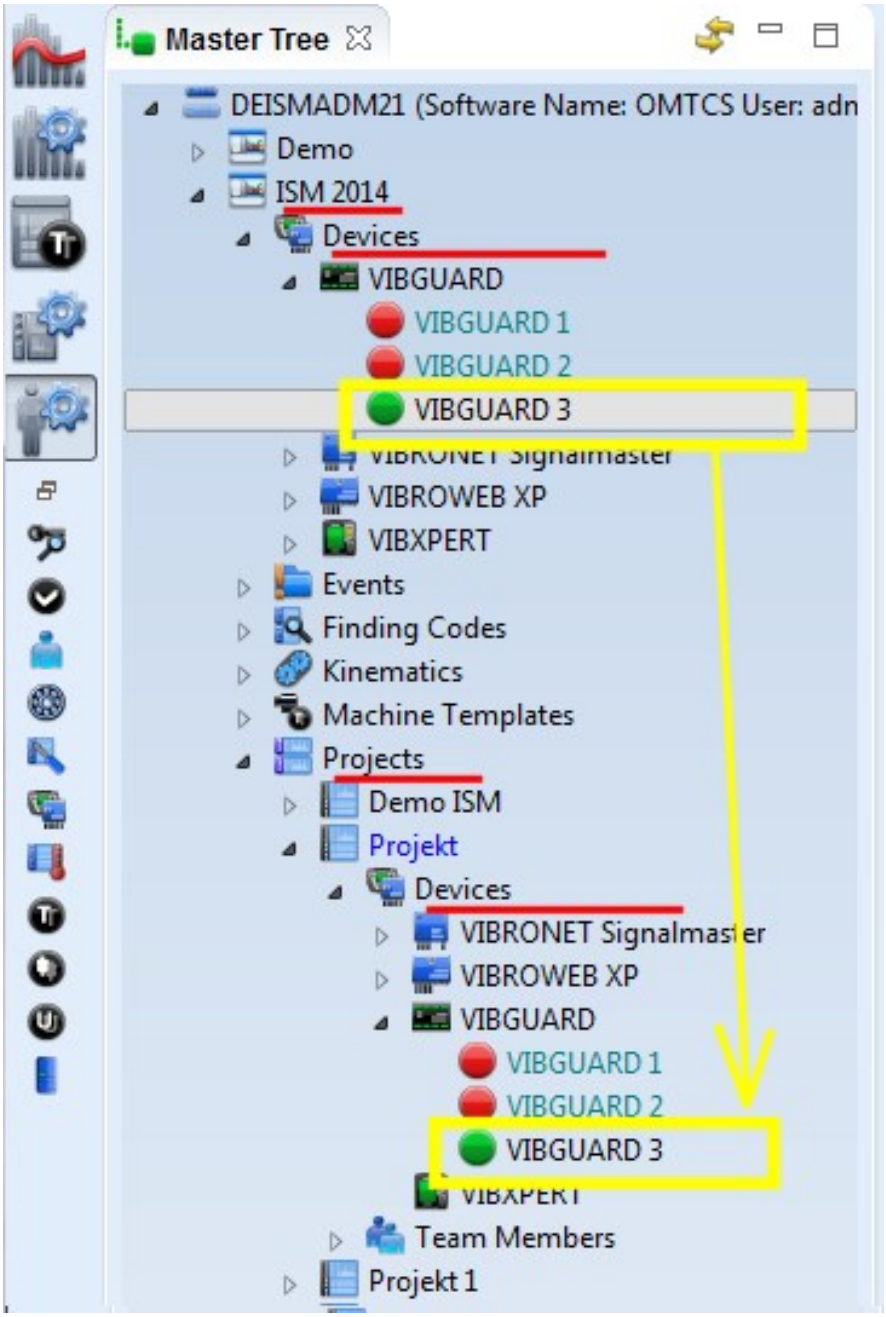
[1] Grouping of related functions and fields in the Editor window

- Switch into the **Administration perspective**.
- In the master tree, open the **database**, which contains the project.
- Open the **Devices** folder in the project folder.
- Using the right mouse button, click on the **device type** (e.g. "VIBGUARD"). A dialog menu appears.
- Click on **Add Device**. The **Add Device to Project** dialog window appears.
- Select the desired online device from the list. Multiple selection is possible (CTRL, SHIFT key)
- Click on **Finish**. The online device appears in the project folder under the respective device type. The activation status is indicated via a traffic light icon (green: active; red: inactive).

The online device is initially deactivated. Only after it is installed and connected to the measurement location and contains a valid measurement configuration, you may activate the online device in the project. Otherwise, the DAP attempts to retrieve the measurement data from the online device and generates unnecessary data traffic and error messages.

Alternative: Drag & Drop and/or Copy & Paste

- Open the **Devices/Device Type** sub-folder in the database



- Mark the desired **online device**.
- Drag & Drop[1] Copy & Paste[2] .
- Drag & Drop[3] Copy & Paste[4]
- Click on **Save** to save the changes.

To remove an online device from the project

---

[1]Press and hold the mouse button, while dragging the online device into the respective sub-folder in the respective project.

[2]Press the right mouse button and select **Copy** in the dialog menu

[3]Release the mouse button to add the online device to the project.

[4]Using the right mouse button, click on the **Devices/Device Type** sub-folder in the respective project and select **Paste** in the dialog menu.

- Open the **Devices/Device Type** sub-folder in the project folder.
- Using the right mouse button, click on the online device to be deleted. A dialog menu appears.
- Click on **Remove Device From Project**.

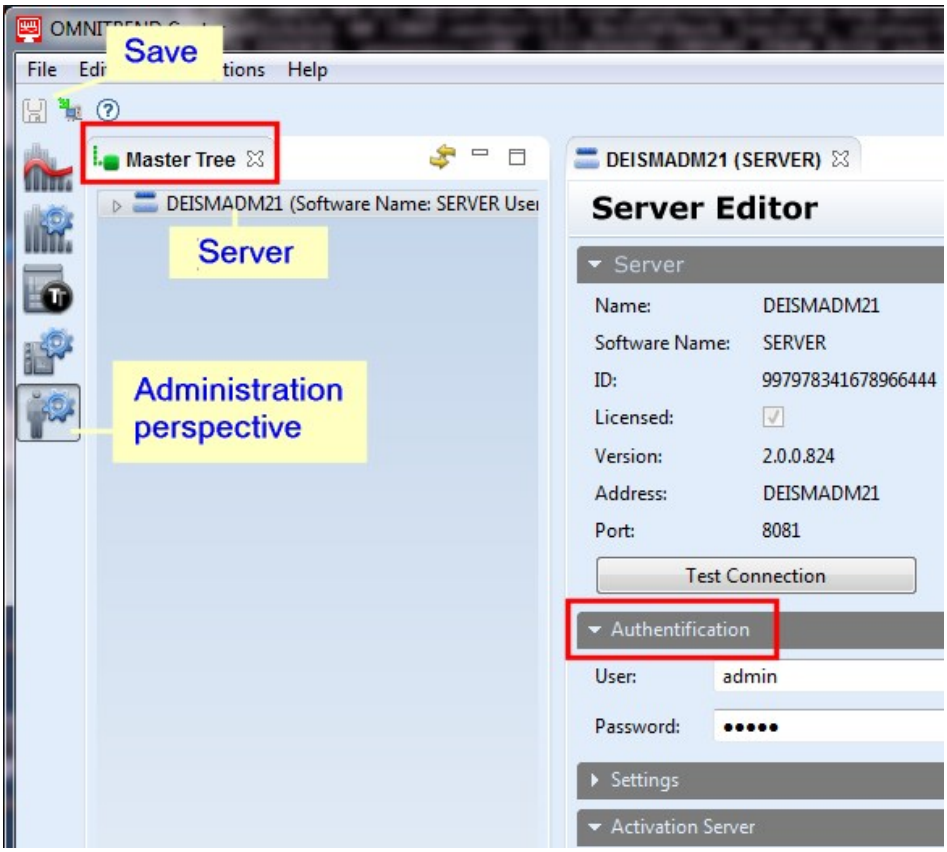
5.3 Establish project team

Prerequisite

You must at least have the **specialist** user role for editing a project.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To assign users to a project team

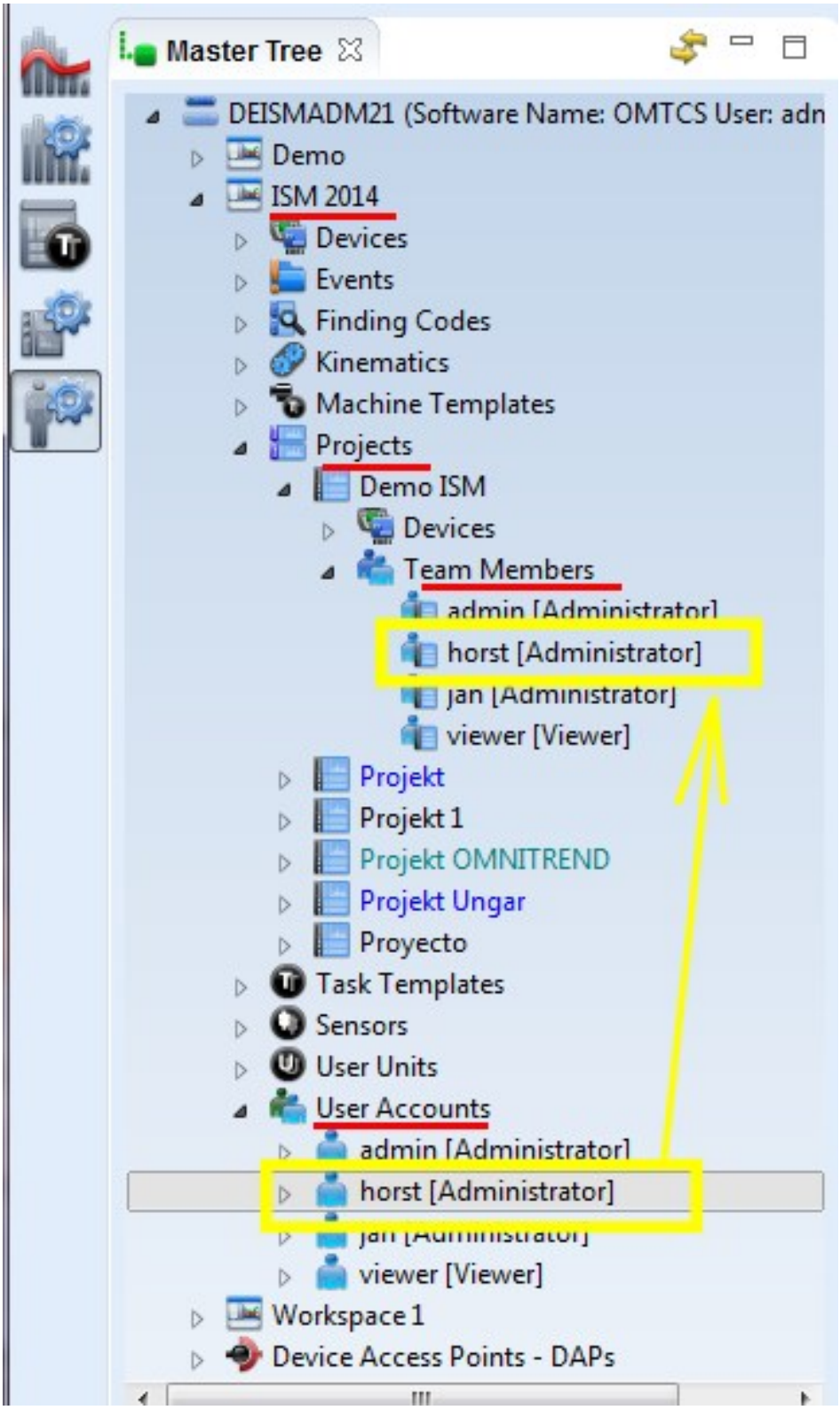
- Switch into the **Administration perspective**.
- In the master tree, open the **database**, which contains the project.

[1]Grouping of related functions and fields in the Editor window

- Double-click on the project folder to open the project editor.
- Open the **User** section in the project editor.
- Click on **Add**. The **Add User to Project** dialog window appears.
- Select the desired user from the list. Multiple selection is possible (CTRL, SHIFT key)
- Click on **OK**.
- Change the user role in the project as needed:
    - Click on the shown **role** in the user list. A selection menu appears.
    - Click on the new role.
- Click on **Save** to save the changes.

Alternative: Drag & Drop and/or Copy & Paste

1. Open the **User** folder in the database



2. Mark the selected user.

3. Drag & Drop[1] Copy & Paste[2]

---

[1]Press and hold the mouse button, while dragging the user to the "Team Members" folder in the respective project.

[2]Press the right mouse button and select **Copy** in the dialog menu

4. Drag & Drop[1] Copy & Paste[2]
5. Change the **user role** in the project editor as needed (see above).
6. Click on **Save** to save the changes.

[1]Release the mouse button to add the user to the project.

[2]Using the right mouse button, click on the "Team Member" folder in the respective project and select **Paste** in the dialog menu

5.4 Open/close project

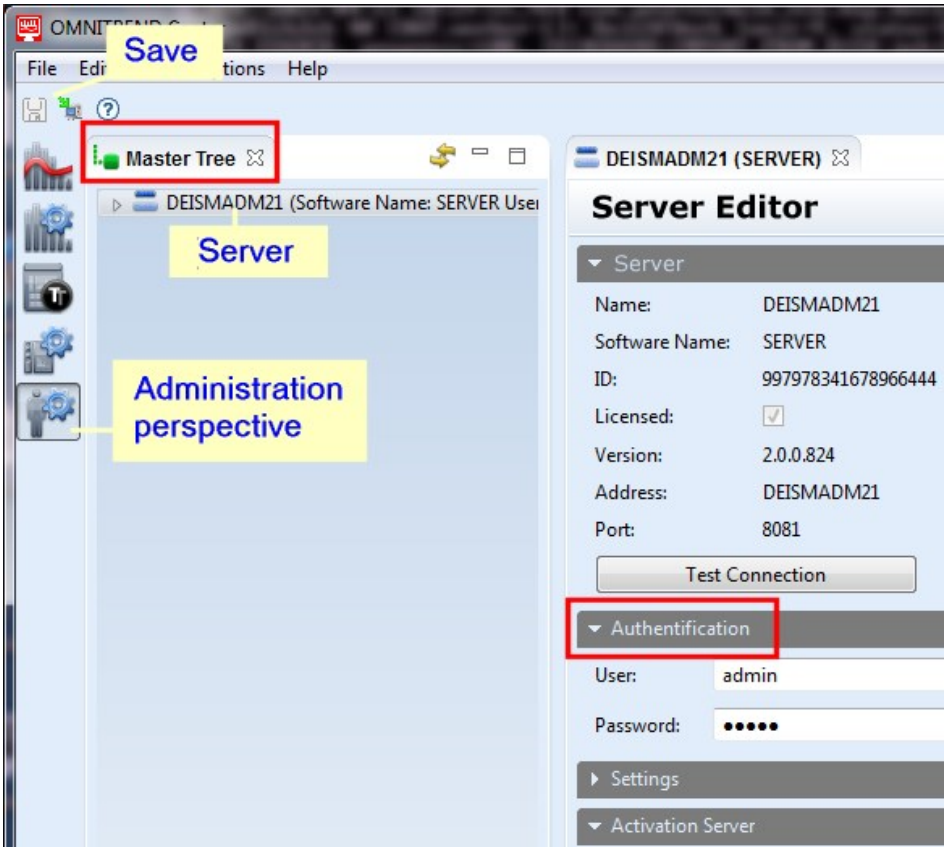
If several projects are created in the database, you can close the projects you are currently not editing.

Prerequisite

You can close and open projects with every user role.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Close project for current session

[1] Grouping of related functions and fields in the Editor window

- Open the **Configuration perspective**.
- Mark the projects in the machine tree, you would like to close.
- In the main menu, click on **File / Close Project for Current Session**.

On the net program start, the hidden project is displayed again.
Top open projects during a session, select the **Open Project for Current Session** option.

Permanently close project

- Open the **Administration perspective**.
- Open the respective **database** as needed.
- Open the **Projects** folder.
- Using the **right mouse button**, click on the project you would like to permanently close.
- Click on **Hide Project on Startup** in the dialog menu.

To show permanently hidden projects, select the **Show Project on Startup** option.
The hidden project remains visible in the Administration perspective and are marked in **blue**. The project is not visible in the Configuration and Analysis perspectives.

6.1 Working in the machine tree

This section introduces the machine tree and how to work with it.

Creating a machine tree

The following sections show how to create a complete branch in the machine tree - from the project level to the measurement task.

Prerequisite

The **project** has been created in the database and is visible in the machine tree. If the **project name** is not visible, proceed as follows:

- In the main menu, select **file / open project for current session**. A dialog window appears.
- Double click on the desired **project**. Now, the project name appears as top tree entry.

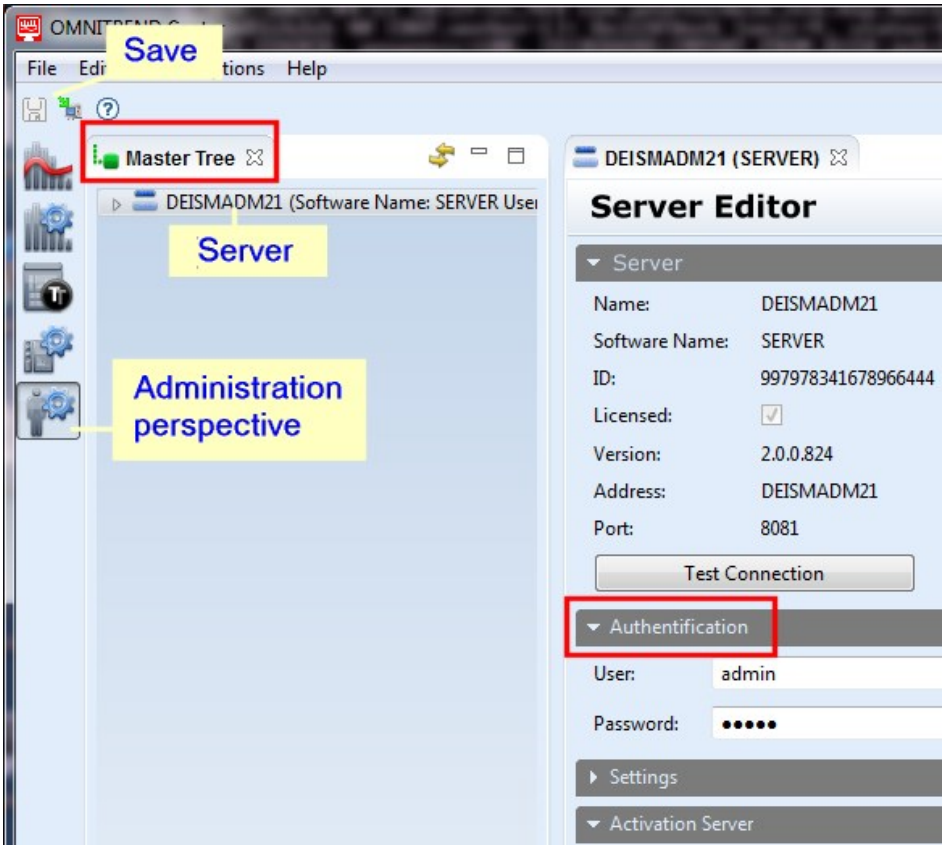
The **measurement templates** and **sensors** required for the measurement tasks are visible in the database.

You must at least have the **specialist** user role to create and edit machine tree elements.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1]Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

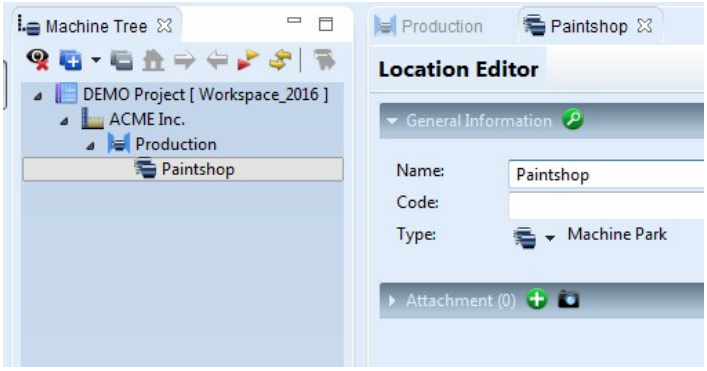
1. Location

This hierarchy element is used to structure and location of the machine trains in an asset. Multiple location planes can be created for extensive assets with a complex structure.

Procedure

- Open the **configuration perspective**.
- Using the right mouse button, click on the **project**.
- Select **add / location**. The **location editor** appears.
- In the **general** section [1], change the **name** and the **type** if necessary. If an internal label is relevant to the location, enter it into the **code** field. Using the **show additional information** button, you can overlay other information about this hierarchy element.
- You can add additional information in the form of a **file** or a **screenshot** if necessary in the **asset** section.
- Then save the changes (CTRL + S).
- Repeat the procedure correspondingly in order to create a further plane of the same type.

[1] Grouping of related functions and fields in the Editor window



2. Machine train

This hierarchy represents a **machine train** in which there are at least two machines connected to each other.

Procedure

- Using the right mouse button, click on the location to which you would like to add the machine train.
- Select **add / machine train**. The **machine train editor** appears.
- Change the following parameters in the **general** section if necessary:
  - **Name**: Label for the machine train
  - **Code**: Internal label for the machine train
  - **Type**: Selection of a suitable machine icon
  - **Foundation**: soft or rigid. The installation type is considered in the analysis of the measurement results.
  - **Expected Machine Speed**: RPM at the reference measurement location; this value is used to calculate the kinematic frequencies in the machine train if now RPM measurement is intended or possible on-site.
  - **Power**: The power of the machine train is considered in the analysis of the measurement results.
  - **Criticality**: . Using the criticality level[1], you define the relevancy of the machine train for the production process.
  - **Route Measurement Schedule**: Here you define the time intervals at which the measurement locations are to be measured.
- Compile the machine train in the **kinematic models** section and position the measurement locations on the machines (see step 3 and 4 in this regard).

  To simplify the configuration, the machine tree is only shown up to the machine train plane as standard. All subordinate planes can be created directly in the machine train editor via a **graphical depiction field** (machines, measurement locations) and via an **assignment table** (measurement tasks).

  The machine train is expanded accordingly in the background and can, if necessary, be shown up to the lowermost plane in **expert view**.
- Assign the measurement tasks to the measurement locations in the **measurement task** section (see section 5 in this regard).

[1]Criticality is a property of a machine train. It is used to differentiate between aggregates important for production and auxiliary aggregates with less production process relevance. Application: Filter criterion for the machine tree.

- You can add additional information in the form of a **file** or a **screenshot** if necessary in the **asset** section.
- Then save the changes (CTRL + S).

3. Machine

This hierarchy element represents the **machine type**.

Procedure

- Open the **kinematic models** section in the **machine train editor**.
- Click on **new**. A selection menu appears.
- Click on a **category** and then on the desired **machine type** (e.g. simple machine/motor). A machine image appears in the graphical depiction field.
- Drag the machine image with mouse to the desired position and click on it to store it. You can change the position of the machine image at a later stage using drag&drop. Change the **name** in the machine editor if necessary. Double-click on the machine image to open the machine editor.
- Add a further machine (e.g. simple machine, fan).
- Assign the individual machines in such a way that they are connected to each other by the connectors in a manner that reflects the reality as closely as possible. To rotate and mirror the machines, use the functions underneath in the local icon bar.

  Editing functions

  The following editing functions are available in the **local icon bar**:

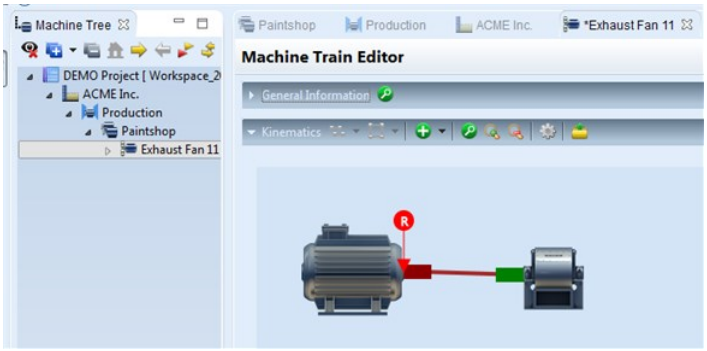
  - **Fit to viewport**: Fit the view of the elements on the display field to the visible area.
  - **Zoom in / Zoom out**: Enlarge / reduce the view.
  - **Settings**: Display the label of the machines and connectors
  - **Open editor**: Open the kinematic model editor for the **machine train**

  The following editing functions are available in the **context menu of the machine** (right mouse button)

  - **Edit**: Open the machine editor
  - **Delete**: Delete machine
  - **Duplicate**: Duplicate machine
  - **Disable / enable in route** / : Activate or deactivate a machine including all measurement locations and measurement tasks in a route.
- To connect the machines, drag a machine close to another machine until the two connectors are connected to each other by means of a red **even**. To delete the connection, click on the even with the right mouse button and select **delete**.

  The configuration of the corresponding **kinematic model** as well as adaptation of the route measurement schedule for the measurement locations on the machine is done in a separate editor. Fur-

ther details can be found in the **configuring a kinematic model** and **machine editor** sections (see the link under the associated topics).



4. Measurement location

This hierarchy element represents the **measurement location** on the machine. In addition to machine-associated measurement locations, measurement locations can also be created on the machine train plane (e.g. for foundation vibrations), or on the location plane (e.g. for visual inspections of piping).

Procedure

- Click on **new** in the list field for the **measurement location pool** . The measurement location pool is located on the right next to the graphical depiction field.
- Select a suitable **measurement location type** (e.g. measurement location for vibration). The measurement location appears in the measurement location pool.
- Change the name of the measurement location if necessary: Mark the measurement location and press the F2 function key.
- Drag the measurement location per drag&drop onto the **machine image** and position it at the location of the installation (e.g. motor drive side horizontal - radial). Depending on the measurement locations and machine type, the following actions are also to be carried out accordingly:
    - **Vibration Measurement Locations**: Use the icon to specify the **measurement direction**. The peak on the icon adapts accordingly if it is moved over the border of the machine image.
    - Machines with multiple **frequency domains**[1]: Specify whether the vibration measurement location is installed on the input side or on the output side.
    - Measurement locations on the **machine train plane**: Drag the measurement location icon onto a free position away from the machines.
    - Measurement locations on the **location plane**: Create the measurement locations directly in the machine under the location hierarchy.
- Repeat the procedure accordingly for all other measurement locations.
- Specify the **reference measurement location** for the **machine speed** on the machine train. The following scenarios are possible:
    - **No RPM measurement**: An RPM measurement on-site is not planned and/or not possible. The RPM is adopted from the database (**general / expected machine speed** section) and related to the reference measurement location. The first connector to have been created on the machine is marked as the reference measurement location. If necessary, the marking can also be placed on a different connector via the context menu (right mouse button).

[1] Area of a machine in which the same RPM or rotational frequency occurs.

- **Only one measurement location for RPM measurement is created**: The RPM measurement location is automatically marked as the reference measurement location .
- **Multiple measurement locations for RPM measurement are created**: Click on the intended reference measurement location with the right mouse button and select the **machine train reference speed** option.

- Then save the changes (CTRL + S).

> The corresponding measurement tasks are assigned automatically with regard to measurement locations for **RPM** and **temperature**.
>
> Specific features of measurement locations for **orbit measurement** and **Triax sensor**: One measurement location is created for each signal path.
>
> Further configuration options for each measurement location type are available in the **measurement location editor** (see the link under the related topics).

5. Measurement Task

This hierarchy element contains all requisite information for **conducting a measurement**.

Procedure

- Open the **task settings** (measurement task) section. In this section you create the measurement tasks for each measurement location using the **tables** shown.
- Click on **add...** in the last line of the table (add...). A dialog window appears.
- Select a suitable **measurement template** from the list and click on **finish**. The measurement task now appears in the left-hand column.
-

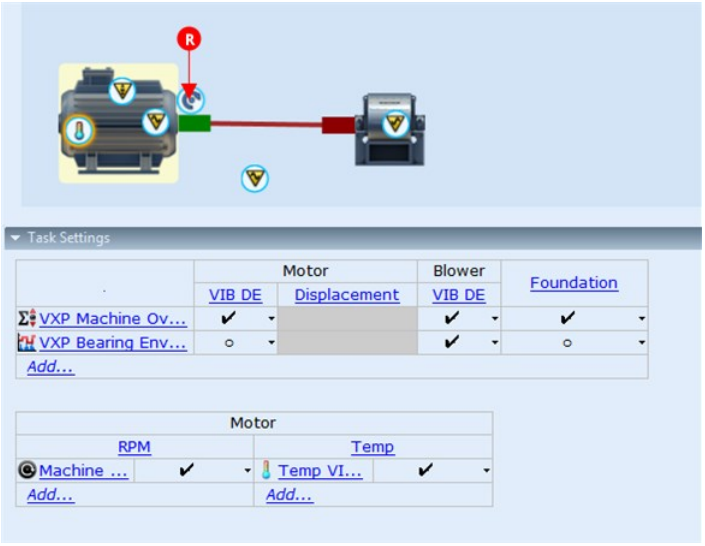
> Vibration measurement tasks are automatically set up and activated at every suitable measurement location.

- If necessary, change the **status of the measurement task** for each measurement location. To do so, click in the corresponding cell in the table and select one of the following options:
  - **Active** ✓ : Measurement task is measured at the measurement location
  - **Disabled O**: Measurement task is not measured at the measurement location.
  - **Delete X**: Delete measurement task at the measurement location.

> To set the status of the measurement task for all measurement locations **at the same time**, proceed as follows:

Click on the measurement task with the right mouse button and select the desired option in the dialog menu that follows (**activate or disable for all measurement locations** or **delete**)

- Repeat the procedure for every other measurement task.
- Then save the changes (CTRL + S).



Division: Vibration measurement locations are managed in a table. All other measurement locations are compiled in a second table.

Structure: The header at the top indicates the names of the **machines**. The second header contains the assigned **measurement locations**.

TIP: If you move the mouse pointer over an entry in the header, the corresponding icon will be highlighted in the graphical depiction field.

The left column contains the **measurement tasks** for the machine train.

Content: The icons in the **table cells** indicate whether the measurement task at the respective measurement location in a route is measured or not.

Table cells with a **gray background** indicate that the measurement task at the measurement location cannot generally be measured as the sensor is not compatible with the measurement settings for example.

Creating a machine tree with machine templates

The procedures described above can also be carried out in one step if you use an appropriately configured machine template comprised of a location, machine train and machine.

When adding a **machine template**, in which **VIBCODE** or **multiplexer** measurement locations are contained, check whether theID[1]was changed or retained. Adapt these where necessary.

Online device in the machine tree

The measurement tasks for an **online device** are created on the channels and are thus contained in the measurement configuration. To be able to assign the measurement data of a machine and the measurement

[1]VIBCODE number / MUX number

configuration to a project, you link the measurement configuration to the machine tree.

Further details in this regard can be found in the **linking a measurement configuration to the machine tree** section (see link under related topics).

Machine Editor

Opening the machine editor

To open the machine editor perform one of the two following procedures:

1. Machine image

- Open the **machine train editor**.
- Double click on the respective **machine image** in the **kinematic model** section.

2. Machine tree

- Double click on the respective **machine icon** in the machine train.

Settings in the machine editor

The following parameters for a machine can be defined or adapted in the machine editor:

General section

- **Name / Code**: Name for the machine in plain text and, if necessary, in coded short form.
- **Power**: The power value from the machine train plane is entered in this field as standard. To adapt the value, activate the **overwrite** option and enter the new value.
- **Machine type**: Change the machine type here if necessary. Only the machine types from the originally selected category can be selected.

Kinematic model section

Here you can create additional measurement locations on the machine. You need to adapt the measurement task to the machine train plane.

- Double click on the machine image to open the **kinematic model editor for the machine**.

Offline settings section

Here you enter the parameters for route-based data acquisition on the machine. Under **route measurement schedule**, you can **overwrite** the setting from the machine train plane.

Attachment section

Here you can add additional information in the form of a **file** or a **screenshot** if necessary.

Measurement Location Editor

Opening the measurement location editor

- Double click on the measurement location icon.

Settings in the measurement location editor

The following parameters for a measurement location can be defined or adapted in the measurement location editor:

General section

- **Name / Code**: Name for the measurement location in plain text and, if necessary, in coded short form.

- **Type**: Here you can make subsequent changes to the type of a vibration measurement location. Measurement locations for a standard sensor, for a sensor on the multiplexer (MUX) or for a VIBCODE sensor can be selected.
- **Route Settings**: Here you can deactivate the measurements at the measurement location for a route.
- **Measurement Setup**: With regard to RPM measurement locations, here you determine how many sensor counter pulses correspond to a complete rotation.

Positions section

- **Rotational Direction**: Rotational direction of the shaft in relation to the sensor arrangements (only orbit measurement location).

Measurement location section

- **Angle to measurement direction**: Measurement direction of the individual sensors or of the three sensor axes (only orbit and triaxial measurement location).

Measurement location address section

- Here you configure the address for a **MUX measurement location** according to the following scheme: MUX group, MUX number, and MUX channel number.

VIBCODE Settings section

- **VIBCODE Number**: Here you can change the suggested coding for the VIBCODE measurement location.

Offline Settings section: Here you enter the parameters for data acquisition on a route.

- **Sensor Settings**: You activate the **permanently mounted sensor** option for a remote measurement location and select the respective sensor.
- **Route Measurement Schedule**: **Overwrite** settings from the machine plane.
- **Triaxial Sensor**: Adapt the arrangement of the sensor axes to the measurement direction.

Kinematic models section

- Frequency Domain[1]: Area on the machine that you would like to link to the measurement location.

Online Settings section

- Here you can find information about the assigned online device, sensor, and channel.

Measurement locations can have measurement tasks for portable measuring devices and/or online devices assigned to them.

Measurement Task Editor

Edit measurement tasks

Perform one of the two following procedures depending on whether you wish to edit a measurement task simultaneously at multiple measurement locations in **multi edit mode** or change the settings for the measurement task at only one measurement task:

1. Editing a measurement task simultaneously at multiple measurement locations (multi edit)

[1]Area of a machine in which the same RPM or rotational frequency occurs.

- Open the **machine train editor**.
- Click on the respective measurement task in the **measurement task** section.

> If the measurement task has been created at multiple measurement locations, the measurement task editor opens in **multi edit** mode. Here you can change the parameters at all relevant measurement locations simultaneously.

2. Editing a measurement task at one measurement location

- Double click on the respective **measurement task icon** at the respective measurement location in the machine tree.

Settings in the measurement task editor

The following parameters for a measurement task can be defined or adapted in the measurement task editor:

General section

- **Name / Code**: Name for the measurement task in plain text and, if necessary, in coded short form.

General Task Information section

- **Measurement**: Information about **measurement type** ('type') and **parameter**.
- **Sensors**: The sensor displayed is for information only. With regard to measurement tasks for portable measuring devices, select the sensor when transferring the route to the measuring device. In the case of measurement tasks for online devices, the sensor is assigned within the scope of the measurement configuration.
- **Route Settings**: Here you can deactivate the measurement task for route-based data acquisition.
- **Task Template Reference**: Information about the task template used.
- **Measurement Information**: Information about measurements that have already been conducted.

Measurement Setup section: Here you can find specific measurement settings for each measurement task.

Data Source section: Here you can define the data source for the X and Y axes for the **XY plot** measurement task. Measurements of characteristic single values are permissible only.

Normalization Parameter section: Here you can activate normalization of the shock pulse measurement values and adjust the necessary parameters.

Visual Inspection Settings section: Here you can define the individual states in a numerical sequence for the **visual inspection** measurement task. If necessary, you can mark specific states with a **threshold** attribute.

Alarm Editor - Table / Graph section: The thresholds for measurement tasks delivering characteristic values or a time waveform, are defined in the alarm editor.

Band Editor - Table / Graph section: The frequency bands for measurement tasks delivering spectral measurement data (amplitude spectrum, envelop spectrum, cepstrum, etc.), are defined in the band editor

Configuring a kinematic model

A kinematic model is **automatically** created with a machine in the database. If multiple machines are put together as a machine train, the corresponding model is also generated automatically.

A. Opening the kinematic model editor for a machine train

- Open the **kinematic models** section in the machine train editor.
- Click on **open editor** in the local icon bar .

The kinematic model for a **machine train** shows the calculated frequencies of all components in the machine train.

The **frequencies** section is for information only. It is used for simulating the characteristic frequencies by varying the reference speed, rotational direction, conditions, influences parameters.

B. Opening the kinematic model editor for a machine

- Open the **kinematic models** section in the **machine editor**.
- Click on **open editor** in the local icon bar .

The kinematic model for a **machine** is dependent on the category of the machine. Simple machines with one frequency domain[1] are depicted in the model by means of the bearings installed and by the variable speed and fixed speed excitation sources on the machine. Machines with two or more frequency domains (e.g. gearbox) have a complex model design.

B.1 To configure a kinematic model for a simple machine (e.g. motor):

- Supplement the data in the **general** section as needed (name, description).
- You can attach documents, photos, and supplementary material for the kinematic model in the **asset** section.
- Enter the roller bearings installed in the machine into the **bearing** section:
  - Mark the **rot. speed** entry.
  - Click on **new element** in the local icon bar. A dialog window appears.
  - Select the bearing **manufacturer** to filter the list.
  - Select the respective **bearings** from the list. Click on **finish** to finish.

    For Online-CMS[2] a maximum of 5 elements is permitted.
- In the **frequency groups** section, you can enter the characteristic frequencies for the machine vibrations:
  - Mark the **rot. speed** entry.
    - Click on **Add** in the local icon bar. A dialog window appears.
    - Enter a **name** in the **General** section.
    - In the **Absolute Frequencies** and/or **Relative Frequencies** section, click on **New Element**. A dialog window appears.
    - Enter a **name** and enter the frequency in **absolute** units and/or in **multiples** of the speed. Click on OK.
    - Click on **Finish** to finish entering characteristic frequencies.

    For Online-CMS[3] a maximum of 5 elements is permitted.
- The calculated characteristic frequencies are indicated in the **frequencies** section relative to the **reference speed**.

  The **frequencies** section is for information only. It is used for simulating the characteristic frequencies by varying the reference speed, rotational direction, conditions, influences parameters.

[1] Area of a machine in which the same RPM or rotational frequency occurs.

[2] - VIBGUARD, VIBRONET Signalmaster -

[3] - VIBGUARD, VIBRONET Signalmaster -

B.2 To create a kinematic model for a gearbox

- Supplement the data in the **general** section as needed (name, description).
- You can attach documents, photos, and supplementary material for the kinematic model in the **asset** section.
- In the **kinematic models** section, click on **new element** and select the gearbox type (**bevel-helical gear unit** or **planetary gear set**. A machine image appears in the graphical depiction field.
- Double click on the machine image in order to open the extended kinematic model editor. The following sections are to be configured in this editor depending on the gearbox type:
  - **Shafts** and **bearings** (bevel-helical gear unit)
  - **Gearbox parameters** and **bearings** (planetary gear set)
- Enter the number of teeth for every gear in the bevel-helical gear unit in the **shafts** section. To create additional gear shafts, click on **Add new entry** in the local icon bar.
- Configuring the design of a planetary gear set in the **gear parameter** section
- Enter the roller bearings installed in the gearbox in the **bearing** section:
  - Mark the first entry, e.g. **shaft 1**(= frequency domain 1).
  - Click on **Add new entry** in the local icon bar. A dialog window appears.
  - Select the bearing **manufacturer** to filter the list.
  - Select the respective **bearings** from the list. Click on **finish** to finish.
  - Repeat the procedure for every other gear stage.

    For Online-CMS[1] a maximum of 5 elements is permitted.
- The calculated characteristic frequencies are indicated in the **frequencies** section relative to the **reference speed**.

  A **linear multistage gearbox** can be compiled from the two gearbox types. Repeat the described procedure in the **kinematic models** section and put the individual gearbox types together.

B.3 To create a kinematic model for a machine with speed converter (e.g. belt drive)

- Supplement the data in the **general information** section as needed (name, description, icon).
- You can attach documents, photos, and supplementary material for the kinematic model in the **asset** section.
- Enter the **ratio** of the two stages in the **stair** section. Change the **labels** as needed.
- In the **frequency groups** section, you can enter the characteristic frequencies for the machine vibrations:
  - Mark the first entry, e.g. ***input stage*** (= frequency domain).
    - Click on **Add** in the local icon bar. A dialog window appears.
    - Enter a **name** in the **General** section.
    - In the **Absolute Frequencies** and/or **Relative Frequencies** section, click on **New Element**. A dialog window appears.
    - Enter a **name** and enter the frequency in **absolute** units and/or in **multiples** of the speed.

[1]- VIBGUARD, VIBRONET Signalmaster -

Click on OK.

- Click on **Finish** to finish entering characteristic frequencies.

> For Online-CMS[1] a maximum of 5 elements is permitted.

- The calculated characteristic frequencies are indicated in the **frequencies** section relative to the **reference speed**.

> The **frequencies** section is for information only. It is used for simulating the characteristic frequencies by varying the reference speed, rotational direction, conditions, influences parameters.

User Defined Machine Kinematic Model

You need to create and configure the kinematic model for a user defined machine.

Opening the kinematic model editor

- Open the **kinematic models** section in the **machine editor**.
- Click on **open editor** in the local icon bar .

In the following section you will learn about the control elements and operating options in the kinematic model editor for a user defined machine.

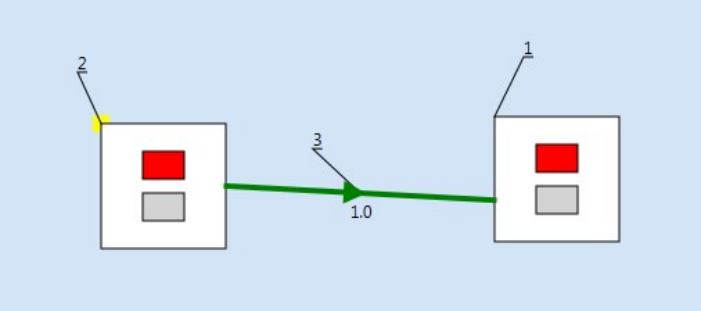
Kinematic models section

Control elements in the local icon bar

- **Add new entry** : Click here and select one of the element categories:
  - You can position a **frequency domain** freely.
  - To create a **connector** you need to click on the relevant frequency domain after selecting the element.
  - To create an **RPM converter** you need to use the mouse to drag a line between two frequency domains after selecting the element.
- **Fit to viewport** : Click here to adjust the elements in the **graphical depiction** to the visible range.
- **Zoom in** **/ Zoom out** : You can enlarge/reduce the view here.
- **Kinematic Viewport Settings** : A dialog window appears, in which you can display the **names** of the elements. Using the **machine speed converter details** option, you can show the ratio.

Every element is activated by clicking. It remains active until a different element is activated.

[1]- VIBGUARD, VIBRONET Signalmaster -



- **Frequency Domain (1)**: Main element in kinematic model. Represents the area with constant speed. Here you configure the installed bearings and excitation sources for the machine vibrations.
- **Connector (2)**: Element for coupling frequency domains located in different machines. At least one connector must be open on every machine so that the machine can be coupled with different machines.
- **RPM converter (3)**: Element for coupling frequency domains located within the same machine. A speed change can be configured.

Configuration of the elements

Click on the respective elements to display one of the following sections:

- **Settings - Frequency Domain**: Here you enter the **bearings** installed in the respective area. In the **frequency group** field, you can configure the **absolute** and **relative machine frequencies**.
- **Settings - Connector**: Here you can enter a label and a comment.
- **Settings - Machine Speed Converter**: Here you configure the ratio between two frequency domains.
  The **simple factor** option is provided for ratios that can be expressed as numerical factor.
  The **complex equation** option covers the cases in which external influences affect the speed conversion and can be expressed by means of a functional correlation.
  You activate the **invert rotational direction** option if the rotational direction reverses when transitioning from one frequency domain to the next, as is the case with gear wheels for example. Deactivate this function e.g. for belt drives.
- **Settings - Machine**: This section appears if you click on the light-blue area away from the elements. Here you define the **conditions** and **external influences** that must be considered during characteristic frequency calculations and speed synchronization.

Linking a measurement configuration to the machine tree

The measurement tasks for an online CMS are created in a measurement configuration and assigned to the measuring channels on the device. A link to the machine tree makes it possible, inter alia, to assign the measurement data to the supervised machines.

Prerequisite

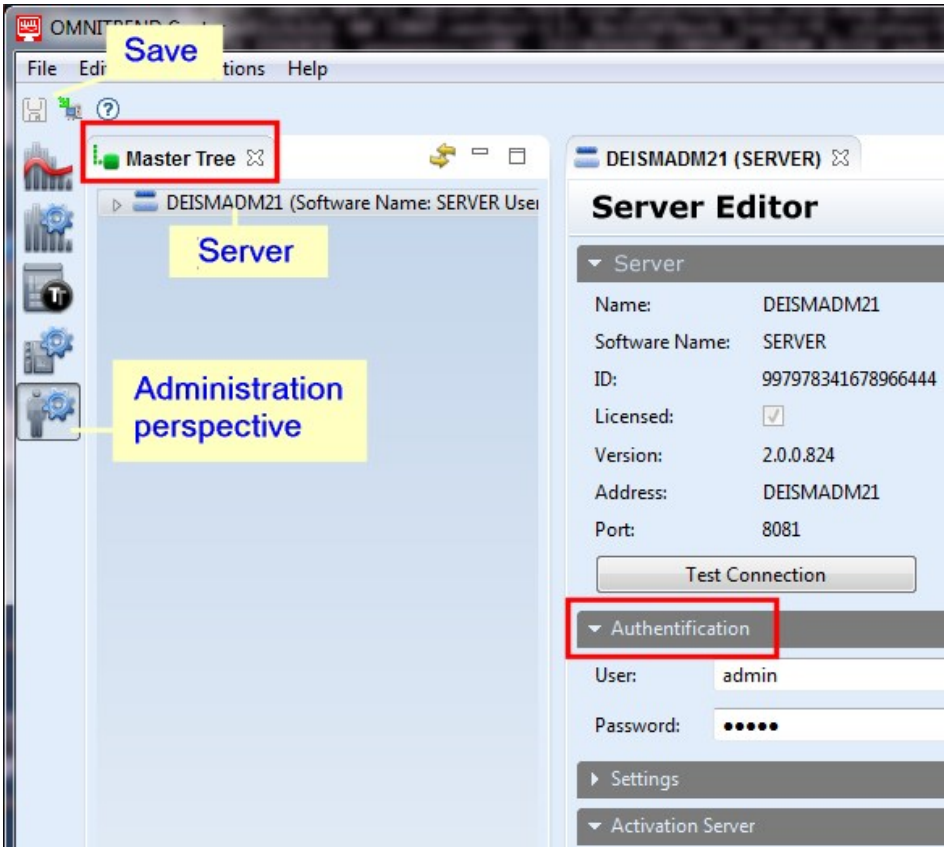
OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.

- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Procedure:

- Open the **configuration perspective**.
- If needed, create the **location**, the **machine train** and **machine** hierarchies in the machine tree.
- Open the **devices** view.
- Double click on the respective online device to open the **device editor**.
- Open the **measurement configuration** section.
- Drag a **channel group** to the corresponding **machine train** in the machine tree. A dialog window appears.
- Assign the **channels** to the supervised machines. To do so, drag the channel onto the machine image and store it at the position of the sensor installation.
- Then click on **finish**.

[1]Grouping of related functions and fields in the Editor window

- Repeat the procedure for all other channel groups, measurement groups, or individual channels.

  If you drag and drop the elements on a **machine**, you then need to place the channels in the right position in the **machine editor**.

- Click on **save** , to accept the changes.

7.1 Edit measurement task

This section contains information on editing measurement tasks.

Create task template

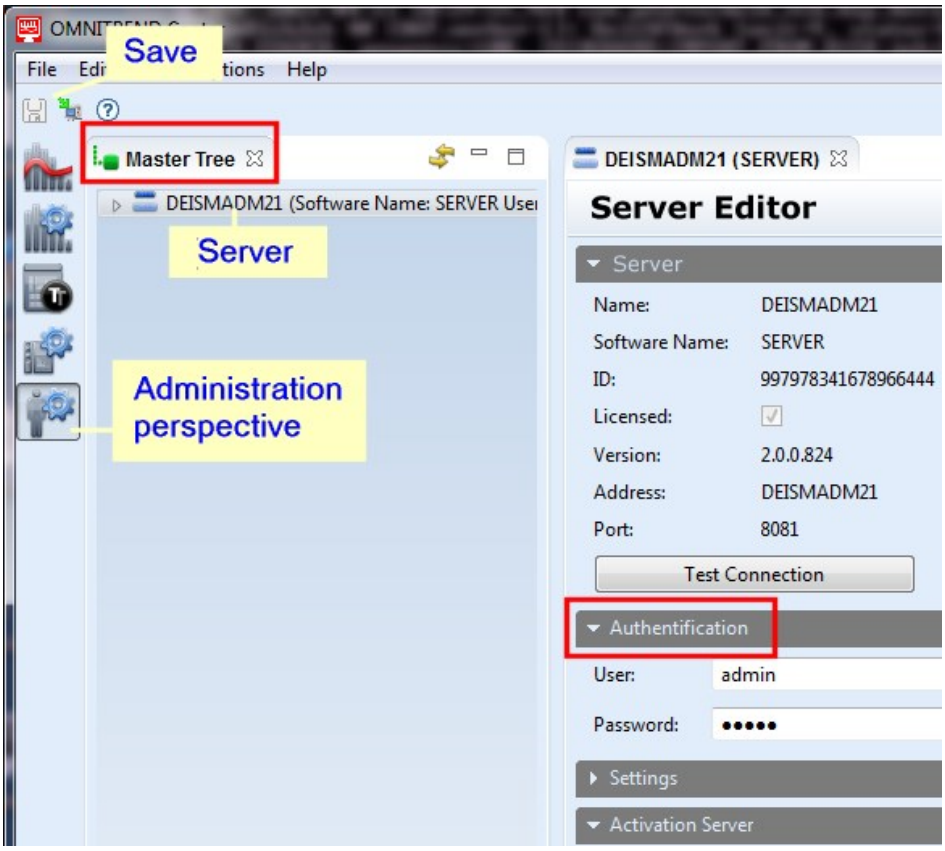
Prerequisite

OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

You can create task templates in the

- **Administration perspective** in the **Task Template** master data folder, OR
- **Configuration perspective** in the **Task Template** view.

[1] Grouping of related functions and fields in the Editor window

You can find step-for-step instructions in the **Create Further Master Data / Task Templates** section.

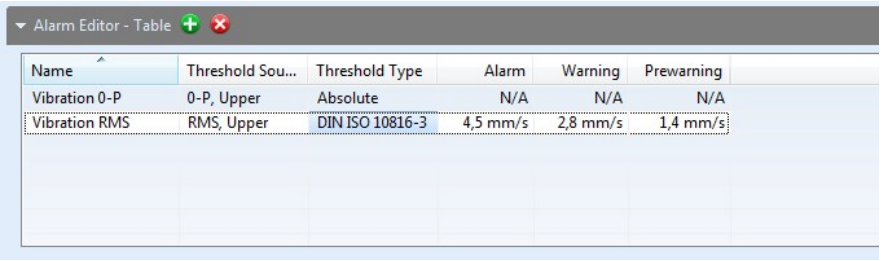
Define broadband thresholds

Broadband thresholds are **frequency-independent** and apply across the entire measured frequency range. You can define them for the following measurement tasks and/or task templates:

- Characteristic vibration values
- Characteristic shock pulse values
- Temperature
- Speed
- Process Parameters
- Time waveform
- Phase

The following parameters are described using the example of a **measurement task**:

- Open the **Configuration perspective**.
- Open the **measurement task editor**. To do so, carry out one of the following actions:
  - Open the **measurement tasks** section in the **machine train editor** and click on the respective measurement task in the table.
    OR
  - Double click on the respective **measurement task** in the **machine tree**.
    OR
  - With regard to online devices with a measurement configuration not yet assigned to a project, open the measurement task editor via the **measurement configuration**.
- Open the **Alarm Editor - Table** section.
- Select the **operating state** in the local toolbar, for which you would like to define the threshold.
- Click on **New Threshold** in the local toolbar. The new threshold appears in the table.



- Click into the respective column to enter the threshold parameters:
  - **Name**: Designation for the threshold, appears in the measurement data graph
  - **Threshold Source**: Parameter, to which the threshold refers to, and position (upper/lower) of the threshold.
  - **Threshold type**: You can also evaluate velocity measurements according to **ISO 10816-3** and/or **ISO 10816-7**. The respective thresholds are automatically applied, if you specified the **power** for the machine, and the installation type (**foundation**) for the machine train. In the case of shock pulse measurements, you can apply the standard values using **Shockpulse Standard** (15 / 10 dBsv).
  - **Alarm / Warning / Prewarning**: Here you enter the values for the three levels. For a phase measurement, you must enter a threshold for the amplitude and the angle range (from ... to) per level.
- Click on **Save** to save the changes.

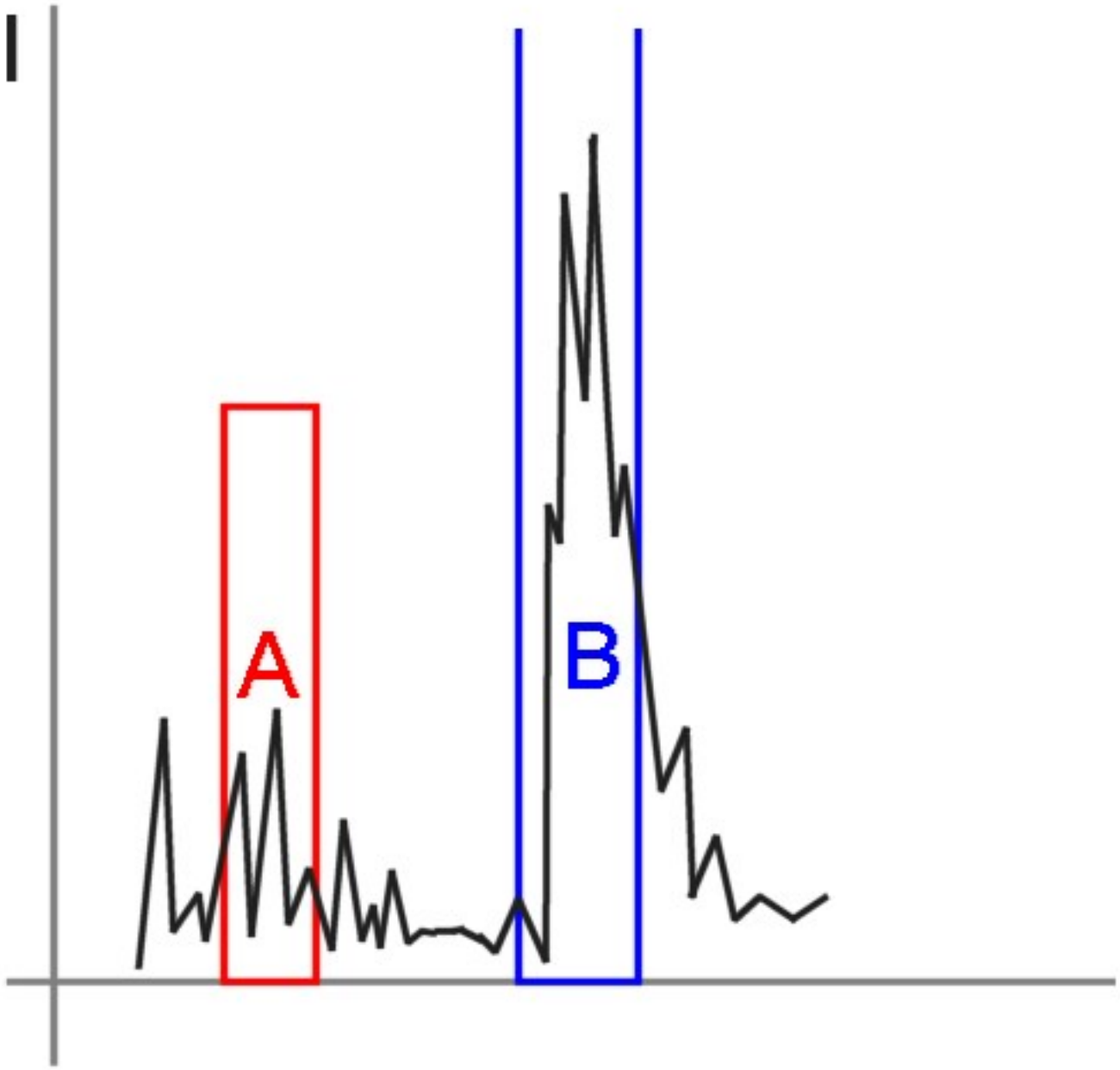
Basics: Characteristic band values and band alarms

Many vibration-induced machine errors can be detected in a spectrum through a typical line pattern. Such errors can be easily and reliably controlled through recording and monitoring of **characteristic values** in the respective spectral ranges.

Term definition

- **Characteristic band value**: Characteristic vibration value in a defined frequency band, e.g. RMS values, 2 Hz - 1 kHz
- **Band alarm**: Characteristic band value with three-level threshold monitoring (prewarning, warning, alarm)
- **Band**: Characteristic band value and/or band alarm
- **Measurement quantity**: Acceleration, velocity, displacement

You usually define bands in the context of a **measurement task**. The following figure shows the difference between a characteristic band value and a band alarm:



A: Band alarm with a threshold (alarm); B: Characteristic band value without meaning

Characteristic band values

The following overview shows the characteristic values that can be calculated from the frequency band:

Name	Description
Power in Band	Signal power in the frequency band
Peak in Band	Maximum signal amplitude in the frequency band
RMS	Effective value (root mean square) in the frequency band
0-P	Zero-peak value in the time range
P-P	Peak-peak value in the time range
Crest	Crest value in the time range
0-P Calc.	Zero-peak value calculated from the RMS value
P-P Calc.	Peak-peak value calculated from the RMS value

Bands can be defined for different purposes. Together with the specific device properties, this results in different types of bands that are summarized in the following overview.

Band types
Application, properties, and compatible devices

Name	Description	Device
Base band	Characteristic value across the entire frequency range of the spectrum; Alarm bands as well as spectrum and frequency marker bands an be removed from the calculation (option: "Gap in Base Band"); Measurement quantity is fixed and specified in the measurement setup; One base band per measurement task only	VIBXPERT, online device
Broadband (auto)	Characteristic value across the entire frequency range of the spectrum; Measurement quantity can be changed; Can only be defined in measurement group	VIBXPERT
Spectrum band	Characteristic value in frequency band; Bands are within the frequency range of the spectrum; Measurement quantity is fixed and specified in the measurement setup; Can only be defined in post processing group for VIBXPERT	VIBXPERT, online device
Trending parameter band	Characteristic value in frequency band; Measurement quantity is fixed and specified in the measurement setup Measurand can be changed; Can only be defined in measurement group;	VIBXPERT

Name	Description	Device
ISO band	Characteristic values in the frequency band acc. to ISO 10816-3/-7 (e.g. 10 Hz-1 kHz); Threshold available from standard, if machine power and machine train foundation are provided; Bands are in the frequency range of the device; Measurement quantity is fixed and specified in the measurement setup	VIBRONET Signalmaster
Alarm band	Same as spectrum band, but evaluation on the device only without saving; For evaluation in OMNITREND Center, the "Evaluation only" option must be activated in the band editor.	VIBXPERT
Single value band	Additional characteristic values in the spectrum band, trending parameter band, or alarm band; Position and width fixed and defined by the main band mentioned above; Thresholds can be freely defined; Measurement quantity can only be selected for the trending parameter band	VIBXPERT, online device
Frequency marker band	Characteristic value in the frequency band; Center frequency and width from kinematic model	VIBGUARD
Harmonic band; **Sub harmonic band;** **Side band**	Characteristic values in frequency bands with a certain distance from the main band; • Main band: Spectrum band, trending parameter band, alarm band, frequency marker band; • Harmonic: 1x, 2x, 3x,.. Center frequency of the main band; • Sub harmonic: 1/2x, 1/3x, 1/4x,.. Center frequency of the main band; • Side band: Center frequency of the main band ± X; Measurement quantity is fixed and specified in the measurement setup	VIBXPERT, online device

Bands can be loaded on the device with the measurement task or only defined for **post processing** in OMNITREND Center. In the first case, the device calculates the characteristic band value, saves it, and performs a threshold analysis as needed. In the second case, the characteristic band value is only calculated and analyzed after the measurement data was imported into the software.

Band groups
Elements for band grouping:

Name	Description
Measurement group	Bands that are loaded on the device (maximum 20 for online devices, maximum 5 for VIBXPERT)
Post processing group	Bands that are not loaded onto the device

In the case of an online device, band alarms can be specified for every **operating state** of the asset.

More about operating states

Every machine generates more or less severe vibrations during operation. Vibration level monitoring using thresholds is only meaningfully possible, if the machine operates under constant conditions or if the bands are adjusted to the changing operating states of the machine.

For example, the signal levels usually increase with increased speed. Speed-dependent characteristic damage frequencies shift within the spectrum. Thus, the bands must be synchronized (updated) for this operating state and the thresholds increased to avoid false alarms.

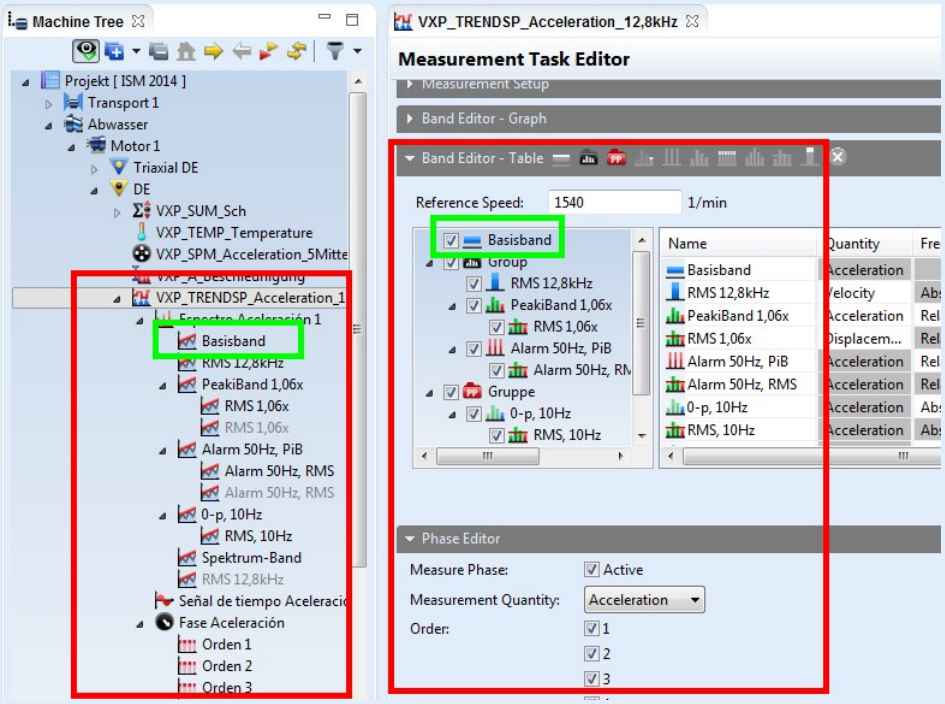
In OMNITREND Center you can consider these "dynamic" cases by defined up to 6 different operating states for a train. Every operating state is characterized by one or several operating parameters (e.g. speed, engine current). The characteristic band values are recorded and the respectively adjusted thresholds monitored separately by the operating state of the train.

Presentation in the machine tree

The characteristic band values can be found as subordinate partial result of the measurement task:

E x a m p l e :

VIBXPERT trending spectrum with characteristic band values and phase measurement as partial result



Define Characteristic Band Values and Band Alarms

Characteristic band values / band alarms are created in the context of a **measurement task**.

You can also create bands in a **task template**. However, the information only available in the context of a measurement task is missing.

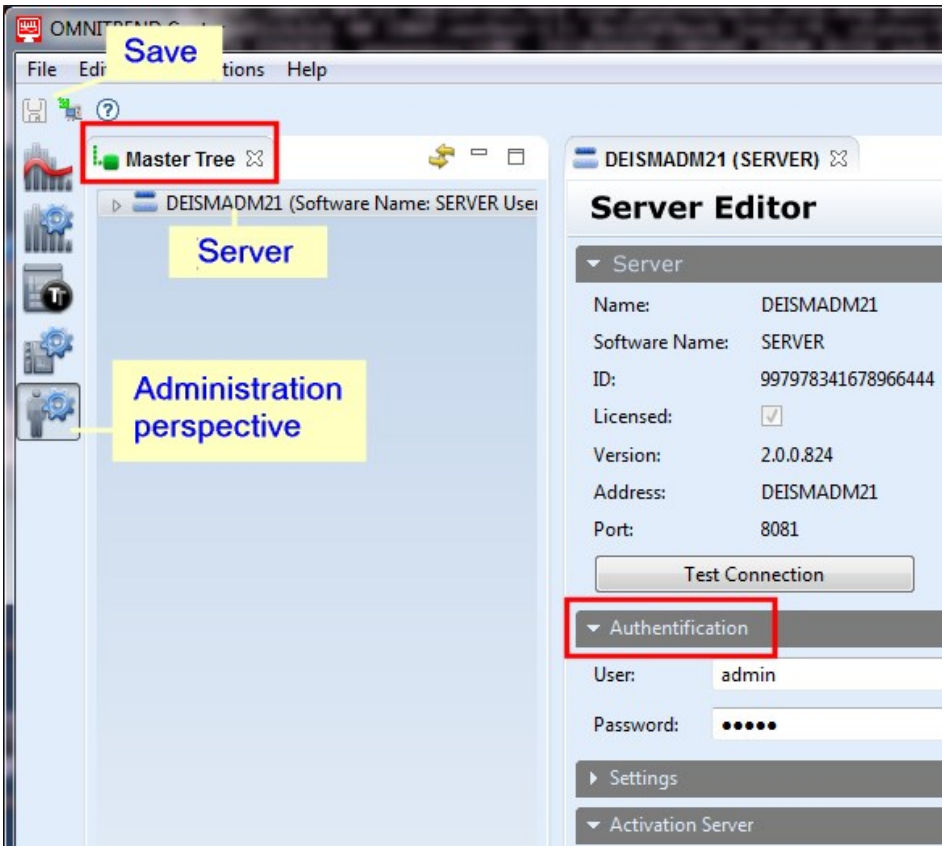
> **E x a m p l e :**
>
> - **Frequency marker bands** require a kinematic model for the machine and/or the machine train.
> - Limit values according to **ISO 10816-3/-7** require information about the machine power and foundation, on which the machine train is installed.

Prerequisite

You must at least have the **specialist** user role for creating and editing characteristic band values / band alarms.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



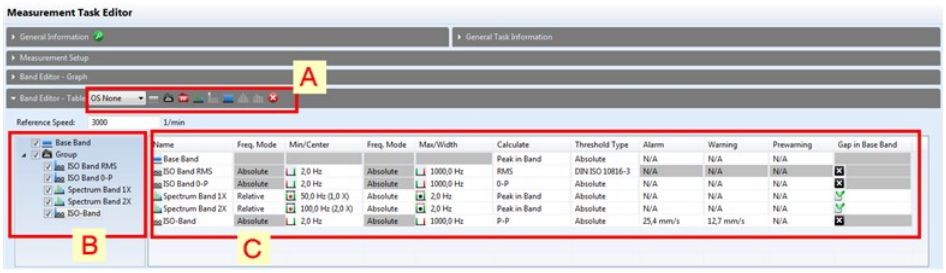
[1] Grouping of related functions and fields in the Editor window

User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Open band editor

- Open the **Configuration perspective**.
- Open the **measurement task editor**. To do so, carry out one of the following actions:
  - Open the **measurement tasks** section in the **machine train editor** and click on the respective measurement task in the table.
    OR
  - Double click on the respective **measurement task** in the **machine tree**.
    OR
  - With regard to online devices with a measurement configuration not yet assigned to a project, open the measurement task editor via the **measurement configuration**.
- Open the **Band Editor - Table** section.

Band editor at a glance



- **A**: **Toolbar** with selection menu for operating states, band types, and delete function.
- **B**: **Band tree** displays the bands in a hierarchical structure and groups them by measurement groups and post processing groups .
- **C**: **Table** with band parameters. Fields marked in gray cannot be changed.

Create characteristic band value

- If needed, create the **band group** first, which should contain the characteristic band value:
  - In the toolbar, click on or .
    Alternative: Press and hold the right mouse button in the band tree and select the desired entry, e.g. **New Band Group**.
  - Double-click in the **band tree** on the new entry and enter a **name** for the band group.
- Mark the band group in the band tree, in which you would like to create the characteristic band value.
  Exception: A base band is created outside of band groups.
- In the toolbar, click on the respective band icon, e.g. for spectrum band.
- Adjust the **band parameters**:
  - **Name**: Designation for characteristic band value in the machine tree and in the measurement data view.

- **Measurement Quantity**(VIBXPERT): The measurement quantity specified from the spectrum can be changed for some band types.
- **Frequency Mode**: Absolute data in Hz (cm) or relative data in multiples of the reference speed (orders).
- **Min/Center and Max/Width**: Frequency band position and width can be specified as follows:
  - Center frequency and width
  - Right (min) and left (max) band limit

  Using the right mouse button, click on the icon and select the desired input mode to switch.
- **Calculate**: Characteristic value that should be calculated based on the frequency band.
- **Evaluation only** (VIBXPERT): Activate this option, if you would like to evaluate the characteristic value not only on the device, but in the software as well.
- **Gap in Base Band** (online device): In the case of characteristic value calculation in the base band, you can also exclude alarm, frequency marker, and spectrum bands.

- Click on **Save** to save the changes.

Create a band alarm

- Select the **operating state** in the local, for which you would like to create a band alarm.
- Enter the **alarm parameters** into the table:

  Threshold Type: Select from the following types:
  - **Absolute**: Enter the threshold as absolute value.
  - **Offset (% / + / sigma)**: The threshold is calculated based on an existing characteristic band value to which a percentage, absolute or statistic offset is added. The reference value results from a reference spectrum or from several averaged spectra that are saved in the database. The reference data is selected in the **Band Editor - Graph** section.
  - **DIN ISO 10816-3/-7**: The thresholds are automatically entered according to the machine classification (power, foundation).

  Alarm, Warning, Prewarning: Enter the evaluation thresholds here. The format depends on the selected threshold type (absolute, offset).

- Conditions of an **operating state-depending** band alarm:
  - Measurement task for **online device**.
  - Operating states are defined in the context of the **channel group**.

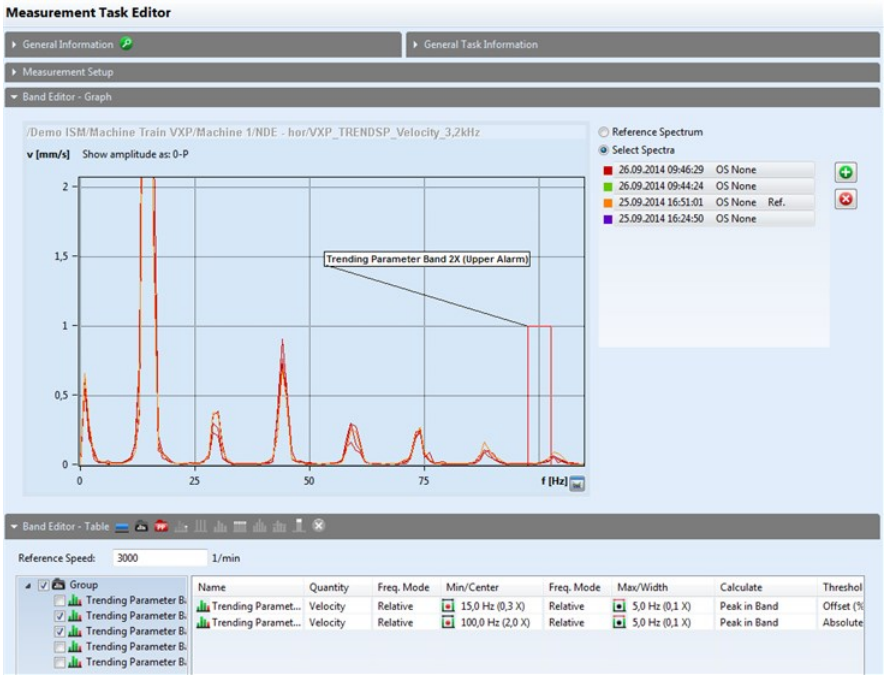
- Mark a **characteristic band value** or create a new characteristic band value.
- Click on **Save** to save the changes.

Deactivate characteristic band value / band alarm

- Deactivate the checkbox next the respective entry in the band tree.
  The entry is removed from the table and the band editor graph.
- Click on **Save** to save the changes.
  If no measurement data is available, the respective sub-result is removed from the machine tree. Otherwise, the sub-result is grayed out.

Select reference data for band alarms with offset

- Open the **Band Editor - Graph** section.



- Execute one of the following two actions:
  - If you would like to use the existing reference spectrum as reference, select the **Reference Spectrum** option.
    You define the reference spectrum in the Analysis perspective in the Measurement Data view.
  - If you would like to use several spectra, select the **Select Spectra** option.
    - Click on **Other Spectra**. A dialog window appears.
    - Select the spectra and click on **Close**.
- Click on **Save** to save the changes.

Configure trending spectrum

When you created the task template for a trending spectrum, you adjusted the main configuration settings, such as type and measurement quantity of the spectrum, frequency range, and resolution.

The following section discusses the configuration

- of the **averaging parameters**
- of the saved **time waveform**
- of the **phase measurement**

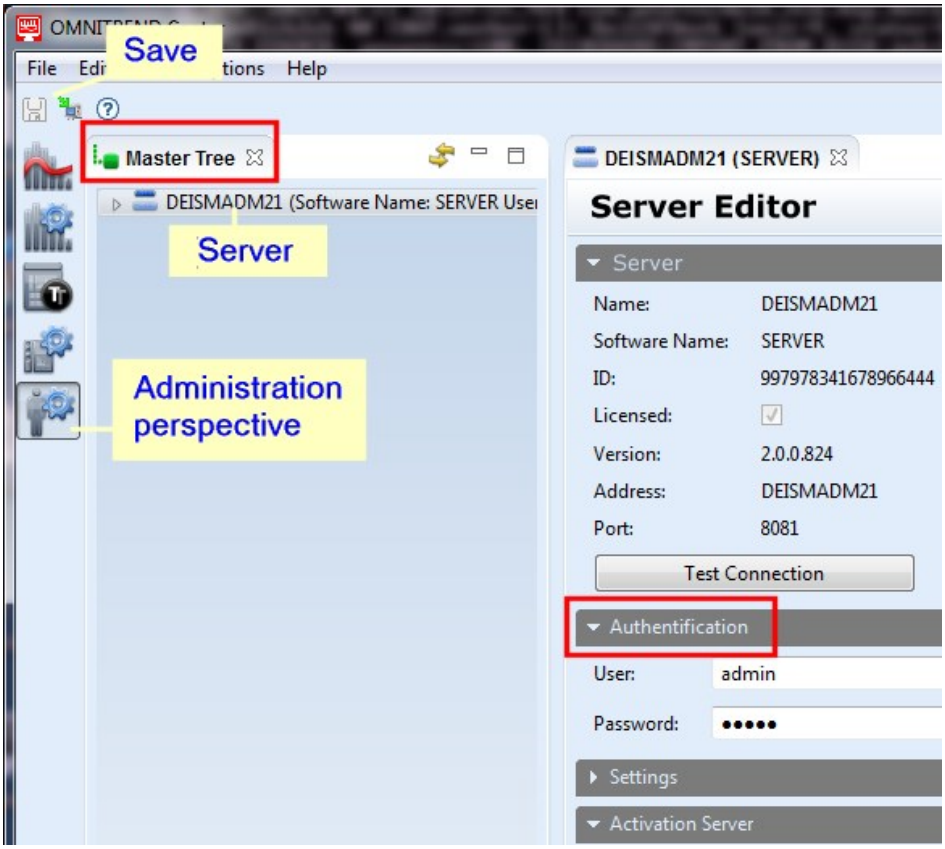
Prerequisite

OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



[1]Grouping of related functions and fields in the Editor window

User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To edit a **task template for a trending spectrum**

- Open the **Configuration perspective**.
- Open the **Task Templates** view .
- Double-click on the respective task template to open the **task template editor**.

  Use the **filter function** in the local toolbar to display the task templates for VIBXPERT.

- Open the **Measurement Setup** section. The parameters are grouped in three columns:
  - **Spectrum**: contains the setting for the spectrum; you specified them, when you created the task template.
  - **Averaging**: Here you adjust the averaging type, the number and overlap of the individual measurements, as well as the signal amplification.
  - **Time waveform**: Here you select, whether the filtered time waveform should be saved with the spectrum. You can optionally also change the measurement quantity for the time waveform. For this purpose, activate the **User Setup** option.
- Adjust the **Machine Speed Mode** to "Keyphasor" and/or "Manual", if the trending spectrum contains speed-depending measurements, calculations, or analyses.
- Open the **Phase Editor** section to assign a **phase measurement**.

  Make sure that the Machine Speed Mode option is set to "Keyphasor"

- Activate the **Measure Phase** option.
- Adjust the **measurement quantity**.
- Select the **orders** that should be displayed as partial results.

Empty page

8 Create measurement configuration

Here you learn, how to create a measurement configuration for an online device and a hand-held device.

8.1 Basics: Measurement Configuration Basics and Structure 110
8.2 Create Measurement Configuration for the VIBGUARD Online Device 114
8.3 Creating a Measurement Configuration for the VIBGUARD compact Online Device 123
8.4 Create Measurement Configuration for the VIBRONET Signalmaster Online Device 132

8.1 Basics: Measurement Configuration Basics and Structure

A **measurement configuration** controls the sequence of the data acquisition and data processing in the measuring device. It primarily comprises the measurement tasks, the sequence of such tasks as well as the measurement settings and assessment criteria.

In the case of an online device, the measurement configuration runs automatically and continuously, either at the same time on all channels or cyclically channel for channel. In the case of hand-held devices, the data is acquired at regular intervals by a user within the scope of a guided **route**.

Measurement configuration - online device

In the case of online devices, the measurement tasks are directly assigned at the device channels, and not via the machine tree. Among others, the links to the machine tree are used for assigning the measurement data to the respective machine. In the case of online devices, the measurement tasks are directly assigned at the device channels, and not via the machine tree. Among others, the link to the machine tree is used for assigning the measurement data to the respective machine and for assigning the measurement configuration to the project.

Online devices work continuously. The VIBGUARD online device records 20 channels at the same time and synchronously. Based on the technical design of the systems and the different applications of the measurement tasks, they are divided into three **measurement groups**:

Characteristic value measurement group

- *Measurement tasks*: Characteristic vibration values, process variables, speed (VIBGUARD)
- *Cycle rate*: 1 second / channel (VIBGUARD)
- *Synchronicity*: Up to 2 measurement tasks / channel (VIBGUARD)

Trending measuring group

- *Measurement tasks*: Spectrum, time waveform, phase, orbit, shock pulse, cepstrum, order analysis (VIBGUARD)
- *Cycle rate*: >1 minute / channel (VIBGUARD)
- *Synchronicity*: Up to 2 measurement tasks / channel (VIBGUARD)
- *Resolution*: Time interval, release signal

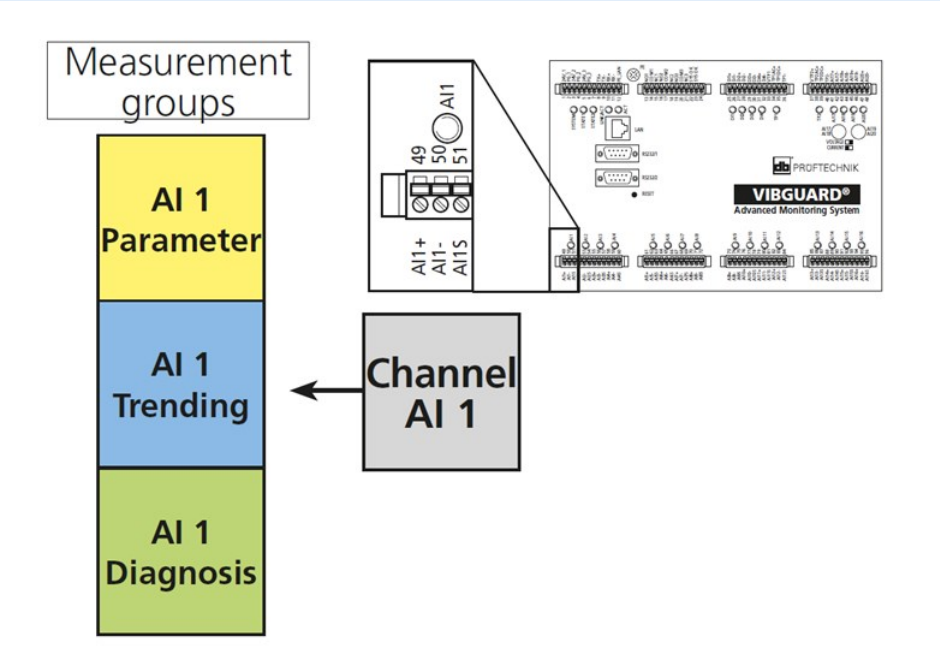
Diagnosis group

- *Measurement tasks*: Trending measurement group = envelop spectrum
- *Cycle rate*: >1 hour / channel (VIBGUARD)
- *Synchronicity*: None, up to 5 measurement tasks / channel are measured in a row (VIBGUARD)
- *Resolution*: Exceeded threshold, time interval, release signal

Using this division, the measurement task can be synchronously captured taking into account the different cycle rates and reduce the data volume to a practical extent. Specific measurement settings can be defined in the context of the respective measurement group.

> A measurement group assigns the measurement tasks in the online device. It is thus a necessary component of a measurement configuration, as no measurement can be performed without it.

Example: Measurement channel and measurement groups

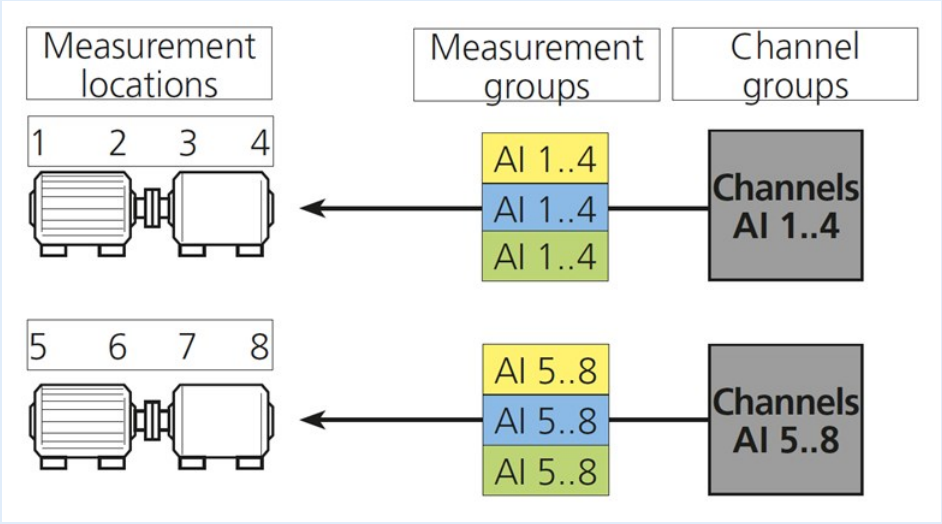


Another addition in the configuration concept of online devices is the grouping of measurement channels into so-called **channel groups**.

This way, the measurement channels and measurement locations at a machine and/or machine train can be correlated. In addition to the spacial arrangement of channel and measurement location, measurements with depending variables are also possible, such as measurements with reference speed, standardized trigger criteria for measurement groups, consideration of operating states.

Channel groups are bound to the online device. A project is only linked when the channel groups are assigned to the machine tree.

Example: Measurement locations, measurement groups, and channel groups



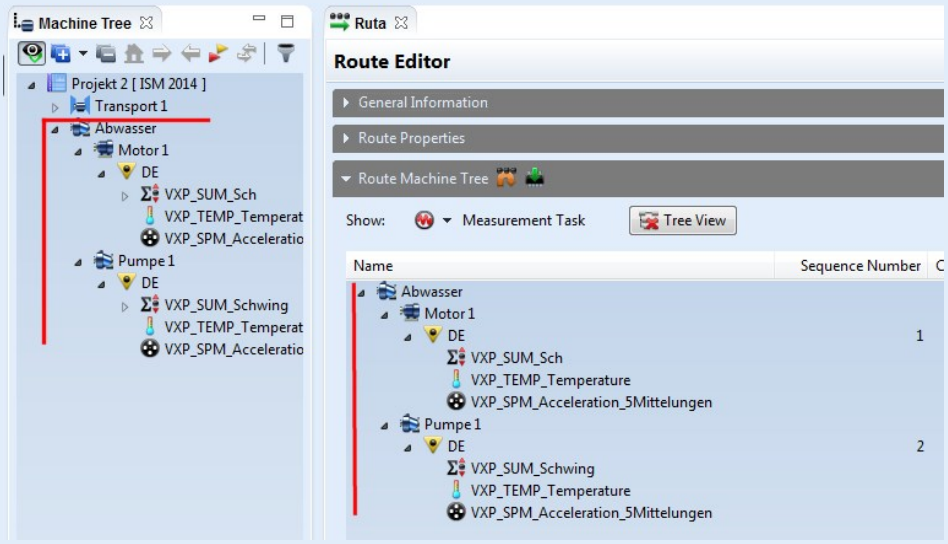
Correlations between measurement group and channel group

- A measurement group must always be created so that the measurement tasks can be measured.
- A channel group is optional. By default, all measurement channels are contained in the channel pool of the online device. The channel pool is thus a "basic channel group".
- Measurement groups are created within a channel group. Several measurement groups of the same type are permissible (characteristic value, trending, diagnosis).
  HOWEVER: One measurement group (characteristic value, tending, diagnosis) only may be active at the same time. In the case of the VIBGUARD, several diagnosis measurement groups can be active.
- Several channel groups can be created in a measurement configuration.

Measurement configuration - hand-held device (route)

With regard to hand-held devices, the assignment of the measurement tasks to the measurement location is done in either the **machine train editor** or in the **machine tree**. A route is bound to a project and can contain the entire machine tree or individual sections thereof. In the context of a route, further parameters must be specified, which are necessary for executing a route, such as history of the measurement tasks, measurement location sequence, reference measurements.

Example: Route as part of a project



8.2 Create Measurement Configuration for the VIBGUARD Online Device

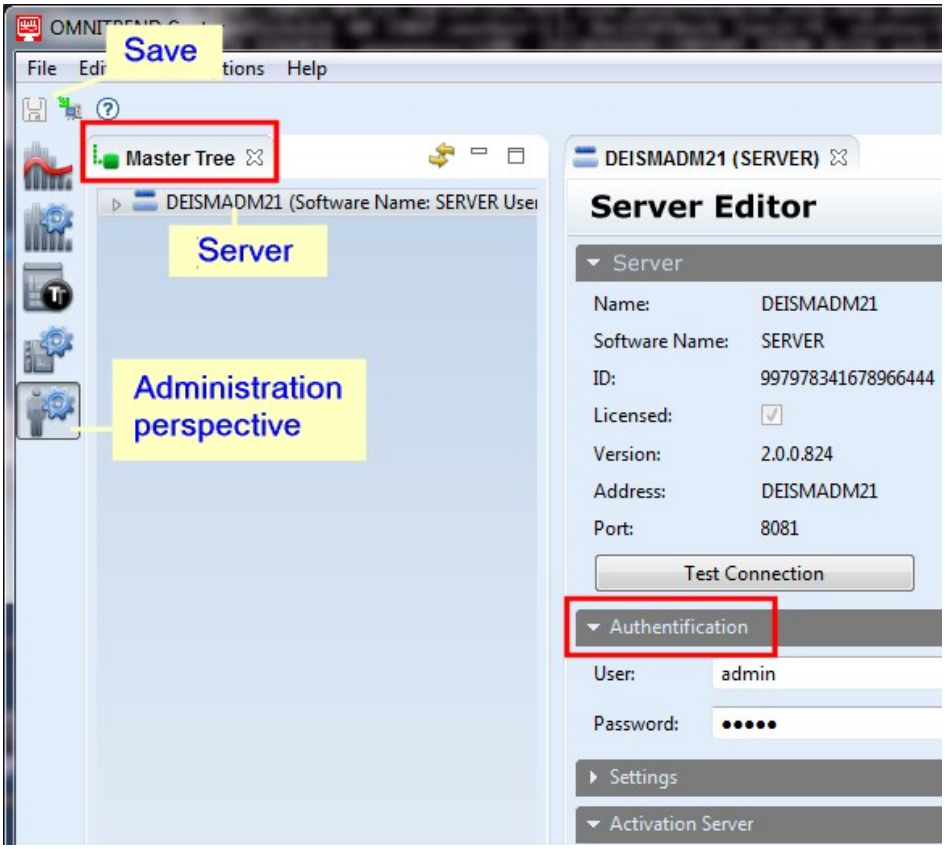
Prerequisite

OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

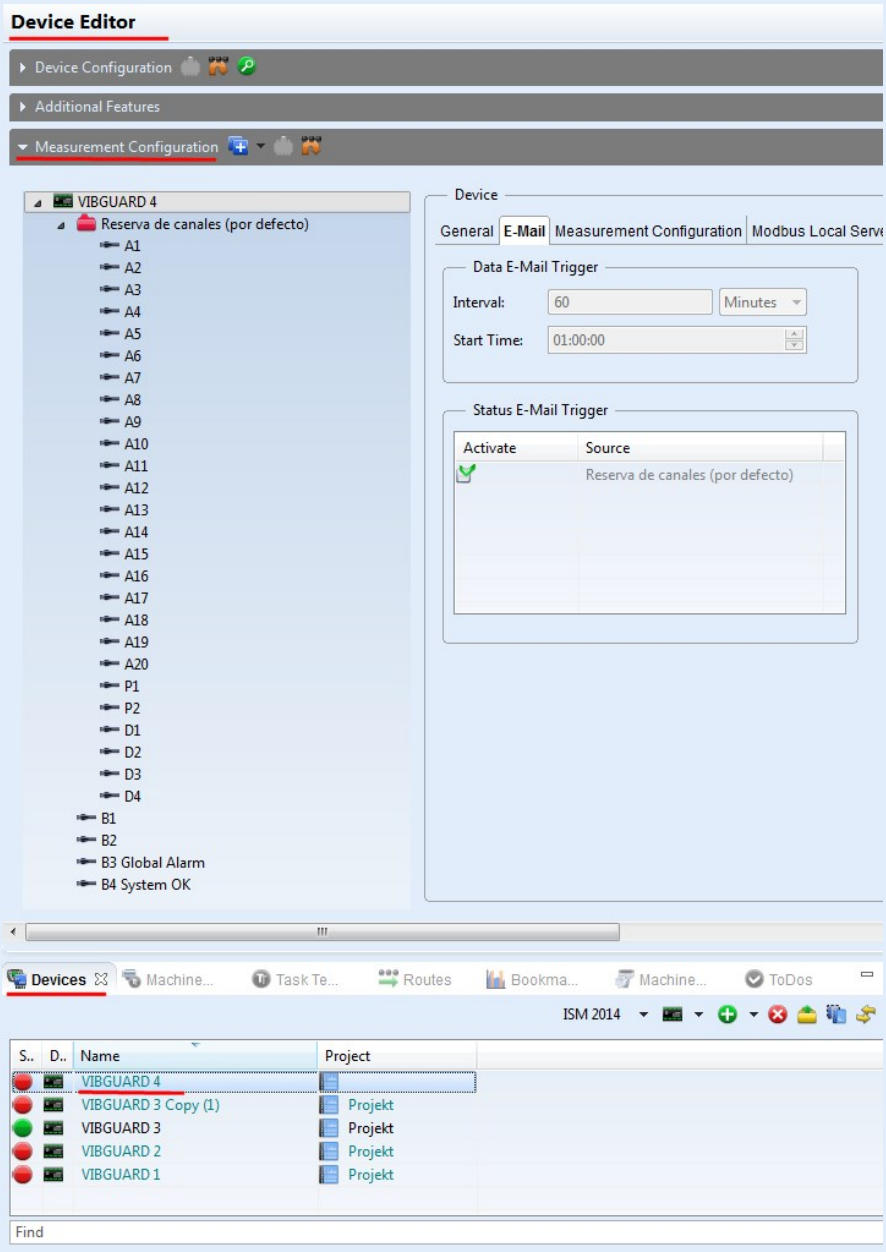
To create a measurement configuration for VIBGUARD:

[1] Grouping of related functions and fields in the Editor window

- Open the **Measurement Configuration**section:
  - Open the **Configuration perspective**.
  - Open the **Devices** view.
  - Double-click on the respective **online device** to open the **device editor**.
  - Open the **Measurement Configuration** section:

E x a m p l e :

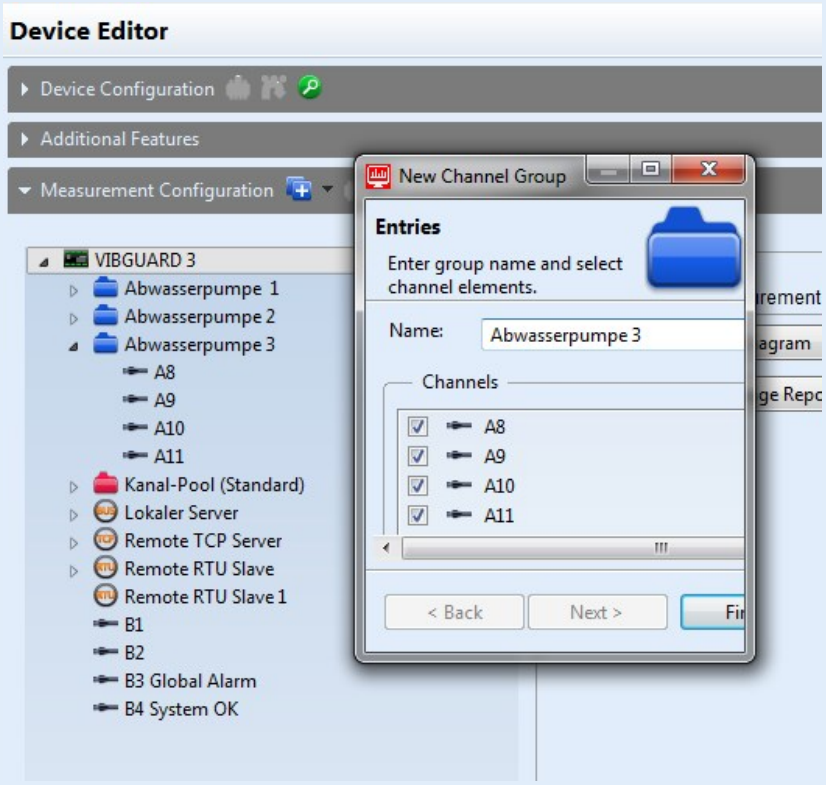
Measurement configuration with channel tree (left) and context properties (right)



All analog and digital input channels are contained in the channel pool. Channels B1 to B4 are provided for digital output signals. System functions (global alarm, system OK) are assigned to B3 and B4. B1 and B2 can be set as alarm output.

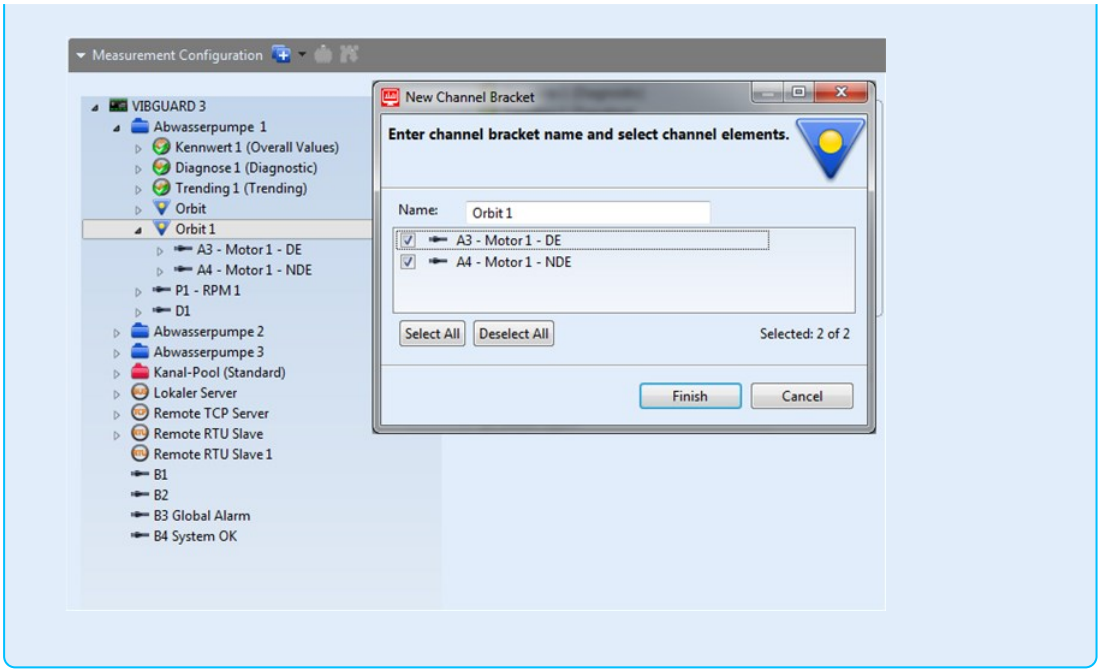
- Create a **channel group** as needed.
  - Using the right mouse button, click on the **device** in the channel tree.
  - Select **Add / Channel Group**. A dialog window appears.
  - Enter a **name** and select the **channels** for the channel group.
  - Click on **Finish**.
  - Repeat the procedure for the any further channel groups. A maximum of 5 channel groups is possible.
  - **E x a m p l e :**

    1 channel group with 4 measurement channels



- Create a **channel bracket** as needed.
  - Using the right mouse button, click on the **channel group** in the channel tree.
  - Select **Add / Channel Bracket**. A dialog window appears.
  - Enter a **name** and select the **channels** for the channel bracket.
  - Click on **Finish**.
  - Repeat the procedure for the any further channel brackets.
  - **E x a m p l e :**

    A **channel bracket** groups 2 analog measurement channels to allow creation of two-channel measurements (e.g. orbit).



- Configure the properties of the **measurement channels**.

  Mark the respective measurement channel to display the context properties:

  - ***Name***: The measurement channel designation is used as measurement location name in the machine tree.
  - ***Permanently Installed Sensor***: Here you select the sensor connected to the measurement channel. If needed, click on the last entry in the list (...) to display all permissible and available sensors. The magnification glass icon opens the sensor editor, where you can review the sensor parameters.

    Save time when assigning the same sensor type to several measurement channels:

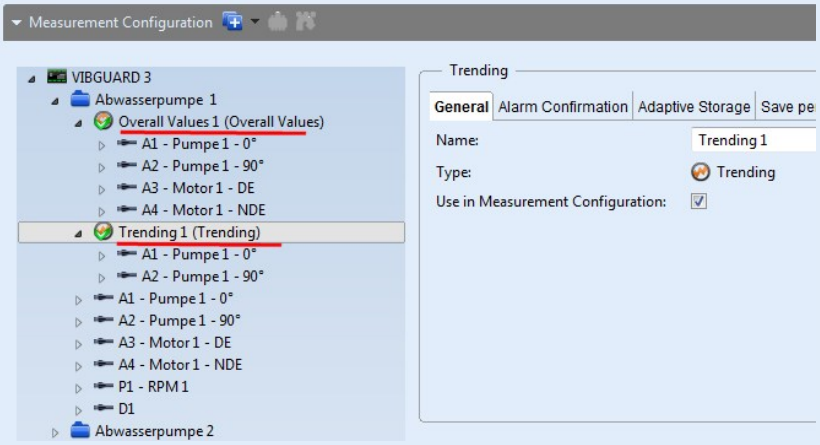
    - Mark **all** respective **measurement channels**.
    - Using the right mouse button, select **Add / Sensor**. A dialog window appears.
    - Select the **sensor** and click on **Finish**.
  - ***Disable Sensor Check***: Independently from the measurement, the measuring section is checked using a separate signal path. Here you can enable and disable this check.
  - ***Number of Pulses*** *(Keyphasor channel P1 and P2)*:Here you enter the number of pulses per shaft revolution.
  - ***Channel Disabled***: Here you deactivate the measurement channel, if the machine is e.g. temporarily shut down.

- Create the **measurement groups** .
  - Using the right mouse button, click on a **channel group** in the channel tree.
  - Select **Add / Measurement Group**. A dialog window appears.
  - Select the **measurement group** type and click on **Next**.
  - Enter a **name** for the measurement group.
  - Select the **measurement channels** or **channel brackets** that should be assigned with the measurement group.
  - Click on **Finish**.
  - Repeat the procedure for the any further measurement groups.

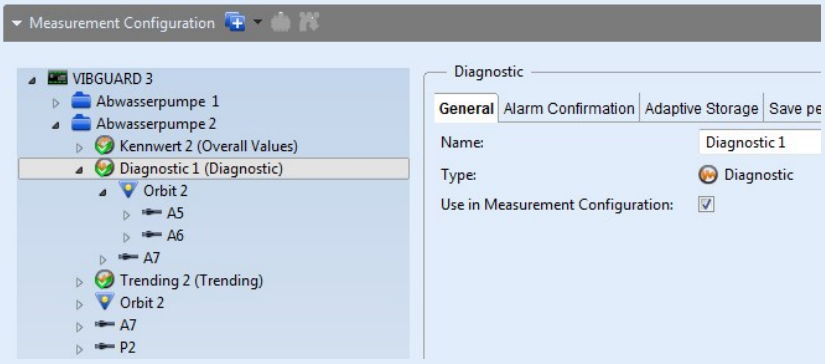
- **Examples:**

  Measurement group **Characteristic Value 1** is mapped to **channels A1 to A4**.

  Measurement group **Trending 1** is mapped to **channels A1 and A2**.



  Measurement group **Diagnosis 2** is mapped to **channel bracket Orbit 2** (channels A5 and A6).



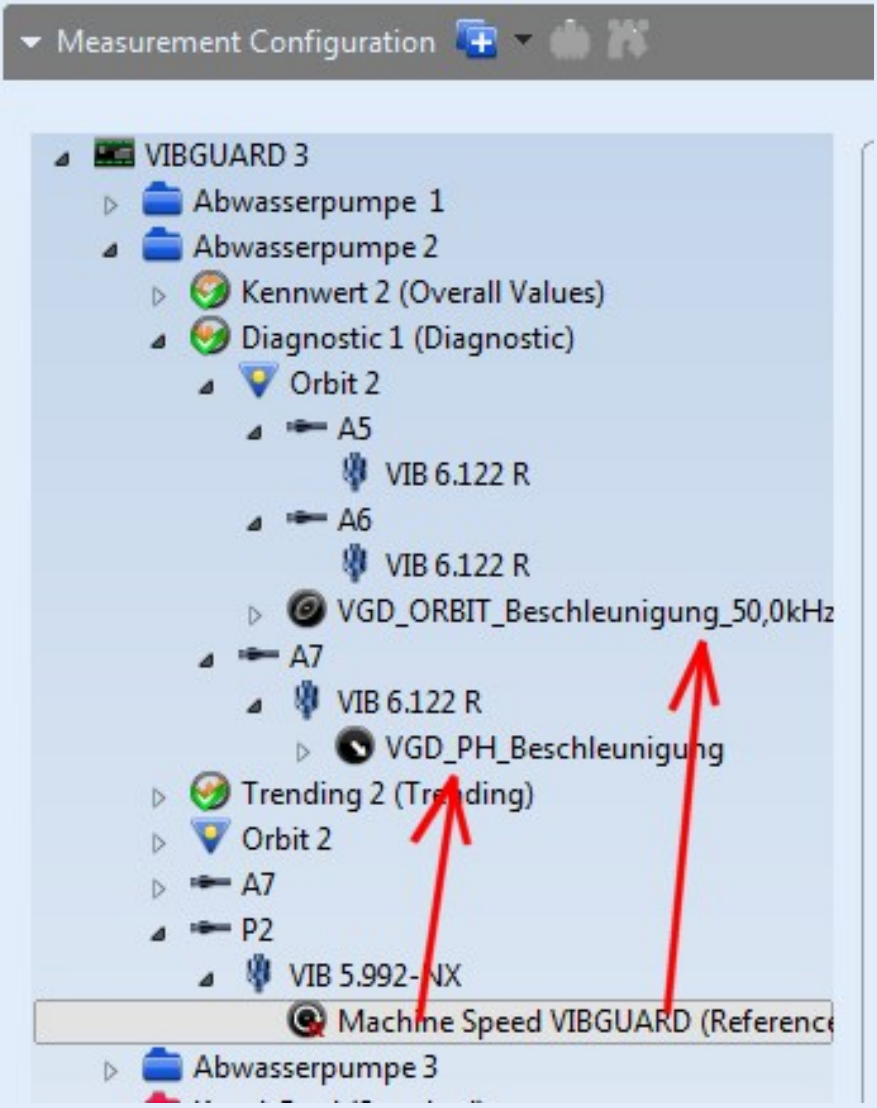
- Assign the **measurement tasks** to the measurement channels.
  - In the channel tree, open the **measurement group**, which contains the channel bracket and which is **compatible**[1] to the measurement task.
  - Using the right mouse button, click on the **measurement channel / channel bracket** and select **Add / Measurement Task**. A dialog window appears.
  - Select the **measurement task**, either based on a **task template** (upper list) or from the measurement tasks, which are already used in a measurement group (lower list).
  - If no suitable task template is contained in the upper list, click on **add** and add a task template.
  - Click on **Finish**.
  - Repeat the procedure for any further measurement task and/or any further measurement channel.

[1] characteristic values in characteristic value measurement group, signals in trending or analysis group

Measurement tasks requiring a **measured reference speed** (phase, orbit, order analyses) must be linked to the respective speed measurement task using drag & drop.

Example:

Assign the reference speed to the **Phase** and **Orbit** measurement tasks via drag & drop.



Save time when assigning the same measurement task to several measurement channels:

- Mark **all** respective **measurement channels**.

- Using the right mouse button, select **Add / Measurement Task**. A dialog window appears.

- Select the **task template(s)** and click on **Finish**.

- Configure the properties of the **channel groups**.

  Mark the channel group to display the context properties:

General: The channel group designation is used as machine train name in the machine tree.

Alarm Confirmation: Here you define, when an alarm status is pending. Using the **Number of Measurements** parameter, you define the number of subsequent measurements used for status evaluation. The **In Alarm (%)** parameter indicates the portion of these measurements that must exceed a threshold[1] so that an alarm state is pending.

E x a m p l e :

You specify 5 measurements and a portion of 80 %. If 4 of 5 subsequent measurements are greater than the threshold, the online device will register an alarm.

Adaptive Storage: Here you define the **measurement data reduction** conditions for the following characteristic values: Vibration, shock pulse, phase, speed, and characteristic band values in spectra.

- *Data Reduction Group*: Here you select the characteristic value, to which the settings should apply.
- *Delta Type*: Select, whether an **absolute**, a **relative** or a **smart relative** deviation should apply as criterion.

  If the delta type is set to **relative**, you must define a **reference value** for every measurement task in the channel group. Measurement data must already be available in the database for this purpose.
  Switch into the **Analysis perspective**. Open the respective measurement graph and set the reference value for the measurement task using the **cursor**. You can list missing reference values in the context of the online device (General tab) using **Adaptive Storage Report**.

  When regenerating an online device "smart relative" is preset by default for measurement tasks, except for temperature (1K), shock pulse (0.1) and DC (0.1) values for which the delta type "absolute" is used.

- Click into the **Delta**, column and enter the deviation between two measurement values, starting from which a new measurement value should be saved. Delta values can be entered for every operating state (OS None = no operating state).

Operating State: Here you define the operating states for the measurement locations in the channel group.

- Click on **Edit Mode** and drag and drop the reference measurement task(s)[2] from the channel tree into the list.
- Adjust the parameters for every operating state: Name, delay, measurement range of the reference measurement.
- Finally, activate the current operating states in the **Mode** column.

Reference Speed: Here you define the measurement task that delivers the reference speed for the channel group. For this purpose, activate the **edit mode** to select the measurement task in the channel tree.

Release Condition: Here you define the **conditions**, under which the **trending** and **diagnosis** measurement groups should be measured.

- **More…**

  Release conditions prevent the execution and saving of measurements without significance, such as machine startup. If the release conditions are not met, the measurement tasks in the **characteristic value measurement group** are measured only and saved in consideration of the adaptive save

[1](alarm, warning, prewarning)

[2]e.g. speed or digital input

settings. You can select process parameters, speed measurements, digital inputs, and even characteristic value measurements as release measurements and insert them into the list field via drag & drop. For this purpose, activate the **edit mode** to select the release measurements in the channel tree. Adjust the **delay** and **release parameters** for every release measurement by double-clicking on the respective column. Using the **Save overall measurements only if release condition is fulfilled** option, the characteristic value measurements are saved as well.

- Configure the properties of the **measurement groups**.

  Mark the measurement group to display the context properties:

  General: The measurement group designation is only used in the channel tree.

  Alarm Condition: By default, the alarm conditions are copied from the channel group. Here, you can **overwrite** them and adjust different conditions.

  Adaptive Storage: By default, the criteria for measurement data reduction are copied from the channel group. Here, you can **overwrite** them and adjust different conditions.

  Save permanently: Here you define the **saving conditions for signals** (spectrum, time waveform).

  - *Save all data*: Saves all measured signals.

    CAUTION! This option can result in significant data volumes depending on the measurement schedule.

  - *Save data on ...*: Only saves signals, if a threshold is exceeded.
  - *Periodic Saving*: Additionally, signals can also be saved at a defined interval. **Activate** this option and adjust the time interval (**interval**, **start time**).

  Interval: Here you define the **measurement interval** for the trending and diagnosis measurement groups. Using the **As fast as possible** option, the intervals adapts to the measurement duration and the utilization of the online device.

  Measurement Trigger: The diagnostic measurement group can be started as follows: time-controlled (interval), via a threshold violation or via an arbitrary reading. The list contains all permissible triggers for the measurement group, which you can **activate** or deactivate in the left column. The trigger criterion (e.g. reading, threshold or digital in status) is set in the **Reading** column.

  - *Abort trending measurements*: Activate this option if the measurements in the trending measurement group are to be stopped in order to measure the diagnosis measurement group immediately.
  - *Action on trigger loss (high to low)*: If the trigger criterion is not valid anymore, the diagnosis group can be finished as follows:
    - *Finish Measurement*: The diagnosis measurement group is finished after completion of the current measurement
    - *Interrupt Measurement*: The diagnosis measurement group is immediately finished. The current measurement is discarded.
    - *Finish Group*: The diagnosis measurement group is only finished after completion of all measurements.

- Configure the properties of the **online device**

  Mark the online device to display the context properties:

General: Here you can display the **Terminal Diagram**for the online device in graphical and tabular form and export it s CSV file. Using **Adaptive Storage Report**, all measurement tasks are listed, for which no reference value has been defined yet for relative data reduction (see note in section **Configure channel group** / **Adaptive Storage**).

E-Mail: Here you adjust the trigger for data and status e-mails.

Measurement Configuration: Here you can save and activate different measurement configurations. Measurement configurations only differ with respect to the active measurement groups.

Modbus Local Server: Here you define, which **measurement values** and **status information** are read out by an external system with Modbus client:

- Click on **Edit Mode** and drag the measurement tasks from the channel group into the list.
- Mapping to the Modbus memory range is specified in the **Status** and/or **Value** columns:
  Status = address for alarm, warning, prewarning, sensor error,
  value = address for measurement value
- Using **Report Modbus Mapping**, you receive an overview of the Modbus entries.

Event Recording: Here you determine which measurement tasks are to be recorded if a specific event occurs. Set the measurement tasks, which are to be recorded, in the **recording tasks** tab. Set the measurement tasks, which are to display an event and trigger the recording, in the **recording trigger** tab.

- Click on **edit mode** and drag the measurement tasks from the channel group into the list.
- Set the time interval for the pre-event and post-event history of the recording (**pre-trigger** / **post-trigger**).
- Enter the maximum number of events to be triggered in a time interval in the **max.trigger/interval** field. One event per hour is set as the default.
- In the **recording trigger** tab, set the conditions for triggering the recording (**threshold, upper/lower trigger**).

This is how event recording works:

The Event Recording module captures time waveforms synchronously on up to 22 (20 analogue + 2 tacho/pulse) channels. One raw signal of each channel is written in real-time into a separate ring buffer and is stored when trigger conditions are fulfilled.

Possible trigger scenarios are alarm threshold violations of spectral bands (status trigger) or of absolute zero-peak values in time waveforms (value trigger).

Thanks to the ring buffer architecture, it also records the part of the time waveform shortly before an event is stored (pre-event history). This feature is ideal for capturing transient events.

- Configure the properties of the **digital outputs** (B1 and B2).

  Mark outputs B1 resp. B2 to display the context properties:

  General: The channel designation is only used in the channel tree.

  Trigger: Outputs B1 and B2 can signal a threshold violation. The list provides the available trigger sources (measurement groups). **Activate** the desired source(s) and select the triggering threshold in the **Value** column.

  You can configure **output B2** either as **alarm output** or as **modem reset**. A modem reset is used to cyclically reset external network components,[1] and to thus secure remote access. Enter the **interval** and **start time** for a modem reset.

[1] modems, routes, switches

8.3 Creating a Measurement Configuration for the VIBGUARD compact Online Device

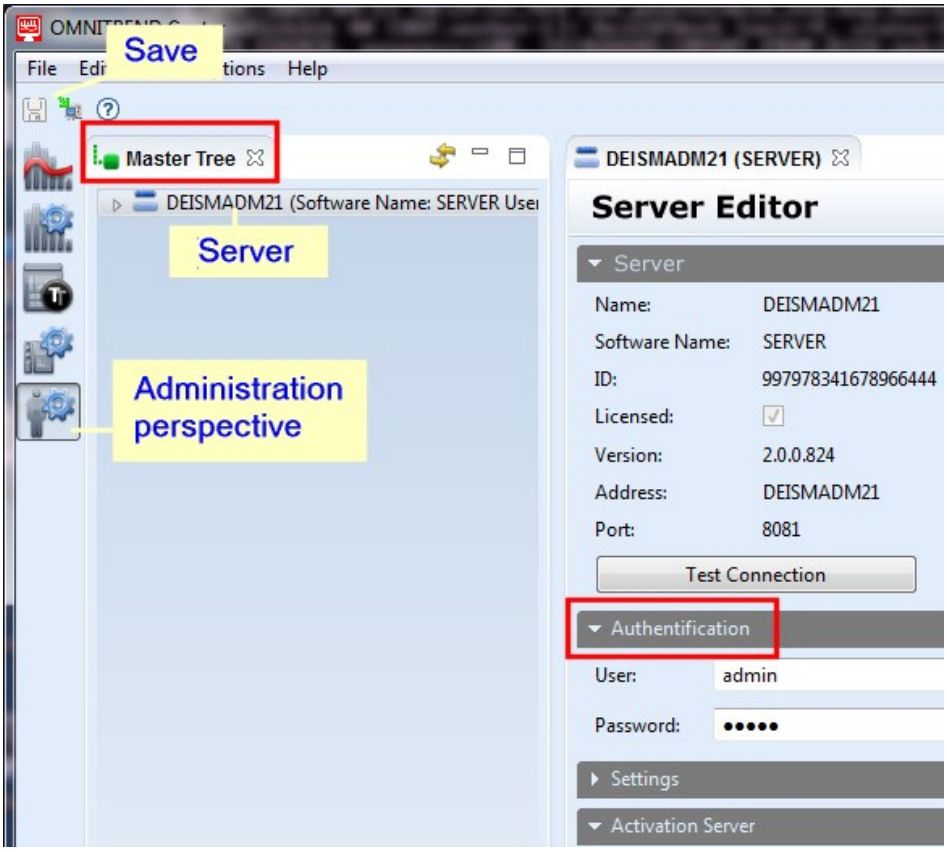
Prerequisite

OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

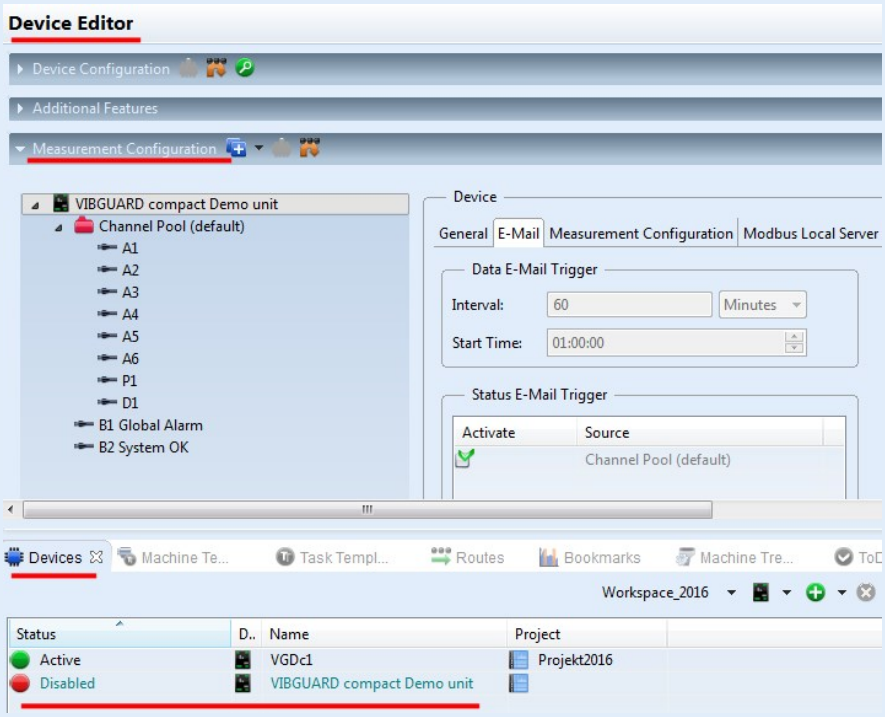
This is how to create a measurement configuration for VIBGUARD compact:

[1]Grouping of related functions and fields in the Editor window

- Open the **measurement configuration** section:
  - Open the **configuration perspective**.
  - Open the **devices** view.
  - Double click on the respective **online device** to open the **device editor**.
  - Open the **measurement configuration** section:

E x a m p l e :

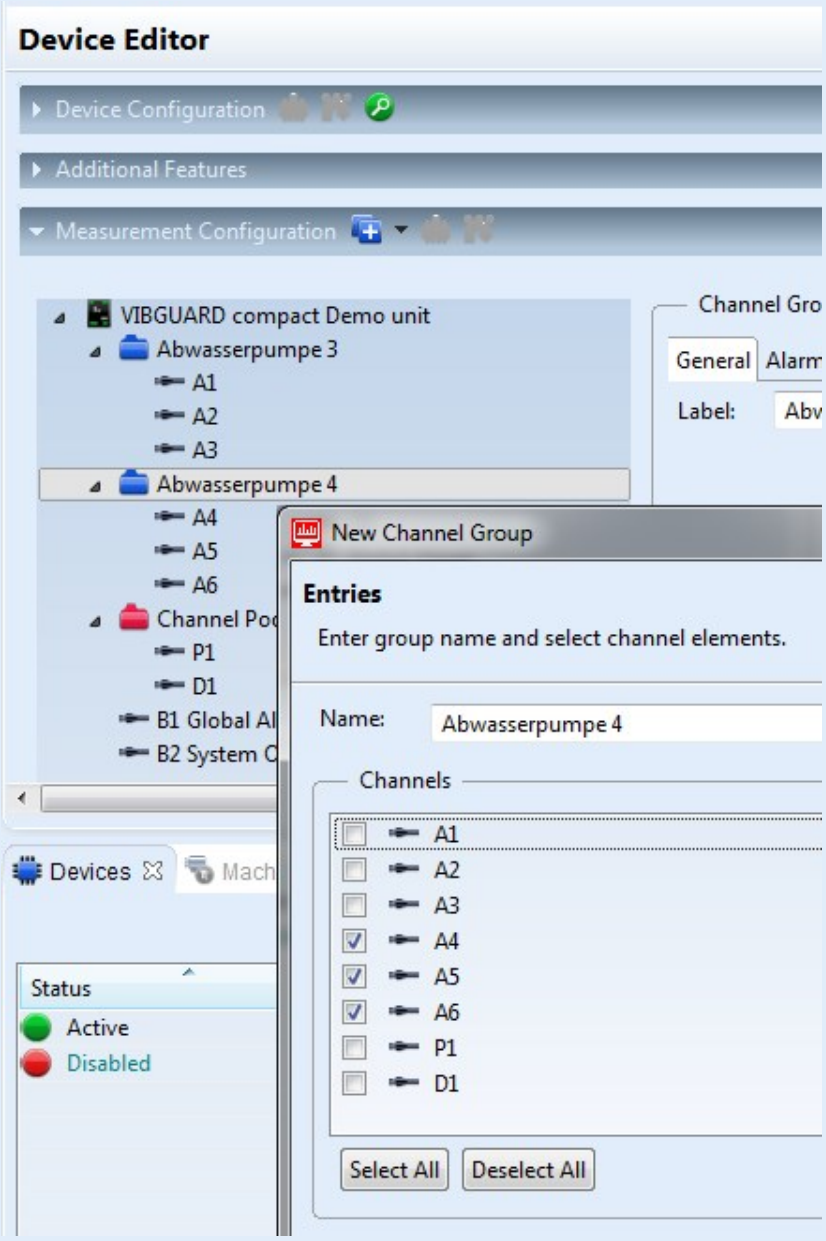
Measurement configuration with channel tree (left) and context properties (right)



All analog and digital input channels are contained in the channel pool. System functions (global alarm, system OK) are assigned to B1 and B2.

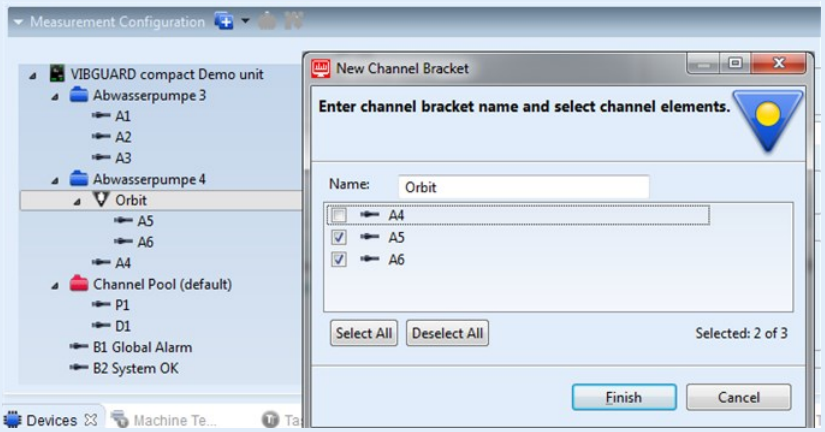
- Create a **channel group** if necessary.
  - Using the right mouse button, click on the **device** in the channel tree.
  - Select **add / channel group**. A dialog window appears.
  - Enter a **name** and select the **channels** for the channel group.
  - Click on **finish**.
  - Repeat the procedure for the any further channel groups. A maximum of 5 channel groups is possible.
  - **E x a m p l e :**

    2 channel groups with 3 measurement channels each



- Create a **channel bracket** if necessary.
  - Using the right mouse button, click on the **channel group** in the channel tree.
  - Select **add / channel bracket**. A dialog window appears.
  - Enter a **name** and select the **channels** for the channel bracket.
  - Click on **finish**.
  - Repeat the procedure for the any further channel brackets.
  - **E x a m p l e :**

    A **channel bracket** groups 2 analog measurement channels to allow creation of two-channel measurements (e.g. orbit).



- Configure the properties of the **measurement channels**.

  Mark the respective measurement channel to display the context properties:

  - ***Name***: The measurement channel designation is used as measurement location name in the machine tree.
  - ***Permanently Installed Sensor***: Here you select the sensor connected to the measurement channel. If needed, click on the last entry in the list (...) to display all permissible and available sensors. The magnification glass icon opens the sensor editor, where you can review the sensor parameters.

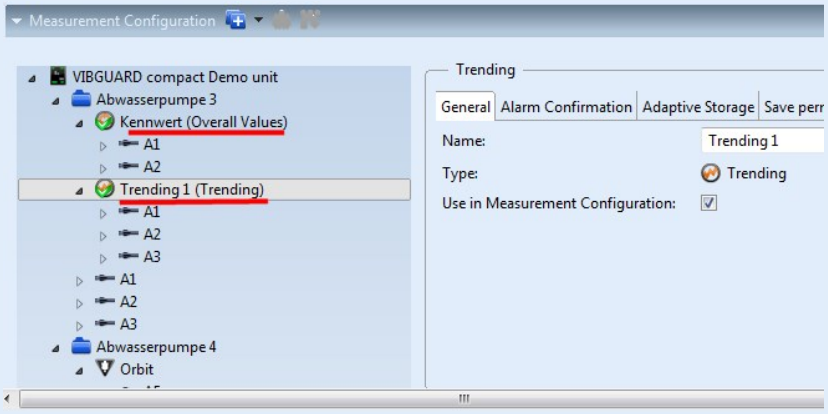
    Save time when assigning the same measurement task to several measurement channels:

    - Mark **all** respective **measurement channels**.
    - Using the right mouse button, select **add / sensor**. A dialog window appears.
    - Select the **sensor** and click on **finish**.
  - ***Disable Sensor Check***: Independently from the measurement, the measuring section is checked using a separate signal path. Here you can enable and disable this check.
  - ***Number of Pulses*** *(Keyphasor channel P1)*:Here you enter the number of pulses per shaft revolution.
  - ***Channel Disabled***: Here you deactivate the measurement channel, if the machine is e.g. temporarily shut down.

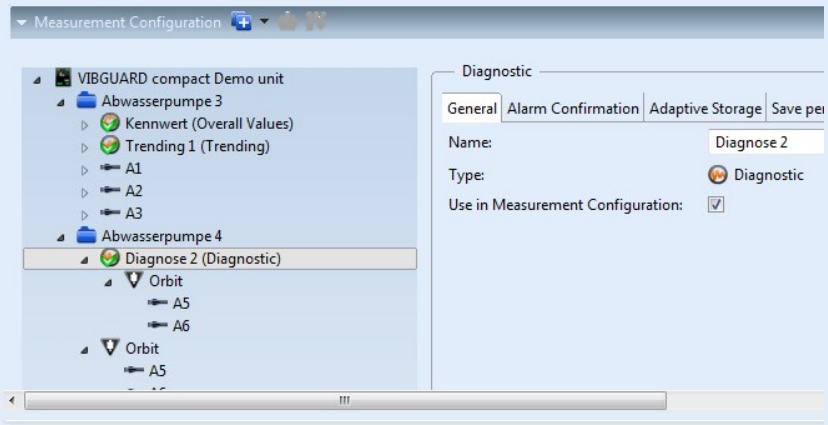
- Create the **measurement groups**.
  - Using the right mouse button, click on a **channel group** in the channel tree.
  - Select **add / measurement group**. A dialog window appears.
  - Select the **measurement group** type and click on **next**.
  - Enter a **name** for the measurement group.
  - Select the **measuring channels** or **channel brackets** that should be assigned with the measurement group.
  - Click on **finish**.
  - Repeat the procedure for the any further measurement groups.
  - **E x a m p l e s :**

    Measurement group **overall** is assigned to **channels A1 and A2**.

    Measurement group **trending 1** is assigned to **channels A1 to A4**.



Measurement group **diagnosis 2** is assigned to **channel bracket orbit** (channels A5 and A6).



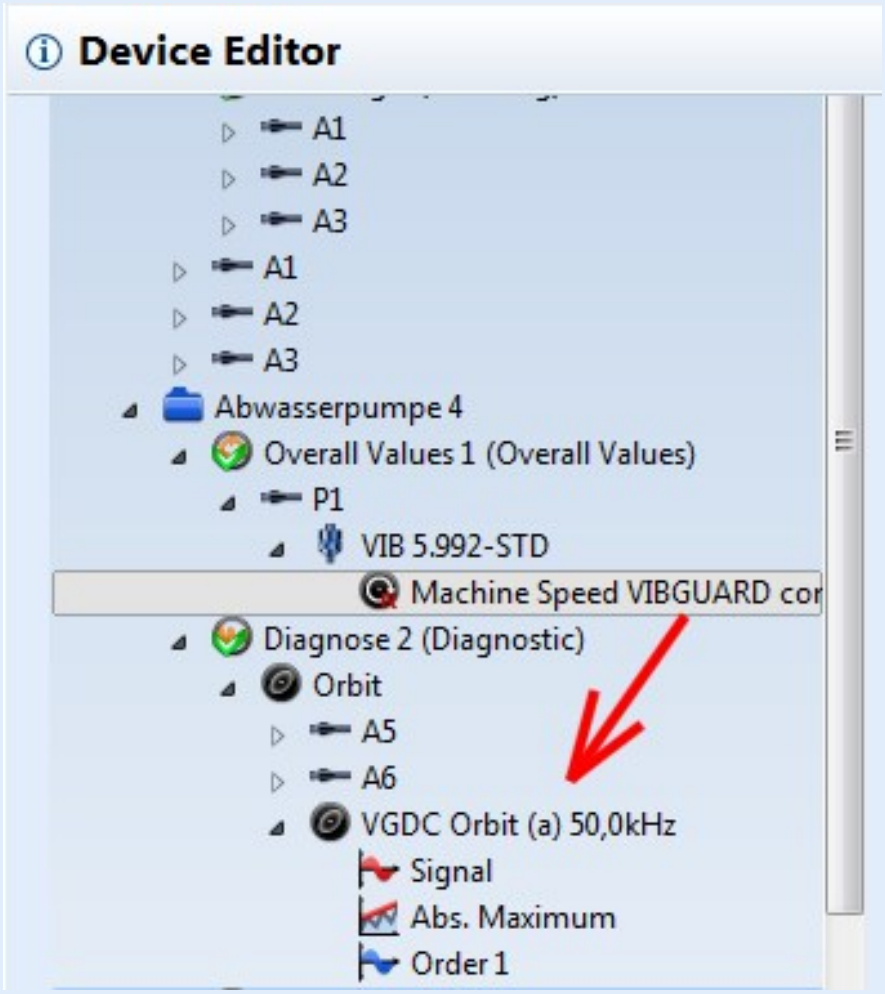
- Assign the **measurement tasks** to the measuring channels.
  - In the channel tree, open the **measurement group**, which contains the measuring channel or the channel bracket. Note the**correlation**[1]between measurement group and measurement task type.
  - Using the right mouse button, click on the **measurement channel / channel bracket** and select **add / measurement task**. A dialog window appears.
  - Select the **measurement task**, either based on a **task template** (upper list) or from the measurement tasks, which are already used in a measurement group (lower list).
  - If no suitable task template is contained in the upper list, click on **add** and add a task template.
  - Click on **finish**.
  - Repeat the procedure for any further measurement task and/or any further measurement channel.

Measurement tasks requiring a **measured reference speed** (phase, orbit, order analyses) must be linked to the respective speed measurement task using drag & drop.

[1]parameters in the parameter measurement group; signals in the trending or diagnosis measurement group

Example:

Assign the reference RPM to the **orbit** measurement task via drag&drop.



Save time when assigning the same measurement task to several measuring channels:

- Mark **all** respective **measuring channels**.

- Using the right mouse button, select **add / measurement task**. A dialog window appears.

- Select the **task template(s)** and click on **finish**.

- Configure the properties of the **channel groups**.

  Mark the channel group to display the context properties:

  General: The channel group designation is used as machine train name in the machine tree.

  Alarm Criterion: Here you define, when an alarm status is pending. Using the **number of measurements** parameter, you define the number of subsequent measurements used for status evaluation. The **in alarm**

(%) parameter indicates the proportion of these measurements that have exceeded athreshold[1]for which there is an alarm state.

> **Example:**
>
> You specify 5 measurements and a portion of 80%. If 4 of 5 subsequent measurements are greater than the threshold, the online device will register an alarm.

Adaptive Storage: Here you define the **measurement data reduction** conditions for the following characteristic values: Vibration, shock pulse, phase, RPM, and characteristic band values in spectra.

- *Data Reduction Group*: Here you select the characteristic value, to which the settings should apply.
- *Delta Type*: Select, whether an **absolute**, a **relative** or a **smart relative** deviation should apply as criterion.

  If the delta type is set to **relative**, you must define a **reference value** for every measurement task in the channel group. Measurement data must already be available in the database for this purpose.
  Switch into the **Analysis perspective**. Open the respective measurement graph and set the reference value for the measurement task using the **cursor**. You can list missing reference values in the context of the online device (General tab) using **Adaptive Storage Report**.

  When regenerating an online device "smart relative" is preset by default for measurement tasks, except for temperature (1K), shock pulse (0.1) and DC (0.1) values for which the delta type "absolute" is used.

- Click into the **Delta**, column and enter the deviation between two measurement values, starting from which a new measurement value should be saved. Delta values can be entered for every operating state (OS None = no operating state).

Operating State: Here you define the operating states for the measurement locations in the channel group.

- Click on **edit mode**, and drag thereference measurement task(s)[2]from the channel tree to the list by drag&drop.
- Adjust the parameters for every operating state: Name, delay, measurement range of the reference measurement.
- Finally, activate the current operating states in the **mode** column.

Reference Speed: Here you define the measurement task that delivers the reference speed for the channel group. For this purpose, activate the **edit mode** to select the measurement task in the channel tree.

Release Condition: Here you define the **conditions**, under which the **trending** and **diagnosis** measurement groups should be measured.

- **More…**

  Release conditions prevent the execution and saving of measurements without significance, such as machine startup. If the release conditions are not met, the measurement tasks in the **characteristic value measurement group** are measured only and saved in consideration of the adaptive save settings. You can select process parameters, speed measurements, digital inputs, and even characteristic value measurements as release measurements and insert them into the list field via drag & drop. For this purpose, activate the **edit mode** to select the release measurements in the channel

[1](alarm, warning, prewarning)

[2]e.g. RPM or digital input

tree. Adjust the **delay** and **release parameters** for every release measurement by double-clicking on the respective column. Using the **save overall measurements only if release condition is fulfilled** option, the characteristic value measurements are saved as well.

- Configure the properties of the **measurement groups**.

  Mark the measurement group to display the context properties:

  General: The measurement group designation is only used in the channel tree.

  Alarm Criterion: By default, the alarm conditions are copied from the channel group. Here, you can **overwrite** them and adjust different conditions.

  Adaptive Storage: By default, the criteria for measurement data reduction are copied from the channel group. Here, you can **overwrite** them and adjust different conditions.

  Save permanently: Here you define the **saving conditions for signals** (spectrum, time waveform).

  - *Save all data*: Saves all measured signals.

    CAUTION! This option can result in significant data volumes depending on the measurement schedule.

  - *Save data on ...*: Only saves signals, if a threshold is exceeded.
  - *Periodic Saving*: Additionally, signals can also be saved at a defined interval. **Activate** this option and adjust the time interval (**interval**, **start time**).

  Interval: Here you define the **measurement interval** for the trending and diagnosis measurement groups. Using the **as fast as possible** option, the intervals adapts to the measurement duration and the utilization of the online device.

  Measurement Trigger: In addition to interval-controlled triggering, the diagnosis measurement can also be started via measurements. The list contains all permissible triggers for the measurement group, which you can **activate** or deactivate in the left column. The trigger criterion (e.g. threshold or digital in status) is adjusted in the **value** column.

  - *Interrupt trending measurements*: Activate this option if the measurements in the trending measurement group are to be stopped in order to measure the diagnosis measurement group immediately.
  - *Action on trigger loss (high to low)*: If the trigger criterion is not valid anymore, the diagnosis group can be finished as follows:
    - *Finish Measurement*: The diagnosis measurement group is finished after completion of the current measurement
    - *Interrupt Measurement*: The diagnosis measurement group is immediately finished, the current measurement is discarded.
    - *Finish Group*: The diagnosis measurement group is only finished after completion of all measurements.

- Configure the properties of the **online devices**

  Mark the online device to display the context properties:

  General: Here you can display the **terminal diagram** for the online device in graphical and tabular form and export it as a CSV file. Using **adaptive storage report**, all measurement tasks are listed, for which no reference value has yet been defined for relative data reduction (see note in section **configure channel group / adaptive storage**).

Email: Here you adjust the trigger for data and status emails.

Measurement configuration: Here you can save and activate different measurement configurations. Measurement configurations only differ with respect to the active measurement groups.

Modbus Local Server: Here you define, which **measurement values** and **status information** are read out by an external system with Modbus client:

- Click on **edit mode** and drag the measurement tasks from the channel group into the list.
- Mapping to the Modbus memory range is specified in the **status** and/or **value** columns:
  Status = address for alarm, warning, prewarning, sensor error
  Value = address for measurement value
- Using **report modbus mapping**, you receive an overview of the Modbus entries.

Event Recording: Here you determine which measurement tasks are to be recorded if a specific event occurs. Set the measurement tasks, which are to be recorded, in the **recording tasks** tab. Set the measurement tasks, which are to display an event and trigger the recording, in the **recording trigger** tab.

- Click on **edit mode** and drag the measurement tasks from the channel group into the list.
- Set the time interval for the pre-event and post-event history of the recording (**pre-trigger** / **post-trigger**).
- Enter the maximum number of events to be triggered in a time interval in the **max.trigger/interval** field. One event per hour is set as the default.
- In the **recording trigger** tab, set the conditions for triggering the recording (**threshold, upper/lower trigger**).

This is how event recording works:

The Event Recording module captures time waveforms synchronously on up to 22 (20 analogue + 2 tacho/pulse) channels. One raw signal of each channel is written in real-time into a separate ring buffer and is stored when trigger conditions are fulfilled.

Possible trigger scenarios are alarm threshold violations of spectral bands (status trigger) or of absolute zero-peak values in time waveforms (value trigger).

Thanks to the ring buffer architecture, it also records the part of the time waveform shortly before an event is stored (pre-event history). This feature is ideal for capturing transient events.

8.4 Create Measurement Configuration for the VIBRONET Signalmaster Online Device

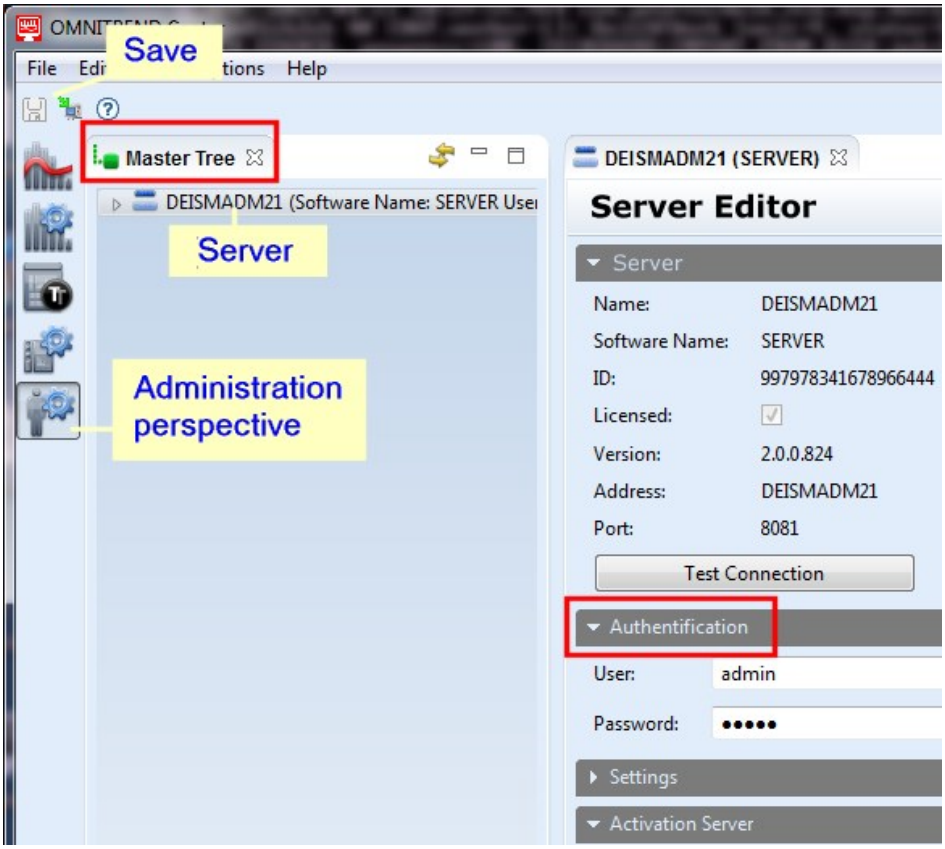
Prerequisite

OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

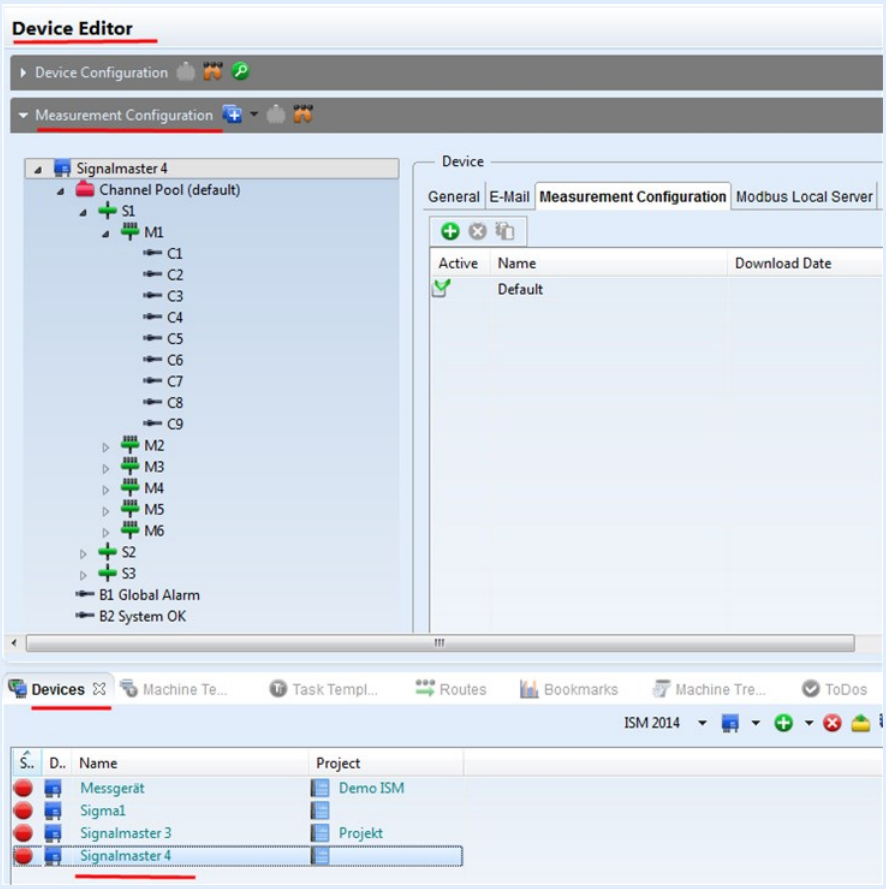
To create a measurement configuration for VIBRONET Signalmaster:

[1] Grouping of related functions and fields in the Editor window

- Open the **Measurement Configuration**section:
  - Open the **Configuration perspective**.
  - Open the **Devices** view.
  - Double-click on the respective **online device** to open the **device editor**.
  - Open the **Measurement Configuration** section:

E x a m p l e :

Measurement configuration with channel tree (left) and context properties (right)

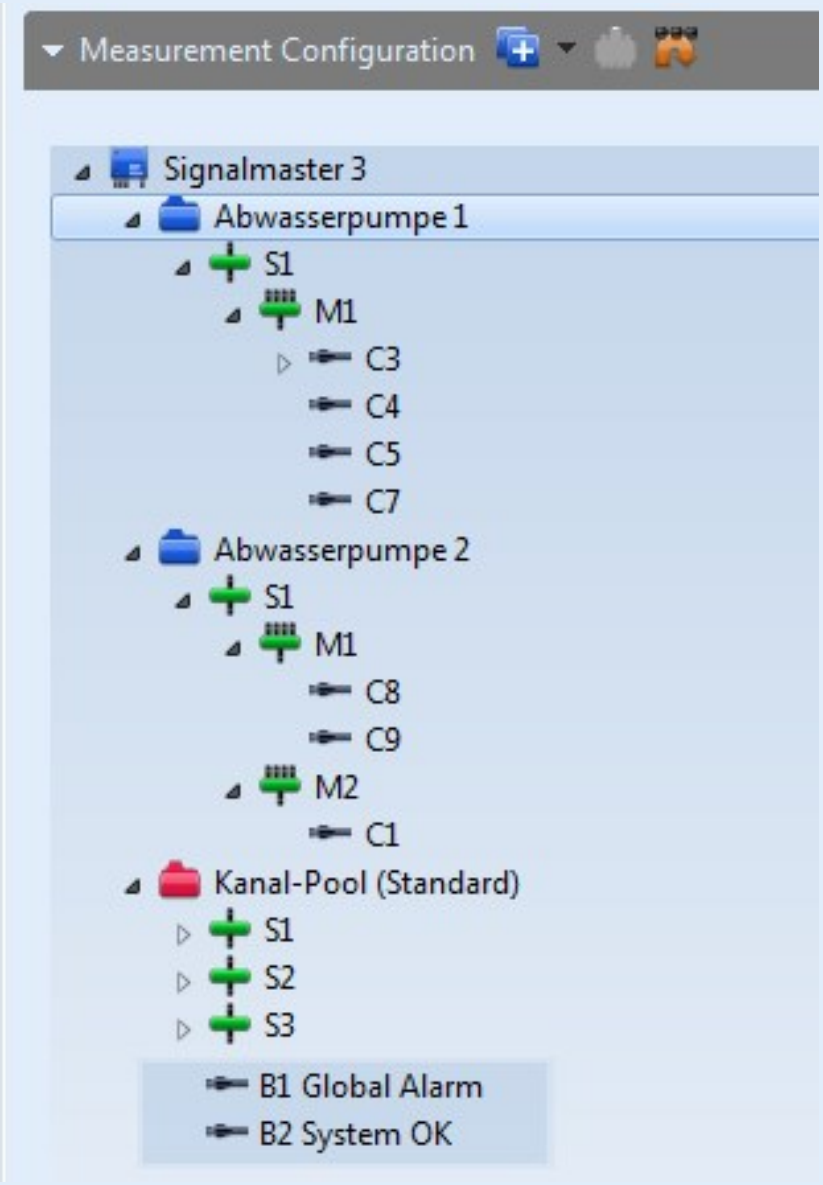


All analog **input channels** C1 ... C9 are contained in the channel pool. String lines S1 ... S3 and multiplexer M1 ... M6 represent the system architecture and are for information only. System functions (global alarm, system OK) are assigned to the digital outputs B1 and B2.

- Create a **channel group** as needed.
  - Using the right mouse button, click on the **device** in the channel tree.
  - Select **Add / Channel Group**. A dialog window appears.
  - Enter a **name** and select the **multiplexers**.
  - Click on **Next** and select the **channels** for the channel group.
  - Click on **Finish**.
  - Repeat the procedure for the any further channel groups (max. 25).

- **Example:**

  2 channel groups (wastewater pump 1 and 2) with 4 resp. 3 measurement channels.



- Configure the properties of the **measurement channels**.

  Mark the respective measurement channel to display the context properties:

  - ***Name***: The measurement channel designation is used as measurement location name in the machine tree.
  - ***Permanently Installed Sensor***: Here you select the sensor connected to the measurement channel. If needed, click on the last entry in the list (...) to display all permissible and available sensors. The magnification glass icon opens the sensor editor, where you can review the sensor parameters.

    Save time when assigning the same sensor type to several measurement channels:

        - Mark **all** respective **measurement channels**.
        - Using the right mouse button, select **Add / Sensor**. A dialog window appears.
        - Select the **sensor** and click on **Finish**.
    - ***Disable Sensor Check***: Independently from the measurement, the measuring section is checked using a separate signal path. Here you can enable and disable this check.
    - ***Input Range***: Here you adjust the amplification.
    - ***Number of Pulses*** *(if a speed sensor is connected to the channel only)*:Here you enter the number of pulses per shaft revolution.
    - ***Channel Disabled***: Here you deactivate the measurement channel, if the machine is e.g. temporarily shut down.

- Create the **measurement groups** .
    - Using the right mouse button, click on a **channel group** in the channel tree.
    - Select **Add / Measurement Group**. A dialog window appears.
    - Select the **measurement group** type and click on **Next**.
    - Enter a **name** for the measurement group.
    - Select the **measurement channels** that should be assigned with the measurement group.
    - Click on **Finish**.
    - Repeat the procedure for the any further measurement groups.

    In a **characteristic value** measurement group, **one** of the following measurement tasks can be assigned only per measurement channel: Process parameters as voltage or current level, speed, temperature.

    In a **trending** measurement group, maximum **two** of the following measurement tasks can be assigned only per measurement channel: Spectrum, time waveform, cepstrum, shock pulse measurement. Characteristic vibration values are calculated as characteristic band values from a spectrum. Only CLD acceleration sensors may be connected to the measurement channels.

    Maximum 5 measurement tasks can be assigned per measurement channel in a **diagnosis** measurement group (trending measurement group + envelop spectrum). Only CLD acceleration sensors may be connected to the measurement channels.

- Assign the **measurement tasks** to the measurement channels.
    - In the channel tree, open the **measurement group**, which contains the measurement channel and is **compatible**[1] with the measurement task.
    - Using the right mouse button, click on the **measurement channel** and select **Add / Measurement Task**. A dialog window appears.
    - Select the **measurement task**, either based on a **task template** (upper list) or from the measurement tasks, which are already used in a measurement group (lower list).
    - If no suitable task template is contained in the upper list, click on **add** and add a task template.
    - Click on **Finish**.
    - Repeat the procedure for any further measurement task and/or any further measurement channel.

[1] see note under 4.

- **Save time** when assigning the same measurement task to several measurement channels:
  - Mark **all** respective **measurement channels**.
  - Using the right mouse button, select **Add / Measurement Task**. A dialog window appears.
  - Select the **task template(s)** and click on **Finish**.

- Configure the properties of the **channel groups**.

  Mark the channel group to display the context properties:

  General: The channel group designation is used as machine train name in the machine tree.

  Alarm Confirmation: Here you define, when an alarm status is pending. Using the **Number of Measurements** parameter, you define the number of subsequent measurements used for status evaluation. The **In Alarm (%)** parameter indicates the portion of these measurements that must exceed a threshold[1] so that an alarm state is pending.

  Example:

  You specify 5 measurements and a portion of 80 %. If 4 of 5 subsequent measurements are greater than the threshold, the online device will register an alarm.

  Adaptive Storage: Here you define the **measurement data reduction** conditions for the following characteristic values: Shock pulse, speed, and characteristic band values in spectra.

  - *Data Reduction Group*: Here you select the characteristic value, to which the settings should apply.
  - *Delta Type*: Select, whether an **absolute** or a **relative** deviation should apply as criterion.

    If the delta type is set to **relative**, you must define a **reference value** for every measurement task in the channel group. Measurement data must already be available in the database for this purpose.

    Switch into the **Analysis perspective**. Open the respective measurement graph and set the reference value for the measurement task using the **cursor**. You can list missing reference values in the context of the online device (General tab) using **Adaptive Storage Report**.

  - Click into the **Delta**, column and enter the deviation between two measurement values, starting from which a new measurement value should be saved.

  Reference Speed: Here you define the measurement task that delivers the reference speed for the channel group. For this purpose, activate the **edit mode** to select the measurement task in the channel tree.

  Release Condition: Here you define the **conditions**, under which the **trending** and **diagnosis** measurement groups should be measured.

  - **More…**

    Release conditions prevent the execution and saving of measurements without significance, such as machine startup. If the release conditions are not met, the measurement tasks in the **characteristic value measurement group** are measured only. You can select process parameters, speed measurements, digital inputs, and even characteristic value measurements as release measurements and insert them into the list field via drag & drop. For this purpose, activate the **edit mode** to select the release measurements in the channel tree. Adjust the **delay** and **release parameters** for every release measurement by double-clicking on the respective column. Using the **Save overall meas-**

[1] (alarm, warning)

urements only if release condition is fulfilled option, the characteristic value measurements are saved as well.

- Configure the properties of the **measurement groups**.

  Mark the measurement group to display the context properties:

  General: The measurement group designation is only used in the channel tree.
  You define in the **characteristic value measurement group**, how many times the measurement tasks should be measured that deliver a reference measurement value or are relevant for a release condition (**once per measurement location** or **once per channel group**).

  Alarm Condition: By default, the alarm conditions are copied from the channel group. Here, you can **overwrite** them and adjust different conditions.

  Adaptive Storage: By default, the criteria for measurement data reduction are copied from the channel group. Here, you can **overwrite** them and adjust different conditions.

  Save permanently: Here you define the **saving conditions for signals** (spectrum, time waveform).

  - *Save all data*: Saves all measured signals.
  - *Save data on ...*: Only saves signals, if a threshold is exceeded.
  - *Periodic Saving*: Additionally, signals can also be saved at a defined interval. **Activate** this option and adjust the time interval (**interval**, **start time**).

  Interval: Here you define the **measurement interval** for the trending and diagnosis measurement groups. Using the **As fast as possible** option, the intervals adapts to the measurement duration and the utilization of the online device.

  > The measurement tasks are always executed sequentially. Measurement groups are executed as follows:
  >
  > **Characteristic value measurement group** (whenever possible), followed by a measurement task from the **trending measurement group**, next the **characteristic value measurement group** again, followed by the next measurement task from the **trending measurement group**, etc.
  >
  > The system checks after every measurement task, whether a diagnosis measurement group was triggered - either via alarm or time interval.

  Measurement Trigger: In addition to interval-controlled triggering, the diagnosis measurement can also be started via threshold violation in another measurement. The list contains all permissible triggers for the measurement group, which you can **activate** or deactivate in the left column. The trigger criterion (e.g. alarm or warning value) is adjusted in the **Value** column.

  - *Action on trigger status changed*: If the trigger criterion is not valid anymore, the diagnosis group can be finished as follows:
    - *Finish Measurement*: The diagnosis measurement group is finished after completion of the current measurement
    - *Finish Group*: The diagnosis measurement group is only finished after completion of all measurements.

- Configure the properties of the **online device**

  Mark the online device to display the context properties:

  General: Here you can display the **Terminal Diagram**for the online device in graphical and tabular form and export it s CSV file. Using **Adaptive Storage Report**, all measurement tasks are listed, for which no reference

value has been defined yet for relative data reduction (see note in section **Configure channel group** / **Adaptive Storage**).

E-Mail: Here you adjust the trigger for data and status e-mails.

Measurement Configuration: Here you can save and activate different measurement configurations. Measurement configurations only differ with respect to the active measurement groups.

Modbus Local Server: Here you define, which **measurement values** and **status information** are read out by an external system with Modbus client:

- Click on **Edit Mode** and drag the measurement tasks from the channel group into the list.
- Mapping to the Modbus memory range is specified in the **Status** and/or **Value** columns:
  Status = address for alarm, warning, sensor error,
  value = address for measurement value
- Using **Report Modbus Mapping**, you receive an overview of the Modbus entries.

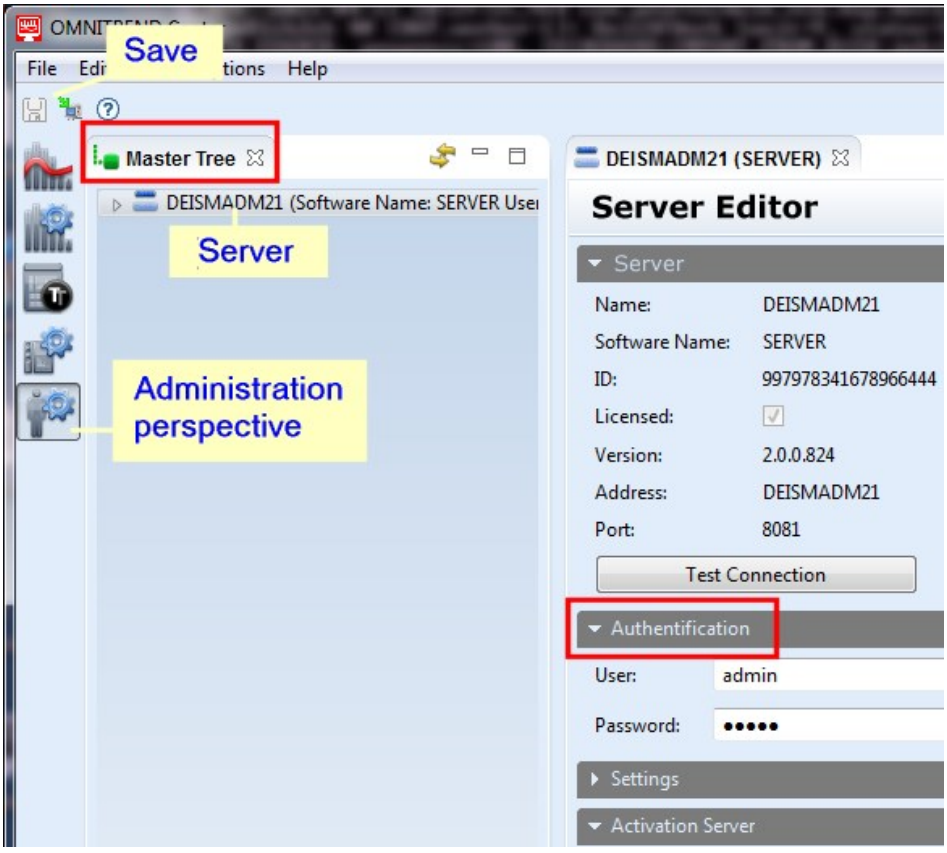
9.1 Create route for a data collector

Prerequisite

You must at least have the **specialist** user role for creating and editing a measurement configuration for data collectors (route).

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To create a route for VIBXPERT II / VIBSCANNER 2:

- Open the **Communication perspective**.
- In the local icon bar of the **route** view click on **New** **> VIBXPERT**.

[1]Grouping of related functions and fields in the Editor window

- Enter a **name** for the route and click on **Finish**. The route editor appears.
- In the **route editor**, you configure the route in the following sections:
    - **General Information**: Here you can change the **name** and enter a short **description**.
    - **Route Properties**: With every route, you can transfer historical measurement data from the database to the device to display trend profiles. Activate this option in the **History** section field as needed and define, how many measurement data sets should be added to the route from which time range. In the Misc section field, you can additionally add measurement data into the route, which are marked as **reference**. Using the **Check Last Measurement Value Increase** option, you can check the measurements for increased deviations.
    - **Route Machine Tree**: The route machine tree shows the elements in the route. To compile a route, proceed as follows:
        - Click with the right mouse button on the element in the **machine tree** that you would like to include in the route.
        - Select the **add to route** option in the dialog menu that follows.

        Alternatively: Drag the elements per drag&drop into the route machine tree.

        You can have the route elements displayed in the sequence of their processing or according to their arrangement in the machine tree using the **sequence view** or **tree view** buttons. The **show** filter enables the display of the route elements up to a certain hierarchy.
- Click on **Save** to save the route.

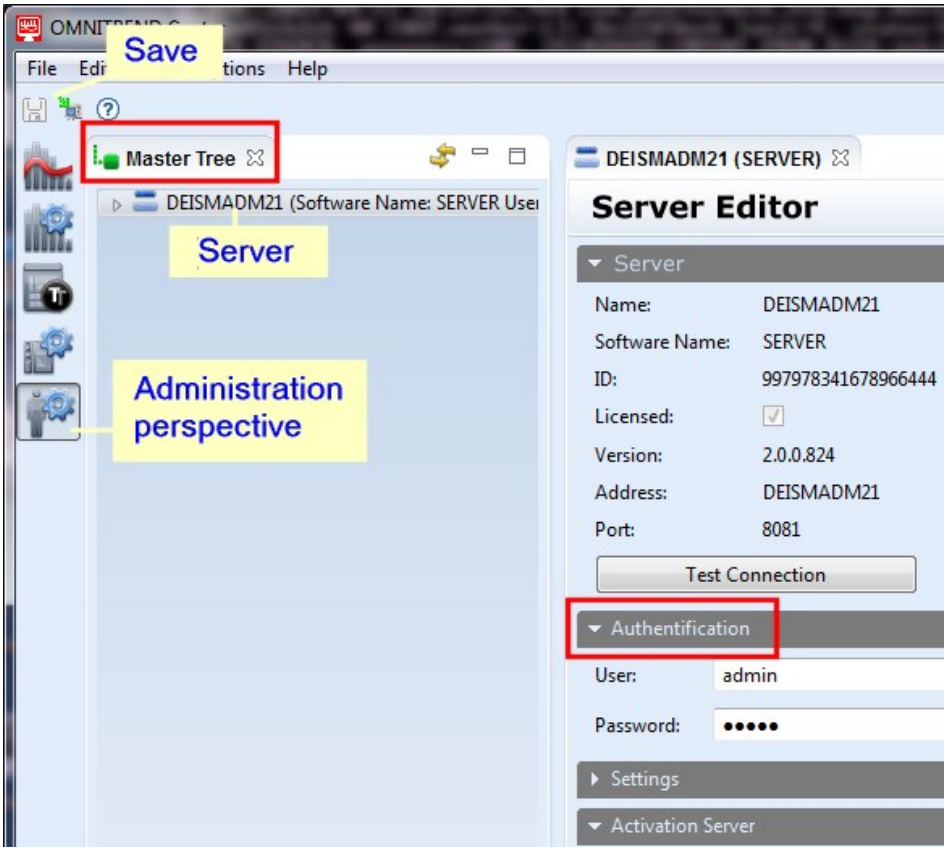
Edit route

Prerequisite

You must at least have the **specialist** user role for editing a route.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



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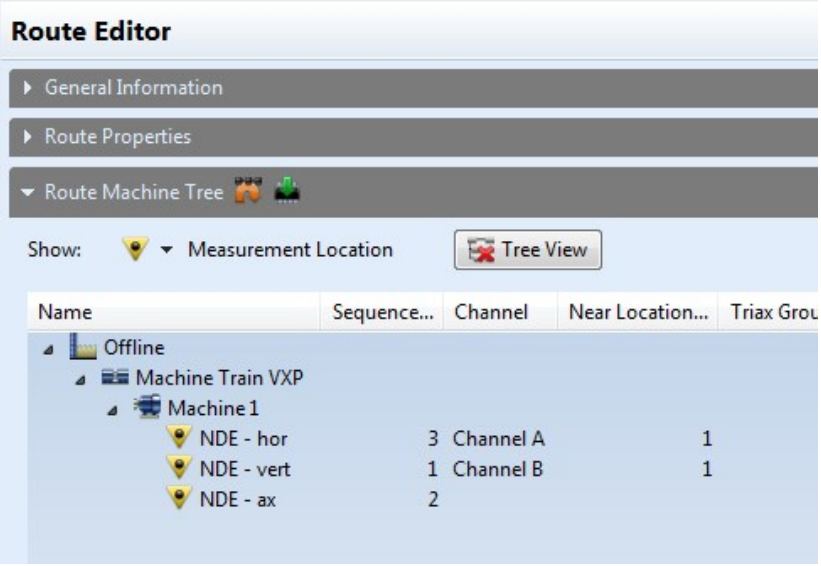
Open route in route editor

- Open the **Communication perspective**.
- Open the **Route** view.
- Double-click on the route, you would like to edit. The **route editor** appears.

[1] Grouping of related functions and fields in the Editor window

- Open the **Route Machine Tree** section.
  The route machine tree shows the content of a route. Two display filters in the local toolbar support you in editing the route:
  - **Show Hierarchy**: Using this filter you select, up to which hierarchy the route machine tree should be presented.
  - **Tree View/ Sequence View**: Using this filter, you switch the display between the element arrangement in the machine tree and the measurement sequence in the route.



Insert new element into the route:

- **Drag and drop** the element from the machine tree into the route machine tree, **or**
- Using the right mouse button, click on the element ("measurement location" hierarchy and higher) in the machine tree and select the **Add to Route** option. The route editor must be active (visible) so that the option can be selected in the dialog menu.

Delete element from route:

- Using the **right mouse button**, click on the element in the route machine tree to be deleted.
- Select **Delete**.

Disable measurement task in all routes:

- **In measurement task editor**
  - Double-click on the respective measurement task in the machine tree. The **measurement task editor** appears.
  - Open the **General Task Information** section.
  - In the **Route Settings** section field, select the **Disabled in Route** option.

Change measurement sequence

The measurement sequence in a route corresponds to the sequence of the measurement locations in the machine tree. If you wish to change the measurement sequence, carry out one of the two following actions (A or B):

A. Change the measurement sequence via sequence numbers:

The measurement location sequence is indicated in the **sequence number** column.

- Double-click on the respective measurement location in the route machine tree. A dialog window appears.
- Enter the new **sequence number** and click on **OK**.

B. Change the measurement sequence manually via drag & drop:

- Make sure that the route machine tree is shown in the **sequence view**.
- Move the elements in question to the desired location via **drag & drop**. You can move individual measurement locations or complete machine trains in one action.
- Click on **Save** to apply the changes.

> Triax measurement locations and “neighboring” measurement locations are retained.

Assign measurement channel manually

Only applies to 2-channel measuring devices (VIBXPERT): The measurement channel for every measurement location is indicated in the **Channel** column. An empty entry means standard (usually channel A).

- Double-click on the respective measurement location in the route machine tree. A dialog window appears.
- Set the **channel** to channel A or channel B and click on **OK**.

Set up near locations

Only applies to 2-channel measuring devices (VIBXPERT): Two spatially near measurement locations can be summarized into one route and measured in a row on channel A and channel B.

- Using the right mouse button, click on one of the two measurement locations.
- Select the **Select Near Location** option. A dialog window appears.
- Set the **channel** for the first measurement location and click on **Next**.
- Select the second, **near location** and click on **Finish**.
- Change the sequence number as needed so that the measurement locations are measured in a row.

Configure Multiplexer (MUX) measurement locations for VIBXPERT II

Multiplexer (MUX[1]) of model series VIB 8.306 can be operated together with VIBXPERT II in the following applications:

Automated data acquisition

- At **difficult to reach** measurement locations, or
- At **a large amount of** measurement locations,

that are equipped with CLD accelerometers (e.g., VIB 6.1xx).

Schematic measurement layout

Properties and restrictions

[1]Abbreviation for multiplexer. Automatic measurement location selector for up to 9 sensors. Component in the Online-CMS VIBRONET Signalmaster, can also be operated with a mobile VIBXPERT II measurement data collector.

- For **VIBXPERT II** only (not for VIBXPERT EX, VIBXPERT I)
- For **vibration measurements** only
- With **CLD sensors** only that can be connected to the MUX
- Maximum 9 CLD sensors per **MUX**
- Maximum 6 MUX in one line (**MUX group**)
- The '**Near Location**' is possible if more than one MUX group exist
- Data acquisition within the scope of a **route** or using a **machine template**
- Diagnosis measurements possible in '**multimode**' operating mode.
- No MUX measurement locations can be set up below a **plane**

Prerequisite

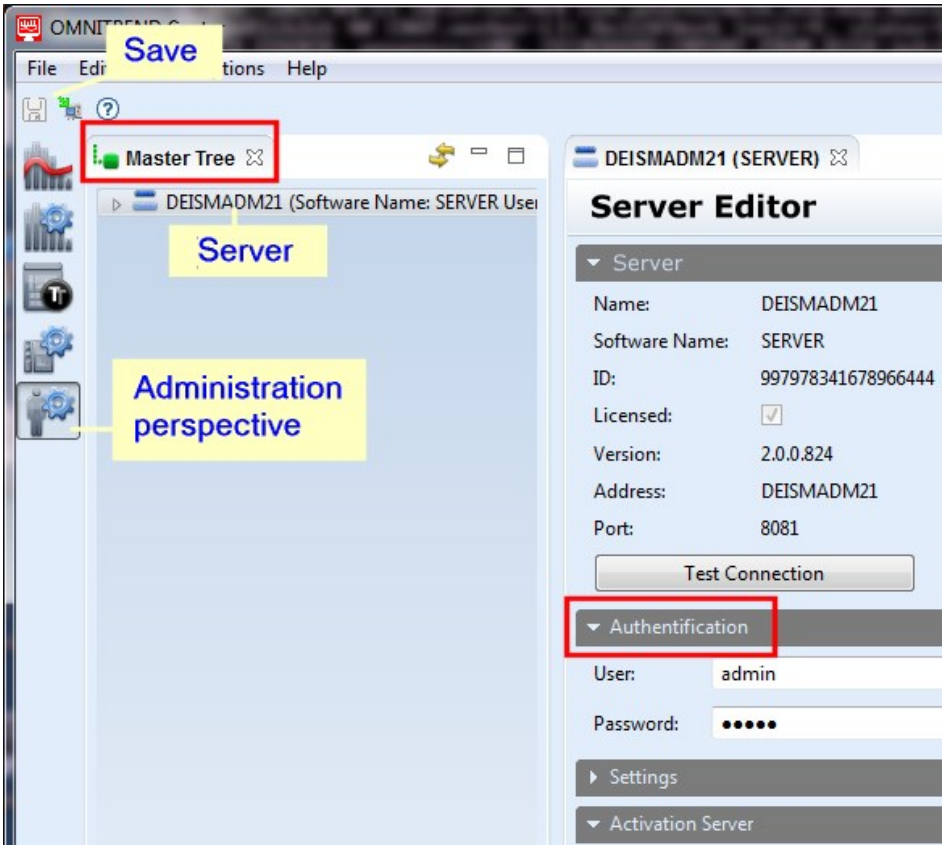
OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1]Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To create a MUX measurement location

- Open the **Configuration perspective**.
- Using the right mouse button, click on the **machine** in the machine tree, where you would like to create the MUX measurement location.
- Select **Add / MUX Measurement Location**. The **measurement location editor** appears.
- Configure the **General**, **Measurement Location Position**, and **Offline Settings** sections.
- Configure the address in the **Measurement Location Address** section according to the following scheme:
  - **MUX croup**: Identifier for the line, where the MUX is installed. An unlimited number of MUX groups is possible.
  - **MUX number**: Identifier for the MUX in the MUX group. The first MUX in the group has number 1.
  - **MUX channel number**: Identifier for the measurement location on the MUX. Maximum 9 channels can be addressed on a MUX.
    The suggested address occupies the next available position in the potential address range.
- To create the measurement location in the next higher, unoccupied MUX group, open the **MUX group**, and click on the digit marked by an **asterisk** (*). You can display already allocated addresses with **show reserved MUX addresses**..

Using the '**Near Location**' function, 2 MUX groups can be measured at the same time. The two ‘near’ locations must be created in different MUX groups so that they can be measured on channel A and channel B at the same time.

Configure VIBCODE Measurement Locations

Data acquisition with mobile data collectors becomes easy and reliable with VIBCODE measurement locations. The VIBCODE system is characterized by the following properties:

- Unique **identification** of the coded measurement location prevents mix-ups.
- Robust **coupling** of the VIBCODE sensor to the measuring pin ensures reproducible measurement conditions and stable signal transmission.

The VIBCODE system can be operated together with VIBXPERT II and VIBSCANNER 2 in the following two applications:

- Vibration-based data acquisition directly at the coded VIBCODE measurement locations
- Identification of remote measurement locations using the VIBCODE system and vibration signal acquisition using a sensor installed permanently on site. This application is only possible in 2-channel operation.

Prerequisite

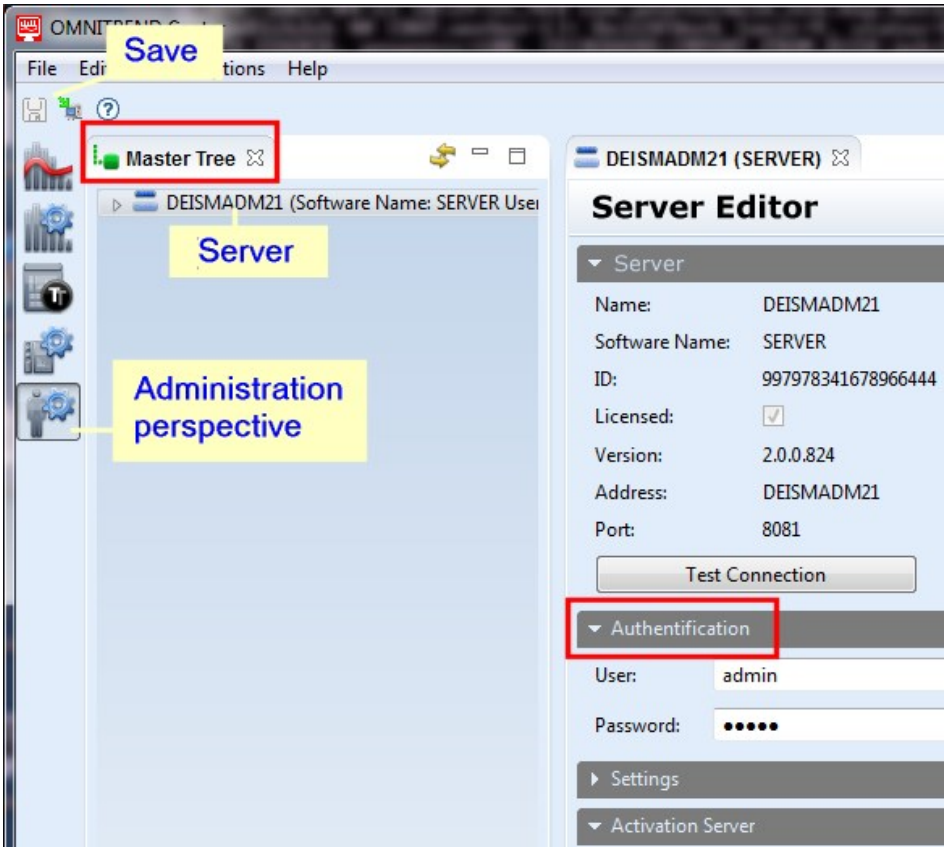
OMNITREND Center runs in **advanced view mode** (Options/User_Settings/General)

You must at least have the **specialist** user role to carry out the following tasks.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1] Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Create a new VIBCODE measurement location for data acquisition (1.)

- Open the **Configuration perspective**.
- Using the right mouse button, click on the **machine** in the machine tree, where you would like to create the VIBCODE measurement location.
- Select **Add / VIBCODE Measurement Location**. The **measurement location editor** appears.
- Configure the **General** and **Measurement Location Position** sections.
- In the **VIBCODE Settings** section, select the **VIBCODE Type** and enter the **VIBCODE Number**:
  - **VIBCODE Type**: Sensor variants with different frequency range (2 Hz / 10 Hz), measurement tasks that are respectively incompatible are automatically filtered from a route.
  - **VIBCODE Number**: Coding of the VIBCODE measurement location. The code number is unique within the operating range, value range: 1 ... 7166. Using **Show VIBCODE Ring**, the bit pattern of the VIBCODE ring can be displayed. The generated VIBCODE report can be used as reference for producing the ring.
- Click on **Save** to save the changes.

Create VIBCODE measurement location for the identification of remote measurement locations (2.)

Create a VIBCODE measurement location as follows for the application listed under point 2:

- Create a new VIBCODE measurement location (see previous section).
- Create the **measurement tasks** for the permanently mounted sensor at the VIBCODE measurement location. The **Offline Settings** section appears.
- Activate the **Permanently Mounted Sensor** option and select the sensor.
- Click on **Save** to save the changes.

Create VIBCODE measurement location based on already existing measurement location

VIBCODE measurement locations can be created based on already existing measurement locations.

- Open the respective **measurement location editor**.
- Select the VIBCODE icon in the **General Information** section, under **Icon**.

The previously set sensor is kept and appears in the **Offline Settings** section. In this configuration, you can operate the VIBCODE in the '(2) Remote Measurement Location' application.

To change the configuration to **Data Acquisition with VIBCODE** (point 1, see above), deactivate the **Permanently Mounted Sensor** option in the **Offline Settings** section.

Measurement tasks that are incompatible with VIBCODE are automatically filtered from a route.

10 Communication and data transfer

This section contains communication and data transfer topics.

10.1 Basics: Data transfer possibilities 152
10.2 Send measurement configuration to device 154
10.3 Send Configuration to Online Device via FTP 157
10.4 Read Measurement Data from Device into OMNITREND Center 158
10.5 Import data 165
10.6 Export measurement data (CSV format) 167
10.7 Exchanging master data between databases 169

10.1 Basics: Data transfer possibilities

OMNITREND Center offers the following data transfer options for the individual device types:

	Communication	VIBSCANNER 2	VIBXPERT II	VIBGUARD	VIBRONET Signalmaster	VIBROWEB XP
Direct	Ethernet (TCP/IP)	✗	✗	✓	✓	✗
	Fieldbus (Modbus TCP, Modbus RTU)	✗	✗	✓	✓	✗
	USB cable	✓	✓	✗	✗	✗
Indirect	Windows file system	✓	✗	✓	✓	✗
	FTP	✗	✗	✓	✓	✗
	E-mail	✗	✗	✓	✓	✗
	USB storage medium	✗	✗	✗	✗	✗

Data transfer to Accelix

Asset information and measurement data is transferred to the cloud-based data platform, Accelix™. Asset information is sent from OMNITREND Center to Accelix. Measurement data is sent from PT Link to Accelix and further to Live-Asset™ Portal, a web-based software for monitoring the asset condition.

The connection between OMNITREND Center has to be done in the Database editor (see Create database).

Explanations

Online device

All online devices can exchange configuration data (system / measurement) as well as measurement data and log files **directly**with OMNITREND Center via a wired or wireless network (**LAN/ WLAN**).

Communication via **Modbus** is provided for the data transfer between online device and process control centers and/or machine controls with the respective infrastructure. The online device can provide and/or receive information.

If no direct connection is available from OMNITREND Center to the online device, the configuration data and firmware updates can be loaded into the online device via **FTP server**. Alternatively, an **export file** can be generated that can be transferred to the online device via a direct connection on site.

In the case of complex projects with many online devices and many measurement data, the data import is automated via the **E-Mail Center**.

> Note: For security reasons, configuration files have to be deleted from any data medium after they have been transferred to the online device. For more information contact service or technical support.

VIBSCANNER 2

The measuring device is connected to the client PC via **USB** cable.

The following data can be transferred from the **measuring device to OMNITREND Center**:

- Measurement results (Route)

The following data can be transferred from **OMNITREND Center to the measuring device**:

- Measurement tasks (Route)

Alternatively, route measurement tasks, route measurement results can also be transferred via the **Windows file system**. Direct communication between the measuring device and OMNITREND Center is not necessary to this end.

VIBXPERT II

The measuring device is connected to the client PC via USB cable.

The following data can be transferred from the **measuring device to OMNITREND Center**:

- Measurement results (Route, Multimode, Balancing)

The following data can be transferred from **OMNITREND Center to the measuring device**:

- Measurement tasks (Route, Machine templates)

10.2 Send measurement configuration to device

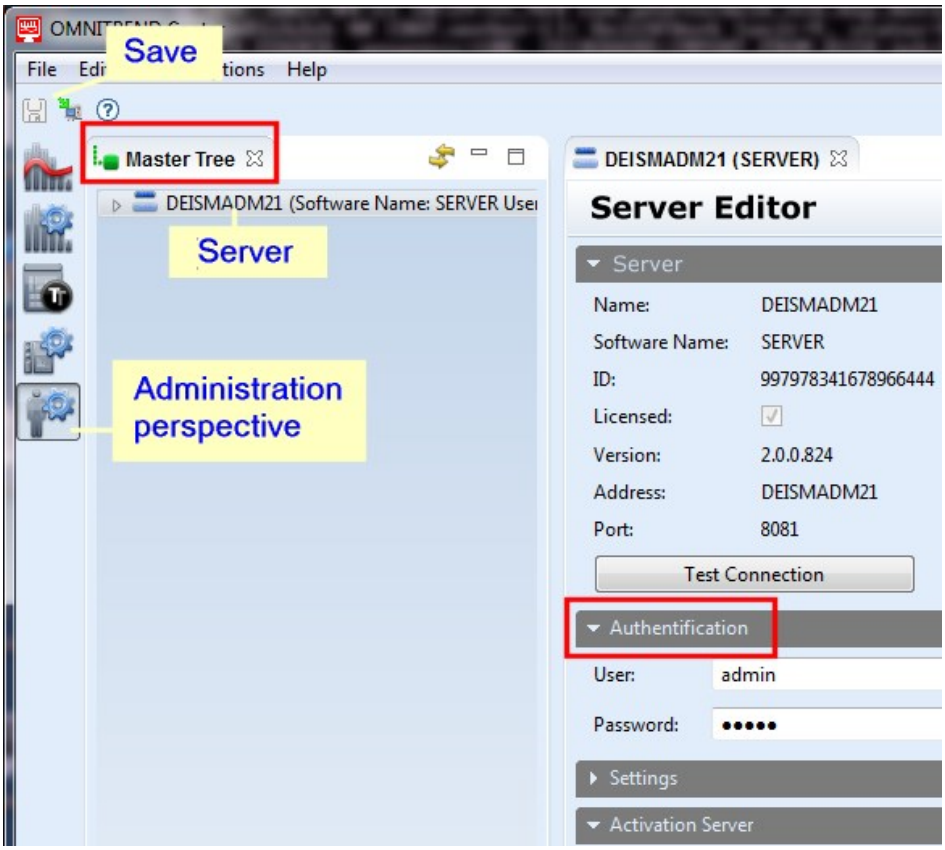
This section discusses the **direct transfer** of measurement configuration to a device.

Prerequisite

- The device can be directly reached from OMNITREND Center, either via USB or the TCP/IP network.
- The parameters for communication with the online device are set up (Measurement Device Editor / System Configuration / Communication).
- The online device is activated.
- You must at least have the **operator** user role for transferring a measurement configuration.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



[1]Grouping of related functions and fields in the Editor window

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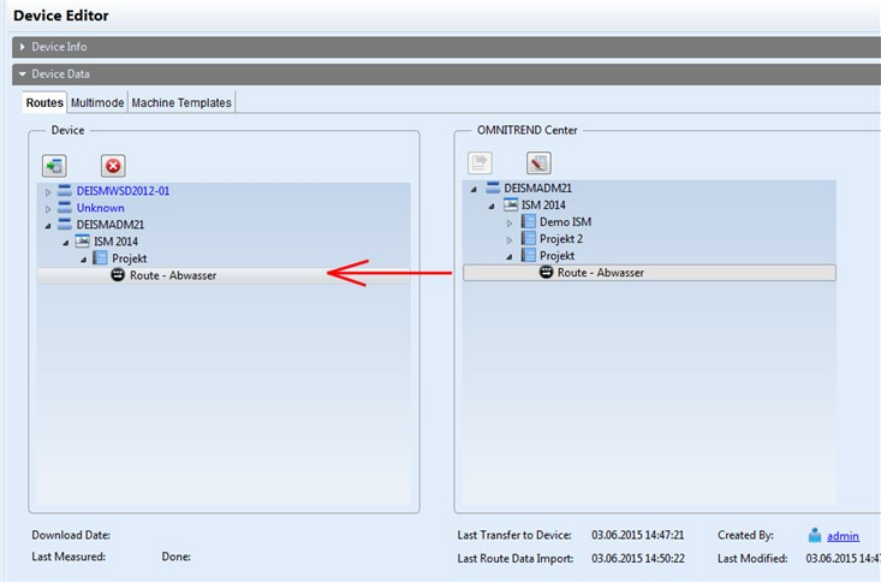
Transfer route to data collector

- Connect the measuring device to the client PC using a **USB cable**.
- Switch into the **Communication perspective**.
- Open the **Device** view.
  The connected measuring device appears in the table. The connection status is **active**.

  If the measuring device is not listed, check the cable connection. If needed, click to a different USB port on the PC and click in the local toolbar on Refresh .
- Double-click on the connected measurement device to open the **device editor**.
- Open the **Device Data** section.
- Open the **Routes** tab.
  The **left** sub-window contains the routes on the **device**.
  The **right** sub-window shows the routes in OMNITREND Center created in the opened projects.
- Mark the **route** to be transferred in the right sub-window.
- Click on **Send Route to Device** . A dialog window appears.
  Alternative: **Drag and drop** the route from the right sub-window into the left sub-window.



- Select the **sensor** contained in the route for each **measurement location type**.
- Click on **Finish**. The route is compiled for the device, checked for inconsistencies, and then transferred.

Transfer measurement configuration to the online device

- Switch into the **Communication perspective**.
- Open the **Device** view.
  The activated online device appear in the table.
- Double-click on the desired online device to open the **device editor**.

- Open the **Measurement Configuration** section.
- Click on **Send Measurement Configuration to Device** . An inquiry appears regarding the current measurement data on the online device.
- Select one of the following options:
    - **YES**: The measurement configuration is uploaded to the online CMS. The current measurement data on the online CMS is deleted in the process.
    - **NO / CANCEL**: The measurement configuration is not transferred; the process is canceled.
- If you wish to import the current measurement data from the online CMS beforehand, call up the “Instant data transfer” function in the PT Link software.
- Then transfer the measurement configuration to the measuring device, as described above.

10.3 Send Configuration to Online Device via FTP

If the configuration data cannot be directly transferred to the online device, you can load the data onto a FTP server. The online device regularly connects to the FTP server and retrieves the current files from the server.

Preparation

Open the **System Configuration**:

- Open the **Communication perspective**.
- Open the **Devices** view.
- Double-click on the respective **online device** to open the **devices editor**.
- Open the **System Configuration** section.

To activate data retrieval via FTP server:

- Open the Update Service tab
- Activate the **Enable Update Service** option
- Enter the FTP connection and login data (see section above).

  Please note that the login data (user, password) applies to the online device login to the FTP server!

- Adjust the interval, at which the online device should check the FTP server for current data.
- Click on **Save** in the main toolbar.

  To enable online device communication via FTP, you must first directly transfer the respective system configuration to the online device.

To transfer configuration data to the FTP server:

- Open the **Communication** tab.
- Activate the **Indirect** and **FTP** options in the **Configuration Export** field.
- Enter the **FTP** server address and the directory, into which the OMNITREND Center configuration data should be transferred.
- Enter the login data (**user, password**). Leave the **port** number at 21.
- Click on **Save** in the main toolbar.
- Click on **Send Measurement Configuration to Device** in the local toolbar of the system and/or measurement configuration. OMNITREND Center Establishes the connection to the FTP server and transfers the configuration data into the specified server directory.

Note: For security reasons, configuration files have to be deleted from any data medium after they have been transferred to the online device. For more information contact service or technical support.

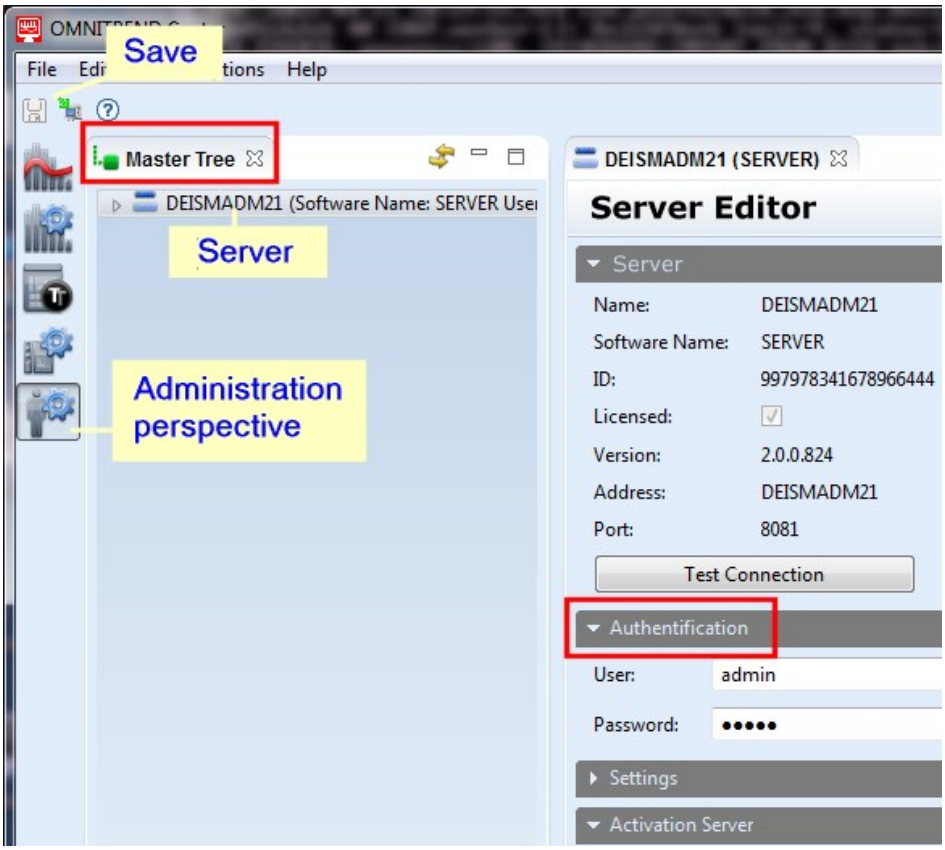
10.4 Read Measurement Data from Device into OMNITREND Center

Prerequisite

You must at least have the **operator** user role for importing measurement data.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



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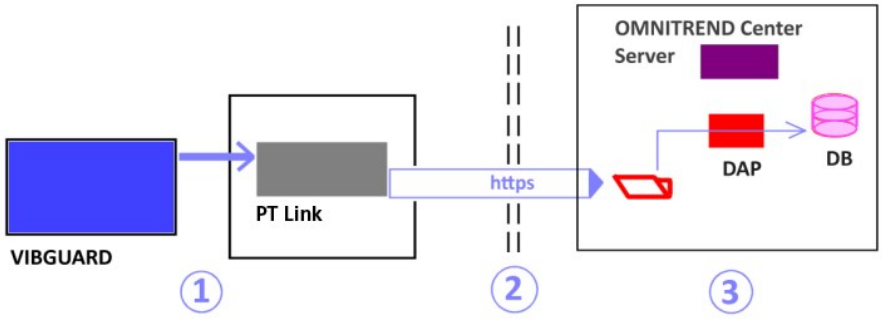
Different options are available to read in measurement data into OMNITREND Center:

[1] Grouping of related functions and fields in the Editor window

Import from an online CMS (VIBGUARD)

Automatic import via PT Link

Multiple processes and components are involved in the automatic import of measurement data into the database (DB). The following graphic shows a schematic overview of the data paths and processes for the VIBGUARD online CMS:



- **Point 1**: VIBGUARD contains a valid measurement configuration and processes the programmed measurement cycle continuously. VIBGUARD stores the data collected in its measurement data memory. The transfer of the measurement data to PT Link starts as soon as the connection to VIBGUARD is configured in PT Link. PT Link retrieves the measurement data every 15 minutes.
- **Point 2**: As soon as PT Link is connected to the OMNITREND Center server, the measurement data is transferred to the server via a secure connection (https). The measurement data is initially stored in the server file system. The data is also transferred every 15 minutes in this context.
- **Point 3**: The DAP transfers the measurement data from the file system to the database. The VIBGUARD CMS in question must be activated in OMNITREND Center to start the transfer. The intervals at which the DAP transfers the measurement data to the database can be specified in the DAP configuration.

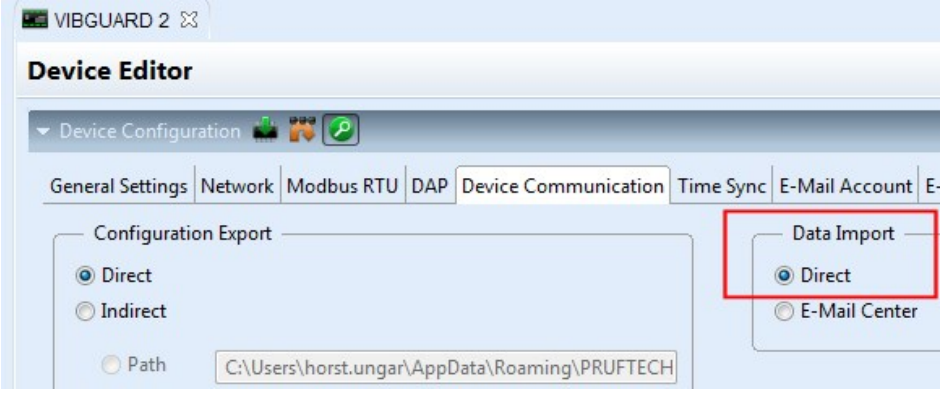
The following section describes the DAP configuration for the measurement data import (point 3 in the graphic above). The remaining processes for the data transfer are set up in the PT Link software.

Preparation

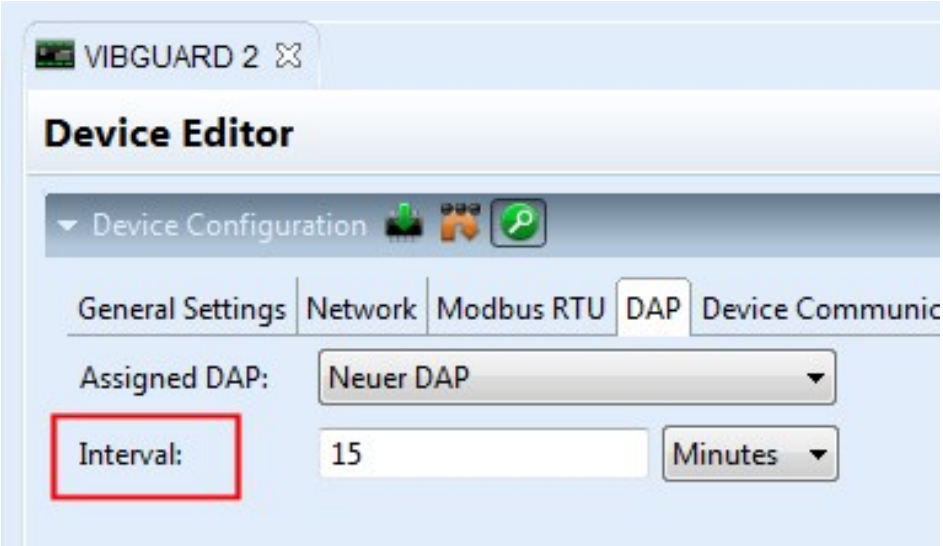
- Open the **System Configuration**:
  - Open the **configuration perspective**.
  - Open the **devices** view.
  - Double click on the respective **online device** to open the **device editor**.
  - Open the **System Configuration** section.

How to configure the DAP for the measurement data import

- Open the **Communication** tab.
- Activate the **Direct** option in the **Import Data** field.



- Confirm the note regarding the measurement configuration on the online device using **OK**
- If needed, check the measurement data import **interval** in the **DAP** tab.

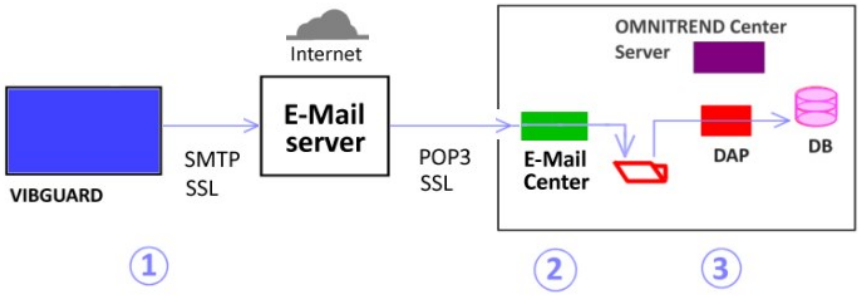


- Click on **Save** in the main toolbar.

You must **activate** the online CMS in question in order to start the import of the measurement data into the database.

Automatic import via OMNITREND E-Mail Center

The measurement data is generally transferred by e-mail attachment for extensive installations involving multiple VIBGUARDs and a large volume of measurement data. The measurement data is imported into the database via the DAP together with the **OMNITREND E-Mail Center** software module, which processes the data traffic with the external e-mail server almost fully automatically. The following graphic shows a schematic overview of the data paths and processes for the VIBGUARD online CMS:



- **Point 1**: VIBGUARD contains a valid measurement configuration and processes the programmed measurement cycle continuously. VIBGUARD stores the data collected in its measurement data memory. VIBGUARD sends the packed measurement data as an e-mail attachment to the configured e-mail server (SMTP) at regular intervals.
- **Point 2**: OMNITREND E-Mail Center connects to the e-mail server and retrieves the e-mail with the measurement data archive. The archive is unpacked and the measurement data is stored in the server file system.
- **Point 3**: The DAP transfers the measurement data from the file system to the database. The VIBGUARD CMS in question must be activated in OMNITREND Center to start the transfer. The intervals at which the DAP transfers the measurement data to the database can be specified in the DAP configuration.

How to configure measurement data import via E-Mail Center

- Open the **Communication** tab.
- Activate the **E-Mail Center** option in the **Import Data** field.
- Confirm the note regarding the measurement configuration on the online device using **OK**.
- Open the **E-Mail Account** tab.
- Enter the details of the SMTP sever on which the online CMS is to send the measurement data by e-mail (**SMTP Settings**).
- Enter the login details for the e-mail account on the SMTP server (**SMTP Authentication**).
- Note: The SMTP sever and the e-mail account have been set up in the course of CMS startup.

  The relevant SMTP for the **E-Mail Center** is configured in the **OMNITREND Center Utility** application.
- Check the interval for sending the data e-mail:
  - Open the **measurement configuration** section.
  - Open the **E-Mail** tab.
  - If needed, change the **interval** in the **Data E-Mail Trigger** field.
- Click on **Save** in the main toolbar.

In addition to the measurement data, all log files are imported as well, such as system logs, events. After a successful data import, the respective information appears as new entries, such as "New Data Available" in the **Tasks** view.

Manual import from the server file system via DAP

When the measurement data is imported automatically, the data is stored in the server file system before the DAP imports it into the database after a set period of time (c.f. graphics above). You can also shorten this waiting time and arrange for the DAP to import the measurement data from the server file system **manually**.

How to start the manual import into the database:

- Click on **Upload to PC** in the main toolbar. A dialog window appears.
- Select the respective device from the device list. The device list only shows active devices.
- Click on **finish** to start the measurement data import.

Importing current measurement data immediately (instant data transfer)

If necessary, you can bypass the set import automatisms and read the current measurement data from the VIBGUARD without any time delay and import the data into the database. This import option is only possible if the measurement data is transferred via PT Link. The relevant function in PT Link is called “Instant data transfer”.

This function transfers the measurement data from VIBGUARD to the server file system and, in doing so, also triggers the measurement data import into the database. The set time intervals are not taken into account.

Import from a portable device

The following measurement data can be imported from a portable measuring device:

- Balance measurements and multimode measurement results (VIBXPERT II)
- Measurement data from a route
- Measurement data from a machine template

Preparation:

- Switch the measuring device on.
- Connect the device to the client PC using a **USB cable**.
- Open the **device editor**. To do so, carry out the following steps:
  - Open the **communication perspective**.
  - Open the **devices** view.

    A green stoplight icon appears in the **status** column, if the measuring device is connected and recognized. If necessary, click on **update**, to reload the device list.
  - Double click on the respective **VIBXPERT II** measuring device. The **device editor** opens.
- Open the **device data** section.

To import balance measurements and multimode measurement results:

- Open the **multimode** tab. The data structure on the device appears. Measurement data in **black** font can be imported. Measurement data in **blue** font is not compatible with the current OMNITREND Center version.

  For the import, you can select the measurement data individually, mark multiple datasets simultaneously (CTRL/SHIFT key) or select a higher level folder.
- The following steps are dependent on the hierarchy level shown in the machine tree.
  If only as far as the **machine train** plane is visible, proceed as follows:

- Drag the measurement data per drag&drop onto the **machine train** in the machine tree to which you would like to add the data. It appears in the **import wizard** with the graphical depiction of the machines and measurement locations.
- Click on the measurement location in the machine graphic to which you would like to add the measurement data. A green tick on the mouse pointer indicates that at least one measurement result can be added.
  The data import starts and is completed by a status notification. If not all measurement data can be imported, repeat the procedure at a different measurement location or select the **diagnostic location** on the machine.

- If the tree structure is completely visible as far as the lowermost plane, drag the measurement data by drag&drop to the intended **measurement location**.

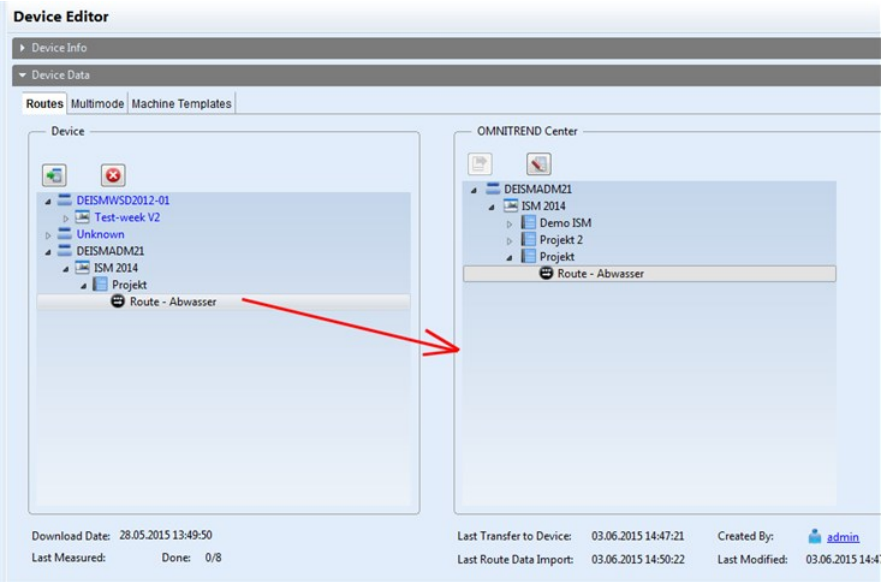
- **Diagnostic locations** contain measurement data that is not measured in the course of a route. It is generated automatically when creating a machine.

To import measurement data from a route:

Prerequisite: The route must have been created in the current database so that the measurement data is added at the correct position in the machine tree. If the route to be imported was created in a different database, connect the respective database to the server before you import the measurement data.

- Open the **route** tab.
- **Drag&Drop** the route from the left pane into the right pane.

  Alternatively: Mark the route and click on **Import route**.



- The routes on the device appear in the left **device** pane. Routes marked in **black** can be imported. Routes marked in **blue** have been created in a different database and cannot be imported until the respective database is connected to the server. Routes marked in **red** are not compatible with OMNITREND Center and cannot be imported.
  In the right **OMNITREND Center** pane, all routes appear that are created in the **active** projects/databases.

- To delete the route in the measuring device, click on **delete**.

As an alternative to the procedure described above, you can also import the routes via the main icon bar:

Quick route import from the device

- Connect the VIBXPERT II to the client PC using a **USB cable**.
- In the main icon bar, click on **Upload to PC**. A dialog window appears.
- Select the connected measuring device from the device list. The routes contained in the measuring device appear in the lower **routes** pane.
- Select the respective route (multiple selections possible) and click on finish.
- A dialog window appears following the import. Here you can find out which routes have been imported successfully and which ones have not.

Route import via the Windows file system

Prerequisite

The routes in **VIBSCANNER 2** can be stored directly in the file system from the measuring device. The routes file to be imported (*.tar / *.zip) is available on the client PC.

- In the main icon bar, click on **Upload to PC**. A dialog window appears.
- Click on the **select file** button (top right).
- Select the backup file and click on **open**. The file is imported, unzipped and the routes contained therein are displayed in the lower pane.
- Select the route and click on **finish**.

To import the measurement data from a machine template

- Open the **machine templates** tab. The machine templates on the device appear in the left **device** pane. The corresponding measurement data is subordinate to the respective machine template.
- Drag the **measurement data** per drag&drop onto the **location** in the **machine tree** at which the measured machine train is located. The measurement data is imported and the machine tree has the corresponding entries added to it.

10.5 Import data

You can import the following data into OMNITREND Center:

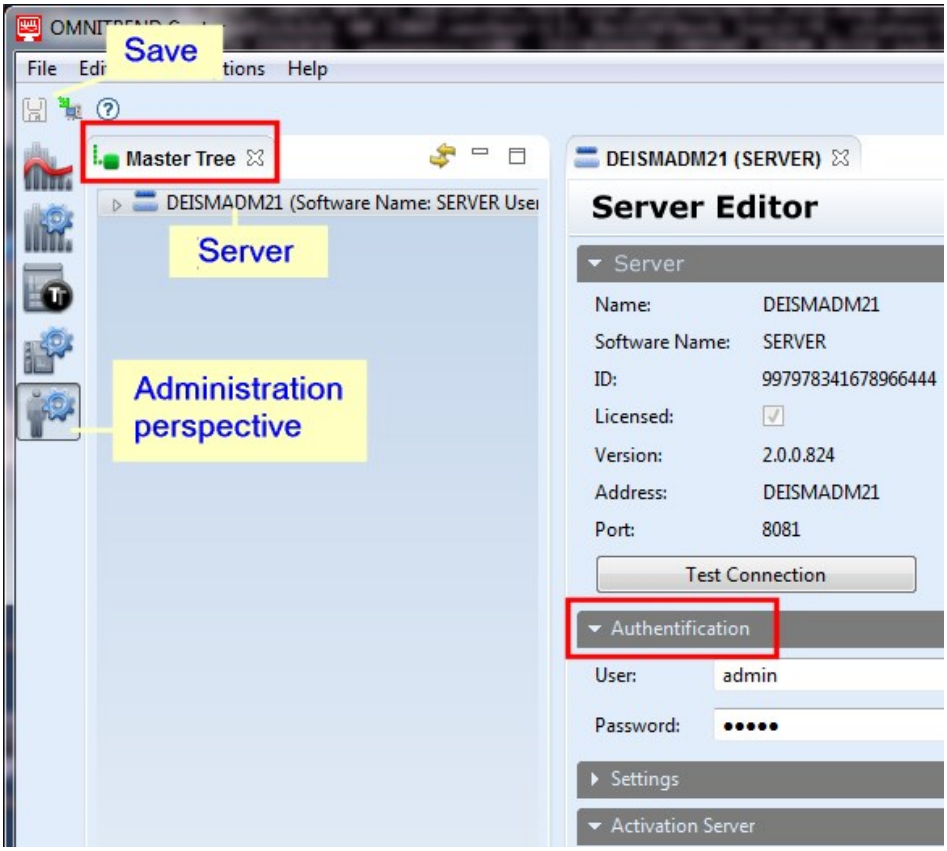
- **Bearing data**
- **Diagnostic codes**
- **Finding codes**
- **Report-Layouts**
- **Licenses**
- **Legacy data** from OMNITREND

Prerequisite

You must at least have the **Specialist** use role to import data. You can import multi-server licenses with the **Viewer** role as well.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



[1]Grouping of related functions and fields in the Editor window

> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To import data

In the **main menu** click on **File**and select the **Import**option. A dialog window appears.

- Select the desired **import wizard** (e.g. bearing) and click on **Next**.
- Depending on the import wizard, enter the following information on the next screen:
    - **Database**: Here you set the database, into which the data should be imported.
    - **Folder / File**: Here you select the folder, in which the imported data should be filed.
- Click on **Finish**to start the data import.

10.6 Export measurement data (CSV format)

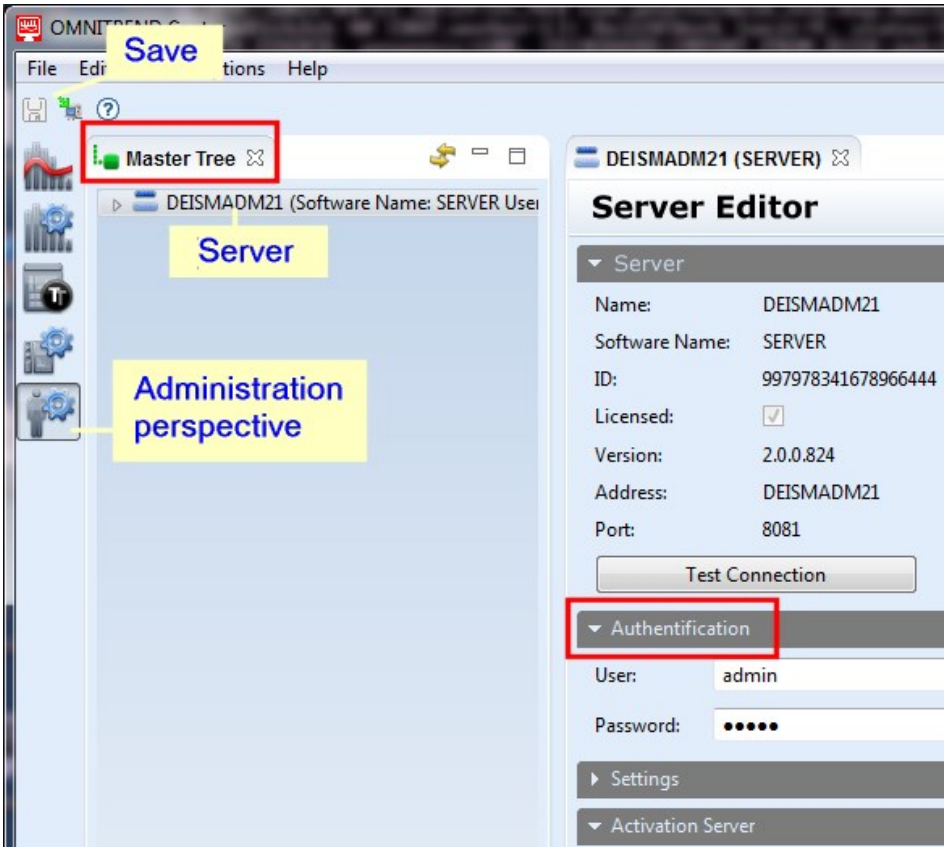
You can export measurement data into the CSV format either **manually ad-hoc** or **automatically from the server**. The exported measurement data can be further processed in a spreadsheet program (e.g. MS Excel).

Prerequisite

You must at least have the **viewer** user role for exporting measurement data.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To export measurement data manually into the CSV format

[1] Grouping of related functions and fields in the Editor window

- Switch into the **Administration perspective**.
- Using the right mouse button, click on the tree node, from which you would like to export measurement data. A dialog menu appears.
- Select **Export Measurement Data**. A dialog window appears.
- Enter the following export parameters:
  - **Folder**: Folder, into which the measurement data are exported.
  - **Time Range**: Specify the measurement data (number, time range) you would like to export.
  - **Field Separator**: Select the character to be used for separating he individual fields.
  - **Decimal Separator**: Select the separator for decimal numbers.
- Click on **Finish** to finish. The measurement data export starts.
- You can open the export folder after a successful data export. Confirm the respective prompt with **Yes**.

To configure the automatic measurement data export as server job

- Switch into the **Report Administration perspective**.
- In the report tree, open the **database**, in which the measurement data is located.
- Using the right mouse button, click on **Report Jobs**. A dialog menu appears.
- Select **New Report Job / Measurement Data Export**. The **report job editor** appears.
- Enter the following export parameters:
  - **General Settings / Layout**: Enter a **name** and select a **layout** for the report.
  - **Schedules**: Click on **New Element** . A dialog window appears:
    Activate the time schedule and **configure** the measurement data export schedule.
  - **Localization**: Here you can set the **language** and **time zone**.
  - **Tree Filter**: Select the tree node, from which the measurement data should be exported. Use the filter function and CTRL button for multiple selections as needed.
  - **Standard**: Here you can select, which measurements should be selected: All, all since last upload, or all from a time range.
  - **Field Separator**: Select the character to be used for separating he individual fields.
  - **Decimal Separator**: Select the separator for decimal numbers.
- Click on **Save** to finish.
  The measurement data export starts at the specified time, assuming that the time schedule is activated.

  The folder for the measurement data export is specified in the context of the **server**.

  Setup folder for automatic measurement data export:

  - Switch into the **Administration perspective**.
  - Log in as **system administrator**.
  - In the master tree, double-click on the server. The **server editor** appears.
  - Open the **Settings** section.
  - Set the respective folder in the **Measurement Data Export Directory** field.
  - Click on **Save** to finish.

10.7 Exchanging master data between databases

If you would like to use master data from one database in another database, you can transfer such data.

You can transfer the following master data:

- User
- Devices
- Task templates
- Machine templates
- Kinematic models
- Sensors
- User defined units

Prerequisite

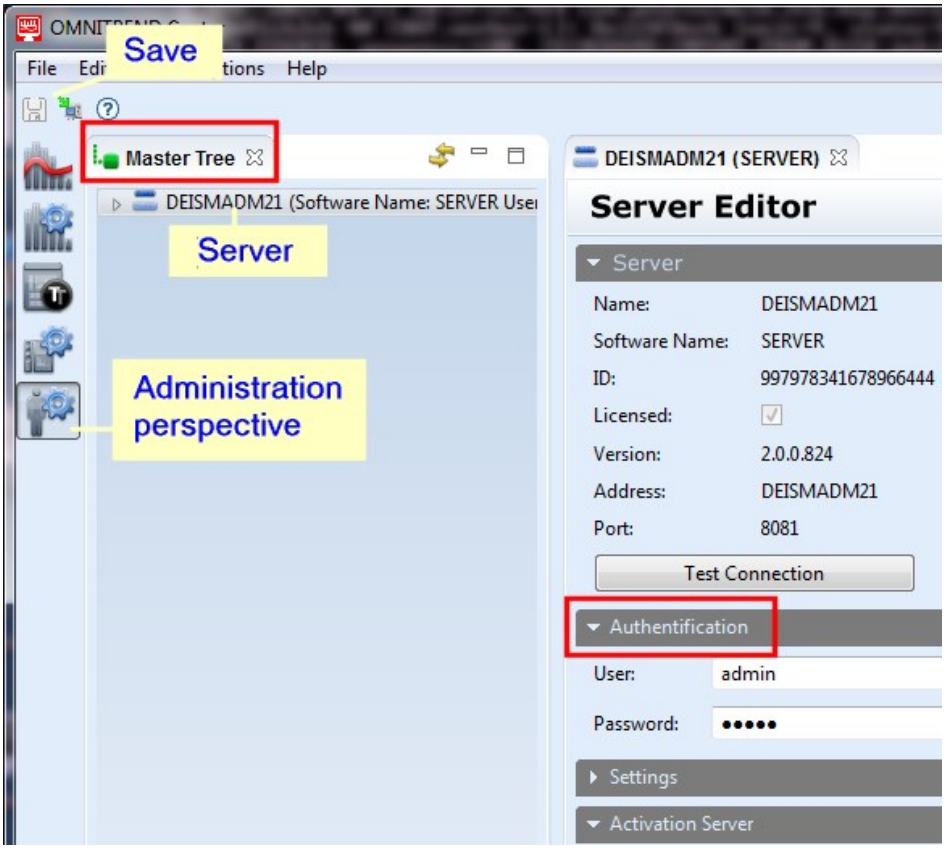
Both databases (source and target) must be connected to the server.

You must be created under the same **user name** in each of the databases and you must have at least the **specialist** role.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1]Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Example: This is how you transfer a measuring device (VIBGUARD)

- Open the **Administration perspective**.
- Open the **source database**
- Open the **devices / VIBGUARD** branch.
- Using the right mouse button, click on the respective VIBGUARD device and select **copy**.
- Open the **devices** branch in the **target database**.
- Using the right mouse button, click on VIBGUARD and select **paste**.

11.1 Basics: Exchange data via Modbus

Online devices use the **Modbus** communication protocol for exchanging data with external control systems.

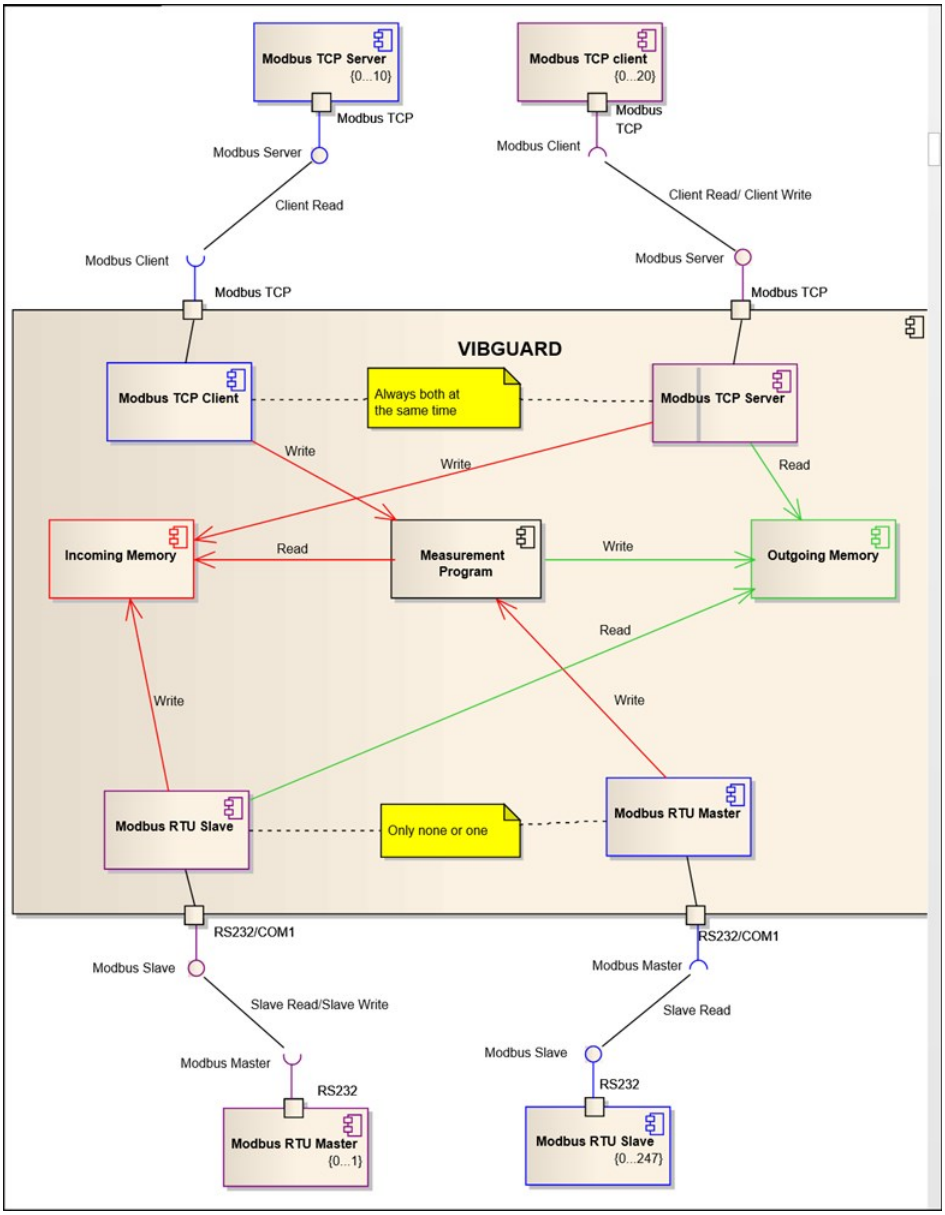
The following **data** can be exchanged:

- **Measurement values**: Characteristic vibration values (parameters), process variables, speed, digital inputs, characteristic band values, phase measurement (order), orbit order), roller bearing conditions (max, carpet)
- **Status information**: Sensor status, alarm, warning, prewarning; this information is provided by online devices only (unidirectional)

The following **operating states** are available:

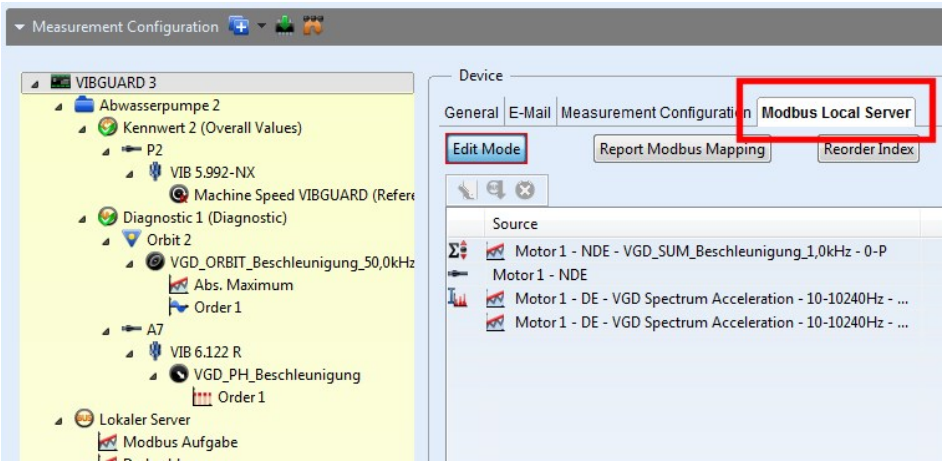
- **Modbus RTU**:
  The online device can have its data read by a third-party system in RTU mode, or have third-party data written into its input memory (**slave**). As **master**, the online device can inquire data from the third-party system. RTU mode activation and serial interface configuration take place within the scope of the system configuration under **Modbus RTU Settings**.
- **Modbus TCP**:
  The online device can provide data for third-party systems as **server** in TCP mod, or have third-party data written into its input memory. As **client**, the online device can read out third-party data from an external server. The TCP mode is always active , if the RTU mode is deactivated. The interface is configured within the scope of the system configuration under **Network - Modbus TCP**. In **TCP mode**, the online device can operate as **client** and as **server**.

The following overview emphasizes the different **operating states** and **communication paths** for the VIBGUARD online device:

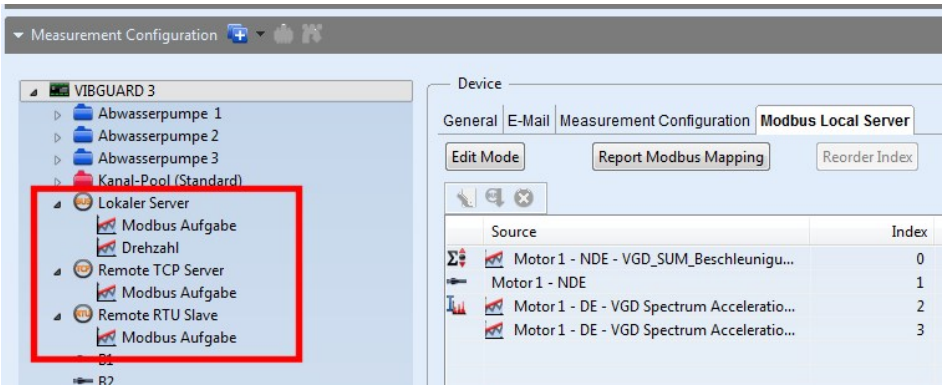


Data exchange based on measurement tasks

The measurement data provided by the online device to a third-party system, is compiled in the device context (**Modbus Local Server** tab).



For measurement data originating from a third-party system, you define **Modbus measurement groups** in the measurement configuration.



The following **measurement group types** exist depending on whether the third-party measurement system can write measurement data actively into the memory, or whether the online device must obtain the measurement data:

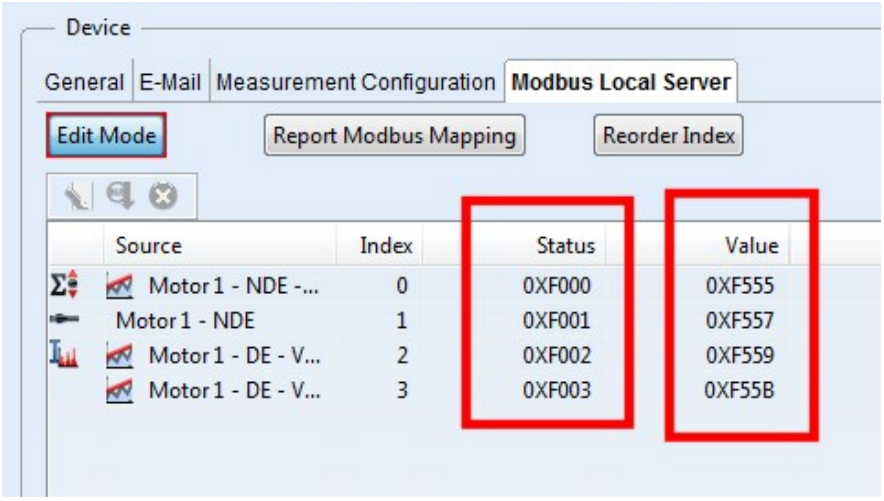
- **Local Server**: In this measurement group, you configure the measurement tasks that should be read in by the online device from a third-party system (online device as RTU slave) and/or that should be written into the memory by the third-party system (online device as TCP server).
- **Remote TCP Server**: In this measurement group, you configure the measurement tasks that should be read in by the online device as TCP client from a third-party system.
- **Remote RTU Slave**: In this measurement group, you configure the measurement tasks that should be read in by the online device as RTU master from a third-party system.

  You define in the **System Configuration** under **Modbus RTU Settings**, whether the online device should operate as **RTU master** or **RTU slave**.

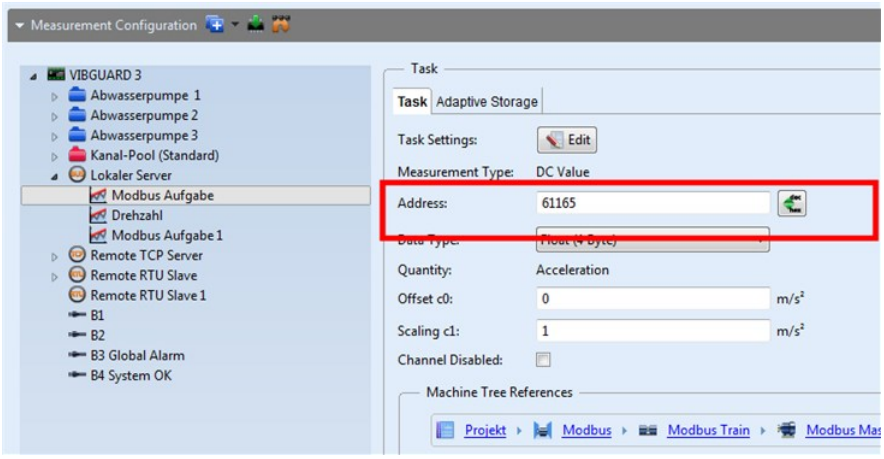
Data addressing

Data exchanged via Modbus is stored in a separate Modbus memory range, one for outgoing and one for ingoing data. To ensure that the measurement program provides and/or processes the correct data, the memory addresses must be assigned in the Modbus range and in the measurement program ("mapping").

- The online device uses the following fixed Modbus address range for data **provision**: 0xF000 to 0xFFFF.
  A **status value** requires a Modbus address. **Measurement values** require two Modbus addresses.
  The following figure shows the Modbus addresses for the status and measurement value.



- The online device uses the following fixed Modbus address range for storing **third-party data**: 0xE000 to 0xEFFF.
  The following figure shows addressing of a Modbus task for reading in third-party data.



Provide data via Modbus

Online devices provide measurement data and status information via a local Modbus server. To correctly transfer the data to third-party systems, the respective measurement tasks and/or measurement channels from the **measurement configuration** must be assigned to the **Modbus memory**.

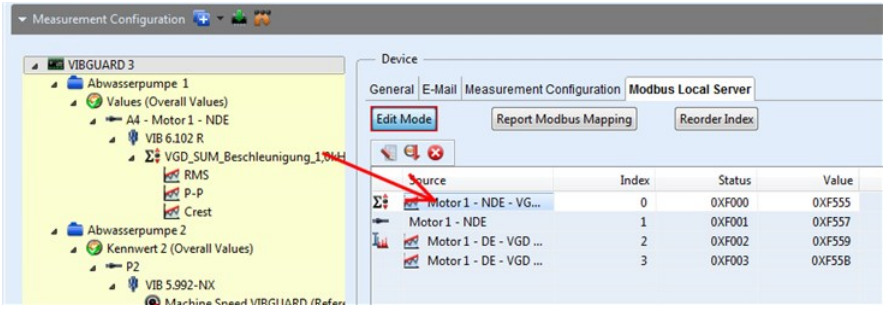
The third-party system accesses the Modbus memory either via **TCP** (max. 20 connections at the same time) or **RTU** (max. 1 connection at the same time).

Prerequisite

The Modbus parameters in the **system configuration** are set: **Network - Modbus TCP** and/or **Modbus RTU**

To provide data via Modbus

- Open the **Measurement Configuration** section:
  - Open the **Communication perspective**.
  - Open the **Devices** view.
  - Double-click on the respective **online device** to open the **device editor**.
  - Open the **Measurement Configuration** section:
- In the **channel tree**, mark the top entry (online device).
- Open the **Modbus Local Server** tab.
- Click on the **Edit Mode** button.
  The channel tree filters all measurement tasks, for which data can be exchanged via Modbus. The background color in the channel tree changes to yellow.
- Drag & drop the respective element (**meas. task** or **meas. channel**) into the right list field.



  The sequence is defined by the **index**.
  The assigned Modbus address is specified in the **Status** and **Value** columns. The presentation can be switched between **Decimal** and **Hex View**. Using the right mouse button, click on the column title and activate/deactivate the **Hex View** option.
- To change the **sequence**, drag the respective element into the list to the desired position. The Modbus address changes automatically.

  Alternative: Change the index number using **Edit** .
- You can also find the following buttons in the local toolbar:
  - **Reorder Index**: Sorts index in increasing order starting with 0.
  - **Report Modbus Mapping**: Create report about mapping the Modbus data.
  - **Delete** : Delete Modbus element. The index is preserved.
- Finally, deactivate the **edit mode**.
- Click on **Save** to save the **Modbus configuration**

Receive data via Modbus

Online devices receive measurement data from third-party systems via Modbus. Depending on how the Modbus protocol is set up in the third-party system and in which operating state communication takes place, the measurement data can be actively read in by the online device and/or the third-party system can write the data into the Modbus memory. The online device is respectively configured as **TCP server**, **TCP client**, **RTU master**, or **RTU slave**.

Measurement data from third-party systems is processed in the online device in the form of a **Modbus task**. You create these Modbus tasks in the measurement configuration in a **Modbus measurement group** and link them with the machine tree (project).

Three types of Modbus measurement groups exist: **Local server**, **remote TCP server**, **remote RTU slave**

> Further details about Modbus measurement groups can be found in section **Basics: Exchange data via Modbus** (link, see under "Related Topics").

Perform the following steps in the **Measurement Configuration** section:

- Open the **Communication perspective**.
- Open the **Devices** view.
- Double-click on the respective **online device** to open the **device editor**.
- Open the **Measurement Configuration** section:

To create a Modbus measurement group

- Using the right mouse button, click on the top entry (online device) in the **channel tree**.
- Select **Add / Modbus Group**. A dialog window appears.
- Enter a **name** and select the **measurement group type**.

  > Maximum number: Local server = 1; remote RTU slave / remote TCP server = 10

- Configure the **connection settings** for the **remote TCP server / remote RTU slave** measurement groups. For this purpose enter the following parameters in the **General** tab:
  Name: Name for the **RTU** slave.
  Address: Network address of the Modbus TCP server on the third-party system
  Slave no.: Slave number (1...247), this is the Unit ID for remote TCP servers.
  Timeout: Time interval, after which the connection is canceled if no data is exchanged.
  Port: 502 for Modbus TCP
  Register: Set the register type to INPUT or HOLDING.

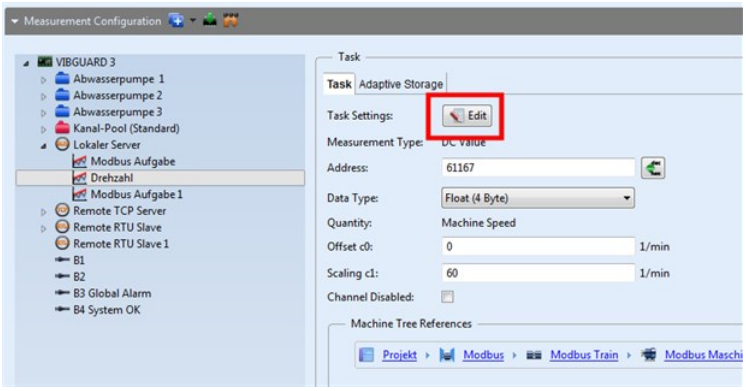
  > The connection settings for the **local server** measurement group are stored in the **system configuration** (Network Modbus TCP/ Modbus RTU).

- Configure the properties of the Modbus measurement group regarding **alarm conditions**, **measurement data reduction** (adaptive saving), and **operating state**.

To create a Modbus task

- Using the right mouse button, click on the **Modbus measurement group**.
- Select **Add / Modbus Task**. A dialog window appears.
- Enter a **name** and select the **measurement quantity**.
- Click on **Next**.

- Enter the following parameters:
  - **Address**: Modbus memory address; You can switch the view (hex/decimal) using **Switch...** .
  - **Data Type**: Data type and byte length of the measurand
  - **Offset c0 / Scaling c1**: Sensor parameters
- Click on **Finish**. The Modbus task is created in the channel tree under the selected Modbus measurement group.
- Configure the properties of the Modbus task regarding **measurement data reduction** (adaptive saving)
- Open the **measurement task editor** using the **Edit** button. Here you can enter thresholds for analysis (Alarm Editor section).



- Repeat the procedure for the any further Modbus tasks.

To create a report about the tasks in the Modbus measurement group

- Click on the **Modbus measurement group** in the channel tree.
- Open the **General** tab
- Click on the **Report Modbus Mapping** button.
  The generated report shows all Modbus tasks with Modus address and data type.

To link Modbus tasks with the machine tree

- Drag and drop the **Modbus task** on the measurement location in the machine tree. The Modbus task is created as measurement task.

OR

- Drag a **Modbus measurement group** on the machine and/or machine train. The Modbus measurement group is created as additional measurement location in the machine tree with the corresponding Modbus tasks.

Delete a Modbus task from the machine tree:

- First, remove the **link** between channel tree and machine tree:
  - Using the right mouse button, click on the respective task in the **channel tree**.
  - Select **Delete Link**.
  - Confirm the deletion confirmation prompt with **Yes**.
- Mark the respective task in the **machine tree**.
- Press the **DEL key** on the keyboard.
- Confirm the deletion confirmation prompt with **OK**.

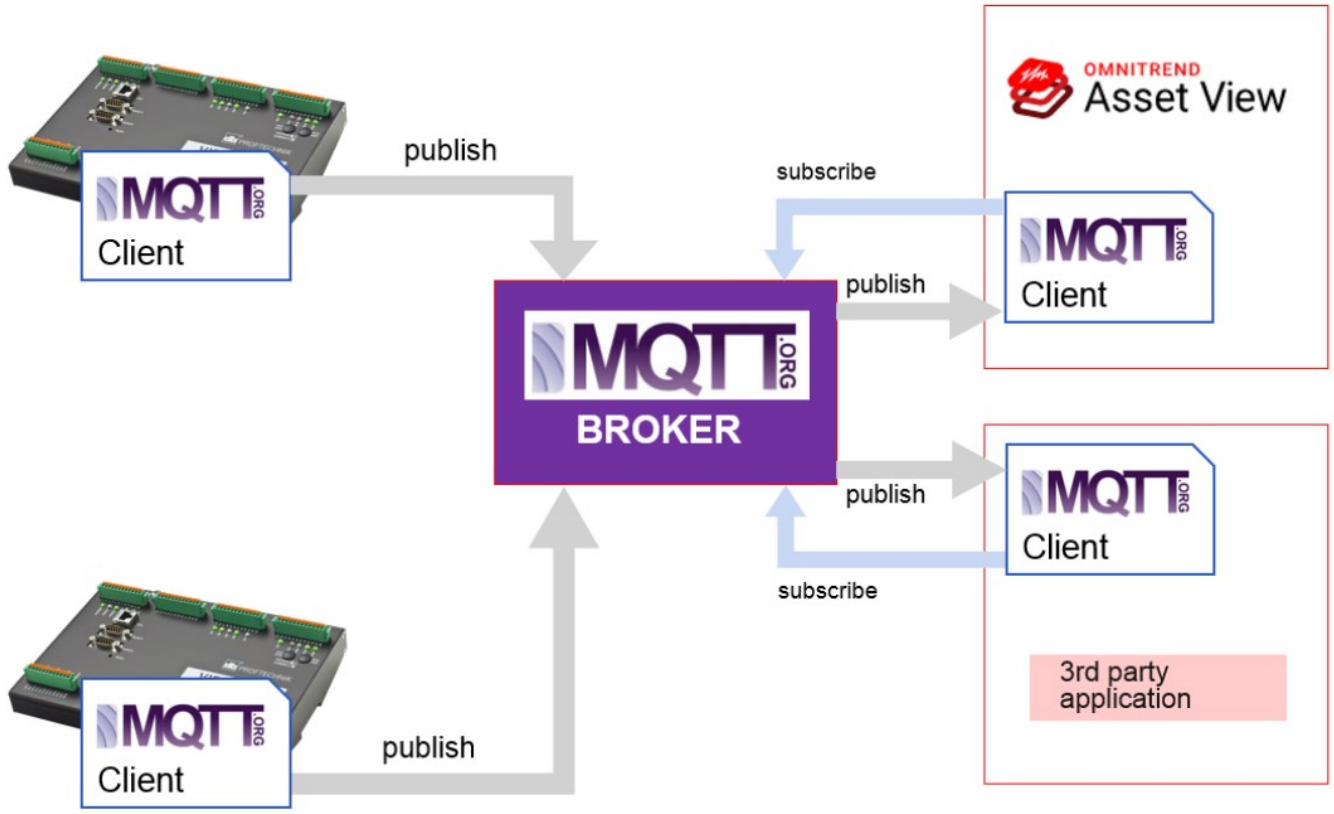
11.2 Basics: Communication in IIoT

The two online CMS **VIBGUARD** and **VIBRONET** Signalmaster have a new communication interface. This interface can be used to issue measurement data and status information to other devices in the form of messages.

The transfer protocol is **MQTT**[1] It is widely used in the Industrial Internet of Things (**IIoT**) and has the following features:

- Reliable communication, even in relation to unstable networks
- Efficient data communication with low consumption of resources and bandwidth
- High scalability via networking of many devices
- Event-driven publish / subscribe architecture

The following overview illustrates the key processes involved in data communication between a data producer (in this instance: VIBGUARD CMS) and a data user



Explanations

- The central element is the **MQTT broker**, which works as a server and organizes the data traffic between data producer and data user.
- The data is received and distributed according to the **publish/subscribe** principle:
  - The data producer delivers (publishes) measurement data to a broker.
  - The data user subscribes to the measurement data of one or more data producers from the broker.
  - The broker distributes the incoming measurement data to the relevant subscribers.

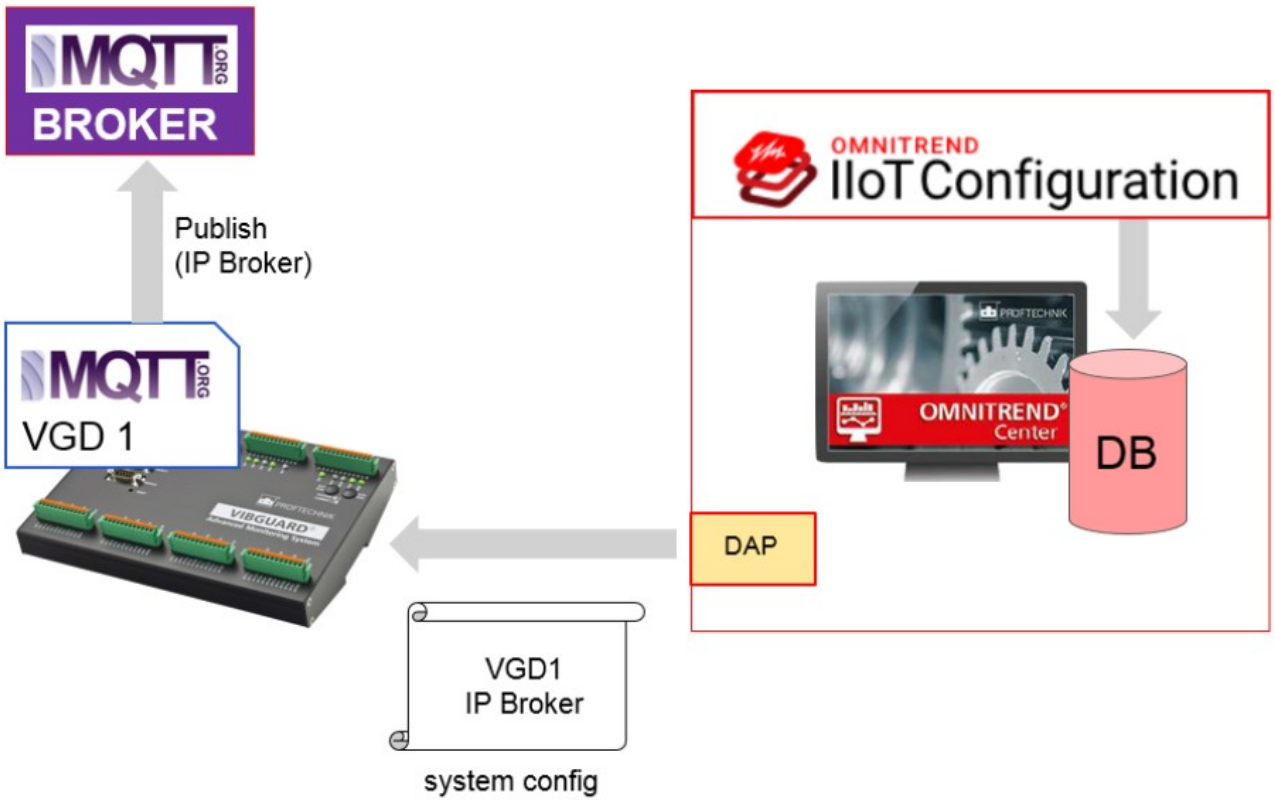
[1] Message Queuing Telemetry Transport.

- Appropriate visualization tools display the data graphically on the subscriber's side, e.g. **OMNITREND Asset View**.
- The number of data producers and data subscribers per broker is arbitrarily scalable, depending on the data throughput.
- The configuration of the MQTT interface in the Online-CMS is done via **OMNITREND IIoT Configuration** software module.

OMNITREND IIoT Configuration - OIIoT

Using the OMNITREND IIoT Configuration (**OIIoT**) web-based software module, you can configure an online CMS for data transmission via MQTT. This **MQTT configuration** is essentially composed of two parameters:

- Assignment of the CMS to an MQTT broker
- IP address at which the MQTT broker can be reached by the CMS in the network

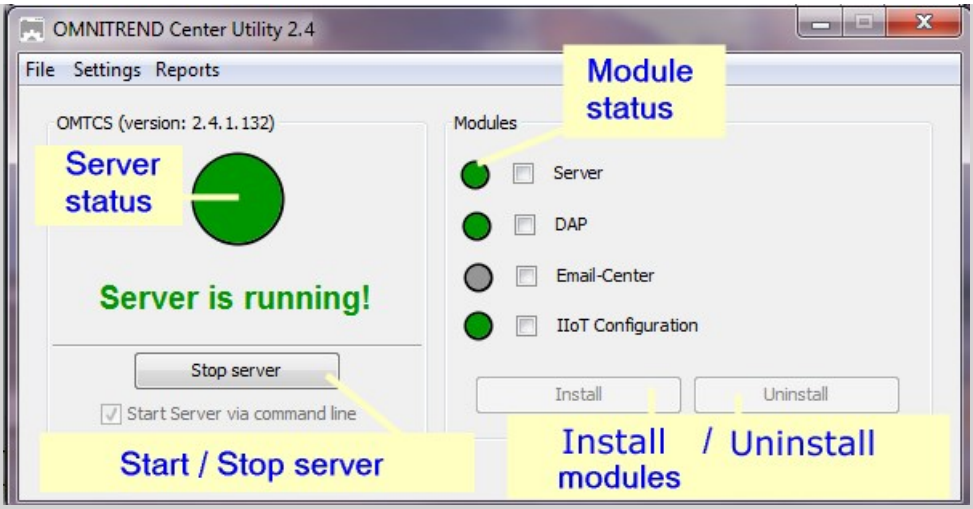


1. Installing OIIoT

OIIoT is **installed** together with the **OMNITREND Center Server**.

2. Starting OIIoT

> Make sure that the OMNITREND Center Server is running and the '**IIoT Configuration**' software module is made available in the **OMNITREND Center Utility**.



OIloT is **called up** either directly in the browser or via the OMNITREND Center Software:

- Browser URL: **http://<SERVER-HOST>:<SERVER-PORT>/com.pruftechnik.ovr.configuration/**
  SERVER-HOST= OMNITREND Center Server; SERVER-PORT = 8081

  OR

- In the OMNITREND Center:
  - Open the **Device Editor** for the respective online CMS.
  - Click on **Expand device configuration** in the **System Configuration** section.
  - Open the **Network** tab.
  - Click on the **OMNITREND IIoT Configuration** button in the **MQTT** field. OIloT is called up in the standard browser.

The user data stored in the OMNITREND Center is valid for OIloT user **login**.

3. Creating and transferring the MQTT configuration

OMNITREND IIoT Configuration (**OIIoT**) uses the database (DB) of the OMNITREND Center software to create the MQTT configuration.

MQTT configuration is done in two steps:

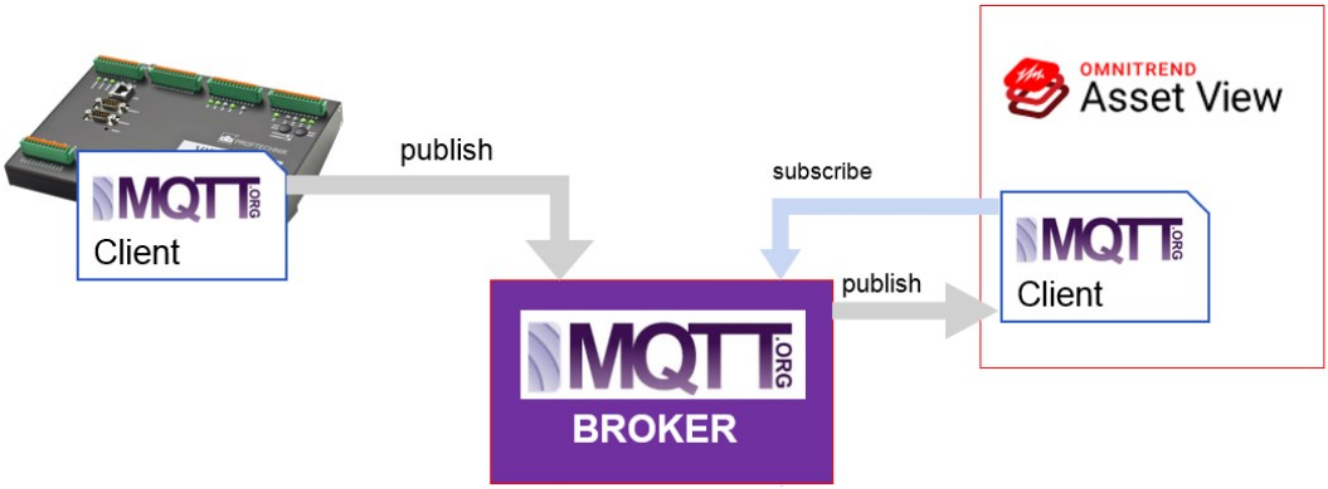
- Create an MQTT broker with IP address, port and name.
- Assign an online CMS to the MQTT broker.

MQTT configuration complements the existing **system configuration** (system config). The system configuration is transferred to the online CMS via the DAP interface.

OMNITREND Asset View - OAV

OMNITREND Asset View (**OAV**) is a web-based software for the visualization of measurement data and status information. Communication is based on the publish/subscribe principle and the MQTT protocol. A server, referred to as the MQTT-Broker, organizes the data traffic between the data producer (in this instance: VIBGUARD) and the data subscriber (in this instance: OAV).

OAV works independently of the OMNITREND Center software.



1. Installation

The OAV installation archive is located on the "OMNITREND Center - VIB 8.200" USB pendrive (path: /Asset View/-setup.exe).

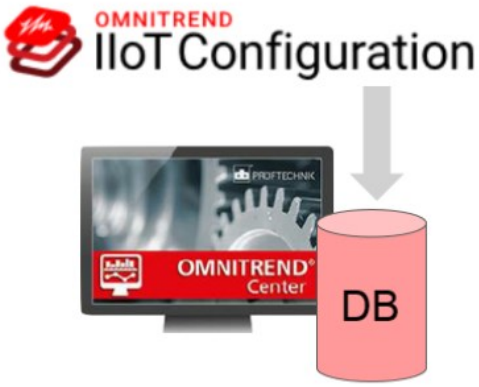
- Install the OAV software on a compatible PC.

An MQTT broker (‘mosquito’) is installed during the **OAV installation**.

> You need the broker address for MQTT configuration of the online CMS.
>
> **Broker IP** = IP, SERVER-HOST (PC on which OAV is installed)
>
> **Broker Port** = 1883 (default)

2. Startup

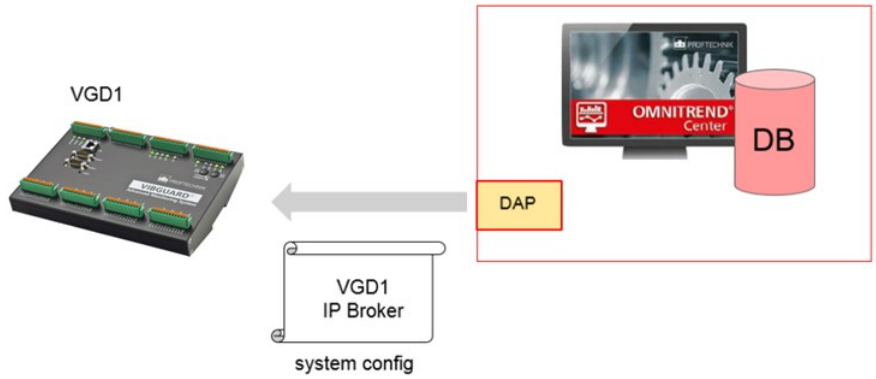
- Create the **MQTT configuration** for online CMS using the **OMNITREND IIoT Configuration** software module. The MQTT configuration is part of the system configuration in the OMNITREND Center.



- Start **OAV** in a web browser: **http://<SERVER-HOST>:<8080>/login**

OMNITREND Asset View

- Load the **system configuration** onto the online CMS from the OMNITREND Center.



- Check the data reception in OAV.

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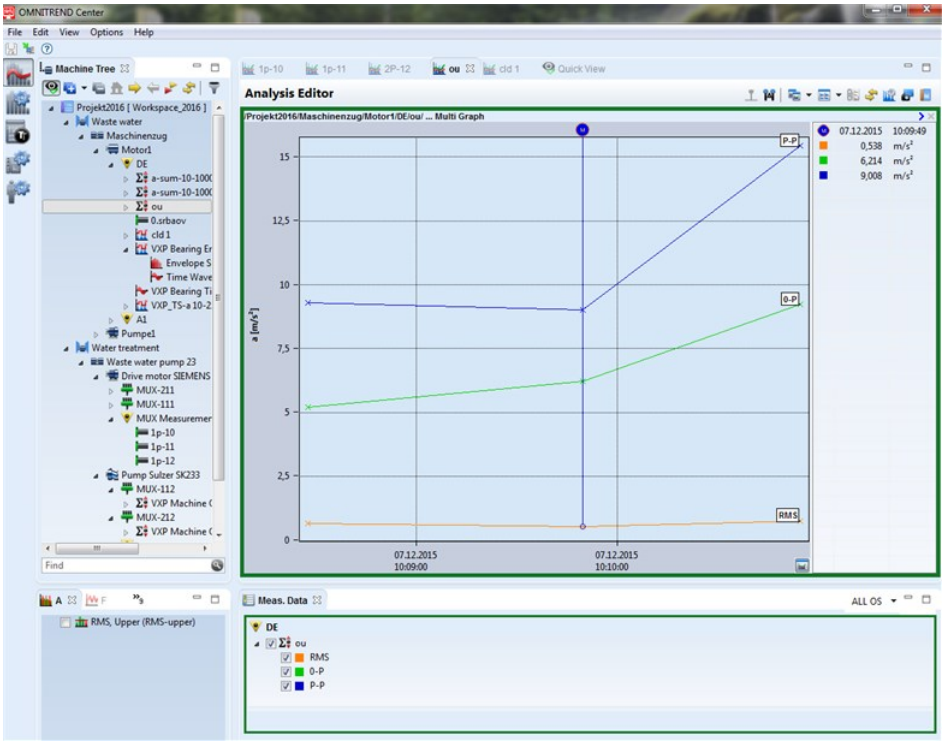
12 Measurement data evaluation

Here you can find all topics regarding the evaluation of the measurement data.

12.1 Basics: Using the analysis editor 186

12.1 Basics: Using the analysis editor

Measurement data is evaluated in the analysis editor. To open a measurement graph, switch into the **Analysis perspective** and double-click on a measurement task in the **machine tree**:



Basic function overview

Zoom function

- **Zoom In / Zoom Out**

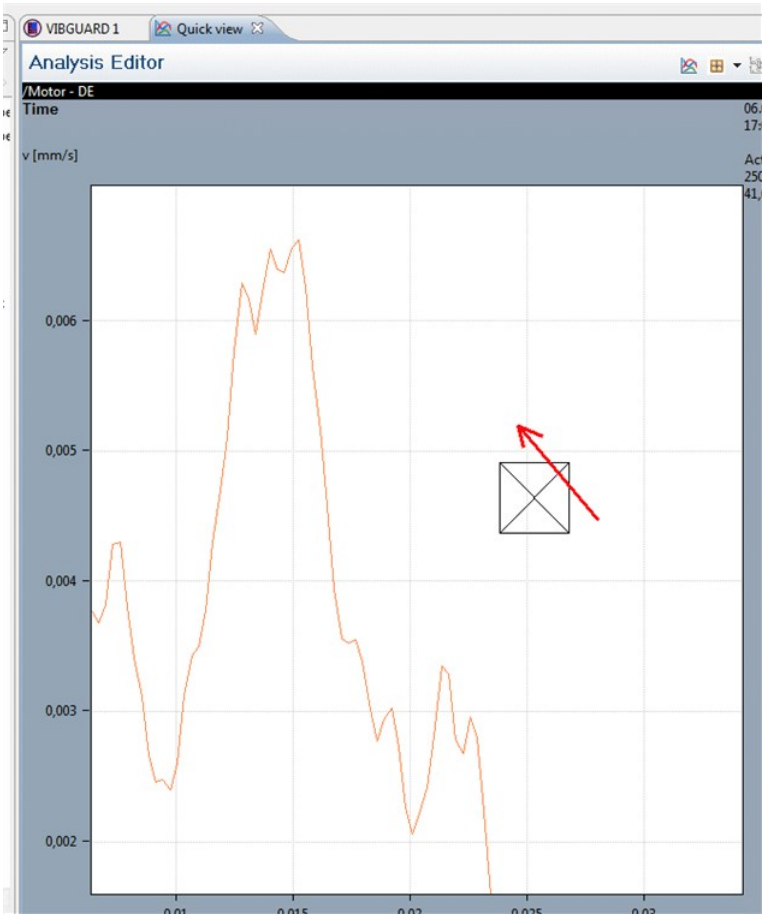
  Select one of the three following methods:

  - **Border Zoom**: Click with the mouse in the graph and draw a **border** around the area to be enlarged, either from …
    - Top left to bottom right, or
    - Bottom left to top right, or

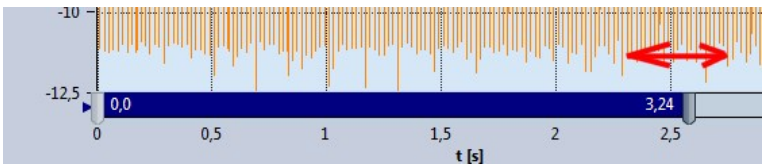
- Top right to bottom left

- To undo the **last zoom-in step**, draw a border from **bottom right to top left** at any point in the graph.

- To unto **all zoom-in steps**, press the <ALT> key, while drawing the border.



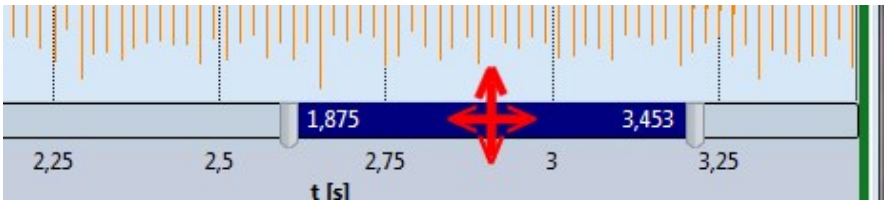
- **Axis Zoom**: Position the mouse pointer on the axis until the dark blue zoom border appears.
  - Drag the **slider** on the left-hand and/or right-hand band end to the desired position.



- **Mousewheel Zoom**: Position the mouse pointer on the axis label.
  - Press the <CTRL> key, and turn the **mousewheel**.

- **Moving the zoom section**
- Position the mouse pointer on the dark blue zoom border so that the mouse pointer appears as a double arrow.

- Press the left-hand mouse button and move the zoom border to the desired position.



Quick View - Static View

Quick View is a dynamic view representing the measurements marked in the machine tree. It is mainly used for quickly reviewing the results. If you would like to present one or several charts statically for evaluation, mark them in the Quick View and click on "All Graphs / Selected Graphs" in the local toolbar.

Graph options

You can change the display settings for the **current graph** as follows:

- Using the right mouse button, click on the display area. A dialog menu appears.
- Select the **Graph Settings** option. A dialog window appears.
- Change the settings as needed. You can find details to the options in the 'Adjust Graph Display' section (link under 'Related Topics')

You can change the display settings for the **current session** as follows:

- In the local toolbar, click on **Edit Session Settings of Graphs**.
- Select the respective category in the left sub-window.
- Change the settings in the right sub-window.
- Click on **OK** to finish.

> You can find the **standard values** for the display settings in the main menu under **Options / User Preferences / Graph**. They apply for the logged in user.

Axis scaling

Using the right mouse button, click on the X and Y axes. Now you can change axis scaling and presentation: from **linear** to **logarithmic** and/or from **frequency presentation** to **order presentation** (for amplitude, envelope, and order-based spectra).

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13.1 Analysis Tools

This section presents, how to use the tools for measurement result analysis.

Check alarm status in the project

You can use the **Alarm Check function** for a quick overview of the alarm status in a project.

Activate and configure Alarm Check

- Switch into the **Analysis perspective**.
- Mark the respective project node in the **machine tree**.
- Click on options for the **Alarm Check function** in the local toolbar. A dialog window appears.
- Activate the **Check Alarms** option.
- Here you provide the **time range**, the check should cover.
- Click on **Finish**.
  In the machine tree, the nodes are marked, where the threshold is exceeded (red=alarm; yellow=warning;green=prewarning;).

Using the Cursor Function

Using the Cursor function, you can analyze the data lines in a graph.

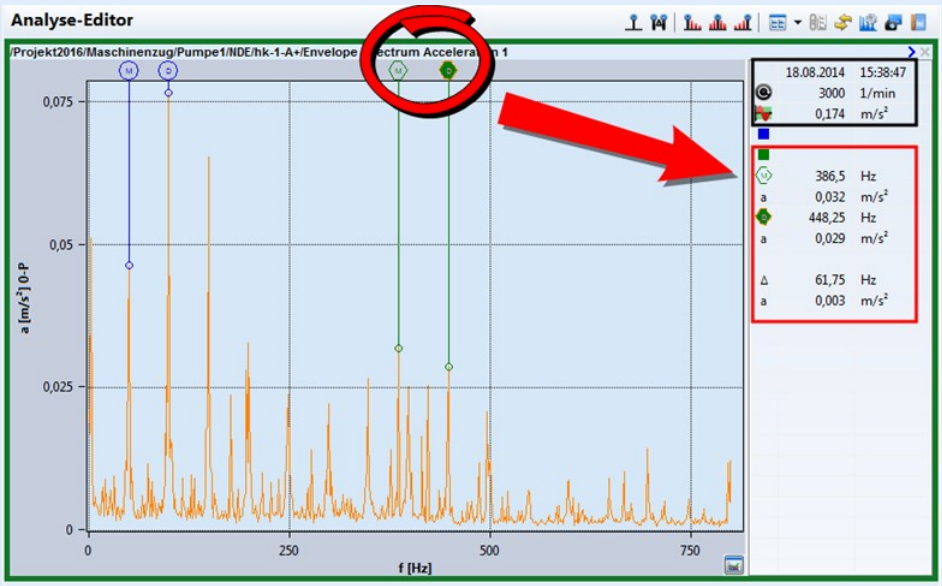
Cursor Infobox

The Cursor Infobox contains the positions and distances of the **main and delta cursors**. The Cursor Infobox appears on the right side of the graph, if one of the following action is performed:

- The cursors is placed in the graph **for the first time**.
- The Cursor Infobox is opened using the arrow symbol **<** (top right).

E x a m p l e :

Spectrum with two cursor families marked in the graph in **blue** and **green**. The Cursor Infobox lists the information regarding the active (green) cursor family.



Information in the Cursor Infobox:

- Field marked in **black**: Date, speed, RMS value of the measurement
- Field marked in **red**: Data for active cursor family.
  - The respective cursor families are marked with a **color square**. Click on it to activate the cursor family. In the example above, the **green** cursor family is active.
  - Circular **cursor icon**: Cursor position on the X-axis. For space reasons, the data for the main and delta cursor are displayed only. The cursor icon of the active cursor is filled with color. In the case of cursor families with harmonics portions, the secondary cursor active last (e.g., 4th harmonic) is listed next to the main cursors.
  - **a**: Signal amplitude at the cursor position.
  - **Delta**: Difference of cursor position and amplitudes (not for harmonics)

Cursor in a characteristic value graph

- Switch into the **Analysis Perspective**.
- Open a **trend measurement**.

- In the graph, click on the data point, where you would like to set the **main cursor**. The **Cursor Infobox** appears on the right side of the graph.
- To set the **delta cursor**, click in the local toolbar on **Delta Cursor**.

One main cursor only can be set in a trend graph.

Functions in the local toolbar of the **Cursor view**:

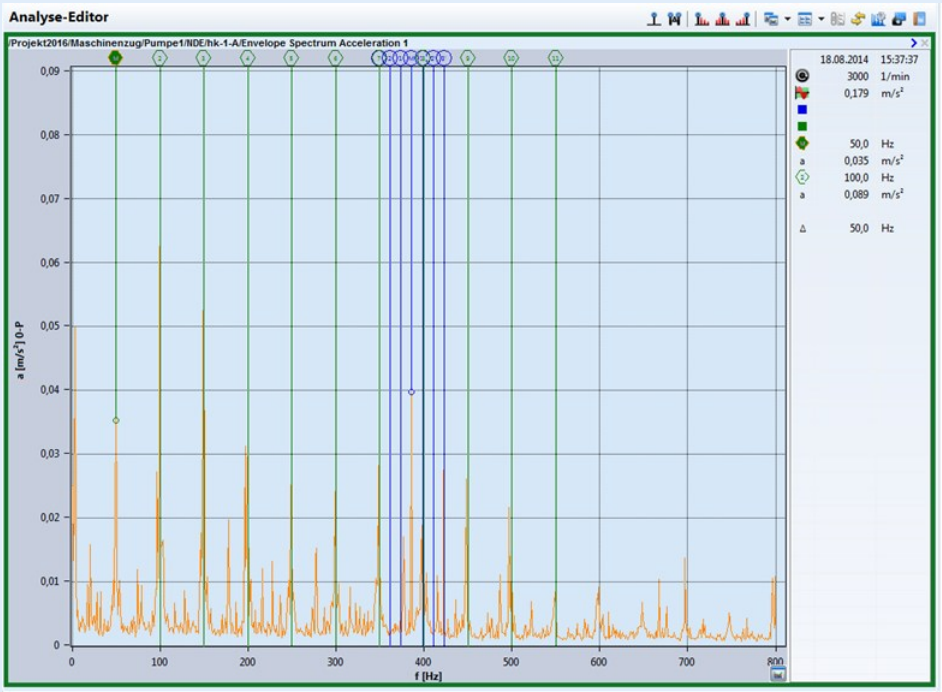
- **Show y values for all data lines**: In a multi graph (e.g., RMS, 0-p, p-p), the Y intersection coordinates can be displayed for all data lines. Otherwise, the intersection with the first sub-result (e.g., RMS) is displayed only.
- **Display absolute cursor values or distance to main cursor**: The X-coordinate of the delta cursor can be displayed as absolute value or as distance to the main cursor.

Cursor in the spectrum, cepstrum, and time waveform

- Switch into the **Analysis Perspective**.
- Open a spectrum.
- In the graph, click on the data point, where you would like to set the **main cursor**. The **Cursor Infobox** appears on the right side of the graph.
- To show additional cursors, click in the local toolbar on the respective cursor icon:
  - **Main Cursor**: Show additional main cursors. Main cursors define the center frequency for a cursor family. For space reasons, the coordinates for main and delta cursors are shown only in the **Cursor Infobox** on the right side of the graph. You can find the data for the cursor family in the **Cursor view**.
  - **Delta Cursor**: Show delta cursors.
  - **Harmonic Cursor** / **Sidebands Cursor** / **Subharmonic Cursor**: These cursor sets enable the analysis of speed-dependent signal portions.
  - **Periodical Cursor**: Using this cursor, you analyze the periodicities in the **time waveform**.

E x a m p l e :

Spectrum in a **harmonic** family (green) and in a **sidebands** family (blue)



Functions in the local toolbar of the **Cursor view**:

- **Display absolute cursor values or distance to main cursor** : The X-coordinate of the cursor can be displayed as absolute value or as distance to the main cursor.

Change reference speed for harmonic cursor families

- Open the **Frequency Markers** view.
- Enter the new **reference speed**.
- Click on **Save** .

Move cursor

- Click on the respective cursor to mark it. The cursor icon is filled in the **color** of the cursor family.
- Move the mouse pointer over the cursor line. Until the mouse pointer icon changes into a **double arrow**.
- Press and hold the left mouse button, while you move the cursor to a new position.
- Release the mouse button.
  Alternative: You can also move the marked cursor using the arrow keys on the keyboard.

Change the number of cursors

- Using the right mouse button, click on the cursor icon. A dialog menu appears.
- Select **Change Number of Cursors**. A dialog window appears.
- Enter the new **name** and click on **Finish**.

Hide cursors / cursor families

Cursor icons of different shapes and colors mark the individual cursor families. For more clarity, you can hide individual cursor families as follows:

- Using the right mouse button, click on a cursor icon from the respective family. A dialog menu appears.
- Select **Remove Cursor** to remove the selected cursor family or select **Remove All Cursors** to delete all cursors from the graph.

Show cursor trend

A cursor trend indicates the profile of the signal amplitude at the cursor position in a cascade or waterfall graph.

- Switch into the **Analysis Perspective**.
- Open the signal measurement.

The measurement must contain several datasets and must be presentable as cascade and/or waterfall graph or spectrogram (e.g., FFT coast-down curves, spectra, time waveforms).

- Open the **Measurement Data** view.
- Mark the measurement data you would like to display.
- Using the right mouse button, click in the graph. A dialog menu appears.
- Click on one of the following options:
  - **Multi Plot / Waterfall Graph**
  - **Cascade Graph**
  - **Spectogram**
- Place the **cursor** into the graph.
- Using the right mouse button, click in the graph. A dialog menu appears.
- Click on **Open Cursor Trend**. A trend graph appears below the signal graph. The trend curve shows the signal profile at the cursor position.

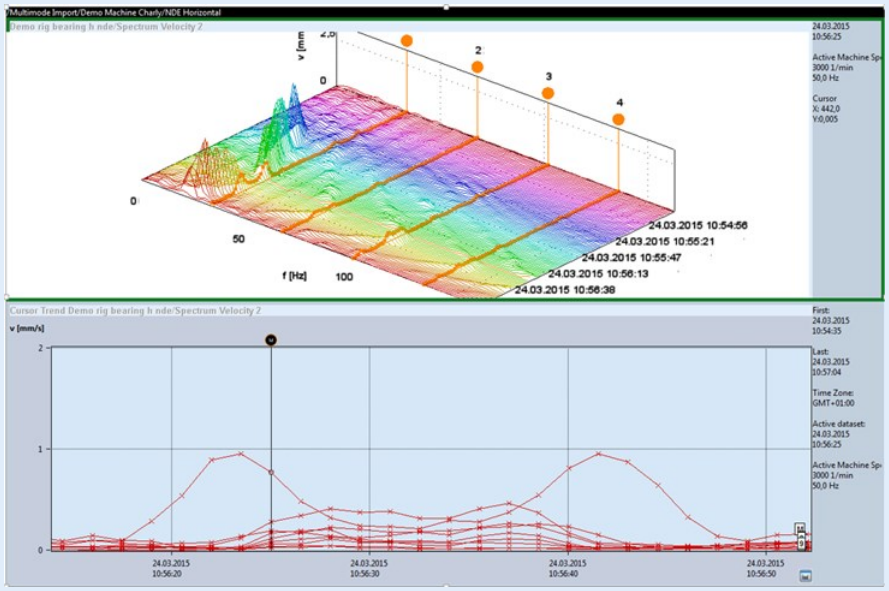
Move cursor in signal graph: The trend curve changes its profile.

Move cursor in trend graph: The cursor in the signal graph changes its position along the Z-axis (time or speed axis).

- **Close cursor trend**: Delete the respective cursor in the signal graph.
  Alternative: Using the right mouse button, click into the trend graph and select **Close Graph**.

  E x a m p l e :

  Cursor trend in a waterfall spectrum


Multimode Import/Demo Machine Charly/NDE Horizontal
Demo rig bearing h nde/Spectrum Velocity 2
v [mm
0
0
50
f [Hz]
100
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3
4
24.03.2015 10:54:56
24.03.2015 10:55:21
24.03.2015 10:55:47
24.03.2015 10:56:13
24.03.2015 10:56:38
Cursor Trend Demo rig bearing h nde/Spectrum Velocity 2
v [mm/s]
2
1
0
24.03.2015 10:56:20
24.03.2015 10:56:30
24.03.2015 10:56:40
24.03.2015 10:56:50

Link graphs

Link several graphs for a more effective analysis. Changes in a graph, such as the zoom factor or the cursor position, are automatically applied to all linked graphs in the analysis editor.

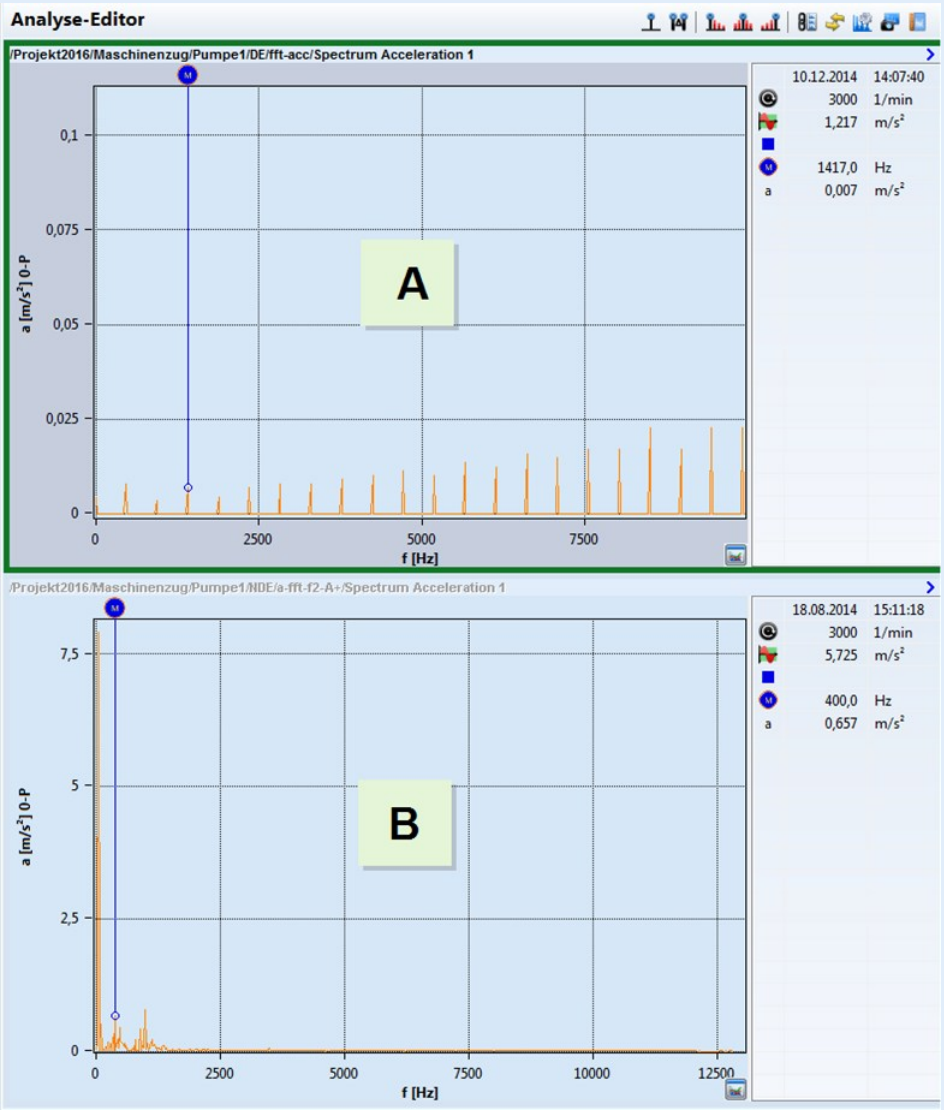
Link graphs (link mode)

- **Open** the graph to be linked in the analysis editor.
- In the local toolbar, click on **Link Graphs** .
  Button appears in every graph on the top left, next to the Y-axis, using which the link mode can be activated /deactivated for every single graph.

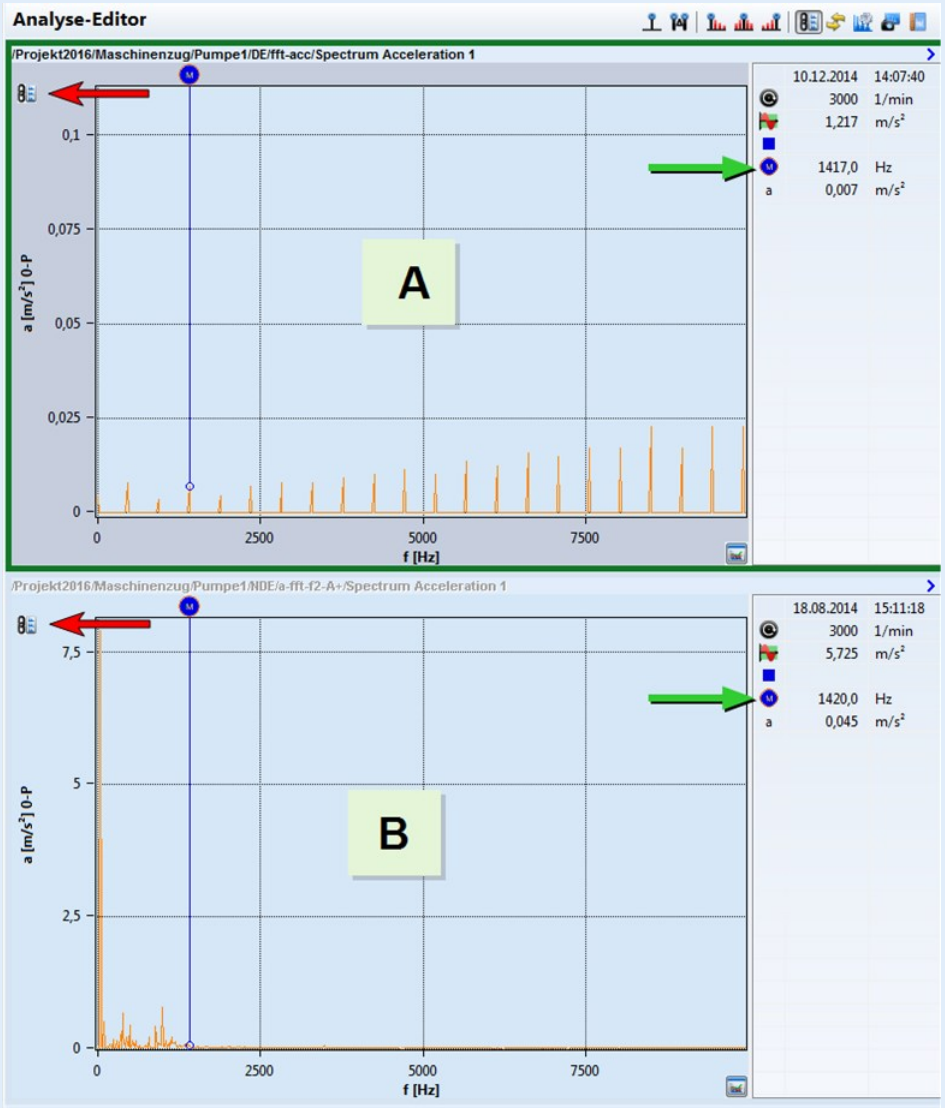
The active graph is used as reference for adjusting the linked graphs.

E x a m p l e :

The analysis editor shows two spectra (A, B). Link mode is deactivated. A cursor is set in spectrum A and it is zoomed into the frequency range.
Link mode is being activated.
The cursor in spectrum B is placed at the same position as in spectrum A and the displayed frequency range is adjusted.



Link mode is deactivated. Zoom factor and cursor position are different in the two spectra.



Link mode is activated (red arrow). Cursor position (green arrow) and zoom factor of the frequency axis are aligned in

both spectra.

Depending on the graph type, the following particularities must be observed:

Spectra

In the case of **spectra** of the same type, the following attributes are linked:

- Zoom / unit of X axis
- Cursor (add, delete, shift, etc.)
- Frequency marker (show/hide, change speed),
- Change speed
- Historical data sets (only if the respective graph option is activated in the **User Preferences**).

Amplitude, envelope, and order-based spectra are spectra of the same type. Order spectra are considered a separate type.

Time waveforms

In the case of **time waveforms**, the following attributes are linked:

- Zoom of X axis
- Cursors (add, delete, shift, etc.)
- Frequency marker (show/hide, change speed),
- Change speed
- Historical data sets (only if the respective graph option is activated in the **User Preferences**).

Trends

In the case of **trends**, the following attributes are linked:

- Zoom of X axis
- Cursors (add, delete, shift, etc.)
- Step presentation of the data line

Frequency marker

Frequency markers support in the diagnostics of machine errors. The following prerequisites must be met to display frequency markers in a spectrum:

- A **kinematic model** is defined for the **machine**, for which the spectrum was measured
- The kinematic models of the corresponding machines are merged at the parent **machine train**.
- The measurement location for the **reference speed** is specified in the kinematic model for the machine train.

Display frequency markers

- Switch into the **Analysis perspective**.
- Click on the respective spectrum measurement in the **machine tree**.
- Open the **Frequency Markers** view . The frequencies that can occur at the respective machine train are displayed in the tree structure.
- Activate the **frequency markers** you would like to show in the spectrum.

If frequency markers are to close to one another, the respective lines are merged into one line for more clarity. The labels are listed in a row next to the line.

Show harmonic frequencies

- Using the right mouse button, click on the graph. A dialog menu appears.
- Click on **Graph Settings**. A dialog window appears.
- In the **Frequency Marker Options** field, activate the **Harmonics** option and enter the desired **number**.
- Click on **Finish**.

Maximum peaks in a signal

To display the ten highest amplitudes in a signal (spectrum cepstrum, time waveform), proceed as follows:

- Switch into the **Analysis perspective**.
- Open the respective measurement result in the **analysis editor**.
- Open the **Maximum Peaks** view . The 10 highest amplitudes are listed.

  In the case of a **time waveform**, this also includes the **negative** amplitudes.
  In the case of graphs with several data lines (**multi graph, waterfall**), the highest amplitudes of the **active** data line are shown.
  You define the number of maximum amplitudes in the **User Preferences** (Options/ User Preferences/ Graph/ Post Processing).

- Click on an entry to place the cursor at the respective position in the graph.
- To **sort** the list, ,click on the respective column title (number, frequency, amplitude).

Reference value / reference signal

Reference values and/or reference signals support in the evaluation of measurement data and in setting characteristic band values and band alarms.

Reference values/signals can be defined for the following measurements:

- Spectrum
- Time waveform
- Characteristic value trend
- Cepstrum
- Phase

In the case of signal measurements, define one measurement from the **historical measurement data set** as reference.

In the case of trend and phase measurements, define the reference value using a **cursor**.

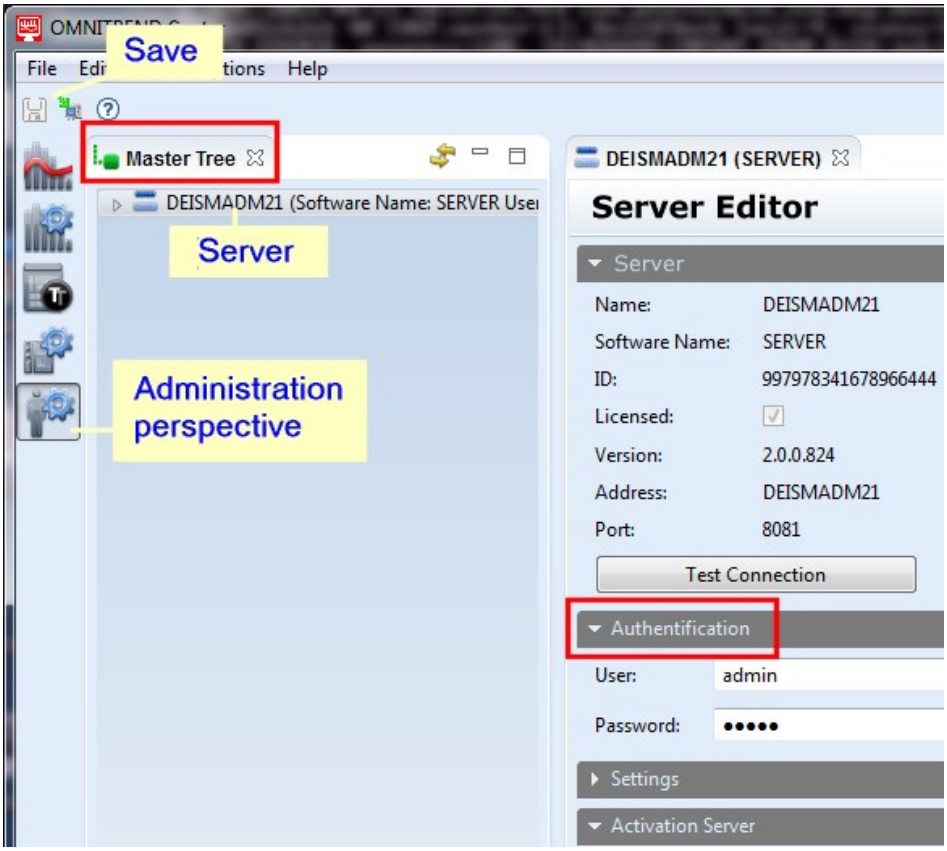
Prerequisite

You must at least have the **specialist** user role for defining reference values/signals.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1]Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Define reference signal

- Switch into the **Analysis perspective**.
- Click on the respective signal measurement in the **machine tree**. The last saved measurement appears in the analysis editor.
- Open the **Measurement Data** view .
- Using the right mouse button, click on the measurement data set, you would like to set as reference. A dialog menu appears.
- Click on **Set Reference Value**. The measurement data set is marked in the list using a green square.

Define reference value

- Switch into the **Analysis perspective**.
- Click on the respective trend or phase measurement in the **machine tree**.
- Click on the **graph** to place the main cursor.
- Move the **cursor** to the position you would like to define as reference value (Y-value).
- Using the right mouse button, click on the **cursor icon** above the graph. A dialog menu appears.
- Click on **Set Reference Value**. The reference value us added in the **Measurement Data** view.

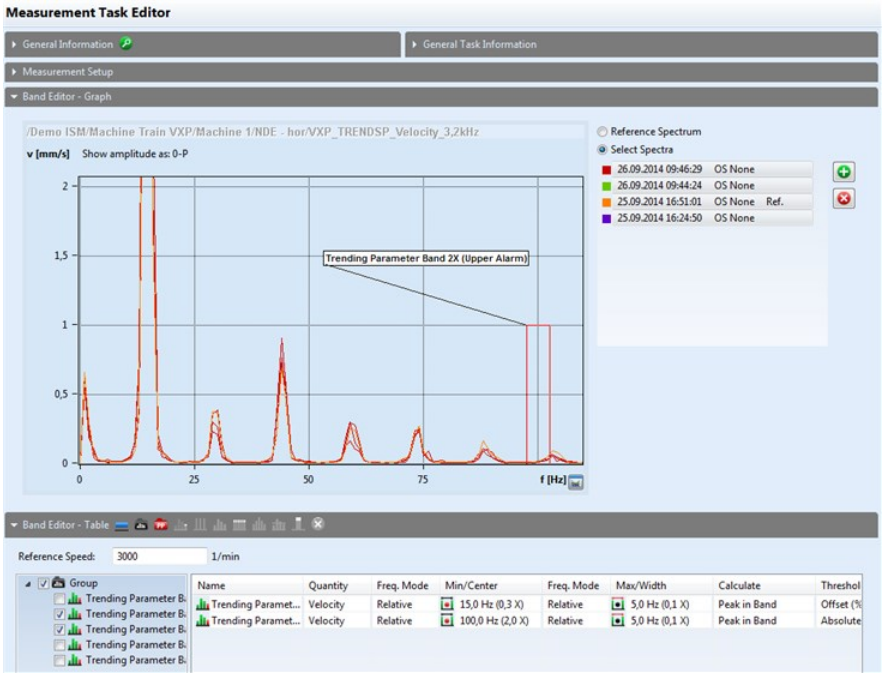
Display reference signal

When evaluating signal measurements, you display the reference signal in the analysis editor as follows:

- Using the right mouse button, click on the graph. A dialog menu appears.
- Activate the **Show Reference Signal** option. The reference signal is shown in the graph.

When creating characteristic band values / band alarms, you display the reference signal as follows:

- In the **measurement task editor** (Configuration perspective), open the **Band Editor - Graph** section.



- Activate the **Reference Spectrum** option (top right). The reference signal is shown and you can adjust characteristic band values / band alarms.

Display reference value

- Switch into the **Analysis perspective**.
- Click on the respective trend or phase measurement in the **machine tree**.
- Open the **Measurement Data** view .
- Click on the reference value in the list. A cursor appears at the respective position in the graph.

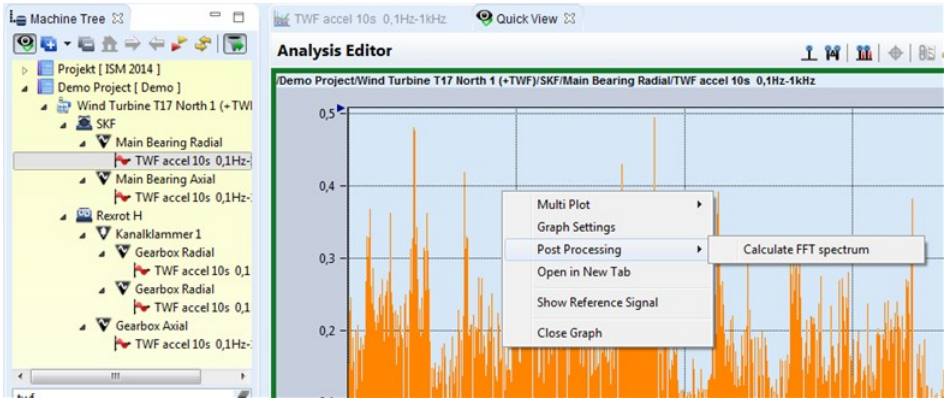
Signal Post Processing

For **spectral analysis** of a measured time waveform, you can have the corresponding (amplitude) FFT spectrum calculated using the post processing function.

Calculating the FFT spectrum from a time waveform

- Switch to the **analysis perspective**.
- Open the respective time waveform in the **analysis editor**.
- Click in the graph with the right mouse button in order to open the context menu.

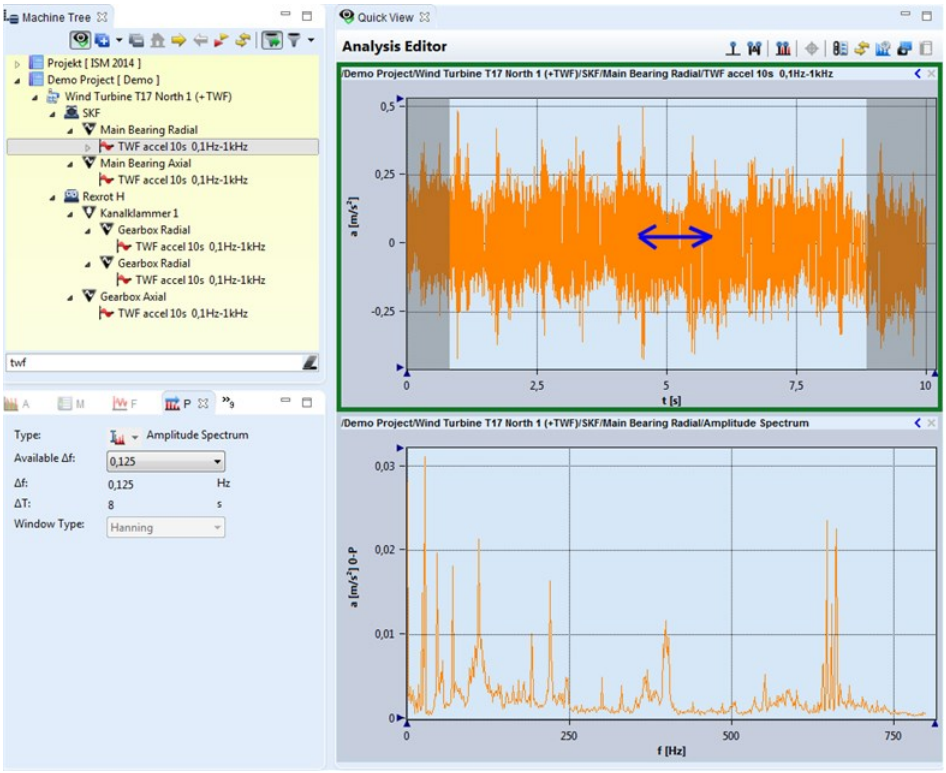
- Select **Post Processing** / **Calculate FFT spectrum**. The **post processing** function is activated and automatically calculates the corresponding FFT spectrum.



The calculated FFT spectrum appears under the time waveform in the analysis editor. The **post processing** view displays the parameters used:

- Spectrum type (=amplitude spectrum)
- delta f (= 1/ delta T)
- Window type (= Hanning).

You define the time frame for the calculation with the **delta f** parameter (length) and by moving the highlighted window area.



Instructions:

The calculated FFT spectrum is subordinate to the time waveform as a **partial result** and is stored in the database. You can access it again at any time and reset the calculation parameters. The resulting FFT spectrum overwrites the previous FFT spectrum.

If the measurement contains multiple time waveforms, you can click on the individual datasets in the **measurement data view** in order to have the corresponding FFT spectrum calculated automatically.

14.1 Analyze Graph

This section introduces the individual types of graphs.

Evaluate trends

A trend curve represents the chronological profile of a measurement value. The following measurement values can be displayed as trend:

- Characteristic vibration values
- Shock pulse measurement values (bearing condition)
- Speed
- Temperature
- Process Parameters
- Single measurement values
- Characteristic band values

Open and evaluate trend curve

- Switch into the **Analysis perspective**.
- Open the respective **measurement task** in the machine tree. The trend curve appears in the analysis editor.

  In the case of measurement tasks with partial results (e.g. characteristic vibration value, characteristic band value), several trend curves may be displayed. Hide them as needed via the **Measurement Data** view.

- Using the **right** mouse button, click on the graph. A dialog menu appears.
- Click on **Trend** and select one of the following functions:
  - **Downtime** : Activate this function to adjust the **downtime level**. All lower measurement values will be hidden in the trend.
  - **Smoothing** : In the case of severely oscillating trend curves, you can smooth the curve profile. For this purpose, a moving average is calculated for every data point. Enter the number of points into the **Points for Smoothing** field, which are before the data point and should be used for calculating the average. The standard value (5) can be adjusted in the **User Preferences** (Graph/ Post Processing).
    Weighting indicates how strongly the calculation is influenced by the points.
    Constant: All points have the same weighting;
    Triweight: Points closer to the data point to be averaged are weighted more.
    The **Maximum Duration** limits the number of **points for smoothing** to a time limit.

    E x a m p l e :

    Raw data trend (top), trend with smoothing (bottom)

- **Scatter band**: This function shows the deviation of the individual measurement values from the average value (standard deviation, 1x sigma). This way, you can detect statistical fluctuations in the trend profile (data points are within the 1x sigma band).
  Specify the number of **points for averaging**. The standard value (20) can be specified in the **User Preferences** (Graph/ Post Processing).
- **Trend Forecast**: Here you can calculate a **forecast** regarding the future trend profile:
  - Select the **trend function** describing the previous trend profile the best.
  - Adjust the **time range**, from which the measurement data should be used for calculating the trend function.
  - Define the forecast interval (**forecast days**).

The **active** trend analysis functions are shown on the top left, next to the Y-axis.

Display thresholds

- Open the **Alarms** view . The thresholds for the active data line are listed only. If there are upper and lower thresholds for a data line, you can select them individually.
- Change the active data line using the (up/down) **arrow keys** on the keyboard. By default, the active data line is marked in **orange**. You can define the color in the **User Preferences** (Graph/ Color/ Dataset)

Cartesian Graph

The following measurements are presented by default in a Cartesian graph:

- **Spectrum (amplitude, envelope curve)**
- **Time signal**
- **Phase**
- **Cepstrum**
- **Coast-down analysis (RMS, phase)**

Basic functions (zoom, scaling) as well as specific analysis tools (e.g., cursor, frequency marker, etc.) are available for analysis.

To change the **display settings**:

- Using the right mouse button, click on the display area. A dialog menu appears.
- Select the **Graph Settings** option. A dialog window appears.
- Change the settings as needed.

In the case of a **phase** measurement, you can use the **Cartesian/Polar** Button to switch the display to a **polar graph**.

Polar Graph

The following measurements are presented by default in a Polar graph:

- **Balancing**
- **Orbit**

Basic functions (zoom, scaling) as well as specific analysis tools (e.g., cursor) are available for analysis.

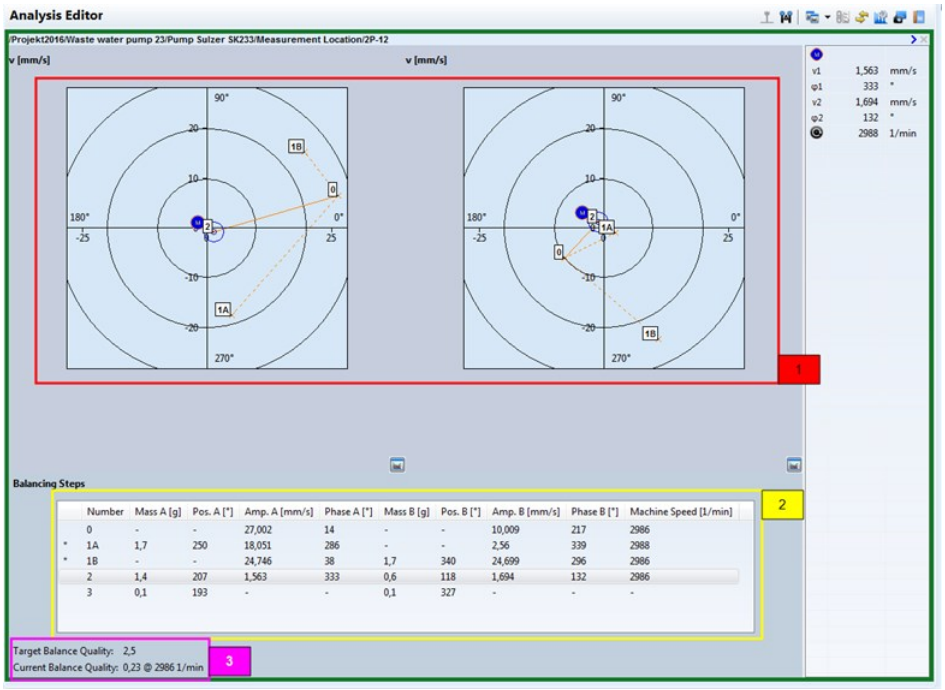
To change the **display settings** for **Orbit** measurements:

- In the local toolbar, click on **Edit session settings of graphs** . A dialog window appears.
- Select the **Orbit** filter in the left sub-window.
- Change the settings in the right sub-window as needed.

Evaluate Balancing Results

Proceed as follows to analyze VIBXPERT II balancing results:

- Switch into the **Analysis Perspective**.
- Open the respective measurement task in the machine tree. The measurement result appears in the analysis editor:



The graph is divided into three sub-areas:

1: **Polar graph**: Amount and direction of the balancing pointers in every balancing step.

- The 0°-position and the direction of rotation in the graph can be set in the **Database Editor** under section **Polar Graph Settings**
- Dashed balancing pointer: Balancing weight was removed again.

2: **List** of measurement results and balancing weights in every balancing step.

- Weighting step marked with star (*): Balancing weight was removed again.

3: **Balancing Quality** with Target and Current value.

> You can also merge several balancing results into a single dataset for a measurement location. Simply drag the respective result files onto the same measurement task icon during measurement result import. You can select the individual results for displaying in the **Meas. Data view**.

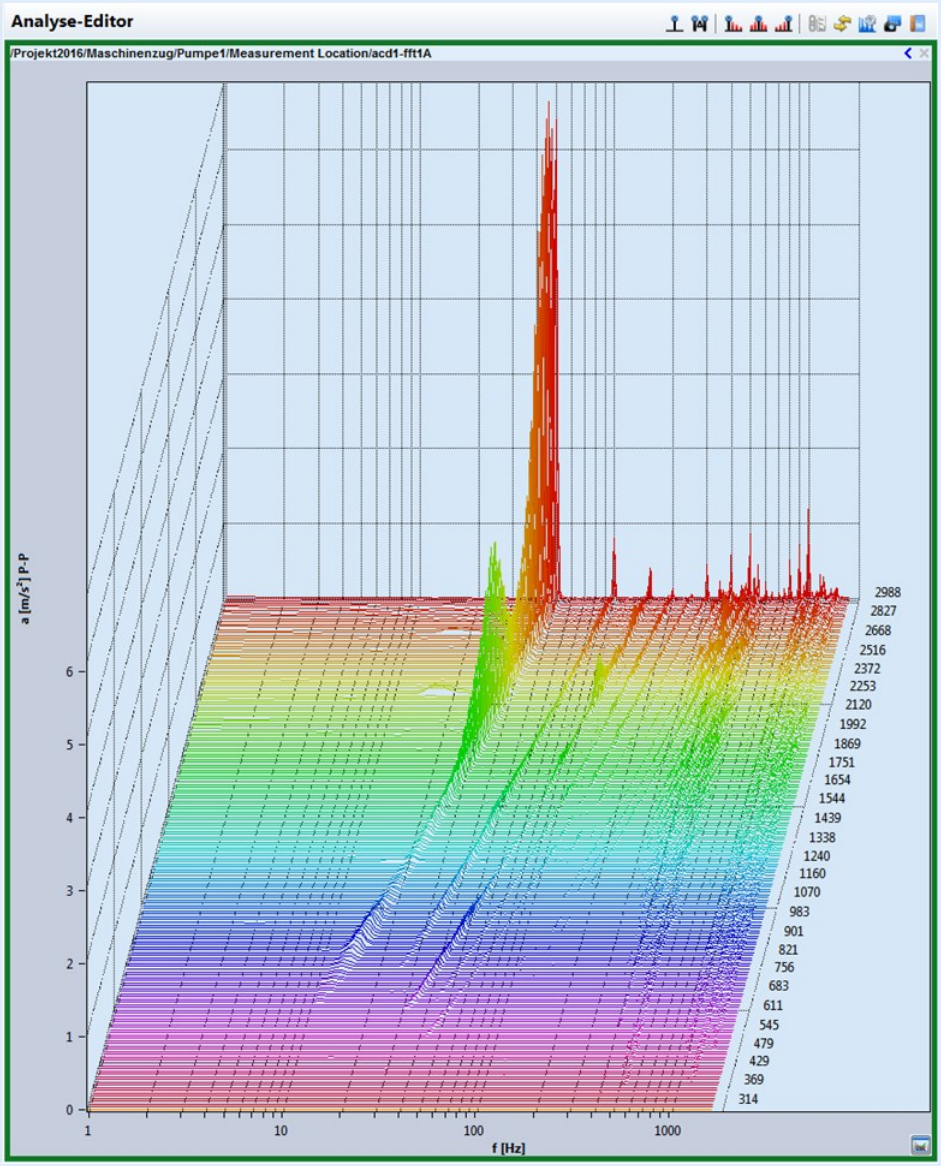
Cascade Graph

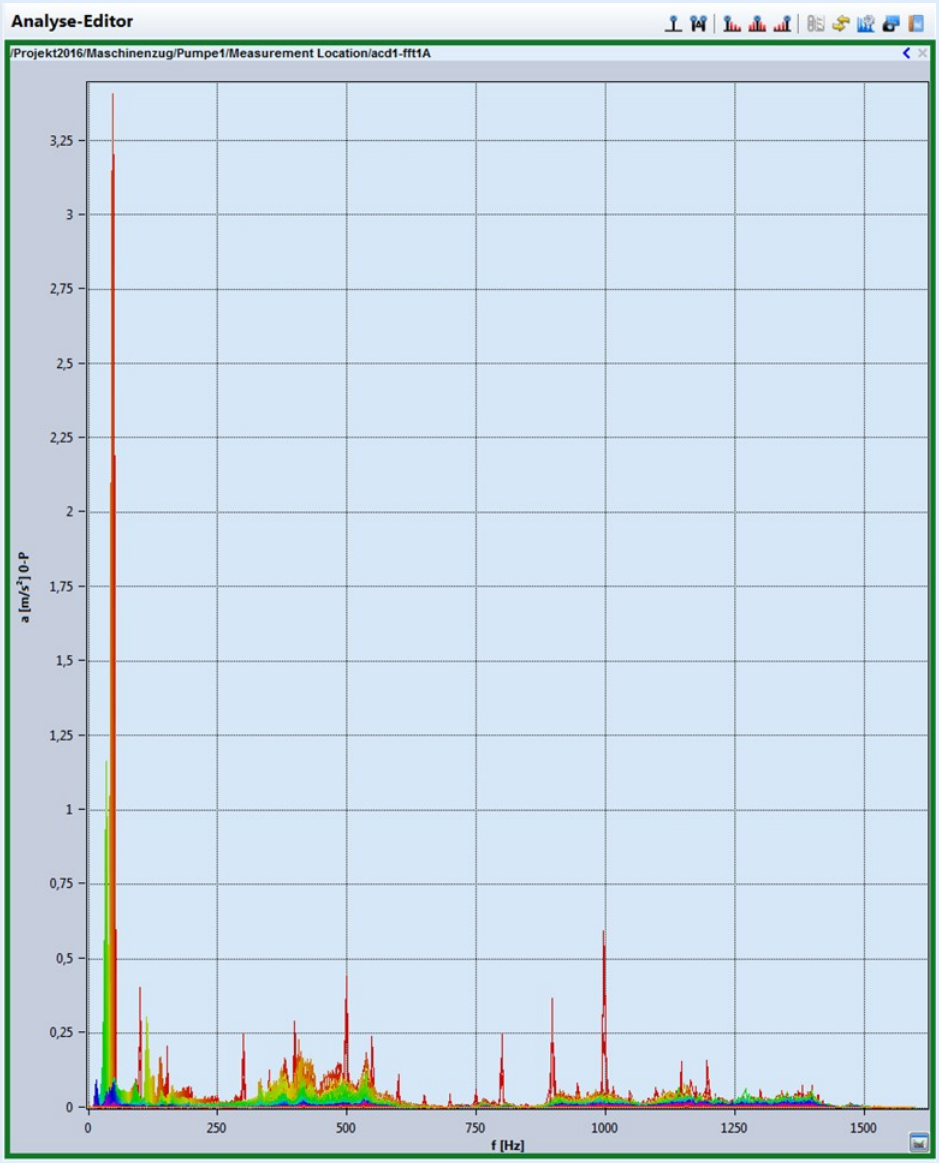
Using a cascade graph, variations can be detected within a series of spectra that can were measured under comparable conditions.

The individual spectra are entered in Z-direction. Due to that, the cascade graph seams to be **three-dimensional**. The parameter in Z-direction is usually a **time factor** (date or time). In the case of a **FFT coast-down analysis**, **speed** is entered in Z-direction.

E x a m p l e :

FFT coast-down analysis as **cascade graph** and in **overlapped presentation**.





Open and configure cascade graph

- Switch into the **Analysis Perspective**.
- Open a measurement task with series of spectra.

> In the case of measurement tasks, whose spectra were measured **time-based**, open the **Measurement Data** view and mark the respective measurement datasets.
> FFT coast-down analyses are speed-based. The individual spectra are contained in a measurement dataset.

- Using the right mouse button, click on the graph. A dialog menu appears.
- Activate the **Open Cascade** option.

Change the **display settings** as needed:

- Using the right mouse button, click on the display area. A dialog menu appears.
- Select the **Graph Settings** option. A dialog window appears.
- The setting options for the Z-axis can be found in the **Z-Axis field**. Here, you can set the angle of inclination and the distance of the data lines. You can present all data lines in one color, reverse their order, and show an/or hide the axis labels.

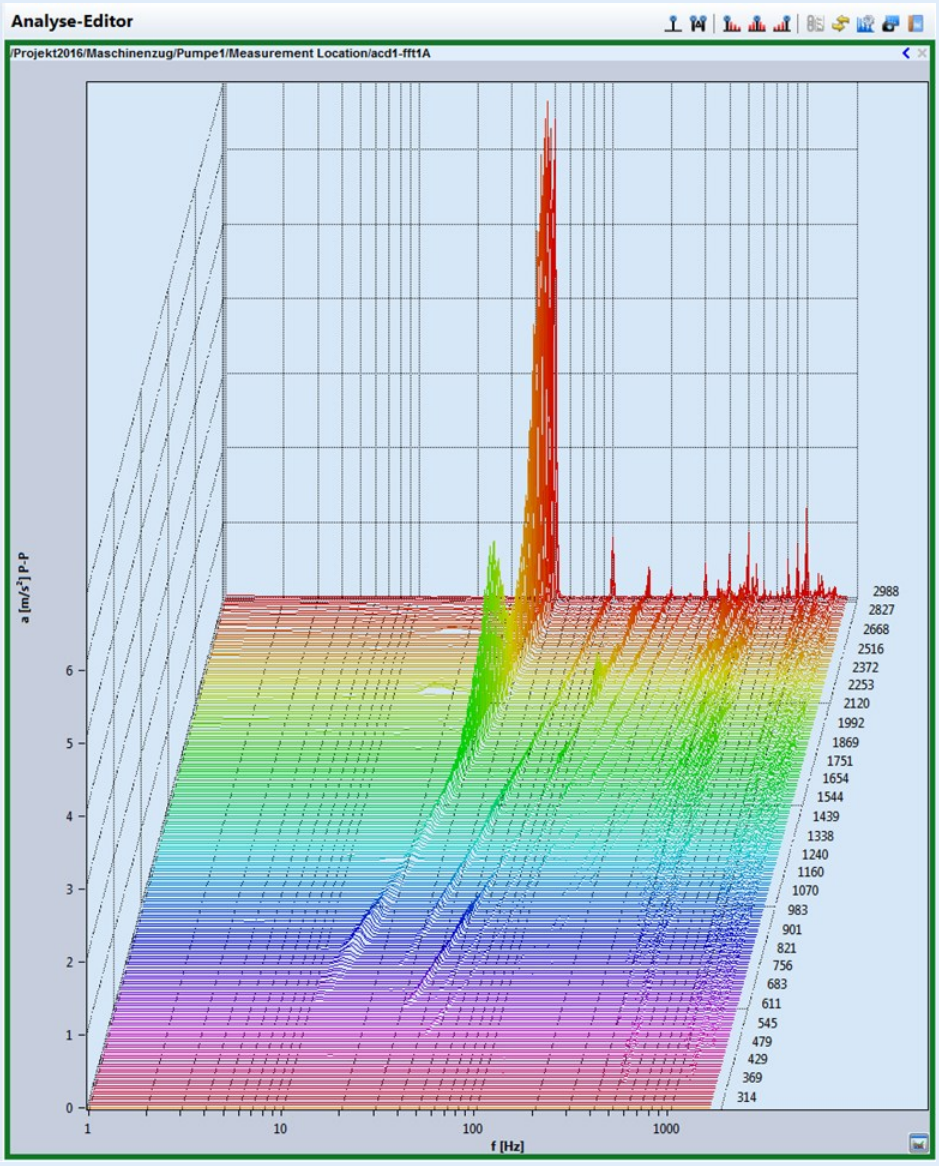
Spectrogram

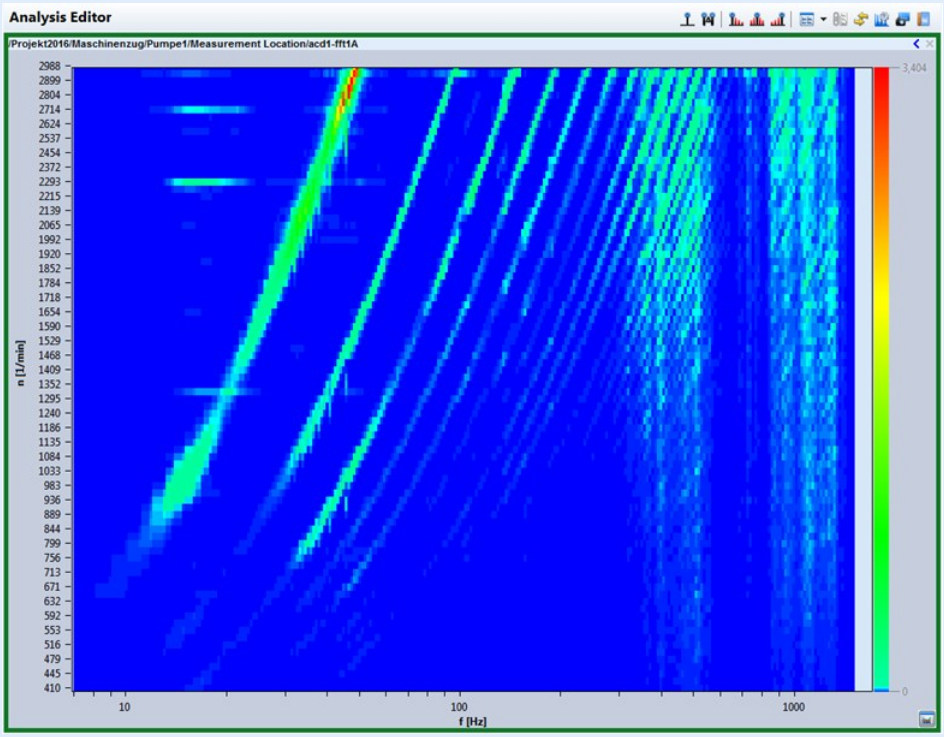
Using a **spectrogram**, variations can be detected within a series of spectra that were measured under comparable conditions. This graph type is characterized by the amplitude presentation as color-coded height profile.

The frequency is shown along the X-axis. The Y-axis indicated the individual spectra in the series. The Z-axis presents the amplitude. The viewing direction corresponds to the Z-axis. The observer sees a top view of the spectra. This allows precise analyses without perspective errors to be considered.

E x a m p l e :

FFT coast-down analysis as **cascade graph** and as **spectrogram**.





Open spectrogram

- Switch into the **Analysis Perspective**.
- Open a measurement task with series of spectra.

> In the case of measurement tasks, whose spectra were measured **time-based**, open the **Measurement Data** view and mark the respective measurement datasets.
> FFT coast-down analyses are speed-based. The individual spectra are contained in a measurement dataset.

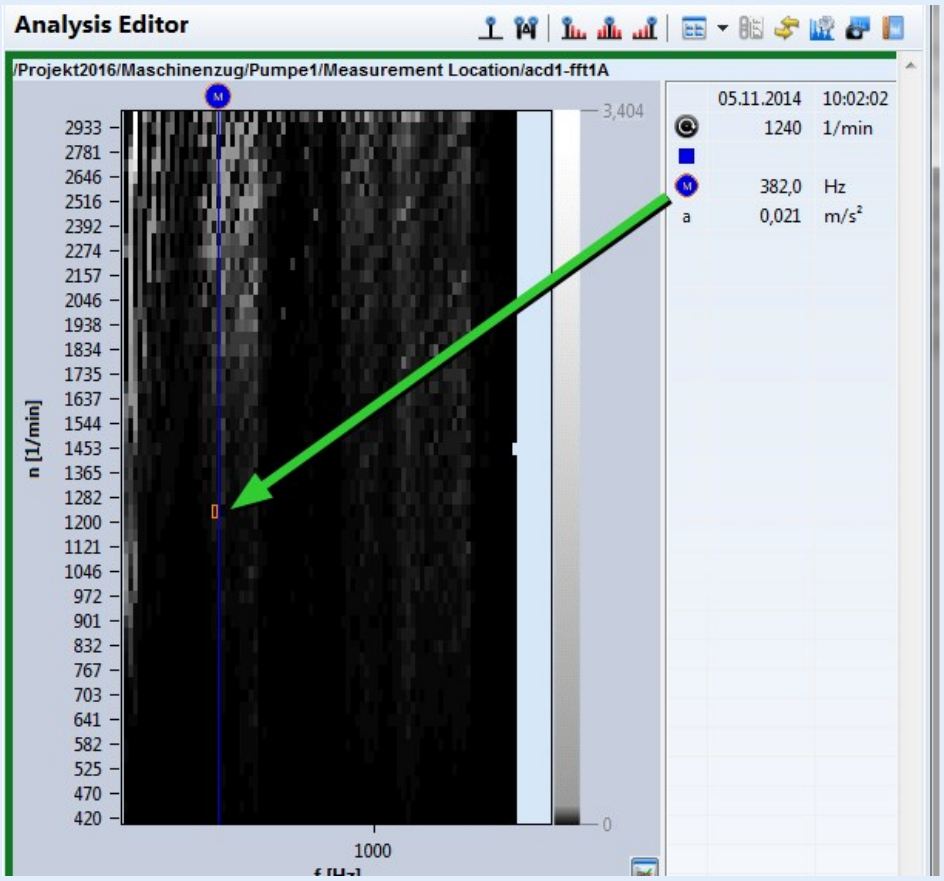
- Using the right mouse button, click on the graph. A dialog menu appears.
- Activate the **Spectrogram** option.

Cursor and active data line

Using the cursor, you can analyze the spectrogram qualitatively. The intersection of the cursor line with the active data line is marked by a small **orange** rectangle. Using the mouse, the cursor can be moved along the frequency axis (X). The active data line can be selected using the arrow keys (up/down) on the keyboard.

E x a m p l e :

Intersection of cursor and active data line in the spectrogram.



If the graph area is too small, data lines and amplitude values will be **compressed**.

As a result, several data lines and amplitude values are combined and presented using an average value. As a result, the spectrogram seems to be blurred. The cursor coordinates show slightly different values than with higher resolution.

Zoom

The spectrogram can be zoomed along the **frequency axis**.

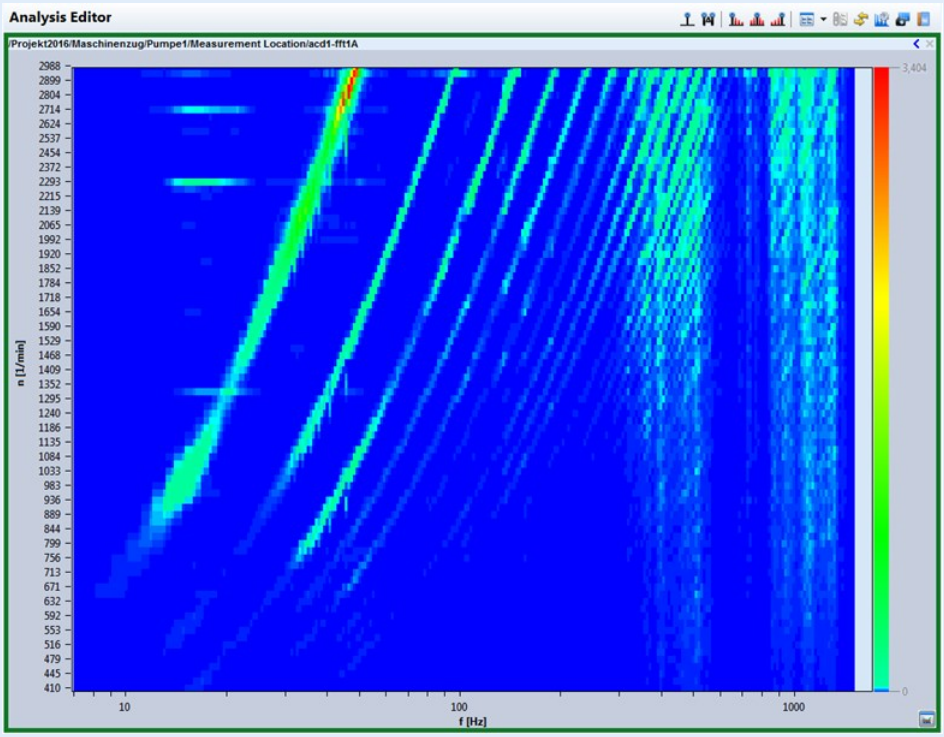
- Position the mouse pointer at the beginning of the range to be enlarged.
- Press and hold the left mouse button, while you move the mouse pointer to the end position.
- Release the mouse button.

Configure color gradient for the amplitude axis

In a spectrogram, the amplitude values are presented as color-coded height profile. The color scale on the right side of the graph indicates the maximum value range. Low amplitudes fill the colors at the bottom end of the scale. The highest amplitudes correspond to the color at the top end of the sale. A skilled adjustment of the color transitions allows for the optimum presentation of the amplitude curves.

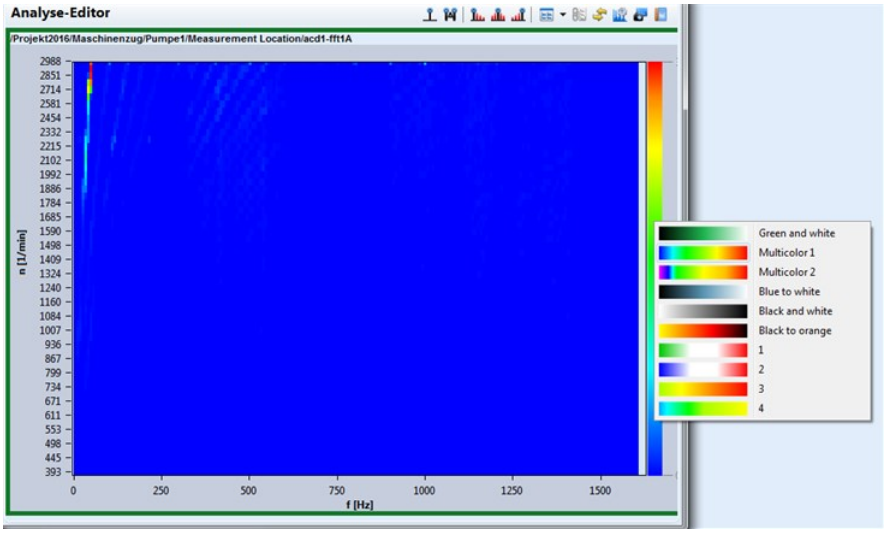
Example: Color gradient of amplitude values

Maximum amplitudes are presented in red. The background noise is shown in blue.



Select color scheme

- Using the right mouse button, click on the color scale. A dialog menu appears.
- Click on the desired color scheme (e.g., Multicolor 1)



You can specify the standard color scheme in the **user settings** or in the **session settings**.

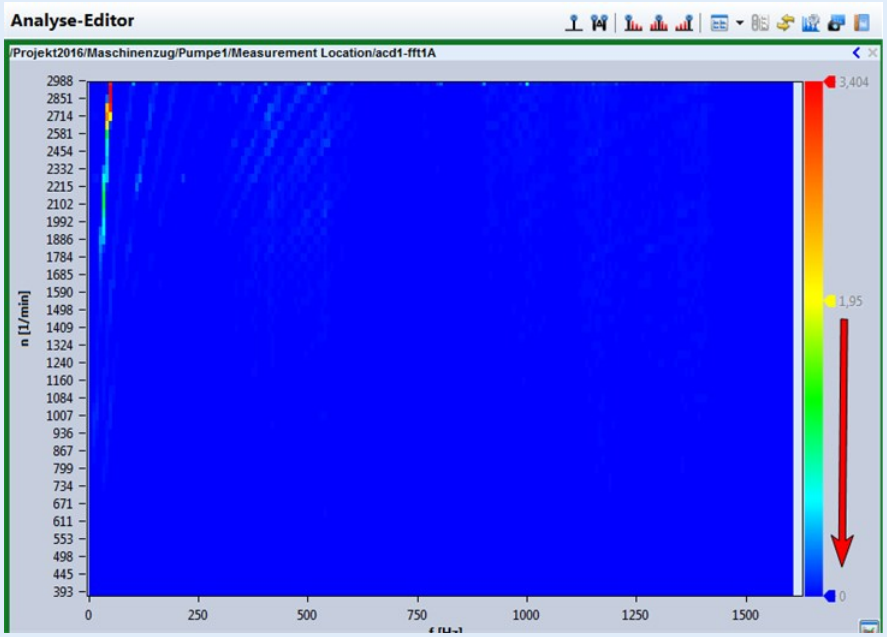
Adjust color gradient

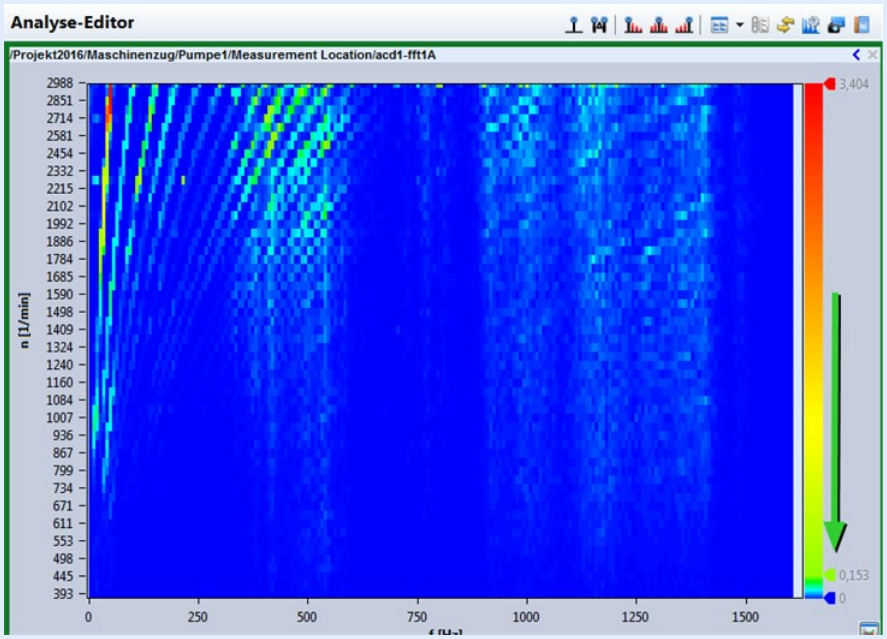
- Click on the color scale to show the color sliders.
- Release the mouse button and move the color slider along the color scale into the desired position.
- Move the mouse away from the color scale to hide the color sliders again.
  Alternative: You can also move the color slider without moving the mouse:

Press the CTRL key and turn the mouse wheel, until the color slider is in the desired position.

Example: Adjust color gradient

Moving the color slider from the yellow range towards the blue range, the lower amplitudes become visible in the spectrogram.



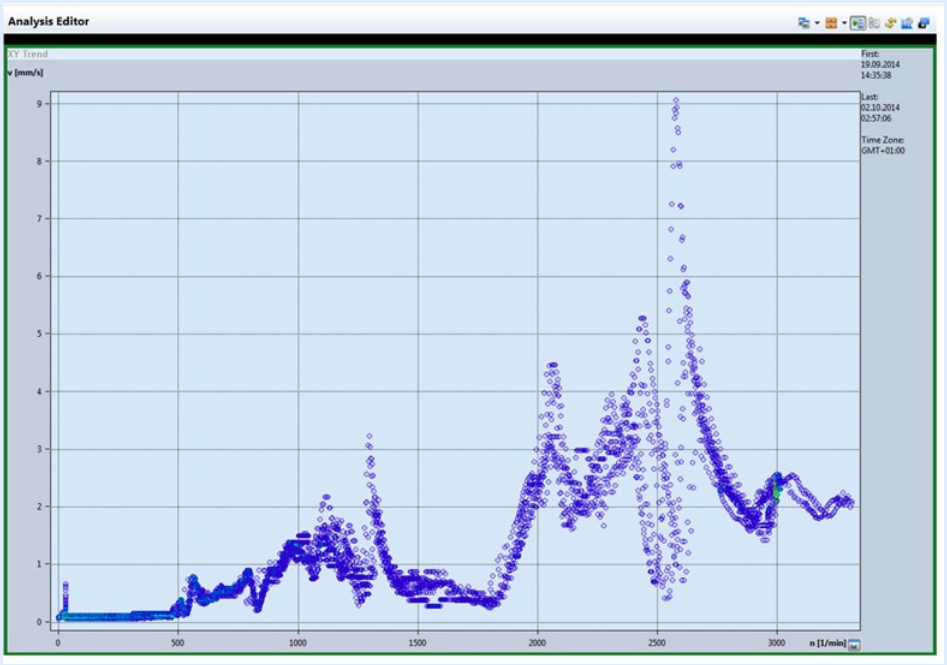


XY plot

Using this function, you can correlate any measurement data with time stamp in a graph. This **post processing function** is available for characteristic values, process data, and measurement tasks, whose results can be presented as **trend**.

E x a m p l e :

The following coastdown curve was generated as XY plot based on measurement data that was measured at the same time using the VIBGUARD online device. The correlation is based on the time stamp of the individual measurement data sets: X (t0) => Y (t0);
X axis: speed, Y axis: vibration amplitude



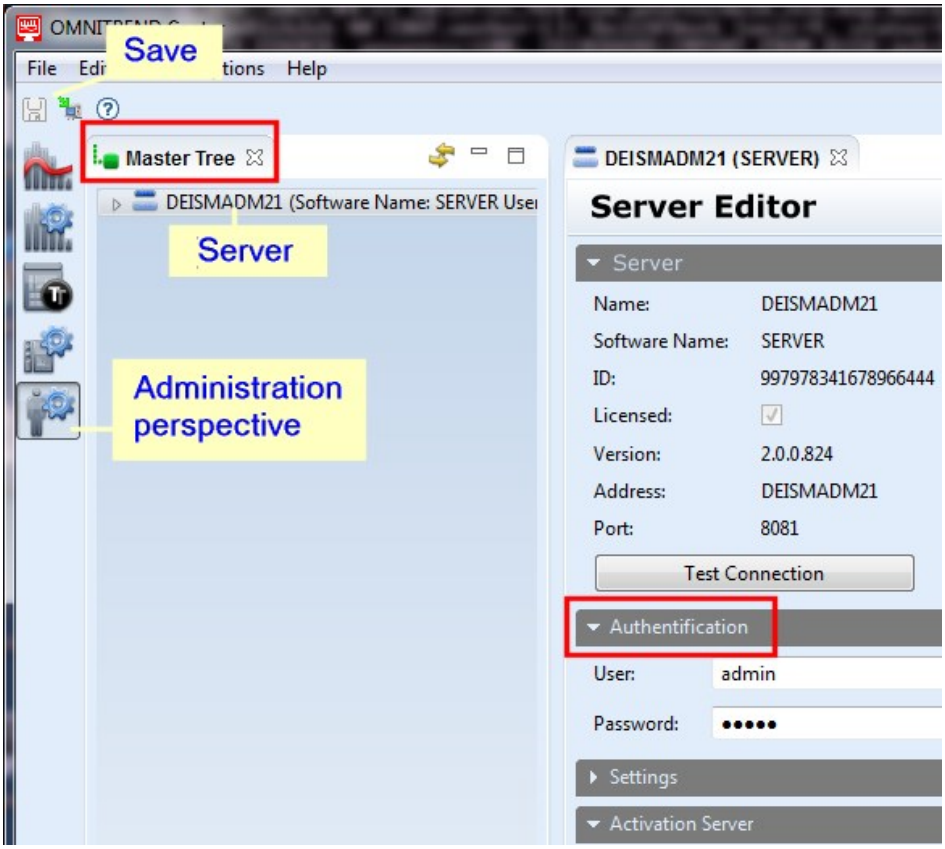
Prerequisite

You must at least have the **specialist** user role for creating a XY plot.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1]Grouping of related functions and fields in the Editor window



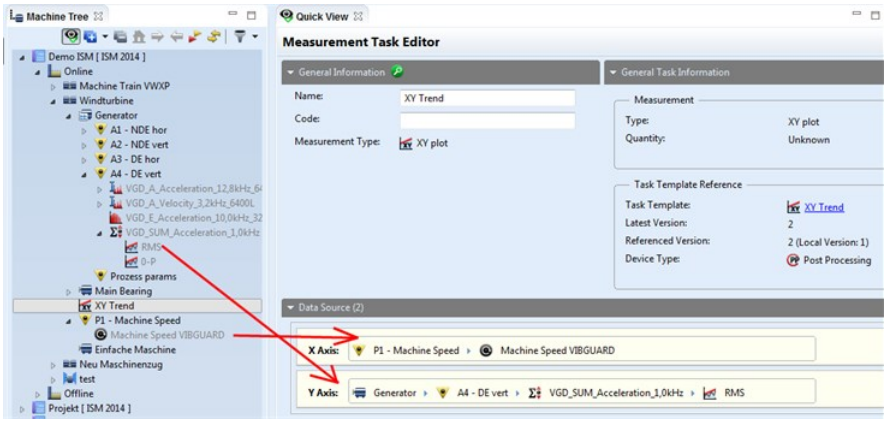
User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Create a XY plot

- Switch into the **Configuration perspective**.
- In the **machine tree**, create the **XY plot** measurement task:

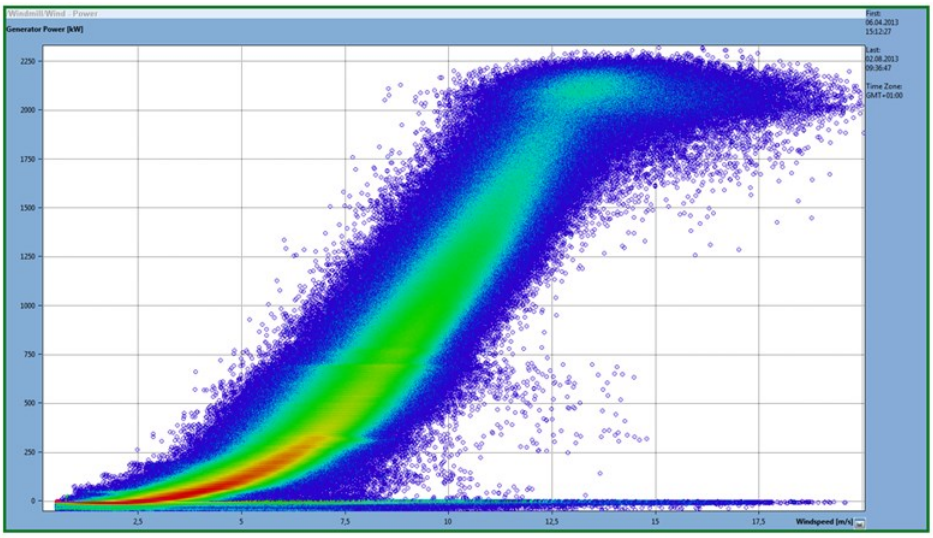
  In the machine tree, the X-Y trend must be created in the hierarchy, in which the measurement data is contained for both axes, or higher (see figure below).

  - Using the right mouse button, click on the suitable **tree node** (measurement location, machine, machine train, etc.). A dialog menu appears.
  - Select **Add / Measurement Task**. A dialog window appears.
  - Select the **XY plot** measurement task and click on **Finish**.
- In the machine tree, click on the newly created measurement task to open the **measurement task editor**.
- Drag and drop the two measurement tasks into the **X Axis / Y Axis fields (Data Source section)**.



Display and evaluate a XY plot

- Switch into the **Analysis perspective**.
- In the machine tree, click on the **XY plot** measurement task. The calculated graph appears in the analysis editor:



Explanation:

- A data point is generated for every value pair with the same time stamp.
- The data points are not connected
- If several data points are on top of one another, this is indicated by the color code:
    - Red: a lot of data points
    - Blue: a few data points

Multi graphs

The following display formats are available for evaluating several datasets:

A. Multi Plot

A **multi plot** represents **several graphs** at the same time and enables the quick comparison of any measurements. A multi plot can be compiled with a few clicks:

- Mark the desired measurement task in the machine tree. Press and hold the CTRL key for multiple selections. The individual measurement graphs are listed in the analysis editor, one below the other, in the order they were selected.

Change the graph layout in the multi plot

- In the analysis editor, click on the graph you would like to move.
- Press and hold the mouse button, until a green dashed frame appears enclosing the graph.
- Move the graph to the desired position. Pay attention to the information shown on green (e.g. "**Drop graph here to move it**"..

B. Multi Graph

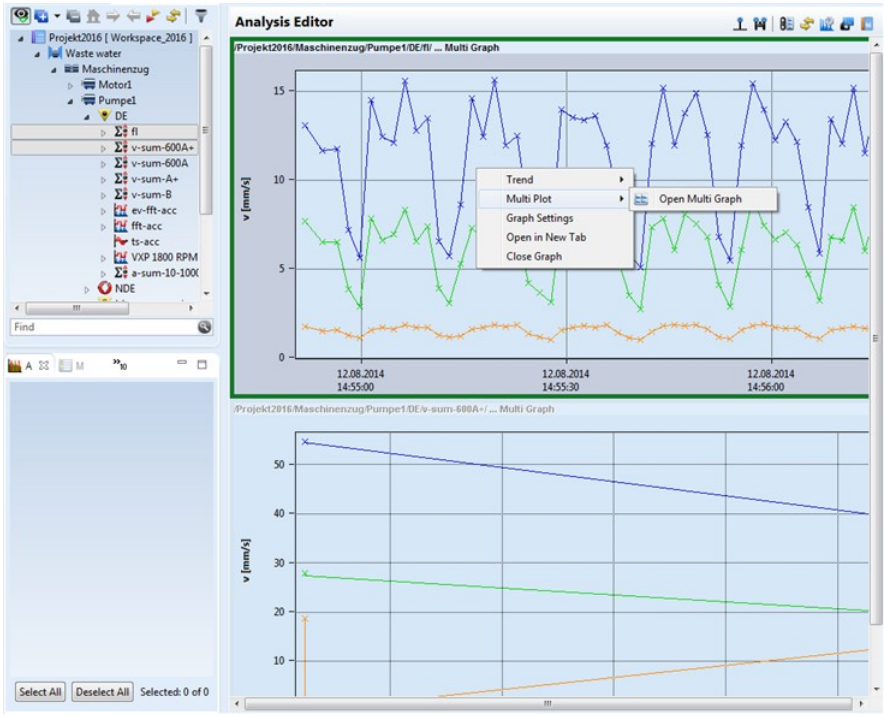
A **multi graph** is a **single graph** containing several data curves, such as RMS value and 0-p value. A multi graph is only possible for measurement that can be presented as **trend** (e.g., characteristic values).

> The following results are presented by default in a multi graph:
> - **(RMS, 0-p, p-p) parameters** in the **Characteristic Vibration Values** measurement task
> - **Characteristic band value** in the **Trend Spectrum** measurement task.

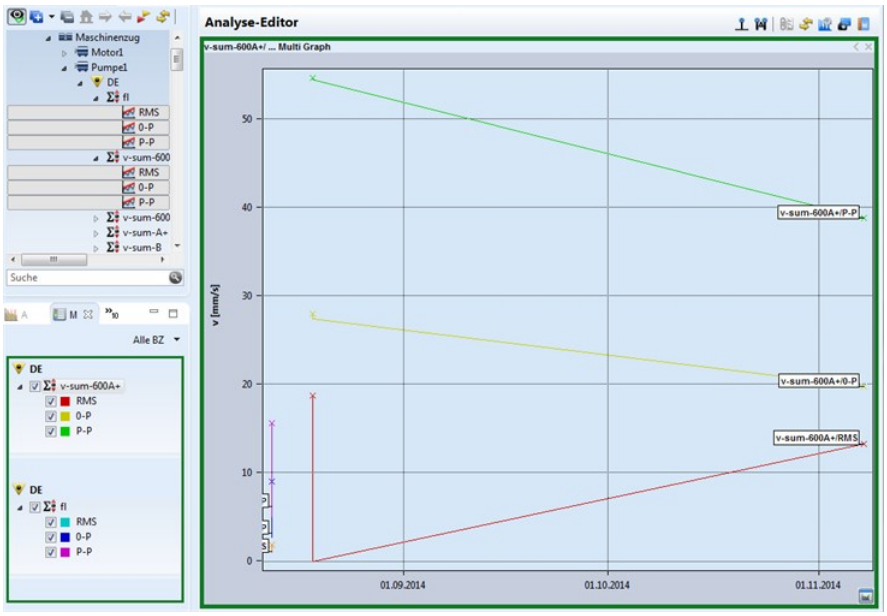
Present several results in a multi graph

- Mark the desired measurement tasks and the sub-results in the machine tree. Press and hold the CTRL key for multiple selections. The measurement data appears first in a **multi plot**.
- Press and hold the CTRL key, while you mark the individual graphs per mouse click in the analysis editor. The background color changes from **light blue** to **gray** (standard colors in the **Options / User Settings / Graph / Color**).
- Using the right mouse button, click on a graph. A dialog menu appears.

- Click on **Multi Plot / Open Multi Graph**. The data curves are now presented in a single graph



Open Multi Graph option in the dialog menu.

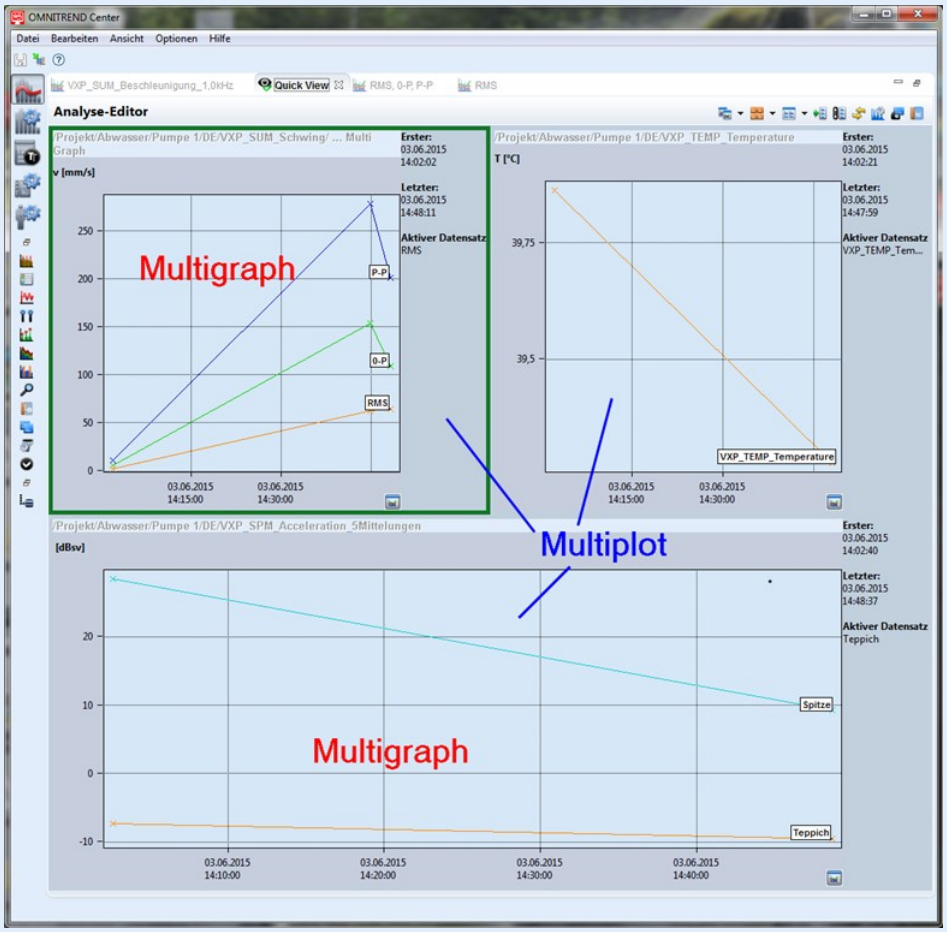


Multi Graph shows all trend results in one graph.

- To show or hide individual sub-results in a multi graph, open the **Measurement Data** view and select/deselect the respective entries.

Overview:

Multi Plot - Multi Graph



C. Multi View

A multi view is a combination of **multi graph** and **multi plot**. This type of graph is used to compile and analyze certain measurement results of a **machine**, a **machine train**, or a **measurement location** in a view.

Create multi view

- Using the right mouse button, click on the respective element (e. g. machine) in the master tree. A dialog menu appears.
- Click on **Edit** and select the **Multi View** option. The **Multi View Configuration** editor window appears.
- In the **Multi View Groups Configuration** section, click on **New Element**. A dialog window appears.
- Enter a **name**.
- Activate the **Standard** option as needed, if this multi view should be used by default for displaying measurement data (only meaningful or more than 2 multi views).
- Click on **OK**.
- Drag and drop the desired **measurement tasks** from the machine tree into the fields of the **Group Content** section.
  Every field represents a diagram. You can place the vibration parameters and characteristic band values in one field each to represent the partial results in one **multi graph**.
- In order to change the **layout** of the fields (graphs), click on **Layout** in the local toolbar and select the desired layout.

- Click on **Save** to finish. The element with a multi view is marked by an additional symbol in the machine tree, e.g.

Display multi view

- In the **machine tree**, click on the element, for which a multi view was created (e.g. machine). The analysis editor opens the standard multi view.
- If you would like to create additional multi views in this hierarchy, open it via the local toolbar using **Change Multi View** .

Adjust Graph Display

Click on the graph with the right mouse key and select the **graph settings** option:

Trend characteristic value, phase / coast-down characteristic value

- **Scale** of X- and Y-axis: manual or automatic
- **Scaling type**: linear or logarithmic

Spectrum

- **Scale** of X- and Y-axis: manual or automatic
- **Scaling Type**: linear, logarithmic, or in dB (Y-axis only)
- **Order Display** activate for order-based spectrum
- **Show amplitude as**: Display amplitude in the **0-p, p-p, or RMS** parameters
- **Options for frequency markers**: Show/hide **Label** and **Harmonics** for frequency markers.
- **Z-Axis**: Settings for cascade graph.

Time signal

- **Scale** of X- and Y-axis: manual or automatic
- Show **Keyphasor Marker**

Orbit, phase, coast-down analysis - phase

- **Scale** of Y-axis in Cartesian presentation: manual or automatic
- **Scaling Type**: linear, logarithmic, or in dB (Y-axis only in coast-down analysis)
- Show **Keyphasor Marker**

To switch the presentation from **Cartesian** to **Polar**, click in the **local toolbar** on **Cartesian/Polar** .

Using the **Use as Session Settings** option, the settings are kept the same for all graphs of the same type, until the session is ended and the client is closed.

14.2 Findings

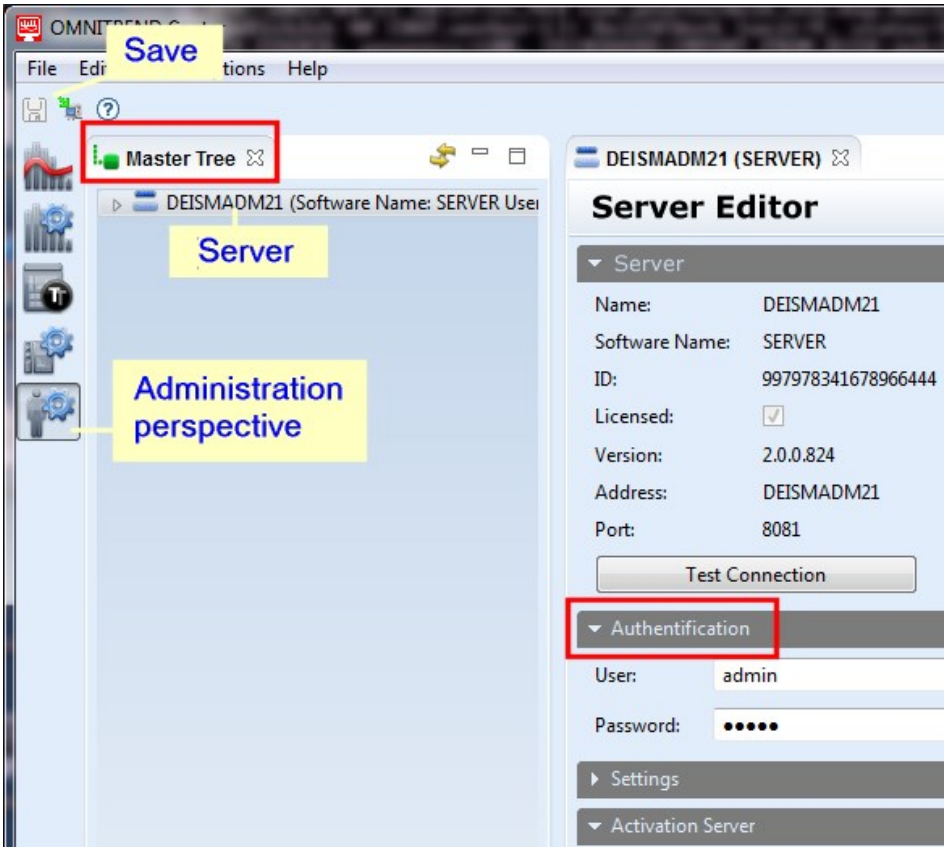
Using a finding, you can document the state of a machine or asset. A finding consists of one or several symptoms, which are inserted as **file**, **screenshot**, or **text**. In addition, **diagnoses** and **correction recommendations** can be added to a finding.

Prerequisite

You must at least have the **operator** user role for creating a finding.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Create finding

[1]Grouping of related functions and fields in the Editor window

- Switch into the **Analysis** or **Configuration** perspective.
- Using the right mouse button, click in the **machine tree** on the element, for which you would like to generate the finding (e.g. machine). A dialog menu appears.
- Click on **New finding**. A dialog window appears.
- Enter a **name** and click on **Finish**. The **findings editor** appears.
- In the **Attributes** section, define the **priority** and activate the **Record History** option as needed to record the changes to the finding.

  Once you record the finding history, you cannot deactivate this option anymore. You must enter a comment for every change to the finding. All changes are logged in the **Finding History** section.

- Enter the **symptoms**:
  - In the **Description** section, you describe the finding in text form.
  - In the **Image Gallery** section, you store screenshots, which you created in the **analysis editor** using the **Capture Screenshot** function. You can find these screenshots in the **Clipboard** view (Analysis perspective). Drag and drop them into the section.
  - You can attach a new screenshot or any other file in the **Attachment** section.
- Enter a **diagnosis** and/or a **correction recommendation** as needed:
  - Click on **New Element** in the respective section. A dialog window appears.
  - Select the suitable **diagnosis / correction recommendation** and click on **Finish**.

  Diagnoses and correction recommendations are **master data** and can be imported into the database as needed (File/ Import/ Findings).

- In the **Relationship** section, you can correlate a finding to another finding:
  - Open the **Findings** view.
  - Drag and drop the respective finding into the **Relationship** section.
  - In the **Relationship** column, select the relationship type (e.g. "duplicate of").
- Click on Save to save the inputs.

14.3 ToDos

Using ToDos, working instructions can be communicated and information exchanged in the database. The following types of ToDos exist:

- **User ToDo**: ToDo that was created by one user and assigned to another user or user role.
- **Device ToDo**: Automatically created ToDo related to the device. Contains information about the critical device status (memory, etc.) or alarm states.
- **System ToDo**: Automatically created ToDo related to the server or DAP. Contains information about the system status or errors on the server or DAP. System ToDos will only be displayed, if the **Receive System ToDos** option is activated in the user editor.

During login, new ToDos appear automatically, if the user has the respective option activated in the **User Preferences** (Options/ User Preferences/ Notifications).

Create user ToDo

You can create user ToDos in the **machine tree** in every hierarchy and in the **master tree** in the context of a device.

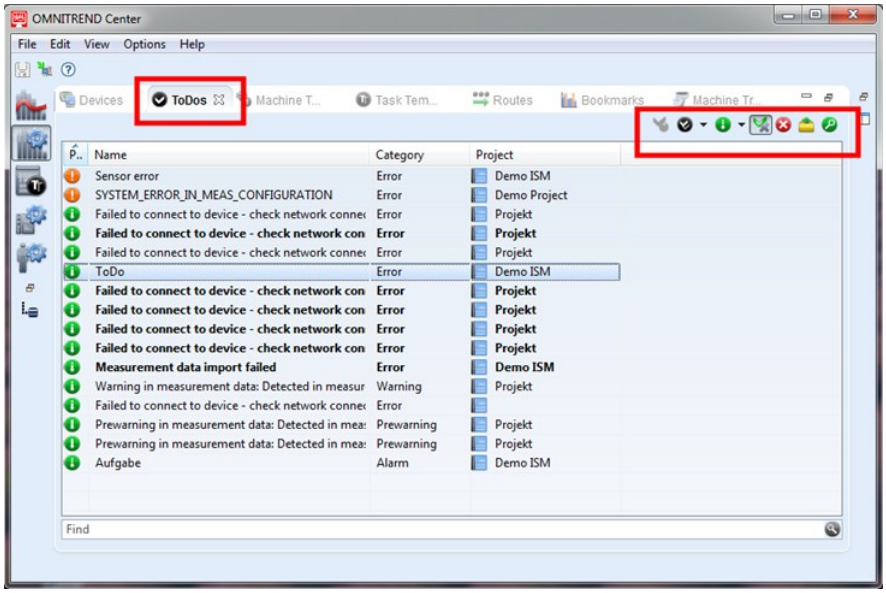
- Switch into the respective **perspective** (Analysis/ Configuration or Administration).
- Using the right mouse button, click on the respective element. A dialog menu appears.
- Click on **New ToDo**. A dialog window appears.
- Enter a designation into the **Name** field.
- Define the **priority** and **category**.
- Click on **Finish**. The **ToDo editor** appears.
- Enter the other parameters as follows:
    - **Section Assignee**: Assign the addressee for the ToDo in the **Assignee** field, either an individual **user**, or all users of a certain **user role**. ToDos assigned to an individual user, can be mad visible to the addressee only using the **Restricted** option.
    - **Section Attribute**: Here you set the **due date**, **status**, as well as **category**, and **priority**.
      Categories: Alarm / Warning / Prewarning: Threshold exceeded; error: Device cannot be reached (in the case of automatically created system ToDos); success: informative, for ToDos that were successfully completed.
    - **Section Description**: Here you describe the ToDo in text form.
    - **Section Attachment**: Here you can attach a **file** and/or **screenshot** to the ToDo.

      > You define the maximum number and file size for attachments in the context of the **database** (Database editor / Attachment section). For **system ToDos**, you adjust these settings in the context of the **server** (Server editor / section: Settings / Fields: Attachments).
- Click on Save to save the inputs.

For the procedures described in the following section, change to the **administration perspective**, and open the **ToDos** view. Here, all tasks are listed that are assigned to you as individual **user** and your **user role**:

Edit ToDos

- Click on **Details** in the local toolbar to show the following edit filters and functions:



- **Unread ToDos** : Only show unread ToDos. Unread ToDos as printed in bold.
- **Class** : Here you only show ToDos, which are assigned to you, which were set up by you, or which are assigned to your user role (**group ToDos**). The number in brackets indicate, how many of the uncompleted ToDos are unread (e.g. 3/0 = 3 of 10 uncompleted ToDos are unread)
- **Priority** : Here you filter the ToDos by priority. The ToDos with lower priority are hidden.
- **Hide completed** : ToDos, whose status was set to **Done**, can here be hidden.

Set the ToDo status to "Done":

- Using the right mouse button, click on the respective ToDo (multiple selection via CTRL key).
- Click on **Status: Done** .

> System ToDos of the **Alarm** category can only be set to "Done" by the respective online device. For this purpose, you must acknowledge the triggering alarm status on the online device. Open the **Devices** view and create an **Online Device Status report** for the respective online device. The report contains a link for every alarm. It acknowledges and reset the alarm status on the online device.

Delete ToDo:

- Mark the respective **ToDos** (multiple selection possible
- Click on **Delete** in the local toolbar.
  Automatically generated ToDos (system / device) cannot be deleted.

15 Reporting

Here you can find all topics regarding the reports in OMNITREND Center.

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15.1 Alarm report

This report lists all measurement tasks, where a threshold was exceeded.

> Check the alarm status in the project using the **Alarm Check function**.
>
> The **Online Device Status report** displays all threshold violations currently pending on the online device. This report also provides hyperlinks for acknowledging these messages on the online device.

Create alarm report

- Switch into the **Analysis perspective**.
- Using the right mouse button, click in the **machine tree** on the node, for which you would like to generate the alarm report (e.g. machine). A dialog menu appears.
- Click on **Report / Alarm / Alarm Report**. A dialog window appears.
- Adjust the **report filter and parameters**:
  - **Time Range**: Here you set the **time range**, the report should cover
  - **Alarm type**: **First alarm** or **highest alarm** will be evaluated.
  - **Threshold**: Alarm, warning, prewarning; in the case of alarm, alarms only are evaluated, in the case of prewarning, all threshold types are evaluated.
- Click on **Next**.
- Change the **standard elements** in the report (logo, etc.) and click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.2 Asset status report

Using this report, you document the status of the machine in a project.

The following **statuses** are displayed:

- Status OK: No thresholds are exceeded on the machine and no findings are open.
- Status not OK: At least one threshold is exceeded on the machine and at least one finding is open.

The following **report types** are available:

- **Asset Status Report Type I**: Status overview without details
- **Asset Status Report Type II**: Status overview with detailed alarm/findings table.

Create asset status report (type I / type II)

- Switch into the **Analysis perspective**.
- Using the right mouse button, click in the **machine tree** on the node, for which you would like to generate the status report (e.g. machine). A dialog menu appears.
- Click on **Report / Assets / Asset Status Report I / II**. A dialog window appears.
- Adjust the **report filter and parameters**:
  - **Time Range**: Here you set the **time range**, the report should cover
  - **Threshold**: Alarm, warning, prewarning; in the case of alarm, alarms only are evaluated, in the case of prewarning, all threshold types are evaluated.
  - **Alarm type**: **First alarm** or **highest alarm** will be evaluated.
- Click on **Next**.
- Change the **standard elements** in the report (logo, etc.) and click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.3 Balancing Report

This report is used for documenting a balancing measurement. Two report types are available:

- **Simple balancing report**: Documents the measurement results as they are displayed in the analysis editor.
- **Customer-specific balancing report**: In this variant, you can copy the contents from a simple report. hide them selectively or add additional information

Create balancing report

- Switch into the **Analysis Perspective**.
- Open the respective balancing measurement.
- Click on **Graph Report** in the local toolbar. . A dialog window appears.
- Select the **report type**:
  - **Simple**: Simple balancing report
  - **Customer**: Customer-specific balancing report.
    Enter the required information into the **General Settings** field.
    Select the option elements for the report in the **Measurement Information** field.
- Click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.4 Create report job

A report job is automatically executed by the server according to a defined time schedule. The **generated reports** are stored under the report job in the Report Administration perspective.

You can create report jobs for the following report types:

- Alarm report
- Asset report I
- Event report
- Findings report
- (Measurement data export)
- Task report

Create report job

- Switch into the **Report Administration perspective**.
- In the report tree, open the **database**, in which you would like to create the report job.
- Using the right mouse button, click on **Report Jobs**. A dialog menu appears.
- Select **New Report Job / *Report Type*** *(see list above)*.
- Configure the new report job in the **report job editor**:
    - In the **General** section, enter a **name** and select a **layout**.
    - Define a time schedule in the **Schedules** section:
        - Click on **New Element** in the local toolbar. A dialog window appears.
        - **Activate** the time schedule and configure the **execution interval**. You can also create and activate several time schedules.
        - Click on **Finish**.
    - In the **Localization** section, you can set the **language** and **time zone**.
    - Adjust the report-specific **filters** (event, alarm, tasks, asset).
- Click on save .

Create ad-hoc report

You can also create the respective report manually to check the report contents:

- Using the right mouse button, click in the **report tree** on the respective report job. A dialog menu appears.
- Click on **Create report**. The report is generated and displayed in the **report editor**.

Active report jobs

In the **Scheduled Report Jobs** view (Administration perspective), you can find all report jobs that were created in the current database and are active.

15.5 Creating a standard layout for reports

A report layout is the design template for the following report types:

- Analysis reports (alarm, event, finding, assets, mux)
- Graph report
- Device event report
- Route reports

Creating a standard layout for reports

- Switch into the **Report Administration perspective**.
- In the report tree, open the **database**, in which you would like to create the layout.
- Using the right mouse button, click on **Layouts**. A dialog menu appears.
- Click on **New Layout / Standard Layout**.
- Configure the new layout in the **Layout Editor**:
  - Enter a **name** in the **General** section.
  - In the **Parameter Definition** section, you can change the parameters for the **available** elements:
    - Mark the respective entry and click in the local toolbar on **Edit Element** . A dialog window appears.
    - Change the settings and click on **Finish**.
  - To create a **new layout element**, click on **New Element** .
  - The available **logo files** are listed in the **Selection** field. To insert the new logo file, proceed as follows:
    - In the **report tree**, click on the newly created layout. A dialog menu appears.
    - Click on **Import File** and select the desired logo file on your PC. The imported file appears as new tree element under the layout node.
    - **Drag & drop** the imported logo file into the **Selection** field.
    - Activate the file as **standard logo** as needed (click on the icon in the Standard column, until is displayed.)

Active Layout

The **active layout** is marked in the report tree using an asterisk (*).

- To use a newly generated layout, right-click it and select the **Set As Default Layout** option.
- To use the factory-created layout as standard layout again, right-click the active layout and select the **Use Factory Settings** option.

Export report layout

- Using the right mouse button, click in the report tree on the respective **report layout**. A dialog menu appears.
- Click on **Export**.
- Enter a **file name** without spaces and select a **folder** for saving.
- Click on **Save**. The report layout is saved in the RTA format.

Import report layout

- In the master tree, click on **File / Import**. The import wizard appears.
- Select **Reports / Report** and click on **Next**.
- Select the **database**, into which the report layout should be imported.
- Click on **File** and select the respective file in the file system.
- Click on **Finish**. The report layout is important and appears in the report tree under the Layouts node.

15.6 Device Reports

These reports provide information about the device and the results saved on the device. You can create the following reports:

- **Device event list**: Report with the events on the device
- **Device list**: Information regarding the device (serial number, firmware, IP address, etc.). This list is usually created for several devices.

Create device list

- Switch into the **Configuration perspective**.
- Open the **Devices** view.
- Mark the respective devices (use the CTRL key for multiple selections).
- Press the right mouse button. A dialog menu appears.
- Click on **Report /Device List**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

Create device event list

- Switch into the **Configuration perspective**.
- Open the **Devices** view.
- Using the right mouse button, click on the respective device. A dialog menu appears.
- Click on **Report /Device Event List**. A dialog window appears.
- Set the **Device Filter**: **Event Type, Time Range, Event State**.
- Activate the **Hide Created Events** and/or **Hide Received Events** options as needed.
- Click on Next.
- Change the report output settings as needed.
- Click on Finish.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.7 Event report

Using this report, you document the events that were registered in the context of the measurement, device, or software. The following report types are available:

- **Event Report**: Events occurring during a measurement, such as an alarm.
- **Device Event List**: Events occurring on the device or entered by the user, such as bearing replaced.
- **Server Event Report**: Events occurring on the server.
- **DAP Event Report**: Events occurring on the DAP.

Create event report

- Switch into the **Analysis perspective**.
- Using the right mouse button, click in the **machine tree** on the node, for which you would like to generate the event report (e.g. machine). A dialog menu appears.
- Click on **Report / Events / Event Report**. A dialog window appears.
- Adjust the **report filter and parameters**:
  - **Event**: Select the events that should be contained in the report.
  - **Status**: Select the status of the events.
- Click on **Next**.
- Change the **standard elements** in the report (logo, etc.) and set the **time range**, the report should cover.
- Click on **Finish** .

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

See the Device Reports section for details regarding the creation of **device event list**. (Hyperlink, see under "Related Topics").

Create server event report

- Switch into the **Administration perspective**.
- Using the right mouse button, click in the **master tree** on the **top entry** (server). A dialog menu appears.
- Click on **Server Event Report**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

Create DAP event report

- Switch into the **Administration perspective**.
- In the **master tree**, open the **Device Access Points - DAPs** node.
- Using the right mouse button, click on the respective **DAP**. A dialog menu appears.
- Click on **DAP Event Report**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.8 Export / print / save report

You can print or export reports into HTML format as follows:

- Generate a report, which then appears in the **report editor**.

Print report

- Click on **Print** in the local toolbar in the upper right corner. The print preview appears.
- Adjust the print parameters and click on **Print**. The report is printed on paper.

Export the report as a PDF file.

- Click on **Save as PDF** in the local icon bar in the upper right corner . A dialog window appears.
- Select the **location** and enter a new **file name** as needed.
- Click on **Save**.

Export report into HTML format.

- Click on **Save as HTML** in the local toolbar in the upper right corner. A dialog window appears.
- Select the **location** and enter a new **file name** as needed.
- Click on **Save**.

Save reports

- Click on Save in the main tool bar.
  The report is saved in the **Reports** view.

Analysis reports and Graph reports can be saved. Analysis reports are reports about **alarms**, **assets**, **events**, **findings, MUX**.

15.9 Findings report

Using this report, you document all findings that were created for the respective node in the machine tree.

Create findings report

- Switch into the **Analysis perspective**.
- Using the right mouse button, click in the **machine tree** on the node, for which you would like to generate the findings report (e.g. machine). A dialog menu appears.
- Click on **Report / Findings / Findings Report**. A dialog window appears.
- Adjust the **report filter and parameters**:
    - **Time Range**: Here you set the **time range**, the report should cover
    - **Status**: Select the status of the findings.
    - **Priority**: Select the priority of the findings.
- Click on **Next**.
- Change the **standard elements** in the report (logo, etc.) and click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.10 Graph report

This report contains all measurement data graphs that are displayed in the analysis editor.

Create graph report

- Click in the local toolbar on **Graph Report** .

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.11 Measurement data reduction report

This report displays all measurement tasks in a measurement configuration for the online device, for which no reference value has been set yet.

Explanation:

You can set up a measurement data reduction for the following characteristic value measurements: Vibration, shock pulse, phase, speed, and characteristic band values in spectra.

This option only saves a new measurement value, if it deviates from the previous measurement value by a certain amount. This procedure saves disk space and avoids redundant measurement data. The measurement value **deviation** can be defined as **relative value** (**delta type**). In the case of relative values, a reference value is required, which must be selected from the historical measurement data set. If this reference value is missing, the measurement data reduction cannot be performed.

Create measurement data reduction report

- Open the **device editor**:
  - Switch into the **Communication perspective.**
  - Open the **Device** view.
  - If needed, select the **database**, in which the device was created and assigned to a project, in the toolbar of the view window.

    The respective pulldown menu only appears, if more than one database was created.

  - Mark the **device**.
  - Click on the toolbar on **Open** to open the device editor.
- Open the **Measurement Configuration** section.
- In the **General** tab, click on **Adaptive Storage Report**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.12 MUX Report

This report lists all measurement locations that are configured on a MUX [1] **and** can be measured with VIBXPERT II.

Create MUX report

- Switch to the **analysis perspective** or to the **configuration perspective**.
- Using the right mouse button, click on the node in the **machine tree**, for which you would like to create the MUX report (e.g., machine). A dialog menu appears.
- Click on **Report / MUX / MUX Report**. A dialog window appears.
- Change the **standard elements** in the report (logo, etc.) as needed and click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

[1] Area of a machine in which the same RPM or rotational frequency occurs.

15.13 Online Device Status report

This report lists the alarms currently pending on the online device, offers a link for **resetting the alarms** on the online device.

Prerequisites:
- A connection is required to the online device.
- The online device must be activated.

Create Online Device Status report

- Switch into the **Configuration perspective**.
- Open the **Devices** view.
- First, check the **connection** to the online device:
    - Double-click on the respective online device to open the **device editor**.
    - Click in the **System Configuration** section, in the **General** tab on the **Read Serial Number** button. The connection to the online device is established and the serial number is read.
- Using the right mouse button, click on the respective online device in the **Device** view. A dialog menu appears.
- Click on **Report / Online Device Status.**

15.14 Route reports

The following reports show specific information regarding the **status of a route**:

- Last Monitored Equipment List
- List of Missed Measurement Locations and Tasks
- List of Completed Measurement Locations and Tasks
- List of Overdue Measurement Locations and Tasks

Create route report

- Switch into the **Configuration perspective**.
- Open the **Routes** view.
- Using the right mouse button, click on the respective route. A dialog menu appears.
- Select **Report** / ***Route Report*** *(see list above)*. A dialog window appears.
- Adjust the **time filter** and click on **Next**.
- Change the **standard elements** in the report (logo, font, etc.) and click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

15.15 VIBCODE Report

This report lists all coded measurement locations that can be automatically identified and measured using the VIBCODE sensor.

Create VIBCODE report

- Switch to the **analysis perspective** or to the **configuration perspective**.
- Using the right mouse button, click on the node in the **machine tree**, for which you would like to create the VIBCODE report (e.g., machine). A dialog menu appears.
- Click on **Report / VIBCODE / VIBCODE Report**. A dialog window appears.
- Change the **standard elements** in the report (logo, etc.) as needed and click on **Finish**.

The report is generated and appears in the **report editor**. You can **save**, **print** and **export** the report.

Empty page

16 Machine templates

Here you can find all topics regarding machine templates.

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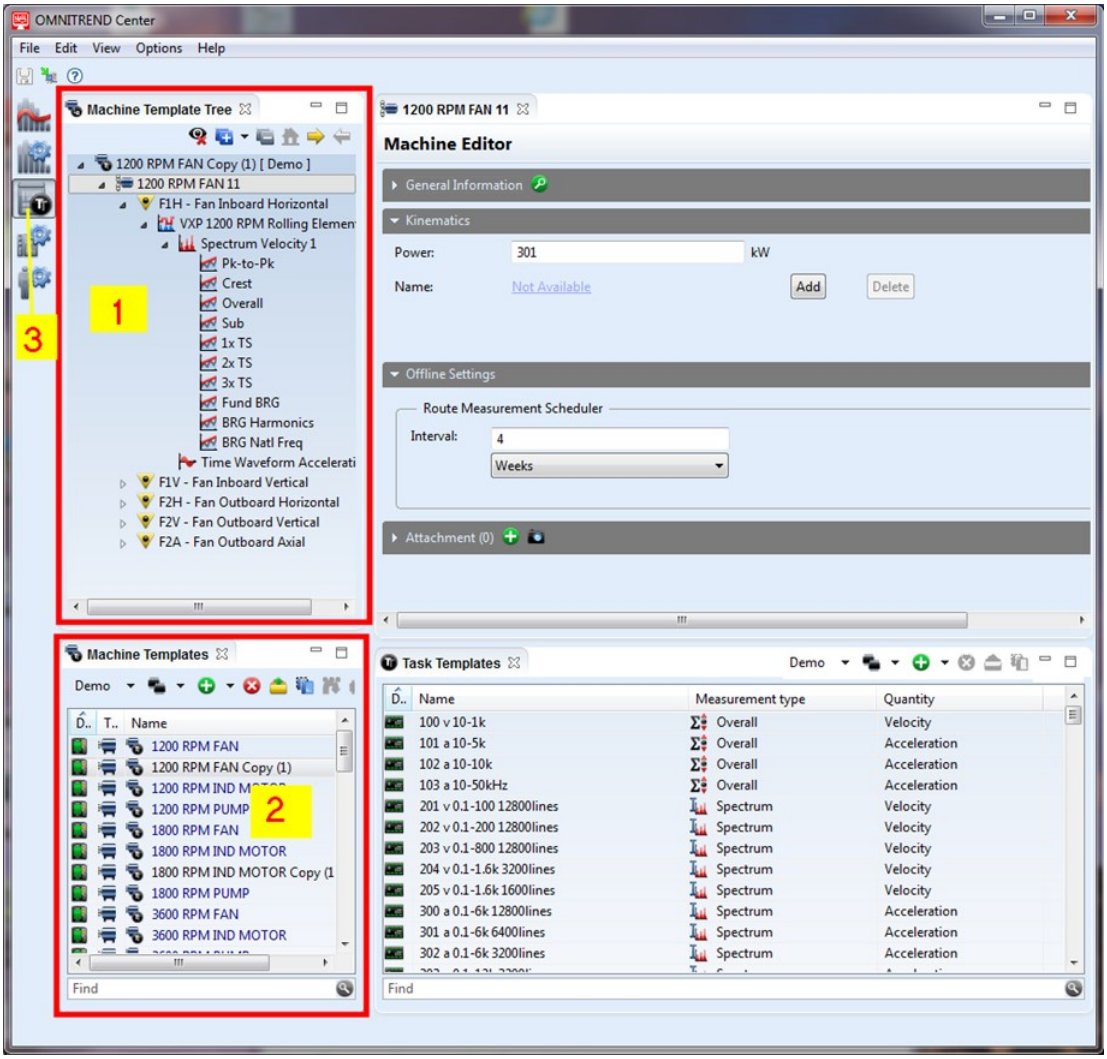
16.1 Basics: Machine templates

Machine templates help in creating a **machine tree** and when **measuring** on many similar machines. They map a machine or machine tree with all child elements, such as measurement locations, measurement tasks.

Further properties and features of machine templates:

- A machine template can be created for a specific**device type**[1]or be created without being device-specific.
- Only machine templates of the **machine train type** can be transferred to a device.
- Every machine template has a **unique name**
- Machine templates are subject to **versioning**, i.e., the version number of the template is incremented in the case of changes.
- Machine templates are managed in the **Machine Templates perspective**.
- Machine templates are **master data** and can be used across all projects

Working in the Machine Templates perspective



[1](for VIBXPERT only in version 2.0)

Open the Machine Templates perspective with the respective **button** (3) on the left border of the window. The **Machine Templates** view (2) contains all machine templates available in the database.

In addition to the **name**, the **type** (machine or machine train) and the corresponding **device** type are indicated. Machine templates configured at the factory are shown in blue font. These templates cannot be changed.

- To **edit** the settings, duplicate a factory template using **Duplicate Element**.
- To **open** a machine template, click on **Open**. The machine template appears in the **Machine Templates tree** (1).
- The individual elements can be edited using the respective **editors** in the top right sub-window.

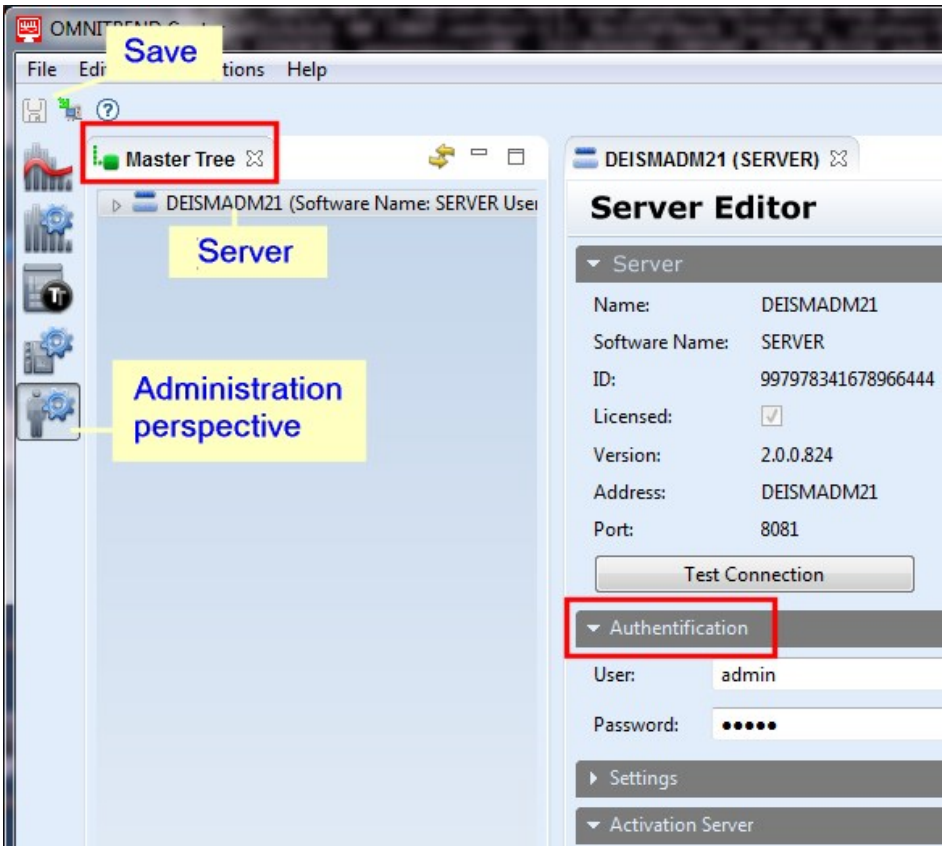
16.2 Create and edit a machine template

Prerequisite

To create and edit a machine template, you must at least have the **specialist** user role.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

There are different options available for **creating** a machine template:

A - To create a new machine template

[1] Grouping of related functions and fields in the Editor window

- Switch into the **Machine Template perspective**.
- Click in the local toolbar of the **Machine Templates view** on **New Element** and then on the corresponding device type (e.g. VIBXPERT). A dialog window appears.
- Enter a unique **name** for the template.
- Select the template **type** (machine train / machine) and click on **Finish**.
- The new template appears in the **Machine Templates tree**. The top node represents the template, whose properties can be changed in the editor. The child node represents the top machine-specific element in the template (machine train or machine)
- To create additional elements in the template, follow the same procedure of **creating a machine tree**.

> When creating measurement tasks, you can drag and drop the desired measurement task from the **Task Templates view** onto the specified measurement location.

B - To create a machine template from a factory template

- Switch into the **Machine Template perspective**.
- Mark the respective factory template (blue font).
- Click in the local toolbar of the **Machine Template view** on **Duplicate Element**.
- Mark the duplicated template and click on **Open**.
- Edit the template in the **Machine Templates tree** (add, delete, configure elements, etc.).

> If you create a **machine train**-type template, you can insert machine-type machine templates as child machines.

B - To create a machine template from the machine tree

- Switch into the **Configuration perspective**.
- Using the right mouse button, click on the node in the **machine tree**, from which you would like to create a template. A dialog menu appears.
- Click on **Create / Machine Template**. A dialog window appears.
- Enter a unique **name** and click on **Finish**. The new template appears in the **Machine Templates** view (Machine Templates perspective).

The elements of a machine template can be **edited** the same as elements in the machine tree. You can newly compile the **measurement location order** as needed, similarly to a route:

- For this purpose, open the **Machine Template Editor**[1].
- Open the **Measurement Location Order** section.
- Change the **sequence number** or drag the measurement locations in question to the desired position via **drag & drop**.

[1] editor for the top node in the template

16.3 Export machine template

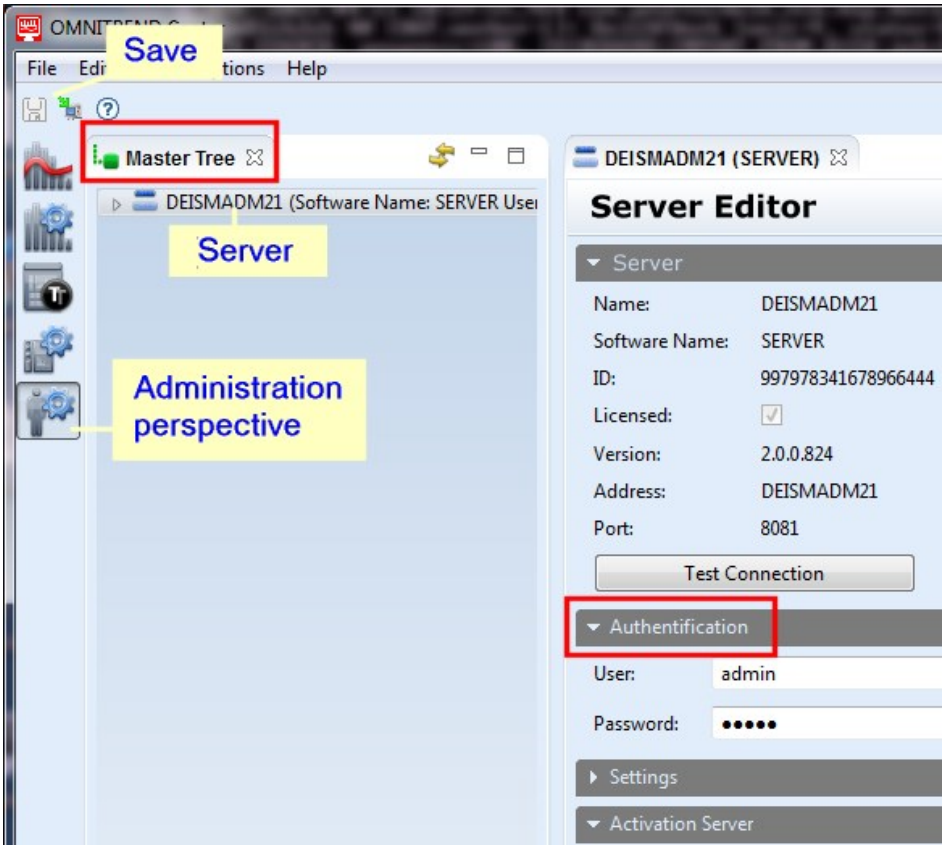
A machine template can be exported into the **file system** or directly loaded to the connected **device** laden.

Prerequisite

You must at least have the **specialist** user role for exporting a machine template.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To export a machine template into the file system

[1] Grouping of related functions and fields in the Editor window

- Switch into the **Machine Template perspective**.
- Mark the respective machine template.
- Click in the local toolbar of the **Machine Template view** on **Export to File System** . A dialog window appears.
- Select the **sensor** contained in the template for each **measurement location type**.
- Select the **folder**, into which the compiled machine template should be saved.
- Click on **Finish**.

To load a machine template directly onto the device[1]

- Connect the device to the client PC using a **USB cable**.
- Switch into the **Machine Template perspective**.
- Mark the respective machine template (type=machine train).
- Click in the local toolbar of the **Machine Template view** on **Send Machine Template to Device** . A dialog window appears.
- Mark the device.
- Select the **sensor** contained in the template for each **measurement location type**.
- Click on **Finish**.

> Machine templates, which contain VIBCODE measurement locations, **cannot** be transferred to VIBXPERT II. The respective measurement locations can only be measured on the basis of a route.

16.4 Import machine template

You can import a machine template into a database via the file system.

This is how to import a machine template from the file system

- Switch into the **Machine Template perspective**.
- In the main menu, click on **File/Import**. A dialog window appears.
- Select the import wizard for machine templates (**Machine templates/ machine template**).
- Click on **Next**.
- In the next window, select the database into which the machine templates are to be imported.
- Specify the folder, in which the archive file (*.tar / *.zip) with the machine templates is stored. Click on **Select directory**, and navigate to the target directory, or enter the path in the field **Directory**.

  > With **Include sub-directories** you will expand the search to include sub-directories. When doing so, note that, depending on the size of the directory structure, the search may take some time.

- Select the file(s) in the field "**Files**".
- Click on **finish**. The machine template(s) is/are imported.

[1](VIBXPERT only in version 2.3.0)

- Confirm the import message with **OK**.

  If one or more machine templates are already in the database, the **resolve import conflict** dialog window appears. In this window, you can decide for each of the machine templates affected whether the template is to be stored as a copy or is to replace the existing machine template. You can deactivate the import of the machine templates using the **skip** option.

17 Best practices

This section provides tips and tricks regarding different topics.

17.1 Best practices: Screenshot 262
17.2 Best practices: Using the search function 264
17.3 Best practices: Using the Filter Function in the Machine Tree 266
17.4 Best practices: Selective Presentation of Sections in the Machine Tree 269
17.5 Best practices: Shortcuts 272
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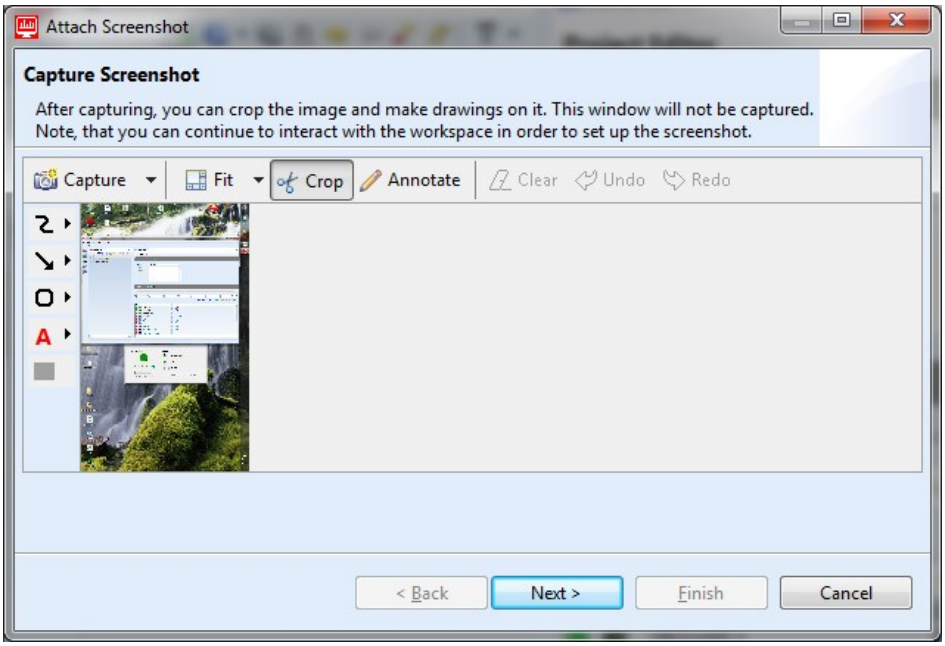
17.1 Best practices: Screenshot

A screenshot[1] is used in OMNITREND Center for different purposes:

- Documenting measurement results
- Confirming findings
- Supplementing project data

The **Screenshot Wizard** is available for capturing and editing screenshots. It can be called up using the photo camera icon . You can find the icon at the following locations in the program:

- In the **Asset** section, in one of the **editors for machine tree elements** - e.g. the Machine Editor (Configuration perspective, Machine Template perspective).
- In the **Finding Editor**, in the **Image Gallery** and/or **Asset** section (Analysis perspective).



Functions in the main menu and the local toolbar

- **Capture / Desktop**: Capture current desktop.
- **Capture / Desktop (delayed)**: Capture desktop after an adjustable delay.
- **Capture / Clipboard**: Insert content from the Windows clipboard.
- **Capture / File**: Insert a user-defined image file (BMP, JPG, PNG).
- **Capture / Selected Rectangle**: Capture content in a selection frame. This option is only available, if an image is inserted in the Screenshot Wizard and a selection frame is placed around the respective section. Activate the Crop function as needed to place a selection frame.
- **Fit / 50% ... 800%**: Work area zoom
- **Fit / Fit**: Restore overall view
- **Crop**: Activate selection frame. This option is automatically activated, after a screenshot was inserted.

[1](the term **screenshot** also applies for externally created image files, such as machine photos)

- **Annotate**: Activate edit mode. The edit mode is also activate if you click on an editing tool in the left toolbar.
- **Clear / Undo / Redo**: Delete all editing steps / undo/repeat the last editing step
- **Local toolbar**: Here you can find tools for inserting lines, arrows, frames, areas, and texts in any color.

Capturing and editing a screenshot

- Click on . The Screenshot Wizard appears.
- Click on **Capture / Desktop (delayed)**.
- Enter the capture **delay** in seconds in the following dialog.
- Click on **OK**. The Screenshot Wizard is hidden during the delay. You can now prepare the program window for screenshot capturing. After the screen capture, the Screenshot Wizard appears with the captured desktop. The **Crop** menu function is activated.
- Enlarge the program window if the Screenshot Wizard as needed to better recognize details in the screenshot.
- Zoom into the respective area of the screenshot as needed. For this purpose, select **Fit / *Zoom factor* (e.g. 200 %)**.
- Using the mouse, place a frame around the desired area in the screenshot.
- Select **Capture / Selected Rectangle** to capture the content of the selection frame as new screenshot.
- To add supplementary contents, such as texts, lines, etc. , click on the respective tool in the local toolbar. Using the mouse, insert the element at the desired location.

The small right arrow next to the tool opens a selection with all available tools in the respective category. In the case of the text tool, the text attributes are opened.

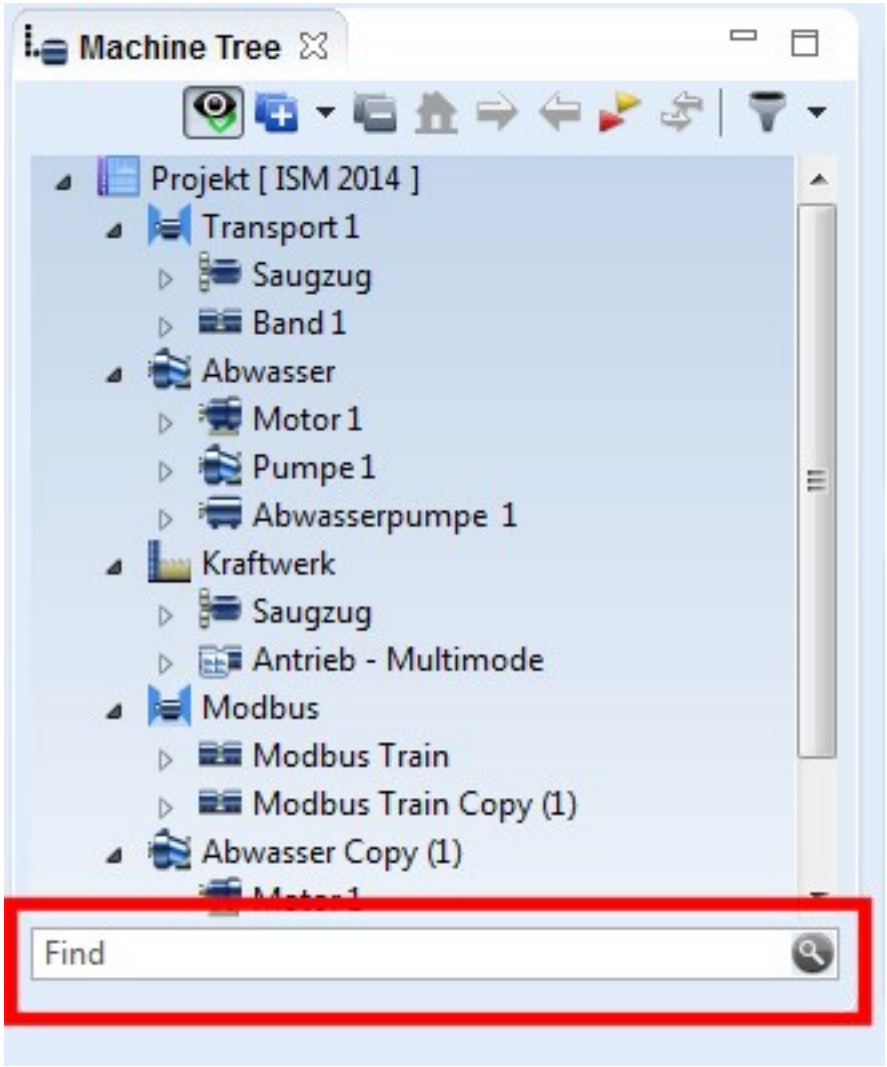
- Click on **Next**, after your finished all editing steps. The next dialog window in the Screenshot Wizard appears.
- Enter a brief **description** and a **file name** for the screenshot.
- Click on **Finish**.

Screenshots created in the **Analysis Editor** using the icon can be found in the **Clipboard** view. These screenshots are automatically created and cannot be edited.

17.2 Best practices: Using the search function

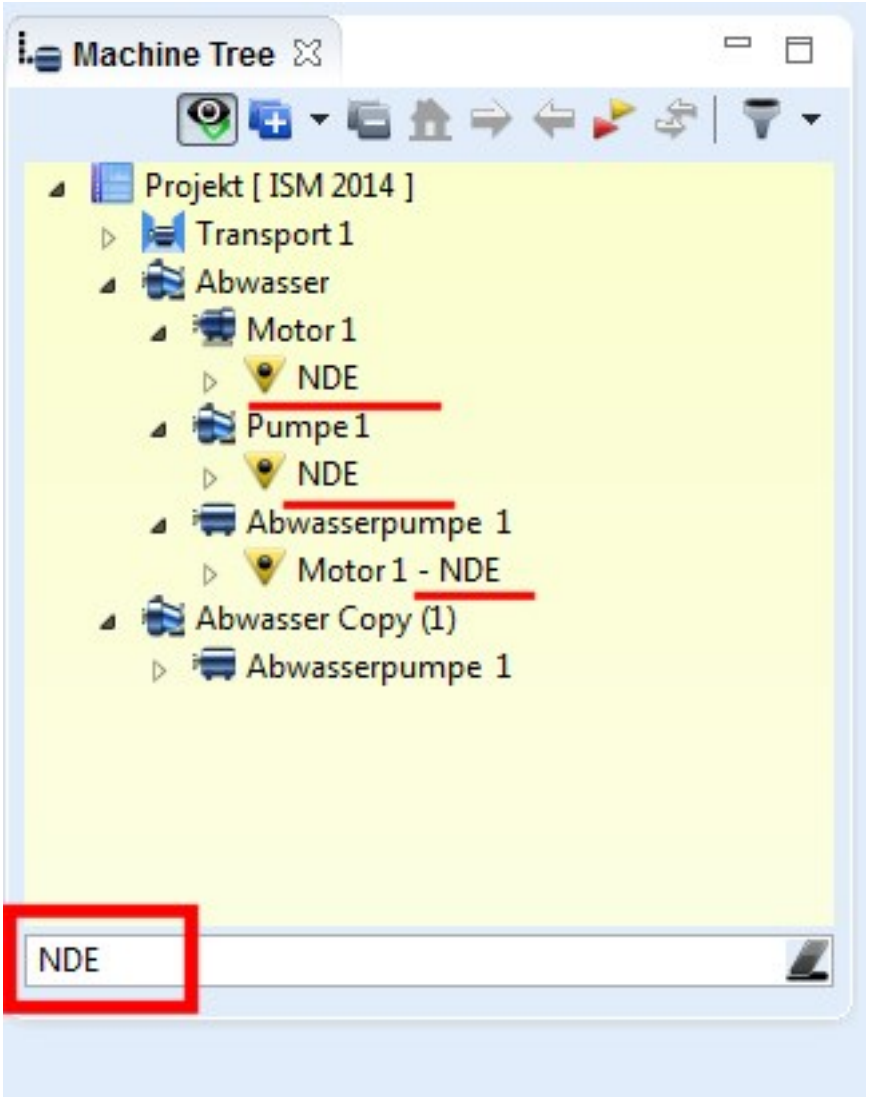
The search functions helps in finding entries in extensive lists and views, such as in the machine tree, in the Task Template, Route or Devices views, etc.

The **input field** for the search term can be found at the bottom of the respective sub-window:



As soon as you enter the search term, the search function starts working.

The **window background color** changes from blue to **yellow** to indicate that the window content is not fully displayed, but filtered.



Click on the eraser icon next to the input field to **delete** the search term.

17.3 Best practices: Using the Filter Function in the Machine Tree

The filter functions supports you in searching for and displaying specific information of the machine and measurement database. The filter criteria[1] are entered in a guided dialog, which can be called up via the **filter tool** or in the **Machine Tree Filter Manager** view.

In the machine tree of the analysis perspective all measurement tasks are displayed by default. Using the **measurement data filter** in the local toolbar, you can hide the measurement tasks for which no measurement data is stored in the database.

If you need a filter after exiting OMNITREND Center, enter an appropriate**name**[2]. The filter is then saved automatically. For evaluations that are only required for the current session, create an**adhoc filter**[3].

Create and manage filters

To create a new filter

- Open the **Analysis or Configuration perspective**.
- Open the **Machine Tree Filter Manager** view.
- Click on **New Element** in the local toolbar. The filter wizard appears.
- Enter a **filter name** and/or leave the field empty for an adhoc filter.
- In the **Filter** field, click on **New Element**. The selection dialog for the filter stages appears.
- Select a **filter stage** and click on OK.
- Repeat the previous step as needed to apply several filter stages at the same time.
- In the **Filter Details** field, enter the respective **filter attribute**.
- Click on **Finish** to apply the filter. The background color in the machine tree changes to yellow to signal an active filter. The new filter is marked as active in the **Machine Tree Filter Manager** view.

Example of a two-stage filter:

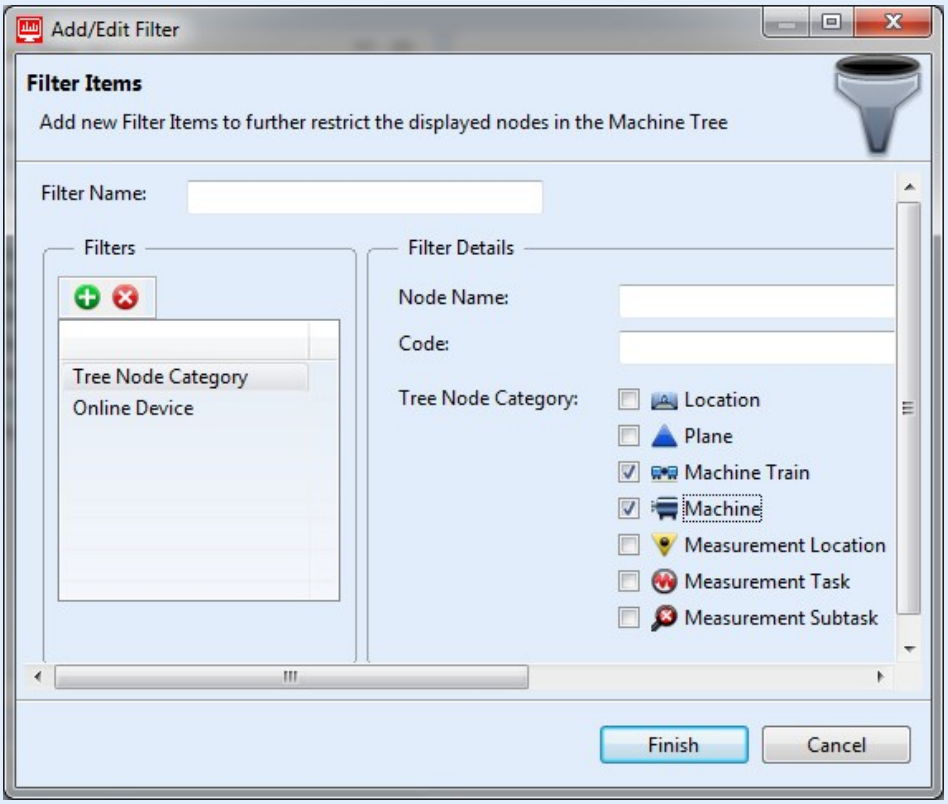
Task: Filter all **machine trains and machines**, whose measurement locations are linked to the **"VIBGUARD 1" online device**.

First filter stage: Tree Node Category.
Select the Machine Train and Machine tree node as filter attribute.

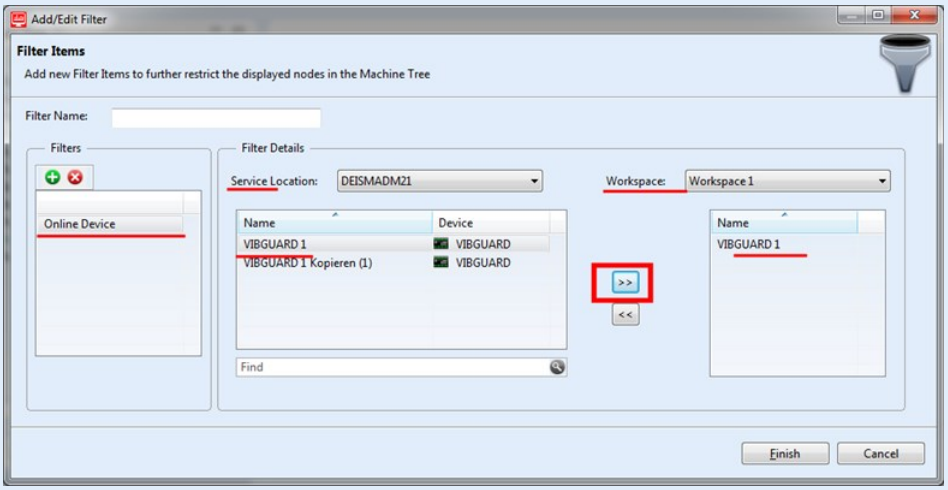
[1] (in the following also referred to as filter stages)

[2] The named filter is available after OMNITREND Center is restarted. If a filter was applied prior to exiting the program, it will also be active after the program is restarted (yellow background).

[3] A filter without a name will be deleted upon exiting the OMNITREND Center. Adhoc filters can be named at a later point in time.



Second filter stage: Online Device.
Select the "VIBGUARD 1" online device as filter attribute in the left list field and click on the ">>" button to move the selection to the right field. **Tip**: The "Server" and "Database" fields must be respectively adjusted so that the online device, you are searching for, is displayed.



To activate / deactivate / delete a filter

- Open the **Analysis or Configuration perspective**.
- Open the **Machine Tree Filter Manager** view.
- In the **Applied** column, click on to **deactivate** the filter or on to **activate** the filter.

- To **delete**, mark the filter and click on .

Menu functions in the filter tool

- **Edit** : Edit active filter or create a new filter
- **Save as** : Name and save an active adhoc filter.
- **Delete** : Deactivate active filter

Menu function in the *Machine Tree Filter Manager* view:

- **New Element** : Create new filter
- **Open** : Edit filter
- **Delete Element** : Delete filter
- **Duplicate Element** : Duplicate filter

17.4 Best practices: Selective Presentation of Sections in the Machine Tree

A machine tree with a large number of entries can quickly become confusing and make the editing of individual branches time-consuming. You have the following options should you only wish to display individual branches in the machine tree:

- Selectively display a **specific** branch in the tree.
- Selectively display multiple branches with a **partially identical name**.

Selectively displaying a specific branch

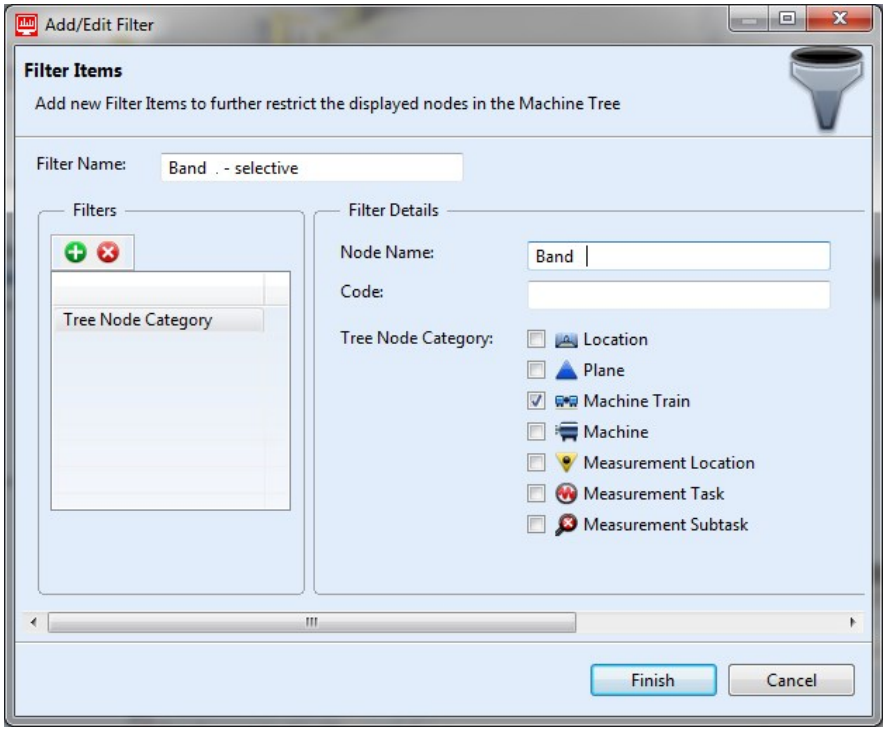
- Mark the branch in the machine tree.
- Click on **Show only this branch** in the local icon bar of the machine tree view.
  The selected branch is displayed with all its subordinate elements. The background color in the machine tree window changes from blue to yellow to signalize that the filter function is active.
- To display the complete machine tree again, click on **Show previous tree view**.

Selectively displaying multiple branches

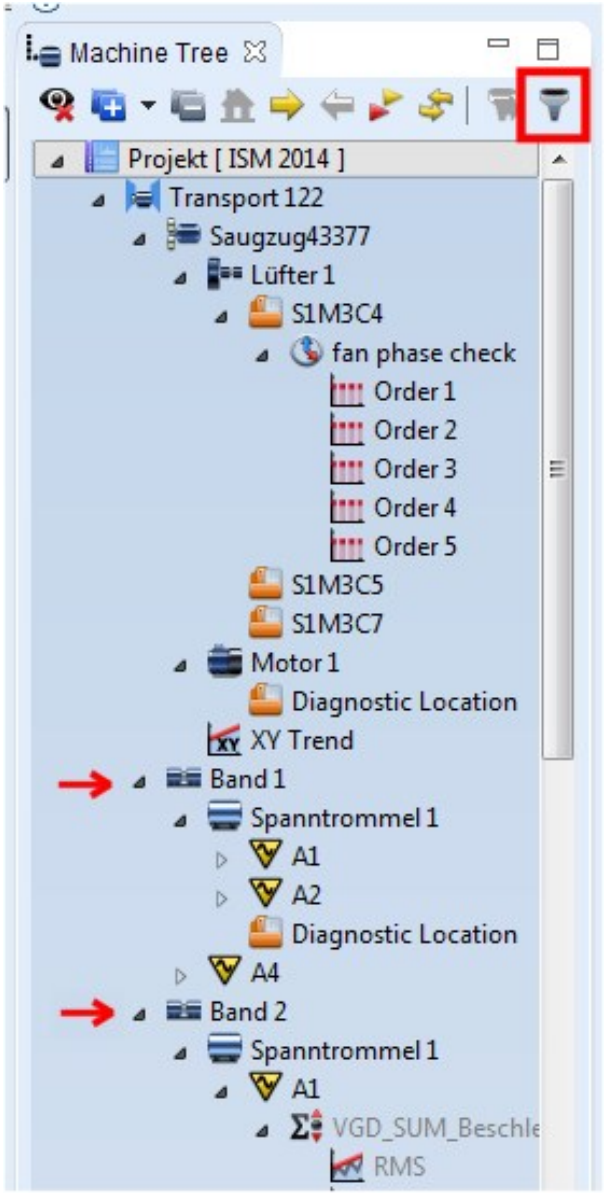
Prerequisite: The branches in question have a fully or partially identical name.

The following example shows how you can selectively display all machine trains of a complex project with the name **Band...**.

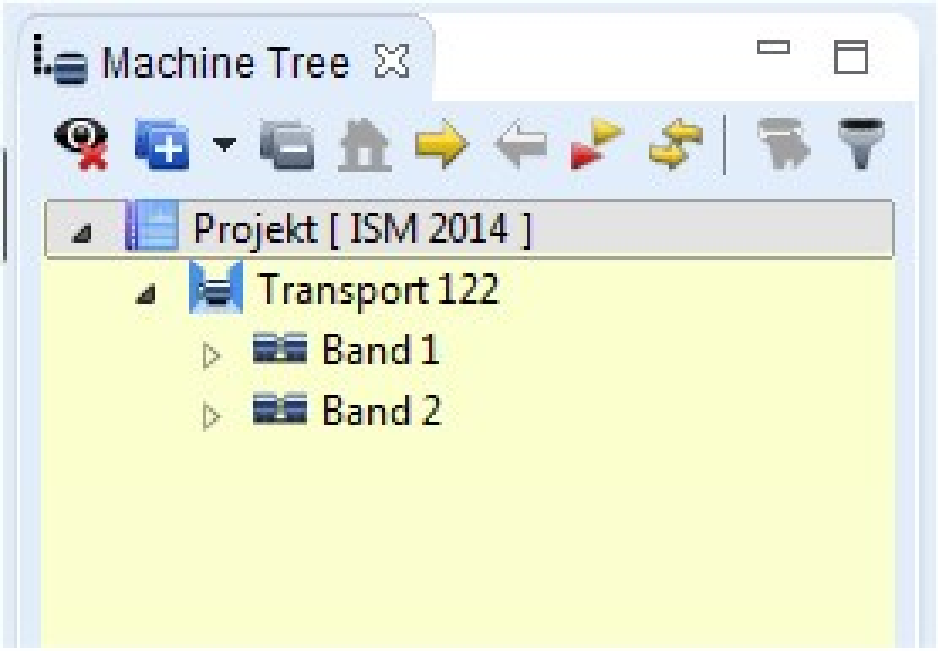
- In the local toolbar of the machine tree view, click on the filter icon and select **Edit**. The filter wizard appears.
- Enter a **filter name** as needed.
- In the **Filter** field, click on **New Element** . The selection dialog for the filter stages appears.
- Select **Tree Node Category** and click on OK.
- In the **Filter Details** field, enter the **node name (here: "Band")** and select **machine train** as category.

- 

- Click on **Finish** to apply the filter.


Machine Tree
Projekt [ISM 2014]
Transport 122
Saugzug43377
Lüfter 1
S1M3C4
fan phase check
Order 1
Order 2
Order 3
Order 4
Order 5
S1M3C5
S1M3C7
Motor 1
Diagnostic Location
XY Trend
Band 1
Spanntrommel 1
A1
A2
Diagnostic Location
A4
Band 2
Spanntrommel 1
A1
VGD_SUM_Beschle
RMS

Before:



After:

17.5 Best practices: Shortcuts

The following keyboard shortcuts are available in OMNITREND Center

Shortcut	Function	Section
F2	Rename tree nodes without having to open editor.	Machine tree
F3	Place the cursor in the search field	Machine tree, main tree, Views
F5	Refresh	View, graph, editor
CTRL + +	Zoom in on the cursor position	Graph
CTRL + -	Zoom out on the cursor position	Graph

17.6 Best practices: Edit Several Measurement Tasks using Multi Edit

Using the**Multi Edit** function, you can edit the properties of several measurement tasks at the same time. Due to the numerous links and dependencies of a measurement task, the following restrictions must be observed:

- The measurement tasks must be **similar**. This means that at least the **device**, **measurement type**, and **measurement quantity** must be the same.
- Deviating parameters are marked in the Multi Edit editor with ***Different Value*** and cannot be changed.

Edit measurement tasks in the Multi Edit editor

- Open the **Configuration perspective**.
- Press and hold the **CTRL key**, while marking the respective measurement tasks in the machine tree.
- Using the **right mouse button**, click on a marked measurement task and select **Edit / Measurement Task Multi Edit**. The Multi Edit editor appears.
- Apply your changes.
- Click on **Save** to apply the changes.

Empty page

18 Maintenance

This section contains system maintenance topics.

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18.4 Connect to server 282
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18.10 Activate and deactivate an online device 292
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18.1 System requirements

Setup recommendations

Setup recommendations are dependent on expected usage.

Parameters listed are minimal suggested for given installation size.

Recommendations are made for the following scenarios:

Size of installation	Number of nodes in machine tree	Data volume produced by all devices
small	< 10k	< 3 GB/month
medium	from 10k to 50k	from 3 to 30 GB/month
large	> 50k	> 30 GB/month

OMNITREND Center Client/Single User

- Hardware:

Size of installation	CPU	RAM OMTC Client without Single User	RAM OMTC Client with Single User
small	Quad core 2.2 GHz	4 GB	8 GB
medium	Quad core 2.4 GHz	6 GB	8 GB
large	Quad core 2.4 GHz	8 GB	16 GB

- Storage:

    - resistant to multiple rewriting; capable of delivering at least 200 IOPS in random 4k read/write scenario
    - SSD storage recommended (for Single User - strongly recommended)
- Operating system:
    - 64 bit: Windows 10 Professional
- Browser:
    - Internet Explorer 11
    - Microsoft Edge (current version)
    - Google Chrome (current version)
- Ports:
    - 42427 and 42428 for single user version
    - 42450, optional for messaging in the client/server version
- Display:
    - 3D graphics card

OMNITREND Center Server

- Hardware:

Size of installation	CPU	RAM
small	Quad core 3 GHz	8 GB
medium	Quad core 3 GHz	8 GB
large	Quad core 3 GHz	12 GB

- Storage
  - resistant to multiple rewriting; capable of delivering at least 1000 IOPS in random 4k read/write scenario
  - SSD strongly recommended
- Operating system:
  - 64 bit: Windows 10 Professional, Windows Server 2012, Windows Server 2016, Windows Server 2019
- Ports:
  - 8011 and 8081, and two free ports for client connection
  - 9998 to manage Email-Center
- For MS SQL Server databases
  - Microsoft SQL Server 2012, 2014, 2016
  - In conjunction with an online device: Standard edition or higher

Supported measuring device types

- Online CMS (Client-Server only):
  - VIBGUARD (Kernel version: KW48/2020 or later)
  - VIBGUARD compact (Kernel version: KW09/2020 or later)
  - VIBROWEB XP (not supported anymore)
  - VIBRONET Signalmaster V3 (KW04/2020 or later)
- Handheld devices (Offline CMS): VIBSCANNER 2, VIBXPERT II, VIBXPERT EX, VIBXPERT I

PT Link

- Hardware:

Size of installation	CPU	RAM
small	Dual core 1 GHz	2 GB
medium	Dual core 2.2 GHz	4 GB
large	Quad core 2.2 GHz	4 GB

- Network:

Case	Network
Devices to PT Link	100Mbps
PT Link to OMTC	1Gbps

- Storage
    - 500MB of free space needed for installation.
    - For data storage high endurance medium is needed, resistant for multiple writing. High TBW storage recommended.
    - Storage capable of 200 IOPS for random access read/write scenario recommended.
    - Amount of storage needed strongly depends on number of devices connected and measurement setup.
- Operating system:
    - 64 bit: Windows 10 Professional, Windows Server 2016

18.2 Update

OMNITREND Center is continuously further developed and improved. The current version can be downloaded free of charge from the PRUFTECHNIK webpage:

www.pruftechnik.com

You can also contact your local sales partner regarding the update.

A. Before the update

- Transfer all **measured data** from the portable measuring device into the OMNITREND Center database.
- Check the current **system requirements** for the PC (server/client PC) ("System requirements" on page 275).
- Create a **backup copy** of the current database. Proceed as follows:
  - **SQL database**: Create the backup copy in MS SQL Management Studio.
  - **HSQL database / single-user version**:
    - Write down the **database ID** (Administration Perspective / Server Editor / Server section).
    - Exit OMNITREND Center (Client, Server, Single user). Wait about 5 minutes until all processes are finished.
    - Open the database folder. In a standard installation the databases are stored under:

      Client-Server = C:\Users\Public\Documents\PRUFTECHNIK\OMTCS\databases

      Single user = C:\Users\Public\Documents\PRUFTECHNIK\OMTCC\databases
    - The database is located in the folder named with the corresponding **database ID**.
    - Pack the database folder in a ZIP archive.
    - Save the ZIP archive in a safe place.

B. Install update

You need to have Windows administrator rights to run the update files.

- Download the update file (*.exe) for the server and client application from the PRUFTECHNIK homepage.
- Copy the file into an empty folder.
- Run the file.

Details regarding the individual installation steps can be found in sections "Server installation" on page 1 and "Client installation" on page 1 or .

C. After the update

- Update the firmware in the portable measuring devices and the kernel in the online CMS. You can obtain the latest versions from your local sales partner.
- When using **Asset View**, update all online configurations in OMNITREND Center and transfer these to the online CMS.

18.3 Security certificates

How to change OMNITREND Center certificate

- Stop OMNITREND Center server and all DAP servers.
- Put yours certificate file **omtc-certificate.keystore** on every machine, where server or DAP is installed, in directory:
  ${installationdirectory} \conf\cert (default value for ${installationdirectory} is C:\Program Files\PRUFTECHNIK\OMTCS)
- Start servers and DAPs.

How to generate certificate for OMNITREND Center/DAP server

Required tools

- Java JDK 8 (1.8.0_152) or later
- Keytool

Generating selfsigned omtc-certificate.keystore

Approach one: Command without interactive prompts

Execute following command in your terminal:

```
keytool.exe -genkey -alias omtc-certificate -keyalg RSA -keystore omtc-certificate.keystore -dname "CN=localhost, OU=Unknown, O=Unknown, L=Unknown, ST=Unknown, C=Unknown" -keypass server-dap -storepass server-dap
```

File

omtc-certificate.keystore created that represents a keystore containing a brand new SSL certificate.

Approach two: Command with interactive prompts

If you want to create a keystore, and you should, the command is the following:

```
keytool -genkey -alias omtc-certificate -keyalg RSA -keystore omtc-certificate.keystore
```

You then will be asked to enter a password for the keystore. The value has to be: **server-dap**

Enter keystore password:

Re-enter new password:

Finally, you will be asked to input some information, but you are free to skip all of it (just press Return to skip an option). In the place of the first and last name, you may want to insert the base name of your host (in my case it is localhost).

```
What is your first and last name?
[Unknown]: localhost
What is the name of your organizational unit?
[Unknown]:
What is the name of your organization?
[Unknown]:
What is the name of your City or Locality?
[Unknown]:
```

```
What is the name of your State or Province?
[Unknown]:
What is the two-letter country code for this unit?
[Unknown]:
Is CN=localhost, OU=Unknown, O=Unknown, L=Unknown, ST=Unknown, C=Unknown cor-
rect?
[no]: yes
Enter key password for tomcat
(RETURN if same as keystore password):
```

At the end of this operation, we'll get a keystore containing a brand new SSL certificate.

Note!

With selfsigned certificates there will still be a warning until you import the certificate as a trusted CA authority on the browser side computer.

```
This CA Root certificate is not trusted. To enable trust, install this cer-
tificate in the Trusted Root Certification Authorities store.
```

Installation of selfsigned omtc-certificate.keystore

You have to put yours certificate on same machine where server is running in:

```
${tomcat.install.directory}/conf/cert/omtc-certificate.keystore
```

On Windows systems the exact path is:

```
${omtcserver.install.directory}/conf/cert/omtc-certificate.keystore
```

18.4 Connect to server

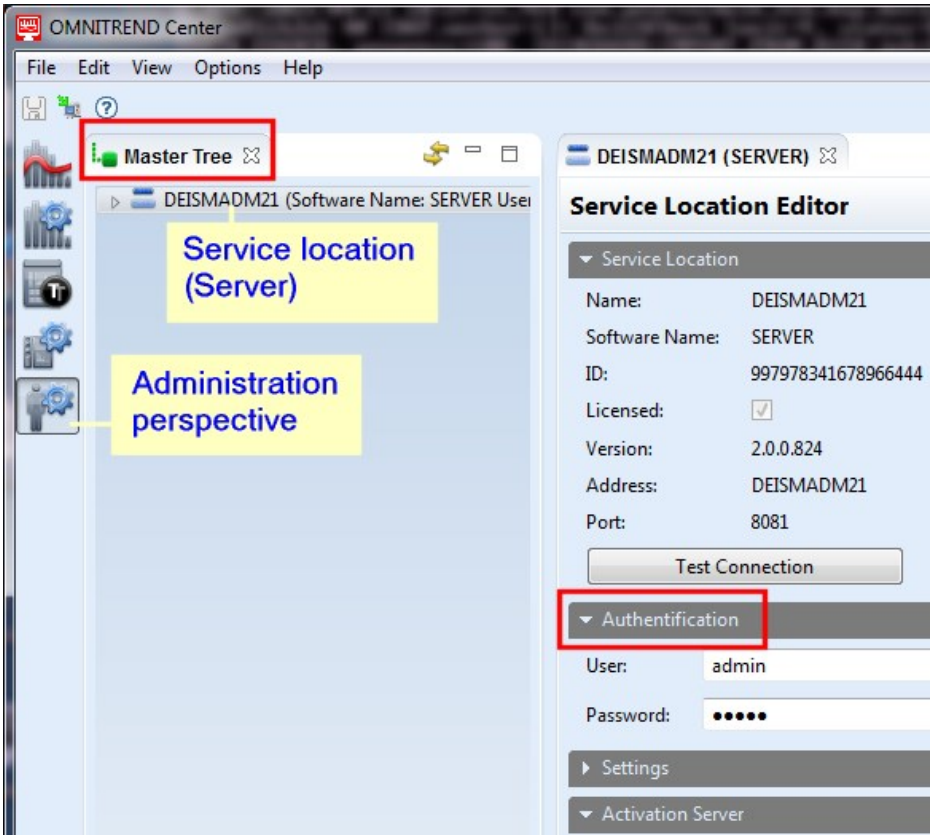
The following section applies to a client-server installation for which the client and server are installed on **different** computers.

To establish connection to the server:

- Using the right mouse button, click in the upper left part of the window (**master tree**). A dialog menu appears.
- Click on **Attach Server**. A dialog window appears.
- Enter the connection data:
  - **Address**: IP address/name of PC, on which server is installed.
  - **Port**: Interface, via which the server should be contacted ("IP settings" on page 285).
  - **Test connection:** Test server connection. Where connection is successful, the message: 'server found at the specified address.'.
  - **User**: Enter the following user name: **system-admin**
  - **Password**: At first login, enter the following password: **system-admin**

    > The user name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

  - Click on **Finish**. The client connects to the server. The server checks the user data, and is subsequently displayed in the master tree.



18.5 Disconnect / detach connection to server

The following section applies to a **client server** installation.

The connection between client and server can be

- **detached permanently** or
- **disconnected temporarily**.

Examples:

The server PC is down for maintenance. In this case, you **detach** the connection, so that connection data and activated licenses are retained.

You administer multiple servers, but have only a single server license available to you. In this case, **disconnect** the connection to the current server, so that you may use the license for another server.

To disconnect/detach the server connection

- Using the right mouse button, click on the server in the master tree. A dialog menu appears.
- Click on...
  - **Detach**
    The server is deleted from the master tree. To restore the connection, follow the instructions in the section "Connect to server" on page 282
  - **Disconnect Server.**
    The server remains visible in the master tree. To restore the connection, in the dialog menu, click on **Connect Server**.

18.6 Server configuration

You configure the server with the program **OMNITREND Center Utility**.

> You need Windows administrator rights to start the utility.

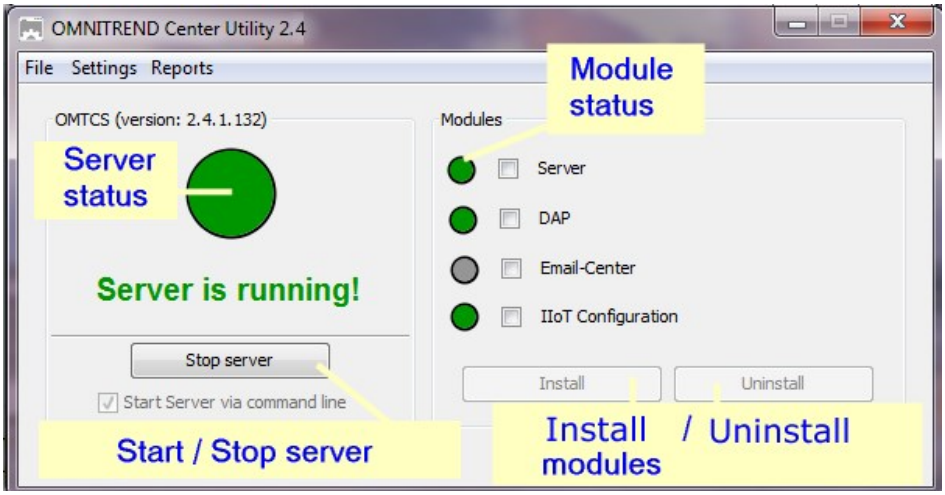
> Only for **MS SQL** server: For startup, the databases for OMNITREND Center must be created and accessible on the server. The configuration for access to the server database is done in the **settings/database settings** menu.

> Definition of terms:
>
> **Server database** = Database with the server-specific content.
>
> **Measurement data database** = Database with the measurement data (hereinafter also referred to as “database”).
>
> Up to and including version 2.1, the format of the server database was **HSQL**; the measurement data existed in a file in **HDF5** format.
>
> From version 2.2 upwards, OMNITREND Center also supports the **MS SQL** database format. Since then, the server database can also be operated in MS-SQL format and the measurement data can be stored in a MS-SQL database. Different procedures therefore arise for accessing and starting the server database.

Starting the OMNITREND Center utility

- Start the utility via the Windows Start menu:

  Programs /PRUFTECHNIK /OMNITREND Center Server / OMNITREND Center Utility



The utility indicates server status via traffic light:

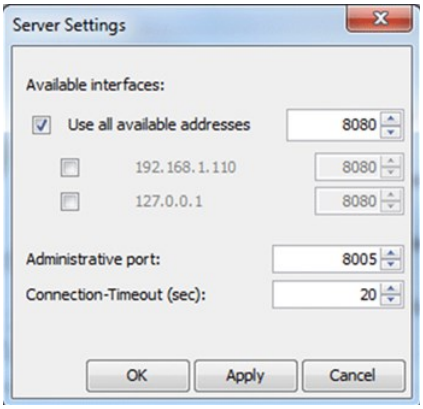
- **Grey**: Server is stopped | **Green**: Server is running | **Red**: Server reports error

You can change the server configuration in the menu **Settings**.

> The server must be stopped, when making changes to the configuration.

IP settings

Click on **Settings/IP settings**:



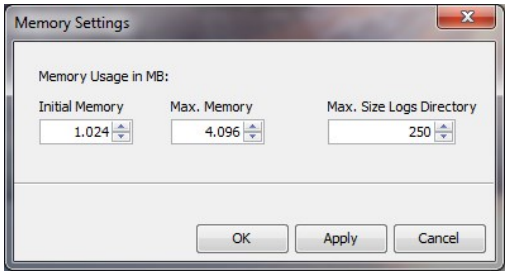
These settings apply to the OMNITREND Center server and the ports at which it is accessible. The set ports must be enabled in the firewall settings for the server to be accessible.

Here you may enter the IP address and port, via which the server can be accessed. The following options are available:

- **Use all available addresses:** The server can be accessed via all IP addresses in use on the server PC. If you would like to access the server via one specific IP address only, enable it in the list. Enable IP address 127.0.0.1, where the server and client are installed on the same PC ('localhost'). By default, the IP address used is the one currently assigned to the server.
- **Administrative port**: Port for sending start and stop commands to the server.
- **Connection timeout (sec)**: Duration following which the connection to the client is terminated where no communication takes place.

Memory space

Click on **Settings/Memory Settings**:



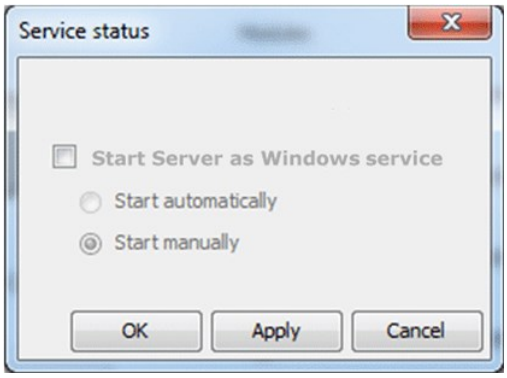
Here you can define the available RAM storage space (in MB) for the server.

- **Initial Memory**: Minimum size
- **Max. Memory**: Maximum available storage space
- **Max. Size Logs Directory**: Maximum storage space for log files on the hard disk.

Set the maximum value as high as possible, taking into account the space required for the operating system and additionally running applications.

Start Options

Click on **Settings/Windows Service**:



Here you can specify whether the server is installed as a **Windows service** and should run in the background after startup. If the server is installed as a Windows service, you can start it either **manually** via the utility, or have it start **automatically** when the PC is booted.

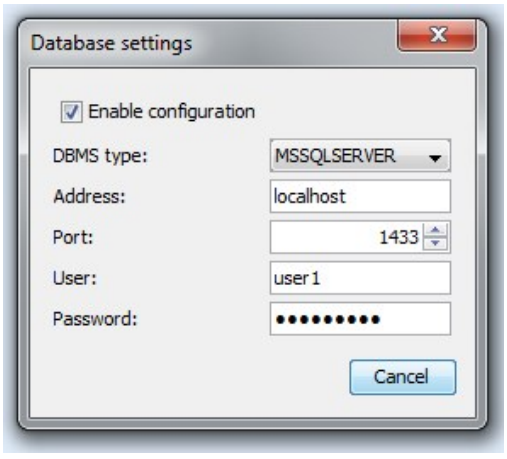
Install server as Windows service and set the start option:

- Activate the **Start Server as Windows service** checkbox.
- Select the desired start option: **Start automatically** or **Start manually**.
- Click on **Apply** to apply the settings.
- Click on **OK**.

If the server is not installed as a Windows service, you must start it via the utility ("Server start/stop" on page 289).

Database configuration (MS SQL)

Click on **settings/database settings**.



Here you enter the connection data for accessing the MS SQL server database. Use this configuration if a server database in MS SQL format is set up for the OMNITREND server. You generally obtain the connection data from the administrator of the MS SQL server.

Server status report

Click on **Reports/Generate status report**.

The server configuration settings are compiled into a file, which, once created, can be opened directly.

Log file

Click on **Reports/Show logfile**.

Each event (status, error) on the server is chronologically recorded in a log file.

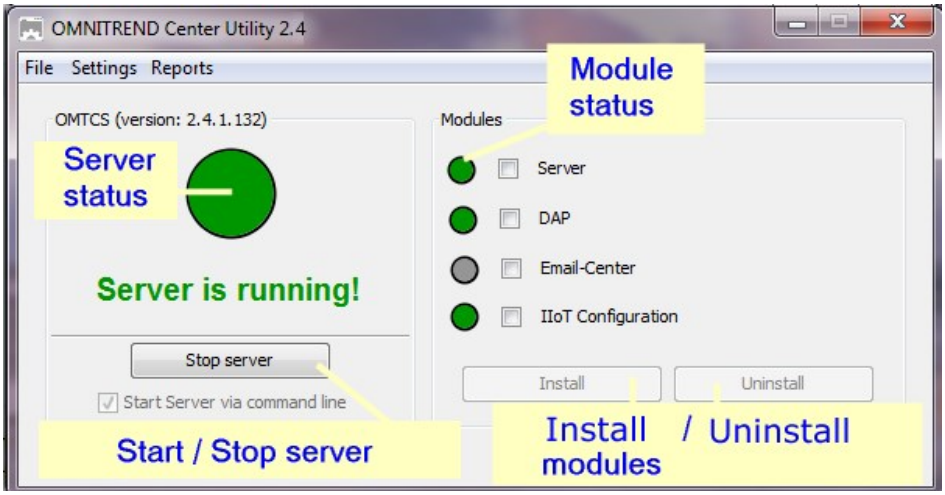
18.7 Install Server modules

In order to be able to use **server modules**[1], you will need to install them via the utility as follows.

> The server must be stopped, during server modules installation.

- In the **Modules** field, check the modules to be installed.
- Click on **Install**. The modules and server statuses are regularly checked, and displayed via the traffic light indicator:
  - **Grey**: The module is not installed.
  - **Green**: The module is installed and the server is running.
  - **Yellow**: The module is installed and the server is stopped.
  - **Red**: Error. The module is unavailable.

> A module may be uninstalled again as required, for e.g. more efficient use of system resources.



[1] 'Server', 'DAP', 'Email Center'

18.8 Server start/stop

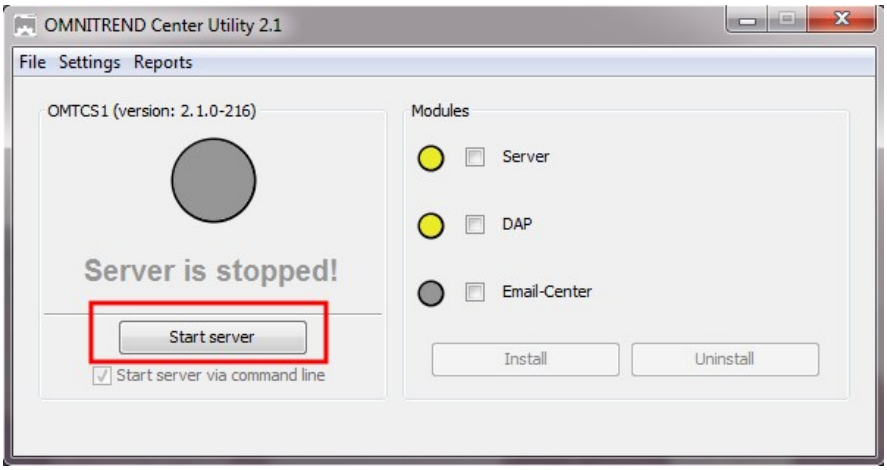
The server can be started as follows:

- The server starts **automatically** when the server PC is booted, if the 'Automatic' **start option** is enabled in the Utility (" Start Options" on page 286).
- You **manually** start the server via the Utility, if the **Manual** start option is enabled in the Utility, or the server is **not** installed as Windows service.

To start the server via the **Utility** proceed as follows:

> You need Windows administrator rights to start the Utility.

- Start the Utility either by double-clicking on the Utility icon on the desktop



- On the utility home page, click on **Start server**.

> The option **Start server via command line** opens a command line window, for detailed analysis of the start sequence. It is always enabled, when the server start is not configured as a Windows service.

The server can be stopped as follows.

Server is installed as a **Windows service**:

- The server is stopped **automatically** when the server PC is shut down.
- You stop the server via the utility: On the utility home page, click on **Stop server**.

Server is **not** installed as Windows service

- You stop the server via the utility: On the utility home page, click on **Stop server**.

18.9 OMNITREND Center activation

Together with the OMNITREND Center software, you have been supplied with the necessary licenses. The activation of these licenses is done either automatically via Internet, or manually via a license file, which you will need to request from PRÜFTECHNIK.

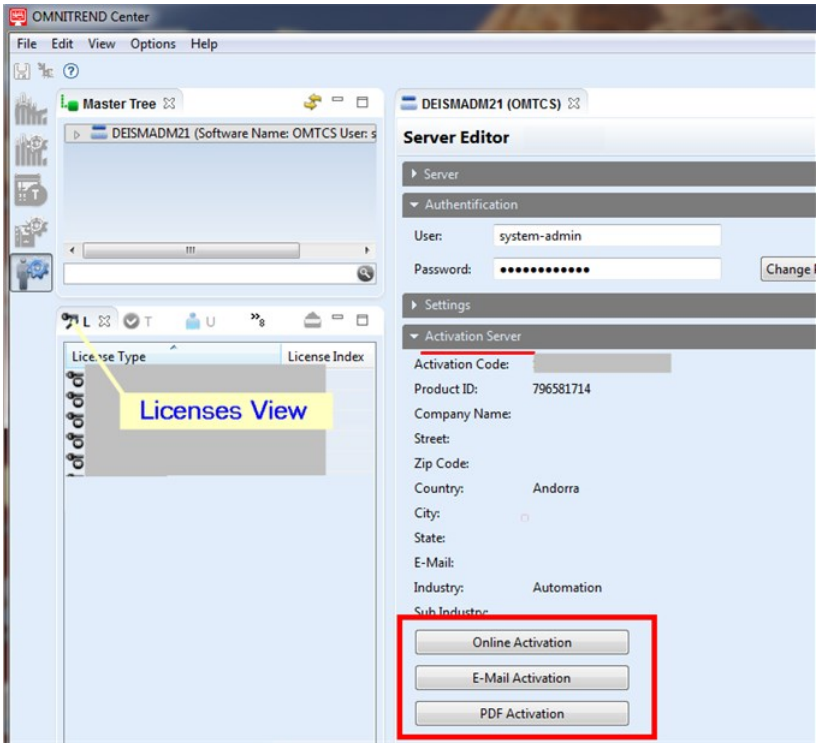
You have the following activation options:

Automatic activation:

Automatic activation takes place, when the server has an Internet connection, and can connect to the PRÜFTECHNIK activation server.

The activation server connection data are preset.

- Switch into the Administration perspective as required.
- In the master tree, double-click on the server to open the **Server editor**.
- In the editor window, open section[1] **Activation server**.
- Click on **Online Activation**. A dialog window appears.
- Enter the required data, and click on **Finish**.
  The server connects to the PRÜFTECHNIK activation server. This checks the licenses and automatically activates the software. Licenses are displayed in the 'License' view (lower left part of window).



Manual activation

If the server has no Internet connection, request the license file as follows, via email or fax:

Click in section **Activation server** ...

[1] Grouping of related functions and fields in the Editor window

- … on **Email Activation**. A dialog window appears.
- Enter your customer data, and click on **Finish**.
  The default email program on the client PC is launched, and an email containing the required activation information appears.
- Send the email.

OR

- … on **PDF Activation**. A dialog window appears.
- Enter your customer data, and click on **Finish**.
  A PDF file is created, and displayed in Adobe Acrobat Reader.
- Print the file, and fax the copy to the fax number provided.

You will receive the license file via email.

Import the license file as follows:

- In the main menu, click on **File/Import**. A dialog window appears.
- Check the **License** import assistant, and click **Next**.
- Select the required server, to which the license should be imported.
- Specify the folder, in which the license files (*.lic) are stored:
  Click on **Select folder**, and navigate to the target folder, or enter the path in the field **Folder**.

  With **Search subfolders** you will expand the search to include subfolders. When doing so, note that, depending on the size of the folder structure, the search may take some time.

- Select the file in the field **Files**.
- Click on **Finish**. The file is imported.
- Confirm the import message with **OK**.
  The licenses appear in the 'License' view (bottom left of window).

Retrospectively obtain licenses

Contact your PRÜFTECHNIK distribution partner, if you require additional licenses. As well as the required license descriptions, PRÜFTECHNIK will require the **activation code**[1] and the customer data, which you must provide when requesting a license file ("Manual activation" on page 290).

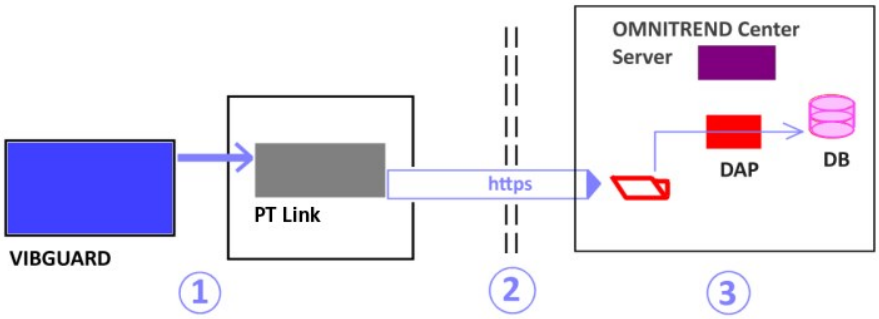
You will be notified, as soon as the new licenses are made available on the PRÜFTECHNIK activation server. If you require manual activation, you will be sent via eMail the relevant license file.

[1] can be found on the installation medium

18.10 Activate and deactivate an online device

By **activating** an online CMS in OMNITREND Center, the DAP starts the transfer of the measurement data (c.f. point 3 in the graphic).

The following graphic shows the path of the measurement data from VIBGUARD to the database:



- **Point 1**: VIBGUARD contains a valid measurement configuration and processes the programmed measurement cycle continuously. VIBGUARD stores the data collected in its measurement data memory. The transfer of the measurement data to PT Link starts as soon as the connection to VIBGUARD is configured in PT Link. PT Link retrieves the measurement data every 15 minutes.
- **Point 2**: As soon as PT Link is connected to the OMNITREND Center server, the measurement data is transferred to the server via a secure connection (https). The measurement data is initially stored in the server file system. The data is also transferred every 15 minutes in this context.
- **Point 3**: The DAP transfers the measurement data from the file system to the database. The VIBGUARD CMS in question must be activated in OMNITREND Center to start the transfer. The intervals at which the DAP transfers the measurement data to the database can be specified in the DAP configuration.

You must **deactivate** the online CMS in question in order to stop the transfer of measurement data to the database. This process is carried out, for example, if the system to be monitored is out of service and the online CMS no longer delivers any 'real' measurement data. You can further communicate with a deactivated online CMS, transfer system and measurement configuration, or read out the serial number. However, measurement data cannot be imported.

You must delete the online CMS in question in PT Link to stop the measurement data transfer.

Prerequisites

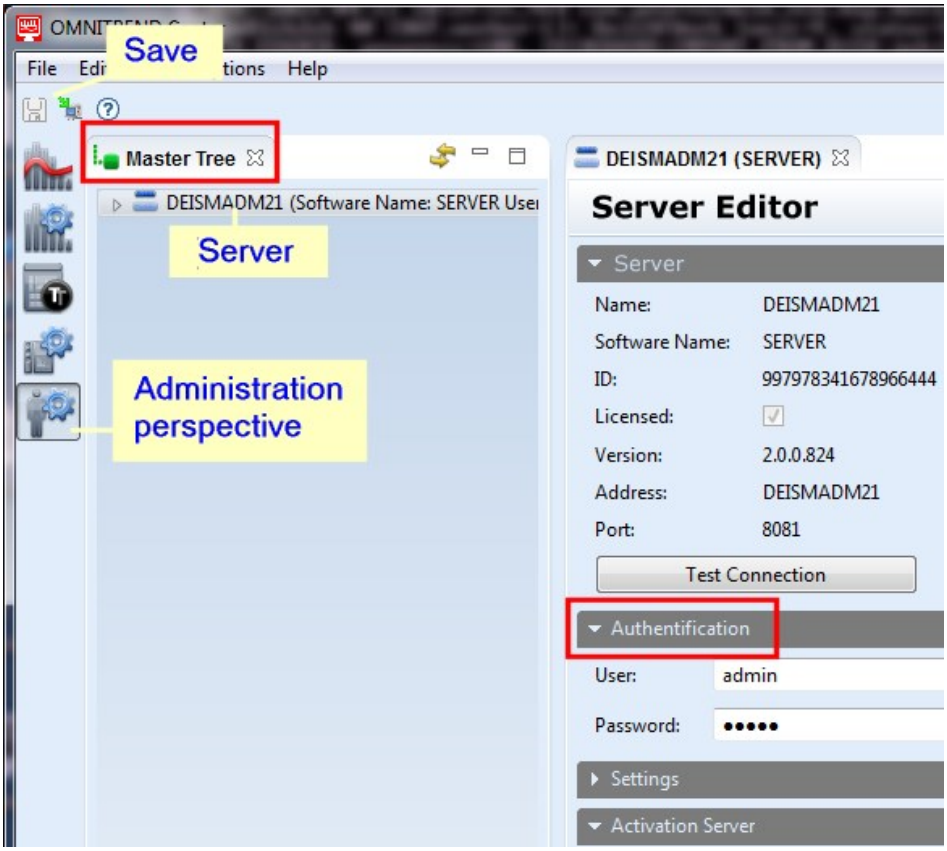
You can activate an online device only after it was registered and assigned to a project. Registration is based on the serial number. The assignment takes place during project configuration.

You must at least have the **specialist** user role for activating /deactivating an online device.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1] Grouping of related functions and fields in the Editor window



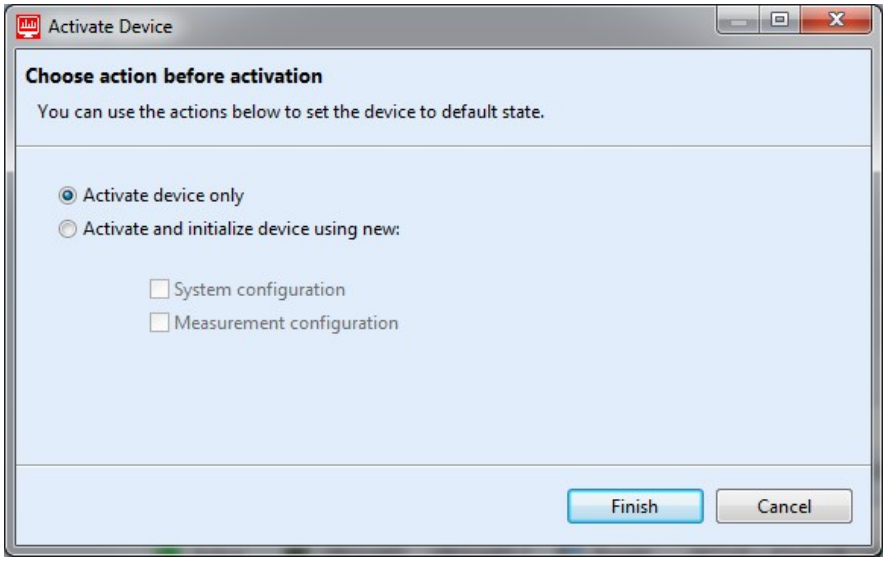
User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To activate an online device

- **Open the device editor**
- Switch into the **Communication perspective.**
- Open the **Device** view.
- If needed, select the **database**, in which the device was created and assigned to a project, in the toolbar of the view window.

The respective pulldown menu only appears, if more than one database was created.

- Mark the **device**.
- Click on the toolbar on **Open** to open the device editor.
- Open the **system configuration** section in the device editor.
- Activate the **Status** parameter in the device editor under the **General** tab.
- Click in the main toolbar on **Save** or press CTRL+S.
- The **Activate Device** dialog window appears, in which you select the actions that should be executed together with activation:



- **Activate measuring device only**: The DAP starts the transfer of the measurement data to the database.
- **Activate and initialize measuring device using new system configuration / measurement configuration**: The DAP starts the transfer of the measurement data to the database and, at the same time, sends the current measurement and/or system configuration to the online CMS.

- Click on **Finish** to save the changes.

To deactivate an online device

- **Open the device editor**
- Switch into the **Communication perspective.**
- Open the **Device** view.
- If needed, select the **database**, in which the device was created and assigned to a project, in the toolbar of the view window.

The respective pulldown menu only appears, if more than one database was created.

- Mark the **device**.
- Click on the toolbar on **Open** to open the device editor.
- Deactivate the **Status** parameter in the device editor under the **General** tab.
- If you applied changes, click in the main toolbar on **Save** or press CTRL+S.
- If necessary, delete the online CMS in question in PT Link to stop the transfer of the measurement data from PT Link.

18.11 Delete Data

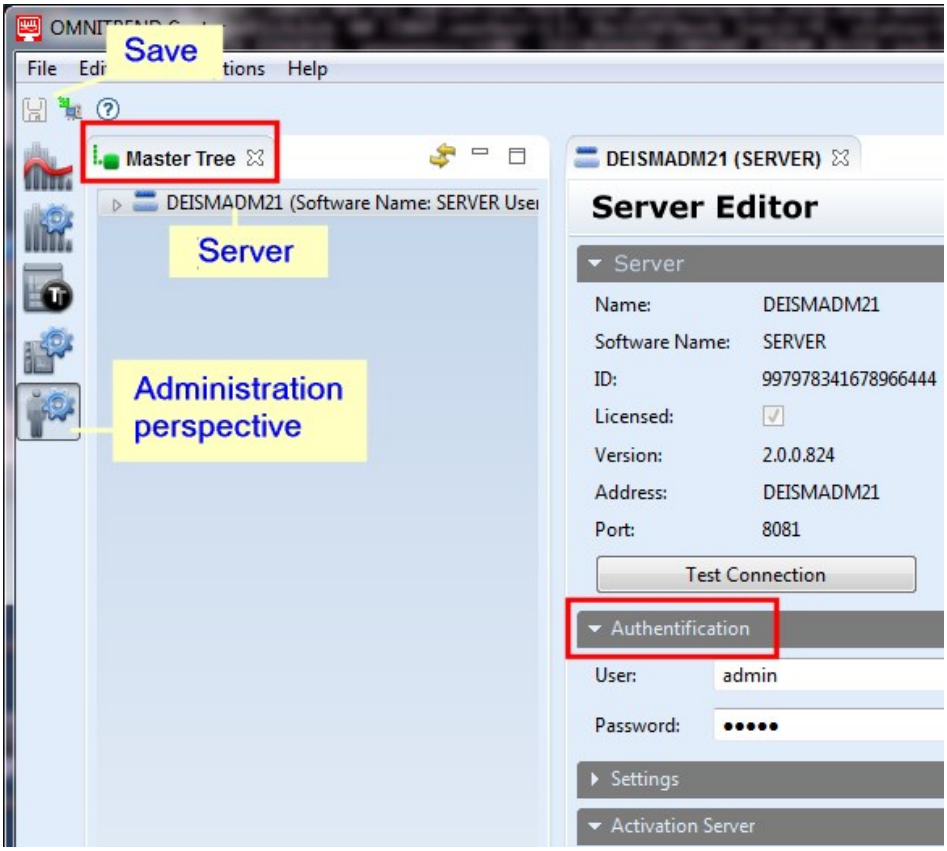
Within the scope of system maintenance, you should check the database regularly for contents that are not required anymore, and delete unnecessary contents.

Prerequisite

You must at least have the **specialist** user role for deleting data.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Delete / deactivate sensor

You can only **delete** a sensor, if no references to this sensor exist in the database.

[1] Grouping of related functions and fields in the Editor window

If the sensor is assigned to a measurement location or if measurement data exists in the database that was recorded using the sensor, you can **disable** the sensor only. A disabled sensor cannot be selected anymore for measurement tasks. You can only disable PRÜFTECHNIK sensors.

You can find the references to a sensor in the **sensor editor** in the **Referenced Measurement Locations (Online) and Tasks (Offline).** sequence.

To delete a sensor

- Switch into the **Administration perspective**.
- Open the **Database/Sensors** node in the master tree
- Using the right mouse button, click on the respective sensor in the master tree.
- Click on **Delete**.
- Confirm the selection with **OK**.

To disable a sensor

- Switch into the **Administration perspective**.
- Open the **Database/Sensors** node in the master tree
- Double-click on the respective sensor to open the sensor editor.
- Deactivate the **Status** field in the **General Information** section.
- Click on **Save** to save the changes.

Delete device

You delete a device, if it is permanently unavailable, e.g. as it is defective or as it was replaced. However, the corresponding measurement data in the database is preserved to perform analyses and reports.

> Hand-held devices, which are connected to the client PC via USB, but which are not registered, are automatically deleted, when OMNITREND Center is exited.

To delete a device

- Switch into the **Configuration perspective**.
- Open the **Device** view.
- Select the database, in which the device is created, as needed in the toolbar of the view window.

> The respective pulldown menu only appears, if more than one database was created.

- Mark the device and click on **Delete Elements** in the toolbar. The **Please confirm** dialog window appears.

> Multiple selection with CTRL or CTRL + SHIFT.

- Confirm the selection with **OK**.

Delete elements in the machine tree

You can only delete an element in the machine tree, if the following prerequisites are met at the same time:

The element to be deleted and all child elements ...

- ... do not contain any **measurement data**.
- ... are not linked to any **measurement channel of an online device** and/or are not contained in any **route**.

Remove the link between measurement location and online device measurement channel

- Open the **Configuration perspective**.
- Open the **Devices** view.
- Double-click on the respective online device to open the **device editor**.
- Open the **Measurement Configuration** section in the editor.
- Mark the **channel** in the channel pool of the respective channel set.
- Using the right mouse button, click on the **Remove Link** option in the dialog menu.
- Confirm the following confirmation prompt with **Yes**.
- Click on **Save** to apply the changes. The respective measurement location and the child measurement tasks are removed from the machine tree.

Delete Measurement Data

- Open the **Configuration perspective**.
- Using the right mouse button, click on the element in the machine tree, from which you would like to delete measurement data.
- Select the **Delete Measurement Data** option. A dialog window appears.
- Enter the required **deletion options** (time interval, reference values).
- Click on **Finish**.

Delete Further Master Data

If needed, you can delete the following master data:

- Task Template
- Kinematic Model
- Machine Template
- Users
- Project
- User Defined Unit
- Roller Bearings

To delete an entry

- Switch into the **Administration perspective**.
- Using the **right mouse button**, click on the respective entry in the master tree.
- Click on **Delete** .
- Confirm the selection with **OK**.

> Factory-pre-configured **measurement and machine templates** are marked in blue and cannot be deleted.

Delete Database

Prerequisite: To delete a database, you must be logged in as **System Administrator**.

To delete a database

- Using the **right mouse button**, click on the respective database in the main tree.
- Click on **delete database** .
- Confirm the safety notice with **OK**.

Events / Delete tasks

Prerequisite: To delete the data sets, you must be logged in as **system administrator** or **administrator**.

This is how to delete events/tasks

- If you are logged in as **administrator**, change to **administration perspective**.
- Using the **right mouse button**, click on the respective database in the main tree.
- Click on **cleanup** . A dialog window appears.
- Activate the delete tasks or delete events options as necessary.
- Set the time period from which the data sets are to be deleted.

> You can define a specific past time period using the **end date** option. If this option is left inactive, all data sets since the start date are deleted.

- Click on **finish**.

18.12 Using multiple databases

If multiple databases have been created, you can connect those of them in use to the server. With regard to databases that are no longer in use, interrupt the connection to the server.

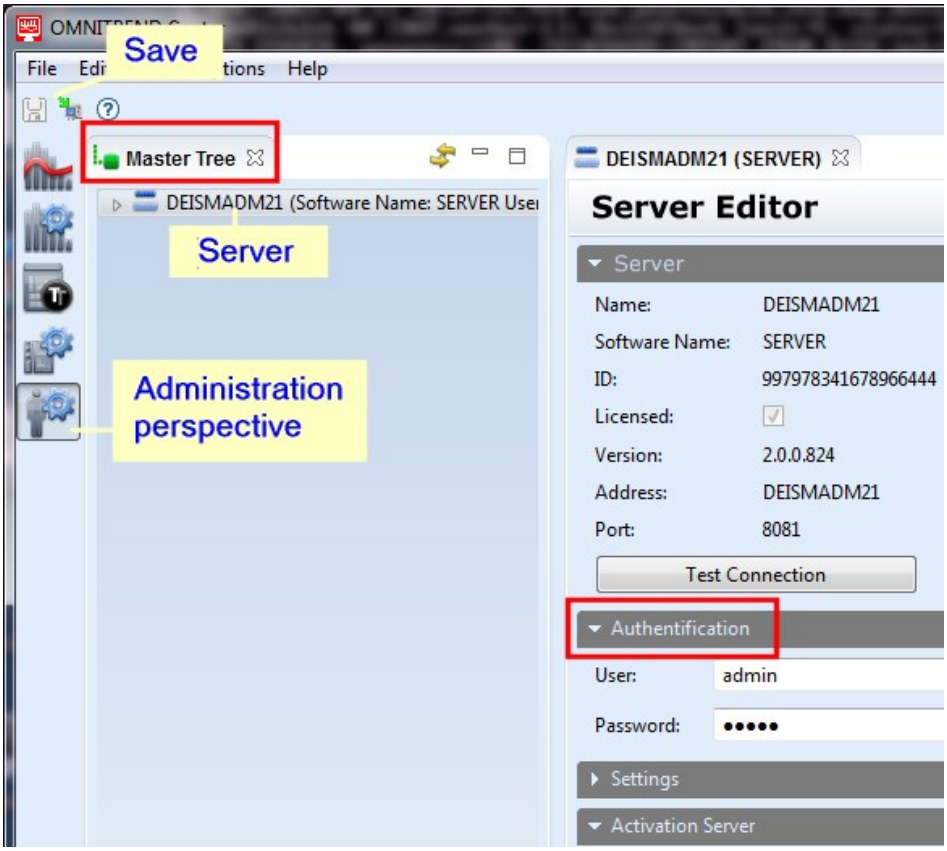
Prerequisite

You need to be logged in as **System Administrator** in order to connect a database to the server or to disconnect it from the server.

To log in as a user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1] Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To connect a database to the server

- Using the **right mouse button**, click on the server (uppermost entry) in the main tree.
- Click on **attach database**. A dialog window appears.
- Select the database type: **HSQLDB** or **MS SQL Server**.
- Depending on the database type, carry out one of the following procedures:
  - **HSQLDB**:
    - Click on **next**.
    - Select the respective database from the list.

    The databases need to be stored in the server directory for them to appear in the list.
    Sample path for standard installation:
    C:\Users\Public\Documents\PRUFTECHNIK\server_name\databases
  - **MS SQL Server**:
    - Enter the connection data for the SQL database server in the **database server connection parameters** field. This is the data you have received from the administrator of the SQL server:
    SQL database user, SQL database password, server (IP address / port).
    - Click on **next**. The connection to the SQL database server is established.
    - Select the respective database from the list.
- Click on **finish** to finish.

To disconnect a database from the server

- Using the **right mouse button**, click on the respective database in the main tree.
- Click on **detach**.
- Confirm the security prompt with **OK**. The database connection is interrupted and the corresponding entry is removed from the main tree.

18.13 Convert Database

You can convert an existing database of type **HSQLDB** to **MS SQL** format.

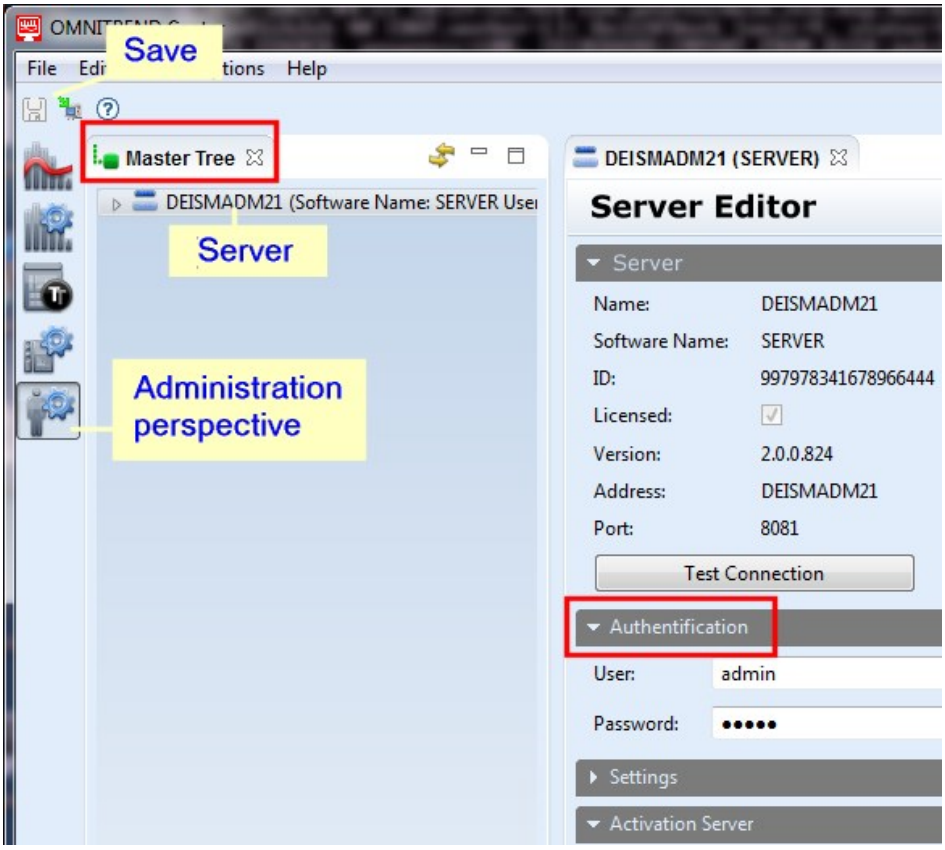
Prerequisite

An empty database needs to be created on the SQL server to this end. You can obtain the requisite connection data from the server administrator: SQL database name, database user, database password, server address.

You must be logged in as **system administrator** to convert a database.

To log in as user:

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.



[1]Grouping of related functions and fields in the Editor window

> User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

To convert a database

- Make sure that there are no users logged in to the respective database and that no measurement data is transferred from the DAP.
- Using the **right mouse button**, click on the respective database in the main tree.
- Click on **convert database**.
- Enter the **database name** as it is to appear in OMNITREND Center. Enter the data that you have received from the administrator of the SQL server in the remaining fields: **SQL database name, SQL database user, SQL database password, SQL server (address)**
- Click on **Finish**.

18.14 Shrinking a database

The size of the database is not reduced as a result of deleting measurement data. If you would like to make storage space available and such storage space is still occupied by the deleted data, you need to shrink the database.

> The "shrink database" function is only available for **HSQLDB** databases. If necessary, databases of the MS SQL type need to be shrinked by the SQL server administrator using appropriate tools.

This is how to shrink a database

Prerequisite: To shrink a database, you must be logged in as **system administrator** or **administrator**.

- Make sure that there are no users logged in to the respective database and that no measurement data is transferred from the DAP.
- If you are logged in as **administrator**, change to **administration perspective**.
- Using the **right mouse button**, click on the respective database in the main tree.
- Click on **Shrink** .
- Confirm the prompt to reduce the database with **Yes**.

18.15 Legacy Data Transfer

This section explains how to transfer legacy data from the OMNITREND PC software to OMNITREND Center . The procedure is divided into the following steps:

- Clean the legacy data in OMNITREND
- Export legacy data from OMNITREND
- Import exported legacy data into OMNITREND Center .
- Check and possibly edit imported data

Safety information

Legacy data may only be transferred from the OMNITREND PC software by trained personnel. Please contact the PRUFTECHNIK support team for questions regarding the migration process.

Back up the respective data prior to the migration process:
OMNITREND database and/or OMNITREND Center database.

Prerequisites

- **Database from OMNITREND version 2.9x**

  Databases from older OMNITREND versions must be updated to the latest version prior to the migration process:
  - For this purpose, update OMNITREND to **version 2.91**.
  - Next, open the respective database in OMNITREND.
  - Exit OMNITREND.

- **Microsoft Framework .NET 4.5 in the current version**

  Windows 7: Check in the **Control Panel** under **Programs and Features**, whether the required Framework is installed. If it is not installed, you can download it from the Microsoft Download Center under
  http://www.microsoft.com/en-us/download/.
  Windows 8: Activate the Framework as needed in the **Control Panel** under **Programs and Features**.

- **Free space: at least 2x the size of the database to be migrated**
- **Legacy data must be cleaned prior to the export.**

Clean the legacy data in OMNITREND

You must deletes duplicates from the database prior to exporting the data.

- Start **OMNITREND**.
- Open the **database** to be exported.

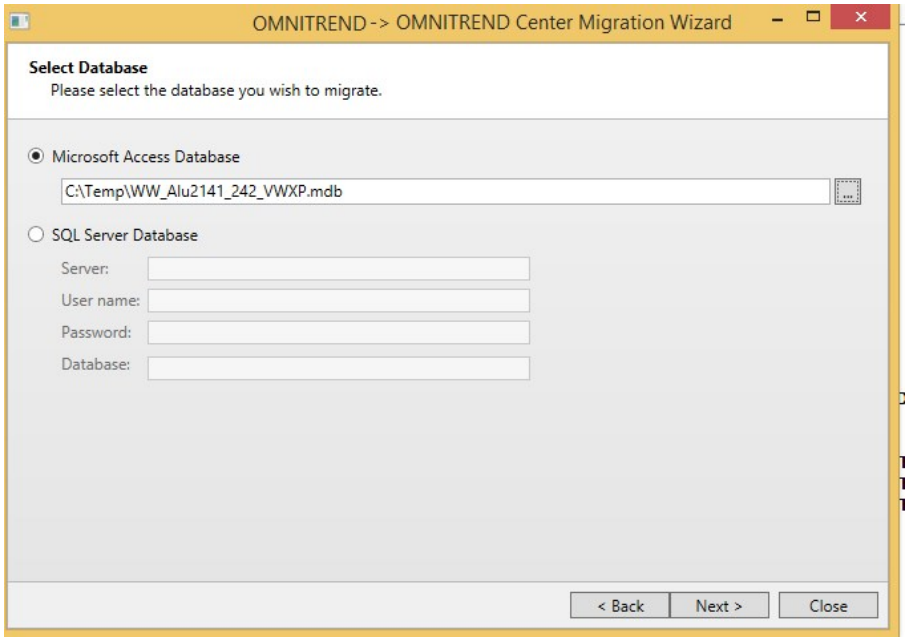
- In the main menu, click on**Database / Machine Manager**. The Machine Manager view appears (yellow background).
- Using the right mouse button, click on the **top tree node** and select **Delete Data / Clean Measurement Data**. A dialog window appears.
- Adjust the **date** in the "**To:**" field to the current date as needed.
- Click on **Delete** to start the clean-up process. A message appears, which indicates the number of deleted entries.
- Click on **OK** to close the message.
- Click on **Close** to close the dialog window.
- You must still optimize MS Access databases:
  In the main menu, click on **Database / Database Optimization / Compress and Repair**.
- A message appears confirming the successful optimization process. Click on **OK**.
- Exit OMNITREND.

Unpack the migration program

- Connect the **installation medium** to the PC.
- Copy the **file archive** using the migration program on the PC (file name: OmtWinExportGUI-9028.zip).
- **Unpack** the file archive in a temporary folder (e.g. C:\temp).

Export legacy data from OMNITREND

- Run **OmtExport.exe**. The migration program opens.
- Click on **Next**.
- Select the **database** to be exported.



- Click on **Next**.

- Select the **folder**, into which the database should be exported.
  The exported data is saved in a sub-folder with the database name.
- Click on **Next**.
- Click on **Start Export** to start the data export.
  A successful data export is confirmed with "Completed in the status field.

> The export process is recorded in a **log file**. You can find this file in the export folder. If errors occur during exporting, contact the PRUFTECHNIK support team with the log file.

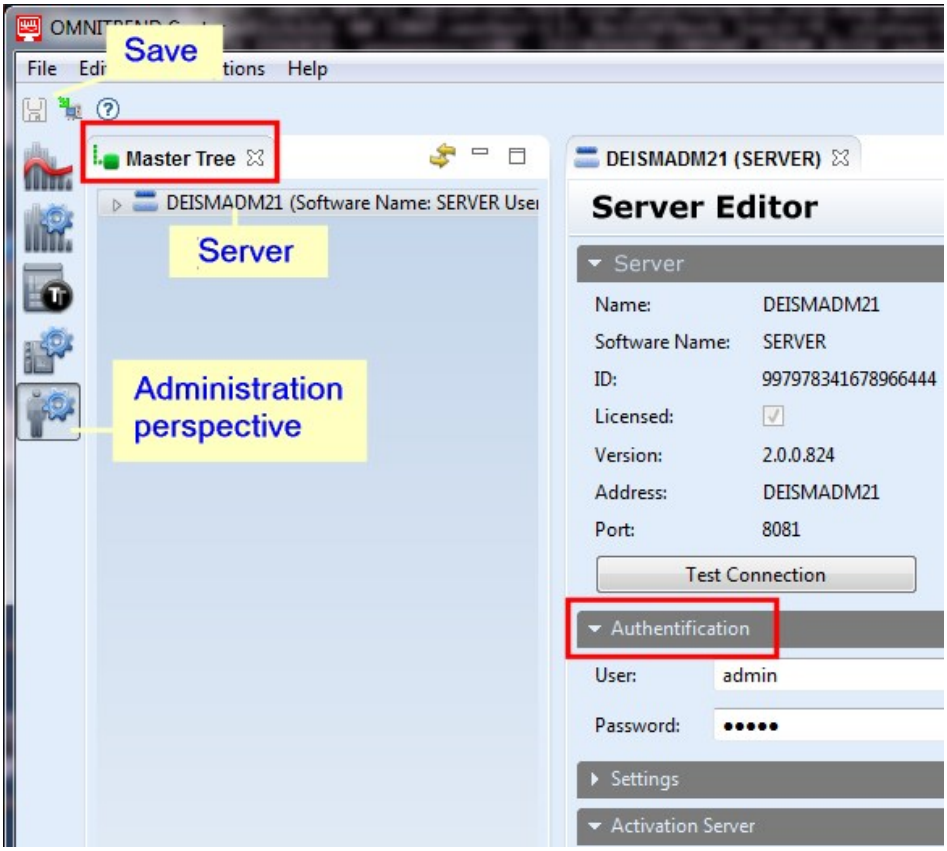
Import legacy data into OMNITREND Center .

> You must at least have the **specialist** user role for importing OMNITREND legacy data.

To log in as a user

- Switch into the **Administration perspective**.
- In the main tree, double-click on the **Server** to open the editor.
  Alternative: Using the **right mouse button**, click on the server and select **Open** in the dialog menu.
- Enter the user name and the respective password in the **Authentification** section[1].
- In the main toolbar, click on **Save** or press the <Ctrl> + <S> keys.

[1]Grouping of related functions and fields in the Editor window



User name **system-admin** is provided for the **system administrator** user role, and cannot be changed. You can change the corresponding password during initial start-up and/or at any time later on in the **Authentification** section using **Change password**.

Preparation

- If needed, create a project in OMNITREND Center , into which the legacy data should be imported.

To import legacy data

- In the main menu, click on **File / Import**. A dialog window appears.
- Mark the **OMNITREND / Legacy Data Transfer** import wizard.
- Click on **Next**.
- Click on **Select Folder** and select the folder with the exported legacy data.
- Click on **Next**.
- Select the destination (project / tree node), into which the legacy data should be inserted.
- Click on **Finish**. The legacy data import starts.

Check and possibly edit imported legacy data

Due to the program-related differences between OMNITREND Center and OMNITREND, the data migration is incomplete and/or not possible for the following datasets:

- **VIBRONET Signalmaster**:
    - You must adjust the measurement configurations due to the new measurement routine in OMNITREND Center retroactively.
    - The **overall characteristic vibration values (a,v,s)** measurement tasks are converted into a **spectrum** measurement task with respective **characteristic band values**.
- **VIBXPERT**:
    - You must newly configure measurement locations with **triaxial sensor**.
    - The **spectrum** measurement task is concerted into **trending spectrum**.
    - **Balancing measurements** and special **multimode measurements** are currently not transferred, such as bump test, coastdown curve, etc.
- **Frequency markers for gearboxes** are not transferred.
- **Events, findings and graphical routes** are currently not transferred.
- Only measurement data of devices supported in OMNITREND Center is transferred.

19 Glossary

C

Cache

The DAP has a cache memory where measurement data from the device are stored before being written to the project.

channel

Element of an online device measurement configuration. Represents the hardware of the device and contains the sensor and the measurement tasks. Linked with the measurement location in the machine tree.

Channel group

Optional element of an online device measurement configuration for grouping measuring channels; visualizes the measurement locations on a machine train or a machine.

Channel pool

Channel pool contains all channels of an online device that are not assigned to any channel group. Unlike the channel group, the following functions can not be configured in the channel pool: - Operating states - Alarm criterion - Data reduction - Refrence machine speed - Release condition

Criticality levels

Criticality is a property of a machine train. It is used to differentiate between aggregates important for production and auxiliary aggregates with less production process relevance. Application: Filter criterion for the machine tree.

Cursor family

Several similar cursor sets respectively form a cursor family, e.g. side band cursor set for center frequency A (family A)

Cursor set

All cursors of the same type, such as Harmonics.

D

DAP

Device access point; data transfer interface between measuring devices and server

Database

Data object on the server PC that contains all measurement and configuration data of the installation. These data are sub-divided into master data and project data.

F

Frequency Domain

Area of a machine in which the same RPM or rotational frequency occurs.

L

Location

Element in the machine tree; represents the location of a machine or a machine train.

M

Machine

Element in the machine tree for a single machine. Can be connected to a measurement location, measurment plane or measurement task.

Machine train

Element in the machine tree for a connected group of machines (e.g. motor pump), or measurement locations, machine templates, planes, measurement tasks.

Machine tree

Part of the master tree; visualizes the structure of the machine park at the project level; visible in the configuration and analysis perspective.

Master data

General, cross-project data of the installation, such as devices, users, sensors. Master data are part of the workspace and can be referenced in the single projects.

Master tree

Graphic representation of the workspace, the server and the DAPs in a tree structure; visible only in the Administration perspective.

Measurement configuration

Data set with all information needed for conducting the measurements. With portable data collectors, a measurement configuration is also known as Route.

Measurement group

Central element of an online device measurement configuration; assigns the measurement tasks at a measurement location; one measurement group each for overall values, trending and diagnostic measurements

Measurement location

Element in the machine tree. Designates the location at the machine where the sensor is installed and the measurement takes place.

Measurement task

Element in the machine tree beneath a measurement location.Contains the measurement parameters, such as measurement type and measured value.

Measuring channel

Element of an online device measurement configuration. Represents the hardware of the device and contains the sensor and the measurement tasks. Linked with the measurement location in the machine tree.

MUX

Abbreviation for multiplexer. Automatic measurement location selector for up to 9 sensors. Component in the Online-CMS VIBRONET Signalmaster, can also be operated with a mobile VIBXPERT II measurement data collector.

P

Perspective

Context-depending view of the program interface; every perspective offers the user relevant views and functions only.

Project

Organizational structure for a particular condition monitoring project. Contains all project-specific configuration data and the measurement data.

Q

Quick View

Dynamic editor view for the current element in the machine tree. Available in the Configuration and the Analysis perspective.

R

Role

Element for the definition and control of the user rights in a project

S

Scheduler

Control program for the DAP, where the chronological sequence for the data import from the cache to the database is configured.

section

Grouping of related functions and fields in the Editor window

Section

Grouping of related functions and fields in the Editor window

Server

Designation for the server application.

System configuration

Device-specific settings, such as connection data, can be loaded separately from a measurement configuration to the device.

T

Tab

Element for grouping contents on a user interface. Tabs are stacked as layers and can be brought to the foreground via mouse click.

U

User

A user can assume different roles in different projects.

user role

Element for the definition and control of the user rights in a project

User role

Element for the definition and control of the user rights in a project

V

Validate

Data check for completeness and validity

Validation

Data check for completeness and validity

Views

Views contain additional information or functions that are displayed in the context of the selected perspective.

W

Window group

Group of several sub-windows, such as the View group in the Configuration perspective.

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