SCHAEFFLER



Schaeffler OPTIME ExpertViewer

User manual

Imprint

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1 General

The Schaeffler OPTIME ExpertViewer software allows you to analyse the measurement data stored by OPTIME sensors and SmartCheck or ProLink devices in the Schaeffler cloud. The characteristic values are shown in the user interface in a clear tree structure, the **Plant overview**. You can select characteristic values from the tree structure; the corresponding data is displayed automatically as a trend in a viewer. You can check specific time signals or spectrums for this trend in two other viewers. A comprehensive range of cursor functions and settings options offer help and support.

You can test the OPTIME ExpertViewer software for a limited time. If you wish to continue using the software after the trial period has expired, please contact your customer support representative to subscribe (see Support).

1.1 About this guide

This guide describes how to use the Schaeffler OPTIME ExpertViewer software. Read this guide carefully before using the software, and store it in a safe place. You can open the guide in the Schaeffler OPTIME ExpertViewer software from the Help icon .

Make sure that

- This guide is available to all users
- If the product is passed on to other users, that this guide is also passed on with it.
- Additions and amendments provided by the manufacturer are always attached to this guide.



System-specific instructions and illustrations

You can use the software described here with both the OPTIME system and the SmartCheck or ProLink system. The usage is largely the same for both systems. The text in this manual always highlights any differences.

Illustrations provide examples to clarify the information and instructions contained in the text. For instances where there is hardly any difference between the systems, we have omitted the illustration of the other system to improve readability and clarity.

Definitions

- Product: the Schaeffler OPTIME ExpertViewer software described in this manual.
- User: person or organisation capable of putting the product into operation and using it.

Symbols used



This symbol indicates

- Helpful additional information and
- Settings or practical tips that will help you to perform activities more efficiently.

Cross-reference symbol 5: This symbol refers to a page in the manual that provides further information. If you are reading the manual in PDF format on a screen, clicking the word to the left of the cross-reference symbol will take you straight to the section in question.

2 About this software

The OPTIME ExpertViewer software is provided as a download and requires an active 'Digital Service Tenant'. To use the software at the end of the trial period, you must have a subscription. Further information is available from your customer support representative (see Support).

2.1 User rights and write access

To install and operate the OPTIME ExpertViewer software, you require special access rights. Please contact your system administrator if you experience problems with the security requirements of your system.

User rights

To install the software, you require administrator rights on your system.



Tip: Install the software with administrator rights and then switch back to a normal user.

Write access

The software saves settings data and log data during operation. You therefore need write access to the following directories:

- **Program directory:** C:\Program Files\Schaeffler\OPTIME ExpertViewer
- **Log file directory:** C:\Users\[User name]\AppData\Roaming\Condition Monitoring

2.2 System requirements

Your system needs to meet the following requirements for you to get the most from your OPTIME ExpertViewer software:

General system requirements

Windows 10 (32/64 bit)

The system requirements recommended by Microsoft must be met as a minimum:

- Dual-core processor
- 2 GB of RAM (recommended: 4 GB of RAM)
- 16 GB of hard disc space available
- DirectX 11 compatible graphics card

In addition:

- Internet connection
- Screen resolution: 1024x768 (pixels) at 96 dpi and normal font size (recommended: 1280x800 or higher)
- Disk space for software: at least 75 MB of free disk space
- Mouse: three-button mouse recommended

2.3 Installing the software

Double-click on the file "**Schaeffler OPTIME ExpertViewer_Setup.exe**". Double clicking starts a wizard, which will guide you through the individual installation steps. This includes–depending on your system configuration–the following steps:

- **Select installation language:** Here you can select the language to be used during the installation of the OPTIME ExpertViewer software.
- **Select target directory:** You can either accept the suggested directory or enter a different directory. The OPTIME ExpertViewer software is saved in the following directory by default:
  C:\Program Files\Schaeffler\OPTIME ExpertViewer

During installation, links are created in the start menu; these links can be used to start the OPTIME ExpertViewer software.



The OPTIME ExpertViewer software is improved on a continuous basis. Software updates will be made available to you.

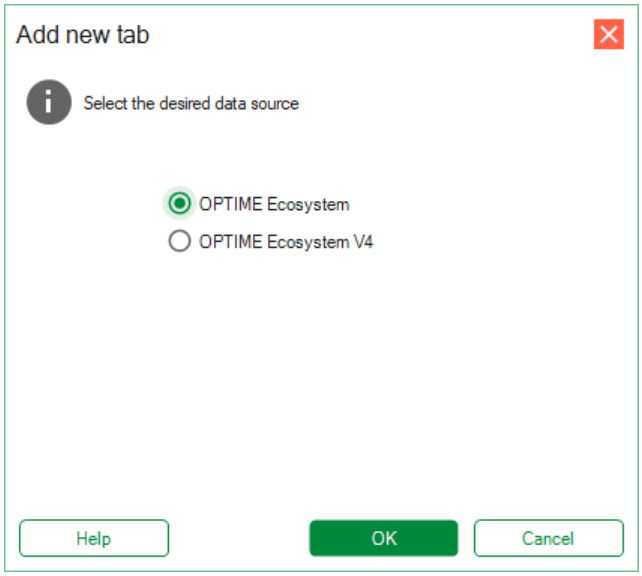
If an update is available, you will be informed via a dialogue box. In the case of security-related updates, the OPTIME ExpertViewer software will close automatically after the notification and the update will be installed.

3 First start-up

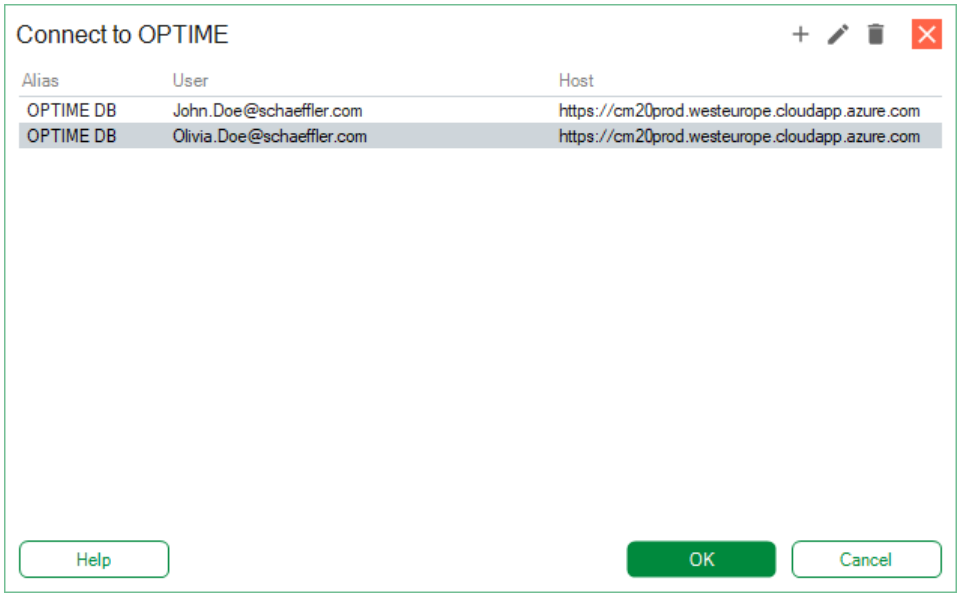
You can start the OPTIME ExpertViewer software via links in the Start menu and on the desktop.

3.1 Connecting the database

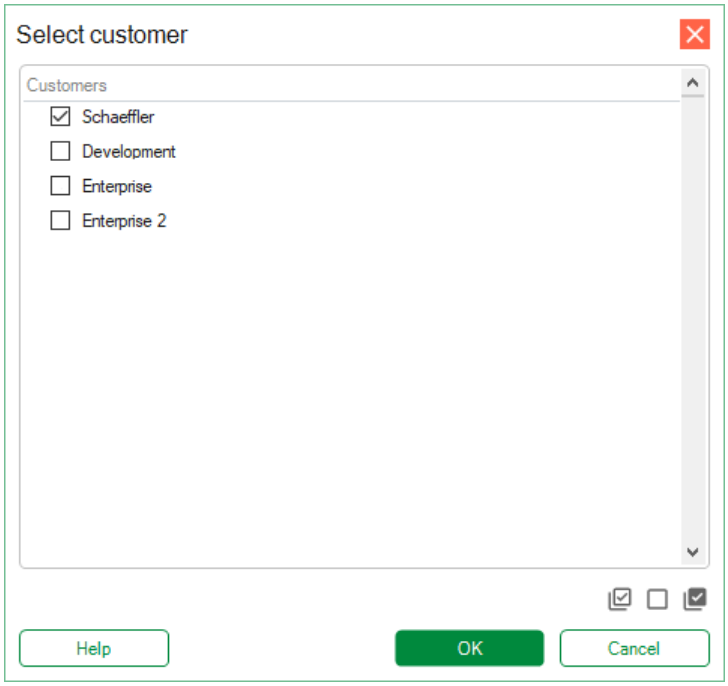
1. Depending on the OPTIME ExpertViewer edition, the **Add new tab** dialogue opens first. This page appears in the language that you selected for the installation. Select your version of **OPTIME Ecosystem** and click **OK**.



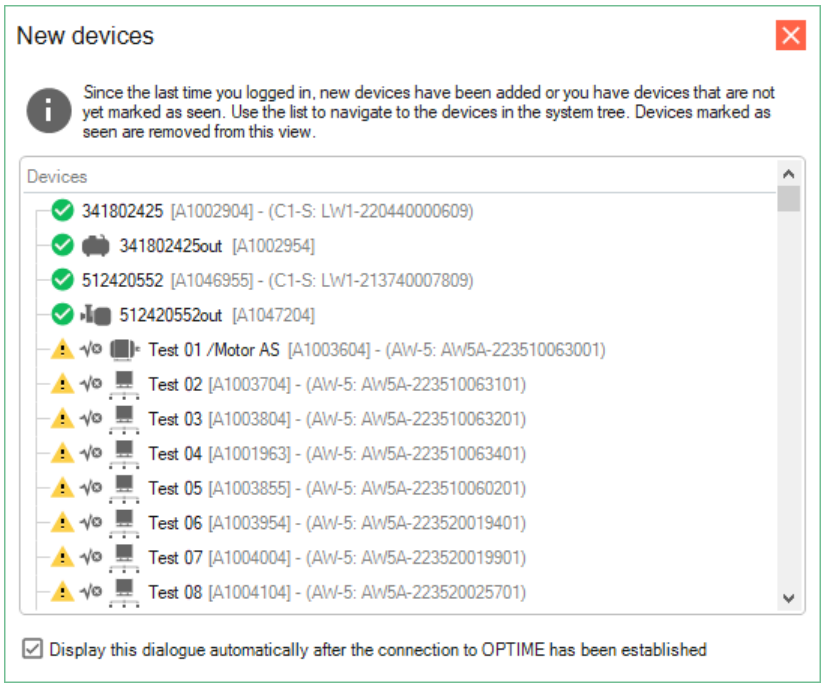
2. The **Connect to OPTIME** dialogue opens. In some OPTIME ExpertViewer editions, this is the start dialogue:



3. Click **Connect** to connect to the Schaeffler OPTIME database.
   If you already have a user account for Schaeffler OPTIME, you can also use this access data for the OPTIME ExpertViewer software. Click the + button to set up the connection to your Schaeffler OPTIME database and then connect to the desired database.
4. The database will load. If you only deal with one customer, go straight to **step 5**.
   If you deal with multiple customers, choose the desired customer in the **Select customers** dialogue box and click **OK**.



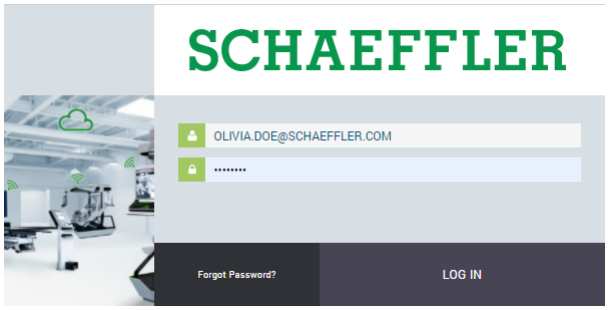
5. The **New devices** dialogue box opens:



Here you have the following options:

- The list gives you an overview of newly added devices and devices that you have not yet marked as seen.
- Click on a device to open it in the plant tree.
- Right-click on a device or click on the ••• button to open the context menu and select **Mark as seen**. This will remove the device from the list.
- Activate the **Display this dialogue automatically after the connection to OPTIME has been established** to display the dialogue as soon as the connection to OPTIME has been established. If you deselect this option, the dialogue box will not be displayed automatically.
- While working with the OPTIME ExpertViewer software, click the button in the plant tree to open the dialogue box 16.

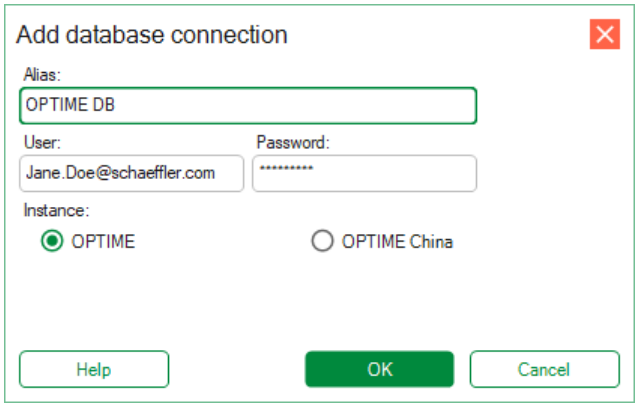
The user name and password for the Schaeffler OPTIME database match the access data you use for the Schaeffler OPTIME dashboard. Example:



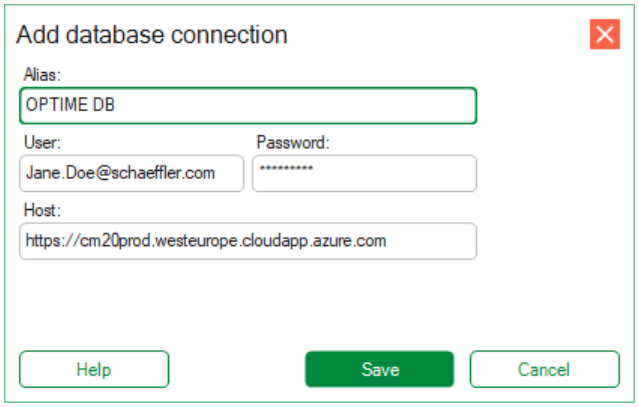
If you have any questions, please contact your OPTIME customer support representative at Schaeffler.

Add database connection

Click the **+** button to set up a new database connection to the Schaeffler cloud:



OPTIME 3



OPTIME 4

- Enter any **alias** as the name for the database connection.
- Please provide your OPTIME **user name** and your **password**.
- For OPTIME 3:
  Select the appropriate instance for your region, i.e. **OPTIME China** for China or **OPTIME** for all other regions.
  For OPTIME 4:
  Enter the host address.
- Click **Save**.

The database connection is added to the list. You can edit an entry in the list if necessary.

If you no longer need a database connection, you can delete it from the list.

Connect to database

Select the database from the list and click **Connect**. The connection to the desired database is established and the data is loaded.

3.2 Adding subscription data

If you install the OPTIME ExpertViewer software on your computer, you can use the trial version to test the software for a limited time. The number of days until the trial version expires is displayed in theAbout section 94 of the software. After this time, you can continue to use the software by purchasing a subscription. Further information is available from your customer support representative (see Support).

Once you have purchased a subscription, you will receive an email with the file `ExpertViewer.subscription`, which contains a key to activate the software. Copy this file to the "Bin" directory in the program directory of the OPTIME ExpertViewer software. By default, the software is installed in the following directory:

- C:\Program Files\Schaeffler\OPTIME ExpertViewer\[Version]\Bin

Activation will not take effect until the OPTIME ExpertViewer software is restarted. More information and the duration of your subscription can be found in the About section 94 of the software. You will also find information on how to add or modify your subscription file.

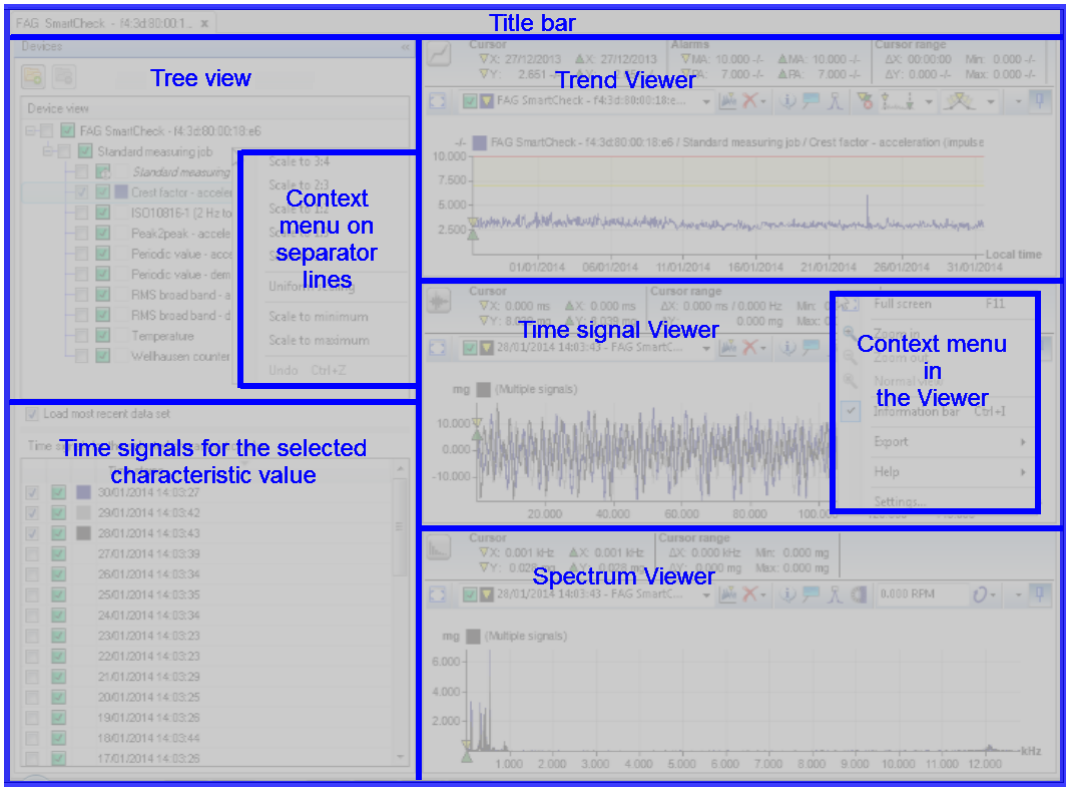


A message will appear in the OPTIME ExpertViewer software a few days before the subscription or trial expires. After expiry, the software cannot be used until it is reactivated.

4 User interface overview

When you exit the OPTIME ExpertViewer software, the most recent size and location of the application window will be saved. The next time you launch the application window, it will open in the same size and position.

The user interface of the Schaeffler OPTIME ExpertViewer software can be divided as follows:



Here you have the following options:

Title bar

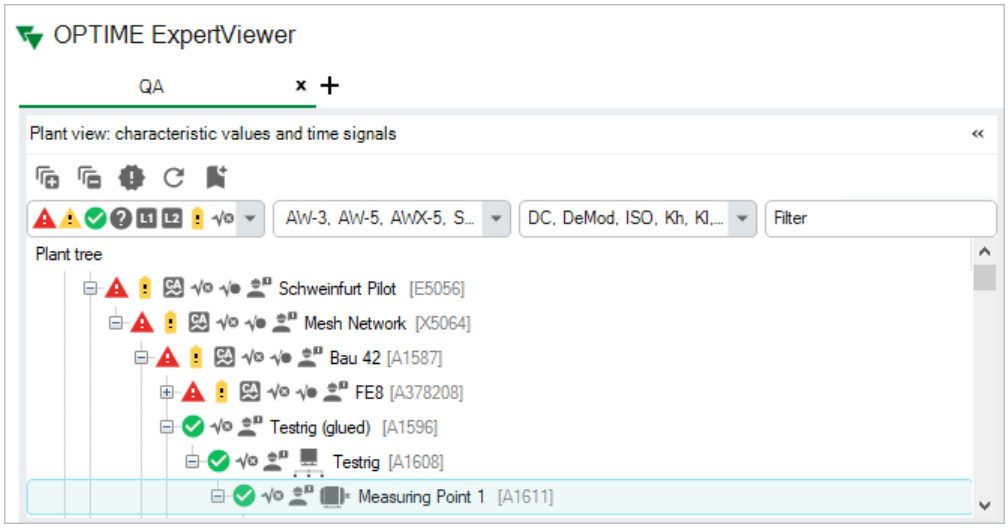
To the left of the company logo you will find the following buttons:

- Opens the user documentation.
- Opens a dialogue with detailed information about your program, including system information, DirectX information and licence information.
- Opens the dialogue where you can view and change the program settings 84.

The buttons to minimise, maximise and close the program window are located to the right of the company logo.

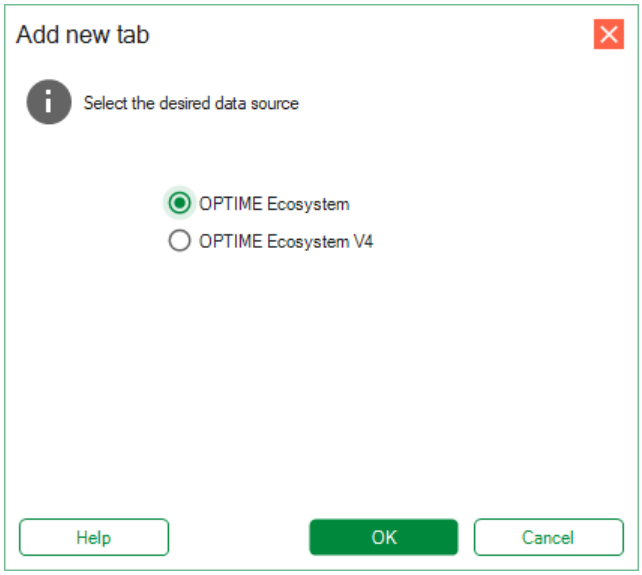
Tab with context menu

When opening the Schaeffler OPTIME ExpertViewer software, you will see the default **Tab 1** as well as a **+** symbol below the title bar, which allows you to add more tabs:



Right-click a tab to open a context menu where you can add new tabs and manage existing tabs:

- **Add new tab:**
  Opens a dialogue box where you can select the **data source** for the new tab:



For OPTIME, the alias of the OPTIME database is used as the name. This name cannot be changed.
Select your version of **OPTIME Ecosystem**. The next step is to connect to the OPTIME database. The data is loaded in the new tab.

A maximum of 32 new tabs are possible.

- **Close tab:** Closes the currently active tab.
- **Close all tabs:** Closes all tabs.
- **Close all tabs except this one:** Closes all tabs except the currently active tab.
- **Reset scaling in all tabs:** Resets the original size of the individual working areas in all the tabs. This means that any scaling that you carried out in the context menu on the separator lines 15 or manually is reversed.



- Once you have connected to the database, the default tab and each new tab is automatically given your **alias** as its name.
- When you close the last tab, the **Add new tab** dialogue opens automatically.

Plant tree (tree view)

If you click on a characteristic value, i.e. select the characteristic value, the associated trend is displayed in the Trend Viewer. The associated time signals are displayed on the lower left-hand side under **Time signals for the selected characteristic value**.

Favourites

Here you will find the plants, measurement jobs or individual characteristic values that you have listed as favourites 14. For details on working with the list of favourites, see the **Favourites** 24 section.

Time signals for the selected characteristic value

The content of this list depends on which characteristic value you have selected in the tree view. You will always see the time signals for the selected characteristic value here. Details about working with the time signals overview can be found in the **Time signals for the selected characteristic value** 25 section.

Trend Viewer

In the Trend Viewer, you can see the trend of the characteristic value that you have selected in the tree view. You can learn how to work with the Trend Viewer in the relevant sections in the **Viewer and diagram** 29 chapter.

Time signal Viewer

In the Time Signal Viewer, you will see the time signals that you selected in the **Time signals for the selected characteristic value** list. You can learn how to work with the Time Signal Viewer in the relevant sections of the **Viewer and diagram** 29 chapter.

Spectrum Viewer

In the Spectrum Viewer, you will see the spectrums for the time signals that you selected in the **Time signals for the selected characteristic value** list. You can learn how to work with the Spectrum Viewer in the relevant sections of the **Viewer and diagram** 29 chapter.

Context menu in the plant tree

At each level of the tree, you can right-click or click the ••• button to open a context menu with the following functions. The functions that are active depend on the overview level:

Add to Favourites (all levels):
Use this command to add the selected characteristic value or the selected level to your **Favourites**.



If the selected characteristic value or level already exists as a Favourite, you must confirm that the existing Favourite is being replaced. This also overwrites any modified favourite name 24 and/or comments on the existing Favourite 24.

Create distribution diagram ...:
Use this command to create a distribution diagram for the selected measurement job 22 via a separate dialogue box. The command is only active on the sensor level.

Filter trends ...:
Use this command to filter the trends for the selected measurement job 21 via a separate dialogue box. The command is only active on the sensor level.

Copy ID to clipboard
Use this command to copy the ID of the selected node to the clipboard. The ID is at the end of the node name.

Copy path to clipboard
Use this command to copy the path in the plant tree to the clipboard for the selected node. The individual levels of the path are separated by slashes **/**.

Execute Black Sheep Detection (all levels):
This command allows you to perform Black Sheep Detection, which is used for outlier detection.

Context menu in the viewer

You can right-click in any Viewer to open a context menu with the following functions:

Full screen
Use this command to switch the Viewer to full screen 29 or return it to the interface of the Schaeffler OPTIME ExpertViewer software.

Zoom in
Use this command to zoom gradually 29 into the diagram for the active Viewer.

Zoom out
This command undoes the last zoom step in the diagram for the active Viewer.

Normal view
This command undoes all of the zoom steps 29 in the diagram for the active Viewer.

Information bar
Use this command to hide or show the information bar of the Viewer.

Export
Use these commands to save or copy a diagram in different formats. You will find detailed information on these commands in the **Exporting diagrams** 79 section.

Help
This is where you can find the OPTIME ExpertViewer **Help** function; the **About** command also offers detailed information on the version of the Schaeffler OPTIME ExpertViewer software.

Settings ...
Use this command to open a dialogue box containing numerous settings options. You can use these to adapt the Schaeffler OPTIME ExpertViewer software to your needs. You will find further information on this in the **Change program settings** 84 section.

Context menu on separator lines

Right-click on the line separating two areas from each other to call up a context menu. This contains functions that allow you to define the size of each area and their relation to each other. The functions relate to the area above a horizontal separator line, or the area to the left of a vertical separator line. The only exception to this rule is the function **Apply uniform scaling**: if you use this function on a horizontal separator line between viewers, it will apply to all three viewers, i.e. display all three with the same size.

The following functions are available to you:

- **Scale to 3:4:** This scales the area to 3/4 of the available space.
- **Scale to 2:3:** This scales the area to 2/3 of the available space.
- **Scale to 1:2:** This scales the area to half of the available space.
- **Scale to 1:3:** This scales the area to a third of the available space.
- **Scale to 1:4:** This scales the area to a quarter of the available space.
- **Uniform scaling:** This scales neighbouring areas to equal sizes.
- **Scale to maximum/minimum:** This scales the area to fit the entire available space.

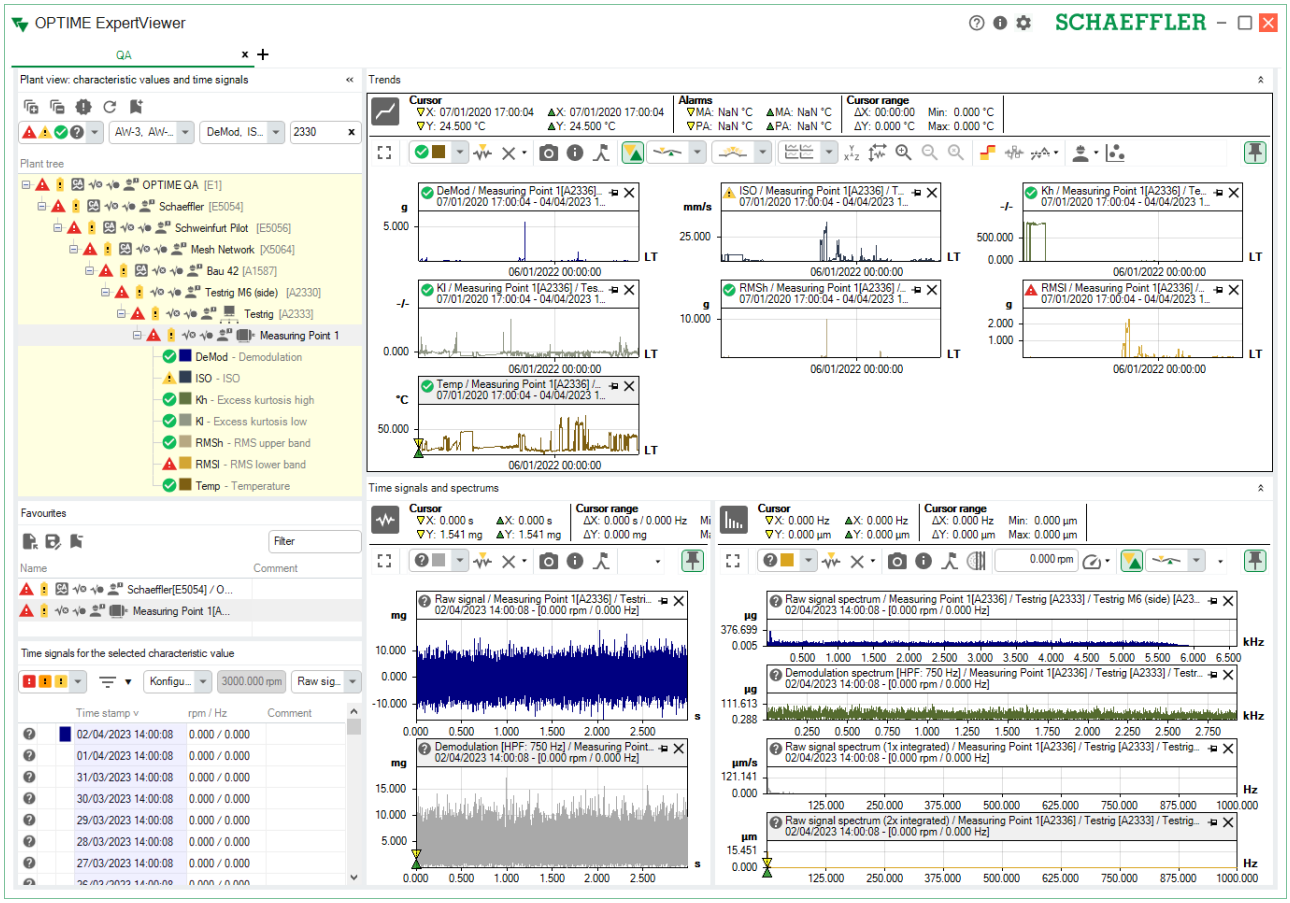


You can also scale the areas manually:

1. Move the mouse over the separator line that you want to move.
2. Once the mouse pointer changes into a double-headed arrow, click and hold the left mouse button and drag the line to the new position.

5 Tree view

In the upper left-hand area you will find the plants with the characteristic values. Both the list of **Time signals for the selected characteristic value** at the bottom left and the Viewers in the right-hand area are empty. If you select a characteristic value, the trend is loaded in the Trend Viewer. In addition, the list of **Time signals for the selected characteristic value** fills up. The latest time signal is automatically displayed in the Time Signal Viewer and in the Spectrum Viewer:



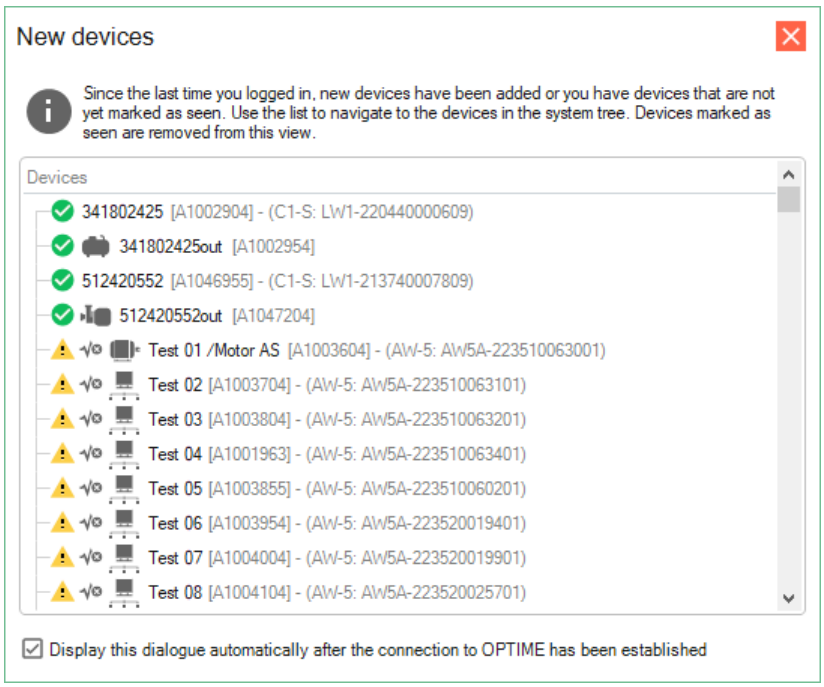
You will find the following functions and information in the tree view:

Buttons and

Click these buttons to expand or collapse the selected level.

Button

Click this button to open the **New devices** dialogue:



Here you have the following options:

- The list gives you an overview of newly added devices and devices that you have not yet marked as seen.
- Click on a device to open it in the plant tree.
- Right-click on a device or click on the ••• button to open the context menu, and select the **Mark as seen** option. This will remove the device from the list.
- Activate the **Display this dialogue automatically...** option to display the dialogue as soon as the connection to OPTIME has been established. If you deselect this option, the dialogue box will not be displayed automatically.

Button

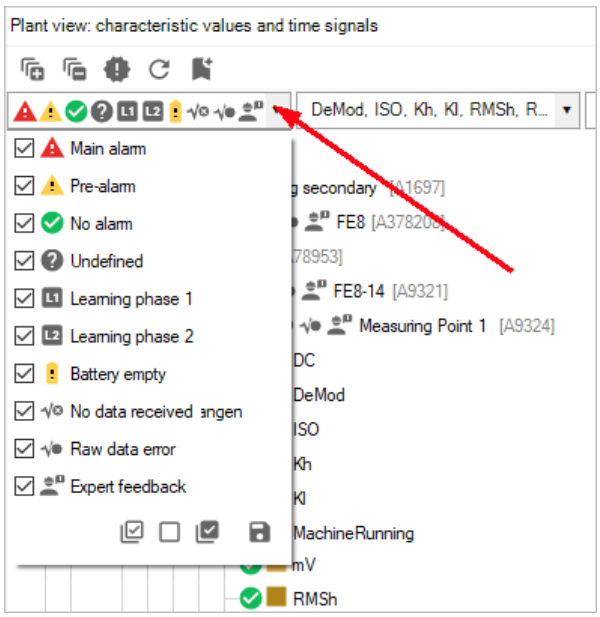
Click this button to reload the tree.

Button

Click this button to add the selected characteristic value or the selected level to the list of favourites.

Filter options

- **Status filter list:**
  Click the list to open it. You can then select the status you want to use for filtering:



Options in the filter list
Click to turn filtering on/off for each individual filter option.

Click this button to turn on all filter options.

Click this button to turn off all filter options.

Click this button to reverse the current filter settings.

Click this button to save the current filter settings as the default settings. These filter settings are then automatically used when the OPTIME ExpertViewer software is launched.

By default, the filters are switched on for all filter options.

- **Device filter list**
  Click on the list to open it. You can then select the device types you want to use for filtering: The list displays only device types that exist in the database.
  You have the same options in the filter list as in the status filter list 18.
- **Characteristic value filter list**
  Click on the list to open it. You can then select the characteristic values you want to use for filtering. The list displays only characteristic values that exist in the database for the filtered device types. The characteristic values in the list are grouped by device type.
  You have the same options in the filter list as in the status filter list 18.
- **Field for filter terms**
  Enter filter terms or strings here and press the RETURN key to filter. The filter term or string can be the name or ID of a node. You have the following options, which you can also use in combination:

  Filter by search term
  Example: Pump ST-567180
  All elements that contain the filter term as a match are displayed.

  Filter by multiple search terms (OR operator, separated by a comma)
  Example: Pump ST-56,6202
  All elements that contain at least one of the filter terms that are separated by a comma are displayed.

  Filter by multiple search terms (AND operator, separated by a slash)
  Example: Pump ST-56/motor/drive side
  All elements containing the filter terms that are separated by a slash are displayed.



If you enter a filter term in the field and press the RETURN key, the background of the filtered view is highlighted in yellow.

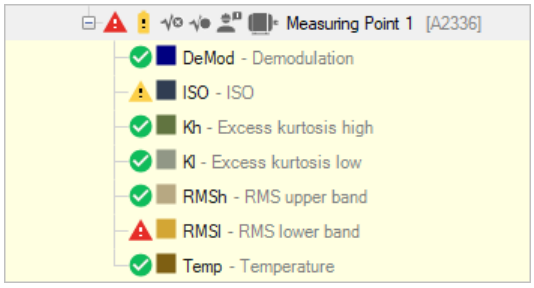
Measurement value details:

The individual levels of the plant tree offer the following information on the measured values in question:

- **Top level:**
  Here you will find the plant name and ID.
- **Middle level**
  Here you will find the names and IDs of the nodes of the plant tree up to the device from which the data originates.
- **Lower two levels:**
  Here you will find the name and ID of the measurement job as well as the individual characteristic values of the measurement job. For each characteristic value, you will find the value abbreviation and the full value name.

Select characteristic value

Select a characteristic value by clicking on the characteristic value in the tree view. The characteristic value is then marked in the tree with the alarm symbol and highlighted in colour , based on which you can also identify it in the Trend Viewer diagram:



You can find the following information:

- The trend for the characteristic value is loaded in the Trend Viewer.
- The last available time signal opens in the Time Signal Viewer. The relevant spectrum is shown in the Spectrum Viewer.
- You can load more trends in the Trend Viewer by selecting additional characteristic values.
- The time signals for the characteristic value are shown in the **Time signals for the selected characteristic value** list. The latest time signal is automatically loaded in the Viewer.
- As soon as you select a different characteristic value, its time signals are shown in the list. You can find details on this in the **Time signals for the selected characteristic value** 25 **section.**

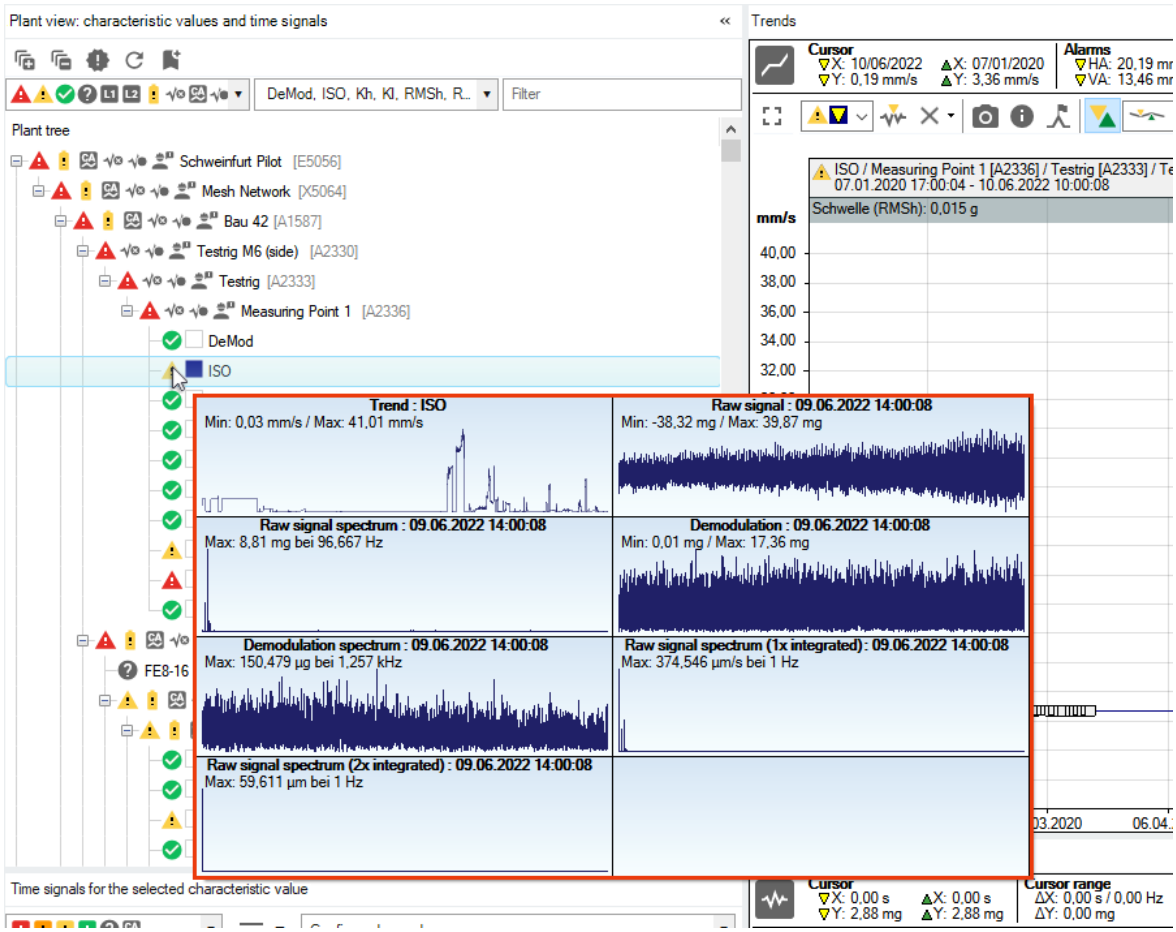
Alarm status

This symbol displays the alarm status on every level. The symbol is shown in different colours depending on the status:

- No measurement has been performed or there is an incorrect or incomplete configuration.
- There is no alarm.
- One or more characteristic values have triggered a pre-alarm.
- One or more characteristic values have triggered a main alarm.

On the level of individual characteristic values, the symbol relates only to the characteristic value in question; in the higher levels its relates to all subordinate characteristic values; the program always shows the most critical alarm status. For instance, if there is a characteristic value with a main alarm, then the main alarm status is set for the entire measurement job.

If you move the mouse over a symbol, you will see a preview of the trend after approx. 300 milliseconds. You will also find brief information here, such as the time stamp or the minimum and maximum values for the Y-axis or the time since the last measurement. The preview disappears automatically after 10 seconds:



No alarm status is displayed for the nodes in the plant tree.

Device type

Each device type will have its own unique symbol at the device levels of the plant tree.

The symbol marks the lubricator output. Click on this level to view details about the status of the lubricator in the Trend Viewer. For example, you can find information about the cartridge fill level or the battery voltage.

More symbols

Depending on the characteristic value and the measurement configuration, this additional information is displayed in the plant tree:
If bearing information or machine speed is available for the characteristic value, the corresponding values are displayed at the end of the name: OPTIME [E1]

The OPTIME sensor battery is low.

No measurement data received in the last 24 hours.

An error occurred during the measurement/There is an error in the raw data.

The measurement data was analysed with the Condition Analyser.

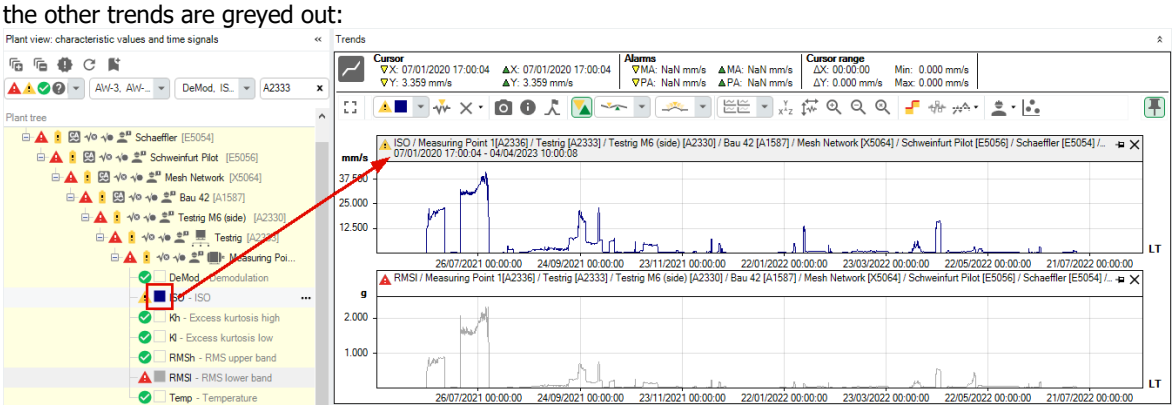
There is at least one expert opinion.

L1 The sensor is in learning mode.

Colour identification

The colour box shows you the colour used to identify the trend in the Trend Viewer. This allows you to differentiate between several loaded trends 38.

If you move the mouse over the coloured box, the associated trend is highlighted in the Trend Viewer, while the other trends are greyed out:

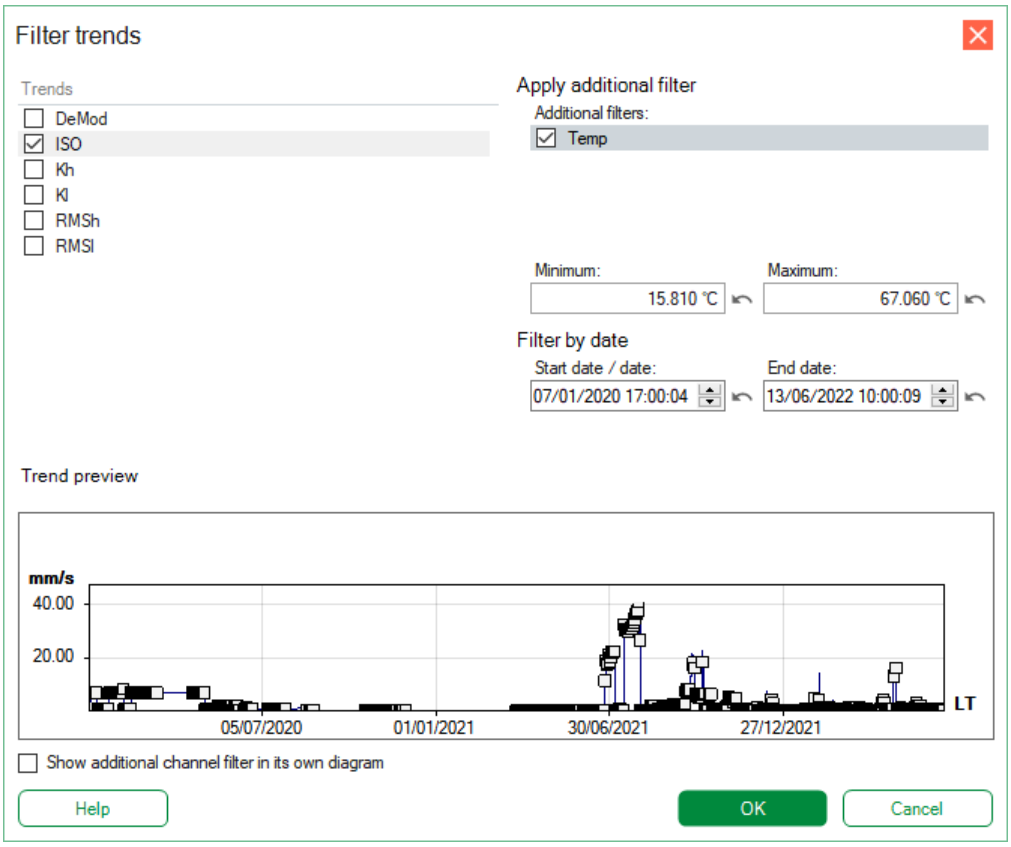


Context menu in the tree view

Right-click on a tree element or a characteristic value to open a context menu. Alternatively, you can select a tree element and then click the ••• button. You can find details on this in the **User interface overview** 14 section.

5.1 Measurement job: Filter trends

You can set up additional filters for trends. To do this, select the **Filter trends...** function in the context menu of the measurement job to open the corresponding dialogue box:



You have the following options:

Trends

Here is the list of trends available for filtering purposes:

- Click on a trend to view it in the **Trend preview**.
- Tick the box in front of the trends you would like to filter. A separate filter result is displayed for each filtered trend.

Apply additional filter

Activate the additional filter for the trend here. You can then set the desired values for **Minimum** and **Maximum**. Clicking ↶ resets your entry to the measurement values.

Filter by date

Enter the **start date** and **end date** by which you would like to filter the trend. Clicking ↶ resets your entry to the full date range.

Trend preview

Here you can see the preview of the trend on which you clicked under **Trends**.

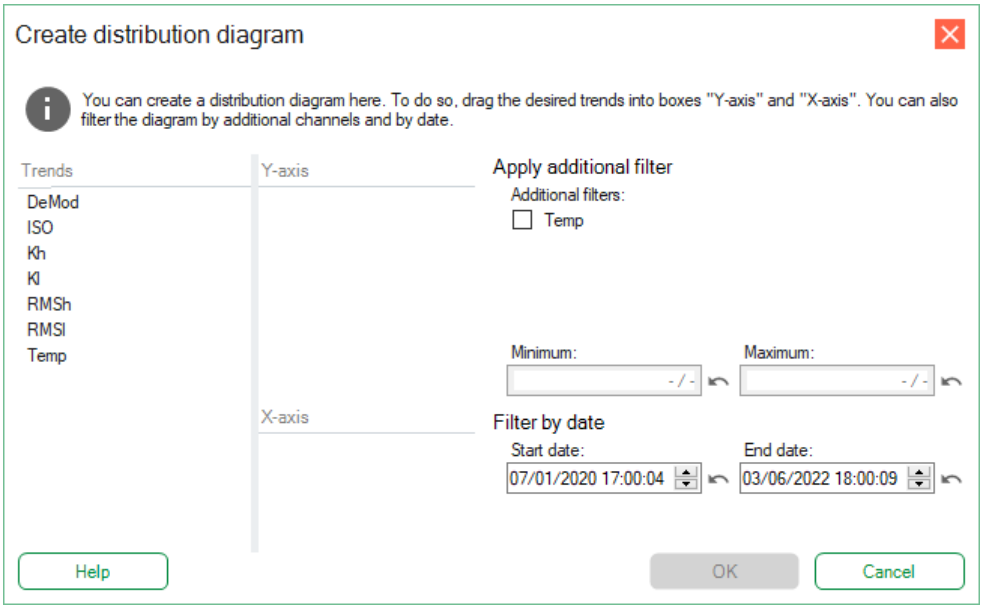
Show additional channel filter in its own diagram

Select this option to see a separate diagram for the additional filter in the result.

Enter the data required and then click **OK**. The filter result is displayed in a separate tab in the Trend Viewer.

5.2 Measurement job: Create distribution diagram

You can create distribution diagrams for measurement jobs. This allows you to see, for example, how the machine performs at different speeds and whether there is an unusual cluster of values at a certain speed. To do this, select the **Create distribution diagram...** function in the context menu of the measurement job to open the corresponding dialogue box. Alternatively, click the button in the toolbar of the Trend Viewer:



You have the following options:

Trends

Here is the list of trends available for the distribution diagram. Click and drag the desired trend to the **Y-axis** or **X-axis** box. A separate diagram is created for each trend in the **Y-axis** box.

Filter by additional channel

Activate the channel by which you would like to filter the diagram. You can then set the desired values for **Minimum** and **Maximum**. Clicking ↶ resets your entry to the measurement values.

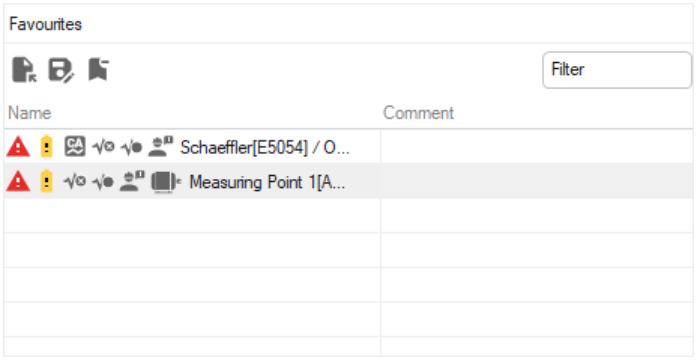
Filter by date

Enter the **start date** and **end date** by which you would like to filter the diagram. Clicking ↶ resets your entry to the full date range.

Enter the data required and then click **OK**. The distribution diagram is displayed in a separate tab in the Trend Viewer.

6 Favourites

The **favourites** list can be found on the left under the **plant tree**. The list contains the plants, measurement jobs or individual characteristic values that you have marked as favourites in the tree 14.



Here you have the following options:

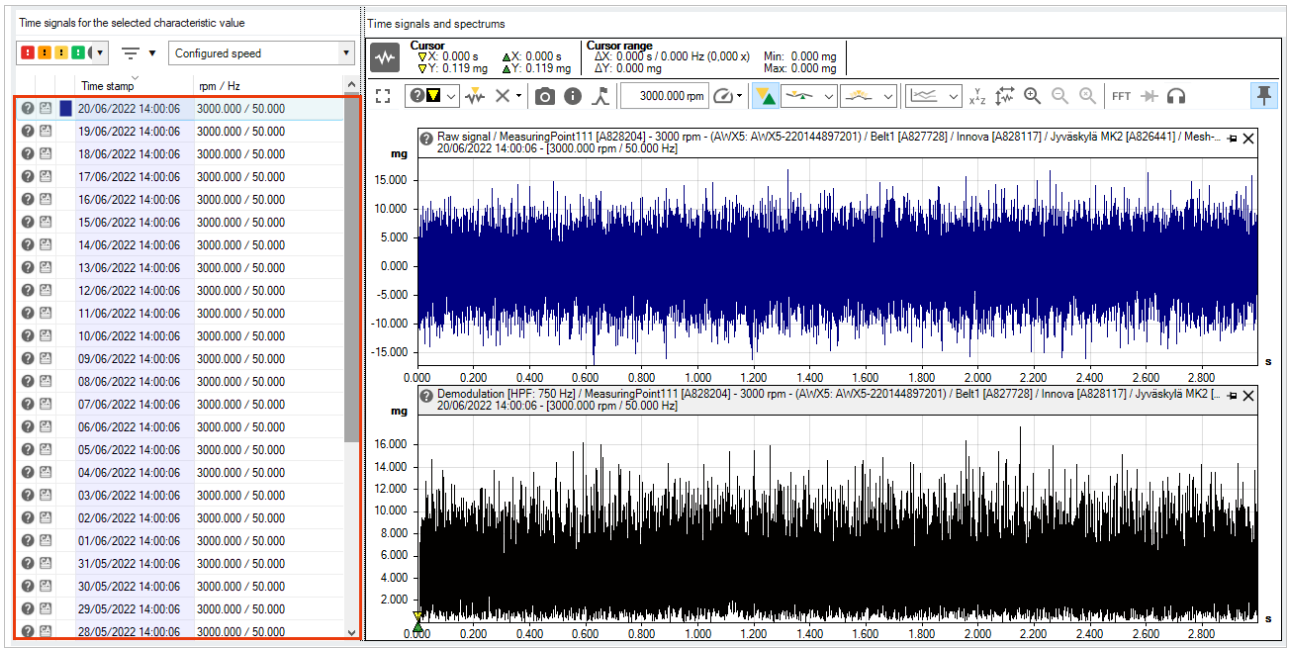
	Click this button to import favourites from a CSV file. The imported favourites are added to the list. Duplicates will not be imported.
	Click this button to export the selected favourites and save them in a CSV file.
	Click this button to remove the selected favourites from the list.
Filter	Enter filter terms or strings here and press the RETURN key to filter favourites. Both names and comments are taken into account when filtering. You have the same input options as in the filter field of the plant tree 18.
Individual favourite entries	Click on a favourite entry to highlight the corresponding plant, measurement job or characteristic value in the tree. For each favourite, you will find the following information: • **Name:** Here you will find the favourite name. By default, this is the entire tree path of the characteristic value, plant, or measurement task to which this favourite is linked. Move the mouse over the favourite name to display its full name. To edit the name, double-click in this field and then type the name you want. • **Comments:** Double-click in this field to enter a comment about the favourite or edit an existing comment.



If you re-add existing favourites, user-defined names and comments will be overwritten.

7 Time signals for the selected characteristic value

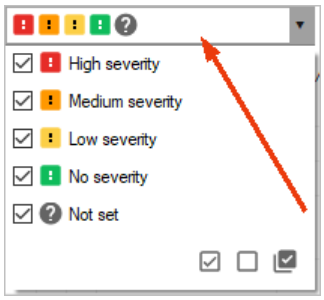
The **list of time signals for the selected characteristic value** can be found on the left under the **favourites** list and the **plant tree**. The content of the list depends on which characteristic value is selected in the favourites list or the tree 19. The time signals that you select here are displayed in the Time Signal Viewer and in the Spectrum Viewer:



Here, you can access the following information and functions:

Filter options

- **Status filter list:**
  Click the list to open it. You can then select the status you want to use for filtering:



Options in the filter list
Click to turn filtering on/off for each individual filter option.

Click this button to turn on all filter options.

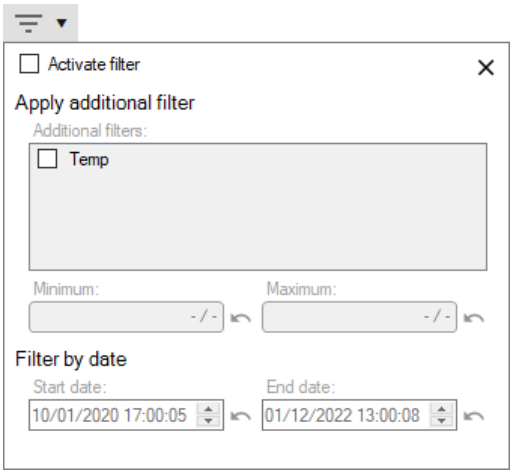
Click this button to turn off all filter options.

Click this button to reverse the current filter settings.

By default, the filters are switched on for all filter options.

Statuses of the time signals are based on assessments that are created manually using the Edit expert opinion function. If there are no assessments, the entry **Not defined** appears.

- **More filter options**
  Click this button to open a dialogue with additional filter options:



  You have the following options:
  Activate filter: Activate this option to use the additional filter options.
  Filter by additional channel: Activate the desired additional channel and use **Minimum** and **Maximum** to specify the value range in order to filter the time signals accordingly.
  Filter by date: Enter the desired **start** and **end date** to filter the time signals accordingly.
- **Signal data filter list**
  Click on the list to open it. You can then select the signal data you want to use for filtering.
  You have the same options in the filter list as in the status filter list 25.



The background of the filtered view is highlighted in yellow.

In the list of **Time signals for the selected characteristic value**, you can use the columns as a sort criterion:

Set any column as a sort criterion by clicking in the column title. Click a second time to change the sort order, i.e. from ascending to descending or vice-versa. The current sort order is displayed by the symbols ▲ for ascending and ▼ for descending.

Speed selection list

Here you can select the speed source. The speed is displayed in the list of time signals in rpm and Hz.

Speed measured: Select this option to use the measured speed as the speed source. The measured speed is part of the time signal.

Configured speed: Select this option to display the speed you specified when commissioning the OPTIME sensor.

Own speed: Select this option to enter a fixed speed value for all time signals in the field next to the list.

Speed labels: Select this option to display the speeds determined by the expert.

[Speed source name]: Select this option to select a characteristic value measured in rpm or Hz as the speed source.

Selecting a time signal

Click a time signal to display it in the Time Signal Viewer and in the Spectrum Viewer.

Selecting multiple time signals

You have the following options for selecting multiple time signals:

- Hold down CTRL and click on the required lines.
- To select a consecutive range of time signals, click on the first time signal in the desired range, hold down the SHIFT key and then click on the last time signal in the desired range.

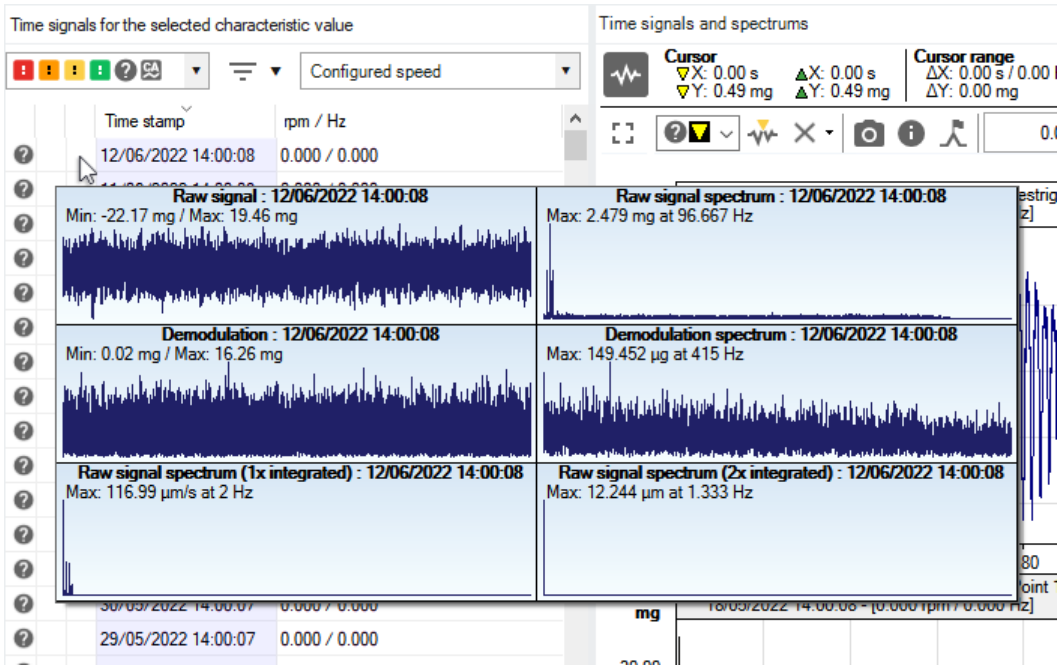
Selected time signals are highlighted in colour.

Alarm status

This symbol indicates the alarm status for the data:

- The measurement was taken but the device was still in the learning phase.
- No alarm
- Pre-alarm
- Main alarm

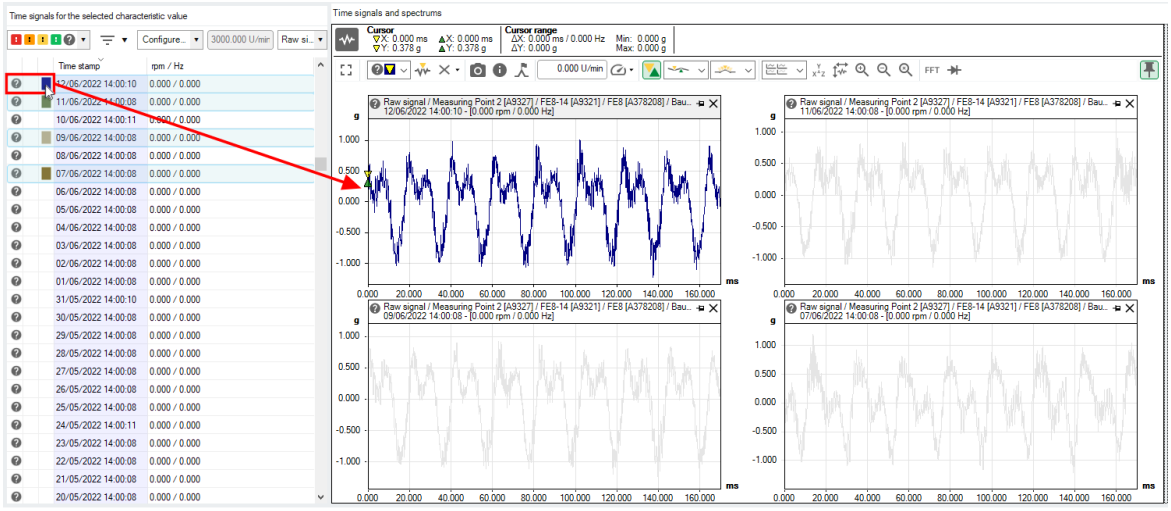
If you move the mouse over a symbol, you will see a preview of the time signal and the spectrum after approx. 300 milliseconds. The preview disappears automatically after 10 seconds:



Colour identification

The coloured box indicates the colour used to display the data in the diagram. In this way you can differentiate between several loaded time signals or spectrums.

If you move the mouse over the time signal line, the corresponding signal is displayed in the colour of the square in the Time Signal Viewer and the other signals are greyed out:



Time stamp

This is where you will find detailed information about when the time signal was saved.

RPM/Hz

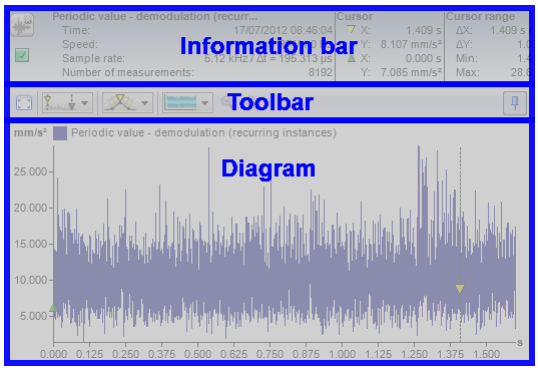
Here you will find information about the speed in revolutions per minute and in hertz.

Comment

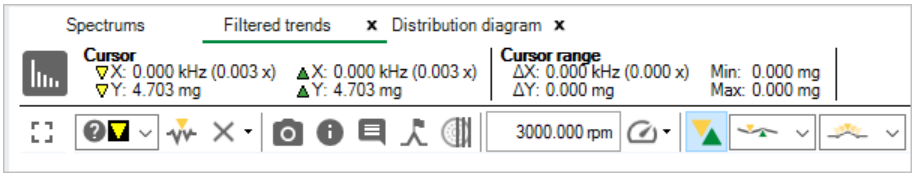
Double-click in the comment cell to enter a signal comment. For example, you can use this to see how far your analysis has progressed or whether it has already been completed. The comment is saved in the system.

8 Viewer and diagram

All of the Schaeffler OPTIME ExpertViewer software viewers are identical in design and offer you the same basic functions and adjustment options, with a few exceptions. Each viewer consists of the information bar 29, toolbar 30 and diagram 34 areas:



The Trend Viewer opens special views in additional tabs. This is the case, for example, with Filtered trends 21 or Distribution diagrams 22:



Apart from the main **Trend** tab, you can close all tabs by clicking **x**.

You can find information on each area of the viewer in the following sections.

Information bar

The upper area of the Viewer contains basic information on the position of the base cursor 50 and measure cursor 50, and on the values of the cursor range.

You can access the following information and functions via the information bar:

This symbol indicates a trend.

This symbol indicates a time signal.

This symbol indicates a spectrum.

By default, trends are displayed in the main viewer, i.e. in the upper of the three viewers. Click the symbols in the viewer information bars to switch the main display:

- Click the trend symbol in the Main Viewer to toggle the display between trend and time signal.
- Click the time signal symbol in the Time Signal Viewer to switch the time signal display between the Main Viewer and the Time Signal Viewer.
- Click the spectrum symbol in the Spectrum Viewer to switch the spectrum display between the Main Viewer and the Spectrum Viewer.

Cursor

The **Cursor** range contains the X and Y positions for both the base cursor and the measure cursor. You can also see the corresponding symbols for both cursors that are used to indicate them in the diagram.

The X and Y values are adjusted automatically when you change the position of the cursor in the diagram.



By default, the cursor position in the trend diagram is at the end of the trend, while in the spectrum diagram it is at the beginning of the spectrum

Alarms

Trend Viewer only

Here you will find the alarm limits for the main alarm and pre-alarm.

Cursor range

This shows you the difference between the base cursor and measure cursor, together with the smallest (**Min.**) and largest (**Max.**) values in the cursor range.

The difference values are adjusted automatically when you change the position of the cursor in the diagram.



If you do not need the information bar or need more space to display the diagram, you can hide it using one of the following methods:

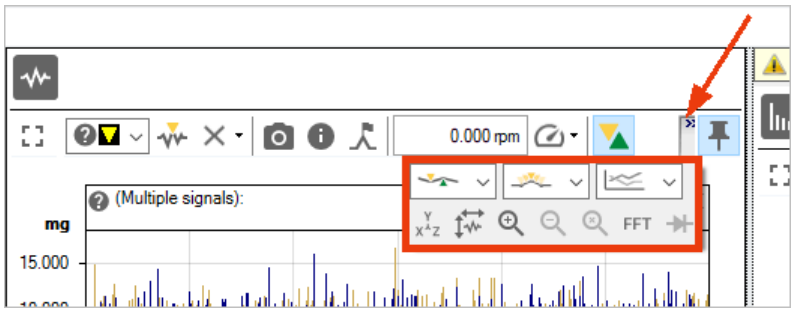
- Right-click to open the context menu for the Viewer 14 and select the **Information bar**. You can also use this function to display the information bar again.
- If you want to hide the information bars for all Viewers when you start the Schaeffler OPTIME ExpertViewer software, you will need to adjust the Viewer program settings:
  1. Right-click to open the context menu for the Viewer 14 and select **Settings**.
  2. Click on **Viewer** 85 in the left-hand area.
  3. In the **Visible elements on startup** section, uncheck the **Information bar** option. The information bar will not appear in any of the viewers when the program is next started.

Toolbar

You can gain access to all the functions for data analysis and working on the diagram in the toolbar. The following overview shows you which functions you can call up via the selection lists and symbols. If a function is not available for all the viewers, you will find a note to this effect.



If not all of the symbols on the toolbar can be displayed, for example if the Viewer is too narrow, you will find the ▾ symbol on the right edge of the toolbar. Click on this to show the hidden toolbar functions:





Click this symbol to show the viewer in full screen mode.

To reintegrate the Viewer into the Schaeffler OPTIME ExpertViewer software interface, click on the symbol.

Alternatively, you can access both commands by right-clicking in the context menu for the Viewer 14.



Use this list to determine the active signal, which is influenced by cursor functions, for instance. In each list entry you can find the following information:

- : The coloured box identifies the loaded trend or the loaded signal. You will find the same colour identification on the left in the **device/plant tree** or in the list of **Time signals for the selected characteristic value**.
- : The yellow triangle identifies the currently active trend, the active time signal or the active spectrum.
- : This symbol indicates the alarm status for the data:

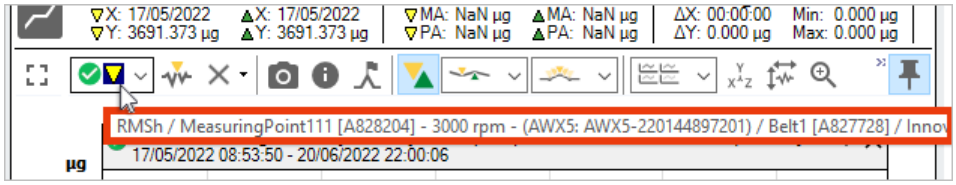
  The measurement was taken but the device was still in the learning phase.

  No alarm

  Pre-alarm

  Main alarm

- If you move the mouse over the visible list entry or open the list, you will see more details. These give you information about the time stamp, the name of the measurement configuration and the speed or frequency:





Click here to display just the active signal. Clicking again shows all the loaded signals.



Use this list to remove selected signals from the diagram. Selected signals can be trends, time signals, or spectrums. You have the following options:

- **Remove current signal:**

  The active signal is removed from the diagram. The other signals continue to be displayed. New active signal is the first signal in the list.
- **Remove all signals:**

  All the signals are removed from the diagram. The viewer is then empty.
- **Remove all other signals:**

  Only the active signal remains visible, all other signals are removed from the diagram.



Click here to take a screenshot of the diagram or active signal. The exact content that is copied depends on the export settings. Press SHIFT +  to open the settings and edit them. You can find details on this in the **Exporting diagrams** 81 section.



Click here to obtain precise information about the active signal. You can find details on this in the **Show signal properties** 42 section.

If the **Histogram** chart view is active, you will receive detailed information about the histogram 62.

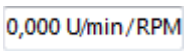


Click here to display the highest peaks of the active signal in a new dialogue. You can find details on this in the **Show highest peaks** 42 section.



Spectrum Viewer only

Click here to view the bearing database. You can find details on this in the **Showing the bearing database/frequency bands** 43 section.



Time Signal and Spectrum Viewer

You can directly input the speed for the active signal in this field. The speed is important for the evaluation of damage frequencies as well as for the cursor functions **speed** and **gear mesh**, the latter for the first harmonic from speed value.

Other speed functions are available by clicking on .



Time Signal and Spectrum Viewer

Click here for further speed/frequency settings. You can find details on this in the **Set speed/frequency** 50 section.



Click here to show the base cursor, measure cursor and the symbols for cursor functions in the diagram. Clicking again hides them all again.



Click here to select cursor functions or to specify basic settings for all cursors and cursor functions. You have the following options:

- **Basis analysis** 52: Selects the **Basis analysis** cursor function.
- **Gear mesh** 57: Selects the **Gear mesh** cursor function. This function is only available in the Spectrum Viewer.
- **Harmonics** 54: Selects the **Harmonics** cursor function.
- **Sidebands** 55: Selects the **Sidebands** cursor function. This function is only available in the Spectrum Viewer.
- **Harmonics with sidebands** 56: Selects the **Harmonics with sidebands** cursor function. This function is only available in the Spectrum Viewer.
- **Speed** 53: Selects the **Speed** cursor function.
- **Cursor settings** 50**:** Select this option to perform general cursor settings and settings for the individual cursor functions.

  You can find details in the **Set cursor** 50 section and in the sections on the relevant cursor functions.



Click here to determine how the precise position of the base cursor will be determined when pulling in the diagram. This feature is useful for detailed analysis. You can find details on this in the **Position cursor** 58 section.



Click here to determine how the data should be displayed in the diagram. You can find details on this in the **Select chart view** 59 section.



Click here to set the X, Y and, if applicable, the Z axes. You can find details on this in the **Edit axes settings** 65 section.



Click here to automatically adjust the maximum and minimum for axes, i.e. to automatically normalise the extreme values of the signals. This allows you to set the data in relation to time. You can find details on this in the **Edit axes settings** 65 section.



Spectrum Viewer only

Click here to set the camera settings for multi-dimensional display options. The function only works for spectrums with the same signal and unit type. You can find details on this in the **Edit camera settings** 66 section.



Spectrum Viewer only

Click here to set the spectrogram display options. The function only works for spectrums with the same signal and unit type. You can find details on this in the **Change spectrogram settings** 67 section.



These buttons provide the following functions:


Zooms in to the diagram a step. One step corresponds to 10% of the axis limits.


Undoes the last zoom step.


Returns the diagram to normal view.



Trend Viewer only

Click here to display the alarm limits for pre-alarm (yellow line) and main alarm (red line) if they are defined for the characteristic. By clicking again, you remove them again.

If the alarm limits are not shown, the scale adapts to the highest peaks.



Trend Viewer only

Click here to show the time signal markers. By clicking again, you remove them again.



Double-click a time signal marker to jump to the corresponding time signal in the **time signals for the selected characteristic value** list. This is useful when you are viewing multiple time signals in the Trend Viewer. For this function, the characteristic value to which the time signals belong must be selected in the plant tree.



Trend Viewer only

Click here to calculate mean values. You have the following options:

- **Show average values:** Use this option to display the averaged values in the diagram.
- **Averaging options:** This option opens the **Averaging options** dialogue. You can find details on this in the **Setting averaging options** 35 section.



Trend Viewer only

Click here to view expert opinions in trend, or to add and edit them. You have the following options:

- **Show expert opinion in trend:** Activate this option to display all of the expert opinions in trend.
- **Edit expert opinion:** This option opens the **Edit expert opinion** dialogue box. Here, you can change existing expert opinions and add new expert opinions.
  For details, see the **Edit Expert Opinion** 68 section.



Trend Viewer only

Click here to create a distribution diagram. You can find details on this in the **Measurement job** 22 section: **Create distribution diagram** 22.



Spectrum Viewer only

Click here to integrate signals into the Viewer. You can find details on possible settings in the **Integrate signals** 75 section.



Spectrum Viewer only

Click here to differentiate signals. With this function, you can derive the acceleration spectrum from a velocity spectrum.



Time Signal Viewer only

Click here to calculate the spectrum/spectrogram from the signal. You can find details on this in the **Calculate spectrum** 77 section.



Time Signal Viewer only

Click here to calculate the demodulation of the signal. Damage can be detected more easily in the envelope than in the raw signal.
The envelope can only be calculated from a raw signal. This button is disabled if there is no raw signal.



Time Signal Viewer only

Click here to listen to the time signal.



Spectrum Viewer only

Click here to calculate order or frequency spectrums automatically. You can find details on possible settings in the **Calculate order spectrum** 78 section.



Spectrum Viewer only

Click the  button to display the results of the Condition Analyser in the spectrum or the  button to display the results in a table.

One of the following options is displayed:

- Damage frequencies of bearings.
- Damage frequencies from HSB analysis. This analysis contains frequencies that the Condition Analyser considers to be damage frequencies.



Click on this button to hide the toolbar of the selected diagram. As soon as you move the mouse over the toolbar it will become visible again, enabling you to use its functions.

To make it permanently visible again, select the diagram and click on the button in the toolbar again.

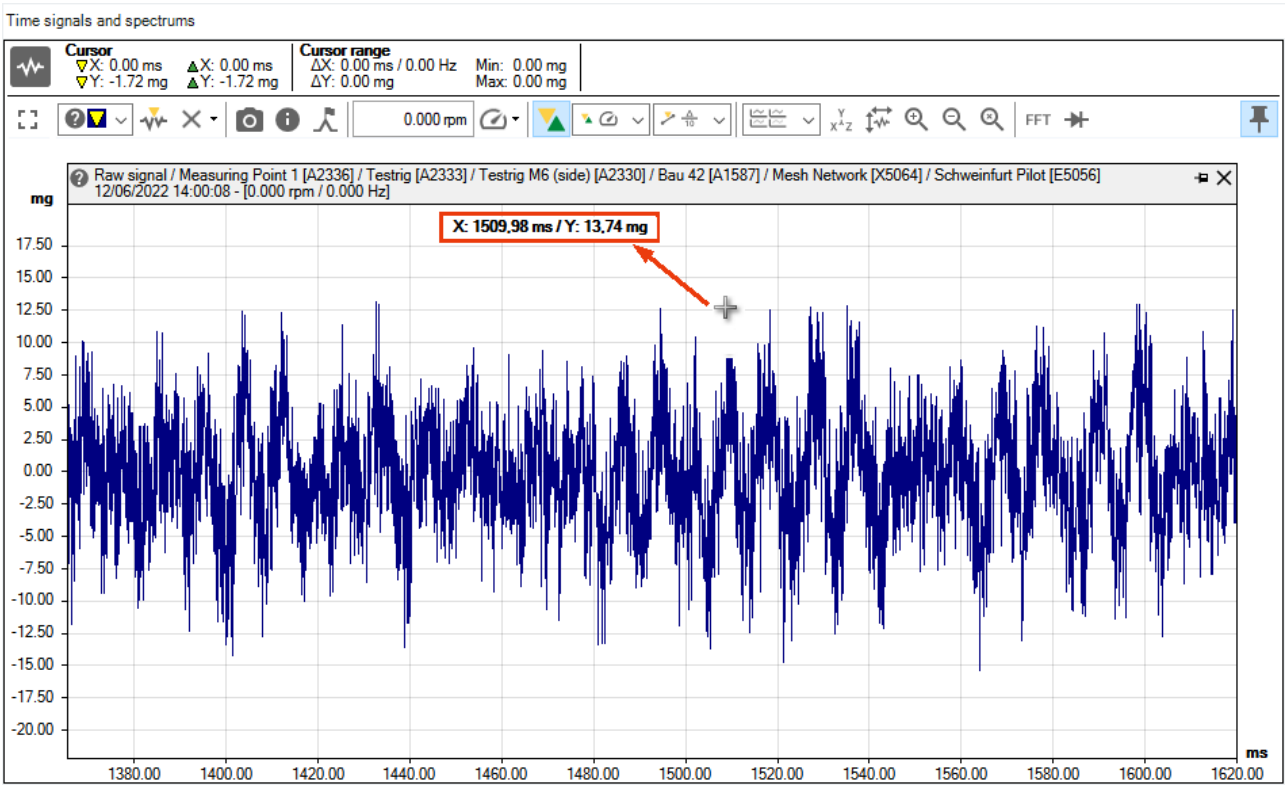


If you want to hide the toolbars for all Viewers when you start the Schaeffler OPTIME ExpertViewer software, you will need to adjust the Viewer program settings:

1. Right-click to open the context menu for the Viewer 14 and select **Settings**.
2. Click on **Viewer** 85 in the left-hand area.
3. In the **Visible elements on startup** section, uncheck the **Toolbar** option. The toolbar will not appear in any viewer when the program is next started.

Diagram

How the diagram is displayed initially depends on the type of viewer, i.e. whether the diagram is viewed in the Trend Viewer, the Time Signal Viewer or the Spectrum Viewer. Information on the mouse position is provided in the same manner in all diagrams: As soon as you move the mouse over a diagram, information on the mouse position is displayed in the top right corner:



Generally speaking, you can change the display directly in the diagram as follows:

- **Base cursor positioning:** Click on the required location in the diagram. The base cursor automatically jumps to that position.
- **Measure cursor positioning:** Hold the SHIFT key and click at the required position in the diagram. The measure cursor automatically jumps to this position.
- Drag the **base cursor** 50 **or measure cursor** 50**:** To do so, move the mouse over the cursor guide until the mouse pointer turns into a double-headed arrow ↔. Now press and hold the left mouse button and drag the cursor to the desired position.
- **Zoom functions**: The mouse and keyboard offer numerous options for zooming into and out of the graph view. To zoom into the diagram, for instance, click inside the diagram, press and hold the left mouse button and drag the mouse over a section of the diagram. Use the back key to undo a zoom step. For detailed information on possible zoom functions, see **Appendix I: Zooming in a diagram** 95.

You can specify further settings for diagram display at the following locations in the Schaeffler OPTIME ExpertViewer software:

- Use View options 59 to determine how the data should be displayed in the diagram, for instance as a **list** or as a **matrix**.
- Use your selection in the device overview 16 and in the list of time signals 25 to determine which data is loaded and displayed in the diagram.
- Use the cursor options 50 to determine, for instance, which cursor and cursor functions are displayed in the diagram.
- Use the axes settings 65 to determine the unit and scaling of the diagram axes.
- You can adjust numerous general diagram display settings in the **Settings** 84 dialogue box; for instance, you can define the colours for the data displayed, symbols for cursors and cursor functions, and the unit profile to be used for axis scaling. You can also set separate settings for each of the three Viewers.

You can also set a trend or signal as a reference:

To do this, click the button in the title bar of the diagram area:

- A trend set as a reference is then visible in a separate diagram area in the Trend Viewer when you select a different characteristic value in the device/plant tree.
- Time signals set as a reference remain available via the signal selection list in the Time Signal or Spectrum Viewer – even if you select time signals of another characteristic value.
- Clicking the button again cancels the reference. Clicking removes the diagram from the Viewer.
- An oblique icon indicates that the viewer contains both signals set as a reference and other signals.

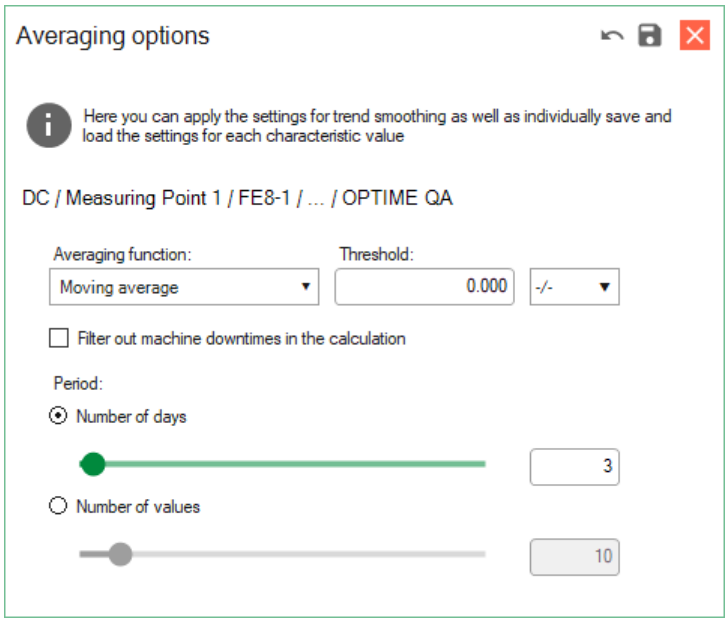
Right-clicking in any of the Viewers will open a context menu with access to important cross-program functions; the example shows the context menu in the Time Signal Viewer:



You will find a brief explanation of these functions and links to additional information in the **User interface overview** 14 section.

8.1 Setting averaging options

Mean values are useful for assessing the status of a machine. Click the button on the Trend Viewer toolbar to **show average values**. You will also find the **Averaging options** option here. This opens the **Averaging options** dialogue, where you can set details of the averaging calculation for the currently selected characteristic value:

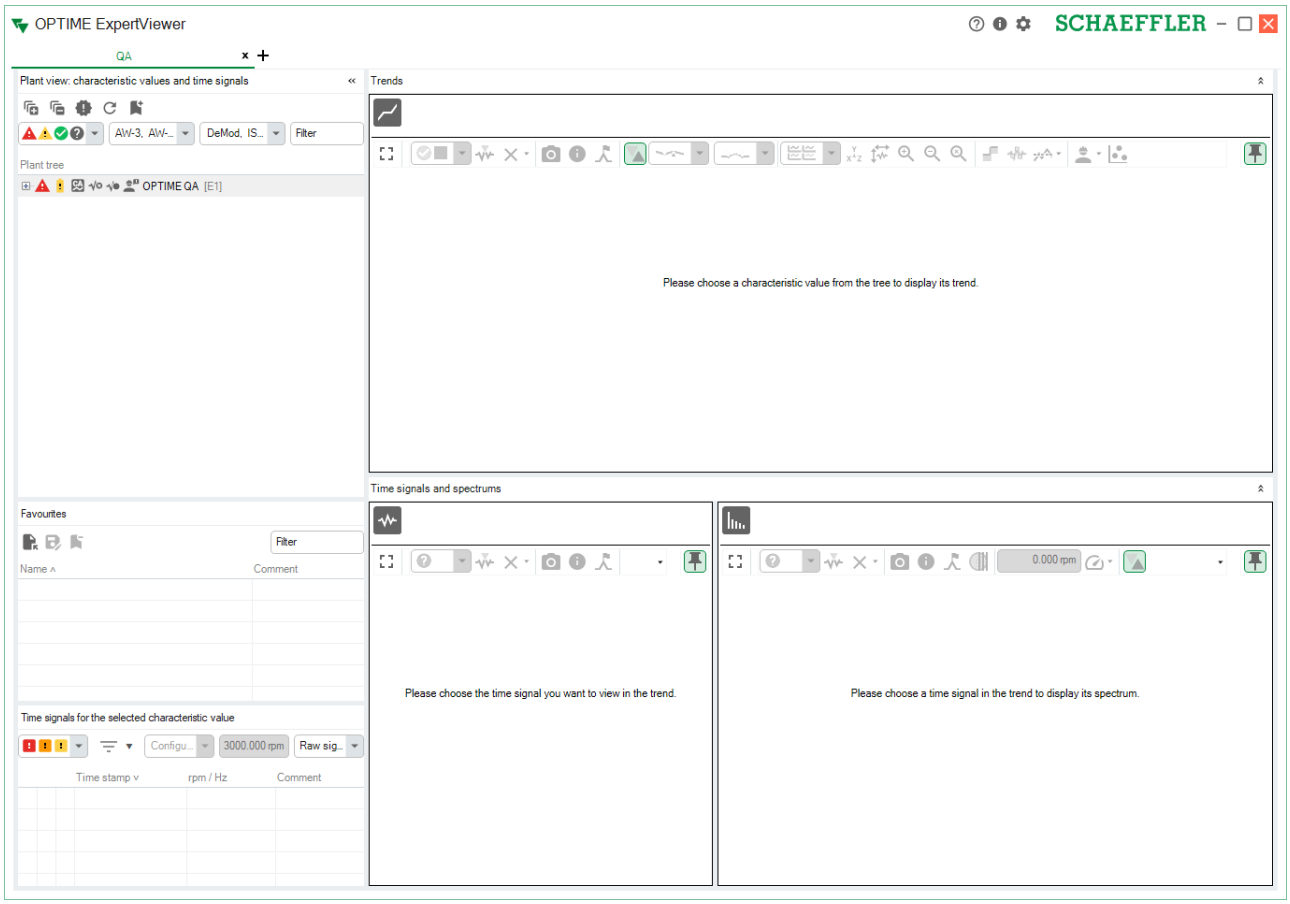


Here you have the following options:

Averaging function and threshold	Select the averaging function, **moving average** or **moving median**. You can also specify the **threshold** at which values are to be taken into account for averaging. By default, the **moving average** is calculated without a **threshold**.
Filter out machine downtimes ...	Activate this option to ignore machine downtimes during averaging and to calculate value gaps. This option is disabled by default.
Period	Specify the **number of days** or the **number of values** over which the averaging is calculated. By default, a period of **3 days** is set.
	Click this button to save the settings for the selected characteristic value.
	Click this button to load the last saved setting.
	Click this button to close the dialogue without saving any changes.

8.2 Opening and removing data

The list of **Time signals for the selected characteristic value** at the bottom left as well as the Trend Viewer, Time Signal Viewer and Spectrum Viewer are still empty:



In the following sections you will learn how to select the data for analysis and open it in the individual viewers, and how to remove the selected data again:

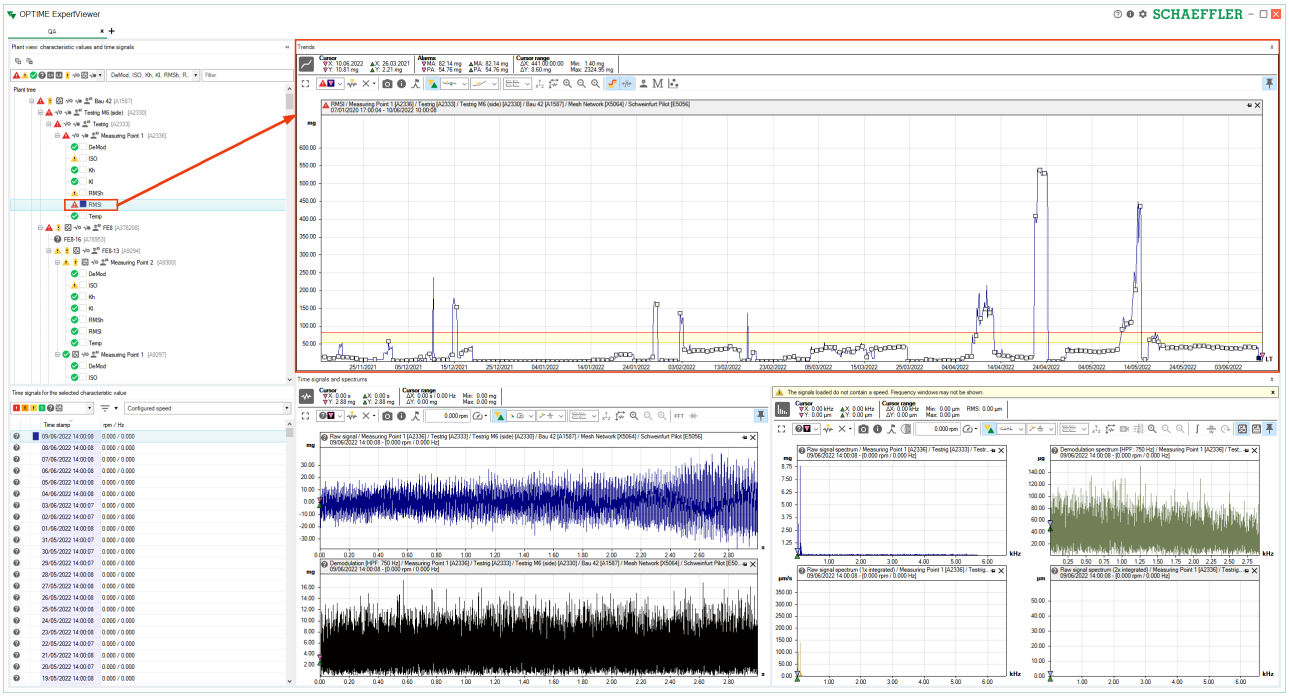
- Open one trend 37 (Trend Viewer)
- Open several trends 38 (Trend Viewer)
- Open one time signal 38 (Time Signal and Spectrum Viewer)
- Open several time signals at the same time 40 (Time Signal and Spectrum Viewer)
- Open time signals from the Trend Viewer 40 (Time Signal and Spectrum Viewer)
- Open spectrum from the Time Signal Viewer 41 (Spectrum Viewer)
- Remove data from the viewers 41



In the device/plant tree and in the list of **Time signals for the selected characteristic value,** you can display a preview of the associated signals. Move the mouse over the appropriate alarm symbol.

Open one trend (Trend Viewer)

Click on the characteristic value in the device/plant tree to load its trend in the Trend Viewer. The list of **Time signals for the selected characteristic value** is also displayed. The last available time signal will be loaded in the Time Signal/Spectrum Viewer:



Open several trends (Trend Viewer)

You can compare the trends of several characteristic values with each other by going to the **device overview** and selecting several characteristic values:

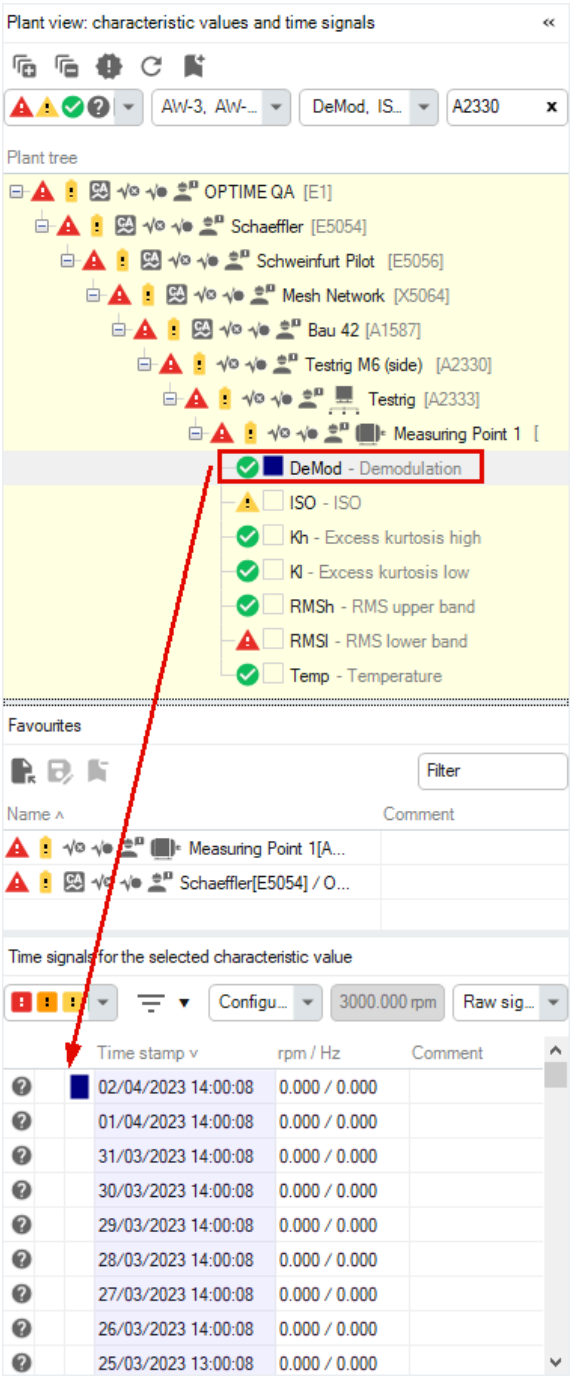
1. Click the first characteristic value to display the corresponding trend.
2. Click the  button in the trend diagram to set the diagram as a reference.
3. If you now click the next characteristic value in the tree, the corresponding diagram will also be displayed in the Trend Viewer. The type of display depends on which diagram view you have selected :



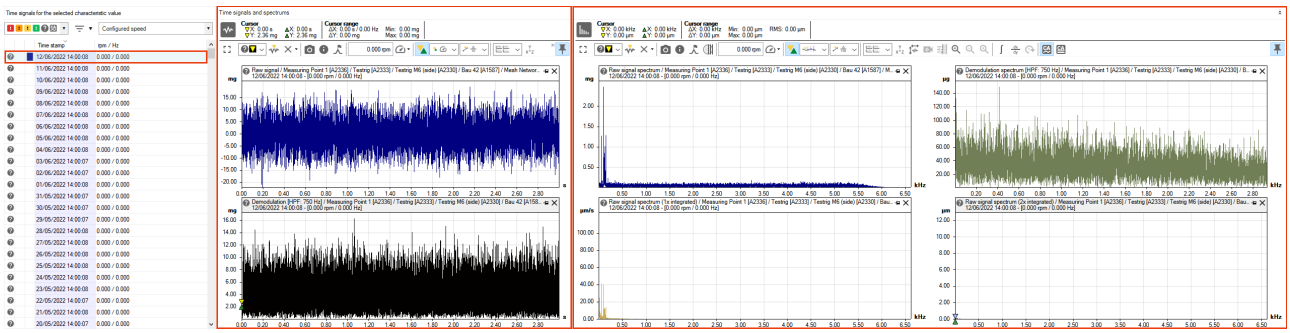
With each additionally opened trend, the Time Signal and Spectrum Viewer are also adapted: For each loaded trend, the last available time signal is loaded in the Time Signal and Spectrum Viewer.

Open one time signal (Time Signal and Spectrum Viewer)

1. Select the characteristic value for which you want to load a time signal. This fills the list of **Time signals for the selected characteristic value** and the latest time signal is displayed in the Time Signal and Spectrum Viewer. What you actually see depends on your version of the software:



2. Click the time signal that you would like to load in the Time Signal and Spectrum Viewer. The signal is then displayed directly:



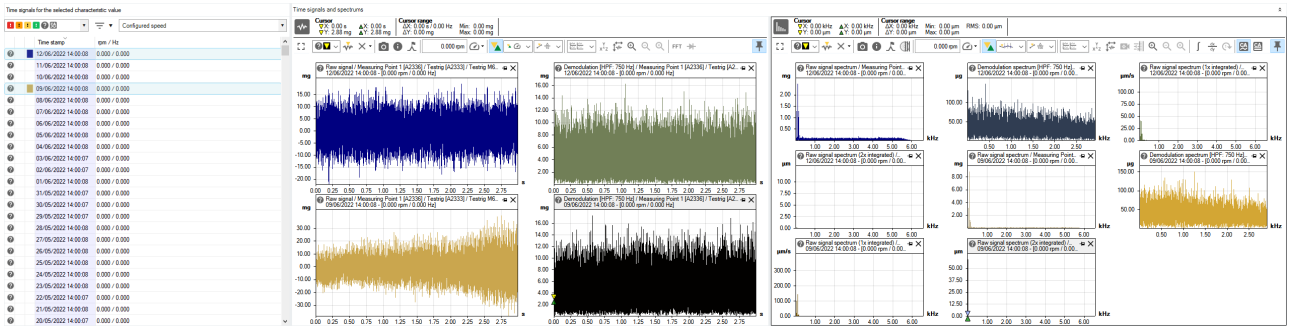
The representation of the spectrums is limited as follows:

- Raw signal spectrums are displayed in full.
- Envelope curve spectrums are truncated depending on sampling rate and high pass frequency.
- Integrated spectrums are only displayed up to a value of 1000 Hz.

However, additional measurement data are still available. To display them, click the **Auto-adjust axis limits** button .

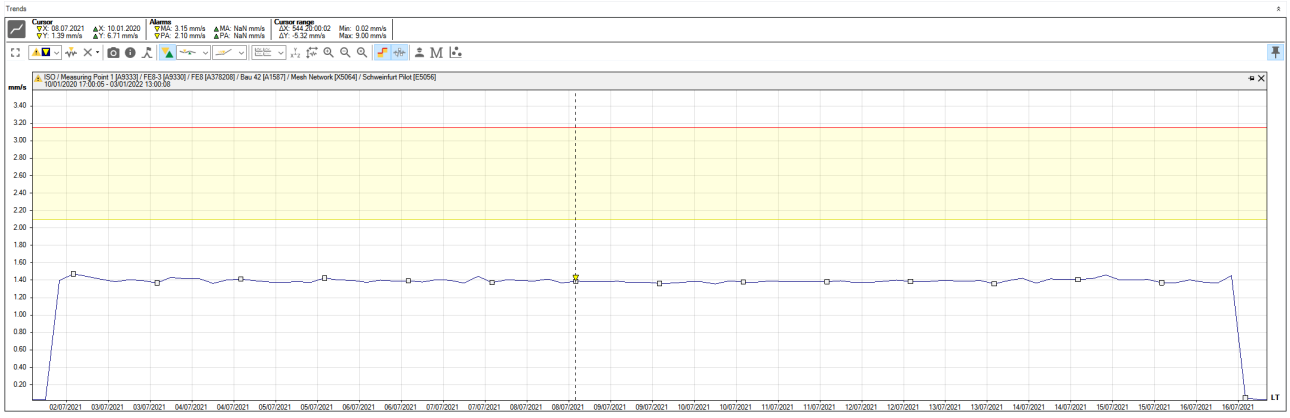
Open several time signals at the same time (Time Signal and Spectrum Viewer)

1. In the list of **Time signals for the selected characteristic value,** select the time signals that you would like to load into the Time Signal and Spectrum Viewer.
   You have the following options:
   - Shift + click: Selects all the time signals that are located in the list between the first and second clicks.
   - CTRL + click: Adds each clicked time signal to the previous selection.
2. All the selected signals are displayed in the Time Signal and Spectrum Viewer:

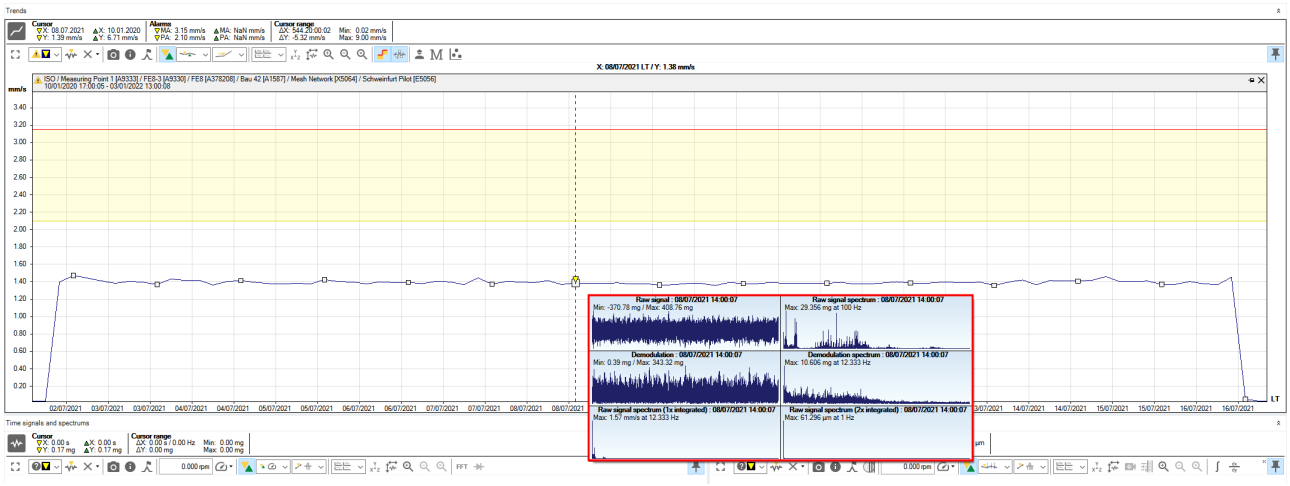


Open time signals from the Trend Viewer (Time Signal and Spectrum Viewer)

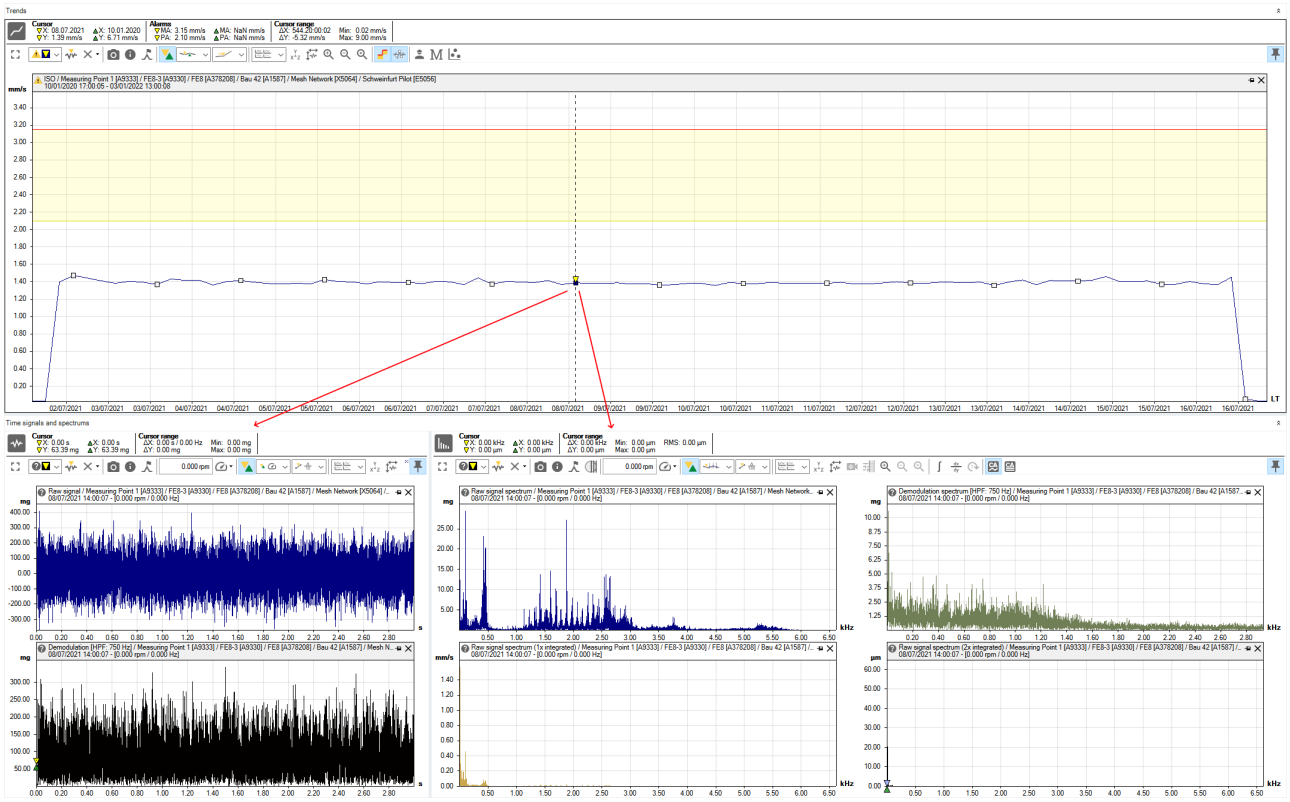
1. Show the time signal marker in the Trend Viewer. To do so, use the button in the toolbar:



2. Click within the Viewer and move the mouse over a time signal marker to see a preview of the diagram and to make it easier to select the required time signal:



3. Double click on the time signal marker to load the associated diagram in the Time Signal and Spectrum Viewer:



The default symbol for the time signal marker is a box; however you can define a different symbol under **Settings > Symbols** 87 in the context menu for the Viewer.

Open spectrum from the Time Signal Viewer (Spectrum Viewer)

You can create a spectrum in the Spectrum Viewer directly from within the Time Signal Viewer and specify your own settings, e.g. for windowing. To do so, use the function **Calculate spectrum** 77 FFT in the toolbar for the Time Signal Viewer.

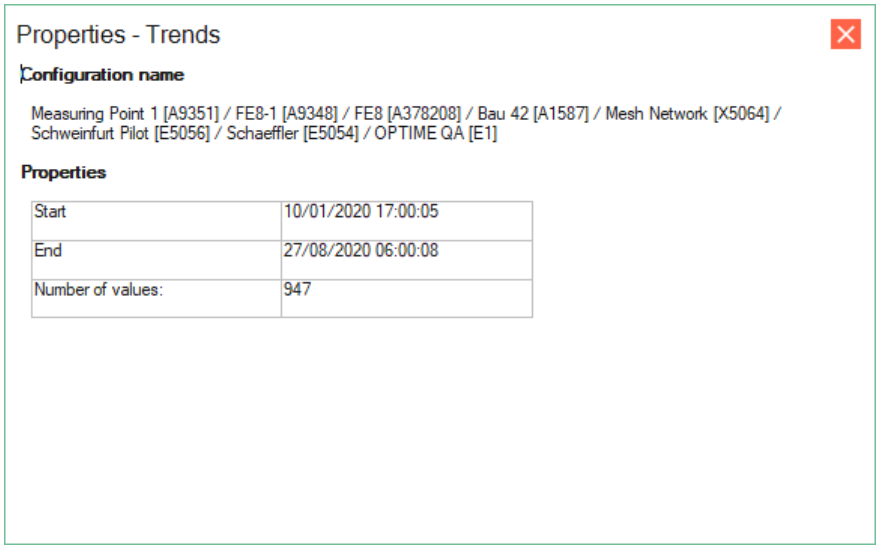
Remove data from the viewers

You have several options to remove data from the viewers:

- You can deselect a time signal in the list of time signals for the selected characteristic value. As a result, the associated signals will be removed from the Time Signal Viewer and the Spectrum Viewer.
- In the toolbar for each viewer, using the ✕ button you will find functions which you can use to remove certain signals from the diagram. More details on this can be found in the **Viewer and diagram** 31 section.
- In the title bar to the right of each diagram, you will find the ✕ button that you can use to close the diagram.

8.3 Show signal properties

If you click on ⓘ in the toolbar, a dialogue box opens with an overview of the most important properties of the active signal:



Here you will find, for instance, the name of the configuration and measurement, the time stamp and the sample rate. For trend, you will also find details of the start and end timepoint for the data set.

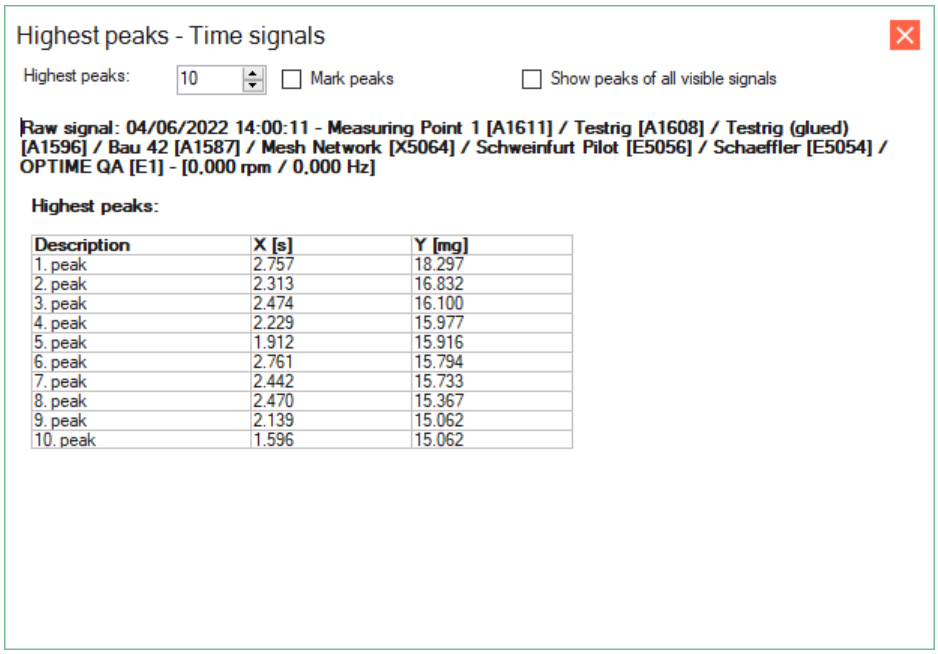
You can select these details, use **CTRL+C** to copy them to the clipboard and then use **CTRL+V** to paste them into a Word document, for instance.



When the **histogram** chart view is active, the **Properties - Trends** dialogue box will display detailed information about the histogram 62.

8.4 Show highest peaks

If you click on ⚑ in the toolbar, a dialogue box opens. Here you will find a table with the highest peaks for the active signal:



Description	X [s]	Y [mg]
1. peak	2.757	18.297
2. peak	2.313	16.832
3. peak	2.474	16.100
4. peak	2.229	15.977
5. peak	1.912	15.916
6. peak	2.761	15.794
7. peak	2.442	15.733
8. peak	2.470	15.367
9. peak	2.139	15.062
10. peak	1.596	15.062

Here you have the following options:

- **Highest peaks:** Determine how many peaks in total should be calculated.
- **Mark peaks:** Activate this option to show the peaks in the diagram. If you do not activate this checkbox, the peaks will only be listed in tabular form.
- **Show peaks of all visible signals:** Activate this option to determine the peaks not only for the active signal/spectrum, but also for all of the signals/spectrums that are selected in the **Time signals for the selected characteristic value** 25 list. The peaks are then listed in tables; the name of the corresponding signal or spectrum is shown in the header of each table. If you have activated the **Mark peaks** option, you will also see all of the peaks displayed in the diagram.

You can select the table(s), use **CTRL+C** to copy them to the clipboard and then use **CTRL+V** to paste them into a Word document, for instance.



- You can define the symbol by which the peaks are denoted in the diagram under Symbol settings 87. To do so, open the context menu for the Viewer 14 and select the **Settings** command. In the **Settings** dialogue box, under **Cursor** you can use the **Other** option to change the shape and colour. Whatever you create here will appear as the symbol for peaks in the diagram.

8.5 Showing the bearing database

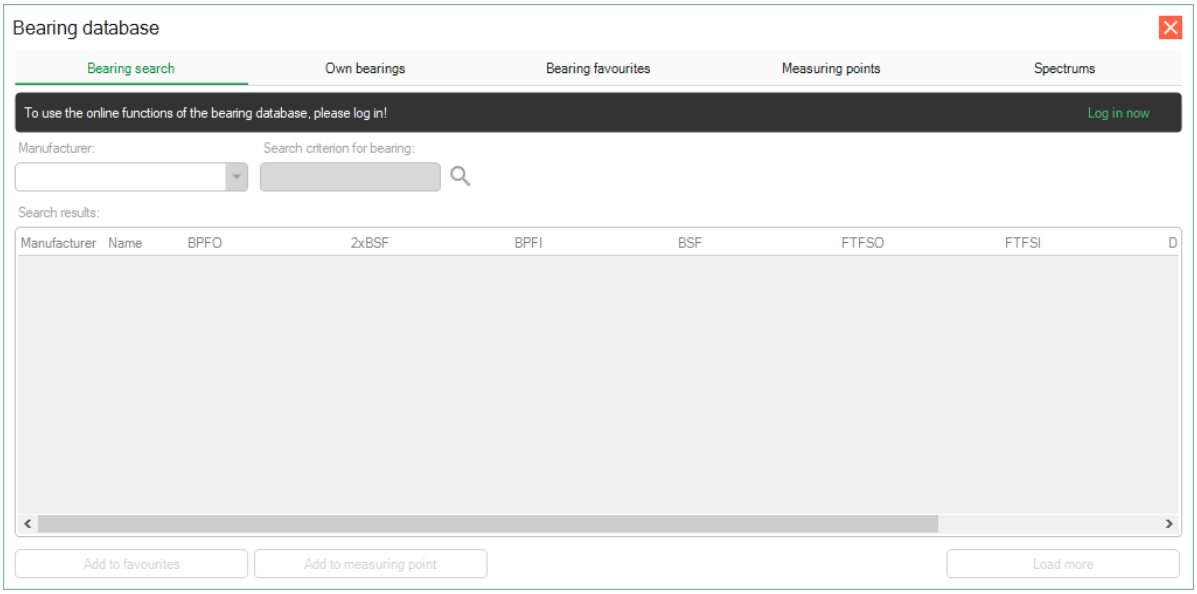
The **Show bearing database/frequency bands** function is only available in the toolbar for the Spectrum Viewer. It opens the **Bearing database** dialogue, which offers numerous functions for working with the bearing database across several tabs.



The frequencies that you find in the database are particularly important for vibration analysis.

To use the functions of the bearing database, proceed as follows:

1. Click on the **Show bearing database / frequency bands** button. The **Bearing database** window opens with the **Bearing search** tab:

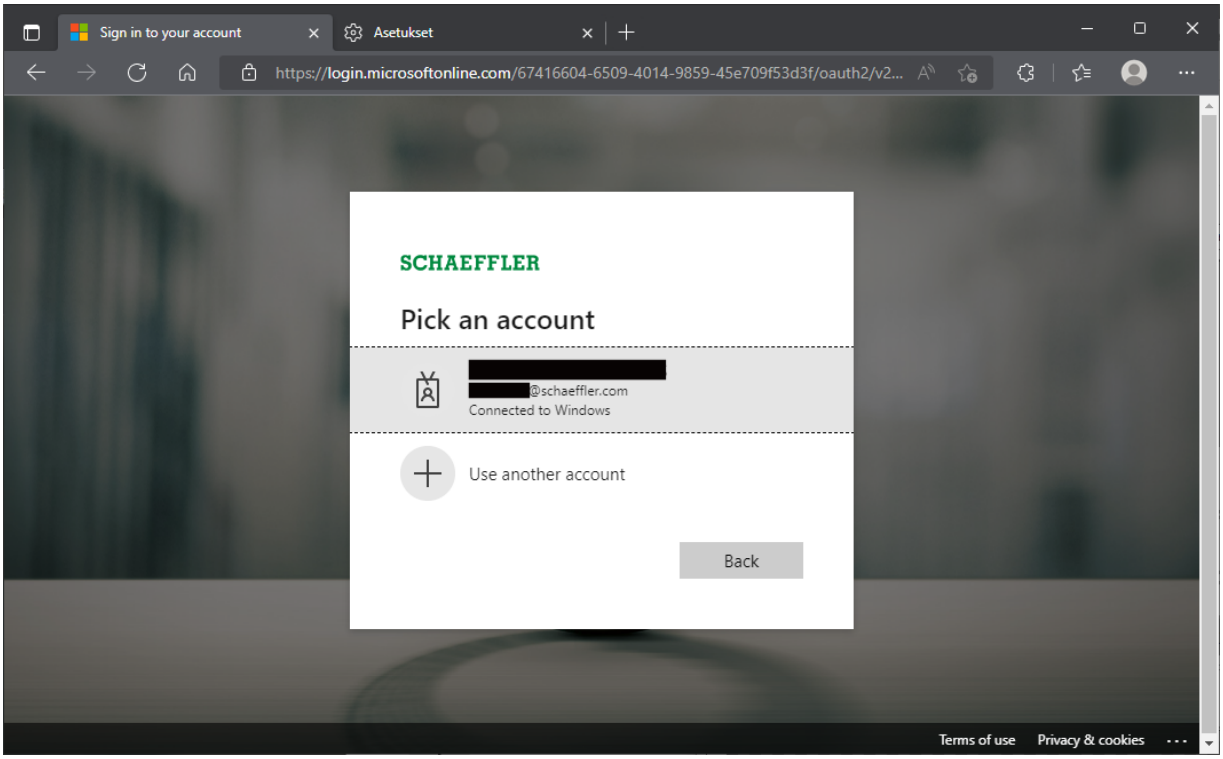


2. You must log in to the bearing database in order to be able to use all the functions in the **Bearing search** and **Own bearings** tabs. To do this, click the **Login now** button in the upper right corner.

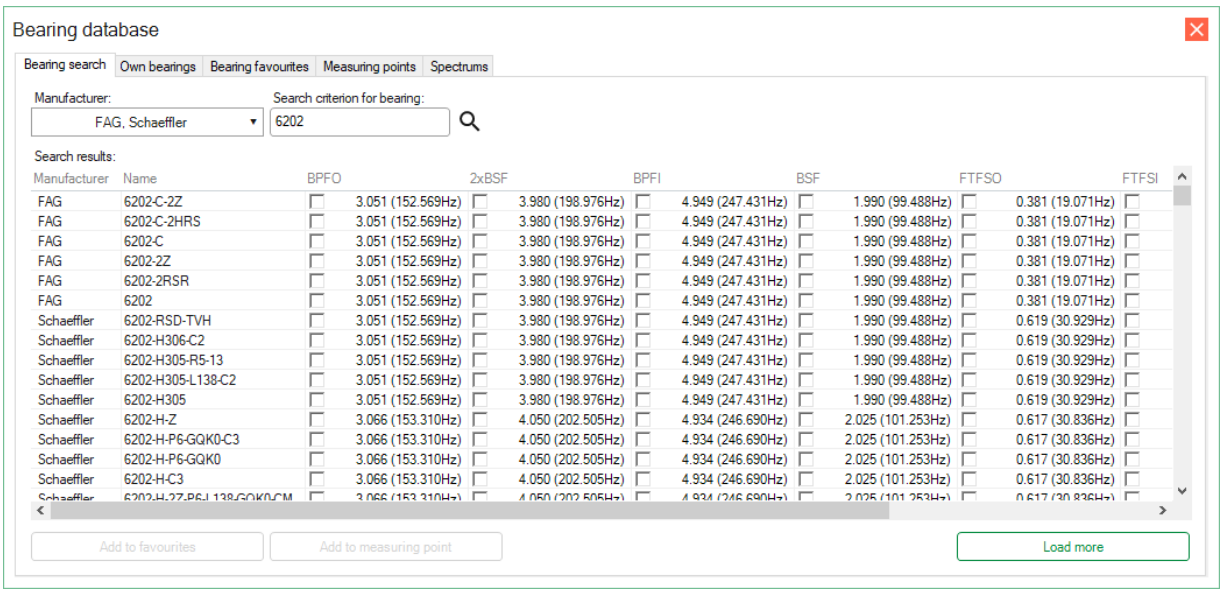


The functions of the **Bearing favourites**, **Measurement points** and **Spectrums** tabs can be used without logging in.

3. The login dialogue opens in your standard browser:



4. Select your user account and complete the login process with two-factor authentication.
5. Close the tab in the browser and return to Schaeffler OPTIME ExpertViewer. All functions in the **Bearing search** and **Own bearings** tabs are now available to you.



- During a session with the Schaeffler OPTIME ExpertViewer software, you only need to connect to your account the first time you launch the bearing database.
- By default, the **Bearing search** tab opens the first time the bearing database is started. Each time you start the database again in the same session, the tab that you had opened last opens first.

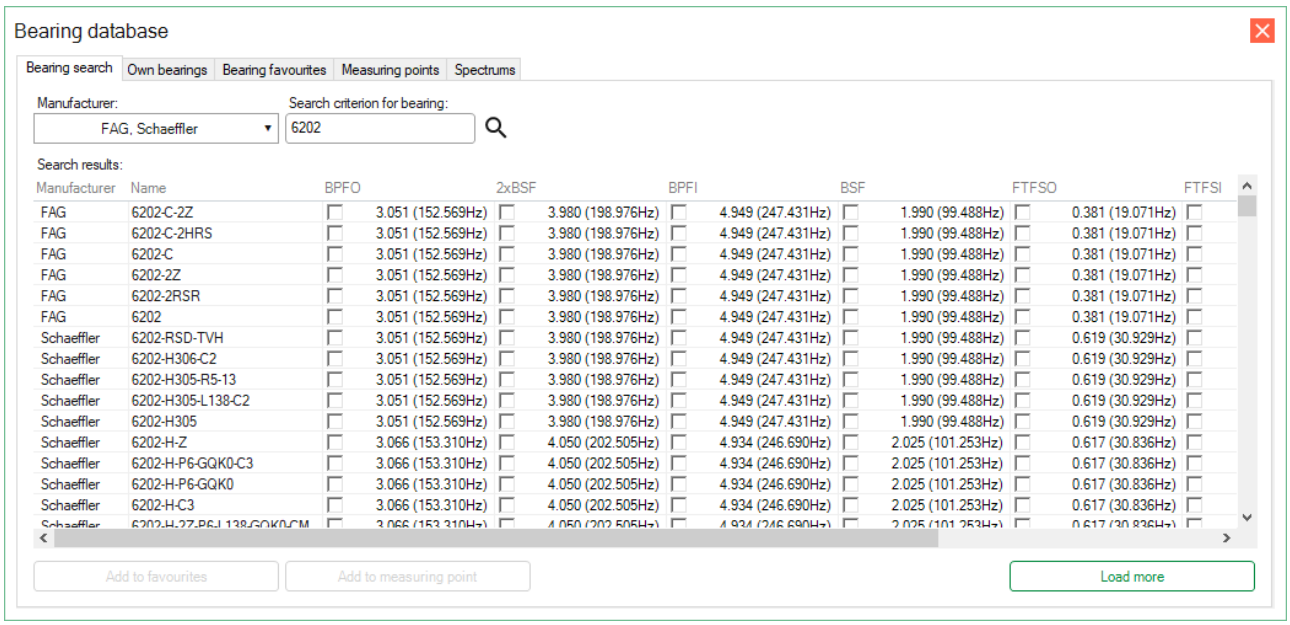
For information on the different options in the bearing database, see the following sections:

- Bearing search 45
- Creating your own bearings 47
- Managing favourite bearings 48
- Managing bearings at the measurement point 49
- Viewing the bearings of the loaded spectrums 49

8.5.1 Bearing search

These functions are only available if you are logged into the bearing database.

In the **Bearing search** tab , you can search for and manage stock:



You have the following options:

Manufacturer

Open the list and click on a manufacturer name to exclude it from or include it in the search. All manufacturers are included in the search by default.

Search criterion

Enter at least one character or any string in this field and click the **Search** button to filter the search result further.

Search results

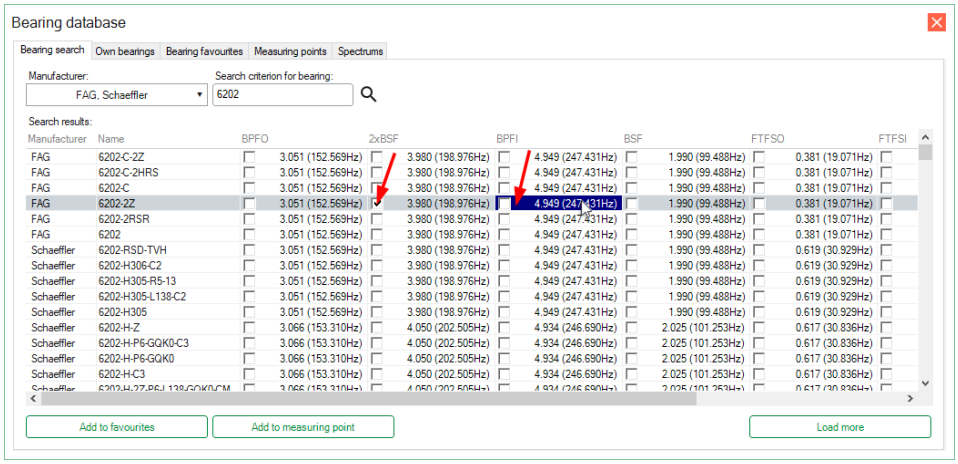
In this table, you will find all bearings that meet your search criteria. You can select bearings as follows:

Left-click: Selects the bearing.

CTRL + left-click: Adds the bearing to an existing selection.

SHIFT + left-click: Selects all bearings between the first and last selected bearings.

Hovering the mouse over an entry in the table displays the corresponding frequencies in the spectrum diagram. Click on the checkbox to display a frequency permanently:



Add to favourites

Click this button to add currently selected bearings to the **Favourite bearings** 48.

Add to measuring point

Click this button to add currently selected bearings to the selected measurement point 49.

Load more

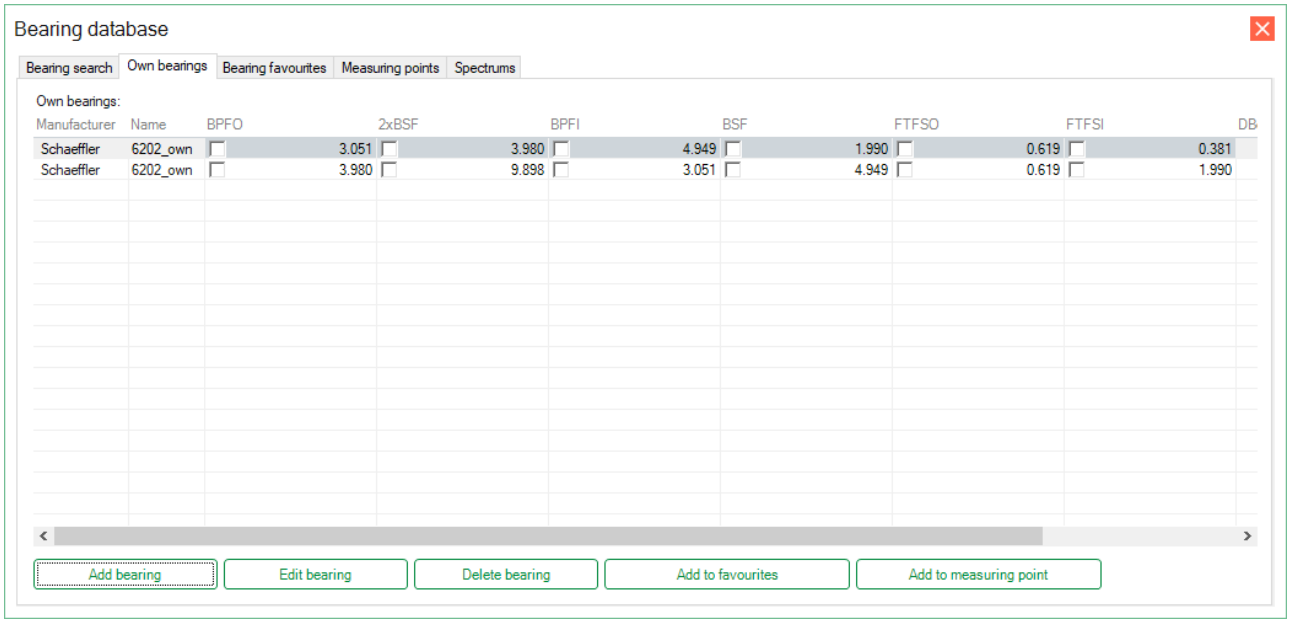
By default, a maximum of 250 bearings are loaded and displayed in the table. Click **Load more** to load and view an additional 250 bearings.

8.5.2 Creating your own bearings



These functions are only available if you are logged into the bearing database.

In the **Own bearings** tab, you can add your own bearings to the database and manage your existing bearings:



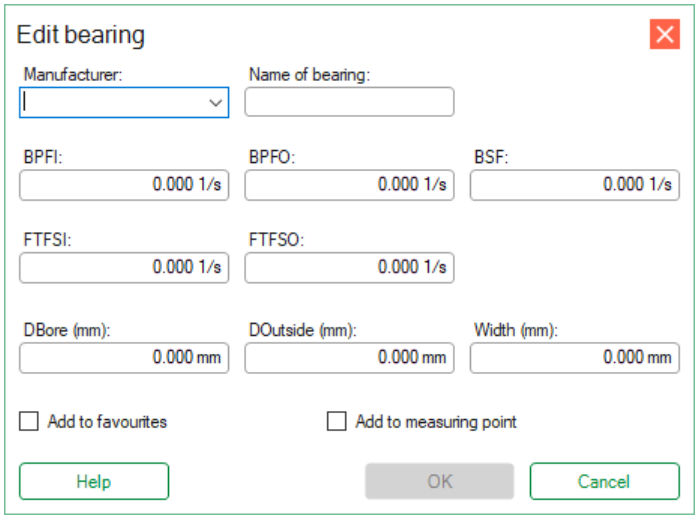
You have the following options:

Own bearings

This table lists all the bearings that you have manually added to the bearing database. You have the same selection options 45 in this table as in the table in the **Bearing search** tab.

Add bearing

Click on this button to add your own bearing to the bearing database. The **Add bearing** dialogue opens:



You have the following options:

Manufacturer: Enter the name of the bearing manufacturer here.

Name of bearing: Enter the name of your bearing here.

Enter the bearing-specific information in the following fields:

BPFI: Here you can determine the cycling frequency of the inner ring (or Ball Pass Frequency Inner race).

BPFO: Here you can determine the cycling frequency of the outer ring (or Ball Pass Frequency Outer race).

BSF: Here you can determine the rotation frequency of the rolling element (or Ball Spin Frequency).

FTFSI: Here you can determine the fundamental train frequency with a stationary inner ring (or Fundamental Train Frequency Standing Inner race).

FTFSO: Here you can determine the fundamental train frequency with a stationary outer ring (or Fundamental Train Frequency Standing Outer race).

DBore (mm): Here you can determine the bore diameter in millimetres (Diameter Bore).

DOutside (mm): Here you can determine the outside diameter in millimetres (Diameter Outside).

Width (mm): Here you can determine the bearing width in millimetres.

Add to favourites: Select this option to add the bearing to the Favourite bearings 48.

Add to measurement point: Activate this option to add the bearing to the selected measurement point 49.

Click **OK** to add the bearing to the database.

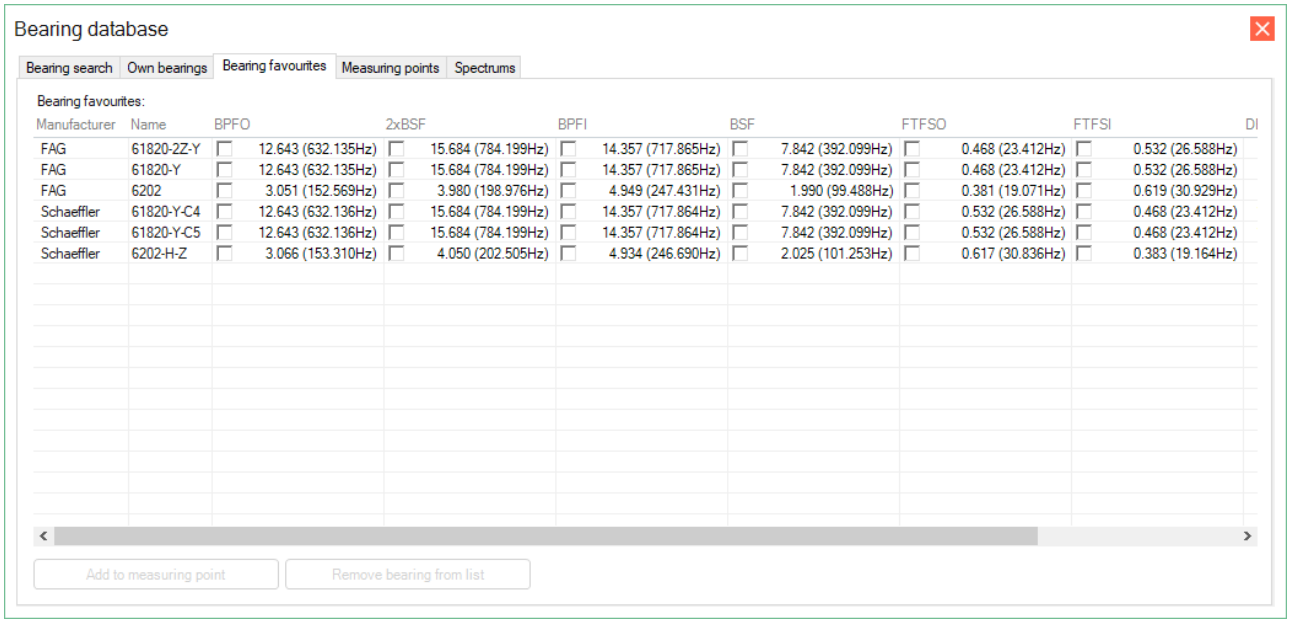


Your bearing-specific information in the **Add bearing** dialogue box is continuously validated. If your information is not correct, relevant notes will appear next to the input fields.

Edit bearing	Click this button to edit the selected bearing. The **Edit bearing** dialogue opens. Change the desired entries and confirm the changes with **OK**.
Delete bearing	Click this button to delete the selected bearing.
Add to favourites	Click this button to add currently selected bearings to the **Favourite bearings** 48.
Add to measuring point	Click this button to add currently selected bearings to the selected measurement point 49 .

8.5.3 Managing favourite bearings

In the **Favourite bearings** tab, you will find the bearings that you have selected in the other tabs via the **Add to favourites** button:



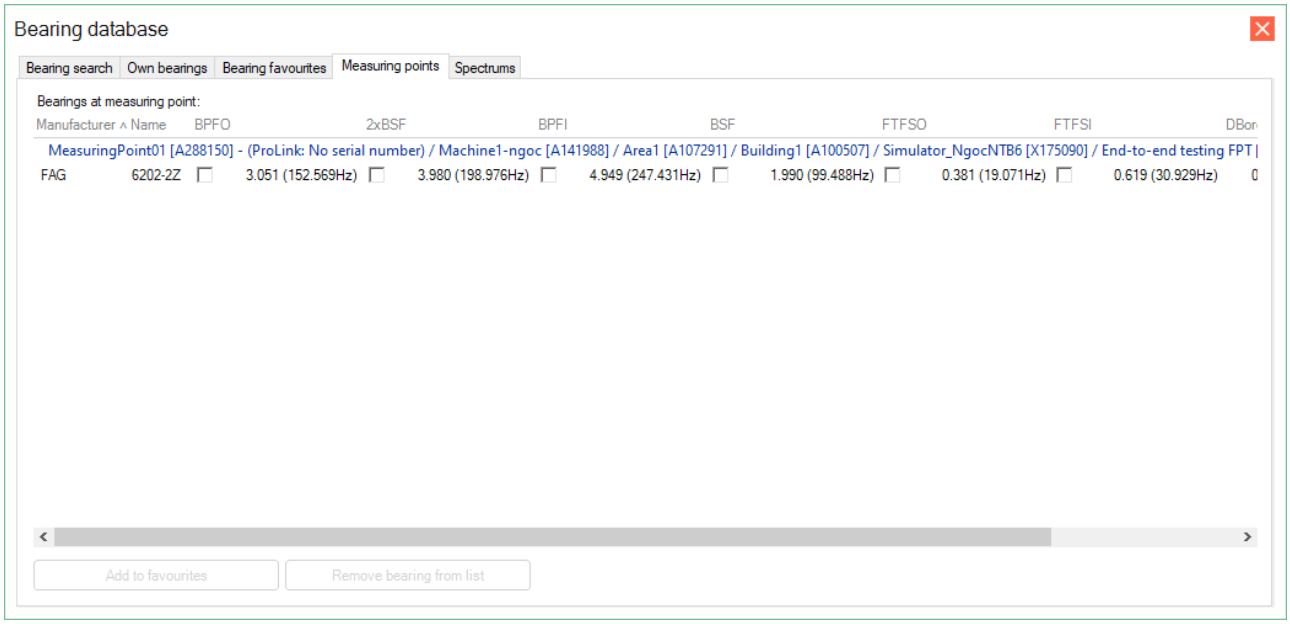
You have the following options:

Bearing favourites	This table contains all the bearings that you have selected as favourites in the other tabs. You have the same selection options 45 in this table as in the table in the **Bearing search** tab.
Add to measuring point	Click this button to remove currently selected bearings from the list of favourites.

Remove bearing from list	Click this button to remove currently selected bearings from the list of favourites.

8.5.4 Managing bearings at the measurement point

In the **Measurement points** tab, you will find the bearings defined for the selected measurement points:

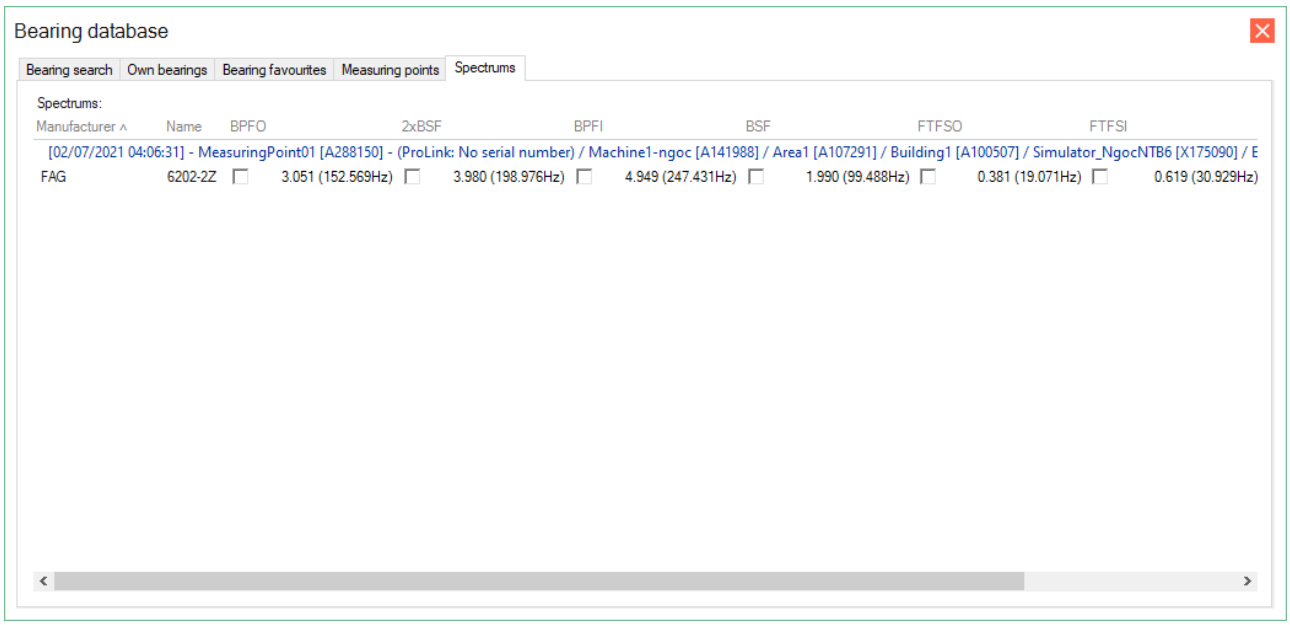


You have the following options:

Bearings at measuring point	This table lists all bearings defined for the currently selected measurement points. You have the same selection options 45 in this table as in the table in the **Bearing search** tab.
Add to favourites	Click this button to add currently selected bearings to the **Favourite bearings** 48.
Remove bearing from list	Click this button to delete currently selected bearings from the list of measurement points.

8.5.5 Viewing the bearings of the loaded spectrums

In the **Spectrums** tab, you will find the bearings that are assigned to the relevant measurement point of the spectrum. If spectrums of different measurement points are loaded with bearings, they are displayed here:



As in the result table of the bearing search 45, you can also hover the mouse over an entry to display the corresponding frequencies in the spectrum diagram. Tick the box to display a frequency permanently.

8.6 Set speed/frequency

If you click in the toolbar, a menu opens with the following options:

- **Apply cursor value:** The speed value calculated from the cursor position is applied to the loaded signals. For the time signal, the distance between the base cursor and measure cursor is used. For the spectrum, the value is calculated from the position of the base cursor. The keyboard shortcut for this function is CTRL + SHIFT + T
- **Apply value to loaded signals:** The speed value of the active signal (identified with a yellow triangle) is applied to all the signals currently loaded in the Viewer.
- **Reset the value of the active signal:** This command resets the speed/frequency for the active signal to the original value.
- **Reset values for all signals:** This command resets the speed/frequency for all signals loaded in the Viewer to the original value.
- **RPM:** Activate this option if you want to specify the speed in **rpm**.
- **Hz:** Activate this option if you want to specify the rotational frequency in **Hz**.

8.7 Cursor setting

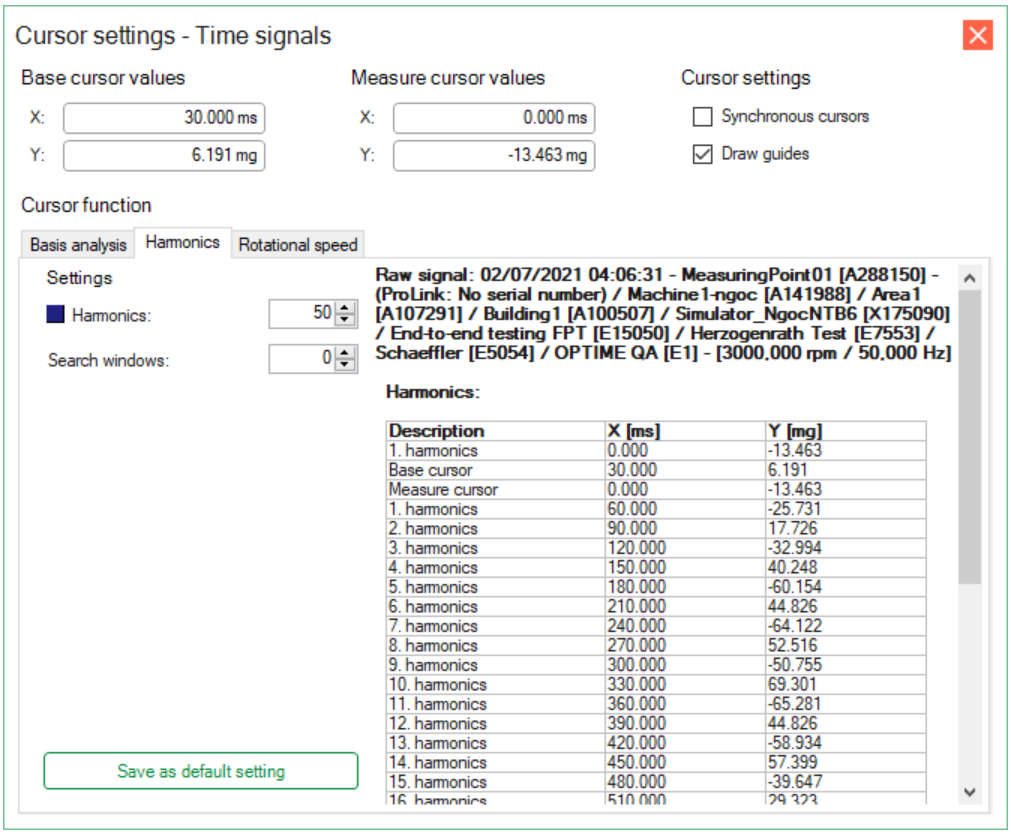
If you click on in the toolbar, a menu opens, in which you can selected the required cursor function 51. In addition, you can open the **Cursor settings** dialogue box from this menu. The **Cursor settings** dialogue box has many options designed to help you use the base and measure cursors and the associated cursor functions 51.

Use the **base cursor** to define the base value for your analysis. In the Spectrum Viewer, for instance, this would be the base frequency you want to determine the harmonics for; you can set the base cursor to a specific time point in the time signal and apply the desired cursor function from then on.

The **measure cursor** is used together with the base cursor to measure and define areas in which the specific cursor functions are then carried out.

The dialogue box is split into two areas:

- In the upper section you will find general settings, which apply for each selected cursor function.
- In the lower section **Cursor function** you will find the tabs for the individual cursor functions and can configure additional settings for each function. By default, you will see the cursor function that is currently selected here:



You have the following options in the area for general settings:

Base cursor or measure cursor values

These fields show the current position of each cursor on the X and Y axis. Click inside a field to enter a value and directly change the cursor's position.

Cursor settings

Synchronous cursors

Activate this option to carry out your selected cursor actions - for instance, positioning the base cursor or applying cursor functions - for all loaded signals.

If the checkbox is deactivated, your cursor functions will only be executed for the active signal 25.

Draw guides

Activate this option to show vertical guides at the cursor position in the diagram in addition to the cursor symbols. The guides for base cursor and measure cursor are dashed; those for cursor functions are solid.

If the checkbox is deactivated, you will only see the cursor symbols in the diagram.

If you deactivate the **Draw guides** option, the guides of the currently active signals remain visible. Only the guides of the inactive signals disappear.

In the **Cursor function** area, your options depend on which function is currently selected. Selecting a tab in the **Cursor function** area determines the cursor function. You can then configure additional settings for this cursor function and use the **Save as presetting** button to set these settings to apply by default.

The availability of tabs depends on which Viewer is active. You will find detailed information on individual sub-tabs in the corresponding section:

- **Basis analysis** 52
- **Harmonics** 54
- **Sidebands (Spectrum only)** 55
- **Harmonics with sidebands (Spectrum only)** 56

- **Gear mesh (Spectrum only)** 57
- **Speed** 53



The only cursor function available for the Trend Viewer is **basis analysis**.

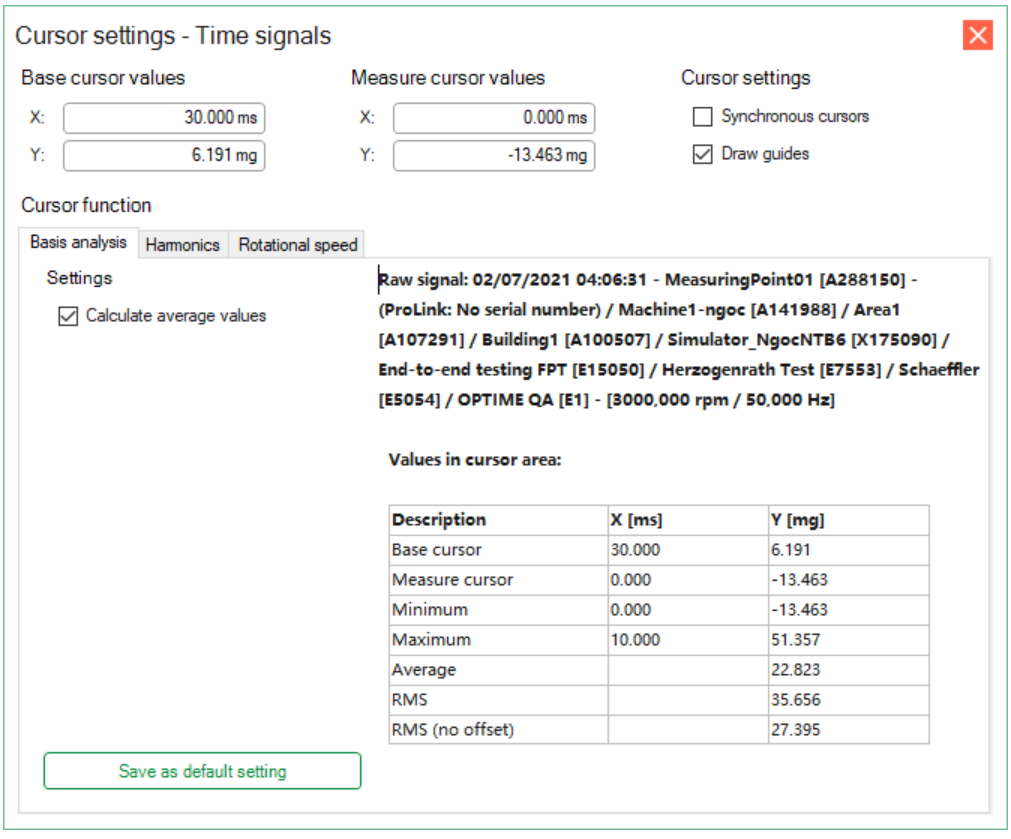
8.7.1 Basis analysis

The basis analysis is the basic cursor function set by default when the program starts. The scope of this function allows you to view the position values for the base cursor 50 and measure cursor 50, as well as the minimum and maximum measurement values of the difference range. In the Trend Viewer, for instance, the delta of the Y values and the scatter of minimum and maximum values are used as an initial interference diagnosis.

You can also activate the calculation of average values; this is of particular interest with regard to the manual calculation of characteristic values in the Spectrum Viewer.

Basis analysis tab

You will find the **Basis analysis** tab in the **Cursor settings** dialogue box under **Select cursor function**:



Here you have the following options:

Calculate average values	If you activate the **Calculate average values** option, the table will be adjusted automatically and the values calculated for the **average value**, **RMS** (root mean square) and **RMS (no offset)** will be added to the table:

Raw signal: 02/07/2021 04:06:31 - MeasuringPoint01 [A288150] - (ProLink: No serial number) / Machine1-ngoc [A141988] / Area1 [A107291] / Building1 [A100507] / Simulator_NgocNTB6 [X175090] / End-to-end testing FPT [E15050] / Herzogenrath Test [E7553] / Schaeffler [E5054] / OPTIME QA [E1] - [3000,000 rpm / 50,000 Hz]

Values in cursor area:

Description	X [ms]	Y [mg]
Base cursor	30.000	6.191
Measure cursor	0.000	-13.463
Minimum	0.000	-13.463
Maximum	10.000	51.357
Average		22.823
RMS		35.656
RMS (no offset)		27.395

This option is deactivated by default, as calculating average values can slow down the display in conjunction with extensive measurements.

Save as default setting Click this button to load and apply the settings you have configured by default.

Table with values You can find all the results of the basis analysis in the table. They include:

- Name of the configuration and signal
- Position value of the base cursor
- Position value of the measure cursor
- Minimum and maximum measurement values on the X and Y-axis
- Average values, RMS (root mean square) and RMS (no offset); you will only be able to find these values if you have activated the **Calculate average values**option.

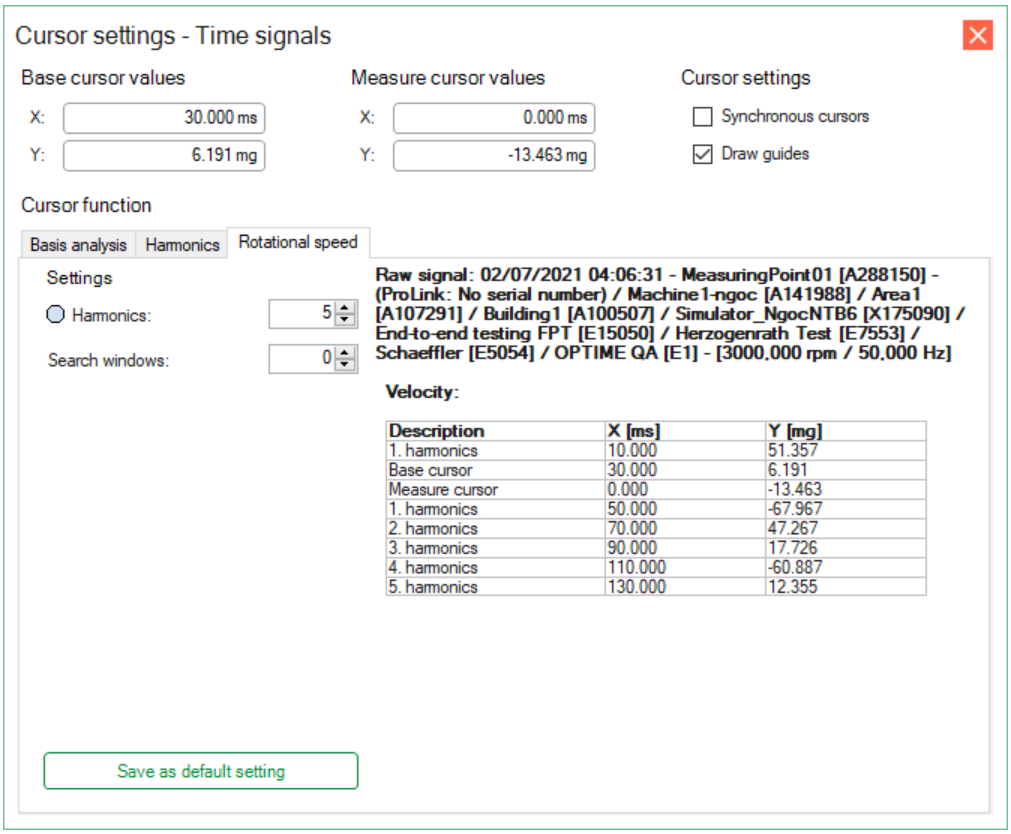
You can select the table - including headers and signal names -, copy it to the clipboard and paste it into a document.

8.7.2 Speed

You can establish harmonics depending on speed using the cursor function **Speed**. The speed is automatically used as a basis when working with the Spectrum Viewer. When working with the Time Signal Viewer, you will need to select a speed range using the base and measure cursors.

Speed tab

You can define cursor function details and view the results of the calculation in the **Speed** tab. You will find the **Speed** tab in the **Cursor settings** dialogue box under **Select cursor function**:



Here you have the following options:

Harmonics	Enter the maximum number of harmonics, i.e. the integral multiple of the base cursor, to be displayed in the diagram.
Search windows	The search window you define here refers to the number of measurement values surrounding the calculated value; the search window is used to search for peaks within the number of measurement values. The table on the right will adjust automatically to reflect any changes to values you make here.
Save as default setting	Click this button to load and apply the settings you have configured by default.
Table with values	Here you can find the X and Y values for all of the harmonics displayed in the diagram. You can select the table - including headers and signal names -, copy it to the clipboard and paste it into a document.

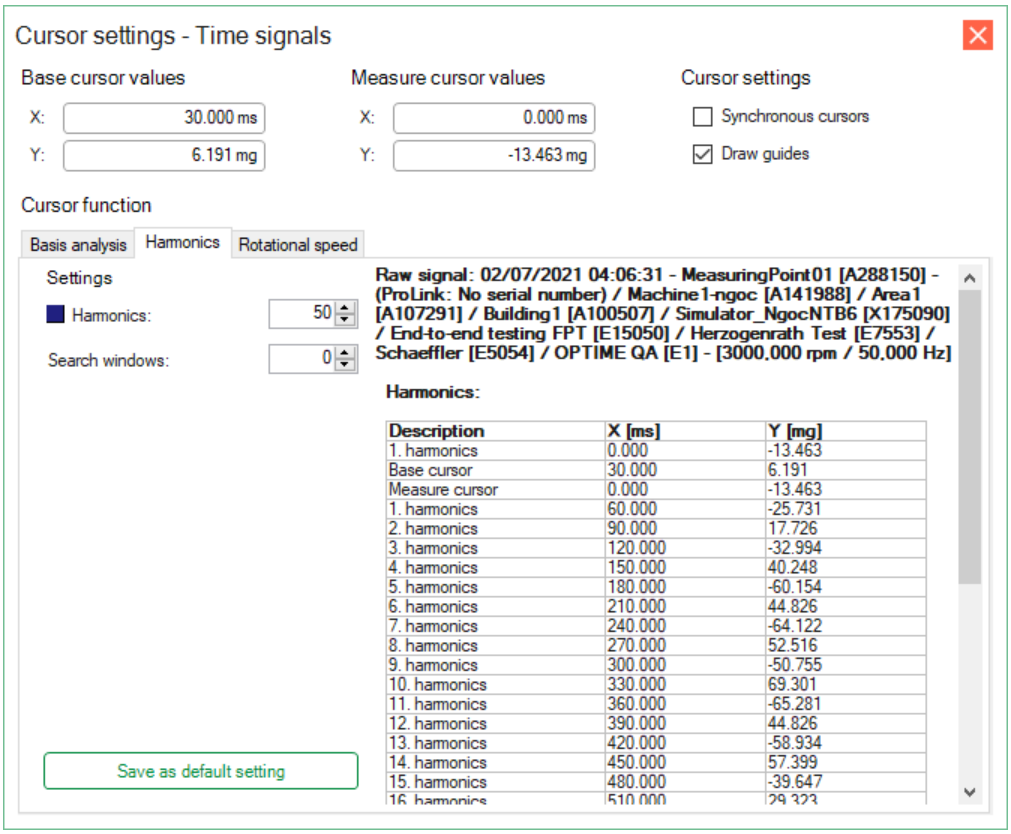
8.7.3 Harmonics

You can use the **Harmonics** cursor function to establish if and where harmonics exist in the diagram; harmonics are the integral multiple of a vibration. The function is particularly suitable for analyses in the Spectrum Viewer, as damage can manifest itself as patterns in the spectrum.

For example, position the base cursor on the suitable frequency in the Spectrum Viewer; the corresponding harmonics appear automatically as a solid line accompanied by the harmonics symbol. You can define the harmonics symbol in the symbol settings 87; you can access these settings by opening the context menu for the Viewer 14 and then selecting **Settings**.

Harmonics tab

You can define cursor function details and view the results of the calculation in the **Harmonics** tab. You will find the **Harmonics** tab in the **Cursor settings** dialogue box under **Select cursor function**:



Here you have the following options:

Harmonics	Enter the maximum number of harmonics, i.e. the integral multiple of the base cursor, to be displayed in the diagram.
Subharmonics	Enter the maximum number of subharmonics, i.e. the integral multiple of the base cursor, to be displayed in the diagram.
Search windows	The search window you define here refers to the number of measurement values surrounding the calculated value; the search window is used to search for peaks within the number of measurement values. The table on the right will adjust automatically to reflect any changes to values you make here.
Save as default setting	Click this button to load and apply the settings you have configured by default.
Table with values	Here you can find the X and Y values for all of the subharmonics and harmonics displayed in the diagram. You can select the table - including headers and signal names -, copy it to the clipboard and paste it into a document.

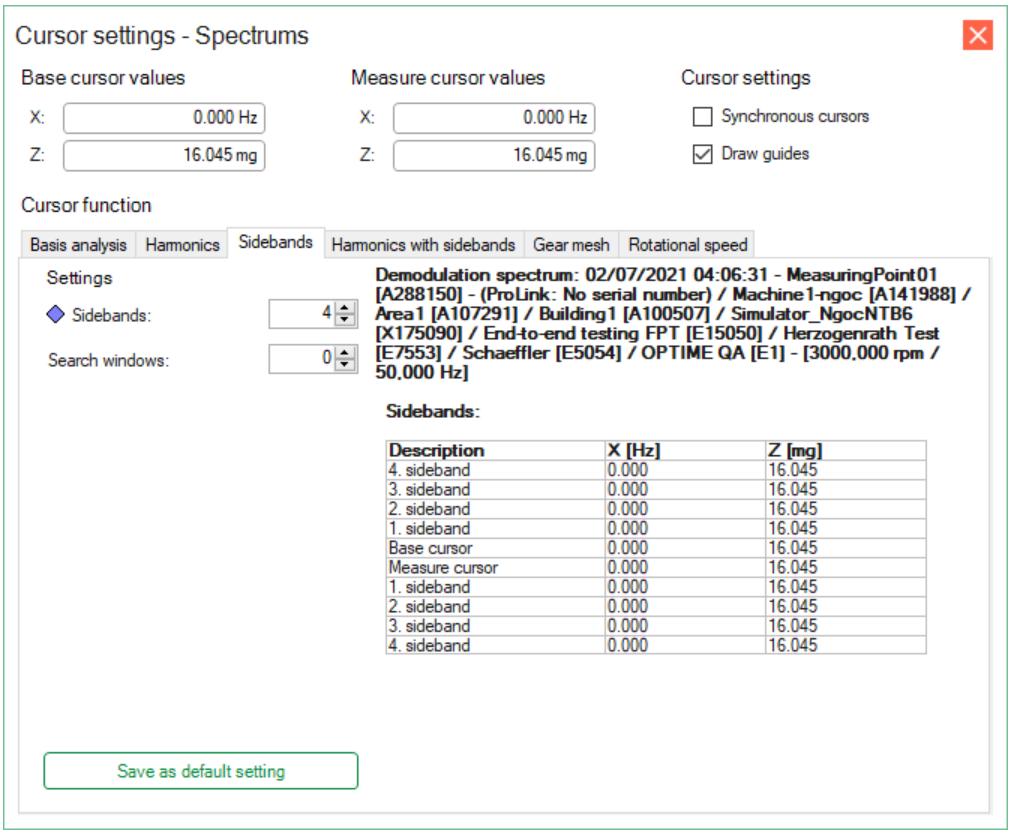
8.7.4 Sidebands (Spectrum only)

You can use the **Sidebands** cursor function to ascertain other measurement values in sidebands. Sidebands are used, in particular, to detect any damage to the outer race.

Set the base cursor at the desired position in the diagram; the corresponding sidebands are automatically displayed as sideband symbols. You can define the sideband symbol in the symbol settings 87; you can access these settings by opening the context menu for the Viewer 14 and then selecting **Settings**.

Sidebands tab

You can define cursor function details and view the results of the calculation in the **Sidebands** tab. If you are working with the Spectrum Viewer, you will find the **Sidebands** tab in the **Cursor settings** dialogue box under **Select cursor function**:



Here you have the following options:

Sidebands	Determine the number of sidebands to be calculated for the current base cursor position. The table on the right will adjust automatically to reflect any changes to values you make here.
Search windows	The search window you define here refers to the number of measurement values surrounding the calculated value; the search window is used to search for peaks within the number of measurement values. The table on the right will adjust automatically to reflect any changes to values you make here.
Save as default setting	Click this button to load and apply the settings you have configured by default.
Table with values	Here you can find the X and Y values for all of the sidebands displayed in the diagram. You can select the table - including headers and signal names -, copy it to the clipboard and paste it into a document.

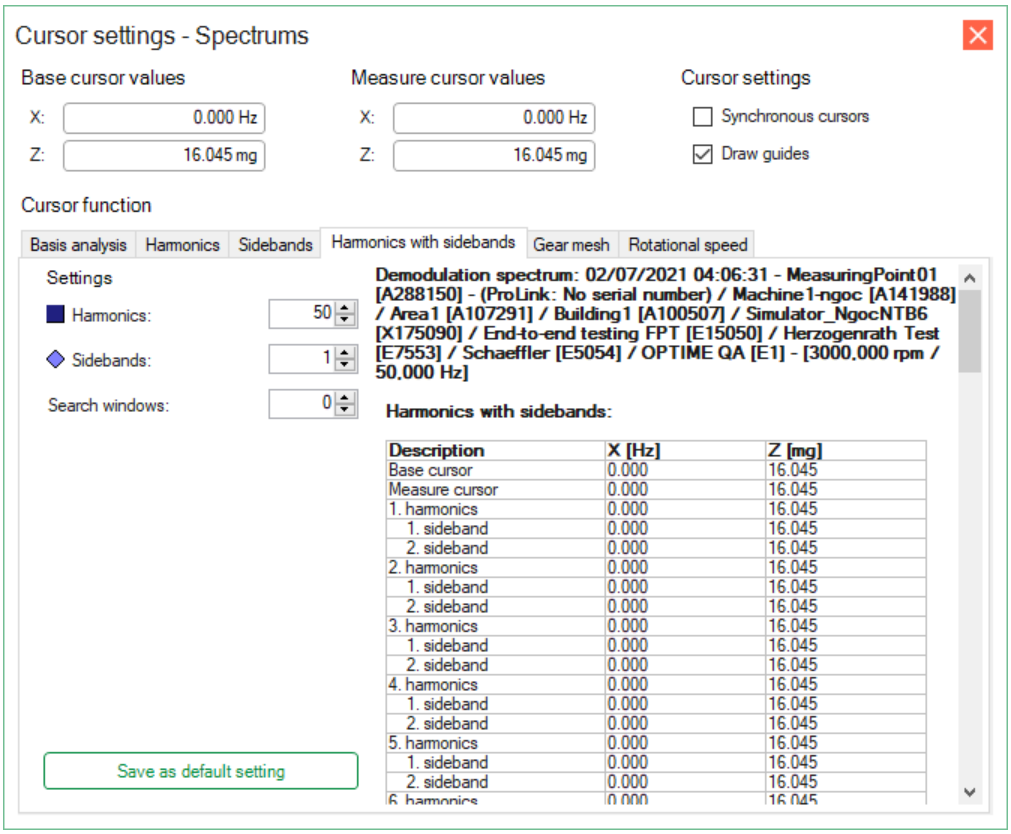
8.7.5 Harmonics with sidebands (Spectrum only)

The cursor function **Harmonics with sidebands** combines the two cursor functions **Harmonics** and **Sidebands**. You can therefore ascertain the harmonics and sidebands simultaneously for the position of the base cursor.

To do so, position the base cursor at the desired location in the diagram; the corresponding harmonics and sidebands are automatically displayed as a solid line and appear together with the corresponding cursor symbols. You can define the cursor symbols in symbol settings 87; to access these settings, open the context menu for the Viewer 14 and select **Settings**.

Harmonics with sidebands tab

You can define cursor function details and view the results of the calculation in the **Harmonics with sidebands** tab. If you are working with the Spectrum Viewer, you will find the **Harmonics with sidebands** tab in the **Cursor settings** dialogue box under **Select cursor function**:



Here you have the following options:

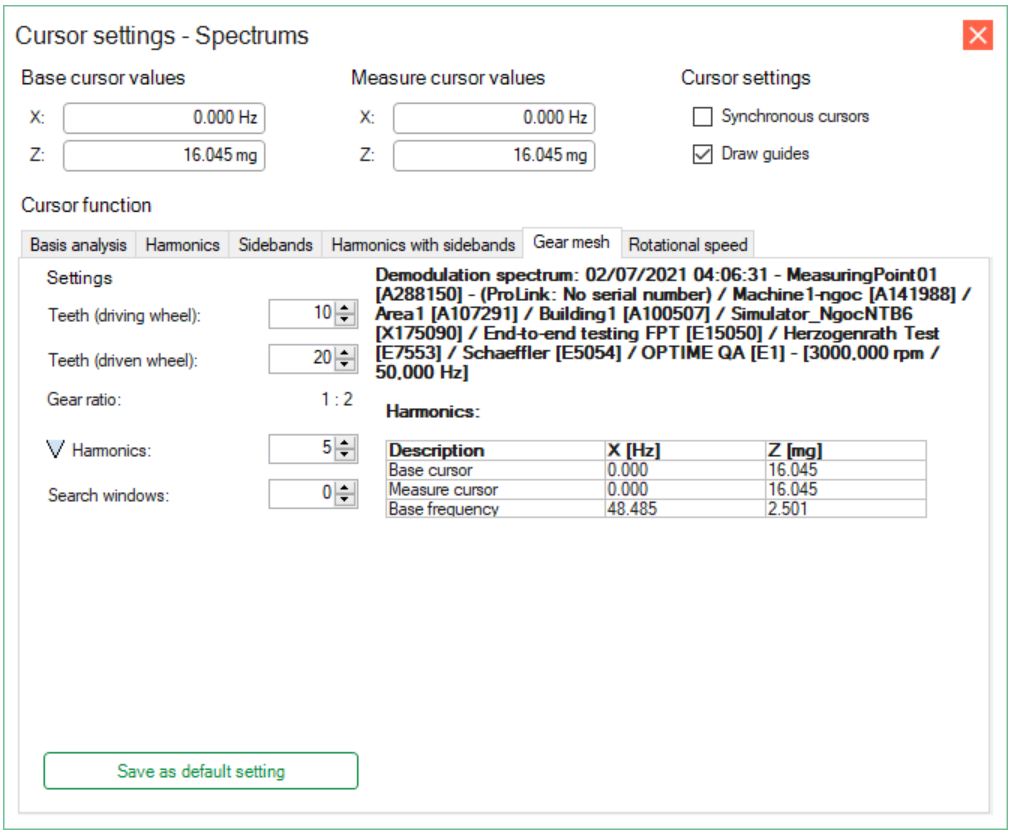
Harmonics	Enter the maximum number of harmonics, i.e. the integral multiple of the base cursor, to be displayed in the diagram.
Sidebands	Determine the number of sidebands to be calculated for the current base cursor position. The table on the right will adjust automatically to reflect any changes to values you make here.
Search windows	The search window you define here refers to the number of measurement values surrounding the calculated value; the search window is used to search for peaks within the number of measurement values. The table on the right will adjust automatically to reflect any changes to values you make here.
Save as default setting	Click this button to load and apply the settings you have configured by default.
Table with values	Here you can find the X and Y values for all of the harmonics and sidebands displayed in the diagram. You can select the table - including headers and signal names -, copy it to the clipboard and paste it into a document.

8.7.6 Gear mesh (Spectrum only)

The **Gear mesh** cursor function is available for gear systems with multiple gears: It allows you to search for gear mesh frequencies depending on the speed.

Gear mesh tab

You can define cursor function details and view the results of the calculation in the **Gear mesh** tab. If you are working with the Spectrum Viewer, you will find the **Gear mesh** tab in the **Cursor settings** dialogue box under **Select cursor function:**



Here you have the following options:

Teeth (driving wheel)	Enter the number of teeth for the pinion.
Teeth (driven wheel)	Enter the number of teeth for the pinion.
Gear ratio	This value is calculated automatically from the information entered for **Teeth (driving wheel)** and **Teeth (driven wheel)**.
Harmonics	Enter the maximum number of harmonics, i.e. the integral multiple of the base cursor, to be displayed in the diagram.
Search windows	The search window you define here refers to the number of measurement values surrounding the calculated value; the search window is used to search for peaks within the number of measurement values. The table on the right will adjust automatically to reflect any changes to values you make here.
Save as default setting	Click this button to load and apply the settings you have configured by default.
Table with values	Here you can find the X and Y values for all of the harmonics and sidebands displayed in the diagram. You can select the table - including headers and signal names -, copy it to the clipboard and paste it into a document.

8.8 Position cursor

If you click on in the toolbar, a list will open, from which you can select a positioning option for the cursor. These options assist you in positioning the base cursor in the diagram precisely. This function can also be used to identify a peak. Here you have the following options:

- **Free:** The cursor position is determined based on pixel coordinates and is freely selectable, even between two measurement values.
- **Next sample:** The base cursor is set to the next measurement value.
- **Nearest peak:** The base cursor is placed at the next peak.

- **Tenths:** The area between two measurement values on the X-axis is divided into tenths; the base cursor is placed at the nearest tenth**.**
- **Hundredths:** The area between two measurement values on the X-axis is divided into hundredths; the base cursor is set to the nearest hundredth**.**



- If you click in the diagram, the cursor always moves to the nearest peak, irrespective of the setting you make here. Precise positioning, in line with the options in this list, occurs by dragging the base cursor. Move the mouse over the base cursor until you see the double-headed arrow:
  
  Click and drag the base cursor to the required position. The interim steps when pulling are defined by the selected positioning option.
- You can show/hide the cursor by clicking  on the toolbar.
- You can also move cursors using the keyboard 96.

8.9 Select diagram view

If you click  in the toolbar, a list opens in which you can select how the diagram should be displayed in the active Viewer. To do so, select the appropriate option from the selection list. The available options depend on the active viewer. You will find detailed information on individual options in the corresponding section:

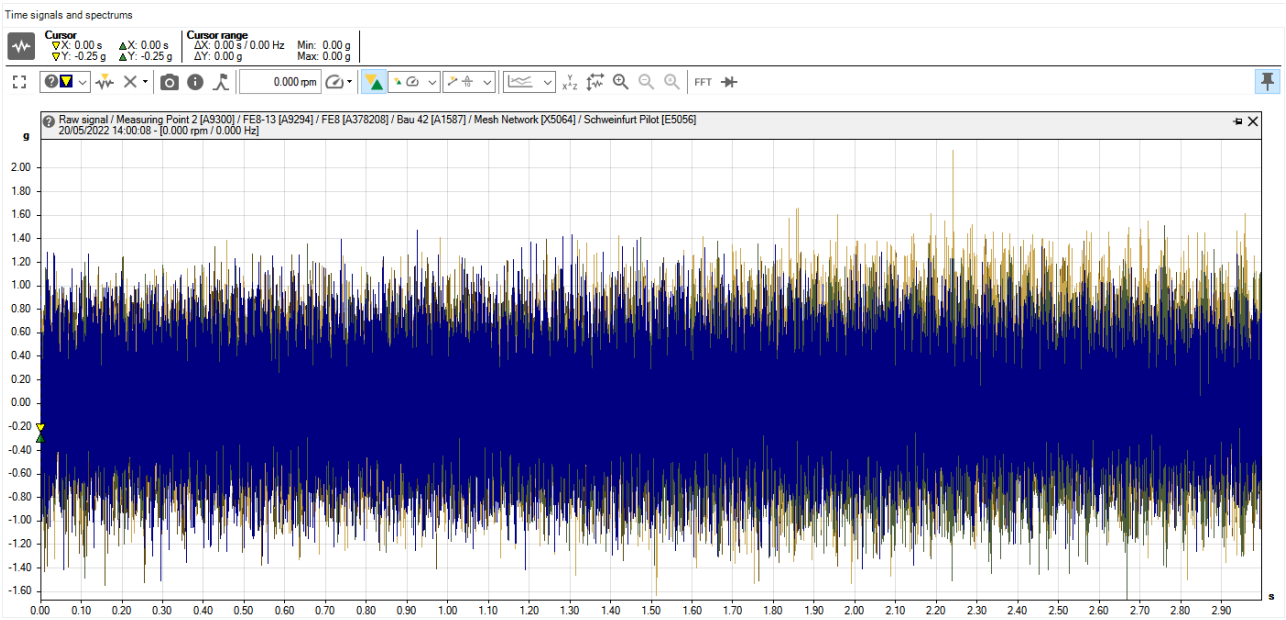
- Overlapping 59
- Multiple Y-axes (Trend only) 60
- Stack 60
- Matrix 61
- Expanded matrix 61
- Wireframe (Spectrum only) 64
- Waterfall (Spectrum only) 64
- 2D spectrogram (Spectrum only) 64
- 3D spectrogram (Spectrum only) 65



- Zoom functions are available in every view.
- The various diagram views are only visible if several signals are open. If you have only one signal open, you will not see any difference between the diagram views.

8.9.1 Overlapping

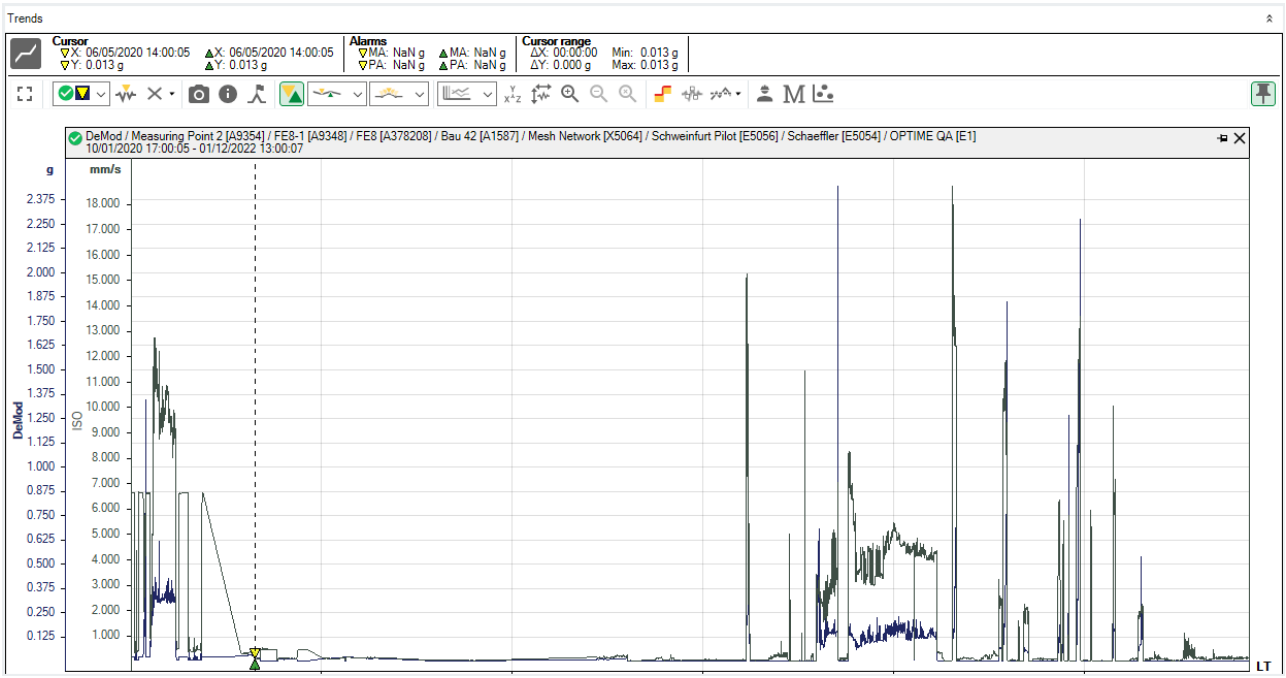
The **Overlapping** view  is available for every Viewer. If you select this option, all data that is open in the active Viewer will be displayed together in one coordinate system. The signals are also grouped by type and unit on the Y-axis. For example, all raw signals and envelopes are displayed together in one coordinate system:



This will provide you with an initial rough overview where you can view the minimum and maximum values for all of the displayed data directly on the axes.

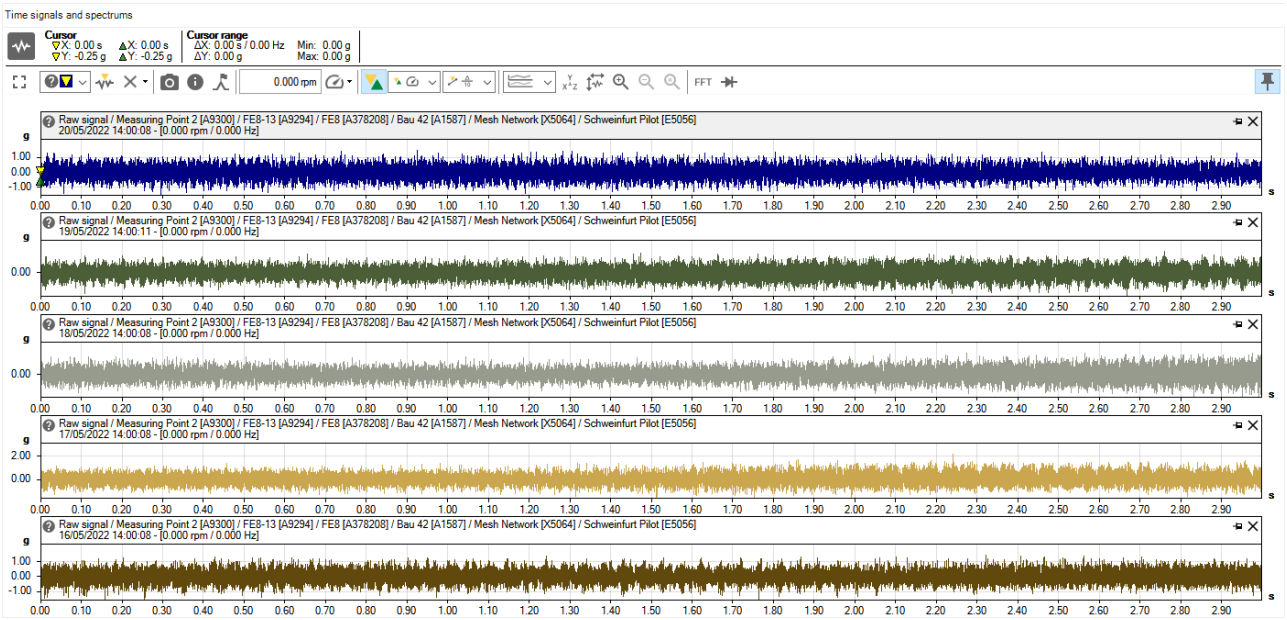
8.9.2 Multiple Y-axes

The **Multiple Y-axes**  view is only available in the Trend Viewer. If you select this option, all data that is open in the active Viewer will be displayed together with its respective Y-axis. The data overlaps. You can use this view to verify how different data correlates with each other:



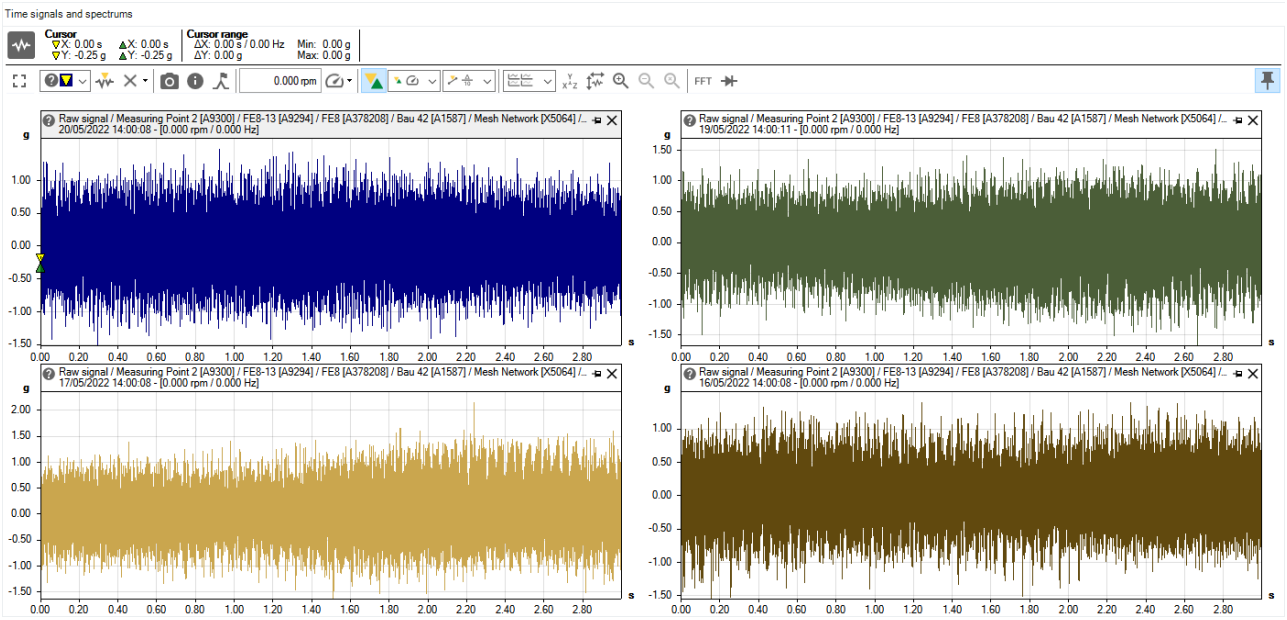
8.9.3 Stack

The **List** view  is available for every Viewer. If you select this option, each dataset open in the active Viewer will receive its own coordinate system. All of the coordinate systems appear as a stack in the viewer:



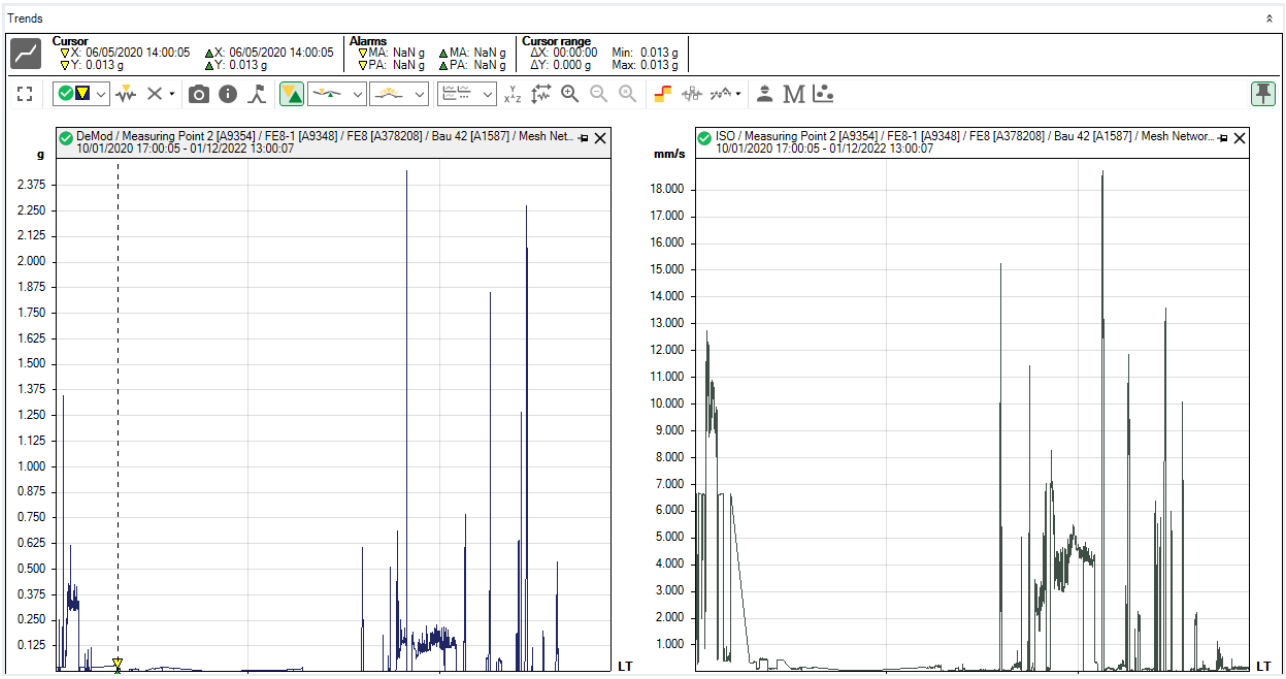
8.9.4 Matrix

The **Matrix** view is available for every Viewer. If you select this option, each dataset open in the Viewer will receive its own coordinate system. These are displayed as a list or as a multi-column matrix in the active Viewer depending on the number of coordinate systems:



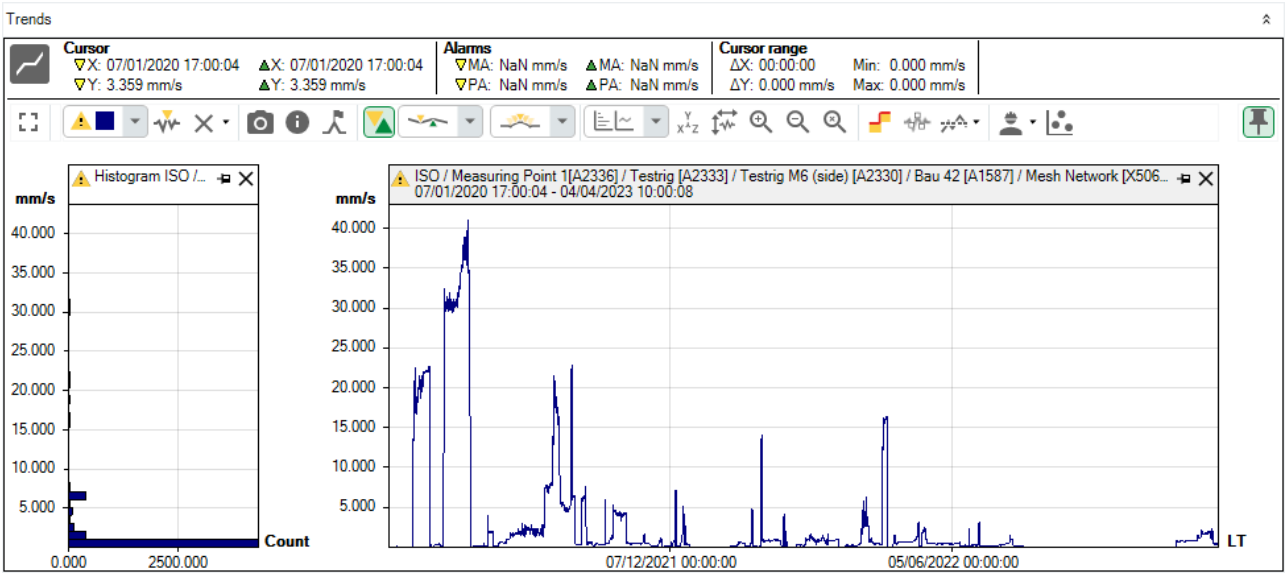
8.9.5 Expanded matrix

The **Expanded matrix** view is available for every Viewer. If you select this option, each dataset open in the Viewer will receive its own coordinate system. Up to a predefined minimum size, the coordinate systems are displayed side by side. If the minimum size is undershot, the coordinate systems are displayed over several lines in the active Viewer:

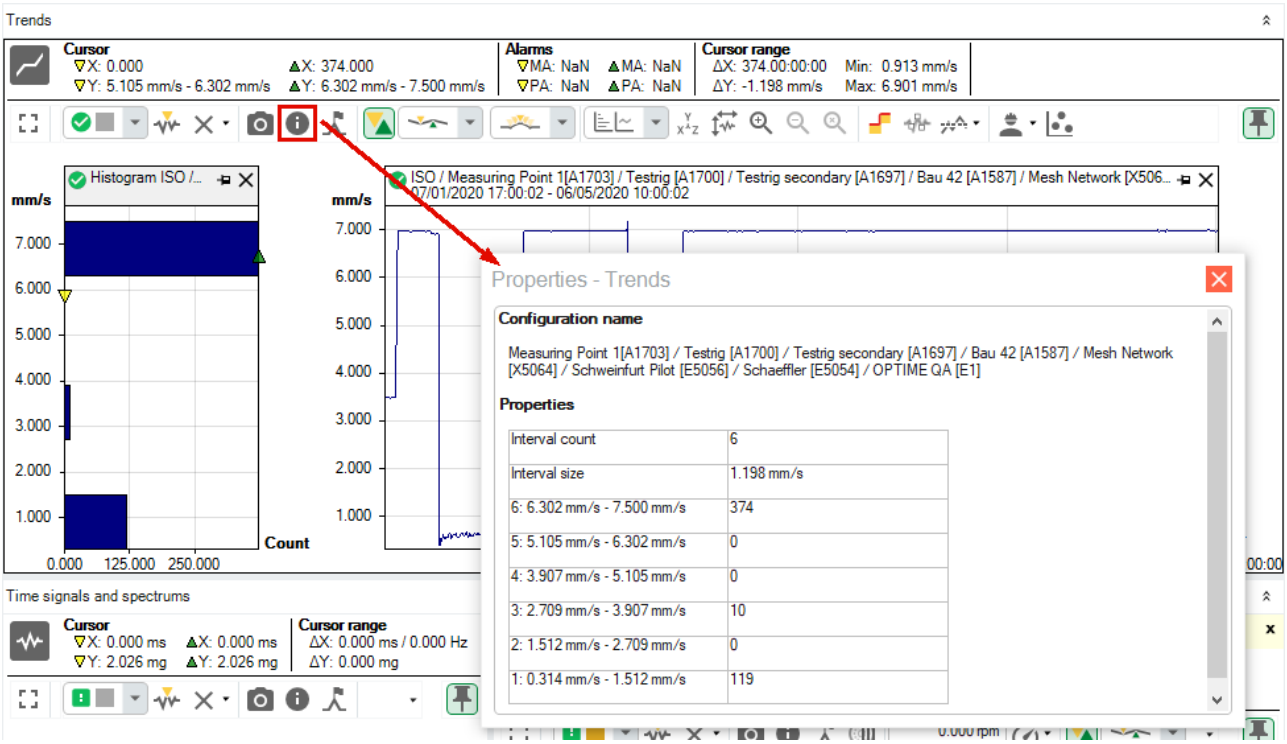


8.9.6 Histogram (Trend only)

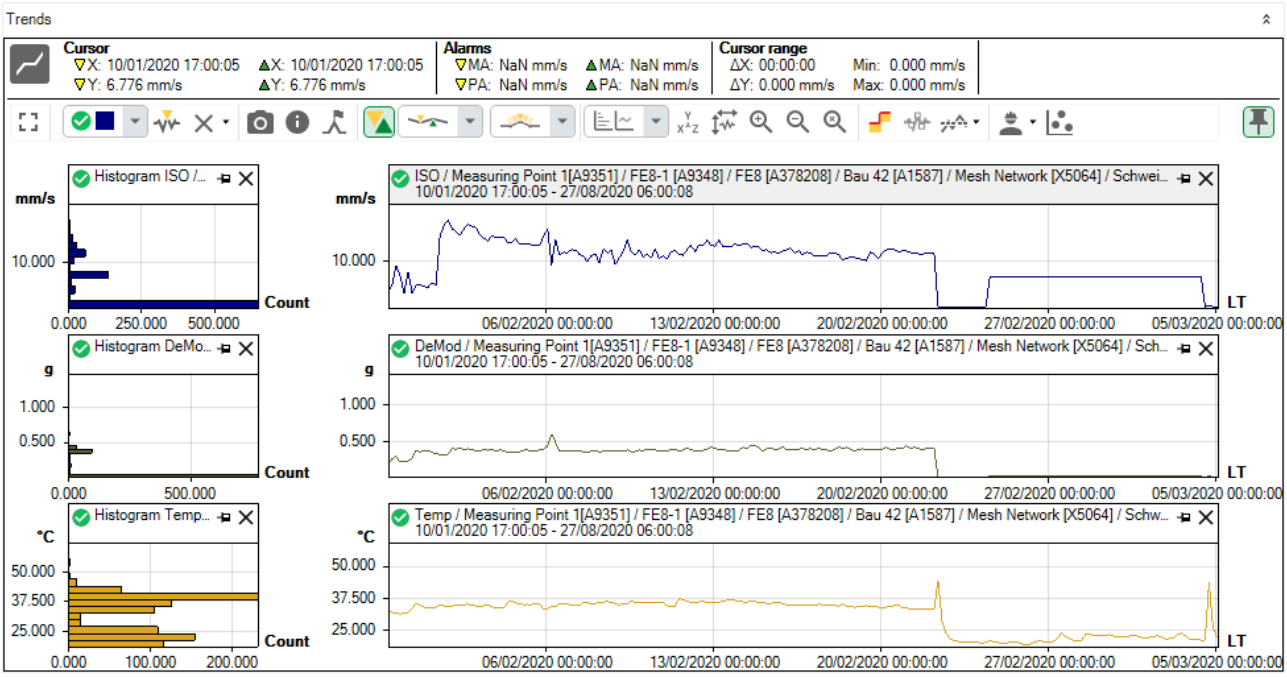
The **Histogram** view is only available in the Trend Viewer. If you select this option, an additional bar chart appears for the displayed data. The bar chart gives you an overview of how many values of the trend fall within a certain value range. You can also see which value range has no values available:



Click on in the toolbar to obtain more information, for example on the number of value ranges and the exact number of values in each value range:



If you have multiple trends open, a histogram is displayed for each trend:

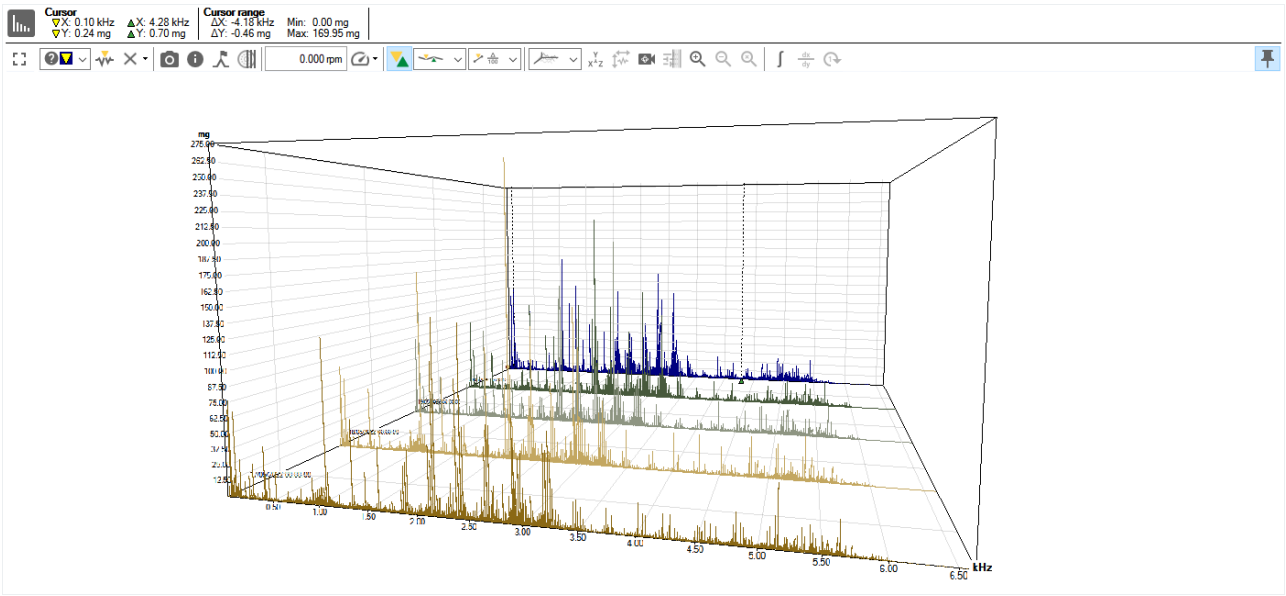


A trend and its associated histogram are linked to each other. If you have multiple trends with histograms open, they will behave as follows:

- When you close a histogram, the associated trend will also close, and vice-versa.
- When you pin a histogram using the button, the associated trend is also pinned, and vice-versa.
- When you remove signals using the button in the toolbar, trends and associated histograms are both removed.

8.9.7 Wireframe (Spectrum only)

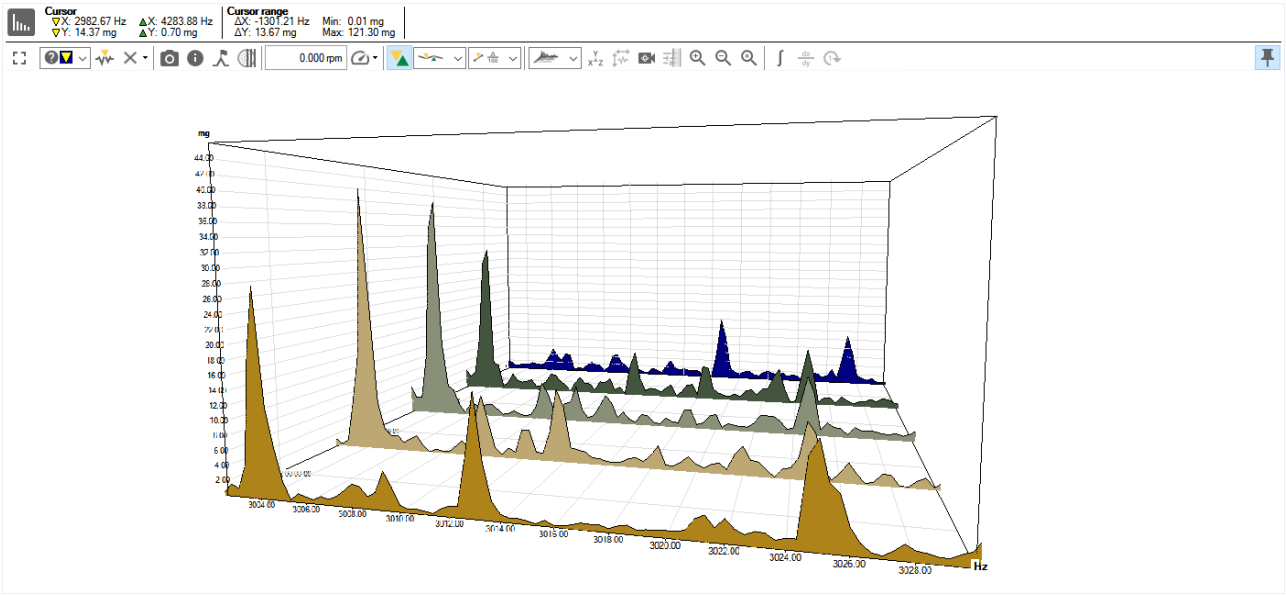
The **Wireframe** view  is only available in the Spectrum Viewer. If you select this option, all of the spectrums that are open in the active Viewer will be displayed on one wireframe:



You can amend the view options for your application by modifying the camera settings 66 and spectrogram settings 67.

8.9.8 Waterfall (Spectrum only)

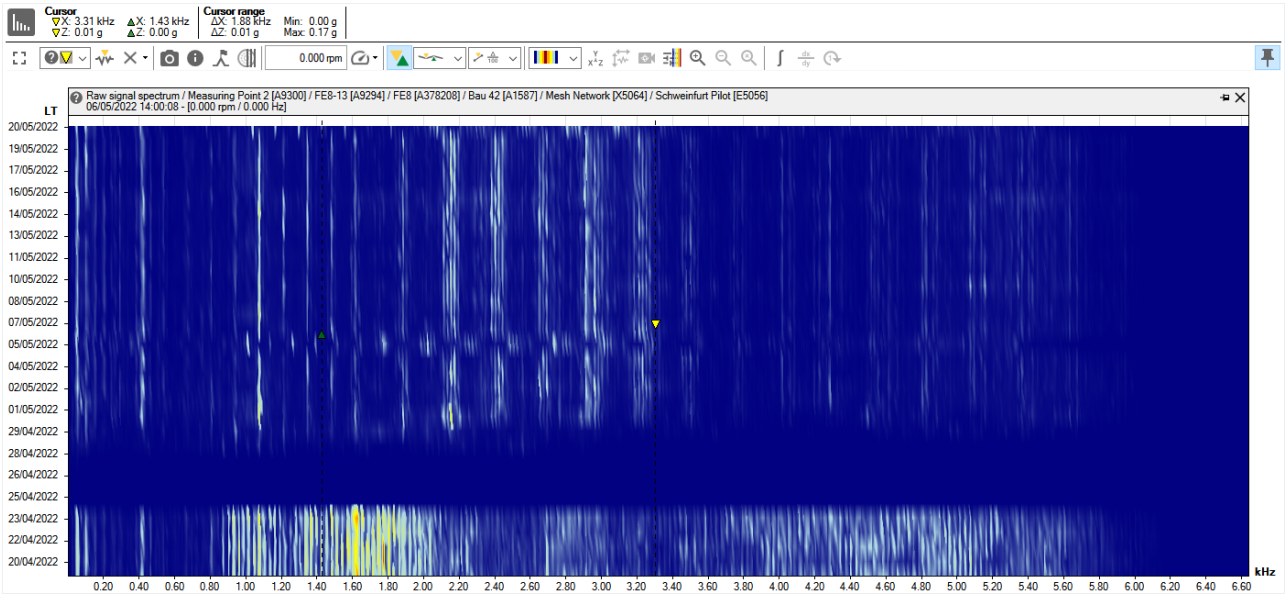
The **Waterfall** view  is only available in the Spectrum Viewer. If you select and set this option, all of the spectrums that are open in the active Viewer will be displayed as a waterfall:



You can amend the view options for your application by modifying the camera settings 66 and spectrogram settings 67.

8.9.9 2D spectrogram (Spectrum only)

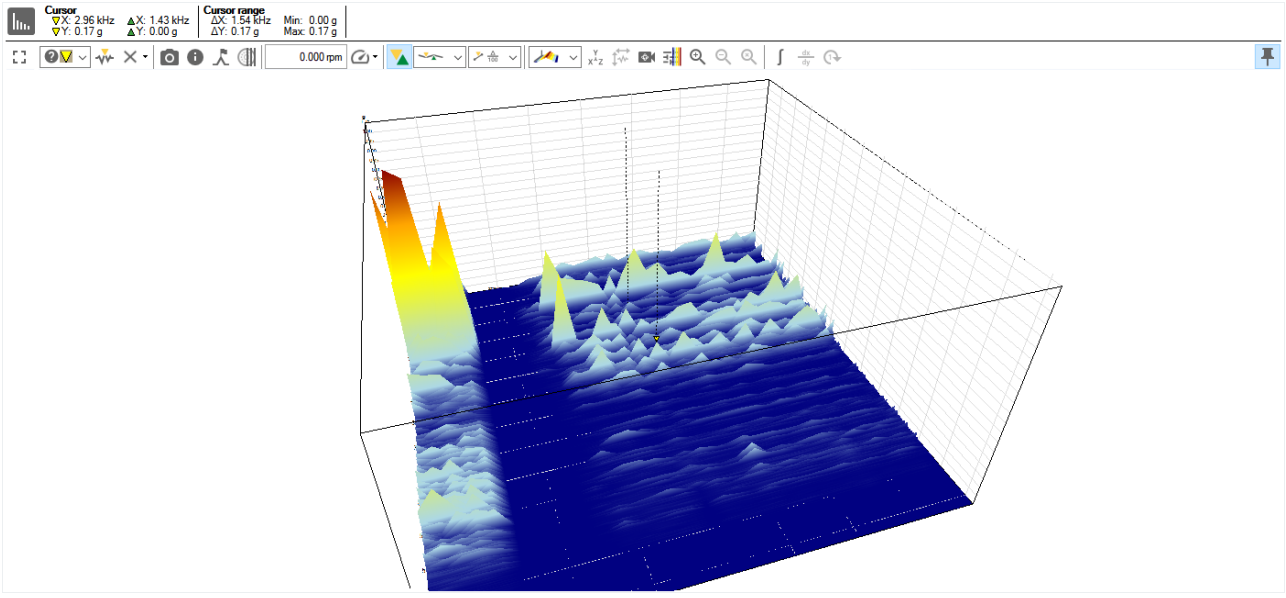
The **2D spectrogram** view  is only available in the Spectrum Viewer. If you select and set this option, all of the spectrums that are open in the active Viewer will be displayed as a two-dimensional spectrogram:



You can amend the view options for your application by modifying the camera settings 66 and spectrogram settings 67.

8.9.10 3D spectrogram (Spectrum only)

The **3D spectrogram** view is only available in the Spectrum Viewer. If you select this option, all of the spectrums that are open in the active Viewer will be displayed as a three-dimensional spectrogram:

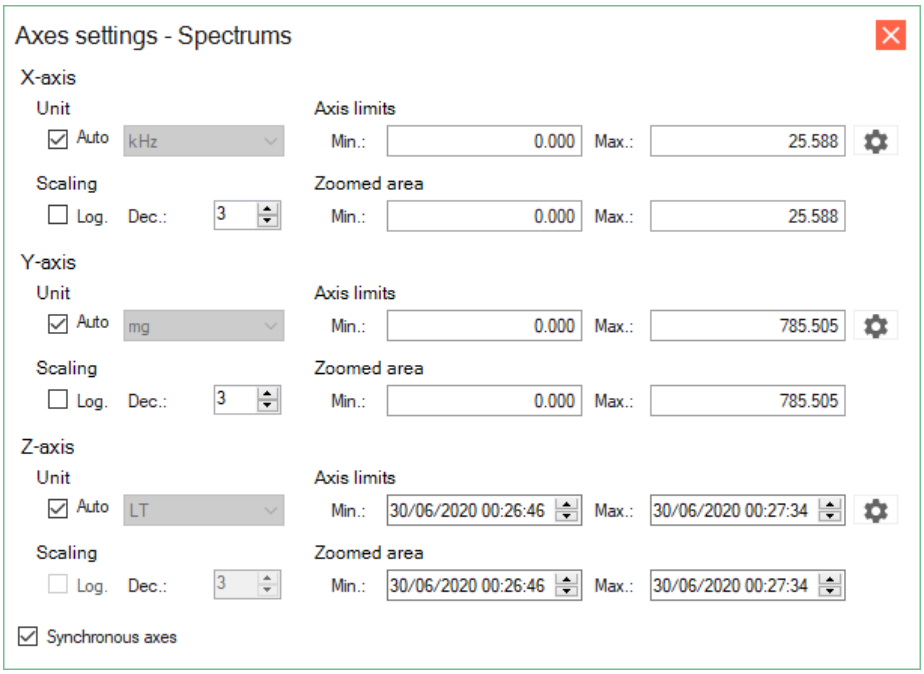


You can amend the view options for your application by modifying the camera settings 66 and spectrogram settings 67.

8.10 Edit axes settings

If you click in the toolbar, a dialogue box opens in which you can specify details for the X and Y axes. Your settings always apply to the axes of the active viewer.

You can specify and change standard settings, e.g. in the **Unit** or **Scaling** area under Viewer settings 85; to do so, open the context menu for the Viewer 14 and go to **Settings**.



You can specify the following settings for the axes:

Unit

Here you can determine the unit used to display the axis. You have the following options:

- **Auto:** Activate this field to prompt the Schaeffler OPTIME ExpertViewer software to use the unit best suited to displaying the current signal types. The Schaeffler OPTIME ExpertViewer software automatically decides which unit prefix provides the best, i.e. the shortest possible, representation in the diagram.
- **Selection list:** You can choose a unit for the axis display from the list. The availability of units depends on the unit profile 88. To change or view unit profiles, open the context menu for the Viewer 14 and select the **Settings** command.

Scaling

This is where you set the scale for the axes:

- **Log.**: This option activates logarithmic scaling (Spectrum Viewer only).
- **Dec.**: Use this option to define how many decimal places should follow the decimal point.

Axis limits

Use this option to determine the unit range to be shown in the diagram. You have the following options:

- Use **Min.** and **Max.** to define the value range you want to show in the diagram.
- : Click this symbol to access the following functions:
  - **Normalise:** The axis range includes the minimum and maximum of all displayed signals, so the axis limits are automatically adjusted to the data.
  - **Reset:** This command resets the original axis limits.

Zoomed area

Use this function to define the area you want to zoom within the axis limits. Zooming out again does not change the defined axis limits.

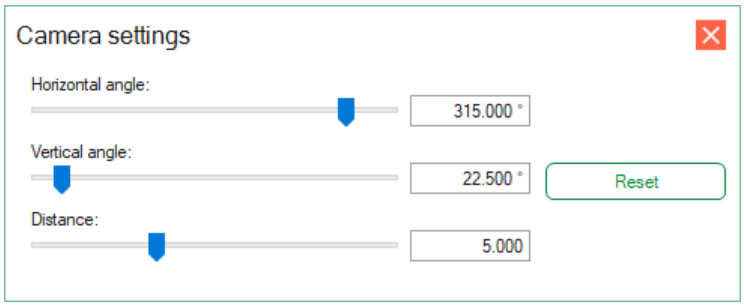
Synchronous axes

If you activate this option, your axis settings will apply to all loaded data.

Uncheck the box if you want to apply your settings to the X and Y axes of the active data only.

8.11 Modify camera settings (Spectrum only)

The **Modify camera settings** function is only available in the toolbar for the Spectrum Viewer and only for the view options **Wireframe**, **Waterfall**, **2D spectrogram** and **3D spectrogram**. It is only available for spectrums that have the same signal and unit types. The function opens a dialogue box, in which you can edit the camera settings for these display options:

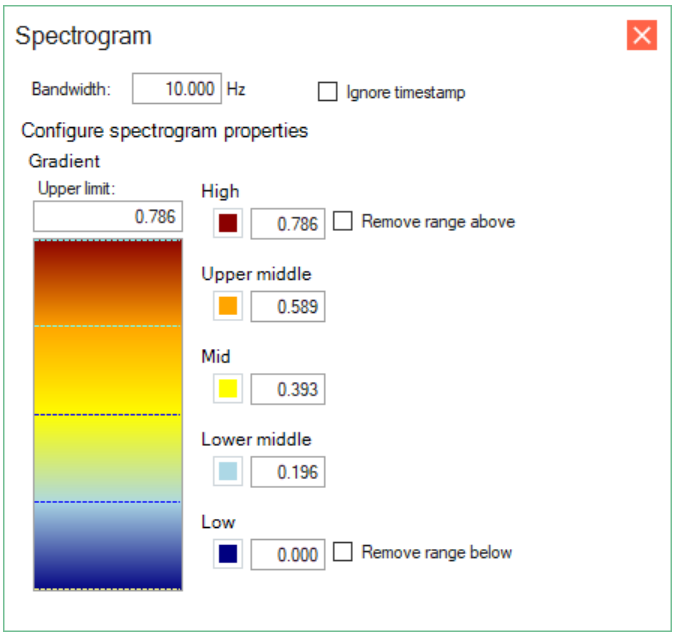


Use these settings to define the perspective from which you view the diagram. Here you have the following options:

- Use the **Horizontal angle** to determine the rotation of the diagram, i.e. which side you will view it from.
- Use the **Vertical angle** to determine whether you will view the diagram more at eye level (small value) or more so from above (greater value).
- The **Distance** refers to the distance between the camera and the centre of the diagram. The maximum value is 10.
- Click on **Reset value** to reset the camera settings to the default values.

8.12 Change spectrogram settings (Spectrum only)

The **Change spectrogram settings** function is only available in the toolbar for the Spectrum Viewer. It is only available for spectrums that have the same signal and unit types. The function opens up a dialogue box, in which you can define the basic spectrogram properties:



Here you have the following options:

Bandwidth

Your graphics board would need a lot of disk space if you were to display every dot when working with many signals. This is avoided by dividing the spectrogram into sections and displaying the maximum value for each one.

If you decrease the value for **bandwidth**, you increase the number of sections; this in turn increases the number of displayed values and improves the accuracy of the display. With regard to weaker graphics boards, you can raise the band width to achieve a balance between accurate display and required disk space.

Ignore timestamp

Select this option to remove the time information from the Y-axis and number the spectrums consecutively.

Configure spectrogram properties

- **Gradient:** You can use the value for the **upper limit** to define the maximum value at which the displayed range of the Y-axis should end. Additionally, the dashed lines tell you at a glance where your values for **Upper**, **Middle** and **Lower** are positioned on the Y-axis.
- For instance, you can set the values for **Upper** and **Lower** at your alarm limits.
- The **Remove range above** and **Remove range below** options allow you to remove these ranges from the diagram and concentrate on analysing the middle range.
- Clicking on the colour symbols for **Upper**, **Middle** and **Lower** opens the standard colour dialogue box 85. You can amend the colour of the relevant area here, for example to achieve a better contrast.

8.13 Adding and editing an expert opinion (trend only)

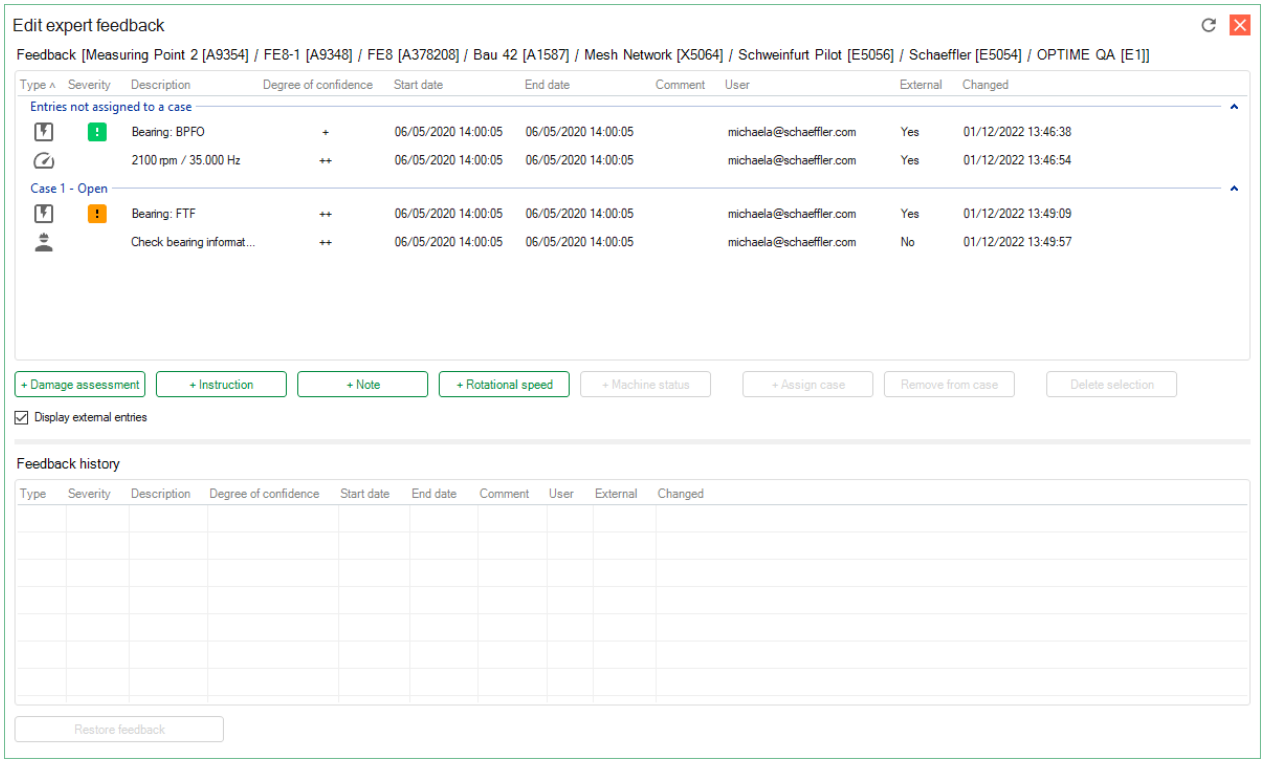
The **Edit expert opinion** function is only available in the toolbar for the Trend Viewer. It opens a dialogue box where you can add detailed information and evaluations concerning the selected trend 68. You can also view and edit existing expert opinions 69 in the same dialogue. You can also check the history of expert opinions and restore previous versions 70.

To view expert opinions in the Trend Viewer chart, click the **Expert Opinion** button and select the **Show Expert Opinion in Trend** option. The cursor must be in the Trend Viewer chart.

Adding an expert opinion

Proceed as follows to create a new expert opinion:

1. In the Trend Viewer diagram, use the base cursor and the measure cursor to highlight the area where you wish to enter additional information and/or assessments.
2. Click the **Expert Opinion** button and select the **Edit expert opinion** option. The **Edit expert opinion** dialogue opens:



You can add the following expert opinions here:

- **Damage assessment:** Select this option to add a damage assessment to the highlighted area 71.
- **Instruction:** Select this option to add an instruction to the highlighted area 72.

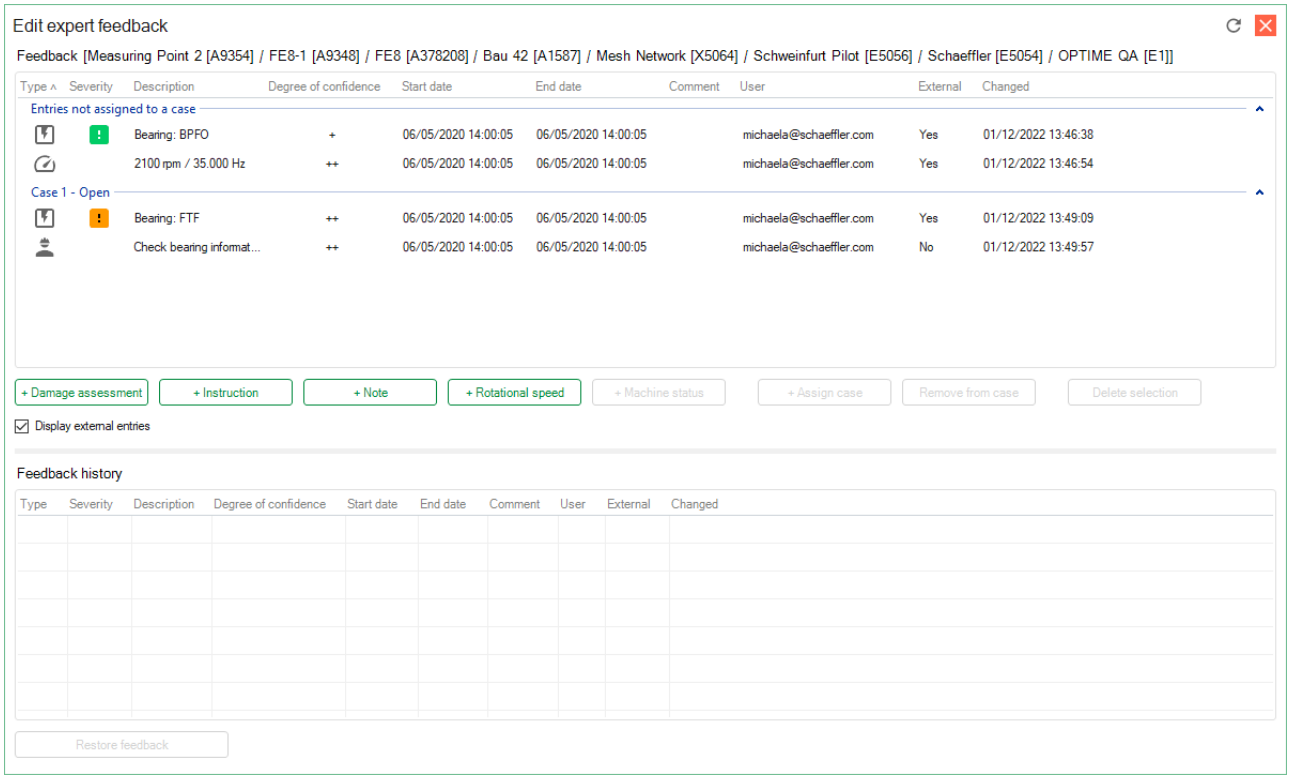
- **Note:** Select this option to add a note to the highlighted area 73.
- **Speed:** Select this option to add a speed to the highlighted area 74.

3. Add the desired expert opinion. It then appears in the overview table and in the diagram. You can then edit it further 69 and, for example, assign it to a case 74.

Edit expert opinion

Proceed as follows to view and edit existing expert opinions:

Click the **Expert opinion** button and select the **Edit expert opinion** option. The **Edit expert opinion** dialogue opens with an overview of the existing expert opinions:



The following information and editing options can be found here:



Click this button at the top right to load changes made by other users.

Table heading

The table heading contains information about the measurement point and characteristic value to which the expert opinions relate.

Information in the table columns:

- **Type**
  The symbols in this column indicate the type of expert opinion:

   There is a damage report here.

   There is an instruction here.

   There is a note here.

   A speed has been specified here.

- **Severity**
  The coloured symbols in this column indicate the severity of the damage in damage assessments. The severity increases from  via and  to .
- **Description**
  Depending on the type of expert opinion, the name of the damage assessment or instruction, the specified speed or the text you entered as a **note** may appear here.

- **Degree of confidence**
  The symbols in this column indicate the confidence with which the expert's opinions are stated. The confidence increases from **0** and **+** to **++** and **+++**.
- **Start date/End Date**
  Here you will find the date or period to which the expert opinion refers.
- **Comment**
  Here you will find the text you have entered as a comment on the expert opinion.
- **User**
  Here you will find the user who created or edited the expert opinion.
- **External**
  Here you will find information about whether the entry is internal or external.
- **Changed**
  Here you will find the date on which the expert opinion was last edited.

Subheadings in the table:
The subheadings in the table correspond to the name of the case to which the subsequent expert opinions are assigned. You can therefore use case assignments to group the overview of expert opinions 74. If you activated the **Relevant for QA** option (meaning relevant for quality assurance) when assigning a case,**Relevant for QA** will also appear in the heading.
Double-click a heading to expand/collapse the associated expert opinions.

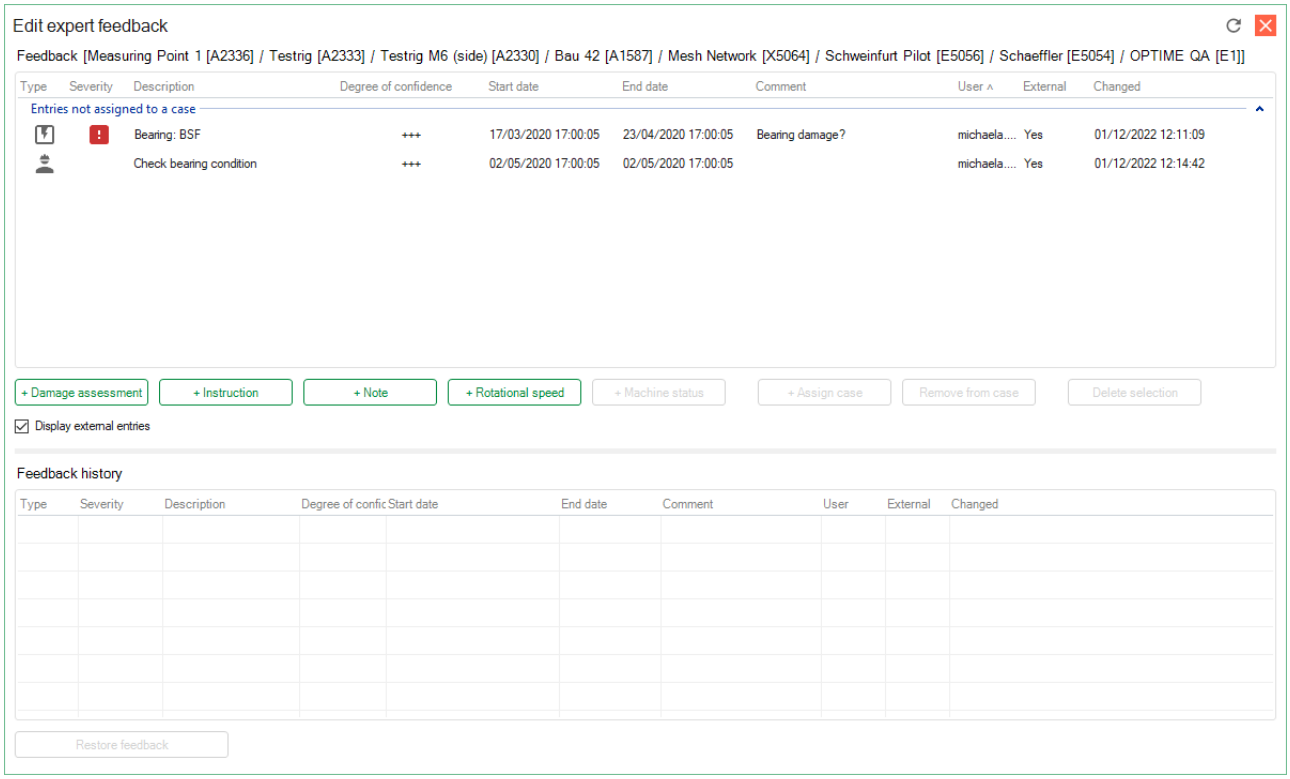
'Show external entries' option:
Activate this option at the bottom left to also display external expert opinions. When you add/edit an expert opinion, you will be asked to specify whether it is external or internal. External entries can only be viewed, not edited.

Selection options in the table:
You can select entries in the table as follows:
- Individual selection: Click on an entry to select it.
- Multiple selection: Hold down CTRL and click on the required lines.
- Selection of a consecutive range: Click on the first entry of the desired range, hold down the SHIFT key, then click on the last entry of the desired row.

Editing options for selected entries:
- **Edit expert opinion:** Double-click an entry to open the corresponding editing dialogue. Details of the editing options can be found in the sections on Damage assessment 71, Instruction 72, Note 73 or Speed 74.
- **Display in the diagram:** Select one or more entries in the table to highlight these entries in colour in the Trend Viewer diagram.
- **Assign/Unassign case:** Select this option to assign entries to a case or unassign them from a case 74.
- **Delete selection:** Select this option to delete the selected expert opinions. You must confirm this action by clicking **OK**.
  If you delete an expert opinion, you will also delete the feedback history for that expert opinion.
- **View feedback history:** Select an entry to view its history 70 and restore the entry to a previous version.

View and restore feedback history

Any changes you make to the expert opinions are displayed in the feedback history:



The following information and editing options can be found here:

Information in the table columns:

You will find the same information here as in the expert opinions table 69.

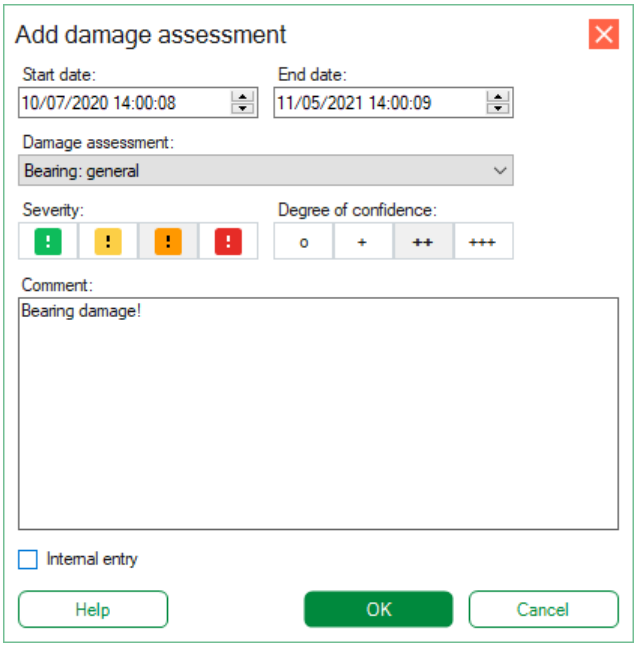
Editing option for selected entries:

- **Restore feedback:** Click this button to restore the currently selected version of the expert opinion. The expert opinion in the overview table above is then replaced by this version. This action also creates a new entry in the feedback history.

8.13.1 Add damage assessment

To add a damage assessment to a trend:

1. In the Trend Viewer diagram, use the base cursor and the measure cursor to highlight the area to which you wish to add a damage assessment.
2. Click the **Edit expert opinion** button. The **Edit expert opinion** dialogue opens.
3. Click **Damage assessment**. The **Add damage assessment** dialogue opens:



Here you have the following options:

Start date and end date: Specify the time period to which the assessment refers.

Damage assessment: Select the appropriate assessment from the pick list.

Severity: Click the symbol corresponding to the severity of the damage. The severity increases from to . The corresponding symbol is also displayed in the time signal selection lists of the OPTIME ExpertViewer software.

Degree of confidence: Click on the symbol that corresponds to your confidence about this assessment. Confidence increases from **0** to **+++** .

Comments: Enter a comment with additional information.

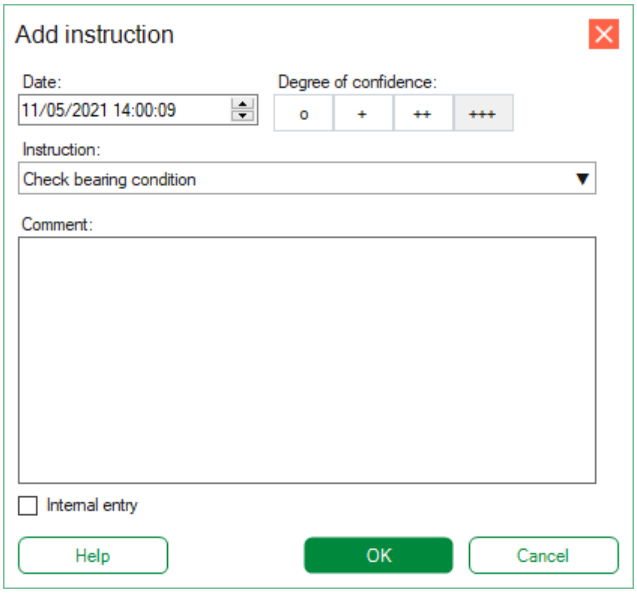
Internal entry: Activate this option if you want to mark this entry as internal.

4. Enter the desired information and click **OK**.
   The damage assessment is added to the graph in the Trend Viewer and appears in the expert opinion overview table.

8.13.2 Add instruction

To add an instruction to a trend:

1. In the Trend Viewer diagram, use the base cursor and the measure cursor to highlight the area to which you wish to add an instruction.
2. Click the **Edit expert opinion** button. The **Edit expert opinion** dialogue opens.
3. Click **Instruction**. The **Add instruction** dialogue opens:



Here you have the following options:

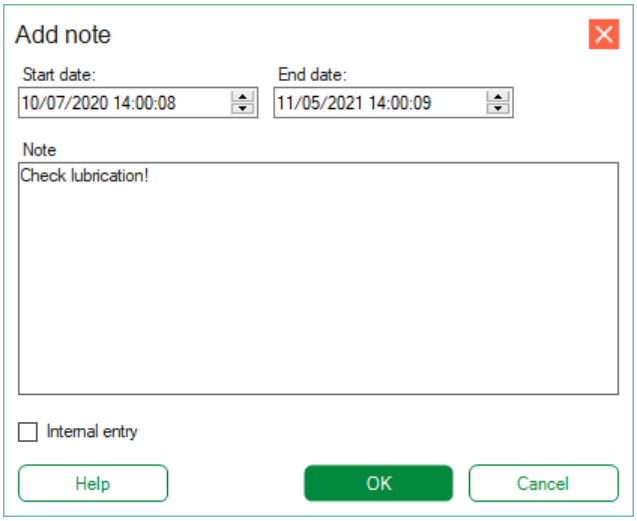
- **Date:** Specify the date to which the instruction refers.
- **Degree of confidence:** Click on the symbol that corresponds to your confidence about this instruction. Confidence increases from **0** to **+++** .
- **Instruction:** Select the appropriate instruction from the pick list.
- **Comments:** Enter a comment with additional information.
- **Internal entry:** Activate this option if you want to mark this entry as internal.

4. Enter the desired information and click **OK**.
   The instruction is added to the graph in the Trend Viewer and appears in the expert opinion overview table.

8.13.3 Add note

To add a note to a trend:

1. In the Trend Viewer diagram, use the base cursor and the measure cursor to highlight the area to which you wish to add a note.
2. Click the **Edit expert opinion** button. The **Edit expert opinion** dialogue opens.
3. Click **Note**. The **Add note** dialogue opens:



Here you have the following options:

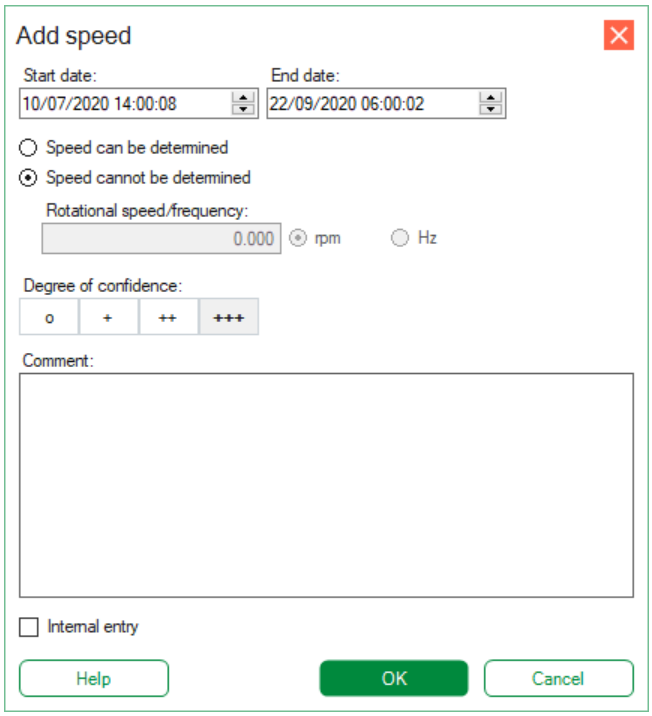
- **Note:** Enter the desired note here.
- **Internal entry:** Activate this option if you want to mark this entry as internal.

4. Enter the desired information and click **OK**.
   The note is added to the graph in the Trend Viewer and appears in the expert opinion overview table.

8.13.4 Add speed

To add a speed to a trend:

1. In the Trend Viewer diagram, use the base cursor and the measure cursor to highlight the area to which you wish to add a speed.
2. Click the **Edit expert opinion** button. The **Edit expert opinion** dialogue opens.
3. Click **Speed**. The **Add speed** dialogue opens:



Here you have the following options:

- **Start date/date and End date:** Specify the time period to which the speed refers.
- **Speed information:**
  - **Speed can be determined/cannot be determined:** Activate the appropriate option.
  - **Speed/frequency:** Enter the speed value here in revolutions per minute (**rpm**) or in hertz (**Hz**)
- **Degree of confidence:** Click on the symbol that corresponds to your confidence about this speed. Confidence increases from **0** to **+++** .
- **Comments:** Enter a comment with additional information.
- **Internal entry:** Activate this option if you want to mark this entry as internal.

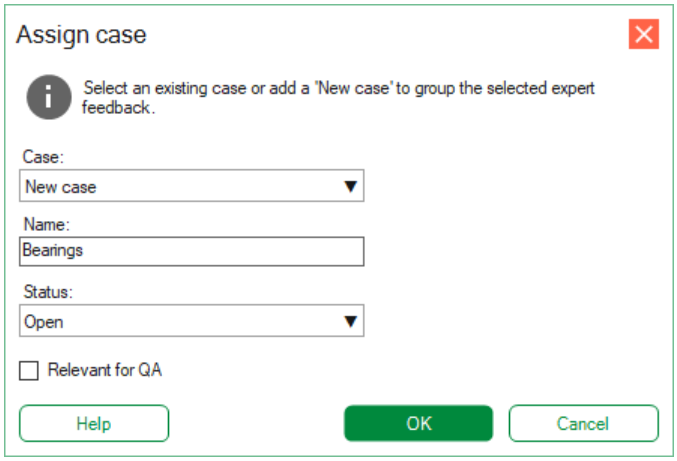
4. Enter the desired information and click **OK**.
   The speed is added to the graph in the Trend Viewer and appears in the expert opinion overview table.

8.13.5 Grouping expert opinions

You can group expert opinions by assigning them to a case or unassigning them from a case.

Assigning expert opinion(s) to a case

1. Click the **Edit expert opinion** button. The **Edit expert opinion** dialogue opens.
2. In the table, select the expert opinion(s) you wish to assign to a case.
3. Click **Assign case**. The **Assign case** dialogue opens:



Here you have the following options:

- **Case:** Select the appropriate case from the selection list. To create a new case, enter new values in **Name** and/or **Status** .
- **Name:** Enter the name of the case you wish to create.
- **Status:** Select the appropriate status for the case. If you change the status for an existing case, a new case is automatically created.
- **Relevant for QA:** Activate this option if this case is relevant to quality assurance.

4. Enter the desired information and click **OK**.

The selected expert opinions are assigned to the case. The name of the case appears in the overview table as a heading above the assigned expert opinions. If you have activated the **Relevant for QA** option, **Relevant for QA** also appears in the heading.

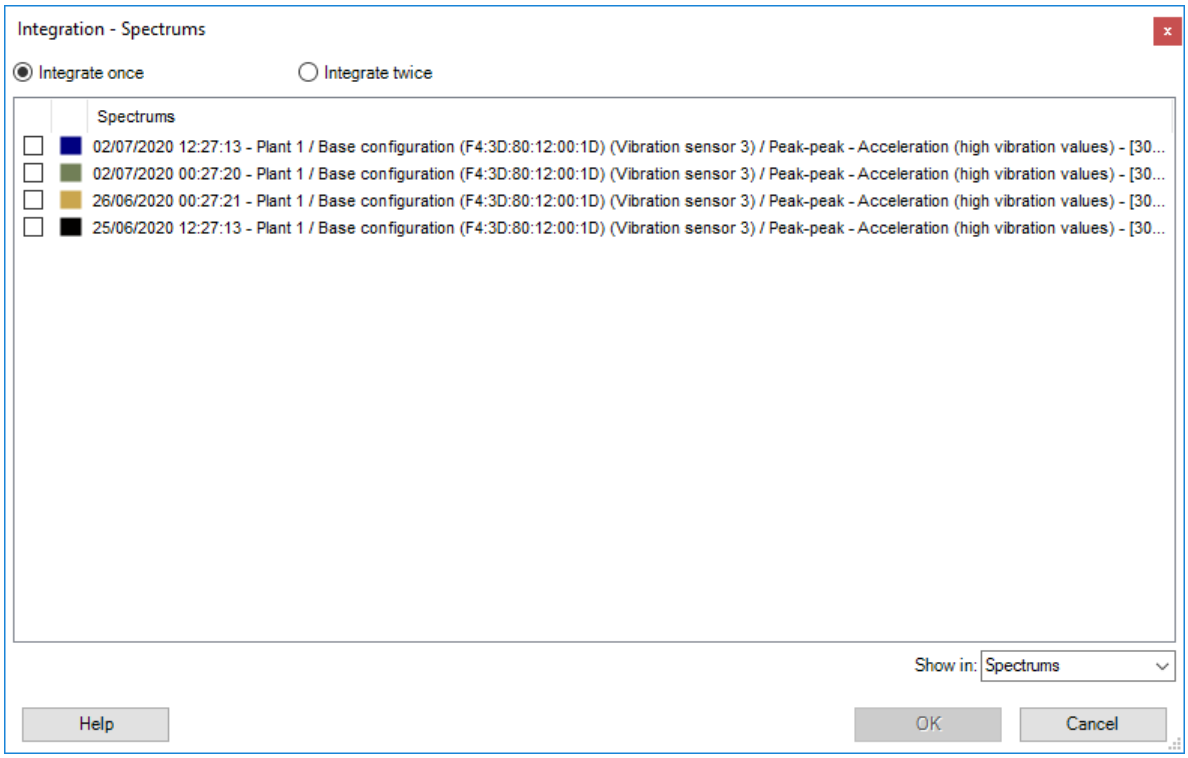
Remove from case

1. Click the **Edit expert opinion** button. The **Edit expert opinion** dialogue opens.
2. In the table, select the expert opinion(s) you wish to unassign from a case.
3. Click **Unassign case**.
   The case assignment for the selected expert opinions will be removed. The entries appear in the overview table under **Entries not assigned to a case**.

8.14 Integrate signals (spectrum)

By default, clicking the **Integrate signals** function ∫ in the Spectrum Viewer toolbar triggers the integration of all signals in the Viewer without opening a separate dialogue box.

You can change this in the Spectrum Viewer settings 91: If you activate the **Use integration dialogue box** option, clicking on ∫ opens a dialogue box in which you can configure settings for the integration:



Here you have the following options:

Integrate once Activate this option to view all the spectrums in the list that can be integrated once.

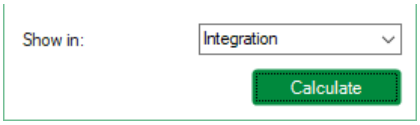
Integrate twice Activate this option to view all the spectrums in the list that can be integrated twice.

Spectrums In this list you will see the spectrums that are available for the integration option selected above. Use the checkbox to activate the required time signals for the integration.

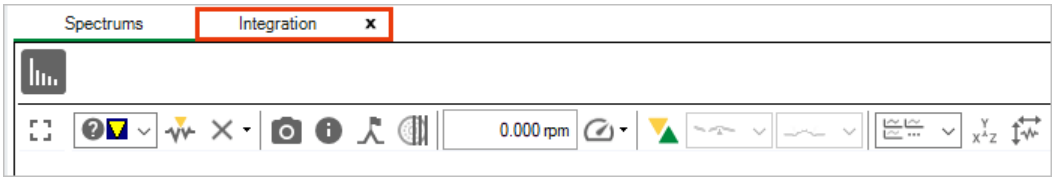
Show in You have the following options to display the integrated spectrums:

Spectrums: Use this option to display the integrated spectrums with all other loaded spectrums in the Spectrum Viewer.

Own tab: You can activate the option **Spectrums** and overwrite it with its own name:



The integrated time signals will then be displayed in a separate tab in the Spectrum Viewer:



Click **OK** to confirm your entries and integrate the selected spectrums.

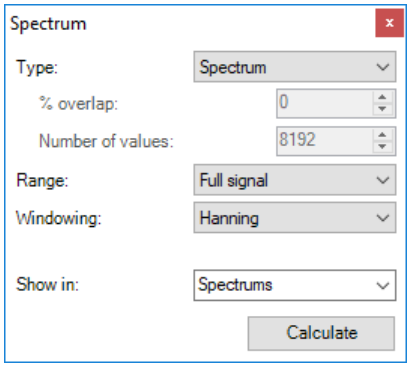
The representation of the spectrums is limited as follows:

- Raw signal spectrums are displayed in full.
- Envelope curve spectrums are truncated depending on sampling rate and high pass frequency.
- Integrated spectrums are only displayed up to a value of 1000 Hz.

However, additional measurement data are still available. To display them, click the **Auto-adjust axis limits** button .

8.15 Calculate Spectrum (time signal only)

The **Calculate Spectrum** function FFT is only available in the toolbar for the Time Signal Viewer. Use this function to produce a spectrum or spectrogram from the currently active time signal in the Time Signal Viewer.



Here you have the following options:

Type
Here you can specify whether the active time signal should be used to generate a **spectrum** or a **spectrogram**.

% overlap (spectrogram only)
Enter the percentage by which the individual spectrums of the spectrogram should overlap each other. The ideal value also depends on the choice of **windowing**; this is where you ensure that all important measurement values are taken into account during spectrum calculation.

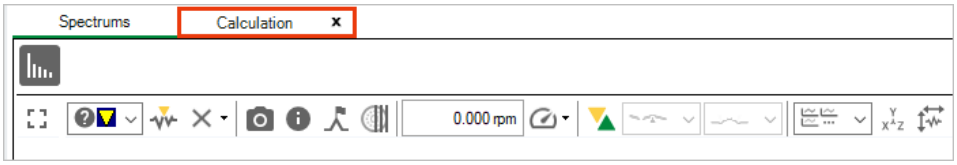
Number of measurement values (spectrogram only)
Enter the number of measurement values after which the next spectrum begins.

Range
Here you can define whether the spectrogram/spectrum should be based on the complete time signal or only on the cursor range. The cursor range is defined by the base cursor 50 and the measure cursor 50.

Windowing
Defines the window function to be used when the spectrogram/spectrum is generated. You can choose between **No windowing**, **Hanning** and **Hamming**.

Show in
Here you can define where the spectrogram/spectrum is displayed. You have two options:

- You can enter a name in the empty field. The newly calculated spectrogram is then displayed on its own tab in the Spectrum Viewer. The tab is given the name you enter here:



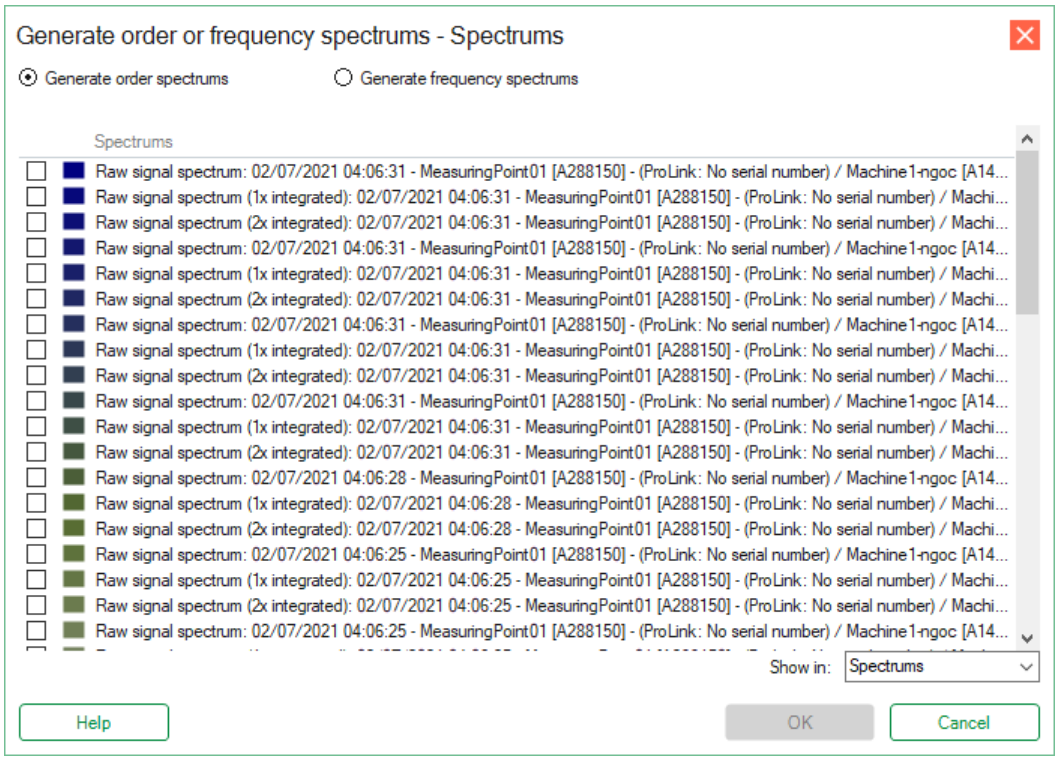
- You can select **Spectrums** to display the newly calculated spectrogram together with all the other open data in the Spectrum Viewer.

Calculate	Click here to create the new spectrogram/spectrum. Depending on the settings in Show in, it will then be displayed in the Spectrum Viewer or on its own tab in the Spectrum Viewer

8.16 Calculate order spectrum (Spectrum only)

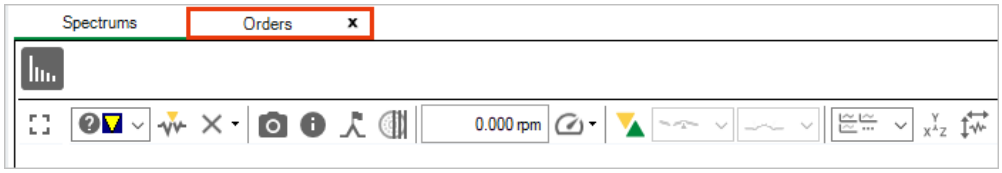
By default, clicking the **Calculate order spectrum** function in the Spectrum Viewer toolbar triggers the calculation of the order spectrums and frequency spectrums without opening a separate dialogue box.

You can change this in the Spectrum Viewer settings 91: If you activate the option **Use order dialogue box**, clicking on opens a dialogue box in which you can configure settings for the calculation:



Here you have the following options:

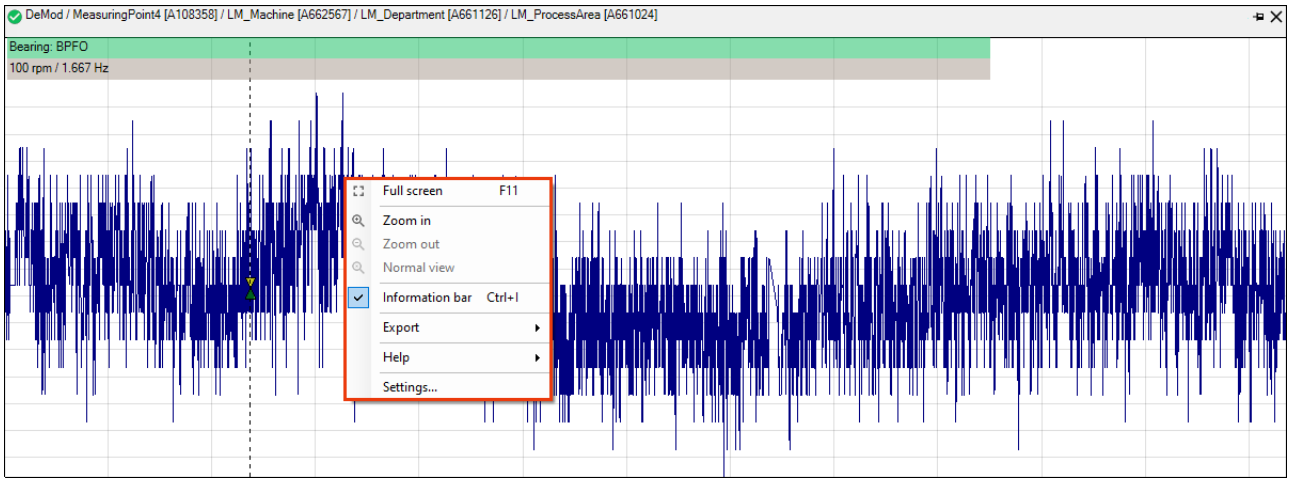
Generate order spectrums	Activate this option to see all the spectrums in the list from which an order spectrum can be generated.
Generate frequency spectrums	Activate this option to see all the spectrums in the list from which a frequency spectrum can be generated.
Spectrums	In this list you will see the spectrums that are available for the option selected above. Use the checkbox to activate the required spectrums for the operation.
Show in	You have the following options to display the generated spectrums: **Spectrums:** Use this option to display the generated spectrums with all other loaded spectrums in the Spectrum Viewer. **Own tab:** You can activate the option **Spectrums** and overwrite it with its own name:  The integrated time signals will then be displayed in the Time Signal Viewer on their own tab:



Click on **OK** to confirm your entries and generate the required spectrums.

8.17 Exporting diagrams

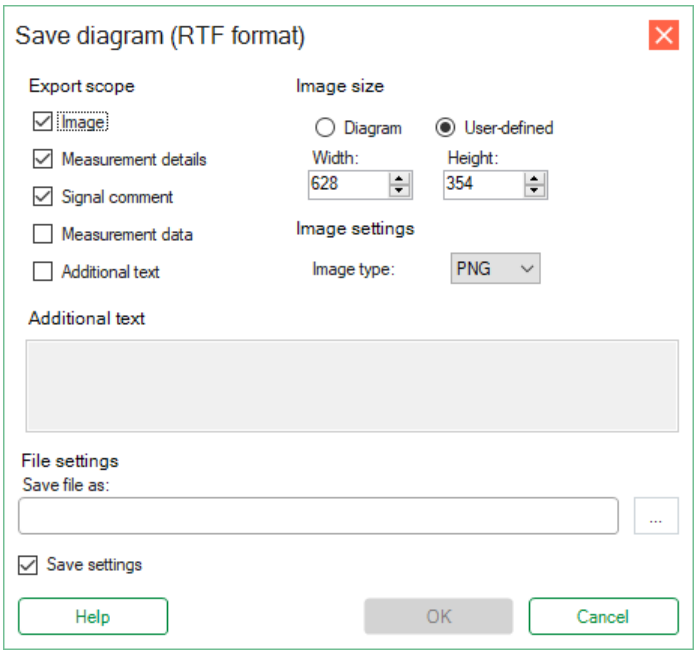
Each viewer allows you to export the diagram and its associated information. You can export the diagram in RTF format, image format and CSV format; you can also choose to save it as a file or copy it to the clipboard. The corresponding commands are called up by right-clicking in the context menu for the viewer:



You will find detailed information on exporting different formats in the following sections. To make the explanations clear, the sections only describe the dialogues that cover the range of options for **Save diagram**. The dialogues of the corresponding options for **Copy diagram** are different in that the **file settings** are missing.

Export diagram in RTF format

When you save or copy a diagram in RTF format, you can subsequently open it in Office applications or paste it into an Office file. To export, select **Export > Save diagram (RTF format)** or **Export > Copy diagram (RTF format)** from the context menu for the Viewer. This opens the corresponding dialogue box:



Here you have the following options:

Export scope

Use these options to determine exactly what the saved or copied diagram should contain:

- **Image**: Exports the diagram together with the information bar.
- **Measurement details**: Exports additional measurement information such as the sampling rate.
- **Signal comment**: Exports the signal comment provided you have defined one in the **Comments** tab; the signal comment usually describes the result after an investigation of a list of signals and acts primarily as an overview.
- **Measurement data**: Exports all of the values for the X and Y coordinates and, where necessary, for the Z coordinates (e.g. for 3D or 2D spectrogram) in tabular form.
- **Additional text**: Activating this option allows you to enter a comment on the diagram in the **Additional text** field. Your comment will then also appear in the exported diagram.

Image size

This is where you define the size of the exported diagram:

- **Diagram:** Sets the size to the Viewer's current dimensions. The diagram may be exported in full screen size in certain circumstances.
- **User-defined:** Allows you to determine the diagram's **width** and **height** yourself. If you select this option, the width and height are optimised as standard for DIN A4 portrait, but can be changed.
  If you increase only the value for the width, the result will be that more values will be displayed on the X-axis and the resolution will be improved.

Image settings

Here you can define whether the image exported as a part of the RTF export should be in PNG or WMF format.

Additional text

You can add further comments on the diagram here if you have activated the **Additional text** option under **Export scope**.

File settings (Save only)

You can save files in RTF format.

Enter the name under which you want to save the diagram.

Click ... to select the directory to which you want to save the file containing the diagram.

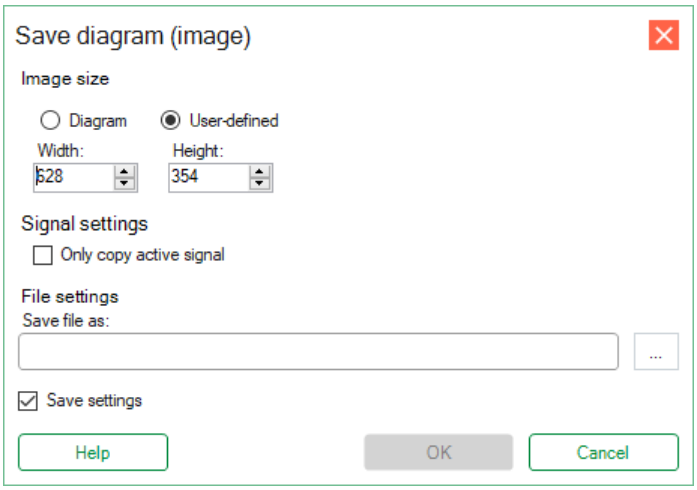
Save settings

If you select this option, the settings you made above will be saved as a default. These settings will be applied automatically every time you call up this export function.

Click **OK** to confirm your settings and export the diagram. Depending on the selected function, you can open the saved file in an Office program or paste the clipboard contents into a Word file, for instance.

Export diagram as an image

If you save or copy the diagram as an image, you will be able to open it in an image editing program or paste it into files that support images. To export, select **Export > Save diagram (image)** or **Export > Copy diagram (image)** from the context menu for the Viewer. Alternatively, hold down the SHIFT key and click on in the Viewer toolbar. This opens the corresponding dialogue box:



Here you have the following options:

Image size

This is where you define the size of the exported diagram:

- **Diagram:** Sets the size to the Viewer's current dimensions. The diagram may be exported in full screen size in certain circumstances.
- **User-defined:** Allows you to determine the diagram's **width** and **height** yourself. If you select this option, the width and height are optimised as standard for DIN A4 portrait, but can be changed.
  If you increase only the value for the width, the result will be that more values will be displayed on the X-axis and the resolution will be improved.

Signal settings

- **Copy only active signal**: Select this option to save or copy only the currently active signal.
  If this option is disabled, all signals are saved or copied.

File settings

You can save files in PNG format.

Enter the name under which you want to save the diagram.

Click ... to select the directory to which you want to save the file containing the diagram.

Save settings

If you select this option, the settings you made above will be saved as a default. These settings will be applied automatically every time you call up this export function.

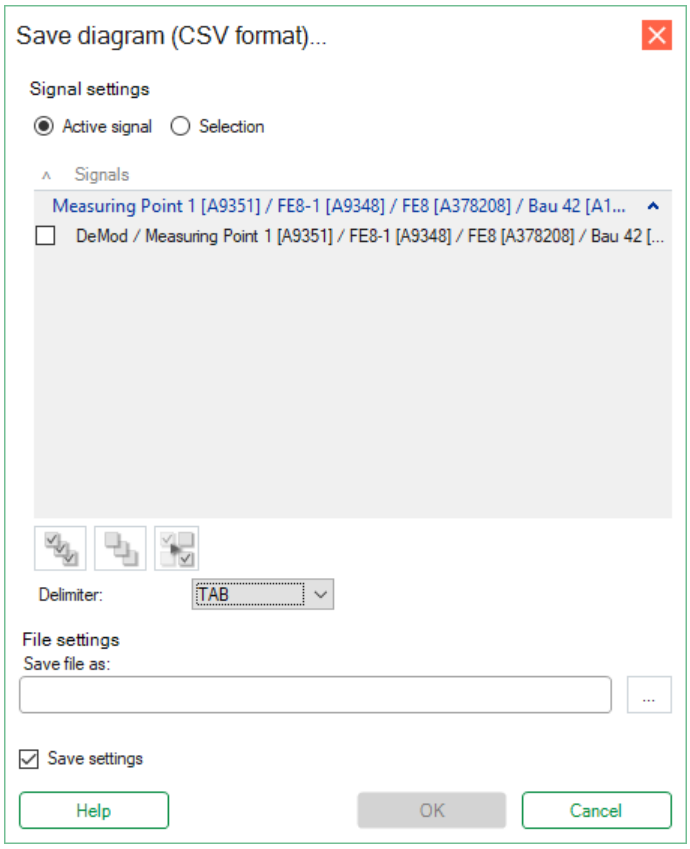
Click **OK** to confirm your settings and export the diagram. Depending on the selected function, you can open the saved file in an image editing program or paste the clipboard contents into a Word file, for instance.



Clicking the button in the Viewer toolbar is the same as clicking **Export > Copy diagram (image)** in the Viewer's context menu.

Export diagram in CSV format

Saving or copying the diagram in CSV format will export all of the X and Y coordinates and, where indicated, the Z coordinates. You can then open them as a table, for instance in MS Excel, or paste them into an appropriate file. To export, select **Export > Save diagram (CSV format)** or **Export > Copy diagram (CSV format)** from the context menu for the Viewer. This opens the corresponding dialogue box:



Here you have the following options:

Signal settings

Here you can determine the signal types you want to export the diagram for:

- **Active signal** 31: You will find the active signal in the signal selection list for the Viewer where it is marked with a yellow triangle.
- **Selection**: Activate this option if you want to select specific signals for export. You can choose from all of the currently loaded signals. Make your selection by activating the checkbox for each signal you want to export. You can also make use of the quick selection options offered by the buttons below the list:

  : Selects all of the signals for export.

  : Selects none of the signals for export.

  : Inverts the current selection, i.e. checks unchecked boxes and unchecks checked boxes.

Use the **Delimiter** option to determine how coordinate values should be separated in the exported format. You can choose between the following options: **TAB**, comma **,** and semicolon **;**.

File settings

You can save files in CSV format.

Enter the name under which you want to save the diagram.

Click ... to select the directory to which you want to save the file containing the diagram.

Save settings

If you select this option, the settings you made above will be saved as a default. These settings will be applied automatically every time you call up this export function.



For the CSV export of the trend, the data for the X axis is transferred as numbers in a time stamp column.

Example: **41884.4173678241**

These values correspond to an EXCEL-specific date and time format:

- **Number before the decimal point**: Number of days since 1/1/1900
- **Number after the decimal point**: Time

To convert this format to the normal date and time format, proceed as follows:

1. Highlight the time stamp column.
2. Right-click and select **Format cells**.
3. On the **Numbers** tab, select the **User-defined** category and then on the right-hand side select the required **Type**, i.e. **DD/MM/YYYY hh:mm:ss**. The example above then corresponds to: **02/09/2014 10:01:01**.

9 Change program settings

Some changes to settings do not take effect until you restart the program. In these cases, the **Restart the application** dialogue opens automatically after the change has been made. You can then decide whether to restart the program immediately or at another time.

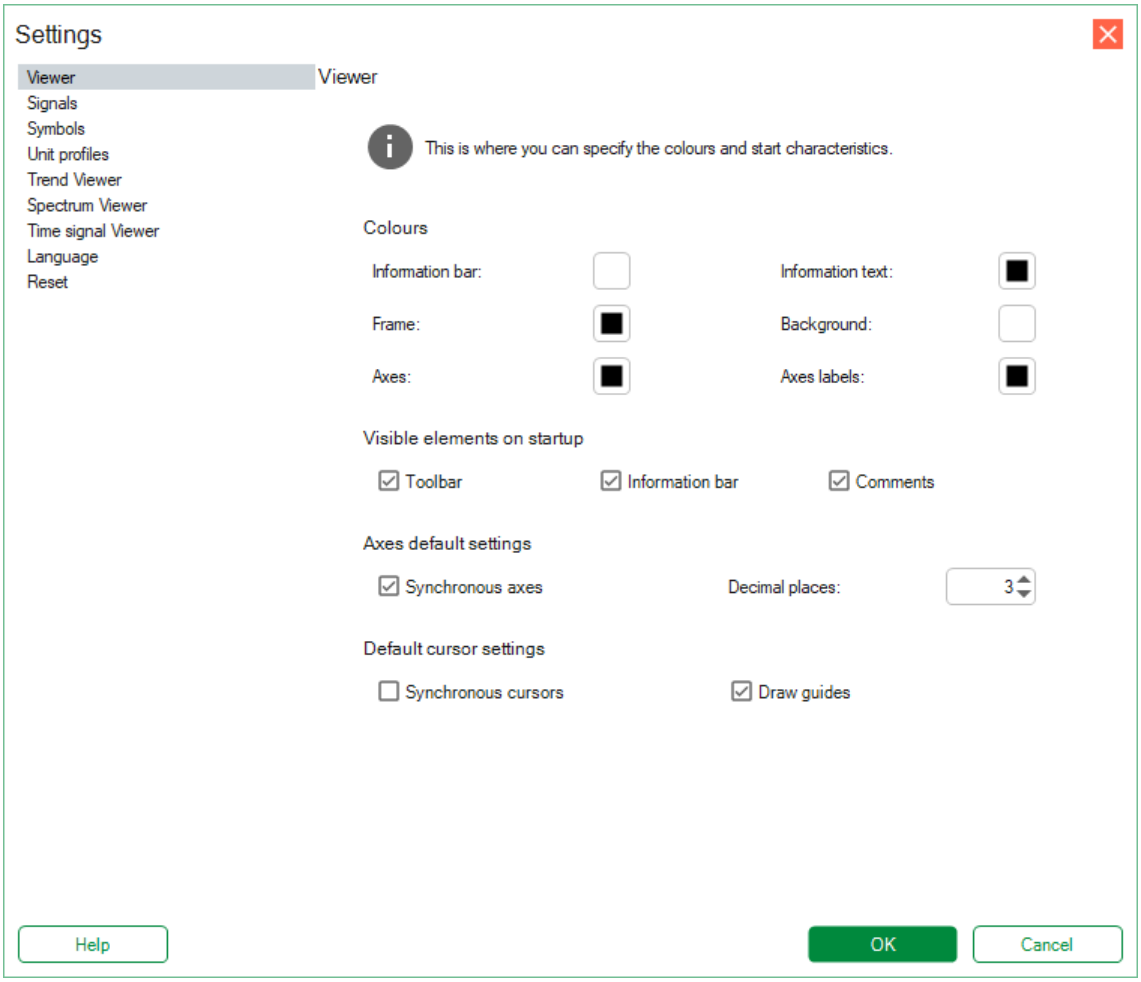
Open the program settings of the Schaeffler OPTIME ExpertViewer software as follows:

- Right-click in one of the Viewers to open the context menu and select the **Settings** command

or

- Click the **Settings** button in the top right corner of the title bar.

The following dialogue appears:



You can select the area for which you want to view or change settings from the list on the left. You will then see the settings you can change for the area in question on the right. You can change the settings for the following areas:

- Viewer 85
- Signals 87
- Symbols 87
- Unit profiles 88
- Trend Viewer 90
- Spectrum Viewer 91
- Time signal Viewer 92
- Language 92
- Reset 93

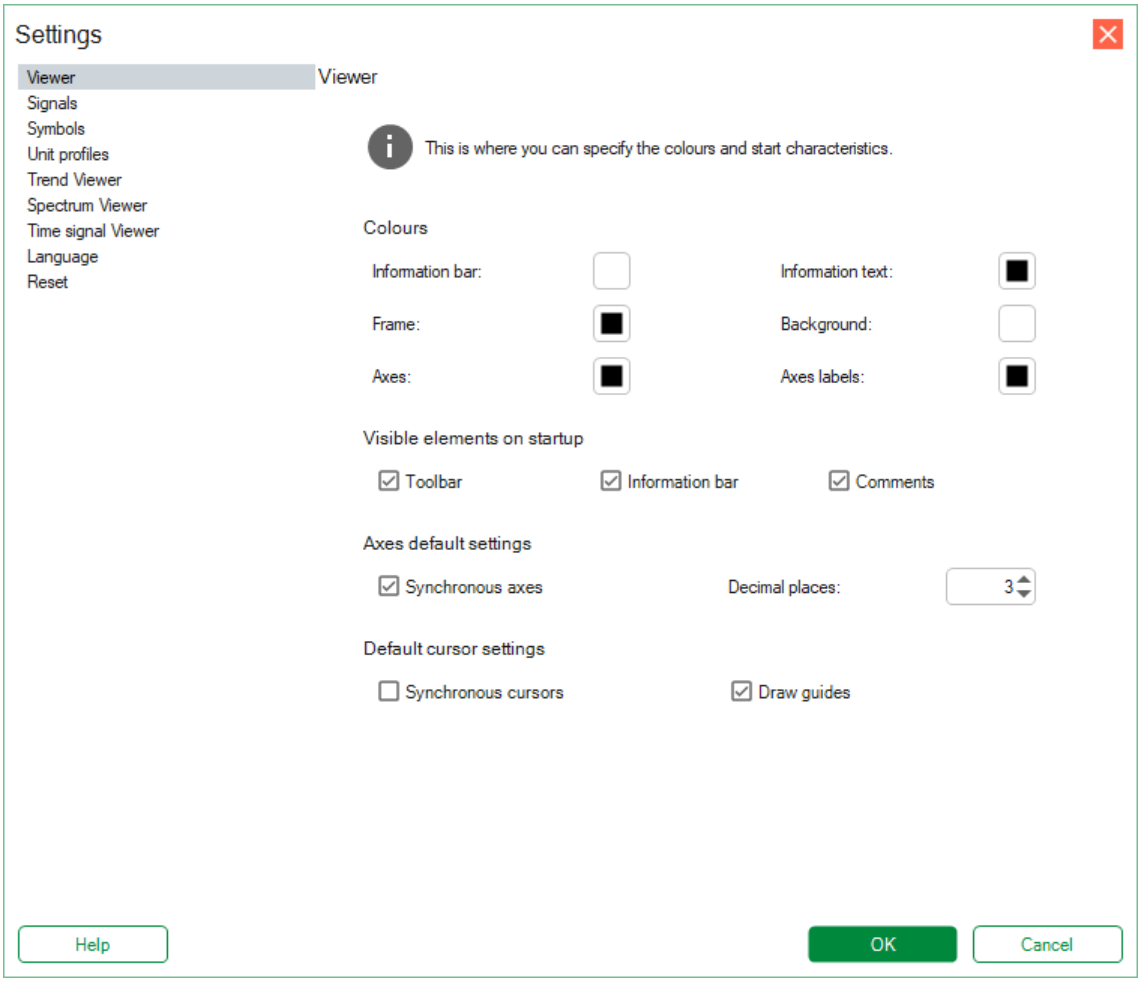
You will find detailed information on settings options in the following sections.

Some of these settings relate to the colours used in the Schaeffler OPTIME ExpertViewer software, e.g. for cursor symbols and signal displays. Follow these steps to change a colour:

1. Click the colour symbol you want to change. This opens the standard colour dialogue box.
2. Choose the colour you want to assign to the cursor symbol or signal display. Here you have the following options:
   - Click one of the **basic colours** to select it.
   - Click inside the colour chart to select a colour.
   - Use the slide on the far right to change the colour shade.
   - Directly enter the required values for **red**, **green** and **blue** or for **colour shade**, **saturation** and **brightness**.
3. Confirm your changes with **OK**.

9.1 Viewer settings

You can determine how the Viewers should look on start-up and their standard behaviour in the **Viewers** area.



You have the following options:

Colours This is where you determine the colours to be used for specific areas of the Viewer, e.g. the background colour of the **information bar** or the colour of the **axes labels**. Click on the corresponding colour symbol to open the standard colour dialogue box 85, where you can specify your settings.

Visible elements on startup

Here you can define which elements of the viewer should be visible on startup.

The **toolbar** and **information bar** elements are activated as standard; **comments** are not visible.

Axes default settings

Here you can define the appearance of the X and Y axes on startup:

- **Synchronous axes:** When this option is activated, any changes made in the **Axes** 65 tab will always apply to the axes of every diagram in the active Viewer. If you deactivate the checkbox, any changes made in the **Axes** 65 tab will only apply to the diagram for the active signal or spectrum.
- **Decimal places:** Here you can define how many decimal places the values for the X and Y axes should have.

The **Synchronous axes** option is activated as standard; 3 decimal places are displayed.

Default cursor settings

Here you can define basic cursor behaviour:

- **Synchronous cursors:** If you select this option, the measure cursor and base cursor will be displayed simultaneously for all data on the display. Any changes to the cursor position for the active data will apply to the cursor positions for all of the data.

  If the checkbox is deactivated, any cursor action will apply to the active data only.
- **Draw guides:** If you activate this option, the program will not only display the cursor symbols in the diagram, but will also draw a line at the corresponding position.

  If the checkbox is deactivated, you will only see the cursor symbols without the line.

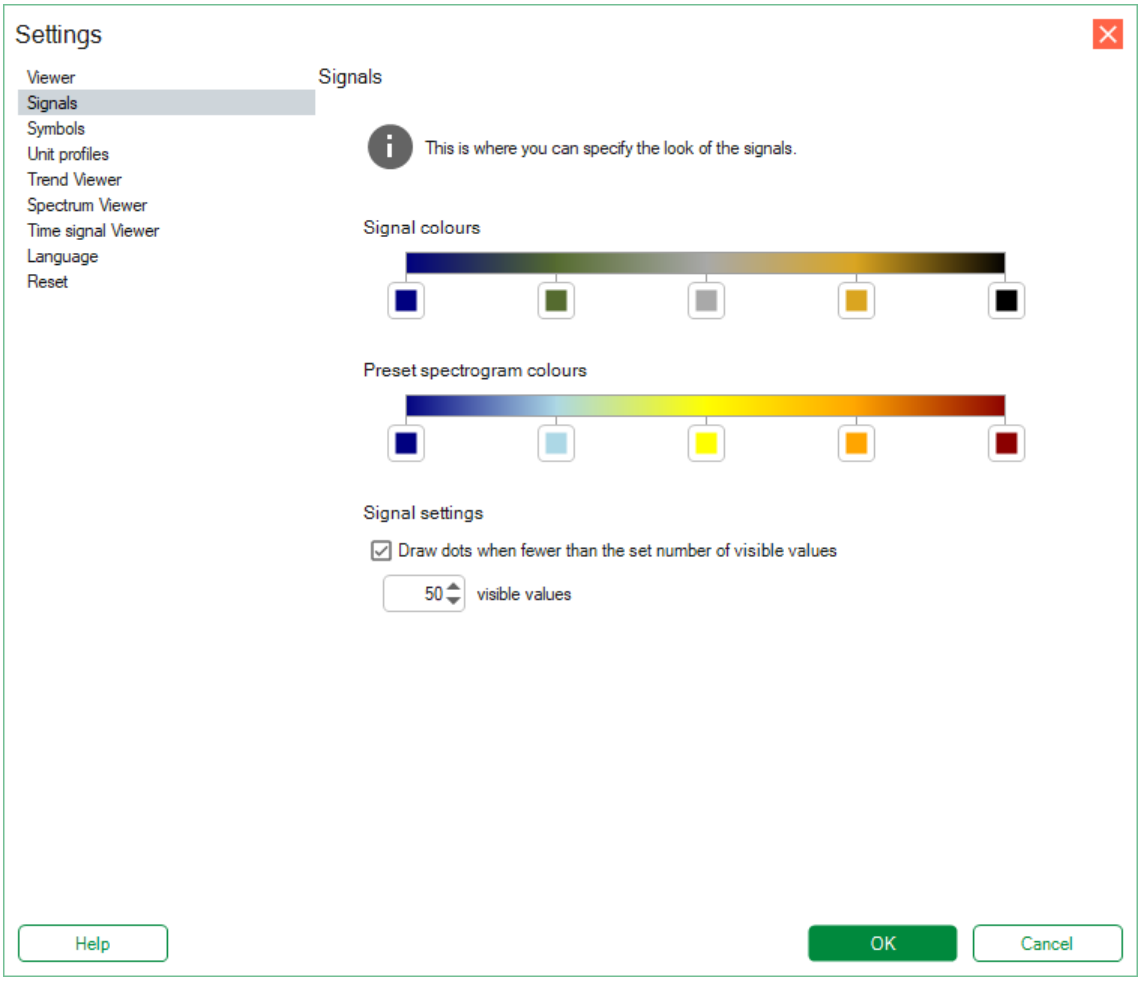
Both options are deactivated as standard.



When you exit the OPTIME ExpertViewer software, the most recent size and location of the application window will be saved. The next time you launch the application window, it will open in the same size and location.

9.2 Signal settings

You can define the colours to be used to display signals, spectrums and spectrograms in the **Signals** area.



You have the following options:

Signal colours

Here you can define the colours to be used to display signals, spectrums and spectrograms in the viewers. Click on the corresponding colour symbol to open the standard colour dialogue box 85, where you can specify your settings.

Preset spectrogram colours

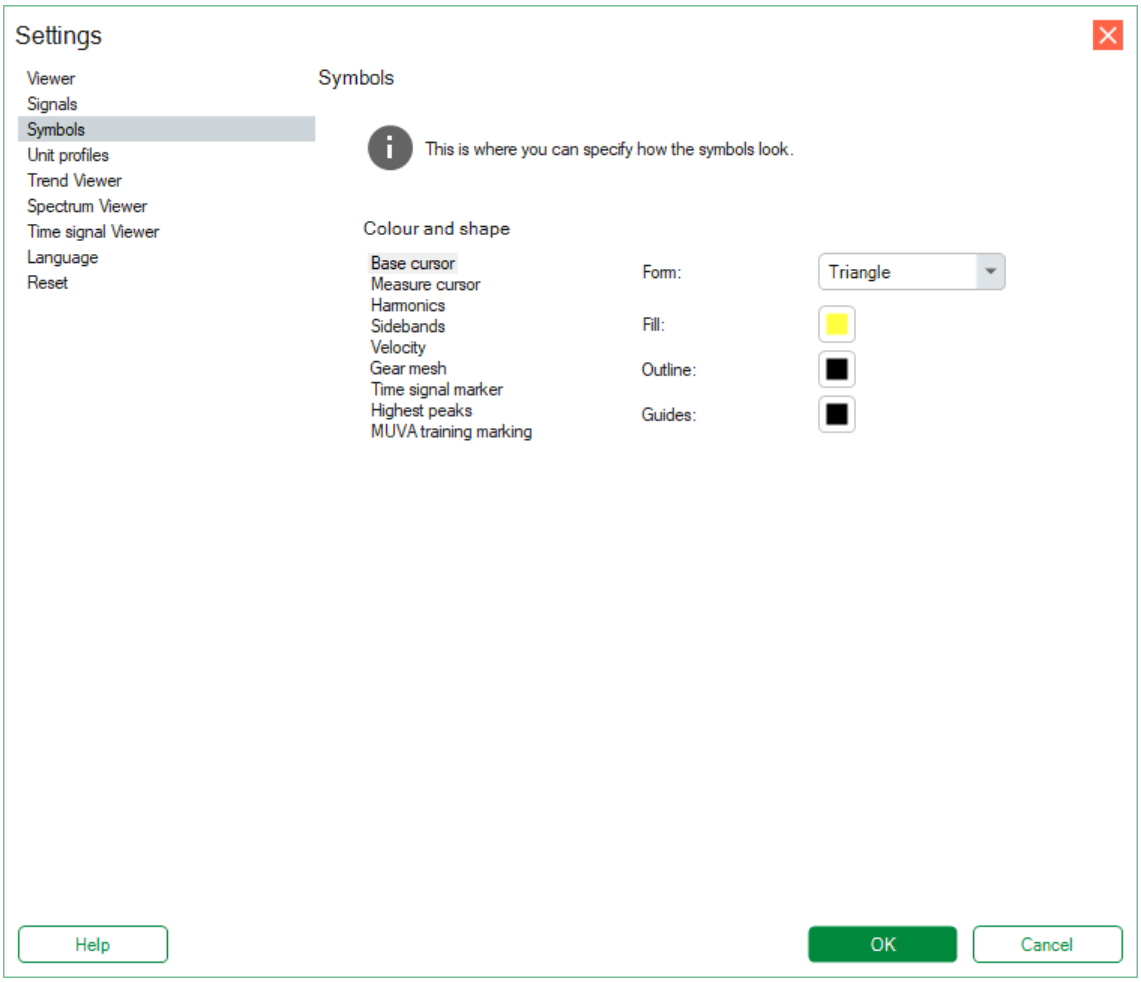
Here you can define the colours to be used for the **2D spectrogram** 64 and **3D spectrogram** 65 view options. Click on the corresponding colour symbol to open the standard colour dialogue box, where you can specify your settings.

Signal settings

- **Draw dots at less than the set number of visible values:** When the option is activated, signals are displayed as dots when there are fewer than 50 values in the visible area of the diagram. If you deactivate the checkbox, the program will also display 50 values and fewer as a solid line. This option is activated by default.
- **Visible values:** Here you can define how many values lie in the visible area of the diagram. This are 50 values by default.

9.3 Symbol settings

You can determine how the cursor and the symbols for cursor functions should looks, as well as their standard behaviour, in the **Symbols** area.



You have the following options:

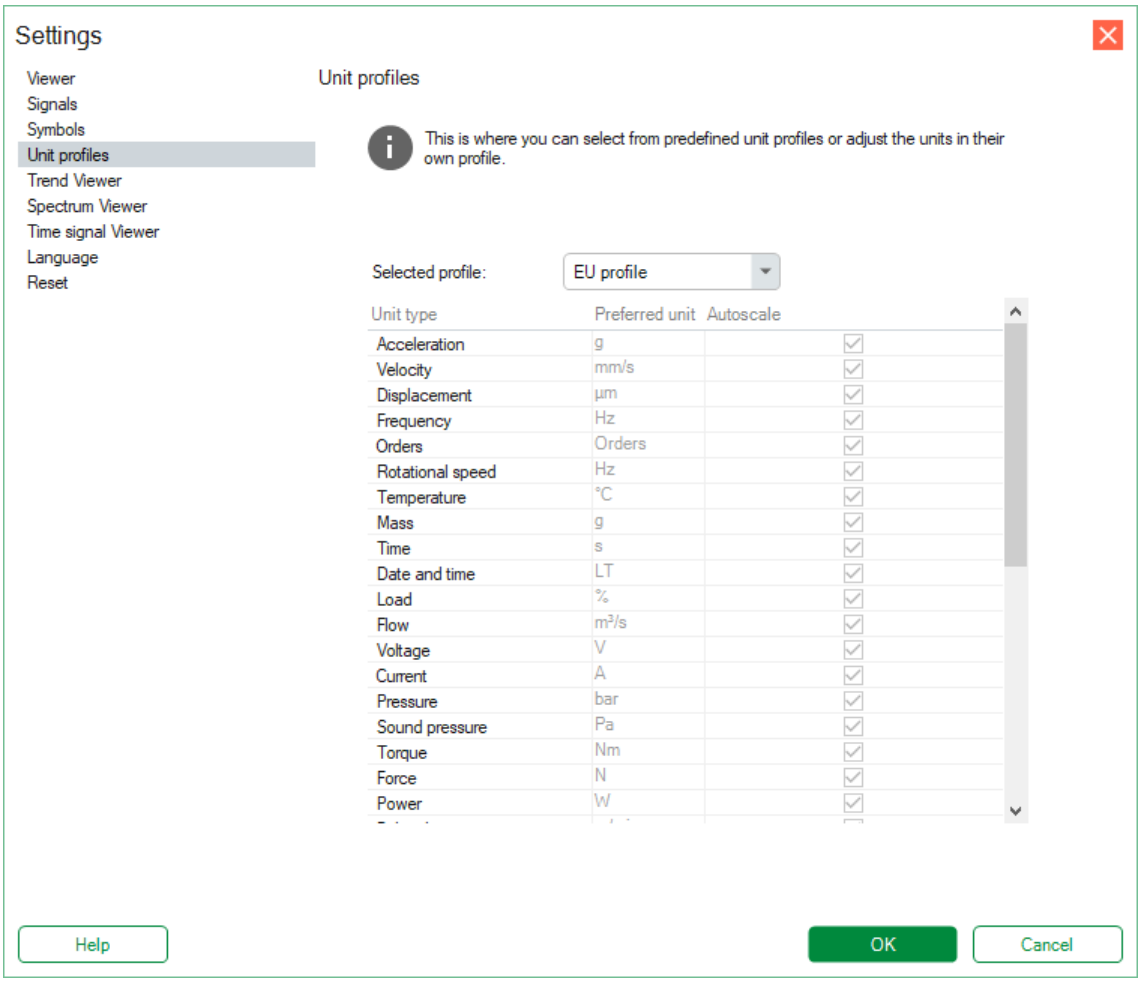
Colour and shape

You can define the shapes and colours to be used for the measure and base cursors and for cursor functions. To do this, proceed as follows:

1. Click on the symbol you want to change in the list on the left. This automatically updates the fields on the right; they show you the current settings for the symbol.
2. In the selection list labelled **Shape**, select the shape you want to use to symbolise the cursor or cursor function in the diagram, e.g. **box** or **diamond**.
3. Define the shape and the colours for its **filling**, **outline** and **guides**. Click on the corresponding colour symbol to open the standard colour dialogue box 85, where you can specify your settings.

9.4 Unit profiles

You can define the unit profile to be used to display the X and Y axes in the diagrams under **Unit profiles**. Unit profiles determine the unit types, units and scaling for X and Y axes.



You have the following options:

Selected profile

You have the following choice:

- **EU profile:** This profile defines the units commonly used in the European region as the **preferred unit**; **auto-scaling** 89 is activated for all unit types. You cannot edit this profile.
- **US profile:** This profile defines the units commonly used in the US region as the **preferred unit**; **auto-scaling** 89 is activated for all unit types. You cannot edit this profile.
- **Own profile:** This profile allows you to specify your own settings for the **preferred unit** as well as for **auto-scaling** 89. When you open the profile for the first time, you will be prompted to select one of the two other profiles based on the language of your operating system. You can, however, change all of the values via the profile table.

Profile table

If you have selected **EU profile** or **US profile**, this table will be used for informational purposes only, i.e. it will show you which unit is preferred for each unit type and whether auto-scaling is activated.

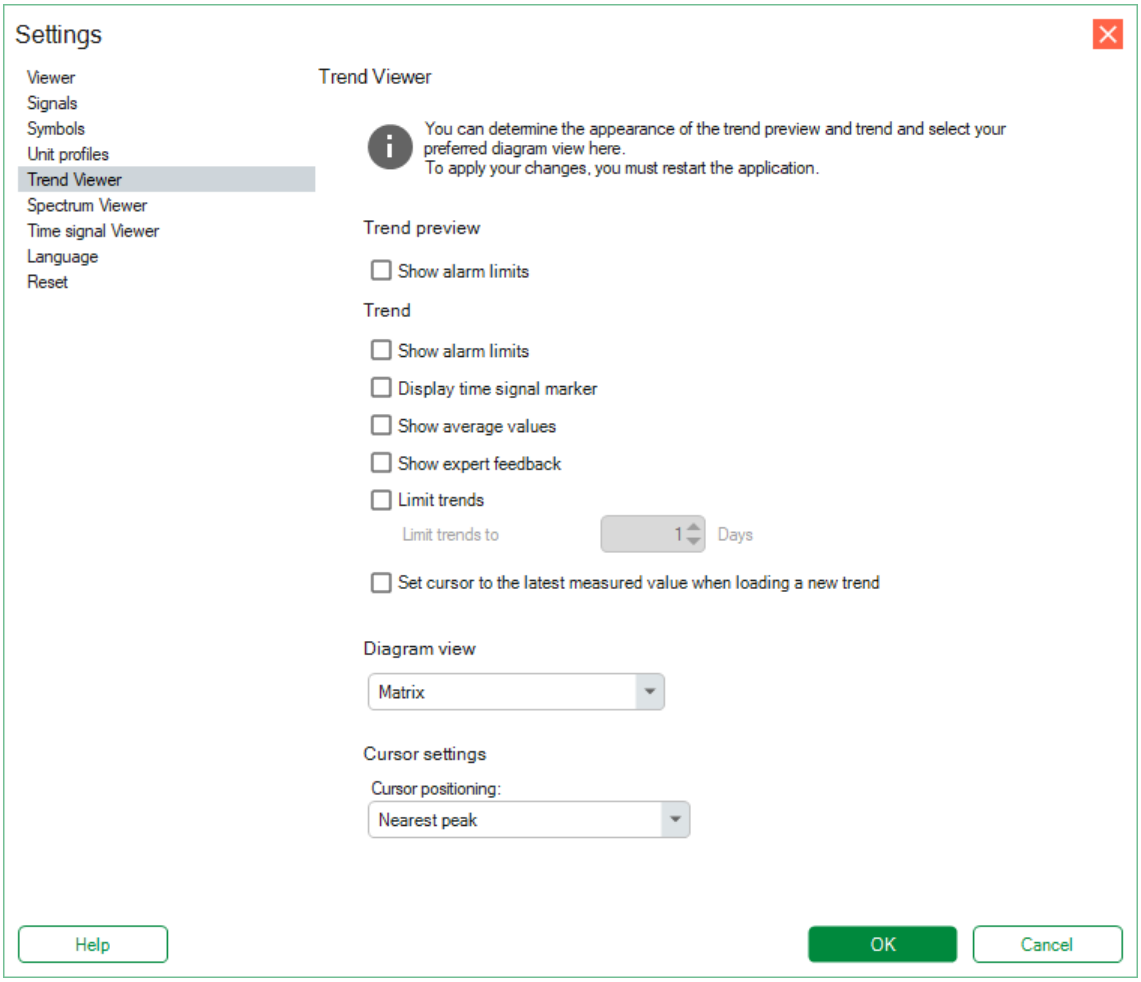
If you have selected **Own profile**, you will have the following options:

- **Preferred unit**: This option allows you to determine the unit to be used as standard for each unit type in every diagram. This unit will always be used to display the axes for this unit type.
- **Auto-scaling:** If this option is activated, the Schaeffler OPTIME ExpertViewer software will automatically decide which unit is best for the diagram display, i.e. provides a clear and short display. This unit may differ from the **preferred unit** under certain circumstances.

A list of the underlying base units for the **EU profile** and the **US profile** can be found in **Appendix II: Base units** 99.

9.5 Trend Viewer settings

In the **Trend Viewer** area, you can set the default behaviour for Trend preview, Trend and the Diagram view.



You have the following options:

Trend preview

Show alarm limits: Activate this option to show the alarm limits in the Trend preview.

Trend

Here, you can determine the default behaviour for the trend display:

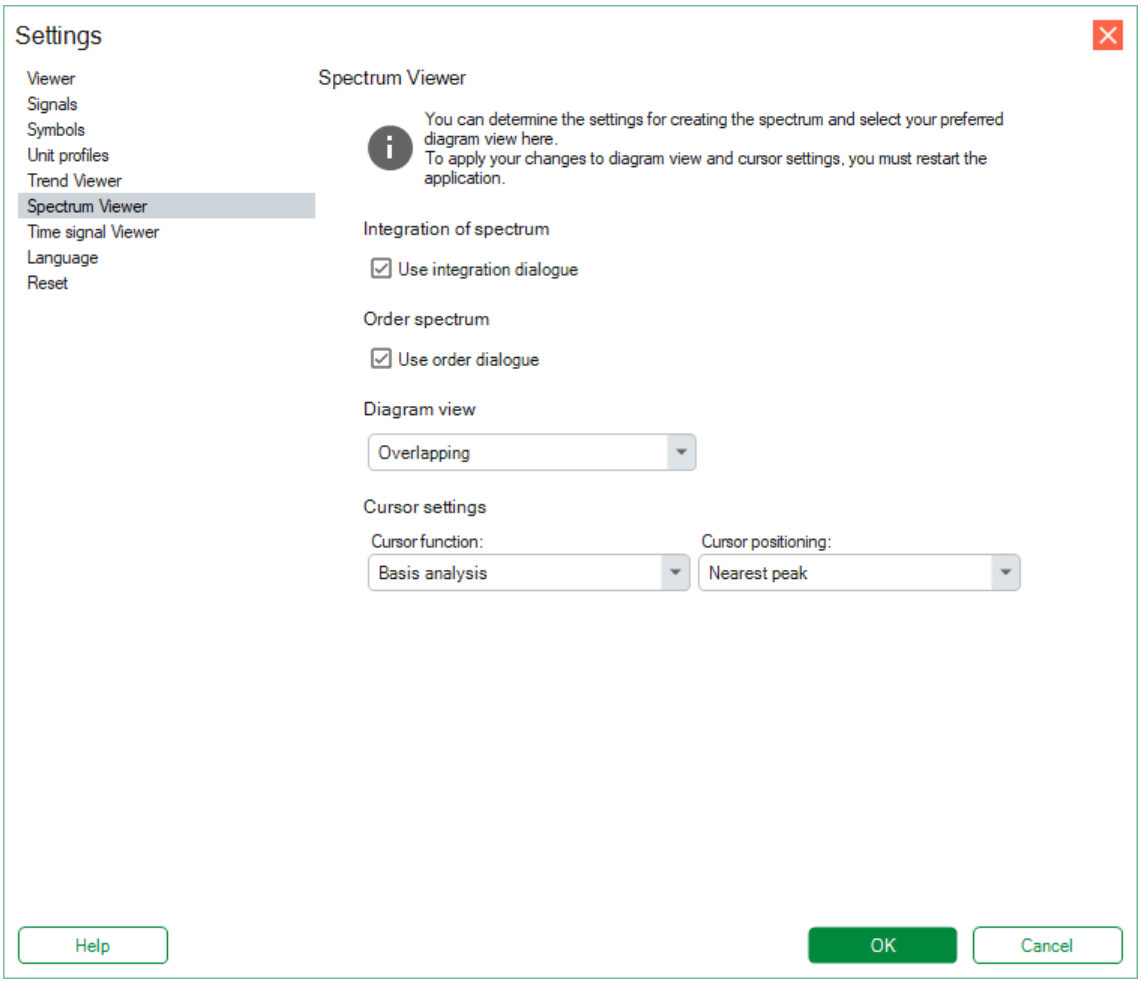
- **Show alarm limits:** Activate this option to show the alarm limits in the trend.
- **Display time signal marker:** Activate this option to display time signal markers in the trend.
- **Show average values:** Activate this option to show the average values in the trend.
- **Show expert feedback:** Activate this option to show the expert feedback in the trend.
- **Limit trends:** Here you can limit the loaded trends. To do this, activate the **Limit trends to** option and enter the desired number of **days** from which the trends can originate.
- **Set cursor to the latest measured value when loading a new trend:** Activate this option to always move the cursor to the most recent measured value when the trend is being loaded.

Diagram view Here, you specify the diagram view in which the Viewer opens by default.

Cursor settings Here you can specify for the Trend Viewer how the precise position of the base cursor will be determined when pulling in the diagram. You can find details on this in the **Position cursor** 58 section.

9.6 Spectrum Viewer settings

In the **Spectrum Viewer** area, you can set the default behaviour for spectrum creation and the diagram view.



You have the following options:

Integration of spectrum Here you can define whether the spectrum is automatically integrated or whether the integration dialogue box opens when you click the **Integrate signals** function ∫ in the Spectrum Viewer toolbar:

- **Use integration dialogue:** Activate this option so that clicking **Integrate signals** ∫ opens the integration dialogue 75.

Order spectrum Here you can define whether the order spectrum is calculated automatically or whether the order dialogue box opens when you click the **Calculate order spectrum** function in the Spectrum Viewer toolbar:

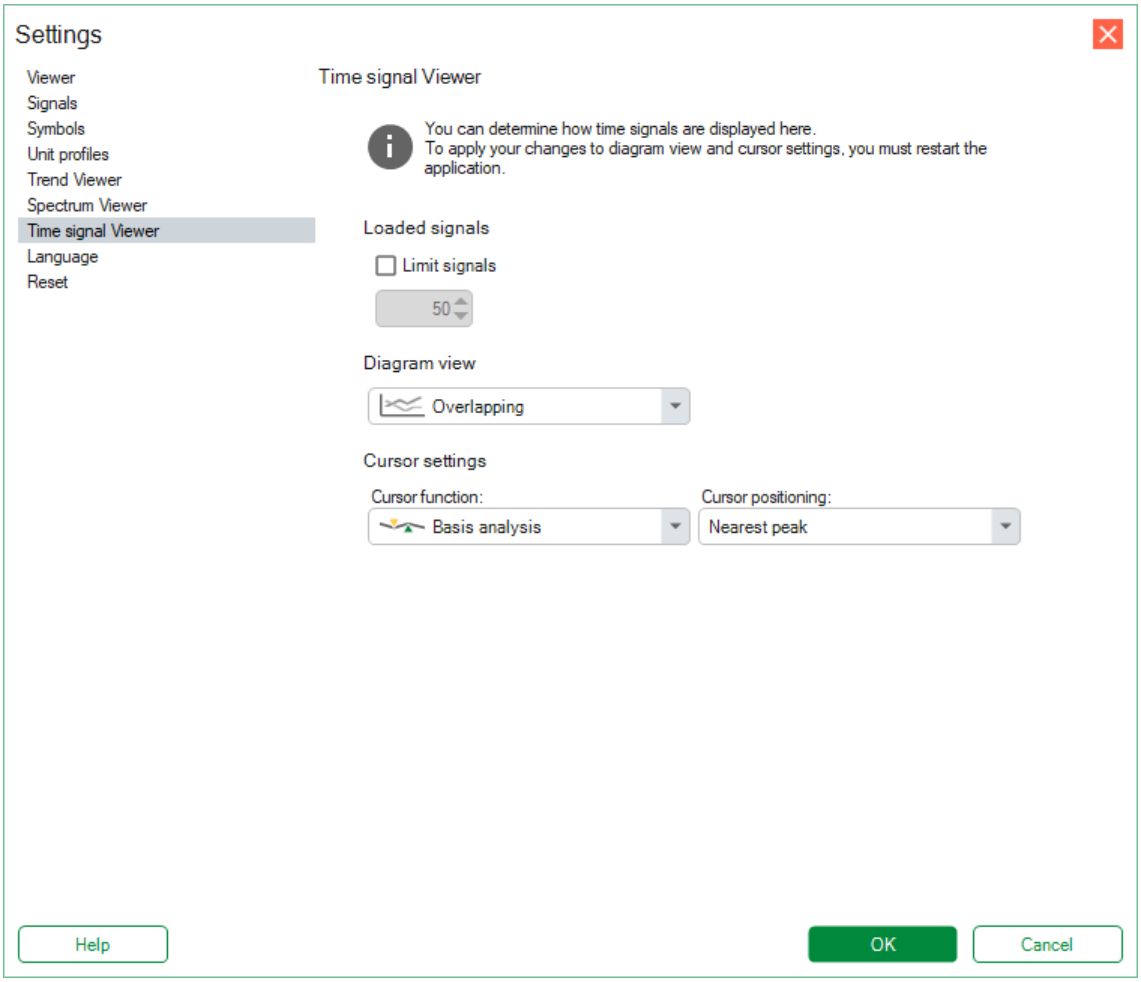
- **Use order dialogue:** Activate this option so that clicking **Calculate order spectrum** opens the order dialogue 78.

Diagram view Here, you specify the diagram view in which the Viewer opens by default.

Cursor settings Here you can define which cursor function is preset for the Spectrum Viewer and how the exact position of the base cursor and measure cursor is determined when dragging in the graph. For details, see the **Cursor setting** 50 and **Position cursor** 58 sections.

9.7 Time Signal Viewer settings

In the **Time Signal Viewer** area, you can set the default behaviour for the display of loaded signals as well as for the diagram view.



You have the following options:

Loaded signals Here you can limit the loaded signals to a specific number and thereby prevent all signals from being loaded unintentionally. To do this, activate the **Limit signals** option and enter the desired number.

Diagram view Here, you specify the diagram view in which the Viewer opens by default.

Cursor settings Here you can define which cursor function is preset for the Spectrum Viewer and how the exact position of the base cursor and measure cursor is determined when dragging in the graph. For details, see the **Cursor setting** 50 and **Position cursor** 58 sections.

9.8 Language

In the **Language** area, you can change the program language of the OPTIME ExpertViewer software. To do so, select the desired language from the list and click **OK**.



This function is only available in the OPTIME ExpertViewer software.

9.9 Reset

You can reset the OPTIME ExpertViewer software program settings to the factory default settings in the **Reset** area. To do so, click on the **Reset program settings** button.



If you reset the software program settings, all database connections are deleted. The subscription information is retained.

10 Further information

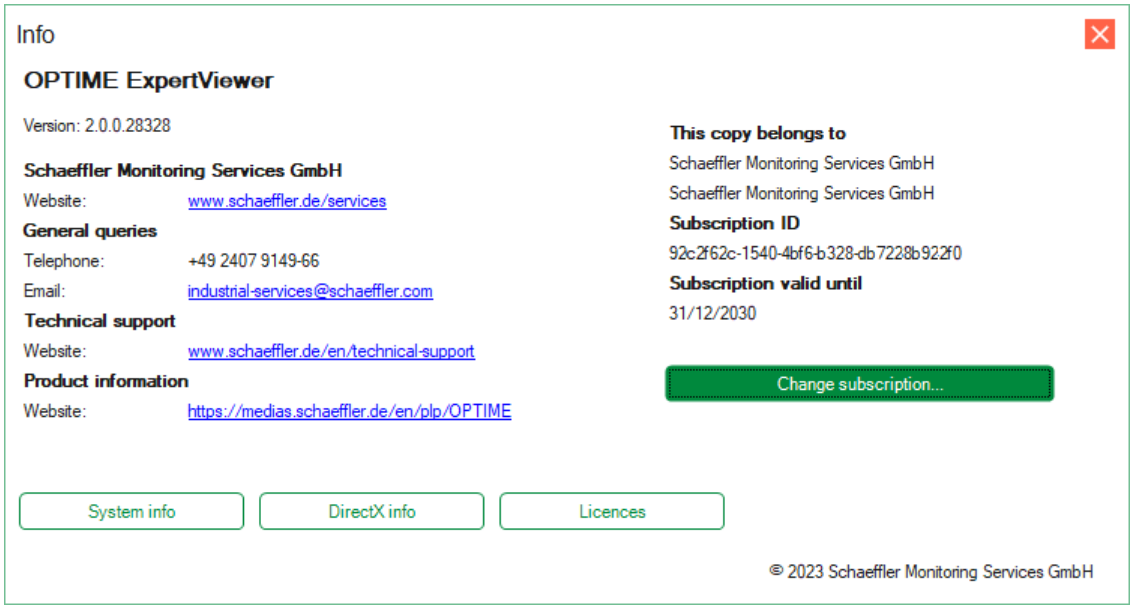
Open the further information in the Schaeffler OPTIME ExpertViewer software as follows:

- Right-click in one of the Viewers to open the context menu and select the **Help > Info** command.

or

- Click the **Info** button in the top-right corner of the title bar.

The following dialogue appears:



Here you have the following options:

- **Version:** Here you can view the current version of your OPTIME ExpertViewer software.
- **Website:** Click this link to switch to the Schaeffler Technologies website.
- **Email:** Click this link to email a general query to Schaeffler Monitoring Services GmbH.
- **Technical support:** Click the link to go to the technical support web page.
- **Product information:** Click the link to go to the OPTIME system information web page or to send an email with a specific query about the OPTIME system.
- **System info:** Click this button to switch directly to the **System information** page of your Windows system.
- **DirectX info:** Click this button to switch directly to the DirectX diagnostic program.
- **Licences:** Click this button for detailed information about the third-party libraries used by the OPTIME ExpertViewer software.
- **This copy belongs to:** and **Subscription runs until:** Here you will find information and the duration of your trial or subscription.
- **Change subscription:** Click this button to select a new subscription file to change the subscription.

Information and services for our vibration monitoring systems

We offer a unique range of services for OPTIME and SmartCheck or ProLink – from training courses, technical mentoring during the induction phase and expert support with diagnostic issues, right through to customised service agreements including remote monitoring and reporting.

11 Appendix I: Working with the keyboard and mouse

You can execute many of the Schaeffler OPTIME ExpertViewer software functions using hotkeys and mouse movements. You will find these functions mainly in the following areas:

- **Zoom functions** 95: Zoom in and out of diagrams in increments simply by using the keyboard or mouse.
- **Scroll and move** 96: Cursor positioning and movements along axes are also possible with the keyboard and mouse.
- Hotkeys and the mouse also offer support in various areas, e.g. camera control 97 in 2D and 3D view or when adjusting the Viewer 97.

You can find details on hotkeys and mouse movements in the following sections.

11.1 Zooming in a diagram

Zooming with hotkeys

+ / -	Zoom in on X-axis / zoom out on X-axis
SHIFT + / SHIFT -	Zoom in on Y-axis / zoom out on Y-axis
CTRL + / CTRL -	Zoom in on Z-axis / zoom out on Z-axis (3D view)
SPACE BAR	Undo all zoom steps
BACK KEY	Undo the last zoom step

Zooming with the mouse, or hotkeys and mouse

Press and hold left mouse button and drag	Zoom along the X-axis: as soon as you release the mouse button, the program zooms into the defined area*)
SHIFT + Press and hold left mouse button and drag	Zoom along the Y-axis: as soon as you release the mouse button, the program zooms into the defined area*)
CTRL + Press and hold left mouse button and drag	Zoom along the X and Y-axes: as soon as you release the mouse button, the program zooms into the defined area*)
Rotate mouse wheel forwards	Zoom into the X-axis by 10%
SHIFT + rotate mouse wheel forwards	Zoom into the Y-axis by 10%
CTRL + rotate mouse wheel forwards	Zoom into the Z-axis by 10%
SHIFT + ALT + left click	Undo all zoom steps
ALT + left click	Undo the last zoom step
Rotate mouse wheel backwards	Undo the last zoom step on the X-axis
SHIFT + rotate mouse wheel backwards	Undo the last zoom step on the Y-axis
CTRL + rotate mouse wheel backwards	Undo the last zoom step on the Z-axis



*) The axis the program will zoom in on depends on the orientation of a 3D diagram:

If you are viewing the diagram from above, **SHIFT +/SHIFT -** will zoom in or out on the Z-axis rather than the Y-axis. In general, the following applies:

- Not using the**SHIFT** key zooms the horizontal axis.
- Using the **SHIFT** key zooms the vertical axis
- Using the **CTRL** key zooms a combination of the two.

11.2 Scrolling and moving in a diagram

Scrolling in the diagram using hotkeys

A / D	Scroll the X-axis
W / S	Scroll the Y-axis
Q / E	Scroll the Z-axis

Scrolling in the diagram using the mouse

Press and hold the centre mouse button and drag the mouse in the desired direction

Using hot keys to move the cursor

ARROW LEFT / ARROW RIGHT	Moves the base cursor
ARROW UP / ARROW DOWN	Moves the measure cursor
CTRL + ARROW LEFT / ARROW RIGHT	Moves base and measure cursor simultaneously whilst maintaining the space between them
CTRL + ARROW UP / ARROW DOWN	Moves base and measure cursor simultaneously whilst maintaining the space between them
SHIFT + ARROW LEFT / ARROW RIGHT	Moves the base cursor at a faster speed
SHIFT + ARROW UP / ARROW DOWN	Moves the measure cursor at a faster speed
HOME	Positions the base cursor at the start of the signal
END	Positions the base cursor at the end of the signal
SHIFT + HOME	Positions the measure cursor at the start of the signal
SHIFT + END	Positions the measure cursor at the end of the signal
ALT + LEFT ARROW/ALT + RIGHT ARROW	**Time signal or spectrum only** Moves the base cursor in hundredths
ALT + UP ARROW/ALT+ DOWN ARROW	**Time signal or spectrum only** Moves the measure cursor in hundredths

Moving the cursor with the mouse

Left-click	Sets base cursor
SHIFT + left click	Sets measure cursor
Left-click on cursor and hold	Grabs base or measure cursor, e.g. to drag it to a different position

CTRL + left click	Sets base cursor and moves measure cursor in relation whilst maintaining the same distance between them
CTRL + SHIFT + left click	Sets measure cursor and moves base cursor in relation whilst maintaining the same distance between them
CTRL + left-click on cursor and hold	Grabs base and measure cursor simultaneously to drag them to a different position

11.3 Other functions

Viewer and diagram

F11	Switch full screen mode on/off You can also switch off full screen mode with **ESC**.
CTRL + C	Copy diagram
CTRL + F	Save diagram
CTRL + I	Show/hide the viewer's information bar

Signal display

INPUT KEY	Change between showing the active signals and all signals
IMAGE UP/IMAGE DOWN	Change between the loaded signals

Select cursor functions

F2	Select cursor function **Basis analysis**
F3	Select cursor function **Gear mesh**
F5	Select cursor function **Harmonics**
F6	Select cursor function **Sidebands**
F7	Select cursor function **Harmonics with sidebands**
F8	Select cursor function **Speed**
F10	Open **Cursor settings** dialogue box
CTRL + SHIFT + T	Apply the cursor value as the speed

Select option for cursor positioning

SHIFT + F2	Select **Free** positioning option
SHIFT + F3	Select **Next value** positioning option
SHIFT + F4	Select **Nearest peak** positioning option
SHIFT + F5	Select **Tenths** positioning option
SHIFT + F6	Select **Hundredths** positioning option

Scaling

CTRL + Z	Reset range scaling 12

Camera functions in 3D spectrogram, waterfall and wireframe views

CTRL + ALT + press and hold middle mouse button	Rotate the diagram around the X and Y-axis
CTRL + ALT + turn mouse wheel	Zoom in/out of the diagram

12 Appendix II: Base units

Basic units in the EU profile and US profile

Unit type	Basic unit EU profile	Basic unit US profile	Autoscale
Acceleration	m/s²	in/s²	Yes
Speed	mm/s	in/s	Yes
Displacement	µm	mil	Yes
Frequency	Hz	Hz	Yes
Orders	Orders	Orders	Yes
Speed	Hz	Hz	Yes
Temperature	°C	°F	Yes
Mass	g	oz	Yes
Time	s	s	Yes
Date and time	Local time	Local time	Yes
Load	%	%	Yes
Flow	m³/s	in³/h	Yes
Voltage	V	V	Yes
Current rating	A	A	Yes
Pressure	bar	bar	Yes
Sound pressure	Pa	Pa	Yes
Torque	Nm	lbf in	Yes
Force	N	N	Yes
Power	W	W	Yes
Belt velocity	m/min	in/s	Yes
Unknown	-	-	Yes
Phase	°	°	Yes
Revolutions	Revolutions	Revolutions	Yes
Counter	Quantity	Quantity	Yes
Strain	µEpsilon	µEpsilon	Yes
Number of particles	Part	Part	Yes
Acoustic viscosity	AV	AV	Yes
Water saturation	%RH	%RH	Yes
Particle rate	Part/min	Part/min	Yes
Particle size	g/h	g/h	Yes
Angle	°	°	Yes
Samples per revolution	°	°	No
Water content	ppm	ppm	Yes
Soot content	%Wt	%WT	Yes
Particle ISO code	ISO	ISO	Yes
Volume	ccm	ccm	Yes
Humidity	%	%	Yes

13 Manufacturer/support

Manufacturer

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52134 Herzogenrath
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Please send all correspondence directly to Schaeffler Monitoring Services GmbH!

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Support

For information on technical support, go to www.schaeffler.de/en/technical-support.