



# ibaPDA

## Data visualization

Manual Part 6  
Issue 8.6

Measurement Systems for Industry and Energy  
[www.iba-ag.com](http://www.iba-ag.com)

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The current version is available for download on our web site [www.iba-ag.com](http://www.iba-ag.com).

Version	Date	Revision	Author	Version SW
8.6	01-2024	ibaQPanel: new button commands; Watch window: properties; Layouts: reset docking configuration	rm	8.6.0

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# 1 About this documentation

This documentation describes the function and application of the software *ibaPDA*.

## 1.1 Target group and previous knowledge

This documentation is aimed at qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if he/she is capable of assessing safety and recognizing possible consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

## 1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <i>Logic diagram</i>
Calling the menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select the menu <i>Logic diagram – Add – New function block</i> .
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Key name> Example: <OK>; <Cancel>
Filenames, paths	<i>Filename, Path</i> Example: <i>Test.docx</i>

## 1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

---

### Danger!



**The non-observance of this safety information may result in an imminent risk of death or severe injury:**

- Observe the specified measures.
- 

### Warning!



**The non-observance of this safety information may result in a potential risk of death or severe injury!**

- Observe the specified measures.
- 

### Caution!



**The non-observance of this safety information may result in a potential risk of injury or material damage!**

- Observe the specified measures
- 

### Note



A note specifies special requirements or actions to be observed.

---

### Tip



Tip or example as a helpful note or insider tip to make the work a little bit easier.

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### Other documentation



Reference to additional documentation or further reading.

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## 1.4 Documentation structure

This documentation fully describes the functionality of the *ibaPDA* system. It is designed both as a tutorial as well as a reference document. The sections and chapters essentially follow the procedure for configuring the system.

In addition to this documentation, you can examine the version history in the main menu, *Help – Version history* (file [versions.htm](#)) for the latest information about the installed version of the program. This file not only lists the bugs that have been eliminated, but also refers to extensions of the system in note form.

In addition, special "NewFeatures..." documentation comes with any software update that includes significant new features, which provides a more detailed description of the new features.

The state of the software to which the respective part of this documentation refers is listed in the revision table on page 2.

The *ibaPDA* system documentation (PDF and printed version) is divided into seven separate parts. Each part has its own section and page numbering beginning at 1, and is updated independently.

<b>Part 1</b>	Introduction and installation	General notes, license policy and add-ons Installation and program start User interface, system architecture, client server User management, printing
<b>Part 2</b>	I/O Manager	Basic information about the I/O Manager, general settings Groups and vector signals, text signals, outputs, configuration files
<b>Part 3</b>	Data interfaces and modules	Interfaces for the measurement data acquisition Standard interfaces, ibaFOB, Ethernet-based interfaces and more. For interfaces for which there are separate manuals, these are referred to.
<b>Part 4</b>	Expression builder	All functions for calculating virtual signals
<b>Part 5</b>	Data storage	Types of data recording, recording profiles, signal selection
<b>Part 6</b>	Data visualization	All display modes for live data, their operation and settings
<b>Part 7</b>	Appendix	Various additions, error listings, etc.

## 2 Introduction

*ibaPDA* offers different types of views for different ways of representing data. The term "view" basically refers to the frame containing certain display types and relevant data. Views can be arranged in different ways on the screen, as further described below.

Available view types:

- Trend graph
- FFT view
- Watch view
- Scope view
- QPanel
- Camera view
- HD trend graph
- HD event table
- HD time periods table
- Numeric digital display
- Text digital display
- PQU spectrum
- PQU phasor view

+ license-dependent views:

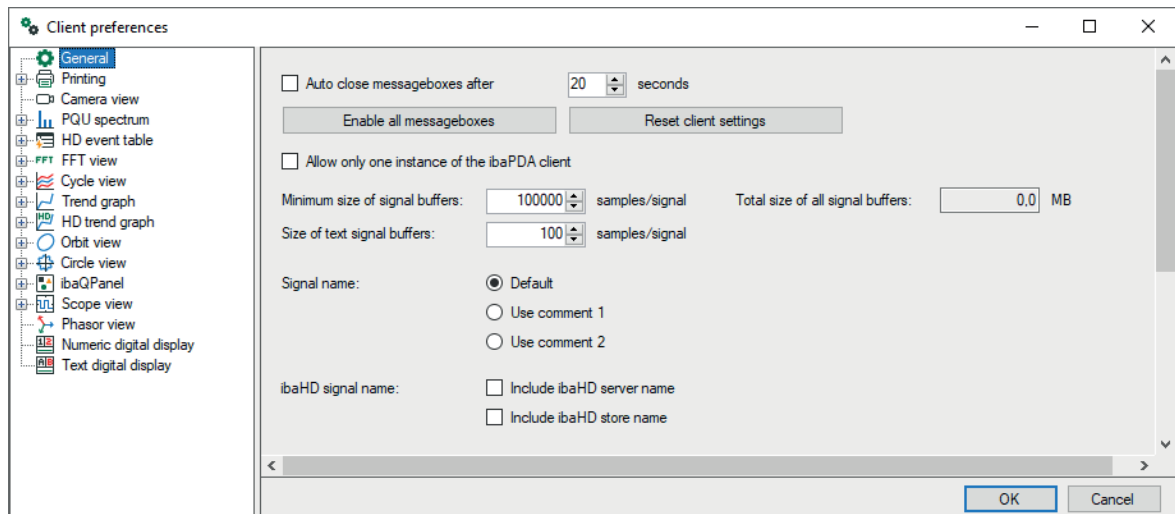
- Orbit view
- Cycle view
- Circle view

Things such as screen layout, docking windows arrangement, number and arrangement of views, number and presentation of individual signals, view settings and different layouts are saved in the layout configuration file.

This section describes the general handling of the views and their settings and properties.



### 3 Client preferences General



#### Auto close messageboxes after ... seconds

Here you can choose if and when messages posted by the *ibaPDA* program (e.g. status or error messages) should be closed. If this option is disabled then the messages must be confirmed manually.

#### <Enable all messageboxes> button

Press this button if you want to be sure that all message boxes are enabled even those which had been disabled before.

#### <Reset client settings> button

Press this button if you want to reset all preference settings made on this client back to factory settings. The client will restart after.

#### Allow only one instance of the ibaPDA client

If you select this option, *ibaPDA* client is prevented from launching multiple times on the same computer. Technically this corresponds to the use of the `/reuse` switch when starting via the command line.

#### Minimum size of signal buffers / Size of text signal buffers

These settings determine the size of each signal buffer, or text signal buffer, on an *ibaPDA* client. The signal buffer contains a number of samples corresponding to a certain time with regard to the sample time. A setting like the 100000 default value, for example, will enable the *ibaPDA* client to show a trend graph for 100 seconds for a signal sampled with 1 ms. If you would like to see a longer period over the x-axis, e. g., 10 minutes, you should increase the buffer size accordingly.

Keep in mind that this setting applies to all signals. If you use large buffers for displaying lots of signals in multiple views, you can run into "Out of Memory" errors. If this happens, reduce the buffer sizes.

#### Signal name: default / use comment 1 / use comment 2

By selecting one of these options, you can use other sources for alternative signal names in the signal tree and views. Default value is the signal name as configured in the I/O configuration.

Please note that the signal name is replaced by comment 1 or comment 2 if you check one of the options *Use comment 1* or *Use comment 2*. Comment 1 or comment 2 in return will then contain the original signal name. This will not affect the I/O Manager but the search functions and signal legend contents.

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**Tip**

This feature can be used to give signals different names in different languages. An integrator can use English signal names while his Chinese customer can use Chinese signal names, for example.

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**HD signal name: including HD server name / including HD store name**

By selecting one or both of these options, you can determine how the signal names of historical data should be displayed in the views.

## 4 General handling of views

### 4.1 Add view

A new view can be opened by clicking on one of the buttons in the main toolbar or by selecting the desired view type in the menu *View – Add view*. The new view opens in its own window.

### 4.2 How to remove a view

If there is only one view in the window (one tab), click on the little cross in the upper right corner.

If there is more than one view in the window (several tabs), select the view to be removed first (indicated by bright black letters in the tab and in the foreground). Then click on the little cross in the upper right corner.



Or right-click on the tab of the relevant view and select *Remove* from the context menu in order to remove a view.

If there is no tab and little cross, you can display them by disabling *Hide tabs* in the *View* menu.

If you just want to hide a view to save space, the best way is to shift it to another view so it can be in the background as a tab.

### 4.3 How to rename a view

You can name and rename a view. The name is displayed on the tab. Right-click on the tab of the relevant view and choose "Rename" from the context menu. Enter the name into the "New name" dialog field and click <OK>.

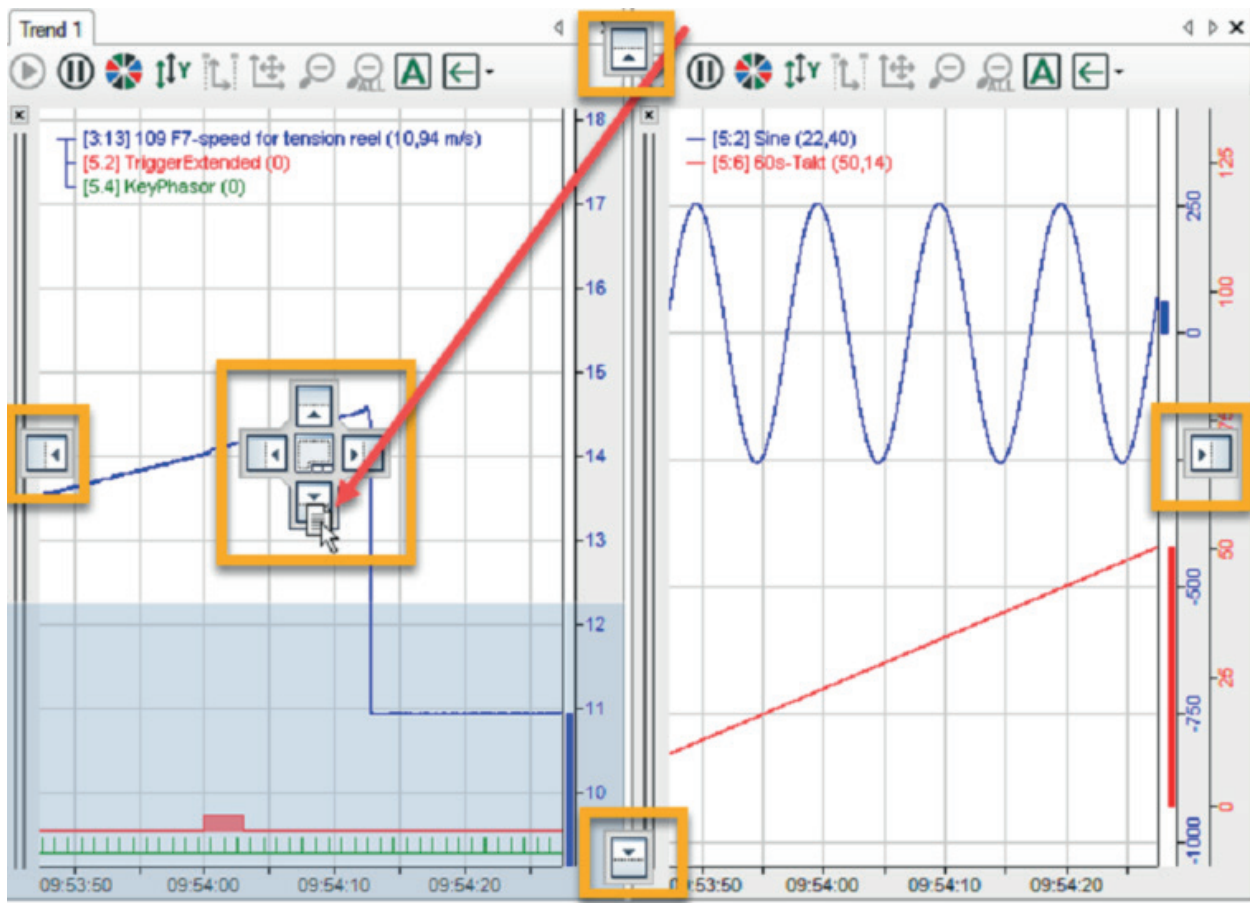
### 4.4 How to move a view

All visible windows in the *ibaPDA* user interface are dockable windows. So are the signal monitors (views). You can move, drag or squeeze the views as you like. Or they can be arranged on top of one another as tabs.

For doing so, use the drag and drop option or the context menu.

#### Combining multiple views in one window (creating a monitor group)

Click on the tab of the view you would like to move, hold the mouse key and drag the view in the middle of the requested window until a cross-shaped group of docking pads appears. Place the mouse over the central pad. A blue area indicates where the view will be placed. Release the mouse button and the view becomes part of the monitor group. Use the same method for moving the views to the side, above or beneath other views.

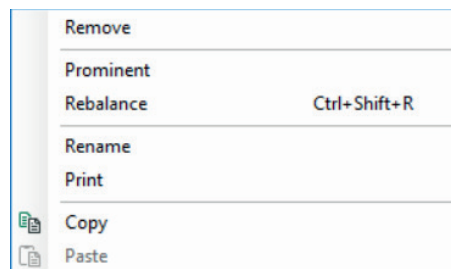


### Separating views

In order to separate views from a joint window, just click on the corresponding view's tab and drag it to a position out of the center of the current window. As soon as a blue frame appears in the upper, lower, left or right part of the window, let it drop. The view is opened in a new window. All windows are automatically rescaled to provide optimal fit on the screen.

## 4.5 Arranging views by context menu

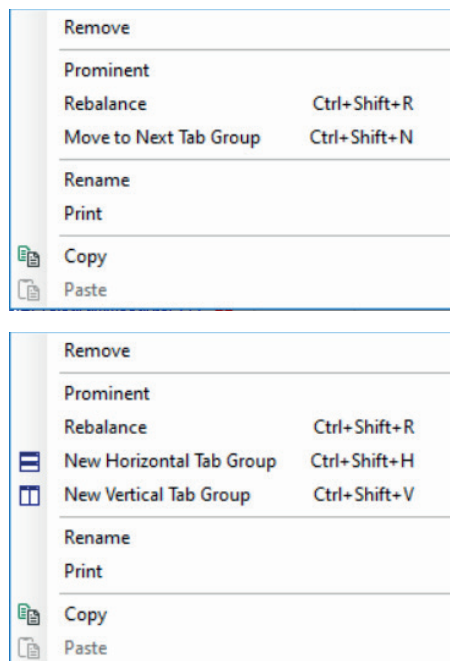
Right-click on the tab label of the view to open the context menu.



Beside the *Close*, *Rename*, *Print*, *Copy* and *Paste* commands, there are also *Prominent* and *Rebalance*.

Select *Prominent* if the respective view is to be shown in full size in the window. This hides all other views, such as trend graphs, FFT, oscilloscope or QPanel views. To switch back to the previous view, click *Rebalance*.

Depending on the number of views and their arrangements, the options in the context menu differ.



As soon as you have multiple tabs arranged, the *Move to Next Tab Group* command or *Move to Previous Tab Group* command appears. "Next" and "Previous" refer to a clockwise manner. If you click on one of these commands, the tab in question is added to the next or previous tab group.

## 5 Selecting and displaying signals

The methods of selecting and displaying measured signals is optimized for mouse keys. Many actions can be performed by drag & drop or via the context menu (right mouse button).

### 5.1 Selecting signals

There are two basic methods to select signals for display:

- A double-click on the desired signal in the signal tree.
  - If no view has been opened yet, a new trend graph containing this signal is opened.
  - If one or more trend graph(s) are already opened, the signal will be added to the focused trend graph.
  - If another view is active, e. g. FFT or scope view, the signal will be added to this view.

You can also drag and drop the signal into the display window. This method also applies to many other views, not just to the trend graph.

With regard to the trend graph, these two methods offer further helpful variants for daily use.

Often, it does not make sense to open a separate chart for each signal, as the display window is filled quite quickly and therefore hard to read. So, you can position several signals in one trend view and decide whether the signals get their own Y-axis or a joint one.

- Select the first signal:  
Drag the desired signal into an open range of the trend graph.
- Select another signal to be displayed in a new signal chart:  
Drag the desired signal in the area of the X axis in the display window or double-click on the signal name in the tree.
- Presenting another signal in an existing graph:  
Simply drag the desired signal into the area of the desired graph. The signal is displayed in the same graph but with its own Y-axis.

---

#### Tip



If you want multiple signals to be displayed quickly in a chart with separated Y axes, press <Ctrl> while double-clicking on the relevant signal names.

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- Select another signal to be displayed in an existing chart, but with respect to the same Y axis as the existing signal:  
Drag the desired signal in the area of the Y-axis of the requested chart. Both signals now use the same Y-axis. A new color is automatically assigned to the new signal. In the upper left corner of the chart, you will find the signal names (legend). Signals with a common axis are linked by a line.

**Tip**

If you want multiple signals to be displayed quickly in a chart with a common Y axis, press <Shift> while double-clicking on the relevant signal names. Each new signal is added to the Y axis of the lowest signal in the legend.

## 5.2 How to search for signals

For finding and selecting signals to be displayed, there is a search function available in the signal tree window.

Just click on the *Search* tab at the bottom.

Enter a complete signal name or parts of it in the entry line.

Then press <RETURN>.

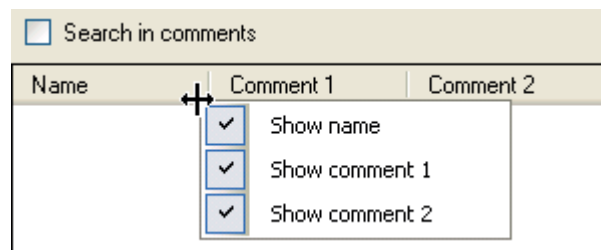
The result list shows all signals containing the search item entered.

If there are too many results, enable the "Search in previous results" option, refine your search term and restart the search.

If you want to keep the results of several search processes, check the "Add to previous results" option before any further search.

Additionally, you can search for the specified string in the comments 1 and 2.

Besides the "Name" column in the result list, you can show or hide the columns for comments using the context menu.




The signals can be dragged directly from the result list into the view.



## 6 Trend graphs

A trend graph in the context of *ibaPDA* is a display of a certain combination of signal charts and curves. Similar to a recorder, trend graphs are used to show live measured data.

Each trend graph view can basically consist of an arbitrary number of curves. The signal curves can be zoomed in and the scales changed.

The pause button  can be used to stop a current trend graph, for example, in order to consider the measured values. The data storage continues in the background.

The default configuration shows a trend graph view without a graph, X or Y axes. After you configured the signals in the I/O manager, they are immediately available for display. For better clarity, you may open several views, which can be arranged in different windows side by side or in tabs.

In addition to the normal trend graph, there are also trend graphs for displaying data from the *ibaHD* server ("HD-trend graph") and existing measurement files ("offline trend graph"). The basic operation of trend graphs is the same for all types.

### 6.1 Controls of a trend graph

#### 6.1.1 Toolbar

Each view has a couple of control buttons in its own toolbar.

Depending on the display type, the toolbars for trend graph, oscilloscope, FFT view, camera view or QPanel differ.

The following describes the trend graph toolbar. For description of the other tool bars, please refer to the corresponding chapters.



The functions are (from left to right):

##### Start scrolling

Only enabled if <Pause scrolling> button was pressed before. Restarts the scrolling of the display at the current time.

Shortcut key: <F6> (toggle)

##### Pause scrolling

Only enabled if the display is scrolling. Stop the continuous display. After clicking this button, the display stops scrolling. A signal table ("Marker table") appears below the signal chart and two rulers are shown in the signal display. The rulers can be moved with the mouse along the X-axis. The corresponding Y-values are displayed in the table below the trend view. The X-axis can be moved with the mouse. This enables the user to see values from the past. For more pause mode control options, see [X-axis buttons](#), page 23.

Shortcut key: <F6> (toggle)

**Automatically assign signal colors**

All curves of this display are colored per signal chart according to the standard scheme.

Also see *Settings*, chapter [➤ Properties and preferences trend graph](#), page 33

**Autoscale all**

All curves of this display are automatically scaled per signal chart and Y axis.

Shortcut: <F5>

**Zoom and auto scale between markers**

Only enabled in pause mode.

View zooms into range between the markers X1 and X2 and the Y-values are auto scaled.

**Restore manual scale**

Only enabled if a manual scaling has been defined in the settings of the signal chart. The manual scaling are restored (where defined) after an autoscaling or zooming action.

**Zoom out one step**

Only enabled if the display has been zoomed. Return to the previous zoom factor (reduce).

Shortcut: <F3>

**Zoom out all**

Only enabled if the display has been zoomed. Will zoom out to initial (automatic) zoom level (no zoom) according to axes settings.

Shortcut: <F4>

**Change legend style**

With every click on this button, the legend in the trend graph changes between transparent, opaque and invisible.

**Change orientation of graphs**

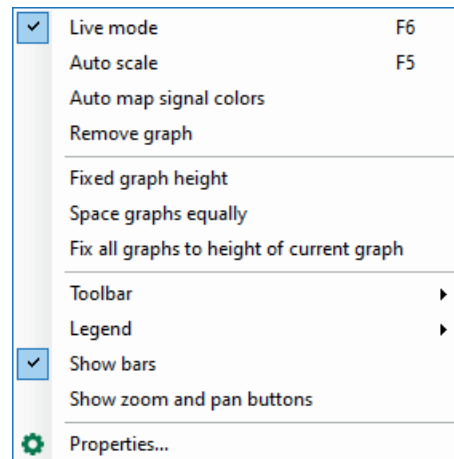
Drop-down menu for selection of scrolling orientation.

The entire toolbar as well as single toolbar buttons can be hidden. In order to do so, use the context menu (see next chapter).

### 6.1.2 Context menu

You can open a context menu by right-clicking in the area of a trend graph.

The context menu provides further control options for the view and may look as follows:



Some menu commands correspond to the functions of the toolbar buttons as described above, like *Live mode/Pause*, *Auto scale* and *Auto map signal colors*. However, the first 4 commands from top only apply to the trend graph the context menu was opened in.

#### Fixed graph height

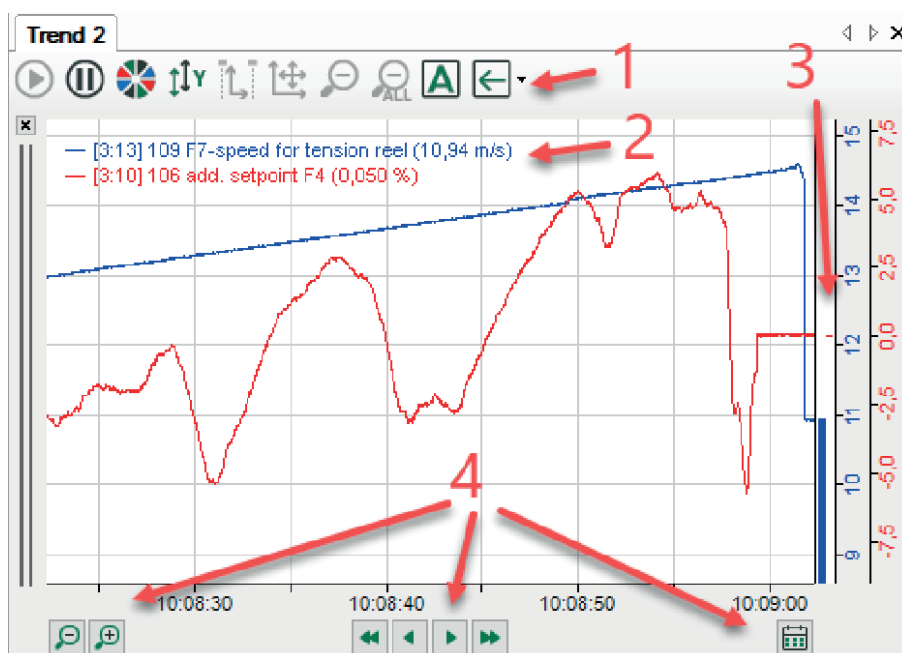
In order to avoid up or downsizing of a trend graph while resizing the view window, you can fix the height of the signal chart individually. When enabling this option, the current height of the signal chart is maintained.

In case of resizing a window vertically, all charts are subject to resizing except for the signal charts, whose heights are defined by this option. If this option is enabled for all signal charts of a view, the minimum height of the display window will always comply with the overall height of all graphs.

#### Space graphs equally

If you click this command, all charts in the view lose their fixed heights and are automatically scaled to fit equally in the view window.

In the next block of the context menu, you can display or hide the indicating elements of a signal monitor:



### Show toolbar (1)

Show or hide the toolbar of the view where the context menu was opened. In the sub-menu you can hide either the entire toolbar or single buttons.

### Show signal values in legend (2)

Show or hide the signal values at the end of the signal legend. Another option is to choose a customized legend text (which is to be configured in the *properties*). This command applies to all trend graphs within the view where the context menu was opened.

### Show bars (3)

Show or hide the value bars along the Y axes. This command applies to all trend graphs within the view where the context menu was opened.

### Show zoom and pan buttons (4)

Show or hide the zoom and pan buttons on the X axis of the view where the context menu was opened.

For more information on controlling zoom and pan buttons, please refer to ➤ *X-axis buttons*, page 23.




### Properties...

If you click on this command, you will enter the *Properties* dialog for setting up of the trend graph view.

For more information, see ➤ *Properties and preferences trend graph*, page 33.

### 6.1.3 X-axis buttons

On the X axis there are various buttons for the navigation. For immediate showing or hiding the buttons, you can use the context menu of the view (see above).

	Zoom function
	Scroll
	Jump to a date





You can enable and configure these buttons in the properties of the X axis.

#### Zoom function

In the pause mode, the <+> button enlarges the center of the X axis and in the live mode the last part of the X axis. The <-> button reduces accordingly. The default value of the zoom factor is 2. This means if the section of the X axis is enlarged, it is half as large as the original section, if it is reduced, the section of the X axis is twice as large as the original section. The zoom factor can be modified via the X axis properties.

For more information, see [↗ X-axis](#), page 42.

#### Scroll

	Scrolls in large steps to the left, starting from the current position
	Scrolls in small steps to the left, starting from the current position
	Scrolls in small steps to the right, starting from the current position
	Scrolls in large steps to the right, starting from the current position







The step can be set via the X axis properties. The default setting for little steps is relative 0.75 and for large steps relative 2. Alternatively, the step can be set as absolute value in hh:mm:ss time units for time-based values and in meter for length-based values.

Example: if the X axis indicates a range of 100 s and if the time stamp goes to 10:00:00, a small step jumps to the left by 75 s on 09:58:45 and a large step to the left by 200 s on 09:56:40.


For more information, see [↗ X-axis](#), page 42.

Panning is possible in paused mode only. When pressing one of the pan buttons in live mode, the display will switch to paused mode automatically.

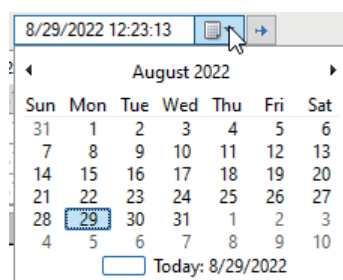
The functions zoom and scroll can be carried out with the help of the keyboard:

Button	Key	Description
	<+>	enlarging
	<->	reducing
	Page up	small step to the right (only in pause mode)
	No key function	large step to the right (only in pause mode)
	Page down	small step to the left
	No key function	large step to the left

### Jump to a date

Clicking the button  opens a calendar where you can enter a date and time on second basis.

With a click on the arrow to the right, the display of the trend graph jumps to this time point.

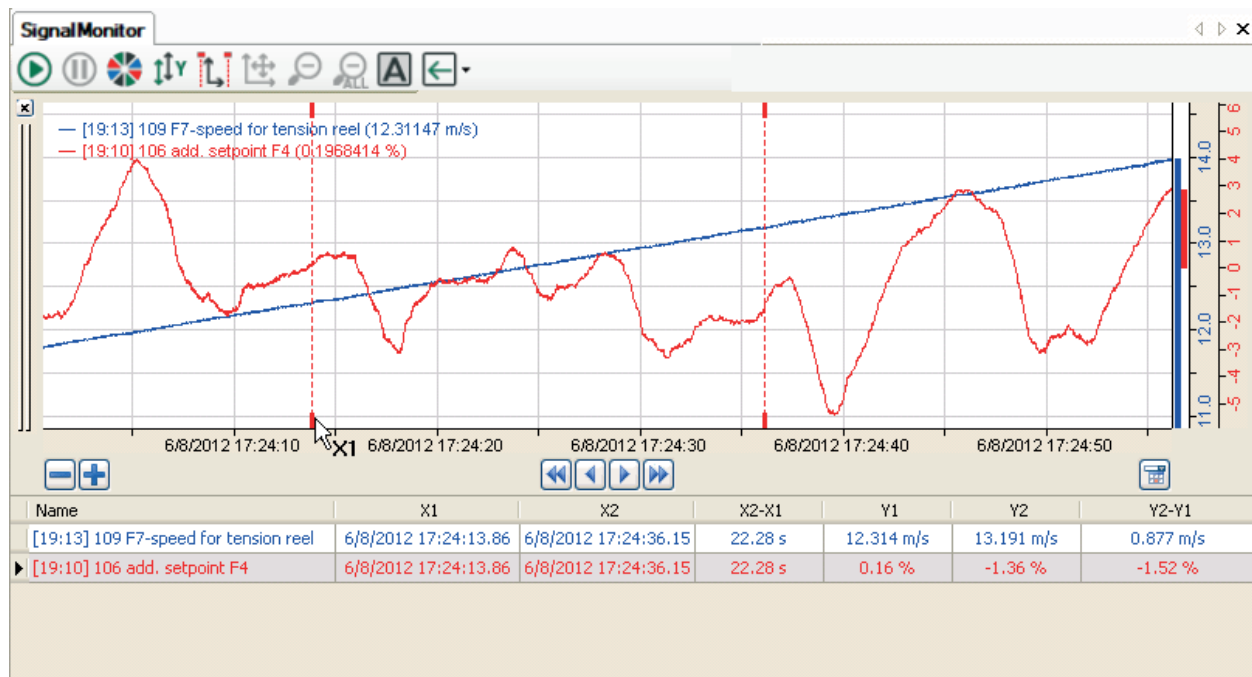


This function is also available on length-based HD trend graphs because the time stamp is always stored along with the length-based data.

A time leap is possible in paused mode only. When pressing the jump button in live mode, the display will switch to paused mode automatically.

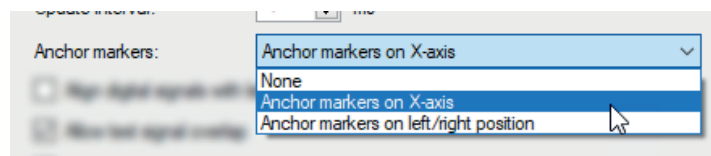
## 6.1.4 Markers and signal table ("marker grid")

### 6.1.4.1 Markers



In pause mode, there are two markers, i.e. X1 and X2, available in the graph. You can move the markers individually in order to check the Y values and differences between the X and Y values of the markers.

There are two modes to control the position of the markers. The markers can be anchored to the X axis or not. These settings can be changed in the trend graph properties.



If the *Anchor markers* option is disabled (*None*), the markers will remain at the same pixel while moving the X-axis and are positioned on a new time stamp, e. g. when dragging or panning.

If the option is enabled (default: *Anchor markers on X-axis*), the markers will remain at the same time stamp. So, if the X axis is moved, the markers will also move. If the X axis is moved so far that the time stamp of the marker is no longer visible, the marker will be moved to the edge of the graph and the grab handles will become lighter. The table still shows the correct position of the marker. You can drag the marker from the edge of the graph back into the current X axis range at any time.

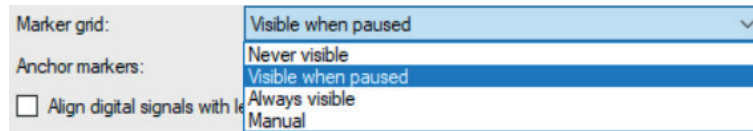
If the option *Anchor markers on left/right position* is enabled, then X1 will be positioned at the left end and X2 at the right end. Hence, the entire visible trend is always between the markers.



### 6.1.4.2 Signal table (marker grid)

The signal table is disabled in live mode by default. It pops up automatically as soon as the view switches into pause mode.

However, you can change this behavior in the preferences or properties of the trend graph.

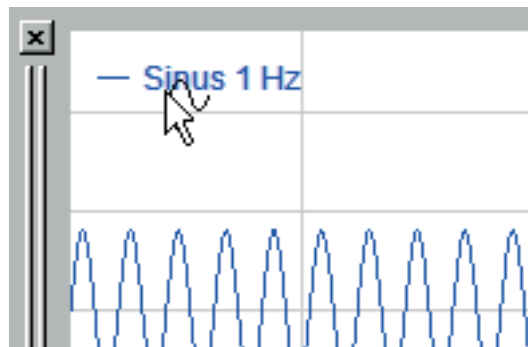


## 6.2 Move signals

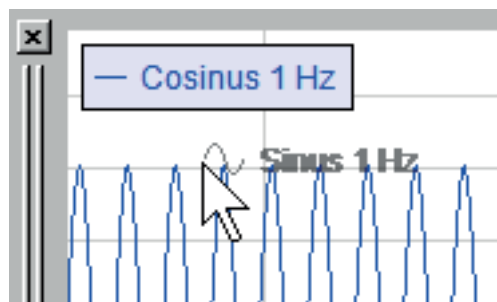
Signals can be shifted between the graphs and even beyond the limits of the window. This means that a signal can be dragged from one graph to another graph that already has a signal.

Here is how it works:

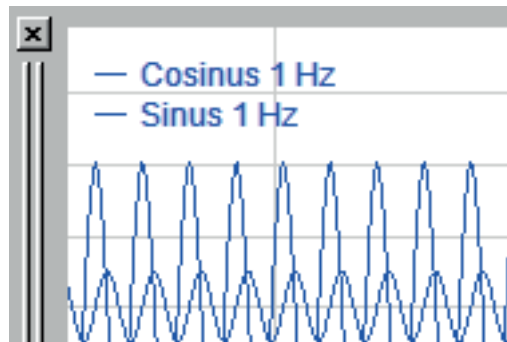
1. In the graph, put the mouse pointer on the signal name to be moved. The cursor indicates with a wavy line that it has acquired the signal.



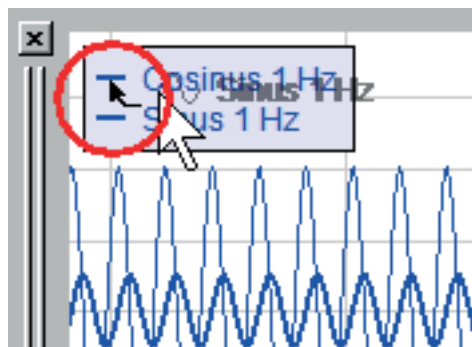
2. Now press the mouse key, hold it and drag the signal into the other graph and let it drop in a free area.



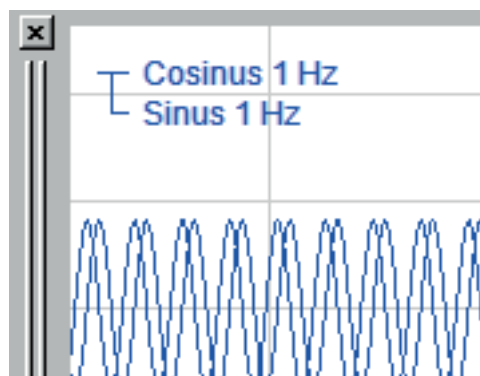
3. The result: two signals, each with its own Y-axis.




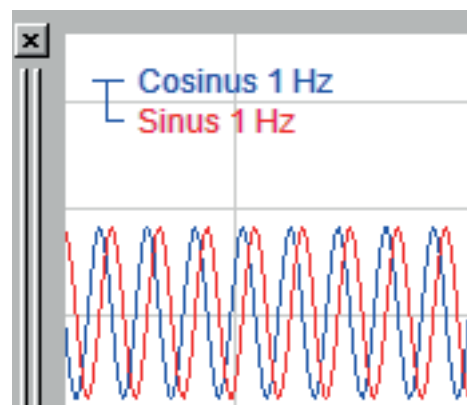
4. If, in step 2, the signal is not dropped, but dragged on the already existing signal (cursor shows a little arrow), the shifted signal will be assigned to the same Y axis.



5. The result: two signals with a common Y axis.



6. By shifting a signal from one graph to the other, the color will not change automatically. In order to get different colors, click on the "Auto color assignment"  toolbar button.



7. If you want to separate signals, just click on the corresponding signal in the legend and drag it into the free area of the display window's X axis. A new graph is opened with that signal.

### 6.3 How to remove a signal from display

In order to remove a signal, right-click on the signal name in the legend and choose "Remove signal" from the context menu.

Alternatively, you can make a right mouse click on the Y axis of the corresponding signal and choose "Remove Y axis" from the context menu ("Remove axis" in case of FFT and oscilloscope view).

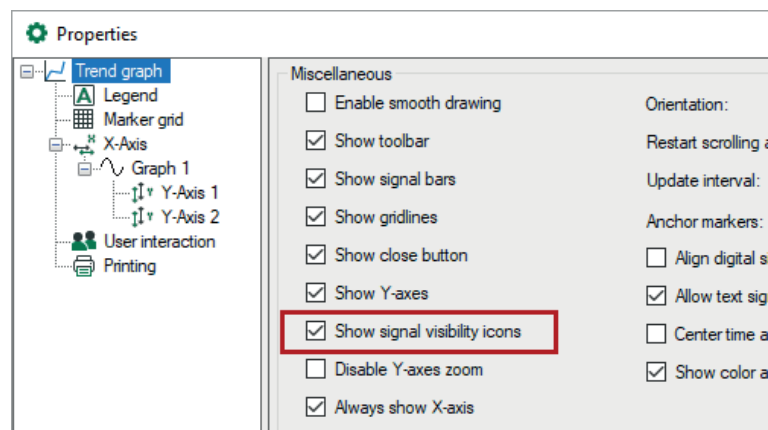
But remember: But remember: by deleting the Y-axis, all signals assigned to this axis are deleted.

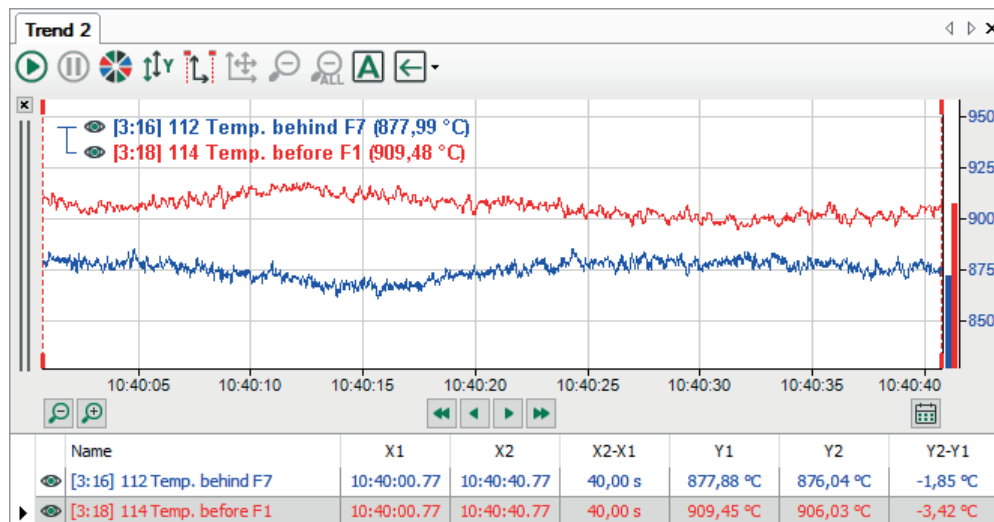
### 6.4 Show and hide signals

If you do not want to remove signals in a trend curve but just temporarily hide them, you can use the function for hiding and displaying a signal.

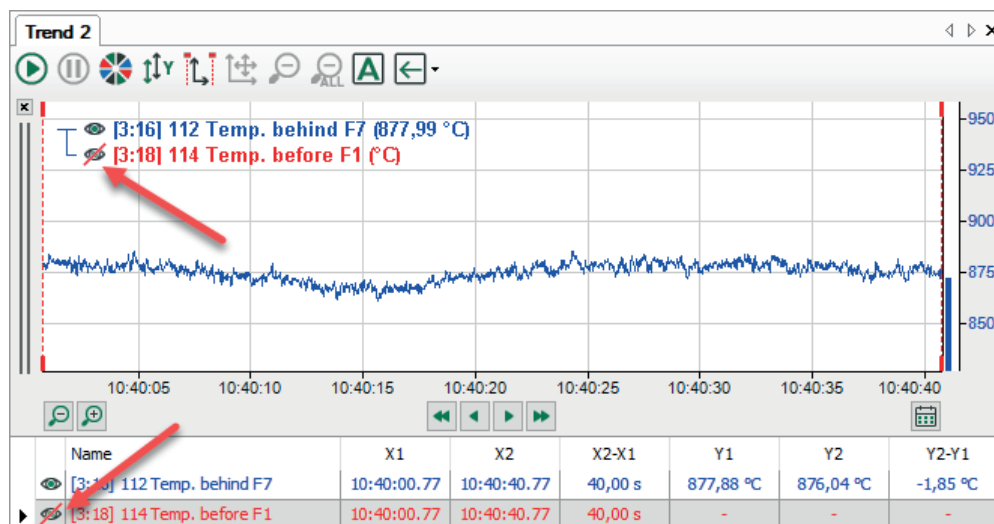
You have the following options:

- By right-clicking on the signal name in the legend, you can display or hide a signal in the context menu.
- If the signal table below the trend curve is open, remove the check mark in the far left column (monitor icon).
- If you have enabled the "Show icons to hide signals" option in the properties of the trend display, you can show and hide the signal by clicking on the monitor icon in the signal legend.





The figure above shows both signals visible, the figure below shows the red curve hidden.



If a signal is hidden then the signal bar is also empty and no marker or actual values are displayed in the signal table.

## 6.5 Using common or separate Y-axes

This description only applies to trend graphs.

You can link a signal to another one, as described in the "Shifting signals" section, to get a common Y axis.

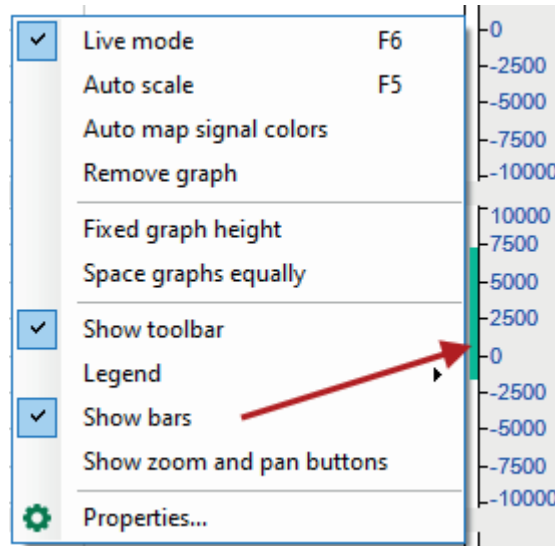
In order to separate Y axes, drag the signal into the free area of the graph, then let it drop.

## 6.6 Bar graph on Y-axis

This description only applies to trend graphs.

Bar charts on the Y axis are another option of signal display.

You can enable the bar graph display either by using the context menu by clicking in the trend graph and select "Show bars", or in the "Properties" dialog *Trend graph – Show bars*.



## 6.7 How to shift a graph

This description only applies to trend graphs.

You may change the top-down order of the charts inside a trend graph view. For a vertical scrolling orientation of the trend graph, the following applies to the right-left order of the charts.

1. Click on the caption bar (gray double line) of the chart you want to move. Hold the mouse key and slightly move the mouse until a bright black frame around the chart appears.
2. Keep mouse key depressed and move the chart up or down, for example, until the frame touches another chart. At first, only the black frame moves and shows above which chart the moved one will be inserted if you drop it.
3. Release the mouse button and the order is changed.

## 6.8 Remove Graphs


This description only applies to trend graphs.

You can remove a graph from a trend graph view with the following methods:

- Click on the little cross top left of the caption bar of the chart.
- Right-click in the free area of the graph to open the context menu and choose *Remove graph*.

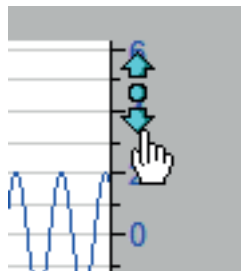
## 6.9 How to scale the axes

### Autoscaling

In order to display a signal between its amplitudes in a graph, use the autoscale function. Make a right click in the graph you would like to scale and choose "Autoscale". All signals, i.e. all Y axes of this graph, will be scaled with respect to the highest and lowest amplitude. If you would like to autoscale all graphs in a view, press <F5> or click on the  button in the view's toolbar.

### Scaling with the mouse

You can change the Y scale with the mouse. Position the mouse cursor near the upper end of the Y axis until two blue arrows and a dot appear.



Mouse click (hold down) on the up-arrow: the scale is stretched (zoom in).

Mouse click (hold down) on the down-arrow: the scale is compressed (zoom out).

Mouse click on the dot: the scale is autoscaled.

If you use a mouse with scroll-wheel, you only need to place the mouse cursor on the Y scale and move the wheel up or down for changing the scale. This also works on the X axis. There is also such a function for the FFT and oscilloscope views.

### Scaling in the graph's properties

Right-click in the graph you want to rescale. Choose *Properties* from the context menu. A dialog opens which shows the settings of this graph. On the Y axis node you can set a scale by manually entering a lower and upper limit. If a graph has separate Y axes, there is one node for every Y axis in the dialog.

---

#### Note

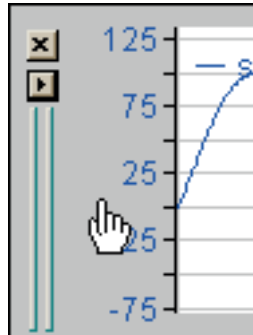


You can open the dialog for the display properties also via the *Configuration - Preferences* main menu. The settings you make there will generally apply to new views and graphs. Views and graphs already there will not be changed.

---

## 6.10 How to shift scales

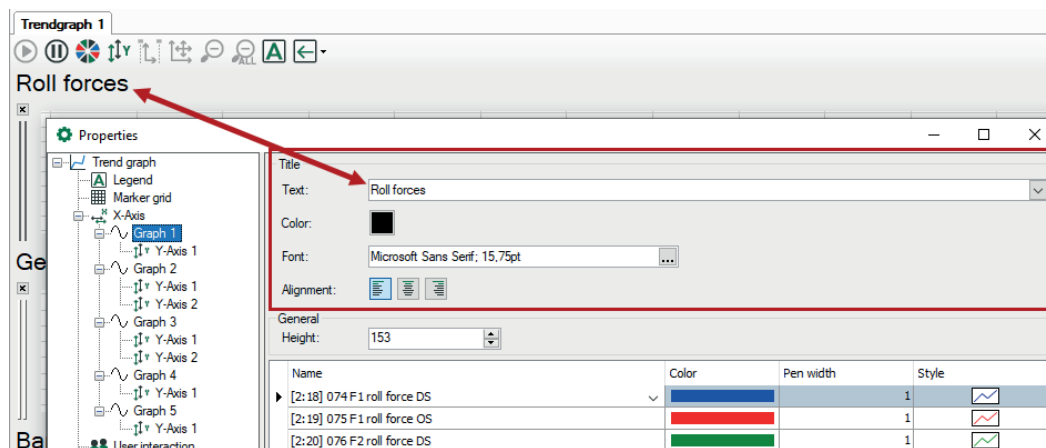
Move the mouse cursor to the Y axis until the hand symbol appears. Keep the left mouse key depressed to move the scale up or down. In the pause mode of the display, the X-axis can be moved in the same way.



## 6.11 Title for signal chart (curve)

You can define a title within a trend graph view for each signal chart (graph).

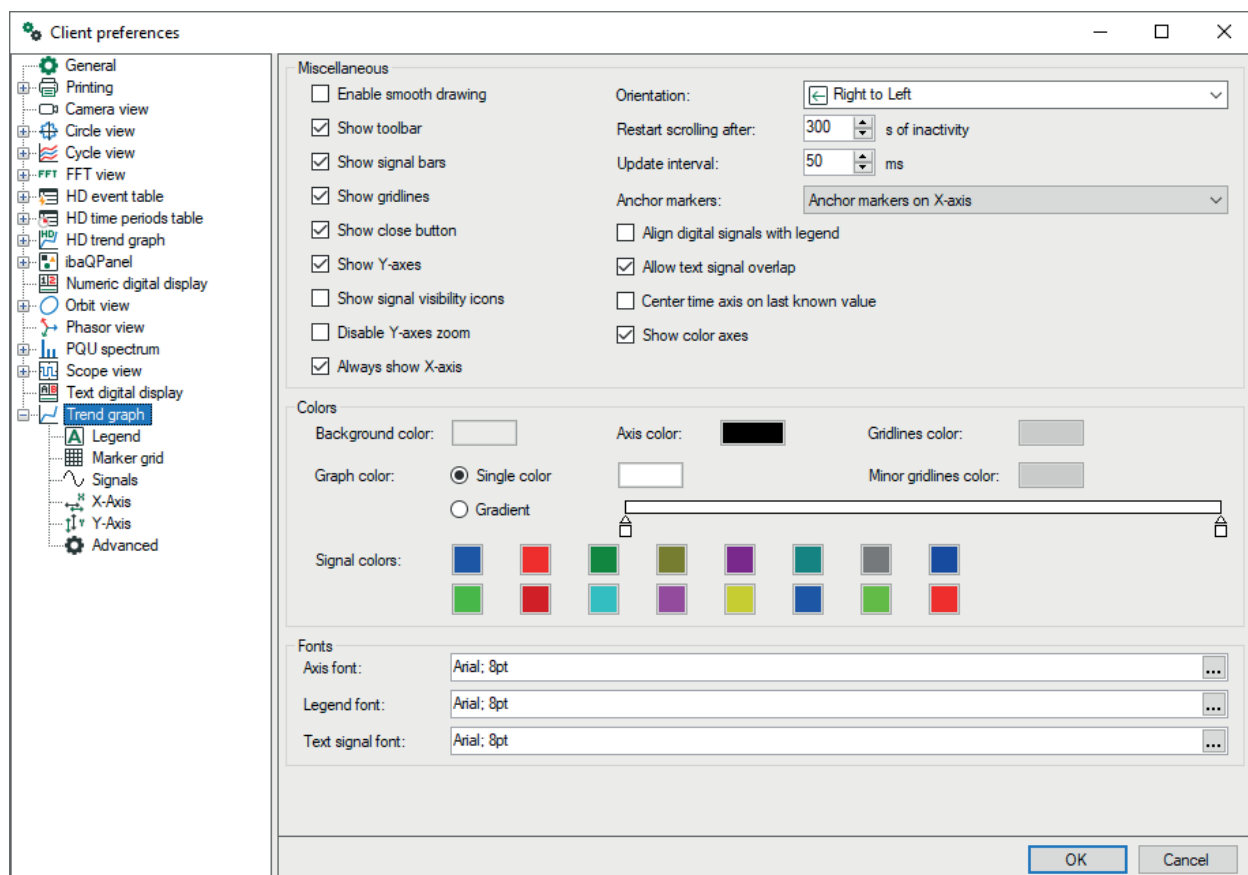
To do this, right-click in the desired signal chart and select *Properties...* In the Properties dialog, select the graph for which you want to define a title. Now, you can enter a title and determine the font, color and alignment of the title bar.



More curves, which are part of the trend display, can be reached in the same dialog. Each graph or graph group in a trend display can receive its own title.



## 6.12 Properties and preferences trend graph



The settings in the "Preferences" dialog basically equal the ones in the "Properties" dialog, except for the "Advanced" node, which is not available in the "Properties".

The "Signals" branch in the preferences tree corresponds to the "X graph" branch in the properties tree. The settings for the Y-axis are available separately in the Properties of a trend display for each curve (Y-axis x).

### Miscellaneous

#### Enable smooth drawing

The curves will be graphically smoothened if this option is selected.

#### Show toolbar

This option determines whether or not the toolbar for display control of each view is displayed below the tab.

#### Show signal bars

By checking this option, a bar graph is displayed near the Y axis. Each signal is displayed by a bar in the corresponding color.

#### Show gridlines

By enabling/disabling this option, you can show or hide the grid lines in the display. Enabled by default.

**Show close button**

By enabling/disabling this option, you can show or hide the small buttons for closing all signal charts of a display.



Hiding the button provides some more space on the screen and prevents the unintended closing of a signal chart. Enabled by default.

**Show Y-axes**

By enabling/disabling this option, you can show or hide the Y axes of all signal charts of a display. Enabled by default.

**Show signal visibility icons**

If you enable this option then a small eye symbol is displayed in the signal legend. By clicking on this symbol you can temporarily hide a signal curve without removing it from the trend display. Clicking again makes the curve visible once more.

**Disable Y-axis zoom**

If you enable this option then all the actions for zooming into the display are only applied in the X direction; the Y direction remains unaffected.

**Always show X-axis**

If you select this option then it is ensured that the x-axis is always displayed under the lowest fully-visible signal chart. If this option is not enabled, the x-axis can scroll downwards out of sight when scrolling within the display (if you have created many signal charts).

**Orientation**

The orientation of the "paper feed" in the signal display can be selected from this pick-list.

**Restart scrolling after ... s of inactivity**

Enter a value in seconds between 10 and 6000. In case the pause button was pressed in a monitor to stop scrolling of the charts scrolling will restart after the given time if no operation (incl. mouse movement) has been made since pressing the pause button.

**Update interval**

Enter a value given in milliseconds between 50 and 10000 for the refresh rate of the trend graph display. A fair fluent movement can be achieved with 100 ms and below.

**Anchor markers on X-axis**

If you enable this option then the markers stay at the x-axis position where they were placed with the mouse even if you then zoom into the curve or scroll along the x-axis. The markers can therefore disappear from sight. If you do not select this option, the markers always remain visible in the curves window, even if you zoom or scroll. However, they do leave their configured x-axis position.

The markers are only visible in pause mode.

**Align digital signals with legend**

Normally, the digital signals are displayed on the bottom of a signal chart. By enabling this option, you can assign the digital signals with the top of the signal chart.

**Allow text signal overlap**

When displaying text channels in an *ibaQPanel* trend curve, it can happen that, depending on the feed rate and change frequency of text channels, the texts are written one above the other so that they are no longer readable or even overwrite the curves. This cannot always be prevented in the online mode of the display. This option is available for the pause mode.

If you enable this option then overlapping text channel displays also appear overlapped in pause mode. If you disable this option then the texts appear cleanly separated as long as there is enough space.

**Center time axis on last known value**

If this option is enabled and you switch to a different layout during the measuring, the position of the time-axis is saved with the last value captured. If you then later retrieve or load the layout then the trend display in pause mode stays exactly the same as when you left the layout.

If this option is not enabled, the trend display continues to run after a layout change and does not go into pause mode.

**Show color axes**

By enabling/disabling this option you can show/hide the color axes in a 2D-vector representation.

**Colors**

This dialog can be used to adjust the colors used for the user interface of the program and for the curves. In order to change the colors, click on the colored buttons and select a color from the palette.

**Background color:**

Color of the area around the graphs, within the view.

**Axis color:**

Color of the scales, for the X axis also color of the labeling (values).

**Gridlines color:**

Color of the grid in the graphs.


**Graph color:**

Background color inside the graphs. Default is monochrome. You can even define a color gradient or shaded background. In order to configure a gradient, double-click on the little squares at the end of the thin color bar in the dialog and select the two colors. If required, double-click on the color bar to add more color tags and color them; they can also be moved. If you want to remove a color tag, simply click on it to select it (black arrow) and press the <DEL> button.

**Signal colors:**

These are the 16 pen colors for the curves. These colors represent the order (top-down) used by the automatic signal color map function. You will find the same colors in a graph's "Properties" dialog, "Signal" tab, for coloring the signals.

**Fonts**

For labeling the axes and legend, you can select different fonts here. To change a font, click on the browser button  in the corresponding input field and choose a font.

### 6.12.1 Legend

You can make various settings for presenting the signal legend in the *Legend* node.

#### Content

Select here what should be displayed in the signal legend.

- Signal name: Only the channel ID and signal name are displayed
- Signal name and value: As above, including the value and unit of measurement in parentheses. The refresh rate of the value display is lower than that of the graphs (approx. 1 s).
  - ... with automatic formatting: The value is automatically formatted.
  - ... with custom formatting: The value is formatted according to the settings of *Precision* (number of decimals), *Width* (minimum number of all digits incl. decimal point) and the option *Show leading zeros*. If you disable the option *Show leading zeros* then empty integer digits will be filled with blanks.
- Custom: User-defined compilation of information according to parameter string.

To create a user-defined legend, select the "Custom" option and click in the input field.

A tool tip appears that shows you all the options for designing the contents of the legend.

**Parameters:**

%n: signal name  
 %u: signal unit  
 %c1: first comment  
 %c2: second comment  
 %m: module name  
 %x1: X-value at X1 marker  
 %x2: X-value at X2 marker  
 %dx: difference between marker X-values  
 %y1: Y-value at X1 marker (= actual Y-value in live mode)  
 %y2: Y-value at X2 marker  
 %dy: difference between marker Y-values  
 %s: sampling period

Use optional format strings "w.p" to specify the formatting of a numeric parameter where "w" is width and "p" is precision. Width is the minimum number of displayed characters. Precision is the number of digits after the decimal point.

By default, the width is reached by adding spaces in front. Use the letter "z" before the dot to add zeros instead of spaces.

E.g. "%5.3y1" shows the y-value at the X1 marker with a minimum width of 5 characters and a precision of 3.  
 E.g. "%12z.6x1" shows the X-value at the X1 marker with a precision of 6 and with zero characters in front so the total width is 12 characters at minimum.

One by one, enter the desired parameters in the input field.

Then, click on <Apply> or <OK>.

**Tip**

It is best to make these settings in the Properties of an active trend graph and then to click on <Apply> to check the appearance of the legend.

- **Text signal:** Choose this setting, if you want to use the value of a text signal in the legend. Click on the entry field beside and select the desired text signal from the signal tree.

**Style**

Choose between 3 styles of legend display:

- **Transparent:** Only the legend text is displayed.
- **Opaque:** The legend is provided with a background that also covers the curves.
- **Invisible:** The legend is completely invisible.

**Use this color for all digital signals in the legend**

If you enable this option, then the legend texts of all digital signals will displayed in the color, set by the color field beside.

The digital signals in the trend graph will keep their original color.

**Tool tip**

In addition to the legend content, you can also configure a tool tip that appears whenever you are hovering the mouse on the signal legend.

The two signal comments are included in the tool tip by default. Alternatively, you can create a custom tool tip for which you can use the same parameters as for the legend contents (see above). This allows you to keep the signal legend short and still obtain further information about the signal if necessary.

**6.12.2 Marker grid**

The marker grid is a table, which is shown underneath a trend graph, displaying values of the signals in the graph referring to the positions of the two markers X1 and X2.

On the node *Marker grid* in the preferences or properties of the trend graph you determine the look of the table and when it is to be displayed.

**Header**

Select the desired foreground color here. This will be the color of the characters in the column headers of the table.

## General

### Visibility

Chose from 4 options for displaying the marker grid:

- Never visible
- Visible when paused
- Always visible
- Manual

If you choose "Manual", an additional button will appear in the toolbar, which you can use to show or hide the table at any time.



### Background color, Gridlines color, Font

Here, you can set up the background color of the table cells and the color of the grid lines as well as font type and size.

### Focused row

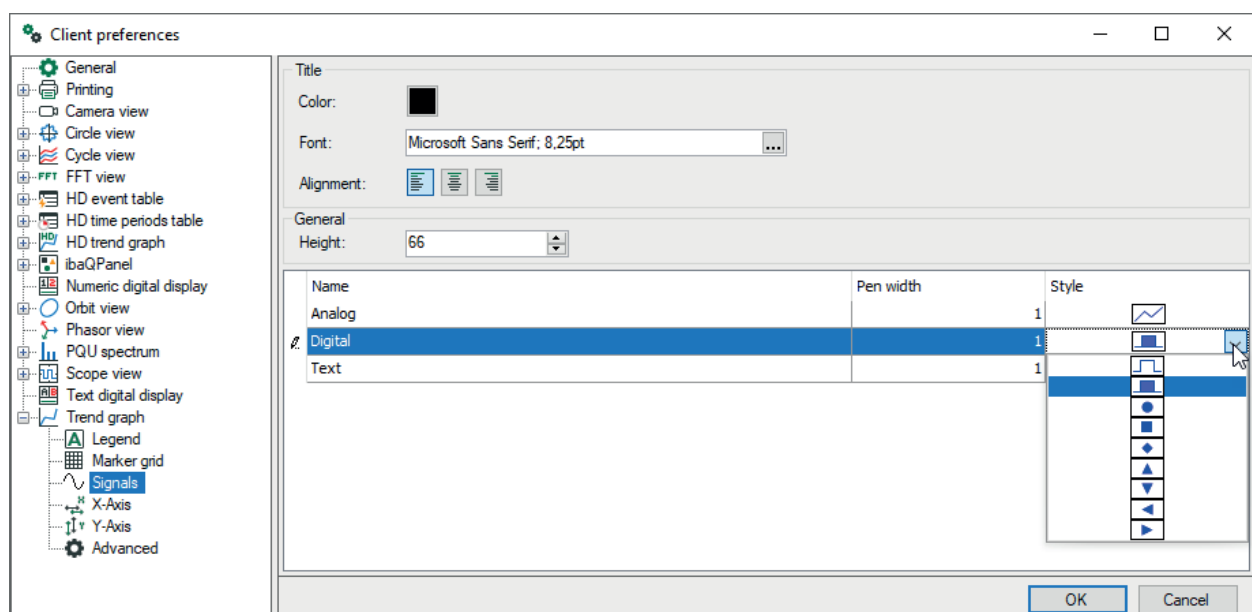
#### Background color

By setting the background color you determine how a table row will be highlighted when selected with the mouse.

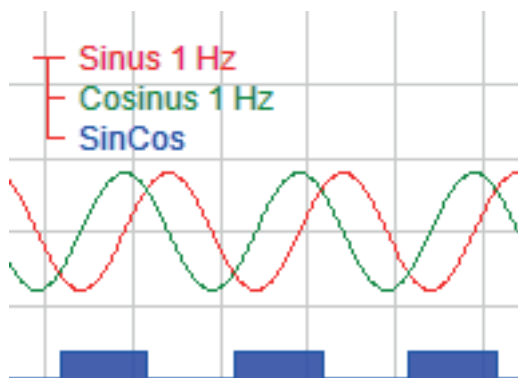
#### Foreground color

This setting determines the font color in case a row is selected. Typically, this is the signal color (default). However, you may choose a different color, in order to generate more contrast in conjunction with another background color, for instance.

## 6.12.3 Signals



In this dialog you can generally define how the curves should be initially displayed. The default setting for curves of analog values is a simple line (line thickness 1), and for digital signals a filled area. Text signals will be displayed in standard font.



You can also select other styles for analog, digital and text signals. Click in the "Style" column. A selection list opens there of the different styles.

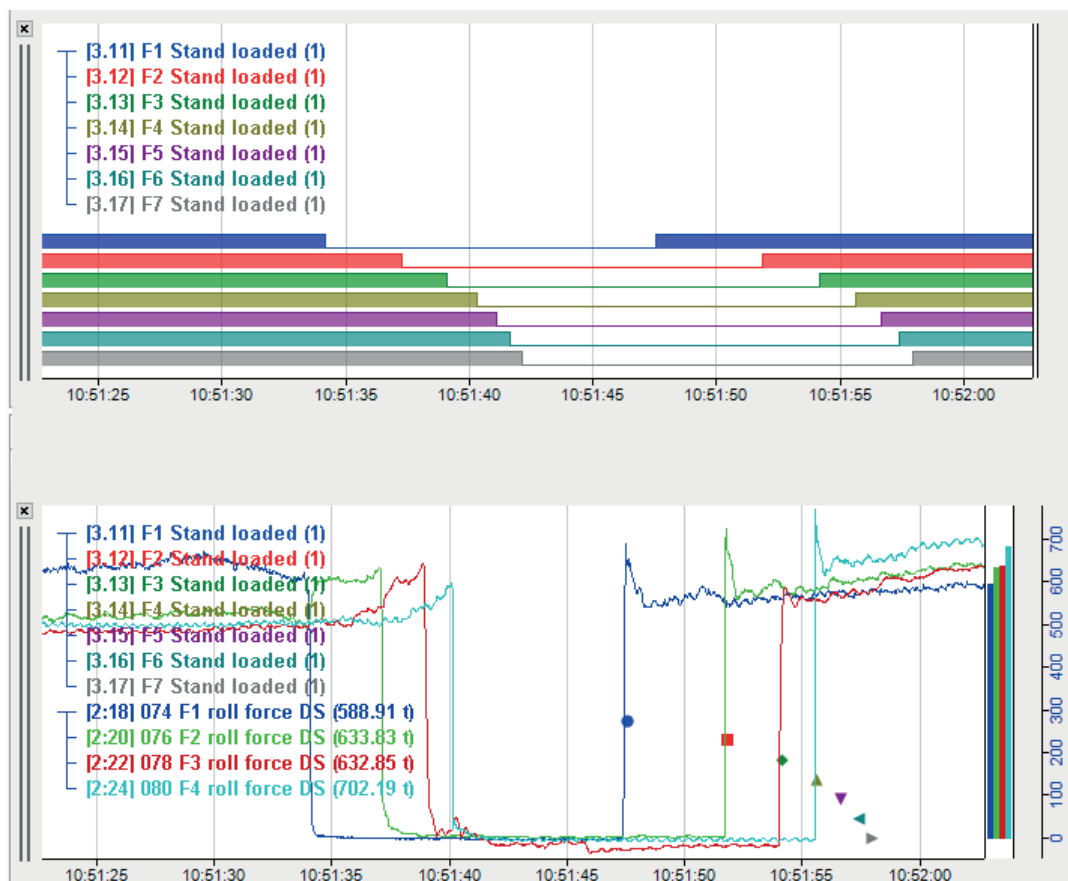
Symbol	Description
Analog signals	
	Line; Curve filled up to zero line; Curve filled to bottom; Curve filled to top
Digital signals	
	Line; Curve filled up to zero line Geometric symbols are displayed at the rising edge of the signal
	Normal; bold; italic; bold & italic

If you select a symbolic style for a digital signal then this symbol is only displayed on the x-axis where there is a rising edge of the signal. The remaining signal curve (TRUE or FALSE) is not displayed.

Example: strip entry in a 7-stand rolling mill

The figure below shows in the upper part a trend of digital signals in standard style, the lower part shows the digital signals in symbol style together with some analog signals.

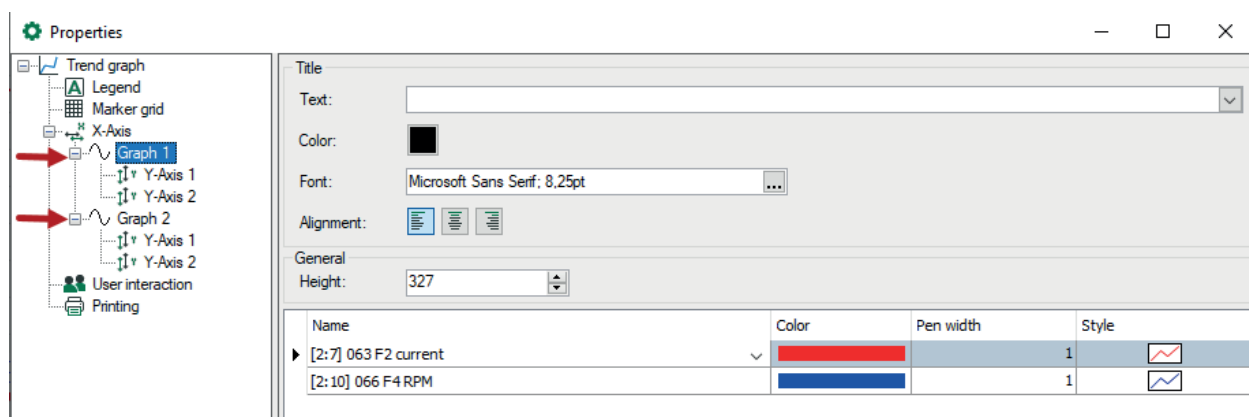




The symbolic style can be useful if the trend display would be overloaded in the standard style, especially when digital and analog signals are presented mixed.

Transparent colors are used for filled curves to avoid one hiding behind the other. The line width can be adjusted in pixels.

In the "Properties" dialog of a trend graph view, you can set up the style for each curve individually. There you will find one or more "Graph x" branches. X is the numbering of the different graph charts within a trend graph view. Under the "X-axis" branch, you will find signals with their properties, grouped by the charts in the view. The following figure shows the properties of a trend graph (view) with two graph charts (graph 1 and graph 2) with two Y-axes each. Graph 1 contains two signals.



In the "Color" column, you may change the color of a signal by selection from a pick-list.

In the preferences you will find these settings under *Trend graph - Signals*.

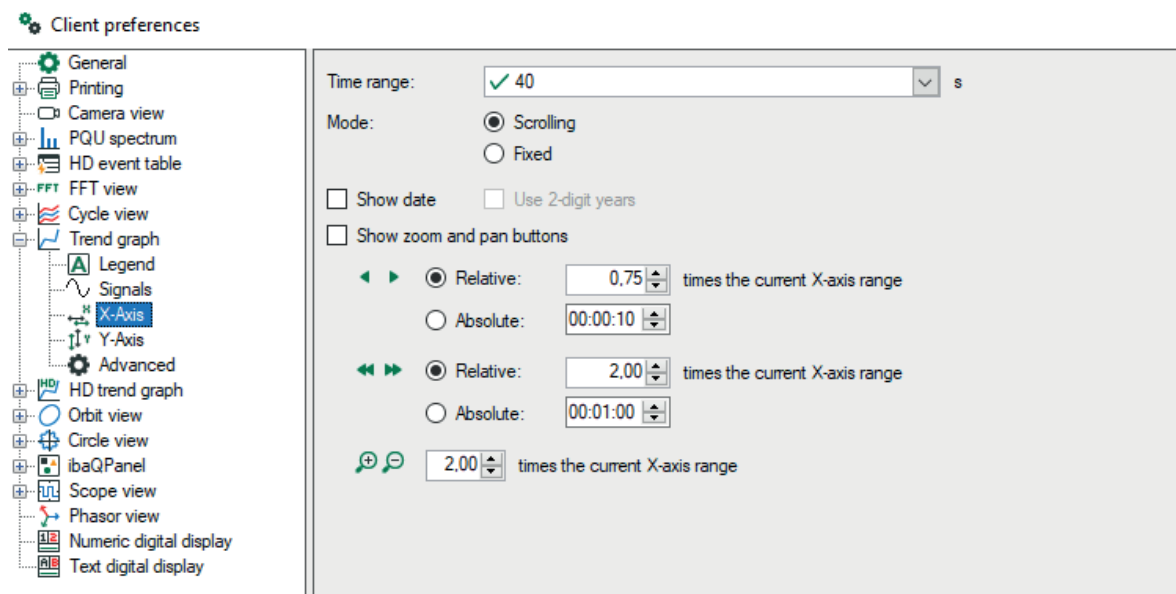
### Set up the graph height

In the *General* area you can determine the minimum height of a graph for its display in a trend graph view by setting the *Height* parameter. The value is given in pixel. A default value of 66 is given in the preferences.

However, a graph will be displayed with maximum possible height when a signal is dragged into an empty trend graph view. Adding more trend graphs will divide the height in equal shares automatically as long as you did not set the height of one or more graphs manually. If there are more trend graphs open in a trend view than space available with regard to the minimum height, a scroll bar appears.

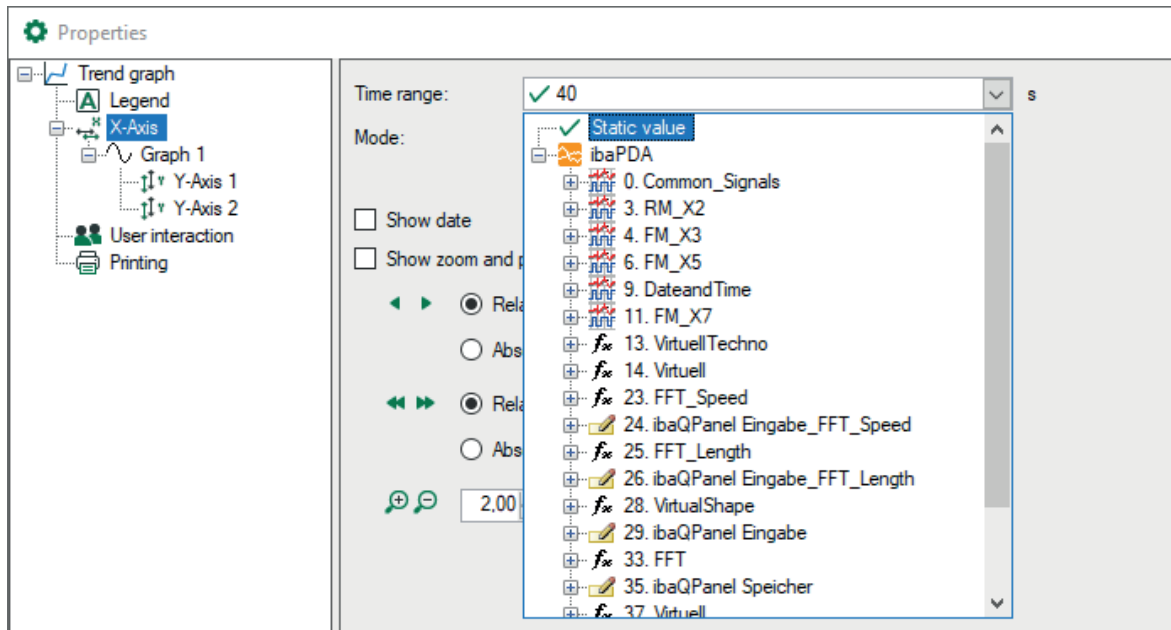
You can adapt the height for each graph in the properties later.

## 6.12.4 X-axis



### Time range

You can configure the time range represented by the X-axis. If you reduce the value, the signal will move faster on the display and changes to an expanded form. If you increase the value, you will see more measuring points in the graph and the signal will move slower. In the preferences, you can only set a static value. In the properties of a specific trend graph view, you can select an analog signal controlling the length of the X-axis.



### Mode

Scrolling: Usually, the time axis moves along with the incoming samples (default).

Locked: If you enable this option, the signal will be written into the static graph. Once the signal curve has reached the end of the visible time range, the display shifts to the next (empty) time unit and continues to write samples.

### Show date

By enabling this option, the date (MM/DD/YYYY) is displayed at the ticks of the X-axis. Optionally, you can reduce the year by 2 digits (MM/DD/YY).

### Show zoom and pan buttons

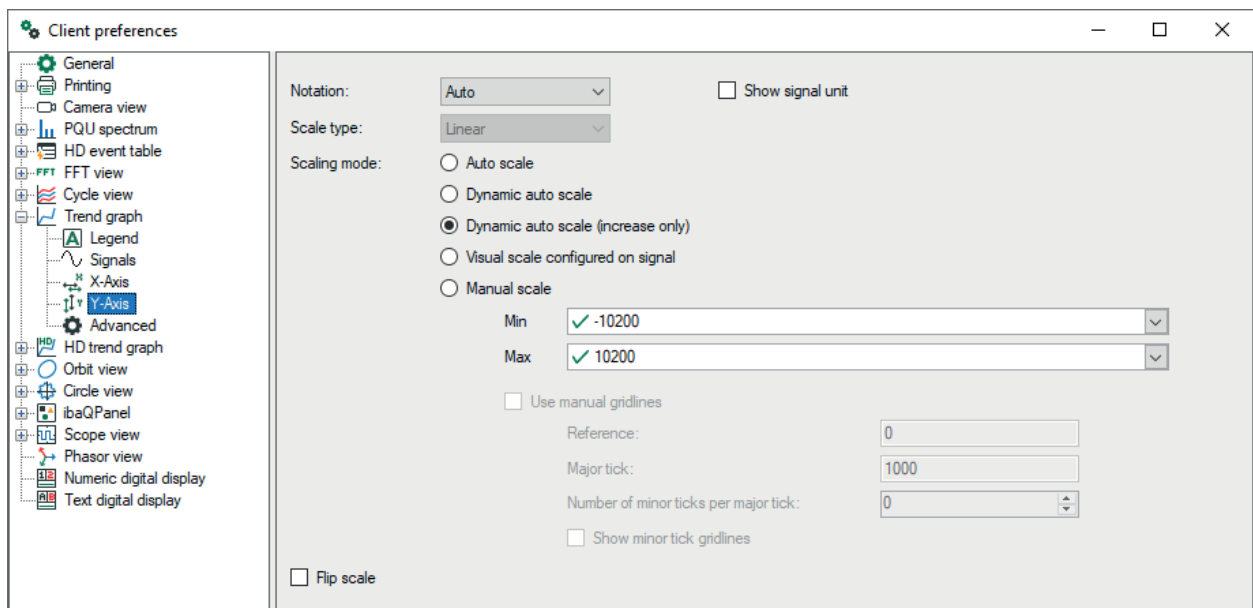
If you enable this option, the zoom and pan buttons will be displayed along the X-axis.

Default settings are:

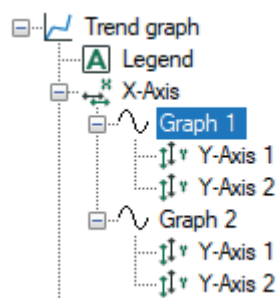
- for small panning steps: 0.75, relative
- for large panning steps: 2.00, relative
- for zooming 2.00

Alternatively, the panning steps can be set as absolute value in the HH:MM:SS time unit.

## 6.12.5 Y-Axis



In the preferences, you will find the branch for setting up the Y axes. If you open the "Properties" dialog of a trend graph view, you will find one branch for each graph in the view as well as subordinated branches for each Y axis of the corresponding graph (see picture below).



Thus, you can set up all Y axes individually.

### Scientific notation

Choose from the pick-list in this field:

- Auto: Depending on the size of the scale values (number of places before or after the decimal point), the scales are labeled in scientific notation (power of 10) or not.
- Standard: Scale values always with digits before and behind the decimal point
- Scientific: Scale values in powers of 10

Optionally you can enable the indication of the signal unit.

### Scaling mode

- Autoscale: this is the default setting; if one or more signals are displayed, the Y-axis of the graph is scaled in accordance with the smallest and largest of all values occurring.
- Dynamic auto scale: if you enable this option, the scaling is always adjusted to the highest and lowest signal amplitudes in the graph (in both directions).
- Dynamic auto scale (only for enlarging): When you enable this option, the scaling is contin-

uously adjusted with the highest signal amplitudes. If the amplitudes go beyond the trend view again, the scaling still remains unchanged.

- **Manual scale:** if this option is selected, the Min and Max scale values can be manually entered or selected from the field next to it. Beside a static value, you can also use any known measured or virtual analog signal configured in the I/O manager. In order to select a signal for minimum or maximum scale, open the pick-list of the corresponding field and make the selection in the signal tree.

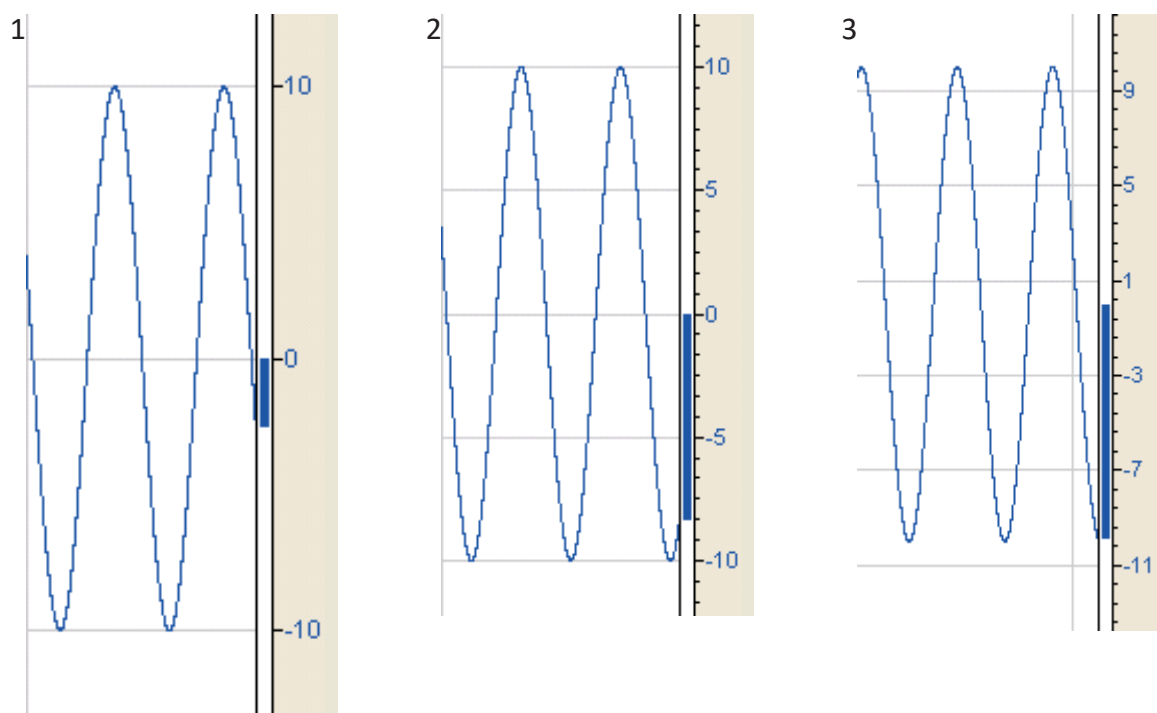
### Using manual grid lines

This option is only available if the manual scaling is enabled.

With the parameters to be entered, you can alter the Y axis and grid lines.

- **Reference**  
Enter any value to be considered as reference for the basic grid line. Usually, the basic grid line is at value 0 (zero). Depending on your needs, the basic grid line can also have, for example, the value 10 or -25.
- **Major tick**  
Enter a value for the major ticks' distances on the Y-axis. Every major tick is linked to another grid line. The major ticks determine the horizontal grid lines in the graph. Depending on the total scaling, a major tick can be set every 10 s, 100 s or every 0.1 s.
- **Number of minor ticks per major tick**  
Enter a value complying with the number of minor ticks between two major ticks. This determines the granularity of the Y-axis. Optionally, you may enable grid lines for minor ticks.

### Example



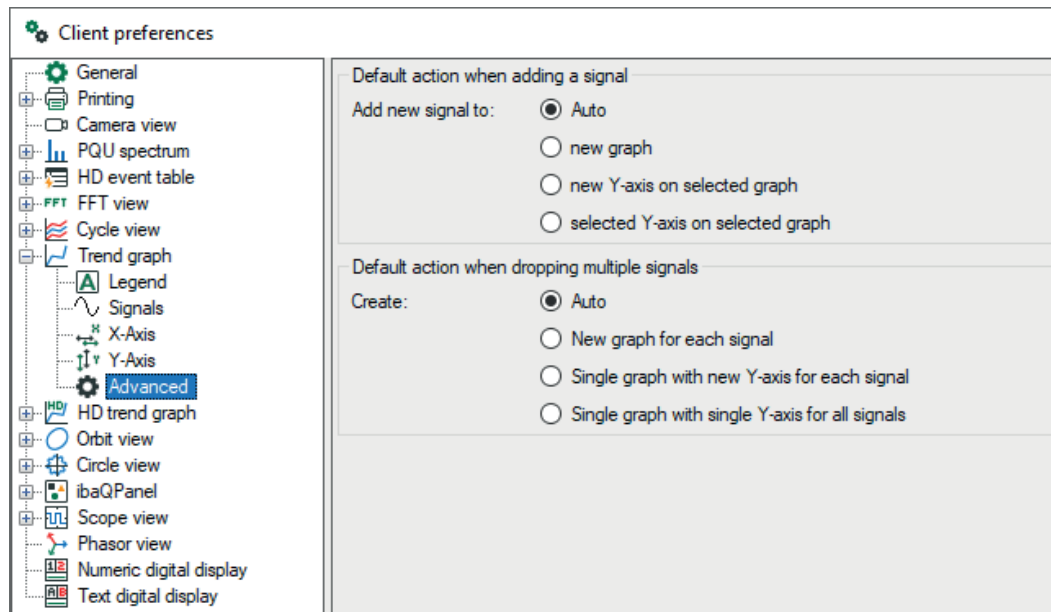
	Reference	Major ticks	Minor ticks per major tick
1	0	10	0
2	0	5	5
3	1	4	4

Trend graph settings for reference, major ticks and minor ticks (example)

By enabling the option *Flip scale* you can swap the scale top-down.

### 6.12.6 Advanced

The advanced options allow you to change the behavior when adding signals to a trend graph by either double-clicking in the signal tree or by drag and drop. The "Advanced" branch is only available in the preferences.



The default behavior is "Auto". If you add a signal with no key combination pressed, a new graph and a new Y axis will be created for the signal. If you hold the <Ctrl> key while adding a signal, a new Y axis is created in the currently selected graph chart and the signal is added to that new Y axis. If you hold the <Shift> key while adding a signal, the signal is added to the currently selected Y axis.

If you drop multiple signals, this behavior is repeated for all signals.

By selecting one of the advanced options, you can override this default behavior and select one specific behavior that will be used always no matter which key combination is pressed.

## 7 FFT view

The FFT view is a spectrum analyzer included as a standard view in *ibaPDA*. It can be used to display the frequency spectrum of one or more signals on multiple value axes.

The FFT view can be used for normal analog signals as well as the modules of *ibaInSpectra* add-ons. Some display features are only available in conjunction with an InSpectra module, as indicated in the corresponding section.

If you use *ibaInSpectra*, you can drag a complete InSpectra module from the signal tree to an FFT view. The settings and mathematical parameters for the FFT view will then automatically taken from the InSpectra module settings.

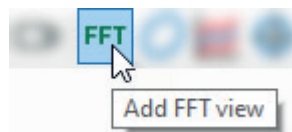
### Other documentation



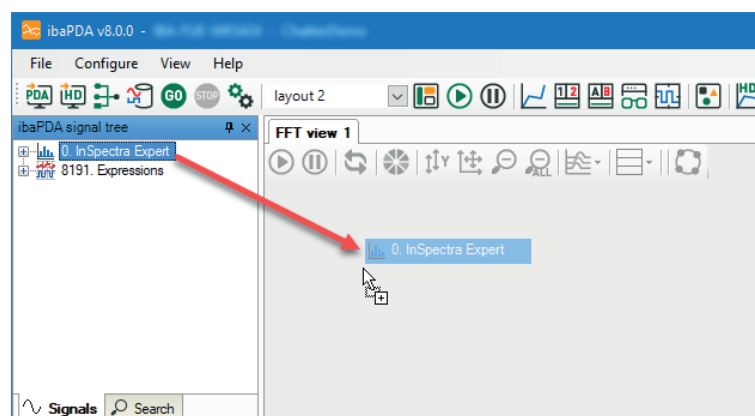
Detailed information on *ibaInSpectra* is contained in the *ibaInSpectra* product manual.

### 7.1 Opening an FFT view in ibaPDA

Use the button to add a new FFT view:



You can move individual or several highlighted signals from the signal tree to the main view of the FFT view using drag & drop. In the case of an InSpectra module, you can drag the entire module into the FFT view. In doing so, relevant parameters for the FFT view are copied from the module settings.





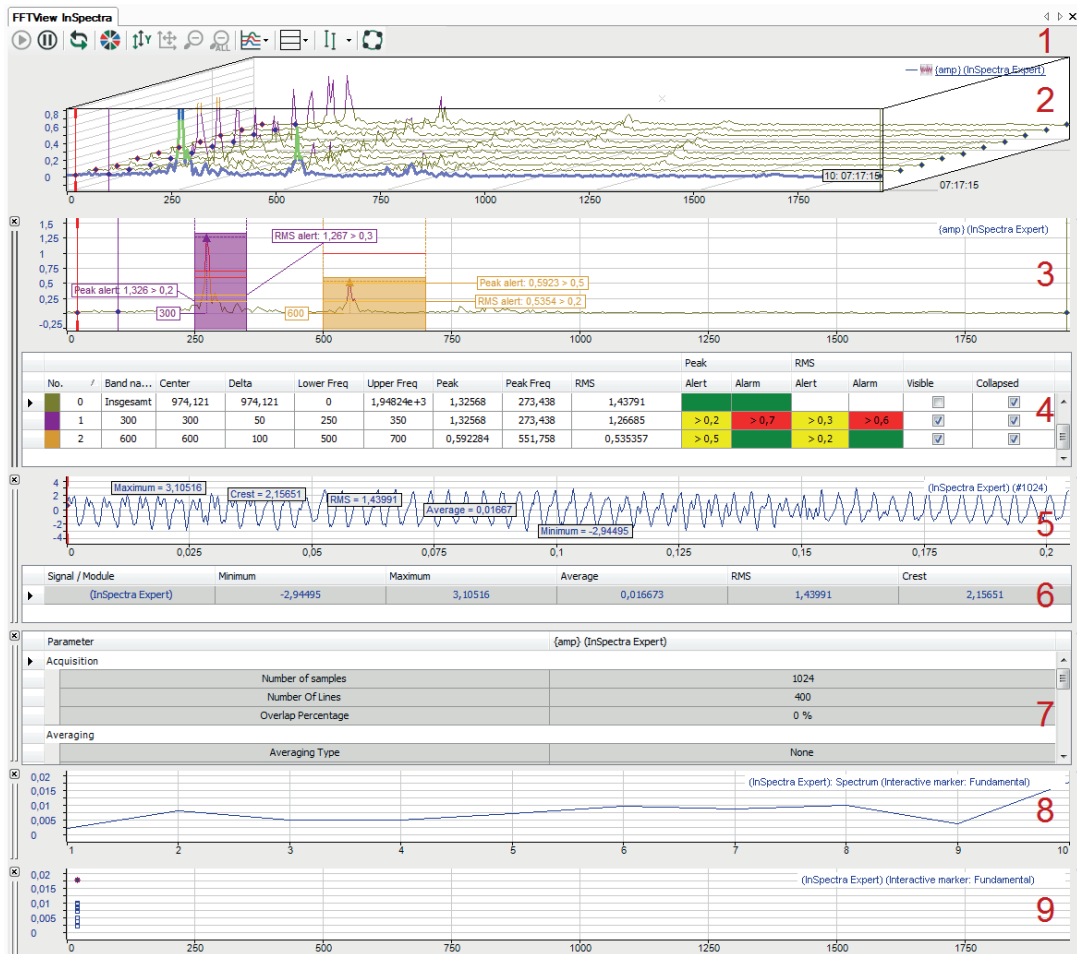
The following hotkeys are available for dragging new signals into a FFT view:

- <Shift>: When you press the <Shift> button while dragging several signals into the FFT view, all signals are placed on a joint Y-axis.
- <Ctrl>: When you press the <Ctrl> key when dragging one or more signals into the FFT view, the existing signals are replaced with new signals. If there are more signals in the view than new signals, the first signals will be replaced. If there are more new signals, the additional signals will be appended.

The description of the FFT view can be found in chapter [↗ FFT view overview](#), page 50

## 7.2 FFT view overview

The FFT view offers a number of special graphs and tables, which can be individually displayed or hidden as needed.



### Legend

- 1 Toolbar
- 2 Main window, signal spectrum of the input signal
- 3 Spectrum graph (bands, frequency domain) <sup>1</sup>
- 4 Spectrum table (data, frequency domain) <sup>2</sup>
- 5 Time graph (graph, time domain)
- 6 Time table (table, time domain)
- 7 Spectrum parameter table
- 8 Slice graph<sup>3</sup>
- 9 Marker spectrum graph<sup>3</sup>













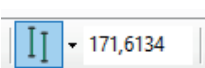
<sup>1</sup> With ibaInSpectra, additional static values, warning and alarm limits


<sup>2</sup> Can only be used with ibaInSpectra

<sup>3</sup> Slice graphs and marker spectrum graphs can exist several times

The main window is always displayed at the top. The additional windows for graphs and data of spectrum and time domain are grouped in pairs. In analogy to normal trend views, their position can be changed at the header bar by using the mouse. You can display or hide the individual graphs and tables within the FFT view by means of the buttons as shown in the above figure.

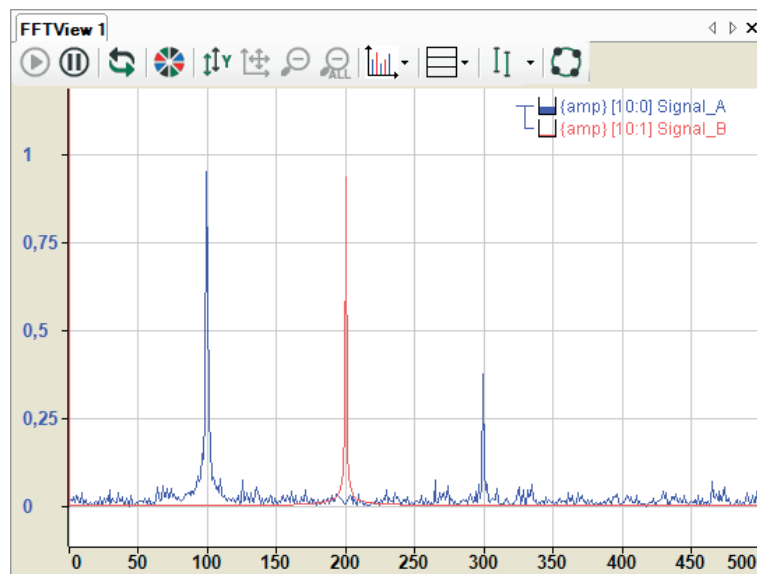
### Toolbar

	Start FFT view / Pause FFT view (only <i>ibaPDA</i> )
	Stop or continue the FFT display update
	Reset all displayed data (only <i>ibaPDA</i> ) The display is cleared only once and all values are set to zero until the next FFT calculation is completed.
	Determine plane count automatically (only <i>ibaAnalyzer</i> )
	Auto color signals
	Auto scale value axis
	Restore manual scale <sup>1)</sup>
 	Zoomout one level / Zoomout all <sup>1)</sup>
	Toggle display type in the FFT main window (single spectrum / waterfall / contour)
	Open the sub menu for showing/hiding the windows Main window with/without waterfall (graph, frequency domain) Spectrum graph (graph, frequency domain) Spectrum table (table, frequency domain) Time graph (graph, time domain) Time table (table, time domain) Display spectrum parameter table Add slice ... Add marker spectrum ...
 	Toggle interactive marker visibility, center or configure the marker If the interactive marker is visible, a value field will be displayed beside the button in the tool bar. The field shows the actual position of the marker on the X-axis (Hz). But you can also enter a value into the field to position the marker accordingly.  No function for configured markers

	Switch to the order spectrum (if speed signal and parameters of the order calculation are configured)
	<sup>1)</sup> Individually affects the main window, spectrum or time graph, depending on the focus

## 7.3 Main window

In the main window, the result of the FFT of the signal to be examined is shown in the frequency domain. The standard view for the main window is the individual spectrum.



You can enable an interactive marker that you want to use to read frequency values and the associated amplitudes along the X-axis.

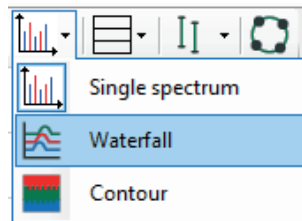
When switching to the waterfall or contour view, the individual results of the frequency analysis are displayed spatially offset. This provides an overview of the history of the frequency response curve.

Detailed information can be found in chapter [↗ Waterfall](#), page 54

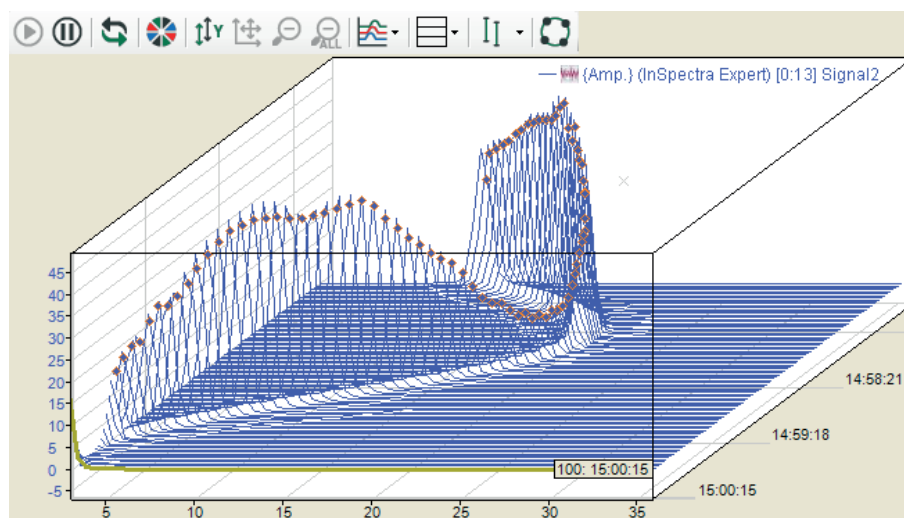
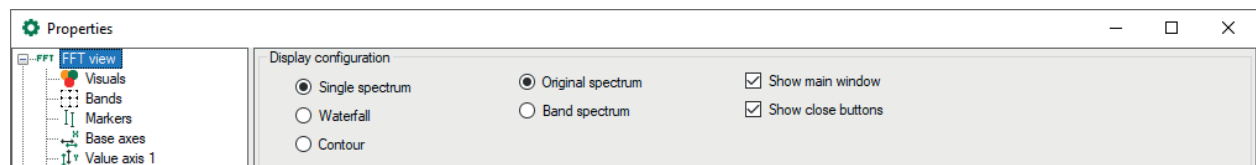
### 7.3.1 Waterfall

The main window of the FFT view can be converted to an isometric perspective. In this mode, the successive FFT events of a spectrum are displayed on a Z-axis, with the newest result closest to the axes origin, in order to create a waterfall effect. The display is restricted in *ibaPDA* to 262144 data points, in *ibaAnalyzer* configurable via memory usage per FFT. However, note that using a waterfall display requires more resources than a single spectrum.

You can switch to the waterfall perspective via the corresponding button in the toolbar of the FFT view.



Alternatively, you can switch perspectives in the properties dialog of the FFT view as well.



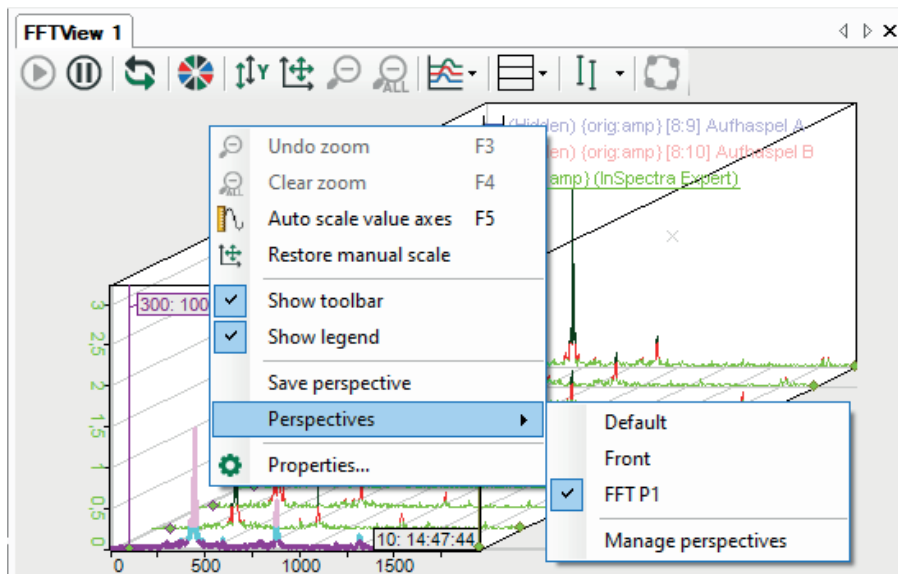
In the above figure, you can see the results of the last 100 calculations and it is clearly visible how the spectrum changed in the course of time.

By using the <Up> and <Down> cursor keys or by scrolling with the mouse wheel, you can move through the planes and have displayed the related spectra and parameters.

When moving the mouse with the <Ctrl> key pressed, you can change the angle and perspective of the view. If you press the <Shift> key at the same time, then the display pans to 0 degrees. The axis position settings are overwritten in this mode.

If you have set the desired perspective, you can save it. To do this, select *Save perspective* in the context menu and enter a name. Saved perspectives also appear in the context menu and can

be re-enabled at any time. When you select *Front* perspective, the display pans to 0 degrees. Selecting *Default* returns you to the default setting. See also chapter [Properties and preferences FFT view](#), page 84



Scales are always displayed at the side of the chart not overlapping with the perspective flow direction. Several spectra can have different sample rates or bin values and thus the clock in which the FFT results are available may vary. That is why it is pre-set that every spectrum moves on the Z-axis at its own pace.

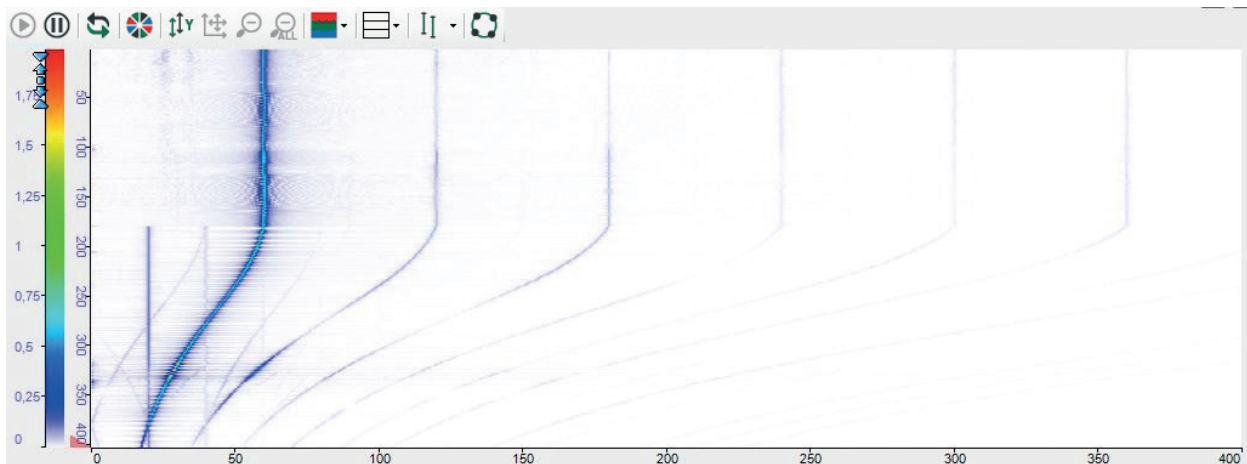
However, there is the option to synchronize the Z-planes across several spectra. With this option enabled, the FFT view will not allow a spectrum to advance over the Z planes until all spectra have generated a new FFT result. While the view is waiting for certain spectra to generate results, the other spectra keep showing their newest results on the front plane.

While the waterfall perspective is enabled, the label, marker and zoom rectangle functionality is limited to the foremost plane.

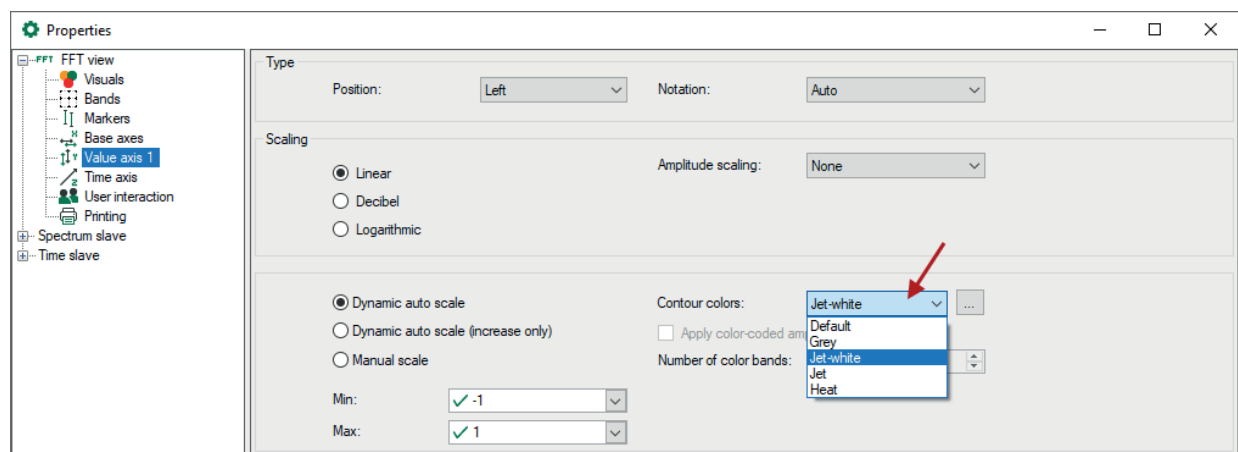
The appearance options of the waterfall display is determined in the properties window in the node *Time axis*. See chapter [Time axis](#), page 101.

### 7.3.2 Contour view

The contour view corresponds to a 2D top view of the waterfall, where the amplitude height is represented by colors.



The color scheme can be configured in the properties of the value axis. Both pre-defined schemes can be selected here and customized color schemes can be created.



### 7.3.3 Zoom

The scale of an axis can be manipulated in three ways.

- Autoscale

You can perform an autoscale via the context menu of the axis or by using the middle mouse button to click on the axis.

- Shift

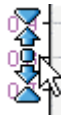
You can shift an axis by dragging it with the mouse.

- Zoom

Using the mouse wheel, you can zoom in and out in the area of the cursor.

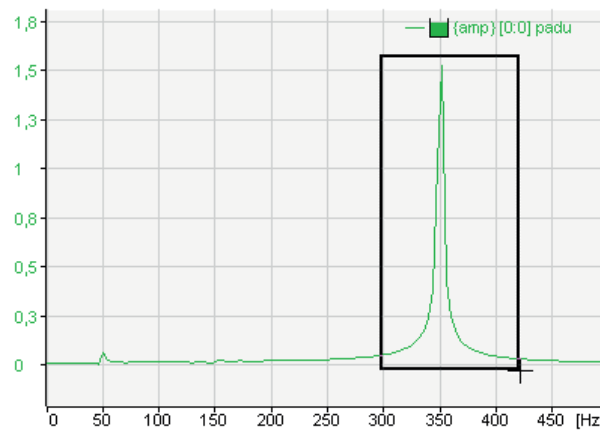
You can change the scale via the pop-up buttons on the axis too. These buttons appear when you move the mouse over the right side of a horizontal axis or over the top of a vertical axis.





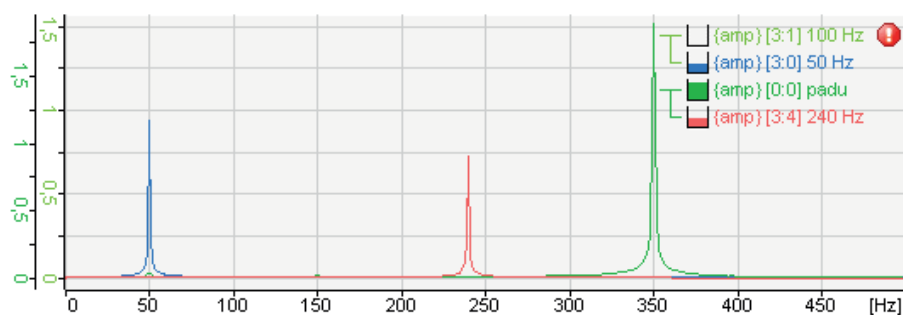
The outermost symbols halve/double the scale range based on the average. The arrows have a similar function, but with a smaller zoom factor. The button in the middle autoscales the axis.

In addition, you can zoom into a certain area of the diagram using the zoom rectangle (click with mouse and drag, see fig. below). The zoom rectangle enables the zoom buttons in the view toolbar, which allow you to return to previous zoom levels.



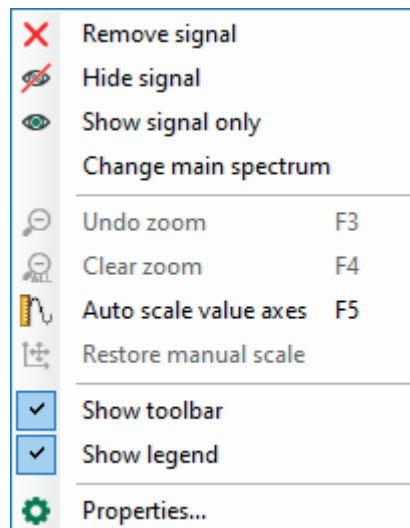
### 7.3.4 Legend

The legend indicates which signals are added to the view. The first part of the legend is the tree structure of the value axis. This shows which spectra are shown on which axis. The second part of the legend shows a visual representation of the percentage buffer fill grade for each signal. The last part indicates the signal name, listed by signal ID and calculation mode. If a signal is invalid, this is indicated by an exclamation mark at the end of the signal row. The example below shows a legend with 4 signals in 2 groups with the first signal (100 Hz) being invalid.



The legend has a drag & drop function. This way, a spectrum can be laid upon different value axes. While dragging the spectrum, an arrow appears in the value axis tree pointing to the tree that will contain the spectrum when it is dropped. If a spectrum is not dropped inside a legend row, the spectrum will be laid upon a new axis.

Right clicking in a legend row makes the context menu of the legend appear.



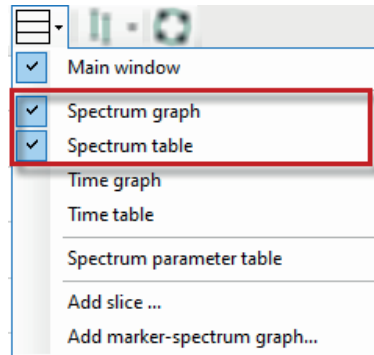
Clicking on “Remove signal” removes the corresponding signal. Clicking on “Hide signal” hides the signal and shows the signal name transparently. The signal is only temporarily hidden and can always be displayed again. By clicking on “Show signal only” in the context menu, only the selected spectrum remains in the display and all other spectra are hidden. Clicking on “Change main spectrum” makes the selected spectrum the main spectrum.

In the context menu under “Properties,” you can display the selected settings for the spectra.

In the properties of the FFT view (main window), you can also configure and enable a separate legend that contains additional information, such as name, comments and sampling time of the input signal, marker values or any literal text.

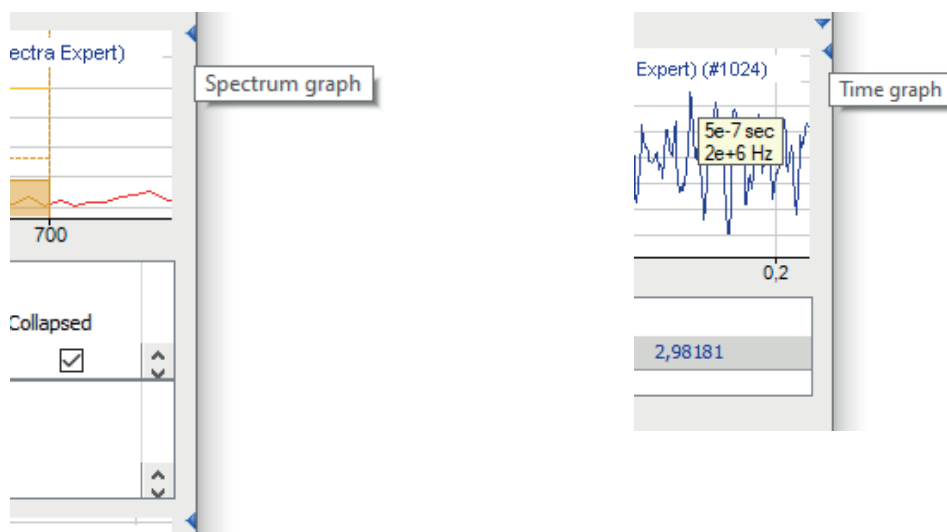
## 7.4 Spectrum graph and spectrum table

In addition to the main window, you can open a graphical and/or tabular display of the data of the frequency spectrum. Click on the button for the window menu in the toolbar of the FFT view for this purpose.



Graphical display and data table form one group, as the table always provides the data matching the spectrum in the graph. However, the graph and table can be individually displayed or hidden.

In addition, the graph and data table can be minimized (see following figure right side) or displayed together (see following figure left side). To do this, simply click on the small triangle on the right margin of the display:

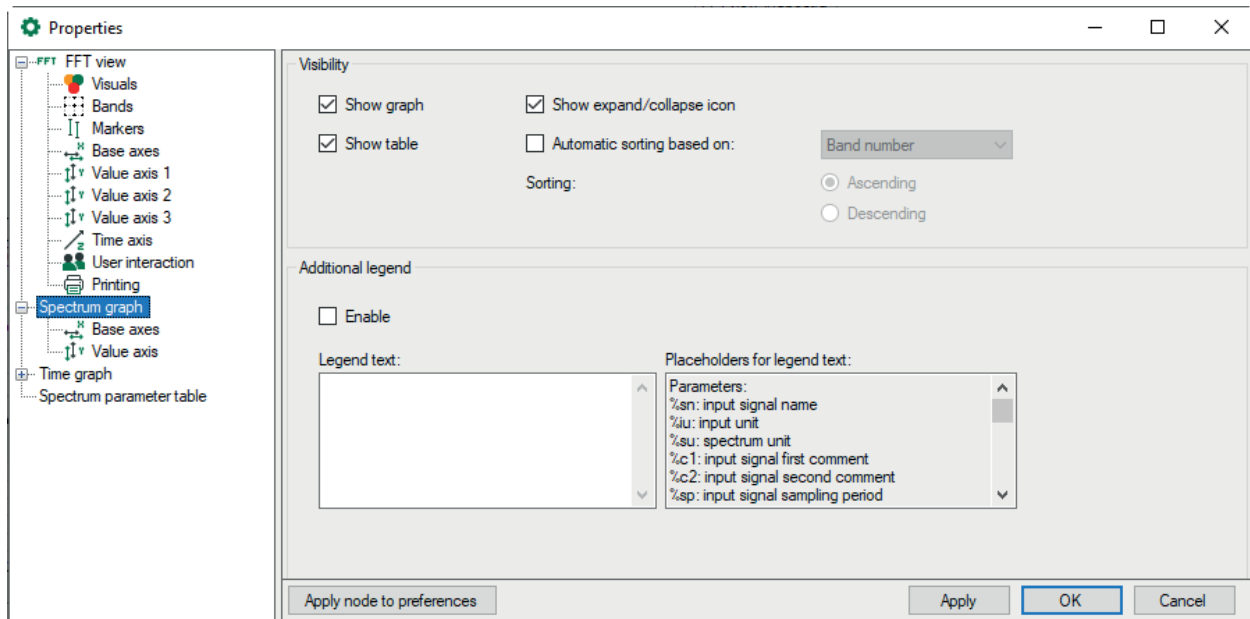


### Note



Without *InSpectra* modules, the spectrum graph shows the same information as the individual spectrum in the main window and the table does not contain any data.

You define general display properties in the properties dialog of the FFT view in node *Spectrum graph*.



### Visibility

You can define here whether the graph and the data table for the spectrum graph are shown by default. Even if a view is disabled here, it can be re-enabled later in the FFT view toolbar.

You can also specify whether the small triangles for expanding and collapsing the graph and data table should be displayed.

The data table can be sorted automatically. Define the parameter (column) here according to which and in which sequence the table is sorted.

### Additional legend

When this option is enabled, another legend is displayed in the spectrum graph window in addition to the normal signal legend. You can define the content of this legend yourself. For example, you can enter a detailed multi-line text, in which placeholders for dynamic information can also be used. The following placeholders are available:

- %sn: Input signal name
- %iu: Input unit
- %su: Spectrum unit
- %c1: Input signal first comment
- %c2: Input signal second comment
- %sp: Input signal sampling time
- %x: X-value at interactive marker
- %y: Y-value at interactive marker
- %xmouse: X-value at mouse cursor
- %ymouse: Y-value at mouse cursor
- %tmouse: Z-value at mouse cursor
- %xmv: X-value of the nearby marker position

- %ymv: Y-value of the nearby marker position
- %tmv: Time value of the nearby marker position
- %nmv: Name of the nearby marker position
- %imn: InSpectra Expert module name
- %n: Band name
- %nb: Band number
- %r: RMS value
- %p: Peak value
- %pf: Peak frequency
- %c: Center frequency
- %d: Delta frequency
- %l: Lower frequency
- %ats: Alert status text
- %ams: Alarm status text
- %events: Alert & alarm status text
- %atrmsl: Limit value for RMS alert
- %atpeakl: Limit value for peak alert
- %amrmsl: Limit value for RMS alarm
- %ampeakl: Limit value for peak alarm
- %atrmspc: Quota of limit value for RMS alert
- %atpeakpc: Quota of limit value for peak alert
- %amrmspc: Quota of limit value for RMS alarm
- %ampeakpc: Quota of limit value for peak alarm
- %v: the monitored value
- %mtype: monitored type: either "rms" or "peak"
- %etype: Event type: either "alert" or "alarm"
- %s: Event status text
- %lim: Limit value of the event
- %pc: Quota of event

By default, all signal-related placeholders are determined based on the first spectrum. To identify another spectrum, use a colon followed by the word "spectrum" and the index of the spectrum, e.g. "%sn:spectrum1", in order to refer to the first spectrum.

Band-related placeholders can be referred to by the band name (e.g. "%p:bandname") or by the band number (e.g. "%p:band0").

Event-related placeholders can be referred to as follows:

- %lim:band0:atpeak (Peak alert)
- %lim:band0:ampeak (Peak alarm)
- %lim:band0:atrms (RMS alert)
- %lim:band0:amrms (RMS alarm)

You may use as well the event name instead of “atpeak”, “ampeak” etc.

Use the optional formatting string “w.p” to specify the format of the numeric parameters, where “w” is the width and “p” is the precision. The width is the minimum number of the characters shown. Precision is the number of decimal places.

Example: “%5.3y1” indicates the Y-value for marker X1 with a width of 5 characters and a precision of 3.

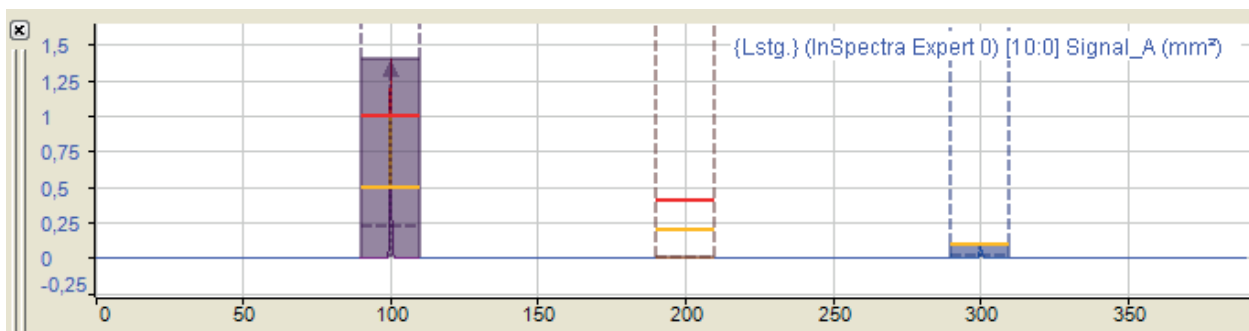
You can combine most of these techniques:

E.g. “%10.5p:spectrum1:someband” E.g. “%.6pc:spectrum2:otherband:eventname”

### 7.4.1 Spectrum graph

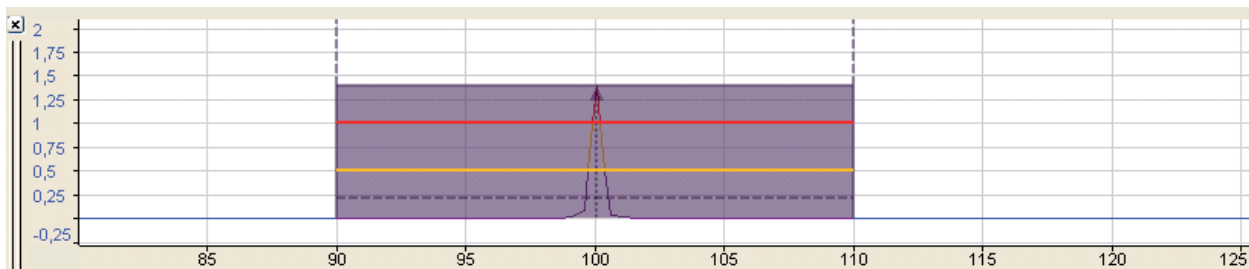
The graphical display of the frequency spectrum always shows the last result of the FFT in two-dimensional appearance or the spectrum selected in the waterfall or contour plot. (The selected spectrum in the waterfall view is shown with a different color, marked in the contour plot with a triangle):

- Spectrum
- Frequency bands
- Value bands
- InSpectra bands
- Characteristic values of the InSpectra bands
- Limits of the InSpectra bands

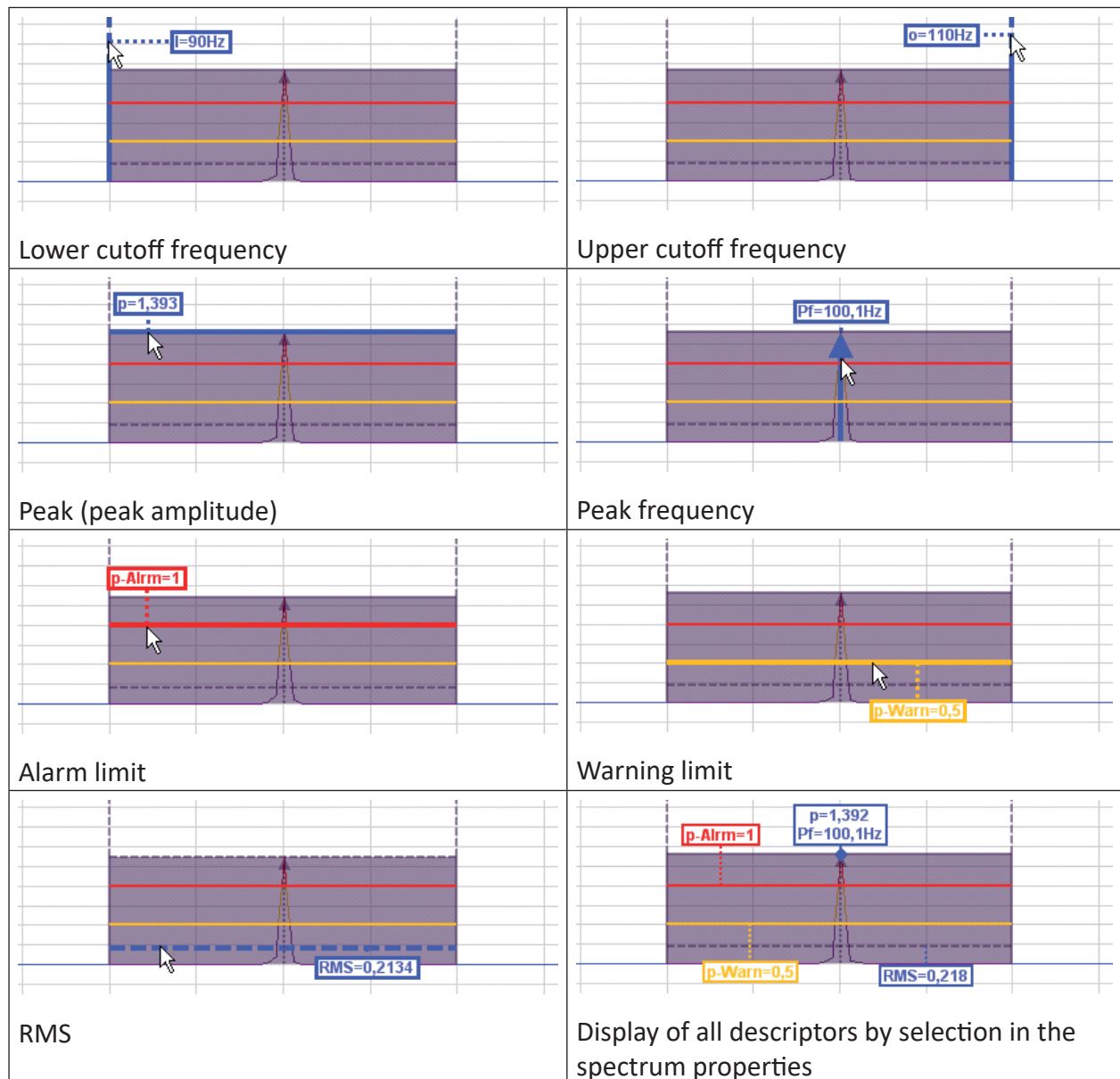


In the figure above the display shows three different frequency bands and at least a part of the spectral graphs from the main window. You can add additional graphs by dragging and dropping them from the main window or from the signal tree via drag & drop. The displays are linked so that all graphs in the small spectral display can also be seen in the main window.

When zooming in, more details can be seen.



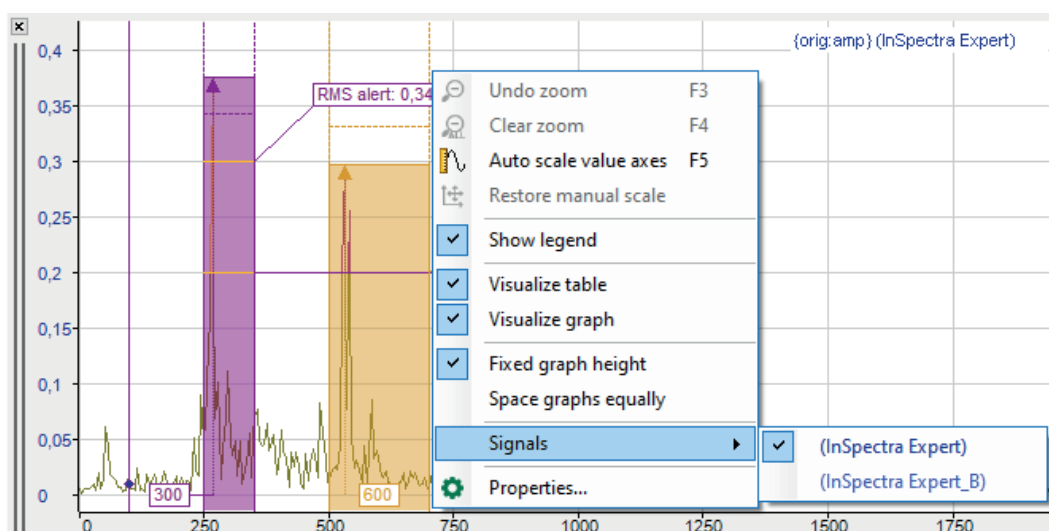
The most important parameters of the frequency bands and of the spectrum are shown with dotted and colored lines. You are shown the respective values when you position the cursor on the lines (hovering).



The configuration of the bands is described in chapter [Bands](#), page 88.

You can decide in the spectrum properties (by using the context menu of the display) which markings and parameters are to be displayed (permanently) and whether the graph should change the color when exceeding the alarm limits.





If there are several spectra in the display, individual display properties can be assigned to every spectrum.

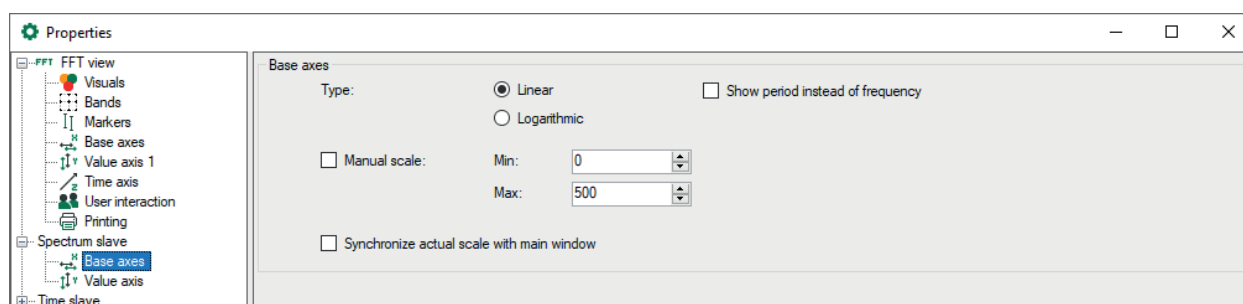
If the spectrum graph has the focus (after a mouse click on the header bar), the tool buttons for zooming out and restoring the manual scale relate to this graph and not to the main window. The same applies to the assigned function keys <F3>, <F4> and <F5>.

### Base axis

The display has a base axis corresponding to that of the main window. You can still modify the settings of the base axis in the display properties, for example, to select a logarithmic division instead of a linear division or to provide manual scaling. In addition, you can display the period instead of the frequency.

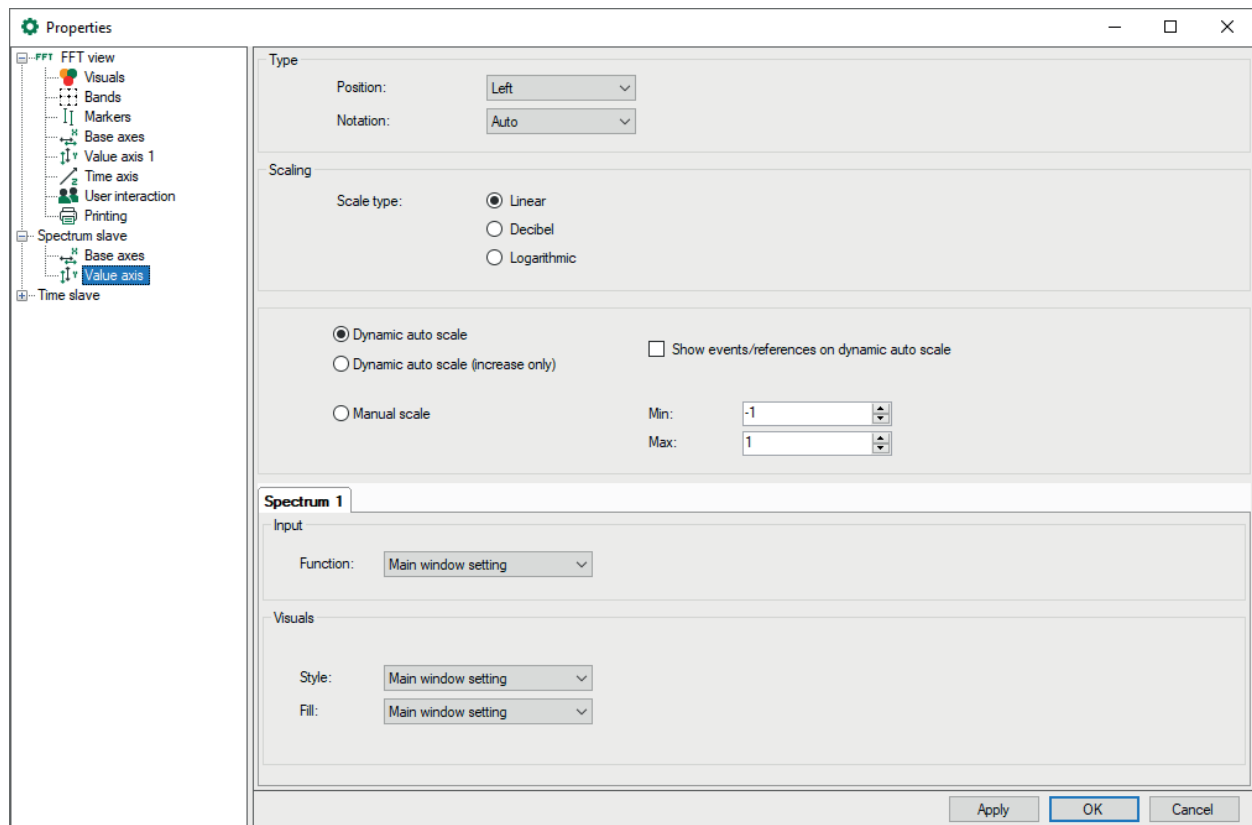
You can choose to scale manually or display the full range.

If you zoom in the spectrum graph or in the main window, this is usually independent from each other. By using the "Follow main window" option, you can determine that a zoom action in the main window also affects the spectrum graph, but only in horizontal direction.



### Value axis

The spectrum graph has only one value axis. All charts in the display are displayed on the same scale of values. You can change the settings of the value axis in the properties of the display.



For scaling the value axis, you can choose between linear, decibel and logarithmic.

### Scaling mode

The options of the value axis of the main view are available for selection, see chapter [Value axes](#), page 95, and in addition:

- Follow main window: With this option, a zoom action in the vertical direction in the main window also affects the spectrum graph.

### Spectrum x

In the *Spectrum x* tab, you can determine the display properties for style and filling for each spectrum separately. You can adopt the main window setting or select individual settings from the respective drop-down menu.

You can also set the display properties for style and fill for each spectrum separately. You can apply the main setting of the window or select individual settings from the respective drop-down menu.

## 7.4.2 Spectrum table

The data table for the frequency spectrum only contains data if it is an InSpectra module. In case of a simple analog signal, the table remains empty.

In the table, a line is automatically created for every defined band of the displayed InSpectra module.

								Peak		RMS			
No.	/	Band ...	Center	Delta	Peak	Peak Freq	RMS	Alert	Alarm	Alert	Alarm	Visible	Collapsed
<input checked="" type="checkbox"/> Show bands <input type="checkbox"/> Enable collapsed bands : (InSpectra Expert)													
0		Insge...	974,121	974,121	1,03141	283,203	1,31708					<input type="checkbox"/>	<input checked="" type="checkbox"/>
1		300	300	50	1,03141	283,203	1,10277	> 0,2	> 0,7	> 0,3	> 0,6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2		600	600	100	0,629698	561,523	0,612792	> 0,5		> 0,2		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

				Events	
No.	/	Name	Value	Alert	Alarm
InSpectra Module: (InSpectra Expert)					
0		P1+P2	1,66111		

The parameters and – if configured – the results are shown for each band. Results and alarms for characteristic values are displayed in the area below. A line is created for each parameter.

If there are several InSpectra modules in the spectrum graph, the table also shows the data for the bands of the other spectra, see in the figure below in the case of two InSpectra modules.

										Peak		RMS			
No.	/	Band...	Center	Delta	Lower F...	Upper F...	Peak	Peak Freq	RMS	Alert	Alarm	Alert	Alarm	Visible	Collapsed
<input checked="" type="checkbox"/> Show bands <input type="checkbox"/> Enable collapsed bands : (InSpectra Expert)															
0		Insge...	974,121	974,121	0	1,94824...	1,48727	458,984	1,68337					<input type="checkbox"/>	<input checked="" type="checkbox"/>
1		300	300	50	250	350	0,074371	297,852	0,130026					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2		600	600	100	500	700	0,100702	517,578	0,217807			> 0,2		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Show bands <input type="checkbox"/> Enable collapsed bands : (InSpectra Expert_C)															
0		Insge...	974,121	974,121	0	1,94824...	0,653055	449,219	0,918155					<input checked="" type="checkbox"/>	<input type="checkbox"/>
1		400	400	100	300	500	0,653055	449,219	0,748773	> 0,5		> 0,2	> 0,4	<input checked="" type="checkbox"/>	<input type="checkbox"/>

You can display or hide the parameter columns via the context menu (right mouse click in the heading).

The screenshot shows the 'Columns' context menu in the ibaPDA software. The menu is open, displaying a list of parameters that can be toggled on or off. The parameters include Band number, Name, Center, Delta, Lower, Upper, Peak, Peak position, RMS, Peak Alert, Peak Alarm, RMS Alert, RMS Alarm, Visible, and Collapsed. The 'Columns' option is highlighted, and a sub-menu is visible, showing the same list of parameters with checkboxes. The background shows a table with columns for No., Band..., Center, Delta, Lower F..., Upper F..., Peak, Peak Freq, RMS, Alert, Alarm, and Visible. The table contains data for two InSpectra modules, with the first module showing a peak at 1,48727 and the second module showing a peak at 0,653055.

In every parameter column, the displayed values can be sorted by clicking on the table header. A triangle in the header indicates whether the sorting direction is ascending or descending. The order is automatically re-sorted if the order changes during acquisition.

You define the preference for sorting in the properties dialog of the FFT view in the node *Spectrum table*, see chapter [Spectrum graph and spectrum table](#), page 59. The figure below shows a data table sorted by peak values.

No.	Band ...	Center	Delta	Lower Freq	Upper Freq	Peak	Peak Freq	RMS
<input checked="" type="checkbox"/> Show bands	<input type="checkbox"/> Enable collapsed bands : (InSpectra Expert)							
2	600	600	100	500	700	0,060893	590,82	0,105716
1	300	300	50	250	350	0,070283	297,852	0,08079
0	Insges...	974,121	974,121	0	1,94824e+3	0,389348	390,625	0,407757

### Show bands / enable collapsed bands

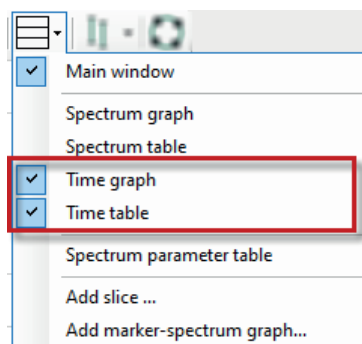
Use this option to globally decide for all bands whether these are displayed in the spectrum graph and whether they can be shown as collapsed bands.

If the option *Show bands* is enabled, the display of individual bands in the *Visible* column can be determined separately.

If the option *Enable collapsed bands* is marked, the display of the individual bands in the *Collapsed* column can be determined separately. Collapsed bands are indicated by a triangle at the center frequency.

## 7.5 Time graph and time table

In addition to the main window, you can open a graphical and/or tabular display of the data of the input signal in the time domain. Click on the button for the window menu in the tool bar of the FFT view.

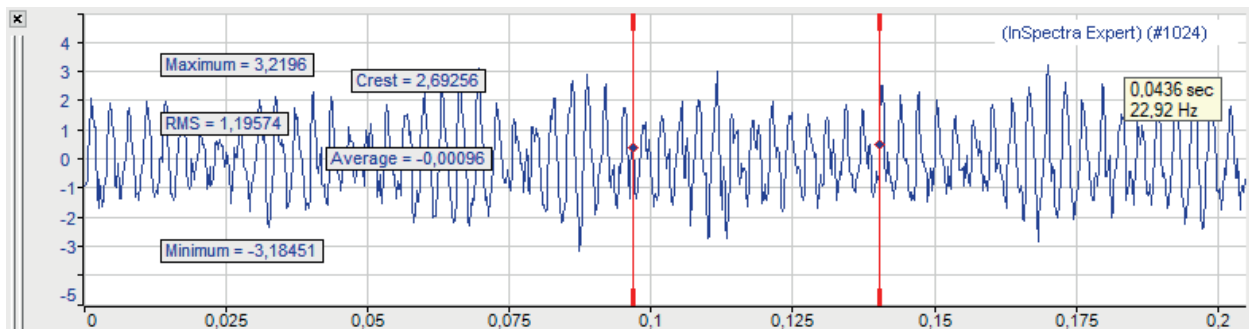


Graphical display and data table form a group, as the table always provides the data matching the graph in the display. However, the graph and table can be individually displayed or hidden.

In addition, the graph and data table can be minimized or displayed together. To do this, simply click on the small triangle on the right margin of the display.

### 7.5.1 Time graph

In the time graph, the time curve of the input signal is graphically displayed. The displayed section contains exactly the samples of the input signal which were included in the FFT calculation.



If the averaging function was enabled in the calculation settings of the profile, then the display shows the time signal of the last internal FFT calculation. The displays of the FFT results in the main window and frequency range, however, are also based on prior values of the input signal.

Basically the input signal of the InSpectra module is displayed. However, you can also drag further signals from the signal tree into the time graph. If there are several signals in the main window already, you can select those in the context menu of the graph.

If the time graph has the focus (after a mouse click on the header bar), the tool buttons for zooming out and restoring the manual scale relate to this graph and not to the main window. The same applies to the assigned function keys <F3>, <F4> and <F5>.

#### Markers

You can also enable markers via the context menu of the display (*Show markers*). The two markers can be moved independently of each other in the display. The legend on the right shows the time difference between the markers and the corresponding frequency.

#### Legend

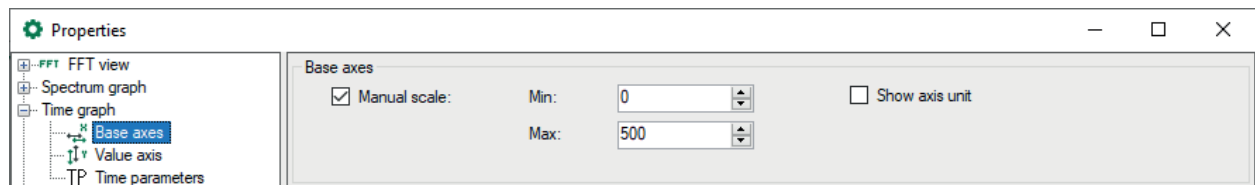
The legend of the display contains various information:

(InSpectra Expert 0) [10:0] Signal\_A (#2048,mm)

- Name of the InSpectra module (if present)
- channel number of the input signal
- Name of the input signal
- Number of samples for the FFT, unit of the input signal

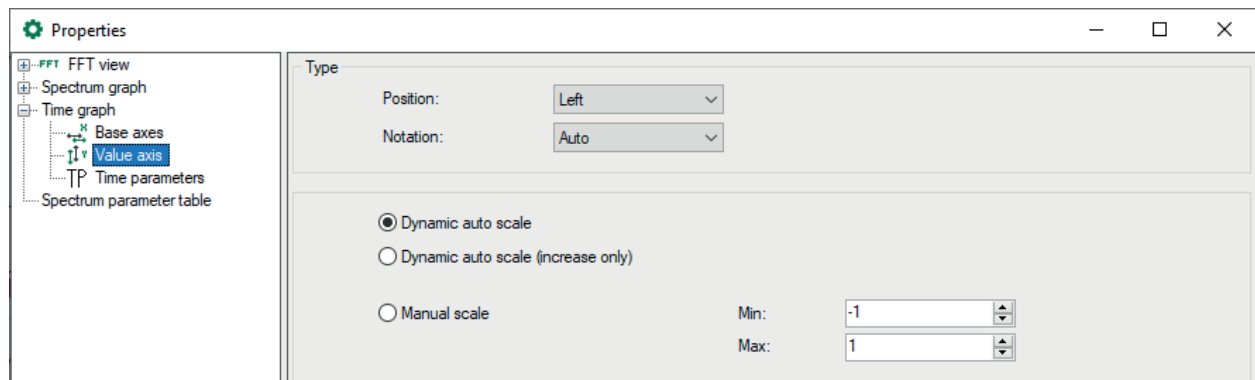
#### Base axis

The time graph has a base axis. When autoscaling, the length of the base axis results from the number of samples and the sampling time. You can modify the settings of the base axis in the properties of the graph.



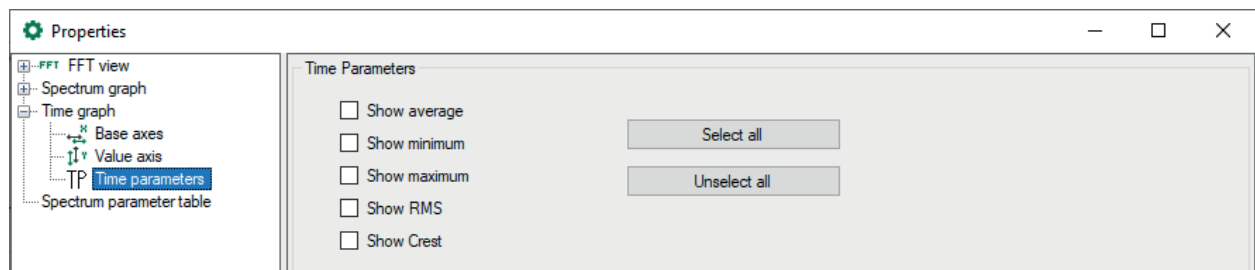
### Value axis

The time graph has only one value axis. All curves in the graph are displayed on the same scale of values. You can modify the settings of the value axis in the properties of the graph.



### Time parameters

The statistical values (average, minimum, maximum, RMS, crest) determined for the input signal in the shown time range can be displayed in the graph. For this purpose, select the desired parameters in the properties dialog of the graph.



### Note



Sometimes, the crest factor and RMS value is not immediately visible in the graph, as it can be significantly higher or lower than the values of the signal curve. Change the scale of the value axis to see the crest factor.

## 7.5.2 Time table

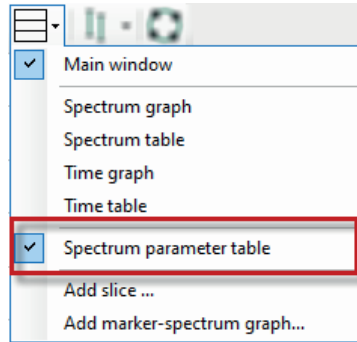
The data table of the time domain shows the same statistical values of the input signal which were described as time parameters above.

Signal / Module	Minimum	Maximum	Average	RMS	Crest
▶ (InSpectra Expert)	-2,40479	1,85547	4,17233e-4	0,899231	2,0634

## 7.6 Spectrum parameter table

The spectrum parameter table is used to display the FFT calculation parameters. This allows you to display the calculation parameters you wish to observe without having to open the properties dialog of the FFT view.

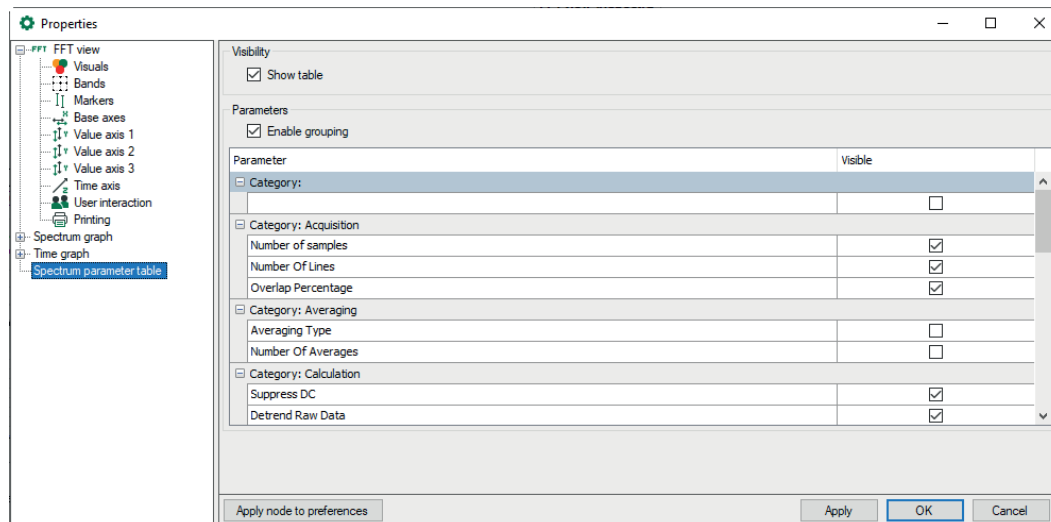
You can add the spectrum parameter table to the display using the drop-down menu.



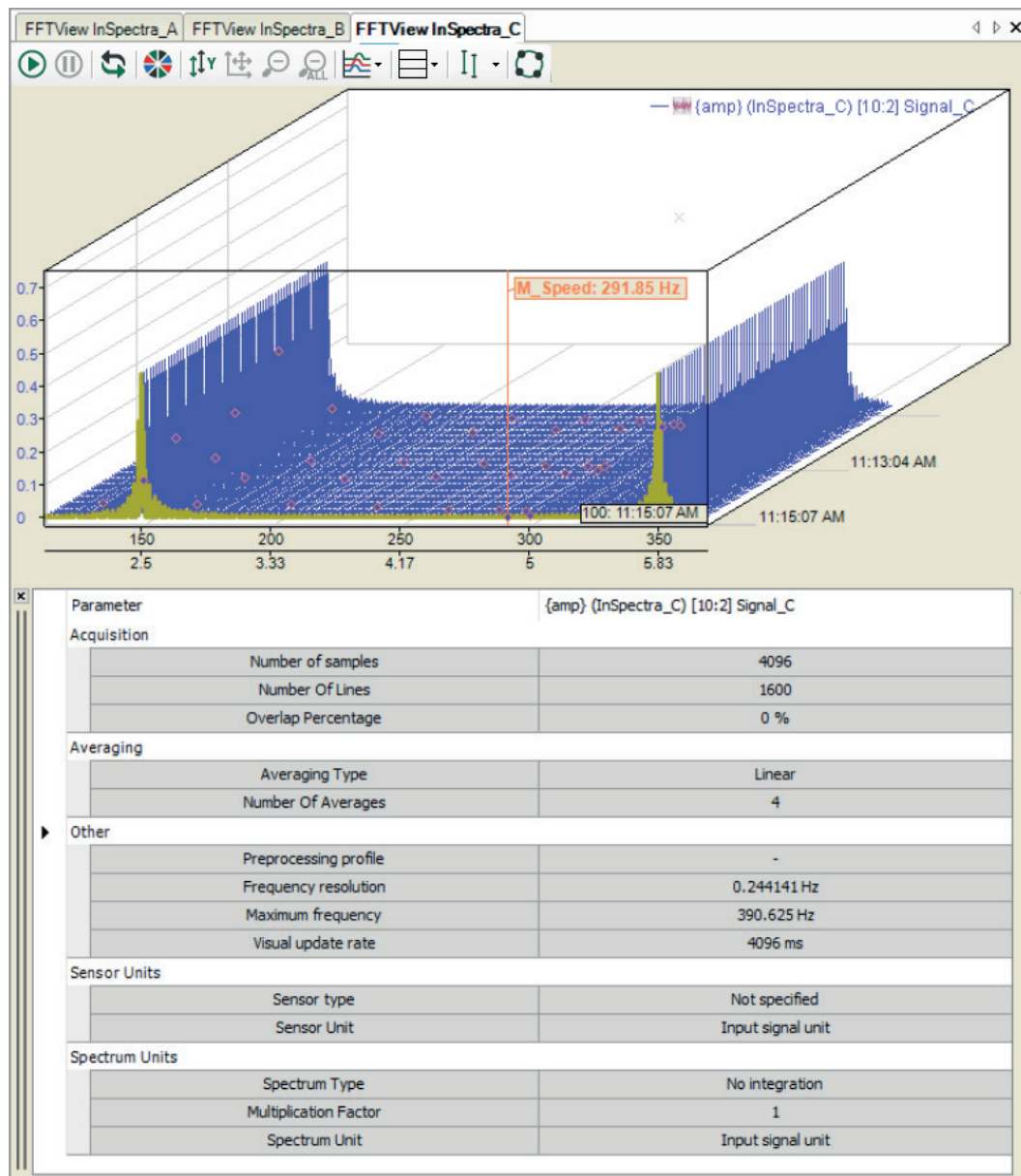
Before doing so, you should specify what information will be displayed in the table, as not all parameters are of interest and you can save some space by reducing the number of parameters.

For example, if you do not want to use an order spectrum, the order parameters can remain hidden.

You can configure the settings in the spectrum parameter table node in the properties of the FFT view. All parameters from the calculation profile are available for selection.



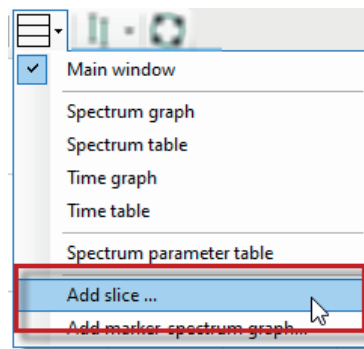
The result might look like this:



## 7.7 Slice view

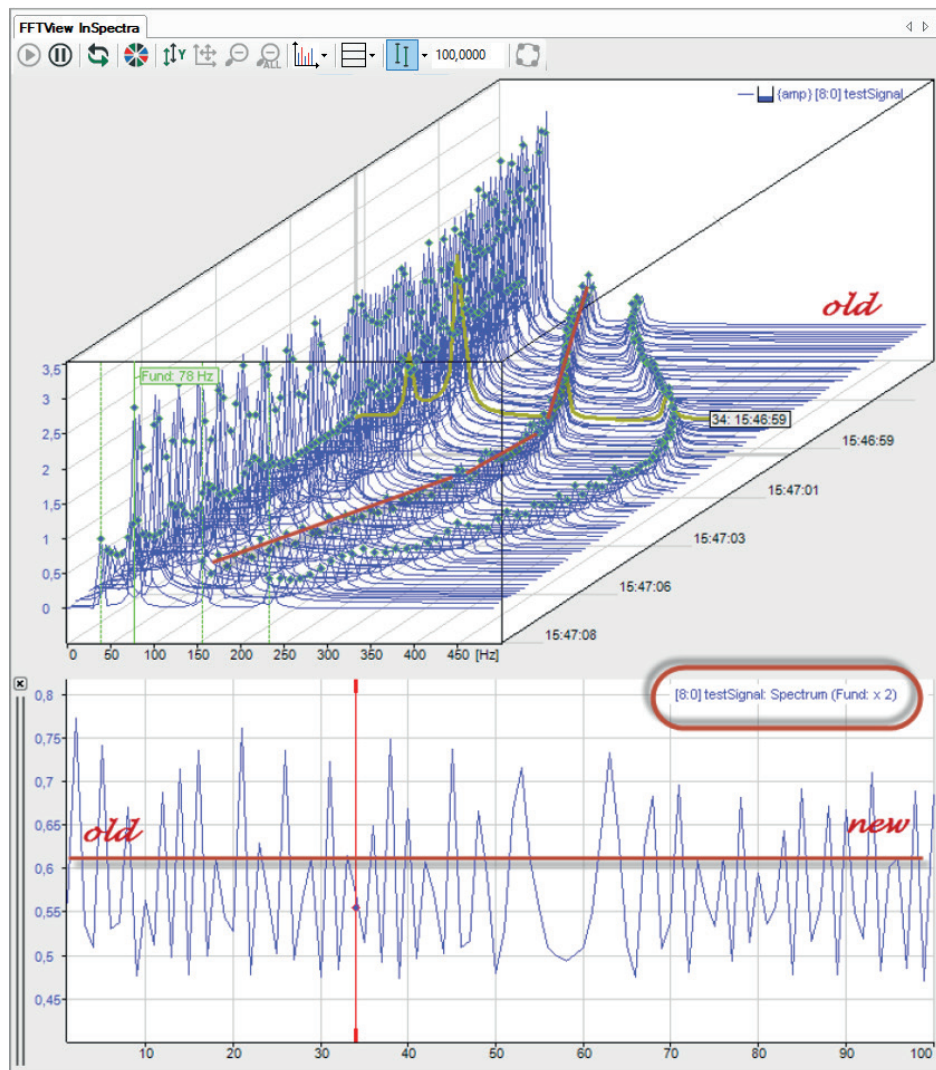
With a slice view, you can essentially represent the chronological sequence of an FFT for a selected marker position. The amplitude profile of a frequency therefore becomes clear, especially in conjunction with the isometric waterfall view. You add a slice view using the drop-down menu for the FFT display.



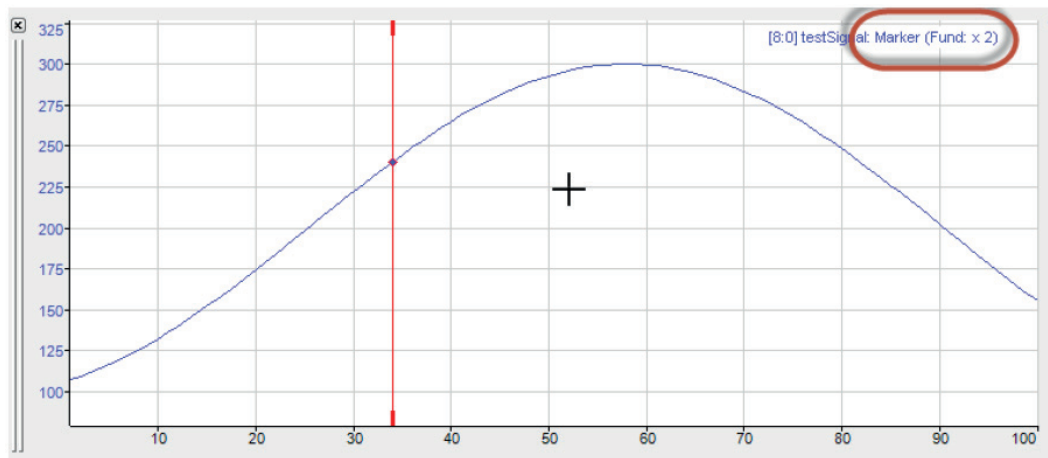


The slice view can operate in two modes:

- In **Spectrum Mode** you can monitor a spectrum value that changes over time:
  - The temporal dimension corresponds to the number of planes in the waterfall view. The highest-numbered plane contains the most recent data (front plane). The scale of the X-axis shows the plane number.
  - The frequency dimension is specified by an interactive marker or a configured marker, which is connected to a signal, e.g., a speed signal.



- In **Marker Mode** you can monitor a frequency value that changes over time:
  - Here again, the temporal dimension corresponds to the number of planes.
  - Application example: Tracking a speed marker to show the speed history.



The mode of the slice view is also displayed in the signal legend.

You can add multiple slice views for different applications.

Once defined, the slice views are listed in the drop-down menu and can also be displayed, hidden and deleted there.

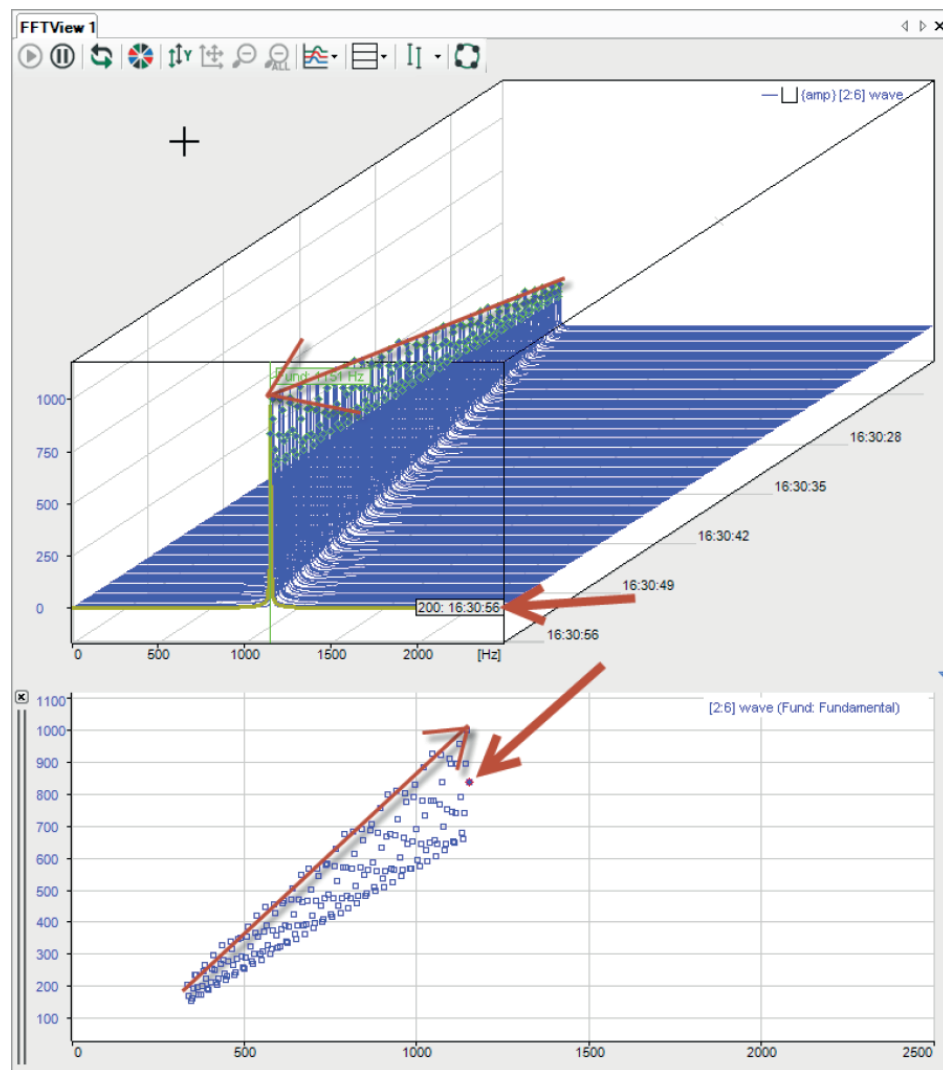
The slice view is specified by a marker. In the properties of the slice view, you can select any defined marker, including any available harmonic markers. You can also quickly switch between the different markers in the context menu on the slice view.

In addition, each slice view has its own interactive marker. You can link the interactive marker with the currently selected plane in the waterfall view with the “Link markers with waterfall” option. Note that the position of the interactive markers in the slice view always corresponds to one plane in the waterfall view.

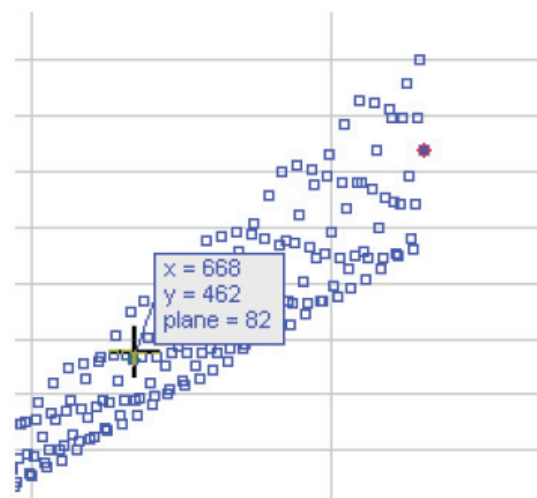
## 7.8 Marker spectrum display

The marker spectrum display is used to represent the relationship between a dynamic marker (horizontal axis in Hz) and the associated spectrum value (vertical axis).

For each plane of the waterfall view, a point for the value pair is entered in the graph.



This display does not have its own interactive marker. When you hold down the <M> key, the mouse moves over the points and the corresponding values (X, Y, and plane) are displayed in a pop-up.



The point within the currently selected plane is highlighted with a red circle. You can add multiple marker spectrum displays and configure them differently.

## 7.9 Markers

For a better evaluation of the frequency analysis, markers can be displayed in the main window and in the spectrum graph. The markers mark frequency values along the x-coordinate. Frequencies of interest can be, for example, a constant or variable fundamental frequency, known resonance frequencies or the harmonic components.

There are several types of markers having different functions:

- Interactive marker

There is one interactive marker. This marker can be switched on or off and manually moved. In the time graph, only this type of marker is available.

- Configured marker

Several markers of this type can be used in a display. This marker cannot be moved manually but its position is not necessarily fixed. The marker position can be set to a constant value or controlled by a signal.

- InSpectra marker

This marker is configured in the InSpectra Expert module and cannot be moved manually.

- Tracking marker

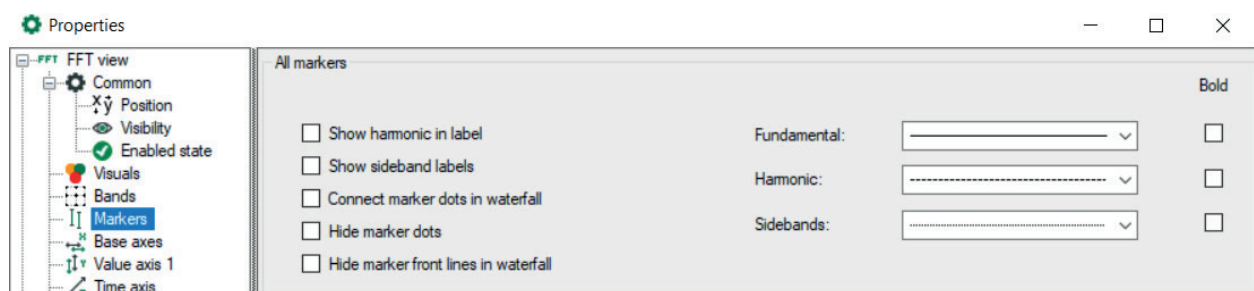
The tracking marker can be used to track the peak value of a spectrum in the contour plot.

For all markers, harmonic markers and sideband markers can be additionally configured.

You can enable or disable the display of the interactive marker by clicking the button in the tool bar of the FFT view. Depending on the focus, the button refers to the main window and the spectrum graph or to the time graph.

You enable or disable the display of the configured markers and the InSpectra marker solely in the properties dialog of the main window.

The markers are configured in the properties of the FFT view (main window).



For all markers, you can set that the factors are shown in the label of the harmonic markers. And it is possible to display sideband labels that show the offset.

In the waterfall display, you can connect the marker dots between the planes.

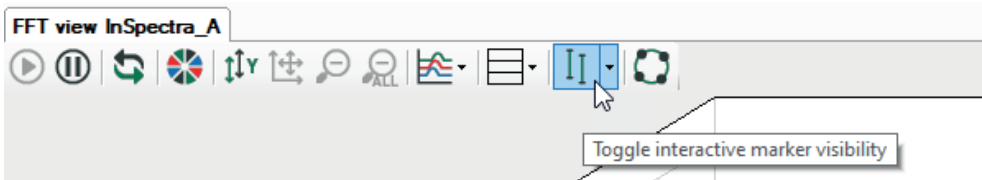
The intersections of the markers with the spectrum are displayed by small diamonds. You can hide these with the option *Hide marker dots*. If *Connect marker dots between planes* is also selected, the markers are shown as a line in the waterfall and in the contour view.

The marker lines can also be hidden in the waterfall display.

For better differentiation, you can assign your own line patterns or bold type to the different markers (first harmonic, harmonic markers and sideband markers).

7.9.1 Interactive marker

The interactive marker is used for spontaneous reading of X and Y values in a spectrum display. It can be shown or hidden at any time.

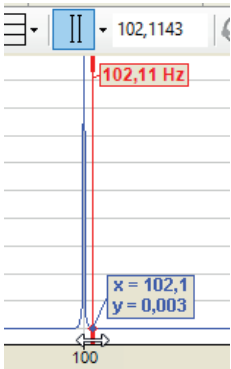


When activating for the first time, the marker is displayed at the position 1 Hz. Every time the marker is switched off and on again, it memorizes the last position.

You can change the marker position either by clicking on the thick ends at the top or at the bottom of the marker or by using the cursor keys:

Keys	Function
<Cursor to the left>/<cursor to the right>	Normal step width
<Shift>+<cursor to the left>/<cursor to the right>	Large steps
<Ctrl>+<cursor to the left>/<cursor to the right>	Small steps

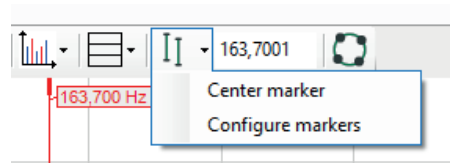
When you move the mouse over the thickened end of the marker, the cursor changes to a double-arrow symbol. You can then move the marker. In the label with the marker color (default: red), the X value is displayed on the base axis. If there are several base axes, you must specify in the settings of the base axes which axis the marker should refer to (Marker Axis). In addition, X and Y values are displayed at the intersection of the marker with the spectrum.



Center markers

Since the marker has a certain position on the frequency axis, it is possible that it is not visible in the image anymore after zooming. Switching the marker off and on to bring it back into the image is useless, as it does not change its position because of that.

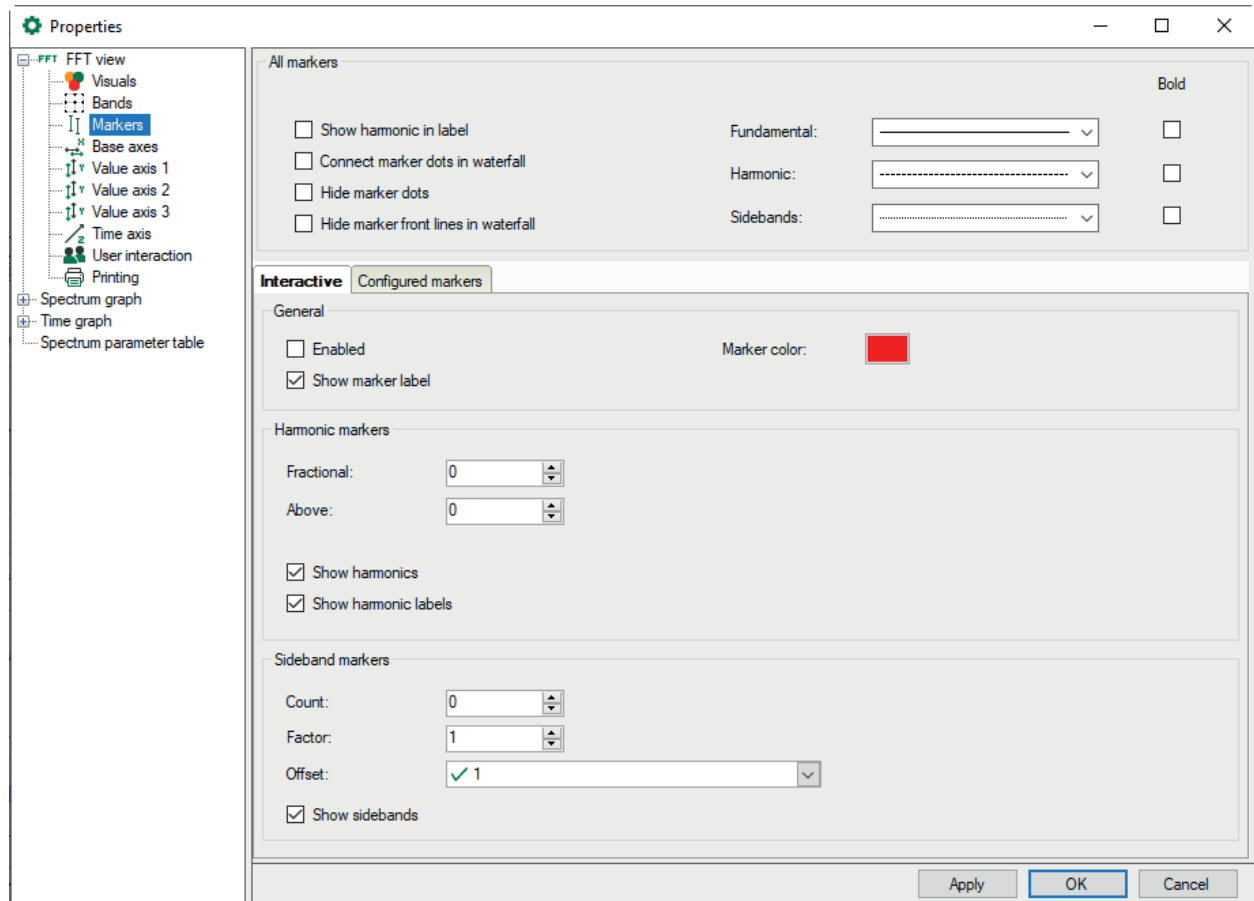
This is what the *Center Marker* function is for. With this function, you place the marker in the center of the section currently visible.



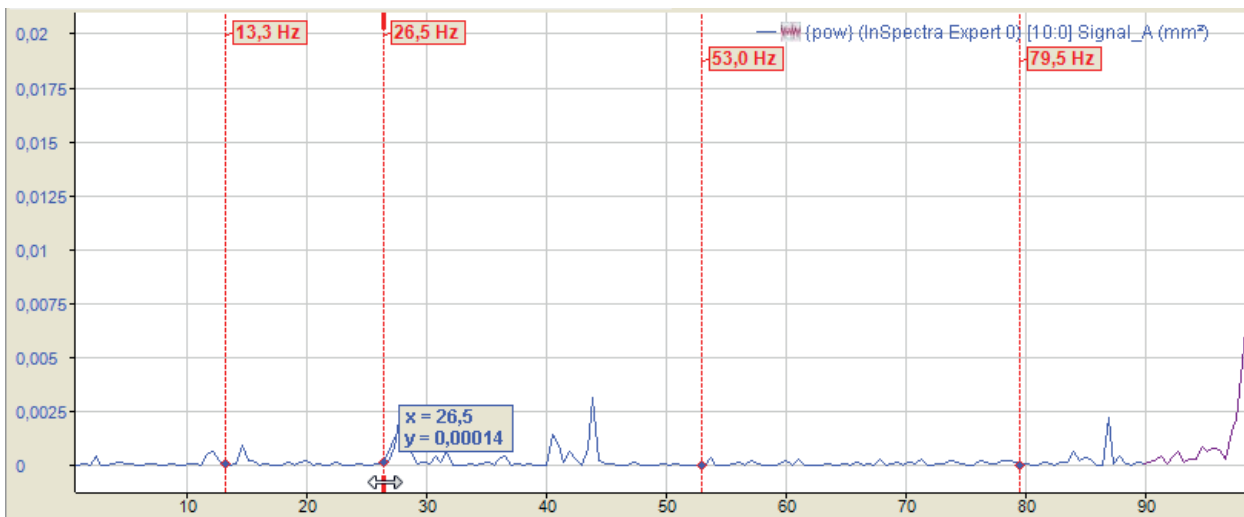
Click on the arrow symbol at the marker button in the tool bar and then on "Center marker."

### Configure marker

In addition to general properties such as color and label, you can also configure harmonic markers and sideband markers in the settings.



Harmonic markers always have a frequency that corresponds to an integer multiple of the main marker. For the harmonic markers, determine the requested number of the harmonic components below and above the current marker frequency. For the harmonic frequencies, further lines are displayed. Additionally, in the "Markers" branch, enable the option "Show harmonic labels" to display the frequency values on the markers.

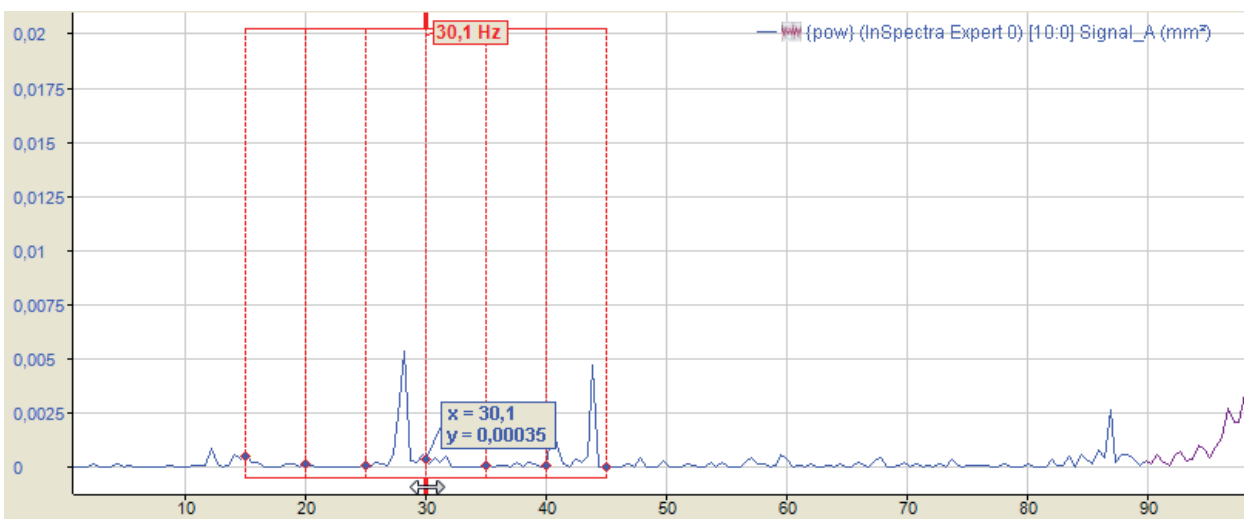


The above figure shows an interactive marker with 1 harmonic component below and 2 harmonic components above the marker frequency of 26.5 Hz.

The values of the harmonic markers are displayed at the maximum height of the value axis. The unit of these values corresponds to the unit of the base axis (see the chapter [Base axes](#), page 93). The view can be configured to show only the frequency of the main marker.

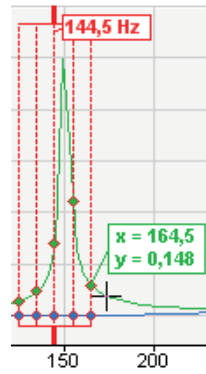
An adjustable number of sideband markers is added symmetrically right and left of the main marker. The distance to the main marker and the neighboring sidebands is the sideband offset, represented in units of the base axis. The sideband offset can be a constant value or an analog signal. The offset can also be changed with the mouse by touching one of the outer markers with the cursor and moving it to the left or right with the mouse button pressed down.

You can enter a factor if the sideband marker is to be at a multiple or fraction of the marker frequency. When the position of the marker in the display is changed by dragging, the factor is updated.

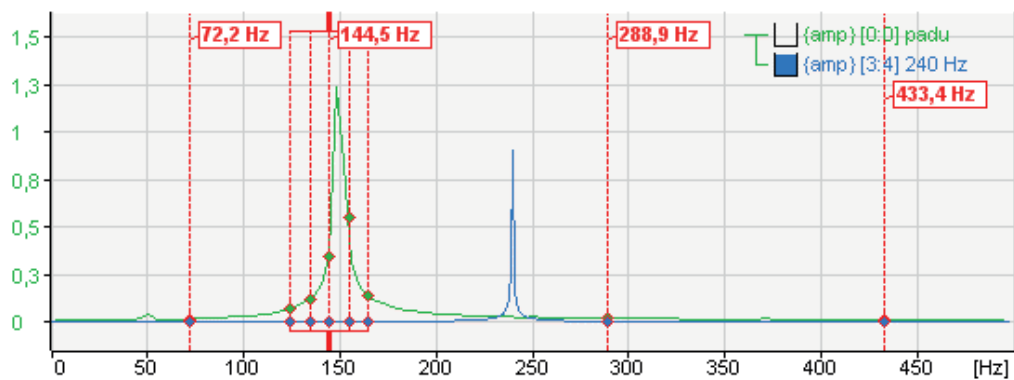


The above figure shows an interactive marker with 3 sidebands and offset of 3 Hz each.

Small diamonds indicate where markers and spectra intersect. If the mouse pointer is moved near a diamond, its coordinates (X and Y values) become visible.



Harmonic component and sideband markers can be displayed in combination, too. The figure below shows a view with a harmonic marker below and two above the main marker. The sideband offset is set to 10 Hz.



#### Note



If the sideband offset is specified by a signal, the value of this signal always has to be  $\geq 0$ . If the value is negative, the offset = 0 and no sideband markers are displayed.

#### Note



You can make the general settings of the markers in the preferences. You will find individual settings for the FFT views in the properties of a view.

For further information, see chapter [Properties and preferences FFT view](#), page 84



## 7.9.2 Configured marker

The so-called configured markers can either be anchored at certain positions on the base axis with fixed values or moved dynamically along the base axis by means of analog signals.

The markers must first be defined and configured. You can configure the markers in the *Properties* dialog of the FFT view, in the “Marker” branch.

**Configured markers**

**Settings**

☒ Show marker labels ☐ Show harmonic labels

☒ Show X value in marker label ☐ Enable collapsed markers

☒ Show factor in marker label

**Local markers**

Name	Fundamental	Factor	Unit	Harmonics		Mode	Sidebands			Unit	Color	Visi...
				Bel...	Above		Of...	Factor	Co...			
M_5Hz	✓ 5	3	Hz	0	0	Both	✓ 1	1	0	Hz	Orange	<input checked="" type="checkbox"/>
M_Drehzahl	^ [2:2] Drehzahl Gerüst	1	Hz	0	0	Both	✓ 1	1	0	Hz	Blue	<input checked="" type="checkbox"/>
*												<input type="checkbox"/>

**InSpectra markers**

Number	Name	Fundamental	Color	Visible
<b>Type: Linked</b>				
0	Mark peak	{fmax}	Red	<input type="checkbox"/>
0	Max	{fmax}	Purple	<input type="checkbox"/>
<b>Type: Normal</b>				
0	Max	{fmax}	Green	<input checked="" type="checkbox"/>
1	300	100	Purple	<input checked="" type="checkbox"/>

### Settings

Here you define whether a marker label is displayed and which information is to be displayed additionally: Value on the X-axis and/or factor.

To create a marker, you simply have to enter the required information in the table line. As soon as you click in the empty space below, a new, empty line is added.

### Name

Enter a clear name to be able to easily identify the marker. The name is shown in the display later on, too.

The entries for fundamental frequency, factor and unit determine the position of the marker on the base axis. The marker position is calculated by multiplying these three parameters.

### Fundamental

You can enter a fixed value or select a signal for the fundamental oscillation or fundamental frequency. To select a signal, click in the table line and then on the arrow symbol. Select the signal from the signal tree.

If you want to use a signal for controlling the marker position, select a signal complying with the frequency you want to monitor.

In the example of the above image, we have selected a velocity, more precisely the speed of a drive in rpm, to control the marker. In doing so, frequencies of interest can be easily tracked,

e. g. during the acceleration and braking phase of a machine. This is especially easy to see in the main window's waterfall and contour view.

---

**Note**

If the signal for the fundamental frequency is negative, the marker is not displayed.

---

**Factor**

The default value of the factor is 1. You can enter another factor if, for example, the marker is to be positioned at a multiple or a fractional part of the fundamental frequency.

If the position of the configured marker in the display is changed by dragging, the factor is updated.

**Unit**

As to the unit, you can choose between Hertz (Hz) and revolutions per minute (rpm). Depending on the settings, another, internal factor is taken into consideration:

- Hz: Factor = 1
- rpm: Factor = 1/60

Order can also be selected for order spectra.

**Harmonics**

As with the interactive marker, you can individually determine the number of harmonic markers above or below the marker frequency for every static marker. Additionally, this mode allows you to select whether only the even or odd harmonic components are taken into consideration or both types.

**Sidebands**

As with the interactive marker, you can individually determine the number of sideband markers and the sideband offset for every marker, static and depending on a signal value. If you drag the sideband markers, the factor is updated during dragging.

Sidebands can have a different unit than the marker itself. You can select the unit here.

---

**Note**

If the sideband offset is specified by a signal, the value of this signal always has to be  $\geq 0$ . If the value is negative, the offset = 0 and no sideband markers are displayed.

---

**Color**

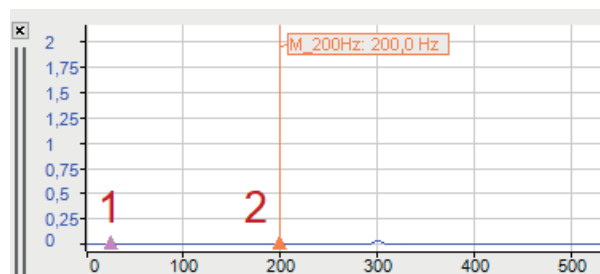
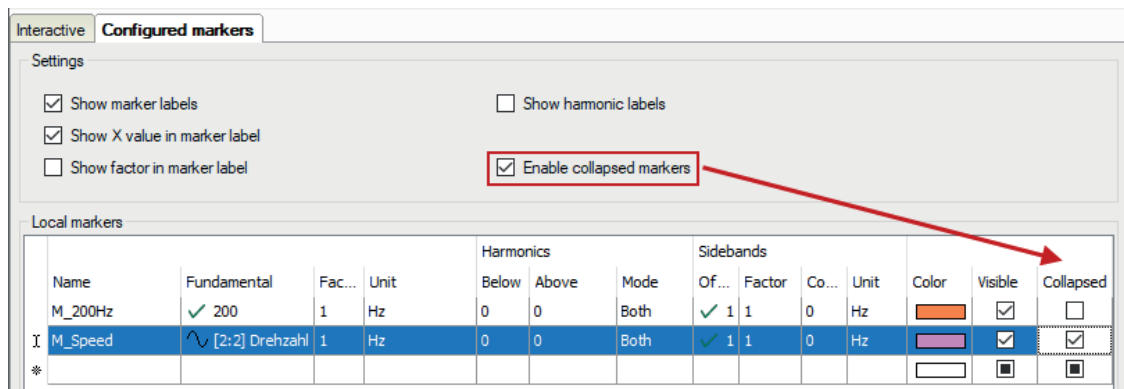
Here, you can allocate an individual color to every static marker

**Visible**

This option decides whether a fixed marker is displayed or not. This is the only possibility of enabling or disabling static markers for the display. The marker button in the toolbar of the FFT view does not control the static markers!

### “Enable collapsed markers” option

When you enable this option, an additional column appears in the marker table, in which you can decide for each marker whether it is normal, i.e. it should be displayed as a line and possibly with a label, or only as a triangle based on a spectrum.



The example above shows a collapsed marker (1) and a normal marker (2).

### InSpectra marker

The InSpectra markers are shown in the table below.

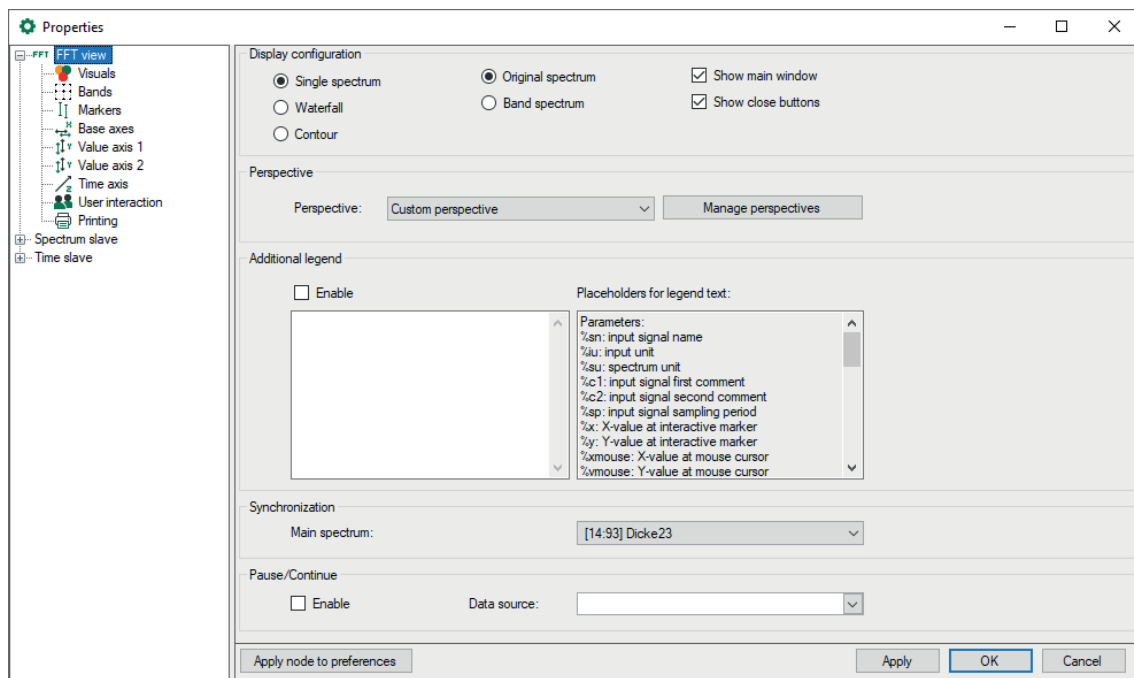
InSpectra markers				
Number	Name	Fundamental	Color	Visible
Type: Linked				
0	Mark peak	{fmax}		<input type="checkbox"/>
0	Max	{fmax}		<input type="checkbox"/>
Type: Normal				
0	Max	{fmax}		<input checked="" type="checkbox"/>
1	300	100		<input checked="" type="checkbox"/>

The settings of the InSpectra markers can only be changed in the InSpectra profile. Only the visibility can be set here.

## 7.10 Properties and preferences FFT view

In the FFT view of *ibaInSpectra* (*ibaPDA*), *ibaAnalyzer-InSpectra* and *ibaQPanel*, all settings can be adopted node by node in the preferences and are thus applied to the newly opened FFT views. Changes can be saved by pressing the button <Apply node to preferences>. The preferences cannot be viewed separately in *ibaAnalyzer*. A new FFT view must be opened in order to view preferences. In *ibaPDA*, you open the preferences via the menu *Configuration - Preferences*.

The node *FFT view* offers general settings for the display of the calculated FFTs. The following figure shows the settings in the properties of the FFT view. The preferences dialog looks similar.

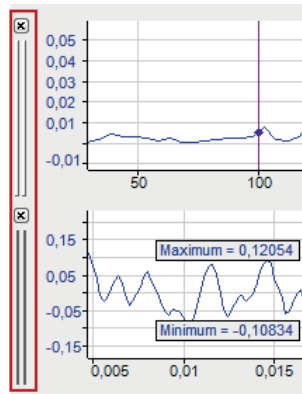


### Display configuration

Choose between single spectrum, the waterfall view and the contour view of the spectra. The visibility of the main window can also be set here.

You can select *Band spectrum* instead of the *Original spectrum*, then the results of the individual bands will be displayed. Settings for this are made in the *Bands* node, see chapter [↗ Bands](#), page 88.

With the *Show close buttons* option you can control the visibility of the close buttons and the lines to the left of the display.



### Perspective: Drop-down list *Custom perspective*

If you have saved different perspectives for the waterfall (3D) view, then you can select one of them.

Click the button <Manage perspectives> to open the dialog for managing perspectives. This lets you delete existing perspectives, copy them to the clipboard or paste them from the clipboard. Since perspectives are always specific to one FFT view, you must copy and paste a perspective that you want to use in exactly the same way in another FFT view into the other FFT view.

The perspective is saved in the display. Once you have configured the desired perspective, select *Save perspectives* in the context menu of the main window. Give the perspective a name and close the dialog with <OK>.

### Additional legend

When this option is enabled, another legend is displayed in the main window in addition to the normal signal legend. You can define the content of this legend yourself. For example, you can enter a detailed multi-line text, in which placeholders for dynamic information can also be used. The following placeholders are available:

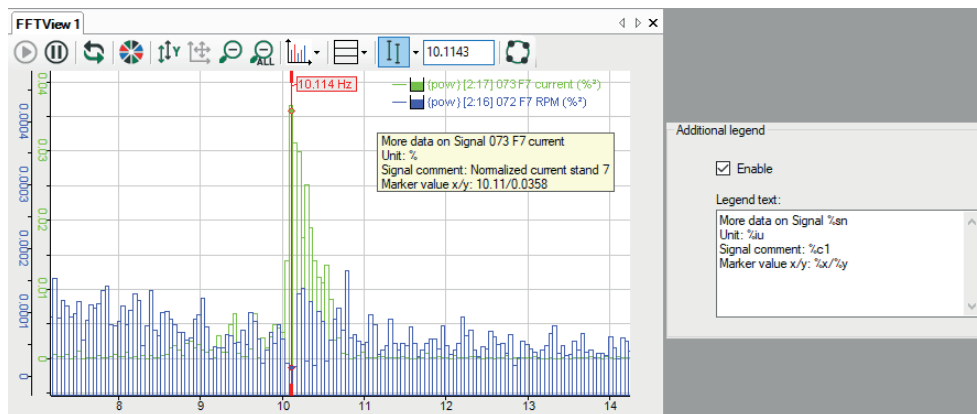
- %sn: Input signal name
- %iu: Input unit
- %su: Spectrum unit
- %c1: Input signal first comment
- %c2: Input signal second comment
- %sp: Input signal sampling time
- %x: X-value at interactive marker
- %y: Y-value at interactive marker
- %xmouse: X-value at mouse cursor
- %ymouse: Y-value at mouse cursor
- %tmouse: Z-value at mouse cursor
- %xmv: X-value of the nearby marker position
- %ymv: Y-value of the nearby marker position
- %tmv: Time value of nearby next marker position

- %nmv: Name of the nearby marker position
- %imn: InSpectra Expert module name
- %rms: RMS value of the selected plane (based on incoming values)

By default, all signal-related placeholders are determined based on the first spectrum. To identify another spectrum, use a colon followed by the word "spectrum" and the index of the spectrum, e.g. "%sn:spectrum1", in order to refer to the first spectrum.

Use the optional formatting string "w.p" to specify the format of the numeric parameters, where "w" is the width and "p" is the precision. The width is the minimum number of the characters shown. Precision is the number of decimal places. Example: "%5.3y1" indicates the Y-value for marker X1 with a width of 5 characters and a precision of 3.

The display always shows the information for the uppermost signal in the main window. The following figure shows the definition of an additional legend (right) and its display (left).



## Synchronization

By default, if only one spectrum is displayed in the FFT view, identifiers, markers and zones are synchronized with this spectrum and this setting is not available. If multiple spectra are displayed in the FFT view, you can define the main spectrum here which will be used for synchronization.

## Pause/Continue

This function is only available in *ibaPDA*. If this option is enabled, the visualization of the FFT is controlled by a digital signal. The FFT calculation is continued.

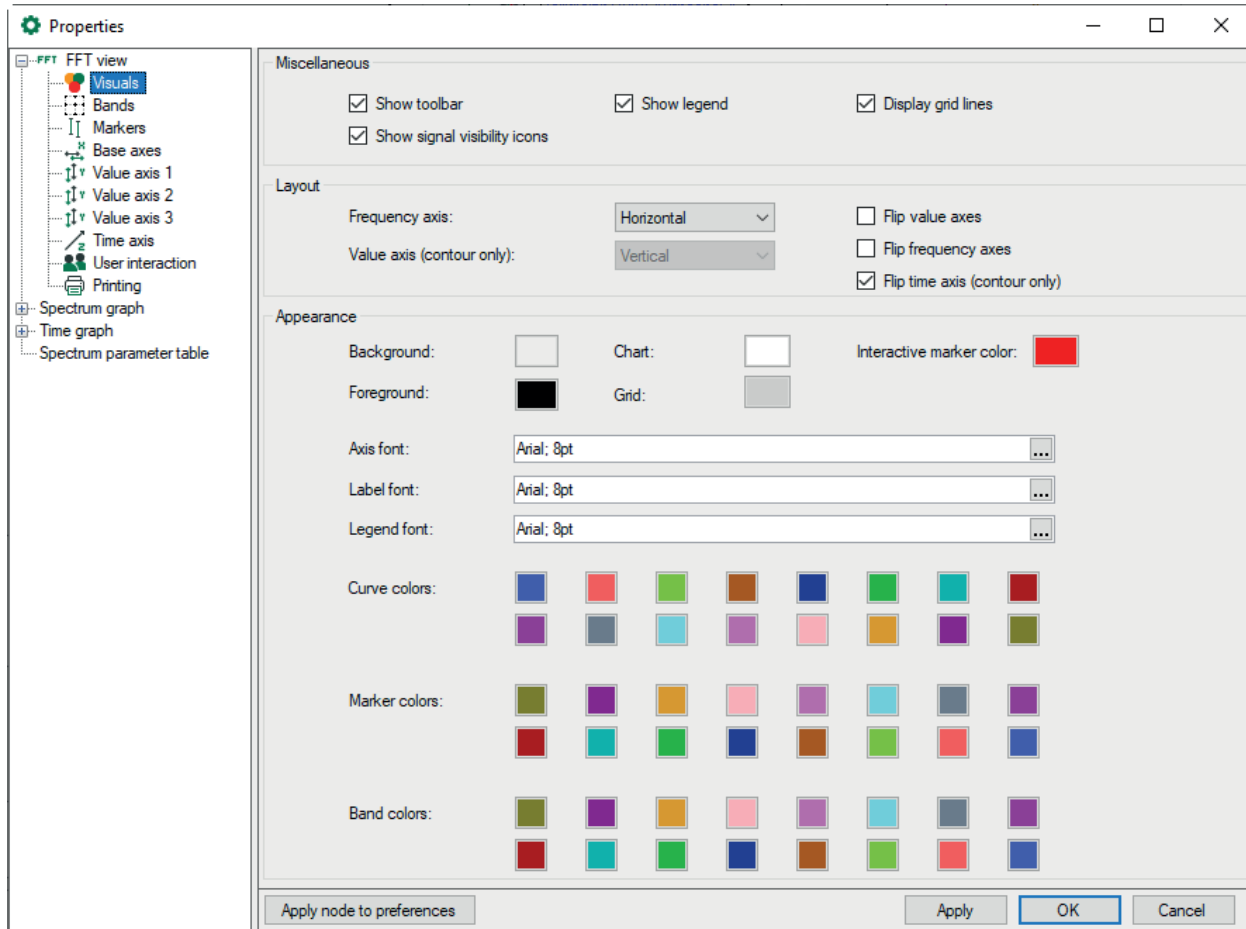
If the digital signal is TRUE (1), the visualization is paused and the display shows the frozen image of the last result.

If the digital signal is FALSE (0), the visualization continues and the display is updated regularly.

You can also enter a time in s after which live mode is automatically continued.

## 7.10.1 Visuals

In the dialog of the *Visuals* node, you can set the appearance and colors of the FFT view.



### Miscellaneous

You can set whether the toolbar, legend and grid lines are displayed or not.

If you have checked the "Show signal visibility icons" option, you can hide and show the signal by clicking the eye icon in the signal legend.



### Layout

You can change the alignment of the FFT axes from horizontal to vertical or vice versa by selecting the relevant option from the picklist *Frequency axis*. You can also flip the individual axes.

For a contour view, the color axis (value axis) can be displayed horizontally or vertically next to it.

### Appearance

Here you make the settings for colors and fonts. For the coloring of curves, markers and bands, 16 colors are available, which are automatically assigned to the corresponding items one after the other when they are added in the view.

## 7.10.2 Bands

The display supports frequency and value bands. These bands highlight certain parts of the spectra in a different color. Frequency bands (horizontal) have a static or dynamic average (center frequency) and a delta width. Value bands (vertical) start at a dynamic or static value and either reach upward to the next value band or positive infinity.

The frequency bands can optionally be assigned to individual spectra or to all spectra. Value bands apply to all spectra.

Bands are configured in the properties dialog in the node *Bands*. There are two types of bands:

- You can allocate *custom bands* to any spectrum or all spectra
- *InSpectra bands* are bands that were configured in the calculation profile of an InSpectra module

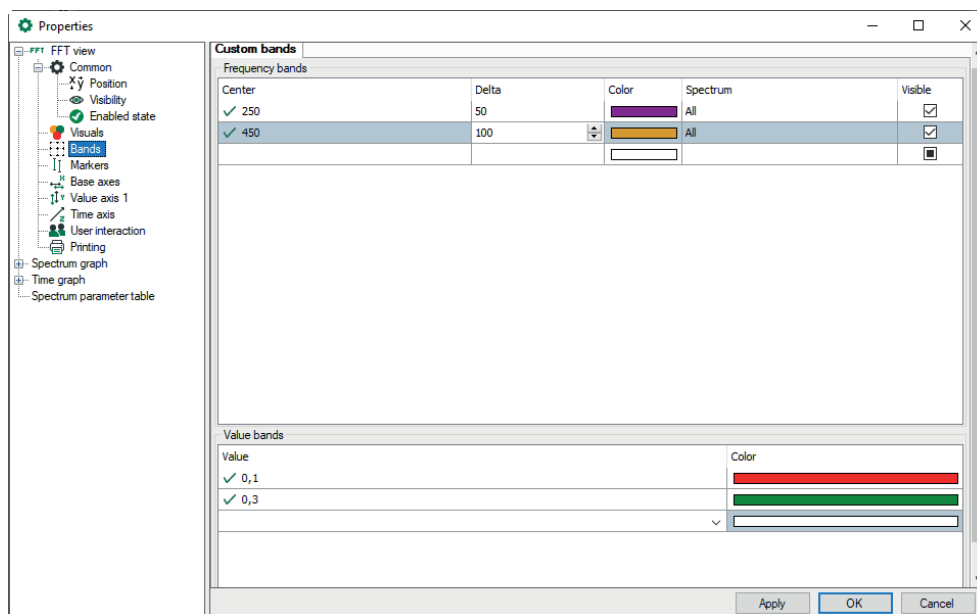
If you have selected *Band spectrum* (instead of *Original spectrum*) in the main node *FFT view*, the *Band spectrum* tab appears. For settings see chapter [↗ Band spectrum](#), page 92.

### Custom bands

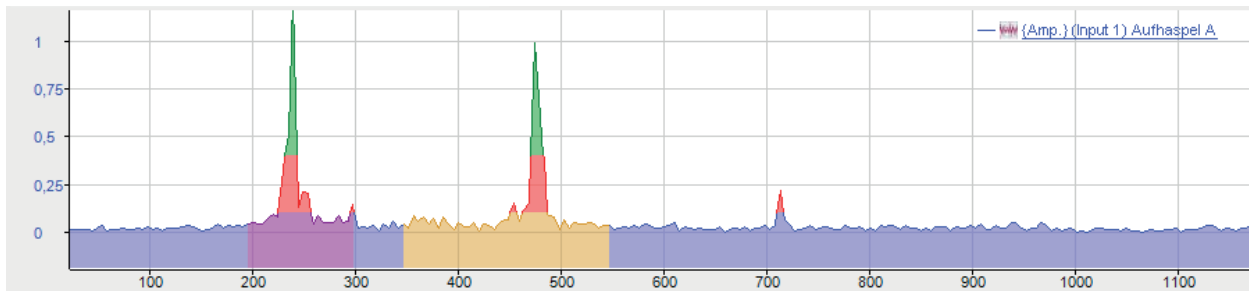
In the *custom bands* tab, you define the frequency bands with a static or dynamic center frequency and a delta frequency. You can allocate a color to the band and a certain spectrum or all spectra.

In the diagram below, you can see the effects of the following settings.

*Example:*







## InSpectra bands

If you use the FFT view with InSpectra, an additional *InSpectra Bands* tab will appear in this dialog.

Properties

- FFT view
- Visuals
- Bands**
- Markers
- Base axes
- Value axis 1
- Time axis
- User interaction
- Printing
- Spectrum graph
- Time graph
- Spectrum parameter table

**InSpectra bands** Custom bands

Band visualization

- ☒ Show bands
- ☐ Enable collapsed bands
- Band label: Show always
- Band label text: %n
- Display bands as: Shaded band
- Bands end at: Peak
- ☒ Bands start at bottom
- Display band results:
  - ☒ Draw peak line
  - ☒ Draw peak frequency line
  - ☒ Highlight lines on hover
  - ☒ Draw RMS line
  - ☐ Show value on hover: Show band label
- ☒ Apply band color to graph
- ☒ Apply band color to main window

Limit curves

- ☐ Display limit curves

Peak/RMS limits

- ☒ Show alerts
- ☒ Draw alert color zones
- ☒ Highlight on hover
- ☒ Show alarms
- ☒ Draw alarm color zones
- Alert label: Show always
- Alarm label: Show never
- %s

Bands

Band number	Name	Center	Delta	Color	Visible
0	Insgesamt	{fmax}/2	{fmax}/2		<input type="checkbox"/>
1	300	300	50		<input checked="" type="checkbox"/>
2	600	600	100		<input checked="" type="checkbox"/>

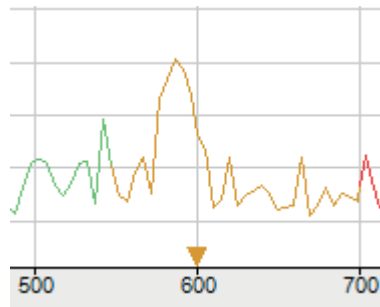
Apply node to preferences

Apply OK Cancel

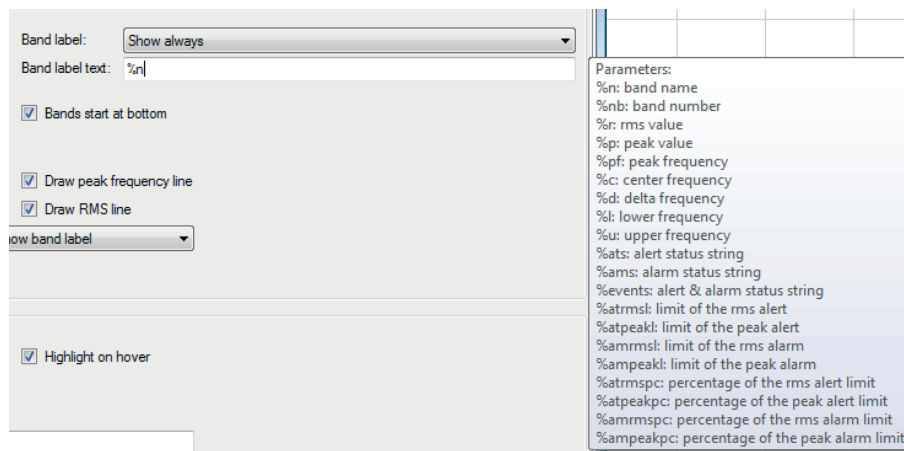
## Band settings

Display properties of the InSpectra bands can be determined in the *Band settings* area.

You can enable the collapsed appearance of the bands and whether the band is highlighted on hover. If this option is enabled, the band is highlighted in the display of the frequency spectrum and in the data table.



You can determine when the band labels are displayed (never, always or on hover) and what is displayed in the label. If you click the band label text field, a list of parameters appears that you can use for dynamic information in the label text.



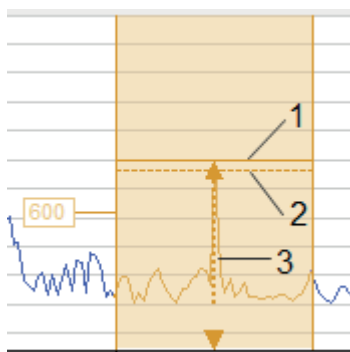
The following parameters can be used:

- %n: Band name
- %nb: Band number
- %r: RMS value
- %p: Peak value
- %pf: Peak frequency
- %c: Center frequency
- %d: Delta frequency
- %l: Lower frequency
- %u: Upper frequency
- %ats: Alert status string
- %ams: Alarm status string
- %events: Alert and alarm status string
- %atrmsl: Limit of the RMS alert
- %atpeakl: Limit of the peak alert

- %amrmsl: Limit of the RMS alarm
- %ampeakl: Limit of the peak alarm
- %atrmssp: Percentage of the RMS alert limit
- %atpeaksp: Percentage of the peak alert limit
- %amrmssp: Percentage of the RMS alarm limit
- %ampeaksp: Percentage of the peak alarm limit

You can determine whether the bands should begin at the lower margin and where they should end (at the end of graph, at the peak or at the RMS value). The frequency bands can be shown as a shaded band or non-shaded band or only as a line at the center frequency.

The characteristic values of the bands can be displayed as lines, which can be highlighted on hover. Example:



- 1 line for peak value
- 2 line for RMS value
- 3 line for frequency peak value, highlight on hover




In addition, the band color can be adopted as a curve color both in the spectrum as well as in the main window.

### Event settings

Display properties for events (alerts, alarms) can be set in the *Event settings* area. Dynamic label texts can also be defined for events. See band settings below.

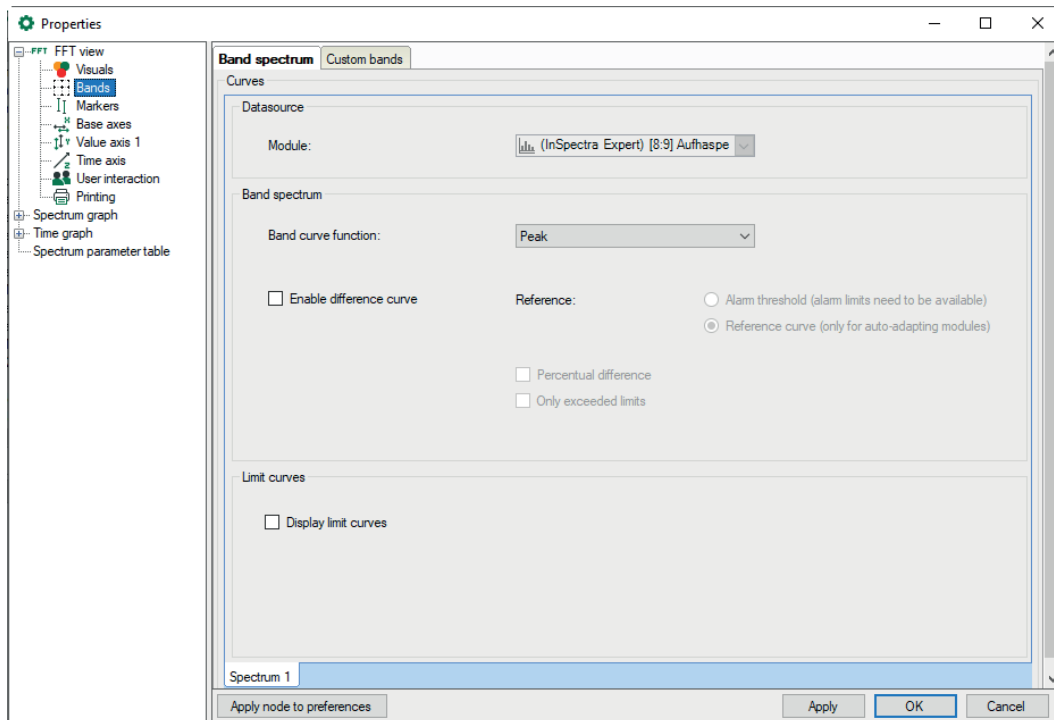
### Bands

The bands configured in an InSpectra profile are shown in the table below in the dialog. The name, center frequency and delta frequency are already defined in the InSpectra profile and can no longer be changed here. The color and visibility can still be changed here.

Bands					
BandNumber	Name	Center	Delta	Color	Visible
0	Insgesamt	{fmax}/2	{fmax}/2		<input type="checkbox"/>
1	300	300	50		<input checked="" type="checkbox"/>
2	600	600	100		<input checked="" type="checkbox"/>

### 7.10.2.1 Band spectrum

The spectra of the individual bands can be displayed in the *Band spectrum* mode.



#### Data source

Display of the module

#### Settings

You can select the displayed curve function in the *Band curve function* drop-down menu:

- Peak, Peak frequency, RMS

#### Enable difference curve

If the FFT view shows an auto-adapting module, a difference spectrum can be displayed representing the difference between the reference curve or the alarm thresholds for each band.

The *Percentual difference* shows all values in percent to the reference values. If *Only exceeded limits* is enabled, the Y-value is set to 0 for all bands in which the limit is not exceeded.

#### Display limit curves

Enable this option to show the limit curves in the FFT display.

### 7.10.3 Markers

You will find the description of the marker settings in chapter [Markers](#), page 76.

### 7.10.4 Base axes

You can choose between linear and logarithmic display here and whether the axis unit is displayed or not. Typically, the base axis has the unit Hz in the frequency domain and seconds in the time domain.

The base axis can be inverted so that, for example, the vibration duration (T) is shown instead of frequency (f). The following applies here:  $T = 1/f$ .

#### Properties

**Base axes**

Type: ☒ Linear ☐ Logarithmic

☐ Manual scale: Min:  Hz Max:  Hz

☐ Show axis unit ☐ Show period instead of frequency

Type	Scale factor	Offset	Position	Notation	Axis unit	Marker axis	Show
Main	✓ 1	✓ 0	Bottom	Auto	Hz	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>
Custom	✓ 2	✓ 10	Bottom	Auto		<input type="radio"/>	<input checked="" type="checkbox"/>
						<input type="radio"/>	<input type="checkbox"/>

Apply node to preferences Apply OK Cancel

The figure above shows the properties of the base axes in the FFT view. By default, the scaling values are automatically determined. However, you can also make a manual specification.

In case of using a manual scale, beside static values you have the possibility to use a signal for determination of beginning and end values of the scale (min, max). Therefore, just click on the arrow in the Min or Max field and select the appropriate signal in the signal tree.

By default, the table of axes only shows the default Hz axis or order axis with optional setting options for the position (top/bottom), notation (auto/standard/scientific), and axis unit. To change these settings, click on the corresponding cell and select them from the drop-down list.

If you have defined several base axes, select which base axis the markers in the display should refer to in the *Marker Axis* column.

Use the *Show* option to control whether the base axis is displayed or not.

You can add and configure other base axes as needed. These additional base axes can have a different scale, reference value or unit.

An offset can be configured for a custom X-axis. Example: a cycle is sampled with an InCycle Expert module, with a start trigger at 50° and stop trigger at 150°. With an offset of 50, the displayed scale starts at 50°. It is also possible to configure a dynamic offset i.e., an offset depending on a signal value.

By default, the basic display settings for the base axes are adopted from the main window and from the spectrum graph. You can then either change some display settings for the base axes for the frequency spectrum display or synchronize them again with those from the main window.

### Note



The manual “Minimum” and “Maximum” scale settings always apply only to the main axis (Hz). All other base axes enabled in the FFT view are scaled automatically.

Each axis to be shown in the graph is represented by a line in the table below.

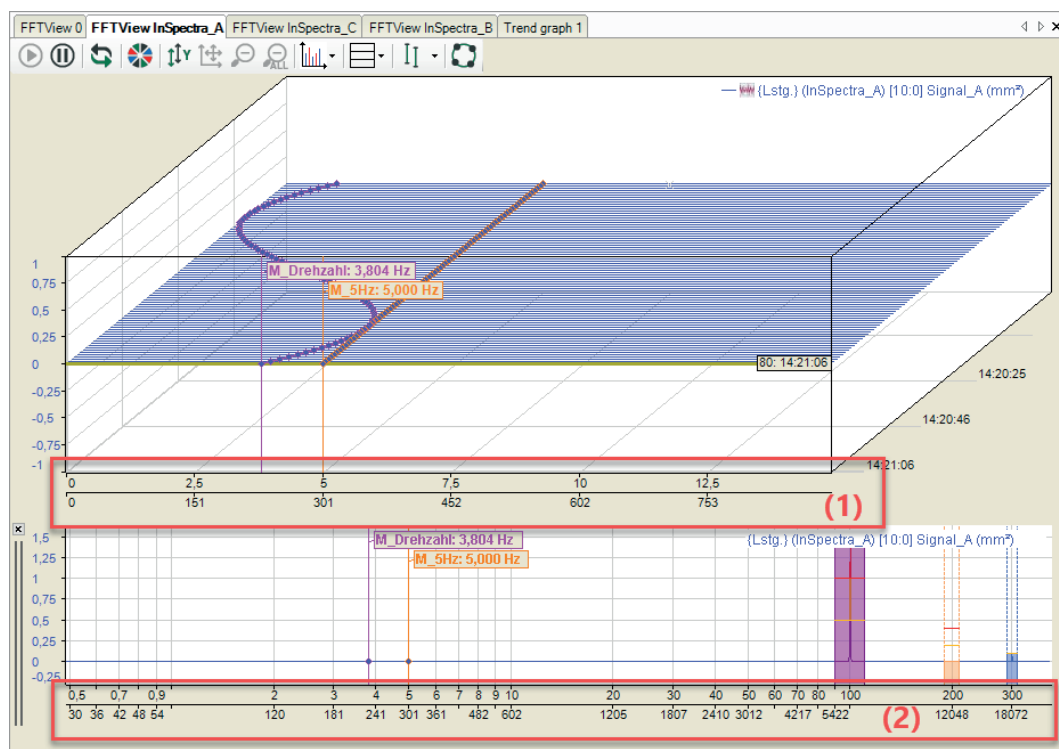
In the following example, two base axes were defined. The first shows the frequency in Hz and the second in rpm. The base axes in the main window (1) are linear. The base axes in the display frequency spectrum (2) are logarithmic.

In addition, the main window was zoomed in.

### Note

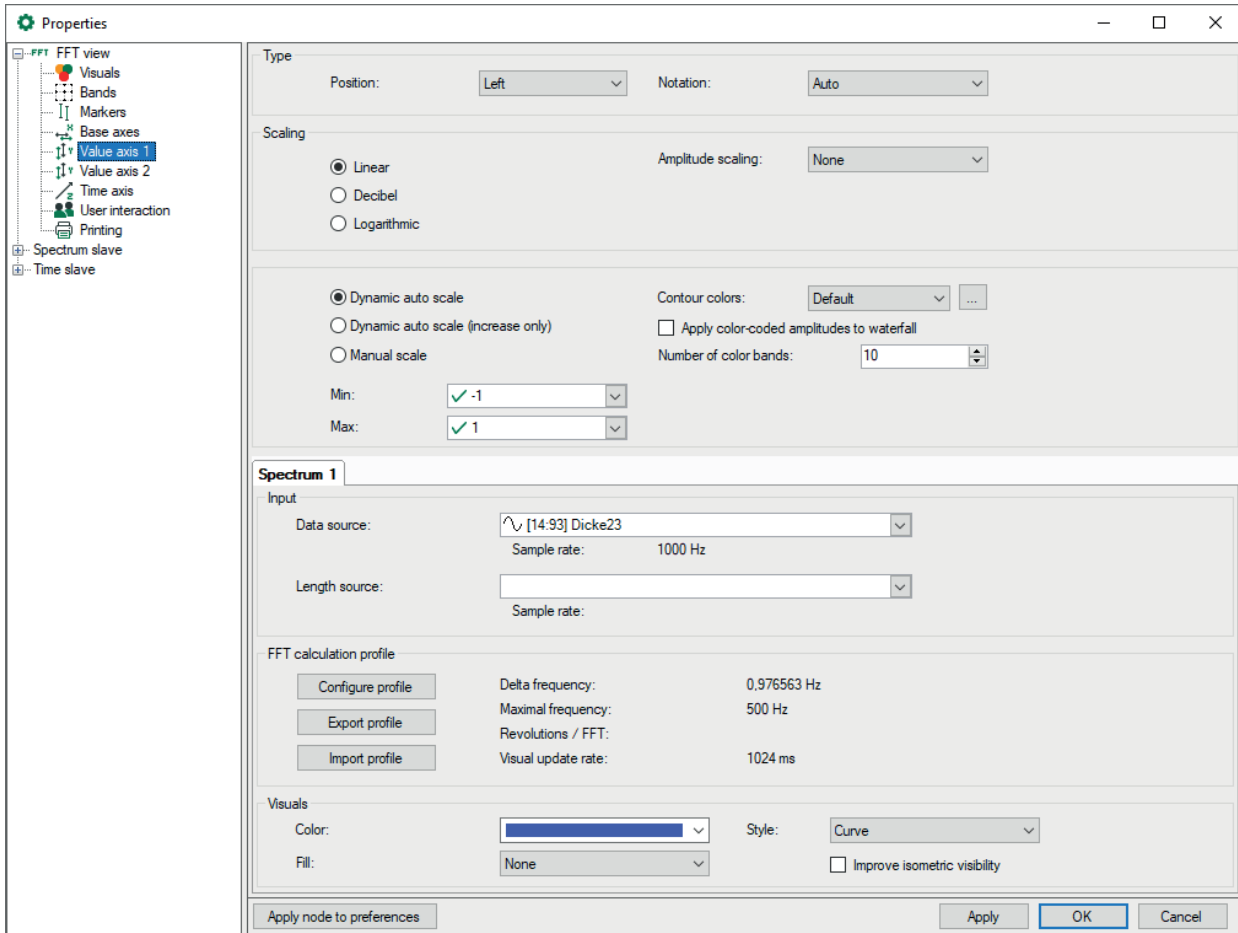


Axis = 1/scaling factor



### 7.10.5 Value axes

A value axis can contain several spectra. Using the legend, you can change the value axis used by a spectrum by changing the sequence of the signals. A value axis can be deleted via its context menu. This also deletes all spectra on this axis. You can also display the settings for the value axis via the context menu.



Settings for type, scaling and view correspond to the usual settings in *ibaPDA* and are self-explanatory.

#### Scaling

*Linear*, *decibel* or *logarithmic* can be set as scale type. This scale type is applied to the appearance of single spectrum, waterfall and contour.

#### Amplitude scaling

Depending on the requirements for the visualization, it may be useful to either emphasize or suppress the amplitudes for the display. The following methods are available:

- **Peak-to-peak**  
Amplitude values are practically multiplied by a factor of two
- **RMS**  
Amplitude values are practically divided by the root 2, thus moving closer to the RMS value.
- **Percentage of signal**  
The scaling of the amplitude values is defined as a percentage of a signal. Select the signal in the *Reference signal for percentage* field.

- Percentage of band peak

The scaling of the amplitude values are based on the peak in a specific band. Enter the band number in the *Band number for percentage* field.

### Scaling mode

- Dynamic auto scale: if you enable this option, the scaling is always adjusted to the highest and lowest signal amplitudes in the graph (in both directions). ⓘ
- Dynamic auto scale (only for enlarging): When you enable this option, the scaling is continuously adjusted with the highest signal amplitudes. If the amplitudes go beyond the trend view again, the scaling still remains unchanged. ⓘ
- Manual scale: if this option is selected, the Min and Max scale values can be manually entered or selected from the field next to it. Beside a static value, you can also use any known measured or virtual analog signal configured in the I/O manager.

### Note



If *Decibel* is selected, the values of the manual scale nevertheless relate to the linear axis. The resulting decibel values are shown next to them.

☐ Dynamic auto scale  
☐ Dynamic auto scale (increase only)  
☒ Manual scale

Min:    
 Max:

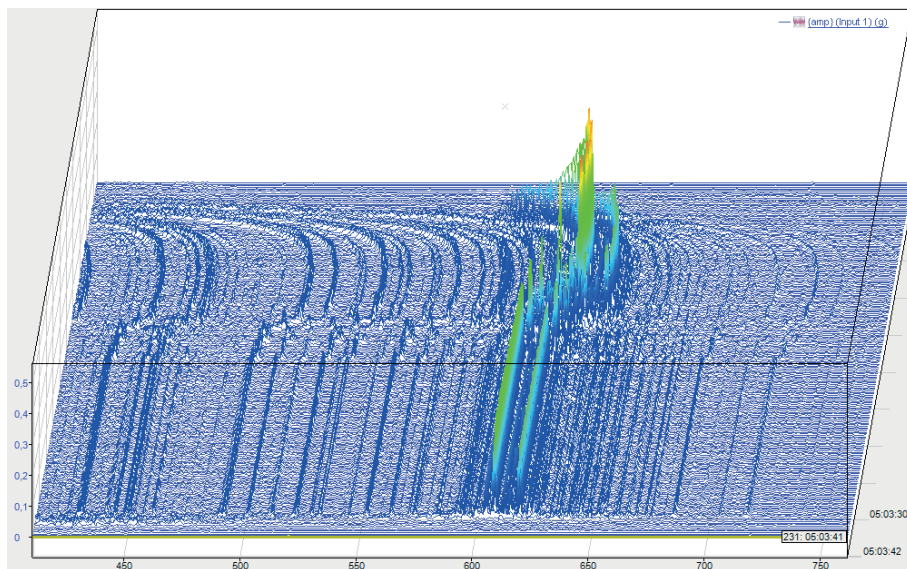
Contour colors:    
☐ Apply color-coded amplitudes to waterfall  
 Number of color bands:

### Color settings

You can choose one of the prepared color schemes for the contour colors (default, grey, jet-white, jet or heat). If you do not like any of the offered color schemes, you can design your own color schemes. To do this, click on the <...> button and the *Manage perspectives* dialog opens. Here you can define new color schemes or change existing ones.

In addition, the colors of the contour view can also be applied to the waterfall view. To do this, enable the *Apply color-coded amplitudes to waterfall* option. The number of color bands defines the color resolution. A maximum of 50 color bands is possible.





### Note



If *Apply color-coded amplitudes to waterfall* is enabled, custom value bands are displayed only in the spectrum graph.

### Spectrum x

By default, a *Spectrum 1* tab is available. These settings are used to process a new signal that is dragged into the FFT view. You can drag multiple signals into an FFT view. If the signals share the same value axis, you will find a separate tab for each signal or spectrum. In the properties, the settings for each spectrum can be changed individually. If each signal or spectrum has its own value axis in the display, each spectrum in the tree structure on the left gets its own node for the value axis.

No calculation profile can be configured in the FFT view of *ibaAnalyzer-InSpectra*. A profile can only be configured for the data acquisition in *ibaPDA* without *ibaInSpectra*. This option is only used for the visualization. The results cannot be acquired. The FFT calculation profile, however, is compatible with InSpectra profiles.

### Input

- Select *Data Source* to specify the signal or InSpectra module to be displayed. If you have already dragged the signal into the display via drag & drop, the field is already filled in.
- You only need to enter a *Speed Source* if you want to perform speed-dependent analyses or work with the order spectrum.

## FFT calculation profile

The way in which *ibaPDA* calculates an FFT is defined in so-called profiles. A profile is a collection of various parameters that are relevant to an FFT.

Each spectrum can be calculated with a different profile. You can define as many profiles as you wish and save them in the system via the export function. You can also import saved profiles into a spectrum.

In the profiles, parameters are defined, including

- Sensor data (important for vibration measurements)
- Spectrum type (e.g. integrate, differentiate)
- Speed data (important for order analysis)
- Number of samples and lines, overlap
- Basic calculation rules for the FFT (e.g. calculation mode, averaging, window type)

The button <Configure profile> opens the configuration dialog for profiles. The buttons <Export profile> and <Import profile> below can be used to export and import profiles.

FFT Profile	
<b>Input</b>	
Unit	Input signal unit
<b>Sensor Units</b>	
Sensor type	Not specified
<b>Spectrum Units</b>	
Spectrum Type	No integration
Multiplication Factor	1
Spectrum Unit	Input signal unit
<b>Speed</b>	
Speed type	Direct speed
Speed unit	Speed signal unit
<b>Order</b>	
Enable order	False
Order mode	Length
Order resolution	0.01
<b>Acquisition</b>	
Number of samples	1024
Number Of Lines	512
Overlap Percentage	0 %
<b>Calculation</b>	
Suppress DC	False
Detrend Raw Data	False
Window Type	Rectangular
Normalized	False
Spectrum Method	Magnitude
<b>Averaging</b>	
Averaging Type	None
<b>Unit</b> The unit of the input of this module	
<div>OK</div> <div>Cancel</div>	

The calculation parameters and their meaning are explained in the *ibaInSpectra* manual in chapter *Setting calculation parameter*.

The information next to the “Profile...” buttons describes the influence of the acquisition parameters:

- Delta frequency:  
Shows the frequency steps between the results of the division of maximum frequency by bin count.
- Max. update rate:  
Time required for update of the FFT view depending on bin count and overlap factor.

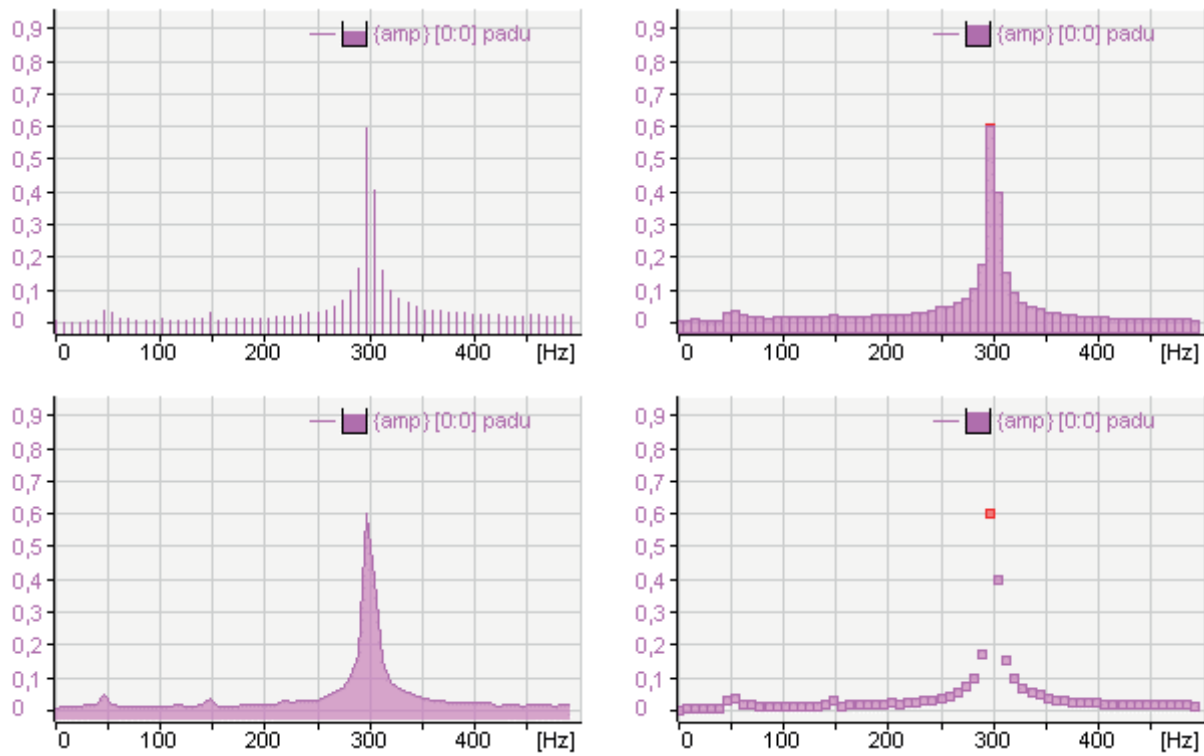
To avoid having to look at the properties to see the profile parameters, the display shows the *Spectrum Parameter Table*. This table is part of the FFT view and can be activated via the drop-down menu in the FFT view. The parameters from the calculation profile shown in the table can be defined in the *Spectrum Parameter Table* node in the FFT view properties. See chapter [↗ Spectrum parameter table, page 71](#)

## View

A spectrum can be visualized in four different ways:

- Lines,
- Bars,
- Curve or
- Dots

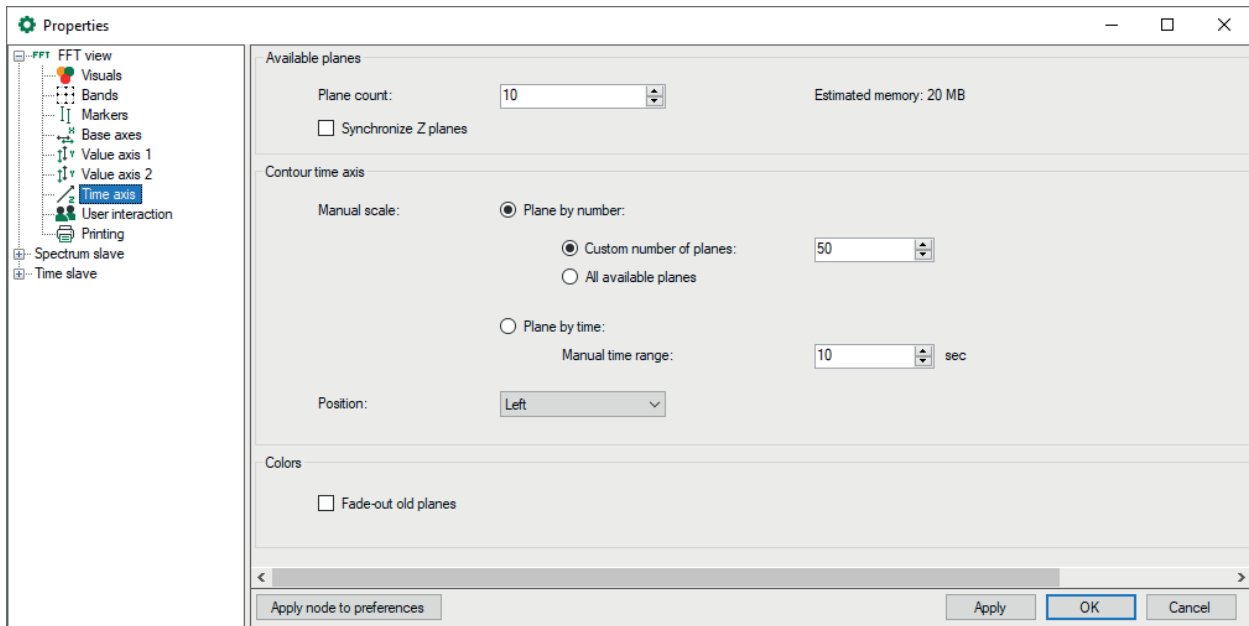
The inner area of a spectrum can be filled with a transparent or opaque color. The figure below shows the four types of spectra visualization, all filled transparently.



The option *Improve isometric visibility* is used to make spectra opaque. This makes some effects in the waterfall view more visible.

## 7.10.6 Time axis

In the *Time axis* node you can define the display options for the waterfall view.



### Time axis

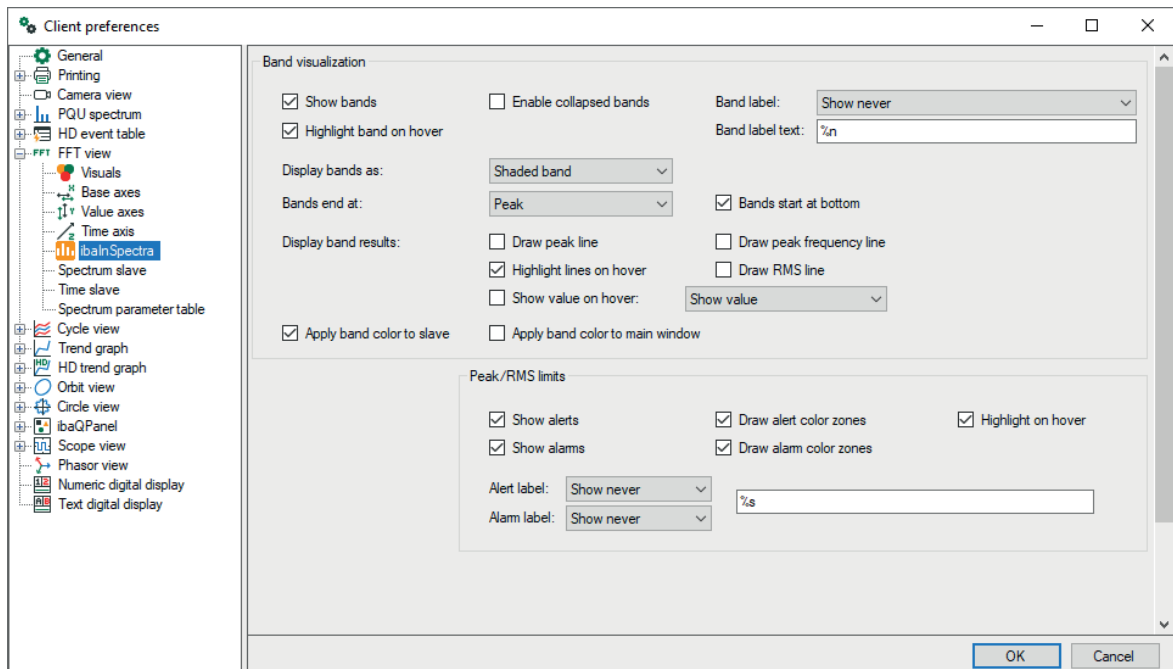
- **Plane count**  
Set the number of planes you wish to be displayed in the Z direction.
- **Synchronize Z planes (option in *ibaPDA* only)**  
If you use multiple spectra in an FFT view, the spectra move forward at their own pace by default, depending on their sample rate or bin count.  
With this option you can synchronize the advance rates of the Z planes across multiple spectra. With this option enabled, the FFT view will not allow a spectrum to advance over the Z planes until all spectra have generated a new FFT result. While the view is waiting for certain spectra to generate results, the other spectra keep showing their newest results on the front plane.
- You can choose whether the oldest or newest plane is in the foreground.
- **Determine plane count automatically (option in *ibaAnalyzer* only)**  
Number of spectra is detected automatically (max = 500).

### Contour time axis

- **Manual scale**  
You can choose between a manually defined number of planes or whether a new plane will be displayed after a defined time.
- **Position**  
Specify the position (left or right) of the time axis.

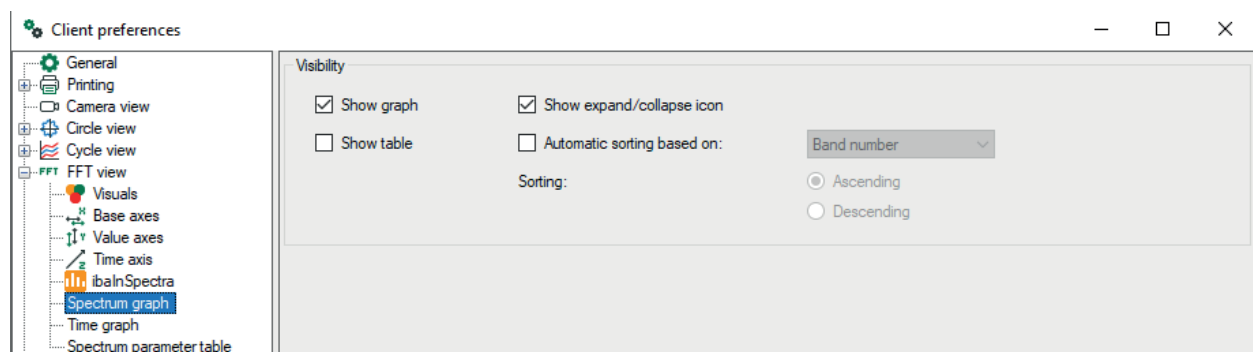
## 7.10.7 InSpectra

The dialog *Preferences* is the same as the properties dialog for InSpectra bands. For a description, see chapter [Bands](#), page 88



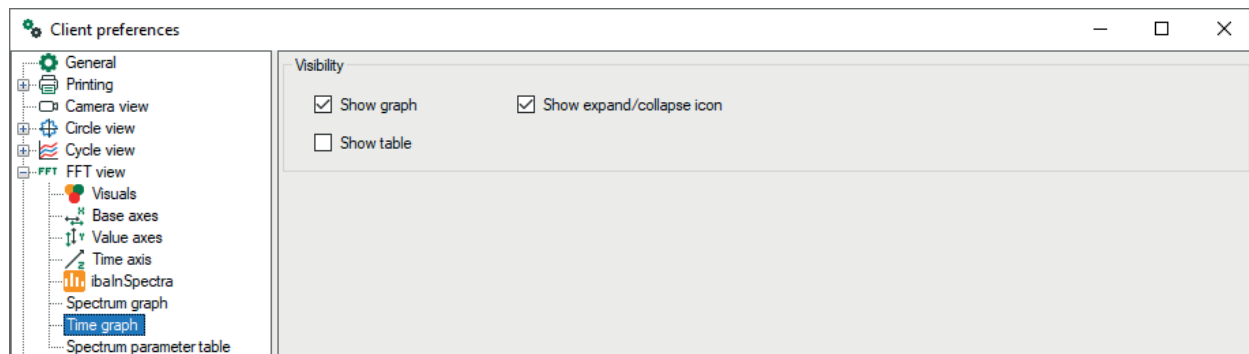
## 7.10.8 Spectrum graph

The *Preferences* dialog only offers setting options for displaying the chart and the table. Optionally, the table can automatically be sorted according to a selected column.



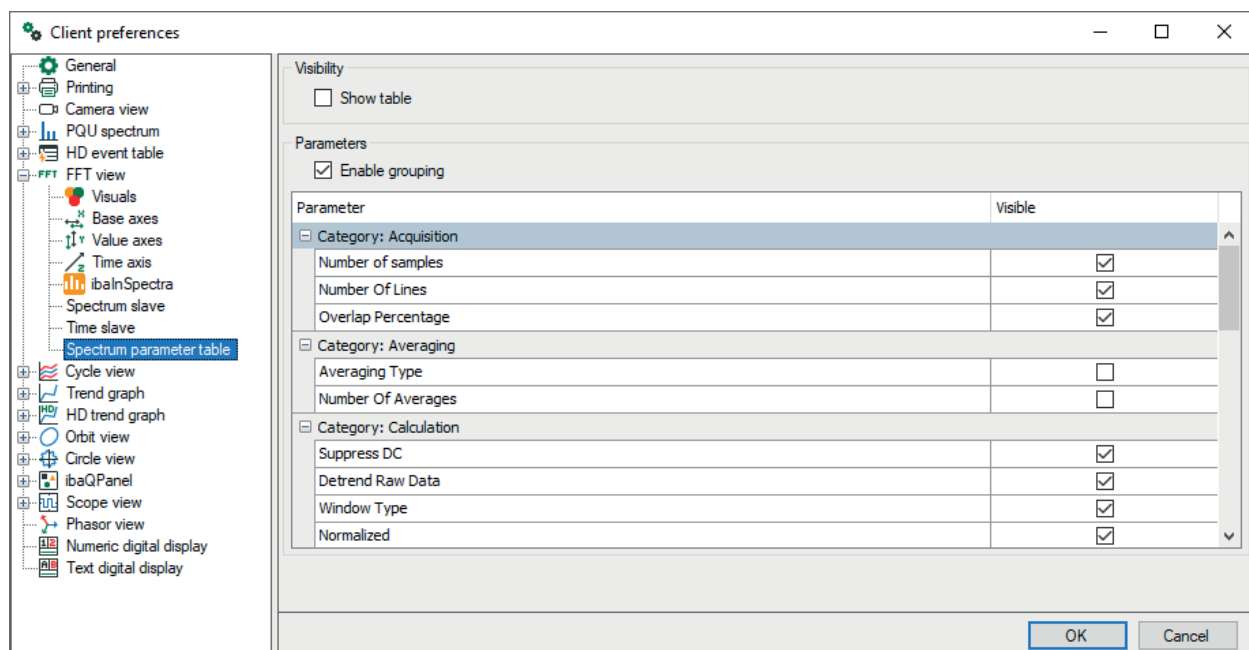
### 7.10.9 Time graph

The *Preferences* dialog only offers setting options for displaying the chart and the table.



### 7.10.10 Spectrum parameter table

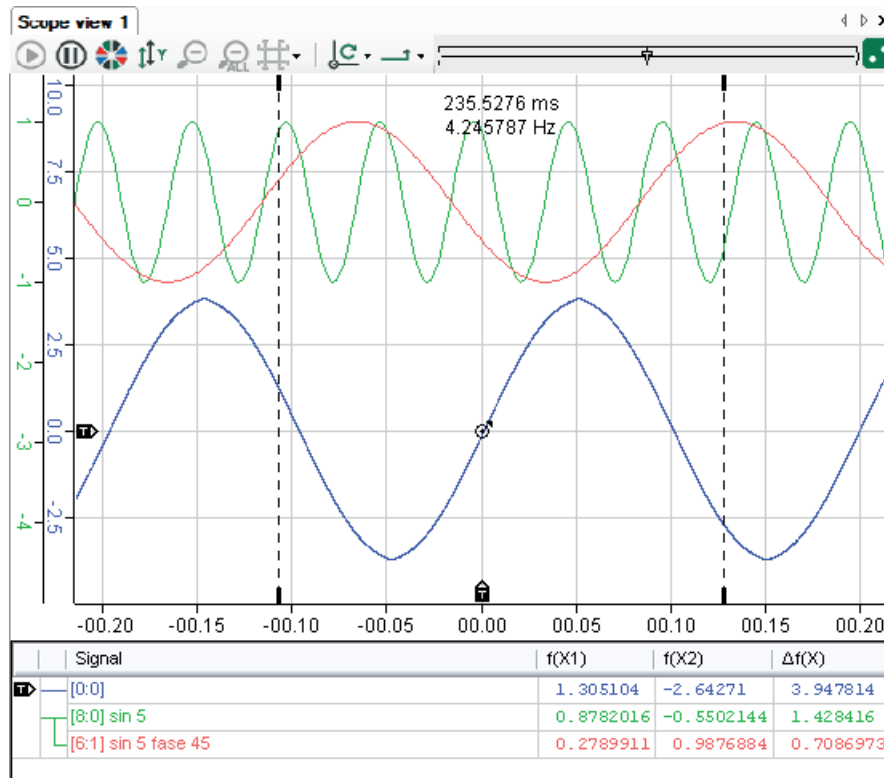
The settings for the spectrum parameter table are the same in the dialogs of the preferences and properties. For a description of the settings, see chapter [↗ Spectrum parameter table](#), page 71



## 8 Scope view

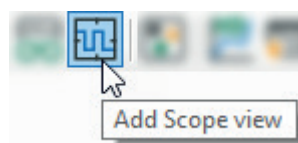
### 8.1 General

The scope view is an oscilloscope included as a standard view in *ibaPDA*. Each view supports one base axis and multiple signals on multiple value axes.



A new scope view can be added to the view by

- clicking the corresponding toolbar button



- or by using the *View – Add view – Add scope view* menu

Signals can be dragged from the *ibaPDA* signal tree onto the view to add them. If the signal is dropped on the chart, a new value axis will be created. To add a signal to an already existing axis, drop the signal on that axis. Every value axis will have the same color as the first signal it contains.

### 8.2 Trigger

The view's trigger is visualized on the chart by a little circle with a dot inside. If the trigger can be moved, trigger markers appear at the side of the chart, near the base and value axes. The trigger can be moved by dragging these markers.



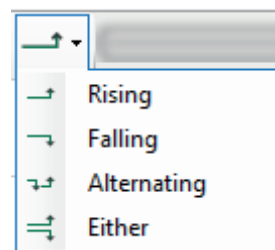
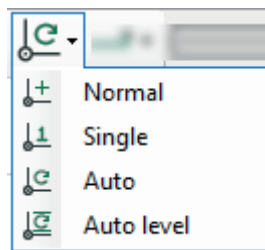
There are four triggering slopes:



Edge type	Description
Rising	Trigger can only fire on the rising edges of the trigger signal
Falling	Trigger can only fire on the falling edges of the trigger signal
Either	Trigger can fire on both falling and rising edges of the trigger signal.
Alternating	If the trigger previously fired on the rising/falling edge, it will fire the next time on the falling/rising edge.

There are four trigger modes:

Trigger mode	Description
Normal	Trigger fires every time the trigger signal passes the trigger value
Single	Trigger fires when the trigger signal passes the trigger value for the first time.
Auto	Like normal mode, but also fires when a time-out expires.
Auto level	Like auto mode, but the trigger value is set to the trigger signal's center value


The trigger mode and slope can be set in the toolbar or in the “properties” dialog of the view.



To enable the trigger, click the “Play” button  in the toolbar. To disable the trigger, click the Pause button . If the trigger is disabled, it will not scan incoming samples.

## 8.3 State indicator

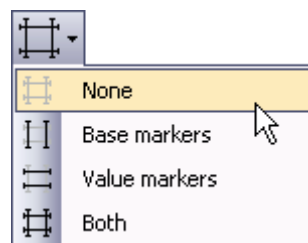
The state indicator shows the state of the trigger. If the trigger is enabled and samples are received, the state graphic will show 2 dots moving in a circle. If the trigger is disabled, the dots do *not* move in a circle. If a trigger fires, a circle runs through the middle of the dots connecting them. If the auto trigger fires, this circle is smaller, only touching the dots.

		
Scanning	Triggered	Auto triggered

Scope status indicator

## 8.4 Markers

Markers can be enabled or disabled in the toolbar or in the "Properties" dialog. There are two base markers and two value markers. These two marker types can be activated separately.



If a marker type is active, it is displayed on the chart and can be moved. More information on markers is displayed between the markers or in the signal table below the chart.

## 8.5 Signal grid

The signal table can be found at the bottom of the view. It displays the ID and name of each signal that has been added to the view.

	Signal	f(X1)	f(X2)	$\Delta f(X)$	Y1	Y2	$\Delta Y$
	[0:0]	2.79194	1.25627	1.53566	7.97447	-1.50742	9.4819
	[8:0] sin 5	-0.39137	-0.87570	0.48432	-0.07347	-3.37960	3.30612
	[6:1] sin 5 fase 45	0.89100	-0.75011	1.64111	-0.07347	-3.37960	3.30612
	[3:0] 50 Hz	-2.79903	0.58778	0.58778	2.48046	-2.55859	5.03906
	[3:8] 10 Hz	0.58778	0.12533	0.46245	2.48046	-2.55859	5.03906

To the left beside the signal name column, there are two more permanent columns: The trigger column and the axis column. The trigger column shows which signal is currently being used as trigger signal. You can change the trigger signal by dragging the trigger icon onto another row. The second column visualizes a small list for every value axis in the view distinguished by different colors. Each list item connects the signals contained with the axis it represents. If the base markers are visible and the base axis is in time mode (X-T), the table shows the  $f(X1)$ ,  $f(X2)$  and  $\Delta f(X)$  columns. If the base axis is in "Value" mode (X-Y), the grid shows the  $X1$ ,  $X2$  and  $\Delta X$  columns.

If the value markers are visible,  $Y1$ ,  $Y2$  and  $\Delta Y$  are shown. You can click inside the "Name" column to shift a signal to another axis. If the signal being dragged is the only one on its axis, this axis will be removed. In order to remove a signal from an axis, drag it to any position, but not into another column. The signal is put on a new axis and added to the bottom of the signal table. In the figure below, the signal [8:0] is added between [0:0] and [6:1] of the blue axis.



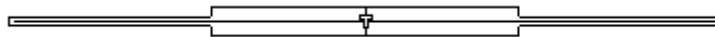
The signal table's height can be adjusted. When moving the mouse to the top of the table, a resize icon appears. To auto-size the table, double-click if the resize icon is visible.

## 8.6 Memory length

The scope view has a user-defined memory size. It can be set in the view's "Properties" dialog as milliseconds. This determines how many samples are buffered for all of the view's signals. The length is limited, depending on the time bases of the signals currently used in the view. So, by adding a new signal, the memory length might change.

## 8.7 Overview

This component is a visual representation of the memory length. It shows which part of the memory length is currently visible on the diagram. It also shows the position of the trigger.



The entire width of the overview visually represents the memory length. The large rectangle represents the currently visible part of the memory length. It can be dragged to the left or right to show other parts of the buffered signals on the diagram. If the cursor is above the rectangle, its size can be increased or decreased by scrolling the mouse wheel. The trigger can also be dragged onto a new base position.

## 8.8 Chart

The chart is the part of the scope view displaying the signals and grid lines. In the X-Y mode, a background image can be placed in the diagram. Furthermore, the chart provides a zoom function. You can draw a zoom rectangle within the diagram, when releasing it, it is zoomed in to the drawn range. When zooming in, the trigger will be disabled. The toolbar buttons can be used to zoom out to the previous level or to zoom out entirely. You can also press the Play button to zoom out and enable the trigger.

If a trigger fires, the chart will be updated with new signal data. The maximum update frequency of the chart is 20 Hz. As the visible part of the memory length gets larger, the update frequency gets smaller. The reduction degree depends on the number of signals, the width of those signals, the base axis mode and its value signal, and the memory length itself.

## 8.9 Axes

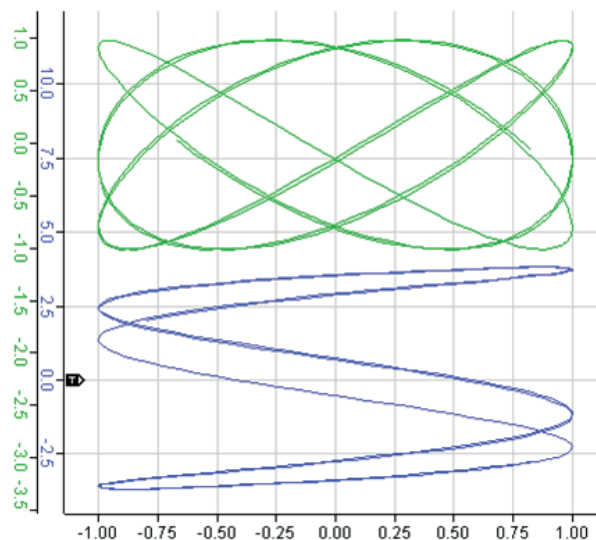
All of the axes on the view can be panned by dragging them with the mouse. You can also perform an axis center zoom (in and out) by scrolling the mouse as soon as the cursor is placed over the axis. If the scaling mode is set to manual, you can auto scale the axis by clicking the center mouse button.

The base axis can operate in two modes:

- time mode (X-T)
- value mode (X-Y)

In time mode, you can choose to center the axis values around the trigger or to use absolute time values.

Value mode requires a signal to be configured in the properties dialog. The base axis then uses the signal values and thus becomes a value axis instead of a time axis. The signal will not be added to the signal grid. The following figure shows a base axis in value mode.

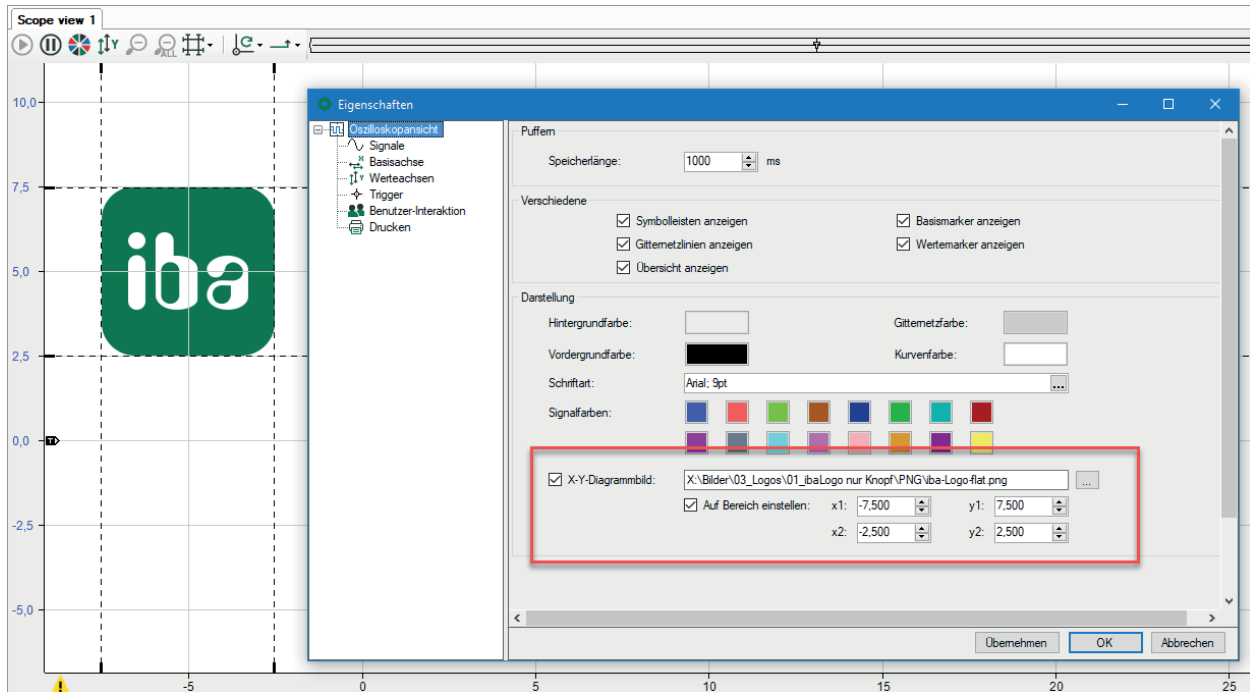


Interacting with the base axis in time mode changes the visible memory length (overview also changes). In value mode, the visible part of the memory length can only be changed by using the overview or by opening the properties dialog.

Note that the axis containing the trigger signal is always placed next to the chart.

## 8.10 Background image

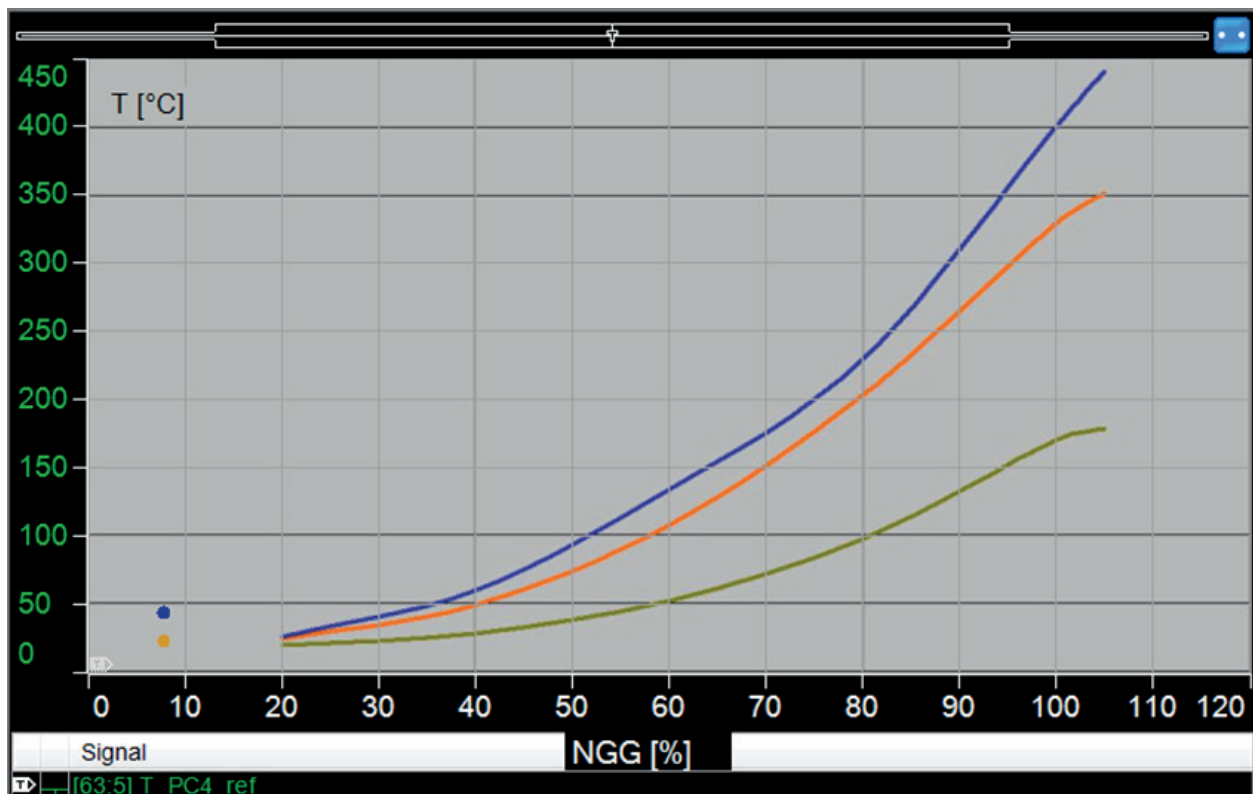
In the X-Y display mode, the oscilloscope view allows to use a graphic file as background image. In order to set up the background image, open the "Properties" dialog of the scope view via the context menu.



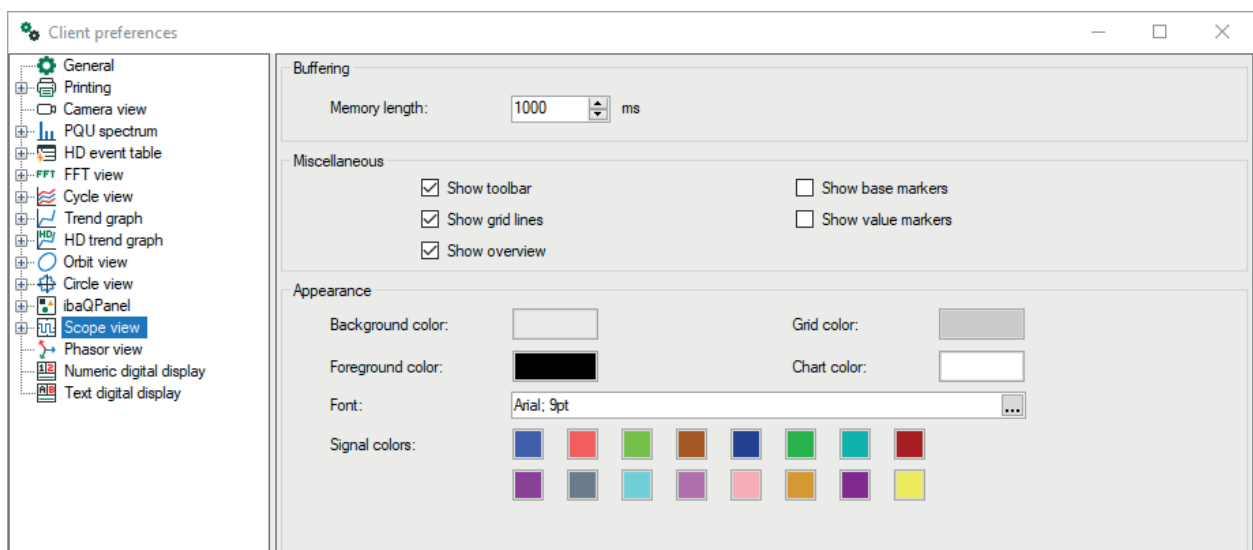
In order to enable/disable the image display, check/uncheck the *X-Y chart image* checkbox. Enter the path and file name of the graphic file in the corresponding field or use the browser button to select the file. The *Map to range* option permits to define size and position of the image in the background. By specifying the coordinates x1/y1 and x2/y2, you can map the 4 corners of the image with regard to the X/Y scales in the view. If the *Map to range* option is disabled, the background image will always be scaled to the size of the scope view.

### Example

A field of characteristic curves (image) as a background for the measured data.



## 8.11 Properties and preferences scope view



### Buffering

#### Memory length

This determines how many samples are buffered for all of the view's signals. The length is limited, depending on the time bases of the signals currently used in the view. So, by adding a new signal, the memory length might change.

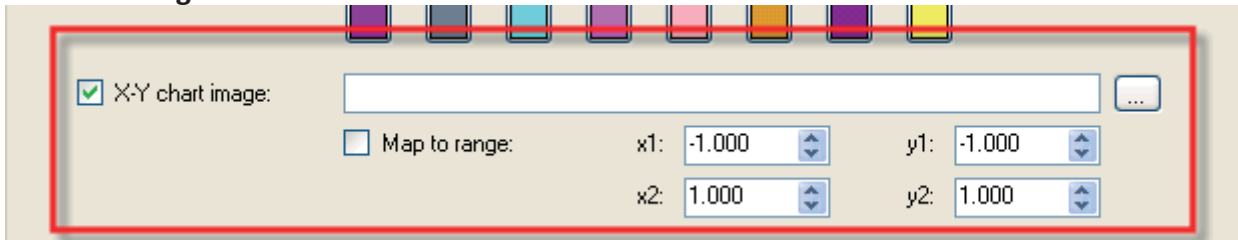
#### Miscellaneous

These settings determine whether the named view elements are shown or hidden.

## Appearance

Setup your preferred colors for the different parts of the scope view, similar to the trend view. In the "Properties" dialog, there is another option available among the display settings.

### X-Y chart image

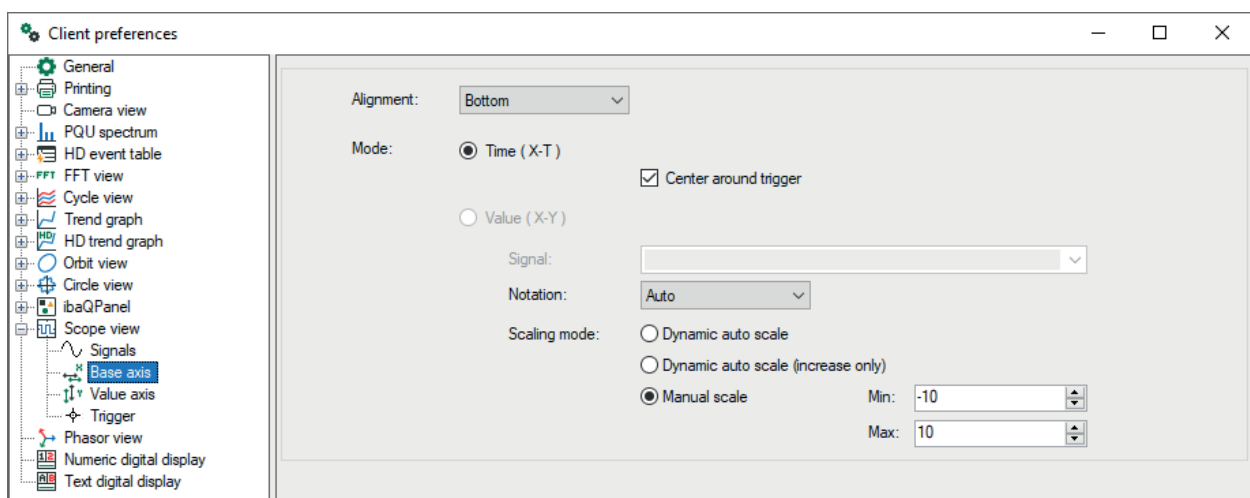


- In order to enable/disable the image display, check/uncheck the "X-Y chart image" checkbox.
- Enter the path and file name of the graphic file in the corresponding field or use the browser button to select the file.
- The "Map to range" option permits to define size and position of the image in the background. By specifying the coordinates x1/y1 and x2/y2, you can map the 4 corners of the image with regard to the X/Y scales in the view.
- If the "Map to range" option is disabled, the background image will always be scaled to the size of the scope view.

### 8.11.1 Signals

As for trend graphs, you can set up basic properties for displaying analog and digital signals at this stage. On the "Signals" branch in the "Properties" dialog of a scope view, you can also change the color of a signal.

### 8.11.2 Base axis



The base axis is always the horizontal axis in a scope view.

## Alignment

Select your preferred position of the base axis scale from the pick-list.

## Mode

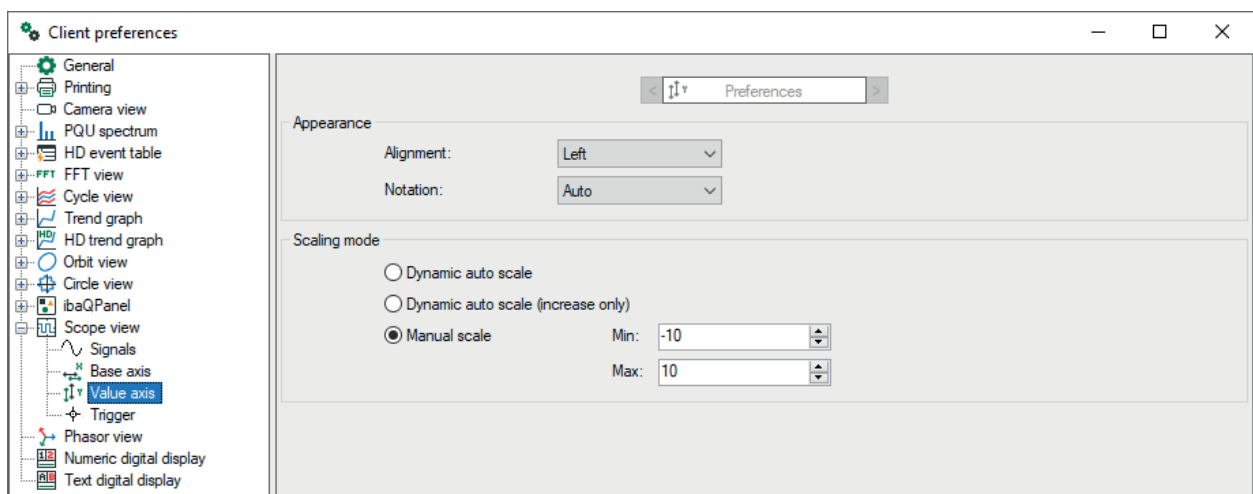
In the preferences, only the "Time (X-T)" mode can be enabled.

The "Center around trigger" option, if enabled, always keeps the trigger level(s) in the middle of the view.

The "Value (X-Y)" mode is only available in the "Properties" dialog. It can be used for X-Y charts. The "Value" mode requires the selection of analog signals whose values are used for the base axis instead of time.

Like for trend graph view, you can set the notation and scaling mode.

### 8.11.3 Value axis

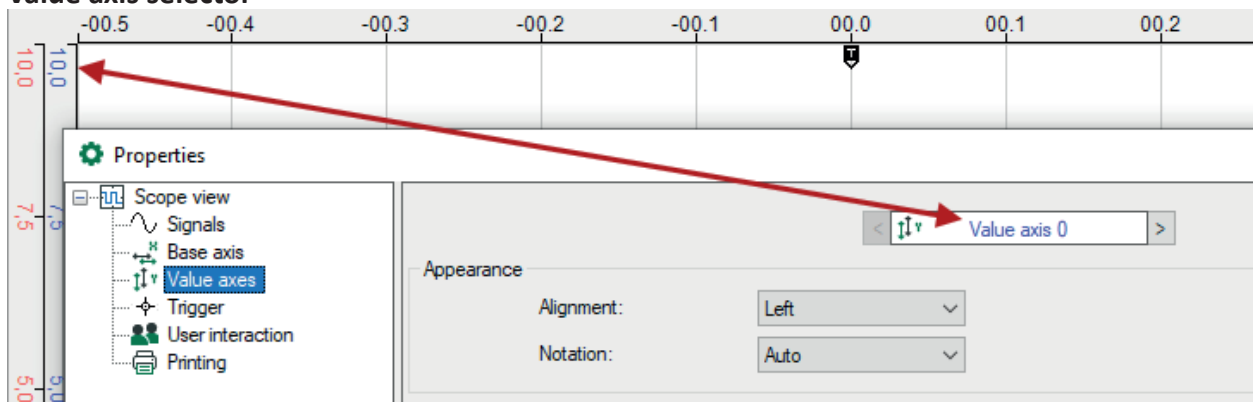


In the "Preferences" dialog, you can set the general options for appearance and scaling mode.

The value axis is always the vertical axis of a scope view.

The value axis selection control on top of the dialog is disabled in the preferences. It is only available in the "Properties" dialog.

### Value axis selector



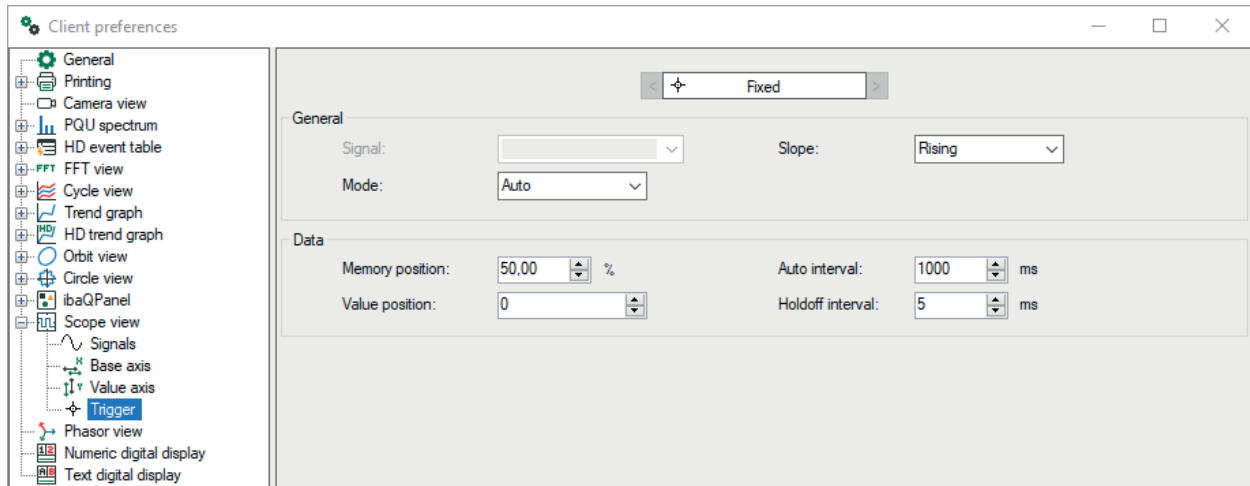
The value axis selector shows the number of the value axis the settings below are related to.

In case you have multiple value axes in the scope view, you can select the value axis you would



like to set up with the arrow buttons on the left and right side of the selector. The color helps to identify the axis.

### 8.11.4 Trigger



In the "Preferences" dialog, you can set the general options for the trigger, such as the mode (normal, single, auto and auto level) and trigger edge (rising, falling, both and alternating). The signal selection is disabled. The signal for controlling the trigger can be selected in the view's "Properties" dialog.

#### Data

##### Memory position

The memory position is a percentage determining the trigger base position, measured from the left side of the view to the right. The default value is 50 % and puts the trigger in the middle.

##### Auto interval

The auto interval is used in "Auto" and "Auto level" trigger modes. If the trigger is fired in one of these modes, it will take up to the given amount of milliseconds before the next trigger fires. Of course, this trigger can also be fired earlier, as up to this moment the trigger keeps on scanning input samples.

##### Value position

The value position determines the trigger level. You can set a value by using the spinners (going in integer steps) or manually enter any value in this field.

##### Holdoff interval

The hold-off interval is the amount of milliseconds after the trigger fired where the trigger does not scan any incoming samples. So, in this period the trigger cannot fire.

## 9 ibaQPanel

*ibaQPanel* is a licensed software add-on for *ibaPDA*. However, a mini license for two display objects comes with every *ibaPDA* standard version.

### Other documentation



For a full description of *ibaQPanel*, please read the corresponding manual for the software product *ibaQPanel*.

### 9.1 General

*ibaQPanel* provides an extended range of objects for visualization of measured values, which have been acquired by *ibaPDA*.

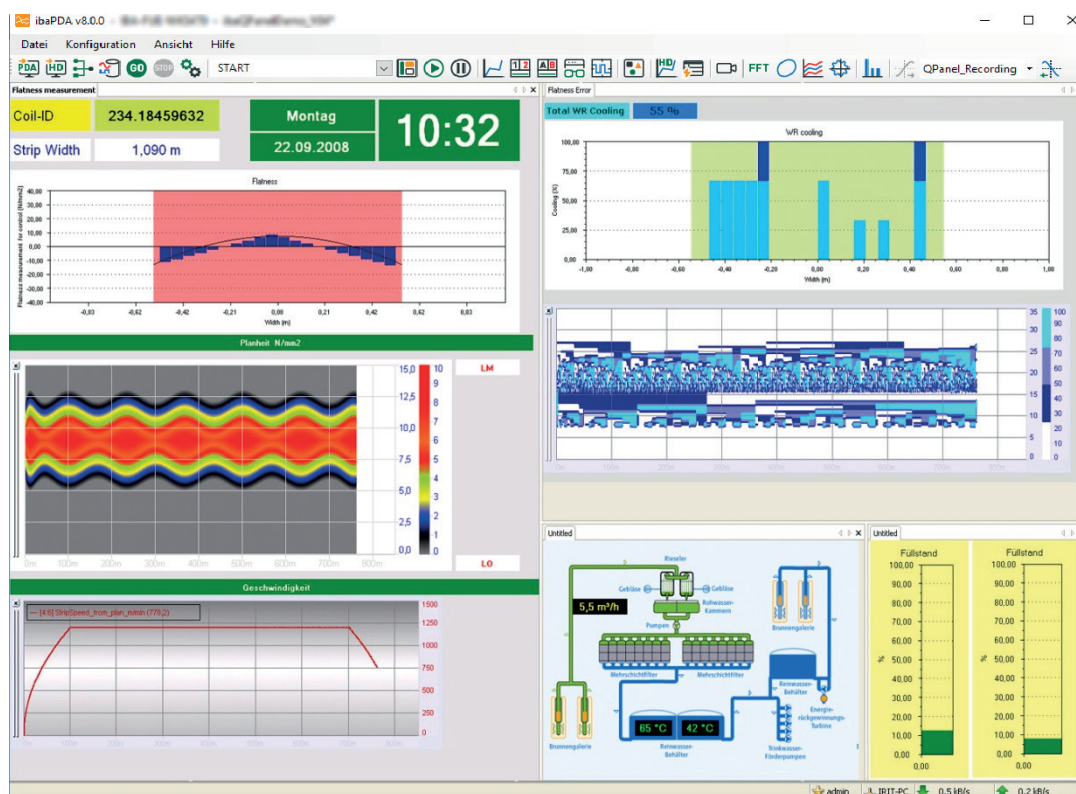
For every computer where the QPanel should be displayed, an *ibaQPanel-Add-on* license and an *ibaPDA* client license are required. Both single and multi-user licenses are available.

The display objects may be arranged in one or more layers and placed anywhere on the screen with a user-defined configuration in terms of size, color, font, etc.

Both data from an *ibaPDA* server and data from an *ibaHD-Server* can be displayed in the view.

Images may be used as background graphics and thus enable the user to create HMI-like screens.

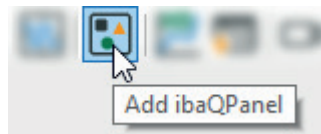
The following figure shows an example with different typical QPanel items.



## 9.2 The ibaQPanel view

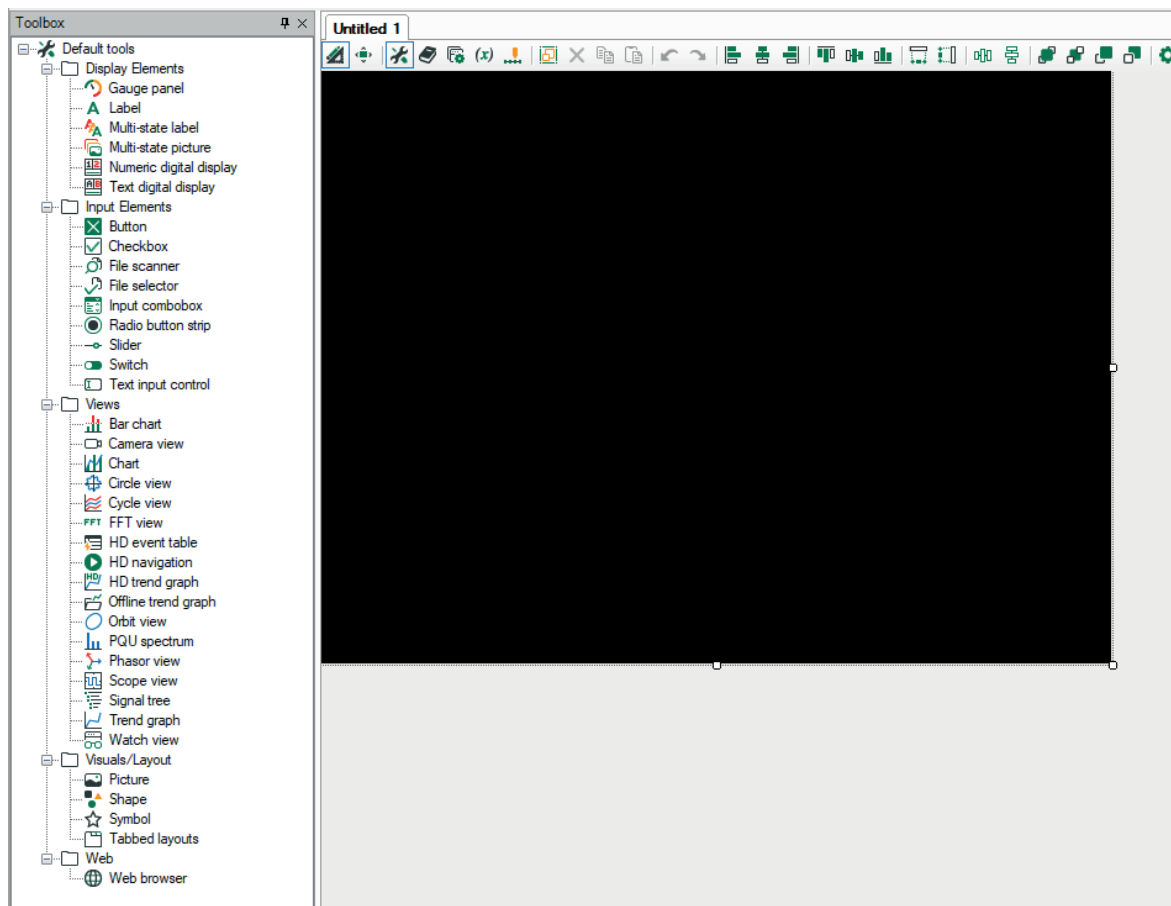
A new *ibaQPanel* view can be added by

- clicking the corresponding toolbar button



- or by using the *View – Add view – Add QPanel* menu

The new QPanel view opens in the design mode and the toolbox containing all types of display objects is displayed.



In a first step, resize the black background according to your needs, as it provides the area where you can place the objects. You may also change the background color or choose a background image.

Then, start to drag the display objects you need out of the tool box into the panel and set them up.

## 9.3 The display objects

<b>Views</b>		
Object	Function	Application
Bar chart	Display of signal values as single-bar or multi-bar charts Color change for value ranges, dynamic limits, polynomial calculation for profiles	General value display Fill levels Profiles
Chart	Multifunction object for the combined display of trend curves, graphic objects, markers, harmonics and texts as well as several base and value axes	Machine presentation, layered presentation
FFT view	Spectrum slave graph of a signal	Frequency analysis Chatter monitoring
HD event table	Display a list of events based on an event-based HD data store	Error and alarm monitoring; search for process events
HD navigation	Parent toolbar for controlling multiple HD views	Space-saving control of multiple HD trend graphs
HD time periods table	Display a list of predefined time periods based on a time-based HD data store	Facilitate the analysis of recurring process steps or procedures as well as regular periods (day, week, shift)
HD trend graph	Display historical data in a trend view; connection to any HD-Server in the network	Comparing data from the past with current values
Camera view	Display a camera view of an ibaCapture-CAM server on the screen Scenario player screen for event-based camera switching.	Monitoring Process control Troubleshooting
Circle view	Relevant parameters for the circle view are derived from the module settings.	Visualization of the results of the InCycle expert module and the InCycle auto-adapting module for rotating processes
Offline trend graph	Display a trend graph from a data file (no live data)	Comparison of older and current measured values, comparison of current values with reference curve
Orbit view	The orbit itself is the appearance of the X/Y data pair during a (or several) revolution(s) of the shaft	Results of the orbit calculation are given as analog values of the respective In-Spectra orbit module
Scope view	Display signals in a digital oscilloscope	Commissioning Troubleshooting

PQU spectrum	Display of a complete PQU spectrum module	Spectrum presentation of electrical values with up to 50 harmonics (power quality)
Signal tree	ibaPDA/ ibaHD signal tree	Source for signals to be added to a view by drag and drop
Trend graph	Display signal values in a trend graph X axis time or length-based; automatic 2D top-down view on vector signals	General value display False color display of profiles (temperature, flatness, etc.)
Watch view	Display window for signal values	Monitoring selected signals regarding change of value or status
Phasor view	Display of a complete PQU phasor module	Phasor presentation of electrical values in a power grid (power quality)
Cycle view	Display of special graphs and tables	Visualization of the results of the InCycle expert module and the InCycle auto-adapting module

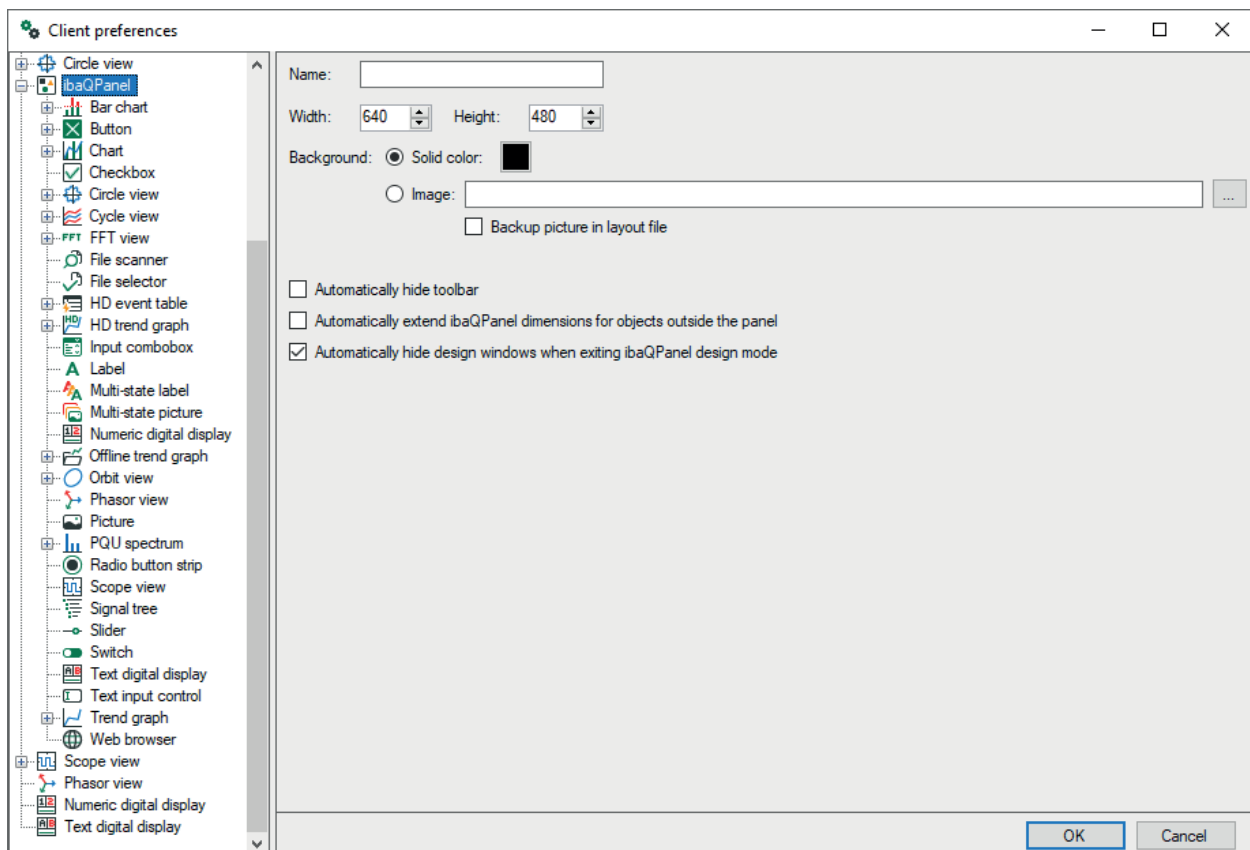
Display elements		
Text digital display	Display of text signals	Large and clear display of text in the style of an LED display
Numeric digital display	Display of signal values as numbers, maintaining the positive and negative peak value (resettable)	Large, clear display of signal values
Gauge panel	Display of signal values on a classic analog-style gauge Circular, linear and numerical gauges available; numerous design options, free set-up of shape, color, scales and pointers.	Highlighted value display Replaces traditional displays
Multi-state picture	Display of various graphics, depending on the signal value	Status display Security warning
Multi-state label	Convert a signal value into different states of a label Color change depending on value range(s), text in label	Status indication
Text field	Display signal values in a trend graph X axis time or length-based; automatic 2D top-down view on vector signals	Labeling of the displays Display of the text signal

Input elements		
Checkbox	Check box with check mark	Enabling / disabling options
Input combobox	Drop-down list with any number of plain text entries. By selecting a list item, a target signal is set to a defined value.	Manual setting of default values
Button	<p>Execute commands using a button:</p> <ul style="list-style-type: none"> <li>Close ibaPDA client</li> <li>Toggle view</li> <li>Run command line</li> <li>Enable application (*.exe)</li> <li>Print (QPanel screen)</li> <li>Digital pulse signal</li> <li>Set signal value</li> <li>Trigger value input control</li> <li>Pause (stop one or all views)</li> <li>Start (continue one or all views)</li> <li>Load layouts from server</li> <li>Save layouts on server</li> <li>Open user management</li> <li>Connect to ibaPDA server</li> <li>Connect to ibaHD server</li> <li>Change language</li> <li>Log out from ibaPDA server</li> <li>Log out from ibaHD-Server</li> </ul> <p>Commands can be run manually or via signal edges; button text and graphics can be adjusted</p>	<p>Control of QPanel display</p> <p>Execution of other applications or scripts</p>
File picker	Shows the contents of a folder in order to select a file. Name of the selected file is written into a text signal.	Interactive load of a data file in an offline trend curve
File scanner	Monitors contents of a folder for automatic selection of the last, second to last, third to last (and so on) file. Name of the selected file is written into a text signal.	Automatic display and update of the last x data file(s) in offline trend curves
Numeric up/down	The numerical value of an analog destination signal can be changed either by clicking buttons (+/- or up/down), turning the mouse wheel or typing in.	Quick, safe and easy way to change a value
Option field	Group of radio buttons	Selection of alternative options, operating mode selection

Switch	On/off switch; switch appearance can be determined by graphics file. Separate graphics for ON, OFF, disabled ON and disabled OFF state possible. Digital target signal.	Switch functions on/off
Slider	Slider's appearance (scale style, orientation, color of background/handle, min/max values etc.) can be configured.	Control element to display values within a scale
Value input control	String or value entry for a text signal or numeric signal. This control replaces the former text input control. There is a conversion function available to convert text input controls in older QPanels into value input controls.	Signal value or additional information on data file, print-out, further applications, etc.

<b>Visuals/Layout</b>		
Image	Embed a graphic object, optionally statically, dynamically (image file name with wildcards) or by order (controlled by folder monitoring)	Process or system presentation
Shape	Basic geometric shapes (line, rectangle, ellipse, polygon); filling and line configurable, optional flashing mode	Simple shapes, animation
Tabbed layouts	Summary of multiple ibaQPanel views and layouts with control over tabs.	Clearer and simpler operation of multiple ibaQPanel layouts
Symbol	Integration of vector graphics (.svg) with option to change the line color and thickness, fill color, rotation and scaling	Use of vector graphics
<b>Web</b>		
Web browser	Display web pages, PDFs and other browser-fitting files; download of files	Display data from ibaDaVIS

## 9.4 Properties and settings Qpanel view



As described in [ibaQPanel](#), page 114, the *ibaQPanel* view is the base for an HMI-like screen design. Beside some special QPanel objects, like multi-state label, multi-state picture, button, label, bar chart, gauge panel and text input control, you can add all other types of views to a QPanel view. Consequently, there are preferences and properties settings for these objects available within the QPanel preferences and properties.

Basically, you can refer to the descriptions of preferences and properties for each view type in the chapters before.

However, some standard views, like the trend graph view, have gained more options and capabilities in the QPanel environment. Only the QPanel-specific features are explained hereinafter.

As for all views, the difference between preferences and properties of a view is mainly the unavailability of signal selection in the preferences.

### Name

Choose and enter any name for the Qpanel.

### Width and height

This is the size of the QPanel background. All QPanel elements must be placed within this area. The default size is 640 x 480 pixels. The size can be adjusted according to your needs. If you plan to design a full screen QPanel, make sure that width and height match the figures of your monitor.

### Background

You can set a solid background color or use an image (bitmap) instead.



Note that the image size should fit the QPanel background size (given in pixels). You cannot re-size the image in ibaQPanel.

If the image is smaller than the background, it will be tiled.

If the image is larger than the background, you will just see a part of it.

**Automatically hide toolbar**

If this option is chosen, the toolbar only appears in design mode when the mouse moves over the upper limit of the window. When fading in, the toolbar slides across the panel; the panel itself, however, will not be moved to the bottom.

**Automatically extend QPanel dimensions for objects outside the panel**

If you copy elements from one panel to another, they will be displayed in the target panel at the same position as in the source panel. If the target panel is too small, the element will be shifted to the border or is not visible anymore. If this option is enabled, the target panel will be automatically enlarged so that the copied element fits the panel.

**Automatically hide design windows when exiting ibaQPanel design mode**

This option is only available in the preferences.

If enabled, the window with the toolbox will be closed automatically on exiting the design mode. Enabling this option may be helpful if you have to switch over frequently between design mode and display mode during the creation of a QPanel.

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**Other documentation**

More detailed information about the functions, settings and properties of each QPanel object can be found in the product manual of *ibaQPanel*.

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## 10 ibaCapture camera view

The *ibaCapture* system consists of hardware and software components and is used for the synchronized recording of measured data and video capture. *ibaCapture* works closely with *ibaPDA*.

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### Note



The basic license for the *ibaCapture* server and the license(s) for the permitted number of cameras and image(s) are provided on the dongle of the *ibaCapture* server PC.

If you have subsequently purchased the *ibaCapture* system for an existing *ibaPDA* system, please note the following:

For *ibaCapture*  $\geq$  V4 (*ibaCapture* v4.x) and *ibaPDA*  $\geq$  6.36:

The license for the *ibaCapture* interface in *ibaPDA* is available by default.

The permission for an *ibaPDA* system to access the *ibaCapture* server is licensed in the dongle of the *ibaCapture* server.

If you want to connect multiple *ibaPDA* systems with an *ibaCapture* server, for each connection you will need an *ibaPDA Interface Capture* license in the dongle of the *ibaCapture* server.

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### Other documentation



For a full description of *ibaCapture*, please read the corresponding manual for the *ibaCapture* software product.

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### 10.1 General

The precise linking of measured data and visual information provides a new quality of process analysis when signal trends and video recording can be watched side-by-side in *ibaAnalyzer* in a synchronized manner.

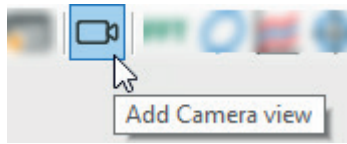
Using the *ibaCapture* player, the camera views of the cameras connected to the *ibaCapture* server can be displayed on the *ibaPDA* client screen allowing you to watch live video streams or video recordings.

In addition, depending on the type of cameras used, control signals for the cameras (e. g. PTZ cameras) can be configured in the I/O-Manager by *ibaPDA*.

## 10.2 The camera view

A new camera view can be added by

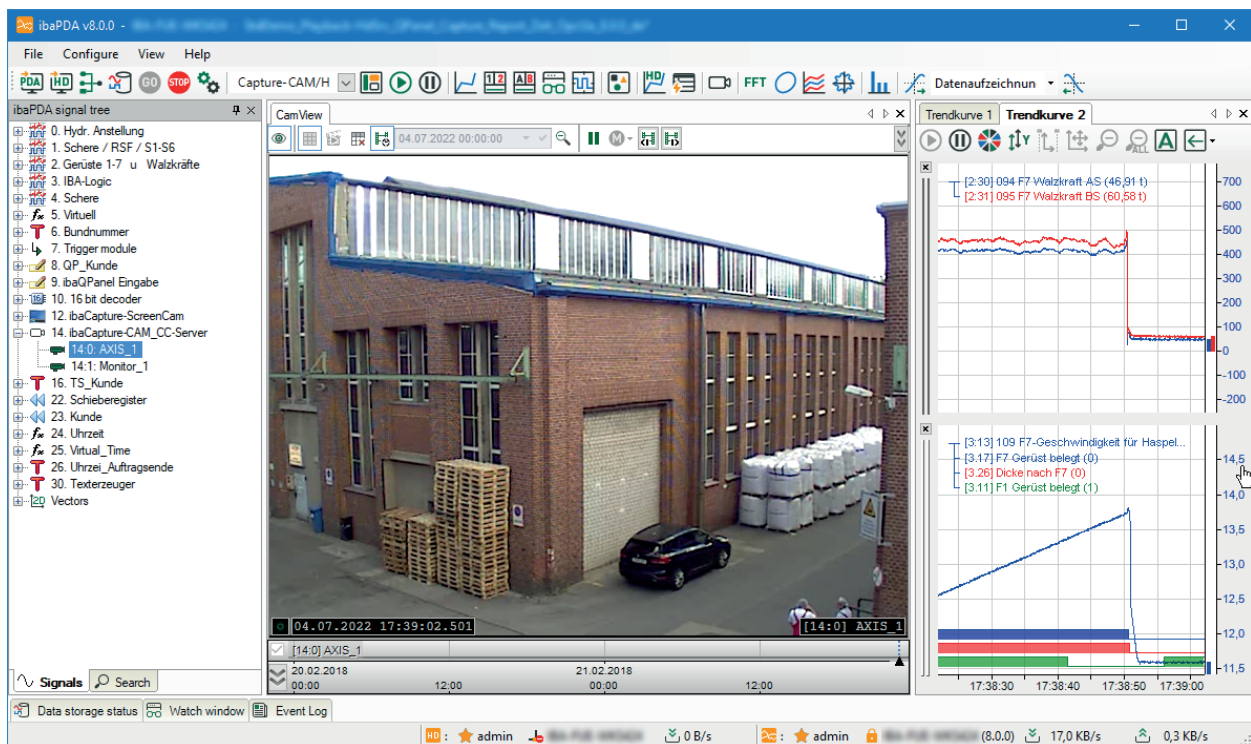
- clicking the corresponding toolbar button



- or by using the menu *View – Add view – Add Camera view*
- or by double clicking on a camera in the signal tree (showing immediately the actual picture of the respective camera).

If you choose one of the first two methods, you should add the cameras to the view by drag and drop them from the signal tree.

In *ibaPDA*, an *ibaCapture* server is assigned to a so called *ibaCapture* module. The *ibaCapture* modules are listed in the signal tree like all other modules. The cameras – up to 64 cameras per module – can take the same position like the measurement signals in other modules.



Generally, the camera view pane can be moved and rearranged like any other view in *ibaPDA* (dockable windows).

The tool used for video display is *ibaCapture* Player. In the camera view, you have different functions such as zooming or panning by using the mouse wheel, showing current images (live) or replaying recordings, etc.

If you use an *ibaCapture* camera view either on your normal *ibaPDA* client or on an *ibaQPanel*, you can use text channels for overlay text displays.

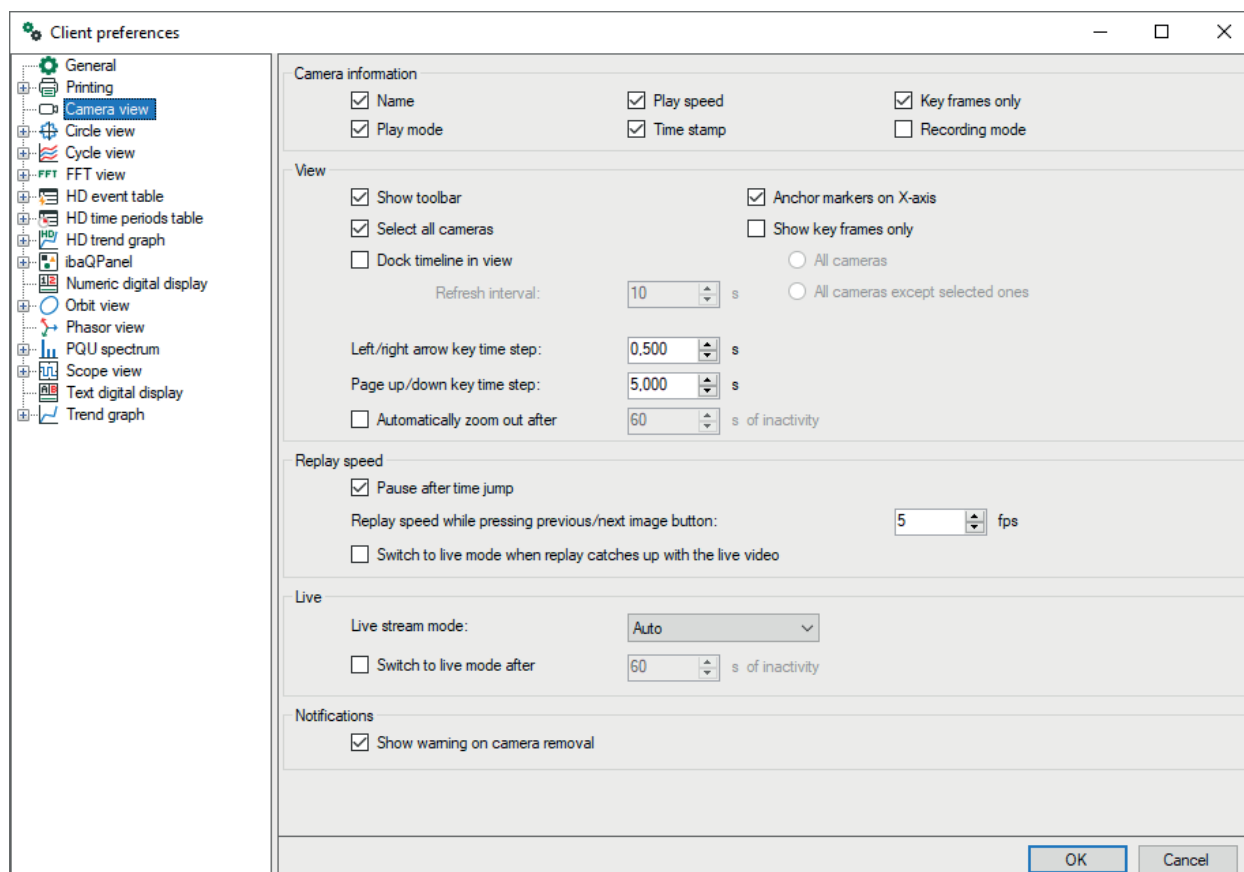
For more information, see manual part 2, Using text signals.

## Other documentation



For more information about settings and operation of the camera view, please refer to the *ibaCapture* product manual.

## 10.3 Properties and preferences camera view



*ibaPDA* uses the same software components for the camera views like the *ibaCapture* Player. Thus, you can set up the same properties and features in the preferences of the camera view like you do in the properties of a camera in the *ibaCapture* Manager.

There is no difference in the settings between the preferences and properties dialog.

### Camera information


By setting/removing a checkmark, you can hide/show the five camera information elements.

- Name
- Play mode
- Play speed
- Time stamp

- Key frames only
- Recording mode



If enabled, the information is displayed at the bottom of the camera view.

## View

- Uncheck the "Show toolbar" option to hide the replay toolbar in the camera view.
- Enable the option *Anchor markers on X-axis* in order to place the play marker in the timeline of the camera view at a certain point of time. When zooming or panning the X-axis the marker sticks to the set point of time.
- Check "Select all cameras" to select and lock all camera windows.  
For doing so, use the symbol  in the toolbar.
- Show key frames only  
In order to save system resources, you can switch the camera display to reduced pictures in the data flow, e.g. by enabling the "Key frames only" view mode. For that purpose, set a checkmark in the "Show key frames only" option field. This activates the two option fields "All cameras" and "All cameras except selected ones".  
Selecting the "All Cameras" option enables you to set the "Key frames only" view mode for all cameras.  
With the "All cameras except selected ones" option, all cameras except for those selected are set to "Key frames only" view mode, i.e. only the selected cameras show fluid motion.
- Check "Dock timeline in view" to display the video timeline on the bottom of the camera view window. Specify in the "Refresh interval" input field the update time of the timeline. Do not set the update time too low in order to avoid unnecessary network load. For more details about the time line, please refer to the *ibaCapture* manual.
- Navigation key time step settings  
By entering values given in seconds for the <←/<→> and <Page up>/<Page down> keys, you can define short time step and long time step setting when using these keys for navigation on the timeline.
- Automatically zoom out after X s of inactivity  
If you enable this option, the camera view will return from a zoomed image back to the full image automatically, unless you operate mouse or keyboard within the specified time range (given in seconds).

## Replay speed

In the section "Replay speed" you can enable the option *Pause after time jump* in order to switch the display in pause mode after performing a time jump. The playback then will not start immediately but wait for your start command.

In addition, for confirming the  (Next image) and  (Previous image) buttons, you can set additional replay speed in images per second (fps).

If you enable the option *Switch to live mode when replay catches up with the live video*, the display continuous scrolling with the actual time at normal speed, after the playback has reached the current point of time. This can only be the case if the replay speed is higher than the original speed.

## Live

The live streaming settings apply to the streaming protocols between the *ibaCapture* server and client. Clients can be *ibaCapture* Manager (camera view), *ibaPDA* camera view or *ibaQPanel* camera view.

For setting up the streaming protocol, you can choose between the following options:

- Auto (default)  
In auto mode, the system starts using the unicast UDP protocol, usually the best choice. If, however, too many frames get lost, the system automatically switches to TCP mode. This could happen, for instance, if the server is running in a Gigabit network while the client is connected over a 100 Mbit network.
- Unicast UDP  
Recommended streaming protocol
- TCP  
Recommended streaming protocol if UDP does not work satisfactorily.
- TCP Active  
Like TCP, if *ibaPDA* should establish the connection.

Furthermore, you can enable an option for the camera view switching to live mode automatically, unless you operate mouse or keyboard within the specified time range (given in seconds).

## Notifications

You can optionally enable a warning message in the view, which appears when a camera has been removed.

## 11 HD trend graph

The HD trend graph is a special trend graph for HD data that lines up from a time in the past until the current moment. It has its own properties, feed and navigation controls and refers to a dedicated HD signal tree.

Only signals supplied by an *ibaHD server* and available in an HD signal tree can be drawn into an HD trend graph. The signal selection of the HD signal tree depends on the HD data storage configuration. The HD data storage is a special type of data storage for recording and representation of historical data. The optional "*ibaHD server*" add-on is required for this feature.

---

### Other documentation



For more information about configuration of HD server and HD data storage, please refer to the *ibaHD-Server* manual.

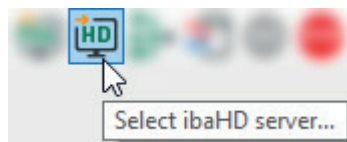
---

### 11.1 Connecting to an HD server

Like the *ibaPDA* client must be connected to an *ibaPDA* server for displaying the normal signals, it must be connected to an *ibaHD-Server* for displaying historical data. The *ibaPDA* client can connect to one HD server at a time which can be installed on the same *ibaPDA* computer or on a remote computer in the network.

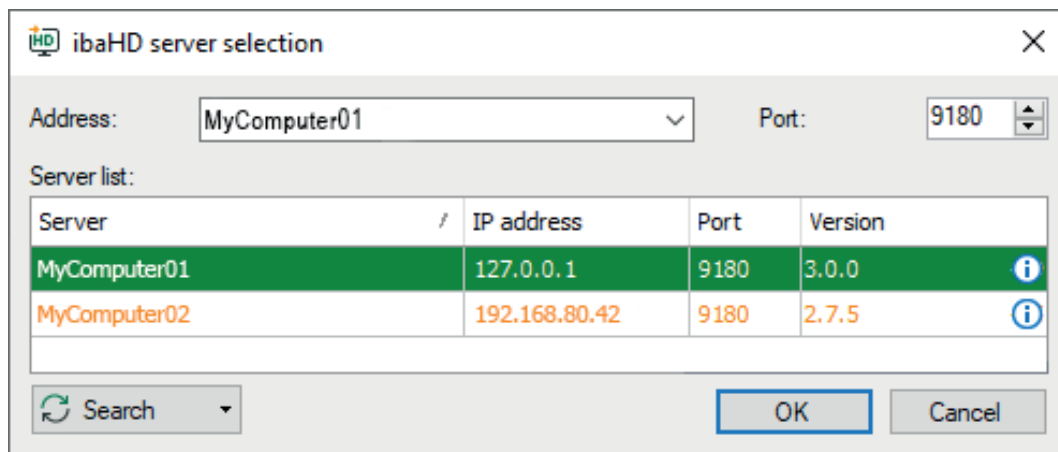
Before you can display historical data, you have to connect to the *ibaHD-Server* server as follows:

- Open the server selection screen either by clicking on the corresponding toolbar button



- or by using the *Configuration – Select HD server...* menu

The form looks like the *ibaPDA* server selection form. By default, the server is set to "Not connected". This means that *ibaPDA* will not connect to an *ibaHD-Server*.



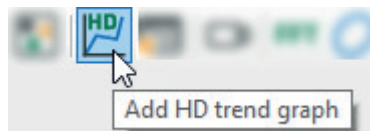
Use the <Search> button to scan the network for active HD servers and select a server from the table or type in a server address. Click the <OK> button to connect to the *ibaHD*-Server. If the HD signal tree has not been visible yet, it will be shown automatically in the *ibaPDA* client.

By the way, the version of the available HD servers will be checked. Version conflicts are color-coded in the table.

## 11.2 Adding an HD trend graph

A new HD trend graph can be added by

- clicking the corresponding toolbar button



- or by using the *View – Add view – Add HD trend graph* menu
- or by double-clicking on a signal in the HD signal tree (if no HD trend graph has been added so far)

If the HD signal tree is not visible, you have to open it by using the *View – HD signal tree* menu, provided the *ibaPDA* client is connected to the HD server. The HD signal tree provides the same functions like the normal signal tree, including a search function.



### 11.3 Operation of the HD trend graph

The historical data trend graph (HD trend graph) almost complies with the normal trend graph. The only difference is the data coming from the *ibaHD-Server* instead of the *ibaPDA* server. This means that the scrolling of the X axis is controlled by the *ibaHD* server.

For the HD trend graph you can only select signals out of the *ibaHD* signal tree. Make sure that the *ibaHD* signal tree is open (menu *View- ibaHD signal tree*).

When adding an HD trend graph, no distinction is made between time- and length-based HD store yet. Depending on whether you pull the first signal in an HD trend graph from a time-based or length-based HD recording, the X-axis automatically converts to time or length units. Only signals with the same base (time or length) can then be added.

Whenever you add a new signal to the HD trend graph, you will see all the historical data for this signal. In the normal trend graph, only the data stored in the signal buffer of the client is displayed.

Along with the introduction of the HD server, new control elements were added to the trend view, e.g. panning and zoom buttons as well as a signal table. While these elements can be hidden or activated for the normal trend view, they are always available in the HD trend view.

For more information on controlling zoom and pan buttons, please refer to [🔗 X-axis buttons](#), page 23.

If numerical and/or text fields have been configured for the event text along with the definition of HD events, these numerical values and texts can be displayed in the HD trend graph.

#### Link to ibaAnalyzer

When the HD trend graph is in pause mode, then it is possible to open the displayed time range in *ibaAnalyzer*. Just right-click on an HD trend graph and select *Open with ibaAnalyzer* in the context menu.

### 11.4 Properties and preferences HD trend graph

Preferences and properties basically equal those of the normal trend graph.

Refer to [🔗 Properties and preferences trend graph](#), page 33

## 12 HD event table

The event table is a special display linked to an event-based HD data storage on an HD server. Event-based data recording is a special kind of (HD) data storage for process events and alarms.

Events must be configured in the event-based HD data storage configuration dialog before they are available in a separate branch in the HD signal tree.

Events can be drawn from the HD signal tree into the event table.

In addition, events can be mapped as text channels and therefore also used in an HD trend graph.

---

### Other documentation.



For more information about configuration of the HD server and event-based HD data storage, please refer to the *ibaHD-Server* manual.

---

### 12.1 Connecting to HD server

Before events can be displayed in an event table, a connection between the *ibaPDA* client and the HD server where the events are recorded must be established.

See chapter ➤ *Connecting to an HD server*, page 127.

### 12.2 Configuration of events

The events to be recorded in the event-based HD data storage must be configured in a special dialog.

---

### Other documentation



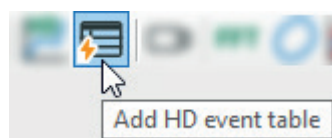
For more information about configuration of events, please refer to the *ibaHD-Server* manual.

---

### 12.3 Adding an event table

A new event table can be added by

- clicking the corresponding toolbar button



- or by using the *View – Add view – Add HD event table* menu

- or by double-clicking on an event in the HD signal tree (if no event table has been added so far)

If the HD signal tree is not visible, you have to open it by using the *View – HD signal tree* menu, provided the *ibaPDA* client is connected to the HD server. The HD signal tree provides the same functions like the normal signal tree, including a search function.

## 12.4 Operation of the event table

Event table					
SpeedMax					
Event	Trigger	Time	Message	Priority	Ack
Strip in F7		01.09.22 16:38:59	Strip no. 704204.00 Entry F7; Speed 10.98; Thickness 2.29	Normal	<input type="checkbox"/>
New coil		01.09.22 16:38:44	New coil number: 704204	Normal	<input type="checkbox"/>
Strip in F7		01.09.22 16:37:36	Strip no. 704203.00 Entry F7; Speed 11.48; Thickness 2.07	Normal	<input type="checkbox"/>
New coil		01.09.22 16:37:20	New coil number: 704203	Normal	<input type="checkbox"/>
Strip in F7		01.09.22 16:36:11	Strip no. 704202.00 Entry F7; Speed 11.51; Thickness 2.07	Normal	<input type="checkbox"/>
New coil		01.09.22 16:35:55	New coil number: 704202	Normal	<input type="checkbox"/>
Speed>		01.09.22 16:35:45	Speed over 14,5 m/s; Coil no.. 704201.00	Normal	<input type="checkbox"/>
Strip in F7		01.09.22 16:34:17	Strip no. 704201.00 Entry F7; Speed 11.48; Thickness 2.07	Normal	<input type="checkbox"/>
New coil		01.09.22 16:34:02	New coil number: 704201	Normal	<input type="checkbox"/>
Speed>		01.09.22 16:34:01	Speed over 14,5 m/s; Coil no.. 704200.00	Normal	<input type="checkbox"/>
Strip in F7		01.09.22 16:32:29	Strip no. 704200.00 Entry F7; Speed 10.85; Thickness 2.29	Normal	<input type="checkbox"/>
New coil		01.09.22 16:32:14	New coil number: 704200	Normal	<input type="checkbox"/>
Strip in F7		01.09.22 16:30:58	Strip no. 704204.00 Entry F7; Speed 10.98; Thickness 2.29	Normal	<input type="checkbox"/>
New coil		01.09.22 16:30:43	New coil number: 704204	Normal	<input type="checkbox"/>
Strip in F7		01.09.22 16:29:35	Strip no. 704203.00 Entry F7; Speed 11.48; Thickness 2.07	Normal	<input type="checkbox"/>

### Toolbar

The tool bar of the event table contains the following control elements:

	Starts live alarm stream.
	Starts the live display of the event table. All triggered live events are immediately displayed in the event table
	Stops the live display of the event table. It is now possible to mark individual signals in the event table
	Displays the number of events in a time range. Select the events of the event table and the time range in the dialog window. The table that appears contains a list with the number of events.
	Opens the editor for creating event queries
	Carries out the event query which has been selected in the drop-down list.
	Copies the row(s) selected in the event table to the clipboard. Only possible in pause mode.
	Exports the row(s) selected in the event table to an Excel or text file. Only possible in pause mode.
	Acknowledges all events displayed in the event table

---

### Add and query signals

All events configured in the HD event-based data storage and enabled for display appear in the table at the time of their occurrence (trigger). An event can be added from the HD signal tree either by:

- drag and drop from the signal tree into the event table or
- enabling the corresponding checkbox in the properties of the event table. To open the properties, right-click on the event table and chose *Properties*.

In order to search for historic occurrences of events, you can edit queries.

---

### Other documentation



For more information about configuration of event queries, please refer to the *ibaHD-Server* manual.

---

After a query had been executed, the event table automatically switches from live mode to pause mode. If you want to return to live mode, you have to press the corresponding button in the toolbar.

For easier control, there is a filter row with some functions below the toolbar:

- **Sorting by mouse click**  
Click on a column header to sort the events by this column in alphabetical/numerical order. Every click on the header toggles between ascending/descending order.
- **Filtering**  
You can filter the table by entering the entire name or parts of it in the input field or by choosing from available options. Press <Enter> after your entry and the table will be sorted. To return to unfiltered view, clean the filter row fields.

For detailed information about the filter functions, please refer to part 8 of the manual, chapter *Advanced filters in tables*.

---

### Tip



If you double-click an event in the list, the HD trend graph will jump to the time of the event and enter Pause mode.

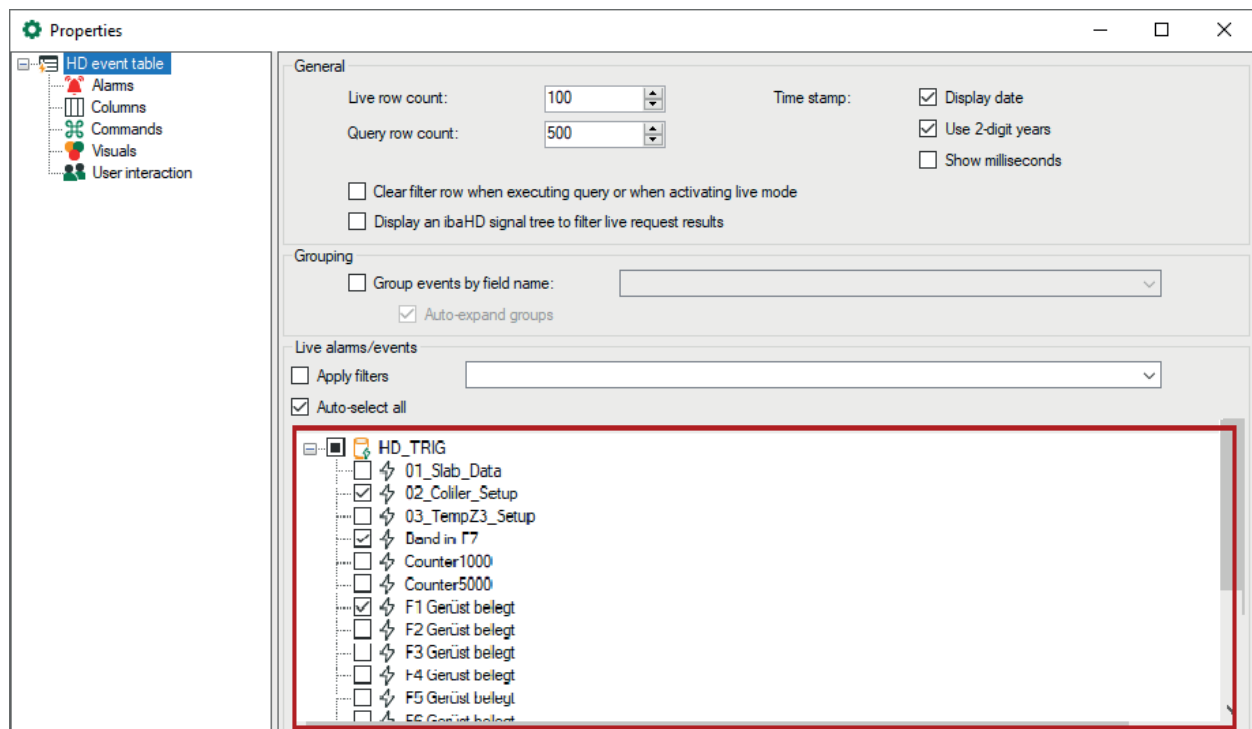
---

### Special features in pause mode

When the view is in pause mode you can select multiple rows. If you then open the context menu with a right-click, you have more features available:

- Copy selected rows to clipboard: This will copy the displayed text of the selected rows to the clipboard. Columns are separated by tabs and rows are separated by new lines.
- Export selected rows to file: This allows you to export the values of the selected rows to an Excel file (.xlsx or .xls) or a text file.

## 12.5 Properties of the HD event table



The event tree (see red frame in figure above) is only available in the properties of an event table.

## 12.5.1 Basic settings

### General

#### Live row count

Here, you can set the number of lines to be displayed in the event table with actual (live) events. A maximum of 1000 rows can be displayed.

#### Query row count

Here, you set the number of lines shall be displayed in the event table after a query had been performed. A maximum of 1000 lines can be displayed.

### Time stamp

- **Display date:**  
Enable this option for displaying the date together with the time stamp in the "Time" column. Otherwise, only the time stamp will be shown.
- **Use 2-digit dates:**  
For the display of the time stamp in the "Time" column, you can select a double digit display of the year. Otherwise, a four-digit display is shown.
- **Show milliseconds:**  
For the display of the time stamp in the "Time" column, you can select the milliseconds option. Otherwise, only seconds are displayed.

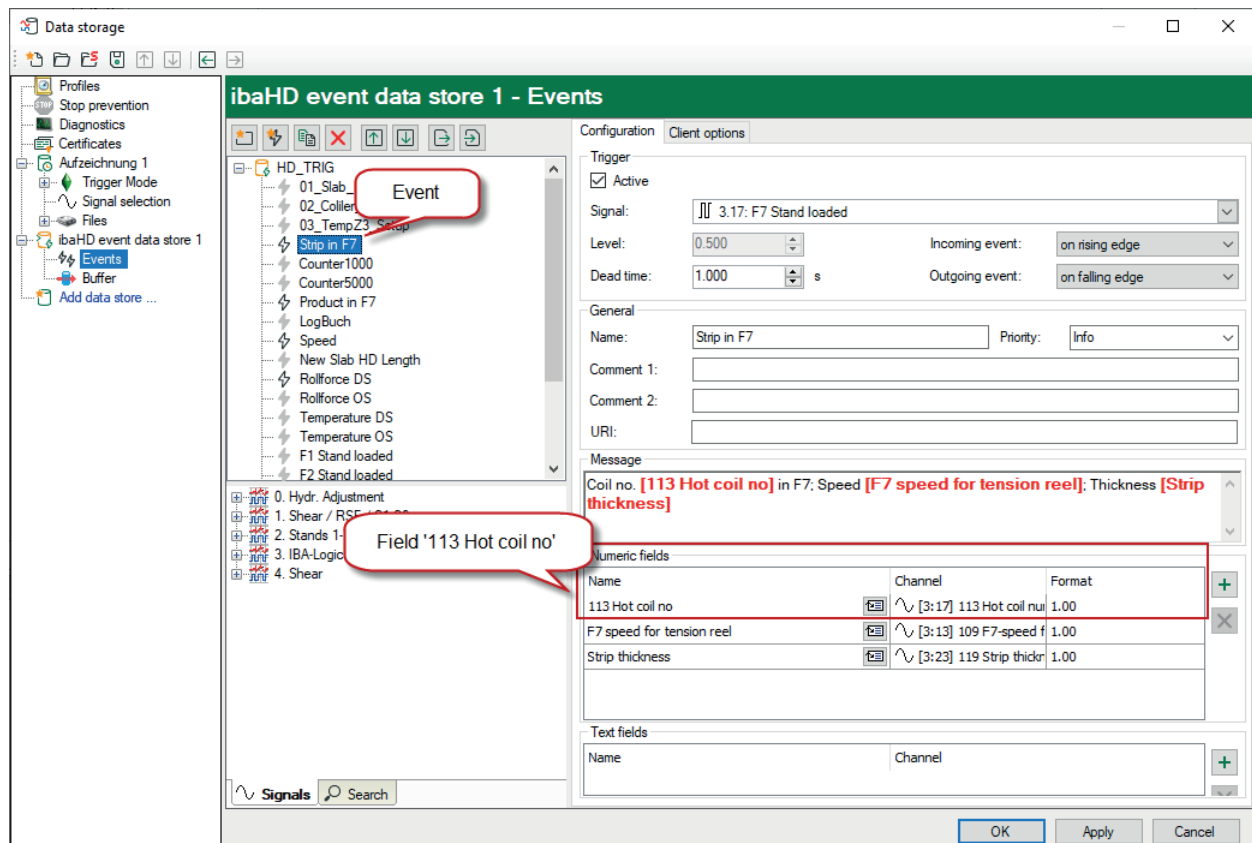
### Clear filter row when executing query or when activating live mode

When you enable this option, then the search patterns that you may have entered in the filter row are automatically deleted as soon as you execute a query or switch to the live mode of the event table. You therefore do not have to remember to manually remove the filter terms again.

### Grouping

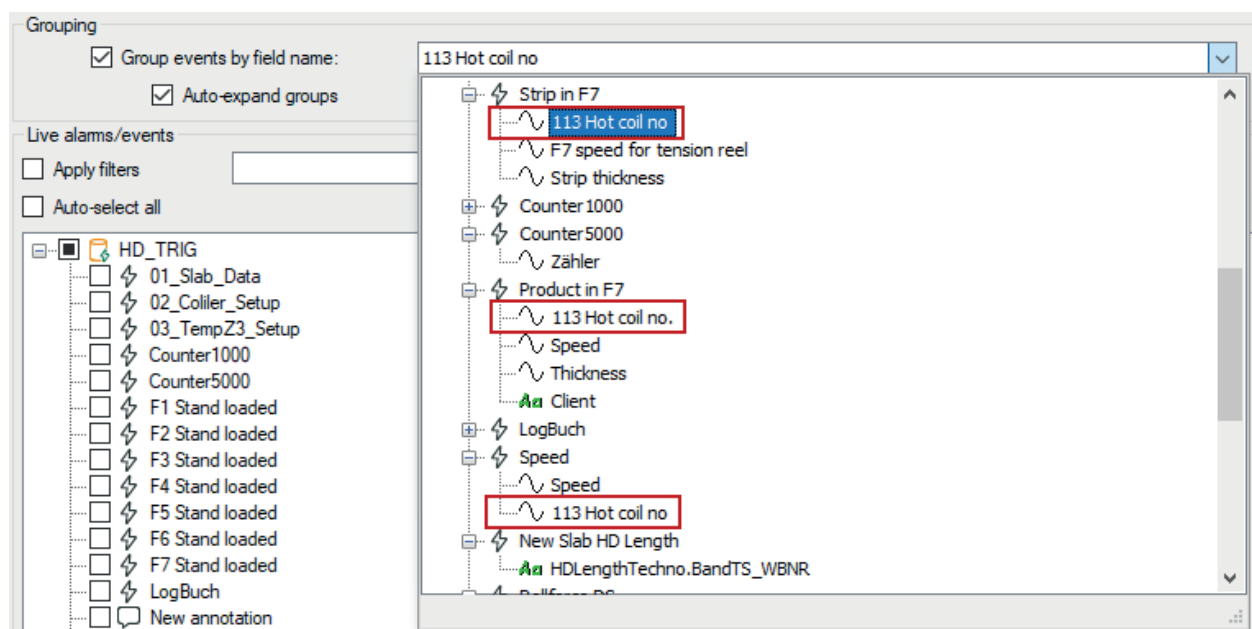
By activating this option you can group events in the table. The grouping is made with a (dynamic) field which is used in the events (see event configuration).

Example for the use of a field during the event configuration:



A grouping can only be carried out reasonably if the field has the same name in all events.

To select a field for the grouping, open the drop-down list in the settings of the event table.



All configured events with their fields are listed there. Select the required field for the grouping and click on <Apply> or <OK>.

All events contained in this field are displayed in groupings now.

In this example this is the field "Coil number".

In the table, a grouping header is set for every value of the field “113 Hot coil number” and the corresponding events will be listed below.

Events grouped according to coil numbers:

Events					
New folder/SpeedMax					
Event	Trigger	Time	Message	Priority	Ack
4204					
Strip at thickness gauge	→	2:53:51 PM	Strip 4204.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:53:51 PM	Strip 4204.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:53:37 PM	Strip 4204.00 present		<input type="checkbox"/>
Strip at thickness gauge	→	2:52:35 PM	Strip 4204.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:52:35 PM	Strip 4204.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:52:20 PM	Strip 4204.00 present		<input type="checkbox"/>
4203					
Strip at thickness gauge	→	2:52:20 PM	Strip 4203.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:52:20 PM	Strip 4203.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:52:05 PM	Strip 4203.00 present		<input type="checkbox"/>
Strip at thickness gauge	→	2:51:12 PM	Strip 4203.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:51:12 PM	Strip 4203.00 left stand F7	Normal	<input type="checkbox"/>
4202					
Strip at thickness gauge	→	2:57:48 PM	Strip 4202.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:57:48 PM	Strip 4202.00 left stand F7	Normal	<input type="checkbox"/>
Strip at thickness gauge	→	2:57:32 PM	Strip 4202.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Strip at thickness gauge	→	2:50:56 PM	Strip 4202.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:50:55 PM	Strip 4202.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:50:55 PM	Strip 4202.00 present		<input type="checkbox"/>
Photo cell FA7	→	2:50:41 PM	Strip 4202.00 present		<input type="checkbox"/>
4201					
Stand F7 discharged	→	2:57:32 PM	Strip 4201.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:57:31 PM	Strip 4201.00 present		<input type="checkbox"/>

You can minimize or extend the groups separately, if required. In the context menu of the event table you can minimize or extend all groups. In the properties dialog you can configure if the group should be extended automatically or not.

Any other events which do not contain the field for grouping are listed under an empty header.

Events					
New folder/SpeedMax					
Event	Trigger	Time	Message	Priority	Ack
4204					
4203					
4202					
4201					
4200					
Cut head end	→	3:05:19 PM	Shear cut head end		<input type="checkbox"/>
Measure roll up	→	3:05:06 PM	Measure roll up		<input type="checkbox"/>
Cut head end	→	3:05:05 PM	Shear cut head end		<input type="checkbox"/>
Measure roll up	→	3:04:40 PM	Measure roll up		<input type="checkbox"/>
New Coil	→	3:03:40 PM	New Coil number: 704201	Normal	<input type="checkbox"/>
Cut head end	→	3:03:27 PM	Shear cut head end		<input type="checkbox"/>
Cut head end	→	3:03:14 PM	Shear cut head end		<input type="checkbox"/>
Measure roll up	→	3:03:14 PM	Measure roll up		<input type="checkbox"/>



As expected, the sorting of the lines in the groups is made according to the selected sorting column (e.g. column "Time", descending). The sorting of the groups will be made after the comparison of values in the sorting column in every first line of the groups.

The first line of a group always contains the maximum or minimum value of the sorting column at ascending or descending sorting.

### Live events

Here, you can see a tree structure of all event-based HD stores of the associated *ibaHD-Server* with the events stored there.

Select here the events which have to be displayed in live mode in the event table.

Selecting the setting "Auto-select all," all events of all HD stores of the associated *ibaHD-Server* are always displayed in the event table.

---

#### Note



Events which you select by drag and drop from the HD signal tree are automatically addressed in the tree structure of the live events.

---

## 12.5.2 Alarms

### Acknowledgment

#### Local acknowledgement Do not send the acknowledgements to the HD-Server but handle them within this Event Table

If you enable this option, the manual acknowledgements of alarms will only be logged in the local event table. The same alarm remains unacknowledged on other clients and/or event lists. If you disable this option, the acknowledgement of an alarm will be performed by the *ibaHD-Server* in all event lists.

Additionally, you may activate an automatic acknowledgement of local events, if this option is enabled.

### Style

If you enable this option, the alarms will always be displayed in a certain format. You can determine how this format looks like by defining the font as well as the foreground and background color.

## 12.5.3 Columns

### Standard, acknowledge and note columns

Here you can select which columns should be shown in the event table and which should not. In addition to the standard columns, you can enable or disable special columns for acknowledgment and notes.

**Tip**

In the event table, you can always enable and disable columns via the context menu.

**Meaning of the acknowledgment columns****Acknowledgment**

This column is enabled by default and is used to acknowledge an event message. The acknowledgment occurs by clicking on the box. Once the message has been acknowledged, a check mark is shown in the box. If the column in the event table is not enabled, then an acknowledgment is not possible.

**Acknowledgment of the time stamp**

The time of the acknowledgment is shown in this column.

**Acknowledgment of a comment**

This column shows the comment that was entered or selected during the acknowledgment (see *acknowledgment options*, further below).

**Acknowledgment system user, ibaHD-User and ibaPDA-User**

In these columns, the respective user name of the user is shown who actuated the acknowledgment.

- *System-User* is the user name who is registered under Windows on the computer or the user account under which the *ibaPDA* client is running.
- *ibaHD-User* is the user name under which the client is registered on the *ibaHD* server according to the user management.
- *ibaPDA-User* is the user name under which the client is registered on the *ibaPDA* server according to the user management.

**Acknowledgment options**

You can adjust the display and handling of the acknowledgment of event messages to your needs in the acknowledgment options settings.

The screenshot shows a dialog box titled "Ack options". It contains three checked checkboxes: "Allow acknowledgment", "Make comment mandatory", and "Allow custom text input for comment". Below these is a section labeled "Dropdown comments:" which contains a list box with three items: "planned", "not planned", and "Replacement required". The list box has a search icon on the left and up/down arrow icons on the right. There is also a red 'X' button and a green checkmark button to the right of the list box.

**Allow acknowledgment**

Enable this option to be able to acknowledge messages in the event table. If you disable this option, then a mouse click in the column *Acknowledgment* does nothing.

### Comment required

If you enable this option, then a dialog for entering or selecting a comment opens automatically as soon as a message has been acknowledged. If you disable this option, then an acknowledgment is completed without comment. An acknowledgment comment can also be added or changed in the event table later.

The comment is shown in the *Acknowledgment comment* column in the event table.

### Allow user text input for comments

If you enable this option, then any plain text can be entered as a comment during the acknowledgment. This is possible as an alternative to selecting prepared comments in the drop-down list. If you disable this option, only the entries from the drop-down list can be used as an acknowledgment comment.

### Info URI

Clicking the URI shown here opens the URI in the computer's default browser.

If this column is not displayed, you can also open the URI by using <Alt>+click on any area of the event entry.

### Drop-down comments

In this list, you can enter acknowledgment comments that are then available to choose from in the drop-down list during acknowledgment. Use the arrow symbols to the right of the list to change the sequence of the comments. Use the delete icon to remove the comment in which the cursor is located.

### Event fields

Event field columns

☒ Create columns for event fields

☐ Dynamically create columns for all fields in table

☒ Create columns for the following fields:

Product number	▼
Speed	▼
119 Strip thickn. beh. F7	▼
*	▼

If you use dynamic fields in the event messages that display actual values of the measured variables, for instance, then you can enable additional columns in the event table for these fields here in the area of the event fields.

One advantage of these additional columns is that they can filter the event table according to the field values.

Example from the event definition with dynamic numeric fields (HD data storage):

Message

Coil no. [113 Hot coil no] in F7; Speed [F7 speed for tension reel]; Thickness [Strip thickness]

Numeric fields

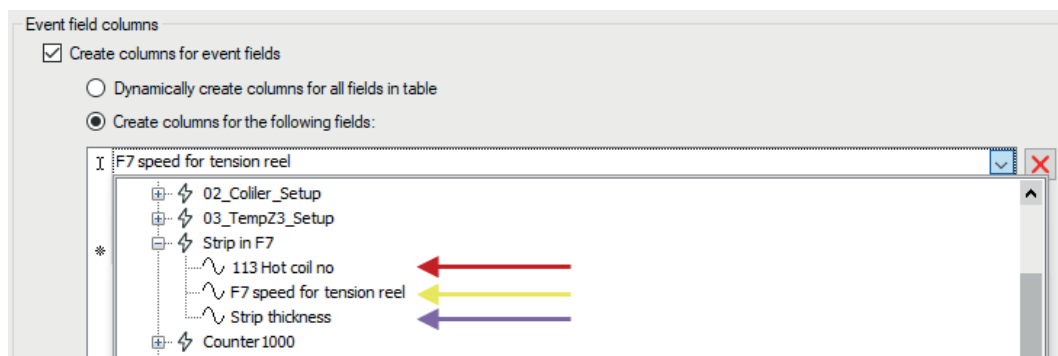
Name	Channel	Format
113 Hot coil no	^ [3:17] 113 Hot coil no	1.00
F7 speed for tension reel	^ [3:13] 109 F7-speed f	1.00
Strip thickness	^ [3:23] 119 Strip thickn	1.00

Example of display of event fields and the associated columns in the event table:

Event	Trigger	Time	Message	/	Ack	F7 speed fo...	Strip thickness	113 Hot coil no
Strip in F7		8/1/22 4:46:07 PM	Coil no. 4200.00 in F7; Speed 10.85; Thickness 2.29		<input type="checkbox"/>	10.853	2.285191	4200
Strip in F7		8/1/22 4:47:55 PM	Coil no. 4200.00 in F7; Speed 10.85; Thickness 2.29		<input type="checkbox"/>	10.853	2.285191	4200
Strip in F7		8/1/22 4:42:16 PM	Coil no. 4200.00 in F7; Speed 14.59; Thickness 2.29		<input type="checkbox"/>	14.59354	2.292516	4200

By selecting the corresponding option field, you can optionally have the columns displayed automatically or select them specifically by hand.

Click on the drop-down list for a targeted selection. A window with the event tree opens, just as the events were defined when configuring the HD storage. Once configured, you will find the corresponding numeric fields or labels under the event nodes.

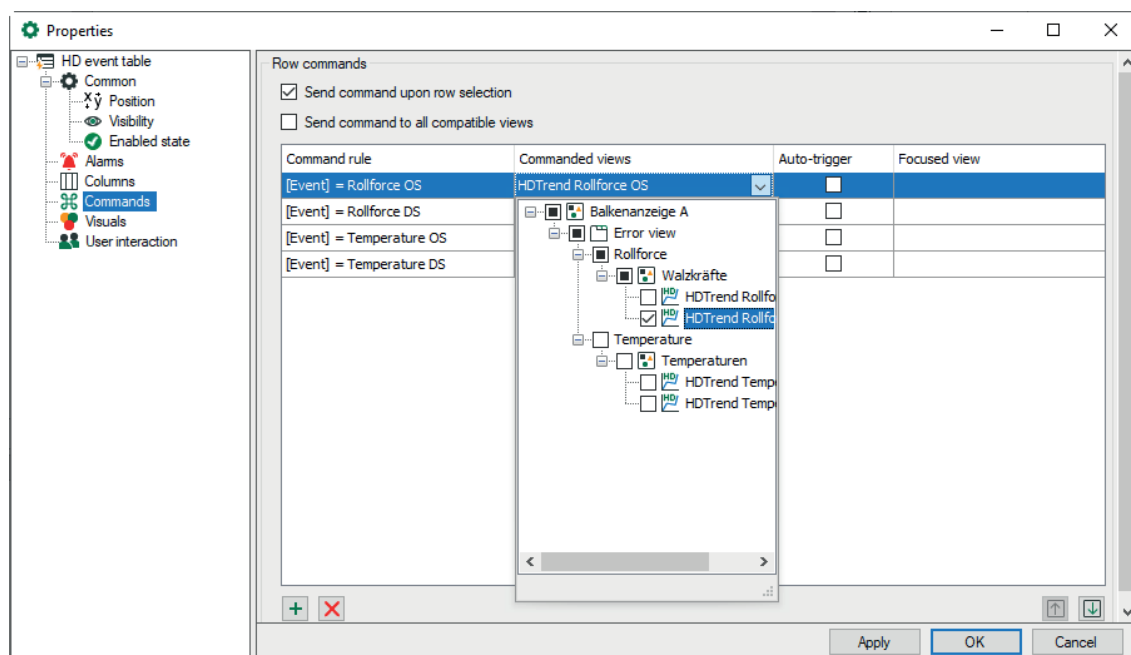


Click on the desired field and it will be included in the list for event field columns.

## 12.5.4 Commands

Event tables can be coupled with HD trend graphs so that when double-clicking on an event line the desired trend graph stops and is placed on the right position of the time or length axis.

In the branch "Commands" in the properties of the event table you can set such line commands.



If you do not enable both options for row commands, then double clicking on an event in the event table does nothing.

If you want all HD trend graphs to jump to the time of the event that you have double clicked, then enable the option *Send command to all compatible views*. The command rules will be disabled in this case.

If you want only certain trend graphs to jump to the time of an event and others to continue to run as normal, then only enable the option *Send command during row selection* and configure the appropriate command rules.

Using the command rules, you can specify exactly for which event and under which conditions which trend views jump to the time of the event.

In the column *Relevant views*, you select the trend graphs which have to be stopped and positioned when the conditions are fulfilled.

If you make a check mark for a command rule in the 'auto-trigger' column, then the view is automatically switched when the configured condition occurs.



You can define as many command rules as you want.

---

#### Note



The list of command rules will be checked from the top down when double clicking on a row in the event table. At the first applied rule, the check will be finished and the command is forwarded to the assigned views.

You can modify the sequence of the rules: Use the button  to move the marked rule up and the button  to move it down.

---

#### Note



When using the command rules, double clicking in the event table is only successful for the events that are included in the command rules.

---

### Configure command rule



Adds a new rule.



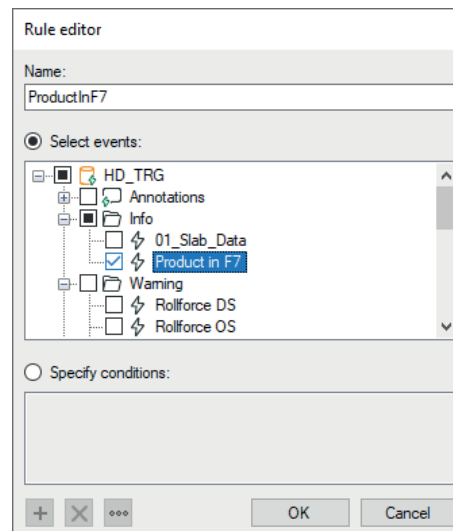
Deletes the marked rule.



Opens the editor for editing the rule

Add a new command rule.

The dialog *Edit rule* opens.



First give the rule a meaningful name.

A rule offers two mutually exclusive methods.

If you enable the “Select events” option, then you can mark one or more events in the tree below that trigger a switching of the trend view, either by the status change "incoming" and/or "outgoing" (auto-trigger) or by double clicking on an event row. For events that are not marked here, the trend view will continue to run.

#### Tip



This method is suitable if you only want to switch certain trend views when double clicking on any event. To do this, mark all events in the tree.

If you enable the "Specify conditions" option, then you can formulate check conditions in the field below that are executed when double clicking on an event row. In the auto-trigger mode, the conditions are checked constantly.

If a condition is met, the trend view is switched.

#### Configure conditions

A condition can consist of one or more expressions that are linked with each other.



Adds a new expression.





Deletes the marked expression.



Opens the editor for editing the expression.

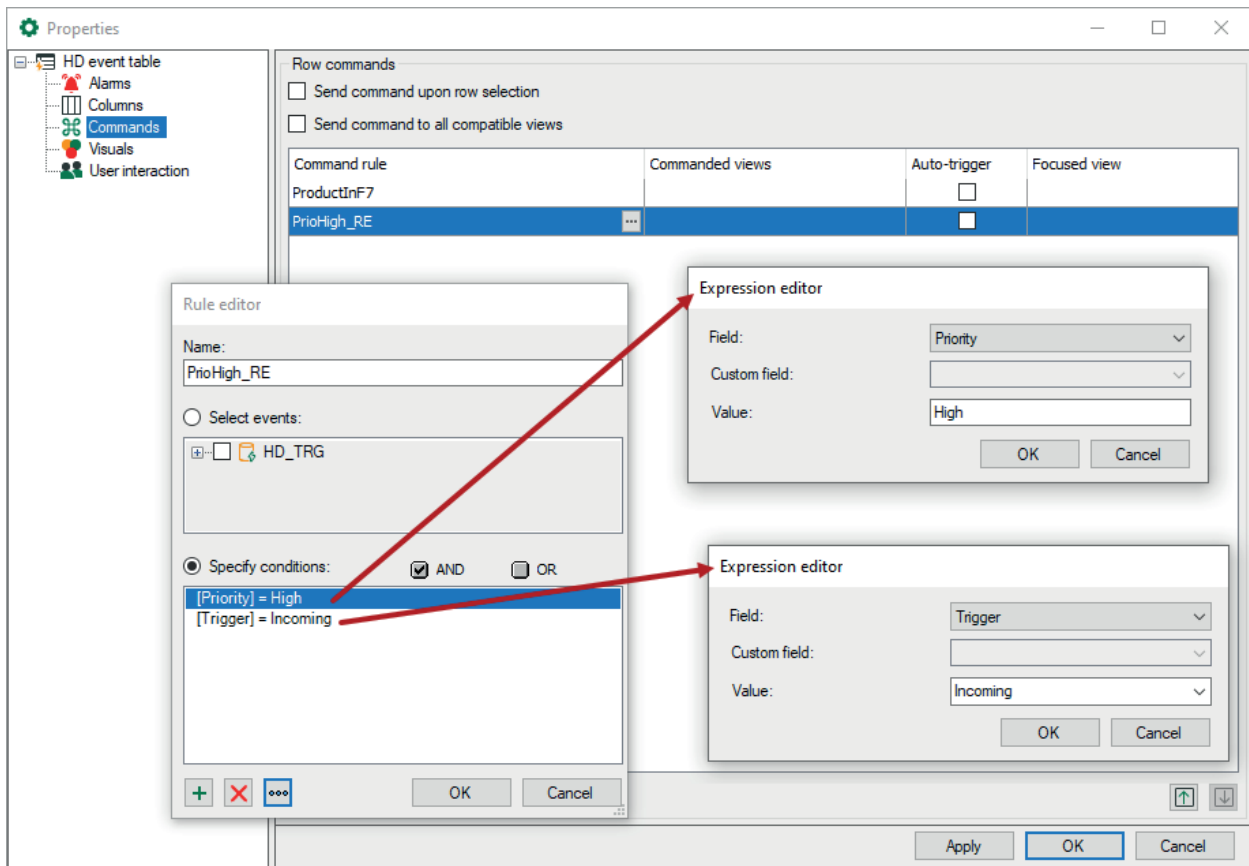
If a condition contains several expressions, then these will be linked with a logical AND or OR.

Click the button  in order to add an expression or the button  to edit an existing expression. In the *Edit expression* dialog, first select a field (e.g. event, comment, trigger, etc.) and then the value (e.g. event name, plaint text incoming/outgoing, etc.)

In the following example, double-clicking on events stops the HD trend graph named "Rolling forces" and sets it to the time stamp of the clicked event. The events meet the following requirements:

- Priority = "High"
- Trigger = "Incoming"

Command rule with two conditions that must be simultaneously met:



**Note**

In an expression you can select the field type "Custom". Therefore commands can be written in order to request number and text fields from the event definition.

Expression editor

Field: Custom

Custom field: 113 Hot coil no

Value: 4200

OK Cancel

With this expression, for example, you could check by double clicking on the event whether it has a number field or label called "coil number" and if it is equal to the value "4200".

Name	Channel	Format
113 Hot coil no	[3:17] 113 Hot coil number	1.00
F7 speed for tension reel	[3:13] 109 F7-speed for tension r	1.00
Strip thickness	[3:23] 119 Strip thickn. beh. F7	1.00


This argument would be met, for example, for the following event:

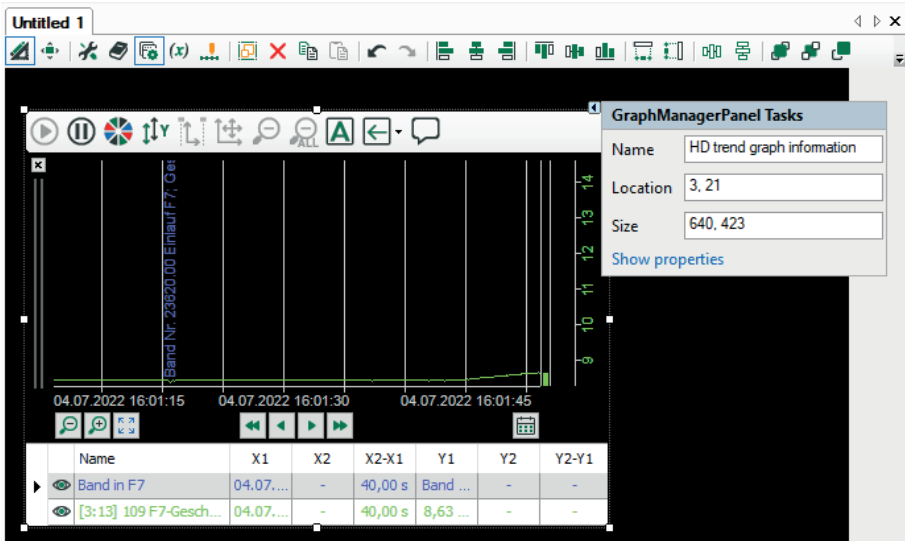
Event	Trigger	Time	Message	Priority	Ack
Strip in F7		8/2/22 10:28:56 AM	Coil no. 4200.00 in F7; Speed 10.85; Thickness 2.29	Info	<input type="checkbox"/>
Strip in F7		8/2/22 10:23:17 AM	Coil no. 4200.00 in F7; Speed 14.59; Thickness 2.29	Info	<input type="checkbox"/>



Note



You can also send commands to HD trend graphs which are placed in *ibaQPanel*. To name an HD trend graph in *ibaQPanel*, in the design mode click on the triangle icon  in the upper right corner of the HD trend graph. Enter the desired designation in the text field "Name".



12.5.5 Visuals

Similar to the commands (see above), the style of the rows in the event table can be controlled, depending on the properties of the occurred event.

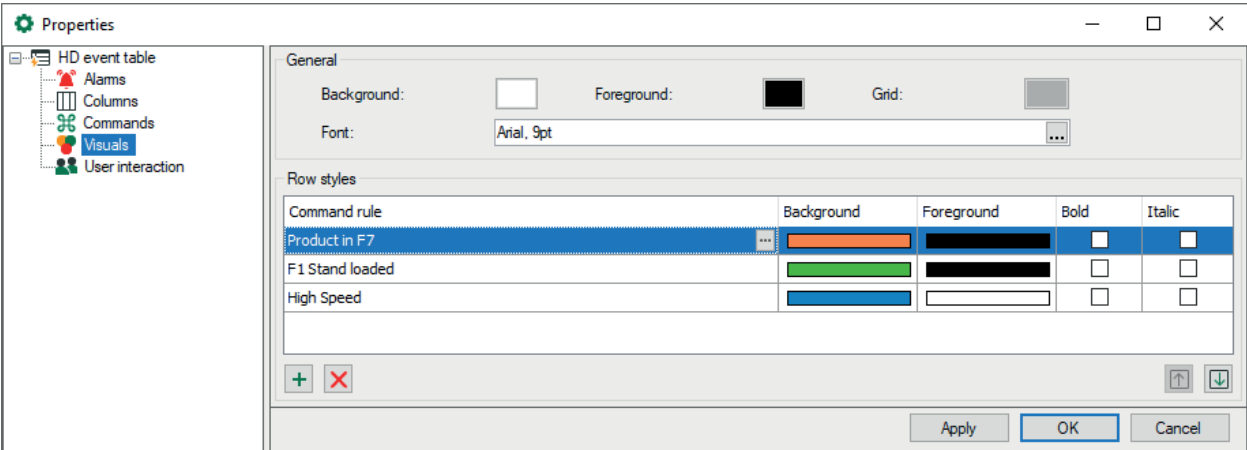
In the "Pane" heading in the properties of the event table, you can set such row styles locally on the *ibaPDA* client.

Note



For every event, you can specify the row style globally already during the event definition (configuration of the HD record, tab *Client options*).

These global row styles are overwritten by the local settings that you make in the properties of the event table.





## General


Here, you set the overall performance of the event table, background and foreground color, the color of the grid and the font.

## Row styles

In the "Row styles" list, you create rules and corresponding style modifications (background and foreground color, bold and italic print of the font).

 Adds a new rule at the end of the list.



 Deletes the marked rule.

 Opens the editor for editing the rule

## Note

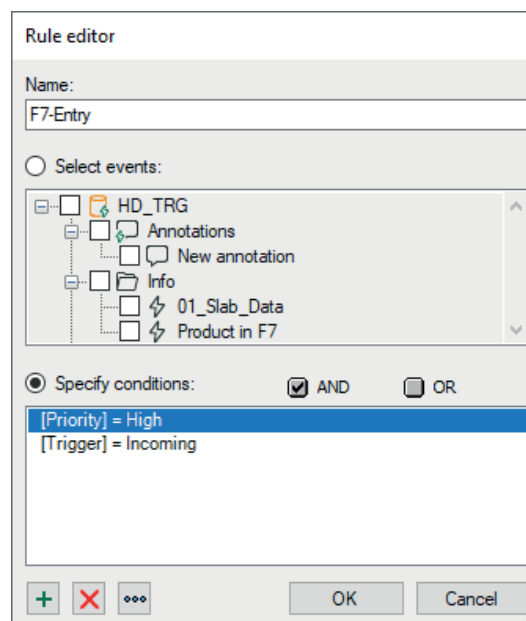


By double-clicking, the list of rules is checked from the top to the bottom. At the first applied rule, the check will be finished and the style modification will be made.

You can modify the sequence of the rules: Use the button  to move the marked rule up and the button  to move it down.

Add a new command rule.

The dialog *Rule editor* opens.



First give the rule a meaningful name.

A rule offers two mutually exclusive methods.

If you enable the "Select events" option, then you can mark one or more events in the tree below that are shown with the row style corresponding to the rule.

**Tip**

This method is suitable if you want to assign a row style to certain events.

If you enable the "Specify conditions" option, then you can formulate check conditions in the field below that are checked constantly during acquisition.

If a condition is met, the corresponding event is provided with the row style.

A condition can consist of one or more expressions that are linked with each other.



Adds a new expression.



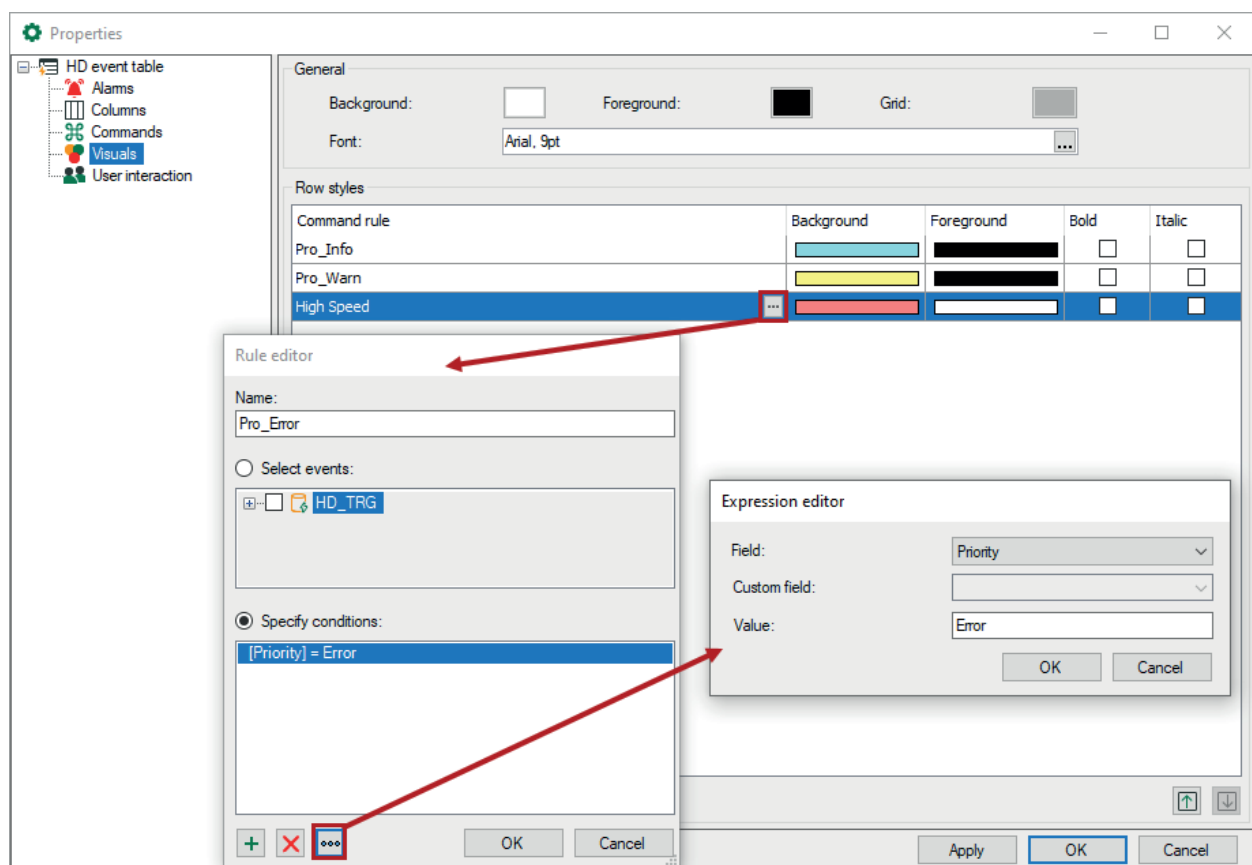
Deletes the marked expression.












Opens the editor for editing the expression.

If a condition contains several expressions, then these will be linked with a logical AND or OR. In the *Edit expression* dialog, first select a field (e.g. event, comment, trigger, etc.) and then a value (e.g. event name, plaint text incoming/outgoing, etc.)

In the example below, for all events the background is colored red and the font is shown in bold. The events meet the requirement priority = "Error".



The row styles shown above as an example change the appearance of an event table as follows:

Event	Tri...	Time	Message	Priority	Ack
					<input type="checkbox"/>
<b>Tension Uncoiler 1</b>		<b>25.04.12 12:00:46</b>	<b>Tension Uncoiler #1 50% above SP level (SP: 35.0 [kN], AV: 35.8 [kN])</b>	<b>Error</b>	<input type="checkbox"/>
Tension Uncoiler 1		25.04.12 12:00:46	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 35.8 [kN])	Warning	<input type="checkbox"/>
<b>Tension Uncoiler 1</b>		<b>25.04.12 12:00:39</b>	<b>Tension Uncoiler #1 50% above SP level (SP: 35.0 [kN], AV: 62.1 [kN])</b>	<b>Error</b>	<input type="checkbox"/>
Tension Uncoiler 1		25.04.12 12:00:39	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 62.1 [kN])	Warning	<input type="checkbox"/>
Coil on Uncoiler 2		25.04.12 12:00:25	New Coil '4AB12346 ' on Uncoiler #2 (Diam.: 1675 mm, Thickn.: 1.01 mm)	Information	<input type="checkbox"/>
Tension Uncoiler 1		25.04.12 12:00:14	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 37.0 [kN])	Warning	<input checked="" type="checkbox"/>
Tension Uncoiler 1		25.04.12 12:00:09	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 47.8 [kN])	Warning	<input checked="" type="checkbox"/>
New Coil welded		25.04.12 11:59:17	Coil '4AB12345 ' welded (Diam.: 1870 mm, Thickn.: 1.02 mm)	Information	<input type="checkbox"/>
Coil on Uncoiler 1		25.04.12 11:58:24	New Coil '4AB12345 ' on Uncoiler #1 (Diam.: 1870 mm, Thickn.: 1.02 mm)	Information	<input checked="" type="checkbox"/>

## 13 HD time periods table

The HD time periods table is a special view linked to the so called "time periods", which is an extended feature of the time based HD data store. The time periods need to be defined in the configuration dialog of the timebased HD datastore before they can be displayed in the time periods table. Furthermore, the configured time periods must have been recorded at least once from the beginning to the end in order to display their data in the table.

By means of the time periods, ranges of time which are delimited by a start event and a stop event (trigger condition, signals etc.) can be selected from an HD time based data store and put on display. Temporal limited time ranges (hours, days, months, shifts etc.) are possible as well.

Moreover, KPIs or other statistical quantities can be evaluated over these time periods and stored, like info fields in a data file.

---

### Other documentation



For more information about configuration of the HD server, the time-based HD data storage and HD time periods, please refer to the *ibaHD-Server* manual.

---

### 13.1 Connecting to an HD server

Before HD time periods can be displayed in an HD time periods table, a connection between the *ibaPDA* client and the HD server where the time periods are recorded must be established.

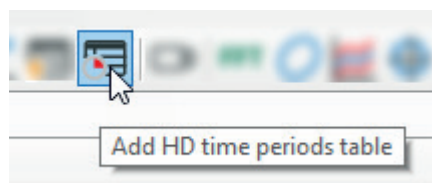
See chapter ↗ *Connecting to HD server*, page 130

The feature of time periods is supported by *ibaHD-Server* version v3.1 or higher.

### 13.2 Adding an HD time periods table

An HD time periods table can be added by

- clicking the corresponding toolbar button



- or by using the *View – Add view- Add HD time periods table* menu

## 13.3 Operation of the time periods table

Name	Start time	End time	coil id
coil_29	10/11/2022 11:19:41	10/11/2022 11:19:45	29
coil_28	10/11/2022 11:19:35	10/11/2022 11:19:53	28
coil_27	10/11/2022 11:19:33	10/11/2022 11:20:01	27
coil_26	10/11/2022 11:19:13	10/11/2022 11:19:26	26
coil_25	10/11/2022 11:18:56	10/11/2022 11:19:20	25
coil_24	10/11/2022 11:18:28	10/11/2022 11:18:31	24
coil_24	10/11/2022 10:41:14	10/11/2022 10:41:17	24
coil_23	10/11/2022 10:32:31	10/11/2022 10:32:36	23
coil_23	10/11/2022 10:32:30	10/11/2022 10:32:36	23
coil_23	10/11/2022 10:32:28	10/11/2022 10:32:36	23
coil_22	10/11/2022 10:32:19	10/11/2022 10:32:21	22
coil_21	10/11/2022 10:21:39	10/11/2022 10:21:53	21
coil_20	10/11/2022 10:21:36	10/11/2022 10:21:44	20

### Toolbar

The tool bar of the time periods table contains the following control elements:

	Starts the live display of the time periods.
	Stops the live display of the time periods (pause). It is now possible to mark individual lines in the table.
	Opens the editor for creating SQL-queries.
	Carries out the SQL-query which has been selected in the drop-down list.
	Shows the signal tree.
	Highlights automatically the most recently added line.
	Copy the time periods which are selected in the table to the clipboard. Only possible in pause mode.
	Exports the time periods which are selected in the table to an Excel or text file. Only possible in pause mode.

You can display time periods from different time period stores of an HD-Server in the table.

Select the time period store which should be displayed. You have the following options:

- Open the tree by clicking the signal tree button in the toolbar and select there the time period store which should be displayed.
- Or drag and drop the time period store out of the HD signal tree into the table.
- Or open the properties by a right mouseclick in the time periods table and select the time period store there.

In live mode new lines will be added when new time periods are generated. The lines are updated when the end time or other info fields are updated.

### Status bar

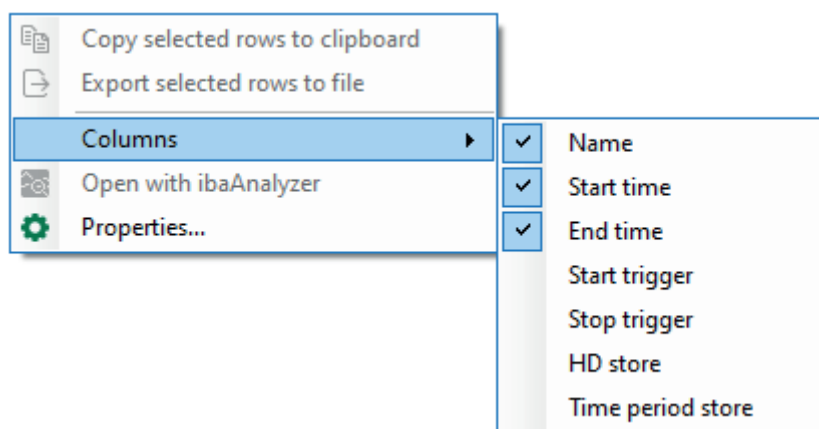
The status bar is on the lower border of the table. It gives information about the SQL-queries carried out (e.g. status of the running query, number of the events, error messages) and if a filter is currently active.

### Sorting

The table can be sorted ascending or descending by every column. Click on the header of the column which you want to use as sorting criterion. The little arrow (up or down) indicates the sorting order (descending or ascending). By default, the descending order is selected for the "Start time" column. Hence, the most recent event is always on top.

### Show/hide columns

If you right-click on the table, you can select the visible columns or hide columns in the context menu.



In the upper section of the context menu, you can select the standard columns, and in the lower section the columns for the info fields. The info field columns that appear in the context menu can be configured in the properties of the time periods table, see next section.

### View a time period in ibaAnalyzer

In order to load a time period out of the table into *ibaAnalyzer* and open it, make a right-click on the desired row and select *Open with ibaAnalyzer* in the context menu. If *ibaAnalyzer* v8.1 or higher is installed on your system, the time period will be opened showing the info fields of the time period. Moreover, the name of the time period is applied as file name. If an older version of *ibaAnalyzer* is installed, then just the time range will be opened and no time period info fields will be queried.

### Special features in pause mode

When the view is in pause mode you can select multiple time period rows. If you then click on *Open with ibaAnalyzer* in the context menu, all selected time periods are opened as separate files in *ibaAnalyzer*.

There are some more features available in the context menu while in pause mode:

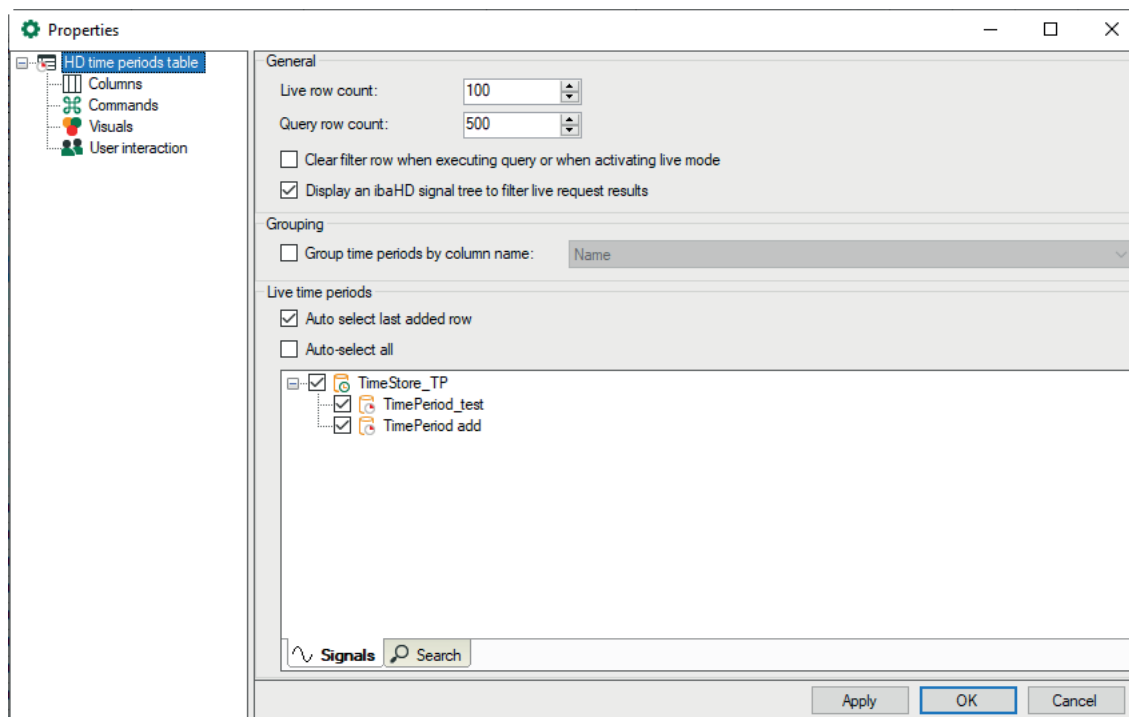
- Copy selected rows to clipboard: This will copy the displayed text of the selected rows to the clipboard. Columns are separated by tabs and rows are separated by new lines.
- Export selected rows to file: This allows you to export the values of the selected rows to an Excel file (.xlsx or .xls) or a text file.

These commands can also be triggered by the last two buttons in the toolbar.

## 13.4 Properties of the HD time periods table

To open the properties dialog, right-click in the HD time periods table and select *Properties* from the context menu.

### 13.4.1 General Settings



#### General

##### Live row count / Query row count

Here, you can set how many rows are to be displayed in the HD time periods table with current time periods and/or how many rows are to be displayed after a query. A maximum of 1000 rows can be displayed.

##### Clear filter row when executing a query or when activating live mode

Enabling this option automatically deletes any search patterns you have entered in the filter row as soon as you execute a query or switch to live mode in the table. This means that you do not have to remember to manually remove the filter terms.

##### Display an HD signal tree to filter live request results

Enabling this option displays the tree structure for the ibaHD time periods.

#### Grouping

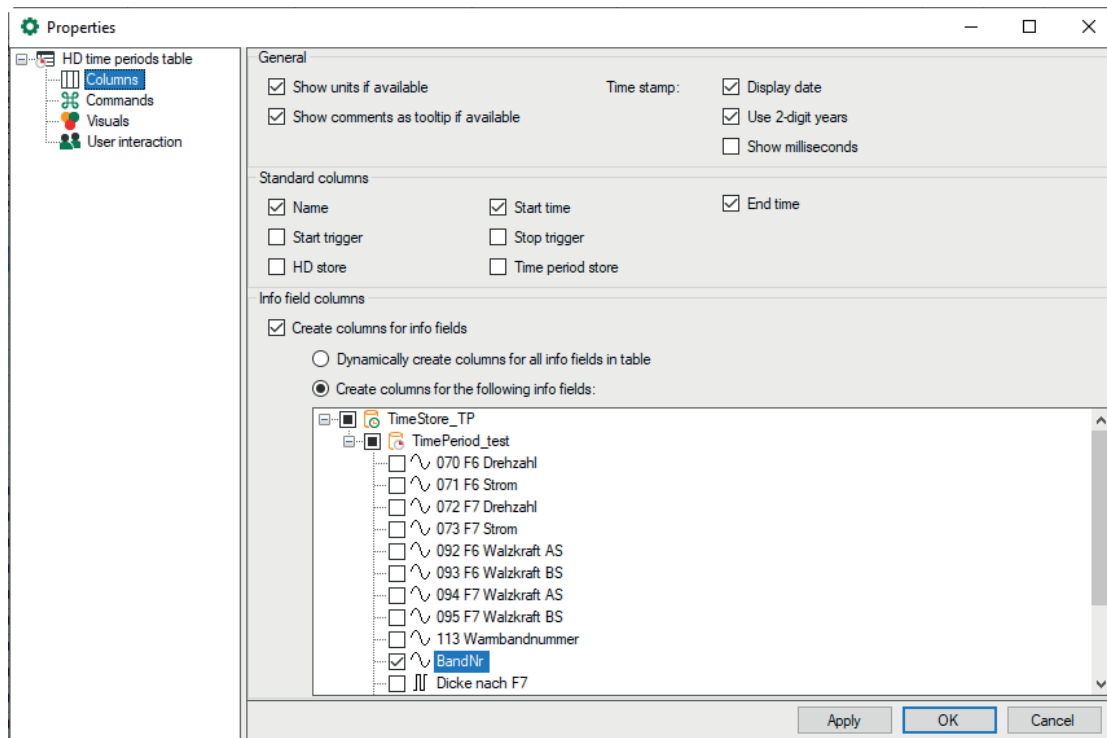
Enabling this option allows you to group time periods in the table using columns. Select a column in the adjacent field.

#### Live time periods

Here, you can specify whether the last row added is to be selected automatically. In the tree structure, you can select the time period store from which the time periods are to be displayed. Select the corresponding stores and the time periods.



## 13.4.2 Columns



### General

Use the options to choose how the data will be formatted in the columns.

### Standard columns

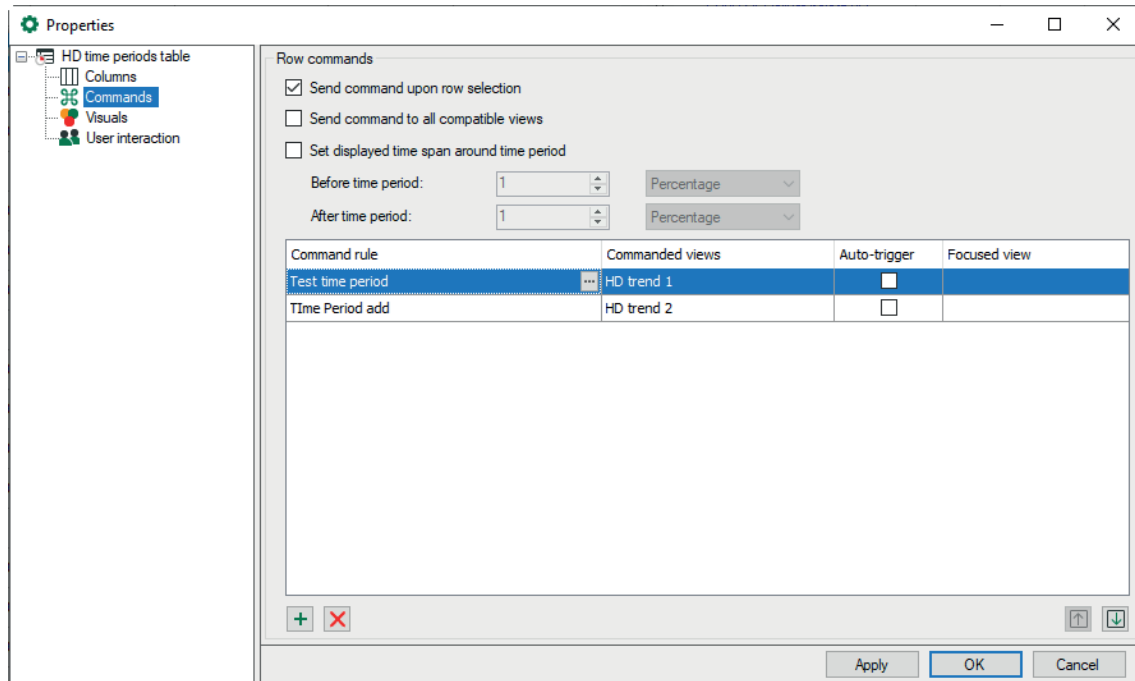
The selected columns are displayed in the HD time periods table.

### Info field columns

You can select the info fields in the tree structure for which a column is added. It is also possible to automatically add columns for all info fields. The selected columns can then be shown or hidden using the context menu in the table. If info fields from different HD time period stores have the same database column name, they are merged a single column in the table.

### 13.4.3 Commands

Time period tables can be linked to HD trend graphs, which means that when you double-click on a row in the table the HD trend graphs show the time period selected in the row from start to end.



The *Send command to all compatible views* option is enabled by default. This means that when you double-click on a row in the table, all HD trend graphs show the selected time period. In this case, the command rules are disabled.

If you enable *Send command upon row selection*, you only have to select a row to execute the command, instead of double-clicking on the row.

The *Set displayed time span around time period* option enables you to add an additional time span before and/or after the period in which the signals are shown in an HD trend graph.

If you only want certain HD trend graphs to show the selected time period, disable the *Send command to all compatible views* option and configure appropriate command rules.

A command has the following properties

- **Command rule:** The rule defines the time period to which the command applies. You can select time period stores or define conditions for columns.
- **Commanded views:** Here, you can select the views that you want to switch to the selected time period.
- **Auto-trigger:** If Auto-trigger is enabled, the command is triggered when a row that meets the rule is added to the table. If Auto-trigger is not enabled, you have to select or double-click on the row, depending on the *Send command upon row selection* option, to trigger the command.
- **Focused view:** Here, you can select whether you want to enable a different view after the command has been triggered.

**Note**

The list of command rules is checked from the top down when you double-click on a row in the table. When the first applicable rule is found, the check is finished and the command is forwarded to the assigned views.

You can change the order using the arrow buttons to move the selected row up or down.

**Configure command rule**

You can change the order using the arrow buttons to move the selected row up or down.



Adds a new rule.

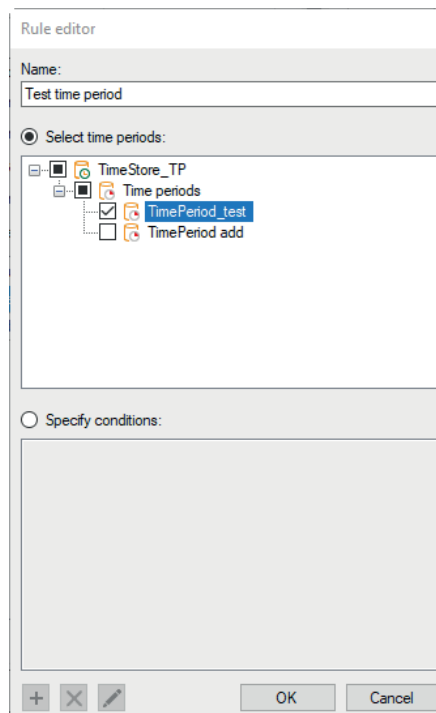


Deletes the selected rule.



Opens the editor for editing the rule

Add a new command rule. The *Rule editor* dialog opens.



First give the rule a meaningful name. A rule provides two mutually exclusive methods.

If you enable the *Select time periods* option, you can select one or more time periods in the tree below that trigger a switching of the HD trend view when a row is either selected or double-clicked.

If you enable the *Specify conditions* option, then you can enter check conditions in the field below that are executed when double clicking on a row. In auto-trigger mode, the conditions are checked continuously.

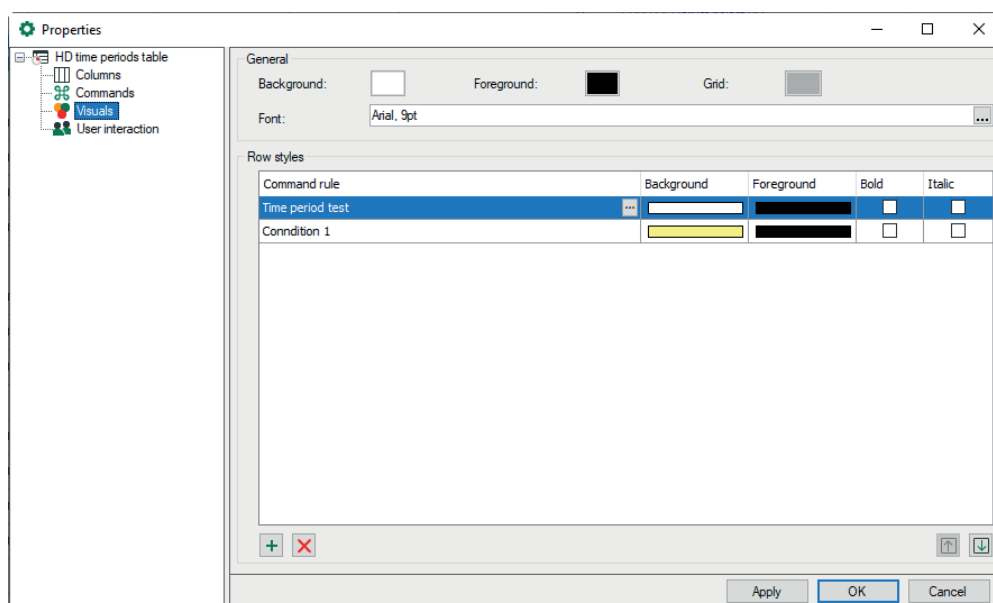
If a condition is met, the trend view is switched.

## Configuring conditions

The procedure for configuring a condition is the same as that for event tables. See chapter [Commands](#), page 140.

### 13.4.4 Visuals

Set up the appearance of the time periods table here.



#### General

Here, you can set the overall appearance of the table, i.e. the background and foreground color, the color of the grid and the font.

#### Row styles

The row style can be controlled depending on the properties of the time periods. In the *Row styles* list, you can create rules and associated style modifications.

**+** Adds a new rule at the end of the list.

**X** Deletes the selected rule.

**...** Opens the editor for editing the rule

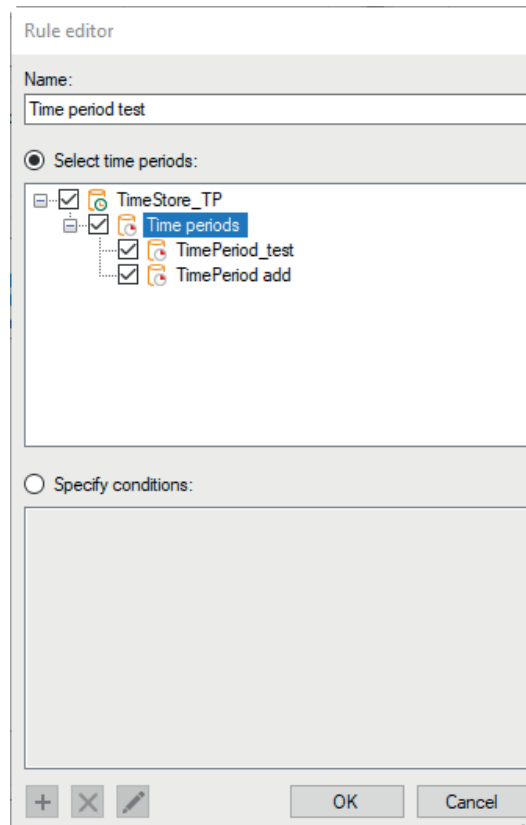
#### Note



Double-clicking checks the list of rules from top to bottom. When the first applicable rule is found, the check is finished and the style modification is made to the row.

You can modify the sequence of the rules: Use the button to move the selected rule up and the button to move it down.

Add a new command rule. The *Rule editor* dialog opens.



First give the rule a meaningful name. A rule provides two mutually exclusive methods.

If you enable the “Select time periods” option, you can select one or more time periods in the tree below that will be displayed using the row style corresponding to the rule.

#### Tip




This method is suitable if you want to assign a row style to certain time periods.

If you enable the *Specify conditions* option, then you can enter check conditions in the field below that are checked continuously during acquisition. If a condition is met, the corresponding time period is assigned the relevant row style. A condition can consist of one or more expressions that are linked with each other.


**+** Adds a new expression.

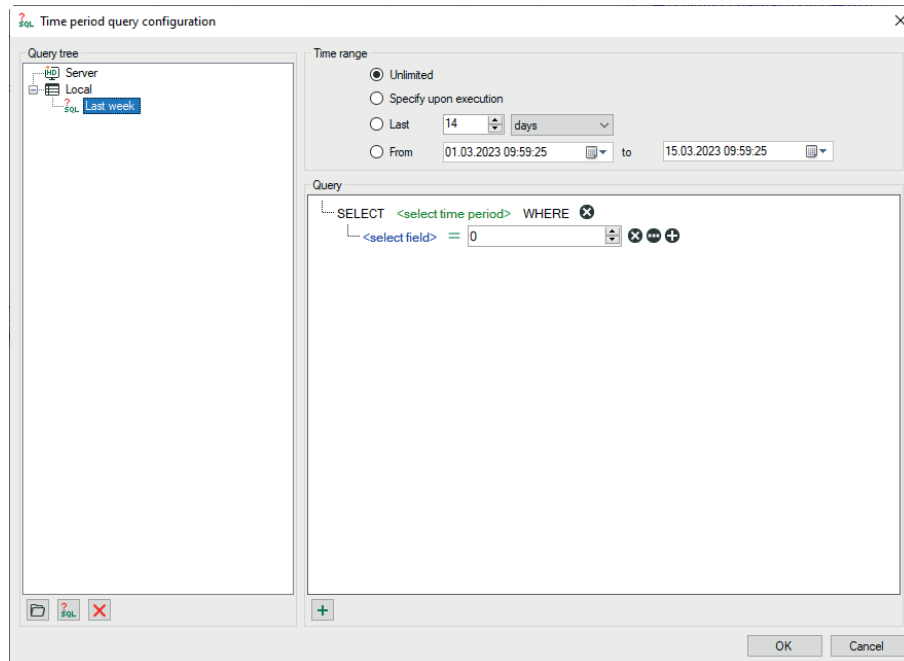
**X** Deletes the selected expression.

 Opens the editor for editing the expression.

## 13.5 Configuration of queries




In the toolbar of the HD time periods table, you can filter the rows displayed by certain criteria. Enter a value or configure a query by clicking on the icon. If you remove a value, the filter is deleted.

Click on the  **SQL** icon in the toolbar for the time periods table to configure queries.



### Configuring queries

All existing queries are shown in the query tree. You can arrange queries by using a directory structure.

	Adds a new folder at the selected position
	Adds a new query at the selected position
	Deletes the selected node and eventually secondary nodes

There are two types of queries:

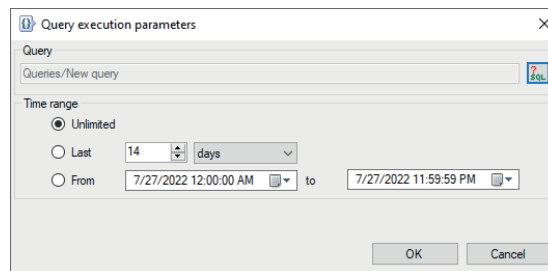
- **Server queries** are saved on the *ibaHD-Server*, which means that all connected clients can use the same server queries.  
Note: Only users who have the right *Edit ibaHD queries* can save or edit server queries.
- **Local queries** are saved in the layout. Other connected clients cannot see these.

### Query range

Every query is executed over a defined time range. There are several options for restricting the query range.

- **Unrestricted:** The query covers the entire HD recording

- Specify upon execution: After clicking on the start button for the query, a dialog appears in which you have to specify the query range



The dialog box titled "Query execution parameters" contains a "Query" section with a text field "Queries/New query" and a "Time range" section. The "Time range" section has three radio buttons: "Unlimited" (selected), "Last" (with a value of 14 and a unit of "days"), and "From" (with a date range from 7/27/2022 12:00:00 AM to 7/27/2022 11:59:59 PM). There are "OK" and "Cancel" buttons at the bottom.

Clicking on <OK> executes the query.

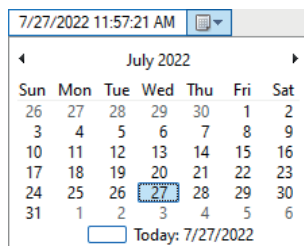
- The last xx minutes/hours/days/weeks/months: The query only covers a fixed period of time from the start of the query, e.g. the last 8 hours for a shift overview.
- From *Date* to *Date*: The query covers the time period between the set days (inclusive).

### Tip



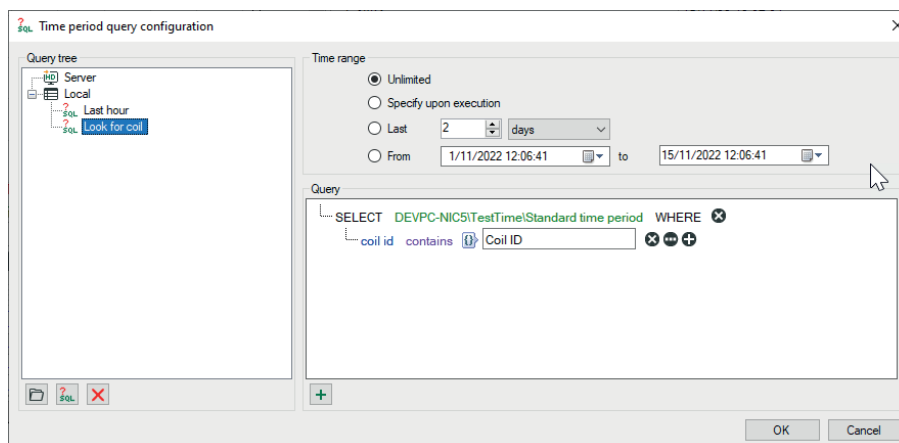
To set the current date, open the Date & Time Picker by clicking on the down arrow.

Here you can select the entry under "Today..."



The date and time picker shows the current date and time as 7/27/2022 11:57:21 AM. Below it is a calendar for July 2022. The date 27 is highlighted. At the bottom, it says "Today: 7/27/2022".

### Query details



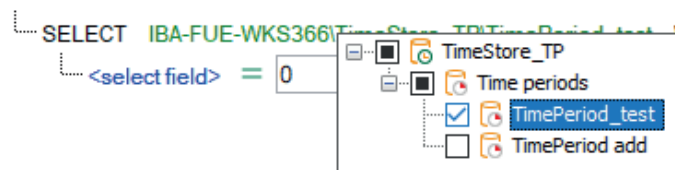
The "Time period query configuration" dialog box shows a "Query tree" on the left with a tree structure: Server > Local > Last hour > Look for coil. The "Time range" section has three radio buttons: "Unlimited" (selected), "Specify upon execution", and "From" (with a date range from 1/11/2022 12:06:41 to 15/11/2022 12:06:41). The "Query" section contains a text field with the following SQL-like query: `SELECT DEVPC-NIC5[TestTime]Standard time period WHERE coil id contains Coil ID`. There are "OK" and "Cancel" buttons at the bottom.

Here, you create the actual query using notation similar to SQL.

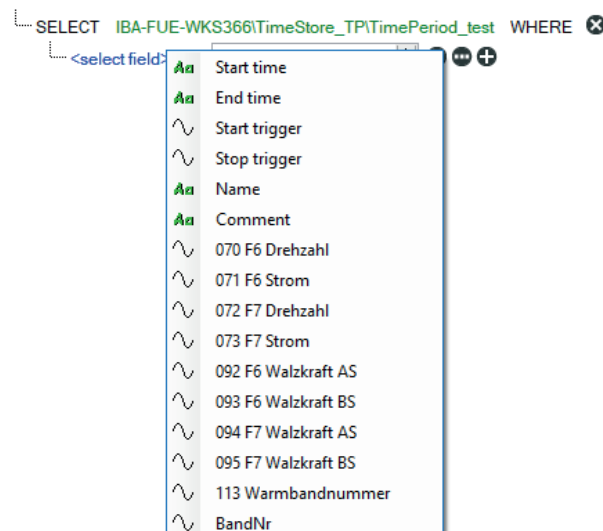
The query begins with a SELECT statement.

```
SELECT <select time period> WHERE
<select field> = 0
```

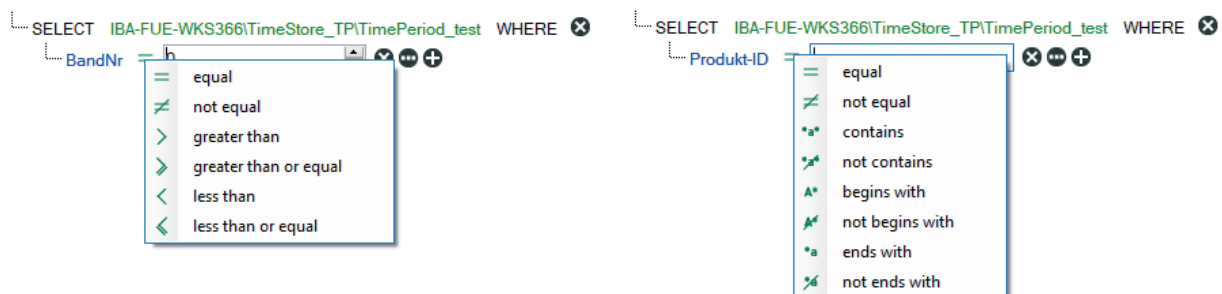
Clicking on the green text opens the tree structure for the configured time periods. Select the time period you want to search for.



Click on the blue text to select a column in the table or any existing information fields.



Depending on the selected field (numeric or text field), clicking on the green equals symbol displays a list of operators. Select the required operator.



Behind the elements in the query, there are different buttons which you can use to extend or modify the query:

: Deletes the expression

: Switches the right side of an expression between a fixed value and a field

: Adds the statement for a new expression

You can change the logical operator that is linked with a group of expressions by clicking on the operator.

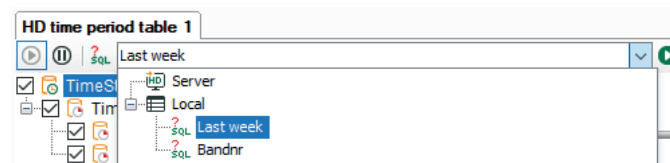




Clicking on <OK> closes the editor and saves the created queries.

### Executing the query

First select the relevant query from the list in the toolbar and then click on the button to the right.



When the query has been completed, the number of results found is displayed in the status bar on the right.

HD time period table 1

SQL Bandnr

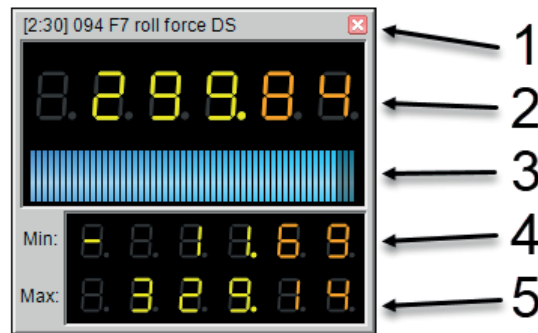
Name	Start time	End time	InfoField...	InfoField_Produ...
pda1836_094360	2/22/23 12:09:13 PM	2/22/23 12:10:46 PM		094360
pda1837_027460	2/22/23 12:11:03 PM	2/22/23 12:12:00 PM		027460
pda1838_081800	2/22/23 12:12:18 PM	2/22/23 12:13:09 PM		081800
pda1839_013160	2/22/23 12:13:14 PM	2/22/23 12:14:49 PM		013160
pda1840_093120	2/22/23 12:14:59 PM	2/22/23 12:15:45 PM		093120
pda1841_094360	2/22/23 12:15:59 PM	2/22/23 12:17:33 PM		094360
pda1842_027460	2/22/23 12:17:49 PM	2/22/23 12:18:47 PM		027460
pda1843_081800	2/22/23 12:19:04 PM	2/22/23 12:19:56 PM		081800
pda1844_013160	2/22/23 12:20:01 PM	2/22/23 12:21:35 PM		013160
pda1845_093120	2/22/23 12:21:45 PM	2/22/23 12:22:31 PM		093120
pda1846_094360	2/22/23 12:22:45 PM	2/22/23 12:24:19 PM		094360
pda1847_027460	2/22/23 12:24:35 PM	2/22/23 12:25:33 PM		027460
pda1848_081800	2/22/23 12:25:50 PM	2/22/23 12:26:42 PM		081800
pda1849_013160	2/22/23 12:26:47 PM	2/22/23 12:28:22 PM		013160
pda1850_093120	2/22/23 12:28:31 PM	2/22/23 12:29:17 PM		093120
pda1851_094360	2/22/23 12:29:32 PM	2/22/23 12:31:05 PM		094360
pda1852_027460	2/22/23 12:31:22 PM	2/22/23 12:32:19 PM		027460
pda1853_081800	2/22/23 12:32:37 PM	2/22/23 12:33:28 PM		081800
pda1854_013160	2/22/23 12:33:33 PM	2/22/23 12:35:08 PM		013160
pda1855_093120	2/22/23 12:35:18 PM	2/22/23 12:36:04 PM		093120
pda1856_094360	2/22/23 12:36:18 PM	2/22/23 12:37:52 PM		094360
pda1857_027460	2/22/23 12:38:08 PM	2/22/23 12:39:06 PM		027460
pda1858_081800	2/22/23 12:39:23 PM	2/22/23 12:40:15 PM		081800
pda1859_013160	2/22/23 12:40:20 PM	2/22/23 12:41:54 PM		013160
pda1860_093120	2/22/23 12:42:04 PM	2/22/23 12:42:50 PM		093120
pda1861_094360	2/22/23 12:43:04 PM	2/22/23 12:44:38 PM		094360
pda1862_027460	2/22/23 12:44:54 PM	2/22/23 12:45:50 PM		027460

40 more...

A query can return more results than the number of rows configured in the table. To display any other results, click on the blue “More...” link.

You can return to live mode by clicking on the  button.

## 14 Numeric digital display

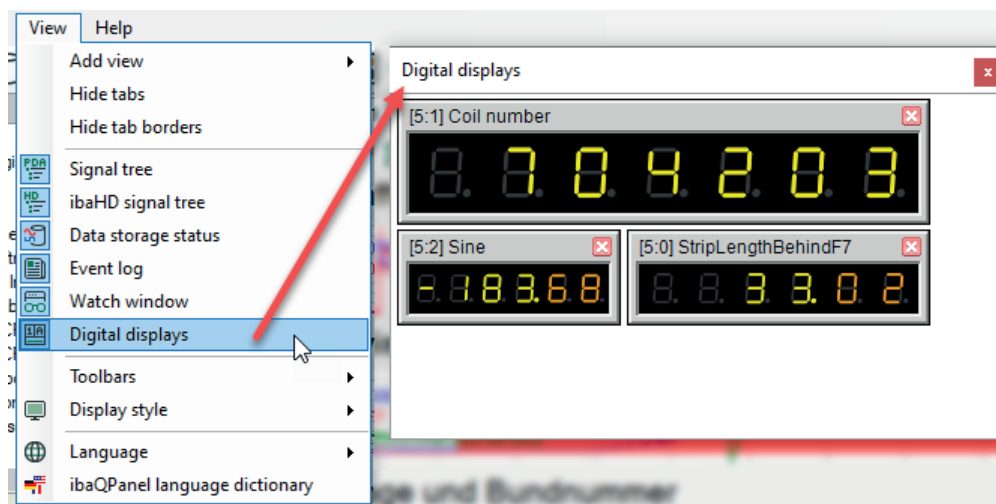


1	Signal name, dock and close button
2	Actual value
3	Range bar
4	Minimum
5	Maximum

A numeric digital display shows the actual value of an analog signal. Optionally, it can be selected the minimum and maximum values of a signal for display (resettable). It can also show a range bar showing the position of the current value between the minimum and maximum signal value. Minimum and maximum value as well as the range bar can be enabled or disabled in the context menu. The digital displays can be positioned freely floating or docked to a digital meter window. Size, number of digits and color of the value indicator can be configured.

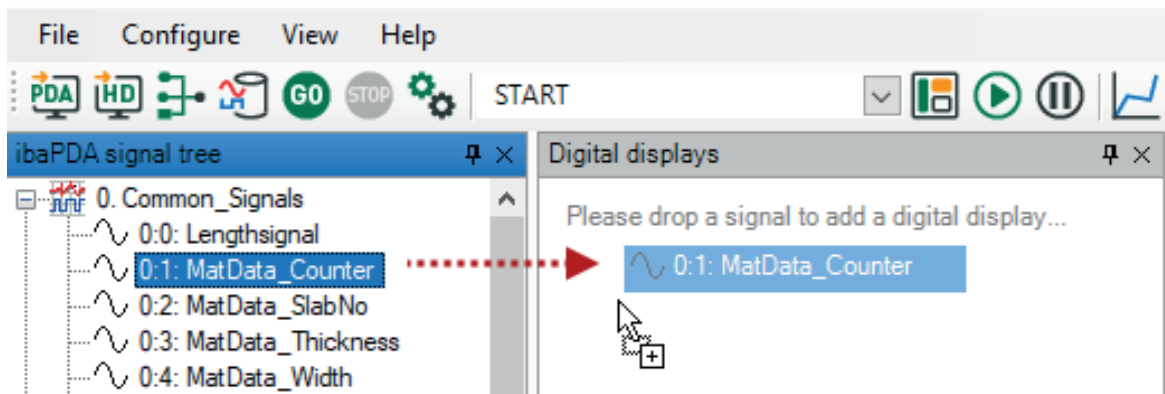
### Adding a digital display to the view

Usually, the digital displays are attached to a special window. The digital display panel can be opened using the *View – Digital displays* menu. If no digital meter has been added yet, the panel will be empty.

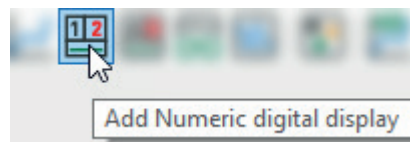


You have several possibilities to add a digital display to the panel:

- Drag a signal from the signal tree into the digital meter panel and let it drop.  
A digital display displaying the actual value is automatically added.



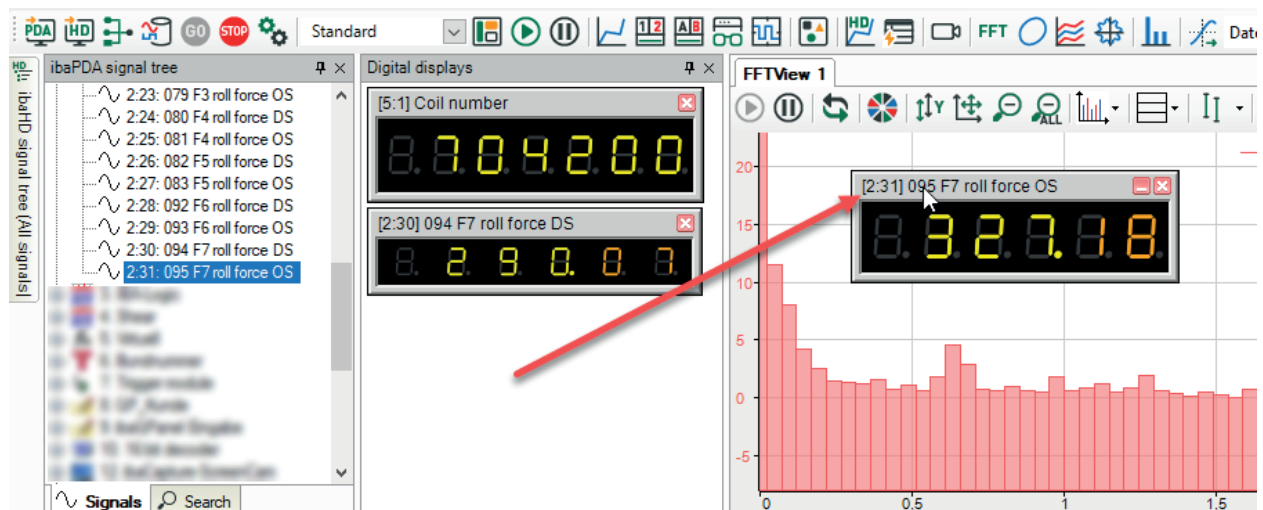
- Click on the corresponding tool button in the toolbar.



The digital display panel opens and a new digital meter is added to it, yet without a signal assigned. The easiest way to transfer a signal to the digital display is to drag and drop the signal out of the signal tree.

Alternatively, you can enter the signal name in the "Properties" dialog of the display.

→ If you want the digital display to be positioned somewhere else as a floating window instead of being attached to the digital display panel, drag it out of the digital display panel. This allows you to move the digital display, e. g. over the trend views.



### Changing the size of the digital display

You can enlarge a digital display in its size by dragging the edges or corners of the display using the mouse. Basically, the size is limited by the screen. If a digital display is docked to a corresponding window, you can reset it back to the default size using the context menu of the digital display window.

A right mouse click in the digital display pane opens the context menu containing 3 functions:

- **Clear**  
This function deletes all digital displays, docked as well as floating displays.
- **Reset size**  
This function resets all digital displays docked in the window back to default size.
- **Dock all**  
This function draws back all floating digital displays and attaches them to the window without resizing.

### Setting up the digital display

For setting up the properties of a digital display, open the context menu.

In the *Properties* dialog, you can specify the following:

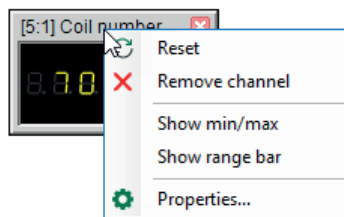
- The data source signal and reset signal
- Display update interval
- Display colors
- Style and format of the value display
- Range bar color

All settings are also available in the "Preferences" dialog except the data source and reset signals.

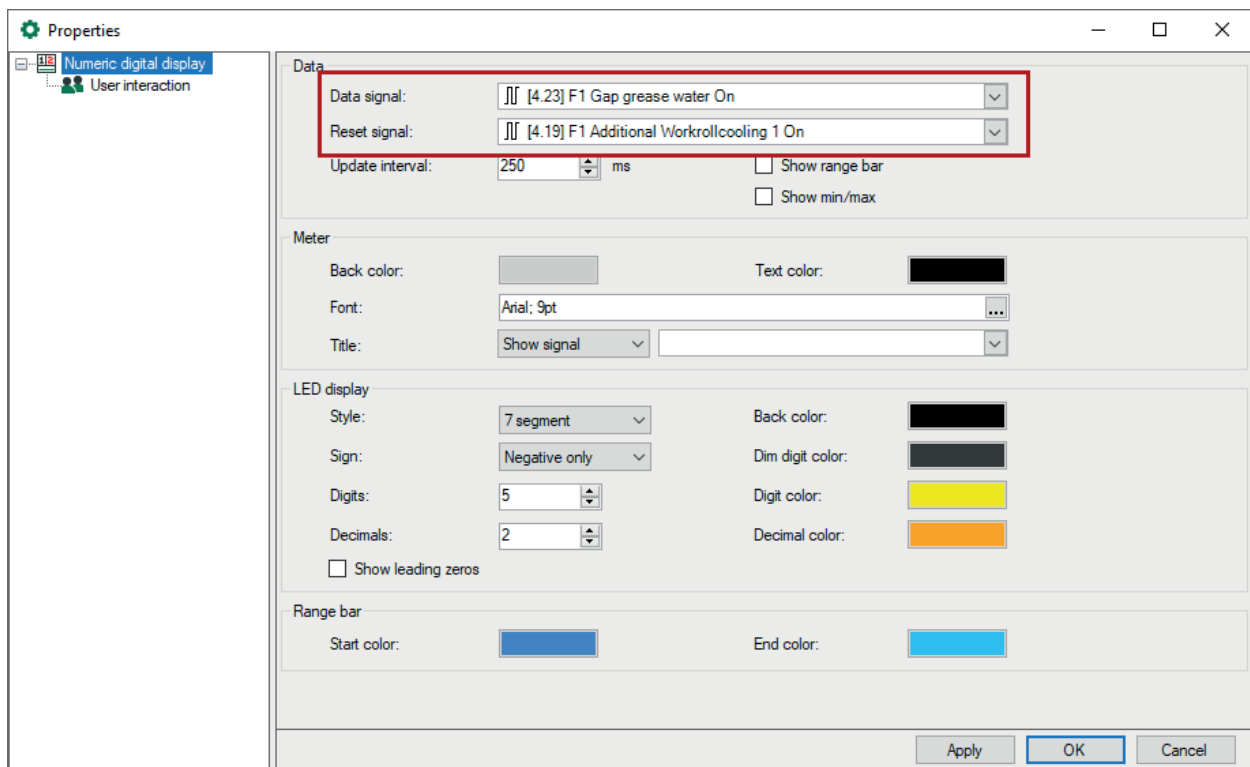
For further information, see chapter “[↗ Properties Numeric digital display, page 166.](#)”

### Context menu

For individual setup of a digital display, for enabling/disabling the range bar and resetting the min/max values, right-click on a display to open the context menu.



## 14.1 Properties Numeric digital display



Preferences and properties of digital displays are basically the same except for the signal selection. Data signal and reset signal selection is available in the "Properties" dialog only (red frame in the picture above).

### Data

#### Data signal

Select here the analog signal, whose value is to be displayed in the digital meter display.

#### Reset signal

Select here a digital signal, which is to reset the min/max values of the digital meter.

#### Update interval

The update time determines the refresh rate for the value display. It is recommended setting a reasonable value (between 250 and 1000 ms) with regard to the human eye.

#### Show range bar, show min/max (Numeric digital display only)

Enabling this option will add a range bar or the minimum and maximum indicators to the display.

### Frame and labeling

Here, you can set up the color scheme of the digital display's frame. By default, the digital display is labeled with the name of the related data signal. Alternatively, you can enter a title instead of the signal name. The font setting applies to both the signal name and the title.

### LED display

Here, you can set up the value display.

**Style**

Choose between a style containing 7 or 14 segments.

**Sign**

Decide how to deal with positive/negative signs.

- Never: Neither "+" nor "-" are displayed
- Negative only: "+" is not displayed
- Always: Both "+" and "-" are displayed

**Digits and decimals**

The number of digits determines the total number of digits in the display, including the integer part and decimal part. If you select "Negative only" or "Always" for sign, an additional digit will be added automatically.

If you set decimals to 0, the value on display will be rounded to the next integer.

**Colors**

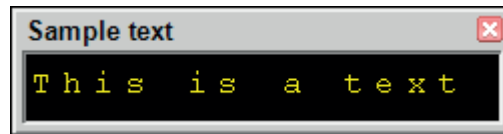
Set up your preferred colors for the different parts of the display.

**Range Bar**

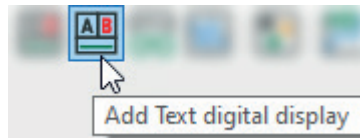
Set up the start color and end color of the range bar in order to get a color gradient from green to red.

## 15 Text digital display

Text digital displays are used to display text signals. Up to 256 characters are allowed.

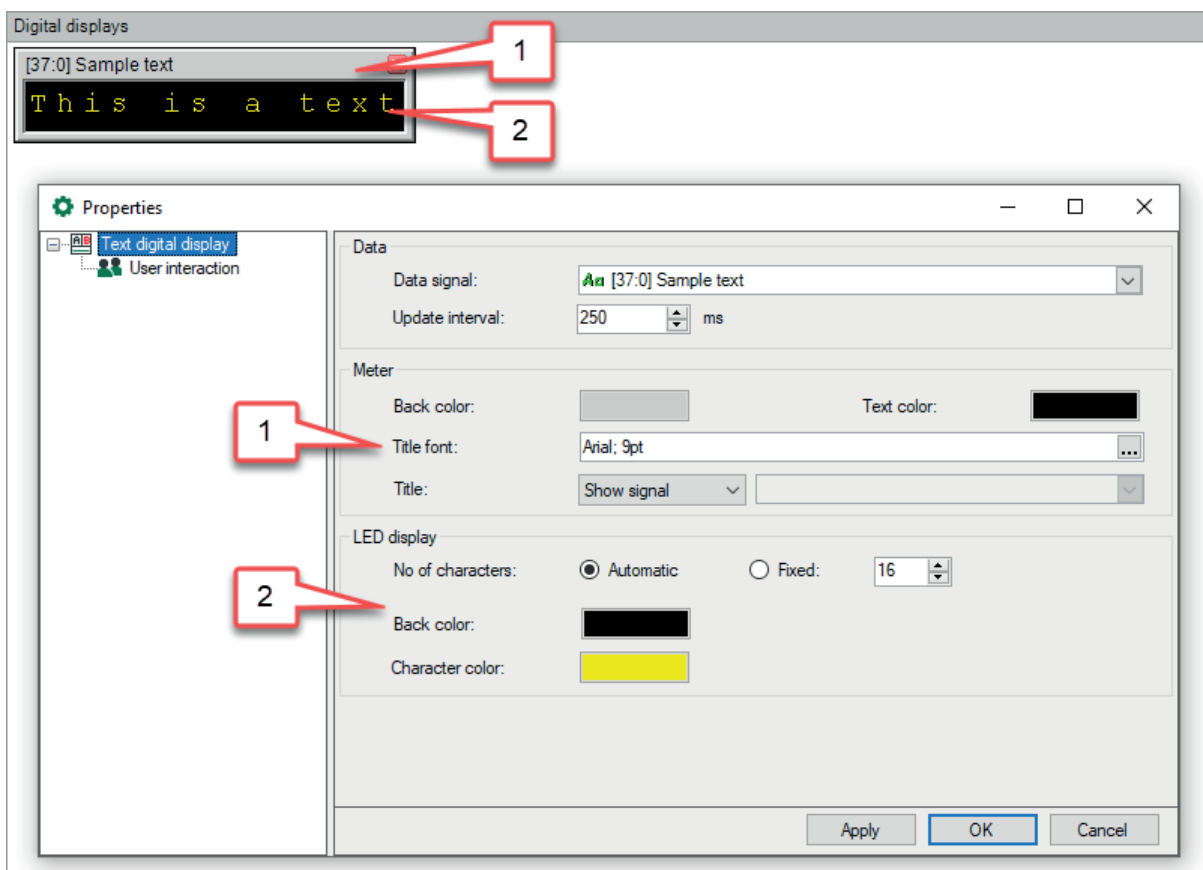


In terms of basic operation, this element is similar to the digital numeric display (see [➤ Numeric digital display](#), page 163). You can also add the digital text display via the view menu or the toolbar and use it in *ibaQPanel*.



The fundamental difference is that the source signal for the display is text signal. The text can be both received from the outside as well as entered via a text input element in *ibaQPanel*.

The following figure shows the relationship between the display and the settings:




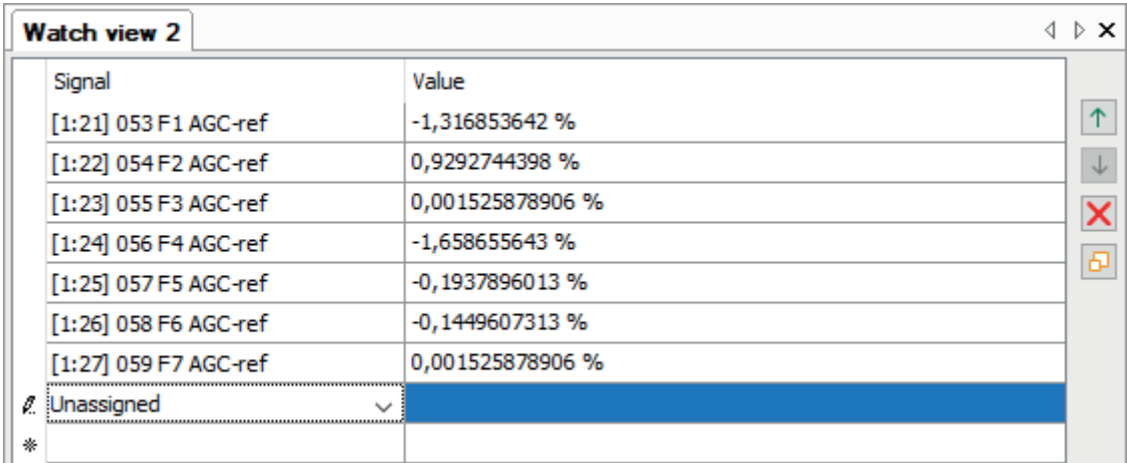
1. Properties of frame and caption, headline optional
2. Properties of the text display; the font size of the display text is calculated automatically and can only be influenced by resizing the text display (using the mouse).



# 16 Watch view

You can use the watch view to monitor the values of any signal in a tabular manner. Numeric signals as well as text signals are supported. Signals of an *ibaPDA* server and of an *ibaHD-Server* can be displayed. You may open and position as many watch views as you like. The watch view is also available in *ibaQPanel*.

You can open the watch view either via the toolbar button  or by using the *View – Add view – Add Watch view* menu.



You can drag one or more signals out of the *ibaPDA* or *ibaHD-Server* signal tree and drop them into the watch view. The number of rows is adapted automatically. Alternatively, you may add signals to the view by clicking on the drop-down icon in the *Signal* column and select the signals in the respective signal tree there.

With the buttons on the right margin of the view you can move or delete the rows. You can select multiple lines by mouseclick + <Ctrl> or mouseclick + <Shift>.






	Move the selected row(s) up by one position.
	Move the selected row(s) down by one position.
	Remove the selected row(s) from the view.
	Group the selected row(s) in a separate section.

Table 1: Control buttons for the watch view

With the lowest button *Assign rows to a section* you can organize the view into two or more sections.

Select one or more rows and click on the button .

A dialog pops up where you can either enter a name for a new section or select an existing section to assign the signals.

Moving the rows with the control buttons only work within the section. If you want to assign a row to another section, use the button *Assign rows to a section* .

If you select a section, the control buttons apply to the entire section. Thus, you can move or delete a section. If you delete a section, all rows assigned to this section will be deleted too. If you want to avoid this, you should first select the rows inside the section and assign them to another section.

You can rename a section by making a right-click on the section title and selecting *Rename...* in the context menu.

### Properties

You can open the properties of the watch window by making a right-click anywhere in the watch window and choosing *Properties...* in the context menu.

The following properties are available:

- **Numeric value formatting:** Beside the automatic formatting you have the possibility to customize the formatting of numeric values in terms of number of digits before and after the decimal point as well as the display of positive values.
- **User interaction:** If you enable this option, users can change signals in the view (add, replace, delete) even if they don't have the right to change layouts but the right to interact with views. If you disable this option, users must have the right to change layouts in order to change signals in the view.

### Special function for signal mapper signals

Basically, signal mapper signals behave like all other signals. However, if no source signals are mapped to these signals, they are handled slightly different in the watch view.

If the watch view contains signal mapper signals without having assigned source signals, another button with a lightning symbol and two more columns will appear automatically.

Signal	Wert	Neuer Wert	Übernehmen
<b>Unmapped</b>			
[50:0] RoomID			<input type="checkbox"/>
[50:1] Temperature	0		<input type="checkbox"/>
[50:2] Humidity	0		<input type="checkbox"/>
<b>Mapped</b>			
[45:0] RoomID_01	Rm220		<input type="checkbox"/>
[45:1] RoomTemp_01	22,10000038 °C		<input type="checkbox"/>
[45:2] RoomHumid_01	77 %		<input type="checkbox"/>

Thereby, you can manually assign values to these unmapped signals. For signals which do not apply to this function, the table cells are grey.

First, check the checkbox in the Apply column for the signals you want to assign a value to. Then, enter your preferred value in the New value column.

In order to apply the values to the signals, click on the lightning button at the right side or press <F6> on the keyboard. Make sure that you don't edit a cell value at this time, otherwise, the hotkey won't work. Digital signals can easily be flipped by pressing <F8>.

The New value and Apply columns support header clicking. It means that when clicking the column header, the contents of the selected cell for that column will be copied to the subsequent rows.

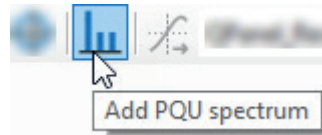
Note, that ibaQPanel signals can also be written using the watch view.

## 17 PQU spectrum

If you collect the measurement data from an *ibaPQU-S* device to measure the electrical power quality, you can define spectrum submodules in the configuration of the device module. These modules calculate the harmonics and interharmonics of voltages and currents up to 50th order.

Using the *PQU spectrum* view, the harmonics and interharmonics can be clearly illustrated as a bar chart. The limit values for individual harmonics are displayed as horizontal marks on the bars.

You can also add the PQU spectrum using the *View* menu or the toolbar:



You can only assign one PQU spectrum module to one *PQU spectrum* view.

---

### Other documentation



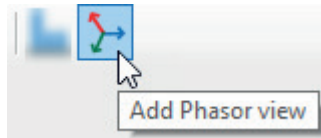
You can find more information on the PQU phasor view in the manual for the product *ibaPQU-S*.

---

## 18 Phasor view

If you collect the measurement data from an *ibaPQU-S* device to measure the electrical power quality, you can define phasor submodules in the configuration of the device module. This module computes the amplitudes and phase angles for voltages and currents for the three phases.

By using the PQU phasor diagram, the voltage and current values are presented clearly. You can also add the PQU phasor diagram using the *View* menu or the toolbar:



You can only assign one PQU phasor module to one PQU phasor diagram.

---

### Other documentation



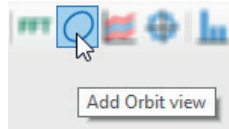
You can find more information on the PQU phasor diagram in the manual for the product, *ibaPQU-S*.

---

## 19 Orbit view

The orbit view represents the position of a shaft inside a sleeve bearing. It is supplied with data by an ibaInSpectra Orbit module.

You can open a new orbit view by clicking on the respective button in the tool bar:



Alternatively, you can use the menu *View - Add view... - Add Orbit view*.

Subsequently, drag the respective ibaInSpectra Orbit module from the signal tree into the orbit view.

---

### Other documentation



Detailed information about the configuration and The methods of Orbit view signals can be found in the *ibaInSpectra* product manual.

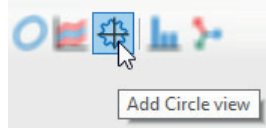
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## 20 Circle view

The Circle view represents the results of an *ibaInCycle Expert* module and of an *ibaInCycle Auto-Adapting* module in *ibaPDA* when applied to rotating processes.

A circle view may include one or more *ibaInCycle* modules.

You can open a new Circle view by clicking on the respective button in the tool bar:



Alternatively, you can use the menu *View - Add view... - Add Circle view*.

Subsequently, drag the respective *ibaInCycle* module from the signal tree into the Circle view.

---

### Other documentation



Detailed information about the configuration and operation of the Circle view can be found in the *ibaInCycle* product manual.

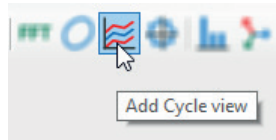
---

## 21 Cycle view

The Cycle view represents the results of an *ibaInCycle Expert* module and an *ibaInCycle Auto-Adapting* module in *ibaPDA* when applied to cyclic or periodic processes.

A Cycle view may include one or more *ibaInCycle* modules. The charts can have individual value axes or lie on a common value axis

You can open a new Cycle view by clicking on the respective button in the tool bar:



Alternatively, you can use the menu *View - Add view... - Add Cycle view*.

Subsequently, drag the respective *ibaInCycle* module from the signal tree into the Cycle view.

---

### Other documentation



Detailed information about the configuration and operation of the Cycle view can be found in the *ibaInCycle* product manual.

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## 22 Zoom function

### 22.1 Zooming in a trend graph view

The zoom function works on both X and Y direction. Place the left mouse cursor in the graph, hold the mouse key depressed and drag it until the desired area is surrounded by a frame. When releasing the mouse key, the designated area will be zoomed in. If you zoom in a graph, the X axis parts of all graphs located in the same view also get zoomed. A view can always have only one time base for all graphs contained. Only parts of the Y axis can be zoomed individually. In the scrolling display, zooming stretches the time base and enlarges the display. The signals, however, move faster, as the same geometrical length of the X axis now refers to a shorter time slice.

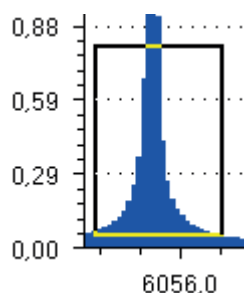
Zooming first applies to the X and Y direction. In the zoomed-in condition, the scale in the Y direction can be changed at any time without affecting the zoomed section of the X axis. Auto-scaling in the Y direction applies to the values in the zoomed area (= visible). Zooming with the mouse keeping the <SHIFT> key pressed will only zoom the X axis.

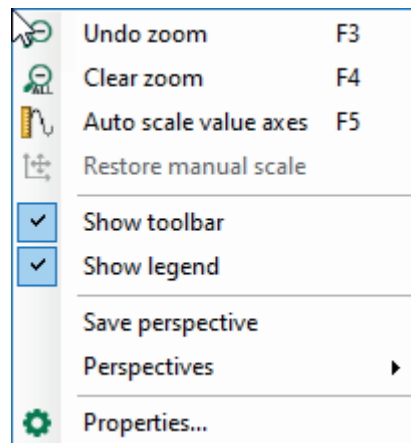
Zooming out can be carried out in steps using the button  or the key <F3>. Every click successively reverses all previous zoom steps.

Use the button  or the key <F4> to reactivate the original, non-zoomed display.

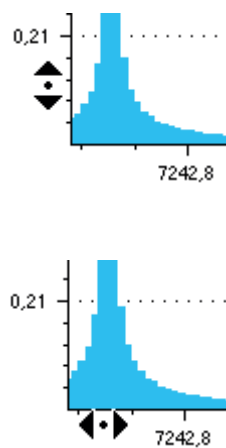
### 22.2 Zooming in the FFT view

It is possible to zoom in to a certain area of the spectrum by drawing a zoom rectangle (keep left mouse key depressed) or by using the context menu (right mouseclick).





Once zoomed, you can pan the spectrum by dragging one of the visible axes in the desired direction. The pan cursor appears when moving over an axis.



You can also use the mouse wheel to zoom in or out around the center of the axis. Note that you can never move outside the scale extremes of an axis.

## 23 Managing layouts

### Note



The layout management has been remodeled completely by release of *ibaPDA* v8.0.0.

If you want to migrate from a former *ibaPDA* version to a version v8.0.0 or higher, please refer to the NewFeatures document of version v8.0.0!

### 23.1 Definition

The term “layout” denominates the arrangement of the ibaPDA client’s screen. Parts of a layout are all visible elements of the ibaPDA client, which are used for visualization and operation such as

- Type, number, size and position of signal views
- Signal assignment of the views incl. color, font size, feed direction etc.
- Type, size, position and visibility of standard windows such as signal tree, data storage status etc.
- Structure and visibility of menu and tool bars

Moreover, the layouts have the following properties

- A layout can be designed and saved individually by the user.
- Any number of layouts can be created.
- Layouts can be switched over while acquisition is running.
- Layouts can be assigned to one or more users.
- The Layout Manager provides for clearly arranged administration of layouts.

### 23.2 Internal structure and file storage

Each layout is stored internally in a file (\*.layout).

All single layout files will be stored together in a ZIP-file (\*.layouts), the so called layout set.

An index file (LayoutConfiguration.config) manages all corresponding layouts.

The images from *ibaQPanel* views are stored in a backup file (BackupStorage.storage).

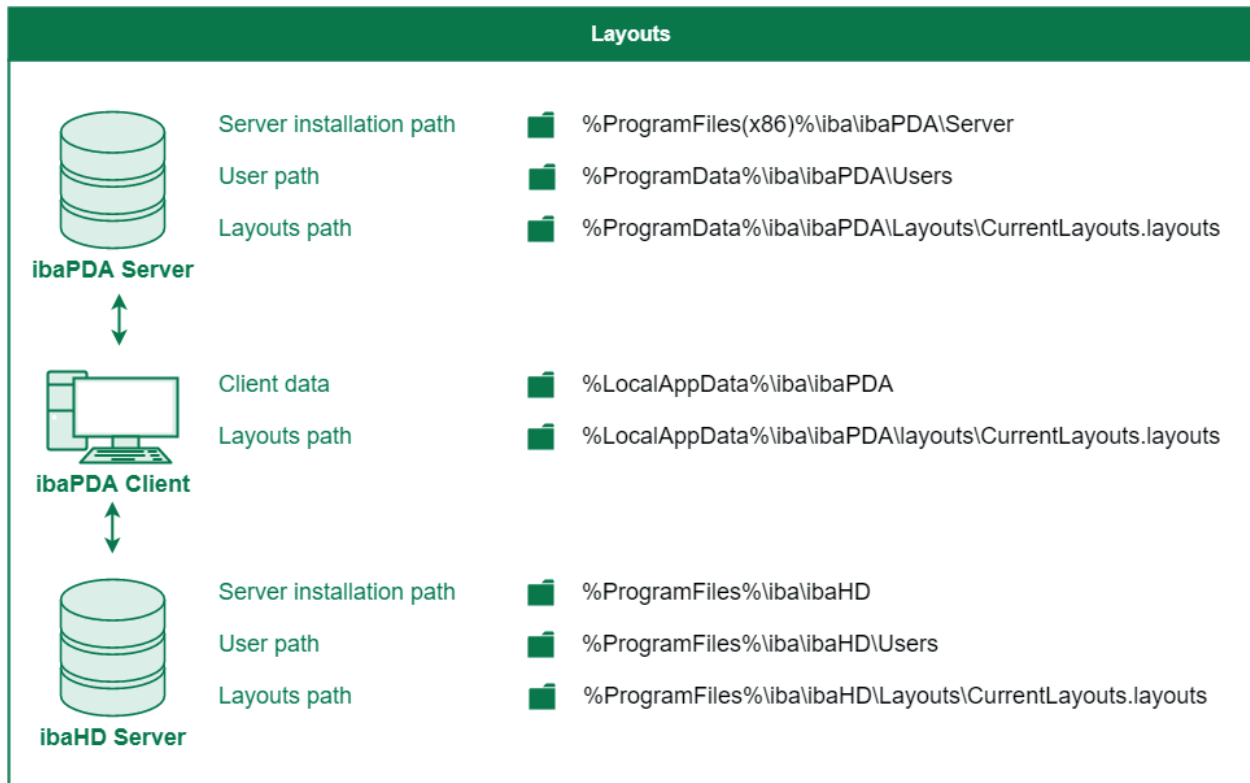
The *ibaQPanel* text translations are stored in a dictionary file (Dictionary.dict).

All these files are XML-files.

The user decides where the files should be stored:

- locally on the client
- on the *ibaPDA* server or
- on the *ibaHD-Server*

The following picture shows an outline of the storage locations




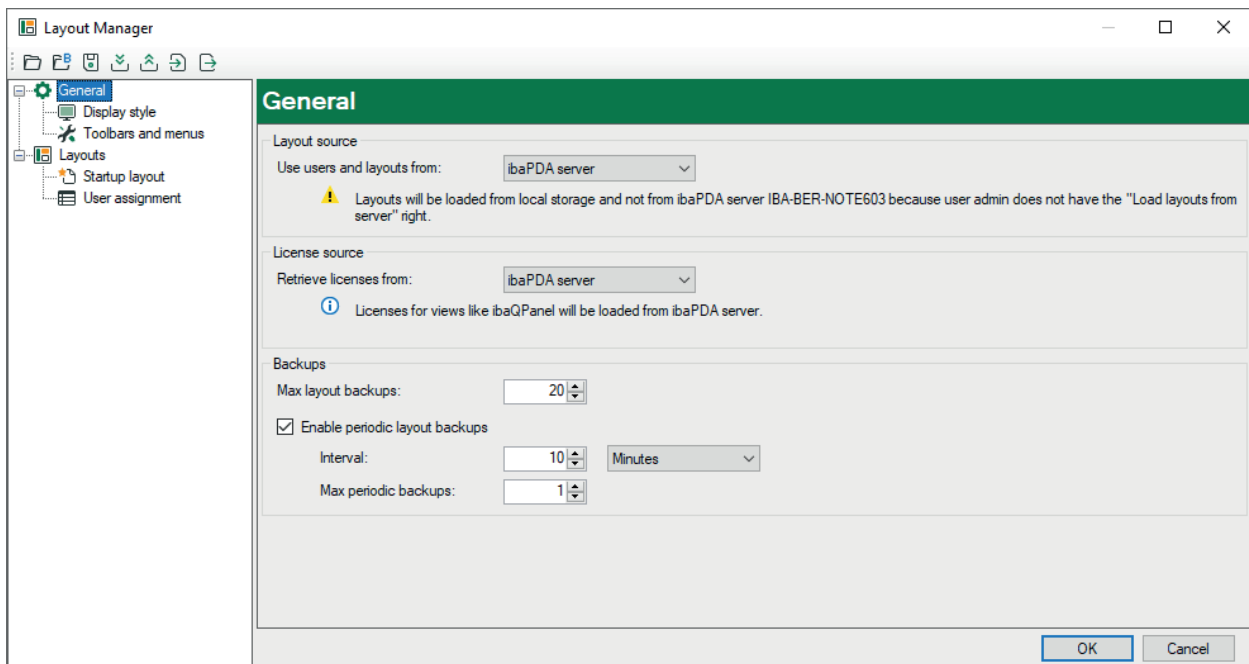
## 23.3 Layout Manager

The Layout Manager is the central dialog to administer all layouts in a clear arrangement. The following functions are available:

- Add, remove and duplicate layouts
- Load, save, import and export layouts
- Arrange layouts in a folder structure
- Assign layouts to different users
- Define startup layouts for users and computers
- Focus general properties of layouts at one place, e.g. layout source (ibaPDA server or ibaHD-Server), display style, backup strategy, user-depending menus and tool bars etc.

You can open the Layout Manager as follows:

- via the symbol in the tool bar 
- via the menu *Configuration - Layout Manager...*
- via the shortcut <Ctrl>+<L>



The user interface of the Layout Manager is divided in three sections:

On top there is the toolbar with the buttons for loading, saving, importing and exporting of layouts.

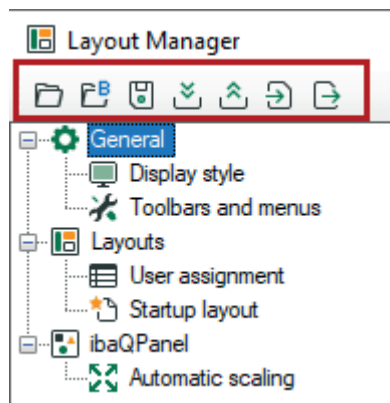
On the left side you'll find the window with the navigation tree, consisting of the following nodes:

- *General* for general settings like layout source, license source and backup strategy
  - *Display style* for setting up the layout display (full screen etc.)
  - *Toolbars and menus* for setting up the visibility of symbols and menus
- *Layouts* for creating and organizing layouts
  - *Startup layout* for setting up user-specific layouts at start of *ibaPDA* client
  - *User assignment* for assigning layouts and users






The right and more prominent section consists of the settings with regard to the selected node in the tree.


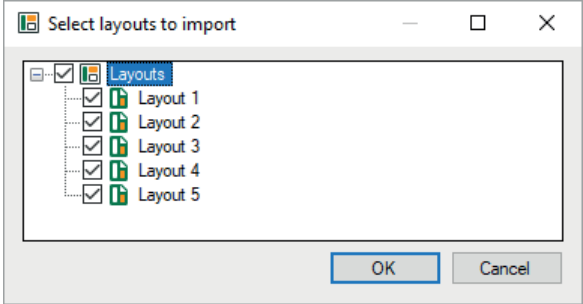
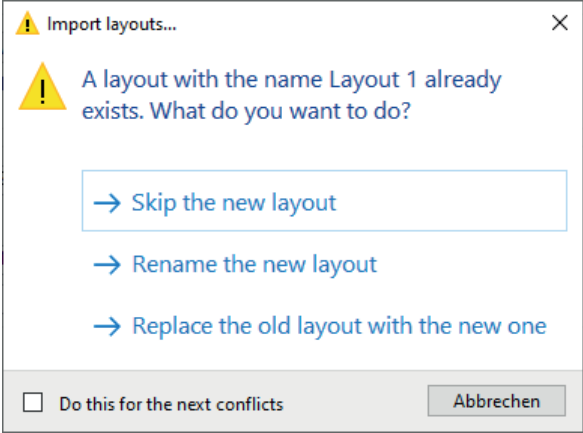

## 23.4 Toolbar for basic functions

In the topmost toolbar of the Layout Manager you'll find the buttons for loading and importing of stored layouts as well as saving and exporting of new or changed layouts.



The buttons provide functions as follows:

Symbol	Function	Description
	Load layouts	Opens a set of layouts from the file system. You can load layouts from new layout files (*.layouts) or old layout files (*.lay).  All loaded layouts at this time will be discarded and replaced by the new layouts.
	Load layouts from backup directory	Opens the directory where the backups are stored. Here, the user can select one of the automatically created backups. See also information about setup of the maximum number of backups ➔ <i>General settings</i> , page 184.
	Save layouts	Saves the current layout set in the file system.
	Load layouts from server	Loads all layouts from the server which is entitled as layout source on the <i>General</i> node. All loaded layouts at this time will be discarded and replaced by the new layouts.  This is only permitted if the logged in user has the right "Load layouts from server" in the user rights or is user "admin".
	Save layouts on server	All currently available layouts will be saved on the server which is entitled as layout source on the <i>General</i> node. The entire set of layouts will be saved. It is not possible to save single layouts. The previous layout set stored on the server will be replaced by this.  The function is only permitted if the logged in user has the right "Save layouts on server" in the user rights or is user "admin".  If there are other logged in users with the right "Load layouts from server", they will be notified, that there is a new layout set available. They can then choose to load the layouts from the server.

Symbol	Function	Description
	Import layouts	<p>Layouts will be imported from a layout file in the file system and added to the currently available layouts. These can be old layout files (*.lay) or layout files of the current version (*.layout, *.layouts). The layouts to be imported can be selected from the layout collection in a dialog.</p>  <p>If a layout to be imported already exists (same name) a dialog opens to resolve the conflict.</p>  <ul style="list-style-type: none"> <li>■ <i>Skip the new layout</i>: The layout will not be imported. The original layout with the same name will remain.</li> <li>■ <i>Rename the new layout</i>: The new layout will be imported and the name will be extended by the suffix “-copy”.</li> <li>■ <i>Replace the old layout with the new one</i>: The new layout will be imported and overwrites the original layout.</li> </ul>
	Export layouts	<p>The current layouts will be exported into a layout file either as a complete layout set or part of it. A dialog opens for selecting the desired layouts.</p> <p>Tip: If there are layouts to be exported, which are already selected under <i>Layouts</i>, then you can use the command <i>Export layouts</i> in the context menu of the layout pool. In the subsequent export dialog the corresponding layouts are already selected.</p>

**Note**

It is also possible to open layout files of previous *ibaPDA* versions (v7.x). They will be automatically converted.

For more information about migrating from *ibaPDA*-v7 to v8 see the document "NewFeatures v.8.0.0".

## 23.5 General settings

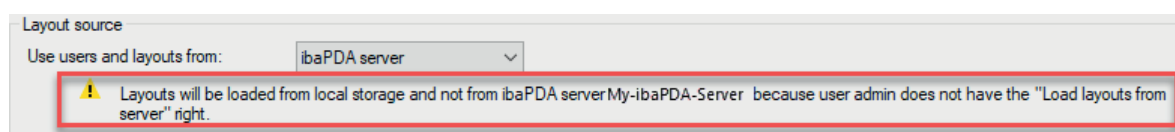
### Source for users and layouts

You should determine the server the layouts will be loaded from and saved to with regard to the *ibaPDA* client you are working on. The following settings are available for selection:

- **Local storage:** Layouts will be loaded from or saved to a local drive of the client only.
  - ZIP file containing all layouts: `C:\Users\MyUsername\AppData\Local\iba\ibaPDA\CurrentLayouts.layouts`
  - Single layout files: `C:\Users\MyUsername\AppData\Local\iba\ibaPDA\layouts`
- **ibaPDA-Server:** Layouts are available on the currently connected *ibaPDA* server and will be loaded from or saved to this server. Regarding the user rights, the user management of *ibaPDA* applies.
- **ibaHD-Server:** Layouts are available on the currently connected *ibaHD* server and will be loaded from or saved to this server. Regarding the user rights, the user management of *ibaHD-Server* applies.

This setting is important with regard to the user rights (Save layouts on server/Load layouts from server) in the user management of the corresponding server. Only if the logged in user has these rights on the selected server he can manually store or load layouts to/from this server.

In case the logged in user has not the rights for saving or loading according to the user management of the selected server, he will be notified by a message.



If you choose *Local storage*, the user management settings will be ignored.

### License source

If license-dependent views are used in a layout, e.g. *ibaQPanel*, the client must fetch the required licenses in order to get the view working.

Setup here whether the licenses should be fetched from the currently connected *ibaPDA* server or *ibaHD-Server*. If you select "Nowhere", no licenses will be fetched. Choose this setting, if you are sure that the layout does not contain license-dependent views.



## Backups

The feature of backups helps to prevent unintended loss of sumptuous designed layouts or to support switching back to a previous configuration step in the course of layout configuration.

You can configure two kinds of backups in the Layout Manager. Both kinds will always store the entire layout set in a layout file with date and time added to the filename.

- Automatic backups: `CurrentLayout_YYYY_MM_DD_HH_MM_SS.layouts`

- Periodic backups: `P_CurrentLayout_YYYY_MM_DD_HH_MM_SS.layouts`

Storage location is the backup path in the folder of the logged in user on the client computer:

```
c:\User\Username\AppData\Local\iba\ibaPDA\backup
```

### Automatic backups

The setting of *Max layout backups* determines the maximum number of automatic backups. Values between 5 and 100 are possible, default is 20. If the number has been reached, the oldest backups will be gradually deleted.

A new backup will be created automatically by each of the following events:

- Closing *ibaPDA* client
- Opening a project
- Generating a support file
- Closing the Layout Manager after applying changes
- Saving layouts on the server
- Connecting an *ibaPDA* server
- Connecting an *ibaHD-Server*

### Periodic backups

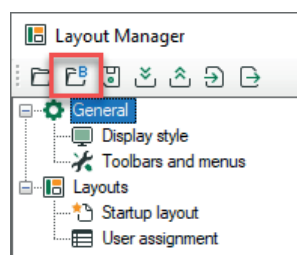
You must enable the periodic backups by a checkmark in order to use them. Periodic backups are particularly suited to prevent loss of already invested work in layouts, e. g. in case the client crashes while you are configuring layouts.

Setup the desired backup interval. Backups will then be continuously created based on this interval in the background. Values from 1 minute up to 100 days are possible.

Here you can also setup a maximum number. When reached, the oldest backups will be deleted.

### Accessing the backups

To load a layout backup, use the appropriate button in the toolbar of the Layout Manager:



## 23.6 Display style

By setting up the *Initial display style* you determine the display style which will always be applied on startup of *ibaPDA* client. The same styles are available for selection as available in the *View* menu or by using the corresponding short keys.

### Note



If you have already set a display style for the user in the user management, then this style will be applied.

You will find more detailed information about the display styles in Part 1 of the *ibaPDA* manual, in chapter *The view menu*.

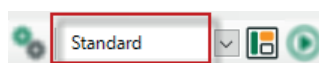
For the special display style “Fixed size” you can setup width and height in pixel units and select some other options.

## 23.7 Toolbars and menus

The toolbars and menus to operate *ibaPDA* client can be adapted for different users in the Layout Manager.

### Width of layout selection in toolbar

This setting determines basically how wide (in pixels) the field for the display of the current layout in the toolbar is.

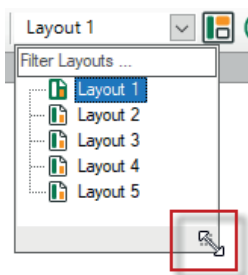


You can see immediately the result in the toolbar when you change the width value in the entry field.

### Note



If needed, you can change the size of the expanded drop-down window with the layouts easily by grabbing the lower right corner with the mouse.



This change will be stored only temporarily for the current session. With restart of *ibaPDA* client the size will be reset to default setting.

## Profiles

The visibility of toolbars and menus is independent from the different layouts. Thus, the visibility of toolbars and layouts cannot be configured differently per layout. However, it is possible to customize their visibility with regard to the user.

So called profiles, which can be assigned to the users, provide for distinction. Thereby, you can control which user can see which toolbar or menu and thus his or her scope of action.




As soon as a user logs in the *ibaPDA* server with his or her name, he or she can only see the toolbars and menus according to the assigned profile. Of course, the user management must be enabled in *ibaPDA*.

Which toolbars and menus are visible or not is stored in a profile. The basic structure of the toolbar, i.e. the arrangement of the single tools and tool groups is fixed. Only single elements can be hidden. The same applies to the menus.

There is a basic setting (default), which show all toolbars and menus.

## Configure profiles

This window lists all available profiles. On the right side of the list you will find buttons for the configuration.

Button	Function
	Create and add a new profile You can create as many profiles as you like. Give a profile a comprehensible name. You can rename the profiles at any time.
	Delete the selected profile
	Configure the profile Select <i>Toolbars</i> or <i>Menus</i> and follow the sub-menus. In the first sub-menu you can hide or show entire toolbars or menus. In the further sub-menus you can hide or show single functions.  With the command <i>Reset</i> in the first menu level you can reset the toolbars and menus for the related profile back to default settings.

While configuring, you can check the results of your selection in the toolbar and menus. Each time you select a profile in the list and click on the configuration button, the toolbar and menus will be displayed accordingly.

## Standard profile

Here, select a profile which should be applied when *ibaPDA* gets started. If you have not configured your own profiles yet, only the profile "Default" is available. If there are already different profiles available they will be shown in the drop-down list. With the user management enabled, all users see the toolbars and menus according to this profile, unless they personally have a different profile assigned.

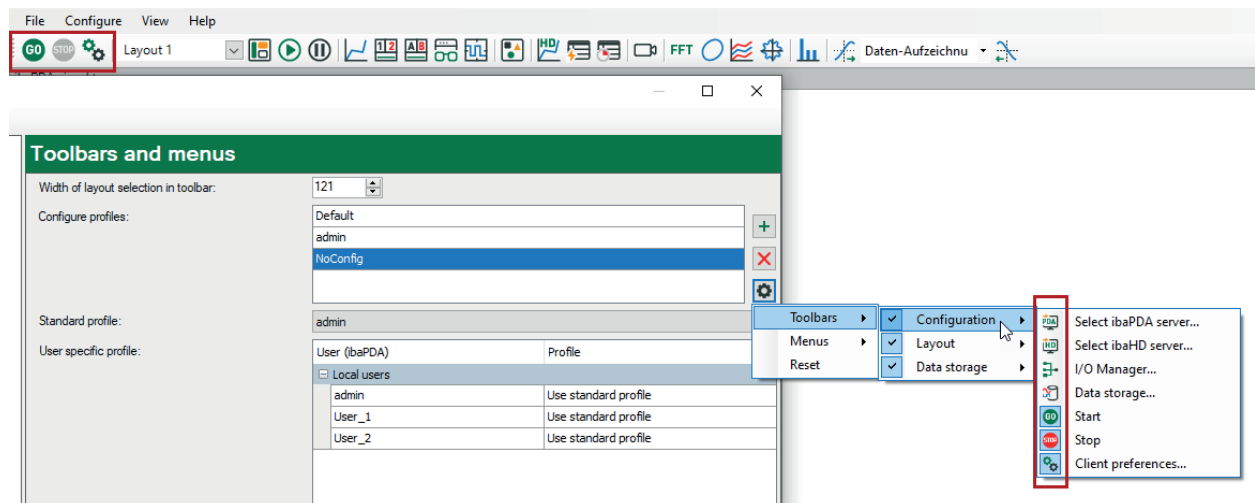
## User specific profile

In this area, all configured local users and domain users are listed.

You can assign each user the desired profile in the *Profile* column:

- Use standard profile: The user will be assigned the profile which has been set under *Standard profile*.
- Default: The user will be assigned the default profile (everything visible).

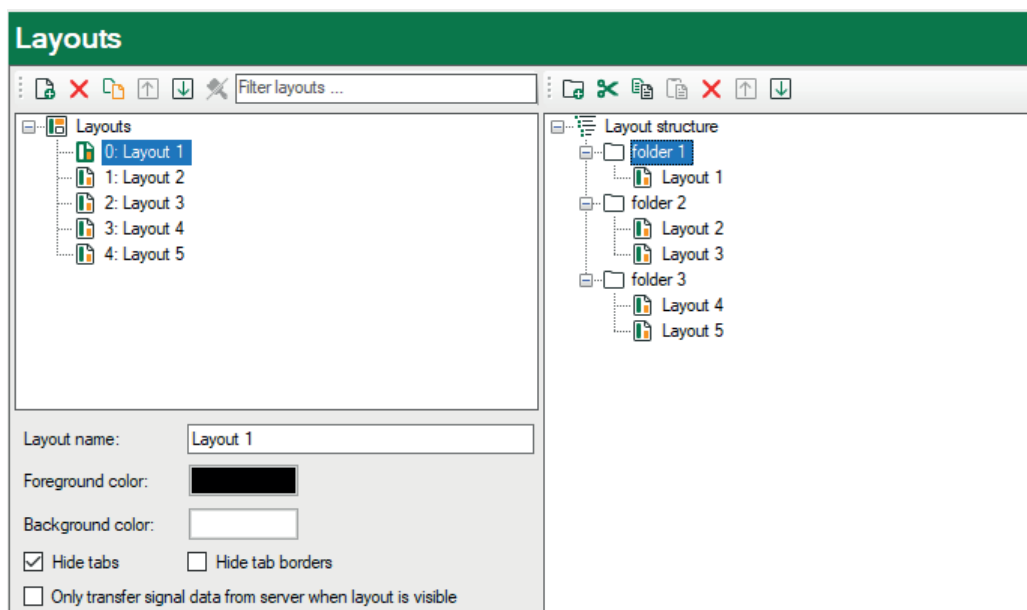
The following figure depicts for example a reduced toolbar, where the buttons for configuration of server, I/O Manager and data storage have been hidden. This setting has been saved as profile "NoConfig" and assigned to *User\_1* and *User\_2*.



In the configuration toolbar section in the upper left corner, the buttons for server selection, I/O Manager and data storage configuration are missing.

## 23.8 Layouts

On the node *Layouts* you define the layouts and arrange them in a structured manner by using folders and/or colors.



The dialog is divided in two parts:

- In the left part, there is the *layout pool*. Here, all currently available layouts are listed and you can create, rename or remove layouts as well as apply some properties to the layouts.
- In the right part, there is the *layout structure*. Here, you can create folders in order to organize the layouts. In the left part, each layout can only exist once, while layouts can appear multiple times in the right part.

### Basic procedure





If you want to create a new layout, proceed as follows:



1. Add a new layout in the Layout Manager and rename it.
2. If needed, you may apply a color to the new layout and/or move it to a folder.
3. Close the Layout Manager
4. Open the drop-down box in the toolbar and select the new layout.
5. Now, change the *ibaPDA* client user interface according to your needs. All changes will be saved immediately in the local layout file in order to prevent loss when closing the *ibaPDA* client.

## 23.8.1 Layout pool

The left part of the dialog is the window with all available layouts. In this area you create new layouts and rename or remove the layouts. Moreover, you can assign each layout some basic properties.

On top of the window there is a toolbar for following actions:

Symbol	Function	Description
	Add new layout	The new layout will be placed below the selected layout in the tree. If the root node <i>Layouts</i> is selected the new layout will be placed at lowest position. The name of the new layout is generated by the pattern "layout <i>index</i> ". The new layout will also be added to the layout structure at the lowest position of the first structure level.
	Delete selected layouts	Multi-selection is possible. If you delete a layout here, it will also be deleted in the structure on the right side.
	Duplicate selected layouts	Multi-selection is possible. The selected layout(s) will be pasted as a copy. The name will be extended by the suffix "-copy".
	Move selected layouts up	Multi-selection is possible. You may change the order by drag and drop as well or by using the hotkeys <Ctrl>+<↑>. If you select layouts which are not adjacent to each other, the gap between them remains when using the button or the hotkeys. When using drag and drop the selected layouts will be placed adjacent to each other at the new position.

Symbol	Function	Description
	Move selected layouts down	Multi-selection is possible. You may change the order by drag and drop as well or by using the hotkeys <Ctrl>+<↓>. If you select layouts which are not adjacent to each other, the gap between them remains when using the button or the hotkeys. When using drag and drop the selected layouts will be placed adjacent to each other at the new position.
	Remove color settings	Only available if colors are used. Function applies on the selected layout. Multi-selection is possible. If the root node <i>Layouts</i> is selected, the color settings of all layouts will be removed.
Filter	Filter out layouts by their names	You can use the filter function to filter the layout list by name. Enter one or more characters or an entire name and the list of layouts will be adapted immediately. As soon as characters have been entered, a green filter icon indicates that the layout list is filtered. In order to remove the filter just click on this filter symbol.

The same functions (except filter) are available in the context menu of the window too.

### More commands in the context menu

If you open the context menu on the root node of the layout pool, you will find the command *Reset all docking configurations*.

This menu function allows you to reset all free floating windows (e.g. signal tree, watch window, data storage status etc.) in all layouts to their default position, size and visibility state.

If you open the context menu on a layout node you can choose between resetting the docking configuration of this layout or applying the docking configuration of this layout to other layouts. In the latter case, a subsequent dialog will open for selecting the layouts you want the docking configuration be applied to.

If you select multiple layout nodes, you can only reset the the docking configuration of the selected layouts.

### Layout properties

Below the layout list you can setup some properties of the layouts.

If you have selected a layout in the list you can rename it. Any name is permitted. Duplicate use of the same name is possible, due to backward compatibility with former program versions. When closing the Layout Manager you will be informed if duplicate names exist and you can correct it manually if needed.

In order to rename a layout you can also use the context menu on a selected layout in the tree or the key <F2>.

The settings of foreground color and background color only apply to the representation of the layout names inside the Layout Manager (pool and structure).

With the options *Hide tabs* and *Hide tab borders* you determine the representation of all views which are part of the layout. These are the same functions, which can be executed in the *View*

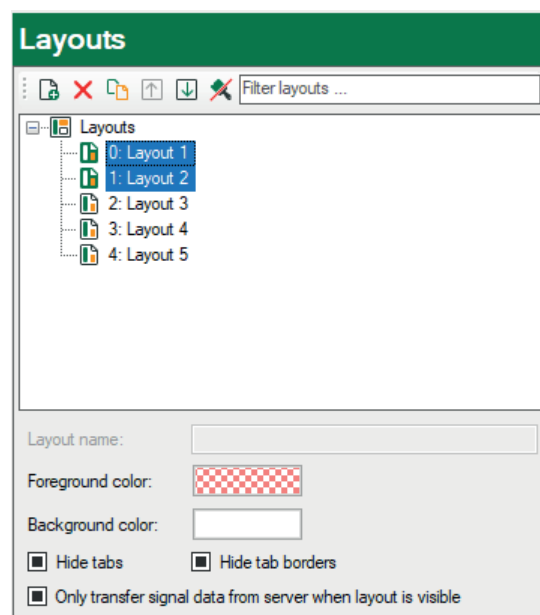
menu. *Hide tabs* only works if the views are not arranged in tab groups. Temporarily, these settings can be changed at any time in an active layout via the *View* menu.

With the option *Only transfer signal data from server when layout is visible* you can reduce the data traffic between server and client. This setting refers to the measurement data (signals) in the views of a layout.

By default this option is disabled. Hence, all data which is contained in any layout will be re-freshed continuously, no matter whether the layout is active (visible) or not. This ensures that the historical signal values of all signals are visible after a switch-over from one layout to another, no matter whether the signals had been visible in the previous layout or not.

If you enable this option, then the values of the signals in the new layout will be loaded after the switch-over. Thus, trend graphs, for example, will be written not before the time of switch-over. For signals which had not been visible in the previous layout, no historical data is available.

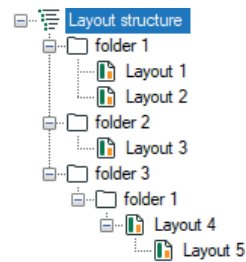
If several layouts with different properties are selected, it looks like as follows:



### 23.8.2 Layout structure

The right part of the dialog shows the layouts listed in a structured manner. By default it is just a flat list like on the left side. You don't have to do nothing if this form is suitable for you. But if you want to arrange or structure your layouts by certain criteria, you can do this here. Particularly, if you have many layouts, a proper arrangement can provide for better clarity.

In the layout structure you can create folders and sub-folders which contain the layouts. You can even subordinate layouts to other layouts. The latter can be helpful, e.g. if you have layouts configured as tabbed layouts in *ibaQPanel*.



On top of the window there is a toolbar for following actions:

Symbol	Function	Description
	Add new folder	This function is only available when the root node <i>Layout structure</i> or another existing folder is selected. If the root node <i>Layout structure</i> is selected, the new folder will be created on the first structure level. If a folder is selected, the new folder will be created as a sub-folder. The name of the new folder is generated by the pattern "folder <i>index</i> ".
	Cut selected elements	Multi-selection is possible. The selected elements are copied to the Windows clipboard.
	Copy selected elements	Multi-selection is possible. The selected elements are copied to the Windows clipboard.
	Paste copied elements	Folders cannot be subordinated to a layout node.
	Delete selected layout or folder	Multi-selection is possible. If you delete a folder, the contained layouts will be deleted in the structure too.  If you have deleted a layout in the structure you can easily add it again by drag and drop from the layout pool.
	Move selected layout or folder up	Multi-select on folders of the same level or on layouts within one folder is possible. You may change the order by drag and drop as well or by using the hotkeys <Ctrl>+<↑>. If you select multiple folders or layouts which are not adjacent to each other, the gap between them remains when using the button or the hotkeys. When using drag and drop the selected layouts will be placed adjacent to each other at the new position.
	Move selected layout or folder down	Multi-select on folders of the same level or on layouts within one folder is possible. You may change the order by drag and drop as well or by using the hotkeys <Ctrl>+<↓>. If you select multiple folders or layouts which are not adjacent to each other, the gap between them remains when using the button or the hotkeys. When using drag and drop the selected layouts will be placed adjacent to each other at the new position.



The same functions are available in the context menu of the window.

If you want to subordinate one or more layouts to another layout, you have different possibilities:

- Drag the respective layout with <Ctrl> key depressed out of the layout pool onto the layout in the layout structure where it should be subordinated.
- Drag the respective layout with <Ctrl> key depressed within the layout structure onto the layout where it should be subordinated.
- Copy or cut the respective layout, select the layout where it should be subordinated and paste it.

### Rename folders

You can rename the folders. Any name is permitted. Duplicate names are possible. When closing the Layout Manager you will be informed if duplicate names exist and you can correct it manually if needed.

### Other structuring rules

- Folders are always displayed on top before the layout nodes.
- A layout node can only exist once inside a folder or as a sub-node below another layout.

## 23.8.3 Startup layout

The settings on this node determine which layout will be shown when you open *ibaPDA* (client). You can choose between several methods to select the startup layout. Fixed, user-specific, client-specific or controlled by a signal

The priority of the methods increases from top to bottom. This means that, for example, the user-specific setting dominates the default startup layout setting.

**Startup layout**

Default startup layout:

User specific startup layout:

Client specific startup layout:

Signal that controls the selected layout:

Last selected layout

User (ibaPDA)	Layout
Local users	
admin	No layout selected
User 1	No layout selected
User 2	No layout selected

No layout selected

Unassigned

You can make the following settings.

### Default startup layout

By default, the last layout of the previous session will be the startup layout again. Alternatively, you may select a layout here, which will always be shown when *ibaPDA* client is opened, no matter which layout was active at the end of the previous session. The precondition is that no other method is used.

### User specific startup layout

Here, you can assign each user a startup layout. The indicated users are derived from the server which is entitled as *layout source* on the *General* node. If a user logs in, the assigned layout will be displayed. If you select here a layout, which is not assigned to this user on the node *User assignment* and hence, would not be visible to this user, a warning pops up.

### Client specific startup layout

This setting determines the startup layout for the client computer you are working on. Thereby, you can make sure that this computer always shows the selected layout on startup, no matter which user has logged in.

### Signal that controls the selected layout

Here you can setup an analog signal, whose value 0 ...n will be used to select a corresponding layout. Best choice is an analog signal with integer values (INTEGER). The link between signal value and layout is the layout index, which you can find in front of every layout in the left window.

## 23.8.4 User assignment

On this node you determine which layouts a user is allowed to see or not. The indicated users are derived from the server which is entitled as *layout source* on the *General* node.

Name	User (ibaPDA)	Local users	User 1	User 2
folder 1		admin		
Layout 1		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
folder 2		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Layout 2		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Layout 3		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
folder 3		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Layout 4		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Layout 5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The dialog is divided in two sections. On the left side there is a table with all the layouts from the layout structure in the first column and the available users in the columns aside.

On the right side there is a preview window, showing what the selected user would see in the layout selection box in the toolbar of *ibaPDA* client. You can hide the preview window in order to have more space for user assignment. Simply click on the control on the border between table and preview window.

### Making assignments

You can assign each user the layouts individually by checkmarks. When assigning layouts in folders, the folder must be assigned too. Even if you have assigned a folder, the desired layouts in the folder must be assigned too.

If you have to assign a larger number of layouts, you can select multiple table cells (mouse click + <Ctrl> or <Shift>) and make the checkmark in any of the selected cells. The same applies to unchecking.

#### Tip

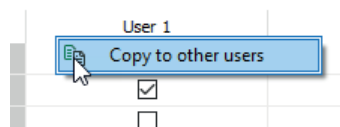


If you want to suspend temporarily the assignment of layouts in a folder for a user you just need to uncheck the folder. Then the user will not see any of the contained layouts. However, the assignment of the layouts sustains and after checking the folder again, all layouts are visible as before.

### Copying assignments

If you have configured the assignments for one user and want the same for other users, you can copy them. Proceed as follows:

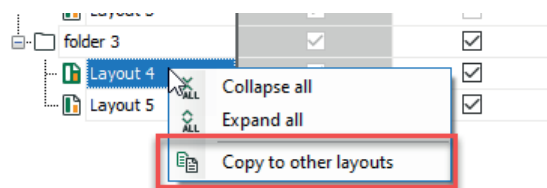
1. Make a right mouseclick on the column header of the user whose assignments you want to copy.
2. Select *Copy to other users* in the context menu.



3. All users will be shown in the subsequent dialog. Select the user(s) here who should get the assignments. The user *admin* is not provided because it has assigned all layouts anyway.

The same method applies to layouts and folders accordingly. For instance, if you have configured a comprehensive user assignment for a layout and you want to transfer it to other layouts alike or similar, proceed as follows:

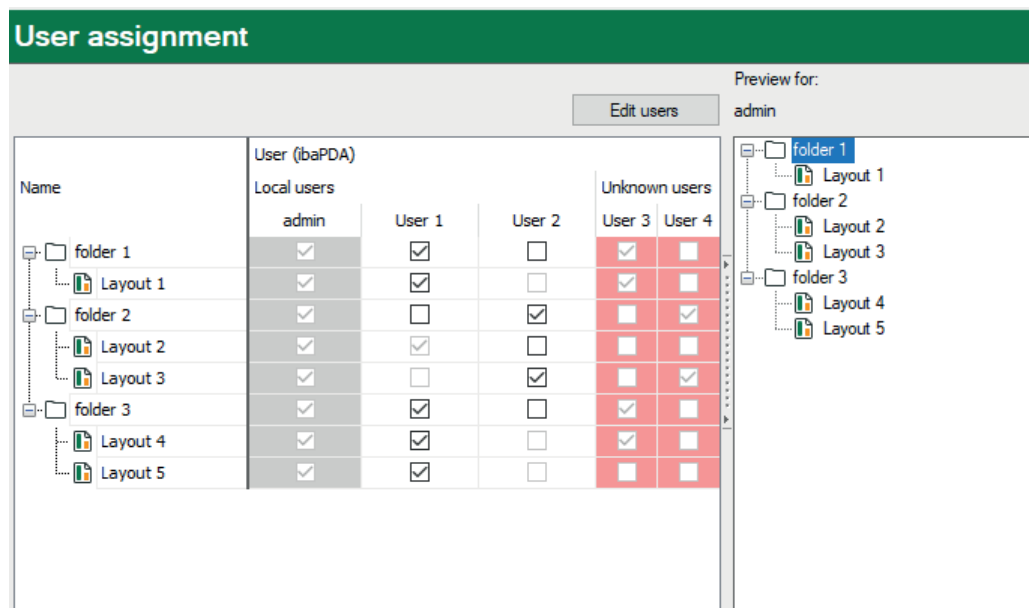
1. In the column with the layout structure select the layout or the folder whose assignments are to be copied.
2. Open the context menu (right mouseclick) and select *Copy to other layouts*.



3. All other layouts/folders will be shown in the subsequent dialog. Select the destinations (layouts or folders) here.

## Unknown users

Some situation may occur when user assignments are stored in the Layout Manager while these users do not exist. The columns of the respective users are colored red.



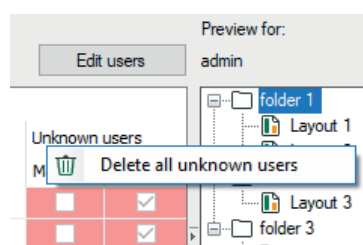
The following scenarios are possible:

- Deleting users in the user management who have layouts assigned
- Switching the *layout source* (ibaPDA, ibaHD-Server) to another server
- Loading a layout set (\*.layouts) with layouts which are assigned to users who are not configured in the user management of the actual server

You have the following options:

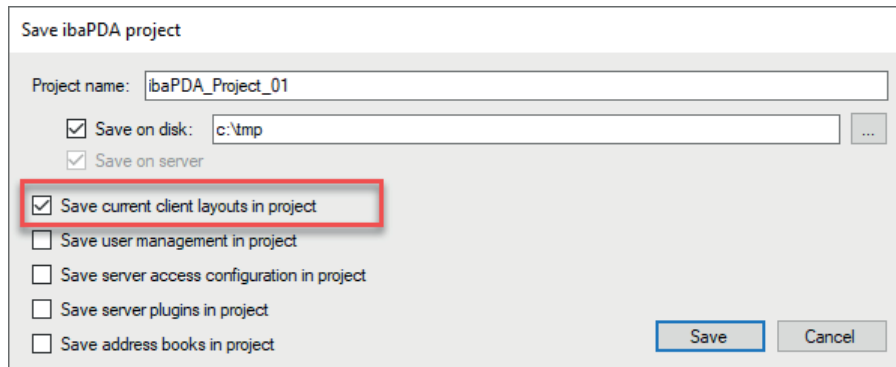
If an unknown user is required, you can create it in the user management of the connected server. Thus, the user is not unknown anymore. Via the button <Edit users> you can easily enter the user management without leaving the Layout Manager.

If an unknown user is not required, you simply can delete it in the Layout Manager. Use the context menu on the column header of the respective user for that. If there are several unknown, not required users make a right mouseclick on the common column header *Unknown users* and you can delete all unknown users at once.




## 23.9 Save layout in project

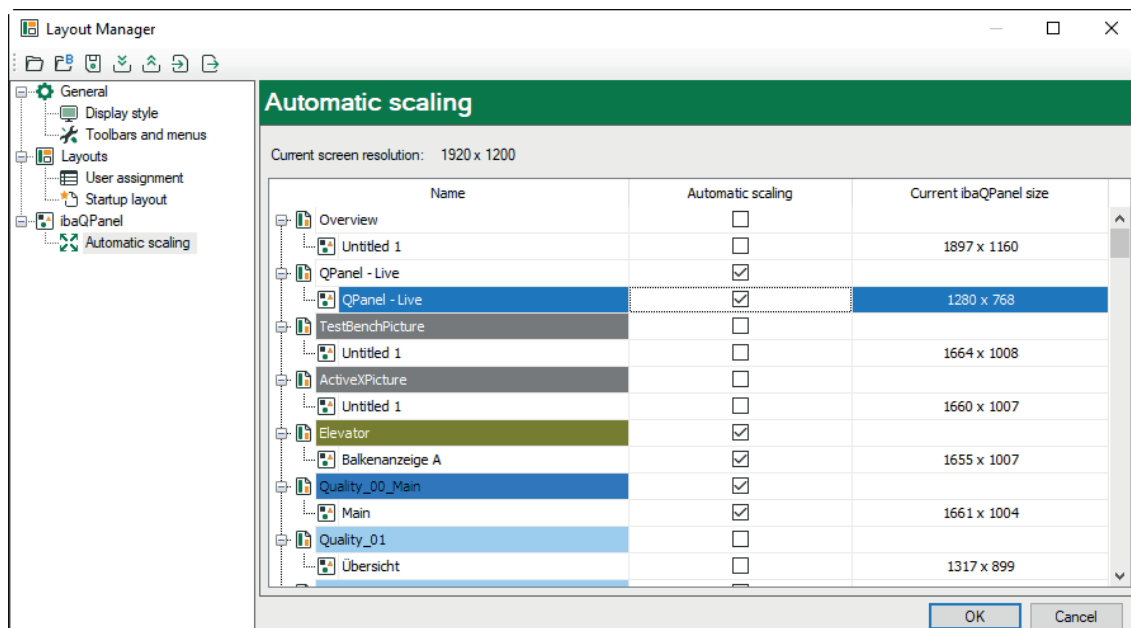
If you want to save the current layouts in a project, make sure that the option *Save current client layouts in project* is enabled in the dialog for saving the project (*File - Save project...*).



## 23.10 Automatic scaling of the QPanel window

An *ibaQPanel* window can be configured to fill the entire screen. If you then open it on a monitor with a different screen resolution, the size of the window changes. You can use the *Automatic scaling* option to automatically adapt the size of the *ibaQPanel* window and all the objects it contains if it is used on a monitor with a different resolution. All text sizes are also rescaled.

Automatic scaling can be enabled in the Layout Manager. Open the Layout Manager by selecting *Configuration - Layout Manager* in the menu or using the  icon.

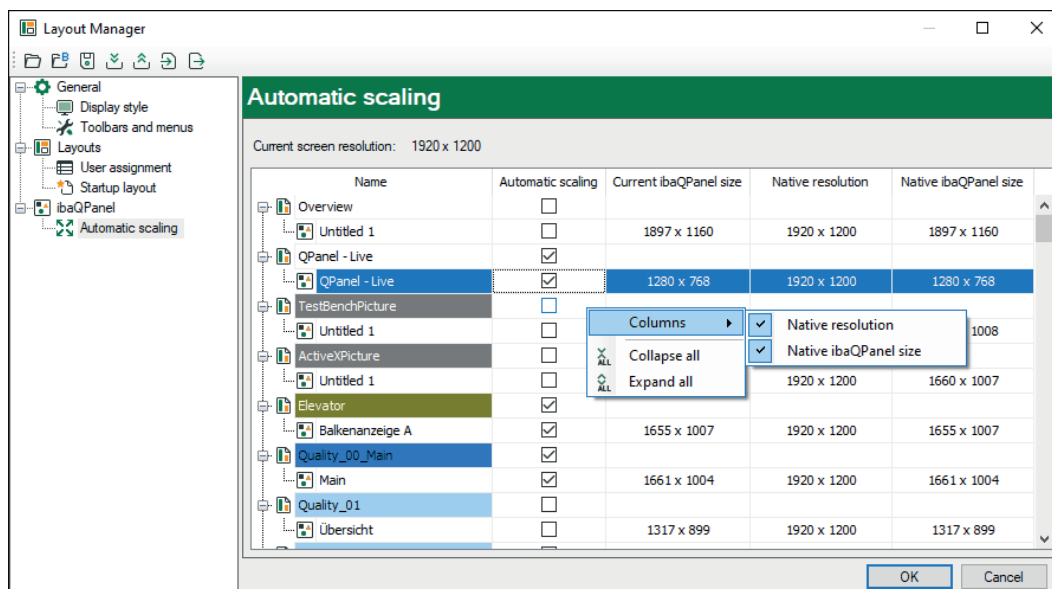


The scaling is carried out when opening *ibaPDA* on a screen with a different resolution. It also works on the fly if you drag the window to another screen with a different resolution.

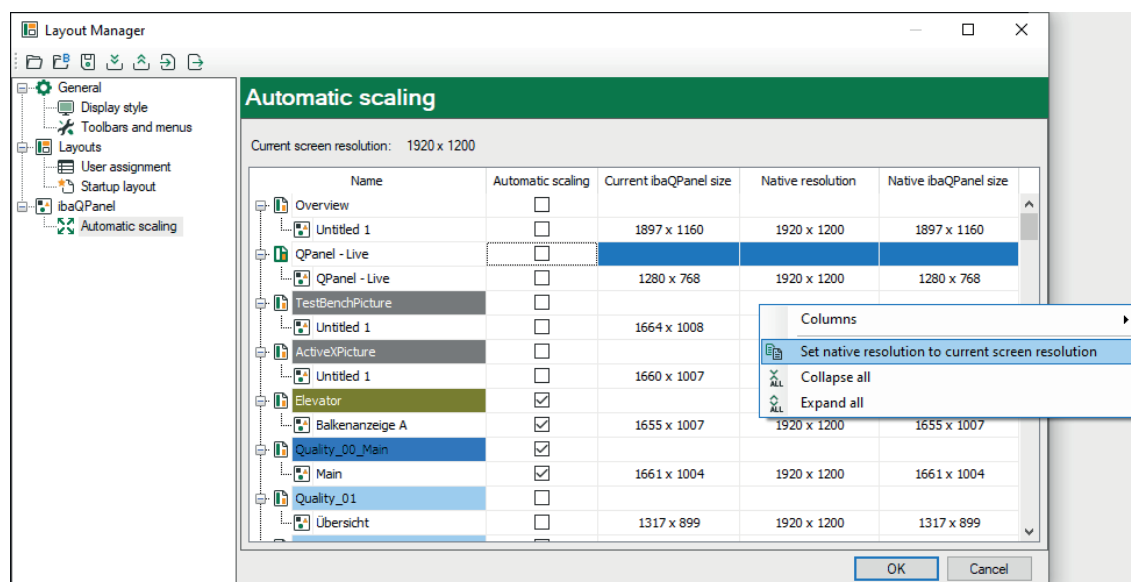
You can enable automatic scaling separately for each window by clicking on the checkbox for the relevant window.

You can use the context menu to show or hide the columns in the table:

- Automatic scaling: Enable/disable automatic scaling
- Current *ibaQPanel* size (in pixels)
- Native resolution: Resolution of the screen on which the window was created
- Native *ibaQPanel* size: Size corresponding to the system resolution.



You can adjust the native resolution to the current screen resolution. To do this, right-click to open the context menu in the *Native resolution* column and select *Set native resolution to current screen resolution*.



When you open an existing layout with an *ibaQPanel* window for the first time in the new version, the native resolution is initialized to the current screen resolution and the native size to the current size.

## 24 Support and contact

### Support

Phone: +49 911 97282-14

Email: [support@iba-ag.com](mailto:support@iba-ag.com)

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### Note



If you need support for software products, please state the number of the license container. For hardware products, please have the serial number of the device ready.

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### Contact

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