zenon manual

Extended Trend

v.7.11

COPADATA
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Contents

1. Welcome to COPA-DATA help

GENERAL HELP

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2. Extended Trend

The Extended Trend is used for the representation of online and historical values(Archive values) of process variables and derived process variables in form of curves. It makes it possible to reread historic data. Scrolling in the Extended Trend provides a ruler and zoom function together with a trend analysis. In contrast to the `trend` dynamic element, it is possible to zoom, browse, query and scale online values and values from archives.

License information

Must be licensed for Editor and Runtime (single-user, Server, Standby and Client).

Note: An `Extended Trend Starter Edition` with limited functionality is already included in the standard license.

EXTENDED TREND STARTER EDITION

In the standard package of zenon, a reduced version of Extended Trend with limited functionality is included with the Starter Edition.

The Starter Edition has the following limitations:

▸ no XY trend

▸ no second time axis

▸ number of curves limited to 8

▸ no logarithmic representation

▸ no scanning

For additional limitations on use in Windows CE projects, the zenon under Windows CE manual, Limitations for zenon chapter.

Attention!

You cannot use any functions that exceed the limitations mentioned above if you have only the Starter Edition license in the Editor.

If you only have the Extended Trend Starter Edition license in the Runtime, you cannot use screen switch functions that do not follow the rules mentioned above. The `Extended Trend` screen will then be loaded with the default filter (=empty filter). An entry in the Diagnosis Server is made

Example: You try to perform a screen switch to an Extended Trend Module screen with 10 curves in Runtime with the Starter Edition. The Trend screen will be opened, but you will not see any curves.

LICENSING

The Extended Trend Starter Edition on the PC can be upgraded to the full Extended Trend module version at any time, without compatibility problems. For I/O licensed version, the Starter Edition is not available.

WINDOWS CE

For the Windows CE 6.0 Runtime, the Extended Trend Module Starter Edition is available in combination with the Historian Starter Edition. None of the two modules are available for any older Windows CE versions. The **extended curve list** *control element is not available in Windows CE. Therefore all control elements that relate to this element are only displayed if the project is not a CE project.*

3. Engineering in the Editor

To use Extended Trend in Runtime, you must the following must be carried out in the Editor:

- ▶ An Extended Trend (on page 6) screen is created
- ▶ A screen switching function (on page 11) is created
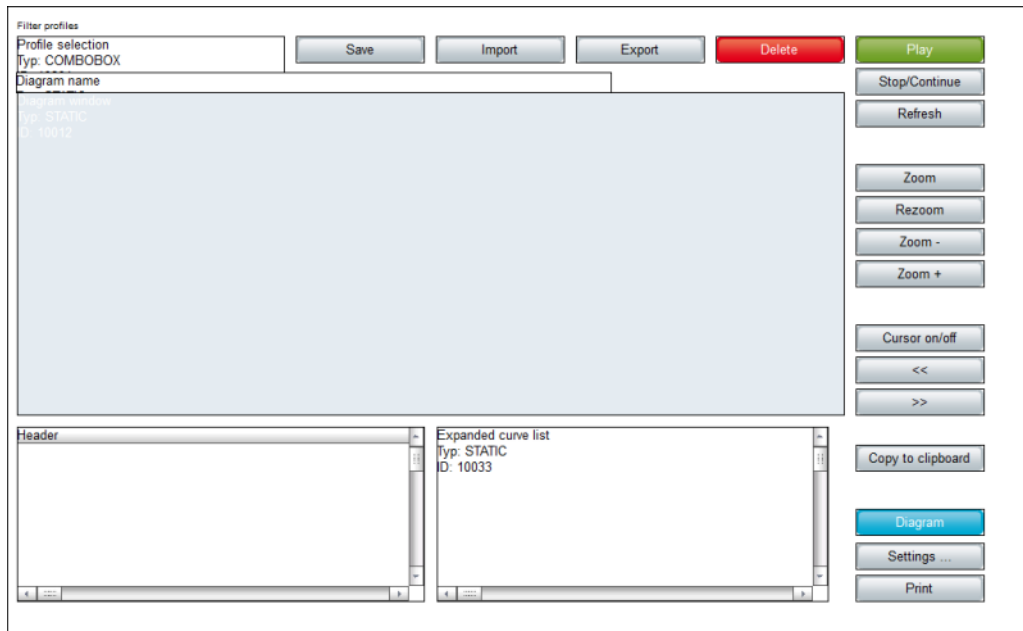- ▶ Curves (on page 64) are configured

3.1 Creating screens of type Extended Trend

Extended Trend is operated in Runtime with the help of an Extended Trend (on page 6) **screen**. This screen must be created in the editor first.

To create an **Extended Trend** screen:

1. Select, in the toolbar or in the context menu of the **Screens** node, the **New Screen** command

2. An standard empty screen is opened

3. Change the screen type in the detail view; to do this:
   a) click on **standard** in the **Screen type** column
   b) Select **Extended Trend** from the drop-down list

4. Click in the screen.

5. Select the **Control elements** menu item in the menu bar

6. Click on **Add template** in the drop-down list

7. The standard elements are inserted

8. Select additional elements as required and insert them into the desired place on the screen

Element	Description
Insert template	Opens the dialog for selecting a template for the screen type.
	Templates are shipped together with zenon and can also be created by the user.
	Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and palced in the screen. Elements can be moved in the screen and placed individually.
Windows	Selection of the window to be displayed for diagrams and curves in Runtime.
Diagram	Window to display trend curve
Diagram name	Shows the diagram name.
Set filter	Displays the status of the current time filter in Runtime.
Cursor output list	Shows the position of the cursor in the diagram window and the values set in diagram settings and cursor output (on page 58)
Curve list (deprecated)	List of curves.
	Is used for CE for compatibility reasons. For all other projects, the **extended curve list** is to be used.
Extended curve list	Curve list that can be edited in Runtime (on page 98):
	▸ Curve name
	▸ Title
	▸ Color
	▸ Y-axis
	▸ Active
	Note: Not available under Windows CE. Is replaced by the **curve list (deprecated)** there.
Diagram functions	Pre-defined controls for diagrams.
Filter	Display of set filter
Diagram settings	Activates the dialog (on page 58) for diagram settings and cursor output

Element	Description
Curves	Change curve parameters.
x-axis	opens the dialog (on page 30) for x-axis settings.
Refresh	Refreshes the display.
Stop	Do not refresh screen.
Next	Update screen
Cursor on/off	Query values
Double cursor on/off	Display (on page 77) values that are between two cursors.
Print	Prints diagram.
	Note: Printouts made using the **Print** button of the **Extended Trend** screen may be different to those made using the **Extended Trend screen switching** or **Print Extended Trend diagram** functions. The functions assume a window size of 1000 x 700. Printing via the button is in the proportion defined in the Editor.
Print with dialog	Choose the printer before printing out the diagram.
Copy to clipboard	Copy representation into the intermediate store.
Export data displayed	exports (on page 95) all visible data of all curves as a CSV file.
Diagram navigation	Buttons for navigation in the diagram.
Cursor one pixel to the left	Places cursor one pixel to the left.
	If the **Shift** key is pressed at the same time, the cursor is moved by 10 pixels.
Cursor one pixel to the right	Places cursor one pixel to the right.
	At the same time as the **Shift** key is pressed, the cursor is moved by 10 pixels.
Backwards	Scroll backward on the time axis (history)
Quarter backwards	Moves the time period displayed back by a quarter of the measuring unit selected.
Forward	Scroll forward on the time axis (current)
Quarter forwards	Moves the displayed time period forwards by a quarter of the unit selected.

Element	Description
`Zoom`	Zoom display
`Step back`	Reduce display
`Zoom +`	reduces display time intervals
`Zoom -`	Increases display time intervals
`Zoom to 100 %`	Sets zoom factor to 100%.
	This zoom action is saved in the zoom history.
	For example: `zooming` is used
	▶ to zoom 2x into a selected area of the Extended Trend,
	▶ then `zoom content to 100%` is selected and
	▶ then a selected area is zoomed into again,
	then there are 4 zoom events in the history. These can be gone back to again using the `Back` button.
Filter profiles	Buttons for filter settings in Runtime.
`Profile selection`	Select profile from list.
`Save`	Saves current setting as a profile.
`Delete`	Deletes selected profile.
`Import`	Imports filter profiles from export file.
`Export`	Exports filter profiles in the file.

💡 **Information**

The `cursor one pixel to the left` and `cursor one pixel to the right` control elements move the cursor if it is active, not the trend.

Arrow keys on the keyboard can also be used instead of the control elements.

If you hold down the `Shift` key when moving with the cursor keys, the movement is carried out in 10-pixel increments.
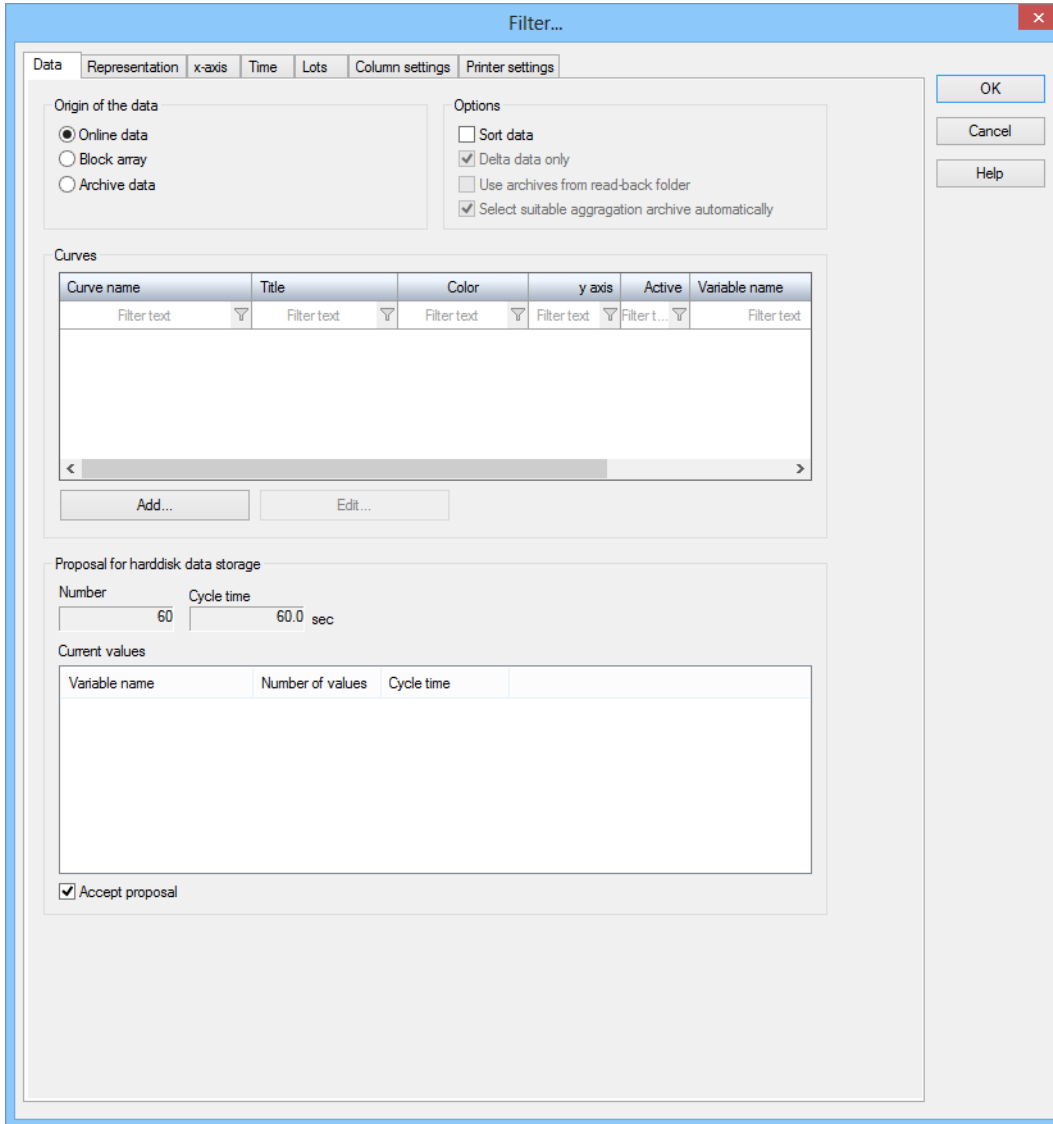
3.2   Screen switch - Extended trend

The parameters for the trend diagram to be displayed in Runtime are defined with the screen switching. Each trend curve is provided with its own name. We recommend not displaying too many trend curves at the same time, so you can maintain a good overview. Several variables can be configured for the configuration of curves, which can then be freely activated in Runtime.

To configure screen switching:

1. Select New function in the context menu in the Function node

2. The dialog for selecting a function is opened

3. navigate to the screens node

4. select screen switch

5. select the desired screen of type Extended Trend

6. The dialog for configuring the diagram is opened

Tab	Description
Data (on page 13)	Configuration of the source of data and curve administration.
Representation (on page 22)	Configuration of the diagram display.
X-axis (on page 25)	Configuration of the x-axis.
Time (on page 33)	Configuration of the time filter.
Lots (on page 48)	Configuration of the lot filter.
Column setting (on page 53)	Configuration of the columns to be displayed:
Printer settings (on page 61)	Configuration of the settings for printing diagrams and saving them as a screen.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.2.1 Data

Configuration of data origin and curves and how they are displayed in Runtime.

The possible options vary depending on the origin of the data.

▶ Online data

▶ Block array

▶ Archive data

CONFIGURATION OF DATA

Parameters	Description
`Origin of the data`	Selection of the data origin: ▸ **`Online data`** ▸ **`Block array`** ▸ **`Archive data`** Can only be selected as long as no curves have been configured.
`Online data`	`Active`: Current online values and saved values are used for the display.
`Block array`	`Active`: Variables with array values are used for the display. You can limit the display of variables to those that are based on a driver that supports variables with array values using this. The display of variables with array values works just like the XY display. However, you may not select a time filter or X variable. Enter, in the X-axis (on page 30) tab (XY-display) for `Scale` `From` and `To` the corresponding array indexes of the source data. **Note:** Block array corresponds to the `Block array size` property that can be set for a variable and is not identical to array variables.
`Archive data`	`Active`: Archive values saved in the database (in ARX format or SQL data) are used for the display. **Note**: Archives in XML, dBase or TXT formats are no longer displayed after the storage cycle has expired.
`Options`	Configuration of options, depending on the origin of the data.
`Sort data`	Only available for **`online data`** and **`archive data.`** `Active`: The data is sorted with a time stamp after loading. **Note:** The use of this option can impair the performance, because the data must be re-sorted each time. **Recommendation:** Use this option if the data comes from an external source and it cannot be ensured that the sequence is correct.

Delta data only	Only available for **archive data.**
	`Active`: When switching or updating the trend, only archives with amended data are loaded.
Use archives from read-back folders	Only available for **archive data.**
	The historical data from the readback folder is used for the display.
Automatically select appropriate aggregated archive	Only available for **archive data.**
	`Active`: The appropriate aggregation archive is automatically selected in Runtime.
	How it works in Runtime
	▸ If a very large time range is selected in the base archive or zooming out is carried out very often, then very large amounts of data are generally required. With this option active, only the data from the next aggregated archive is displayed. If the diagram is zoomed in on again, the diagram switches back to the previous archive.
	▸ Threshold: Root from diagram width = number of values from the aggregated archive. Example: Diagram width 625 pixel results in a threshold of 25 values. If the threshold cannot be determined, 15 values is used as a default.
	▸ The archive that appears first in the following sequence is selected from the aggregated archives: - Average - Maximum – Minimum – Sum Note: If the variable for the diagram is selected from an aggregated archive, then: - only the same aggregation function is used - no longer gone back to the direction of the base archive
	▸ If several aggregated archives are present on one level with the same aggregation function, the first one is always used.
	▸ If only a sum variable is found for a variable from the base archive, there is a warning in the diagnosis viewer and in the output window of the Editor.

	Default setting: ▸ `active` ▸ With the exception of projects that were created before version 7.11 and converted to the current version.
`Curves`	Display and activation of the configured curves. All curves are shown in this window. Display in Runtime can be activated and deactivated here. The displayed columns in the curve list correspond to the current configuration of the **`extended curve list`** in the **`Column settings`** (on page 53) tab. Important columns: ▸ **`Curve name`**: The curve name is displayed. ▸ **`Title`**: The configured curve title is displayed. ▸ **`Color`**: The configured curve color is displayed. ▸ `Y-axis`: Activation/deactivation of the display of the Y-axis in Runtime by clicking in the checkbox. If the checkbox has been deactivated, the Y-axis for the curve can be selected and displayed in Runtime in the **`Extended Trend`** screen. ▸ `Active`: Activation/deactivation of the display of the curve in Runtime by clicking in the checkbox. If the checkbox has been deactivated, the curve can be selected and displayed in Runtime in the **`Extended Trend`** screen. ▸ **`Variable name`**: The variable name is displayed. ▸ Variable identification: The variable identification is displayed. **Note:** ▸ The permitted number of curves depends on the license. ▸ When selecting an `string` archive variable, the `Gantt display` (on page 69) option is automatically displayed in the **`Curve settings`** (on page 64) dialog.
`Add`	Opens the dialog to select a variable, depending on the origin of the data:

	▸ **Online data**: numeric variables ▸ **Block array**: numeric variables ▸ **Archive data**: Variables of existing archives
Edit	Opens the dialog to configure curves (on page 64).
Delete	Removes selected curves from the list. Only available if curves have been configured.
Proposal for hard disk data storage	Only available for **online data**. Offers the values proposed by the properties of the Harddisk data storage group in the zenon Editor. The calculation of the proposal is directly related to the refresh rate (**Display** tab). For **YT display** (on page 26), the time configured in the time filter is also included in the calculation.
Number	Number of values that are written. Corresponds to the value that is entered in the Number of values property.
Cycle time	Cycle time in seconds. Corresponds to the value that is entered in the Cycle time [s] property.
Preview	Displays the current value of variables that are to be replaced by the proposed values.
Accept proposal	Active: Writes the proposed values to the respective properties of the variables when the dialog is closed with **OK**. Note: It is activated if the Harddisk data storage active property is deactivated.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

HARDDISK DATA STORAGE

If online variables are to e displayed in Extended Trend, it is recommended that the values for saving the variable values are coordinated on the hard drive. If, when configuring the screen switching to an **Extended Trend** screen, the option Online data is selected, the system proposes optimal values for saving the variable values to the hard disk. These values can also be amended manually.

In the zenon Editor, you can find these properties in the `Harddisk data storage` group. This includes the properties:

▶ `Harddisk data storage active`: Switches data saving on or off.

▶ `Number of values`: Number of values that are saved.

▶ `Cycle time [s]`: Cycle time in seconds.

▶ `Recording type`: type of saving:

   • `Hard disk data (cyclical)`:: Cyclical writing of values to the hard disk.

   • `Resorted values (RDA)`: The values are written blockwise by the driver on to the hard disk.
     Suitable for post mortem analysis. The control unit must therefore be configured to save data in the event of an error and to write this to the hard drive once back in operation.

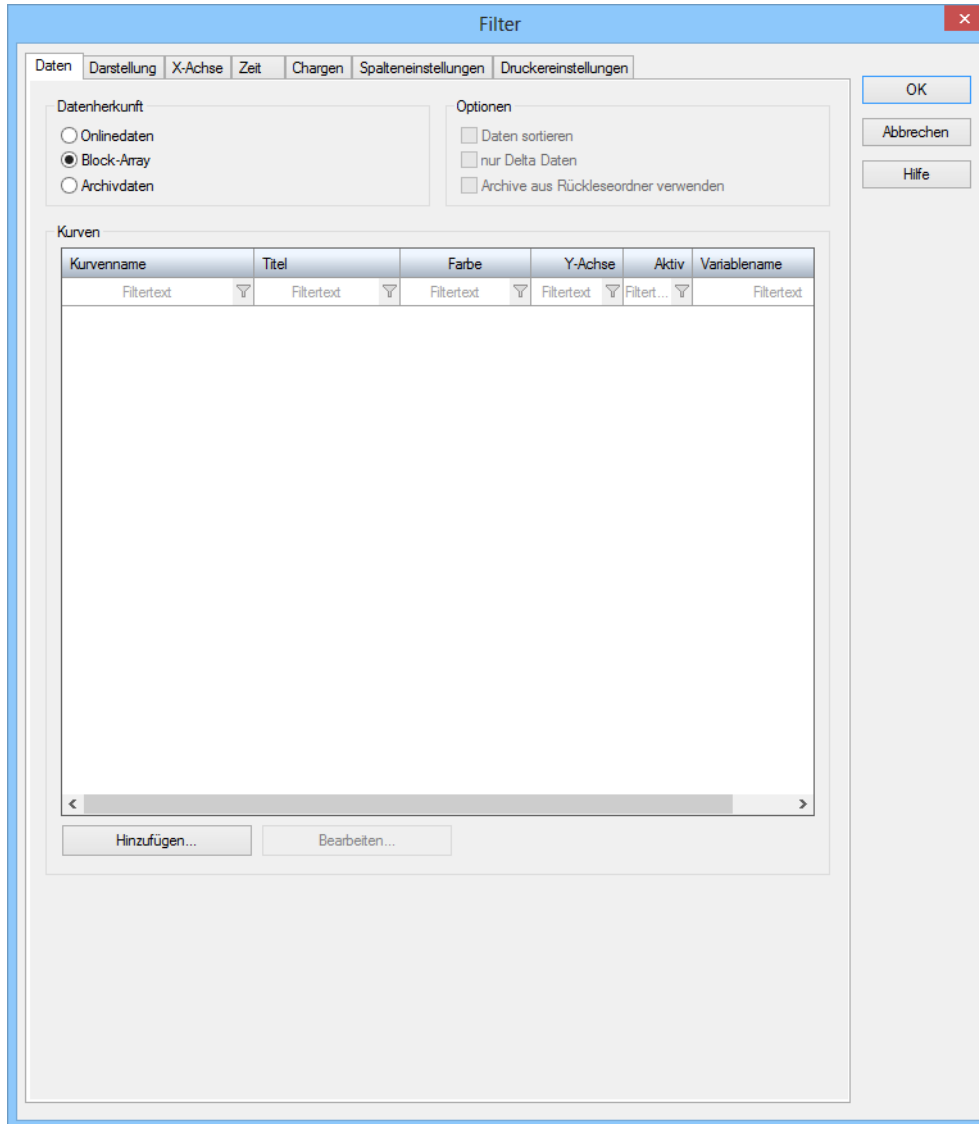If hard disk data backup is not used, data is not saved in Runtime.

Block array

To set up variables with array data:

▶ Define the `Block array size` property in the `Additional settings` group for the corresponding variable, for example 10
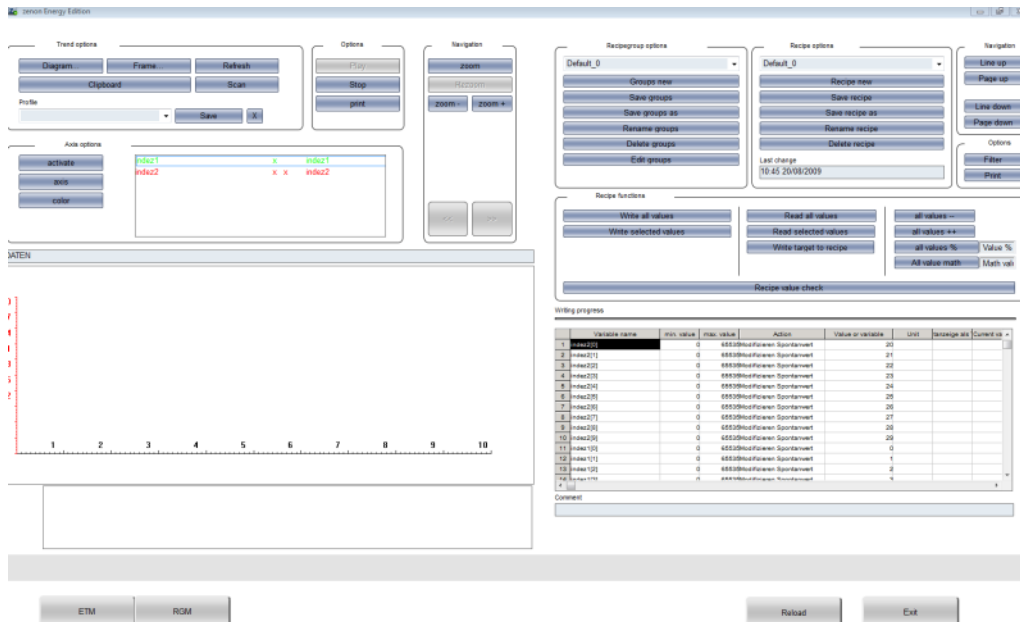
▶ Select, for the **screen switching** function, the `Block array` property on the ETM screen:
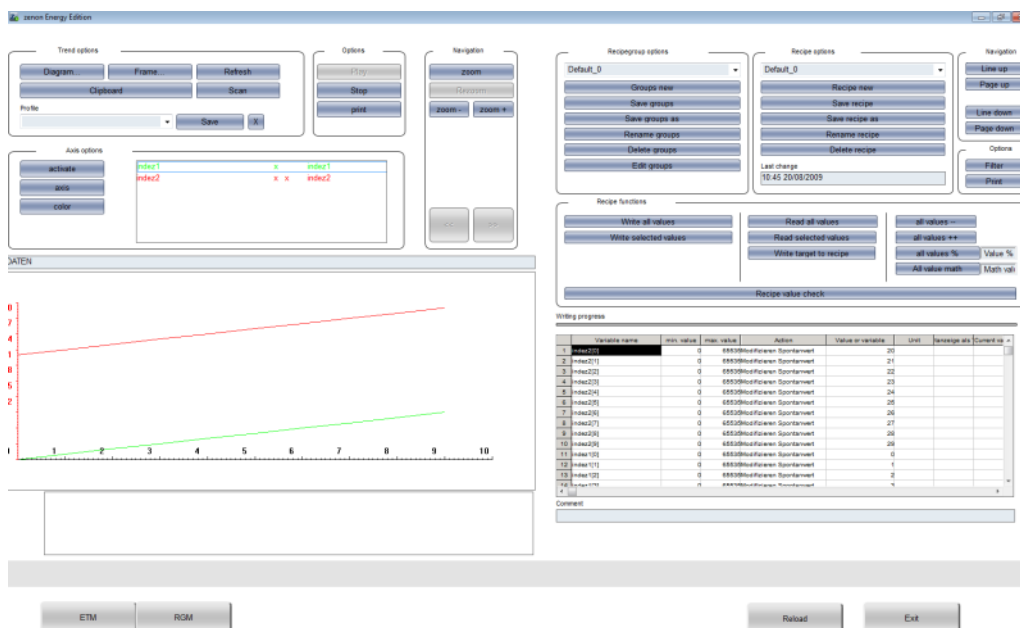
RESULT IN RUNTIME

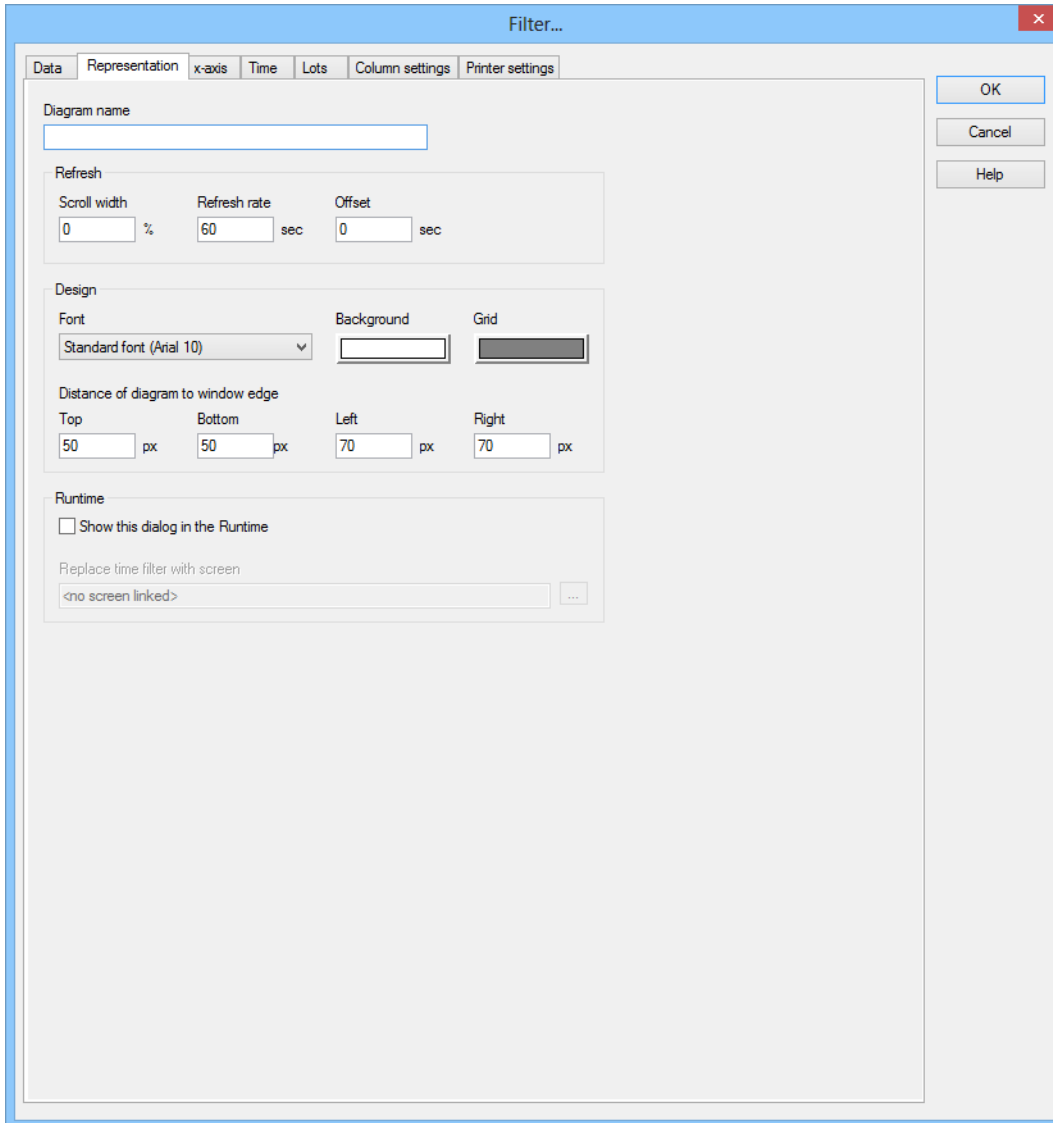1. The ETM screen is still empty when Runtime is started:

2. The values of the variables with block arrays are displayed as soon as the recipe values are set:

3.2.2 Representation

Settings for the display of the diagram in Runtime:

Parameters	Description
Diagram name	Freely-configurable diagram name. Maximum length: `30 characters` **Integrate lot names dynamically**: The diagram name can contain lot names. To do this, insert the character sequence `%c%` into the name. In Runtime, each `%c%` is replaced by the lot names that replace the filter requirements. For example: The diagram name **Diagram1_%C%_End** results in **Diagram1_Lot1_End** in Runtime
Update	Settings for the allocation of the monitors.
Scroll width	Stipulation of the screen scrolling in percent if the right edge of the diagram has been reached. Possible values: `0` to `100`: **Attention** Only available for YT display (on page 26).
Refresh rate	Set the refresh rate in seconds. ▸ The value must be greater than `0` for **online data** and **block array**. ▸ The screens cannot be loaded statically for **online data** and **block array**. ▸ For **archive data**, the `refresh rate` automatically adapts to the loading time of the data. If loading lasts longer than half of the refresh interval, the refresh rate is doubled. Alternatively, the value for the refresh rate can be set to `0` for **archive data**. This results in the displayed data not being updated. This setting is helpful if a large amount of data is to be displayed in the ETM. If, in this case, Refresh rate is set to a low value, this can lead to an infinite loop. Respective maximum: `3600 s` **Optimize refresh rate:** When reading archive data, a log message is created at the start and the end by the server (including standalone servers) and the client. The log message can be read with the help of the Diagnosis Viewer. With this it can be determined how long the reading lasts and the `Refresh rate` and be defined accordingly.

`Offset`	Moving the zero point of the time axis to the stated value in seconds. Maximum: `65535 s` Not available for **`block array`** data source.
`Design`	Settings for the design of the diagram.
`Font`	Selection of the user-defined font for the axis labels and the value indicators from a drop-down list
`Background`	Selection of the background color for the displayed graphics. Clicking on the button opens the dialog to select the screen.
`Grid`	Selection of the color for the overlaid grid. Clicking on the button opens the dialog to select the screen.
`Distance diagram to window border`	Settings for the stipulation of the distance between the diagram and the window frames. Respective minimum: `10 px` Respective maximum: `2000 px`
`Top`	Distance between the upper edge of the control element and the trend curves represented inside it. (**Attention**: Room for later optional showing of stored details with active pointer)
`Bottom`	Distance between the lower edge of the control element and the X-axis (Origin 0%-Y-axis) (**Attention**: take the room for two-line labeling of the X-axis for the configured user defined font into account)
`Left`	Distance between the left edge of the control element and the Y-axis (Origin 0%-X-axis) (**Attention**: take the room for the left-hand side labeling of the Y-axis for the configured user-defined font into account)
`Right`	Distance between the left edge of the control element and the y-axis (Origin 100%-X-axis) (**Attention**: take the room for the right-hand side labeling of the Y-axis for the configured user defined font into account)
`Runtime`	Settings for action in Runtime.
`Show this dialog in the`	`Active`: The dialog to select a time range is opened in Runtime

Runtime	when screen switching.
	Requirement: A **time period** (on page 43) is defined in the time filter. If, in the **X axis** (on page 25) tab for the **XY display** (on page 30), the option Comparison with 2nd time period is activated, two time filters for both X-axes are offered.
Replace time filter with screen	Only available if the Offer this dialog in Runtime option has been activated.
	Replaces the dialog with a time filter screen in Runtime. The currently-linked screen is displayed.
	Click the ... button and the dialog opens to select a screen. Only screens from the project calling them up and time filter screens are offered.
	When selecting a filter screen, the **BOX SCREEN** information is also shown in the detail view of the function in the **Parameter** column; without a linked screen, only **BOX** is displayed.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.2.3   X-axis

Settings for the X-axis. This can be configured in two different forms:

▶   YT-display (on page 26): Display of the trend curves over the configured time range. When configuring the time axis, the time range, the lots and the axis display can be defined.

▶   XY display (on page 30): Display of the values over a process or a derived variable (local curves, operating points etc.).

YT display

Parameters	Description
X-axis	Selection of display type.
YT display	`Active`: The display of the curves over time is configured.
XY display	`Active`: Display of the curves using another variable is configured.
Variable for X-axis	(not available for YT display.))
Axis title	(not available for YT display.))
Position	Entry of a percentage value for the positioning of the X-axis in relation to the height of the Y-axis. Possible values: `0` to `100`. For example: ▸ `0` %: Positioning at the lower end of the Y-axis. ▸ `100` %: Positioning at the upper end of the Y-axis. ▸ `50` %: Positioning in the middle of the Y-axis.
Color	Definition of the axis color. Click on the color and a dialog opens to select a color. **Note:** Can be configured independently of the trend curve color.
Show vertical grid lines	`Active`: Vertical assistance lines are displayed at the main ticks in Runtime.
Comparison with 2nd Period	`Active`: Display comparison with a second time period. Only for archives with a filter for a time range or a lot. A comparison with relative lot filter is not possible. Two time ranges are displayed at the same time for each per archive variable (e.g. comparison over a week). Two trends are called up when it is called up. The second time range is displayed on the opposite labeling side of the time axis in the Color of the grid (on page 22). Only available with a full license.
Realtime display	`Active`: The axis must already have time markers. `Inactive`: The switching time is defined as `00:00` and is

	labeled relatively in the past `(-01:00)`.
Labeling	Position of the axis labeling.
`Above the axis`	Axis labeling above the axis.
`Below the axis`	Axis labeling below the axis.
Type of axis	(not available for YT display.))
`Linear`	(not available for YT display.))
`Logarithmic`	(not available for YT display.))
Axis subdivision	Definition of the axis subdivision.
`Number of main ticks`	Number of main subdivisions with value indication. Maximum: `60`
`Length of main ticks`	Length of main tick lines in pixels. Maximum: `10`
`Number of sub ticks`	Number of subdivisions between two main subdivisions. Maximum: `60`
`Number of main ticks automatic`	(not available for YT display.))
Scale	Stipulation of the values for the scale by activating the checkboxes: ▶ `JJ`: Year ▶ `MM`: Month `DD`: Day ▶ `HH`: Hour ▶ `MM`: Minutes ▶ `SS`: Second ▶ `MS`: Millisecond
`Cursor sizing handle`	*Definition of the circle-shaped sizing handle displayed in the middle to make it easier to use the rulers, such as in touch operation.*

Diameter	*Diameter of the sizing handle in pixels.*
	▸ `0`: no sizing handle (compatible with projects from versions before version 7) ▸ `>0`: Sizing handle is displayed according to the value entered *Default: 0* *Maximum: 100*
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

XY display

Parameters	Description
X-axis	Selection of display type.
YT display	`Active`: The display of the curves over time is configured.
XY display	`Active`: Display of the curves using another variable is configured.
Variable for X-axis	Selection and marking of one of the variables allocated to the diagram. It is used for the X axis.
	Clicking on the `...` button opens the dialog for variable selection, depending on the origin of the data.
Axis title	Text of axis labeling in Runtime.
	Maximum length: `30 characters`
Position	Entry of a percentage value for the positioning of the X-axis in relation to the height of the Y-axis.
	Possible values: `0` to `100`
	For example:
	▸ `0 %`: Positioning at the lower end of the Y-axis.
	▸ `100 %`: Positioning at the upper end of the Y-axis.
	▸ `50 %`: Positioning in the middle of the Y-axis.
Color	Definition of the axis color. Click on the color and a dialog opens to select a color.
	Note: Can be configured independently of the trend curve color.
Show vertical grid lines	`Active`: Vertical assistance lines are displayed at the main ticks in Runtime.
Comparison with 2nd Period	(not available for XY display.)
Realtime display	(not available for XY display.)
Labeling	Position of the axis labeling.
Above the axis	Axis labeling above the axis.
Below the axis	Axis labeling below the axis.

Parameters	Description
Type of axis	Selection of the display of the axis:
	▸ Linear
	▸ Logarithmic
Linear	`Active`: Linear display of the axis.
Logarithmic	`Active`: Logarithmic display of the axis.
	Only available with a full license.
Scaling	Definition of the axis subdivision.
Number of main ticks	Number of main subdivisions with value indication.
	Maximum: `100`
Length of main ticks	Length of main tick lines in pixels.
	Maximum: `4 – 10`
Number of subsidiary ticks	Number of subdivisions between two main subdivisions.
	Maximum: `4 – 10`
Automatic number of main ticks	(not available for YT display.))
Scale	Stipulation of the values for the scale by activating the checkboxes:
	▸ `JJ`: Year
	▸ `MM`: Month
	`DD`: Day
	▸ `HH`: Hour
	▸ `MM`: Minuten
	▸ `SS`: Second
	▸ `MS`: Millisecond
Cursor sizing handle	*(not available for XY display.)*
Diameter	*(not available for XY display.)*
OK	Applies all changes in all tabs and closes the dialog.

Parameters	Description
`Cancel`	Discards all changes in all tabs and closes the dialog.
`Help`	Opens online help.

> 💡 **Information**
>
> **Display of X-axis in the diagram from version 6.51**
>
> *Archive data for the X-axis is no longer loaded for performance reasons. To display the X-axis in the diagram anyway:*
>
> ▸ Add the variable selected for the `variable for X-axis` as well as the curve (on page 11) in the diagram
>
> ▸ Deactivate the display for this curve

> 💡 **Information**
>
> *If an XY display is configured, then only the respective current value is shown when the scanning is started. This cannot be updated. The cursor cannot be moved.*

3.2.4   Time

Configuration of the time filter. Not available for `block array` data source.

Note: Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.

Time filters can be pre-set in both the Editor and in Runtime for:

- ▸ Absolute period of time (on page 36)

- ▸ Relative period of time (on page 38)

- ▸ From (on page 40)

- ▸ Time period (on page 43)

Time filtering can be carried out in two ways:
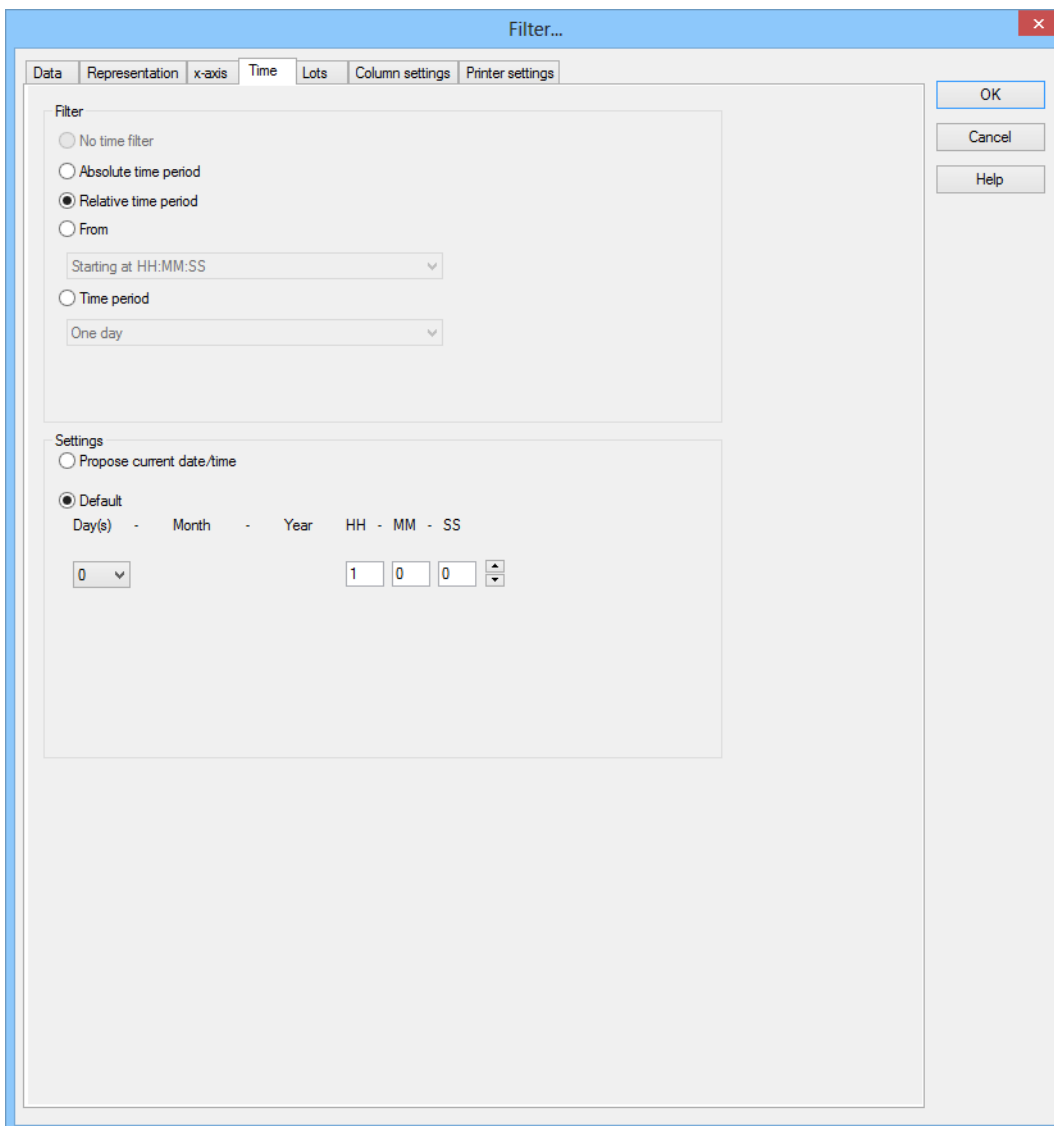
1. Define time period in the Editor (on page 45)

   Fixed time areas are used. A time period is given in the editor. It is only possible to filter according to this time period in Runtime. Other filters - such as filtering according to variable name, alarm/event groups and alarm/event classes etc. can no longer be amended in Runtime.

2. Time filter configurable in Runtime (on page 46)

   The time filter is defined in the Editor and can be changed in Runtime as desired.

TIME FILTER

Parameters	Description
Filter	Selection of the filter.
No time filter	Active: No time filter is used. Not available for Extended Trend
Absolute filter	Active: A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used. In the settings section, the corresponding options can be shown and configured there. Note: Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.
Relative period of time	Active: A relative time period is entered. In the settings section, the corresponding options can be shown and configured there. Attention: this filter is constantly updated.
From	Active: A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. Selection of the area mode from drop-down list: ▸ From HH:MM:SS o' clock ▸ From day - HH:MM:SS o' clock ▸ From day, month - HH:MM:SS o' clock In the settings section, the corresponding options can be shown and configured there. Attention: The start point of this filter is not updated automatically. Only the existing times are used when shown. The end time point is not defined with this filter, it is carried over.
Time period	Active: A fixed time period is entered. Selection of the area mode from drop-down list: ▸ One day ▸ One week ▸ Two weeks
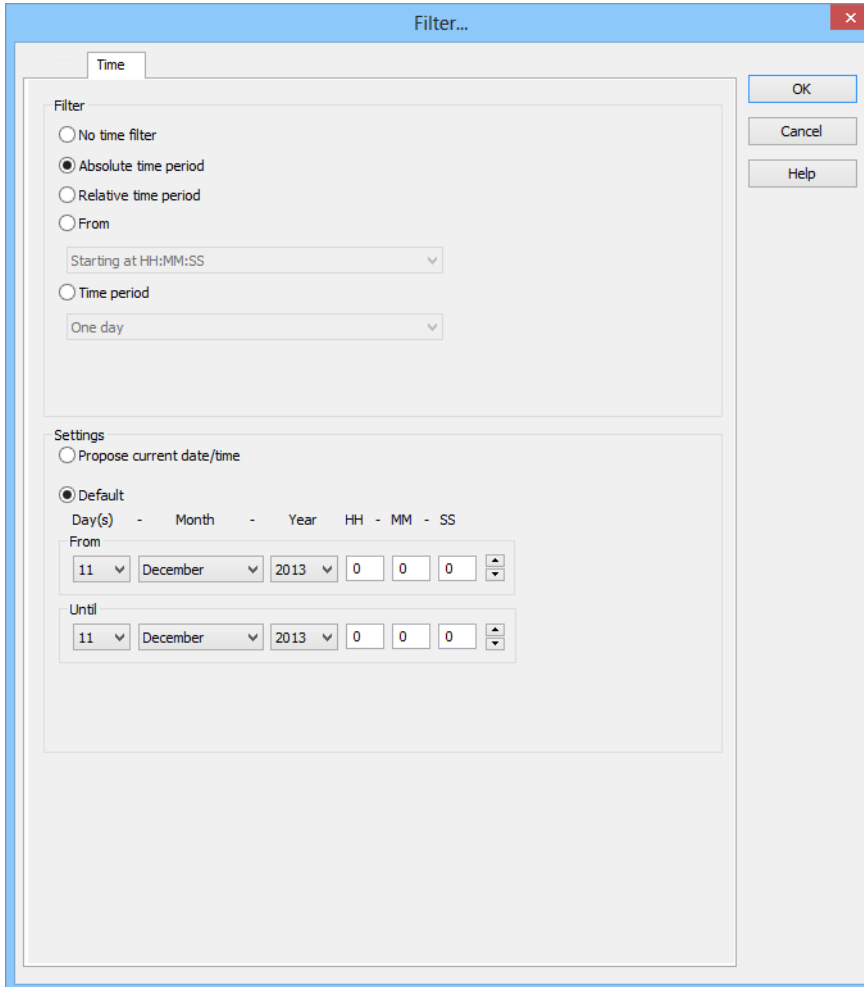
	▸ One month
	▸ One Year
	▸ 15 minutes
	▸ 30 minutes
	▸ 60 minutes
	In the settings section, the corresponding options can be shown and configured there.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Absolute time period

You define a fixed time period with the absolute filter. When the function is executed, the defined absolute time period is exactly used. To set the filter:

1. Select, in the **Filter** section, the `Absolute time period` option

2. Configure the desired time in the `Settings` section

Parameters	Description
`Options`	Configuration of the time filter.
`Propose current date/time`	`Active`: Time filter is displayed in Runtime.
`Default`	`Active`: The time filter is prescribed in the Editor. Only the start time can still be configured in Runtime.
`From`	Start time of the filter. Selection of day, month, year, hour, minute and second
`To`	End time of the filter. Selection of day, month, year, hour, minute and second
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Relative period of time

A relative time period is entered.
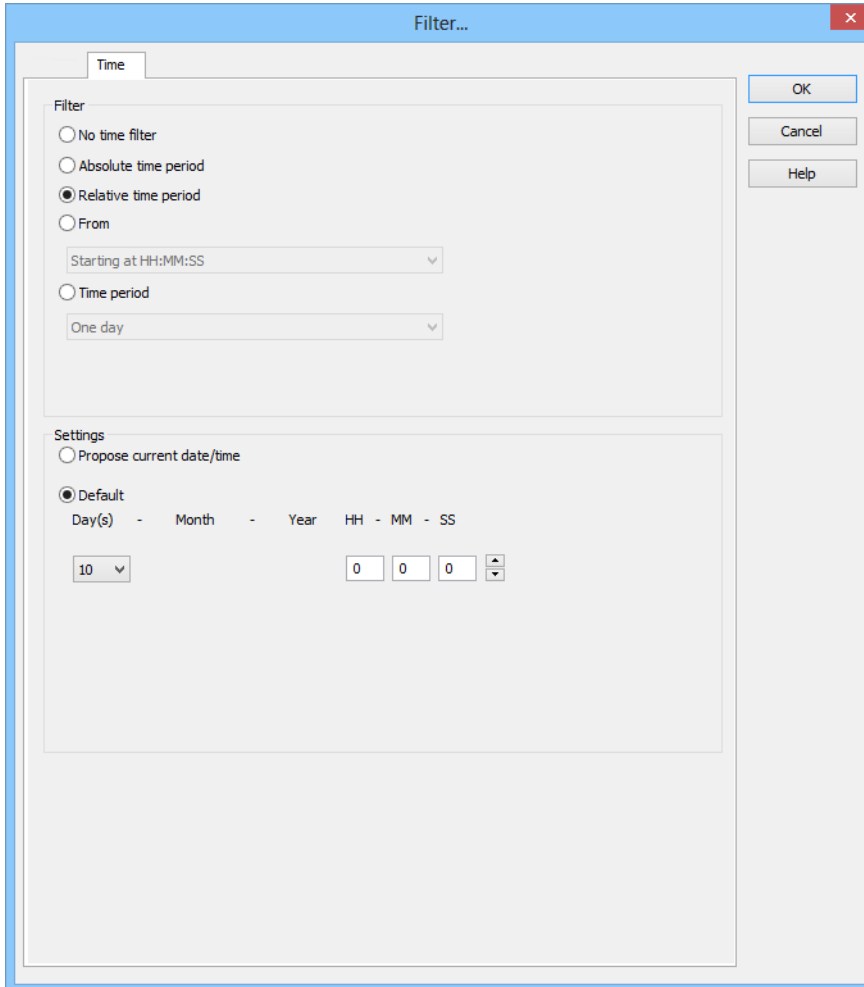
Attention: This filter is updated constantly and continues to run.
Example: You set a relative time of 10 minutes and switch to a screen with this time filter at $12:00$. You are then shown the data from $11:50$ to $12:00$ when switching. If the screen stays open, the filter is automatically updated. At $12:01$, you see the data from $11:51 - 12:01$ etc.

To set the filter:

1. Select, in the **Filter** section, the `Relative period of time` option

2. Configure the desired time in the `Settings` section

Parameters	Description
`Options`	Configuration of the time filter.
`Propose current date/time`	`Active`: Time filter is displayed in Runtime.
`Default`	`Active`: The time filter is prescribed in the Editor. Only the start time can still be configured in Runtime. Selection of the relative time period in days, hours, minutes and seconds.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

From

A time from which the filter is effective is defined. To set the filter:

1. Select, in the **Filter** section, the `Off` option

2. Select the desired filter from the drop-down list.

   - `From HH:MM:SS o' clock`

   - `From day – HH:MM:SS o' clock`

   - `From day, month – HH:MM:SS o' clock`

3. Configure the desired time in the `Settings` section

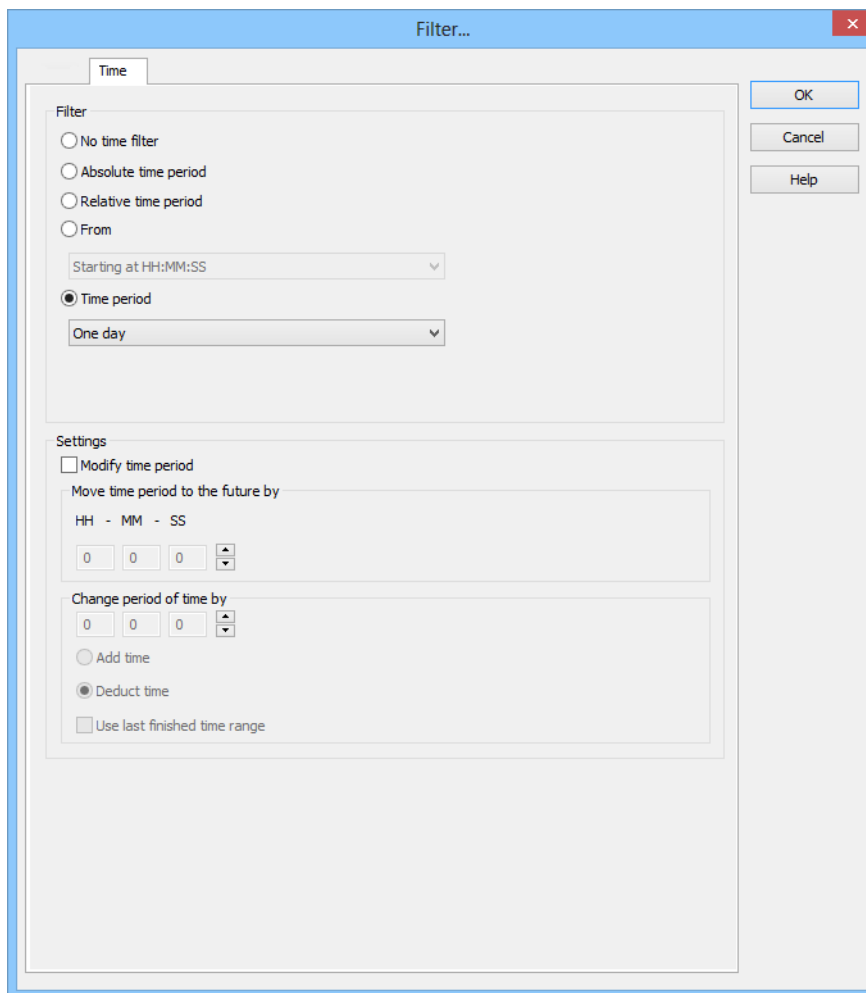| Parameters	Description
`Options`	Configuration of the time filter.
`[Date/Time]`	Depending on the settings of the `Off` option, the time from which the filter is effective is configured here: ▸ `From HH:MM:SS o' clock` ▸ `From day - HH:MM:SS o' clock` ▸ `From day, month - HH:MM:SS o' clock` **Attention!** The start point of this filter is not updated automatically. Only the existing times are used when shown, even if the screen remains open and 23:00:00 is reached. The end time point is not defined with this filter, it is carried over.
▸ `From HH:MM:SS o' clock`	A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. **Example:** You enter `23:00:00`. If it is then 23:30 when executing the function, then it is filtered from 23:00:00 up to the current point in time. If it is 22:30 however, then filtering takes place from 23:00:00 on the previous day to the current point in time.
▸ `From day - HH:MM:SS o' clock`	A day and time for the start of the filter are entered. If the time given has not been reached in the current month, the corresponding time from the previous month is used. **Example:** You enter `day 5 - 23:00:00`. If it is the 10th of the month at 23:30, then filtering takes place from the 5th of the month from 23:00:00 to the current time point. If, however, it is the 4th of the month, then filtering takes place from the 5th of the previous month to the current time point.
▸ `From day, month - HH:MM:SS o' clock`	A month, day and time for the start of the filter are entered. If the time stated has not been reached in the current year, the corresponding time from the previous year is used. **Example:** You enter `Day 5, Month October - 23:00:00`. If it is October 10th at 23:30, then filtering takes place from October 5th from 23:00:00 to the current time point. If, however, it is only October 4th, then filtering takes place from the 5th of the previous year to the current time point.
`OK`	Applies all changes in all tabs and closes the dialog.
`Cancel`	Discards all changes in all tabs and closes the dialog.
`Help`	Opens online help.

Time period

A time period in which the filter is effective is defined. To set the filter:

1. Select, in the `Filter` section, the `Time period` option

2. Configure the desired time in the `Settings` section

Parameters	Description
`Options`	Configuration of the time filter.
`Modify time period`	Allows amendments to cycles, postponements and extensions of time periods. `Active`: Evaluation is carried out in accordance with the following rules: ▶ First, the `Use last finished time period` option is evaluated. ▶ After this, `Change time period by` is used. ▶ `Move time period to the future by` is then applied. `Inactive`: No changes to the time period are made. **Attention:** With version 7.10, filter actions on the basis of this function led to different results than those in the versions before.
`Move time period to the future by`	`Active`: The time period defined in the filter is postponed to the future. Given in `hours - minutes - seconds`. If a postponement that is the same or greater than the selected `time period` is set, a note to check the configuration is displayed.
`Change period of time by`	`Active`: The time period defined in the filter is modified. Given in `hours - minutes - seconds`. If a change and a postponement that are the same or greater than the selected `time period` is set, a note to check the configuration is displayed.
`Add time`	`Active`: The time stated in `Change time period by` is added to the time defined in the `Time range` option.
`Deduct time`	`Active`: The time stated in `Change time period by` is deducted from the time defined in the `Time range` option.
`Use last finished time period`	`Active`: The last finished time period is used.
`OK`	Applies all changes in all tabs and closes the dialog.
`Cancel`	Discards all changes in all tabs and closes the dialog.

Help	Opens online help.

Define time period in the Editor

With this method, you enter a fixed time period into the editor, which is applied when the function is carried out in Runtime. You can then only define the start time in Runtime, but no further filter settings.

For example: You set a 30 minute time filter. In Runtime, you can now only set when this 30 minute time period is to start. However, you cannot change the filter to a day filter.

> ⚠ **Attention**
>
> *When using this type of filter, you can also no longer amend all other filters in Runtime that are available in the* **General** *tab. It is still possible to filter for text, status and equipment.*

To create the filter:

1. The screen must have the **Filter** button to start the filter in Runtime

2. select the desired filter

3. Configure the selected time period
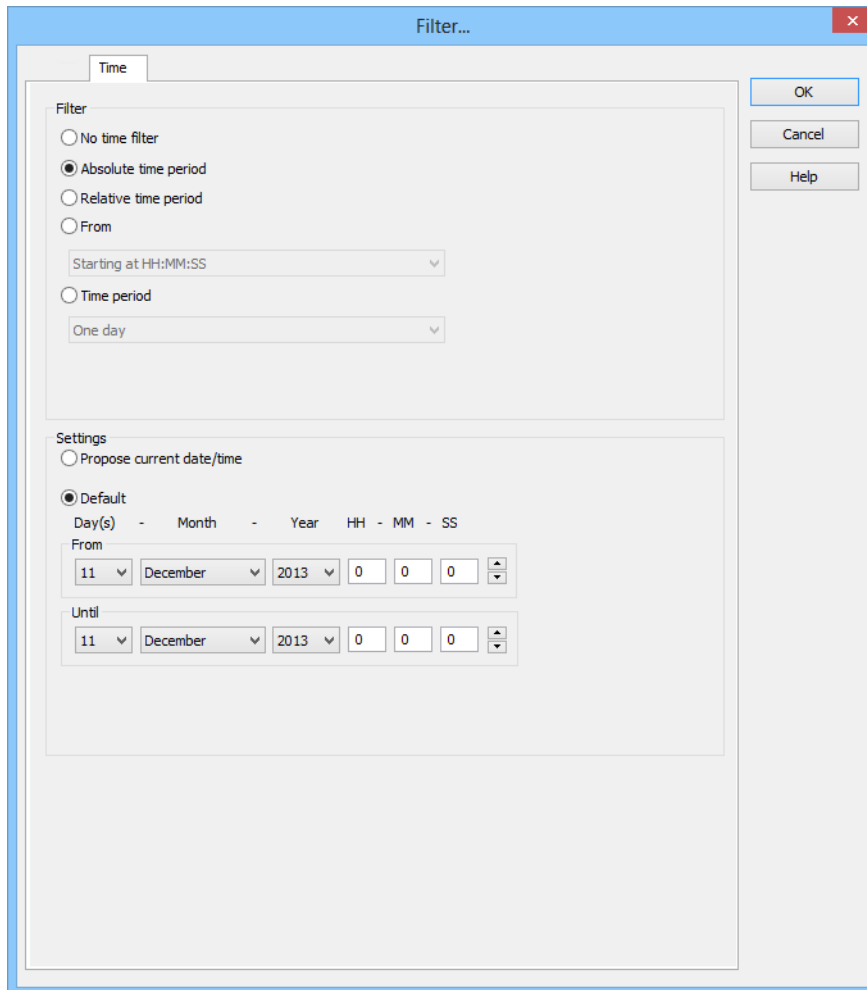
Tip for time period: Activate the `Offer this dialog in Runtime` option in the filter dialog. This way you can amend the start time before the function is carried out. Do not have the filter displayed in Runtime when the function is turned on; this way the current time period is always used. If you have activated the `Use last closed time period` option, the previous time period is shown.

For example: You have set a 30 minute filter. It is 10.45 when the function is activated. If the `Use last closed time period` option is deactivated, the filter is set to the current time period 10:30:00 to 10:59:59. If the option is activated, the filter is set to the previous time period of 10:00:00 to 10:29:59.

Time filter can be configured in Runtime

With this method, you stipulate a time filter in the Editor. This can be amended in Runtime before execution. To create the filter:

1. The screen must have `Filter` and `Display filter` buttons

2. select the desired filter:

    - Absolute time period
    - Relative period of time

3. Select, in the Settings section, the option `Propose current date/time`

4. The filter dialog is opened in Runtime with the current date and time
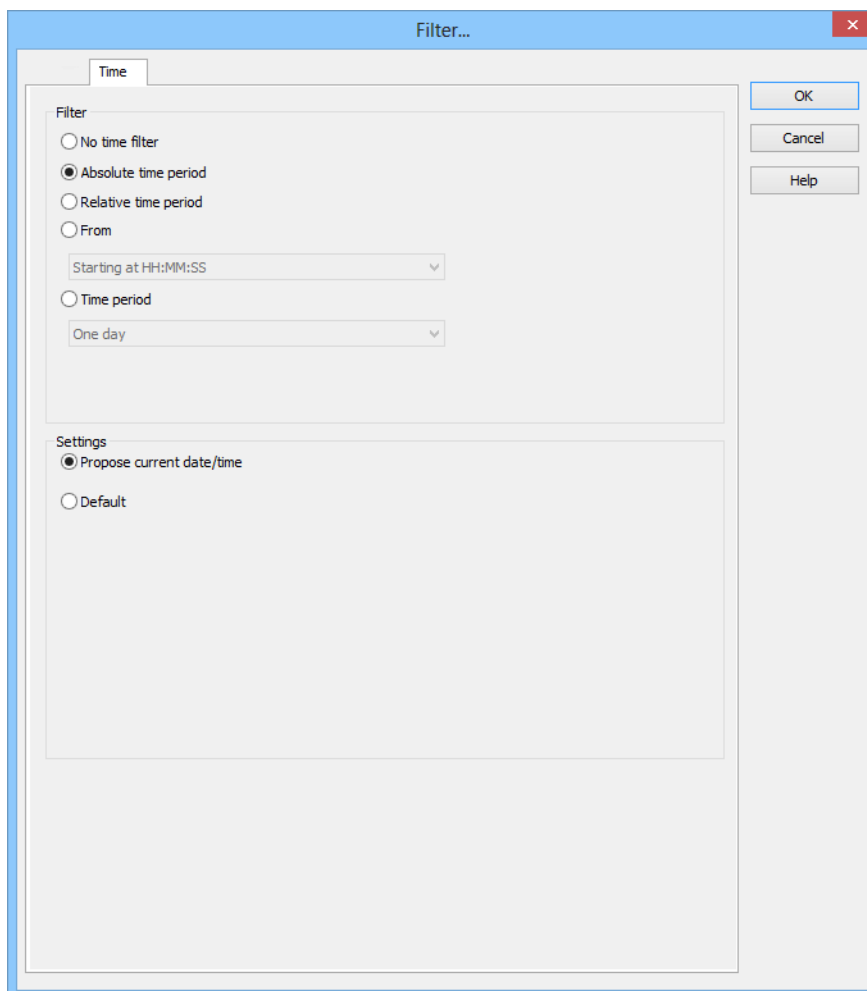
3.2.5 Lots

Configuration of the lot filter. Only available for `archive data` data source.

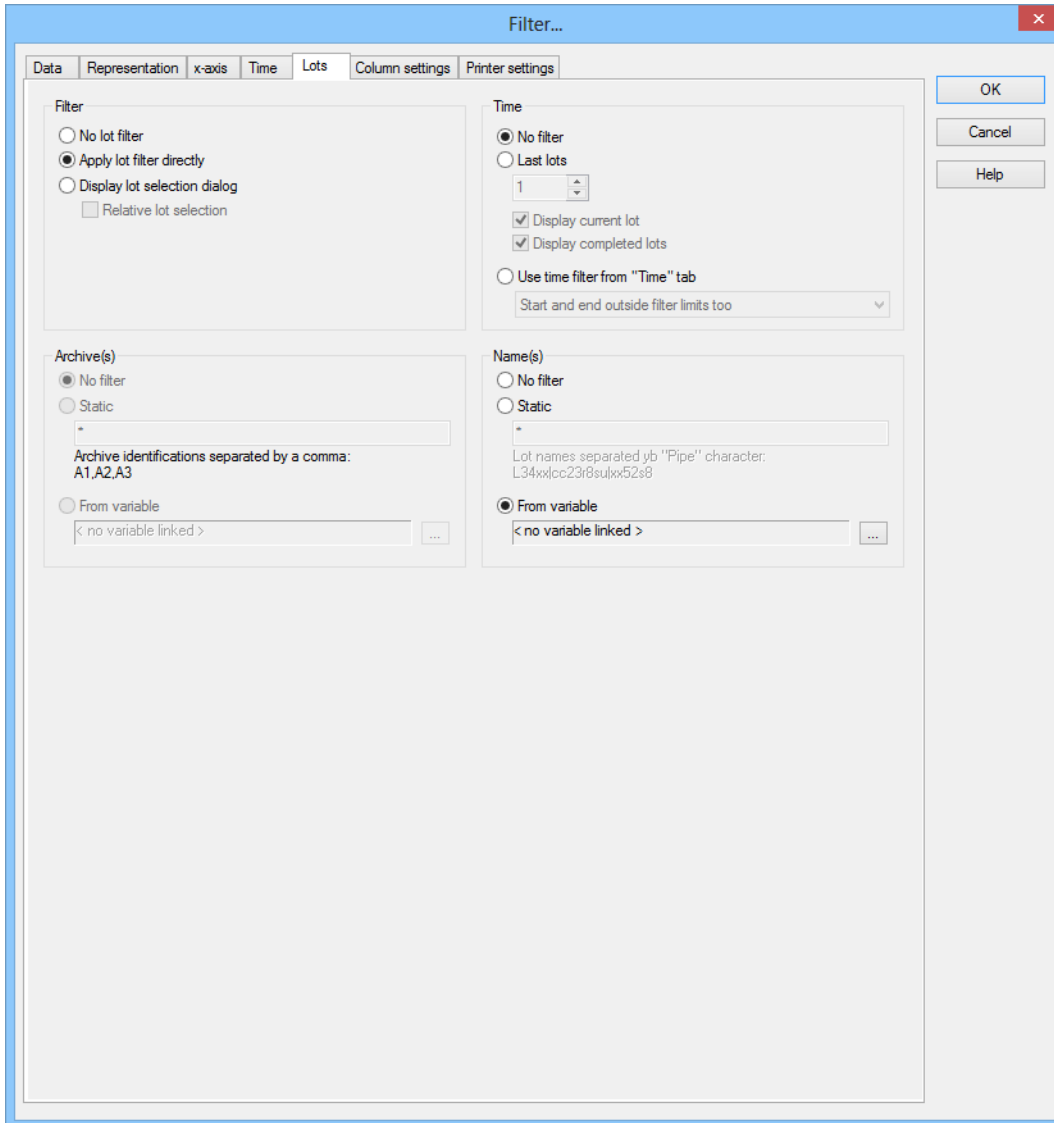| Parameters	Description
Filter	Settings for the application of the lot filter. Selection of one of the options: ▶ No lot filter ▶ Apply lot filter directly ▶ Display selection dialog
No lot filter	Active: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in Runtime.
Apply lot filter directly	Active: The filter configured here is applied in Runtime directly.
Display selection dialog	Active: The dialog for lot selection is shown in Runtime. Options can be pre-selected in the Editor.
Relative lot selection	Active: Enables several lots to be compared directly. Display always starts from the zero point. Only available for **Extended Trend** and **faceplates** and only if the option Display lot selection dialog has been activated. The Windows CE project property must be deactivated in the project properties.
Time	Configuration of the time filter for lot selection. Selection of one of the options: ▶ No filter ▶ Last lots ▶ Apply time filter from "Time" tab
No filter	Active: The time range set in the **Time** tab is not taken into account. All completed and current lots are displayed.
Last lots	Active: Input of the number of lots last concluded, according to what they should be filtered for. Input of the number in the number field or configuration via cursor keys. The option allows the combination of both options Display current lots and Display completed lots. Example: 3 lots are to be displayed, 2 are running and 10 have been completed. The following is shown: the two that are current and one that

	has been completed.
	Attention: At least one of the two options `Display current lots` or `Display completed lots` must be activated. If both options have been deactivated, this corresponds to the `No filter` setting.
	Note on compatibility: If the current lots or the combination of current and completed lots are selected and the project is compiled for a version before 7.11, the completed lots are shown in Runtime.
`Display current lots`	`Active:` The current lots are displayed.
	Note: If the number of lots to be displayed is greater than the number of current lots, lots that have been completed are also shown until the set limit has been reached. Example: 3 lots are to be displayed. 1 lot is running, 5 have been completed. The one current lot and two completed lots are displayed.
`Display completed lots`	`Active:` The completed lots are displayed.
	Note: If the number of lots to be displayed is greater than the number of completed lots, lots that have been completed are also shown until the set limit has been reached.
`Apply time filter from "Time" tab`	`Active:` Pre-filtering is carried out with the settings of the **Time** tab. The effective range of the filter can be amended within this time range. Select from drop-down list:
	▸ `Start and end also outside filter limits:` (Default) Lots can start before the start time configured in the **Time** filter and end after the configured end time.
	▸ `Start and end only outside filter limits:` Lots must start and end within the time points configured in the **Time** filter for the start and end.
	▸ `Start also before filter limit:` Lots can start before the start time configured in the **Time** filter and end after the configured end time.
	▸ `End also after the filter limit:` Lots can also end after the end time set in the **time** filter, but must start at or after the configured start time.
	▸ `Adjust start and end to filter limits:` Lots are cut to the time points configured in the **Time** filter for the start and end.

`Archive(s)`	Configuration of filtering for archives. Selection of one of the options:
	▸ `No filter`
	▸ `Static`
	▸ `From variable`
	Note: Only available for the following modules if the option `Apply lot filter directly` has been selected:
	▸ Archive revision
	▸ ETM
	▸ Report Generator
	▸ Report Viewer
`No filter`	`Active`: Filtering for archive names is not carried out.
`Static`	`Active`: Archives whose identification corresponds to the character string entered in the input field are filtered for.
	Input of the archive identifications in the input field:
	▸ Several identifications are separated by a comma (`,`).
	▸ `*` or empty: All archives, no filter.
`From variable`	`Active`: The value of the variables linked here is applied as a filter for archive names in Runtime.
	Click on the `...` button to open the dialog for selecting a variable.
	Only available for all modules if the `Apply lot filter directly` option has been selected:
	Notes for variables in Runtime
	The variable selection is only activated in Runtime if a valid variable has already been linked in Runtime. The `...` button is always deactivated in Runtime. The option can be selected, but no new variable can be linked.
	If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols.
	Attention: If the selected variable is not found in Runtime, there is no filtering for archive names. This also applies if the value of the variables

	cannot be determined. The filter then corresponds to the `No filter` setting.
Name(s)	Configuration of the filtering to names. Selection of one of the options: ▸ `No filter` ▸ `Static` ▸ `From variable`
`No filter`	`Active`: Filtering for lot names is not carried out.
`Static`	`Active`: Lot names that correspond to the character string entered in the input field are filtered for. Input of the lot name in the input field: ▸ Several entries are separated by a pipe character (`|`). ▸ `*` or empty: All lots of all displayed archives, no filter.
`From variable`	`Active`: The value of the variables linked here is applied as a filter for lot names in Runtime. Click on the `...` button to open the dialog for selecting a variable. Not available if the option `Apply lot filter directly` has been selected. **Notes for variables in Runtime** The variable selection is only activated in Runtime if a valid variable has already been linked in Runtime. The `...` button is always deactivated in Runtime. The option can be selected, but no new variable can be linked. If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable is not found in Runtime, there is no filtering for lot names. This also applies if the value of the variables cannot be determined. The filter then corresponds to the `No filter` setting.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.2.6 Column settings

Configuration of the column settings for the extended curve list.

Parameters	Description
Cursor output / values between first and second cursor	Configuration of the column types and column widths to be displayed.
Column type	Column types available: **Cursor output** ▸ Date ▸ Variable ▸ Value ▸ Measuring unit ▸ Limit Text ▸ Status **Values between first and second cursor** ▸ Minimum ▸ Average ▸ Maximum ▸ Time difference ▸ Value difference ▸ Sum ▸ Standard deviation ▸ Number of measuring points Clicking in the checkbox activates/deactivates the display of the type in Runtime.
Width	Column width of the column output or column width of the measuring points between first and second cursor in the cursor output list. The value corresponds to the number of the characters. Clicking in the value allows it to be edited.
Display header in the scan window in compatibility mode	Active: For zenon versions before 6.51 SP0, column headings are shown for "scan window in compatibility mode". Is used to display

	converted projects in Runtime, for example. Not necessary for projects from version 6.51 onwards. All column titles are displayed in the `Scan list`.
Extended curve list	Configuration of the column settings for the extended curve list.
List field	Display of the configured columns.
Column selection	Opens dialog to select the columns (on page 56).
Column format	Opens a dialog to format the columns (on page 57).
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

💡 Information

The title of the header of the cursor output list can be changed with the help of the language switch.

To provide the header also when converting projects of older versions, you can either delete the existing cursor output list and replace it with the new element or you activate checkbox `Display header.`

If you create projects for zenon version earlier than 6.51 SP0, you can insert the respective cursor output list after you selected the desired Runtime version.

Column selection

You configure the columns to be displayed in Runtime here.
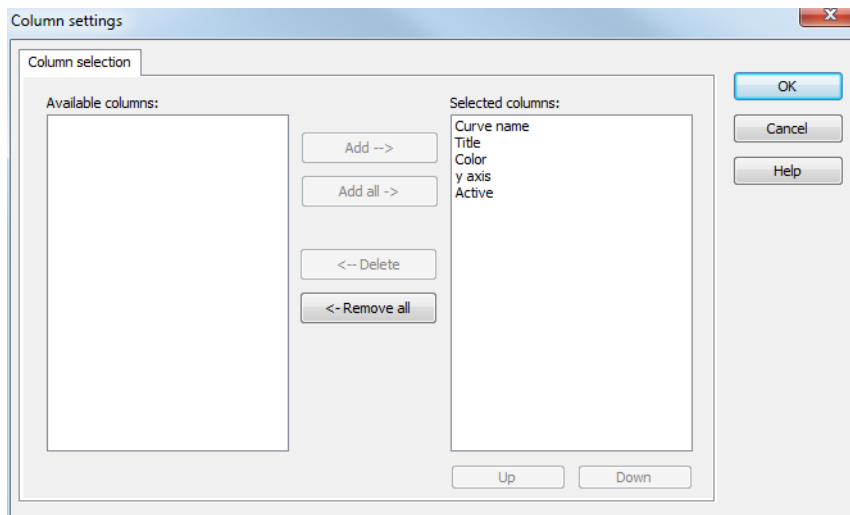
Button	Function
Add	Moves the selected column from the available ones to the selected items. After you confirm the dialog with OK, they are shown in the detail view.
Add all	Moves all available columns to the selected columns.
Remove	Removes the marked columns from the selected items and shows them in the list of available columns. After you confirm the dialog with OK, they are removed from the detail view.
Remove all	All columns are removed from the list of the selected columns.
Up	Moves the selected entry upward. This function is only available for unique entries, multiple selection is not possible.
Down	Moves the selected entry downward. This function is only available for unique entries, multiple selection is not possible.
OK	Applies settings and closes the dialog.
Cancel	Discards settings and closes the dialog.
Help	Opens online help.

Column format

The columns are formatted here.
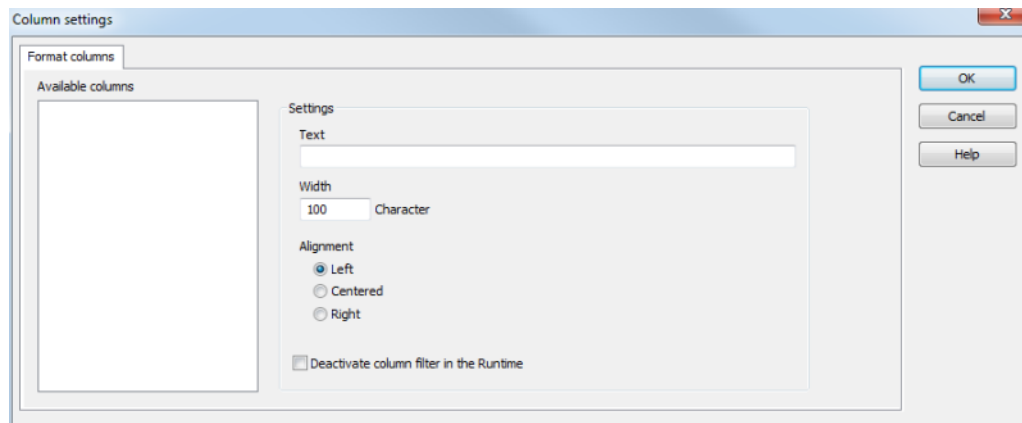
Parameters	Description
`Available columns`	List of the available columns via `Column selection`. The column selected here is configured using the settings in the `Parameters` section.
`Parameters`	Settings for selected column.
`Labeling`	Name for column title. The column title is online language switchable. For this you must enter the @ character in front of the name.
`Width`	Width of the column in characters. Calculation: Number time average character width of the selected font.
`Alignment`	Alignment. Possible settings: ▸ Left-justified: Text is justified on the left edge of the column. ▸ Centered: Text is displayed centered in the column. ▸ Right Text is justified on the right edge of the column.
`Block column filter in Runtime`	`Active:` The filter for this column cannot be changed in Runtime. Note: Only available for: ▸ Batch Control ▸ Extended Trend ▸ Message Control ▸ Recipegroup Manager
`OK`	Applies settings and closes the dialog.
`Cancel`	Discards settings and closes the dialog.
`Help`	Opens online help.

Customize view of cursor output list

The appearance of the cursor output list can be adapted to individual requirements:

SCROLL BARS, HEADERS AND GRIDS

To define the size and appearance of scroll bars, the header or grids for the reports:

1. Activate, in the `Representation` group, the `Extended graphical settings` property

2. Define the desired properties in the groups `Scroll bars` and `Header and grid` for the Alarm Message List element on the screen

> 💡 **Information**
>
> *If the `Graphics file` property is selected for the `Display style` property, then all elements for which no graphics file has been selected are shown with a color gradient. Transparent graphics cannot be used for control elements for lists.*

SORTING IN RUNTIME

To mark the relevant column for sorting in Runtime and to determine the sorting sequence, configure the graphic element for the title line:

1. Select the `Graphics files` for the `Display style` property

2. link properties `Sort ascending` and `Sort descending` each with a graphics file

3. in the Runtime the selected graphic for the corresponding sorting order is displayed in the column which is relevant for the sorting

4. Click on the graphic in order to change the sorting order

5. Click on header in order to activate the column for sorting

OPERATE HEADER IN THE RUNTIME

You can enable users to operate the header in the Runtime. With this an individual adjustment of the display in the Runtime is possible:

- ▶ Move columns

- ▶ Change size

- ▶ Change sorting order.

To do this, navigate to `Alarm Message List` group in the settings and select, in the `Header AML` property, `Operable headers`. Alternatively, you can also switch the header to inoperable or invisible here.

These settings apply for all headers in the project.

> 💡 **Information**
>
> *You can prohibit the manipulation and/or the visibility of the header for each screen Alarm Message List by deactivating the property* `Show header` *or* `Make header editable` *for the tabular view.*
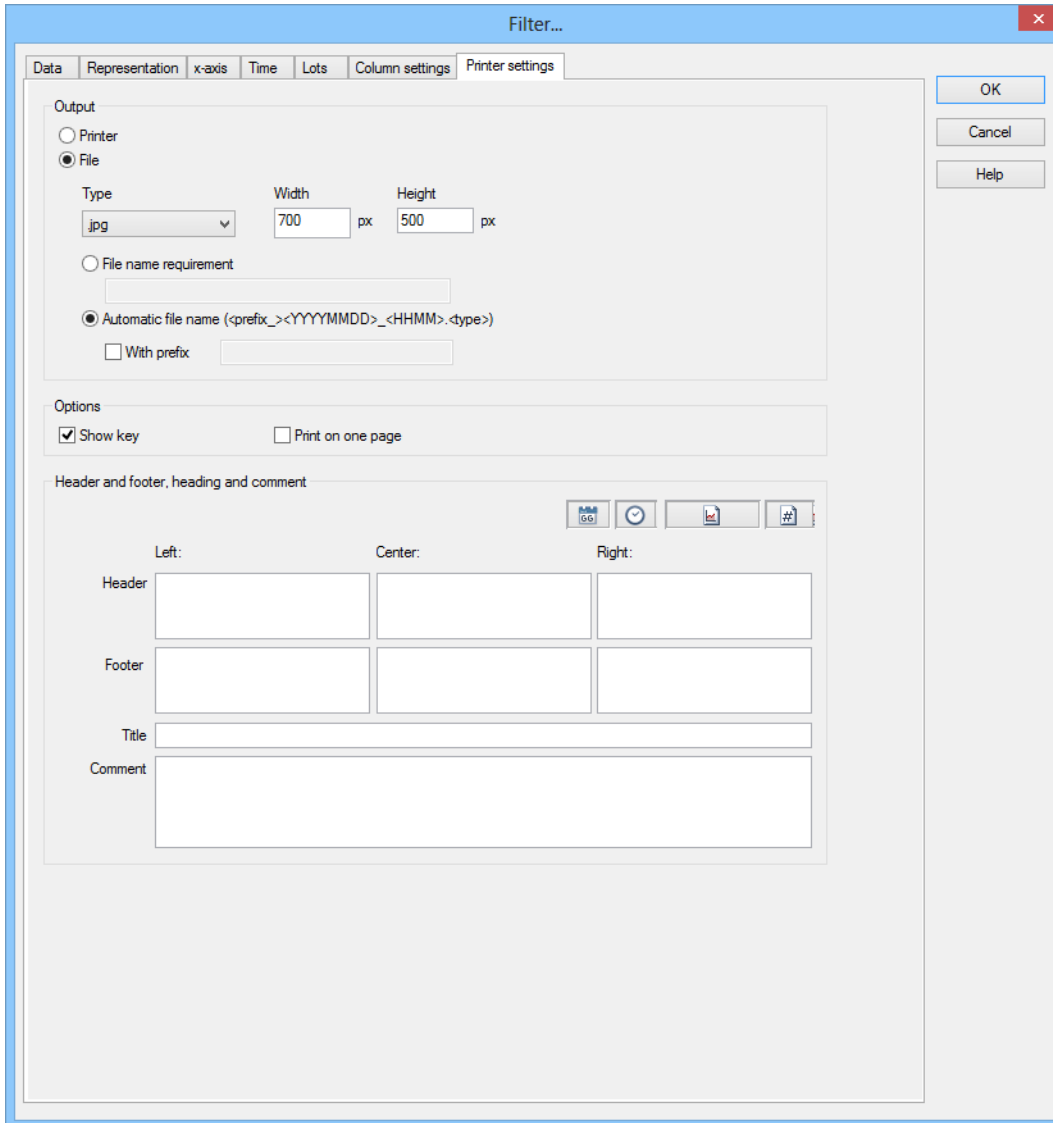
PREVIEW

By activating the `Extended graphical settings` property in the Editor, the header and scroll bars can be previewed. This way, details such as color fill effects, light effects or grids can be configured more easily.

Attention: As the size of the scroll bars equals their size in the Runtime, the total size of the list in the Editor can vary from the size in the Runtime. This is also true for the size of the header and the font of the header.

3.2.7   Printer settings

Configuration of the settings for the print-out or output to a file.

Parameters	Description
Output	Configuration of the output type and the corresponding options.
Printer	`Active`: The diagram is output to the printer that is defined in the **General configuration** of zenon by default `for screenshots`. See also the chapter on printers.
File	`Active`: The diagram is saved as a file. Configure the output with the options: ▸ `Type` ▸ `Width` ▸ `Height` ▸ `Stipulation of file name` ▸ `Automatic file name` ▸ `With prefix` These options are only available for output to a file.
Type	Selection of the file type from the drop-down list. Available are: ▸ JPG ▸ BMP ▸ SVG
Width	Entry of the width of the graphics file in pixels.
Height	Entry of the height of the graphics file in pixels.
Stipulation of file name	`Active`: Entry of any desired file name.
Automatic file name	`Active`: The filename is issued automatically. Format: **<Prefix_><YYYYMMDD>_<HHMM>.<Type>**
With prefix	Only available if `automatic file name` has been activated. Enter a desired prefix for the automatically-created filename. This is prefixed by the name separated by an underscore (_).
Options	Configuration of the options.

Display legend	`Active`: A key is printed out with the diagram. This informs you of the curves and their colors, for example.
Print on one page	`Active`: The key is output on the same page as the diagram.
Header and footer, heading and comment	For printing an Extended Trend diagram, additional information can be configured for the header and footer, as well as a heading and comments. Four buttons are available for easier input: ▸ Date ▸ Time ▸ Diagram name ▸ Page number
Header	Entry of information for the header in the following areas: ▸ Left ▸ Center ▸ Right
Footer	Entry of information for the footer in the following areas: ▸ Left ▸ Center ▸ Right
Title	Entry of a title.
Comment	Entry of a comment.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Note: Printouts made using the **Print** button of the **Extended Trend** screen may be different to those made using the **Extended Trend screen switching** or **Print Extended Trend diagram** functions. The functions assume a window size of 1000 x 700. Printing via the button is in the proportion defined in the Editor. Cancel

3.3   Configuring curves

Curves are created by clicking on the `Add` button in the `Data` (on page 13) tab. To configure curves:

1. Highlight the curve in the list

2. click on the button `Edit`

3. The dialog for configuration is opened

4. configure:

    a) Curve settings (on page 64)

    b) Y-axis parameter (on page 67)

3.3.1   Curve settings
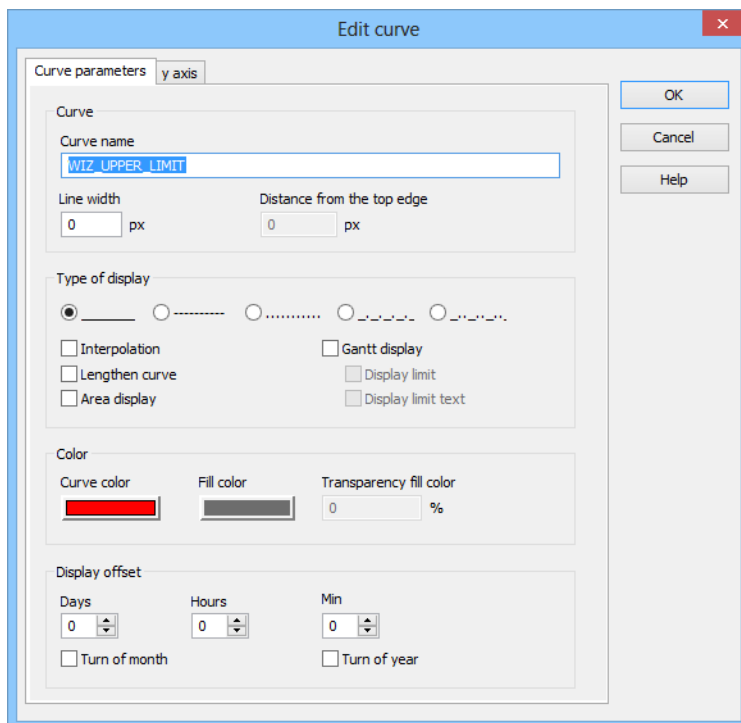
For each trend curve the curve features can be parameterized.

Parameters	Description
Curve	Configuration of the curve.
Curve name	Freely definable curve name. The variable name is entered by default. Note: Subsequent amendment of the variable name has no influence on the existing curve names.
Line width [Pixel]	Defines the width of the curve in pixels.
Distance from the top frame [Pixel]	Only available for **Gantt display**. Definition of the distance in pixels from Gantt chart to the top diagram frame.

Type of display	Definition of line type for trend curve. Possible formats:
	
	  ▸ Line
	
	  ▸ Dashes
	
	  ▸ Dots
	
	  ▸ Dash-dot
	
	  ▸ Dash-dot-dot
	
	Note: If, in the Graphics quality property, Windows basis was selected, only solid lines can be displayed in Extended Trend for a line width of greater than 1.

Interpolation	Active: Values are connected using polylines (supporting positions). Inactive: Value changes are displayed as line jumps (stepped display).
Lengthen curve	Active: The curve is lengthened from the last available datapoint to the current moment.
Area display	Active: The values are displayed as surfaces instead of lines.
Gantt display	Active: Gantt display for this curve is activated. The curve name is used as labeling For details on limitations, seethe Gantt display (on page 69) and Y-axis parameters (on page 67) sections.
Display limit	Only available for **Gantt display**. Active: The numerical limit is displayed.

Display limit text	Only available for **Gantt display**. Active: The description of the limit value is displayed.
Color	Configuration of the color display.
Curve color	Configuration of the curve color. Clicking on Color opens the color selection dialog.
Fill color	Configuration of the fill color. Clicking on Color opens the color selection dialog. Only effective if the Area display option has been activated.
Transparency of the fill color [%]	Stipulation of the transparency of the fill color in percent. This can prevent curves being overlaid by curves with area display. ▸ 0 %: no transparency ▸ 100 %: fully transparent Note: Not available for Windows CE.
Display offset	Configuration of the display offset
Days	Moves the curve by the set number of days.
Hours	Moves the curve by the set number of hours.
Minutes	Moves the curve by the set number of seconds.
Month change	Moves the curve by a month.
Turn of year	Moves the curve by a year.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.3.2 Y axis parameter

The curve parameters are defined this dialog and the curve parameters (on page 64) dialog.
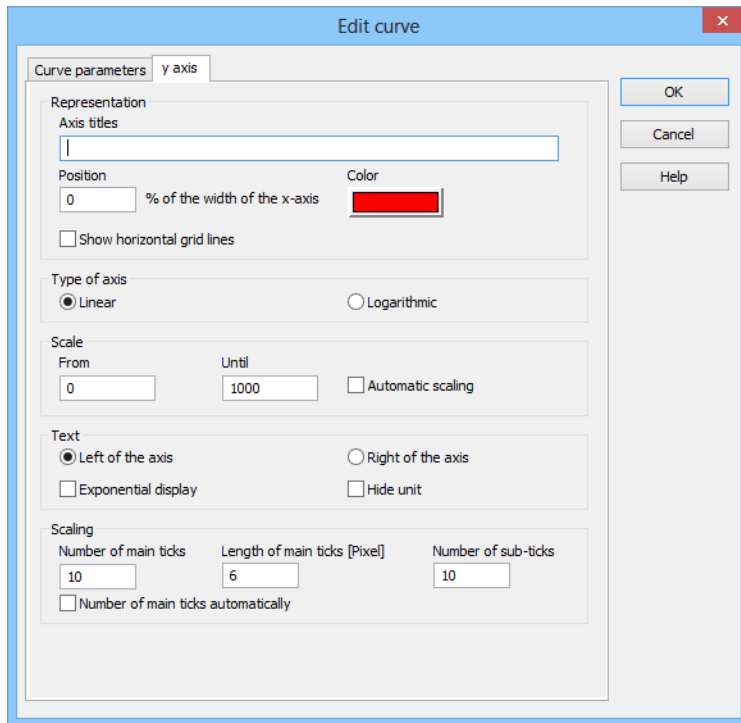
Parameters	Description
Representation	Parameters for display of curves in Runtime.
Axis title	Name of the axis.
Position	Positioning of the Y-axis on the X-axis in percentage of the length of the X-axis. ▸ 0 = left, ▸ 100 = right
Color	Configuration of the axis color. Clicking on Color opens the color selection dialog. **Attention:** Can be configured independently of the trend curve color.
Display horizontal grid lines	Display of help lines on the main ticks. not available for Gantt display.
Type of axis	Defining of the scaling of the Y-axis. not available for Gantt display.
Linear	Linear division of the Y-axis. not available for Gantt display.
Logarithmic	Logarithmic division of the Y-axis
Scale	Define representation range of the process variables within their configured technical limits (zoom function). not available for Gantt display.
From	Scaling start value.
Until	Scaling end value.
Automatic scaling	Active: The scaling of the axis is automatically determined for this curve in Runtime. The min/max values of the area to be displayed are used as axis limits. If the checkbox is activated, the input fields for the scaling (From/To) are no longer available for individual configuration.
Labeling	Position of the axis labeling
Left of the axis	Values are displayed to the left of the axis.

Right of the axis	Values are displayed to the right of the axis.
Exponential display	Values are displayed exponentially. not available for Gantt display.
Hide unit	`Active`: Unit for axis labeling is not displayed. Allows the display of several variables with different units. Default: `inactive` not available for Gantt display.
Axis subdivision	Definition of the axis subdivision. not available for Gantt display.
Number of main ticks	Number of main ticks with value indication.
Length of main ticks (in pixels)	Length of main ticks in pixels.
Number of sub ticks	Number of subdivisions between two main ticks.
Number of main ticks automatic	Automatic setting of scaling and axis subdivision during online operation.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

The display of curve and Y-axis are configured using the checkboxes for **Y-axis** and **Active** in the Data tab.

3.3.3   Gantt display

With the help of the Gantt display you can visualize the state of a piece of equipment in the **Extended Trend**. For example it can be displayed when a piece of equipment has been in operation, in maintenance, idle and so one. With the display in the **Extended Trend** it is possible to compare the states of a piece of equipment with the characteristic curve of the process. Thus you can make conclusion about the behavior of a piece of equipment. For example you detect an abnormal behavior of the characteristic curve of the process but you see according to the Gantt chart that the equipment was in maintenance at that time.

ENGINEERING

With the Gantt display, the limits and reaction matrices are taken into consideration for the evaluation, not the actual values of the respective variables. The display reflects the status of a piece of equipment; the exact value does not play a role.

The individual Gantt charts are displayed in the top frame of the control element. Take care that you engineer the frame large enough so that no display problems arise.
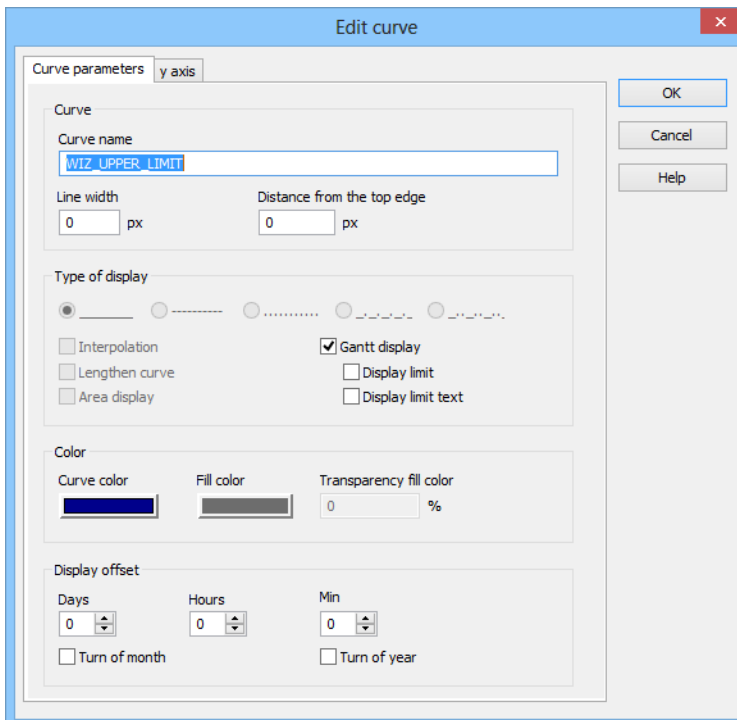
As a basis for the color of the respective Gantt charts the violated limit or reaction matrix is used. In doing so, the currently-configured limits and states of the `Reaction matrix` are always used for this. If you change them, even historic evaluations are displayed with the current values. There is no history for the limits or the states of a `Reaction matrix`.

💡 **Information**

CURVE PARAMETERS

The curve settings for the Gantt display are changed using the same dialog as the general curve configuration. The parameters to be set differ in part:

- ▶ The `curve name` is used as labeling

- ▶ `Distance from the top edge`: A negative value must be entered here to display the curve in Extended Trend.

- ▶ `Display limit`

- ▶ `Display limit text`

If the options `Display limit` and `Display limit text` are used together, the display is:
`Limit text/limit value`

Y-AXIS

The Y-axis is configured using the same dialog as the general curve configuration. The label is configured here.

- ▶ `Color`

- ▶ `Position in % of the width of the X-axis (measured from the left)`

The following Y-axis settings are not available for Gantt displays:

- ▶ `Display horizontal grid line`

- ▶ `Type of axis`

- ▶ `Scale`

- ▶ `Exponential display`

▶ Axis subdivision
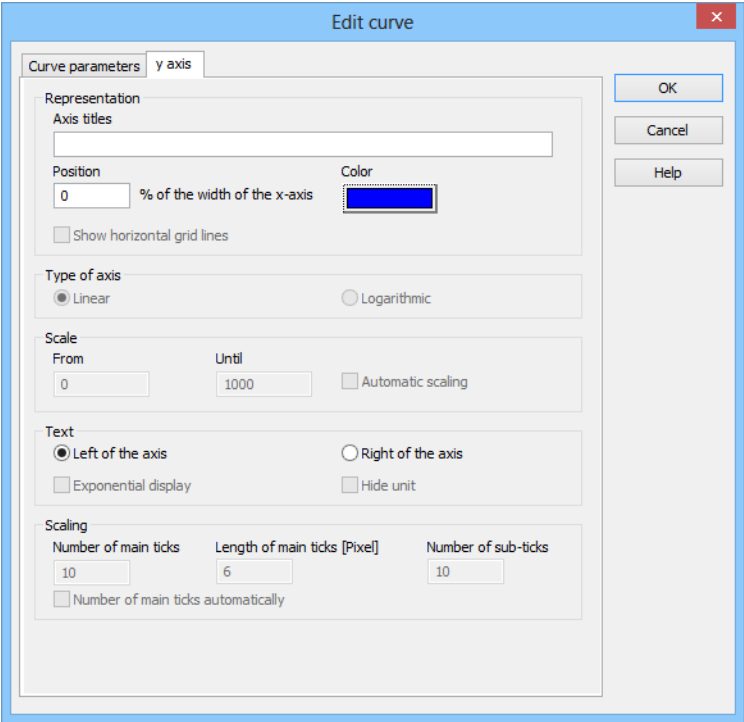
Display during Runtime:
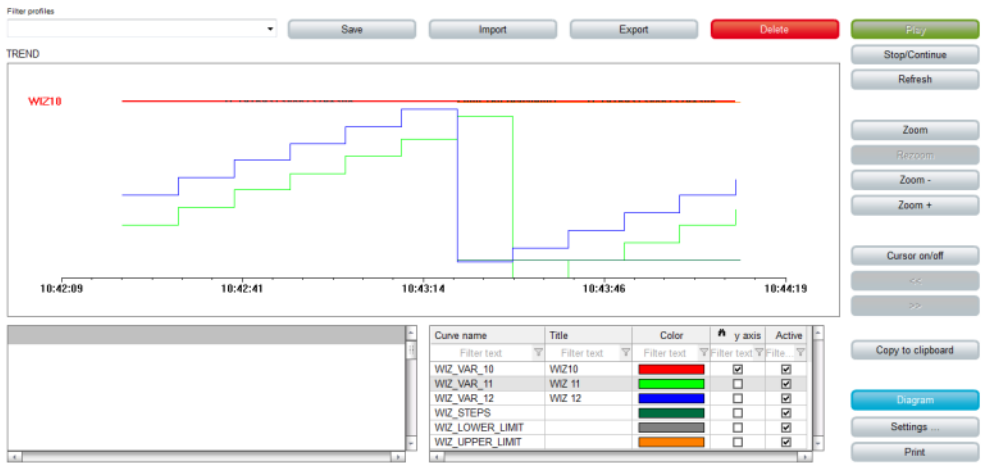
GANTT DISPLAY FOR STRING VARIABLES

The configuration of the curve settings for Gantt display for `string` archive variables is different from the configuration of other Gantt displays in these aspects:

▶ Display limit: is inactive

▸ `Display limit value text:` is inactive

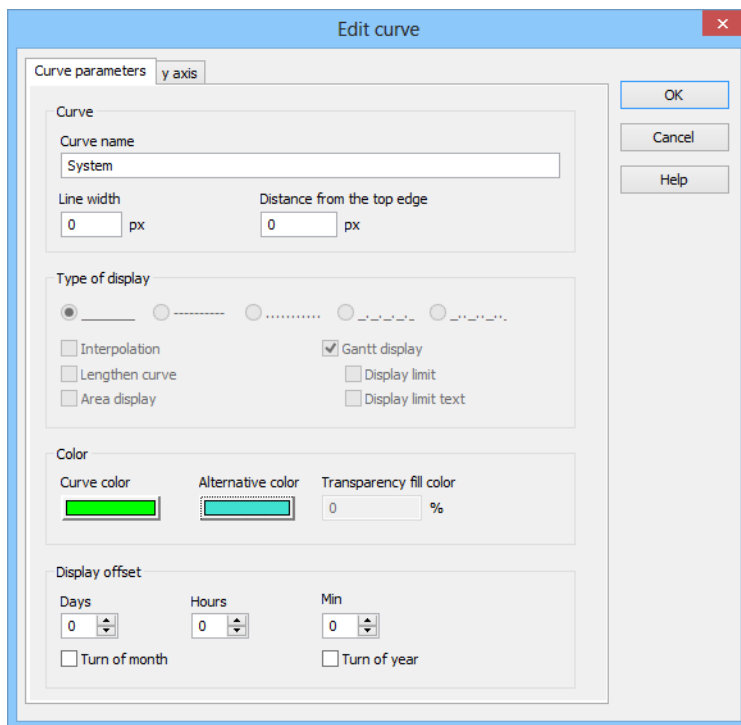▸ `Alternative color:` replaces the `fill color` property and is initialized with a color that differs from the `curve color`

In the Runtime:

Display with this Gantt display is as with a conventional Gantt display, however with the following differences:

▸ For each new value of the variable, the bar changes color between `curve color` and `alternative color`

▸ The string value of the variables is displayed as a text

NOTES ON CONFIGURATION OF THE GANTT DISPLAY FOR STRING VARIABLES

For Gantt curves with text, the `line width` is not amended automatically. The default value `0` here corresponds to a width of `1 pixel`. The font is taken from the settings in the **`Display`** (on page 22) tab; the font color is `black`.

If, for the recording of string variables in the archive, `record on change` has been selected and he current status is to be displayed, then the `Save process screen on startup` option must be activated.

If Runtime files were created for a version before zenon 7.11, then:

- ▶ The Gantt display curve for string variables is not removed

- ▶ A bar without text is displayed for as long as the variable has a value

3.4 Filter profiles

Filter profiles are filter settings which can be saved by the user in the Runtime. In order to use the filter profiles there is a submenu `Filter profiles` in the menu `Control elements` with the following elements:

Parameters	Description
`Filter profiles`	Profile administration
`Profile selection`	Select saved profile (drop-down list)
`Save`	Save settings as profile (button)
`Delete`	Delete profile (button)

Now the filter settings can be changed in the Runtime. Then any unique name for the defined settings can be entered in the element `Profile selection`. With the button `Save` the profile is saved permanently and is available in future sessions.

After having selected a profile that is no longer needed in the `Profile selection` it can be deleted with the button `Delete`.

3.5 "Print Extended Trend diagram" function

With the help of the `Print Extended Trend diagram` function, you can print Extended Trend diagrams or save them in a file (JPG, BMP or SVG) without opening the `Extended Trend` screen.

To configure the function:

1. create a new function

2. navigate to the Applications node

3. Select Print Extended Trend diagram

The function will be created along the lines of screen switching (on page 11).

Note: Printouts made using the **Print** button of the **Extended Trend** screen may be different to those made using the **Extended Trend screen switching** or **Print Extended Trend diagram** functions. The functions assume a window size of 1000 x 700. Printing via the button is in the proportion defined in the Editor.

3.6   Entries in the project.ini

The following entries are possible in the `project.ini` file for the extended trend.

Parameters	Description
[DEFAULT]	General settings
MILLISEK=	▸ 1: Display in millisecond grid ▸ 0: minimal in the update grid
[EW_TREND]	
ANZEIGE_GWTEXT=	▸ 1: Display limit value text (default) ▸ 0: do not display
[ARCHIV]	Archive projecting
ARCHDIGITS=	Number of decimal places when exporting archives in **TXT**, **XML** or **DBF** format and for export to a SQL server. Default: 1
TRENNZEICHEN=	Separator for export to ASCII file. Default: ;
SPEICHER=	Maximum number of values that are read in for Extended Trend, archive revision and reports. Default: 1000
KANALAUSWAHL=	Setting of whether all channels are displayed for ETM archive channels: ▸ 1: display ▸ 2: do not display
SQL_MAXROWS=	Maximum number values which can be read from the SQL. Entry is ensued in 1000 steps. 100 = 100.000 values. As of version 6.50, there is an automatic check that there is always at least 10% free memory left.

4. Operating during Runtime

In online operation the window for the Extended Trend is opened via a function call . The screen pre-defined in the Editor (on page 6) is called up.
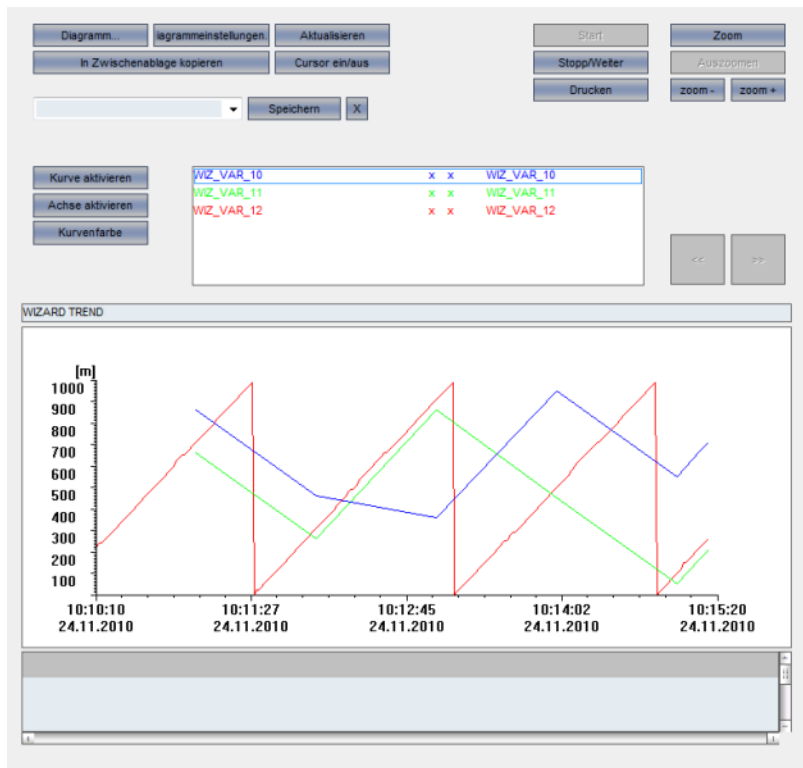
With extended curve list:
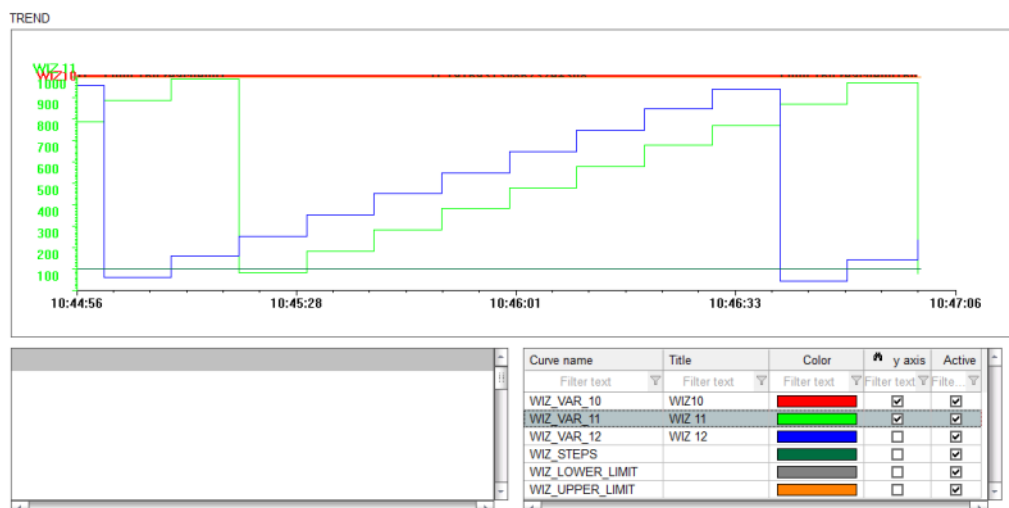
There are different control elements available to operate the extended trend and the displays, depending on the configuration (on page 6). Possible options are:

Element	Description
`Insert template`	Opens the dialog for selecting a template for the screen type.
	Templates are shipped together with zenon and can also be created by the user.
	Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and palced in the screen. Elements can be moved in the screen and placed individually.

Element	Description
`Windows`	Selection of the window to be displayed for diagrams and curves in Runtime.
Diagram	Window to display trend curve
Diagram name	Shows the diagram name.
`Set filter`	Displays the status of the current time filter in Runtime.
Cursor output list	Shows the position of the cursor in the diagram window and the values set in diagram settings and cursor output (on page 58)
Curve list (deprecated)	List of curves. Is used for CE for compatibility reasons. For all other projects, the **extended curve list**

Element	Description
	is to be used.
Extended curve list	Curve list that can be edited in Runtime (on page 98): ▸ Curve name ▸ Title ▸ Color ▸ Y-axis ▸ Active **Note:** Not available under Windows CE. Is replaced by the **curve list (deprecated)** there.
Diagram functions	Pre-defined controls for diagrams.
Filter	Display of set filter
Diagram settings	Activates the dialog (on page 58) for diagram settings and cursor output
Curves	Change curve parameters.

Element	Description
`x-axis`	opens the dialog (on page 30) for x-axis settings.
`Refresh`	Refreshes the display.
`Stop`	Do not refresh screen.
`Next`	Update screen
`Cursor on/off`	Query values
`Double cursor on/off`	Display (on page 77) values that are between two cursors.
`Print`	Prints diagram.

Note:
Printouts made using the **`Print`** button of the **`Extended Trend`** screen may be different to those made using the **`Extended Trend screen switching`** or **`Print Extended Trend diagram`** functions.

Element	Description
	The functions assume a window size of 1000 x 700. Printing via the button is in the proportion defined in the Editor.
Print with dialog	Choose the printer before printing out the diagram.
Copy to clipboard	Copy representation into the intermediate store.
Export data displayed	exports (on page 95) all visible data of all curves as a CSV file.
Diagram navigation	Buttons for navigation in the diagram.
Cursor one pixel to the left	Places cursor one pixel to the left. If the **Shift** key is pressed at the same time, the cursor is moved by 10

Element	Description
	pixels.
`Cursor one pixel to the right`	Places cursor one pixel to the right.
	At the same time as the **Shift** key is pressed, the cursor is moved by 10 pixels.
`Backwards`	Scroll backward on the time axis (history)
Quarter backwards	Moves the time period displayed back by a quarter of the measuring unit selected.
`Forward`	Scroll forward on the time axis (current)
Quarter forwards	Moves the displayed time period forwards by a quarter of the unit selected.
`Zoom`	Zoom display
`Step back`	Reduce display

Element	Description
Zoom +	reduces display time intervals
Zoom –	Increases display time intervals

Element	Description

`Zoom to 100 %`	Sets zoom factor to 100%.
	
	This zoom action is saved in the zoom history.
	
	For example: **zooming** is used
	
	  ▸ to zoom 2x into a selected area of the Extended Trend,
	
	  ▸ then **zoom content to 100%** is selected and
	
	  ▸ then a selected area is zoomed into again,
	
	then there are 4 zoom events in the history. These can be gone back to again using the **Back** button.

Element	Description
Filter profiles	Buttons for filter settings in Runtime.
Profile selection	Select profile from list.
Save	Saves current setting as a profile.
Delete	Deletes selected profile.
Import	Imports filter profiles from export file.
Export	Exports filter profiles in the file.

💡 Information

The **cursor one pixel to the left** *and* **cursor one pixel to the right** *control elements move the cursor if it is active, not the trend.*

Arrow keys on the keyboard can also be used instead of the control elements.

If you hold down the `Shift` *key when moving with the cursor keys, the movement is carried out in 10-pixel increments.*

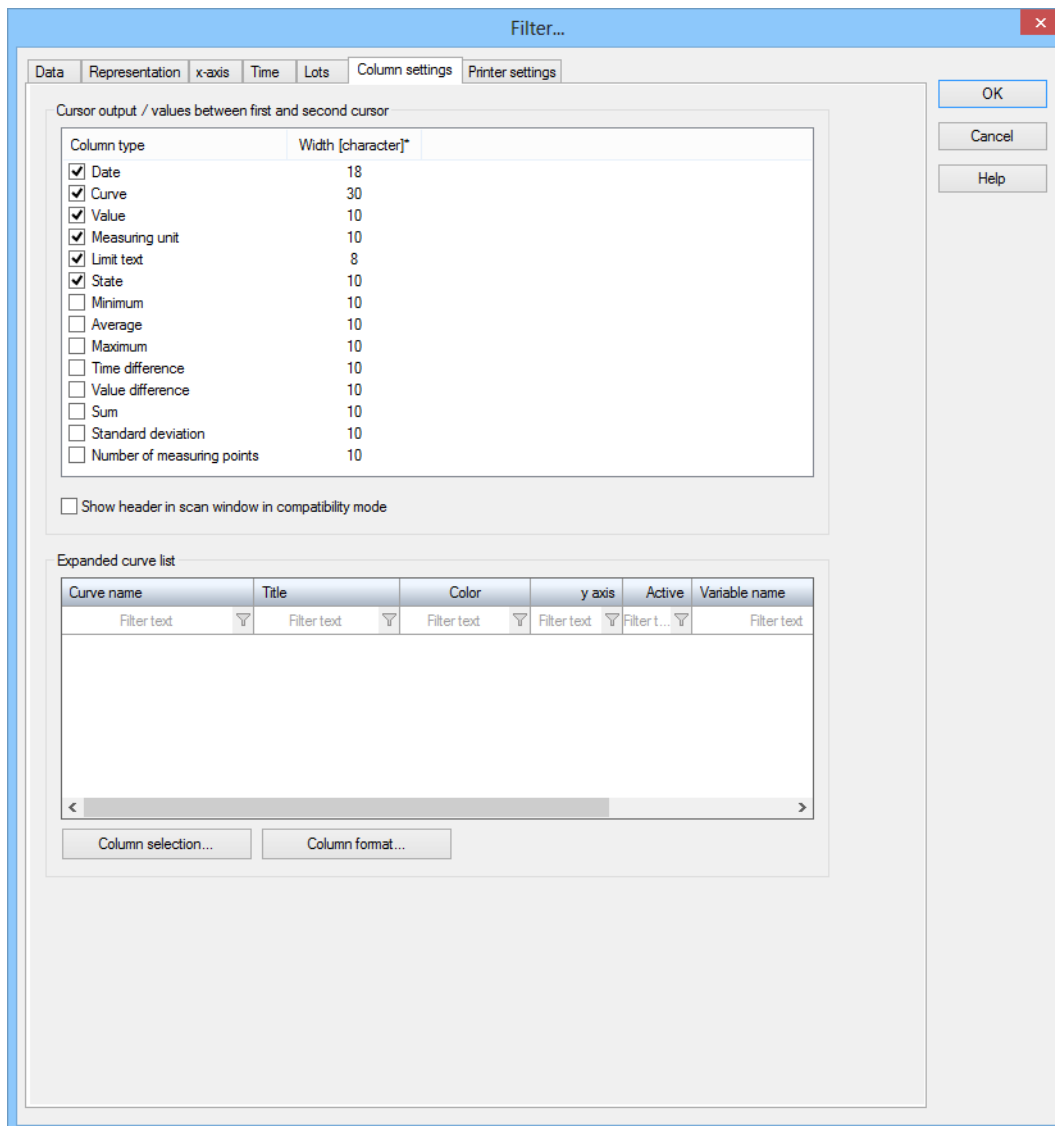| Element	Description
💡 **Information** *The refresh rate dynamically adjusts to the loading time of the data for archive trend. If loading lasts longer than half of the refresh interval, the refresh rate is doubled.*	

CURSOR

Click on button `Cursor on/off` in order to start the scanning mode. A cursor appears in the middle of the diagram. You can move the cursor by left-clicking on it and moving the mouse while still pressing the mouse button. You can also use the keyboard. Press `Left` or `Right` in order to move the cursor in small steps. To carry out larger steps, press Shift at the same time. You can see the respective value in the cursor output window. Click on button `Cursor on/off` again in order to exit the scanning mode. The following information can be displayed in the cursor output window:

Parameters	Description
Date	Date/Time of the saved value
Variable	Variable name of the saved value
Value	Technical value of the saved value
Unit	Unit of the saved value
Limit Text	Condition text (limit value text) of the saved value.
Status	Status of the saved value .
Minimum	Minimum of the period of representation (optional).
Average	Average of the period of representation (optional).
Maximum	Maximum of the period of representation (optional)

In order to change the displayed information and the according column widths, click on the button
`Diagram settings...` The dialog to configure the Extended Trend (on page 11) is opened. :

In the `Column settings` tab, you can set the column widths for the different entries in the cursor output window. With the help of the checkbox you decide which columns you want to display.

DOUBLE CURSOR ON/OFF

If you engineered the control element `Double cursor on/off`, you have the possibility to use a second cursor in the diagram. With this a scanning with two separate cursors is possible. Click on button `Double cursor on/off` in order to display two cursors on at the left end and one at the right end of the diagram. You can move the second cursors either with the help of the mouse or the keyboard. In order to do this press and hold `Ctrl` und press `Left` or `Right` to move the cursor in small steps. To carry out larger steps, press Shift at the same time.

The values between the first and the second cursor are displayed in the cursor output window. You can customize the available columns as desired in the Diagram settings and cursor output dialog.
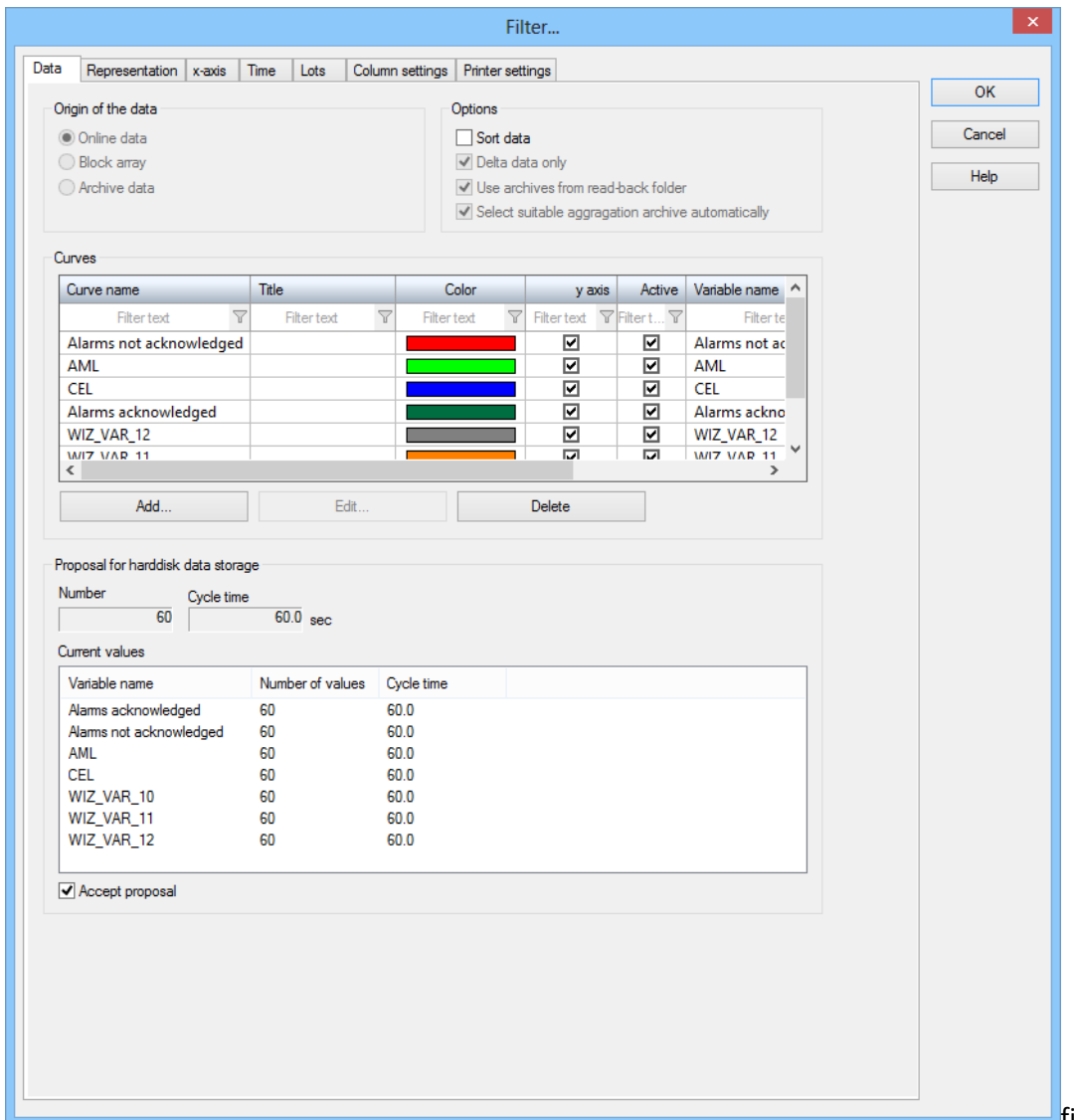
> ### Information
>
> *The double cursor is not available for the* `block array` *data type.*

DIAGRAM SETTINGS

From the existing configuration, which was done in the editor, temporary changes (without saving) can be carried out in runtime. Click on the button `Diagram...` to open the window Create diagram

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Possible changes:

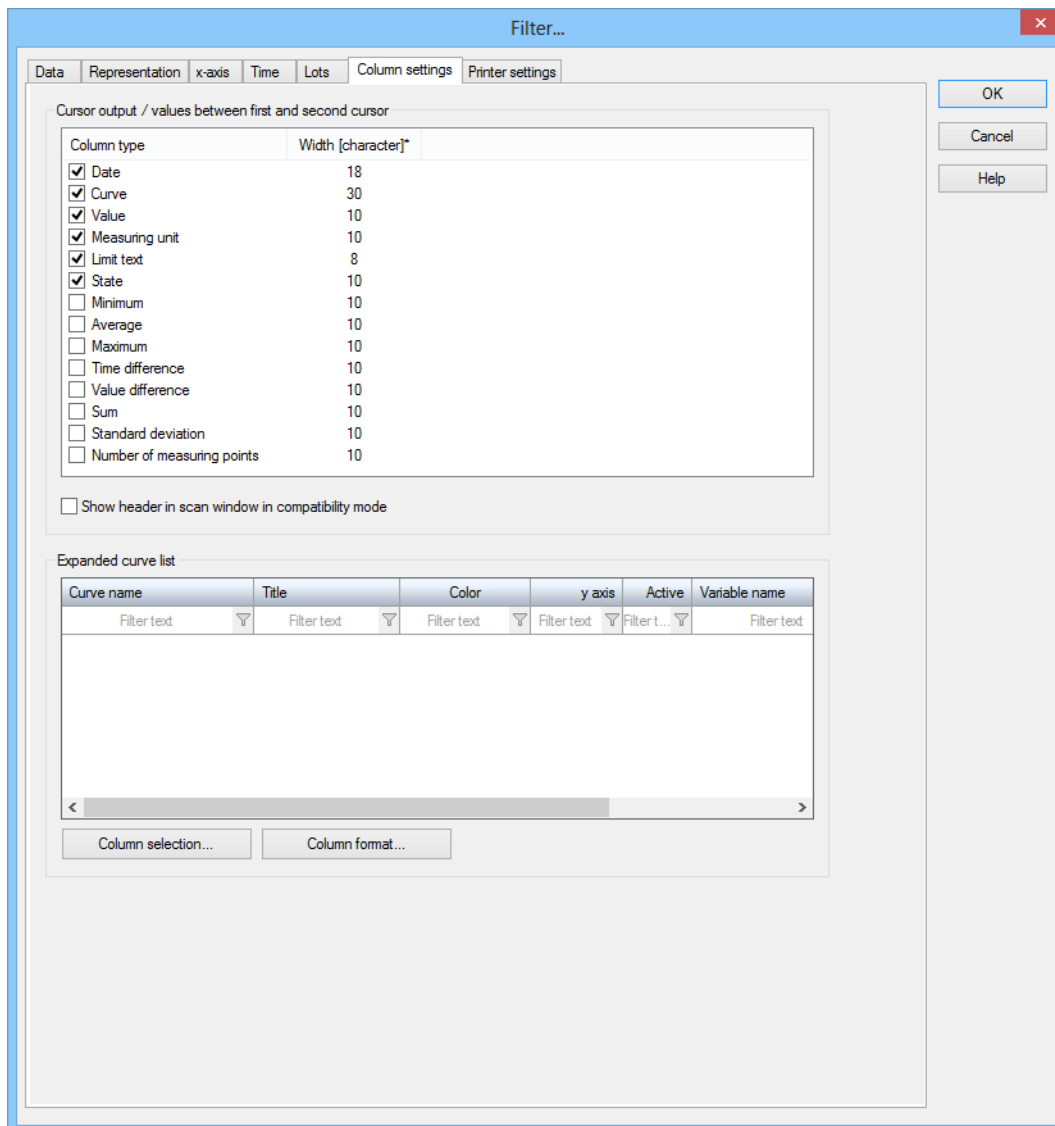| Parameters	Description
`Active`	Activates and deactivates the display of the curve.
`Y-axis`	Representation of the curve's y-axis
Curve > editing	Editing the settings of the selected trend curve.
Column settings	Settings of the diagram parameters.
Representation: Design	User defined font for x- and y-axis labeling and value indication
Representation: Update	Updating of the diagram for online data

4.1   Cursor

Click on button **Cursor on/off** in order to start the scanning mode. A cursor appears in the middle of the diagram. You can move the cursor by left-clicking on it and moving the mouse while still pressing the mouse button. You can also use the keyboard. Press **Left** or **Right** in order to move the cursor in small steps. To carry out larger steps, press Shift at the same time. You can see the respective value in the cursor output window. Click on button **Cursor on/off** again in order to exit the scanning mode. The following information can be displayed in the cursor output window:

Parameters	Description
Date	Date/Time of the saved value
Variable	Variable name of the saved value
Value	Technical value of the saved value
Unit	Unit of the saved value
Limit Text	Condition text (limit value text) of the saved value.
Status	Status of the saved value .
Minimum	Minimum of the period of representation (optional).
Average	Average of the period of representation (optional).
Maximum	Maximum of the period of representation (optional)

In order to change the displayed information and the according column widths, click on the button `Diagram settings...` The dialog to configure the Extended Trend (on page 11) is opened. :

In the `Column settings` tab, you can set the column widths for the different entries in the cursor output window. With the help of the checkbox you decide which columns you want to display.

💡 **Information**

If an XY display is configured, then only the respective current value is shown when the scanning is started. This cannot be updated. The cursor cannot be moved.

DOUBLE CURSOR ON/OFF

If you engineered the control element `Double cursor on/off`, you have the possibility to use a second cursor in the diagram. With this a scanning with two separate cursors is possible. Click on button `Double`

`cursor on/off` in order to display two cursors on at the left end and one at the right end of the diagram. You can move the second cursors either with the help of the mouse or the keyboard. In order to do this press and hold `Ctrl` und press **Left** or **Right** to move the cursor in small steps. To carry out larger steps, press Shift at the same time.

The values between the first and the second cursor are displayed in the cursor output window. You can customize the available columns as desired in the Diagram settings and cursor output dialog.

Information

The double cursor is not available for the `block` *array data type.*

4.2   Export data

As a control element, an Export all data button for Extended Trend can be inserted and used in Runtime. In doing so, all visible data of all curves displayed is saved in a text file in CSV format.

FORMAT OF CSV FILE

- ▶ The output is in the form of a Unicode text file.

- ▶ Separator: Semi-colon (;)

- ▶ You are free to choose storage location and file name in the save dialog.

- ▶ The file has no header.

- ▶ The data is displayed in this order in the text file:

`Variable name;Identification;Value;Unit;Status;Time`

Property	Format
`Variable name`:	Character string
`Identification:`	Character string
`Value:`	▶ Up to 8 digits before the decimal separator, ▶ 8 digits behind the decimal separator
`Unit:`	Character string
`Status:`	Character string
`Time:`	`dd.mm.yyyy hh:mm:ss.ms`

There is no output if an exported variable property is empty.

> *Example:* MyVarREAL_4;;978.45000000;;SPONT;09.09.2011 09:37:44.443
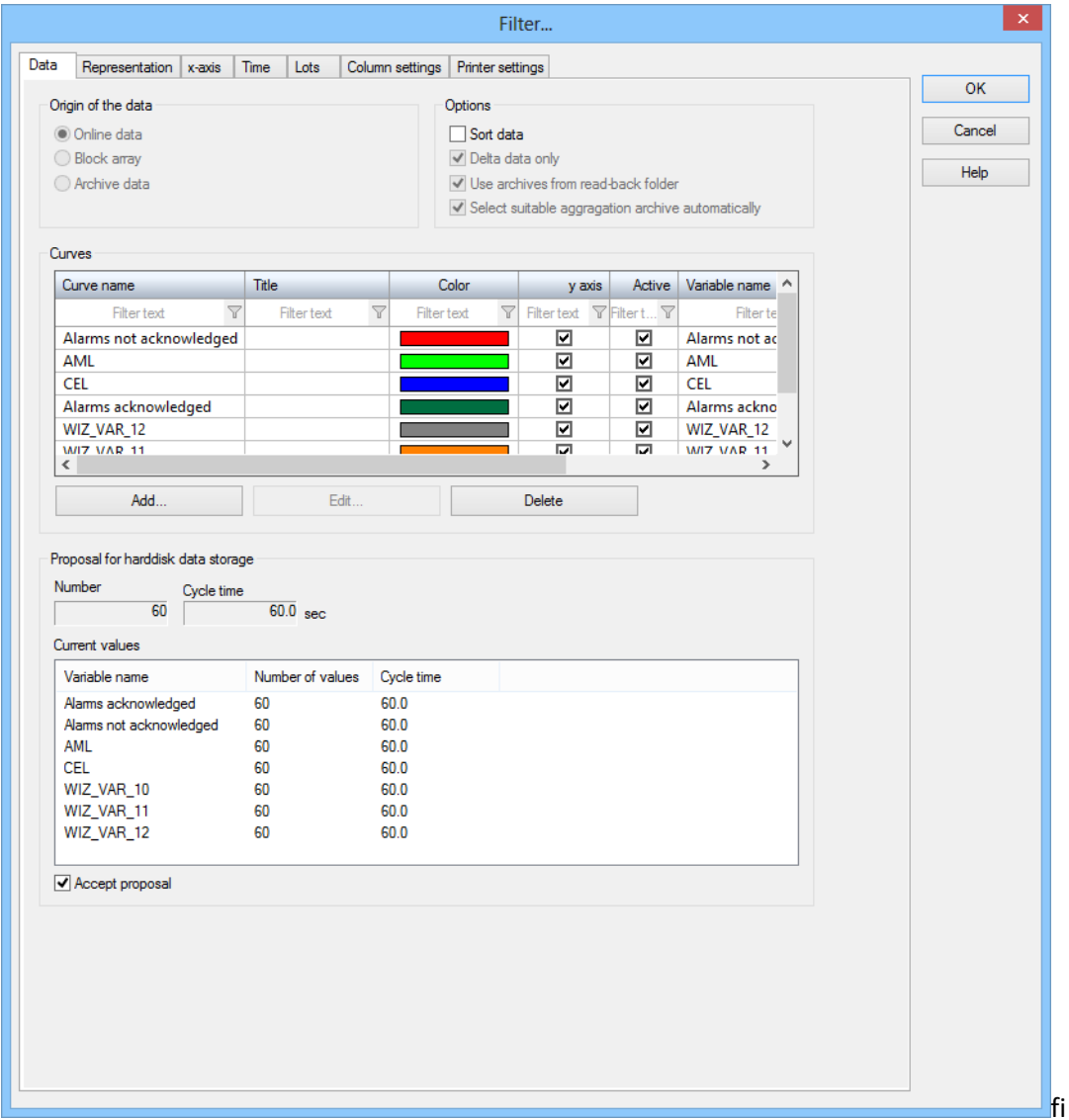
⚠ **Attention**

If too many curves are selected for export, the data collection can require a considerable amount of time.

4.3   Diagram settings

From the existing configuration, which was done in the editor, temporary changes (without saving) can be carried out in runtime. To open the dialog for configuration, click on the `Diagram` button.

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Important amendment options:

Parameters	Description
`Other data:` *Curve > active*	Activates and deactivates the display of the curve.
`Other data:` *Curves -> Y-axis*	Representation of the curve's y-axis
`Other data:` *Curve -> editing*	Editing the settings of the selected trend curve.
`Column settings`	Settings of the diagram parameters.
`Representation: Design`	User defined font for x- and y-axis labeling and value indication
`Representation: Update`	Updating of the diagram for online data

4.4 Operate extended curve list

If the extended curve list is configured in the Editor, curves can be edited in Runtime. It is possible:

▶ To filter for:

- Activation
- Color
- Curve name
- Title
- Variable name
- Variable identification
- Y-axis

▶ To edit curve names

▶ To edit titles

▶ To edit colors

▶ To activate or deactivate the Y-axis

▶ To activate or deactivate curves

To edit an element, click in the corresponding cell of the list.

Curve name	Title	Color	y axis	Active	Variable name ∇	Variable identification
Filter text ▽	Filter text ▽	Filter text ▽	Filter text ▽	Filte... ▽	Filter text ▽	Filter text ▽
WIZ_VAR_12		██████	☑	☑	WIZ_VAR_12	
WIZ_VAR_11		██████	☑	☑	WIZ_VAR_11	
WIZ_VAR_10		██████	☑	☑	WIZ_VAR_10	
WIZ_UPPER_LIMIT		██████	☑	☑	WIZ_UPPER_LIMIT	
System		██████	☐	☑	System	Sys

💡 **Information**

The extended curve list cannot be displayed with Windows CE and is replaced by the
normal curve list.

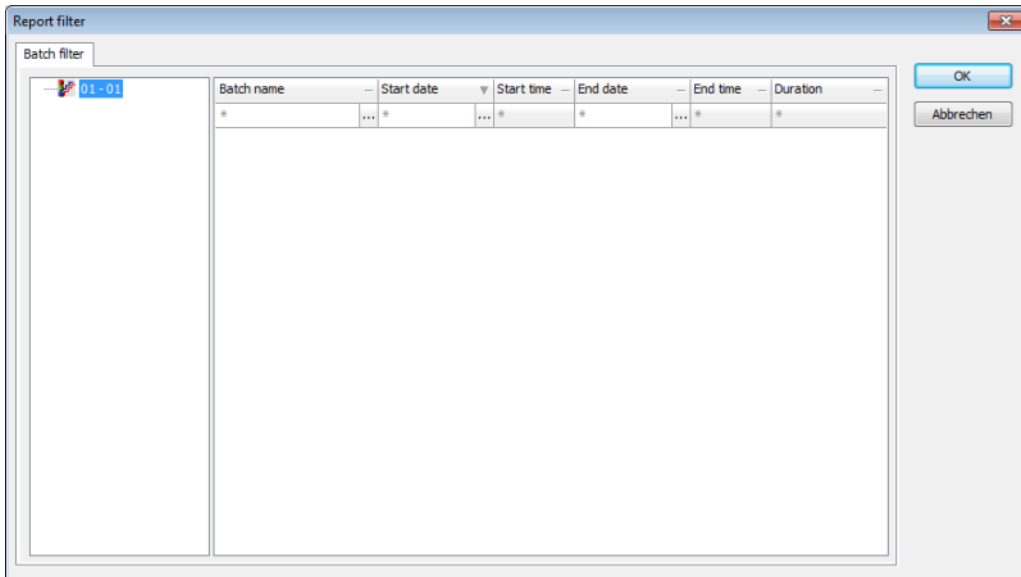## DESIGNING CHECKBOXES WITH GRAPHICS

Checkboxes with graphics can be designed individually. To do this, assign the desired graphics to the
corresponding properties of the curve list in the editor. The graphics must already be created in the
`Files\graphics` node. Properties to be configured in the Representation group:

▶ On

▶ On (inactive)

▶ Off

▶ Off (inactive)

The defined graphics are drawn in Runtime with the aspect ratio being taken into account.

4.5 Filter for screen switch

If you switch to a screen of type Extended Trend the following filter is displayed.

Parameters	Description
Lot filter	Selection of the recipe group that is to be imported. The filter consists of the two lists: ▸ **List of archives:** a list of the archives ▸ **List of lots:** List of lots allocated to the selected archive.
List of archives	Selection of the desired archive node *: ▸ Collects all lots of the displayed archive. ▸ The key is the lot name. ▸ The start time is the start time of the earliest lot. ▸ The end time is the latest end time of all lots.
List of lots	Display of the lots allocated to the selected archive. Filtering through entry of text, date, time or rime range - depending on type. Sort by clicking on the header.
Lot name	Displays the name of all available lots. Filter: Entry of a character sequence. Only lots matching the respective character string will be displayed.
Start date	Shows the start date of all available lots. Filter: Entry of a start date or selection from a calendar.
Start time	Only available if you entered a start date. Display of the start time of all available lots. Filter: Entry of a start time. * means 12:00:00 AM o' clock.
End date	Shows the start date of all available lots. Filter: Entry of an end date or selection from a calendar.
End time	Only available if you entered an end date. Display of the start time of all available lots. Filter: Entry of a start time. * means 11:59:59 PM o' clock.
Duration	This column displays the duration for each available lot.

	Display only.

> 💡 **Information**
>
> *Still open lots are also displayed if they match the set filter criteria.*

> 💡 **Information**
>
> *The value of the lot variable is written in the index file and in the header of the ARX file at the start of the lot. These entries are adjusted with every change of the variable. When the lot is closed, the value of the lot variable at this moment is finally written in the index file and in the header.*
>
> *Thus the lot name is final when the lot is closed.*

4.6   Hints for online operation

The current diagram name can be shown on a control element on opening the diagram in online operation.

Pressing the `zoom` button gives the possibility of representing the available values in a finer resolution and in a smaller interval (X- and Y-axis). The zoom procedure is activated after pressing and pulling out of an area on the diagram. Multiple zooming is possible. Zooming is only possible if the selected area covers at least one subdivision per axis.

Pressing the `Rezoom` button switches the zoom factor back in the steps in which it was previously defined.

If in extended trend archive values are displayed or if the continuous updating of the online data is switched off then the current values of the curves up to the current time are re-read in by pressing the `Refresh` button. Or it is updated corresponding to the refresh times defined in the `Diagram`.

Paging in extended trend beyond the represented X-axis is possible with the use of the << button (display older values) or >>(display more recent values). If online data are displayed a maximum HD entry depth as defined for the process variables can be represented. If archive values are represented then the configuration of the archive stored in the database is decisive.

With Online data and refreshing the visualization changes with each refresh corresponding to the most current entry. If scrolling is unwanted the refresh has to be stopped in the online data. Switching off is done by pressing the `stop` button. Paging and zooming are possible. If the continuous updating should be reactivated then the `Play` button is to be pressed. With the diagram's next refresh cycle the new data and the new X-axis range are updated.

> 💡 **Information**
>
> *Online variables in Extended Trend:*
>
> *The online variables for Extended Trend are configured in the Editor and can no longer be changed in Runtime. The HDD ring buffer is also configured for the variable during configuration in the editor. It is not possible to create or change the ring buffer for variables in Runtime. Online variables therefore cannot be adapted in Runtime.*
>
> *Variables from archives can also continue to be added in Runtime.*
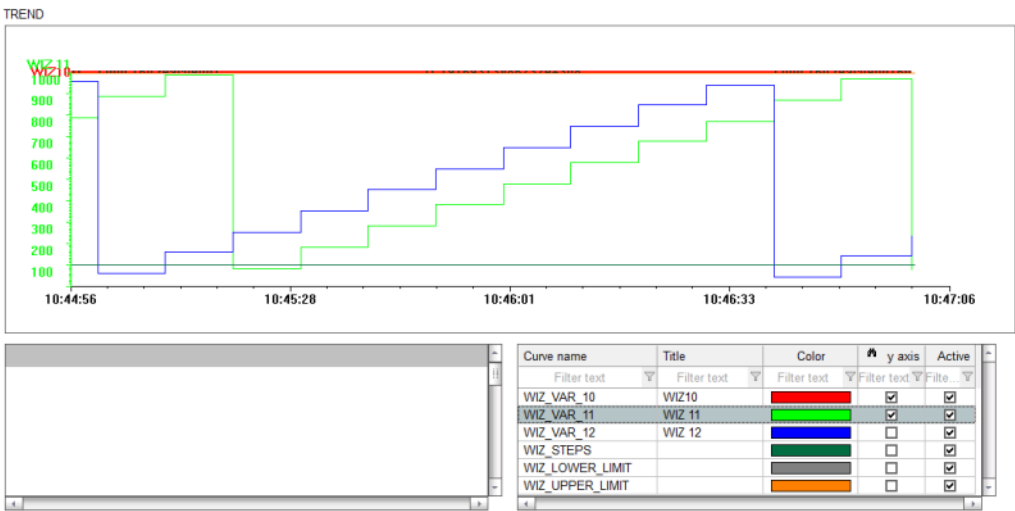
The displayed details are:

Element	Description
`Curve color`	Text in color in which the curve is configured
`Date`	Date stamp of the interrogated value
`Time`	Time stamp of the interrogated value
`Name`	Curve name
`Value`	Technical value
`Limit value display`	Display of a set limit value if the setting is in the `project.ini` file. [EW_TREND] ANZEIGE_GWTEXT=1 Limit value text `0` Do not display `11` = Display (default)

4.7   Fast change of axis parameters in the online operation

To determine the value of displayed curves precisely, the X-axis and Y-axis can be moved. Moving is possible by means of:

- ▶ Dragging & dropping with the left mouse button
  - Moving the x-axis vertically
  - Moving the y-axis horizontally
    The y-axis is duplicated when moved: The original axis remains in place when the copy is moved.

- ▶ Click on the axis with the right mouse button to open the configuration dialog:
  - X-axis tab ,YT display (on page 26)
  - Y-axis dialog (on page 67)

The movement is reset when the screen is reopened.