



zenon
by COPA-DATA

zenon manual

Reporting

v.8.20



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1 Welcome to COPA-DATA help

ZENON VIDEO TUTORIALS

You can find practical examples for project configuration with zenon in our YouTube channel (https://www.copadata.com/tutorial_menu). The tutorials are grouped according to topics and give an initial insight into working with different zenon modules. All tutorials are available in English.

GENERAL HELP

If you cannot find any information you require in this help chapter or can think of anything that you would like added, please send an email to documentation@copadata.com.

PROJECT SUPPORT

You can receive support for any real project you may have from our customer service team, which you can contact via email at support@copadata.com.

LICENSES AND MODULES

If you find that you need other modules or licenses, our staff will be happy to help you. Email sales@copadata.com.

2 Reporting

The integrated reporting in zenon serves as documentation, evaluation and presentation of process data on the basis of online and archive data from zenon. Reporting is divided into:

- ▶ Report Generator (on page 5)
- ▶ Report Viewer (on page 214)

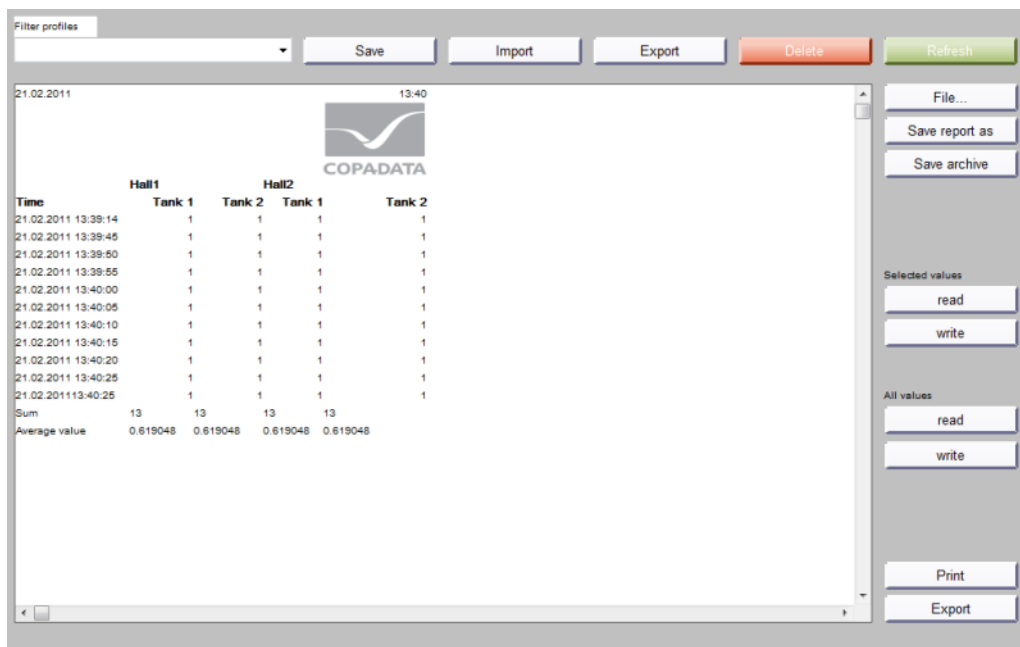
Neither reporting variant is available with Windows CE.

zenon Analyzer is available for comprehensive, platform-independent reporting of the process level through to ERP. Your COPA-DATA sales partner would be happy to inform you about this.

3 Report Generator

The Report Generator documents, evaluates and presents process data on the basis of online and archive data. The report generator works on a cell-orientated basis. Each cell can be assigned certain functions and formats.

Reports are configured using the **Report Generator** screen type. The data is filtered, calculated, issued and displayed via report functions (on page 51). These are entered using dialogs or manually. Values can be read and - if permitted on the screen - also edited. The report generator meets the requirements of rule sheet and ATV H260.



PROJECT MANAGER CONTEXT MENU

Menu item	Action
New report	Creates a new report in the list in detail view.
Import existing report...	Opens the File Manager to select an existing file.
Editor profile	Opens the drop-down list with predefined editor profiles.
Help	Opens online help.



Information

The status bits NORM and N_NORM are not displayed in the report or the status bit NORM cannot be changed using the report.

3.1 Engineering in the Editor

To be able to use reports in the Runtime, the following must be carried out in the Editor:

- ▶ A **Report Generator** screen (on page 6) is created
- ▶ A report (on page 10) is created and configured
- ▶ A switching function (on page 152) is configured in the Runtime

Recommended procedure for planning the report:

- ▶ Create report (on page 10)
- ▶ Format report (on page 23)
- ▶ Create archive filter (on page 49)
- ▶ Configure report functions (on page 51)

3.1.1 Create screen of type Report Generator

CREATE SCREEN OF TYPE REPORT GENERATOR

In the **Report Generator** screen, the reports created with the *Report Generator* are displayed in the Runtime and configured with the corresponding rights. The display size depends on the template size selected. The report that is displayed can be determined in screen switching or in the Runtime.

ENGINEERING

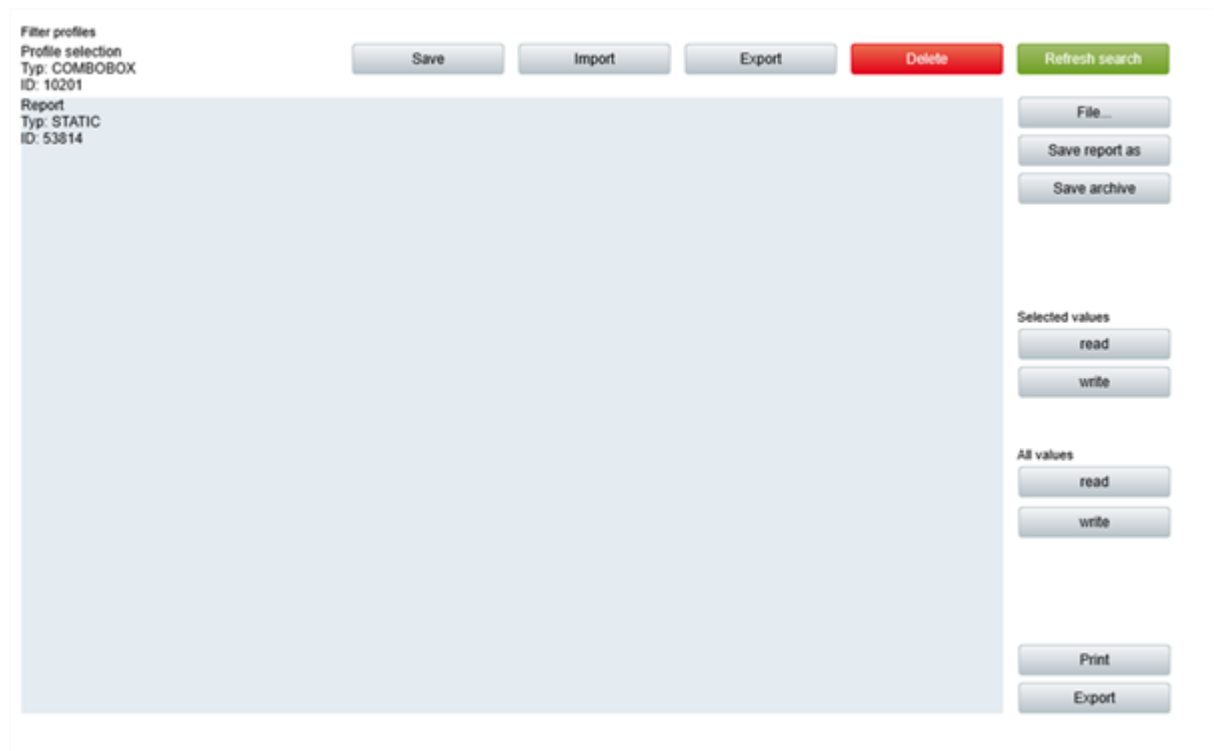
Two procedures are available to create a screen:

- ▶ The use of the screen creation dialog
- ▶ The creation of a screen using the properties

Steps to create the screen using the properties if the screen creation dialog has been deactivated in the menu bar under **Tools, Settings** and **Use assistant**:

1. Create a new screen.
To do this, select the **New screen** command in the tool bar or in the context menu of the **Screens** node.
2. Change the properties of the screen:
 - a) Name the screen in the **Name** property.
 - b) Select **Report Generator** in the **Screen type** property.

- c) Select the desired frame in the **Frame** property.
3. Configure the content of the screen:
 - a) Select the **Elements (screen type)** menu item from the menu bar.
 - b) Select *Insert template* in the drop-down list.
The dialog to select pre-defined layouts is opened. Certain control elements are inserted into the screen at predefined positions.
 - c) Remove elements that are not required from the screen.
 - d) If necessary, select additional elements in the **Elements** drop-down list. Place these at the desired position in the screen.
4. Create a screen switch function.



Parameter	Description
Insert template...	<p>Opens the dialog for selecting a template for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined position 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 placed in the zenon screen. Elements</p>

Parameter	Description
	can be moved on the screen and arranged individually.

WINDOW

Control elements for window display.

Parameter	Description
Report window	Shows the report.
Set filter	Displays the status of the time filter currently configured in the Runtime.
Compatible elements	<p>Standard Win32 control elements that have been replaced or removed by zenon elements (<i>dynamic text</i>, <i>switch</i>) and continue to be available due to compatibility reasons. These elements are not taken into account with automatic insertion of templates.</p> <p>For the description, see current elements.</p> <p>► Set filter</p>

FUNCTIONS

Control elements for control in the Runtime.

Parameter	Description
Filter...	Select report file and change filter conditions.
Refresh	Recreate build report completely (values and display).
Print	Print report in the Runtime.
Export	Export report.
Save archive	Write changed values to the archive.
Save report	<p>Report is saved in the Runtime (*.xrs).</p> <p>Attention: When saving, formulas and functions are replaced by the current values. The functions in these reports (.xrs files) are no longer available. These reports can also not be edited in the editor anymore.</p> <p>Recommendation: Set original report files to "write-protected" status and save changes with Save as in a</p>

Parameter	Description
	new file.
Save report as...	Report is saved under a new name in the Runtime (*.xrs); formulas and functions are replaced by current values.
Read selected values	Selected values are read in again from the driver.
Write selected values	Selected values are sent to the driver.
Read all values	All values are read in again from the driver.
Write all values	All values are sent to the driver.

NAVIGATION

Control elements for navigation.

Parameter	Description
Line up	Scroll text in list element up
Line down	Scroll text in list element down
Column right	Scroll text in list element to the right
Column left	Scroll text in list element to the left
Page up	Scroll text in list element up
Page down	Scroll text in list element down
Page right	Scroll text in list element to the right
Page left	Scroll text in list element to the left

FILTER PROFILES

Buttons for filter settings in the Runtime.

Parameter	Description
Profile selection	Select profile from list.
Save	<p>Saves current setting as a profile.</p> <p>Note: The name can be a maximum of 31 characters long and must only contain valid characters. Prohibited are: ! \ / : * ? < > ""</p>

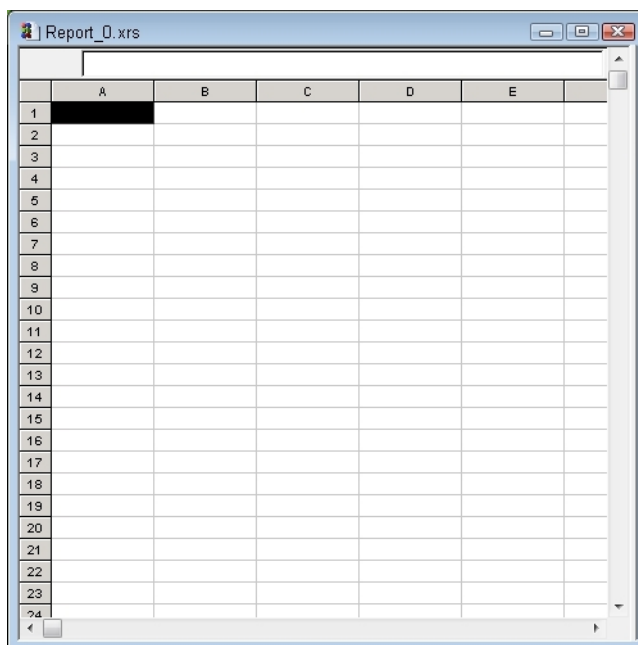
Parameter	Description
Delete	Deletes selected profile.
Import	Imports filter profiles from export file.
Export	Exports filter profiles in the file.

3.1.2 Create a new report

Before a report is created, the report printer should be defined because the page formatting of a report depends on the printer that has been set. Subsequent changing of the printer can necessitate reformatting of the existing table.

In order to create a new report:

- ▶ Navigate to the report generator node in the project manager
- ▶ Select the **New report** command in the context menu
- ▶ a new report is created in the detail view
- ▶ An empty worksheet is created in the main window



Functionalities of the worksheet:

- ▶ Assignment of process information using report functions (on page 51)
- ▶ Formatted display of content of cells, columns and rows
- ▶ Subtotals

- ▶ Assignment of editing blocks



Information

The following applies for the input in cells: A decimal value can be entered with a **comma** as well as with a **period** as a separator. The decimal separator is automatically changed to a **period**.

You can find out more information in the chapters:

- ▶ Set up page (on page 24)
- ▶ Printer settings (on page 19)
- ▶ Formatting (on page 23)
- ▶ Report functions (on page 51)

3.1.2.1 Report menu

The **Report** menu is shown when a **report** is selected:

Parameter	Description
Save report	Saves all changes in the active report. Changes in other reports are not saved.
Export report functions	Exports all report functions from the active report to a text file. Structure: Column / row =function(parameter)
Refresh report	Draws a new report.
Calculate report	Calculates a new report.
Set up page (on page 24)	Opens the dialog to set up the print page.
Print report	Prints the report using the printer defined in the standard settings.
Print area	Defines printed areas or cancels them: <ul style="list-style-type: none"> ▶ Define printing area: Defines marked areas of the table as a print area. ▶ Release printing area: Cancels defined print area
Report - Page view	Switches from layout view to page view. The view can be zoomed using the left mouse button.

Parameter	Description
	Leaving page view: Press the Esc key.
Report file Info (on page 21)	Opens the dialog to administer the report file information.

3.1.2.2 Menu Edit

When a report is selected, the **Edit** menu offers special functions for reports:

Command	Description
Cut	<p>Cuts highlighted area and copies it to the clipboard.</p> <p>Only available if at least one item of project configuration content has been selected.</p>
Copy	<p>Copies highlighted area to the clipboard.</p> <p>Only available if at least one item of project configuration content has been selected.</p>
Paste	<p>Pastes the contents of the clipboard.</p> <p>Only available if Copy or Cut has previously been carried out.</p>
Paste enhanced	<p>Provides advanced paste options for cell operations. Selection from context menu.</p> <ul style="list-style-type: none"> ▶ <i>All:</i> Pastes the complete content of the clipboard. ▶ <i>Formulas:</i> Pastes only the formula content of the clipboard. ▶ <i>Value:</i> Only pastes content of the clipboard with value: Caution: The relationship to formulas is lost in the process. ▶ <i>Format:</i> Only takes on the format of the content saved in the clipboard without content <p>Only available if Copy or Cut has previously been carried out.</p>
Fill	<p>Copies the content of the selected cell and transfers it to all further highlighted cells.</p> <p>Selection from context menu.</p>

Command	Description
	<ul style="list-style-type: none"> ▶ <i>Downwards:</i> Content is copied into selected cells below the selection (column). ▶ <i>To the right:</i> Content is copied into selected cells to the right of the selection (column).
Remove area	<p>Removes content from the highlighted cells.</p> <p>Selection from context menu.</p> <ul style="list-style-type: none"> ▶ <i>All:</i> Complete content is removed from highlighted cells. ▶ <i>Contents only:</i> Only contents are removed from highlighted cells. The format of the cells is retained in the process. ▶ <i>Format:</i> Only formatting of the highlighted cells is removed. All content is retained in the process.
Delete column/row	Deletes highlighted columns or rows.
Insert column/row	<p>Inserts new columns or rows.</p> <p>Insertion is carried out above the row or to the left of the column. As many rows/columns are inserted as are highlighted in the worksheet.</p> <p>Tip: always highlight the complete lines or columns by clicking on the column or line markers. Multiple selection is possible if the Shift key is held down.</p>
Search/replace	Opens the dialog (on page 22) for searching and replacing table content.

3.1.2.3 Format menu

The Format menu provides properties and functions for formatting the report table:

Parameters	Description
Cells	Formatting options for cells (on page 31):

Parameters	Description
	<ul style="list-style-type: none"> ▶ Font ▶ Pattern ▶ Border ▶ Alignment ▶ Numbers ▶ Lists
Line	Formatting options for rows: <ul style="list-style-type: none"> ▶ Line height: Opens dialog to define the row height ▶ Row format: Opens dialog for all row properties (on page 47)
Column	Formatting options for columns: <ul style="list-style-type: none"> ▶ Column width: Opens dialog to define the column width: ▶ Column format: Opens dialog for all column properties (on page 46)
Report	Opens the dialog (on page 27) to format the report.
Function wizard	Opens assistant to create report functions (on page 51).
Filter	Opens report filter (on page 49) to select archives.

3.1.2.4 Toolbar Report Generator

A toolbar is available in the Editor for the Report Generator.
To call this up, if it is not visible:

1. Open the **Extras -> Settings -> Tab: menu Toolbar**
2. Activate the checkbox next to **Report Generator**.
3. Confirm with **OK**.



Symbol	Description
Print report	Prints the report on the default printer.
Report - Page view	Opens the report in a preview. The report can be enlarged or minimized in the preview (zoom), you can leaf through it and it is

Symbol	Description
	printable.
Refresh report	Refreshes the display.
Recalculate functions	Recalculates the formulas in the report.
Function wizard	Opens a dialog that helps with the configuration of functions.
Font	Opens the dialog for cell formatting - focused on the Font tab.
Text alignment	Opens the dialog for cell formatting - focused on the Alignment tab.
Border	Opens the dialog for cell formatting - focused on the Border tab.
Pattern	Opens the dialog for cell formatting - focused on the Pattern tab.
Options for toolbar	<p>Clicking on the arrow opens the submenu:</p> <p><i>Active:</i> Toolbar is displayed.</p> <p>If the toolbar is not displayed, it can be activated using the Options -> Toolbar menu.</p> <p>Note: For free placed toolbar (undocked from the Editor) options are not displayed. The toolbar can be closed by clicking on button X.</p>

3.1.2.5 Detail view of context menu and toolbar

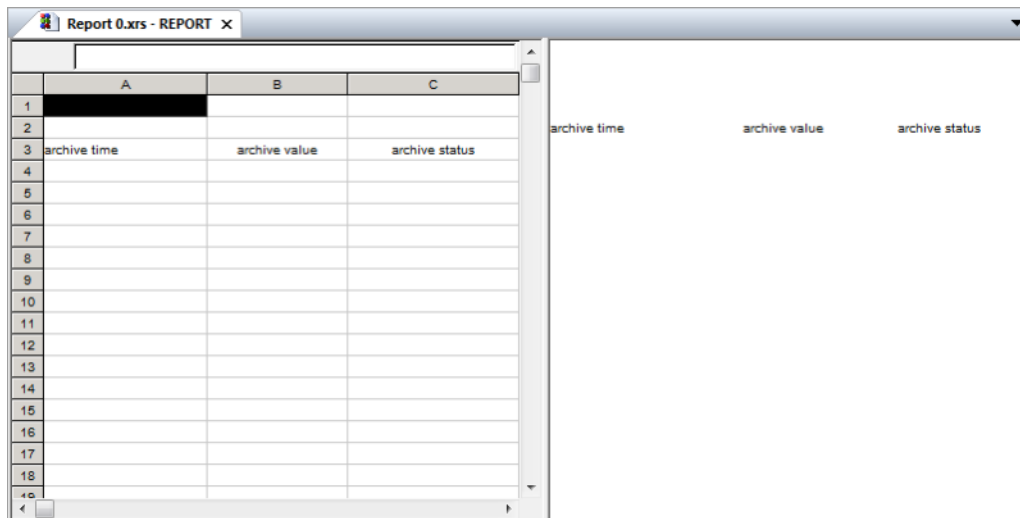


Menu item	Action
New report	Creates a new report in the list in detail view.
Open report	<p>Opens the selected report or focuses on the one that is already open.</p> <p>Only active if a report is selected in the detail view.</p>
Create standard function (on page 152)	Creates a zenon function for report generator. The action is documented in the output window.
Jump back to starting element	Jumps back to the initial position in the zenon Editor.

Menu item	Action
	Note: Only available in the context menu if a jump to the current position has been made from another position with the Linked elements context menu entry.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the content from the clipboard. If an entry with the same name already exists, the content is pasted as " Copy of... ".
Delete	Deletes selected entries after a confirmation from list.
Import existing report...	Opens the File Manager to select an existing file.
Remove all filters	Removes all filter settings. Note: Only active if the current view is filtered.
Edit selected cell	Opens the selected cell for editing. The binocular symbol in the header shows which cell has been selected in a highlighted line. Only cells that can be edited can be selected.
Replace text in selected column	Opens the dialog to search and replace texts for the selected column.
Properties	Opens the Properties window.
Help	Opens online help.

3.1.2.6 Creation of table window

Reports are displayed in two parts when being edited in the Editor in the main window:



- ▶ The left area contains the table for the draft
- ▶ The right part displays a preview of the output

The size of both areas can be amended individually. To do this, move the mouse to the right edge of the table scroll bar until the mouse pointer becomes a moving tool. Move the scroll bar to the desired position.

INPUT ROW

The table has an input row at the upper edge. If, when configuring (on page 28) the report, the **Edit in the cell** option is activated, this row is not displayed. Input must then be made in the row itself.

3.1.2.7 Data sheet context menu

Command	Description
Cut	Cuts highlighted area and copies it to the clipboard. Only available if at least one item of project configuration content has been selected.
Copy	Copies highlighted area to the clipboard. Only available if at least one item of project configuration content has been selected.
Paste	Pastes the contents of the clipboard.

Command	Description
	Only available if Copy or Cut has previously been carried out.
Paste enhanced	<p>Provides advanced paste options for cell operations. Selection from context menu.</p> <ul style="list-style-type: none"> ▶ <i>All:</i> Pastes the complete content of the clipboard. ▶ <i>Formulas:</i> Pastes only the formula content of the clipboard. ▶ <i>Value:</i> Only pastes content of the clipboard with value: Caution: The relationship to formulas is lost in the process. ▶ <i>Format:</i> Only takes on the format of the content saved in the clipboard without content <p>Only available if Copy or Cut has previously been carried out.</p>
Fill	<p>Copies the content of the selected cell and transfers it to all further highlighted cells.</p> <p>Selection from context menu.</p> <ul style="list-style-type: none"> ▶ <i>Downwards:</i> Content is copied into selected cells below the selection (column). ▶ <i>To the right:</i> Content is copied into selected cells to the right of the selection (column).
Remove area	<p>Removes content from the highlighted cells.</p> <p>Selection from context menu.</p> <ul style="list-style-type: none"> ▶ <i>All:</i> Complete content is removed from highlighted cells. ▶ <i>Contents only:</i> Only contents are removed from highlighted cells. The format of the cells is retained in the process. ▶ <i>Format:</i> Only formatting of the highlighted cells is removed. All content is retained in the process.
Delete column/row	Deletes highlighted columns or rows.

Command	Description
Insert column/row	<p>Inserts new columns or rows.</p> <p>Insertion is carried out above the row or to the left of the column. As many rows/columns are inserted as are highlighted in the worksheet.</p> <p>Tip: always highlight the complete lines or columns by clicking on the column or line markers. Multiple selection is possible if the Shift key is held down.</p>
Search/replace	Opens the dialog (on page 22) for searching and replacing table content.
Menu item	Action
Report...	Opens the dialog to format the report (on page 27).
Cell...	Opens the dialog to format a cell (on page 31).
Column...	Opens the dialog to format the columns (on page 46).
Row...	Opens the dialog to format the rows (on page 47).
Functions...	<p>Opens the assistant to create report functions (on page 51).</p> <p>Note: The assistant offers a selection of over 150 functions. Further functions can be entered manually into the input line of the data sheet.</p>

3.1.3 Printer settings

The report layout (side margins, page sizes) depends on the printer configured. You can find the settings for the report printer via **File -> General configuration -> Standard -> Printer for values to be given and protocols**.

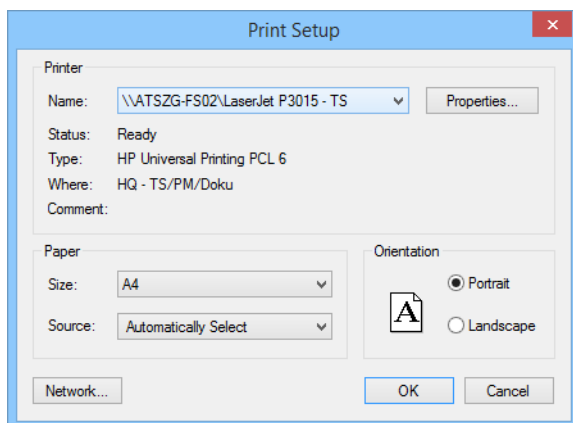
Here you define

- ▶ the printer and
 - ▶ Paper format of the print
 - ▶ Paper source of the printer
 - ▶ Direction of print

⚠ Attention

The desired printer must be selected before creating the report, because the page formatting of a report depends on the printer that has been set. Subsequent changing of the printer can necessitate reformatting of the existing table.

PRINTER CONFIGURATION



PRINTER

Parameter	Description
Printer	Settings for the printer.
Name:	Selection of the printer from the drop-down list. The list contains all printers configured in the operating system.
Properties...	Opens printer configuration dialog.
State:	Display printer state. For information only.
Type:	Display printer type. For information only
Location:	Display the location of the printer if configured. For information only.
Comment:	Display comment about printer if configured. For information only.

PAPER

Parameter	Description
Paper	Configuration of the printout.

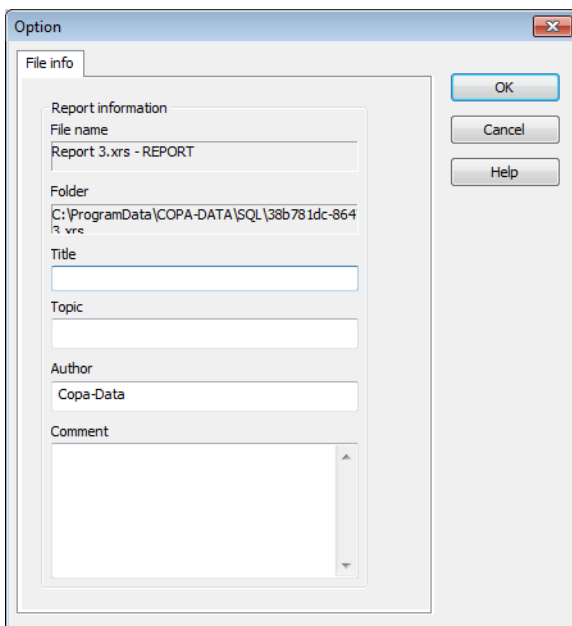
Parameter	Description
Size	Select paper format from drop-down list.
Source	Select paper feed from drop-down list.

ALIGNMENT

Parameter	Description
Alignment	Select paper alignment. Possible parameters: <ul style="list-style-type: none"> ► <i>Portrait format</i> ► <i>Landscape</i>
Network	Opens dialog for selecting a printer in the network.
OK	Applies configuration and closes the dialog. Printing is thus started in the Runtime.
Cancel	Discards configuration and closes the dialog. This also cancels the printout in the Runtime.

3.1.4 File info

In the **Report -> Report file info** dialog, information on the respective report file can be saved.



The screenshot shows a Windows-style dialog box titled "Option" with a "File info" tab selected. The dialog contains several input fields and buttons. On the right side, there are three buttons: "OK", "Cancel", and "Help". The main area contains the following fields:

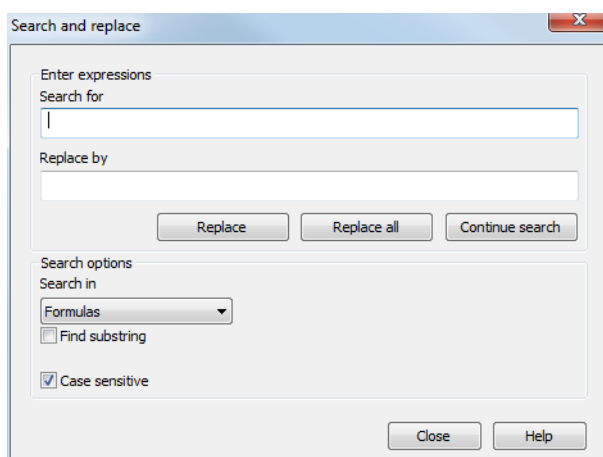
- Report information** (grouped header):
 - File name**: Report 3.xrs - REPORT
 - Folder**: C:\ProgramData\COPA-DATA\SQL\38b781dc-86413-vre
 - Title**: (empty text box)
 - Topic**: (empty text box)
 - Author**: Copa-Data
 - Comment**: (empty text area)

Parameters	Description
File name	Name of the report file. Information only; cannot be changed here. Can be changed in the detail view.
Folder	Save location of the report file. Information only; cannot be changed here.
Title	Free text input
Theme	Free text input
Author	Free text input
Comment	Free text input

3.1.5 Finding and replacing in the report

To find formulas, character strings or values and replace these:

1. Activate the desired report
2. Select **Find/replace** in the **Edit** menu.
3. The dialog to find and replace is opened



Parameters	Description
Enter expressions	Input of character string for finding and replacing.
Search for	Character string that is being searched for.

Parameters	Description
Replace by	Character string that replaces the one that is found.
Replace	Replaces currently displayed finding with sequence from Replace with .
Replace all	Replaces all currently displayed findings with sequence from Replace with .
Continue search	Looks for next instance of the character string being searched for.
Search options	Search options
Search in	Select from drop-down list: <ul style="list-style-type: none"> ▶ Formulas: Searches in formulas ▶ String: Searches in character strings ▶ Value: Searches in values
Find substring	Also searches partial areas of cells.
Case sensitive	Note capitalization during the search.
Close	Closes the dialog.
Help	Opens online help

3.1.6 Formatting

Before creating a report, the necessary formatting should be carried out:

- ▶ **Page (on page 24):** Set up print properties for the page
- ▶ **Report (on page 27):** Set up report properties
- ▶ **Cell (on page 31):** Define the formatting of the cells (direction, border, font, pattern, type, lists)
- ▶ **Columns and cells (on page 45):** Formatting for selected columns or cells

You can find the settings in the **Report** and **Format** drop-down lists in the menu bar or in the context menu of the worksheet.

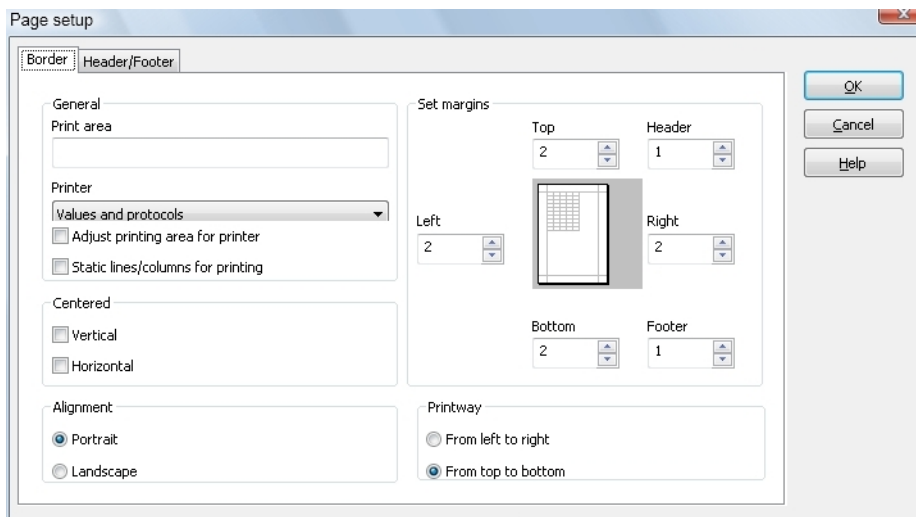
Hint: Ensure that reports with large amounts of data have sufficient lines/columns for output.

3.1.6.1 Set up page

The **Set up page...** command in the **Report** menu opens the dialog to configure the report page. This contains the two tabs:

- ▶ Border (on page 24)
- ▶ Headers and footers (on page 26)

3.1.6.1.1 Border

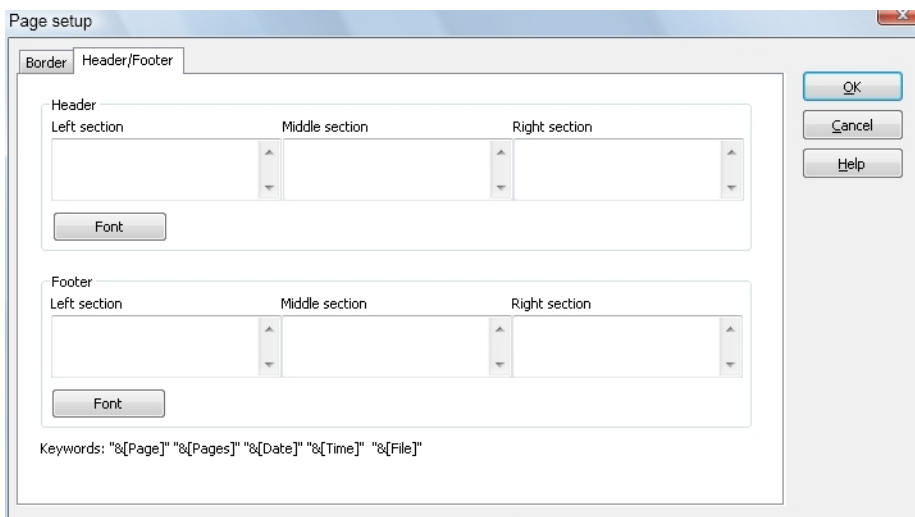


Parameter	Description
Set margins	Define print margin independently of the printer setting (on page 19)
top	Distance of the report from the upper edge.
bottom	Distance of the report from the lower edge.
left	Distance of the report from the left edge.
right	Distance of the report from the right edge.
Header	<p>Distance of the header from the text.</p> <p>Possible values: 0 to 20; 0 = hidden.</p> <p>The value selected must be large enough to be able to display the selected font size under header and footer (on page 26).</p>
Footer	Distance of the footer from the text.

Parameter	Description
	<p>Possible values: 0 to 20; 0 = hidden.</p> <p>The value selected must be large enough to be able to display the selected font size under header and footer (on page 26).</p>
General	
Print area	<p>Defines the print area based on the cell A1. Input in the text field: <i>Coordinates of the end value</i> of the range.</p> <p>Example: D5 defines the print area of the cells A1 to D5.</p> <p>Note: The print area must be at least 2 lines and 2 columns All instructions with A or 1 are thus invalid and are not executed.</p> <p>Examples: A7: invalid; D1: invalid; B2: valid.</p>
Printer	<p>selection of the printer for the report. Clicking on the drop-down list opens the list of all defined printers available in zenon printer settings.</p> <p>Default: <i>Values and protocols</i></p>
Adjust printing area to printer	<p><i>Active:</i> The printing area of the report is adjusted to the settings of the selected printer.</p> <p>Note: The print area must be at least 2 lines and 2 columns All instructions with A or 1 are thus invalid and are not executed.</p> <p>Examples: A7: invalid; D1: invalid; B2: valid.</p>
Static lines/columns for printing	<i>Active:</i> Static lines and columns are also printed.
Centered	Orientation of the report on the print page
vertical	Centers the report vertically.
horizontal	Centers the report horizontally.
Alignment	Settings of page format
Portrait format	Prints in portrait format.
Landscape	Prints in landscape format.
Printway	Sequence of the page print out for multiple pages

Parameter	Description
From left to right	Print out several pages from left to right.
From top to bottom	Print out several pages from top to bottom.

3.1.6.1.2 Headers and footers



Parameters	Description
Header	Definition of the header area
Left section	Left text for the left third of the header.
Middle section	Centered text for the center of the header.
Right section	Right text for the right third of the header.
Font	Opens the dialog to select the font, font size and emphasis of the footer text.
Footer	Definition of the footer area
Left section	Left text for the left third of the footer.
Middle section	Centered text for the center of the footer.
Right section	Right text for the right third of the footer.
Font	<p>Opens the dialog to select the font, font size and emphasis of the footer text.</p> <p>Note that the settings for the header/footer can be selected</p>

Parameters	Description
	in borders (on page 24) in such a way that the font size can be displayed in full.
Keywords	Key words for headers and footers
<i>&[Page]</i>	Page number
<i>&[Pages]</i>	Total number of pages
<i>&[Date]</i>	Printing date
<i>&[Time]</i>	Printing time
<i>&[File]</i>	File name

3.1.6.2 Format report

For formatting the whole report, there are the following settings for:

- ▶ General (on page 28): General settings for the report
- ▶ Columns: (on page 29) Settings for columns, such as number etc.
- ▶ Rows (on page 30): Settings for rows, such as number etc.

Carry out the following steps to format a report:

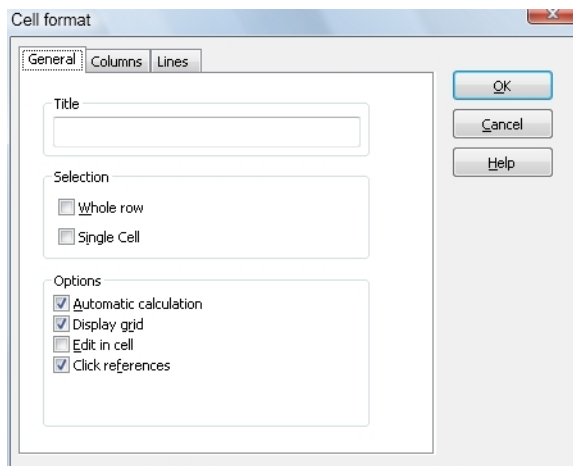
Case 1:

1. Switch to the **Report Generator** node.
2. Select the desired report in the detail view.
3. Select the **Report...** entry in the **Format** menu bar of the zenon Editor
The **Report** dialog is opened.

Case 2:

1. Switch to the **Report Generator** node.
2. Select the desired report in the detail view.
The report sheet is displayed in the main window.
3. Select the **Format report...** context menu entry in the main window for the report sheet
The **Report** dialog is opened.

3.1.6.2.1 General



Parameter	Description
Selection	Defines selection behavior when clicked. Configuration using checkboxes
<i>Whole row</i>	<i>Active:</i> The whole row is selected.
<i>one cell</i>	<i>Active:</i> Only the cell that has been clicked on is selected; multiple selection of cells is not possible.

OPTIONS

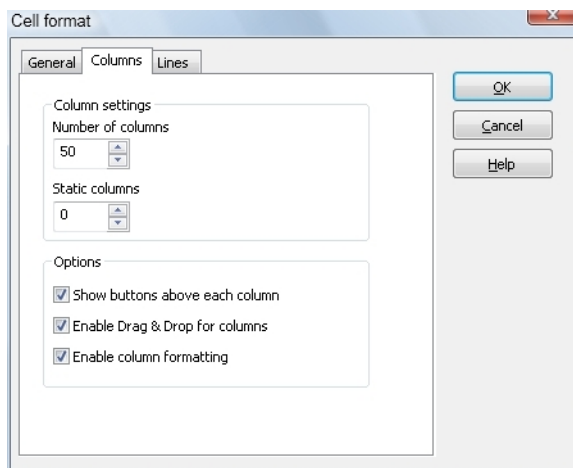
Parameter	Description
Automatic calculation	<i>Active:</i> Calculations are automatically updated when input values are changed.
Display grid	<i>Active:</i> Shows grid network lines in the editor.
Edit in cell	<i>Active:</i> Entries are made in the cell directly; the input cell in the report window is shaded out.
Click references	<i>Active:</i> The cell that has been clicked is accepted as the report coordinate when formulas are entered. For example: Instead of entering A12, the A12 cell is clicked.

CLOSE DIALOG

Option	Description
OK	Applies all changes in all tabs and closes the dialog.

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

3.1.6.2 Columns



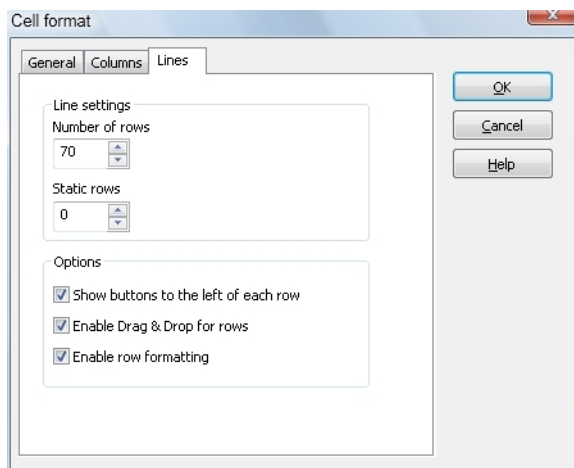
Parameter	Description
Column settings	
Number of columns	Defines the maximum number of columns. Valid value: 0 to 31000.
Static columns	Number of columns that are always shown. Scrolling only takes place after the static columns.
Show buttons in the first column	<i>Active:</i> Shows target numbers.
Enable column formatting	<i>Active:</i> The column width can be adjusted using the mouse by dragging the borders of the header.

CLOSE DIALOG

Option	Description
OK	Applies all changes in all tabs and closes the dialog.

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

3.1.6.2.3 Lines



Configurable features of the rows are:

Parameter	Description
Number of rows	Defines the maximum number of rows. Valid value: 0 to 31000.
Static rows	Number of rows that are always shown. Scrolling only takes place after the static rows.
Show buttons in the first row	<i>Active:</i> Shows column header >(A, B, C, ...).
Enable row formatting	<i>Active:</i> The row width can be adjusted using the mouse by dragging the borders of the row numbering.

CLOSE DIALOG

Option	Description
OK	Applies all changes in all tabs and closes the dialog.

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

3.1.6.3 Format cell

The following settings are available for formatting the cells of the report sheet:

- ▶ Alignment (on page 32)
- ▶ Border (on page 33)
- ▶ Font (on page 35)
- ▶ Pattern (on page 36)
- ▶ Cell type (on page 37)
- ▶ Drop-down lists (on page 43)

Carry out the following steps to format a cell:

Case 1:

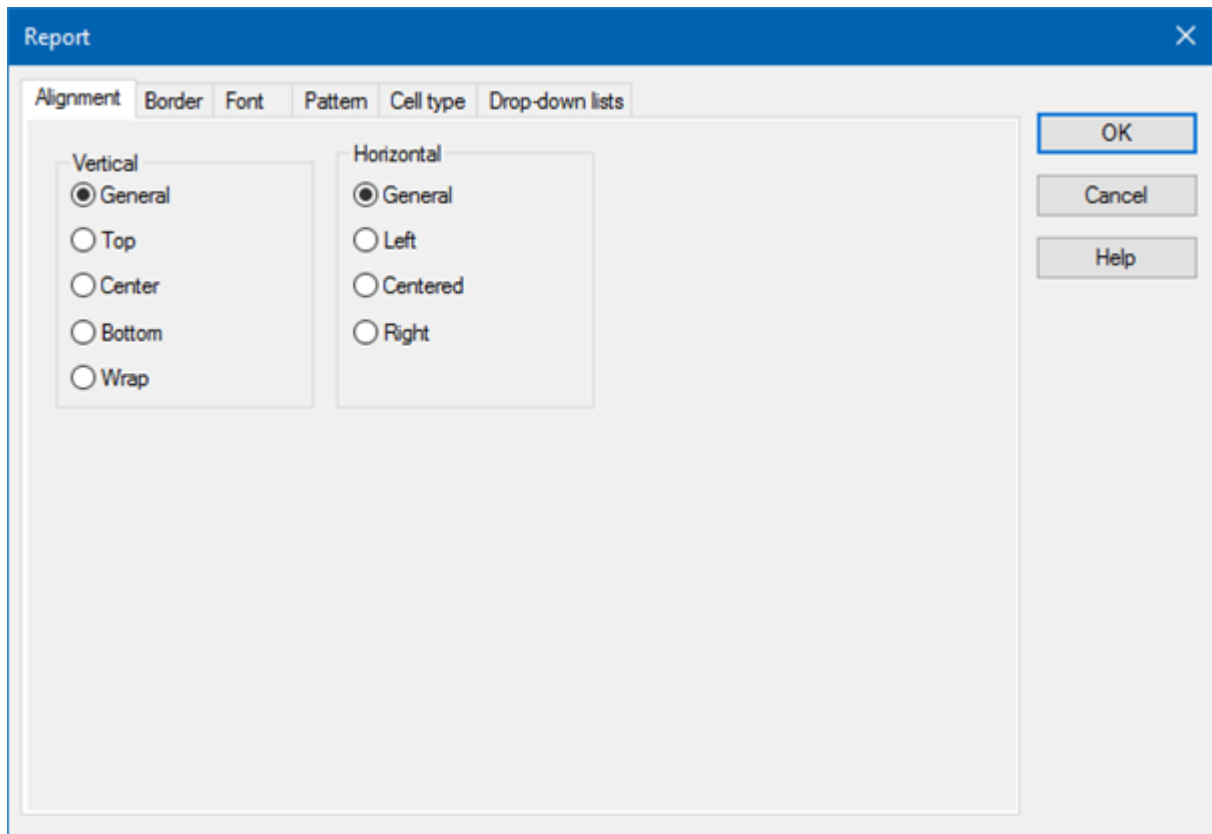
1. Switch to the **Report Generator** node.
2. Select the desired report in the detail view.
3. In the **Format** menu bar of the zenon Editor, select the desired sub-entry in the **Cells** entry. The **Report** dialog is opened. The display of the tab in this dialog corresponds to the selection in the menu entry.

Case 2:

1. Switch to the **Report Generator** node.
2. Select the desired report in the detail view.
The report sheet is displayed in the main window.
3. Select the **Format cells...** context menu entry in the main window for the report sheet
The **Report** dialog is opened.

3.1.6.3.1 Alignment

The display of cell contents is defined in the **Orientation** tab.



The following are available for vertical positioning:

- ▶ **General**
- ▶ **Top**
- ▶ **Center**
- ▶ **Bottom**
- ▶ **Wrap**

The following are available for horizontal positioning:

- ▶ **General**
- ▶ **Left**
- ▶ **Center**
- ▶ **Right**



Information

If text is to be displayed vertically, select the **vertical** property in the **Font** property.

CLOSE DIALOG

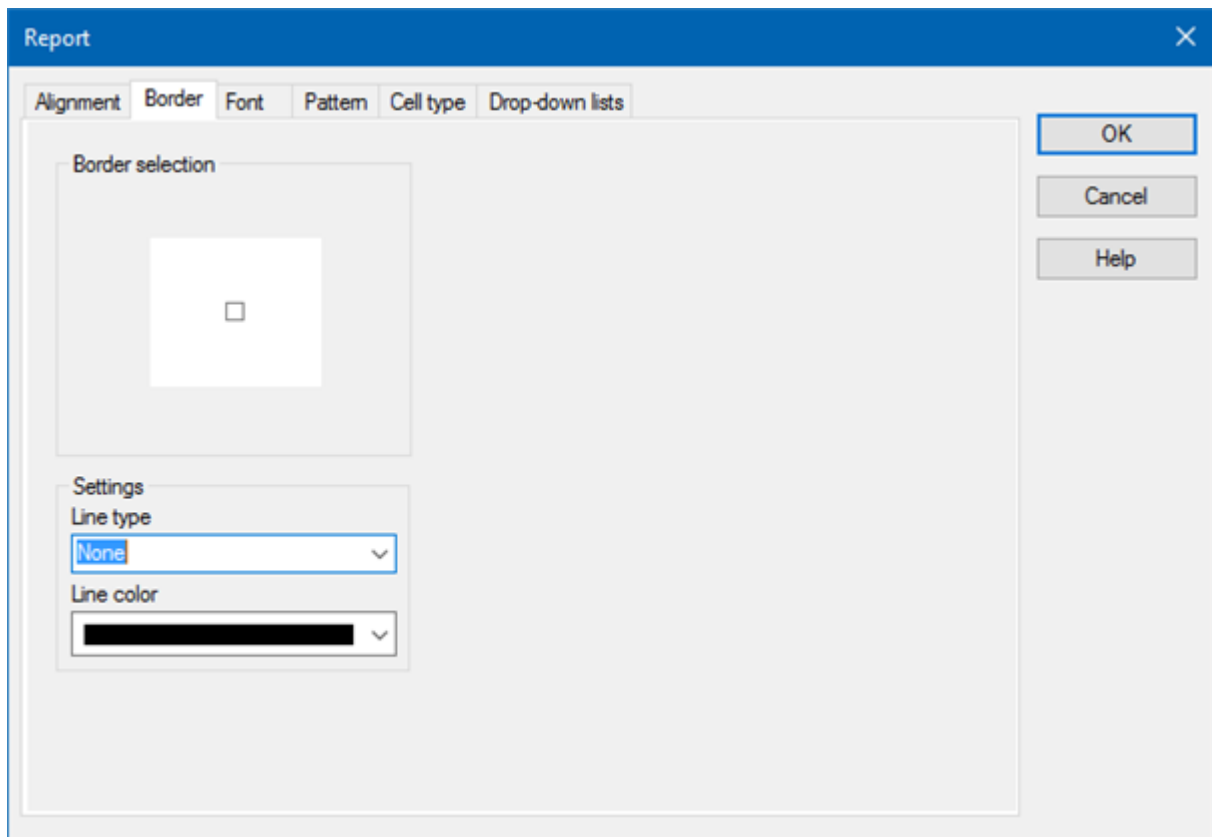
Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.1.6.3.2Border

In the Frame tab, you define if a frame is displayed around a cell and if so, in what form. You can define each side of the frame (top, bottom, left, right) in terms of type and color:

1. Define the type and color.

2. Allocate these by clicking the whole frame or an individual page.



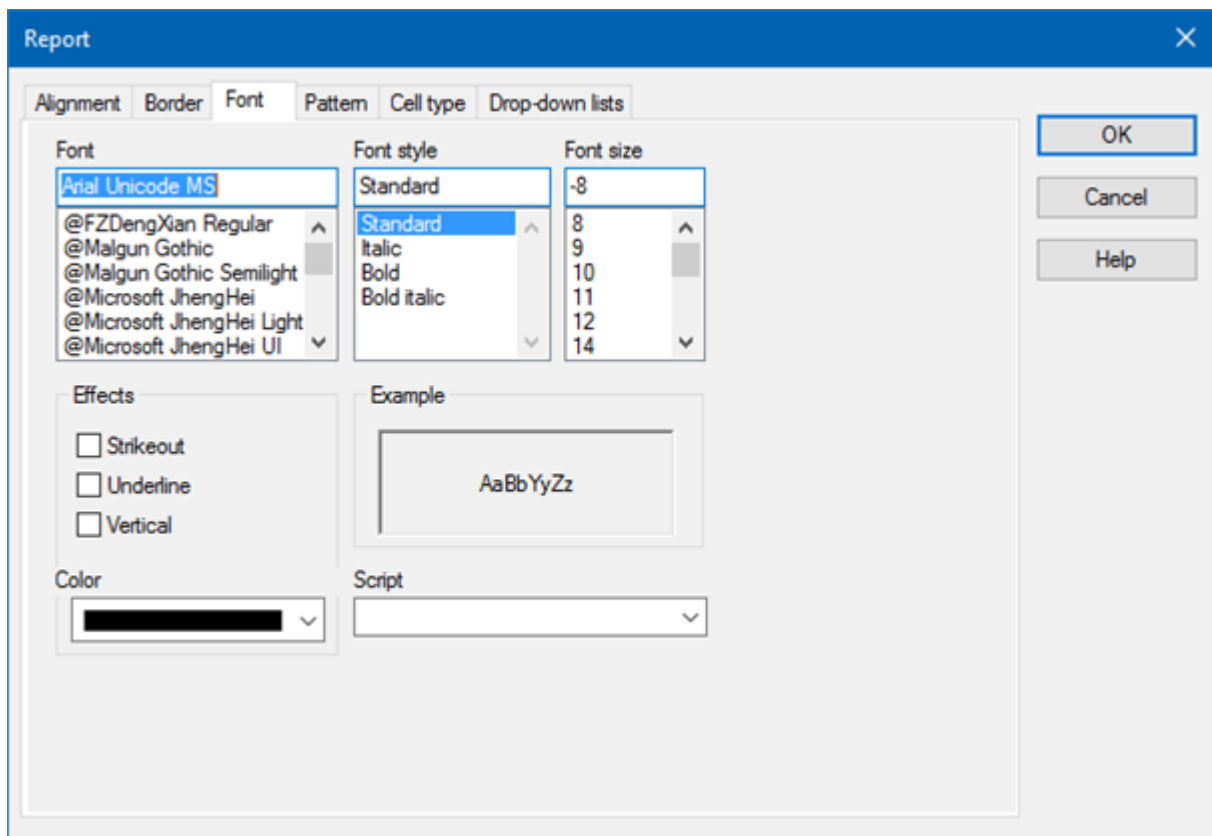
Parameter	Description
Border selection	Clicking in the center activates all our frame sides. Clicking on the frame side activates these.
Line type	Selection of line type from drop-down list.
Line color	Selection of line color from drop-down list.

CLOSE DIALOG

Option	Description
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.

3.1.6.3.3 Font

The standard Windows settings are available for fonts.



Parameter	Description
Font	Selection of the font.
Font style	Selection of the aspect.
Font size	Selection of aspect in point.
Effects	Selection of font effects by means of a checkbox: <ul style="list-style-type: none"> ► Struck out Text is displayed as strike-through in the cell. ► Underlined Text is displayed as underlined in the cell. ► Vertical: Text is written from top to bottom.
Color	Is not taken into account! The color must, for example, be set in a dynamic element when using the font
Script	Is not taken into account! Unicode display is used throughout.

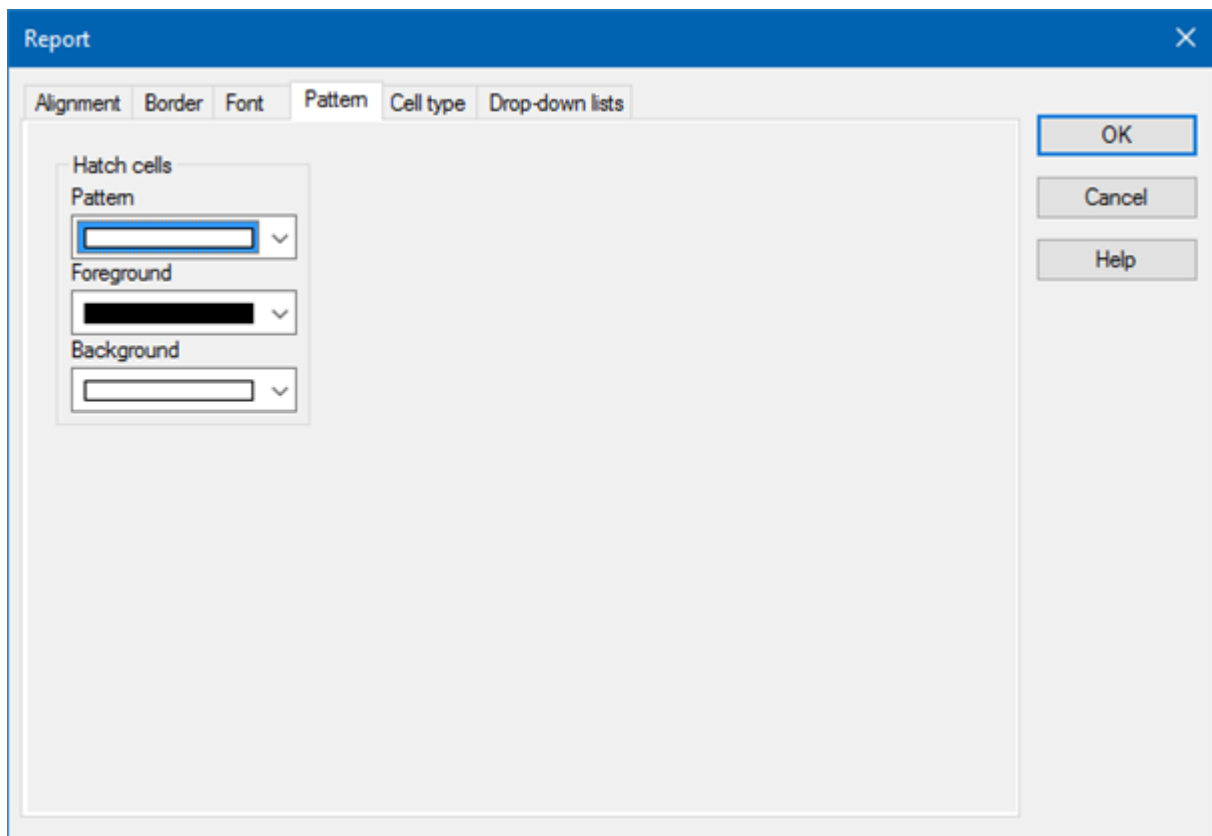
Parameter	Description
Example	Shows effects of the selection on the text in the cell.

CLOSE DIALOG

Option	Description
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.

3.1.6.3.4Pattern

You define the color and pattern of the cell in the pattern tab.



Parameter	Description
Pattern	Selection of cell pattern from the drop-down list.
Foreground	Selection of foreground color from drop-down list.
Background	Selection of background color from drop-down list.

CLOSE DIALOG

Option	Description
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.

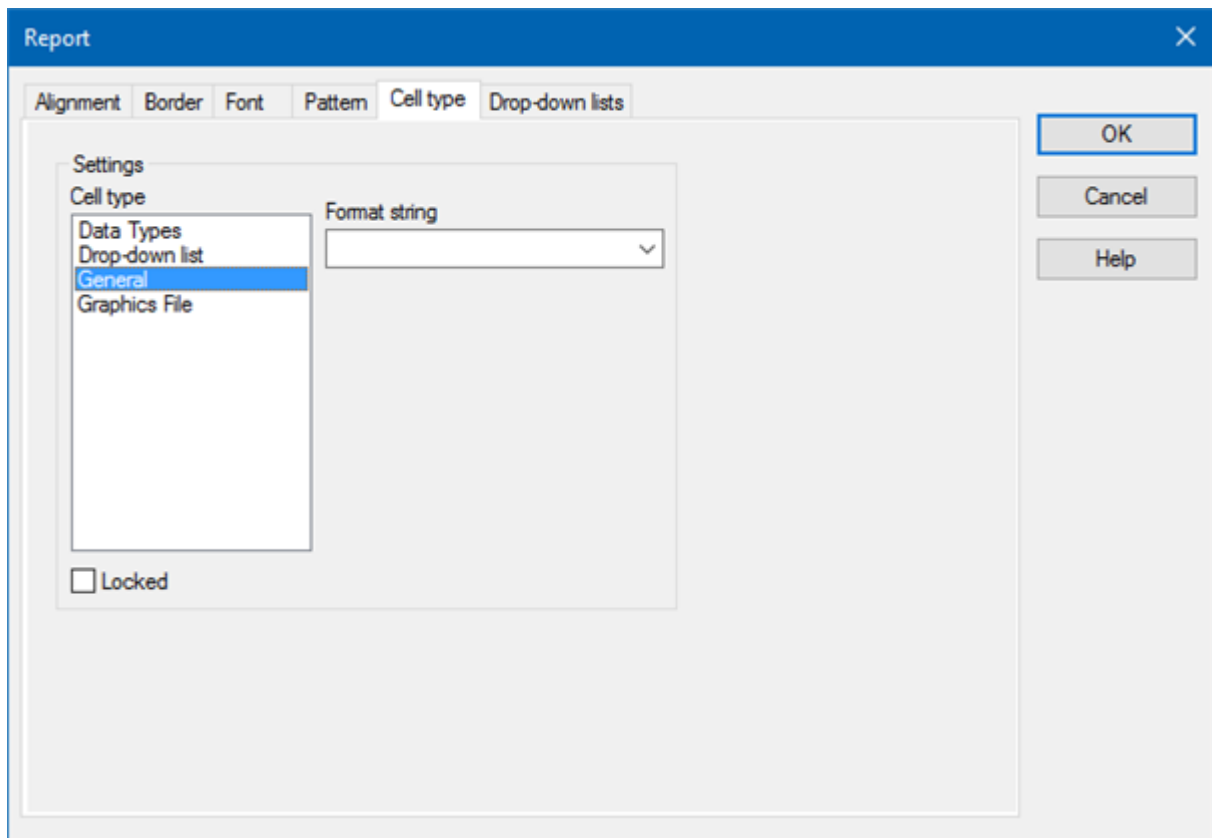
3.1.6.3.5 Cell type

Define the output format in the **cell type** tab. You have the choice between:

- ▶ General: Output of values, data and binary data
- ▶ Drop-down list: Creation of drop-down lists
- ▶ Data type: Definition of data types
- ▶ Graphics file: Inserting graphics

The respective format key is described in the Formatting key (on page 149) chapter.

GENERAL



Option	Description
Format strings	<p>Selection of the output format for the respective cell type or selection from a drop-down list.</p> <ul style="list-style-type: none"> ▶ <i>Value</i>: Numerical value. For details, see the Numerical data types (on page 149) chapter. ▶ <i>Date</i>: Date information. For details, see the Data types for date and time (on page 151) chapter. ▶ <i>Time</i>: Time information. For details, see the Data types for date and time (on page 151) chapter. ▶ <i>Binary value</i>: binary value. For details, see the Logical data types (on page 150) chapter.
Locked	<p><i>Active</i>: Locks the cell for editing in the editor and locks entries in the online report.</p>

Example

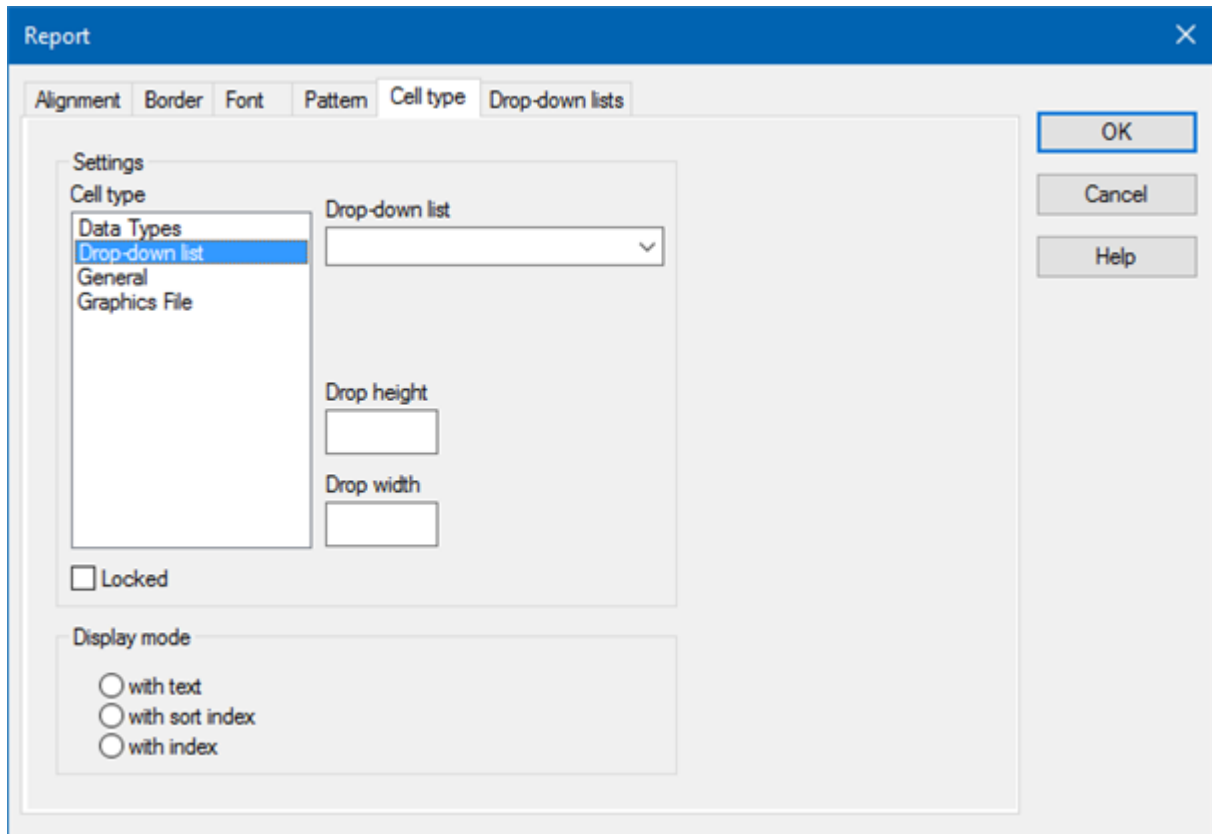
Format string for value output:

*0.00 = any desired value with two decimal points

dd/mm/yy hh:mm = 01/01/10 12:30 (corresponding to the settings in the operating system)

DROP-DOWN LIST

The drop-down list cell type offers drop-down lists to select pre-defined inputs. Before this cell type can be used, a list must be created in the combobox lists (on page 43) tab.

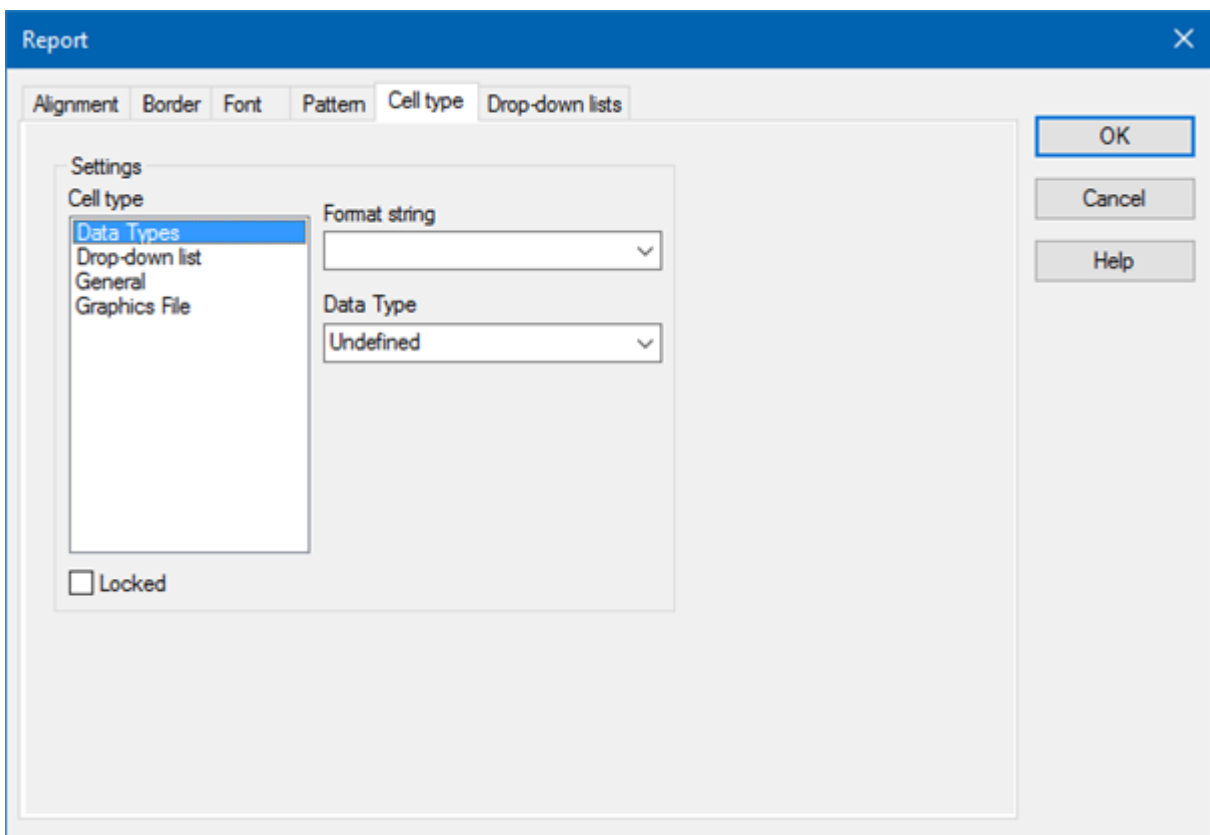


Option	Description
Drop-down list	Name of the drop-down list. This must already be defined in the Drop-down lists (on page 43) tab.
Drop height	Display height
Drop width	Display width
Locked	<i>Active:</i> Locks the cell for editing in the editor and locks entries in the online report.

Option	Description
Display mode	<p>Type of display. Selection by means of a radio button:</p> <ul style="list-style-type: none"> ▶ with text: Alphabetically sorted according to text. ▶ with sort index: Sorted according to sorting index (ascending). ▶ with index: Sorted according to the order of input of the list entries

DATA TYPE

An input template is created in the report with the data type. Existing functions are removed from this cell. The user receives instructions on how data is to be entered into the cell.



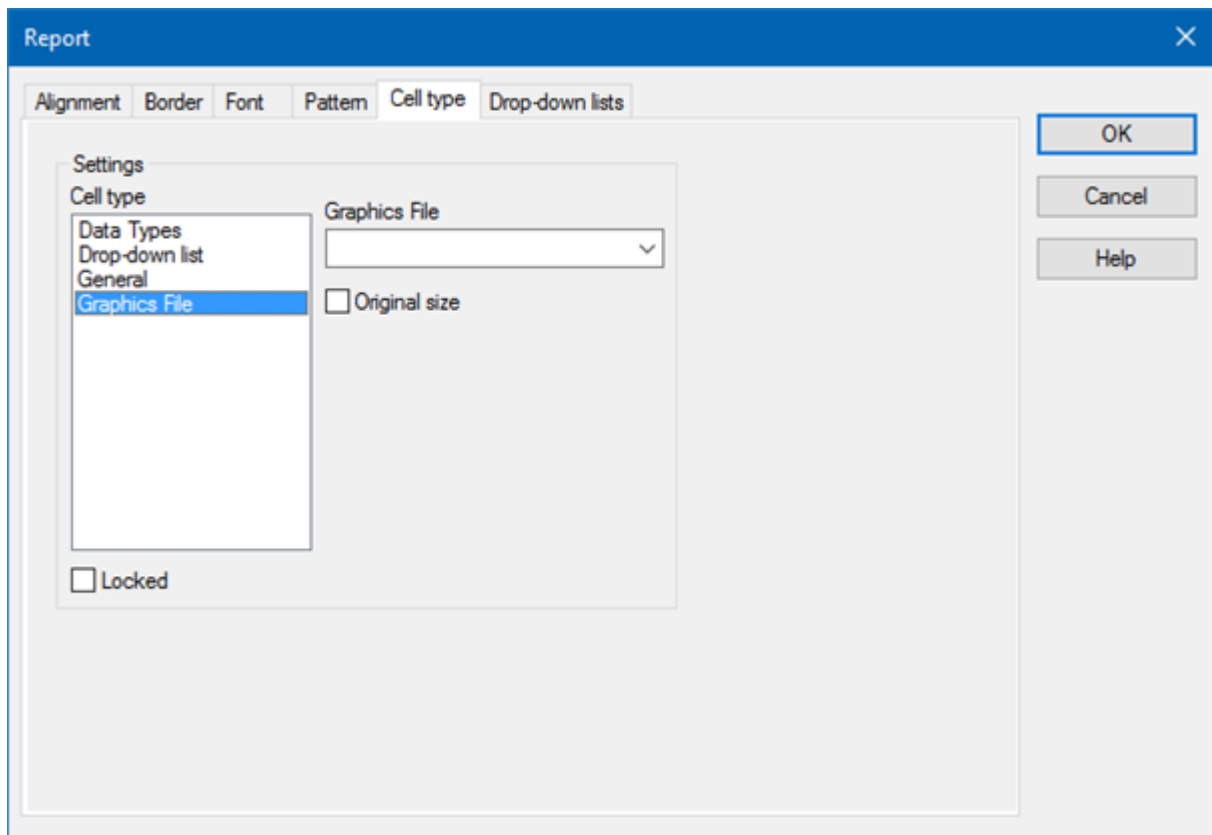
The screenshot shows a 'Report' dialog box with the 'Cell type' tab selected. On the left, a 'Settings' tree has 'Data Types' highlighted. The main area contains a 'Format string' dropdown menu and a 'Data Type' dropdown menu currently set to 'Undefined'. A 'Locked' checkbox is at the bottom left. On the right, there are 'OK', 'Cancel', and 'Help' buttons.

Option	Description
Format string	Entry of the format, depending on the data type, or selection from a drop-down list.
Data type	Selection of the project from the drop-down list:

Option	Description
	<ul style="list-style-type: none"> ▶ <i>Date/Time</i>: Input of a date/time value. For format string details, see the Data types for date and time (on page 151) chapter. ▶ <i>Float</i>: Input of a float value. For format string details, see the Numerical data types (on page 149) chapter. ▶ <i>Integer</i>: Input of an integer value. For format string details, see the Numerical data types (on page 149) chapter. ▶ <i>Logical</i>: Input of a binary value. For format string details, see the Logical data types (on page 150) chapter. Configurable: <i>Yes/no; right/wrong</i>. ▶ <i>Text</i>: Input of text. ▶ <i>Undefined</i>: No data type defined
Locked	<i>Active</i> : Locks the cell for editing in the editor and locks entries in the online report.

GRAPHICS FILE

Graphics files must be created before they are selected in the project manager: **File nodes -> Graphics -> [context menu] Add files.**



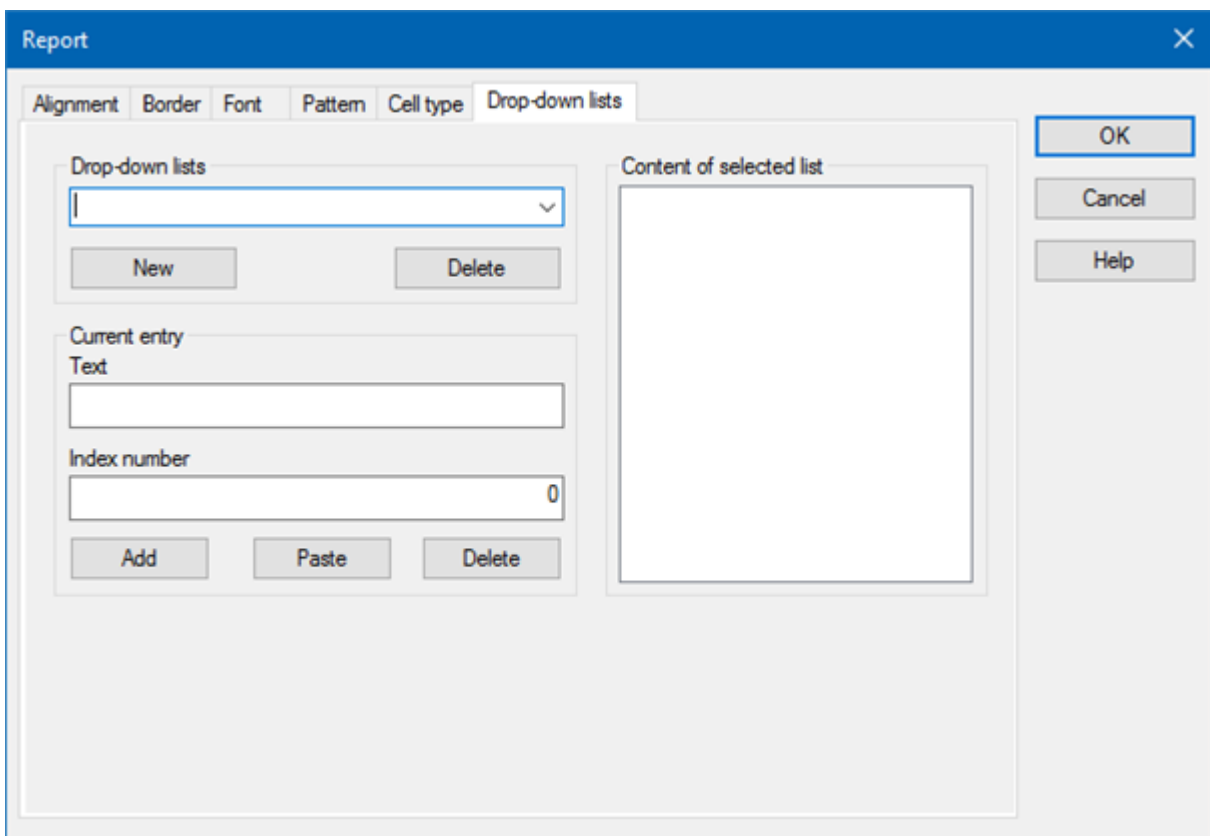
Parameter	Description
Graphics File	Selection of graphics file. BMP, JPG, GIF, PNG and WMF formats are supported.
Original size	<p><i>Display of the graphics file:</i></p> <ul style="list-style-type: none"> ▶ <i>Active:</i> The graphics are displayed in original size. ▶ <i>Inactive:</i> The graphics are adapted to the size of the cell. <p>Default: <i>inactive</i></p>
Locked	<ul style="list-style-type: none"> ▶ <i>Active:</i> Locks the cell for editing in the editor and locks entries in the online report.

CLOSE DIALOG

Option	Description
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.

3.1.6.3.6 Drop-down lists

In the **Combobox lists** tab, lists for the cell type **Combobox** are defined.



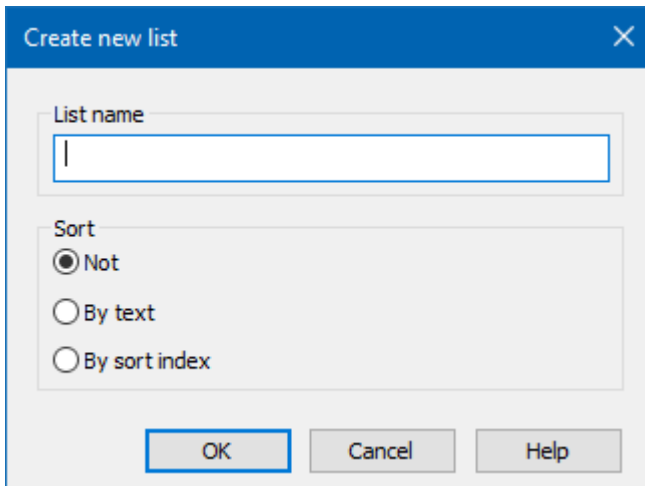
Parameter	Description
Drop-down lists	Drop-down list to select existing lists.
New	Opens the dialog to create a new list.
Delete	Deletes selected list.
Contents of selected list	Shows contents of the selected lists

Parameter	Description
Current entry	Configuration of the entry.
text	Input of the text, as it is to appear in the list in the Runtime.
Index number	<p>Input of an index number for sorting of the list.</p> <ul style="list-style-type: none"> ▶ Minimum value: 0 No sorting according to index. There is a choice of sorting lists in the Runtime alphabetically or in the order of input. <p>Maximum value: 9999999999</p>
Add	<p>The new entry is inserted depending on the settings in Content of the selected list that were selected when the list was created.</p> <ul style="list-style-type: none"> ▶ <i>Not</i>: Entry is inserted at the end of the list. ▶ <i>By text</i>: Alphabetic sequence. ▶ <i>By codes</i>: Code number determines the sequence (increasing) in lists.
Add	The new entry is added above the entry selected in the Content of selected list .
Delete	Deletes the entry selected in Content of selected list .

CLOSE DIALOG

Option	Description
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.

CREATE NEW LIST



Parameter	Description
List name	Name of list
Sort	<p>Sorting criteria for display in Content of the selected list and in the Runtime. Selection of a radio button:</p> <ul style="list-style-type: none"> ▶ <i>Not</i>: Entry is inserted at the end of the list. ▶ <i>By text</i>: Alphabetic sequence. ▶ <i>By sort index</i>: Index number determines the sequence (ascending) in lists.

3.1.6.4 Format columns and cells

If an entire row or an entire column is highlighted, the additional commands **Format column** or **Format row** are available in the context menu.

As with **Format cell**, tabs are available for:

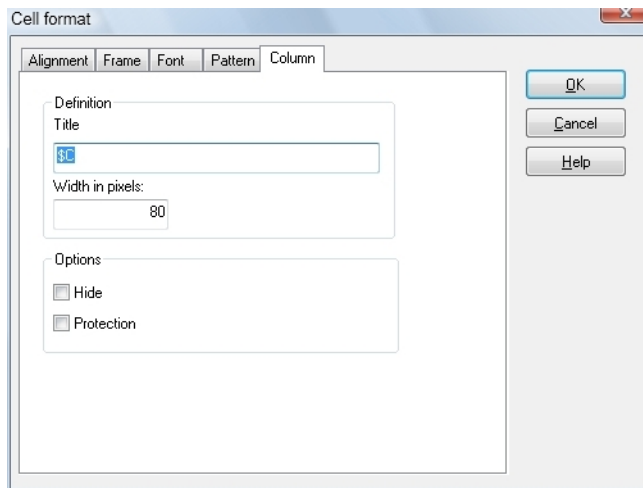
- ▶ Alignment (on page 32)
- ▶ Border (on page 35)
- ▶ Font (on page 35)
- ▶ Pattern (on page 36)

Note: These settings always only concern the column heading or the row heading. They have no effect on the other cells of a column or row. These must always be formatted using the **Format cells** (on page 31) dialog.

There is also a further Column (on page 46) or Row (on page 47) tab available in this dialog.

3.1.6.4.1 Column

The properties for the column are configured in this tab. This configuration is applicable for the complete column.



DEFINITION

General settings for a column.

Parameter	Description
Title	<p>Defines column heading.</p> <p><i>\$C</i>: Letters in a rising sequence of column numbers</p> <p><i>E</i>: The column automatically expands to the correct number of columns if an archive*, aml or cel is present in one of the cells. If other report functions are used, "E" may not be used. "E" can be used in a report several times.</p> <p>Default: <i>\$C</i></p>
Width in pixels	Width of the column in pixels

OPTIONS

Settings for visibility and protection from changes in a column.

Parameter	Description
Hide	<p>Display of the cell. Configuration by means of checkbox:</p> <p><i>Active</i>: The column is hidden.</p>

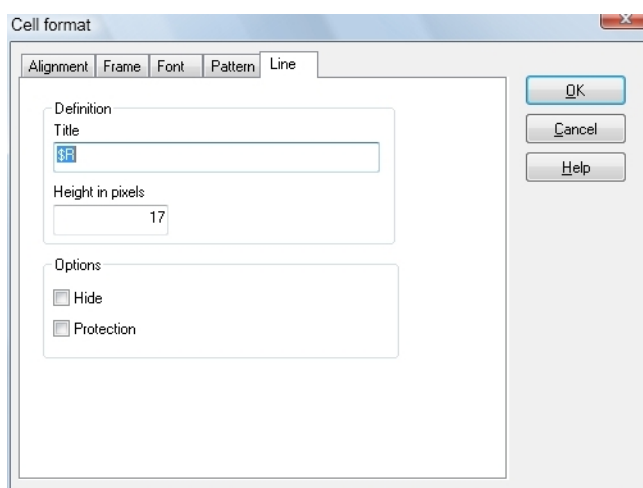
Parameter	Description
	<p><i>Inactive:</i> The column is shown.</p> <p>To show a column that has been hidden: Highlight the two neighboring columns and set the Hide property to <i>inactive</i>.</p> <p>Attention: Functions that are in the hidden cells are not executed. To execute a function without it being shown: Set the row height or column width to 0.</p>
Protection	<p>Change lock for a column. Configuration by means of checkbox:</p> <p><i>Active:</i> The cells in the column are protected from changes of formatting.</p> <p><i>Inactive:</i> The cells of this column can be formatted.</p>

CLOSE DIALOG

Option	Description
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.

3.1.6.4.2Line

Properties for the selected row can be configured in this tab. This configuration applies for the whole row.



DEFINITION

General settings for a row.

Parameter	Description
Title	<p>Defines row heading.</p> <p><i>\$R</i>: Numbers in reverse order of column number</p> <p><i>E</i>: The row automatically expands to the correct number of rows if an archive*, aml or cel is present in one of the cells. If other report functions are used, "E" may not be used. "E" can be used in a report several times.</p> <p>Default: <i>\$R</i></p>
Height in pixels	Height of the row in pixels.

OPTIONS

Settings for visibility and change lock in a cell.

Parameter	Description
Hide	<p>Display of the row. Configuration by means of checkbox:</p> <p><i>Active</i>: The row is hidden.</p> <p><i>Inactive</i>: The row is displayed.</p> <p>To show a row that has been hidden: Highlight the two neighboring rows and set the Hide property to <i>inactive</i>.</p> <p>Attention: Functions that are in the hidden cells are not executed. To execute a function without it being shown: Set the row height or column width to 0.</p>
Protection	<p>Change lock for the row. Configuration by means of checkbox:</p> <p><i>Active</i>: The cells in the row are protected from changes of formatting.</p> <p><i>Inactive</i>: The cells of this row can be formatted.</p>

CLOSE DIALOG

Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.

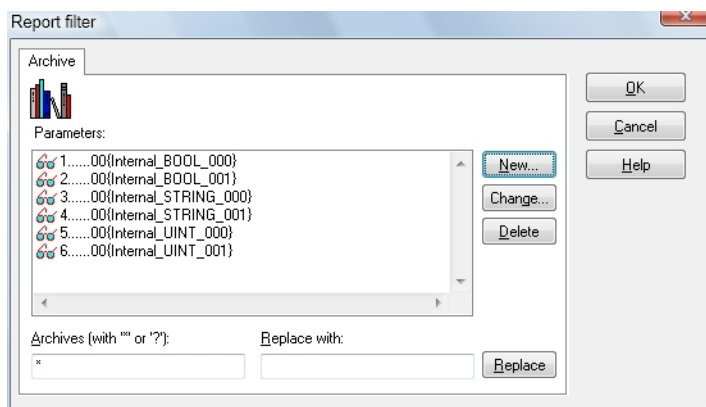
Option	Description
Help	Opens online help.

3.1.7 Set up archive filter

Should archive values be used in the report then these are to be defined before activating the report functions.

To set up the archive filter:

1. Open the **Format** menu.
2. Select the **Filter** command.



Option	Description
Parameter	List of variables selected from the archives. The figures in front of the variables are used for assignment in the archive and protocol functions (on page 55).
New	Opens the dialog for selecting variables.
Change	Opens the dialog for selecting variables.
Delete	Deletes selected variable from the Parameters list.
Archives	Definition of a filter criterion for the source variables that are to be replaced for use in the Report Generator. Wildcards *and ?are permitted at the start or end of an expression.
Replace by	Enter the expression that is to replace the string that is being searched for
Replace	Carries out a search and replace. The archives used in the Report Generator are replaced according to the rule.

Option	Description
	<p>The result is displayed in a message box.</p> <p>Note: When using the Editor in English, the rule to replace STRING variables in aggregated archives is as follows: *FOLLOWINGARCHIVEIDSOURCE* -> TARGETFOLLOWINGARCHIVEID</p>

EXAMPLES FOR REPLACING ARCHIVES

Linked archives in the report: **1A, 2A, A1, A2**

EXAMPLE 1

A Replaced at the first position by **B**:

- ▶ **Archives:** **A** (corresponds to **A***)
- ▶ **Replace with:** **B**
- ▶ **Result:** **1A, 2A, B1, B2**

EXAMPLE 2

A Replaced at the second position by **B**:

- ▶ **Archives:** **?A**
- ▶ **Replace with:** **B**
- ▶ **Result:** **1B, 2B, A1, A2**

EXAMPLE 1

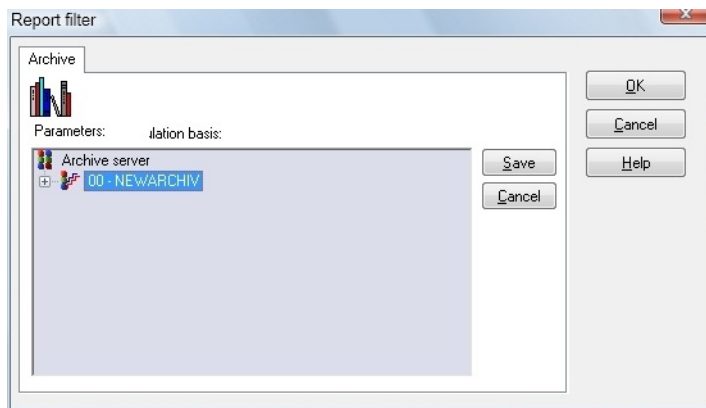
A Is generally replaced by **B**:

- ▶ **Archives:** ***A**
- ▶ **Replace with:** **B**
- ▶ **Result:** **1B, 2B, B1, B2**

DIALOG FOR "NEW FILTER" OR "CHANGE FILTER"

Clicking on the **New** or **Change** button opens the dialog to select the variables: The variables are selected from archives.

When selecting an archive, all variables linked to it are selected. Individual variables can be selected by expanding the archive with [+].



Option	Description
Parameter	<p>Display of the archives present. It is possible to select a complete archive or individual variables.</p> <p>Each variable automatically receives an increasing number, which is addressed in the report functions for archive (on page 55). A report can therefore also be used throughout projects.</p>
Save	Provides selected archives/variables for the report.
Cancel	Leaves dialog without selection.

Each variable automatically receives an increasing number, which is addressed in the report functions for archive (on page 55).

3.1.8 Report functions

For the formation of the report, different formatting and calculation functions are available.

► **Processing functions:**

Defined access to selected zenon data (online and archive values, user, computer names etc.)

► **Report functions**

- formatting functions
- calculating functions

The following groups of functions are available:

- Database functions (on page 80)

- ▶ Date and time functions (on page 88)
- ▶ Logical functions (on page 92)
- ▶ Archive and protocol functions (on page 55)
- ▶ Statistical functions (on page 115)
- ▶ Mathematical and trigonometric functions (on page 98)
- ▶ Text functions (on page 125)
- ▶ Recipegroup Manager functions (on page 112)
- ▶ Other functions (on page 133)

The functions that are used most often can be configured using the function assistant (on page 54).

ENTER

The input of the functions is done in the input row of the report.

If several cells are to receive the same input/function:

1. Highlight the starting cell and the target cell
2. Select the **Fill** command in the context menu and the desired direction (*right* or *down*)

References to cell co-ordinates in the function are automatically adjusted.

EXAMPLE FOR INPUTS

Parameters	Description
<code>=archiv(1,value,downwards)</code>	All values of the archive variable 1 are displayed downwards from the cell.
<code>=sum(A4:D4)</code>	The contents of cells A4 to D4 are added together. The cell must be formatted as a value.
<code>=now()</code>	Provides the current date/the current time.



Information

Report functions can lead to error messages in the editor if not all data required to calculate the required data is properly available. To check to see that the project configuration is correct, test the report in Runtime.

Direction

Options	Meaning
<i>Right</i>	<p>Value is entered to the right (row).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one column, the value is entered downwards (in the column).</p>
<i>bottom</i>	<p>Value is entered downwards (column).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one row, the value is entered to the right (in the row).</p>

Info

The Report Generator module has to be licensed in the development environment and in the Runtime (standalone, server/standby and clients).

If the module is not licensed in the Runtime, the following functions are not available:

- ▶ Save archives (for manual inputs)
- ▶ and writing set values

Read access is possible.

3.1.8.1 Conventions

The following conventions are valid:

Parameters	Description
Number:	<i>(num)</i> ; divider for decimal points depends on the settings in the operating system (1,0 or 1.0).
Range	(A1:A10)

Parameters	Description
String:	Character sequence is separated by a dual apostrophe ("), for example "ABC".
Radians:	The input of goniometric functions is done in radians.

CONVERSION OF DEGREES INTO RADIANS

degrees	arc measurement	radians
0,00	0	0
45,00	$\pi/4$	0,78539816339744828
90,00	$\pi/2$	1,5707963267948966
135,00	$3\pi/4$	2,3561944901923448
180,00	π	3,1415926535897931
225,00	$5\pi/4$	3,9269908169872414
270,00	$3\pi/2$	4,7123889803846897
315,00	$7\pi/4$	5,497787143782138
360,00	2π	6,2831853071795862

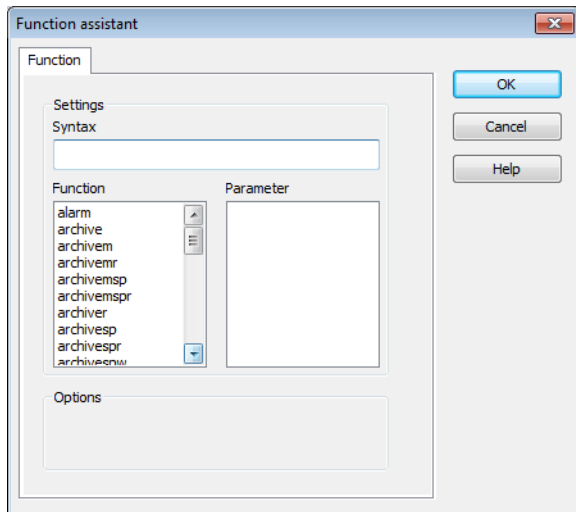
3.1.8.2 Function wizard

The function assistant supports the planning of report functions. It makes the most frequently used functions available. All other functions are manually entered into the input cell.

To open the function assistant:

1. Click in the desired cell
2. in the context menu, select the **Functions** command
3. The assistant is opened

- The selection on the assistant is transferred to the input cell;
any quotation marks that are open may need to be closed manually



Parameters	Description
Syntax	Result of the selection of function and parameter.
Function	Selection of the function.
Parameters	Selection of parameter that is available for the selected function.

3.1.8.3 Archive and logging functions

BASICS

All archive functions build on the basic *archive(FILTERINDEX,PARAMETER,RICHTUNG)* function.

The expansions are distinguishable by additional letters in function names.

Code	Meaning	Comment
<i>r</i>	read only	There is only read access to the archive. Changed values cannot be saved.
<i>sp</i>	Columns	Provides special formatting to define cells to be used.
<i>m</i>	Mathematics	Only has an effect on <i>value</i> and <i>time</i> .
<i>ex</i>	extended	provides special treatments.
<i>w</i>	write	Writing is possible.

FILTER INDEX

The filter index creates a distinction between archive filter numbers (on page 49) used in the report functions and variables from the archives.

Example

```
=archive(5,"value","downwards")
```

FILTERINDEX = 5

The entry present in the filter under no. 5 is used for the report function.

PARAMETER

Options	Possible value
<i>value</i>	[1-n]
<i>state</i>	[1-n]
<i>time</i>	[1-n]
<i>number</i>	[1]

Direction

Options	Meaning
<i>Right</i>	<p>Value is entered to the right (row).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one column, the value is entered downwards (in the column).</p>
<i>bottom</i>	<p>Value is entered downwards (column).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one row, the value is entered to the right (in the row).</p>

All archive functions can be created with the function assistant (on page 59).

On outputting the status information, the settings from the *project.ini* file in the [STATUS] section or the settings from the internally defined allocation are used. If the status labeling was changed in

project.ini, the amended name is given. (Tip: makes it possible to keep the project compatible with old status labels.)

In online operation, the query time is either defined in the function query (on page 152) or given in the Runtime when a report file is opened.

CHANGE ARCHIVE ENTRIES

If permitted by user authorizations, archive values can also be changed in the Runtime. Changes are either saved manually via the *Save* control element or automatically saved when saving a report file. The status of an amended entry is automatically set to *manual value*.



Information

Changing string fields in the report: If a text consists only of numbers, spaces are removed by default when it is saved. Spaces that are desired must be displayed by ASCII character 255 (**Alt+255**).

3.1.8.3.1 Handling of archive entries

Archive entries can be displayed in a report and also be changed and saved in the archive again with sufficient user authorizations. There is a function assistant (on page 59) available to create the report functions.

READING AND WRITING ARCHIVE ENTRIES

The following contents of an archive entry can be read for display in a report:

- ▶ Value
- ▶ Status
- ▶ *Time*

The following archive entries can be changed and saved via calculations and new entries in the report:

- ▶ Value
- ▶ *State*

Amended archive entries are saved in the Runtime using the **Save archive** button. Saving changes can be stopped by:

- ▶ Activating the *Read only* option in the zenon *Screen switching* function for the report screen
- ▶ Activating the **Locked** option in the format (on page 37) dialog cell

If the value of an archive entry is changed, the status is set as *MAN_VAL* when it is saved in the archive.

Exception: If the status of the archive entry is changed, only the changed status is entered. If safety regulations such as those of the FDA are to be met, no status change may be permitted as a result of the report when configuring. Archive entries with *MAN_VAL* status are displayed in *blue* in a report.

DISPLAY

Archive entries can be represented as archive value rows or as row-formatted archive value rows. The cell in which the archive function is configured is considered the starting point. Starting from this cell, the archive entries that are in the time range of the opened report are displayed rightwards or downwards.

If no archive entry is found then a - is output in the cell in which the archive function is defined.

ARCHIVE VALUE ROWS

The read-in archive entries are shown as a row, one after the other, without blank spaces.

ROW-FORMATTED ARCHIVE VALUE ROWS

The read-in archive entries are shown with a defined number of:

- ▶ Archive entries per row
- ▶ Blank spaces between two entries
- ▶ Empty rows between the rows.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1-P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ $P1$ = number of rows to be filled with values
- ▶ $P2$ = empty rows between the values
- ▶ $P3$ = empty columns

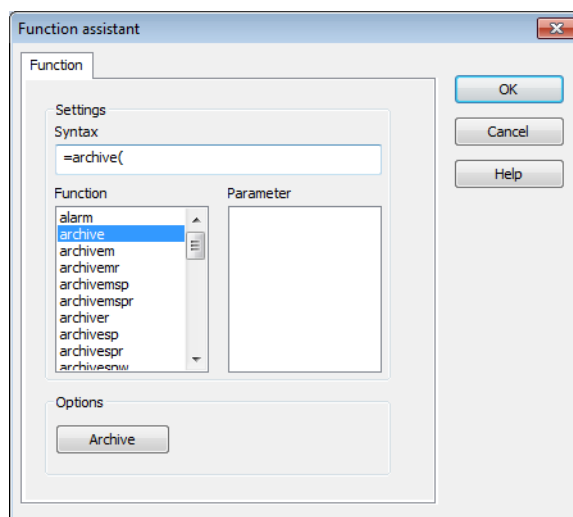
WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ $P1$ = number of columns to be filled
- ▶ $P2$ = empty rows between the values
- ▶ $P3$ = empty rows between the values

3.1.8.3 Configuration with function assistant

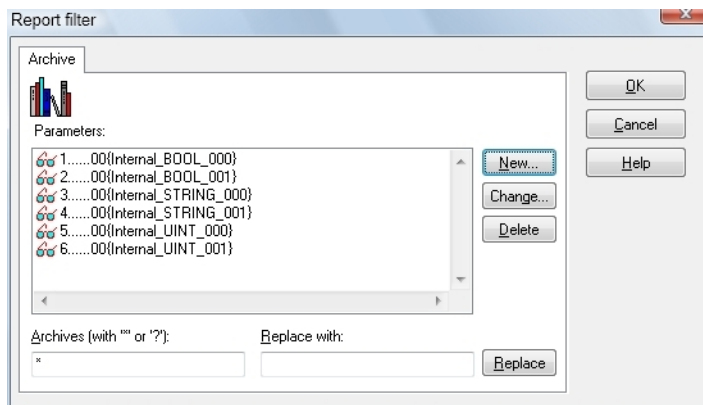
You can configure report functions for the archive with the function assistant:

1. Select the desired cell in the context menu with the **Functions** command.
2. The assistant is opened.
3. Select the desired archive function.

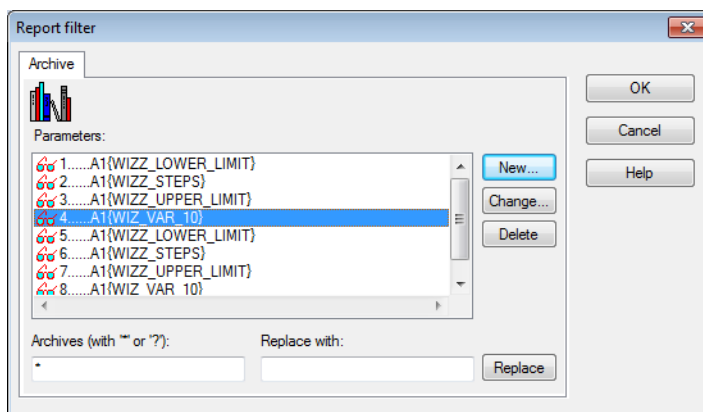


4. The archive function is entered into the syntax.

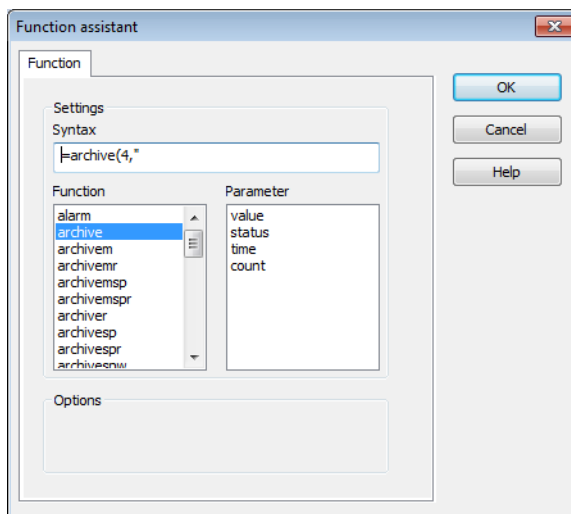
5. Clicking on archive opens the archive filter (on page 49).



6. Select the desired entry.



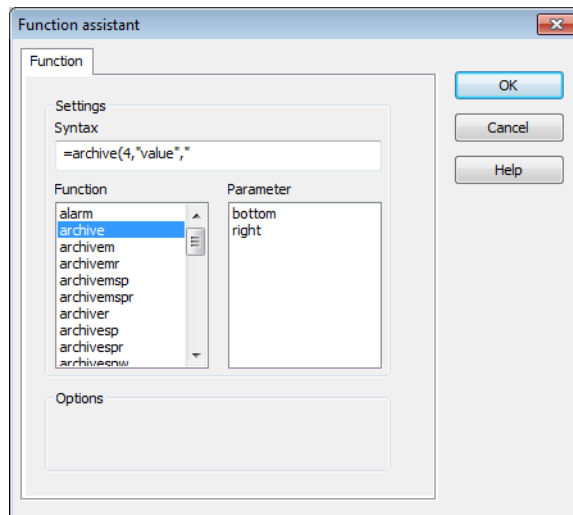
7. The reference number of the entry (for example 4) is transferred to the string of the syntax.
8. Select the desired parameter, for example *value*.



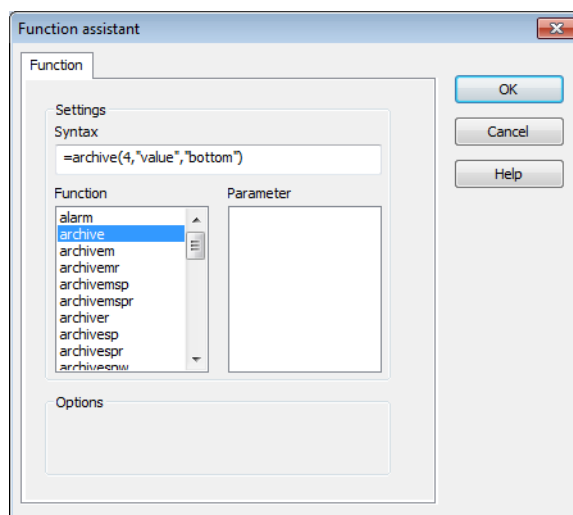
9. The parameter is transferred into the string.
10. Select the desired direction of the entry in the table:
 - *below*: The function fills the column

- *right*: The function fills the row

Attention: When using the *archivesp* function, corresponding columns/rows are envisaged! If for example, to the right is selected, but there is only one column available, then the values are entered downwards (in the only column available).



11. The direction is transferred into the string.
12. The brackets are closed.



13. The function is transferred to the cell by clicking on OK.

3.1.8.3.3 archive

Value, Status or time of the archive entry can be read. Changes are either saved manually via the *Save* control element or automatically saved when saving a report file. The status of an amended entry is automatically set to *manual value*.

Syntax: `=archive(FILTERINDEX,PARAMETER,DIRECTION)`

Transfer parameters	Valid range	Comment
FILTERINDEX		Corresponding entry from the archive filter (on page 49).
PARAMETER	value, status, time, count	The selected parameter is read from the archive and displayed.
DIRECTION	bottom, right	Defines the direction in which filling is to take place, starting from the cell in which the function was created.

Example

In a report, all archive values from the archive variable 1 should be given downwards.

```
=archive(1,"value","downwards")
```

3.1.8.3.4archiveex

Syntax:

```
=archiveex(FILTERINDEX,PARAMETER,DIRECTION,STATUS,SUBSTITUTETEXT,NN_TEXT,NN_SUBSTITUT  
EVALUE,CYCLEOFFSET)
```

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>STATUS</i>	<i>SPONT, MAN_VAL, INVALID</i>	Status of the values to be displayed.
<i>ALTERNATETEXT</i>		Text to be displayed if the status of the archive variables does not correspond to the <i>STATUS</i> .
<i>ND_TEXT</i>		Text for the "non-detectability limit"; not case-sensitive.
<i>ND_ALTERNATEVALUE</i>		Cell reference or entered value are possible. If

Transfer parameters	Valid range	Comment
		the <i>ALTERNATETEXT</i> is entered into the cell and then the table is saved, the <i>NN_ALTERNATEVALUE</i> is written to the archive.
<i>CYCLOFFSET</i>		Is only taken into account for filter type: <ul style="list-style-type: none"> ▶ <i>Time, day</i> ▶ <i>Time, month</i> ▶ <i>Time, year</i> ▶ <i>Time, week</i> ▶ <i>Time, 2week</i> ▶ <i>Time, 15min.</i> ▶ <i>Time, 30min.</i> ▶ <i>Time, 60min.</i>

Example

```
=archiveex(1,"time","downwards",SPONT,MAN_VAL,"-","NN",G2,-2)
```

3.1.8.3.5archiveexr

Syntax:

```
=archiveexr(FILTERINDEX,PARAMETER,DIRECTION,STATUS,SUBSTITUTETEXT,NN_TEXT,NN_SUBSTITUTETVALUE,CYCLOFFSET)
```

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>STATUS</i>	<i>SPONT,MAN_VAL,INVALID</i>	Status of the values to be displayed.
<i>ALTERNATETEXT</i>		Text to be displayed, if the status of the

Transfer parameters	Valid range	Comment
		archive variables does not correspond to the <i>STATUS</i> .
<i>ND_TEXT</i>		Text for the "non-detectability limit"; not case-sensitive.
<i>ND_ALTERNATEVALUE</i>		Cell reference or entered value are possible. If the <i>ALTERNATETEXT</i> is entered into the cell and then the table is saved, the <i>NN_ALTERNATEVALUE</i> is written to the archive.
<i>CYCLOFFSET</i>		Is only taken into account for filter type: <ul style="list-style-type: none"> ▶ <i>Time, day</i> ▶ <i>Time, month</i> ▶ <i>Time, year</i> ▶ <i>Time, week</i> ▶ <i>Time, 2week</i> ▶ <i>Time, 15min.</i> ▶ <i>Time, 30min.</i> ▶ <i>Time, 60min.</i>

3.1.8.3.6archivem

This function makes it possible to automatically change values or times of an archive entry by adding a constant to a value. Changes are either saved manually via the *Save* control element or automatically saved when saving a report file. The status of an amended entry is automatically set to *manual value*.

Syntax: =*archivem*(*FILTERINDEX*,*PARAMETER*,*DIRECTION*,*MATH*)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.

Transfer parameters	Valid range	Comment
<i>MATH</i>		<ul style="list-style-type: none"> ▶ Constant: signed ▶ Decimal points: Point separator (.) ▶ Correction of a time: In minutes <p>Notes on negative sign: With zenon versions 7.10, 7.11, 7.20 and 7.50, numbers with negative signs must be given in single quotation marks. Single quotation marks are permitted in all other versions, but are not necessary. For example: =archivem(2,"time","below",-10")</p>

The value is read-in and shown in the report with the appropriate manipulation. The corrected values can be saved using **Save archive**.

Attention

Every time the archive is saved, the values are corrected by the defined constant!

3.1.8.3.7 archivemr

This function makes it possible to automatically change values or times of an archive entry by adding a constant to a value.

Syntax: =archivemr(FILTERINDEX,PARAMETER,DIRECTION)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>MATH</i>		<ul style="list-style-type: none"> ▶ Constant: signed ▶ Decimal points: Point separator (.) ▶ Correction of a time: In minutes

Transfer parameters	Valid range	Comment
		Notes on negative sign: With zenon versions 7.10, 7.11, 7.20 and 7.50, numbers with negative signs must be given in single quotation marks. Single quotation marks are permitted in all other versions, but are not necessary. For example: =archivemr(2,"time","below",-10")

⚠Attention

Changed values cannot be saved in the archive.

The value is read-in and shown in the report with the appropriate manipulation. Only *time* and *value* are possible as parameters. =archivemr(4,value,right,6.5)

All archive values read are increased by 6.50 for the display in the report.

=archivemr(4,time,right,-1)

The time stamps of the archive entries are corrected back by 1 minute for display in the report.

Possibility for use: For example, for a calculated monthly value that is only available after the end of the month (time stamp, for example. 00:01:00).

3.1.8.3.8archivemsp

This function makes it possible to automatically change the value or times of an archive entry by adding a constant to the value as well as establishing the cells for the entries. The value is read-in and shown in the report with the appropriate manipulation. Changes are either saved manually via the *Save* control element or automatically saved when saving a report file. The status of an amended entry is automatically set to *manual value*.

Syntax: =archivemsp(FILTERINDEX,PARAMETER,DIRECTION)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the

Transfer parameters	Valid range	Comment
		archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>P1</i>		Number of archive values in the first row.
<i>P2</i>		Empty cells between two value outputs.
<i>P3</i>		Empty cells until the next value row.
<i>MATH</i>		<ul style="list-style-type: none"> ▶ Constants with sign, constants: with sign ▶ Decimal points: Point separator (.) ▶ Correction of a time: In minutes

Attention

The values are corrected by the defined constant with every **Save archive**.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1-P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled

- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values
- ▶

Example

```
=archivemsp(4,"time","right",16,1,0,-0.5)
```

All time entries of the archive entry with the filter number 4 are retarded 30 seconds; 16 entries are envisaged with an empty column and no space.

3.1.8.3.9 archivemsp

This function makes it possible to automatically change values or times of an archive entry for display in a report by adding a constant to a value. The value is read-in and shown in the report with the appropriate manipulation. Only *time* and *value* are possible as parameters.

Attention

Changed values cannot be saved in the archive.

Syntax: =archivemsp(FILTERINDEX,PARAMETER,DIRECTION)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>P1</i>		Number of archive values in the first row.
<i>P2</i>		Empty cells between two value outputs.
<i>P3</i>		Empty cells until the next value row.
<i>MATH</i>		<ul style="list-style-type: none"> ▶ Constants with sign, constants: with sign ▶ Decimal points: Point separator (.) ▶ Correction of a time: In minutes

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1*-*P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

Example

```
=archivemsp(4,"time","right",16,1,0,-0.5)
```

All time entries of the archive entry with the filter number 4 are retarded 30 seconds; 16 entries are envisaged with 1 empty column and 0 spaces.

3.1.8.3.10 archiver

This function makes it possible to read the value, status and time of an archive entry. No changes are possible.

Syntax: =archiver(FILTERINDEX,PARAMETER,DIRECTION)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.

This differs from the *archive* (on page 61) function in that no manual entries can be made in the Runtime.

Area of application: These functions are employed, for example, if an entry in a report must be shown several times and may only be edited at one place. All entries of the time range of the report are shown in the report going downwards or to the right from the cell in which the function was created.

3.1.8.3.11 archivesp

Value, Status or time of the archive entry can be read. Changes are either saved manually via the *Save* control element or automatically saved when saving a report file. The status of an amended entry is automatically set to *manual value*.

Syntax: =archivesp(*FILTERINDEX*,*PARAMETER*,*DIRECTION*,*P1*,*P2*,*P3*)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction
<i>P1</i>		Number of archive values in the first row
<i>P2</i>		Empty cells between two value outputs
<i>P3</i>		Empty cells until the next value row

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns

- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1-P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

On outputting the status information, the settings from the *project.ini* file in the **[STATUS]** section or the settings from the internally defined allocation are used. If the status labeling was changed in *project.ini*, the amended name is given. (Tip: makes it possible to keep the project compatible with old status labels.)

3.1.8.3.12 archivespr

Value, Status or time of the archive entry can be read.

Syntax: =archivespr(*FILTERINDEX,PARAMETER,DIRECTION,P1,P2,P3*)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>		Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction
<i>P1</i>		Number of archive values in the first row
<i>P2</i>		Empty cells between two value outputs
<i>P3</i>		Empty cells until the next value row

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1*-*P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

Unlike the *archivesp* (on page 70) function, no manual presettings can be set on the cells. These functions are employed, for example, if an entry in a log must be shown several times and may only be edited at one place. All entries of the time range of the report are shown in the report going downwards or to the right from the cell in which the function was created

Example

```
=archivespr(1,"value","downwards",12,1,3)
```

All values of the archive entry with the filter number *1* are written *downwards*; *12* entries are envisaged with *1* empty row and *3* empty columns.

3.1.8.3.13 archivespw

This function suppresses the displays of read-in archive entries and makes it possible to define the cells to be used. When saving, the archive entries are overwritten with values and statuses existing at other places (e.g. calculated).

Syntax: =archivespw (FILTERINDEX,PARAMETER,DIRECTION,P1,P2,P3,SZ_VALUE,SZ_STATUS)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>P1</i>		Number of archive values in the first row.
<i>P2</i>		Empty cells between two value outputs.
<i>P3</i>		Empty cells until the next value row.
<i>SZ_VALUE</i>	Start-cell values	Cell from which calculated values start to appear.
<i>SZ_STATUS</i>	Start cell status	Defining a fixed status text (for example MAN_VAL), or stating the starting cell from which the status text should be taken.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters P1-P3.

WHEN SELECTING **DOWN**, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

STATUS TEXTS

The configuring is not done via the input help but directly in the cell. In doing so, the following applies:

- ▶ When entering the status texts, the defined short texts from the *project.ini* file or from the system-internal default configuration must be used. This applies regardless of whether the statuses are pre-set and fixed, or read in from another cell.
- ▶ Several statuses are separated by a comma (,).
- ▶ The calculated values are updated regardless of whether the newly calculated value has changed in comparison to the read-in value.
- ▶ The status is changed to manual value (*MAN_VAL*).

3.1.8.3.14 archivew

This function suppresses the display of the archive entries that have been read in for the report. When saving, the archive entries are overwritten with values and states existing at other places (e.g. calculated). This report function can be used as an example for reduction of monthly values to annual values as an archive value.

Syntax: =*archivew*(*FILTERINDEX*,*PARAMETER*,*DIRECTION*,*P1*,*P2*,*P3*,*SZ_VALUE*,*SZ_STATUS*)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>value, status, time, count</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>SZ_VALUE</i>	Start-cell values	Cell from which calculated values start to appear.
<i>SZ_STATUS</i>	Start cell state	Defining a fixed status text (for example <i>MAN_VAL</i>), or stating the starting cell from which the status text should be

Transfer parameters	Valid range	Comment
		taken.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1-P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

STATUS TEXTS

The configuring is not done via the input help but directly in the cell. In doing so, the following applies:

- ▶ When entering the status texts, the defined short texts from the *project.ini* file or from the system-internal default configuration must be used. This applies regardless of whether the statuses are pre-set and fixed, or read in from another cell.
- ▶ Several states are separated by a comma (,).
- ▶ The calculated values are updated regardless of whether the newly calculated value has changed in comparison to the read-in value.
- ▶ The state is changed to manual value (*MAN_VAL*).

Example

Reductions from monthly values to annual values as an archive value:

In a monthly report with daily values, the amount of days on which a limit value *x* was exceeded is calculated. The sum of the limit value violations is written into a cell of the report.

- ▶ In an archive, a value was defined that gets one entry per month.
- ▶ This entry is read in via *archivew* in the report.
- ▶ `=archivew(4,"value","downwards",B12,C12)`
 - ▶ 4: Variable from archive filter
 - ▶ *value*: Parameter of variables that are to be displayed
 - ▶ *bottom*: Direction in which values are written
 - ▶ B12: Start cell, corresponds to the calculated cell
 - ▶ C12: Defines status text to be given
- ▶ The sum is written to the archive value when the archive values are saved.

3.1.8.3.15 archivetime

The *archivetime* function supplies, depending on the time filter that has been set, the time information for the start and end of the archive interrogation in online operation.

Syntax: `=archivetime(FILTERINDEX,PARAMETER)`

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>absolutetimefrom</i> , <i>absolutetimeto</i>	Start time or end time of the archive request.

3.1.8.3.16 batch

This function outputs the first lot names for the archive selected in the filter area of the report.

Syntax: `=batch(FILTERINDEX)`

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).

Example

=batch(1)

First lot name for the archive of the variables placed at position 1 of the archive filter.

3.1.8.3.17 batch no.

This function displays different information about lots. The output is displayed as a list which is evaluated from top to bottom or from left to right. The following are displayed:

- ▶ Name of the lots
- ▶ Start time stamp
- ▶ End point

Syntax: *=batchnr(FILTERINDEX,PARAMETER,DIRECTION)*

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>PARAMETER</i>	<i>name, time from, time to</i>	The selected parameter is read from the archive and displayed
<i>DIRECTION</i>	<i>bottom, left</i>	Filling in the corresponding direction.

3.1.8.3.18 wmz

The *=wmz* function provides the result of the heat counter archive. Counter overflow is not automatically checked.

Syntax:

=wmz(FILTERINDEX,ACTIVATED,OVERFLOW,STARTVALUE,ENDVALUE,COUNTERINFO,ERRORCOUNTER)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>AKTIVATED</i>	0 = deactivated >1 = activated	The function is not executed with 0.
<i>OVERFLOW</i>	Value or cell reference	With an overflow of 1000, an error is recognized with an archive value of 1000 or higher.
<i>STARTVALUE</i>	Cell reference	First valid value from the archive.
<i>ENDVALUE</i>	Cell reference	Last valid value from the archive.
<i>COUNTERINFO</i>	Cell reference	<p>Start of the counter change. <i>Right</i> direction from the cell reference.</p> <p>Consists of four cell entries:</p> <ul style="list-style-type: none"> ▶ Date and time of the first value after a counter change ▶ Value before the counter change ▶ Value after the counter change ▶ Empty cell
<i>ERRORCOUNTER</i>	Cell reference	<p>States the number of errors found in a cell.</p> <p>Causes of the error:</p> <ul style="list-style-type: none"> ▶ Value \geq as defined in OVERFLOW ▶ Values ≤ 0 ▶ With two consecutive archive values, the first value is greater than the subsequent value.

The sum of all valid values is written in the cell of the function.

3.1.8.3.19 wmzz

The *wmzz* function (*filter index, direction, P1, P2, P3, activated, overflow*) provides the result of the heat counter archive in pairs, i.e. the difference between two consecutive archive values is given.

The output 0 is given if

- ▶ The first value is \geq the subsequent value.
- ▶ One of the two values is \geq OVERFLOW.

- ▶ One of the two values is = 0.

Syntax: =wmzz(filter index, direction, P1, P2, P3, activated, overflow)

Transfer parameters	Valid range	Comment
<i>FILTERINDEX</i>	[1-n]	Corresponding entry from the archive filter (on page 49).
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.
<i>P1</i>		Number of archive values in the first row
<i>P2</i>		Empty cells between two value outputs
<i>P3</i>		Empty cells until the next value row
<i>ACTIVATED</i>	0 = deactivated 1 = activated	The function is not executed with 0.
<i>OVERFLOW</i>	Value or cell reference	With an overflow of 1000, an error is recognized with an archive value of 1000 or higher.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down, right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters P1-P3.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values

- ▶ *P3* = empty rows between the values

3.1.8.4 Database functions

This function enables data from Access or SQL databases to be read off.

Syntax: `=sqldao (DATABASE,SQL-QUERY,PARA1,PARA2)`

Transfer parameters	Comment
DATABASE	Name of the *.mdb database or the OLEDB provider.
SQL query	<p>The following standard database queries can be used:</p> <ul style="list-style-type: none"> ▶ SELECT ▶ INSERT ▶ UPDATE ▶ DELETE ▶ EXECUTE <p>Transfer of parameters. Choice of:</p> <ul style="list-style-type: none"> ▶ Two integers: %d %d ▶ Two strings: %s %s
PARA1	parameters for SQL query
PARA2	parameters for SQL query

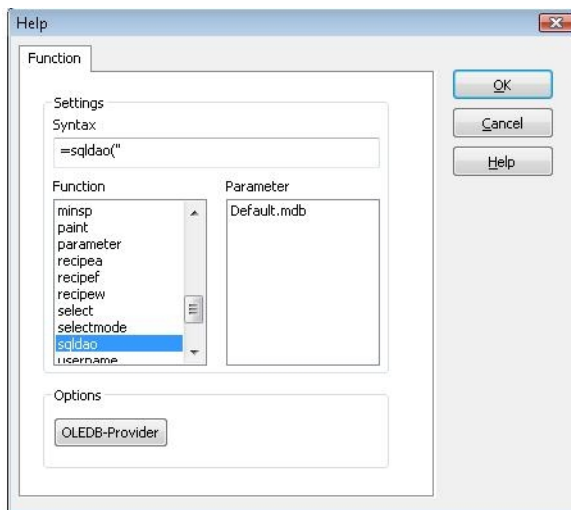
SUPPORTED DATA TYPES

The `sqldao` function supports the following database data types:

- ▶ *DBTYPE_I1*
- ▶ *DBTYPE_UI1*
- ▶ *DBTYPE_I2*
- ▶ *DBTYPE_UI2*
- ▶ *DBTYPE_I4*
- ▶ *DBTYPE_UI4*
- ▶ *DBTYPE_I8*
- ▶ *DBTYPE_UI8*

- *DBTYPE_R4*
- *DBTYPE_R8*
- *DBTYPE_STR*
- *DBTYPE_WSTR*
- *DBTYPE_BSTR*

CONFIGURATION WITH FUNCTION ASSISTANT

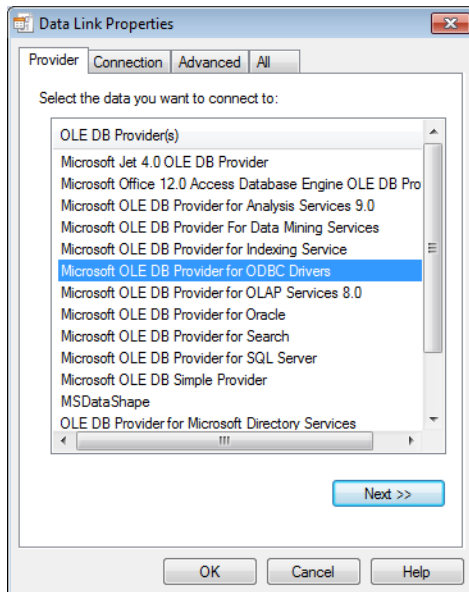


You can use MS Access databases and databases with OLEDB provider. For this, use the following syntax:

Database	Syntax
MS Access database	<code>=sql dao (database,SQL query,Para1,Para2)</code>
Databases with OLEDB provider	<p>Replace the reference to a database with an OLEDB initialization string. This string can be</p> <ul style="list-style-type: none"> ‣ entered manually or ‣ created by clicking on the OLEDB provider button.

DATABASES WITH OLEDB PROVIDER

Clicking on the **OLEDB provider** button opens the dialog for **data linking properties**:



Here, you define the connection to the desired database:

- ▶ OLEDB provider type
- ▶ Data source
- ▶ Registration information
- ▶ etc.

After confirmation of the dialog by clicking on **OK**, the initialization string is generated and inserted into the *Syntax* field.

Syntax: `=sqldao (Provider,SQL query,Para1,Para2)`

Attention

The initialization string must always start with the character sequence *Provider=*.
Note upper case and lower case letters, because the string is *case sensitive*.

SETTINGS FOR MS ACCESS AND OLEDB

Transfer parameters	Description
Database	<p>Name of the *.mdb database.</p> <p>Storage directory: Project folder which is superordinate to the Runtime folder.</p> <p>E.g.:</p> <p>Runtime storage location: Subfolder of</p>

Transfer parameters	Description
	<p><i>C:\Users\Public\Documents\zenon_Projects\Multi\TEST_PROJEKT</i></p> <p>Save location *.mdb: saved directly in the folder <i>C:\Users\Public\Documents\zenon_Projects\Multi\TEST_PROJEKT</i></p> <p>The project folder is defined in the project properties.</p>
Provider	OleDb provider; the initialization string must always begin with <i>Provider=</i> (case sensitive).
SQL query	<p>You can use standard 'select' database queries here.</p> <p>Two-integer parameters can be transferred with %d %d and two-string parameters can be transferred with %s %s</p>
Para1, Para2	Parameters for SQL query.

3.1.8.4.1 Example of access

EXAMPLES FOR MS ACCESS

Example database: *Address.mdb*

Name	First name	Street	City	Telephone	CanAddress
Müllner	Egon	Am Rheinberg 22	5020 Salzburg	0662/32935 4	1
Roider	Jürgen	Mozartgasse 7	5020 Salzburg	0662/32935 4	2
Leitner	Hans	Strubergasse 6	5020 Salzburg	0662/32935 4	3
Müller	Peter	Blumengasse 6	80003 München	089/234243	5
Weinberger	ww	Hafnergasse 5	7020 Klagenfurt	0222/2222	6

EXAMPLE 1

All entries from the *Addresses* table with *Name* field names are to be given.

Function: =sqldao(*Adress.mdb*,*SELECT Adressen.name FROM Adressen ;,1,1*)

<i>Address.mdb</i>	Access database (must be in the project database path)
<i>SELECT</i>	Tells the Microsoft Jet database module to return information from the database as a group of records
<i>Address.name</i>	table.field name
<i>FROM</i>	states the table of query in which to find the fields stated in the SELECT statement
<i>Addresses</i>	Table

Result:

Müllner
Roider
Leitner
Müller
Weinberger

EXAMPLE 2

- ▶ Lower limit: Contents of cell *E1*
- ▶ Upper limit: Contents of cell *E2*
- ▶ Field name for evaluation: *CanAddress*
- ▶ Entries from the *Addresses* table with *Name* and *First name* field names are to be given.
- ▶ The *CanAddress* condition must be higher than contents of cell *E1* and lower than contents of cell *E2*.

Function: =sqldao(*Address.mdb*,*SELECT Address.name,Address.first name FROM Address WHERE (((Addressen.CanAdresse)>%d) AND ((Address.CanAdresse)<%d)) ;,E1,E2)*

<i>Address.mdb</i>	Access database (must be in the project database path)
<i>SELECT</i>	Tells the Microsoft Jet database module to return information from the database as a group of records
<i>Address.name</i>	table.field name
,	SQL separator
<i>Address.first name</i>	table.field name
<i>FROM</i>	states the table of query in which to find the fields

<i>Address.mdb</i>	Access database (must be in the project database path)
	stated in the SELECT statement
<i>Addresses</i>	Table
<i>WHERE</i>	States which records of the table defined in the FROM section are affected by a SELECT, UPDATE or DELETE statement
<i>((Address.CanAddress)>%d)</i>	Condition: table.field name
<i>AND</i>	Linkage
<i>((Address.CanAddress)<%d))</i>	Condition: table.field name
<i>;</i>	SQL statement end
<i>E1, E2:</i>	Cell references (integer)

Result for E1 = 1, E2 = 6

Roider	Jürgen	2
Leitner	Hans	3
Müller	Peter	5



Information

For further information on SQL statements refer to the Online-Help of Access.

3.1.8.4.2SQL example

EXAMPLE FOR DATABASES WITH OLEDB PROVIDER

```
=sqldao("Provider=SQLNCLI.1;Integrated Security=SSPI;Persist Security Info=False;Initial Catalog=<databasename>;Data Source=<database instance>;Use Procedure for Prepare=1;Auto Translate=True;Packet Size=4096;Workstation ID=<PCNAME>;Use Encryption for Data=False;Tag with column collation when possible=False","SELECT <tablename>.<columnname> FROM <tablename>;",0,0)
```

Transfer parameters	Comment
DATABASE	"Provider=SQLNCLI.1;Integrated Security=SSPI;Persist Security Info=False;Initial Catalog=<dbname>;Data Source=<datasource>;Use Procedure for Prepare=1;Auto Translate=True;Packet Size=4096;Workstation ID=<PCNAME>;Use Encryption for Data=False;Tag with column collation when possible=False"
SQL query	"SELECT <tablename>.<columnname> FROM <tablename>;"
PARA1	0
PARA2	0

VALUES FOR EXAMPLE

Database: "AdventureWorks"

Installation: AdventureWorksDB.msi

Source: <http://msftdbprodsamples.codeplex.com/releases/view/4004>

Computer name: "PC1"

Authentication: "Windows NT"

SQL server instance: "SQLEXPRESS"

SELECT

SELECT

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column collation when possible=False", "SELECT TOP 100 [AddressID],[AddressLine1],[AddressLine2],[City],[StateProvinceID],[PostalCode] FROM [AdventureWorks].[Person].[Address] ORDER BY AddressID;",0,0)
```

SELECT WITH STRING PARAMETER (CELL H2)

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column collation when possible=False", "SELECT TOP 100
```

```
[AddressID],[AddressLine1],[AddressLine2],[City],[StateProvinceID],[PostalCode] FROM
[AdventureWorks].[Person].[Address] WHERE (City = N'%s') ORDER BY AddressID;" ,H2,0)
```

SELECT WITH NUMERICAL PARAMETER (CELL H2)

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial
Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto
Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column
collation when possible=False", "SELECT TOP 100
[AddressID],[AddressLine1],[AddressLine2],[City],[StateProvinceID],[PostalCode] FROM
[AdventureWorks].[Person].[Address] WHERE (StateProvinceID = %d) ORDER BY AddressID;" ,H2,0)
```

INSERT

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial
Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto
Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column
collation when possible=False", "INSERT INTO [AdventureWorks].[Sales].[Currency]
(CurrencyCode,Name,ModifiedDate) VALUES ('AAA','NewValue','");",0,0)
```

UPDATE

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial
Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto
Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column
collation when possible=False", "UPDATE Sales.Currency SET Name = 'ModifiedValue' WHERE CurrencyCode
= 'AAA';",0,0)
```

DELETE

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial
Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto
Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column
collation when possible=False", "DELETE Sales.Currency WHERE CurrencyCode = 'AAA';",0,0)
```

EXECUTE

EXECUTE with numerical parameter (cell J2)

```
=sql dao("Provider=SQLOLEDB.1;Integrated Security=SSPI;Persist Security Info=False;Initial
Catalog=AdventureWorks;Data Source=.\SQLEXPRESS;Use Procedure for Prepare=1;Auto
Translate=True;Packet Size=4096;Workstation ID=PC1;Use Encryption for Data=False;Tag with column
collation when possible=False", "EXECUTE dbo.uspGetBillOfMaterials %d, '2001-05-08 12:35:29.123';",J2,0)
```

3.1.8.5 Date and time functions

This function gives date and time values.

You can find general formatting keys in the Data types for date and time (on page 151) chapter. Note the requirements of individual functions.

Note: Year entries from 2000 must always be made with four digits. For example, 19 is interpreted as 1919. 2019 must be entered with four digits.

3.1.8.5.1 date

The *date* (*iYear*, *iMonth*, *iDay*) function date calculates the date from the numerical values for year (*iYear*), month (*iMonth*) and day (*iDay*).

Syntax: =date(*iYear*,*iMonth*,*iDay*)

Transfer parameters	Valid range	Comment
<i>iYear</i>	[0100-2200]	
<i>iMonth</i>	[1-12]	Values out of the valid range are set to the upper or lower limit
<i>iDay</i>	[1-(28,29,30,31)]	Values out of the valid range are set to the upper or lower limit

Result format: date

Standard format: dd/mm/yyyy

Example

=date(2010,5,12) is 12.05.2010

Cell A1=2010, cell A2=5, cell A3=12, cell A4=date(A1,A2,A3) is 12.05.2010

3.1.8.5.2 datevalue

The *datevalue*(*date_text*) function calculates the date from the date text (*date_text*).

- ▶ Syntax: =datevalue(*date_text*)
- ▶ Input format for *date_text*: dd.mm.yyyy hh:mm:ss

3.1.8.5.3 day

The *day(date)* function calculates the day from a date value.

Syntax: *=day(date)*

Result format: Integer

Example

=now() with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
Cell A2=*day(A1)* is 5

3.1.8.5.4 hour

The *hour(time)* function calculates the hour from a time value.

Syntax: *=hour(time)*

Result format: Integer

Example

=now() with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
Cell A2=*hour(A1)* is 12

3.1.8.5.5 minute

The *minute(time)* function calculates the minutes from a time value.

Syntax: *=minute(time)*

Result format: Integer

Example

=now() with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
cell A2=*minute(A1)* is 46

3.1.8.5.6month

The *month(date)* function calculates the month from the date value.

Syntax: *=month(date)*

Result format: Integer

Example

=now() with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
Cell A2=*month(A1)* is 6

3.1.8.5.7now

The *now()* function displays the current date and time.

The cell automatically gets the format string dd/mm/yy.

Syntax: *=now()*

Example

=now() is 05.06.2010
=now() with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10

3.1.8.5.8second

The *second(time)* function calculates the seconds from a time value.

Syntax: *=second(time)*

Result format: Integer

Example

=now() with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
Cell A2=*second(A1)* is 24

3.1.8.5.9 time

The *time(iHour, iMinute, iSecond)* function provides the time from the numerical values for hour (*iHour*), minute (*iMinute*) and seconds (*iSecond*).

The cell automatically gets the format string hh:mm:ss.

Syntax: *=time(iHour,iMinute,iSecond)*

Transfer parameters	Valid range	Comment
<i>iHour</i>	[0-23]	Values out of the valid range are set to the upper or lower limit
<i>iMinute</i>	[0-59]	Values out of the valid range are set to the upper or lower limit
<i>iSecond</i>	[0-59]	Values out of the valid range are set to the upper or lower limit

Result format: *time*

Example

=time(12,24,48) is 12:24:48

Cell A1=12, cell A2=24, cell A3=48 , cell A4=*time(A1,A2,A3)* is 12:24:48

3.1.8.5.10 today

The *today()* function displays the current date.

The cell automatically gets the format string dd/mm/yy.

Syntax: *=today()*

Example

=today() is 05.06.2010

=today() with format string hh:mm:ss dd/mm/yy is 12:00:00 AM 05.06.10

3.1.8.5.11 weekday

The *weekday(date)* function calculates the weekday from the date value.

Syntax: `=weekday(date)`

value	Weekday
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

Result format: Integer

Example

`=now()` with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
Cell A2=`weekday(A1)` is 3

3.1.8.5.12 year

The `year(date)` function calculates the year from the date value.

Syntax: `=year(date)`

Result format: Integer

Example

`=now()` with format string hh:mm:ss dd/mm/yy is 12:46:24 05.06.10
Cell A2=`year(A1)` is 2010

3.1.8.6 Logical functions

This section summarizes all logical functions of the report generator

3.1.8.6.1 and

The *and(logical,logical)* function provides the *TRUE* value if both arguments are *TRUE*.

The cell automatically gets the format string *True;False*.

Syntax: *=and(logical,logical)*

EXAMPLE

Cell A1	Cell A2	Cell A3= <i>and(A1,A2)</i>
<i>false</i>	<i>false</i>	<i>false</i>
<i>false</i>	<i>true</i>	<i>false</i>
<i>true</i>	<i>false</i>	<i>false</i>
<i>true</i>	<i>true</i>	<i>true</i>

3.1.8.6.2 exact

The *exact(string1,string2)* function returns the value *TRUE*, if both text strings are identical (case-sensitive).

Syntax: *=exact(string1,string2)*

3.1.8.6.3 false

The *false()* function returns the value *FALSE*.

The cell automatically gets the format string *True;False*.

Syntax: *=false()*

Example

The entry in cell A1=*false()* is *False*

3.1.8.6.4if

The *if(exprTest, valTrue, valFalse)* function provides the content of *valTrue* (value or string), if the argument is *exprTest TRUE*, otherwise the content of *valFalse*. It is possible to nest *if* functions, for example by implementing *and*-links.

Syntax: *=if(exprTest, valTrue, valFalse)*

3.1.8.6.5isblank

The *isblank(ref)* function has the logical value *TRUE*, if the reference cell is empty.

Syntax: *=isblank(ref)*

EXAMPLE

ContentA1	A1	Result
Logical expression	No	<i>False</i>
Text	This is a text	<i>False</i>
empty		<i>True</i>
Number	123.00	<i>False</i>
Error	#ARG!	<i>False</i>

3.1.8.6.6iserror

The *iserror(ref)* function has the logical value *TRUE* if the reference cell contains an error.

Syntax: *=iserror(ref)*

EXAMPLE

ContentA1	A1	Result
Logical expression	No	<i>False</i>
Text	This is a text	<i>False</i>

ContentA1	A1	Result
empty		<i>False</i>
Number	123.00	<i>False</i>
Error	#ARG!	<i>True</i>

3.1.8.6.7 islogical

The *islogical(ref)* function has the logical value *TRUE* if the reference cell contains a logical value.

Syntax: *=islogical(ref)*

Example

ContentA1	A1	Result
Logical expression	No	<i>True</i>
Text	This is a text	<i>False</i>
empty		<i>False</i>
Number	123.00	<i>False</i>
Error	#ARG!	<i>False</i>

3.1.8.6.8 isnontext

The *isnontext(ref)* function has the logical value *TRUE* if the reference cell does not contain a text string.

Syntax: *=isnontext(ref)*

EXAMPLE

ContentA1	A1	Result
Logical expression	No	<i>True</i>
Text	This is a text	<i>False</i>

ContentA1	A1	Result
empty		<i>True</i>
Number	123.00	<i>True</i>
Error	#ARG!	<i>False</i>

3.1.8.6.9 isnumber

The *isnumber(ref)* function has the logical value *TRUE* if the reference cell contains a numerical value.

Syntax: *=isnumber(ref)*

EXAMPLE

ContentA1	A1	Result
Logical Link	No	<i>False</i>
Text	This is a text	<i>False</i>
empty		<i>False</i>
Number	123.00	<i>True</i>
Error	#ARG!	<i>False</i>

3.1.8.6.10 isref

The *isref(ref)* function has the logical value *TRUE* if the reference cell contains a reference to another cell.

Syntax: *=isref(ref)*

EXAMPLE

ContentA1	A1	Result
Logical expression	No	<i>False</i>
Text	This is a text	<i>False</i>

ContentA1	A1	Result
empty		<i>False</i>
Number	123.00	<i>False</i>
Error	#ARG!	<i>False</i>
Reference	=B1	<i>True</i>

3.1.8.6.11 istext

The *istext(ref)* function has the logical value *TRUE* if the reference cell contains a text string.

Syntax: *=istext(ref)*

EXAMPLE

ContentA1	A1	Result
Logical link	No	<i>False</i>
Text	This is a text	<i>True</i>
empty		<i>False</i>
Number	123.00	<i>False</i>
Error	#ARG!	<i>False</i>

3.1.8.6.12 not

The *not(logical)* function returns the logical opposite of the argument.

The cell automatically gets the format string *True;False*.

Syntax: *=not(logical)*

EXAMPLE

Cell A1	Cell A2= <i>not(A1)</i>
<i>false</i>	<i>True</i>

Cell A1	Cell A2= <i>not</i> (A1)
<i>true</i>	<i>False</i>

3.1.8.6.13 or

The *or(logical,logical)* function provides the *TRUE* logical value if both arguments are *TRUE*.

The cell automatically gets the format string *True;False*.

Syntax: *=or(logical,logical)*

EXAMPLE

Cell A1	Cell A2	Cell A3= <i>or</i> (A1,A2)
<i>false</i>	<i>false</i>	<i>false</i>
<i>false</i>	<i>true</i>	<i>true</i>
<i>true</i>	<i>false</i>	<i>true</i>
<i>true</i>	<i>true</i>	<i>true</i>

3.1.8.6.14 true

The *true()* function returns the logical value *TRUE*.

The cell automatically gets the format string *True;False*.

Syntax: *=true()*

Example

The entry in cell A1=*true()* is *True*

3.1.8.7 Mathematical and trigonometric functions

Common mathematical functions are available for reports. These can not only be planned using the function assistant, but can also be directly entered into the input row.

3.1.8.7.1 abs

The *abs (num)* function returns the absolute value of a number as a result. The absolute value of a number is the value without sign.

Syntax: =abs(num)

num: is the real number, that is the basis for the absolute value

Example

=abs(2,2) is 2

=abs(-2,2) is 2

3.1.8.7.2 acos

The *acos (num)* function provides the arc cosine of a number.

Syntax: =acos(num)

3.1.8.7.3 acosh

The *acosh (num)* function provides the inverse hyperbolic cosine of a number.

Syntax: =acosh(num)

3.1.8.7.4 asin

The *asin (num)* function provides the arc cosine of a number.

Syntax: =asin(num)

3.1.8.7.5 asinh

The *asinh (num)* function provides the inverted hyperbolic sine of a number.

Syntax: =asinh(num)

3.1.8.7.6 atan

The *atan (num)* function provides the arc tangent of a number.

Syntax: =*atan*(*num*)

3.1.8.7.7 atanh

The *atanh* (*num*) function provides the inverted hyperbolic tangent of a number.

Syntax: =*atanh*(*num*)

3.1.8.7.8 atan2

The *atan2* (*x,y*) function provides the arc tangent based on an x and y coordinate.

Syntax: =*atan2*(*x, y*)

3.1.8.7.9 ceil

The *ceil* (*num*) function returns the next higher whole-numbered value of the value, rounded up.

Syntax: =*ceil*(*num*)

Example

=*ceil*(2.2) is 3

=*ceil*(-2.2) is -3

3.1.8.7.10 column

The *column* (*ref*) function provides the column number of a connection (for example C3=2) in the value range of 0 to *n*.

Syntax: =*column*(*ref*)

3.1.8.7.11 columns

The *columns* (*range*) function returns the numbers of columns in the stated range.

Syntax: =*columns*(*range*)

3.1.8.7.12 cos

The *cos*(*num*) function provides the cosine of a number.

Syntax: `=cos(num)`

EXAMPLE

`=cos(Input)`

	Input	Result
degrees	radians()	cosine
0,00	0	1,000
45,00	0,78539816339744828	0,707
90,00	1,5707963267948966	0,000
135,00	2,3561944901923448	-0,707
180,00	3,1415926535897931	-1,000
225,00	3,9269908169872414	-0,707
270,00	4,7123889803846897	-0,000
315,00	5,497787143782138	0,707
360,00	6,2831853071795862	1,000

3.1.8.7.13 cosh

The `cosh(num)` function provides the hyperbolic cosine of a number.

Syntax: `=cosh(num)`

3.1.8.7.14 degree

The `degree(num)` function converts radians to degrees.

Syntax: `=degree(num)`

EXAMPLE

`=degree(Input)`

Input	Result
<i>Radians()</i>	<i>Degree()</i>
0	0
0,78539816339744828	45
1,5707963267948966	90
2,3561944901923448	135
3,1415926535897931	180
3,9269908169872414	225
4,7123889803846897	270
5,497787143782138	315
6,2831853071795862	360

3.1.8.7.15 even

The *even(num)* function returns the next higher even whole-numbered value. Negative values are rounded from 0 away.

Syntax: *=even(num)*

Example

=even(2.2) is 4

=even(-2.2) is -4

3.1.8.7.16 exp

The *exp(num)* function potentializes the basis *e* with the number stated as argument.

Syntax: *=exp(num)*

Example

`=exp(0)` is 1

`=exp(1)` is 2.718282

`=exp(10)` is 22026.465795

3.1.8.7.17 fact

The `fact(int)` function provides the factorial of a number.

Syntax: `=fact(int)`

Example

`=fact(0)` is 1 (1)

`=fact(1)` is 1 (1)

`=fact(2)` is 2 (1*2)

`=fact(3)` is 6 (1*2*3)

`=fact(4)` is 24 (1*2*3*4)

`=fact(5)` is 120 (1*2*3*4*5)

3.1.8.7.18 factdouble

The `factdouble(num)` function provides the double factorial of a number. In doing so, only the product of each second number is formed.

Syntax: `=factdouble(num)`

Example

`=factdouble(0)` is 0 (0)

`=factdouble(1)` is 1 (1)

`=factdouble(2)` is 2 (2)

`=factdouble(3)` is 3 (1*3)

`=factdouble(4)` is 8 (2*4)

`=factdouble(5)` is 15 (1*3*5)

3.1.8.7.19 floor

The `floor(num)` function returns the next lower whole-numbered value of the value, rounded down. Negative values are rounded in direction to 0.

Syntax: `=floor(num)`

Example

`=floor(2.2)` is 2

`=floor(-2.2)` is -2

3.1.8.7.20 int

The `int(num)` function returns the next lower whole-numbered value of the value, rounded down. Negative values are rounded from 0 away.

Syntax: `=int(num)`

Example

`=int(2.2)` is 2

`=int(-2.2)` is -3

3.1.8.7.21 ln

The $\ln(num)$ function provides the natural logarithm of a number.

Syntax: $=\ln(num)$

Example

$=\ln(1)$ is 0

$=\ln(2.718282)$ is 1

$=\ln(22026.465795)$ is 10

3.1.8.7.22 log10

The $\log_{10}(num)$ function calculates the logarithm of a value on the basis of 10.

Syntax: $=\log_{10}(num)$

Example

$=\log_{10}(1)$ is 0

$=\log_{10}(10)$ is 1

$=\log_{10}(100)$ is 2

$=\log_{10}(1000)$ is 3

3.1.8.7.23 mod

The $\text{mod}(num, divisor)$ function returns the rest of the division of a value (num) by the divisor ($divisor$).

Syntax: $=\text{mod}(num, divisor)$

Example

`=mod(0.3)` is 0

`=mod(1.3)` is 1

`=mod(2.3)` is 2

`=mod(3.3)` is 0

`=mod(4.3)` is 1

3.1.8.7.24 odd

The function `odd(num)` returns the next higher odd whole-numbered value. Negative values are rounded from 0 away.

Syntax: `=odd(num)`

Example

`=odd(2.2)` is 3

`=odd(-2,2)` is -3

3.1.8.7.25 pi

The `pi()` function pi returns the value for pi: 3.1415926535897931

Syntax: `=pi()`

Standard format: `*0.#####`

Example

`=pi()` is with standard formatting 3.141593

3.1.8.7.26 product

The `product(range)` function calculates the product of the values in the stated area.

Syntax: *=product(range)*

EXAMPLE

Cells A1 to A10: any numbers

Cell B1=*product(A1:A10)*

Cell/column	A	B
1	1	3628800
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

The result for the range A1 to A10 is 3628800.

3.1.8.7.27 quotient

The *quotient(num,divisor)* function returns the whole-numbered part of a division.

Syntax: *=quotient(num,divisor)*

Example

=quotient(0.3) is 0

=quotient(1.3) is 1

=quotient(2.3) is 2

=quotient(3.3) is 3

=quotient(4.3) is 4

3.1.8.7.28 radians

The *radians(num)* function converts degrees into radians.

Syntax: *=radians(num)*

num: input in degrees

EXAMPLE

=radians(Input)

Input	Result
0,00	0
45,00	0,78539816339744828
90,00	1,5707963267948966
135,00	2,3561944901923448
180,00	3,1415926535897931
225,00	3,9269908169872414
270,00	4,7123889803846897
315,00	5,497787143782138
360,00	6,2831853071795862

3.1.8.7.29 rand

The *rand()* function returns a new random value between 0.000 and 1.000 every time the report is calculated.

Syntax: *=rand()*

3.1.8.7.30 randbetween

The *randbetween(min,max)* function returns a new random value between *min* and *max* every time the report is calculated.

Syntax: *=randbetween(min,max)*

3.1.8.7.31 round

The *round(num,digits)* function rounds a value (*num*) to a stated number of decimals (*digits*).

Syntax: *=round(num,digits)*

3.1.8.7.32 row

The *row(ref)* function returns the row number of a reference (e.g. C3=3) in the value range from 0 to *n*.

Syntax: *=row(ref)*

3.1.8.7.33 rows

The *rows(range)* function calculates the number of empty cells in the defined range.

Syntax: *=rows(range)*

3.1.8.7.34 sign

The *sign(num)* function provides the value

- ▶ 1, if the number (*num*) is positive
- ▶ -1 if the number is negative
- ▶ 0 if the number is 0

Syntax: *=sign(num)*

Example

=sign(2.2) is 1

=sign(-2.2) is -1

=sign(0.0) is 0

3.1.8.7.35 sin

The *sin(num)* function provides the sine of a number.

Syntax: *=sin(num)*

num: input in radians

EXAMPLE

`=sin(Input)`

	Input	Result
degrees	radians()	sine
0,00	0	0,000
45,00	0,78539816339744828	0,707
90,00	1,5707963267948966	1,000
135,00	2,3561944901923448	0,707
180,00	3,1415926535897931	0,000
225,00	3,9269908169872414	-0,707
270,00	4,7123889803846897	-1,000
315,00	5,497787143782138	-0,707
360,00	6,2831853071795862	-0,000

3.1.8.7.36 sinh

The *sinh(num)* function provides the hyperbolic sine of a number.

Syntax: `=sinh(num)`

3.1.8.7.37 sqrt

The *sqrt(num)* function provides the square root of a number.

Syntax: `=sqrt(num)`

Example

`=sqrt(1)` is 1

`=sqrt(2)` is 1.414214

`=sqrt(3)` is 1.732051

`=sqrt(4)` is 2

3.1.8.7.38 sqrtpi

The `sqrtpi(num)` function provides the square root of a **pi** value.

Syntax: `=sqrtpi()`

Example

`=sqrtpi(1)` is 3.141593 = 1*pi

`=sqrtpi(2)` is 4.442883 = `sqrt(2)*pi`

`=sqrtpi(3)` is 5.441398 = `sqrt(3)*pi`

`=sqrtpi(4)` is 6.283185 = `sqrt(4)*pi`

3.1.8.7.39 tan

The `tan(num)` function provides the tangent of a number.

Syntax: `=tan(num)`

3.1.8.7.40 tanh

The `tanh(num)` function provides the hyperbolic tangent of a number.

Syntax: `=tanh(num)`

3.1.8.7.41 trunc

The `trunc(num)` function returns the next lower whole-numbered value of the value, rounded down. Negative values are rounded in direction to 0.

Syntax: `=trunc(num)`

Example

`=trunc(2.2)` is 2

`=trunc(-2.2)` is -2

3.1.8.8 Recipegroup Manager functions

Variables from other loaded projects that are used in recipes can also be displayed with the report functions for the recipe group manager. These functions can only be used with screens of the recipegroup manager type.

The function assistant (on page 54) is available for configuration.

3.1.8.8.1 recipea

The `=recipea(Inhalt)` function displays general data of a recipe of the recipe group manager.

Syntax: `=recipea(Inhalt)`

Contents	Description
<i>muser</i>	User who last edited the recipe.
<i>mzeit</i>	Time of the last change.
<i>rez</i>	Name of the recipe.
<i>rezg</i>	Name of the recipe group to which the recipe belongs.
<i>reznum</i>	Number of the recipe
<i>text1</i> to <i>text 8</i>	User comments 1 to 8 of the recipe.
<i>text2</i>	User comment 2 for the recipe.
<i>version</i>	Version number of the recipe.
<i>status</i>	Status of the recipe as text. For example: 1 - sample recipe

Example

`=recipea(recnum)`

3.1.8.8.2recipef

The `=recipef(content,variable)` function displays variable-orientated data of a recipe of the Recipegroup Manager. These data can freely be positioned in the report.

Syntax: `=recipef(content,variable)`

Contents	Description
<i>name</i>	Name of the variable.
<i>identification</i>	Identification of the variable.
<i>type</i>	Source type.
<i>unit</i>	Technical unit of measurement the variables.
<i>value</i>	Value for the variable in the recipe.
<i>symbolic</i>	Display of limit value texts from the reaction matrix or limit value as text.
<i>min</i>	Minimum of the permitted value range for the variable in this recipe.
<i>max</i>	Maximum of the permitted value range for the variable in this recipe.
<i>actual_value</i>	If the defined variable does not exist in the selected recipe, the cell is marked with -.
<i>Interlocking</i>	Display of Interlocking. Because the names are not available in the Runtime, only the IDs of the interlockings selected in the Recipegroup Manager are displayed.
<i>visibility</i>	Shows visibility of the variables.
<i>Graphic Recipe Variable</i>	Shows the name of the linked graphic recipe variable. Only displayed in the Runtime. Configuration in the Editor.
<i>filter</i>	Filter text that was selected in the RGM.
<i>Keyboard</i>	Shows linked keyboard keyboard.
<i>Set value limit</i>	Yes: Takes over set value limit to the variable.

Contents	Description
	Only displayed in the Runtime. Configuration in the Editor.

Example

```
=recipef("value","temperature")
```

3.1.8.8.3 recipew

The `=recipew(content,direction)` function displays variable-orientated data of a recipe of the Recipegroup Manager in table form.

Syntax: `=recipew(content,direction)`

Contents	Description
<i>name</i>	Name of the variable.
<i>identification</i>	Identification of the variable.
<i>type</i>	Source type.
<i>unit</i>	Technical unit of measurement the variables.
<i>value</i>	Value for the variable in the recipe.
<i>symbolic</i>	Display of values as text.
<i>min</i>	Minimum of the permitted value range for the variable in this recipe.
<i>max</i>	Maximum of the permitted value range for the variable in this recipe.
<i>actual_value</i>	If the defined variable does not exist in the selected recipe, the cell is marked with -.
<i>Interlocking</i>	Display of Interlocking. Because the names are not available in the Runtime, only the IDs of the interlockings selected in the Recipegroup Manager are displayed.
<i>visibility</i>	Shows visibility of the variables.
<i>Graphical recipe variable</i>	Shows the name of the linked Graphical recipe variable. Only displayed in the Runtime. Configuration in the Editor.

Contents	Description
<i>filter</i>	Filter text that was selected in the RGM.
<i>Keyboard</i>	Shows linked keyboard keyboard.
<i>Set value limit</i>	Yes: Takes over set value limit to the variable. Only displayed in the Runtime. Configuration in the Editor.

Example

`=recipew(name,bottom)`

3.1.8.9 Statistical functions

Common statistical functions are available for reports. These can not only be planned using the function assistant, but can also be directly entered into the input row.

3.1.8.9.1 avg

The *avg (range)* function calculates the average of the values within the range.

Syntax: `=avg(range)`

EXAMPLE

Cell A4= `avg(A1:A3)`

Row/column	A
1	1
2	3
3	5
4	3

The average of the cells A1 to A3 is 3

3.1.8.9.2count

The *count (range)* function returns the number of numerical values in the stated range.

Syntax: =count(range)

EXAMPLE

Cell A5= count(A1:A4)

Row/column n	A
1	1
2	Text
3	
4	3
5	2

The number of numerical values in the cells A1 to A4 is 2.

3.1.8.9.3counta

The *counta (range)* function calculates the number of non-empty cells in a given range.

Syntax: =counta(range)

EXAMPLE

Cell A5=counta(A1:A4)

Row/colum nn	A
1	1
2	text
3	
4	3
5	3

The number of non-empty cells in the range **A1** to **A4** is 3.

3.1.8.9.4countblank

The *countblank (range)* function calculates the number of empty cells in a given range.

Syntax: =countblank(range)

EXAMPLE

CellA5 = countblank(A1:A4)

Row/column	A
1	1
2	Text
3	
4	3
5	1

The number of empty cells in the range A1 to A4 is 1.

3.1.8.9.5max

The *max (range)* function calculates the highest value in a range.

Syntax: =max(range)

EXAMPLE

Cells A1 to A10: any numbers

Cell B1=max(A1:A10)

Row/column	A	B
1	1	10
2	2	
3	3	
4	4	
5	5	

Row/column	A	B
6	6	
7	7	
8	8	
9	9	
10	10	

The highest value in range A1 to A10 is in cell A10 and is 10.

3.1.8.9.6min

The *min (range)* function calculates the lowest value in a range.

Syntax: *=min(range)*

EXAMPLE

Cells A1 to A10: any numbers

Cell B1=*min(A1:A10)*

Row/column n	A	B
1	1	1
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

The lowest value in range A1 to A10 is in cell A1 and is 1.

3.1.8.9.7 percentile

The *percentile* (*range,num*) function returns as result a threshold value, from which the values are accepted.

Syntax: =percentile(*range,num*)

Range: Is a matrix or a data range that describes the relative position of the data.

Num: Integer from 0-100

EXAMPLE

Cells A1 to A10: any numbers

Cell B1=percentile(A1:A10,90)

Row/column	A	B
1	1	9,1
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

The threshold value for the range A1 to A10 is 9.1.

3.1.8.9.8 stdev

The *stdev* (*range*) function returns an estimation of the standard deviation based on a random sample of the values in the defined area.

Formula:

$$s = \sqrt{\frac{n \sum x^2 - (\sum x)^2}{n(n-1)}}$$

Syntax: =stdev(range)

EXAMPLE

Cells A1 to A10: any numbers

Cell A11=stdev(A1:A10)

Row/column	A
1	745,00
2	730,00
3	732,00
4	768,00
5	769,00
6	747,00
7	718,00
8	723,00
9	766,00
10	739,00
11	18,785633

The standard deviation for the area A1 to A10 is estimated using on the sample on 18,85633 as a basis.

3.1.8.9stdevp

The *stdevp (range)* function returns an estimation of the standard deviation based on the total of the values in the defined area.

Formula:

$$s = \sqrt{\frac{n \sum x^2 - (\sum x)^2}{n^2}}$$

Syntax: =stdevp(range)

EXAMPLE

Cells A1 to A10: any numbers

Cell A11= *stdevp*(A1:A10)

Row/column n	A
1	745,00
2	730,00
3	732,00
4	768,00
5	769,00
6	747,00
7	718,00
8	723,00
9	766,00
10	739,00
11	17,821616

The standard deviation for the range A1 to A10 is estimated at 17.821616.

3.1.8.9.10 sum

The *sum (range)* function calculates the sum of the values in the defined area.

Syntax: =*sum*(range)

EXAMPLE

Cells A1 to A10: any numbers

Cell B1=*sum*(A1:A10)

Row/column	A	B
1	1	55
2	2	
3	3	
4	4	

Row/column	A	B
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

The sum of all values in the A1 to A10 range is 55.

3.1.8.9.11 sumsq

The *sumsq (range)* function calculates the sum of the squares of the values within a range.

Syntax: =sumsq(range)

EXAMPLE

Cells A1 to A10: any numbers

Cell A11=sumsq(A1:A10)

Row /column	A	B
1	1	1
2	2	4
3	3	9
4	4	16
5	5	25
6	6	36
7	7	49
8	8	56
9	9	81

Row /column	A	B
10	10	100
11	385	385

SUPERVISION

Cell B1 to B10: Squares of A1 to A10

Cell B11= *sum*(B1:B10)

3.1.8.9.12 var

The *var* (*range*) function returns an estimation of the variance based on a random sample of the values in the defined area.

Formula:

$$v = \frac{n \sum x^2 - (\sum x)^2}{n(n-1)}$$

Syntax: =*var*(*range*)

EXAMPLE

Cells A1 to A10: any numbers

Cell A11=*var*(A1:A10)

Row/column	A
1	745,00
2	730,00
3	732,00
4	768,00
5	769,00
6	747,00
7	718,00

Row/column n	A
8	723,00
9	766,00
10	739,00
11	352,9

The variance for the area A1 to A10 is estimated using on the sample on 352.9 as a basis.

3.1.8.9.13 varp

The *varp (range)* function returns an estimation of the variation based on the total of the values in the defined area.

Formula:

$$v = \frac{n \sum x^2 - (\sum x)^2}{n^2}$$

Syntax: =varp(range)

EXAMPLE

Cells A1 to A10: any numbers

Cell A11=varp(A1:A10)

Row/column	A
1	745,00
2	730,00
3	732,00
4	768,00
5	769,00
6	747,00
7	718,00
8	723,00
9	766,00

Row/column	A
10	739,00
11	317,61

The variance for the range A1 to A10 is estimated at 317.61.

3.1.8.10 Text functions

Different text functions are available for reports. These can not only be planned using the function assistant, but can also be directly entered into the input row. Exception: paint (on page 129)

3.1.8.10.1 char

The function *char(code)* returns the ASCII character that is defined under *code*.

Syntax: =char(*code*)

code: number between 1 and 255.

Example

=char(88) is X

If the cell A1 contains the value 35, the =char (A1) function gives the character # as a result.

To determine the ASCII code for a character, use the code (on page 125) function.

3.1.8.10.2 clean

The *clean(string)* function deletes all control characters from a text character chain.

Syntax: =clean(*string*)

3.1.8.10.3 code

The *code(string)* function provides the ASCII code for the first character in a text character chain.

If the string is in the brackets of the text to be coded, it is put in quotation marks. If it refers to another row, this is entered.

Syntax: =code(*string*)

Example

`=code("z")` is 122.

Cell A1 contains the text *zoom*:

`=code(A1)` is 122.

To determine the character corresponding to an ASCII code, use the `char` (on page 125) function.

Attention

The `code(string)` function only provides the ASCII code for the first character in a text string.

3.1.8.10.4 find

The `find(keystring,string,start)` function provides the position of a character sequence (*keystring*) within a text string (*string*). The position is found in the text string starting at the start character (*start*) with case-sensitivity.

Syntax: `=find(keystring,string,start)`

Example

Cell A1: *cd*

Cell A2: *ABCDabcd*

Cell A3: *1*

Cell A4=`find(A1,A2,A3)`: Result =7

3.1.8.10.5 fixed

The `fixed(num,decimals)` function formats a number and converts it into a defined character string.

Syntax: `=fixed(num,decimals)`

- ▶ *num*: Numerical value or cell reference
- ▶ *decimals*: Number of decimals

Example

Cell A1 = 12345.672

=fixed(A1,2) is 12345.67

=fixed(A1,1) is 12345,6

The separator and the display also depend on the regional settings and formatting settings in cell (on page 31).

Note: The fixed() function cannot be combined with a format string such as the stating of units.

DIFFERENCE TO ZENON 5.50 AND EARLIER VERSIONS

The *fixed()* function also has the argument *no_seps* in versions up to 5.50. The argument is optional and controls the display of thousand separators.

Syntax: =fixed(num,decimals,no_seps)

- ▶ *no-seps:*
 - ▶ 0: A separator is inserted
 - ▶ 1: A separator is left out

Figures are generally shown without thousand separators in later versions.

3.1.8.10.6 left

The *left(string,num)* function provides the number of characters from a character string defined in (*num*), starting with the first character.

Syntax: =left(string,num)

- ▶ *string:* Character string in quotation marks or reference to a cell with a character string
- ▶ *num:* Number of characters that are to be read off, starting with the first

Example

Cell A1 = abcdefgh

=left(A1,3) is abc

=left(A1,5) is abcde

To read off characters beginning with the last character of a character string, use the right (on page 130) function.

3.1.8.10.7 len

The *len(string)* function provides the number of characters in a character string.

Syntax: *=len(string)*

Example

Cell A1 = *abc*
=len(A1) is 3

Cell A1 = *abcdefgh*
=len(A1) is 8

3.1.8.10.8 lower

The *lower(string)* function replaces all upper case letters of a text character string with lower case letters.

Syntax: *=lower(string)*

Example

Cell A1 = *AbCdEf*
=lower(A1) is *abcdef*

To replace lower case letters with upper case letters, use the upper (on page 132) function.

3.1.8.10.9 mid

The *mid(string,numStart,numLen)* function extracted

- ▶ From the defined character string *string*
- ▶ A new character string
- ▶ With a number of characters defined by the *numLen* argument
- ▶ From the start position defined by *numStart*.

Syntax: *=mid(string,numStart,numLen)*

Example

Cell A1 = *abcdefgh*
=mid(A1,2,4) is *bcde*

3.1.8.10.10 paint

The *=paint(referenz)* function continues the character string given in the referenced cell, if there is not enough space for this in the referenced cell. Thus long character strings can be well displayed by being divided into several cells.

Syntax: *=paint(referenz)*

Example

Cell A1 contains the characters: *abcdefghijklmn*

In cell A1, the following is displayed due to the width of the cell: *abcdefg*

=paint(A1) in cell A2 leads to this display:

A1: *abcdefg*

A2: *hijklmn*

This text function can be configured with the function assistant.

3.1.8.10.11proper

The *proper(string)* function transforms the first character of a word into upper case letters and all subsequent characters into lower case letters. The start of the word is the first alphabetical character of a character string. If the character string contains several non-alphabetic characters, a new word is started after each non-alphabetic character.

Syntax: *= proper (string)*

Example

Cell A1 = *AbCdEf*
=proper(A1) is *Abcdef*

Cell A1 = *aBcDeF*
=proper(A1) is *Abcdef*

Cell A1 = *1aBcD2eF*
=proper(A1) is *1Abcd2Ef*

3.1.8.10.12 replace

The function *replace(string,numStart,numLen,stringNew)*

- ▶ replaces, in the text character string *string*,
- ▶ from the start position defined by *numStart*,
- ▶ a number of characters defined by *numLen*
- ▶ with characters from the new text character string, *stringNew*

Syntax: *=replace(string,numStart,numLen,stringNew)*

Example

Cell A1 = *abcdefgh*

Zelle A2 = *xyz*

=replace(A1,3,2,A2) is *abxyzefgh*

In this example, in the string *abcdefgh*, the characters *cd* (3rd position in the string, 2 characters) are replaced with *xyz*.

3.1.8.10.13 rept

The *rept(string,num)* function repeats the character string *string* for as many times as is defined in *num*.

Syntax: *=rept(string,num)*

Example

Cell A1 = *abc*

Cell A2 = *3*

=rept(A1,A2) is *abccabccabcc*

3.1.8.10.14 right

The *right(string,num)* function provides the number of characters from a character string defined in (*num*), starting with the last character.

Syntax: *=right(string,num)*

- ▶ *string*: Character string in quotation marks or reference to a cell with a character string

- ▶ *num*: Number of characters that are to be read off, starting with the last

Example

Cell A1 = *abcdefgh*

=*right*(A1,3) is *fgh*

=*right*(A1,5) is *defgh*

To read off characters beginning with the first character of a character string, use the left (on page 127) function.

3.1.8.10.15 search

The *search(keystring,string,start)* function provides

- ▶ the position of a search text *keystring*
- ▶ within a character string *string*
- ▶ from the start character position *start*

Syntax: =*search*(string,keystring,start)

EXAMPLE

Cell A4=*search*(A1,A2,A3)

Cell/column	A
1	<i>abcdeABCDEabcde</i>
2	<i>cd</i>
3	<i>1</i>
4	<i>3</i>

The function in cell A4 finds the text being searched for *cd* in cell A1 at position 3.

3.1.8.10.16 substitute

The function *substitute(string,oldstring,newstring,instance)*

- ▶ replaces, in the character string , *string*
- ▶ an *oldstring* character sequence
- ▶ with a new character sequence *newstring*

- ▶ whereby *instance* determines the position of
- ▶ *instance=0* replaces all character strings found

The function is case sensitive.

Syntax: `=substitute(string, oldstring, newstring, instance)`

Example

Cell A1 = *abcdef ABCDEF abcdef ABCDEF abcdef ABCDEF*

Cell A2 = *XYZ*

Example 1:

`=substitute(A1,"ABCDEF",A2,0)` is *abcdef XYZ abcdef XYZ abcdef XYZ*

In this example, the whole character sequence *ABCDEF* in the entire string *abcdef ABCDEF abcdef ABCDEF abcdef ABCDEF* is replaced by *XYZ*

Example 2:

`=substitute(A1,"abcdef",A2,2)` is *abcdef ABCDEF XYZ ABCDEF abcdef ABCDEF*

In this example, the second character sequence *abcdef* found in the string *abcdef ABCDEF abcdef ABCDEF abcdef ABCDEF* is replaced by *XYZ*.

Note: Character string within the function are put into quotation marks ("character string").

3.1.8.10.17 trim

The `trim(string)` function allows a maximum of one space between two characters. All other spaces are removed.

Syntax: `=trim(string)`

Example

Cell A1 = *Too many spaces are reduced to one.*

`=trim (A1)` is: *Too many spaces are reduced to one.*

3.1.8.10.18 upper

The `upper(string)` function replaces all lower case letters of a text character string with upper case letters.

Syntax: `=upper(string)`

Example

Cell A1 = *AbCdEf*
 =upper(A1) is *ABCDEF*

To replace upper case letters with lower case letters, use the lower (on page 128) function.

3.1.8.11 Other functions

Other functions group together report functions that cannot be allocated to a sub-group.

The function assistant (on page 54) is available for configuration.

3.1.8.11.1 Alarm

This function shows information from the alarm administration as a formatted list in a report form.

Syntax: =alarm(FILTER,PARAMETER,DIRECTION)

Transfer parameters	Valid range	Comment
<i>FILTER</i>		Configuration via AML filter.
<i>PARAMETER</i>	<ul style="list-style-type: none"> ▶ <i>name</i> ▶ <i>Identification</i> ▶ <i>text</i> ▶ <i>status</i> ▶ <i>value</i> ▶ <i>time received</i> ▶ <i>time sent</i> ▶ <i>time acknowledged</i> ▶ <i>time reactivated</i> ▶ <i>status reactivated</i> ▶ <i>number reactivated</i> ▶ <i>active</i> ▶ <i>number_h</i> ▶ <i>number_t</i> 	Selection of the filter column to be read. Note: <ul style="list-style-type: none"> ▶ <i>project</i>: Only present in the AML filter with multi-user projects ▶ <i>number</i>: only for one project ▶ <i>number_h</i>: only for one project ▶ <i>number_t</i>: only for one project ▶ <i>number_m</i>: only for one project

Transfer parameters	Valid range	Comment
	<ul style="list-style-type: none"> ▶ <i>number_m</i> ▶ <i>user</i> ▶ <i>computer</i> ▶ <i>note</i> ▶ <i>class</i> ▶ <i>group</i> ▶ <i>project</i> ▶ <i>number</i> 	
<i>RICHTUNG</i>	<ul style="list-style-type: none"> ▶ <i>Down</i> ▶ <i>Left</i> 	Filling in the corresponding direction.

The time filter results from the definition in Screen switching filter report (on page 153).

Direction

Options	Meaning
<i>Right</i>	<p>Value is entered to the right (row).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one column, the value is entered downwards (in the column).</p>
<i>bottom</i>	<p>Value is entered downwards (column).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one row, the value is entered to the right (in the row).</p>



Information

To ensure that the function can dynamically insert lines or columns without overwriting other lines/columns, the labeling of the corresponding row (on page 47) or column (on page 46) must be set to *E* (for "Expand").

3.1.8.11.2 cel

This function shows information from the chronological event list (CEL) as a formatted list in a report. Configuration with the function assistant works along the lines of configuration of the *aml* (on page 136) function.

Syntax: `=cel(FILTER,PARAMETER,DIRECTION)`

Transfer parameters	Valid range	Comment
<i>FILTER</i>		Configuration via CEL filter.
<i>PARAMETER</i>	<ul style="list-style-type: none"> ▶ <i>name</i> ▶ <i>Identification</i> ▶ <i>text</i> ▶ <i>status</i> ▶ <i>value</i> ▶ <i>time received</i> ▶ <i>user</i> ▶ <i>computer</i> ▶ <i>note</i> ▶ <i>class</i> ▶ <i>group</i> ▶ <i>project</i> ▶ <i>number</i> 	Selection of the filter column to be read. Note: <ul style="list-style-type: none"> ▶ <i>project</i>: Only present in the CEL filter with multi-user projects ▶ <i>number</i>: only for one project
<i>DIRECTION</i>	<i>bottom, right</i>	Filling in the corresponding direction.

The time filter results from the definition in Screen switching filter report (on page 153).

Direction

Options	Meaning
<i>Right</i>	Value is entered to the right (row). There must be sufficient cells left free for expected entries from further report creation. Attention: If an <i>archivesp</i> function is created with only one column, the value is entered downwards (in

Options	Meaning
	the column).
<i>bottom</i>	<p>Value is entered downwards (column).</p> <p>There must be sufficient cells left free for expected entries from further report creation.</p> <p>Attention: If an <i>archivesp</i> function is created with only one row, the value is entered to the right (in the row).</p>



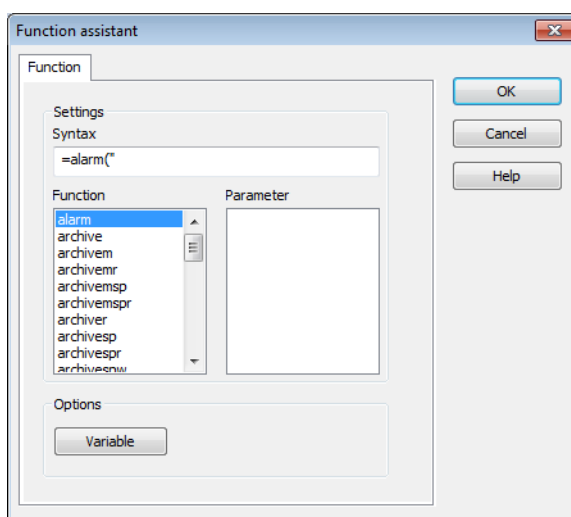
Information

To ensure that the function can dynamically insert lines or columns without overwriting other lines/columns, the labeling of the corresponding row (on page 47) or column (on page 46) must be set to *E* (for "Expand").

3.1.8.11.3 Configuring the alarm and CEL with the function assistant

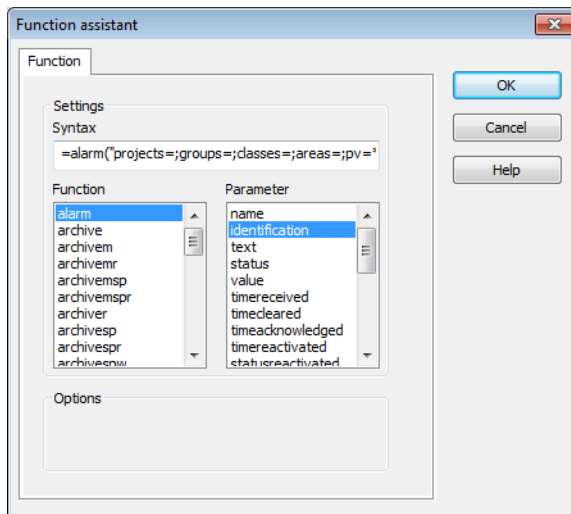
You can configure functions for AML and CEL with the function assistant. This example is carried out with *aml* and works along the lines of *cel*:

1. Select the desired cell in the context menu with the **Report functions** command.
2. The assistant is opened.
3. Select *Alarm*.

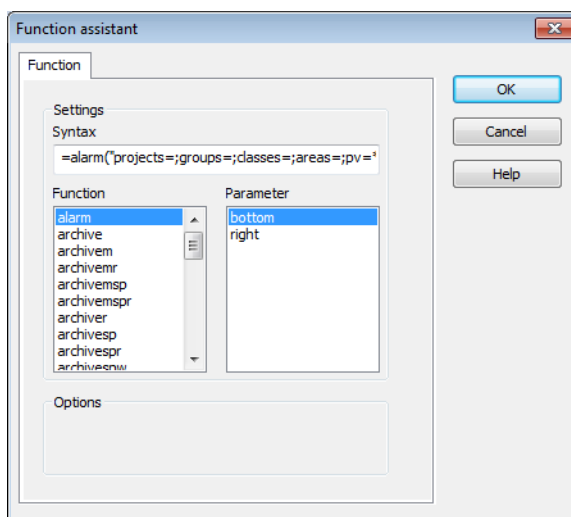


4. The *alarm* report function is entered into the syntax.

5. Clicking on **Variable** opens the Filter for AML. (cel: Filter for CEL.)
6. Configure the filter.
7. Select the desired parameter by double clicking, for example *identification*).



8. The parameter is transferred into the string.
9. Select the desired direction of the entry in the table by double clicking:
 - ▶ *below*: The function fills the column
 - ▶ *right*: The function fills the row



10. The direction is transferred into the string.
11. The brackets are closed.
12. The function is transferred to the cell by clicking on OK.

3.1.8.11.4 compare

The *compare(range,"condition")* function compares values in the stated range with a condition and returns the number of hits.

Syntax: =compare(range,"condition")

Range cells that are used for the comparison

Condition: Content for which the examination is relevant (information always in quotation marks)

Example

```
=compare(A1:A10,6>"=5")
```

Compares cells 1 to 10 in column A and gives the number of values that are greater than or equal to 5.

3.1.8.11.5 comparesp

The *comparesp(start cell,direction,P1,P2,P3,P4,"condition")* function compares values in a given area in a special format with a condition and returns the number of the hits from a reference area.

Syntax: =comparesp(start cell,direction,P1,P2,P3,P4,"condition")

Parameters	Description
<i>Start cell</i>	Cell with the first value.
<i>Direction</i>	"right" or "bottom"
<i>P1</i>	Number of values in the first row.
<i>P2</i>	Empty cells between two value outputs.
<i>P3</i>	Empty cells until the next value row.
<i>P4</i>	Maximum number of values to compare.
<i>Condition</i>	condition. Information always in quotation marks.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- *P1:* Number

- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters P1-P3.

WHEN SELECTING **DOWN**, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING **RIGHT**, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

Example

```
=comparesp(A1,downwards,12,0,0,12,"=5")
```

3.1.8.11.6 comparespsum

The *comparespsum*(*start cell*,*direction*,*P1*,*P2*,*P3*,*P4*,"*condition*") function compares values in a given area in a special format with a condition and returns the sum of the hits from a reference area.

Syntax: =comparespsum(*start cell*,*direction*,*P1*,*P2*,*P3*,*P4*,"*condition*")

Parameters	Description
<i>Start cell</i>	Cell with the first value.
<i>Direction</i>	"right" or "bottom"
<i>P1</i>	Number of values in the first row.
<i>P2</i>	Empty cells between two value outputs.
<i>P3</i>	Empty cells until the next value row.

Parameters	Description
<i>P4</i>	Maximum number of values to compare.
<i>Condition</i>	condition. Information always in quotation marks.

CONTROL CELLS

The parameters *P1*, *P2* and *P3* set out which cells of the report can be filled:

- ▶ *P1*: Number
- ▶ *P2*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns
- ▶ *P3*: Empty cells between two value outputs, depending on *DIRECTION* (*down*, *right*) either empty rows or empty columns

All entries of the time range of the report are shown in the report, going downwards or to the right from the cell in which the function was given, with the row format defined by the parameters *P1*-*P3*.

WHEN SELECTING *DOWN*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of rows to be filled with values
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty columns

WHEN SELECTING *RIGHT*, THE FOLLOWING APPLIES:

- ▶ *P1* = number of columns to be filled
- ▶ *P2* = empty rows between the values
- ▶ *P3* = empty rows between the values

Example

```
=comparespsum(A1,downwards,12,0,0,12,"=5")
```

3.1.8.11.7 comparesum

The *comparesum*(*comparison range*,*sum reference*,"*condition*") function compares values in the stated area with a condition and returns the sum of the hits from a reference area.

Syntax: =*comparesum*(*comparison range*,*sum reference*,"*condition*")

- ▶ *Range* cells that are used for the comparison
- ▶ *Sum reference*: value that is given if the condition is met

Condition: Content for which the examination is relevant (information always in quotation marks)

Example

```
=comparesum(B2:B11,A2,"=5")
```

Cells B2 to B11 are checked for =5. In the lines where this is true, the values of the cell are added to column A.

3.1.8.11.8 computername

The *computername*() function provides the computer names of the computers on which the report is executed.

Syntax: =*computername*()

No transfer parameters are needed.

3.1.8.11.9 maxsp















The *maxsp* function determines the highest value in a range und displays it. The format can be a color or underlined.

Syntax: =*maxsp*(*range*,*num*)

Transfer parameters	Valid range	Comment
<i>range</i>	A1-ATWH31000	Maximum number of columns: 31000 Maximum number of rows: 31000
<i>num</i>	-1 0-15	-1 : underlined 0 ... 15: Color according to the font color in the Create new font dialog (screens/fonts). You can find the allocation list under this table.

ALLOCATION OF FONT COLORS

The font colors are taken from the operating system. To make it easier for you, you can find a list of colors as they are used in Windows:

Color	Number
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	10
	11
	12
	13
	14
	15

Note: If colors are rearranged or redefined in the operating system, the colors defined for *maxsp* also change.

EXAMPLE

The highest value is to be displayed as underlined in report A1 to B4.

INPUT IN THE EDITOR:

Row/column	A	B	C
1	8	5	= <i>maxsp</i> (A1=1; B4=-1)
2	20	2	
3	12	10	
4	32	14	

RESULT IN THE RUNTIME

	A	B
01	08	05
02	12	02
03	12	10
04	<u>32</u>	14

3.1.8.11.10minsp








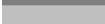








The *minsp(range,num)* functions determine the highest value in a range und displays it. The format can be a color or underlined.

Syntax: *=minsp(range,num)*

Transfer parameters	Valid range	Comment
<i>range</i>	A1-ATWH31000	
<i>num</i>	-1 0-15	-1: underlined 0 ... 15: Color according to the font color in the Create new font dialog (screens/fonts). You can find the allocation list under this table.

ALLOCATION OF FONT COLORS

The font colors are taken from the operating system. To make it easier for you, you can find a list of colors as they are used in Windows:

Color	Number
	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	10
	11
	12
	13
	14
	15

Note: If colors are rearranged or redefined in the operating system, the colors defined for *minsp* also change.

Example

Cell C1=*minsp*(A1:B4,-1)

3.1.8.11.11 Parameter

Parameters make it possible to define a report that is executed via the zenon **Execute report** function and different transfer parameters used in the process perform different tasks. For example, a single report can be used to display the archives of several PLCs. Or a report displays values in different units of measurement. Syntax: *=parameter(Number)*

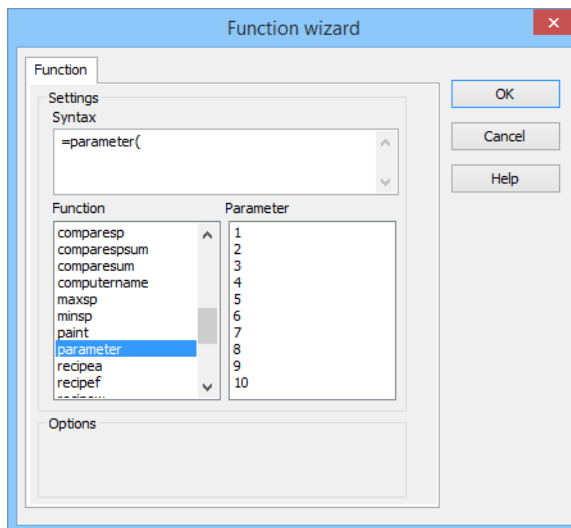
Ten parameters are available:

- ▶ 1 - 5: String type

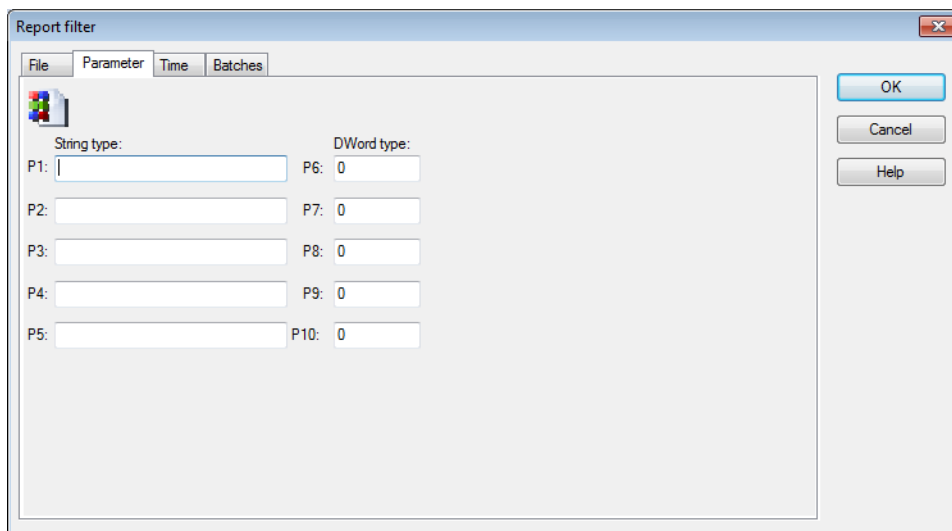
- ▶ 6 - 10: DWord type

ENGINEERING

1. Allocate the desired parameters to the appropriate cells in the report



2. Supplement the parameters with any computer operations or references that may be required.
3. In the Runtime, select the values for the parameters using the **Execute report** function or the **File...** button in the **Report Generator** screen and the **Parameters** tab.



Hint: If you would like to display data from different archives in a report, for example five PLCs, then define a joint report. You control the display via five zenon functions that provide the parameters. You can simply copy these functions, however you must always only change the transfer values in the Parameters tab.

EXAMPLES OF PARAMETERS

- ▶ `=parameter(1)`: allocates parameter (1) to the cell
- ▶ `=parameter(6)*A1/100`: allocates the parameter (6) to the cell, multiplies the value that was set in the *Parameters* tab by the value from cell A1 and divides this by 100

3.1.8.11.12select

The `=select(cell address)` function defines the cell that should be selected on opening the report. As a parameter the cell reference has to be stated.

Syntax: `=select(cell address)`

Example

`=select(B3)` selects cell B3.

Note: Can be combined with `selectmode()`.

3.1.8.11.13selectmode

The `selectmode` function (*selection mode*) sets the selection mode.

The exact cell is determined using the `select` function. The `selectmode()` and `select()` functions are also combined.

Syntax: `=selectmode (Parameter)`

Parameters:

- ▶ (1): One cell can be selected
- ▶ (2): Highlight cells in a rectangular area
- ▶ (3): Highlight one or more attendant cells

EXAMPLES

CELL

Function	Meaning
<code>=selectmode(1)</code>	An individual cell is highlighted.
<code>=select(B6)</code>	The cell B6 is selected and highlighted.

CELL IN LINE

Function	Meaning
<code>=selectmode(3)</code>	A complete cell is highlighted.
<code>=select(A5)</code>	The cell A5 is selected and the line of this cell is highlighted.

3.1.8.11.14 user name

The *username* function username returns the user names that are currently logged in to zenon.

Syntax: `=username()`

No transfer parameters are needed.

3.1.8.11.15 variabler

The `=variabler(variable name,property)` function provides information on a variable.

Syntax: `=variabler(variable name,property)`

Parameters	Description
<i>name</i>	Variable name.
<i>text</i>	Current limit text in the event of a limit being exceeded.
<i>value</i>	Current value of the variable.
<i>unit</i>	Unit of the variable.
<i>identification</i>	Identification of the variable.
<i>mmin</i>	Minimum measuring range of the variable.
<i>mmax</i>	Maximum measuring range of the variable
<i>status</i>	Current status of the variable.
<i>gw1</i>	Limit 1 of the variable.
<i>gw2</i>	Limit 2 of the variable.

Parameters	Description
<i>gw3</i>	Limit 3 of the variable.
<i>gw4</i>	Limit 4 of the variable.



Information

The report is created more quickly if the variables called up are advised.

CONFIGURATION WITH THE FUNCTION ASSISTANT

1. Select the **Report functions** report table in the context menu
2. Select *variabler*
3. click on the **Variable** button
4. Select the desired variable:
Several variables can be selected; these are entered in a downward direction, starting from the cell in which the report function is defined
5. select the property to be displayed



Example

```
=variabler("WIZ_VAR_10","name")
```

3.1.8.11.16variablerw

The `variablerw(variablename,property,action)` function provides information on variables and writes values in variables.

Syntax: `=variablerw(VariableName,Property,Action)`

Property	Description
<i>name</i>	Variable name.
<i>text</i>	Current limit value text in the event of a limit being exceeded.
<i>value</i>	Current value of the variable.
<i>unit</i>	Unit of the variable.

Property	Description
	Note: may not be used together with unit conversion. Only for use with older projects. If a unit of a variable defined in the unit conversion is changed with this report command in the Runtime, configuration must be carried out again in unit switching.
<i>identification</i>	Identification of the variable
<i>mmin</i>	Minimum measuring range of the variable. Note: may not be used together with unit shift.
<i>mmax</i>	Maximum measuring range of the variable Note: may not be used together with unit shift.
<i>status</i>	Current status of the variable.
<i>gw1</i>	Limit value 1 of the variable.
<i>gw2</i>	Limit value 2 of the variable.
<i>gw3</i>	Limit value 3 of the variable.
<i>gw4</i>	Limit value 4 of the variable.



Information

The report is created more quickly if the variables called up are advised.

CONFIGURATION WITH THE FUNCTION ASSISTANT

1. Select the **Report functions** report table in the context menu
2. Select *variabler*
3. click on the **Variable** button
4. Select the desired variable:
Several variables can be selected; these are entered in a downward direction, starting from the cell in which the report function is defined
5. select the property to be displayed
6. Enter the desired action

Example

```
=variablerw("WIZ_VAR_10","value","read")
```

WRITE VALUE TO VARIABLE

To write a value from the Report Generator to a variable, enter the variable name, the "value" property and the cell that contains the value to:

```
=variablerw(variable name,"value",cell)
```

Example: `=variablerw("InternalVariable","value",A2)`

3.1.8.12 Formatting keys

The formatting keys define the formatted output of cell details depending on the cell contents (data types).

The definition is made:

- ▶ In the drop-down list **Format -> Cells -> Numbers -> Cell type tab -> General/format string**
or
- ▶ In the context menu Report table -> **Cell -> Cell type tab -> General/format string**

3.1.8.12.1 Numerical data types

Format keys for numerical data types are symbolic dummies that are replaced by the formatted value.

- ▶ The comma is used as a thousand-divider; a period is used for decimal points.
- ▶ Each character which does not represent a format key is transferred into the output as a text character.
- ▶ If no format key is given, the format *0.* is used as a standard setting.

Note: A maximum of 15 decimal digits are permitted with the standard setting.

Format key	Description
,	Inserts the thousand-separator three digits after the decimal separator.
(comma)	
.	Inserts the decimal separator.
(period)	
;	Separates the format key for positive and negative value ranges.

Format key	Description
(semicolon)	
#	Is only replaced if the corresponding place is also available.
*	All places before ore after the decimal point are displayed.
0 (Cero)	If the position in the value does not exist then it is filled with zero.
/	The following character is treated as a text character string.

EXAMPLES

Data	Format key	Formatted text	Description
-0.2	*0.00	-0.20	Two decimal places are always output.
123	*00000	00123	The first 5 places are output with leading zeros.
104	->*<-	->104<-	Numbers are basically output between the ->...<- characters.
0.2500	*0.*	0.25	For values between -1.0 and 1.0, a leading zero is always output.
12	+*0.00;-*0.00	+12.00	Positive values are indicated with + and negative values with -.

3.1.8.12.2 Logical data types

Yes/No information can be displayed in different ways with logical data types. The output text is determined using the formatting key.

- ▶ Format: *Text1;Text2*
- ▶ Output:
 - ▶ Positive values including zero = *Text 1*
 - ▶ Negative values = *Text 2*

Output information can be described independently of the cell formatting with the *if* (on page 94)(*exprTest, valTrue, valFalse*) function.

EXAMPLE

Data	Format key	Formatted text	Description
1		Yes	If no formatting key is given, true/false is used as a default.
-1	Yes;No	No	

3.1.8.12.3 Data types for date and time

A variety of formatting keys are available for the output of date and time details. In input mode and for output without formatting keys, the output format defined under the windows country settings is used.

**Information**

Descriptions for days and months can be configured as language switchable in the Runtime.

Each character which does not represent a format key is transferred into the output as a text character.

Format key	Value	Description
min	1 - 12	Month numerical short
mm	01 - 12	Month numerical long
mmm	Jan - Dec	Month short
mmmm	January - December	Month long
d	1 - 31	Day short
dd	01 - 31	Day long
ddd	Sun - Sat	Weekday short
dddd	Sunday - Saturday	Weekday long
yy	00 - 99	Year short
yyyy	1700 - 2900	Year long (0x is interpreted as 190x)
/		International date separator

Format key	Value	Description
h	0 - 23 oder 1 - 12	Hour short, either 24 h or 12 h with <i>ap</i>
hh	00 - 23 oder 01 - 12	Hour long, either 24 h or 12 h with <i>ap</i>
mm	00-59	Minutes, only after h or hh
ss	00-59	seconds
ff	000-999	Milliseconds
ap	<i>am</i> , <i>pm</i> (or international equivalent)	am or pm
:		International time separator
(colon)		

EXAMPLE

Data	Format key	Formatted text
22.09.95 2:05 PM	dddd dd/mm/yyyy	<i>Friday 22.09.1995</i>
22.09.95 2:05 PM	dd/mmmm yyyy	<i>22.September 1995</i>
22.09.95 2:05 PM	dd/mm/yy hh:mm	<i>9/22/1995 2:05 PM</i>
22.09.95 2:05 PM	hh:mm:ff	<i>2:05 PM:000</i>

3.1.9 zenon functions for Report Generator

zenon provides functions to control the Report Generator in Runtime.

The screen switching (on page 153) function switches to the **Report Generator** screen and makes it possible to define filters.

Special functions make it possible to print, export, and execute a report in the Runtime. To create zenon functions for the report generator:

1. In the functions context menu, go to: **New function -> Report generator**.
2. Select the desired function:

- ▶ Print report (on page 193)
- ▶ Export report (on page 194)
- ▶ Report: execute (on page 191)

3.1.9.1 Report Generator screen switching

To use command sequences in the Runtime, configure a screen switch function to a **Report Generator** screen:

1. Create a new **Report Generator** screen.
2. Select the **New function** entry in the **Functions** node.
3. Select the **Screen switching** function.
4. Select the **Report Generator** screen.
The report filter (on page 153) is displayed.
5. Select the desired properties.
6. Link the function to a button in the screen in order to switch to the **Report Generator** screen in the Runtime.

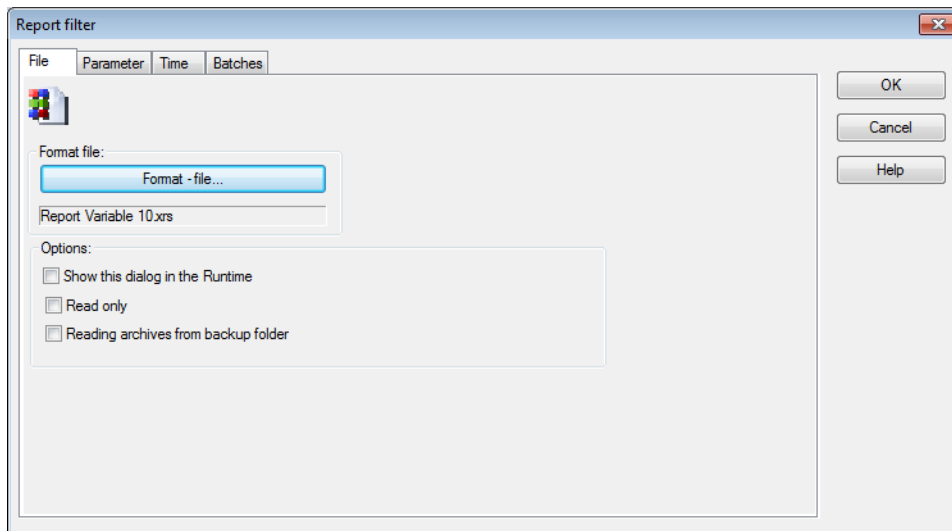
3.1.9.2 Report filter

Displayed when creating zenon functions for configuring reports:

- ▶ File (on page 154): Selection of report file and conditions in the Runtime
- ▶ Parameter (on page 155): Transfer parameters
- ▶ Time (on page 156): Time period
- ▶ Lots (on page 174): Filtering on batches
- ▶ Links (on page 183): Replace functions
- ▶ Indexes (on page 187): Replace indices

3.1.9.2.1 File

In the 'File' tab, you define which report is called up when screen switching or if this is to be decided in the Runtime.



Parameter	Description
Format file	selection of the report file configured (on page 10) in the editor (*.xrs)
Show this dialog in the Runtime	<p><i>Active:</i> Before every call of the screen the filter dialog is opened. The filter settings can be modified. This option is not available with Windows CE.</p> <p>Note: If, in the Lots tab, the Show lot selection dialog option is also selected, then the lot selection dialog is called up in the Runtime. This is no longer displayed after reloading.</p> <p>Notes for time range filters:</p> <p>Show this dialog in the Runtime <i>active:</i></p> <ul style="list-style-type: none"> ▶ The dialog with the filter settings is opened in Runtime when switching screens. The filter is no longer offered when reloading. This behavior can differ for individual screen types if the dialog was displayed in screen switching and canceled. ▶ The last time period that has finished is always used. <p>Show this dialog in Runtime <i>inactive:</i> The screen is opened with the set time filter.</p> <ul style="list-style-type: none"> ▶ Use last finished time range <i>active:</i> The last time period that has finished is always used

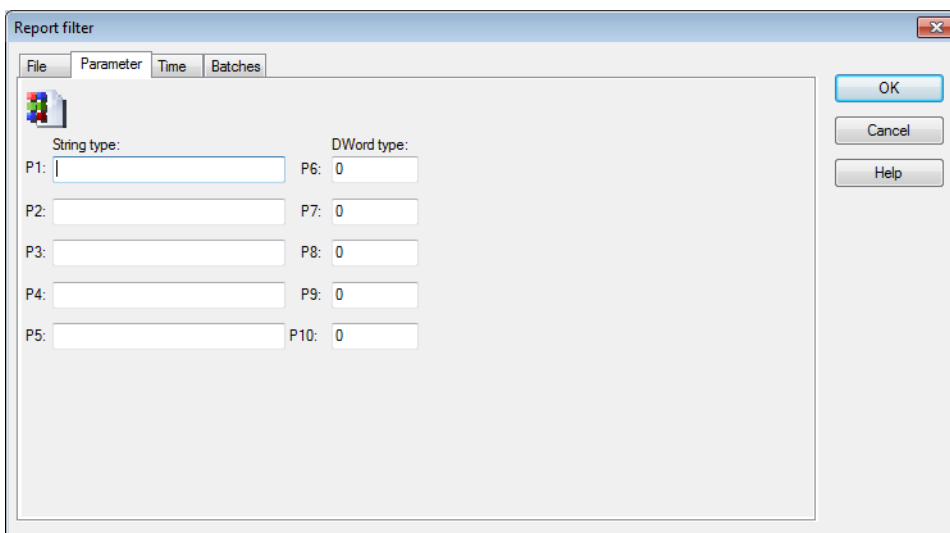
Parameter	Description
	<ul style="list-style-type: none"> ► Use last finished time period <i>inactive</i>: The current time period is used.
read only	<i>Active</i> : Entries can only be read. It is not possible to change or save them.
Reading archives from the read-back folder	<i>Active</i> : Stored archives are read in from the read-back folder defined in project configuration. When loading archive data from the readback folder, the archive data from the Runtime path and from all subfolders of the readback folder is also read.

The file configuration is different for:

- Print report (on page 193)
- Export Report (on page 194)
- Report: execute (on page 191)

3.1.9.2.2 Parameters

Parameters make it possible to use a report for different archives. To do this, the fields to be used flexibly are defined with the *parameter(Number)* (on page 143) report function. The parameters to be used are set in the 'Parameters' tab of the screen switching function. For example, a single report can be used to display the archives of several controls. Or a report displays values in different units of measurement.



Ten parameters are available:

- 1 - 5: String type

- ▶ 6 - 10: DWord type

If, for example, the archive data of five PLCs is to be displayed, a report is created and the five parameters for the PLCs are transferred via the five switching functions.

3.1.9.2.3 Time

Time filters make it possible to limit the data to be displayed or exported. The time filters are very flexible to implement and can be pre-set in the Editor or amended in the Runtime.

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

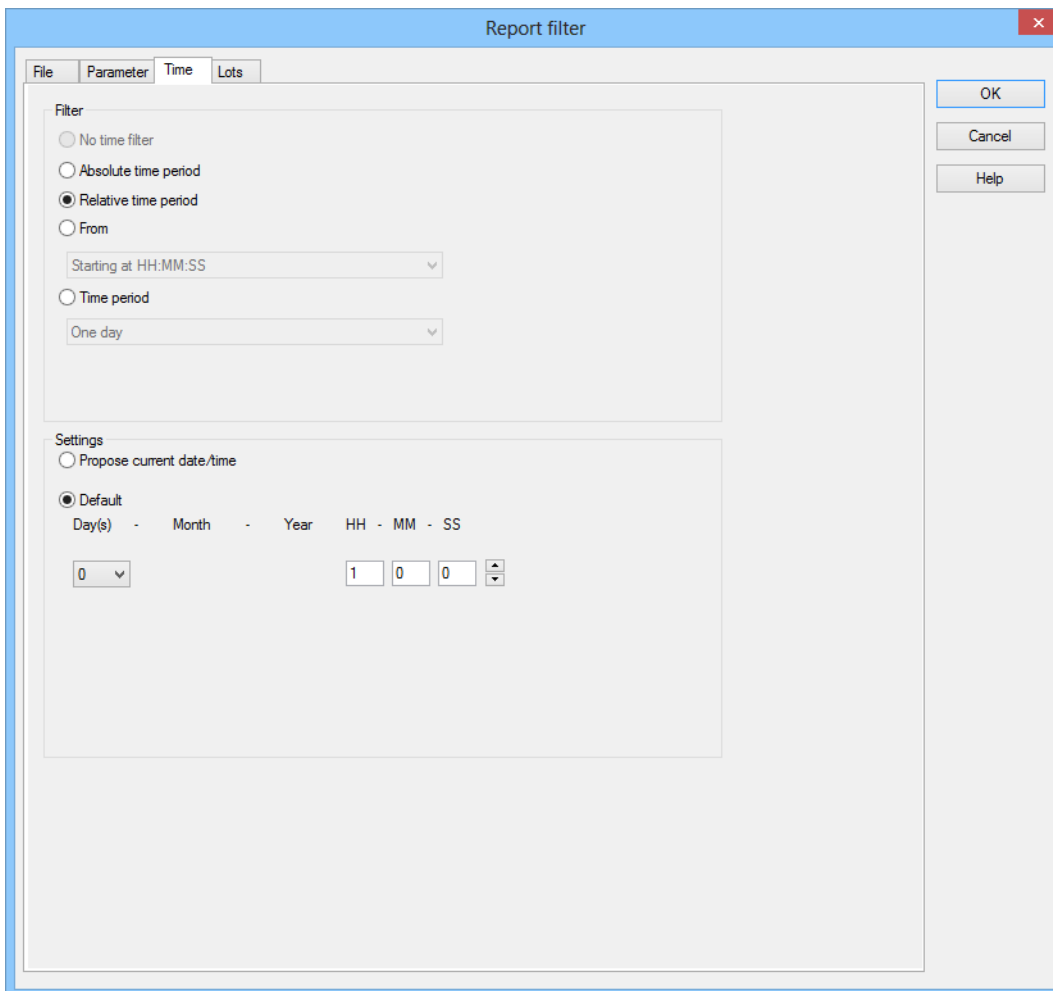
Time filters can both be pre-set in the Editor or amended in the Runtime for:

- ▶ Absolute time period (on page 160)
- ▶ Relative time period (on page 161)
- ▶ From (on page 163)
- ▶ Time period (on page 166)

Time filtering can be carried out in two ways:

1. Define time period in the Editor (on page 171)
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 also no longer be amended in the Runtime.
2. Time filter amendable in Runtime (on page 173)
Pre-defined times are used. The time filter is defined in the Editor and can be changed in the Runtime as desired.

TIME FILTER



FILTER

Selection of the filter.

Parameter	Description
No time filter	<p><i>Active:</i> No time filter is used.</p> <p>Note: In the Runtime, all entries since 1. 1. 1990 are displayed. Use of this filter setting is not supported by Extended Trend.</p>
Absolute time period	<p><i>Active:</i> A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used.</p> <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>Note: Time is saved in UTC. For details see chapter Handling of date</p>

Parameter	Description
	and time in chapter Runtime.
Relative time period	<p><i>Active:</i> A relative time period is entered.</p> <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>Attention: this filter is constantly updated.</p> <p>Process Recorder: The time that is played back is used as the current time in the Process Recorder module in playback mode. As a result, reference is always made at the time of the recorded and reproduced data, and not at the time when the data is played back on the computer.</p>
From	<p><i>Active:</i> 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.</p> <p>Selection of the area mode from drop-down list:</p> <ul style="list-style-type: none"> ▶ Starting from HH:MM:SS ▶ Starting from day at HH:MM:SS ▶ Starting from day, month - HH:MM:SS <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>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.</p> <p>Process Recorder: The time that is played back is used as the current time in the Process Recorder module in playback mode. As a result, reference is always made at the time of the recorded and reproduced data, and not at the time when the data is played back on the computer.</p>
Time period	<p><i>Active:</i> A fixed time period is entered. Selection of the area mode from drop-down list:</p> <ul style="list-style-type: none"> ▶ One day ▶ One week

Parameter	Description
	<ul style="list-style-type: none"> ▶ Two weeks ▶ One month ▶ One Year ▶ 15 minutes ▶ 30 minutes ▶ 60 minutes <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>The following selection is also enabled on activation:</p> <ul style="list-style-type: none"> ▶ Offer selection dialog ▶ Use current date/time <p>The Modify time period property can be activated.</p> <p>The time period can be moved to the future.</p> <p>The time period can be amended.</p> <p>Example: Create a screen switch, for example to an <i>AML</i> screen. In the screen switching filter dialog in the Time tab, set the filter to time period and select One Month in the drop-down list. Select Use current date/time under Settings. Activate the checkbox option Modify time period. Enter the following setting under Move time period to the future: HH = 0. Activate, under Change time period by, the checkbox option Use the last completed time period.</p> <p>Evaluation: today's date: 22.02.2018</p> <p>Result of the time filter in the Runtime: 01.01.2018 - 31.01.2018</p>

CLOSE DIALOG

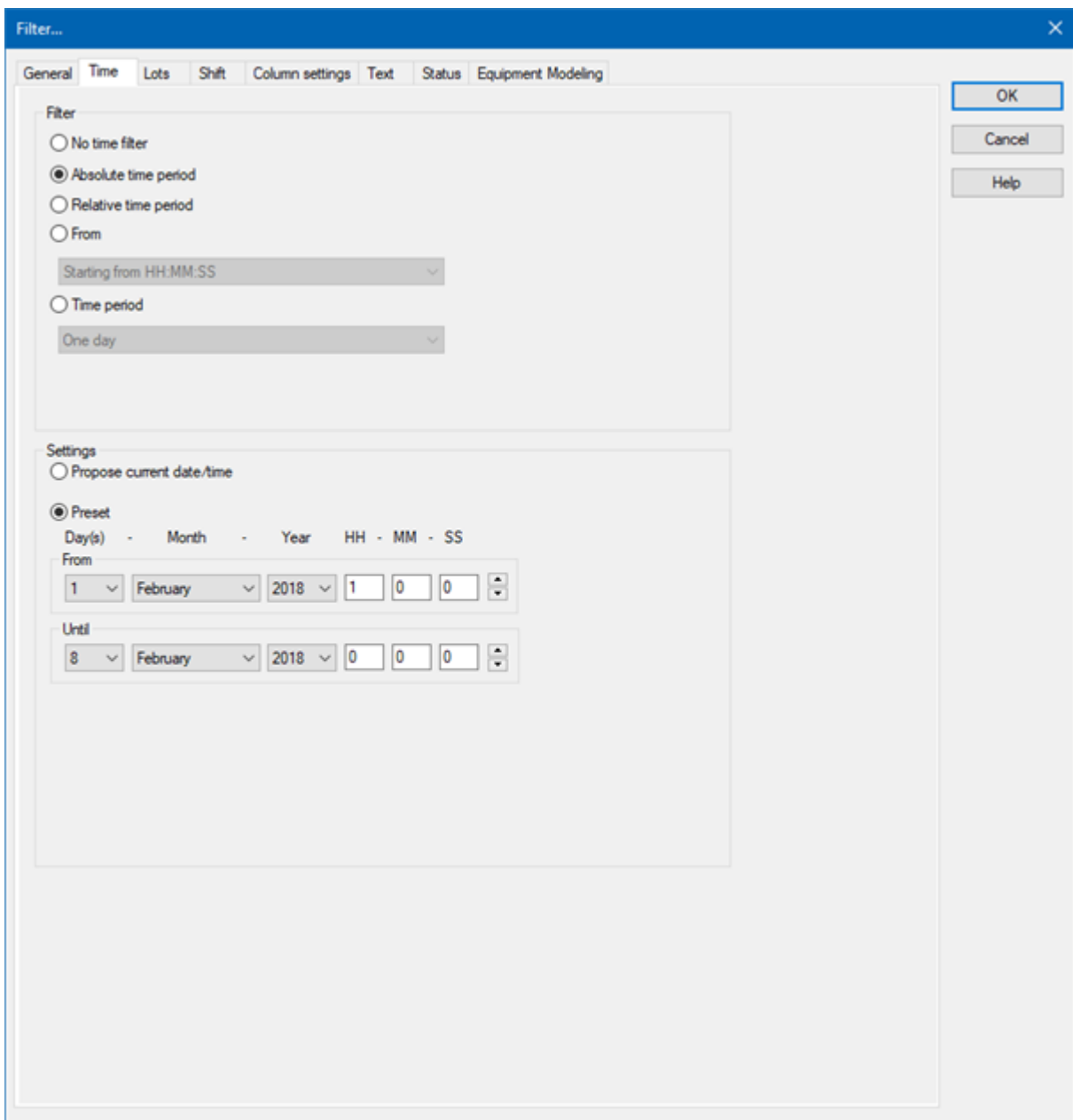
Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Note: A time filter must be configured for screen switching to a **Report Generator** screen. The **No time filter** option is not available.

3.1.9.2.4 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



Parameter	Beschreibung
Einstellungen	Konfiguration des Zeitfilters.

Parameter	Beschreibung
Aktuelles Datum/Uhrzeit vorschlagen	<i>Aktiv:</i> Zeitfilter wird zur Runtime konfiguriert.
Vorgabe	<i>Aktiv:</i> Zeitfilter wird im Editor vorgegeben. Zur Runtime kann nur noch der Startzeitpunkt festgelegt werden.
Von	Startzeitpunkt des Filters. Auswahl von Tag, Monat, Jahr, Stunde, Minute und Sekunde.
Bis	Endzeitpunkt des Filters. Auswahl von Tag, Monat, Jahr, Stunde, Minute und Sekunde.

CLOSE DIALOG

Option	Description
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.

3.1.9.2.5 Relative period of time

A relative time period is entered.

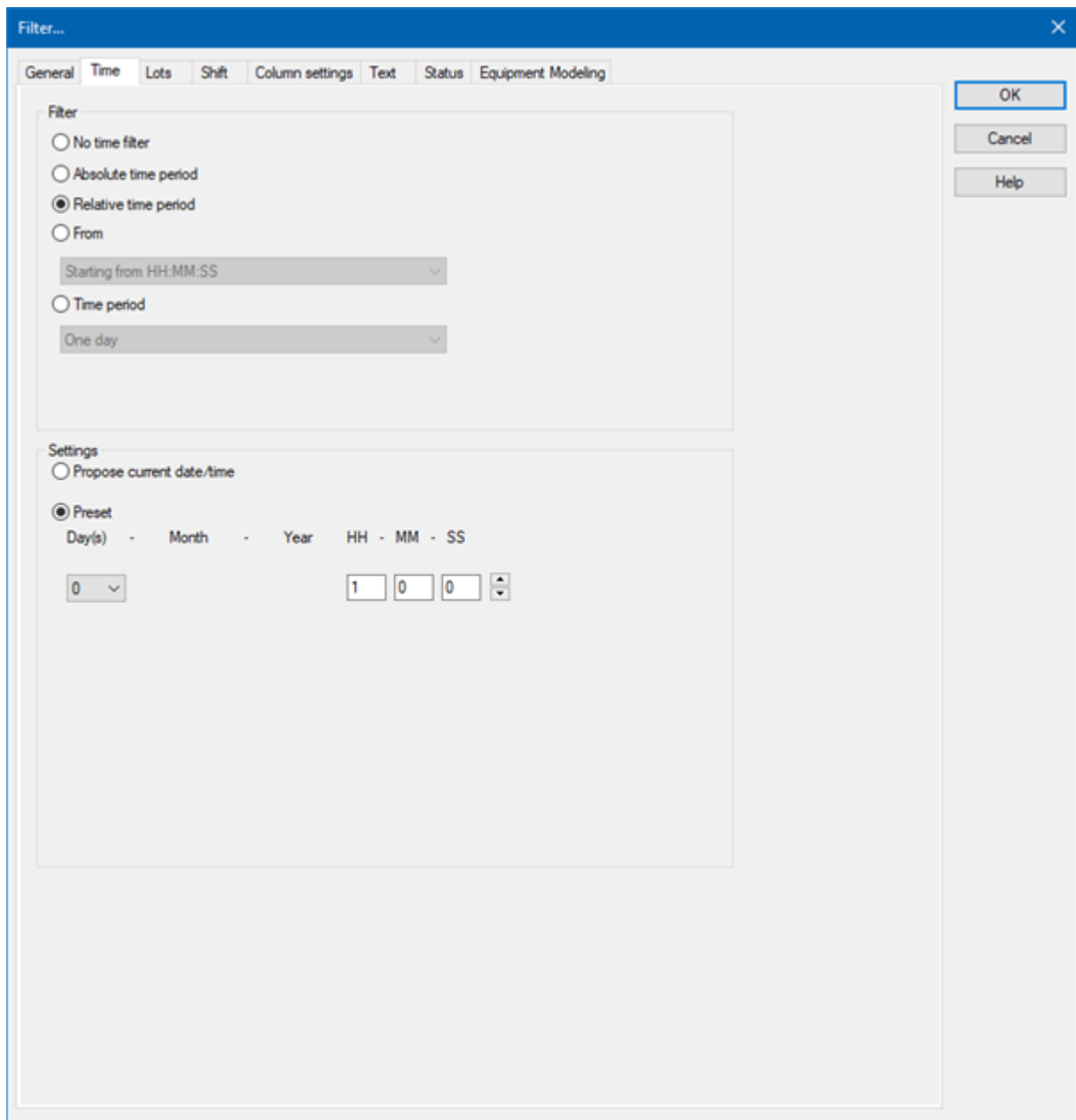
Attention: This filter is updated constantly and continues to run.

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



Parameter	Description
Settings	Configuration of the time filter.
Propose current date/time	<i>Active:</i> Time filter is configured in the Runtime.
Default	<p><i>Active:</i> The time filter is prescribed in the Editor. Only the start time can still be stipulated in the Runtime.</p> <p>Selection of the relative time period in days, hours, minutes and seconds.</p>

CLOSE DIALOG

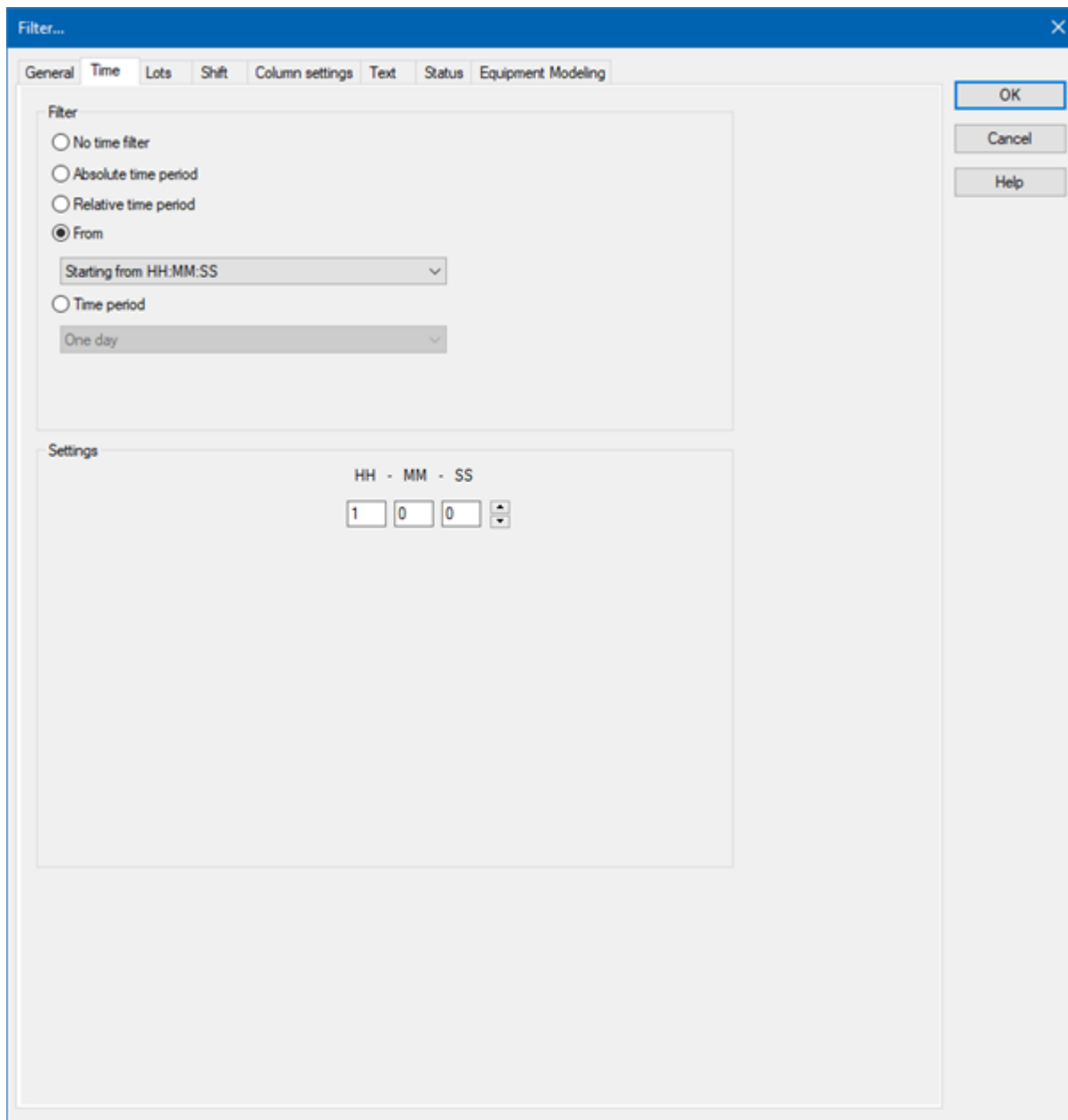
Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.1.9.2.6From

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.
 - ▶ *Starting from HH:MM:SS*
 - ▶ *Starting from day - HH:MM:SS*
 - ▶ *Starting from day, month - at HH:MM:SS*

- Configure the desired time in the **Settings** section



Filter...

General Time Lots Shift Column settings Text Status Equipment Modeling

Filter

☐ No time filter
☐ Absolute time period
☐ Relative time period
☒ From

Starting from HH:MM:SS

☐ Time period
 One day

Settings

HH - MM - SS

1 0 0

OK Cancel Help

Parameter	Description
Settings	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: <ul style="list-style-type: none"> ▶ Starting from HH:MM:SS ▶ Starting from day at HH:MM:SS ▶ Starting from day, month - HH:MM:SS

Parameter	Description
	<p>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.</p> <p>The end time point is not defined with this filter, it is carried over.</p>
▶ <i>Starting from HH:MM:SS</i>	<p>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.</p> <p>Example: You enter <i>11:00:00 PM</i>. 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.</p>
▶ <i>Starting from day at HH:MM:SS</i>	<p>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.</p> <p>Example: You enter day 5 - 11:00:00 PM. 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 is carried out from 23:00 on the 5th of the previous month to the current time point.</p>
▶ <i>Starting from day, month - HH:MM:SS</i>	<p>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.</p> <p>Example: You enter Day 5, Month October - 11:00:00 PM. 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 23:00 on the 5th of the previous year to the current time point.</p>

CLOSE DIALOG

Option	Description
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.

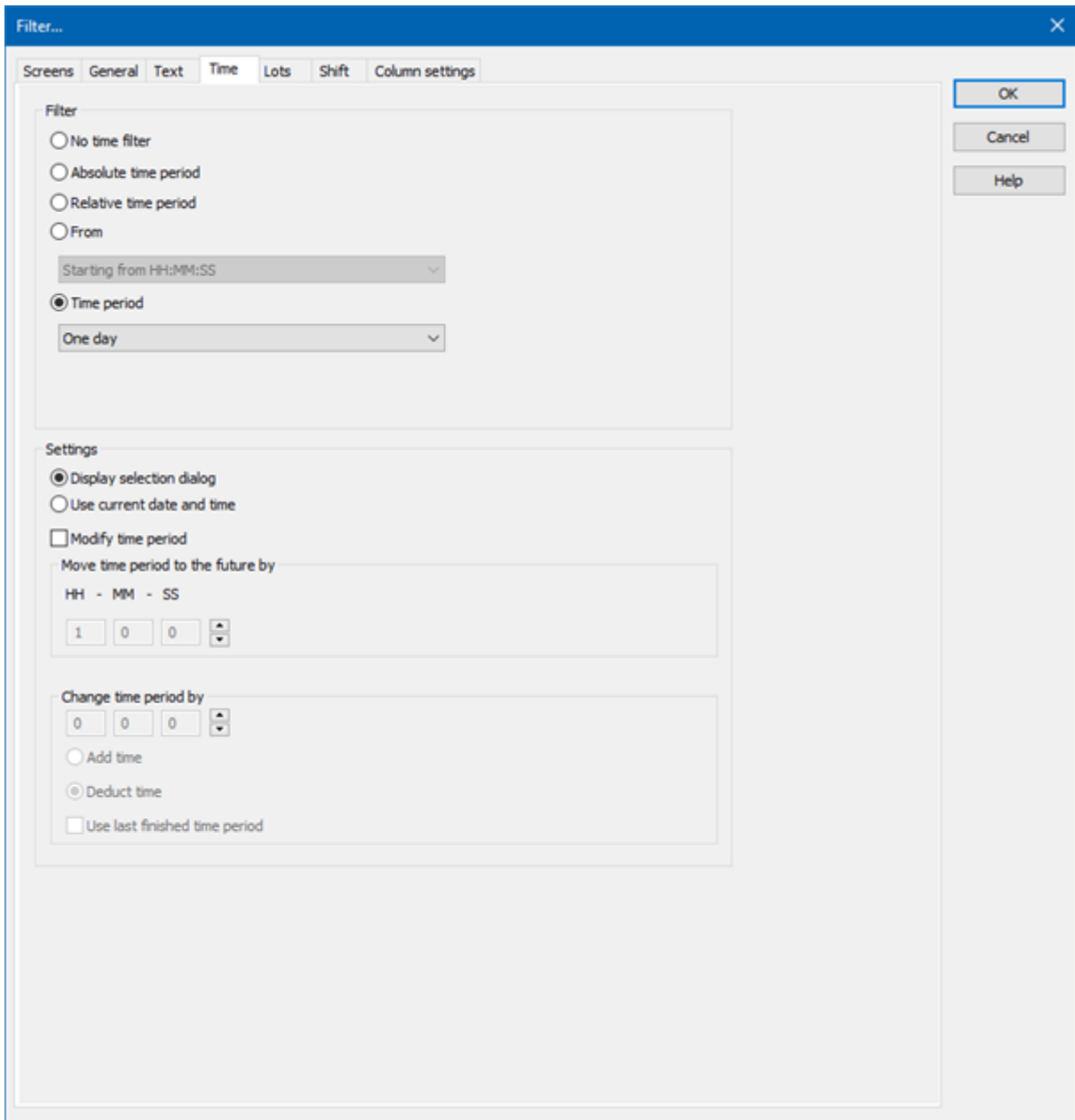
3.1.9.2.7Time period

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.

3. **Note:** The **Offer selection dialog** and **Use current date/time** entries are deactivated if, in the **Filter...** dialog in the **Display** tab under **Runtime**, the **Show this dialog in Runtime** property has been activated.



Filter...

Screens General Text **Time** Lots Shift Column settings

Filter

☐ No time filter

☐ Absolute time period

☐ Relative time period

☐ From

Starting from HH:MM:SS

☒ Time period

One day

Settings

☒ Display selection dialog

☐ Use current date and time

☐ Modify time period

Move time period to the future by

HH - MM - SS

1 0 0

Change time period by

0 0 0

☐ Add time

☒ Deduct time

☐ Use last finished time period

OK Cancel Help

Option	Description
Time period	<p>Selection of a time range from a drop-down list.</p> <p>In Runtime this time range is filtered. The filter starts with the fixed start time of its time period:</p> <ul style="list-style-type: none"> 15 minutes: 0, 15, 30, 45 minutes of the hour

Option	Description
	<ul style="list-style-type: none"> ▶ 30 minutes: 0, 30 minutes of the hour ▶ 60 minutes: 0 minutes of the hour <p>Example 1:</p> <ul style="list-style-type: none"> ▶ Time period: 60 minutes ▶ Current time: 8:50 AM ▶ Result: Display for 08:00 - 08:50 <p>Example 2:</p> <ul style="list-style-type: none"> ▶ Time period: 60 minutes ▶ Current time: 9:00 AM ▶ Result: Display for 08:00 - 9:00 AM <p>Example 3:</p> <ul style="list-style-type: none"> ▶ Time period: 15 minutes ▶ Current time: 8:35 AM ▶ Result: Display for 8:30 AM - 8:35 AM <p>Example 4:</p> <ul style="list-style-type: none"> ▶ Time period: 15 minutes ▶ Current time: 8:45 AM ▶ Result: Display for 8:30 AM - 8:45 AM <p>Dialog in the Runtime:</p> <p>If this dialog is also offered in the Runtime, the start time of the time range can be selected.</p> <p>The following possibilities for selection are activated:</p> <ul style="list-style-type: none"> ▶ Offer selection dialog ▶ Use current date/time <p>The Modify time period property can be activated.</p> <ul style="list-style-type: none"> ▶ The time period can be moved to the future. ▶ The time period can be amended.
Settings	Optional setting for the time range.
Offer selection dialog	The selection dialog for the start time of the filter is offered

Option	Description
	in the Runtime.
Use current date/time	The current date/time is set for the filter.
Modify time period	<p>Allows amendments to cycles, postponements and extensions of time periods.</p> <p><i>Active:</i> Evaluation is carried out in accordance with the following rules:</p> <ul style="list-style-type: none"> ▶ 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. <p><i>Inactive:</i> No changes to the time period are made.</p> <p>Attention: As of version 7.10, filter actions on the basis of this function lead to different results than in prior versions.</p>
Move time period to the future by	<p><i>Active:</i> The time period defined in the filter is postponed to the future. The start and end time are moved by the set time span.</p> <p>Given in <i>hours - minutes - seconds</i>.</p> <p>If a postponement that is the same or greater than the selected time period is set, a note to check the configuration is displayed.</p> <p>Note: The default value for HH is 1. If, for example, an evaluation of the last month is to be undertaken, this value must be set to 0.</p>
Change time period to	<p><i>Active:</i> The time period defined in the filter is modified. The end time is moved by the set time span. The start time remains unchanged.</p> <p>Given in <i>hours - minutes - seconds</i>.</p> <p>The time range can be added or deducted. Selection by means of radio buttons:</p> <ul style="list-style-type: none"> ▶ Add time: The time stated in Change time period by is added to the time defined in the Time range option.

Option	Description
	<p>► Deduct time: The time stated in Change time period by is deducted from the time defined in the Time range option.</p> <p>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 next to the control element for time configuration.</p> <p>The following options are available:</p> <ul style="list-style-type: none"> ► <i>Use current time period</i> ► <i>Use last finished time period</i> ► <i>Use next completed time period</i> <p>Default: <i>Use current time period</i></p>
Use current time period	<i>Active:</i> The current time period is used for the filter process.
Use last finished time period	<p><i>Active:</i> The last selected and fully-completed time period in the Time period option is used.</p> <p>Example: For the Time period option, <i>One day</i> was selected. Filtering is thus carried out for "Yesterday", because this is the last day that was completed in full.</p>
Use next completed time period	<p><i>Active:</i> The last selected and fully-completed time period in the time period option is used.</p> <p>Example: For the Time period option, <i>One day</i> was selected. Filtering is thus carried out for "tomorrow", because this is the next day that will be completed in full.</p>

CLOSE DIALOG

Option	Description
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.

3.1.9.2.8 Specify 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 the Runtime. You can then only define the start time in the 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.

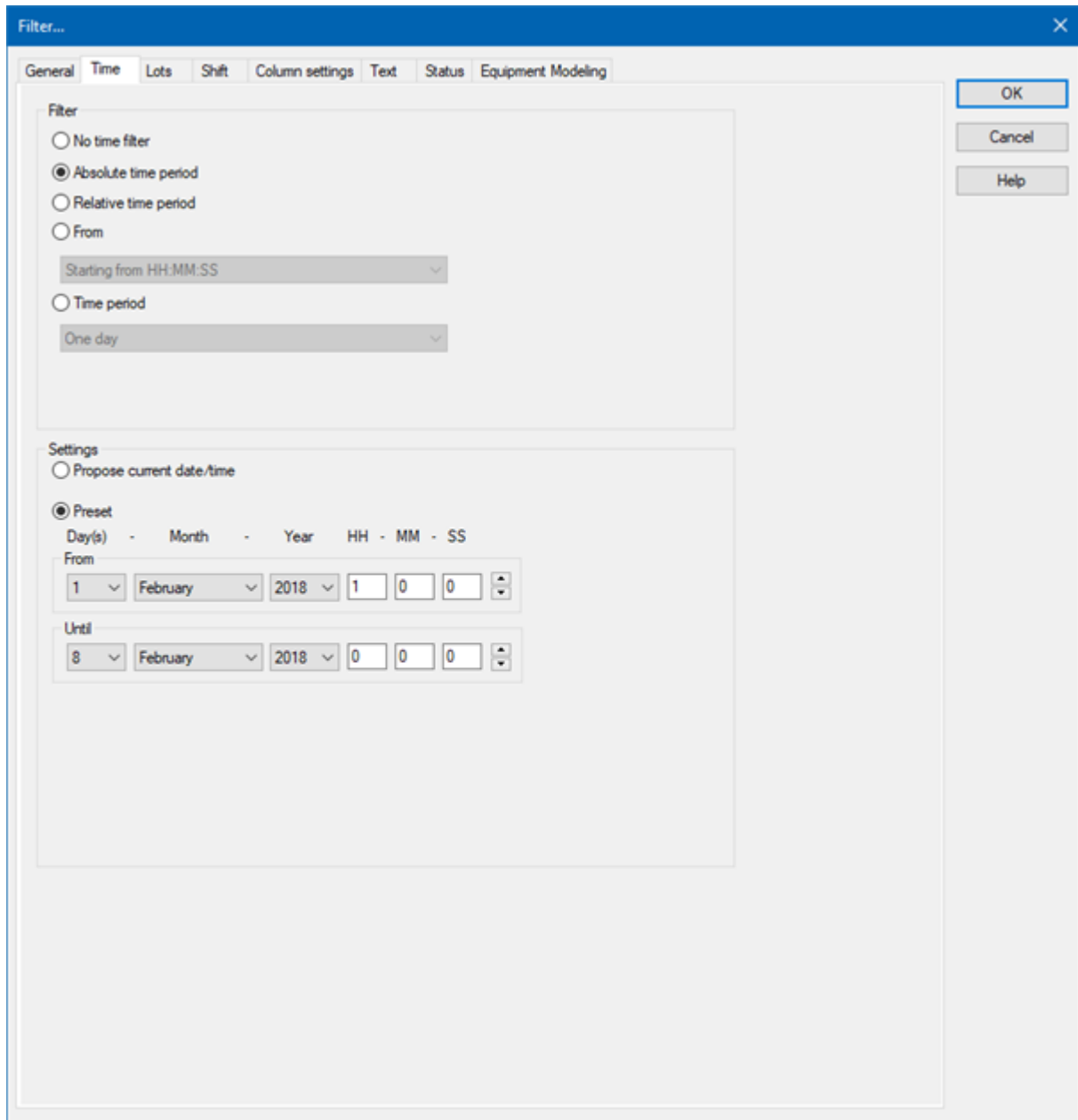
Attention

When using this type of filter, you can also no longer amend all other filters in the 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 the Runtime
2. select the desired filter

3. Configure the selected time period



Day(s)	Month	Year	HH	MM	SS
From					
1	February	2018	1	0	0
Until					
8	February	2018	0	0	0

Tip for time period: Activate the *Show 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.

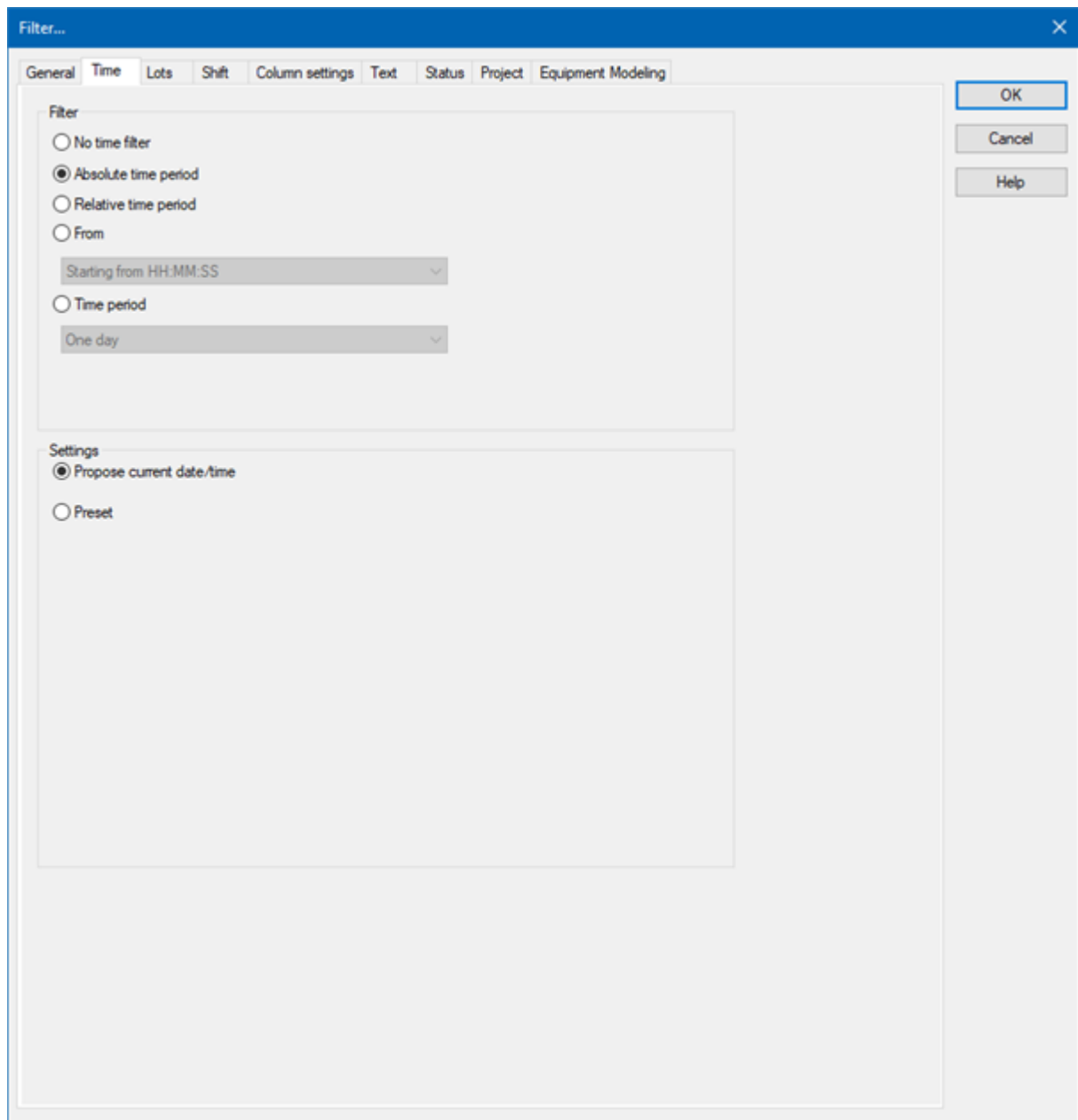
3.1.9.2.9 Time filter can be configured in Runtime

With this method, the time filter can be amended in the Runtime before execution.

To create the filter:

1. select the desired filter:
 - ▶ Absolute time period
 - ▶ Relative time period
 - ▶ Time period
2. Select, in the Settings section, the option **Propose current date/time**

3. The filter dialog is opened in the Runtime with the current date and time



3.1.9.2.10 Lots

You configure the limitation of the display to certain lots in this tab. The lot information is also applied to the existing filter. Lot filtering corresponds to filtering in the archives.



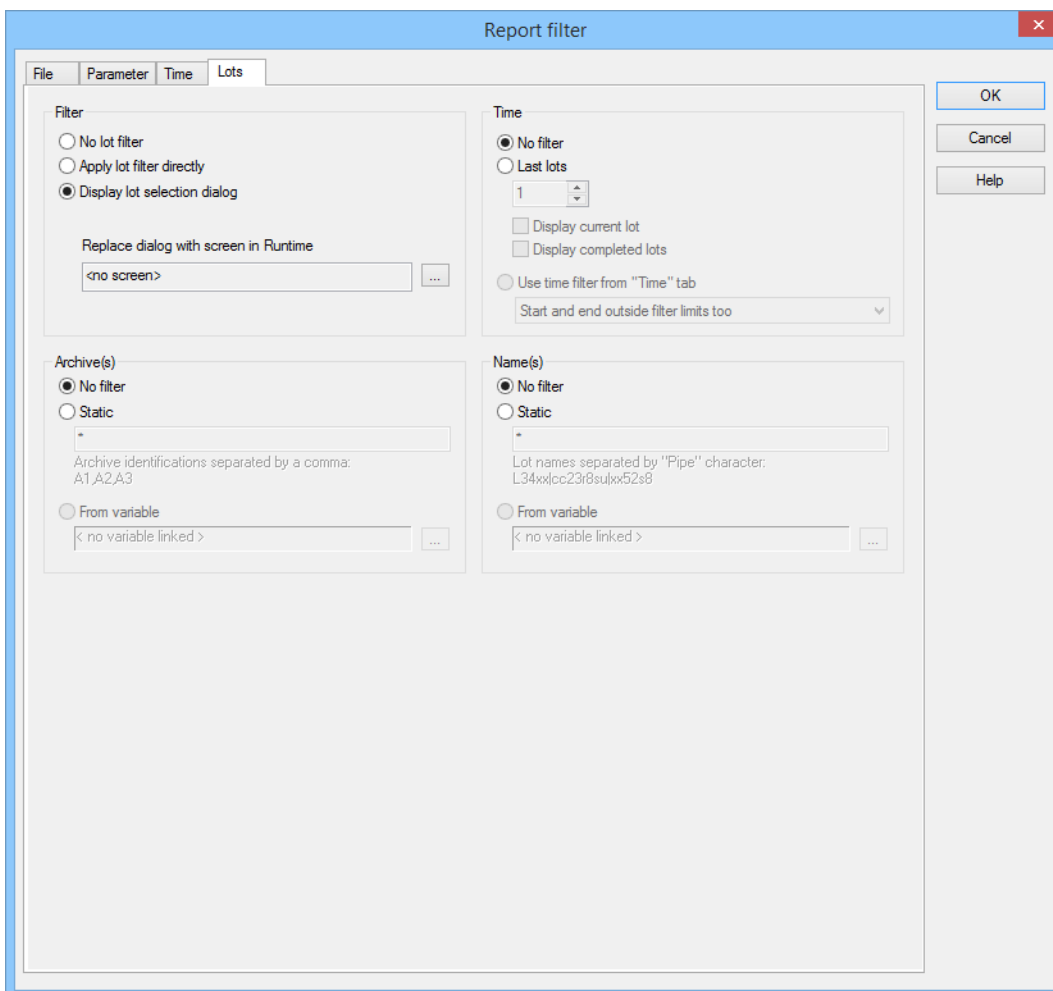
Information

Some filters in zenon can be configured independently of one another and then combined in the Runtime. This is only possible to a limited extent with the lot filter.

The lot filter can offer a list of existing lots in the Runtime. It is Runtime data that is not available in the Editor.

When configuring the screen switching in the Editor, the **time filter** tab can only be used in conjunction with the lot filter as a prefilter for the lot selection dialog. If a lot from this list is then selected in the Runtime, the time filter is overwritten with the data from the selected lot, in order to achieve precise filtering for the selected lot.

That means: If the lot selection dialog is used in the Runtime and a lot is selected, the time filter displayed does not correspond to the one configured in the Editor.



FILTER

Settings for the application of the lot filter. Selection of one of the following options:

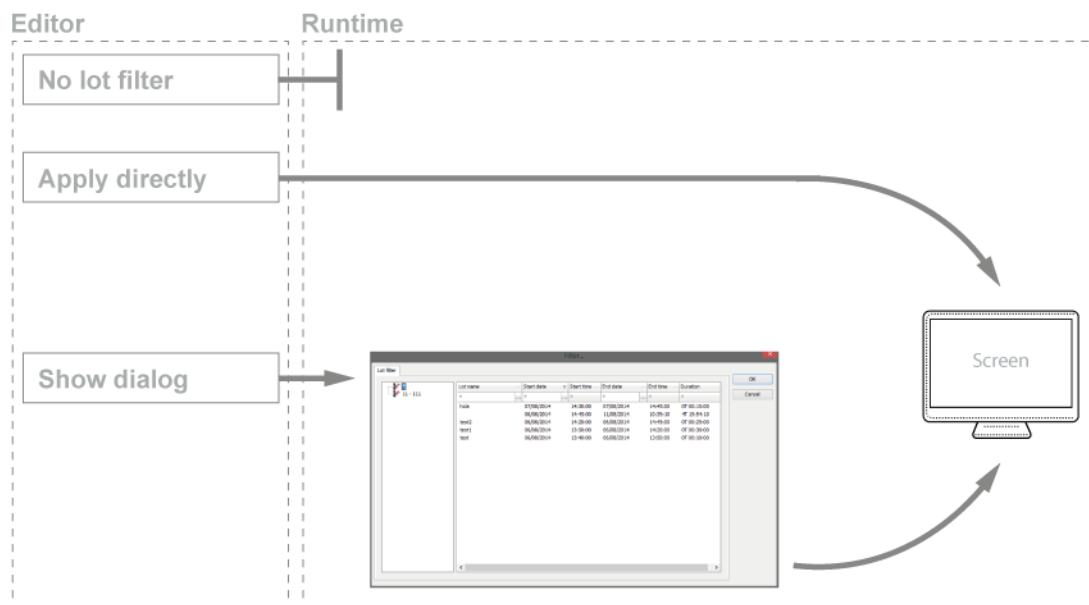
- ▶ **No lot filter**
- ▶ **Apply lot filter directly**
- ▶ **Display lot selection dialog**

Note: If the lot filter is shown as a dialog, it can be prefiltered for archive identifications. It is expressly recommended that you use this prefiltering for performance improvements.

Option	Description
No lot filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in the Runtime.
Apply lot filter directly	<ul style="list-style-type: none"> ▶ <i>Active:</i> The filter configured here is applied in the Runtime directly. <p>Note: There is no possibility to have all lots in a list displayed and to select one manually. If a certain lot is to be shown, the filter for the archives, name and time must be configured accordingly. This requires the existing data to be known very well. Alternatively, it is recommended that the Show lot selection dialog option is selected.</p>
Display lot selection dialog	<p><i>Active:</i> The dialog for lot selection is shown in the Runtime when:</p> <ul style="list-style-type: none"> ▶ Clicking on Filter or ▶ screen switching, if the Show this dialog in Runtime option has been activated (Not available for each function/screen type) <p>Note: The dialog is not shown on reloading.</p> <p>Options can be pre-selected in the Editor.</p>
Replace in Runtime with screen	<p>Only available if the Show lot selection dialog option has been selected.</p> <p>Note: Only available in screen switching functions.</p> <p>Definition of a screen that is to be called up in the Runtime instead of the lot selection dialog. Only <i>time/lot/shift filter</i> screens are offered.</p> <p>Click the ... button and the dialog opens to select a</p>

Option	Description
	<p>screen.</p> <p>If the linked screen is not found in the Runtime, a search is made for corresponding screens with specific names.</p> <p>Note: A lot filter screen can also be selected using the Show this dialog in Runtime option. However this is not used as a lot filter here, but as a time filter screen. The lot filter options are not correctly applied at this position.</p>
<p>Display lot selection dialog</p>	<p>Attention: This option is only available for Extended Trend. With faceplates, it is displayed for all screen types, but here it is also only available for ETM.</p> <p><u>Configuration for ETM:</u></p> <p>In order for the option to be available, the Show lot selection dialog option must be activated and the Windows CE project property must be deactivated in the project properties.</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> Enables several lots to be compared directly. Display always starts from the zero point. <p>Note: If the option is activated, the Diagram and X-axis buttons are not available in the Runtime. This also applies for the right-click functionality.</p>

Overview of the implementation of the configuration in the Runtime:



TIME

Configuration of the time filter for lot selection. Selection of one of the following options:

- ▶ **No filter**
- ▶ **Last lots**
- ▶ **Use time filter from "Time" tab**

Option	Description
No filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> The time range set in the Time tab is not taken into account. All completed and current lots are displayed.
Last lots	<p>Attention: Only works in conjunction with the Apply lot filter directly option.</p> <p>The option allows the combination of both options Display current lots and Display completed lots. At least one of the two options must be activated. If both options have been deactivated, this corresponds to the No filter setting.</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> 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 arrow keys.

Option	Description
	<p>Example: 3 was entered as a value for the option. 2 lots run and 10 have been ended. The following is shown: the two that are current and one that has been completed.</p> <p>Note: The setting of the time filter is not used as a time period for the current lots, but the last year. This filter will not be executed as a prefilter and can therefore not be used to improve performance.</p> <p>Note on compatibility: If the project is compiled for a version before 7.11, then: If the current lots are selected, or the combination of current and completed lots, then only the completed lots are shown in the Runtime.</p>
Display current lots	<ul style="list-style-type: none"> ▶ <i>Active:</i> The current lots are displayed. <p>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.</p> <p>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.</p>
Display completed lots	<ul style="list-style-type: none"> ▶ <i>Active:</i> The completed lots are displayed. <p>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.</p>
Use time filter from "Time" tab	<ul style="list-style-type: none"> ▶ <i>Active:</i> Pre-filtering is carried out with the settings of the Time tab. <p>The effective range of the filter can be amended within this time range. Select from drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Start and end also outside filter limits:</i> (Default) Lots can start before the start time configured in the Time filter and end after the configured end time. ▶ <i>Start and end only outside filter limits:</i> Lots must start and end within the time points configured in the Time filter for the start and end.

Option	Description
	<ul style="list-style-type: none"> ▶ <i>Start also before filter limit:</i> Lots can start before the start time configured in the Time filter and end after the configured end time. ▶ <i>End also after the filter limit:</i> Lots can also end after the end time set in the time filter, but must start at or after the configured start time. ▶ <i>Adjust start and end to filter limits:</i> Lots are cut to the time points configured in the Time filter for the start and end.

ARCHIVES

Configuration of filtering for archives. This filter is applied as a prefilter for the lot selection dialog.

Selection of one of the following options:

- ▶ **No filter**
- ▶ **Static**
- ▶ **From variable**

Option	Description
No filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> Filtering for archive names is not carried out.
Static	<ul style="list-style-type: none"> ▶ <i>Active:</i> Archives whose identification corresponds to the character string entered in the input field are filtered for. <p>Input of the archive identifications in the input field:</p> <ul style="list-style-type: none"> ▶ Several identifications are separated by a comma (,). ▶ * or empty: All archives, no filter.
From variable	<ul style="list-style-type: none"> ▶ <i>Active:</i> The value of the variables linked here is applied as a filter for archive names in the Runtime. <p>Click on button ... in order to open the dialog for selecting a variable.</p> <p>Available for AML and CEL modules if the Apply lot</p>

Option	Description
	<p>filter directly option has been selected: Other modules use their own configurations.</p> <p>Notes for variables in the Runtime:</p> <ul style="list-style-type: none"> ▶ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The ... button is always deactivated in the 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. <p>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 variable cannot be determined. The filter then corresponds to the No filter setting.</p>

Note for ETM: In the ETM, the archives are established by the curves configured in screen switching. This is only possible in the Runtime with the **relative lots** option. With this, the variables must be selected in the Runtime, which is in turn stipulated by the possible selection of archives. The archive, once filtered, must be one of the archives that relate to the configured curves. No data is displayed if this is not the case. This setting can also be used to limit the displayed curves. However these remain shown in the curve list.

ETM example:

Configured curves	Data source	Archive prefiltering in the lot filter	Result in the screen
A	AR	AR	Is shown in the curve list and drawn in the trend.
B	EA		Is only shown in the curve list.
C	EP		Is only shown in the curve list.

Note archive revision: The archive for which the screen is opened is already selected in the screen switching function. Because only 1 archive can be selected, further limitation makes no sense.

Example of archive revision:

Configured archive	Archive prefiltering in the lot filter	Result in the screen
AR	EA	No data is displayed.

NAMES

Configuration of the filtering to names. Selection of one of the following options:

- ▶ **No filter**
- ▶ **Static**
- ▶ **From variable**

Option	Description
No filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> Filtering for lot names is not carried out.
Static	<ul style="list-style-type: none"> ▶ <i>Active:</i> Lot names that correspond to the character string entered in the input field are filtered for. <p>Input of the lot name in the input field:</p> <ul style="list-style-type: none"> ▶ Several entries are separated by a pipe character (). ▶ Note: Lot name must not contain a character! ▶ * or empty: All lots of all displayed archives, no filter.
From variable	<ul style="list-style-type: none"> ▶ <i>Active:</i> The value of the variable linked here is applied as a filter for lot names in the Runtime. <p>Click on the ... button to open the dialog for selecting a variable.</p> <p>Only available if the option Apply lot filter directly has been selected.</p> <p>Notes for variables in the Runtime:</p> <ul style="list-style-type: none"> ▶ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The ... button is always deactivated in the 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.

Option	Description
	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 variable cannot be determined. The filter then corresponds to the No filter setting.

CLOSE DIALOG

Option	Description
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.

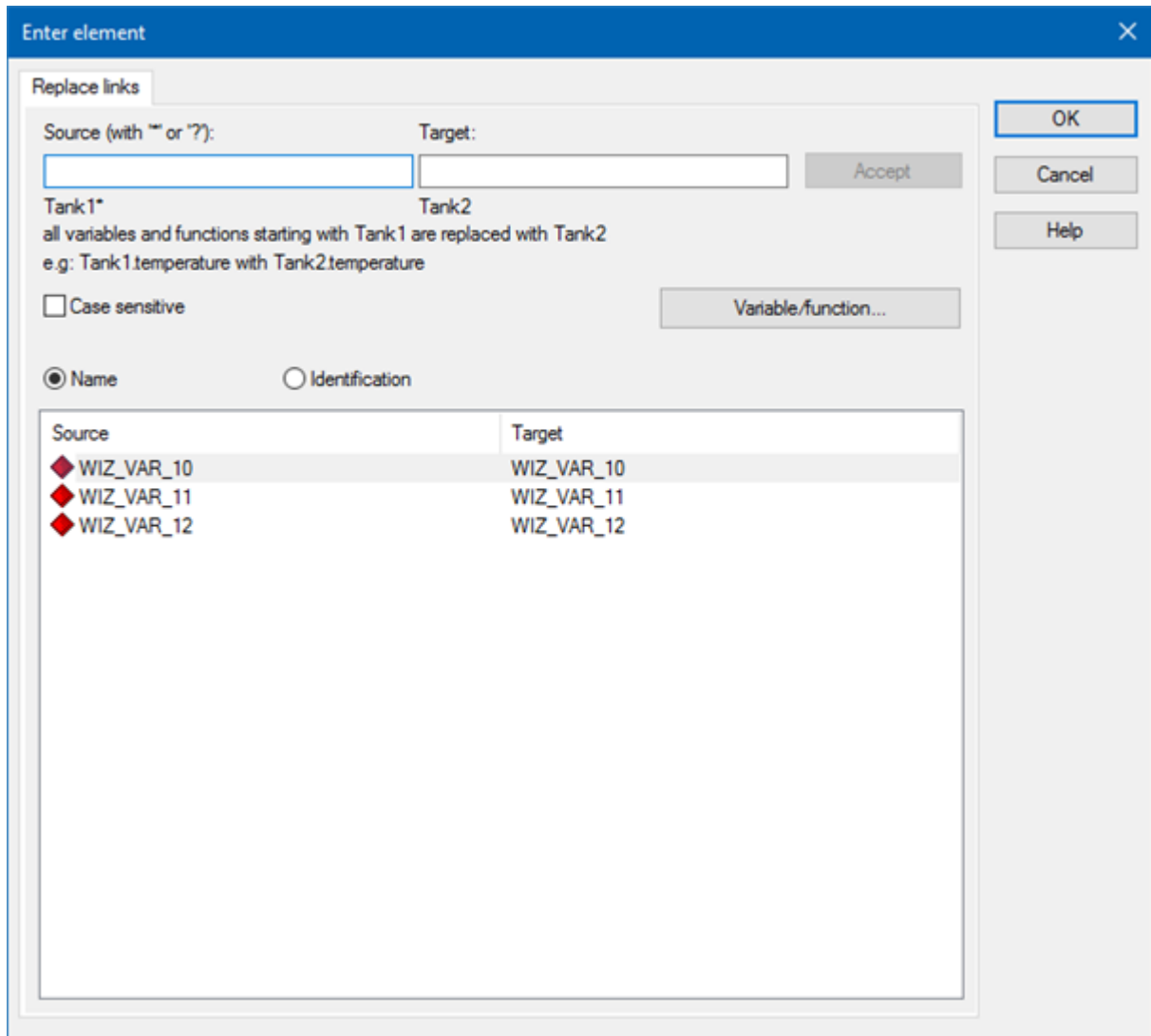
3.1.9.2.11 Replacing links

Linked variables or functions can be permanently replaced in the Editor in a rule-based manner. The replacement is not limited to the functions or variables defined in the properties of the **Variable/function** group. All other variables used the screen can also be replaced, such as variables for **Visibility**, **Flashing**, **Size and rotation dynamic** and others.

To replace variables or functions in a rule-based manner in the element directly:

1. Highlight the desired element and open it by right clicking the element in the context menu.
2. Select **Replace Links**.

The dialog for the replacement of links opens



Enter element

Replace links

Source (with "*" or "?"): Target:

Tank1* Tank2
all variables and functions starting with Tank1 are replaced with Tank2
e.g: Tank1.temperature with Tank2.temperature

☐ Case sensitive

☒ Name ☐ Identification

Source	Target
◆ WIZ_VAR_10	WIZ_VAR_10
◆ WIZ_VAR_11	WIZ_VAR_11
◆ WIZ_VAR_12	WIZ_VAR_12

Property	Description
Source	<p>Enter the partial string to be searched for.</p> <p>The placeholders * and ? can be used:</p> <ul style="list-style-type: none"> ▶ *: desired number of characters *aste finds Taste, Stopptaste, ... *aste* finds Tasten, Tastendruck, Pasteurisierung, ... ▶ ?: precisely one character. For example: T?ste finds Teste and Taste. <p>The placeholder * is permitted as a prefix and/or suffix.</p> <p>When using placeholders, note when a character appears more than once. The first thing found is always replaced when</p>

Property	Description
	<p>several things are found:</p> <ul style="list-style-type: none"> ▶ Example character sequence: 01{SU(00,Test1)} Test1 should be replaced with Test 2. ▶ Source entry <i>*1</i> and target entry <i>2</i> finds and replaces the <i>1</i> in <i>01</i> but not in the subsequent following <i>Test1</i>. Result: 02{SU(00,Test1)} ▶ Source entry <i>*test1</i> and target entry <i>test2</i> finds and replaces <i>Test1</i>. Result: 01{SU(00,Test2)}
Target	<p>Entry of the partial string</p> <p>Note: Source and target must be in the same project.</p>
Apply	Swaps target strings from the source for those defined in the target .
Note capitalization	When swapping, be sure that any capitalization is an exact match.
Name	Swaps information in process variable names.
Identification	Exchanges information in the identification
Variable/function	<p>Opens the selection list for variables/functions in relation to the selected line in the list. Clicking on the variable or function in the list defines new target variable or target function.</p> <p>Alternative: Double-click on the corresponding source variable or source function.</p>

REPLACE

REPLACE WITH MANUAL SELECTION

To replace elements manually:

- ▶ Select the element from the list that you would like to replace as the source.
- ▶ Select a target element via the **Variable/Function** button

The previous element is replaced by the new one.

AUTOMATED REPLACEMENT WITH RULES

To automatically replace elements on the basis of rules:

- ▶ In the **Source** input field, define the parameters for the element that you wish to replace
- ▶ Define the parameter for the new variable/function in the **Target** input field
- ▶ Specify what is to be replaced via **Name/Identification**.
- ▶ Click on **Accept**.



Information

The target variable or target function can also be in a different project as the source variable or source function. In doing so, all projects concerned must be started and available on the same computer in Runtime.

Internal variable IDs are used for replacement. This means that if variables are used or functions are renamed, the replacement remains.

Attention

When replacing variables, be aware of the type and signal resolution. If you replace a variable with one of an incompatible type, this can lead to errors during execution. You will be warned when making the substitution; the substitution will however be carried out.



Information

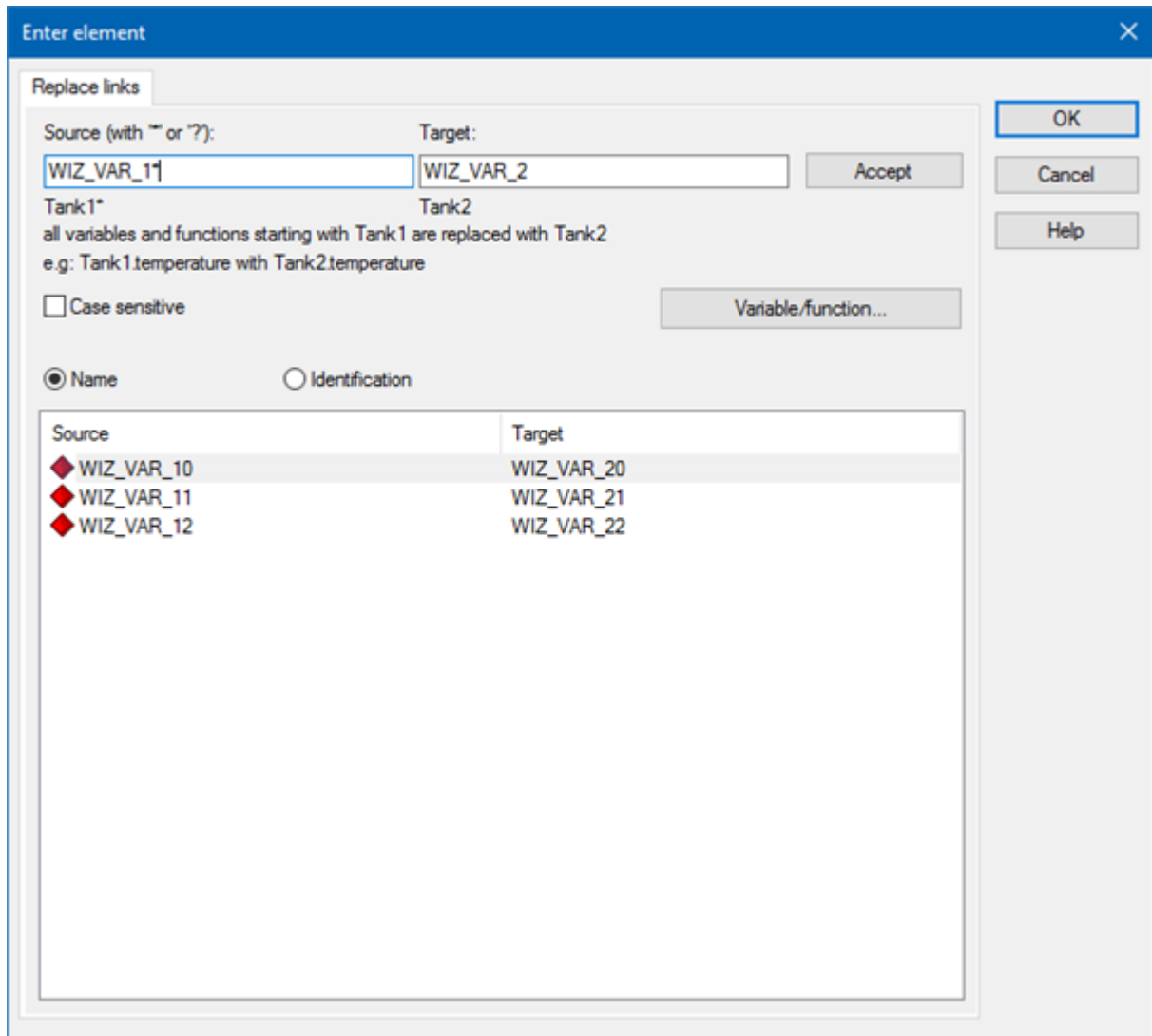
Replace via Drag&Drop: Elements that can only contain one variable or function can be swapped by dragging & dropping. Drag the new variable or function to the element using the mouse. It automatically replaces the previous one.

EXAMPLE

All variables with *WIZ_VAR_1* in the name are to be replaced by *WIZ_VAR_2*.

1. Enter, into the **Source** text field, *WIZ_VAR_1*. With the * character, you can include all variables that start with *WIZ_VAR_1*.
2. Enter *WIZ_VAR_2* into the **target** text field.
3. Click on **Accept**.

4. The variables `WIZ_VAR_10`, `WIZ_VAR_11`, and `WIZ_VAR_12` are replaced by the variables `WIZ_VAR_20`, `WIZ_VAR_21` and `WIZ_VAR_22`.



3.1.9.2.12 Replace indices

When switching screens in Runtime, variables, functions and ALC aliases can be replaced dynamically using indexing rules or element-specific parameters.

Possibilities for substitution:

- ▶ Using indexing variables: for example `{X01}`
- ▶ Using element-specific parameters: `{PARAM}`
- ▶ Without indexing variables or parameters

⚠Attention

Because the names are replaced, variables and functions should always be given different names. Variables and functions are replaced if the names are the same.

Example: If there is a **test** variable and a **test** function and the **test** variable is to be replaced, the **test** function is also replaced at the same time.

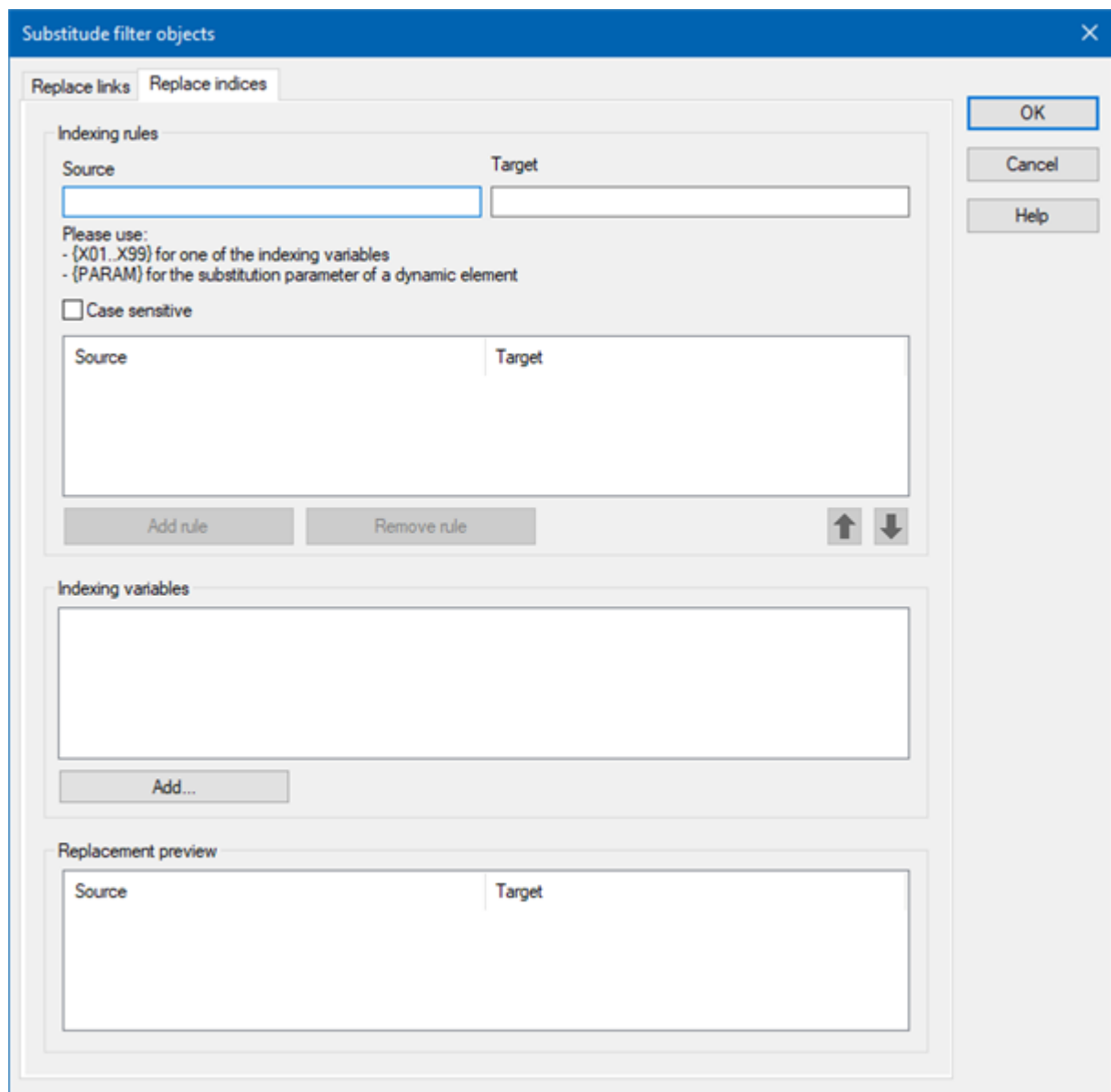
Hint: Name variables and functions each with a prefix (for example **var_** and **func_**). You therefore always have an overview in lists too.

⚠Attention

In contrast to replacing linkings, replacement using indices is purely name-based and not via internal variable IDs.

This means that if variables, functions or ALC aliases used in the screen switch function are renamed, these changes must also be made in the screen switch function.

REPLACE INDEXES DIALOG



Substitute filter objects

Replace links Replace indices

Indexing rules

Source Target

Please use:

- {X01..X99} for one of the indexing variables
- {PARAM} for the substitution parameter of a dynamic element

☐ Case sensitive

Source Target

Add rule Remove rule

Indexing variables

Add...

Replacement preview

Source Target

OK Cancel Help

INDEXING RULES

Parameter	Description
Indexing rules	Configuration of the rules for the replacement of variables, functions and ALC aliases.
Source	Entry of the source that is to be substituted.
Target	Entry of the target. Parameters for values from indexing values such as {X01} and parameters {PARAM} for functions can also be used.

Parameter	Description
Match case	► <i>Active</i> : The replacement is case-sensitive.
List of rules	List of defined rules.
Add rule	Clicking on the button adds the defined rule available via Source and Target to the list. Info : If a rule is selected in the list, this is overwritten. To add a new rule, the selection must be removed beforehand.
Remove rule	Clicking on the button deletes the selected rule from the list.
Arrow upwards	Clicking on the button arranges the selected rule in the list one position up.
Arrow downwards	Clicking on the button arranges the selected rule in the list one position down.

Note: The **Replace indices** method can also be applied without indexing variables. The variables are entered in the list of rules.

Advantage: If sub-elements are added to the structure, the function does not need to be amended a further time as was the case with the **Replace linkings** method.

INDEXING VARIABLES

Parameter	Description
Indexing variables	Configuration of the indexing variables.
List of rules	Shows the selected indexing variables.
Add	Clicking on the button opens the dialog to add and remove indexing variables. Selected variables are added in sequence and given a parameter. This can be used in the replacement rules for the respective indexing variable. The values of these variables are generally used during replacement.

REPLACEMENT PREVIEW

Parameter	Description
Replacement preview	Lists all configured replacements. Clicking on an entry also fills the Source and Target options in the indexing

Parameter	Description
	rules section.

CLOSE DIALOG

Option	Description
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.

Attention

If index variables are used in a network project, the client must first get the value from the server. Then the calculation is executed. On devices with weak hardware performance, this may cause delays when screen switching.

Tip: Always activate indexing variables in a network project **Harddisk data storage active**.

3.1.9.3 Report Generator: execute

The **Report Generator: execute** function makes it possible to execute a report automatically in the background in the Runtime. If a writing function is configured in the report, values calculated in the report can automatically be written to archives or to the process image.

To configure the function:

1. Create a new function
2. Select, in the **Report generator** section, the **Execute report** entry
3. The dialog for the report filter (on page 153) is opened

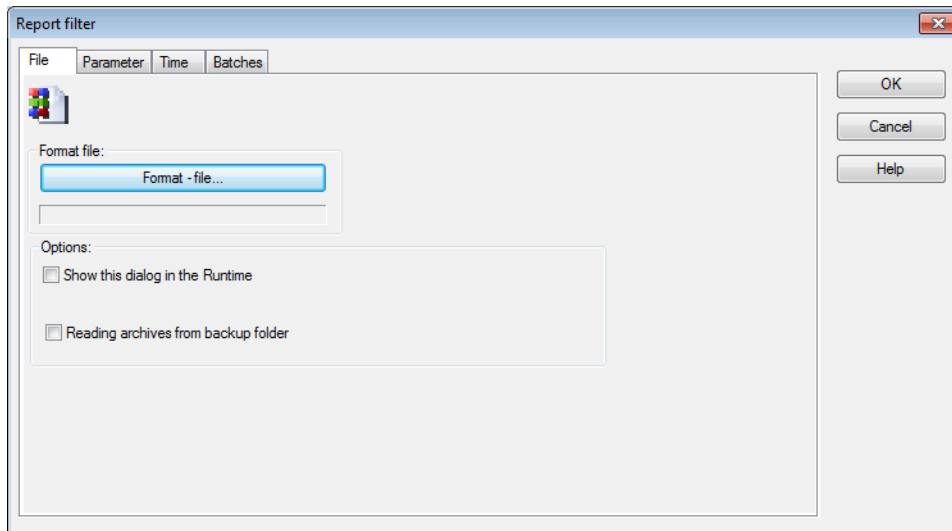
Note: The **File** tab settings are different. The settings that are valid for **Execute report** are clarified in this chapter; you can find all further settings in the report filter (on page 153) chapter.

- ▶ Parameter (on page 155)
 - ▶ Time (on page 156)
 - ▶ Lots (on page 174)
4. select the desired properties

- link the function with a button on the screen in order to switch in the Runtime

CONFIGURATION OF FILE TAB

The configuration of the File tab is slightly different to the configuration for screen switching.



Parameter	Description
Format file	selection of the report file configured (on page 10) in the editor (*.xrs)
Show this dialog in the Runtime	<i>Active:</i> This filter dialog is offered before being called up in the Runtime.
Reading archives from the read-back folder	<p><i>Active:</i> Stored archives are read in from the read-back folder defined in project configuration.</p> <p>When loading archive data from the readback folder, the archive data from the Runtime path and from all subfolders of the readback folder is also read.</p>



Information

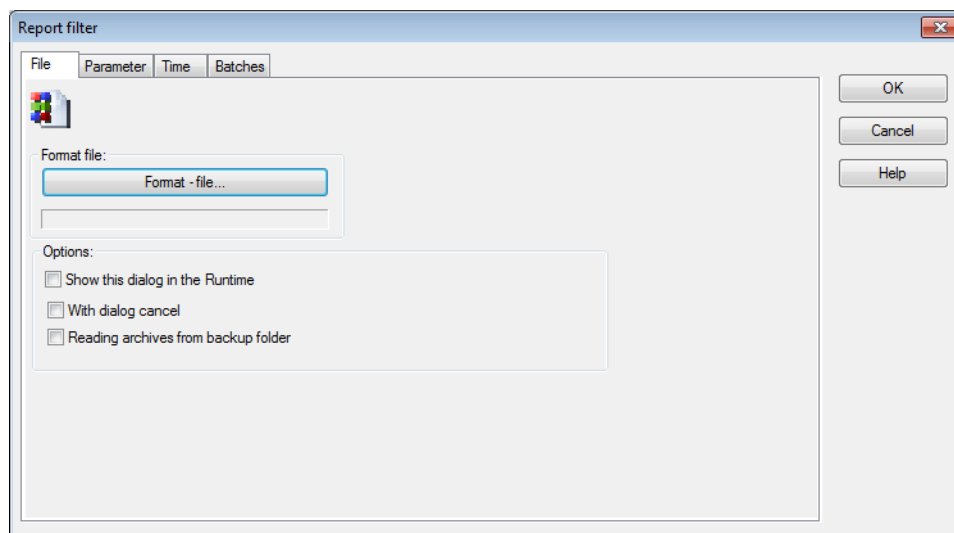
With this function, all write actions are carried out in the report.

3.1.9.4 Print Report Generator

The **Report Generator: execute** function makes it possible to print out a report without calling it up beforehand. To configure the function:

1. Create a new function
2. Select, in the **Report generator** section, the **Execute report** entry
3. The dialog for the report filter (on page 153) is opened
4. **Note:** The **File** tab settings are different. The settings that are valid for **Print report** are clarified in this chapter; you can find all further settings in the report filter (on page 153) chapter.
 - ▶ Parameter (on page 155)
 - ▶ Time (on page 156)
 - ▶ Lots (on page 174)
5. select the desired properties
6. link the function with a button on the screen in order to switch in the Runtime

CONFIGURATION OF FILE TAB



Parameter	Description
Format file	selection of the report file configured (on page 10) in the editor (*.xrs)
Show this dialog in the Runtime	<i>Active:</i> This filter dialog is offered before being called up in the Runtime.
With dialog cancel	<i>Active:</i> A button to cancel printing is shown whilst the report is

Parameter	Description
	being prepared for print.
Reading archives from the read-back folder	<p><i>Active:</i> Stored archives are read in from the read-back folder defined in project configuration.</p> <p>When loading archive data from the readback folder, the archive data from the Runtime path and from all subfolders of the readback folder is also read.</p>



Information

Archive entries can only be read with the **Print report** function. Write actions are not possible.

3.1.9.5 Export Report Generator

The **Export Report Generator** function is used to write a report in the background to a file during online operation. The export file is stored in the \Export sub-folder of the project folder. (open from zenon: highlight project, press **ctrl+alt+D**.) Provide the file parameters, the filter and the time as the transfer parameters.

The **Export report** function makes it possible to export a report without calling it up beforehand. To configure the function:

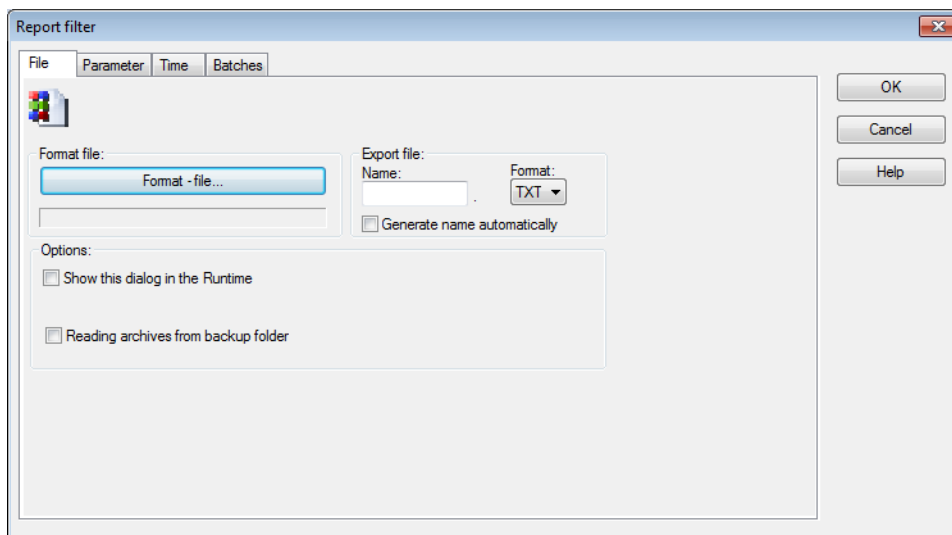
1. Create a new function
2. Select, in the **Report generator** section, the **Export report** entry
3. The dialog for the report filter (on page 153) is opened
4. **Note:** The **File** tab settings are different. The settings that are valid for **Export report** are clarified in this chapter; you can find all further settings in the report filter (on page 153) chapter.
 - ▶ Parameter (on page 155)
 - ▶ Time (on page 156)
 - ▶ Lots (on page 174)
5. select the desired properties
6. link the function with a button on the screen in order to switch in the Runtime



Information

When exporting a report using the **Export report** function, the converted units are exported at units of measurement. The basic units are not a part of the export.

CONFIGURATION OF FILE TAB



Parameter	Description
Format file	selection of the report file configured (on page 10) in the editor (*.xrs)
Show this dialog in the Runtime	<i>Active:</i> This filter dialog is offered before being called up in the Runtime.
Reading archives from the read-back folder	<p><i>Active:</i> Stored archives are read in from the read-back folder defined in project configuration.</p> <p>When loading archive data from the readback folder, the archive data from the Runtime path and from all subfolders of the readback folder is also read.</p>
Export file	Properties of the file that is exported in the report.
Name	<p>Name of the file.</p> <p>Maximum of eight alphanumeric characters. If no name is given and automatic naming is switched off, the name <i>dummy</i> is used.</p> <p>Attention: The use of special characters may lead to a loss of data.</p>

Parameter	Description
Format	Format of the export file.
▶ <i>TXT</i>	Text file
▶ <i>XRS</i>	zenon Report file
▶ <i>XML</i>	XML-File
Generate name automatically	<i>Active:</i> The filename is created automatically. It consists of the short identifier and the coded date and the chosen file ending.

CODING NAME FOR AUTOMATIC NAMING

Code	Meaning
<i>xx</i>	Short identifier: 2 characters The first two characters of the name given under 'Name' or the name issued by the system, <i>du</i> .
<i>JJ</i>	Year: two-digits
<i>MM</i>	Month: two-digits
<i>TT</i>	Day: two-digits
<i>HH</i>	Hour: two-digits
<i>MM</i>	Minute: two-digits
<i>SS</i>	Second: two-digits

EXAMPLE

- ▶ The **Report** report file is exported on 9. 6. 6. 2010 at 11:52 in XRS format
- ▶ Automatic file name: **re100506091152.xrs**

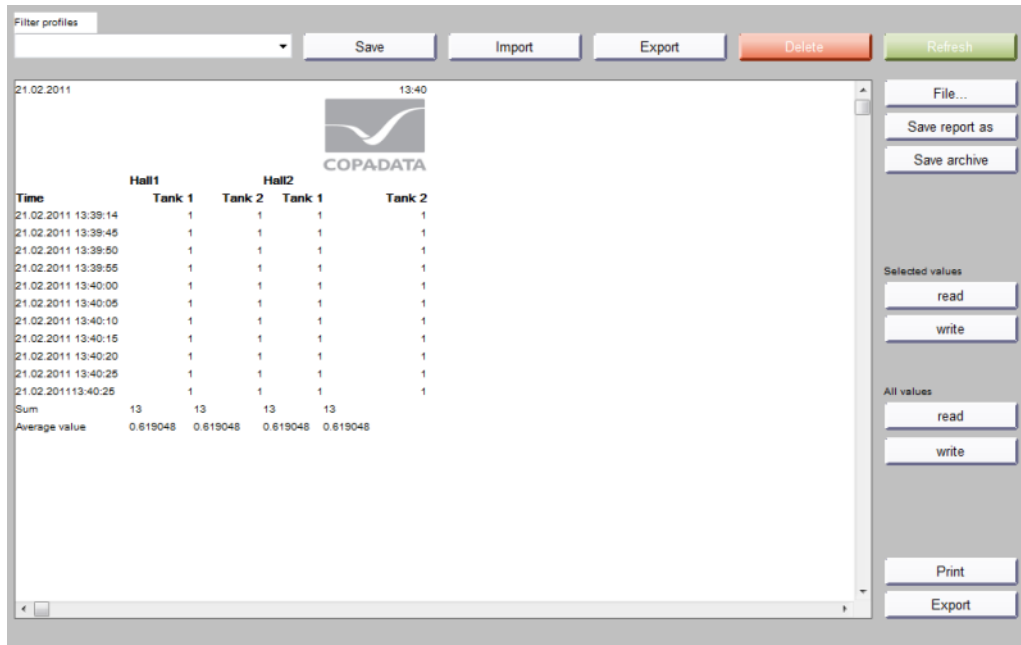


Information

Archive entries can only be read with the **Export report** function. Write actions are not possible.

3.2 Operation in the Runtime

The reports on the configured buttons are displayed, configured and administered in the Runtime. The following user elements are available in the Runtime:



Parameter	Description
Insert template...	<p>Opens the dialog for selecting a template for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined position 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 placed in the zenon screen. Elements can be moved on the screen and arranged individually.</p>

WINDOW

Control elements for window display.

Parameter	Description
Report window	Shows the report.
Set filter	Displays the status of the time filter currently configured in the Runtime.

Parameter	Description
Compatible elements	<p>Standard Win32 control elements that have been replaced or removed by zenon elements (<i>dynamic text</i>, <i>switch</i>) and continue to be available due to compatibility reasons. These elements are not taken into account with automatic insertion of templates.</p> <p>For the description, see current elements.</p> <p>► Set filter</p>

FUNCTIONS

Control elements for control in the Runtime.

Parameter	Description
Filter...	Select report file and change filter conditions.
Refresh	Recreate build report completely (values and display).
Print	Print report in the Runtime.
Export	Export report.
Save archive	Write changed values to the archive.
Save report	<p>Report is saved in the Runtime (*.xrs).</p> <p>Attention: When saving, formulas and functions are replaced by the current values. The functions in these reports (.xrs files) are no longer available. These reports can also not be edited in the editor anymore.</p> <p>Recommendation: Set original report files to "write-protected" status and save changes with Save as in a new file.</p>
Save report as...	Report is saved under a new name in the Runtime (*.xrs); formulas and functions are replaced by current values.
Read selected values	Selected values are read in again from the driver.
Write selected values	Selected values are sent to the driver.
Read all values	All values are read in again from the driver.
Write all values	All values are sent to the driver.

NAVIGATION

Control elements for navigation.

Parameter	Description
Line up	Scroll text in list element up
Line down	Scroll text in list element down
Column right	Scroll text in list element to the right
Column left	Scroll text in list element to the left
Page up	Scroll text in list element up
Page down	Scroll text in list element down
Page right	Scroll text in list element to the right
Page left	Scroll text in list element to the left

FILTER PROFILES

Buttons for filter settings in the Runtime.

Parameter	Description
Profile selection	Select profile from list.
Save	Saves current setting as a profile. Note: The name can be a maximum of 31 characters long and must only contain valid characters. Prohibited are: ! \ / : * ? < > ""
Delete	Deletes selected profile.
Import	Imports filter profiles from export file.
Export	Exports filter profiles in the file.



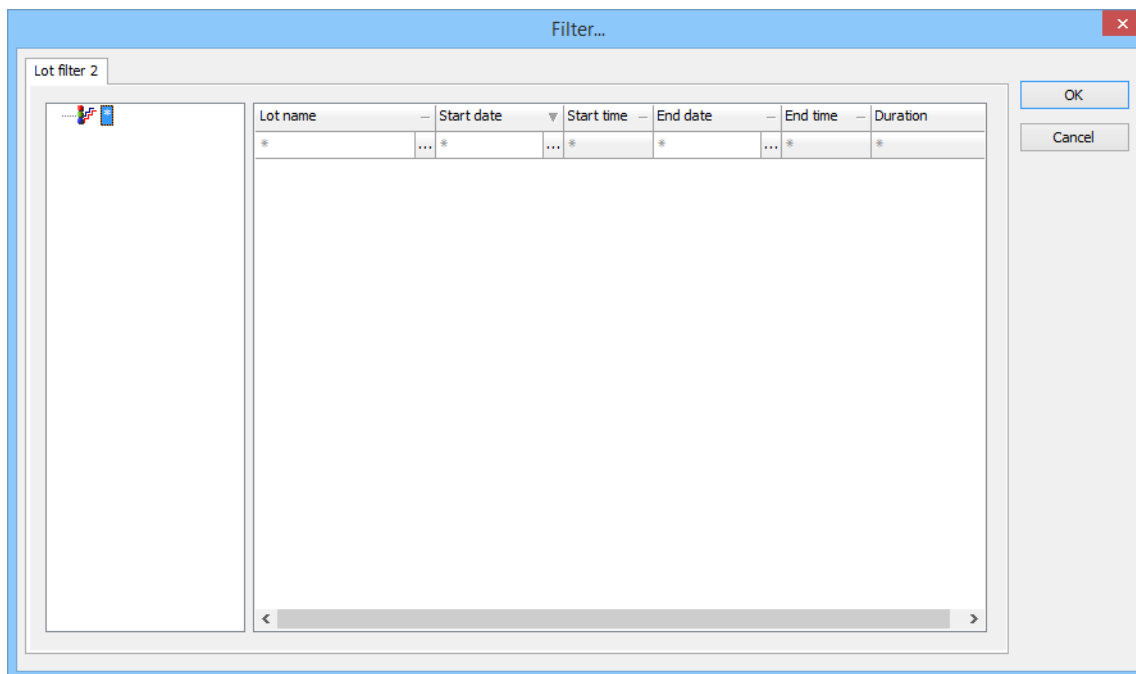
Information

A period is used as a decimal separator. When inputting, both a period or a comma can be used. The separator is automatically converted by the system.

Example: 10,5 is turned into 10.5

3.2.1 Lot filter for screen switching

If you switch to a **Report Generator** screen that filters for lots, the following filter is displayed:



Parameter	Description
Lot filter	<p>Selection of the recipe group that is to be imported. The filter consists of the two lists:</p> <ul style="list-style-type: none"> ▶ List of archives: List of archives ▶ List of lots: List of lots allocated to the selected archive.
List of archives	<p>Selection of the desired archive</p> <p>node *:</p> <ul style="list-style-type: none"> ▶ 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	<p>Display of the lots allocated to the selected archive.</p> <p>Filtering through entry of text, date, time or rime range - depending on type.</p>

Parameter	Description
	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 end 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 end time of all available lots. Filter: Entry of an end 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.

3.3 Example of archive data in reports

In this example, you create archive data in a report. To do this:

1. Open a new report using the context menu and the **New report** entry.
2. Design the Title area (on page 202)
3. Fill the data area (on page 206)
4. Set up a **Report Generator** screen (on page 211) and create a function

3.3.1 Title area

The title area contains, in the first four rows:

- ▶ Texts (on page 202) as headings for the data
- ▶ Date (on page 203) and time
- ▶ Company logo (on page 204)

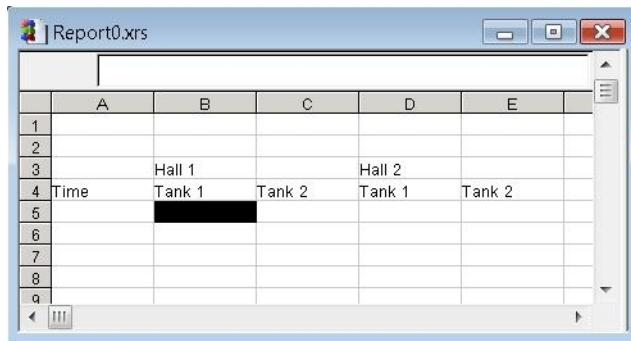
The title area is formatted in such a way that it is fixed for longer reports and does not disappear from view during scrolling.

3.3.1.1 Texts

Enter the following texts as headings for the report:

- ▶ Time
- ▶ Hall 1
 - ▶ Tank 1
 - ▶ Tank 2
- ▶ Hall 2
 - ▶ Tank 1

► Tank 2

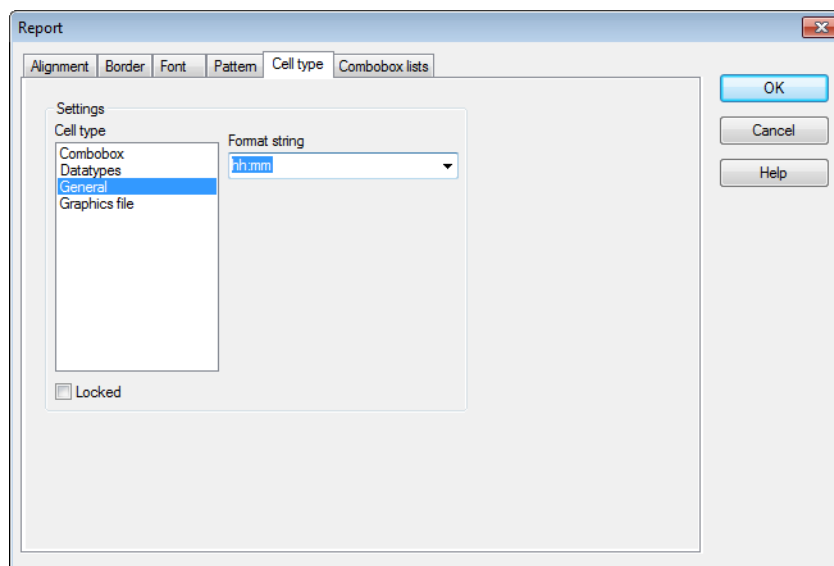


	A	B	C	D	E
1					
2					
3		Hall 1		Hall 2	
4	Time	Tank 1	Tank 2	Tank 1	Tank 2
5					
6					
7					
8					
9					

3.3.1.2 Date and time

The date and time of the report are configured for the for cells A1 and E1 with report functions. To do this:

1. Enter the function `=now()` into the cells A1 and E1.
2. The current date is now displayed in both cells.
3. In order to get the time in cell E1 instead, you have to change the formatting of this cell.
 - a) Highlight cell E1
 - b) Open the format dialog using the Format/Cells/Editing menu.
 - c) Select the formatting string as shown in the illustration below



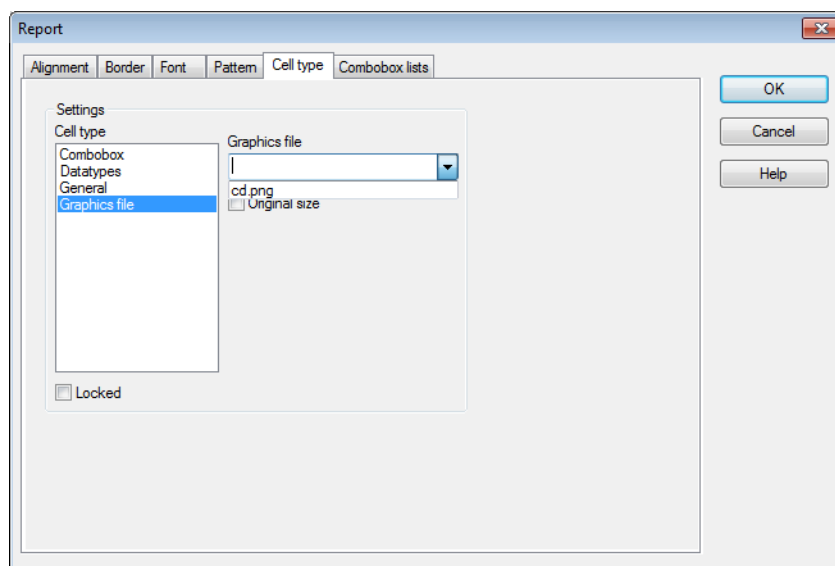
4. The result:

	10:24							
	A	B	C	D	E	F	G	H
1	04.02.2011				10:24			
2								
3		Hall 1		Hall 2				
4	Time	Tank 1	Tank 2	Tank 1	Tank2			
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								


3.3.1.3 Screens as a company logo

Screens in cells are not treated as cell contents by the Report Generator, but as formatting. Configuration is therefore carried out using cell formatting:

1. Import the desired screen in the Project Manager into the **Files/graphics** nodes
2. Select cell E2 with the left mouse button.
3. Open the context menu of the report with the right mouse button and select the **Cell** command.
4. Switch to the **Cell Type** tab in the dialog
5. Change the cell type to *Graphics file*
6. Select the desired screen from the drop-down list on the right-hand side



7. The result:

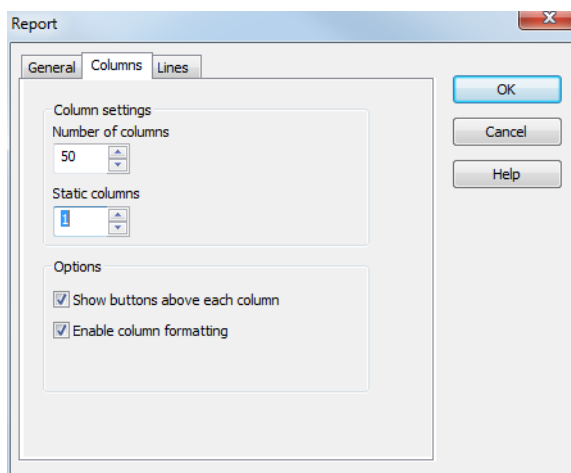
	A	B	C	D	E	F	G	H
1	04.02.2011				10:24			
2								
3		Hall 1		Hall 2				
4	Time	Tank 1	Tank 2	Tank 1	Tank2			
5								
6								
7								
8								
9								
10								
11								
12								
13								

3.3.1.4 Fixed title area for multipage reports

To always have the row and column titles in view in multi-page reports, you must prevent these also being moved when the report is scrolled. To do this, define fixed title areas.

To fix the row title:

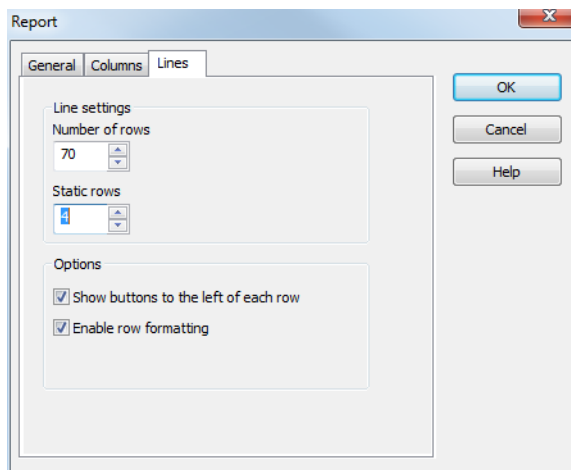
1. Select the **Report** command in the Format menu.
2. The configuration dialog is opened
3. Open the **Columns** tab



Next to the number of columns you also can define the number of **Non-scrolling columns** here. The stipulated number of fixed columns is then no longer scrolled out of the visible screen area.

4. Enter 1 for the **Non-scrolling columns**.

5. Change to the **Rows:** tab



Our column headings are in rows 1 to 4 for the lines:

6. Enter 4 for the **Non-scrolling rows**.
7. Confirm all changes by clicking on the **OK** button

3.3.2 Data area

In the data area:

- ▶ Configure the display of time (on page 206) and values (on page 210)
- ▶ Have the sum and average (on page 210) displayed

3.3.2.1 Time

The time of the displayed archive values is displayed in column A.



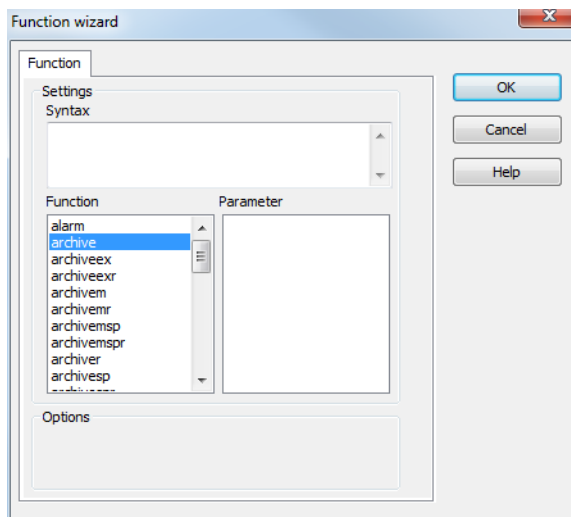
Information

We select a cyclical archive as a basis. The entries of all variables are therefore made at the same time and a time column is sufficient for all entries.

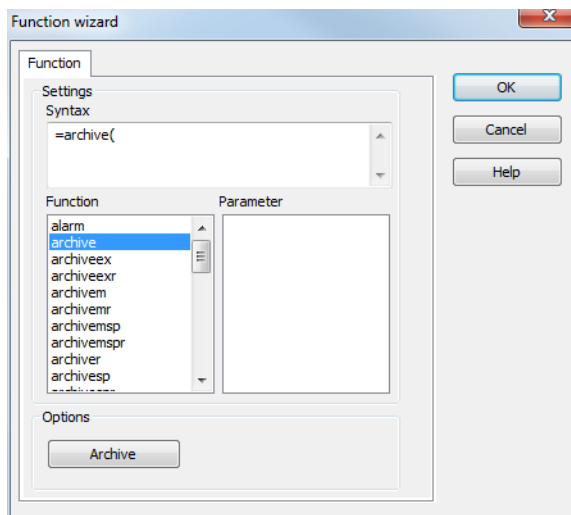
To configure the time:

1. Select cell A5.
2. Select the **Function assistant** command in the **Format** menu

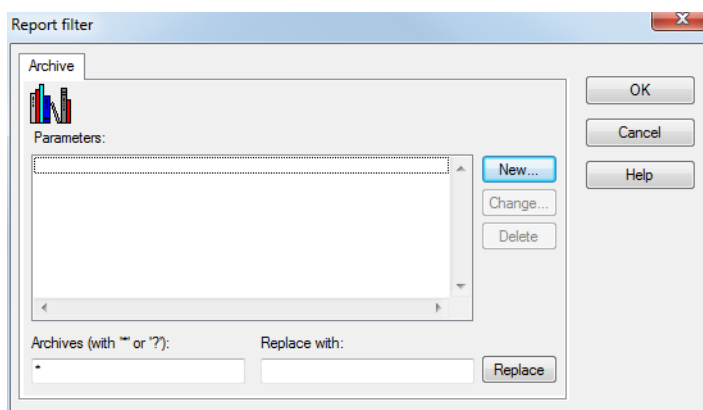
- The function assistant is opened



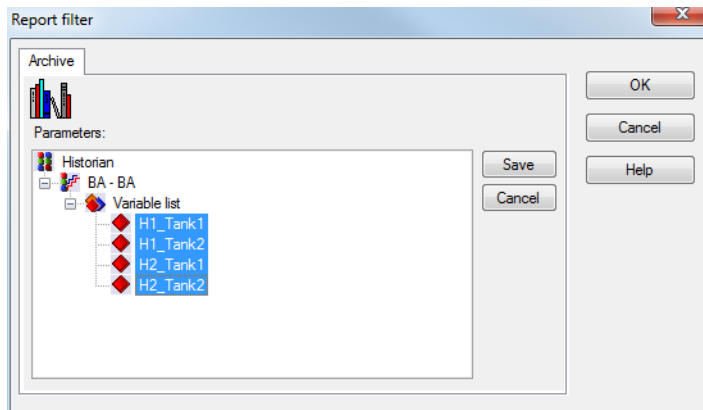
- Select the **Archive** function with a double-click.
- The **Archive** button is always displayed in the lower area of the dialog



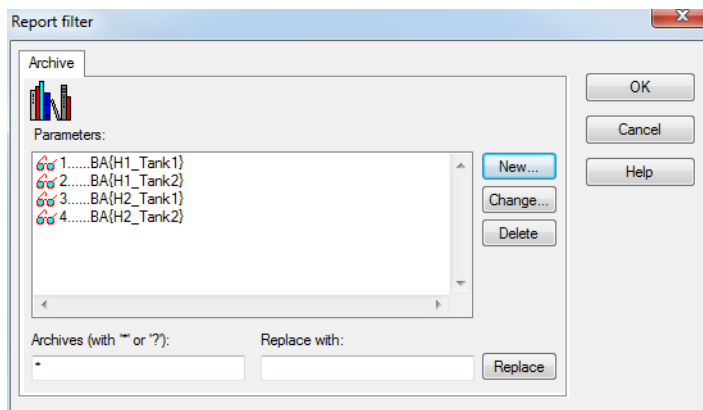
- Click on **Archive**
- The dialog for archive selection is opened:



8. Click on **New**
9. The archives stored in the archive server node are displayed
10. Select the variables as shown in the screenshot

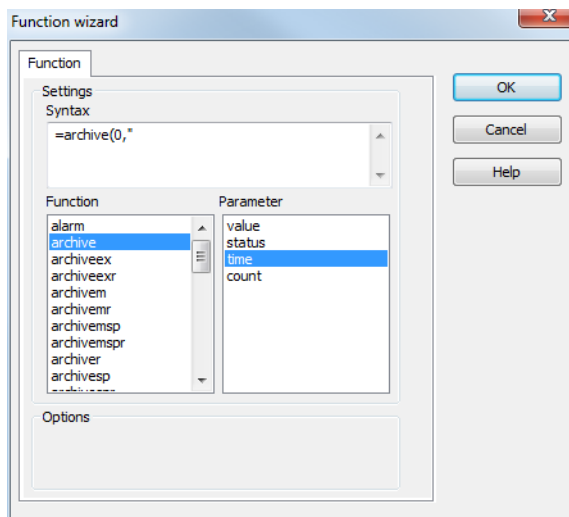


11. Click on Save
12. Select the variable "H1_Tank1"

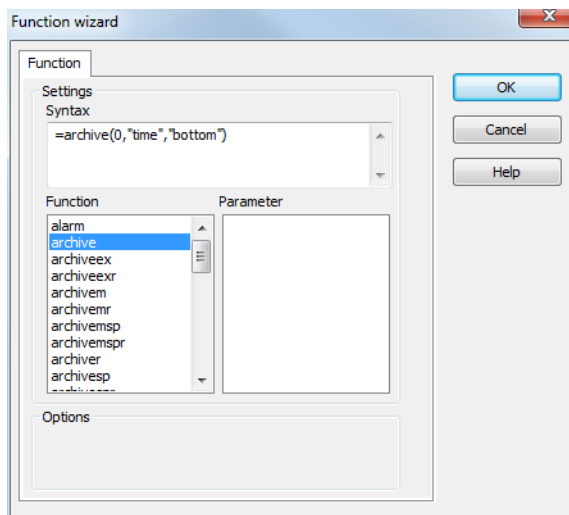


13. Confirm the selection by clicking on OK
14. The function assistant is displayed again

15. Select *time* as the **parameter** with a double-click.



16. Select the **parameter** *down* with a double-click.
17. Configuration of the function is complete (`=archive(1,"time","down")`)



18. Close the assistant by clicking on the **OK** button

The time of variable archiving is thus continued downwards from row 5 in column A.



Information

The parameters always have to be selected with a double-click. All parameters have been set up once the function in the preview is closed with a bracket and no further parameters are offered. If the **OK** button is clicked on before all parameters have been selected, the assistant is closed before all parameters for the function have been set up.

3.3.2.2 Values

You configure the values for the tanks in hall 1 and 2 in the same manner as the configuration for the time (on page 206). Pay attention to the following differences:


- ▶ The archive variables no longer need to be set up. They already exist and can be selected immediately. Assign each tank the corresponding variable.
- ▶ Instead of the *time* parameter, select the *value* parameter.

COPYING A FUNCTION

As soon as you have created a function, you can copy it to other cells and then edit it accordingly:

To do this:

1. Highlight the cell to be changed
2. Then click in the editing cell
3. In the function that is now displayed, the reference numbers refer to the corresponding archive variables as they are automatically issued during archive selection when the function is first created
4. Therefore replace the 1 as the first parameter in column **C** by a 2 in column **D** with a 3 and in column **E** with a 4

	A	B	C	D	E	F
1	04.02.2011				11:09	
2						
3		Hall1		Hall2		
4	Time	Tank 1	Tank 2	Tank 1	Tank 2	
5	archive time	archive value	archive value	archive value	archive value	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

3.3.2.3 Sum and average

For this report, you now configure the display of sum and average.

To do this, you must determine how many cells are needed for archive entries. You define these in the Report Generator. The number of entries in the list depends on the filter settings that are used to subsequently call up the report (**Execute report**, **Print report**, **Export report** functions).

In our example, we will select a time range of two minutes. As our archive records values every five seconds, this will make 24 entries for the report. Therefore:

1. Enter the text **Sum** into cell *A29*.
2. Enter the text **Average:** into cell *A30* on
3. Enter the function **=sum(B5:B25)** into cell *B29*.
4. Enter the function **=sum(B5:B25)** into cell *B30*.
5. Copy the cell *B29* to *C29*, *D29* and *E29*
6. Copy the cell *B30* to *C30*, *D30* and *E30*
7. Save the report under the name **Archiv.xls**



Information

When entering the functions, you can either type in cell names or click on the corresponding cell with the mouse.

If you copy functions with cell addresses in the Report Generator, the cell addresses are automatically adapted.

3.3.3 Displaying the report in Runtime

To be able to look at the report in Runtime, you need:

- ▶ A **Report Generator** screen
- ▶ A screen switching function

CREATE SCREEN OF TYPE REPORT

To create a **Report Generator** screen:

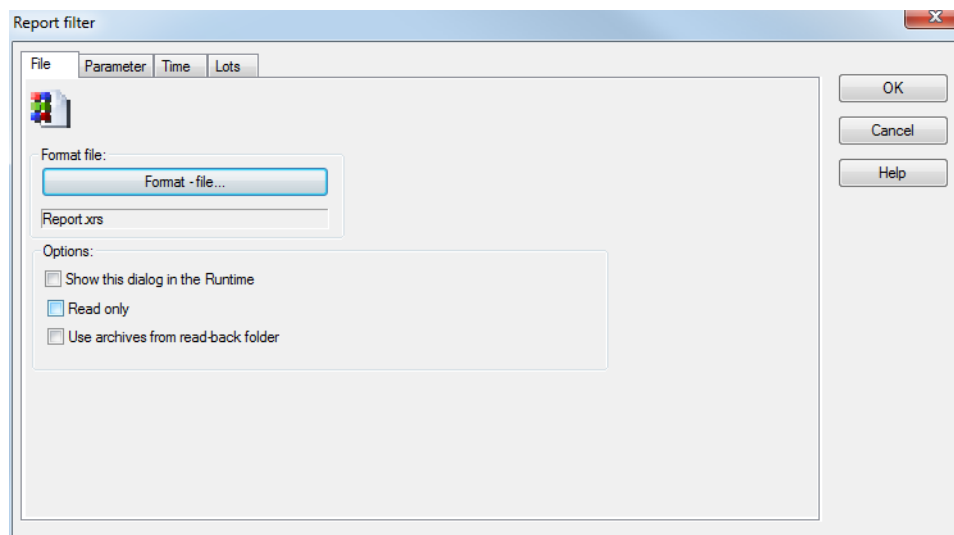
1. Create a new screen named **Report**
2. Select **Report Generator** as the screen type .
3. Select the frame MAIN
4. Click in the new screen.
5. Select the *Add template...* command in the **Elements [screen type name]** menu
The dialog to select pre-defined screen content is displayed.

6. Select the desired template.
7. Confirm your selection by clicking on the **Apply** button.
8. Add any other control elements that may be required.

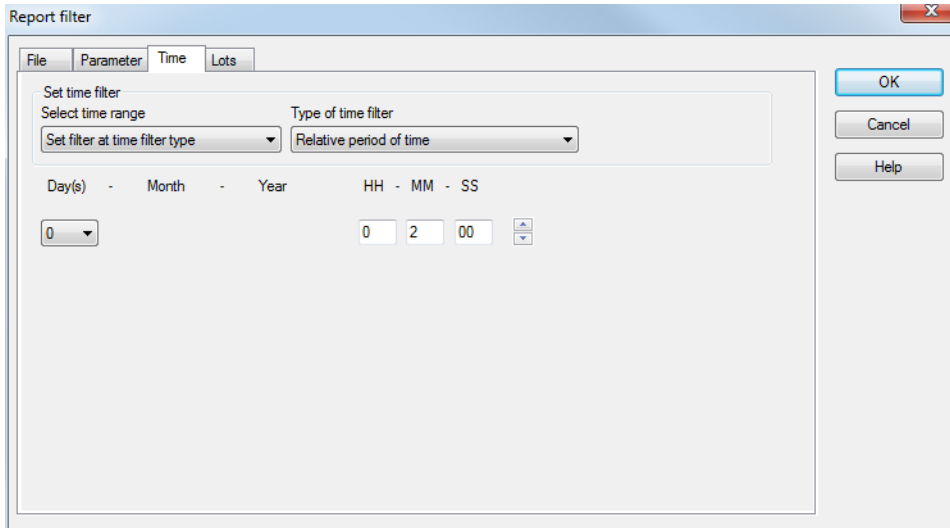
CREATING A FUNCTION

Create a screen switch function to select the screen in the Runtime. To do this:

1. Add a new button to the start screen
2. Label it with **Report**
3. Change to the **Functions** node
create a new function
4. Select **Screen switch**
5. Select the **Report** screen
6. The report filter is opened



7. Click on the **Format file** button
8. Select *Archiv.xls*
9. Open the **Time** tab



Report filter

File Parameter Time Lots

Set time filter

Select time range: Set filter at time filter type

Type of time filter: Relative period of time

Day(s) - Month - Year HH - MM - SS

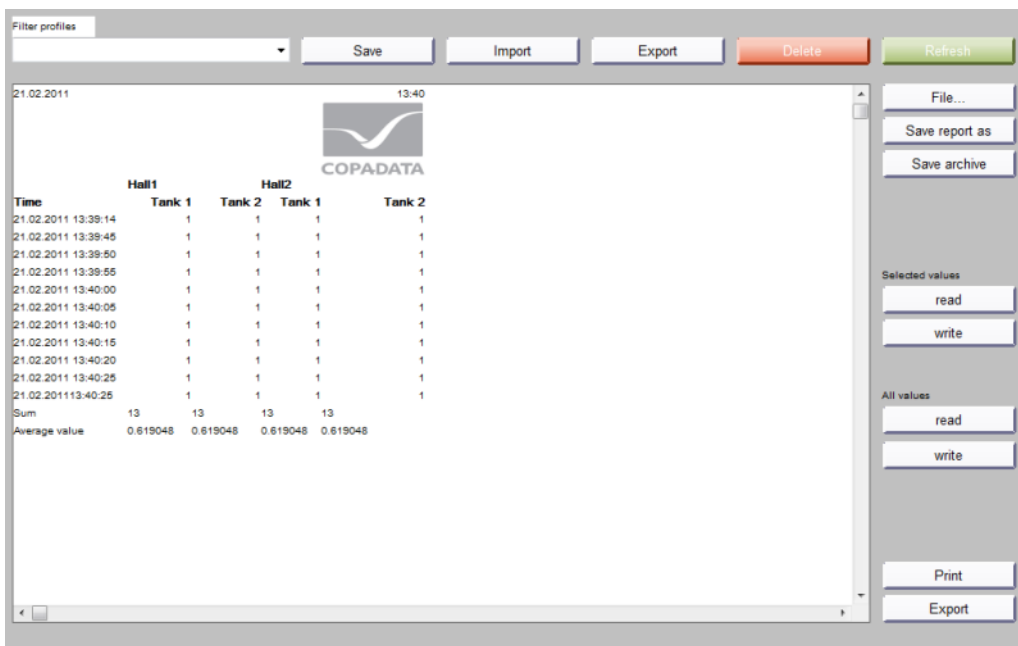
0 0 2 00

OK Cancel Help

10. Set, for our example
 - a) The time format to *Relative time period* and
 - b) Set the time to *2 minutes*.

You can read more about the time filter in the Alarm Message List manual in the time filter chapter

11. Close the filter by clicking on OK
12. Allocate a the configured button to the function
13. Start the function in the Runtime



Filter profiles

Save Import Export Delete Refresh

21.02.2011 13:40

COPADATA

Time	Hall1		Hall2	
	Tank 1	Tank 2	Tank 1	Tank 2
21.02.2011 13:39:14	1	1	1	1
21.02.2011 13:39:45	1	1	1	1
21.02.2011 13:39:50	1	1	1	1
21.02.2011 13:39:55	1	1	1	1
21.02.2011 13:40:00	1	1	1	1
21.02.2011 13:40:05	1	1	1	1
21.02.2011 13:40:10	1	1	1	1
21.02.2011 13:40:15	1	1	1	1
21.02.2011 13:40:20	1	1	1	1
21.02.2011 13:40:25	1	1	1	1
21.02.2011 13:40:25	1	1	1	1
Sum	13	13	13	13
Average value	0.619048	0.619048	0.619048	0.619048

File... Save report as Save archive

Selected values read write

All values read write

Print Export

4 Report Viewer

The Report Viewer can be used to display RDL reports of archive data, AML data, and CEL data as well as online values. Two historical time ranges can also be compared using two configurable time ranges.

RDL files that display the report template for Runtime are created and edited in the Editor. There are already 7 pre-defined datasets available. Further datasets can be created (on page 310) freely; only the table scheme (on page 322) for the four data categories is stipulated.

Attention: External datasets are not supported.

The source data that supplies the datasets created in the RDL file in Runtime is defined in the screen switching function (on page 220) on the Report Viewer (on page 216) screen. For each dataset used in the RDL file, a dataset with the same name and data origin must be created. The source variables and filter criteria can be prescribed for these depending on their type.

Attention

Reports that are displayed with the zenon **Report Viewer** are displayed depending on the settings for the Windows font size.

This means: Reports are, in the event of changes to the size, not scaled using the automatic screen adjustment of zenon. The content is not adjusted with screen scalings.

TYPICAL CONFIGURATION STEPS:

1. Create a new report definition file (on page 306) or import one.
2. Create a report viewer (on page 216) screen.
3. Create a screen switching function (on page 220) and configure datasets (on page 266).
4. Configure output (on page 299) as a PDF or output to the printer.
5. Configure (on page 310) an RDL file
6. Call up the function in the Runtime using a button or menu.

LIMITATIONS

Reports cannot be as large as you want, because the processing of quantities of data that are too large in a dataset can influence the performance of Runtime. The size of a report is limited to the issue of 65535 value/lines per dataset.

Note: For datasets with archive files, 5,000 values are issued for each variable contained in the archive.

⚠ Attention

If several Report Viewer functions (print, export) are executed at the same time, this can lead to Runtime being placed under load.

4.1 Engineering in the Editor

To be able to use the Report Viewer in the Runtime, the following must be carried out in the Editor:

1. Create a Report Viewer (on page 216) screen
2. Create or import an RDL file, if none is present
3. Set up a screen switching function (on page 220) on the Report Viewer screen
4. Configure the datasets in the screen switching
5. Amend the report definition file (on page 306) (RDL) to suit the datasets (on page 322) defined in zenon.
6. Add a button to call up the Report Viewer in the Runtime in the start screen or the menu screen

FOLDER FOR REPORT DEFINITION FILES (RDL)

RDL files are stored in the project tree in the Files/Report Viewer node. Existing RDL files can be imported and edited here or new files can be created.



REPORT TEMPLATE CONTEXT MENU

Menu item	Action
New report definition file	Open the dialog (on page 308) to create a new RDL file on the basis of the previously-defined data sets.
Open report definition file	<p>Opens the program linked to the RFL files to edit an existing definition file.</p> <p>zenon first looks for MS Report Builder, then for MS Report Designer (on page 310) by default.</p>
Create standard function	<p>Only available in the toolbar.</p> <p>Creates a screen switch to a Report Viewer type screen to be selected and enters the selected RDL file</p>

Menu item	Action
	into the Report definition file option.
Jump back to starting element	With linked elements, jumps back to the element from which the report template was jumped to. Only present in the context menu if linked elements are present.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the content from the clipboard. If an entry with the same name already exists, the content is pasted as " Copy of... ".
Delete	Deletes selected entries after a confirmation from list.
Import existing report definition file	Opens dialog to import existing report definition files. These must be of RDL 2.0 type.
Remove all filters	Removes all filter settings. Note: Only active if the current view is filtered.
Edit selected cell	Opens the selected cell for editing. The binocular symbol in the header shows which cell has been selected in a highlighted line. Only cells that can be edited can be selected.
Replace text in selected column	Opens the dialog to search and replace texts for the selected column.
Properties	Opens the Properties window.
Help	Opens online help.

4.1.1 Create Report Viewer screen

ENGINEERING

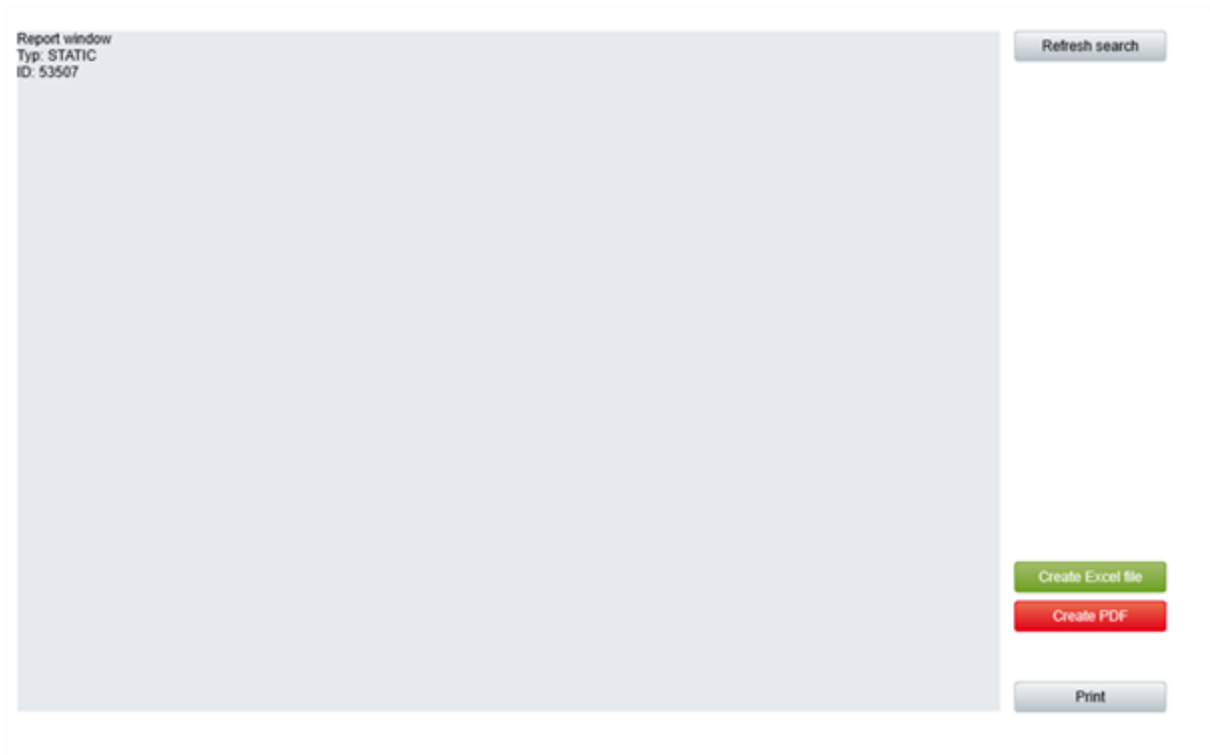
Two procedures are available to create a screen:

- ▶ The use of the screen creation dialog
- ▶ The creation of a screen using the properties

Steps to create the screen using the properties if the screen creation dialog has been deactivated in the menu bar under **Tools**, **Settings** and **Use assistant**:

1. Create a new screen.
To do this, select the **New screen** command in the tool bar or in the context menu of the **Screens** node.
2. Change the properties of the screen:
 - a) Name the screen in the **Name** property.
 - b) Select **Report Viewer** in the **Screen type** property.
 - c) Select the desired frame in the **Frame** property.
3. Configure the content of the screen:
 - a) Select the **Elements (screen type)** menu item from the menu bar.
 - b) Select *Insert template* in the drop-down list.
The dialog to select pre-defined layouts is opened. Certain control elements are inserted into the screen at predefined positions.
 - c) Remove elements that are not required from the screen.
 - d) If necessary, select additional elements in the **Elements** drop-down list. Place these at the desired position in the screen.
4. Create a screen switch function.

Note: Data set names in a screen switch to a **Report Viewer** screen must be uniquely assignable and can therefore only be issued once. An error message is issued otherwise.



Parameter	Description
Insert template	<p>Opens the dialog for selecting a template for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined position 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 placed in the zenon screen. Elements can be moved on the screen and arranged individually.</p>
Report window	<p>Functions and profiles for the report.</p> <p>Note: The Show integrated Report Viewer tool bar property in the Representation properties group can be used to activate or deactivate the display of the internal Report Viewer tool bar in the Runtime.</p>
Set filter	<p>Shortened display of the currently selected filter conditions in a compact filter line.</p>

Parameter	Description
	Static Win32 control element. Was replaced by a <i>dynamic text</i> field. For the description, see current element.
Set filter (detail list)	Detailed display of the currently selected filter conditions in a text window. Details can be found in the Runtime manual in the Filter section.
Refresh	Reloads the report definition and the data and displays the report with the updated data.
Print	Prints the report on the printer defined for values and logs.
Create PDF	Saves the report currently being displayed as a PDF file in the folder defined for export.
Create Excel file	Saves the report currently being displayed as an Excel file in the folder defined for export.
Compatible elements	Control elements that are replaced or removed by newer versions and continue to be available for compatibility reasons. These elements are not taken into account with automatic insertion of templates.
Set filter	Static Win32 control element. Was replaced by a <i>dynamic text</i> field. For the description, see current element.

NAVIGATION

Control elements for the navigation of the report display in Runtime. These control elements can be configured as a replacement for the internal tool bar of the Report Viewer and are especially suitable for Touch navigation. The **Show integrated Report Viewer tool bar** is used to show or hide the internal tool bar of the Report Viewer.

Parameter	Description
Current Page	Number of the report page that is currently displayed.
Number of pages	Display of the total number of pages in the report. Display in Runtime: If the complete scope cannot be determined, a ? character is visualized.
First Page	Goes to the first page of the report. Display in Runtime: Not available if the first page of the report is already being displayed.

Parameter	Description
Previous page	Goes to the previous page of the report. Display in Runtime:Not available if the first page of the report is being displayed.
Next page	Goes to the next page of the report. Display in Runtime:Not available if the last page of the report is being displayed.
Last Page	Goes to the last page of the report. Display in Runtime:Not available if the last page of the report is being displayed.

ZOOM

Parameter	Description
Zoom +	Enlarges the view of the report. Display in Runtime:The zoom stages are fixed.
Zoom -	Reduces the view of the report. Display in Runtime:The zoom stages are fixed.
Reset zoom	Zoom is set to 100%. The report is displayed with 100% display size. Display in Runtime:Not available if the report is currently displayed with 100% display size.

4.1.2 Screen switching to a Report Viewer screen

Configure screen switching to a **Report Viewer** screen in order to be able to use this screen type in the Runtime.

Procedure:

1. Create a screen switch function.
The dialog for the report filter (on page 266) is opened.
2. Select the RDL file in the **Report Definition** (on page 221) tab.
3. Define the module filter (on page 225) and/or time filter (on page 230).

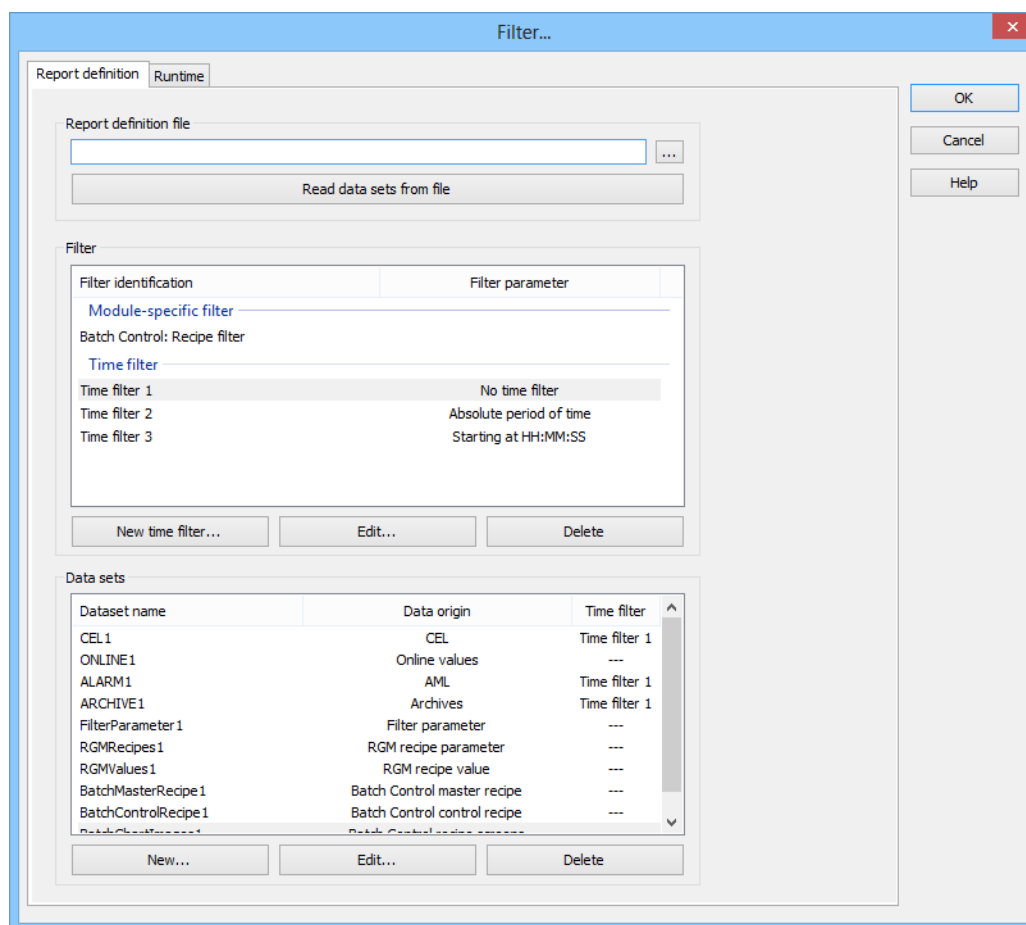
4. Create the desired data sets (on page 266).

Note: Data set names in a screen switch to a **Report Viewer** screen must be uniquely assignable and can therefore only be issued once. An error message is issued otherwise.

5. Switch to to the **Runtime** tab.
6. If you want, you can configure the creation of the time filter in the Runtime (on page 224) in the **Runtime** tab.
7. Link the function to a button on the screen in order to switch in the Runtime
8. Edit the datasets in the RDL file (on page 306) according to their settings in screen switching.

4.1.2.1 Report definition

You configure the data sets and filters to be displayed in this tab.



Parameters	Description
Report definition file	RDL file that is used for report definition. A click on the ... button opens the file selection dialog. This file must be present in the Files/Report Viewer

Parameters	Description
	node.
Reading data sets from a file	<p>Clicking on the button reads the data sets from the RDL file (on page 306) defined in the Report definition file and enters them into the Datasets list.</p> <p>In doing so, the following applies:</p> <ul style="list-style-type: none"> ▶ All datasets that can be assigned to an existing dataset type (on page 322) in zenon in terms of column number and naming are created automatically. ▶ Unknown data sets are ignored. ▶ If a time filter is needed, the first (time filter 1) is linked. If there is not yet a time filter present, a time filter with standard settings (relative, last hour) is displayed and linked. <p>Note: The Datasets list must be empty so that datasets from an RDL file can be inserted automatically. Existing data sets must be deleted before the function is used.</p>
Filter	<p>List of the available filters with a display of names and filter type. The following is available:</p> <ul style="list-style-type: none"> ▶ Module-specific filter: Batch Control recipe filter (on page 225) ▶ Time filter Time filter is automatically named with ascending numbering. <p>Configuration:</p> <ul style="list-style-type: none"> ▶ Clicking on the Module-specific filter opens the dialog to configure a batch filter (on page 225). ▶ Clicking on the New time filter ... button opens the dialog to configure a time filter (on page 230). <p>Double-clicking on the group overview opens the first configured filter of the group.</p>

Parameters	Description
New time filter	Opens the dialog (on page 230) for configuring a new time filter.
Edit	Opens the list of the time filters highlighted in the list for editing.
Delete	<p>Deletes the time filter highlighted in the list. The following time filters are automatically renamed.</p> <p>Attention: If a time filter is deleted, the assignment of the data set to the time filters must be reconfigured. Otherwise incorrect time periods are shown in Runtime.</p>
Data sets	<p>Display of the configured datasets (on page 266). The list contains:</p> <ul style="list-style-type: none"> ▶ Dataset name ▶ Origin of the data ▶ Time Filter
New	Opens the dialog (on page 265) to create a new report definition.
Edit	Opens the dialog (on page 266) to edit the definition of the selected element.
Delete	Deletes the selected element and its definition from the list.
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

If a data source is created in the RDL file that cannot be configured in the filter of a Report Viewer function, the missing data sets are replaced by blank entries. The report is therefore also displayed correctly in this case.

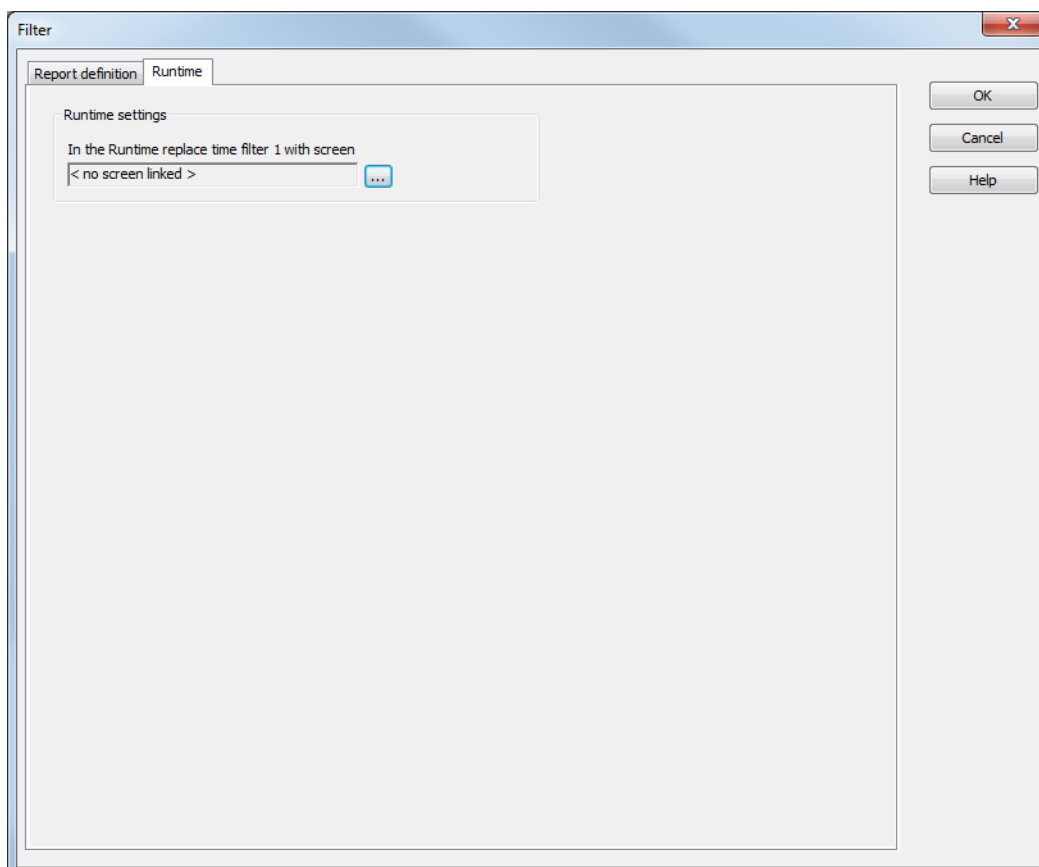
KEYBOARD SHORTCUTS

You can use the following keyboard shortcuts in this tab:

- ▶ **Add:** Adds a new filter or a new data set.
- ▶ **Remove:** Deletes the highlighted entry.
- ▶ **Space:** Opens the highlighted entry for editing.

4.1.2.2 Runtime

In this tab, you configure the replacement of the first time filter by a *time/lot/shift filter* screen. With this, you can, when calling up a **Report Viewer** screen for example, use a separate screen with time filters instead of the filter configured in screen switching.



Parameter	Description
Runtime settings	Settings for actions in the the Runtime.
Replacing time filter 1 with a screen in Runtime	Replaces the first configured time filter with a <i>time/lot/shift filter</i> screen in the Runtime. The currently-linked screen is displayed.

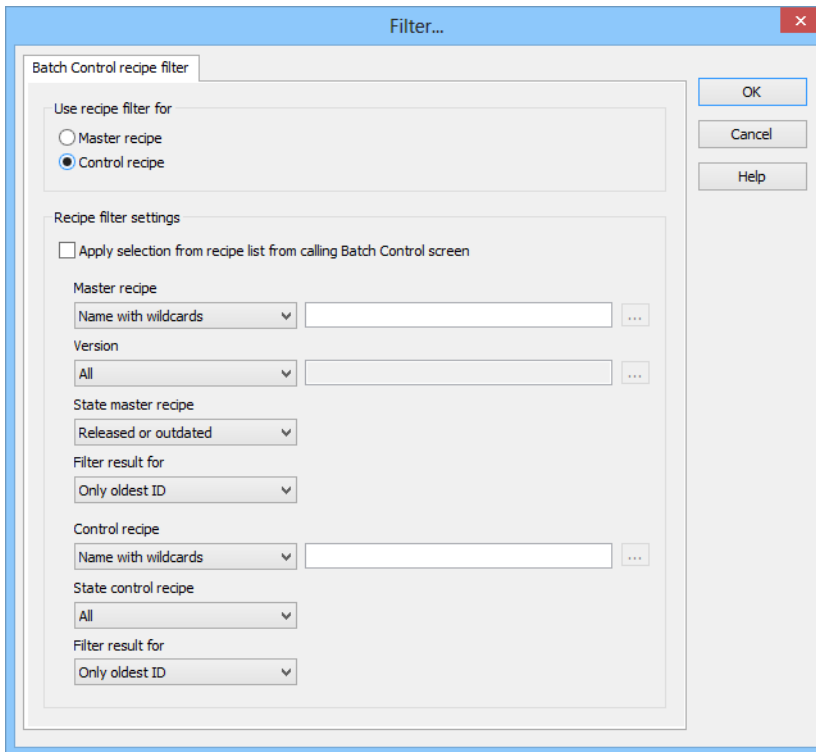
Parameter	Description
	<p>Click the ... button and the dialog opens to select a screen. Only screens from the project calling them up and <i>time/lot/shift filter</i> screens are offered.</p> <p>When selecting a filter screen, the BOX SCREEN information is also shown in the detail view of the function in the Parameter column; without a linked screen, only BOX is displayed.</p>
OK	Accepts changes in all tabs and closes dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

4.1.2.3 Batch Control recipe filter

When screen switching to a **Report Viewer** screen, a filter can be set for recipes from the Batch Control module. To filter according to recipes:

1. Open the Report definition (on page 221) tab for screen switching.
2. Go to area **Filter**.
3. In the **Module-specific filter** tab, click on **Batch Control:Recipe filter**.

The dialog for configuring the filter is opened.



USE RECIPE FILTER FOR

Option	Description
Use recipe filter for	Selection of the recipe type that is applied to the filter: <ul style="list-style-type: none"> ▶ Master recipe ▶ Control recipe
Master recipe	<i>Active:</i> It is filtered on Master recipes.
Control recipe	<p><i>Active:</i> It is filtered on control recipes.</p> <p>Note: The attendant master recipes must also be selected. If no master recipe has been selected for the control recipe, the filter cannot find the recipe being searched for in the Runtime.</p> <p>Hint: If the master recipe is not known, filtering of all master recipes with a placeholder is recommended.</p>

RECIPE FILTER SETTINGS

Option	Description
Recipe filter settings	Options for the recipe filter
Apply selection from recipe list from calling Batch Control screen	<ul style="list-style-type: none"> ▶ <i>Active:</i> In the Runtime, the first selected recipe of the batch screen from which the report viewer screen is called up is used. Individual settings in this dialog are then not available. ▶ <i>Inactive:</i> The filter settings are changed individually using this dialog.
Master recipe	<p>Parameters for the selection of the master recipe. Select from drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Name with wildcards:</i> A name with placeholder can be entered into the input field. Filtering according to this name is carried out. ▶ <i>Name from variable:</i>____ The name of the master recipe is defined by a variable in the Runtime. Click on button ... opens the dialog for selecting variables. ▶ <i>ID from variable:</i>____ The ID of the master recipe is defined by a variable in the Runtime. Click on button ... opens the dialog for selecting variables.
Version	<p>Selection of the version from the drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>All:</i> The version stated is ignored and each version found is used. ▶ <i>Fixed version:</i> This filters for versions that are entered in this field. Highest possible version: 4294967295 ▶ <i>Version from variable:</i> The version of the master recipe is defined by a variable in the Runtime. Click on button ... in order to open the dialog for selecting a variable. ▶ <i>Only oldest version:</i> Only the recipe with the oldest version number is used.

Option	Description
	<ul style="list-style-type: none"> ▶ <i>Only newest version:</i> Only the recipe with the newest version number is used. ▶ Default: <i>All</i>
Status of master recipe	<p>State of the recipe Selection from drop-down list, depending on filtering:</p> <p>Filtering for template recipes:</p> <ul style="list-style-type: none"> ▶ All ▶ Edit mode ▶ Released ▶ Test mode ▶ Test in execution ▶ Ended with an error ▶ Outdated <p>Filtering for control recipes:</p> <ul style="list-style-type: none"> ▶ Released or outdated ▶ Released ▶ Outdated
Filter result for	<p>Define which ID is to be selected when filtering for names by selecting from the drop-down list:</p> <ul style="list-style-type: none"> ▶ Only oldest ID ▶ Only newest ID <p>Because a report can only be used for one recipe, it is not possible to filter for "all recipes".</p>
Control recipe	<p>Parameters for the selection of the control recipe. Select from drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Name with wildcards:</i> A name with placeholder can be entered into the input field. Filtering according to this name is carried out. ▶ <i>Name from variable:___</i> The name of the control recipe is defined by a variable in the Runtime. Click on button ... opens

Option	Description
	<p>the dialog for selecting variables.</p> <ul style="list-style-type: none"> ▶ <i>ID from variable:</i> The ID of the master recipe is defined by a variable in the Runtime. Click on button ... opens the dialog for selecting variables. Precisely one recipe can be found if the variable value at the time of execution is a valid ID of a control recipe. ▶ <i>Job ID from variable:</i> Finds control recipes that have the given job ID number. Any type of variable can be linked. The value is automatically converted into STRING. Note: If the variable does not have a value, no recipe is sent to the Report Viewer.
State of control recipe	<p>Selection of the recipe status from the drop-down list:</p> <ul style="list-style-type: none"> ▶ All ▶ Prepared ▶ In execution ▶ Executed ▶ Terminated with error ▶ Outdated
Filter result for	<p>Define which ID is to be selected when filtering for names or job ID by selecting from the drop-down list:</p> <ul style="list-style-type: none"> ▶ Only oldest ID ▶ Only newest ID
OK	Applies all changes, creates filter and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Note for variable selection using name or ID: For the selection of variables according to name or ID, numerical variables and string variables can be selected respectively. The data types are converted to the respective correct form.

4.1.2.4 Time Filter

Time filters make it possible to limit the data to be displayed or exported. The time filters are very flexible to implement and can be pre-set in the Editor or amended in the Runtime.

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

Clicking on the **New** button or **Edit** button in the **Time filter** section of the **Report definition** (on page 221) tab opens the dialog to configure a time filter. Any number of time filters can be used.

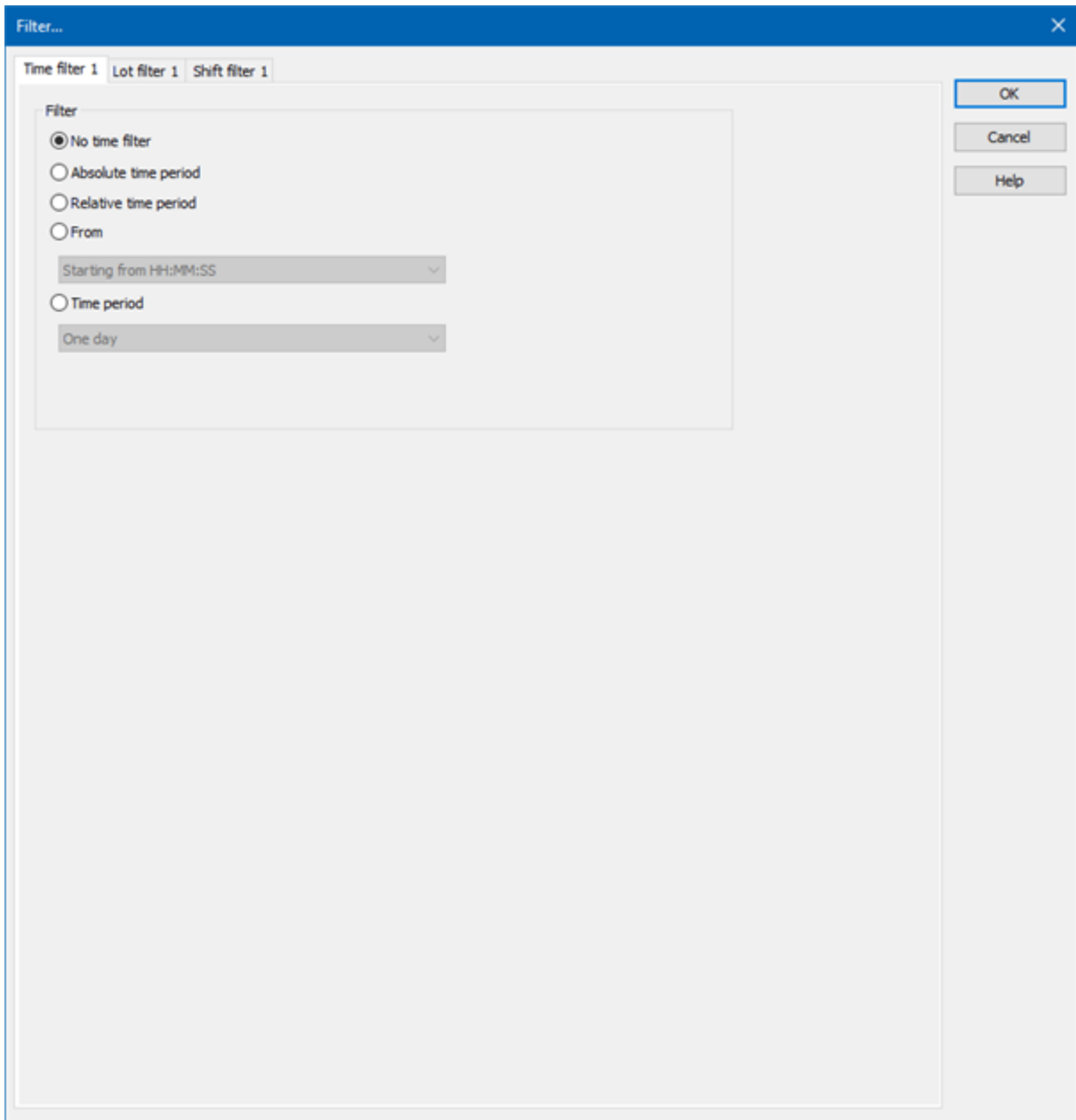
Time filters can be pre-set in both the Editor and in the Runtime, when configured accordingly, for:

- ▶ Absolute time period (on page 160)
- ▶ Relative time period (on page 161)
- ▶ From (on page 163)
- ▶ Time period (on page 166)
- ▶ Lots (on page 249)
- ▶ Shifts (on page 257)

Time filtering can be carried out in two ways:

1. Define time period in the Editor (on page 171)
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 also no longer be amended in the Runtime.
2. Time filter configurable in Runtime (on page 173)
Pre-configured times are used. The time filter is defined in the Editor and can be changed in the Runtime as desired.

TIME FILTER



FILTER

Selection of the filter.

Parameter	Description
No time filter	<p><i>Active:</i> No time filter is used.</p> <p>Note: In the Runtime, all entries since 1. 1. 1990 are displayed. Use of this filter setting is not supported by Extended Trend.</p>

Parameter	Description
Absolute time period	<p><i>Active:</i> A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used.</p> <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>Note: Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.</p>
Relative time period	<p><i>Active:</i> A relative time period is entered.</p> <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>Attention: this filter is constantly updated.</p> <p>Process Recorder: The time that is played back is used as the current time in the Process Recorder module in playback mode. As a result, reference is always made at the time of the recorded and reproduced data, and not at the time when the data is played back on the computer.</p>
From	<p><i>Active:</i> 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.</p> <p>Selection of the area mode from drop-down list:</p> <ul style="list-style-type: none"> ▶ Starting from HH:MM:SS ▶ Starting from day at HH:MM:SS ▶ Starting from day, month - HH:MM:SS <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>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.</p> <p>Process Recorder: The time that is played back is used as the current time in the Process Recorder module in playback mode. As a result, reference is always made at the time of the recorded and reproduced data, and not at the time when the data is played back on the computer.</p>

Parameter	Description
Time period	<p><i>Active:</i> A fixed time period is entered. Selection of the area mode from drop-down list:</p> <ul style="list-style-type: none"> ▶ One day ▶ One week ▶ Two weeks ▶ One month ▶ One Year ▶ 15 minutes ▶ 30 minutes ▶ 60 minutes <p>In the settings section, the corresponding options can be shown and configured there.</p> <p>The following selection is also enabled on activation:</p> <ul style="list-style-type: none"> ▶ Offer selection dialog ▶ Use current date/time <p>The Modify time period property can be activated.</p> <p>The time period can be moved to the future.</p> <p>The time period can be amended.</p> <p>Example: Create a screen switch, for example to an <i>AML</i> screen. In the screen switching filter dialog in the Time tab, set the filter to time period and select One Month in the drop-down list. Select Use current date/time under Settings. Activate the checkbox option Modify time period. Enter the following setting under Move time period to the future: HH = 0. Activate, under Change time period by, the checkbox option Use the last completed time period.</p> <p>Evaluation: today's date: 22.02.2018</p> <p>Result of the time filter in the Runtime: 01.01.2018 - 31.01.2018</p>

CLOSE DIALOG

Option	Description
OK	Applies all changes in all tabs and closes the dialog.

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

Note: If the **no time filter** option is set as time filter type, all entries in the Runtime since 1. 1. 2000 are displayed.

Attention

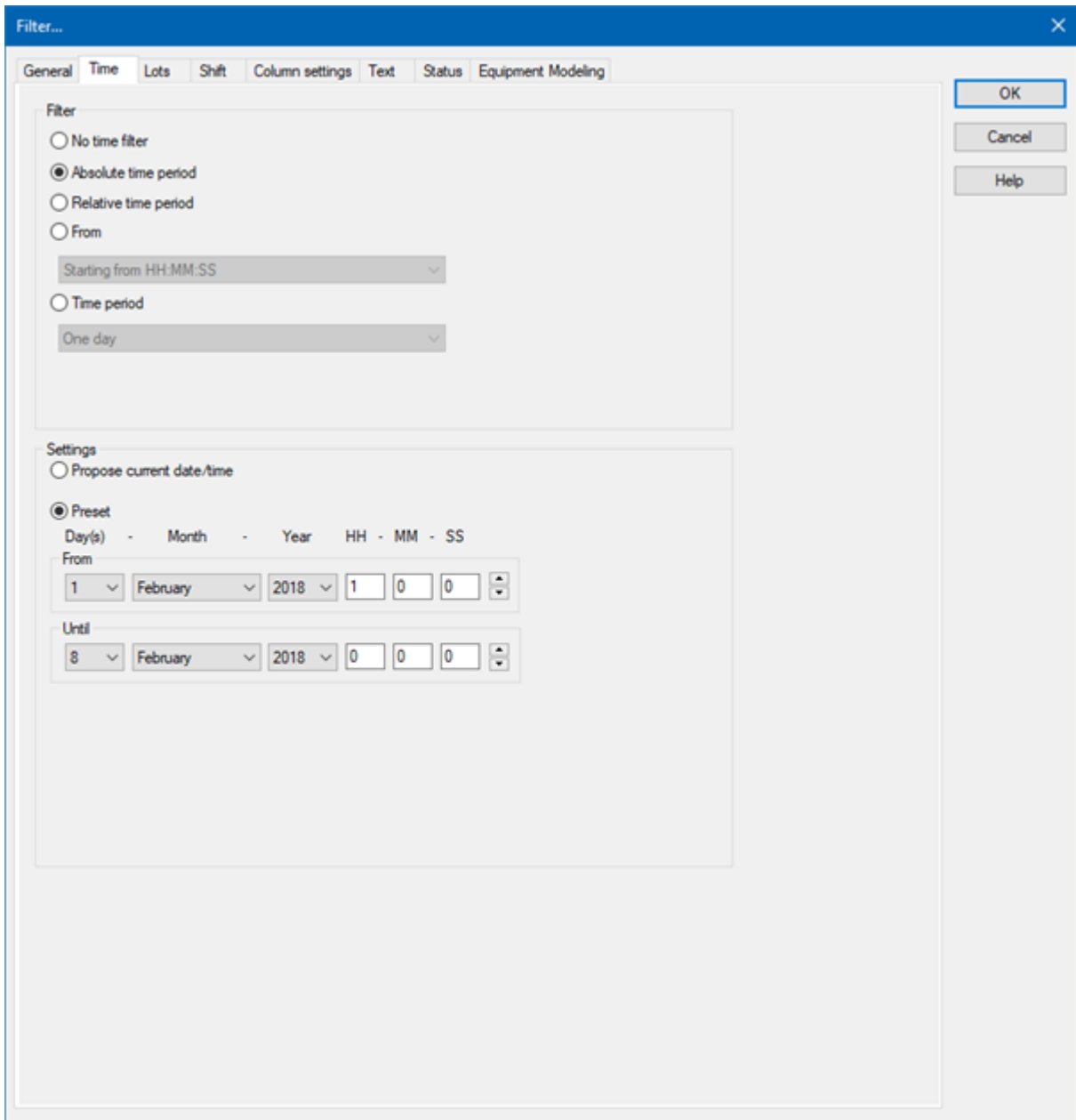
A **Report Viewer** screen can have several time filters. If, in the Runtime (on page 224) tab, a filter is set to a Report Viewer type screen using a *time filter* screen, then only the first time filter is replaced with the settings of the filter screen. Other filter types of the time filter are automatically set to *no time filter*.

4.1.2.4.1 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



Filter...

General | **Time** | Lots | Shift | Column settings | Text | Status | Equipment Modeling

Filter

☐ No time filter

☒ Absolute time period

☐ Relative time period

☐ From

Starting from HH:MM:SS

☐ Time period

One day

Settings

☐ Propose current date/time

☒ Preset

Day(s) - Month - Year HH - MM - SS

From

1 February 2018 1 0 0

Until

8 February 2018 0 0 0

OK Cancel Help

Parameter	Beschreibung
Einstellungen	Konfiguration des Zeitfilters.
Aktuelles Datum/Uhrzeit vorschlagen	Aktiv: Zeitfilter wird zur Runtime konfiguriert.
Vorgabe	Aktiv: Zeitfilter wird im Editor vorgegeben. Zur Runtime kann nur noch der Startzeitpunkt festgelegt werden.
Von	Startzeitpunkt des Filters. Auswahl von Tag, Monat, Jahr,

Parameter	Beschreibung
	Stunde, Minute und Sekunde.
Bis	Endzeitzeitpunkt des Filters. Auswahl von Tag, Monat, Jahr, Stunde, Minute und Sekunde.

CLOSE DIALOG

Option	Description
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.

4.1.2.4.2 Relative period of time

A relative time period is entered.

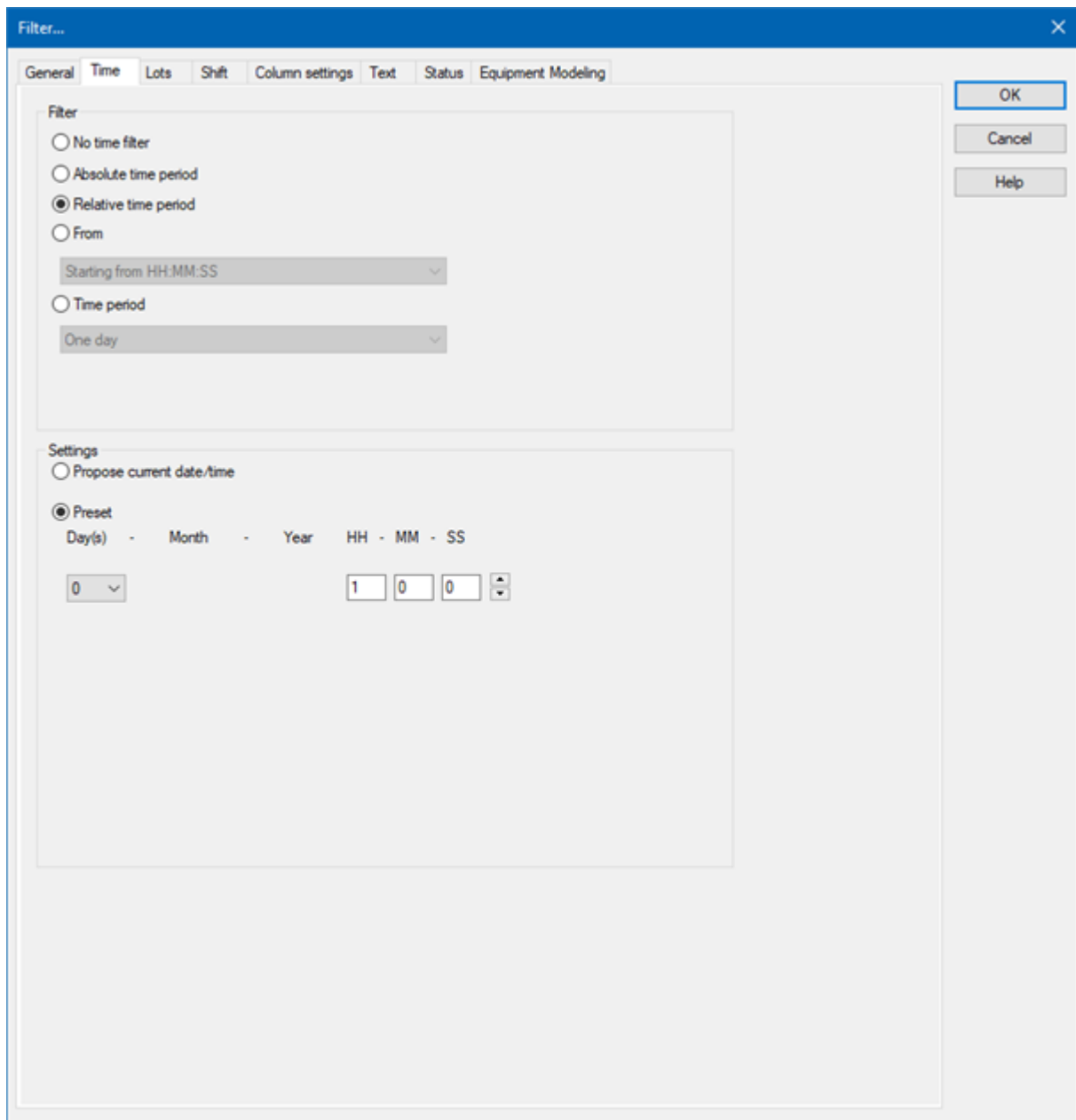
Attention: This filter is updated constantly and continues to run.

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



Parameter	Description
Settings	Configuration of the time filter.
Propose current date/time	<i>Active:</i> Time filter is configured in the Runtime.
Default	<p><i>Active:</i> The time filter is prescribed in the Editor. Only the start time can still be stipulated in the Runtime.</p> <p>Selection of the relative time period in days, hours, minutes and seconds.</p>

CLOSE DIALOG

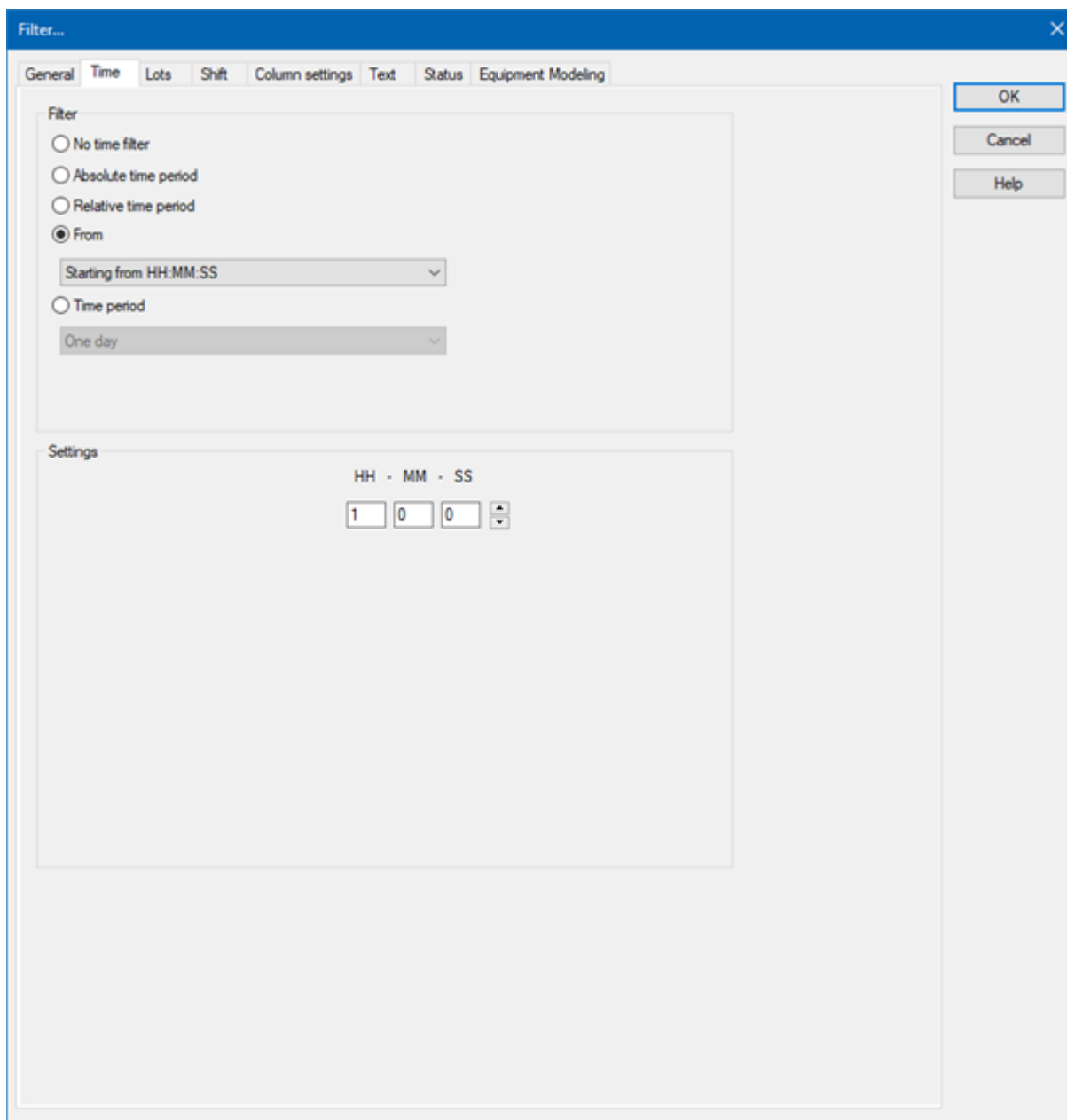
Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

4.1.2.4.3From

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.
 - ▶ *Starting from HH:MM:SS*
 - ▶ *Starting from day - HH:MM:SS*
 - ▶ *Starting from day, month - at HH:MM:SS*

- Configure the desired time in the **Settings** section



Filter...

General **Time** Lots Shift Column settings Text Status Equipment Modeling

Filter

☐ No time filter
☐ Absolute time period
☐ Relative time period
☒ From

Starting from HH:MM:SS

☐ Time period
 One day

Settings

HH - MM - SS

1 0 0

OK Cancel Help

Parameter	Description
Settings	Configuration of the time filter.
[Date/Time]	<p>Depending on the settings of the Off option, the time from which the filter is effective is configured here:</p> <ul style="list-style-type: none"> ▶ Starting from HH:MM:SS ▶ Starting from day at HH:MM:SS ▶ Starting from day, month - HH:MM:SS

Parameter	Description
	<p>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.</p> <p>The end time point is not defined with this filter, it is carried over.</p>
▶ <i>Starting from HH:MM:SS</i>	<p>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.</p> <p>Example: You enter <i>11:00:00 PM</i>. 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.</p>
▶ <i>Starting from day at HH:MM:SS</i>	<p>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.</p> <p>Example: You enter day 5 - 11:00:00 PM. 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 is carried out from 23:00 on the 5th of the previous month to the current time point.</p>
▶ <i>Starting from day, month - HH:MM:SS</i>	<p>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.</p> <p>Example: You enter Day 5, Month October - 11:00:00 PM. 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 23:00 on the 5th of the previous year to the current time point.</p>

CLOSE DIALOG

Option	Description
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.

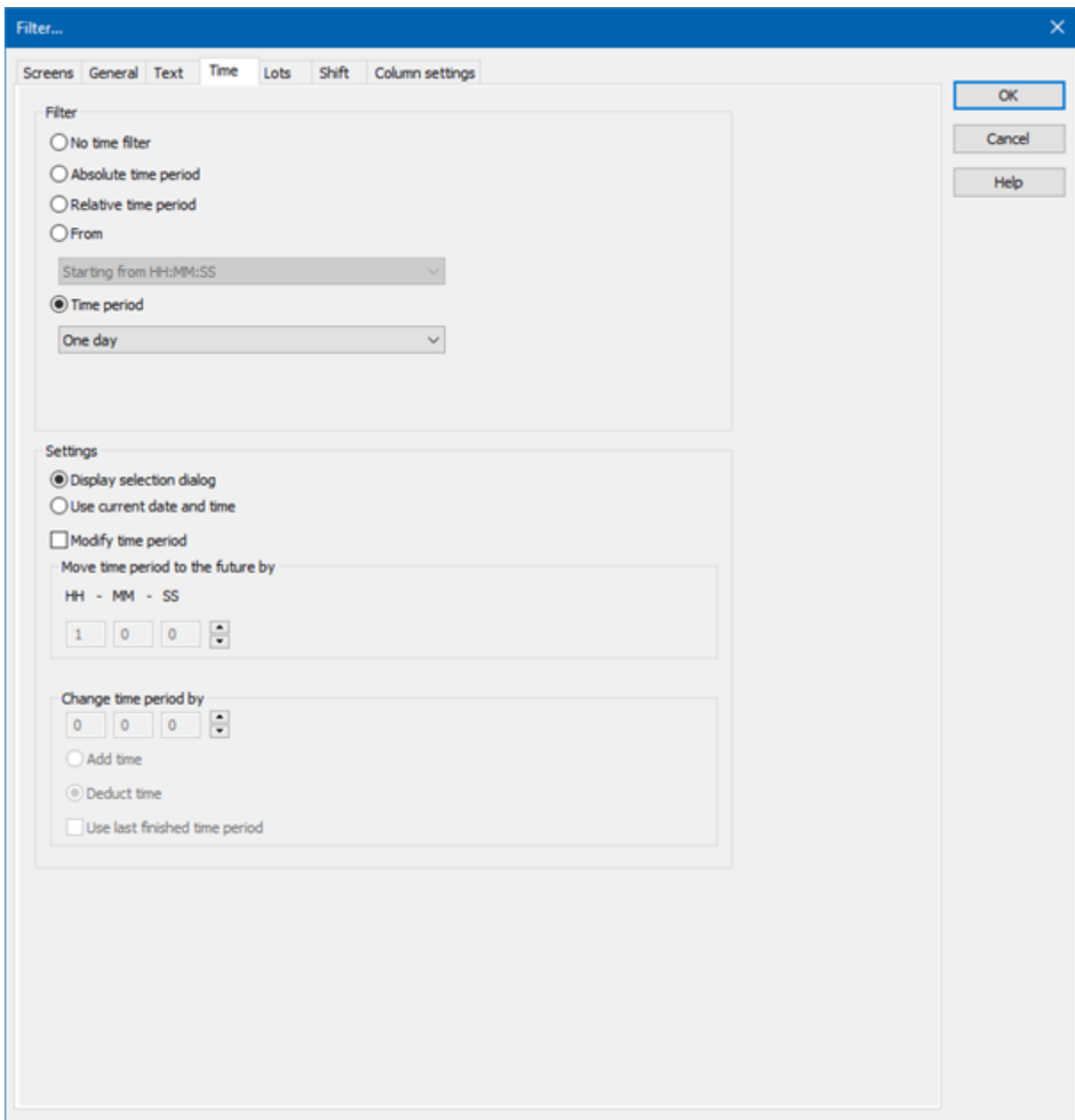
4.1.2.4.4 Time period

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.

3. **Note:** The **Offer selection dialog** and **Use current date/time** entries are deactivated if, in the **Filter...** dialog in the **Display** tab under **Runtime**, the **Show this dialog in Runtime** property has been activated.



Filter...

Screens General Text **Time** Lots Shift Column settings

Filter

☐ No time filter

☐ Absolute time period

☐ Relative time period

☐ From

Starting from HH:MM:SS

☒ Time period

One day

Settings

☒ Display selection dialog

☐ Use current date and time

☐ Modify time period

Move time period to the future by

HH - MM - SS

1 0 0

Change time period by

0 0 0

☐ Add time

☒ Deduct time

☐ Use last finished time period

OK Cancel Help

Option	Description
Time period	<p>Selection of a time range from a drop-down list.</p> <p>In Runtime this time range is filtered. The filter starts with the fixed start time of its time period:</p> <ul style="list-style-type: none"> 15 minutes: 0, 15, 30, 45 minutes of the hour

Option	Description
	<ul style="list-style-type: none"> ▶ 30 minutes: 0, 30 minutes of the hour ▶ 60 minutes: 0 minutes of the hour <p><u>Example 1:</u></p> <ul style="list-style-type: none"> ▶ Time period: 60 minutes ▶ Current time: 8:50 AM ▶ Result: Display for 08:00 - 08:50 <p><u>Example 2:</u></p> <ul style="list-style-type: none"> ▶ Time period: 60 minutes ▶ Current time: 9:00 AM ▶ Result: Display for 08:00 - 9:00 AM <p><u>Example 3:</u></p> <ul style="list-style-type: none"> ▶ Time period: 15 minutes ▶ Current time: 8:35 AM ▶ Result: Display for 8:30 AM - 8:35 AM <p><u>Example 4:</u></p> <ul style="list-style-type: none"> ▶ Time period: 15 minutes ▶ Current time: 8:45 AM ▶ Result: Display for 8:30 AM - 8:45 AM <p>Dialog in the Runtime:</p> <p>If this dialog is also offered in the Runtime, the start time of the time range can be selected.</p> <p>The following possibilities for selection are activated:</p> <ul style="list-style-type: none"> ▶ Offer selection dialog ▶ Use current date/time <p>The Modify time period property can be activated.</p> <ul style="list-style-type: none"> ▶ The time period can be moved to the future. ▶ The time period can be amended.
Settings	Optional setting for the time range.
Offer selection dialog	The selection dialog for the start time of the filter is offered

Option	Description
	in the Runtime.
Use current date/time	The current date/time is set for the filter.
Modify time period	<p>Allows amendments to cycles, postponements and extensions of time periods.</p> <p><i>Active:</i> Evaluation is carried out in accordance with the following rules:</p> <ul style="list-style-type: none"> ▶ 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. <p><i>Inactive:</i> No changes to the time period are made.</p> <p>Attention: As of version 7.10, filter actions on the basis of this function lead to different results than in prior versions.</p>
Move time period to the future by	<p><i>Active:</i> The time period defined in the filter is postponed to the future. The start and end time are moved by the set time span.</p> <p>Given in <i>hours - minutes - seconds</i>.</p> <p>If a postponement that is the same or greater than the selected time period is set, a note to check the configuration is displayed.</p> <p>Note: The default value for HH is 1. If, for example, an evaluation of the last month is to be undertaken, this value must be set to 0.</p>
Change time period to	<p><i>Active:</i> The time period defined in the filter is modified. The end time is moved by the set time span. The start time remains unchanged.</p> <p>Given in <i>hours - minutes - seconds</i>.</p> <p>The time range can be added or deducted. Selection by means of radio buttons:</p> <ul style="list-style-type: none"> ▶ Add time: The time stated in Change time period by is added to the time defined in the Time range option.

Option	Description
	<p>► Deduct time: The time stated in Change time period by is deducted from the time defined in the Time range option.</p> <p>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 next to the control element for time configuration.</p> <p>The following options are available:</p> <ul style="list-style-type: none"> ► <i>Use current time period</i> ► <i>Use last finished time period</i> ► <i>Use next completed time period</i> <p>Default: <i>Use current time period</i></p>
Use current time period	<i>Active:</i> The current time period is used for the filter process.
Use last finished time period	<p><i>Active:</i> The last selected and fully-completed time period in the Time period option is used.</p> <p>Example: For the Time period option, <i>One day</i> was selected. Filtering is thus carried out for "Yesterday", because this is the last day that was completed in full.</p>
Use next completed time period	<p><i>Active:</i> The last selected and fully-completed time period in the time period option is used.</p> <p>Example: For the Time period option, <i>One day</i> was selected. Filtering is thus carried out for "tomorrow", because this is the next day that will be completed in full.</p>

CLOSE DIALOG

Option	Description
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.

4.1.2.4.5 Specify 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 the Runtime. You can then only define the start time in the 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.

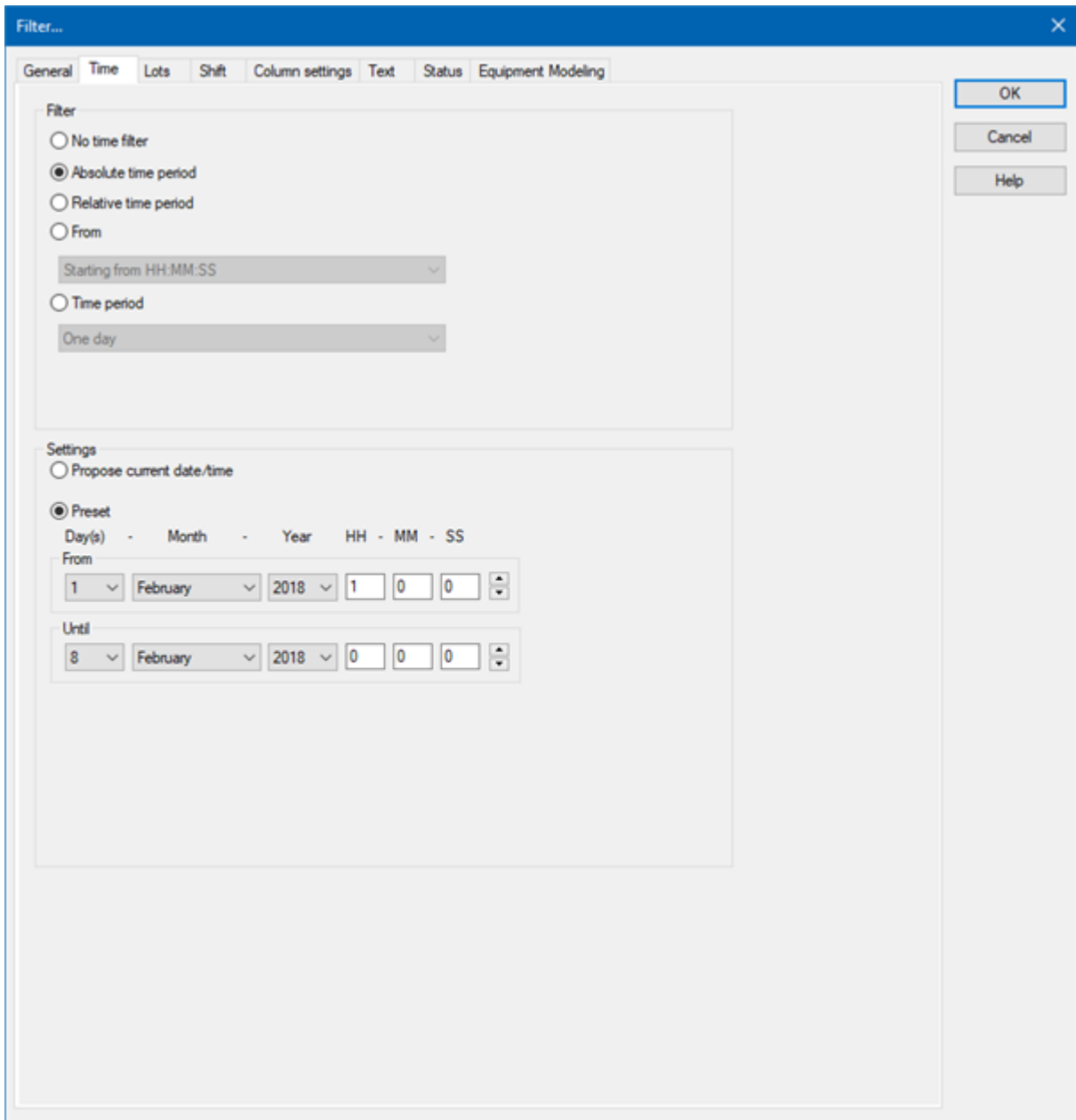
Attention

When using this type of filter, you can also no longer amend all other filters in the 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 the Runtime
2. select the desired filter

3. Configure the selected time period



Filter...

General Time Lots Shift Column settings Text Status Equipment Modeling

Filter

☐ No time filter

☒ Absolute time period

☐ Relative time period

☐ From

Starting from HH:MM:SS

☐ Time period

One day

Settings

☐ Propose current date/time

☒ Preset

Day(s) - Month - Year HH - MM - SS

From

1 February 2018 1 0 0

Until

8 February 2018 0 0 0

OK Cancel Help

Tip for time period: Activate the *Show 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.

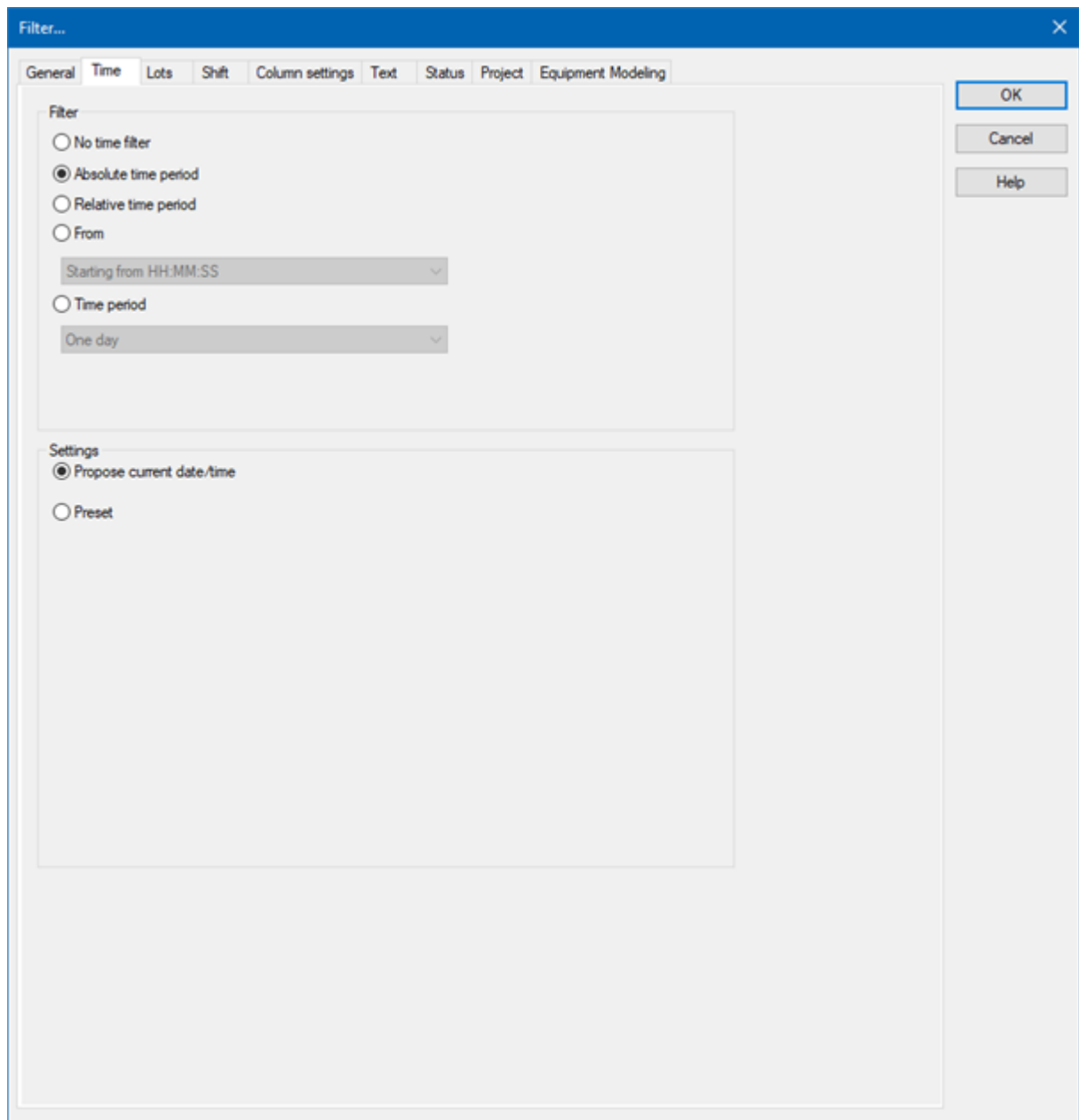
4.1.2.4.6 Time filter can be configured in Runtime

With this method, the time filter can be amended in the Runtime before execution.

To create the filter:

1. select the desired filter:
 - ▶ Absolute time period
 - ▶ Relative time period
 - ▶ Time period
2. Select, in the Settings section, the option **Propose current date/time**

3. The filter dialog is opened in the Runtime with the current date and time



4.1.2.4.7Lots

You configure the limitation of the display to certain lots in this tab. The lot information is also applied to the existing filter. If the lot filter is activated, a list of all configured lots that correspond to the configured time period is obtained from the archive server in the Runtime in advance.



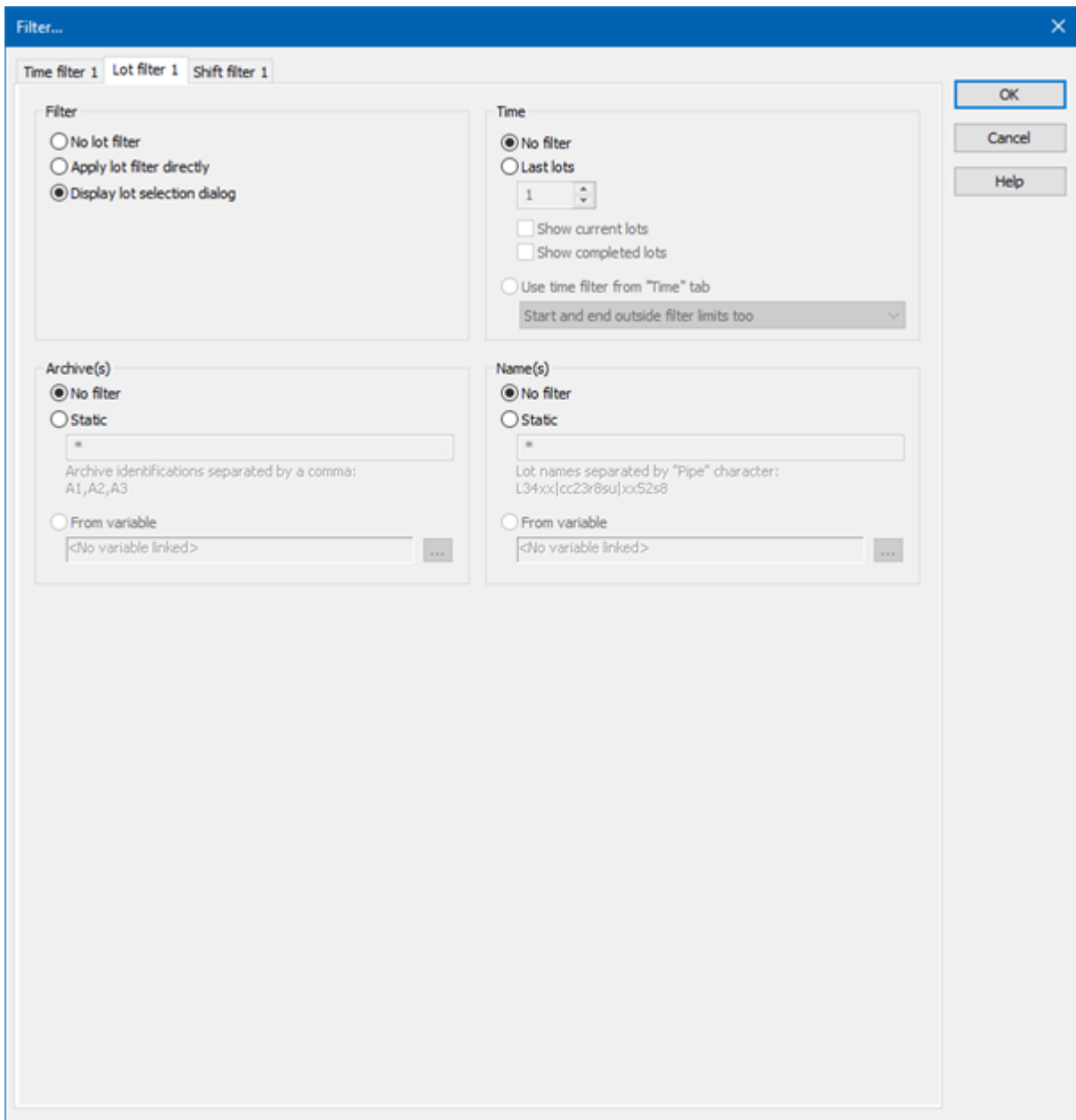
Information

Some filters in zenon can be configured independently of one another and then combined in the Runtime. This is only possible to a limited extent with the lot filter.

The lot filter can offer a list of existing lots in the Runtime. It is Runtime data that is not available in the Editor.

When configuring the screen switching in the Editor, the **time filter** tab can only be used in conjunction with the lot filter as a prefilter for the lot selection dialog. If a lot from this list is then selected in the Runtime, the time filter is overwritten with the data from the selected lot, in order to achieve precise filtering for the selected lot.

That means: If the lot selection dialog is used in the Runtime and a lot is selected, the time filter displayed does not correspond to the one configured in the Editor.



FILTER

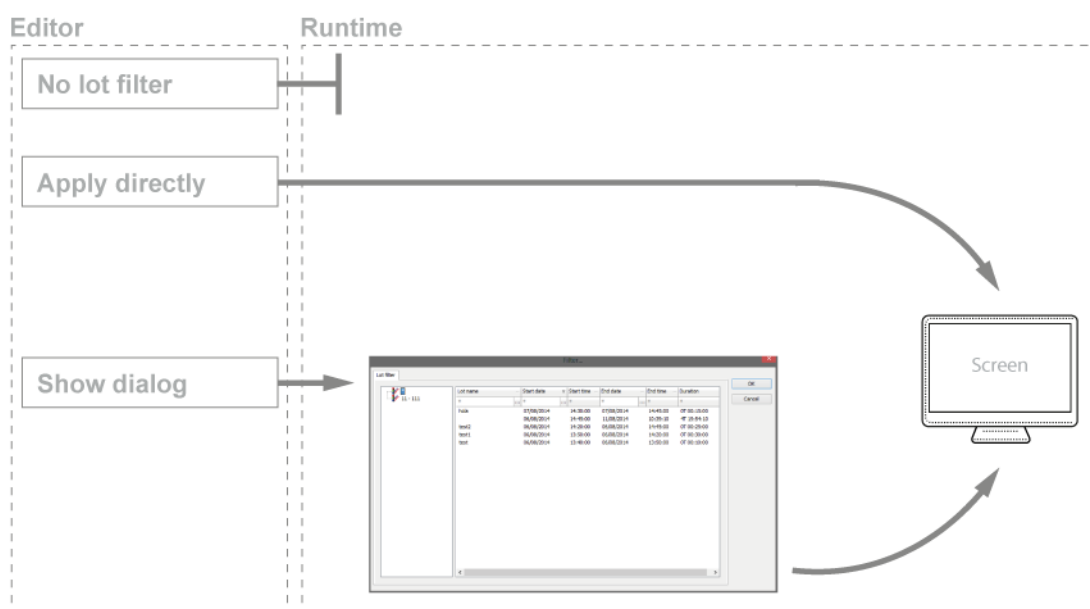
Settings for the application of the lot filter. Selection of one of the following options:

- ▶ **No lot filter**
- ▶ **Apply lot filter directly**
- ▶ **Display lot selection dialog**

Note: If the lot filter is shown as a dialog, it can be prefiltered for archive identifications. It is expressly recommended that you use this prefiltering for performance improvements.

Option	Description
No lot filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in Runtime.
Apply lot filter directly	<ul style="list-style-type: none"> ▶ <i>Active:</i> The filter configured here is applied in Runtime directly. <p>Note: There is no possibility to have all lots in a list displayed and to select one manually. If a certain lot is to be shown, the filter for the archives, name and time must be configured accordingly. This requires the existing data to be known very well. Alternatively, it is recommended that the Show lot selection dialog option is selected.</p>
Display lot selection dialog	<p><i>Active:</i> The dialog for lot selection is shown in Runtime when:</p> <ul style="list-style-type: none"> ▶ Clicking on Filter or ▶ screen switching, if the Show this dialog in Runtime option has been activated (Not available for each function/screen type) <p>Note: The dialog is not shown on reloading.</p> <p>Options can be pre-selected in the Editor.</p>

Overview of the implementation of configuration in Runtime:



TIME

Configuration of the time filter for lot selection. Selection of one of the following options:

- ▶ **No filter**
- ▶ **Last lots**
- ▶ **Use time filter from "Time" tab**

Option	Description
No filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> The time range set in the Time tab is not taken into account. All completed and current lots are displayed.
Last lots	<p>Attention: Only works in conjunction with the Apply lot filter directly option.</p> <p>The option allows the combination of both options Display current lots and Display completed lots. At least one of the two options must be activated. If both options have been deactivated, this corresponds to the No filter setting.</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> 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 arrow keys. <p>Example: 3 was entered as a value for the option. 2 lots run and 10 have been ended. The following is shown: the two that are current and one that has been completed.</p> <p>Note: The setting of the time filter is not used as a time period for the current lots, but the last year. This filter will not be executed as a prefilter and can therefore not be used to improve performance.</p> <p>Note on compatibility: If the project is compiled for a version before 7.11, then: If the current lots are selected or the combination of current and completed lots, then only the completed lots are shown in Runtime.</p>
Display current lots	<ul style="list-style-type: none"> ▶ <i>Active:</i> The current lots are displayed. <p>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</p>

Option	Description
	<p>reached.</p> <p>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.</p>
Display completed lots	<ul style="list-style-type: none"> ▶ <i>Active:</i> The completed lots are displayed. <p>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.</p>
Use time filter from "Time" tab	<ul style="list-style-type: none"> ▶ <i>Active:</i> Pre-filtering is carried out with the settings of the Time tab. <p>The effective range of the filter can be amended within this time range. Select from drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Start and end also outside filter limits:</i> (Default) Lots can start before the start time configured in the Time filter and end after the configured end time. ▶ <i>Start and end only outside filter limits:</i> Lots must start and end within the time points configured in the Time filter for the start and end. ▶ <i>Start also before filter limit:</i> Lots can start before the start time configured in the Time filter and end after the configured end time. ▶ <i>End also after the filter limit:</i> Lots can also end after the end time set in the time filter, but must start at or after the configured start time. ▶ <i>Adjust start and end to filter limits:</i> Lots are cut to the time points configured in the Time filter for the start and end.

ARCHIVES

Configuration of filtering for archives. This filter is applied as a prefilter for the lot selection dialog.

Selection of one of the following options:

- ▶ **No filter**

- ▶ Static
- ▶ From variable

Option	Description
No filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> Filtering for archive names is not carried out.
Static	<ul style="list-style-type: none"> ▶ <i>Active:</i> Archives whose identification corresponds to the character string entered in the input field are filtered for. <p>Input of the archive identifications in the input field:</p> <ul style="list-style-type: none"> ▶ Several identifications are separated by a comma (,). ▶ * or empty: All archives, no filter.
From variable	<ul style="list-style-type: none"> ▶ <i>Active:</i> The value of the variables linked here is applied as a filter for archive names in Runtime. <p>Click on button ... in order to open the dialog for selecting a variable.</p> <p>Available for AML and CEL modules if the Apply lot filter directly option has been selected: Other modules use their own configurations.</p> <p>Notes for variables in the Runtime:</p> <ul style="list-style-type: none"> ▶ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The ... button is always deactivated in the 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. <p>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 variable cannot be determined. The filter then corresponds to the No filter setting.</p>

Note for ETM: In the ETM, the archives are established by the curves configured in screen switching. In Runtime, this is only possible in connecting with the **Relative lot selection** option. With this, the variables must be selected in Runtime, which is in turn stipulated by the possible selection of

archives. The archive, once filtered, must be one of the archives that relate to the configured curves. No data is displayed if this is not the case. This setting can also be used to limit the displayed curves. However these remain shown in the curve list.

ETM example:

Configured curves	Data source	Archive prefiltering in the lot filter	Result in the screen
A	AR	AR	Is shown in the curve list and drawn in the trend.
B	EA		Is only shown in the curve list.
C	EP		Is only shown in the curve list.

Note archive revision: The archive for which the screen is opened is already selected in the screen switching function. Because only 1 archive can be selected, further limitation makes no sense.

Example of archive revision:

Configured archive	Archive prefiltering in the lot filter	Result in the screen
AR	EA	No data is displayed.

NAMES

Configuration of the filtering to names. Selection of one of the following options:

- ▶ **No filter**
- ▶ **Static**
- ▶ **From variable**

Option	Description
No filter	<ul style="list-style-type: none"> ▶ <i>Active:</i> Filtering for lot names is not carried out.
Static	<ul style="list-style-type: none"> ▶ <i>Active:</i> Lot names that correspond to the character string entered in the input field are filtered for. <p>Input of the lot name in the input field:</p> <ul style="list-style-type: none"> ▶ Several entries are separated by a pipe character (). ▶ * or empty: All lots of all displayed archives, no filter.
From variable	<ul style="list-style-type: none"> ▶ <i>Active:</i> The value of the variable linked here is applied as a filter for lot names in Runtime.

Option	Description
	<p>Click on the ... button to open the dialog for selecting a variable.</p> <p>Only available if the option Apply lot filter directly has been selected.</p> <p>Notes for variables in the Runtime:</p> <ul style="list-style-type: none"> ▶ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The ... button is always deactivated in the 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. <p>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 variable cannot be determined. The filter then corresponds to the No filter setting.</p>

CLOSE DIALOG

Option	Description
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.

4.1.2.4.8 Shifts

Datasets for AML, CEL and archives can also be filtered for shifts. To do this, configure the Shift tab in the time filter and apply the time filter to the data set. If several shift filters and/or lot filters are configured, they are shown in Runtime in a separate tab.

You configure the limitation of the display to certain shifts in this tab. The shift information is also applied to the existing filter.

Note:

- ▶ The shift filter requires a configured time filter. If the time filter is set to the **No time filter** option, the shift filter is deactivated. A notice of the cause of the deactivation is shown.
- ▶ If the lot filter is activated, the shift filter is automatically deactivated. Both filters mutually exclude one another. A notice of the cause of the deactivation is shown.

CONFIGURATION

To filter for shifts:

1. Configure the time filter.
 - ▶ **Absolute time filter:** Shifts from the absolute defined time period are shown.
 - ▶ **Relative time filter:** Shifts from the relative defined time range are shown.
The upper limit is set at 1440 minutes by default.
 - ▶ **From:** Shifts from a certain time point are shown.
 - ▶ **Time period:** Shifts within a certain time range are shown.
2. Configure the shift filter.

To do this, select one of the options:

 - ▶ **Apply shift filter directly:**

The configured time filter is used to filter the shifts in the Runtime. In doing so, all shifts that are at least partly in the time filter range are taken into account. Even if the time filter is defined in the Runtime, the shift filter is applied after selecting the time period. If there is no suitable shift, no data is shown in the CEL screen.

The set filter continues to have an effect on the CEL data. If a shift is only partially within the set time range, only the CEL entries that are both in the time filter and the shift are shown.
 - ▶ **Show shift selection:**

The shift filter is configured and applied when called up in the Runtime when the screen is called up. All shifts that are at least partly in the time filter range are offered in a list for selection. After selecting one or more shifts, the time filter is overwritten and set to the times of the selected shifts. It is thus ensured that the complete shift is always included in the filter.

Note: If, in the **General** tab, the **Show this dialog in Runtime** option is activated at the same time, the complete configuration dialog with all tabs is called up instead of the shift selection. The user can then redefine all options.
3. Configure **Name** and **Options** if required.

With the Apply shift filter directly option, the shifts are permanently monitored by the filter and the filter is amended if necessary.

The shifts for filtering the data are redetermined if:

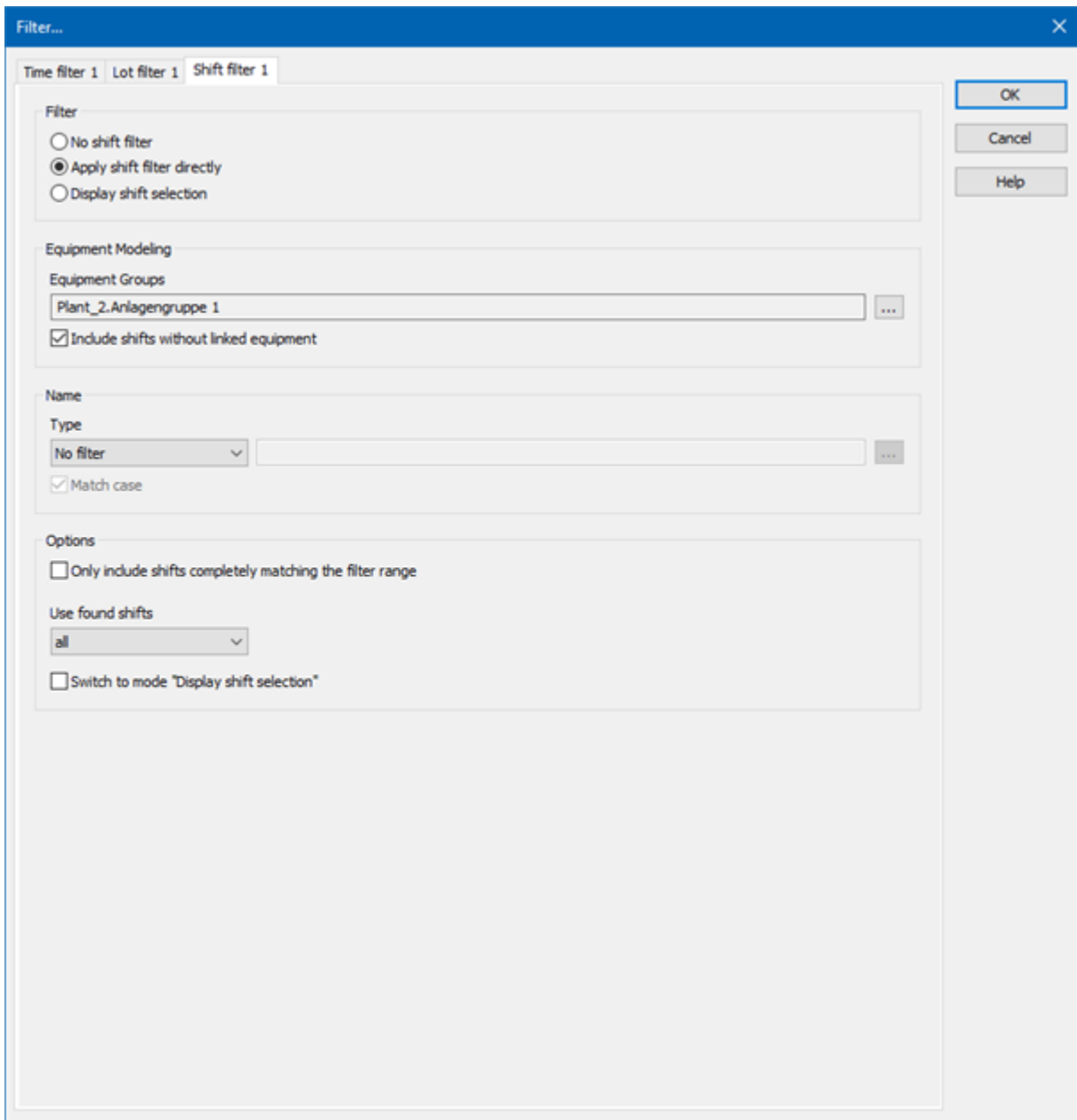
- ▶ Shifts are reconfigured

- ▶ Shifts are newly-created in the filter time period
- ▶ The time period is reconfigured

The following are not taken into account in the filter:

- ▶ Deleted shifts
- ▶ Shifts that are removed from the time filter due to a change of the time period

SHIFT DIALOG



Filter...

Time filter 1 | Lot filter 1 | Shift filter 1

Filter

☐ No shift filter

☒ Apply shift filter directly

☐ Display shift selection

Equipment Modeling

Equipment Groups

Plant_2.Anlagengruppe 1

☒ Include shifts without linked equipment

Name

Type

No filter

☒ Match case

Options

☐ Only include shifts completely matching the filter range

Use found shifts

all

☐ Switch to mode "Display shift selection"

OK Cancel Help

FILTER

Settings for the application of the shift filter. Selection of one of the following options:

- ▶ **No shift filter**
- ▶ **Apply shift filter directly**
- ▶ **Display shift selection**

Option	Description
No shift filter	Shift filter selection: <ul style="list-style-type: none"> ▶ <i>Active:</i> The shift filter is deactivated and cannot be configured. Filtering for shifts is not carried out in Runtime.
Apply shift filter directly	Applying the shift filter in Runtime: <ul style="list-style-type: none"> ▶ <i>Active:</i> The filter configured here is applied in Runtime directly. Equipment groups and shift names can be preselected. ▶ Plus Switch to "Display shift selection" mode option: The dialog for shift selection is shown in Runtime when screen switching. The dialog is not shown on reloading.
Display shift selection	Display of the shift selection in Runtime: <ul style="list-style-type: none"> ▶ <i>Active:</i> The dialog for shift selection is shown in Runtime when screen switching. The settings selected in the Editor are applicable for the reading of shifts in Runtime. The dialog is not shown on reloading. <p>Note: Changes to the shift calendar are not applied in the report when the report is open.</p>

EQUIPMENT MODELING

Configuration of the equipment groups for filtering for shifts.

Option	Description
Equipment groups	Selection of equipment groups to which shifts must be linked. Clicking on the ... button opens the dialog to select equipment groups. If several equipment groups are selected, they are displayed in the option separated by a semicolon (;).

Option	Description
Include shifts without linked equipment	<p>Selection of whether linking to an equipment group is necessary.</p> <ul style="list-style-type: none"> ▶ <i>Active</i>: Shifts that are not linked to an equipment group are also taken into account. ▶ <i>Inactive</i>: Only shifts that are linked to at least one equipment group are taken into account. <p>Default: <i>active</i></p>

NAME

Configuration of the shift names for which filtering is to take place.

Selection of one of the following options:

- ▶ **No filter**
- ▶ **Name with wildcards**
- ▶ **Name from variable**

Option	Description
Type	<p>Selection of the filter type from a drop-down list when filtering according to name:</p> <ul style="list-style-type: none"> ▶ <i>No filter</i>: Filtering for names is not carried out. ▶ <i>Name with wildcards</i>: A name with placeholder can be entered into the input field. All shifts whose name is applicable for the filter are included. ▶ <i>Name from variable</i>: The name of the shift is defined by a variable in the Runtime. Click on the ... Button to open the dialog to select a variable. <p>Default: <i>No filter</i></p> <p><u>Wildcards:</u></p> <ul style="list-style-type: none"> ▶ *: Replaces desired characters in the desired quantity. Can be used as a search term at any desired place. red* finds all texts that start with red. ▶ ?: Replaces precisely one character. r?d finds red, rad, ...

Option	Description
	<p>Notes for variables in the Runtime:</p> <ul style="list-style-type: none"> ▶ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The ... button is always deactivated in the 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. <p>Attention: If the selected variable cannot be found in Runtime or the value of the variables cannot be determined, the filter is treated like the No filter setting.</p>
Match case	<p>Setting for filtering for upper/lower case</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> Capitalization is taken into account for names. <p>Default: <i>active</i></p>

OPTIONS

Configuration of the options for filtering for shifts in the CEL.

Option	Description
Only include shifts that are fully in the filter range	<p>Configuration of which shifts are displayed.</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> Only shifts that are fully in the time filter set are shown. ▶ <i>Inactive:</i> Shifts that start earlier and/or finish later are also shown. <p>Default: <i>inactive</i></p> <p><u>Example:</u></p> <ul style="list-style-type: none"> ▶ Time filter: Today 08:00 – 12:00. ▶ Existing shift: Today 8:30 AM – 5:00 PM. <p>Result for:</p> <ul style="list-style-type: none"> ▶ Option <i>active</i>: The shift is not taken into account because it is not fully in the time filter. ▶ <i>Inactive</i> option: The shift is taken into account because it is

Option	Description
	partly in the time filter.
Use shifts found	<p>Selection of shifts that are taken into account, from drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>All</i>: All shifts found are taken into account. ▶ <i>Earliest shift only</i>: Of the shifts found, only the earliest are taken into account. The earliest shift is the shift with the earliest start time. If several shifts have the same start time, one of these shifts is selected randomly. ▶ <i>Only last shift</i>: Of the shifts found, only the latest shift is taken into account. The latest shift is the shift with the latest end time. If several shifts have the same end time, one of these shifts is selected randomly. <p>Default: <i>All</i></p> <p>Attention: The Only include shifts that are fully in the filter range influences the evaluation of this option. If it is active, only shifts that are fully in the time range can be found. If it is inactive, shifts that start earlier or end later can be found.</p> <p>Example:</p> <p><u>Configuration and shifts:</u></p> <ul style="list-style-type: none"> ▶ Only include shifts that are fully in the filter range option: active. ▶ Use found shifts option: <i>Latest shift only</i> ▶ Time filter: Today 08:00 – 10:00 AM. ▶ Shift 1: Today 08:00 – 8:30 AM. ▶ Shift 2: Today 8:30 AM – 9:00 AM. ▶ Shift 3: Today 10:00 AM – 11:00 AM. <p><u>Result:</u></p> <ul style="list-style-type: none"> ▶ Shift 2 is used
Switch to "Show shift selection" mode	<ul style="list-style-type: none"> ▶ <i>Active</i>: The filter acts as with the Show shift selection option. The time filter is set to absolute; start and end

Option	Description
	<p>correspond to the start time and end time of the shifts. If no shift is found, the times are set to 0 for the time filter.</p> <p>Default: <i>inactive</i></p> <p><u>Behavior in the Runtime:</u></p> <p>If the shift management is set to Show shift selection in the Runtime, the filter options also have an effect on the shifts shown in the shift list. The shift list is filtered accordingly by clicking on the Update button.</p>

CLOSE DIALOG

Option	Description
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.

EXAMPLE OF APPLYING SHIFT FILTER DIRECTLY

The effect that the **apply shift filter directly** filter has in Runtime depends on the **Switch to "Show shift selection" mode** option.

Two time filters are created in this example; one shift is deleted in Runtime once a shift is activated.

Two time filters with shift filters are configured:

- ▶ **Filter1: Apply shift filter directly**
- ▶ **Filter2: Apply shift filter directly** plus **Switch to "Display shift selection" mode** option:

They are used by these datasets:

- ▶ Archives: use **Filter1**
- ▶ CEL: uses **Filter2**

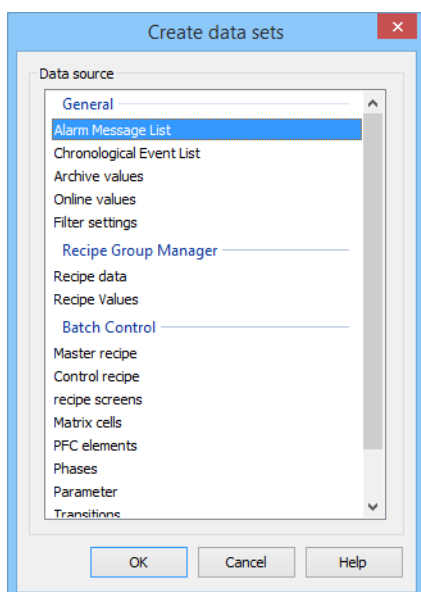
The screen is always called up with these screens. All shifts in the filter are displayed for archives and CEL. A shift in the filter is deleted:

- ▶ Archives: The deleted shift is removed from the display when updating.
- ▶ CEL: The deleted shift is shown until the screen is called up again.

4.1.2.5 New dataset dialog

To define a new data set:

1. Define, in the screen switching (on page 221), the RDL file on which it is based, on a **Report Viewer** screen
2. Click, in the **Datasets** section, on the **New** button
3. The dialog to create the datasets is opened
4. Select the data origin you want to assign
5. Confirm the selection by clicking **OK**
6. the dialog (on page 266) for configuring the defined type is opened



Parameters	Description
Data source	<p>Selection of the data origin:</p> <p><u>General</u></p> <ul style="list-style-type: none"> ▶ Alarm Message List (on page 267) ▶ Chronological Event List (on page 269) ▶ archive value (on page 272) ▶ online values (on page 275) ▶ filter settings (on page 276) <p><u>Recipegroup Manager</u></p> <ul style="list-style-type: none"> ▶ RGM recipe data (on page 277) ▶ RGM recipe values (on page 283)

Parameters	Description
	<u>Batch Control</u> <ul style="list-style-type: none"> ▶ Master recipe (on page 289) ▶ Control recipe (on page 290) ▶ Recipe screens (on page 290) ▶ Matrix structure (on page 293) ▶ PFC structure (on page 294) ▶ Phases (on page 295) ▶ Parameter (on page 296) ▶ Transitions (on page 297) ▶ Unit allocations (on page 298) ▶ Operation instances (on page 299)
OK	Confirms selection and opens dialog (on page 266) for configuration of the type.
Cancel	Closes dialog without further configuration.
Help	Opens online help.

4.1.2.6 Datasets in the Report Viewer

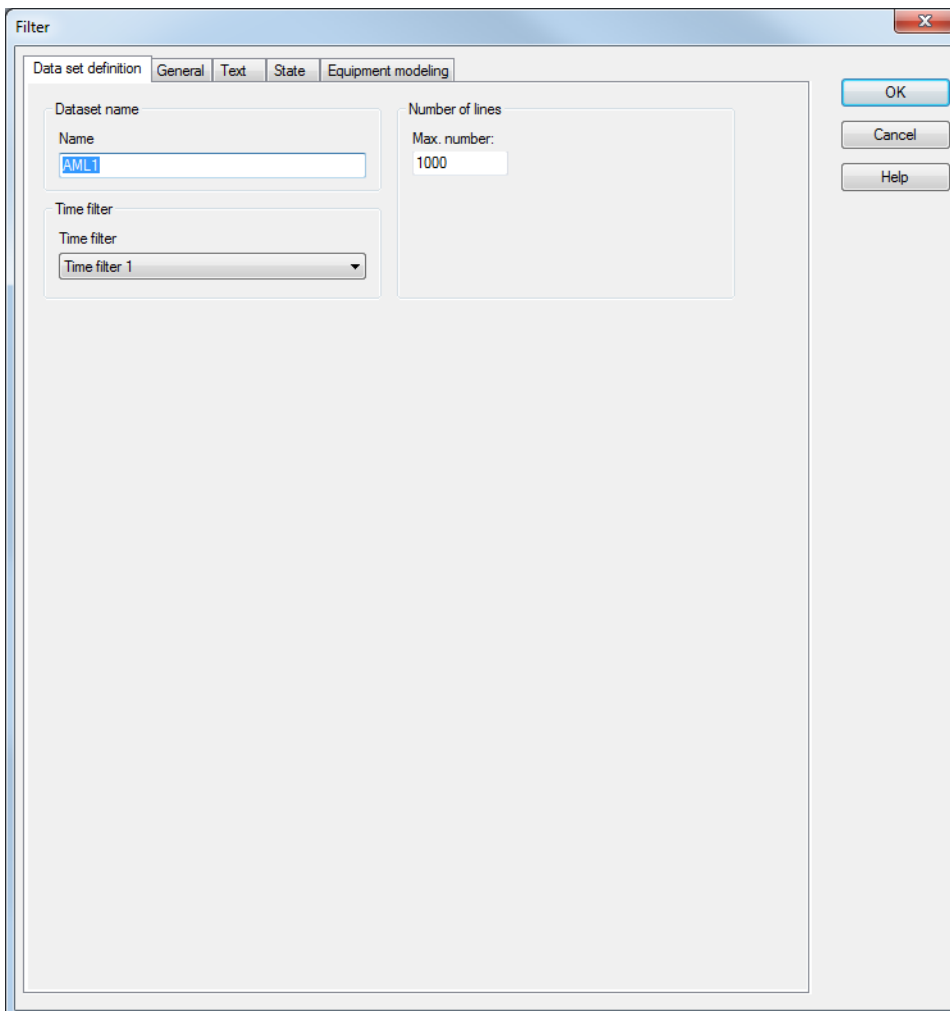
The settings for the different datasets depend on the type of data origin to be configured:

- ▶ General
 - ▶ AML data (on page 267)
 - ▶ CEL data (on page 269)
 - ▶ Archive data (on page 272)
 - ▶ Online values (on page 275)
 - ▶ Filter settings (on page 276)
- ▶ RGM
 - ▶ RGM recipe data (on page 277)
 - ▶ RGM recipe value (on page 283)
- ▶ Batch Control (on page 288)
 - ▶ Master recipe (on page 289)

- ▶ Control recipe (on page 290)
- ▶ Recipe screens (on page 290)
- ▶ Matrix cells (on page 293)
- ▶ PFC structure (on page 294)
- ▶ Phases (on page 295)
- ▶ Parameters (on page 296)
- ▶ Transitions (on page 297)
- ▶ Unit allocations (on page 298)
- ▶ Operation instance (on page 299)

4.1.2.6.1 AML data

Configuration of the AML files:



The screenshot shows a 'Filter' dialog box with a tabbed interface. The 'Data set definition' tab is active, showing fields for 'Dataset name' (Name: AML1), 'Time filter' (Time filter 1), and 'Number of lines' (Max. number: 1000). The 'General' tab is also visible. The dialog includes 'OK', 'Cancel', and 'Help' buttons.

Parameters	Description
Dataset name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Maximum number	<p>Maximum number of entries per variable in the report.</p> <p>If the report has more entries than defined here due to its filter criteria, the first n entries are output. n corresponds to the value entered.</p> <ul style="list-style-type: none"> ▶ Minimum: 1 ▶ Maximum: 65535 <p>Default: 1000</p>
Time Filter	<p>Selection of the time filter from the drop-down list. Contains the time filter defined in the Report Definition (on page 221) tab.</p>
General tab	<p>Settings for:</p> <ul style="list-style-type: none"> ▶ Variable filter ▶ Type of alarm ▶ Origin of the data ▶ Alarm/event groups, alarm/event classes and alarm areas <p>For details see the Alarm administration manual, General chapter.</p>
Text tab	<p>Settings for the text filter.</p> <p>For details see the Alarm administration manual, Text chapter.</p>
State tab	<p>Data for evaluation of status bits.</p> <p>For details see the Alarm administration manual, Status chapter.</p>
Equipment modeling tab	<p>Selection of the equipment model.</p>

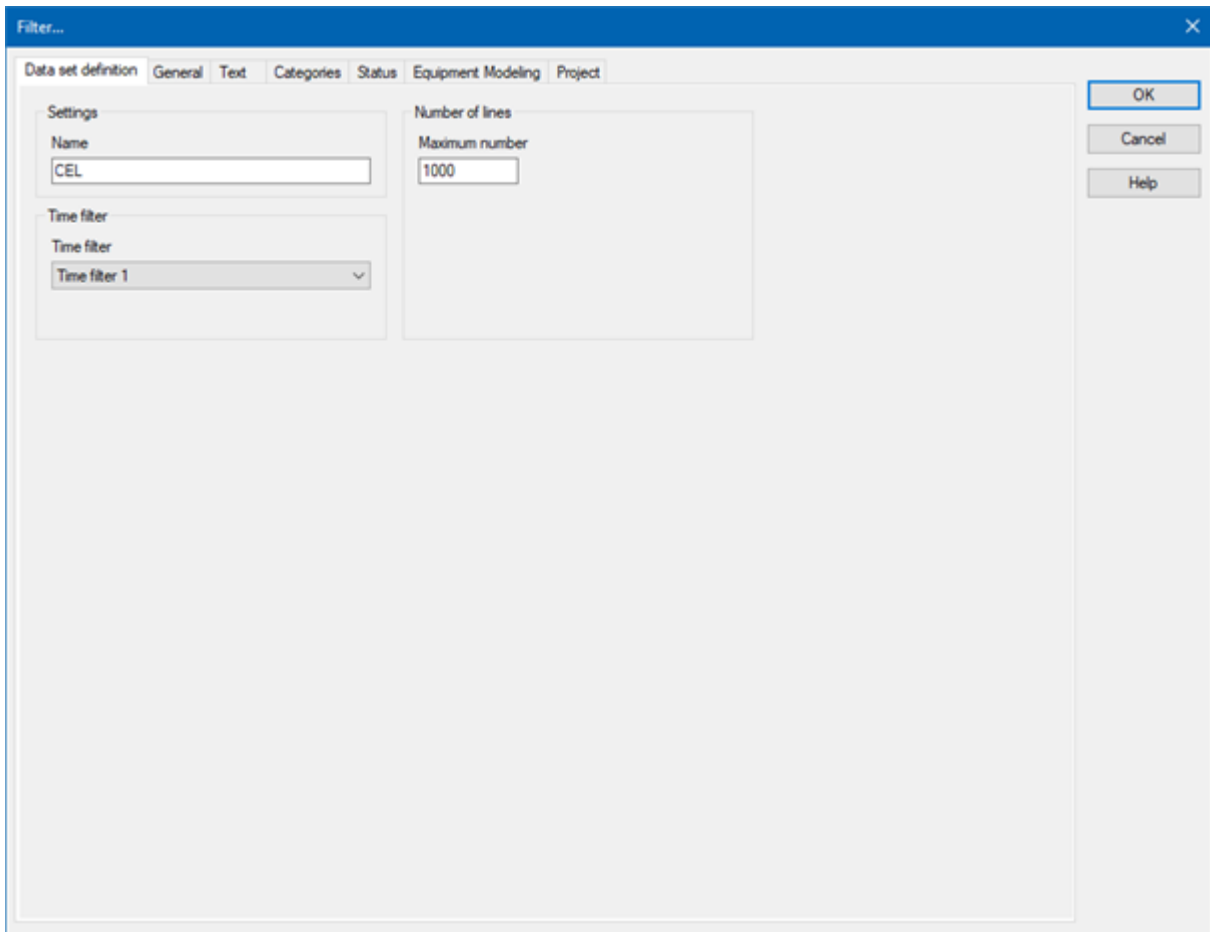
Parameters	Description
	For details see the Equipment modeling manual, Equipment modeling dialog chapter.
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes dialog.
Help	Opens online help.

4.1.2.6.2 CEL data

Configuration of the CEL data using several tabs.

DATA SET TAB DEFINITION

Options for the data set



The screenshot shows a 'Filter...' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog has several tabs: 'Data set definition', 'General', 'Text', 'Categories', 'Status', 'Equipment Modeling', and 'Project'. The 'Data set definition' tab is active. It contains two main sections: 'Settings' and 'Number of lines'. In the 'Settings' section, there is a 'Name' field with the text 'CEL' and a 'Time filter' dropdown menu currently showing 'Time filter 1'. In the 'Number of lines' section, there is a 'Maximum number' field with the value '1000'. On the right side of the dialog, there are three buttons: 'OK', 'Cancel', and 'Help'.

Option	Description
Name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Maximum number	<p>Maximum number of entries per variable in the report.</p> <p>If the report has more entries than defined here due to its filter criteria, the first n entries are output. n corresponds to the value entered.</p> <ul style="list-style-type: none"> ▶ Minimum: 1 ▶ Maximum: 65535 <p>Default: 1000</p>
Time Filter	<p>Selection of the time filter from the drop-down list.</p> <p>Contains the time filter defined in the Report Definition (on page 221) tab.</p>

FURTHER TABS

Furthermore, the following tabs are available for configuration:

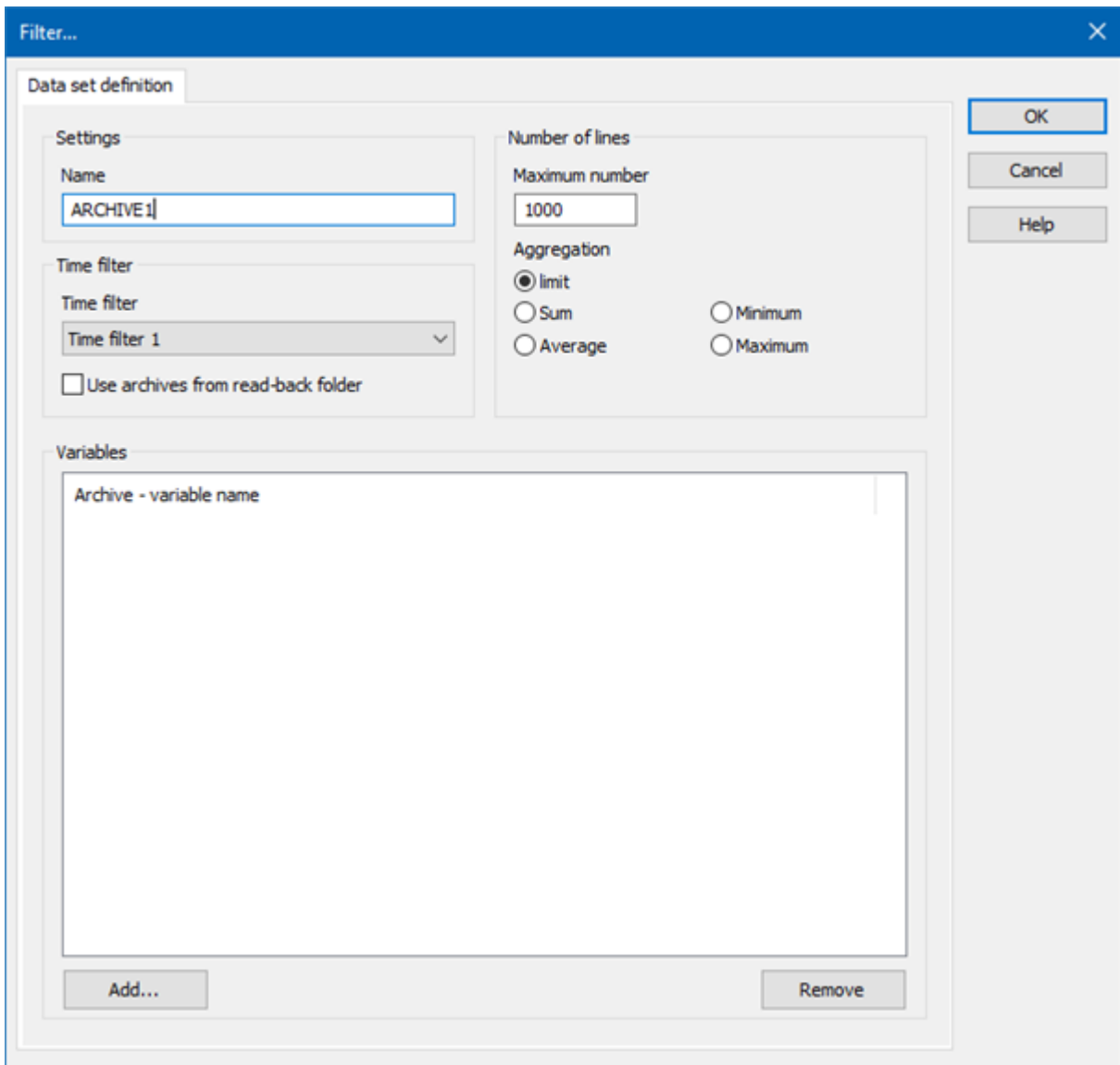
Tab	Description
General	<p>Settings for:</p> <ul style="list-style-type: none"> ▶ Variable filter ▶ Origin of the data ▶ Alarm/event groups, alarm/event classes and alarm areas <p>For details see the Chronological Event List manual, General chapter.</p>
text	<p>Settings for the text filter.</p> <p>For details see the Alarm administration manual, Text chapter.</p>
Categories	<p>Configuration of the categories to be filtered.</p>

Tab	Description
	For details, see the Categorization manual, Configuration in screen switching and functions area, Categories chapter.
State	Data for evaluation of status bits. For details see the Alarm administration manual, Status chapter.
Equipment Modeling	Selection of the equipment model. For details see the Equipment Modeling manual, Equipment Modeling Dialog chapter.
Project	Selection of the projects. For details, see the Project administration and workspace manual, Configuration of the project filter chapter.

CLOSE DIALOG

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.

4.1.2.6.3 Archive values

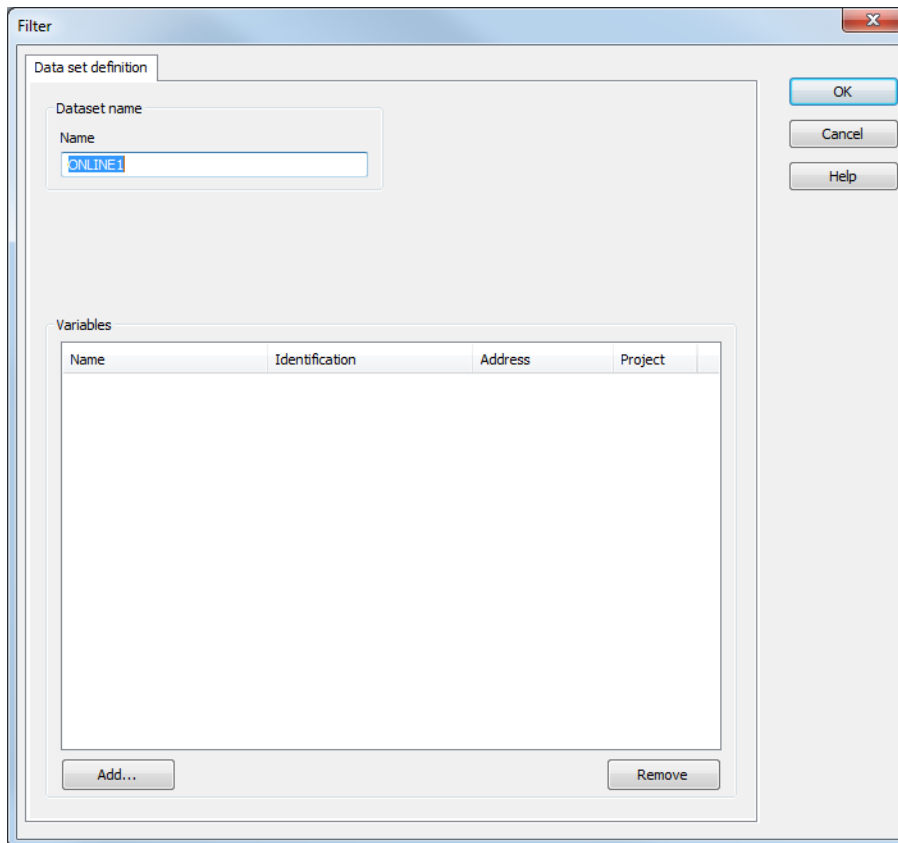


Parameter	Description
Dataset name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Maximum number	<p>Maximum number of entries per variable in the report. If the report has more entries than defined here due to its filter criteria, the first n entries are output. n corresponds to the value entered.</p>

Parameter	Description
	<ul style="list-style-type: none"> ▶ Minimum: 1 ▶ Maximum: 65535 <p>Default: 1000</p>
Aggregation	<p>type of aggregation:</p> <ul style="list-style-type: none"> ▶ <i>limit:</i> Outputs the first n values per archive channel if the filter criteria were to provide more entries than this number. ▶ <i>Sum:</i> Time range is divided into n equidistant time intervals and the archive values in them are added up. Status values are ORed. ▶ <i>Average:</i> Time range is divided into n equidistant time intervals and the archive values in them will be averaged. Status values are ORed. ▶ <i>Minimum:</i> Time range is divided into n equidistant time intervals and the archive values in them are minimized. ▶ <i>Maximum:</i> Time range is divided into n equidistant time intervals and the archive values in them are maximized. <p>The time stamp corresponds to the respective start time of the interval.</p>
Time Filter	Selection of the time filter from the drop-down list. Contains the time filter defined in the Report definition (on page 221) tab.
Use archives from read-back folder	<p>Save path for archive data for report creation.</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> Data for report creation of archive data is read back from the read-back folder. Note: The save location is the <i>read-back folder for archives</i> set up in the General project property under Name/Folder and File storage. ▶ <i>Inactive:</i> Data for report creation is read from the archive data in the Runtime folder. Note: Save location is the Runtime folder configured in the General project property under Name/Folder. <p>Default: <i>inactive</i></p>

Parameter	Description
	<p>If the dataset configurations are combined with the filter configurations, the following is to be noted with lots:</p> <p>If a time filter was configured in the Lot Filter (on page 249) tab, both the read-back folder and the Runtime folder can contain valid data. If the data source for a time filter is the read-back folder, all data is read from the read-back folder.</p>
Variables	<p>List of selected variables.</p> <p>Display format:</p> <p><i>[archive short description] - [name of the variable]</i></p>
Add	<p>Opens the dialog to select archive variables.</p> <p>Multiple selection is possible.</p>
Remove	<p>Deletes the selected variable from the list.</p> <p>Note: The selected variable will be deleted from the list without requesting confirmation.</p>
OK	<p>Applies settings and closes the dialog.</p>
Cancel	<p>Discards changes and closes dialog.</p>
Help	<p>Opens online help.</p>

4.1.2.6.4 Online values



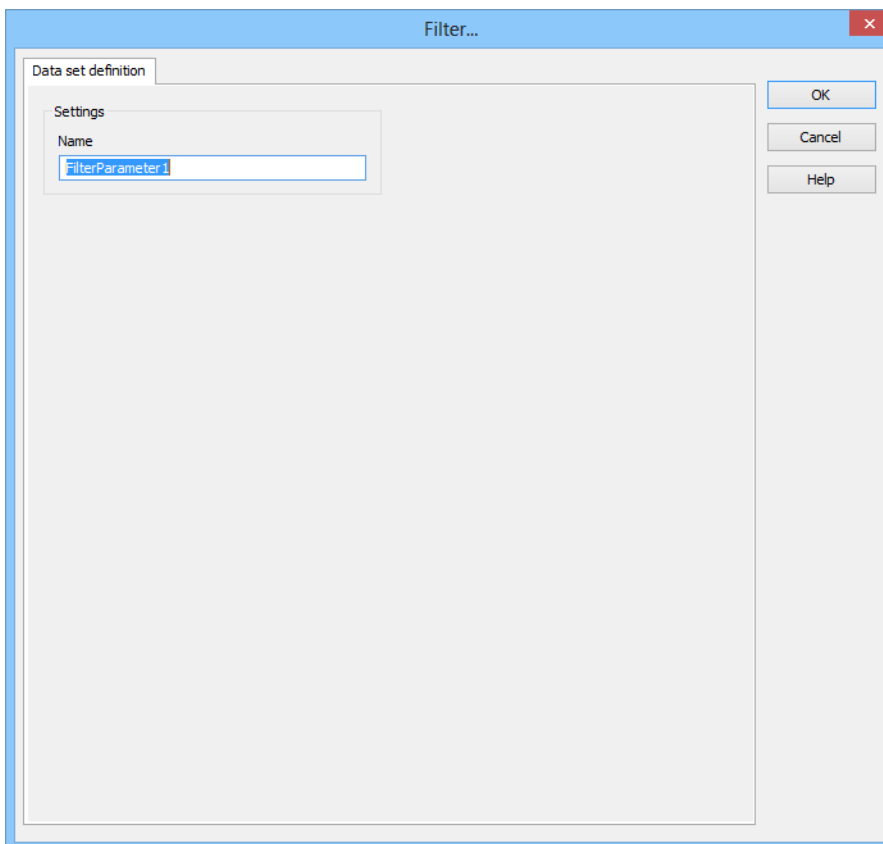
Parameters	Description
Dataset name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Variables	List of selected variables with: <ul style="list-style-type: none"> ▶ Name ▶ Identification ▶ Address ▶ Project
Add	Opens the dialog for selecting several variables.
Remove	Deletes selected variables from the list.
OK	Applies settings and closes the dialog.

Parameters	Description
Cancel	Discards changes and closes dialog.
Help	Opens online help.

4.1.2.6.5 Filter settings

The data set (on page 326) displays the defined time filter and their use by other data sets. The following are displayed in the report:

- ▶ Data set
- ▶ Set filter
- ▶ Filter conditions

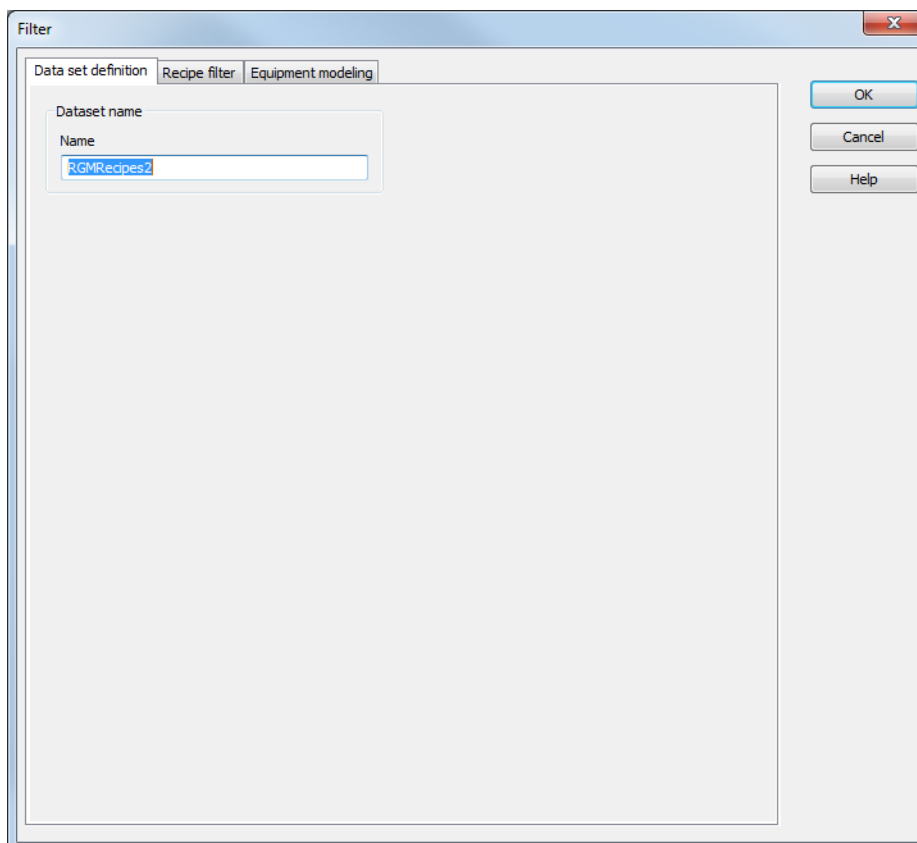


Parameters	Description
Dataset name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty

Parameters	Description
	<ul style="list-style-type: none"> ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

4.1.2.6 RGM recipe data

Configuration of the RGM recipe data:

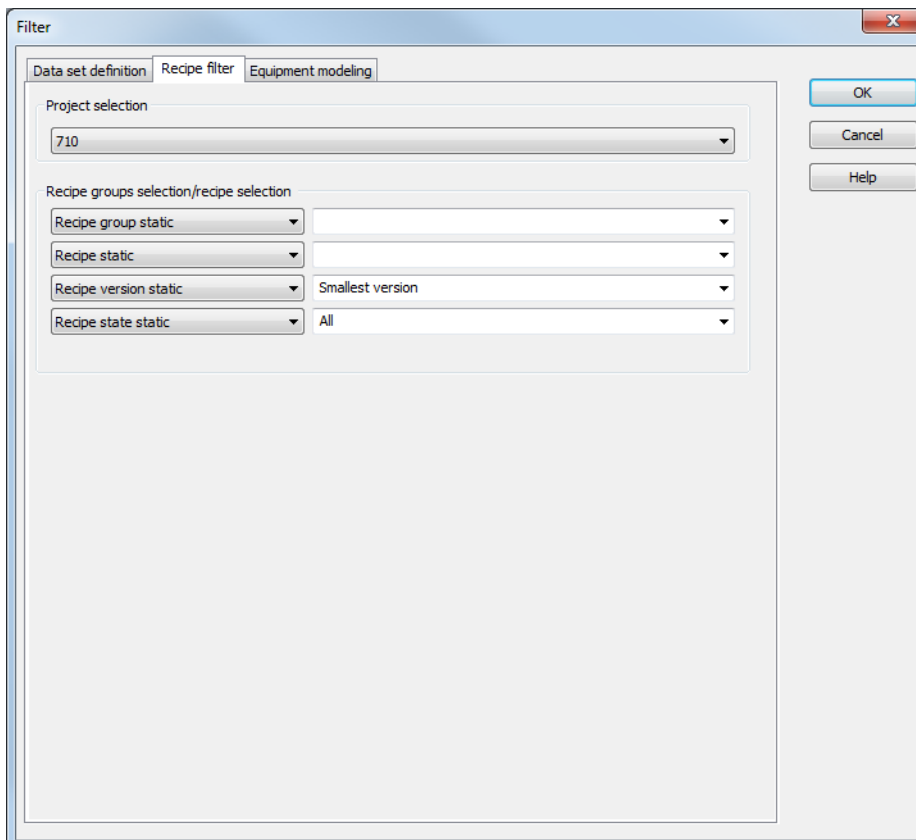


Parameters	Description
Dataset name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty

Parameters	Description
	<ul style="list-style-type: none"> ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
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.

RECIPE FILTER

Configuration of the recipe filter



Parameter	Description
Project selection	Selection of the project for the recipe data from the drop-down list.
Recipe group	Selection of the recipe group.

Parameter	Description
	<p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe group) ▶ Dynamic via variable (Recipegroup name from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Selection of the group:</p> <ul style="list-style-type: none"> ▶ from drop-down list ▶ Input of a filter text with wildcards (? for exactly one character and * for 0 to as many characters as desired) ▶ Via a string variable: The text value of the variable is then interpreted as a group name or filter text with wildcards
Recipe	<p>Selection of the recipe from the selected recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe) ▶ Dynamic via variable (Recipe name from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Selection of the name:</p> <ul style="list-style-type: none"> ▶ from drop-down list ▶ Input of a filter text with wildcards (? for exactly one character and * for 0 to as many characters as desired) ▶ Via a string variable: The text value of the variable is then interpreted as a recipe name or filter text with wildcards
Recipe version static	<p>Selection of the recipe version from the selected recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe version) ▶ Dynamic via variable (Recipe version from variable) <p>Clicking on Property opens a drop-down list to select the method.</p>

Parameter	Description
	<p>Select version:</p> <ul style="list-style-type: none"> ▶ Entry from the drop-down list: <ul style="list-style-type: none"> - <i>Largest version</i> - <i>Smallest version</i> - <i>All</i> - recipe versions (only available if the group and recipe selection results in an individual recipe; selection without wildcards) ▶ Entering of a list of recipe versions, with the versions separated by commas (,), for example "1, 3, 5" ▶ A string variable that provides a list of version numbers as a text separated by a comma (,) ▶ A numerical variable with a version number (1 - 89999) or the values: <ul style="list-style-type: none"> - 90000 for "<i>Smallest version</i>" - 90001 for "<i>Largest version</i>" - 90002 for "<i>all versions</i>"
Recipe status static	<p>Selection of the recipe status from the selected recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe status) ▶ Dynamic via variable (Recipe status from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Selection of the status:</p> <ul style="list-style-type: none"> ▶ Entry from drop-down list: <ul style="list-style-type: none"> - <i>All</i> - individual recipe status ▶ List of recipe status separated by comma (,) for example "1, 2, 7" ▶ A string variable that provides a list of status numbers as a text separated by a comma (,) ▶ A numeric value with a status number (1 - 4294967294; 0xFFFFFFFF) or the value ▶ 0 for <i>All</i>

Parameter	Description
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.

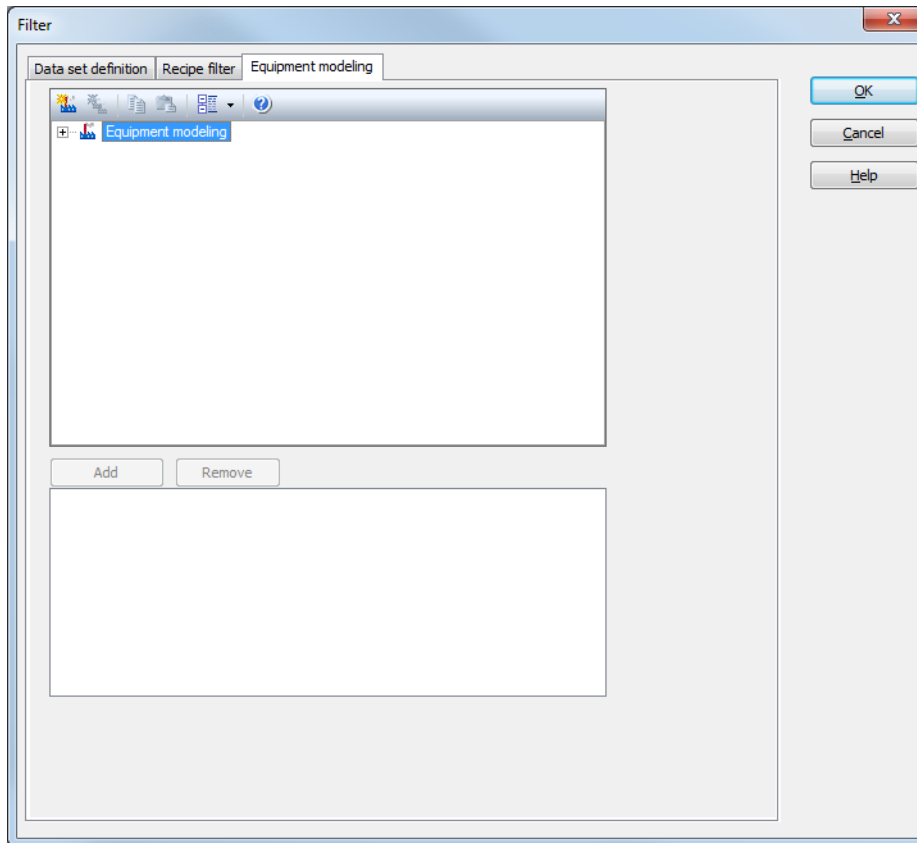
Possible combinations of recipe version and recipe status:

Version filter	Status filter	Result
<i>Smallest version</i>	<i>All</i>	Only the smallest respective versions of all recipes are shown.
<i>Smallest version</i>	<i>1.2</i>	Only the recipe versions that have the status <i>1</i> or <i>2</i> have the smallest versions shown.
<i>Largest version</i>	<i>All</i>	Only the largest respective versions of all recipes are shown.
<i>Largest version</i>	<i>1.2</i>	Only the recipe versions that have the status <i>1</i> or <i>2</i> have the largest versions shown.
<i>All</i>	<i>All</i>	All recipe versions are displayed.
<i>All</i>	<i>1.2</i>	All recipe versions with the status <i>1</i> or <i>2</i> are displayed.
<i>2.3</i>	<i>All</i>	All recipe versions <i>2</i> and <i>3</i> are displayed regardless of status.
<i>2.3</i>	<i>1.2</i>	The respective recipe version <i>2</i> and <i>3</i> is displayed if these have either the status <i>1</i> or <i>2</i> .

You can read more about the RGM in the Recipegroup Manager manual.

EQUIPMENT MODELING

Selection of an Equipment model.

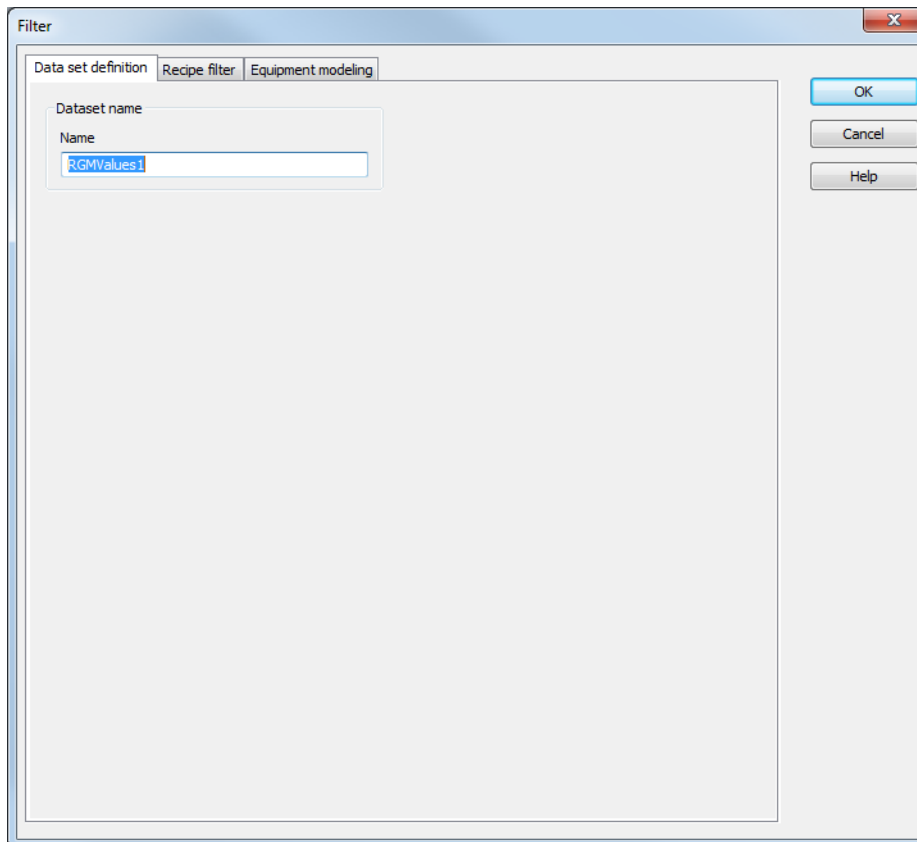


Select the desired equipment model from the list or create a new equipment model.

Note: Equipment models are managed in the global project. A global project must be present here in order to be able to create a new equipment model.

4.1.2.6.7 RGM recipe value

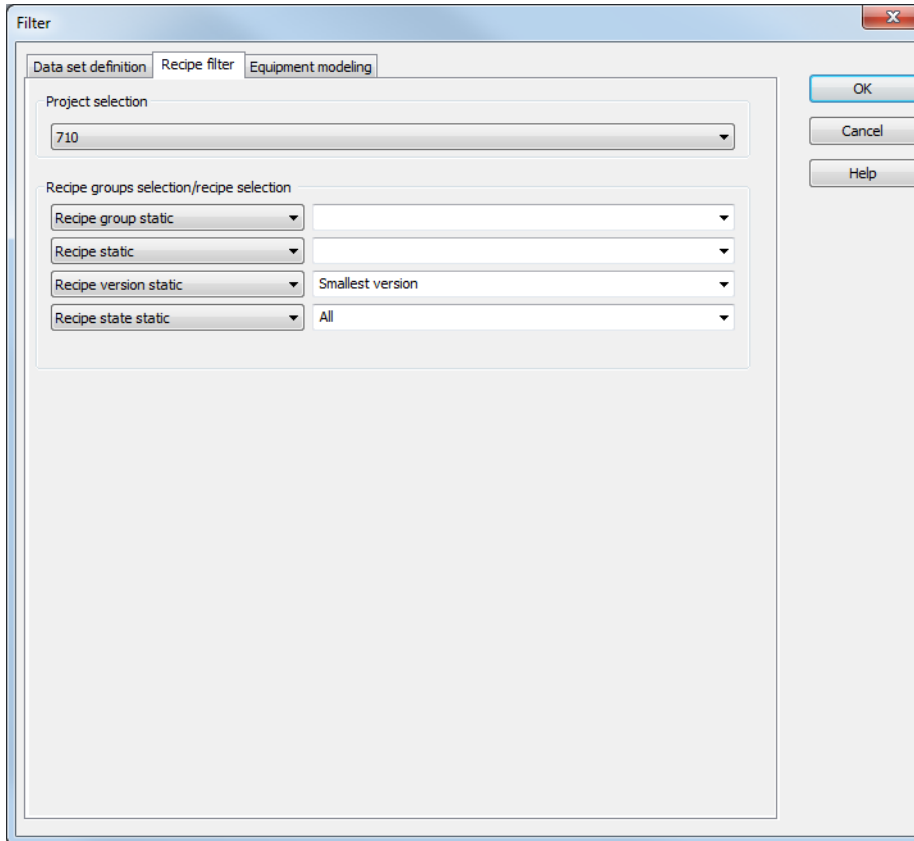
Configuration of the RGM recipe values. The visibility variables are evaluated for the output of recipe values. Only recipe values with the status *visible* are displayed in the Report Viewer:



Parameters	Description
Dataset name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

RECIPE FILTER

Configuration of the recipe filter



Parameter	Description
Project selection	Selection of the project for the recipe data from the drop-down list.
Recipe group	<p>Selection of the recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe group) ▶ Dynamic via variable (Recipegroup name from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Selection of the group:</p> <ul style="list-style-type: none"> ▶ from drop-down list ▶ Input of a filter text with wildcards (? for exactly one character and * for 0 to as many characters as desired)

Parameter	Description
	<ul style="list-style-type: none"> ▶ Via a string variable: The text value of the variable is then interpreted as a group name or filter text with wildcards
Recipe	<p>Selection of the recipe from the selected recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe) ▶ Dynamic via variable (Recipe name from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Selection of the name:</p> <ul style="list-style-type: none"> ▶ from drop-down list ▶ Input of a filter text with wildcards (? for exactly one character and * for 0 to as many characters as desired) ▶ Via a string variable: The text value of the variable is then interpreted as a recipe name or filter text with wildcards
Recipe version static	<p>Selection of the recipe version from the selected recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe version) ▶ Dynamic via variable (Recipe version from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Select version:</p> <ul style="list-style-type: none"> ▶ Entry from the drop-down list: <ul style="list-style-type: none"> - <i>Largest version</i> - <i>Smallest version</i> - <i>All</i> - recipe versions (only available if the group and recipe selection results in an individual recipe; selection without wildcards) ▶ Entering of a list of recipe versions, with the versions separated by commas (,), for example "1, 3, 5" ▶ A string variable that provides a list of version numbers

Parameter	Description
	<p>as a text separated by a comma (,)</p> <ul style="list-style-type: none"> ▶ A numerical variable with a version number (1 - 89999) or the values: <ul style="list-style-type: none"> - 90000 for "<i>Smallest version</i>" - 90001 for "<i>Largest version</i>" - 90002 for "<i>all versions</i>"
Recipe status static	<p>Selection of the recipe status from the selected recipe group.</p> <p>The selection can take place:</p> <ul style="list-style-type: none"> ▶ Static from pre-defined entries (Static recipe status) ▶ Dynamic via variable (Recipe status from variable) <p>Clicking on Property opens a drop-down list to select the method.</p> <p>Selection of the status:</p> <ul style="list-style-type: none"> ▶ Entry from drop-down list: <ul style="list-style-type: none"> - <i>All</i> - individual recipe status ▶ List of recipe status separated by comma (,) for example "1, 2, 7" ▶ A string variable that provides a list of status numbers as a text separated by a comma (,) ▶ A numeric value with a status number (1 - 4294967294; 0xFFFFFFFF) or the value ▶ 0 for <i>All</i>
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.

Possible combinations of recipe version and recipe status:

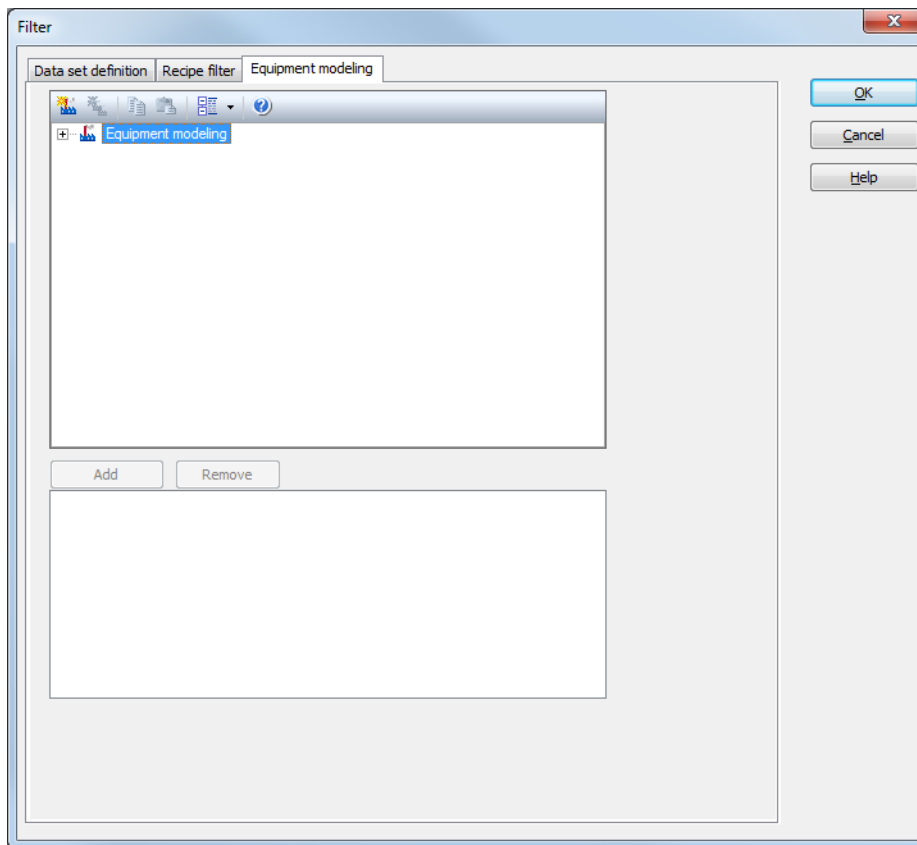
Version filter	Status filter	Result
<i>Smallest version</i>	<i>All</i>	Only the smallest respective versions of all recipes are shown.
<i>Smallest version</i>	<i>1.2</i>	Only the recipe versions that have the status 1 or 2 have

Version filter	Status filter	Result
		the smallest versions shown.
<i>Largest version</i>	<i>All</i>	Only the largest respective versions of all recipes are shown.
<i>Largest version</i>	<i>1.2</i>	Only the recipe versions that have the status <i>1</i> or <i>2</i> have the largest versions shown.
<i>All</i>	<i>All</i>	All recipe versions are displayed.
<i>All</i>	<i>1.2</i>	All recipe versions with the status <i>1</i> or <i>2</i> are displayed.
<i>2.3</i>	<i>All</i>	All recipe versions <i>2</i> and <i>3</i> are displayed regardless of status.
<i>2.3</i>	<i>1.2</i>	The respective recipe version <i>2</i> and <i>3</i> is displayed if these have either the status <i>1</i> or <i>2</i> .

You can read more about the RGM in the Recipegroup Manager manual.

EQUIPMENT MODELING

Selection of an Equipment model.



Select the desired equipment model from the list or create a new equipment model.

Note: Equipment models are managed in the global project. A global project must be present here in order to be able to create a new equipment model.

4.1.2.6.8 datasets for Batch Control:

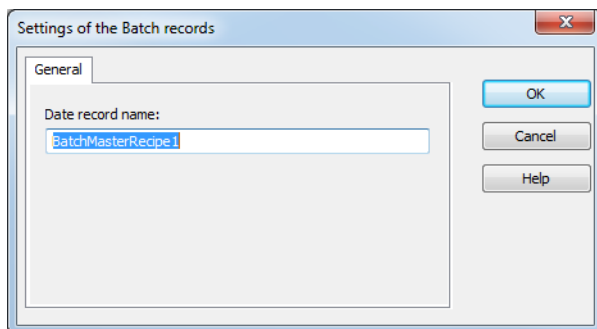
The following datasets are available for the Batch Control module:

- ▶ Master recipe (on page 289)
- ▶ Control recipe (on page 290)
- ▶ Recipe screens (on page 290)
- ▶ Matrix cells (on page 293)
- ▶ PFC structure (on page 294)
- ▶ Phases (on page 295)

- ▶ Parameters (on page 296)
- ▶ Transitions (on page 297)
- ▶ Unit allocations (on page 298)
- ▶ Operation instance (on page 299)

4.1.2.6.9 Master recipe

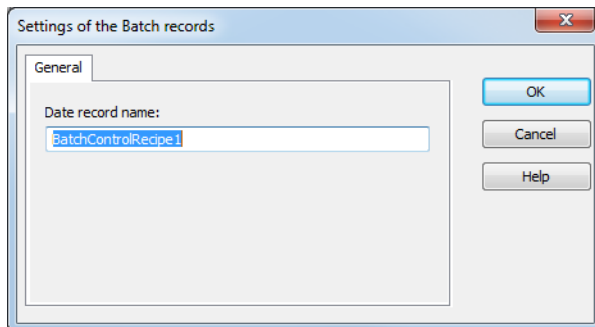
Configuration of a data set for a master recipe in the Batch Control module.



Parameters	Description
Data set name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.10 Control recipe

Configuration of a data set for a control recipe in the Batch Control module.

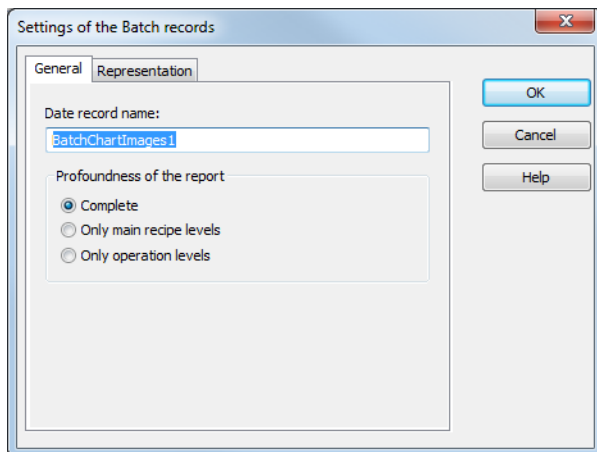


Parameters	Description
Data set name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.11 Recipe screens

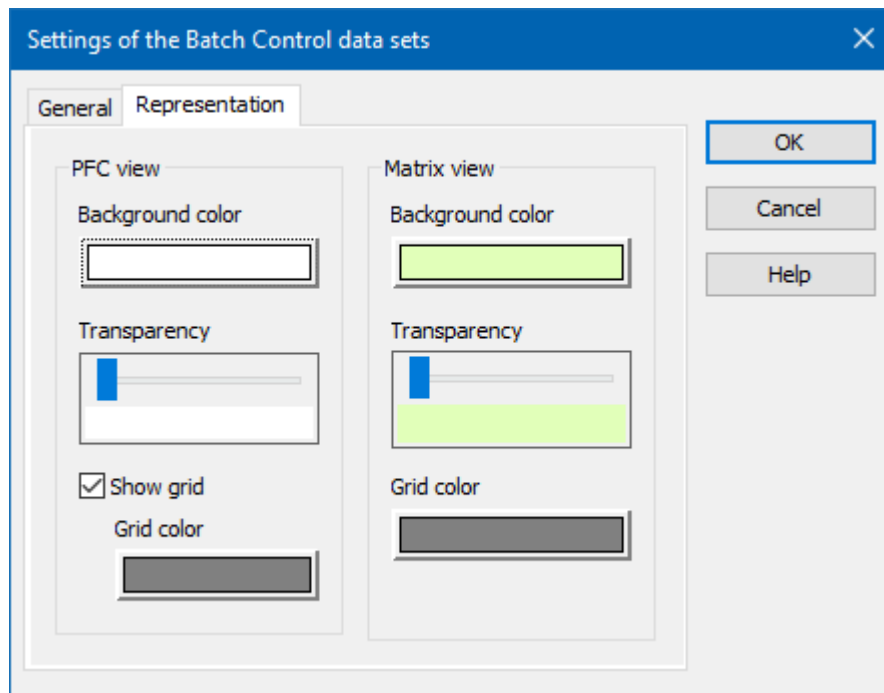
Configuration of a data set for recipe screens in the Batch Control module. For screens, in addition to the report detail, it is also possible to prescribe the display in the Runtime.

GENERAL



Parameter	Description
Data set name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Profoundness of the report	<p>Configuration of the report detail:</p> <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes dialog.
Help	Opens online help.

DISPLAY

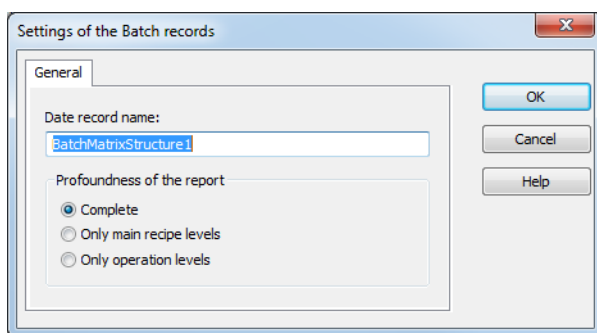


Parameter	Description
PFC view	Display for PFC recipes
Background color	Definition for the background color. Click on the color and a dialog opens to select a color or a palette.
Transparency	Setting of the transparency using a slider.
Display grid	<i>Active:</i> Grid is displayed.
Grid color	Definition for the grid color. Click on the color and a dialog opens to select a color or a palette.
Matrix view	Display for matrix recipes
Background color	Definition for the background color. Click on the color and a dialog opens to select a color or a palette.
Opacity	Setting of the opacity using a slider.
Grid color	Definition for the grid color. Click on the color and a dialog opens to select a color or a palette.
OK	Applies settings and closes the dialog.

Parameter	Description
Cancel	Discards changes and closes dialog.
Help	Opens online help.

4.1.2.6.12 Matrix cells

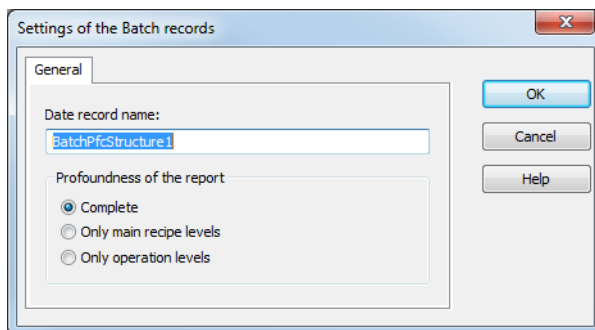
Configuration of a data set for the structure of a matrix recipe in the Batch Control module.



Parameters	Description
Date set name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Profoundness of the report	Configuration of the report detail: <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

4.1.2.6.13 PFC structure

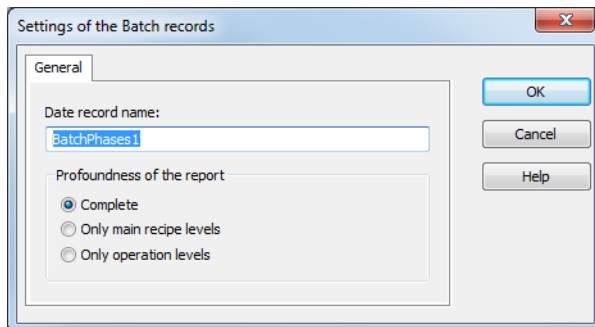
Configuration of a data set for the structure of a PFC recipe in the Batch Control module.



Parameters	Description
Data set name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Profoundness of the report	<p>Configuration of the report detail:</p> <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.14 Phases

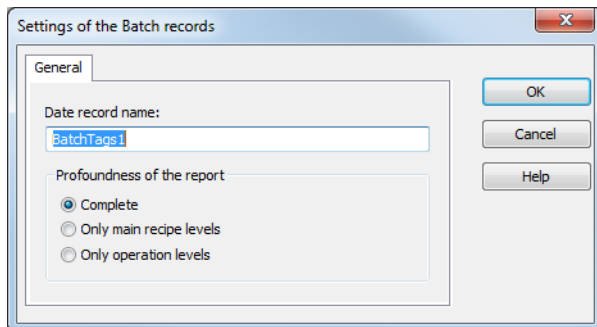
Configuration of a data set for phases in the Batch Control module.



Parameters	Description
Data set name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Profoundness of the report	<p>Configuration of the report detail:</p> <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.15 Parameters

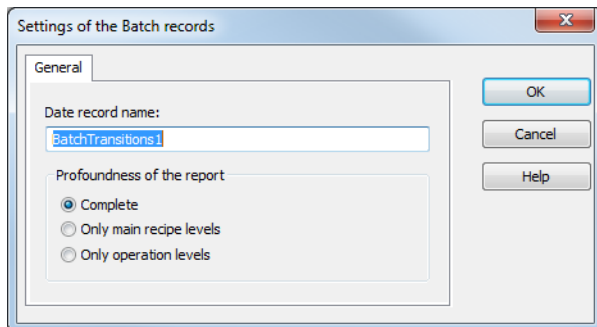
Configuration of a data set for parameters in the Batch Control module.



Parameters	Description
Data set name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Profoundness of the report	<p>Configuration of the report detail:</p> <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.16 Transitions

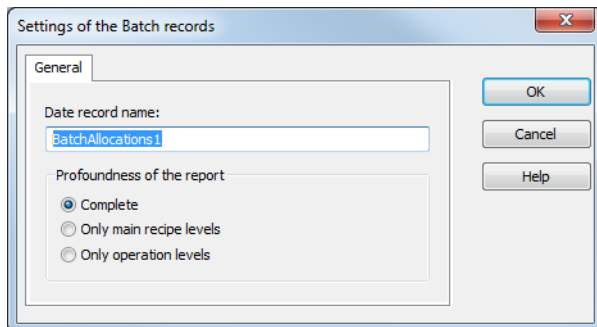
Configuration of a data set for transitions in the Batch Control module.



Parameters	Description
Data set name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
Profoundness of the report	<p>Configuration of the report detail:</p> <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.17 Unit allocations

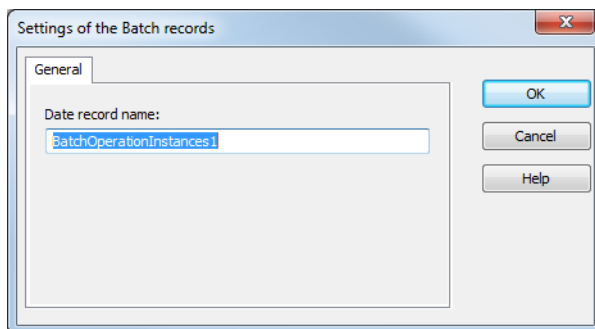
Configuration of a data set for unit allocation in the Batch Control module.



Parameters	Description
Data set name	<p>Name of the data set:</p> <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
	<p>Configuration of the report detail:</p> <ul style="list-style-type: none"> ▶ Complete: Report contains data from the whole recipe, including its operations. ▶ Only main recipe levels: Report only contains data from the main recipe. ▶ Only partial recipe levels: Report only contains data from the operations contained in the recipe
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.2.6.18 Operation instance

Configuration of a data set for operation instances in the Batch Control module.



Parameters	Description
Data set name	Name of the data set: <ul style="list-style-type: none"> ▶ must not be empty ▶ Must correspond exactly to the name of the data set in the RDL file (on page 306) ▶ Must not contain any spaces or special characters
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

4.1.3 Export or print function report

With the **Report Viewer: export/print** function, reports can be exported in the Runtime as a PDF, an Excel file or as an online printout. As part of the processing, the rendering is executed in its own thread, as a result of which operation of the Runtime is ensured during this time.

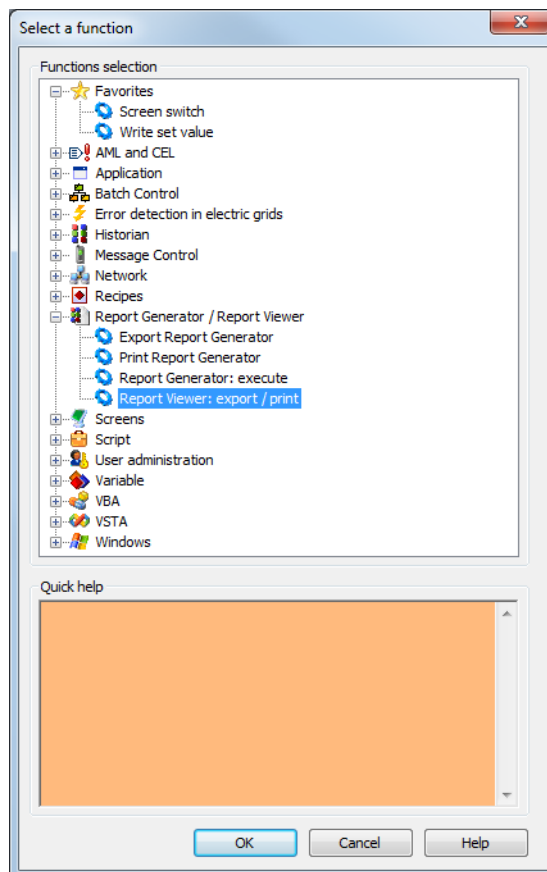
Only the execution of functions of a lower priority is blocked until the Report Viewer has completed rendering.

Output as a PDF or printout can alternatively be carried out by means of screen-type-specific control elements (on page 336), whereby the operability of the Runtime can be restricted until the end of the output.

To create the function:

1. Select the **New function...** command in the **Functions** node

The function selection is opened.



2. Go to the **Report Generator/Report Viewer/Analyzer** node.

3. Select the **Report Viewer: export/print** function.

The dialog for configuration is opened

4. Details on the configuration of the dialog:

- ▶ As PDF: See Configure output as a PDF (on page 301) section
- ▶ To the printer: See Configure output to the printer (on page 302) section
- ▶ As an Excel file: See Configure output as a PDF section (on page 303).
- ▶ Report definition: See Report definition (on page 221) chapter, Screen switching to Report Viewer type screen (on page 220)



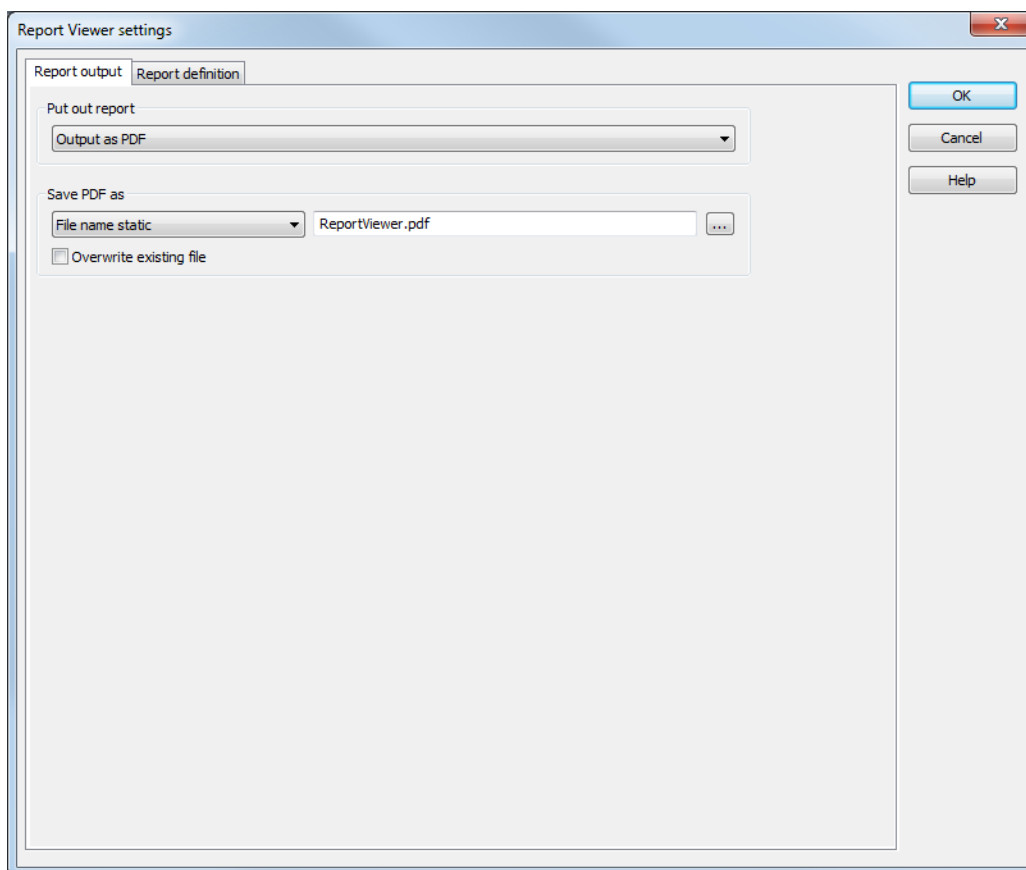
Information

The graphics display of the report can vary slightly between the different output formats.

4.1.3.1 Configure output as PDF

To output the report as a PDF:

1. For the **Report output** option, select *Output as PDF*
2. Define a fixed filename or select a variable that defines the filename in the Runtime.
3. Decide whether existing files are to be overwritten.
4. Confirm your configuration by clicking on the **OK** button.



Parameter	Description
Put out report	<p>Selection of how the report is to be output from a drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Output as PDF</i>: Creates PDF according to the configuration ▶ <i>Output on printer</i>: Outputs the report via the defined printer.
Save PDF as	<p>Selection of the issuing of the file name from a drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Static file name</i>: Name is entered in the text field and

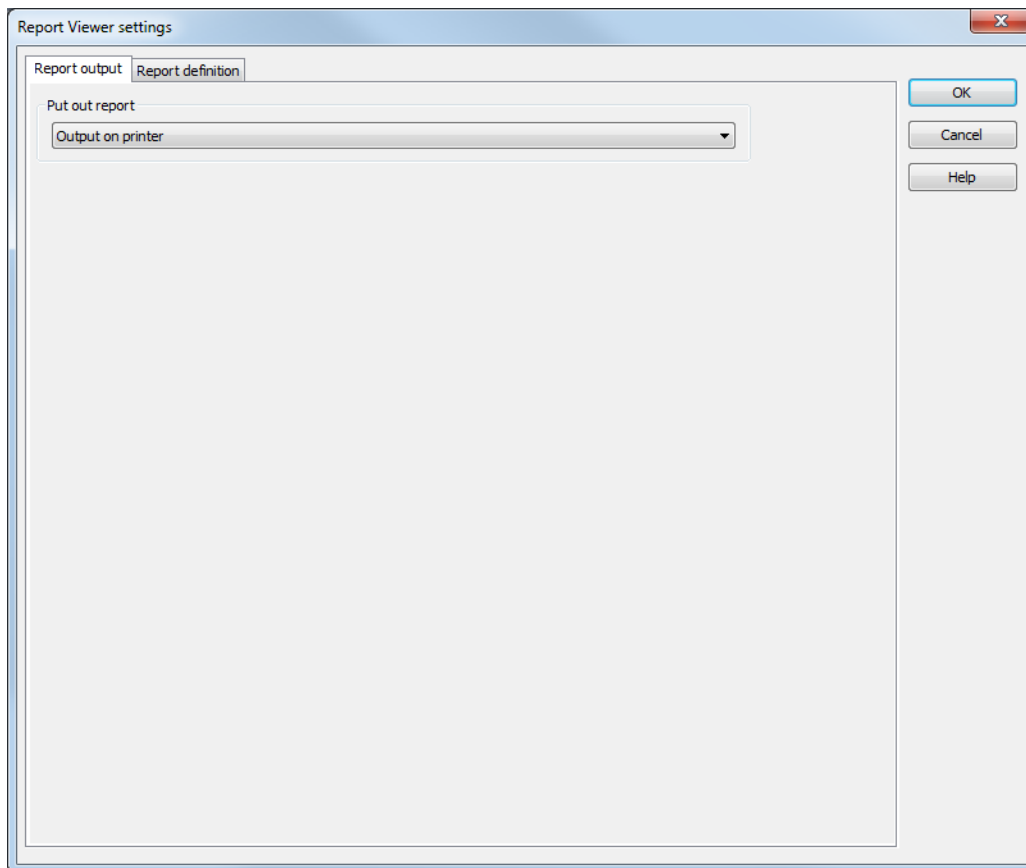
Parameter	Description
	<p>selected from the file Explorer after clicking on the ... button.</p> <ul style="list-style-type: none"> ▶ <i>File name from variable</i>: Clicking on the ... button opens the dialog to select a variable that sends the filename for the report in the Runtime. <p>Composition of the static filename:</p> <p>For static file names, the components of the name are compiled using placeholders:</p> <ul style="list-style-type: none"> ▶ <ProjectName>: Name of the project ▶ <DateTime>: Date and time in accordance with system settings ▶ <Date>: Date in accordance with system settings ▶ <Time>: Time in accordance with system settings <p>The placeholders can also be inserted into the text field by right-clicking on the text field above the context menu at the current cursor position.</p> <p>The file name can be given as either an absolute path or as a relative path (relative to the export folder of the project).</p> <p>Save location for PDFs:</p> <p>As in the folder defined for export. Default path: <code>%PUBLIC%\Documents\zenon_Projects\[PROJECTNAME]>\Export</code></p>
Overwrite existing file	<i>Active</i> : Existing files in the save location are overwritten.
OK	Accepts changes in all tabs and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

4.1.3.2 Configure output to the printer

To configure the report for a printer:

1. For the **Report output** option, select *Output to printer*

2. Confirm your configuration by clicking on the **OK** button



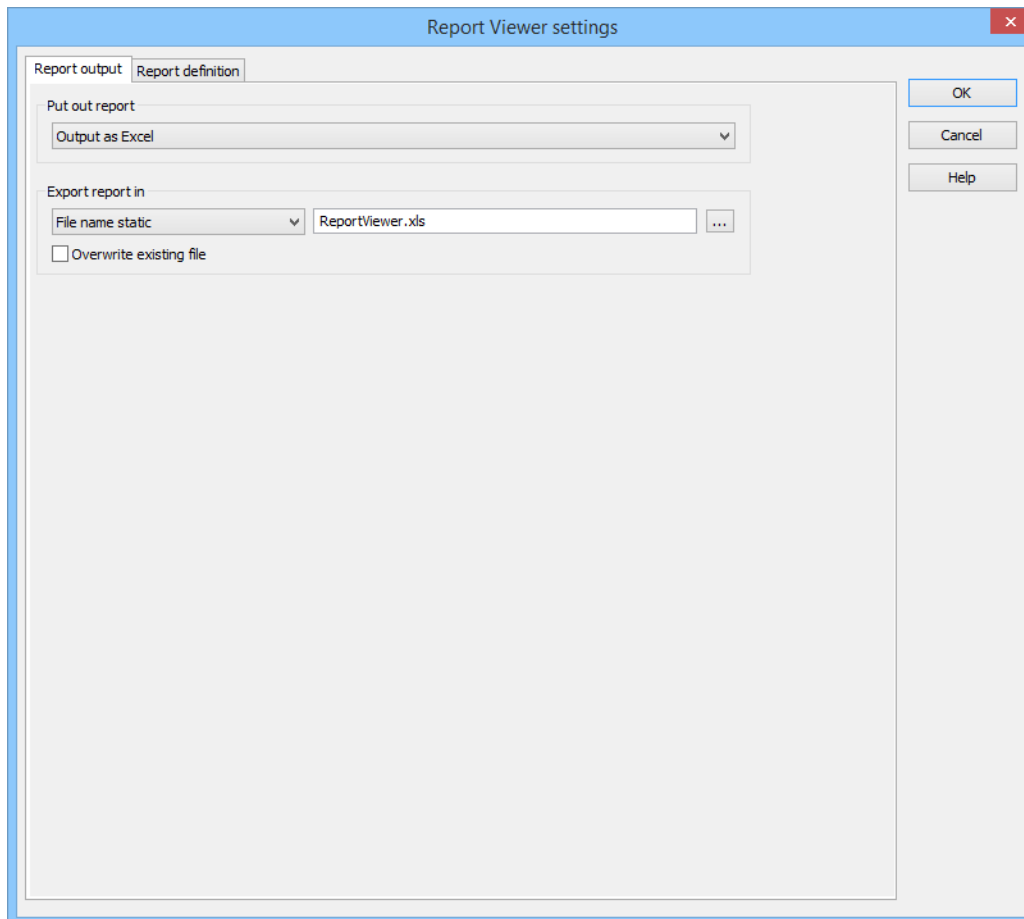
Parameters	Description
Put out report	Selection of how the report is to be output from a drop-down list: <ul style="list-style-type: none"> ▶ <i>Output as PDF</i>: Creates PDF according to the configuration ▶ <i>Output on printer</i>: Outputs the report via the defined printer.
OK	Accepts changes in all tabs and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

4.1.3.3 Configure output as Excel file

To output the report as an Excel file:

1. Select, in the **Output report** drop-down list, the *Output as Excel* entry.
2. Select, in the **Export report as** drop-down list, the type of file naming.
File names can be freely configured or they get the file name from variables.

3. Decide whether the existing files are to be overwritten
4. Confirm your configuration by clicking on the **OK** button



Parameter	Description
Put out report	<p>Selection of how the report is to be output from a drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Output as PDF</i>: Creates PDF according to the configuration ▶ <i>Output on printer</i>: Outputs the report via the defined printer. ▶ <i>Output as Excel</i>: Creates an Excel file of the report.
Export report in	<p>Selection of the issuing of the file name from a drop-down list:</p> <ul style="list-style-type: none"> ▶ <i>Static file name</i>: Name is entered in the text field and selected from the file Explorer after clicking on the ... button. ▶ <i>File name from variable</i>: Clicking on the ... button

Parameter	Description
	<p>opens the dialog to select a variable that sends the filename for the report in the Runtime.</p> <p>Composition of the static filename:</p> <p>For static file names (<i>Static file name</i>), the components of the name are compiled using placeholders:</p> <ul style="list-style-type: none"> ▶ <ProjectName>: Name of the project ▶ <DateTime>: Date and time in accordance with system settings ▶ <Date>: Date in accordance with system settings ▶ <Time>: Time in accordance with system settings <p>The placeholders can also be inserted into the text field by right-clicking on the text field above the context menu at the current cursor position.</p> <p>The file name can be given as either an absolute path or as a relative path (relative to the export folder of the project).</p> <p>Save path for file:</p> <p>As in the folder defined for export. Default path: <code>%PUBLIC%\Documents\zenon_Projects\[PROJECTNAME]>\Export</code></p>
Overwrite existing file	<i>Active</i> : Existing files in the save location are overwritten.

CLOSE DIALOG

Option	Description
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.

4.2 Report definition files

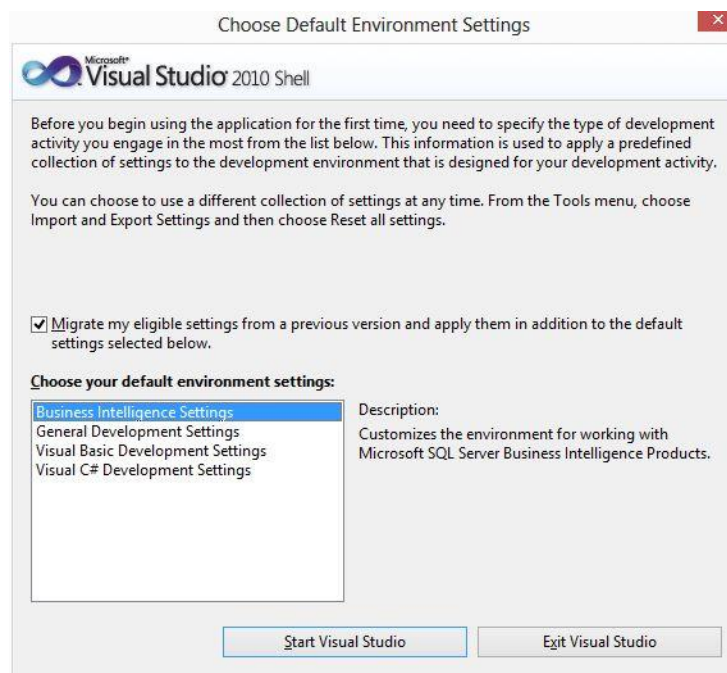
To create your own datasets or edit existing ones, you need appropriate software to render the RDL files. You have the following options for this:

► **SQL Server Data Tool (SSDT):**

Is supplied by COPA-DATA from zenon 7.10 and also installed when installing zenon.

SSDT consists of Microsoft Visual Studio 2010 with other project types that are only available for SQL Server Business Intelligence and is the primary environment for business services projects such as reporting. Templates for creating objects necessary for the Business Intelligence solution are provided as well as designer, tools and assistants for processing these objects.

When calling up an RDL file to edit with SSDT, a selection window to set the environment setting for Visual Studio 2010 may be shown:



Select the *Business Intelligence Settings* options and click on the Start **Visual Studio** button.

► **Microsoft Report Builder 3.0:**

Is available on the Microsoft download page (<https://www.microsoft.com/en-us/download/details.aspx?id=53613>) as a download. It provides a wizard for the configuration of datasets and is recommended for users without special knowledge for the configuration of RDL files.

Attention: Note the licensing conditions before downloading.

Users of the zenon Analyzer already have Report Builder 3 and the SQL license required for the Report Builder.

► **Software from other suppliers:**

Software from other manufacturers can also be used to edit report definition files.

If both the MS Report Builder and the Microsoft SQL Server Data Tools are installed, you can select the desired tool in a dialog.

Attention

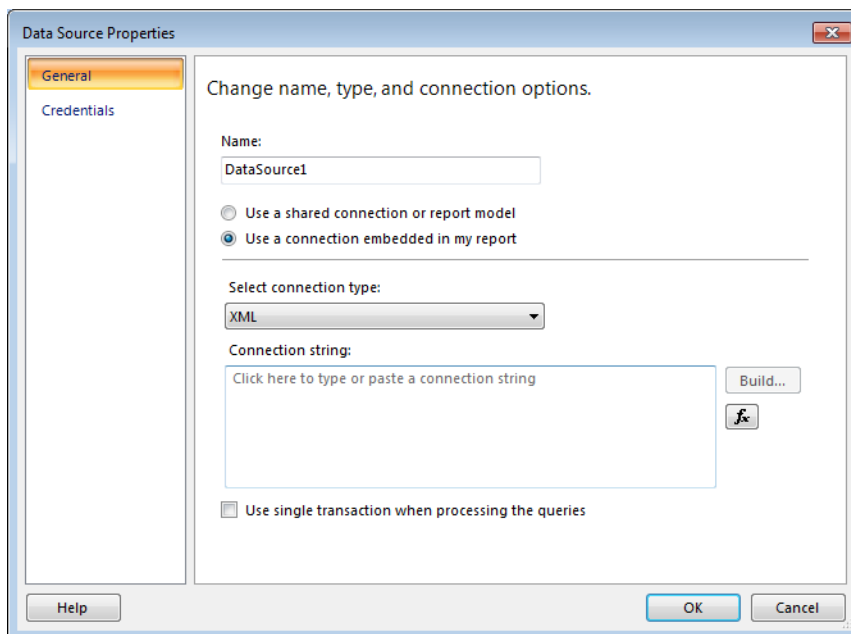
Note:

- ▶ RDL files should always be created and edited with the same tool.
- ▶ If an RDL file was saved with SQL Server Data Tools, it can be edited with MS Report Builder 3.0, but not with Report Builder 2.0 any more.

DATA SOURCE

The properties for the data source (superordinate to the datasets) must not be changed.

The standard settings are:



Parameters	Description
Name	DataSource1
Connection	Use a connection embedded in my report
Select connection type	XML

EDITING OF RDL FILES IN PROJECTS WITH DISTRIBUTED ENGINEERING

Note, when editing RDL files with distributed engineering, that files are not automatically set to "*Check out*" (checkout) when opened.

- ▶ It is possible to open RDL files with the SSDT or the MS Report Builder (on page 310), to edit these and save changes locally, without the file being set to "*Check out*". These changes can however be accepted on the server and are thus lost again when synchronizing or with *Check out*. The older version of the server is automatically adopted.
- ▶ It is also possible to open an RDL file that has been set to "*Check out*" on another computer, to edit this and to save changes locally. The file is not write protected when being set to "*Check out*". These local changes are also overwritten again when synchronizing.

To save changes on a lasting basis, the RDL file must be set to "*Check out*" before opening.

Attention

RDL files may only be renamed in the zenon Editor.

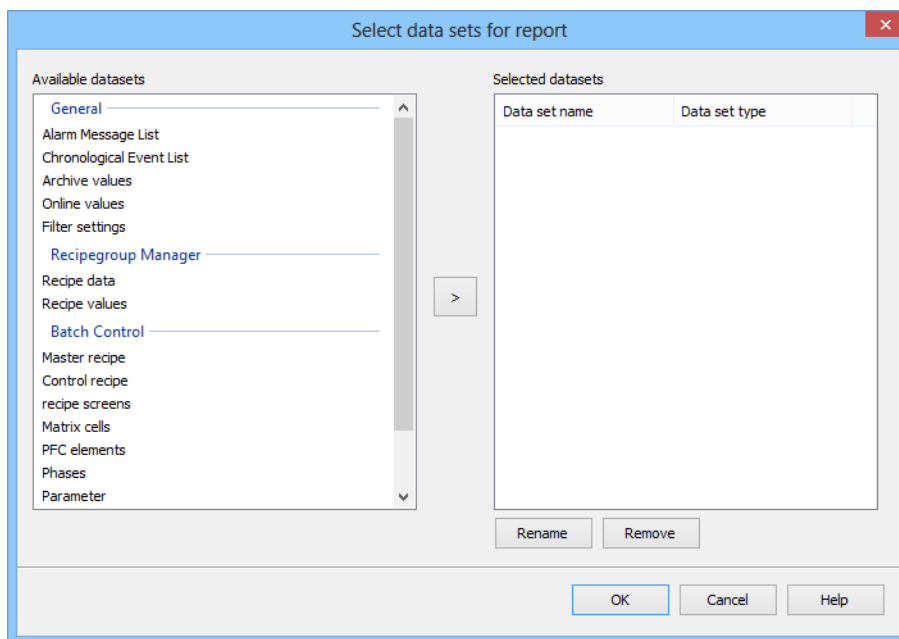
If RDL files are renamed in SSDT or MS Report Builder, the new name is not taken on in projects with distributed engineering and changes are lost.

4.2.1 Configuring data sets for a new report

To create a new RDL file with the previously-defined data sets:

1. Navigate to the node **Files/Report Viewer**.
2. Select the **New report definition file** command in the context menu or in the toolbar of the detail view.
3. The dialog to select and configure the datasets for the report is opened
4. Configure the desired datasets,
5. Close the dialog and start MS Report Builder (on page 310) by clicking on the OK button.
6. Configure the RDL files in the Report Builder and save them.

SELECT DATA SETS DIALOG FOR REPORT



Parameter	Description
Available datasets	<p>Lists all datasets available.</p> <p>Click on the > button or double click on a data set to insert a new data set of the selected type into the Selected datasets list.</p>
Button >	Inserts a new dataset of the selected type into the Selected datasets list.
Selected datasets	<p>Lists all configured datasets.</p> <p>Keyboard operation:</p> <p>F2 ... rename the selected dataset</p> <p>Del ... delete the selected dataset</p>
Rename	<p>Makes it possible to rename the selected data set (keyboard: F2).</p> <p>The name of the data set must be unique. A change is only accepted if the name remains unique.</p>
Remove	The selected dataset is deleted (keyboard: Del).
OK	Applies settings and closes the dialog.

Parameter	Description
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

4.2.2 Creating and editing RDL files with MS Report Builder

MS Report Builder is available on the Microsoft download page (<https://www.microsoft.com/en-us/download/details.aspx?id=53613>) as a free download.

Attention: Note the licensing conditions before downloading.

Users of the zenon Analyzer already have Report Builder 3 and the SQL license required for the Report Builder. However, Report Builder 2 must be installed and used for editing the datasets of the Report Viewer.

Install the Report Builder and check if it is correctly linked to zenon.

COMPATIBILITY

Reports can, from zenon version 8.00, be displayed with the current standard for report definitions. This allows, for example, the display of reports that have been created with Report Builder version 3.0.

.RDL files that have been created with version 2.0 of Report Builder can continue to be used in the current zenon version.

Supported report schemes:

- ▶ *schemas.microsoft.com/sqlserver/reporting/2010/01/reportdefinition*
(Microsoft Report Builder 3.0)
- ▶ *schemas.microsoft.com/sqlserver/reporting/2008/01/reportdefinition*
(Microsoft Report Builder 2.0)

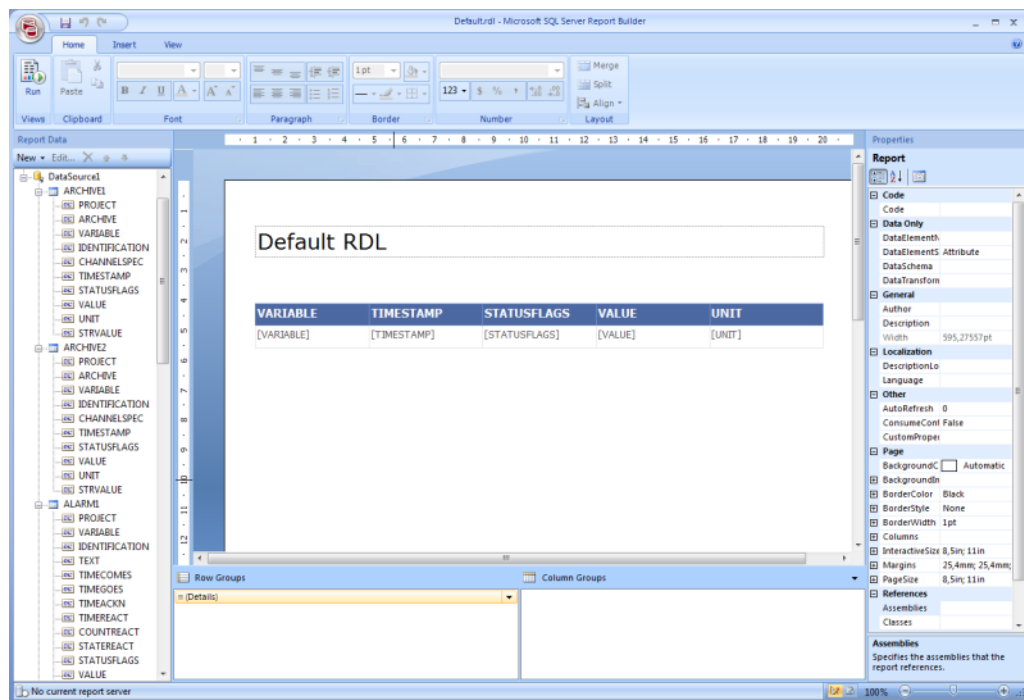
Attention: If current zenon projects contain RDL data that has been created with Report Builder 3.0, a warning dialog is shown during compilation for older zenon versions. Conversion of these .RDL files into version 2.0 is not carried out.

CREATING AN RDL FILE

To create an RDL file:

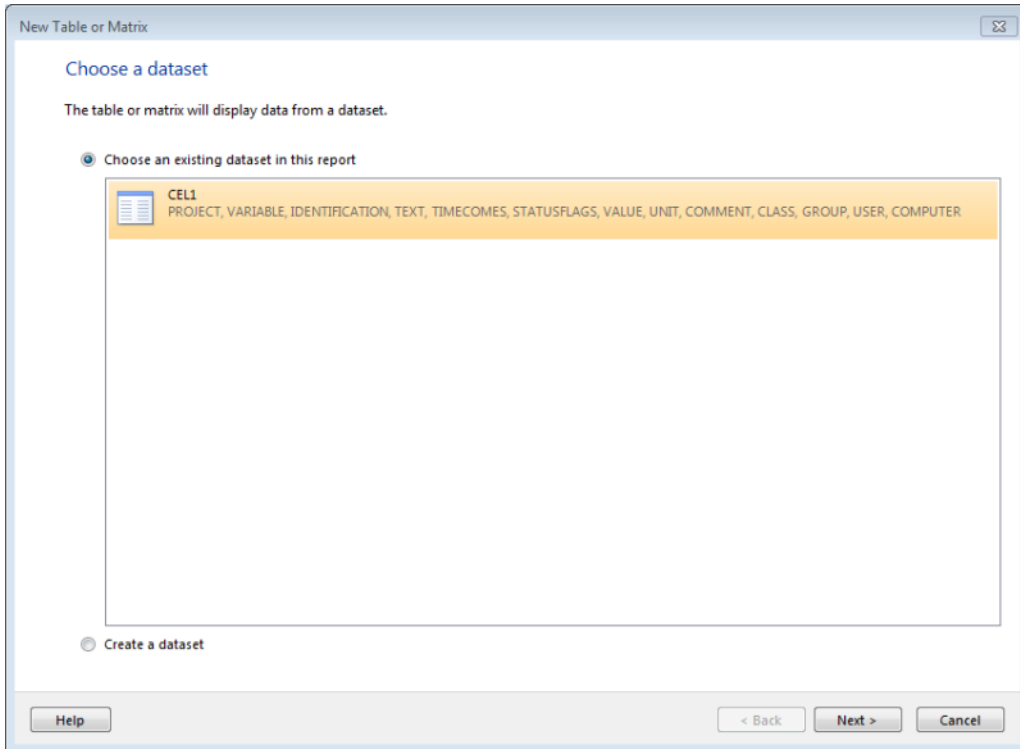
1. Select, in the zenon Editor, in the **File/Report Viewer** node in the context menu or the **New report definition file** command in the toolbar. The dialog to configure the desired data sets (on page 308) is opened.

2. MS Report Builder is started as soon as you confirm the dialog with **OK**:



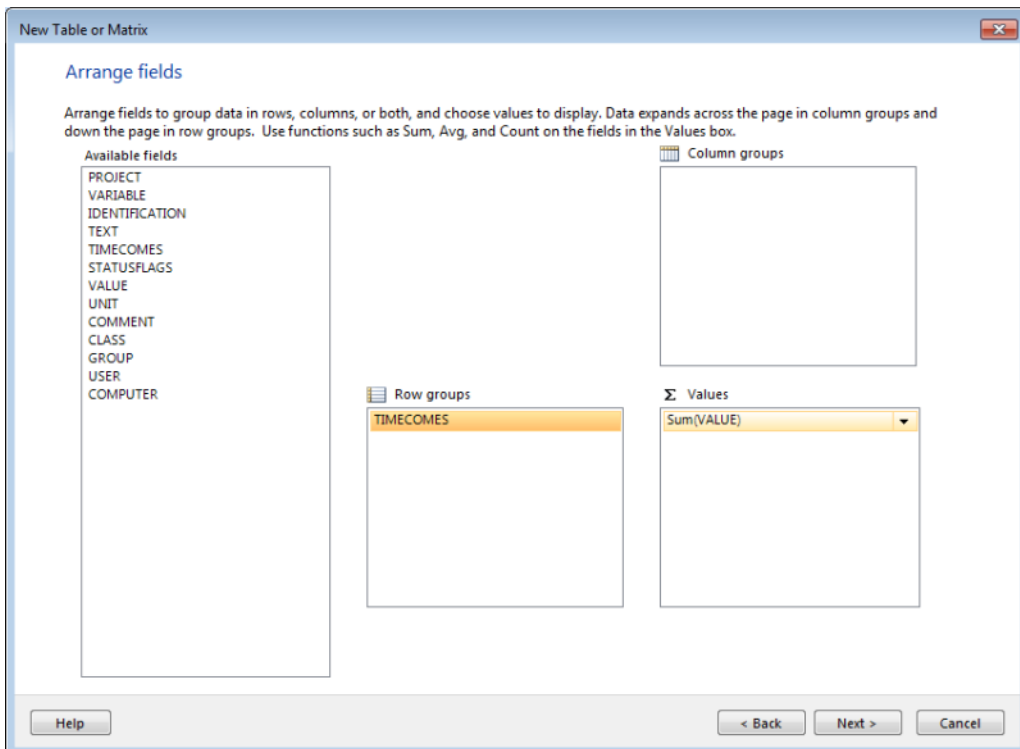
3. Adapt the datasets (on page 316) to the configuration in the screen switching function by:
 - ▶ Rename: Datasets must be identical with the dataset names in screen switching
 - ▶ Delete: Datasets that do not have any corresponding linking in the screen switching and are thus not supplied with data lead to an error message in Runtime
 - ▶ Create new: Datasets that are configured in the screen switching but do not have any corresponding entries in the RDL file lead to an error message in Runtime.
4. Select, in the **Insert** menu, the command **Table -> Table Wizard**.
5. The wizard is started.

6. Select the desired dataset.



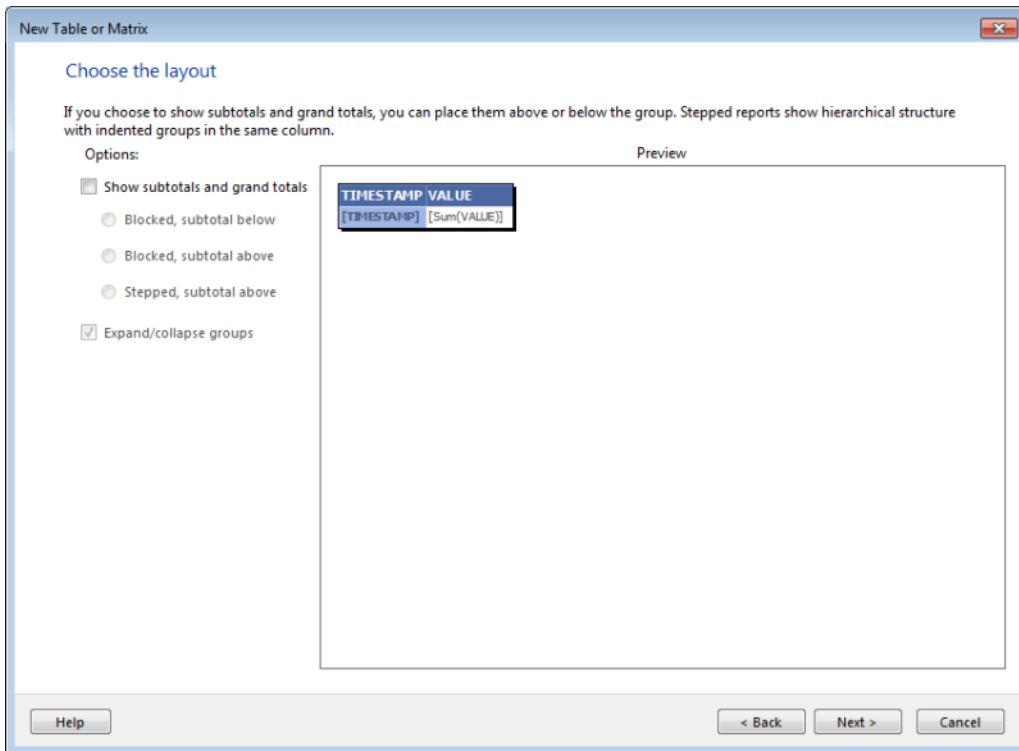
The screenshot shows the 'New Table or Matrix' dialog box with the 'Choose a dataset' tab selected. The text 'The table or matrix will display data from a dataset.' is present. Under the 'Choose an existing dataset in this report' radio button, a list of datasets is shown. The first dataset, 'CEL1', is highlighted and contains the fields: PROJECT, VARIABLE, IDENTIFICATION, TEXT, TIMECOMES, STATUSFLAGS, VALUE, UNIT, COMMENT, CLASS, GROUP, USER, and COMPUTER. The 'Create a dataset' radio button is unselected. At the bottom, there are 'Help', '< Back', 'Next >', and 'Cancel' buttons.

7. Locate the fields as desired.



The screenshot shows the 'New Table or Matrix' dialog box with the 'Arrange fields' tab selected. The text 'Arrange fields to group data in rows, columns, or both, and choose values to display. Data expands across the page in column groups and down the page in row groups. Use functions such as Sum, Avg, and Count on the fields in the Values box.' is present. On the left, under 'Available fields', a list of fields is shown: PROJECT, VARIABLE, IDENTIFICATION, TEXT, TIMECOMES, STATUSFLAGS, VALUE, UNIT, COMMENT, CLASS, GROUP, USER, and COMPUTER. In the center, under 'Row groups', the field 'TIMECOMES' is selected. On the right, under 'Column groups', no field is selected. At the bottom right, under 'Values', the function 'Sum(VALUE)' is selected. At the bottom, there are 'Help', '< Back', 'Next >', and 'Cancel' buttons.

8. Click on **Next** and select the layout.



The dialog box is titled "New Table or Matrix". It has a section "Choose the layout" with a sub-header "Options:". Below this, there are four options: "Show subtotals and grand totals" (checked), "Blocked, subtotal below", "Blocked, subtotal above", and "Stepped, subtotal above". There is also a checkbox for "Expand/collapse groups" which is checked. To the right of the options is a "Preview" area showing a table with two columns: "TIMESTAMP" and "VALUE". The first row contains "[TIMESTAMP]" and "[Sum(VALUE)]". At the bottom of the dialog are buttons for "Help", "< Back", "Next >", and "Cancel".

Choose the layout

If you choose to show subtotals and grand totals, you can place them above or below the group. Stepped reports show hierarchical structure with indented groups in the same column.

Options:

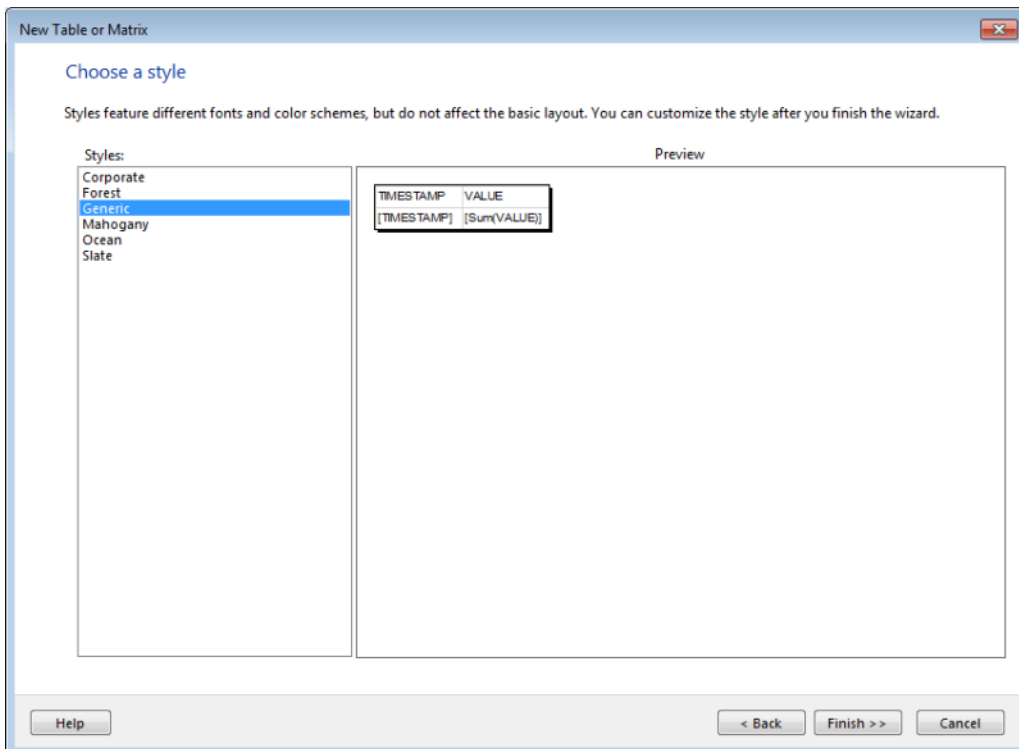
- ☒ Show subtotals and grand totals
 - ☐ Blocked, subtotal below
 - ☐ Blocked, subtotal above
 - ☐ Stepped, subtotal above
- ☒ Expand/collapse groups

Preview

TIMESTAMP	VALUE
[TIMESTAMP]	[Sum(VALUE)]

Help < Back Next > Cancel

9. Click on **Next** and select the style of the display.



The dialog box is titled "New Table or Matrix". It has a section "Choose a style" with a sub-header "Styles:". Below this, there is a list of styles: "Corporate", "Forest", "Gothic" (highlighted), "Mahogany", "Ocean", and "Slate". To the right of the styles is a "Preview" area showing a table with two columns: "TIMESTAMP" and "VALUE". The first row contains "[TIMESTAMP]" and "[Sum(VALUE)]". At the bottom of the dialog are buttons for "Help", "< Back", "Finish >>", and "Cancel".

Choose a style

Styles feature different fonts and color schemes, but do not affect the basic layout. You can customize the style after you finish the wizard.

Styles:

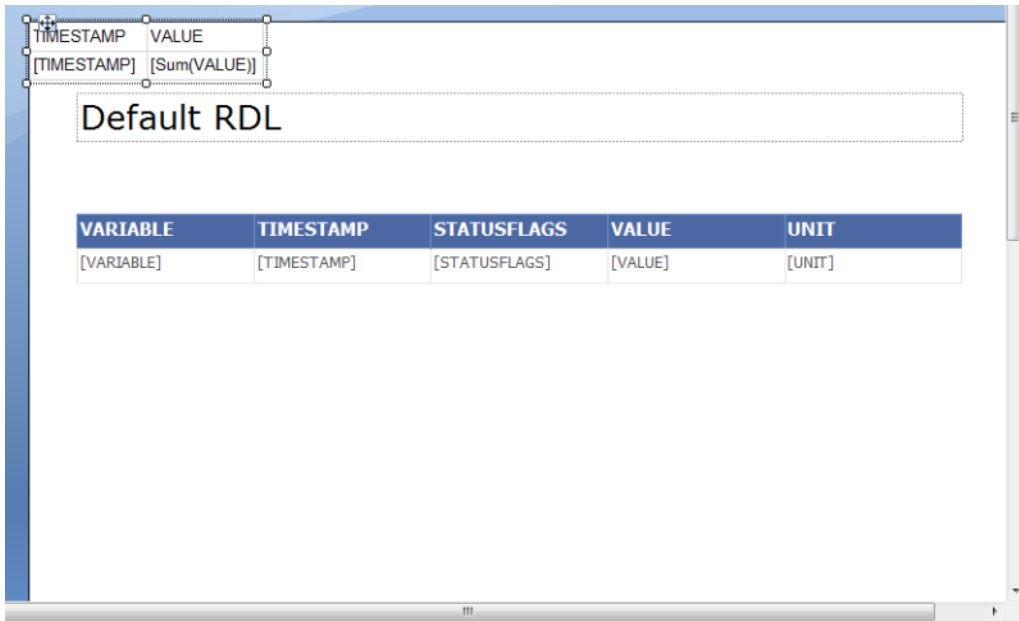
- Corporate
- Forest
- Gothic
- Mahogany
- Ocean
- Slate

Preview

TIMESTAMP	VALUE
[TIMESTAMP]	[Sum(VALUE)]

Help < Back Finish >> Cancel

10. Click on **Finish**.
The dataset is displayed with the finished table




TIMESTAMP	VALUE
[TIMESTAMP]	[Sum(VALUE)]

Default RDL

VARIABLE	TIMESTAMP	STATUSFLAGS	VALUE	UNIT
[VARIABLE]	[TIMESTAMP]	[STATUSFLAGS]	[VALUE]	[UNIT]

11. Delete the sample table.
12. Place the newly created table at the desired location.
13. Adapt the heading as desired.

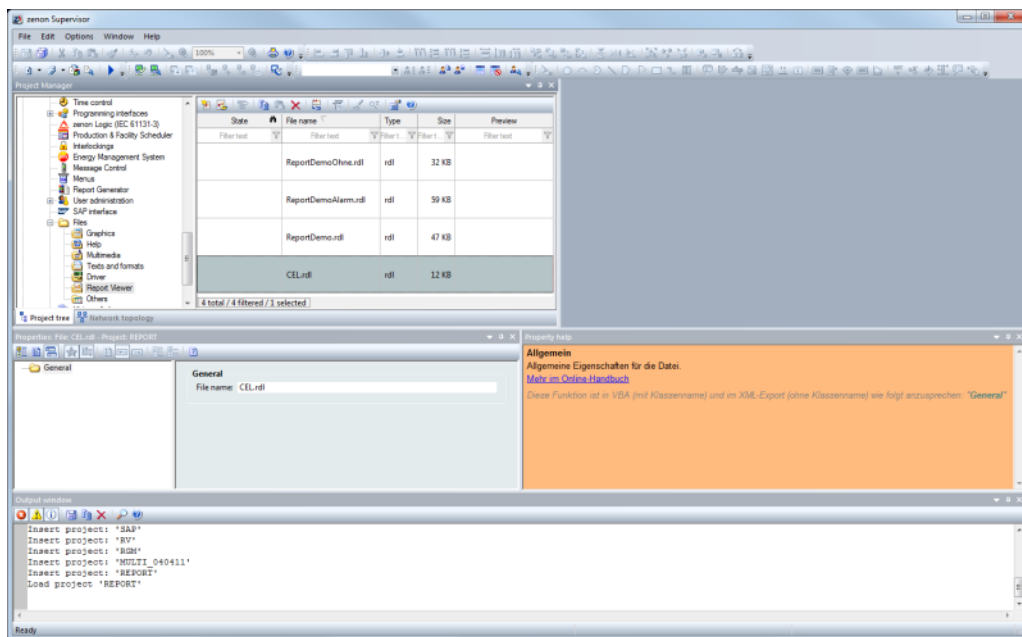


CEL RDL

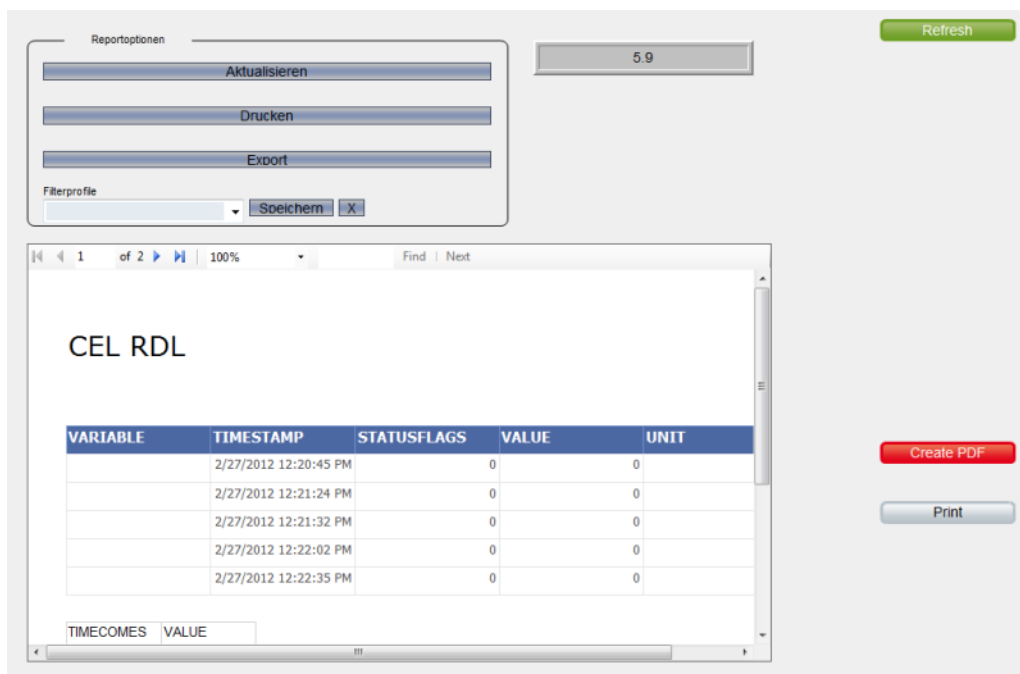
TIMECOMES	VALUE
[TIMECOMES]	[Sum(VALUE)]

14. Repeat the process for all datasets to be configured.

15. Save the RDL file.

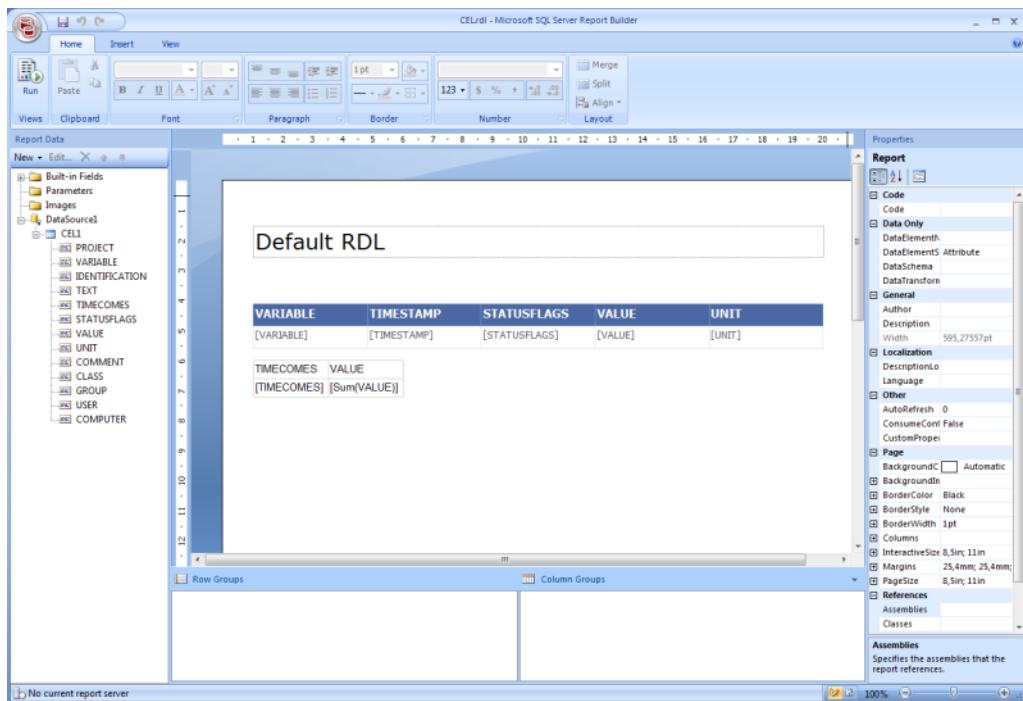


Result in the Runtime:



EDITING AN RDL FILE

To edit an RDL file, double click the file or select the **Open report definition file** command. Use the same process as creation for editing.



4.2.2.1 Administering datasets

You can do the following with datasets in the Report Builder:

- ▶ Rename
- ▶ delete
- ▶ create new

Number and name of the dataset of an RDL file must always correspond to that of the dataset defined in screen switching.

Attention

Note:

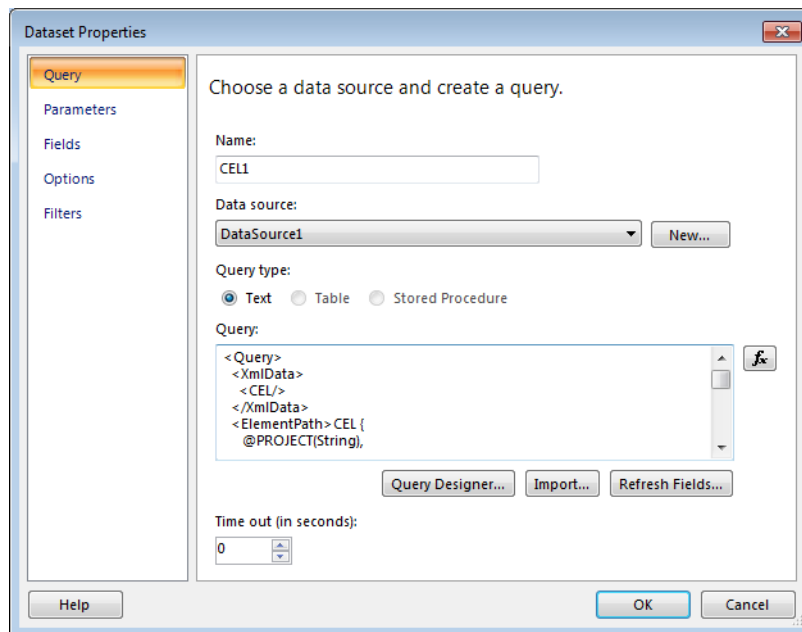
- ▶ The data source must not be edited.
- ▶ The data sets must not be edited.

RENAMING A DATASET

To rename a data set:

1. Right-click on the data set
2. Select the **Properties** command in the context menu
3. The dialog for setting the properties of the data set is opened
4. Give it the desired name in the **Name** property

Note: the name must correspond to the name in the screen switching (on page 220). It must not contain any spaces or special characters.

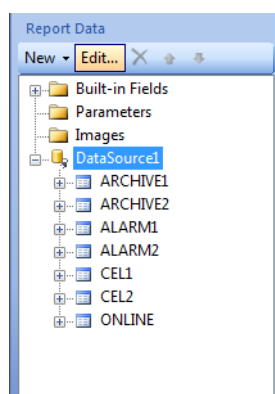


5. Leave the other settings unchanged
6. Close the dialog by clicking on **OK**.

DELETING THE DATA SET

To delete a data set:

1. Highlight the data set to be deleted in the report data window below the data source



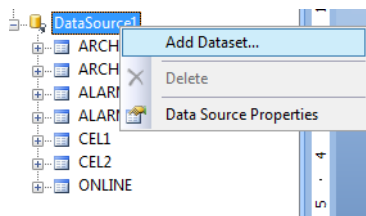
2. Select the **Delete** command in the context menu

- the data set is deleted after confirmation is requested

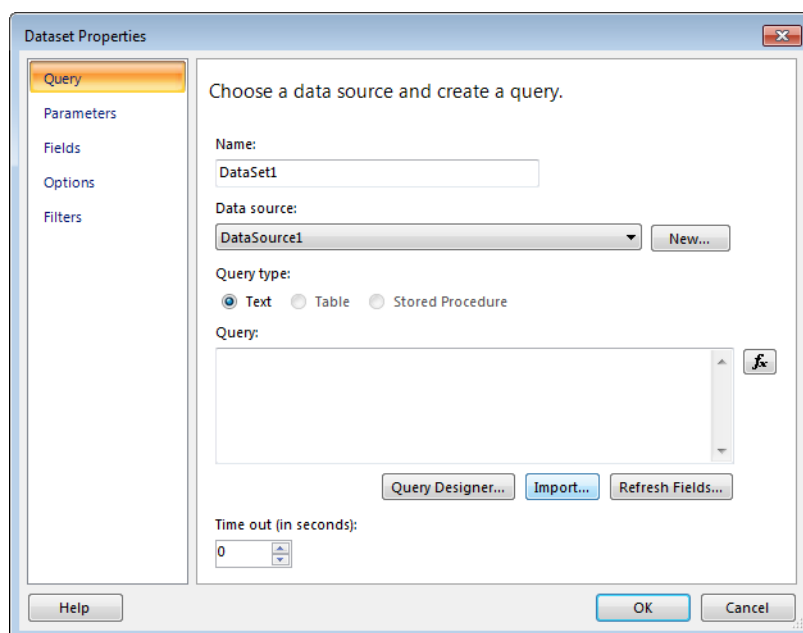
CREATING A NEW DATA SET

To create a new data set:

- Right-click on the data source
- Select **Add dataset** in the context menu



- A new data set is created and the properties window is opened



- name it as you wish

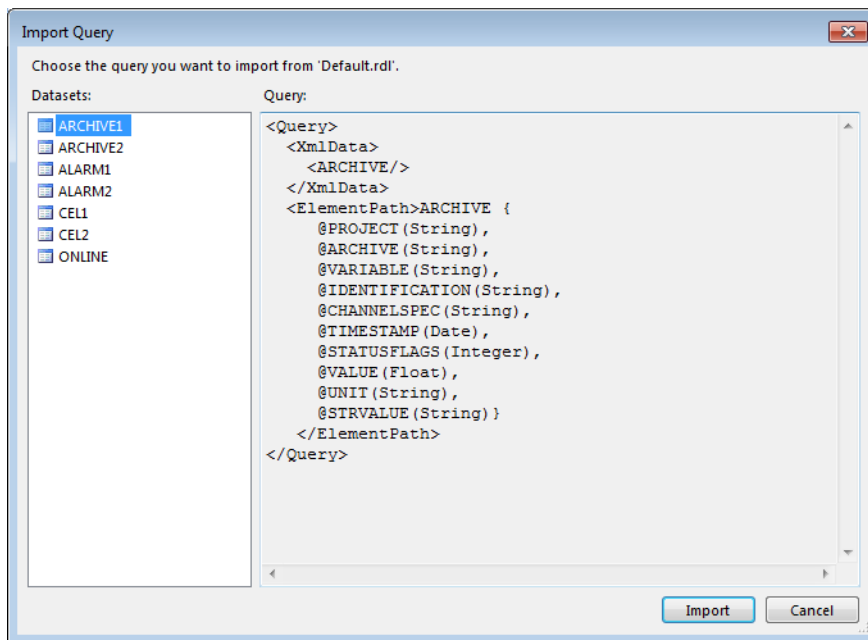
Note: the name must correspond to the name in the screen switching (on page 220). It must not contain any spaces or special characters.

- Insert the appropriate query; you have three options for doing this:
 - Query Designer:** Opens the dialog for manual input of the query
 - Import:** Import from an existing RDL file
 - Copying manually from an existing dataset: First open the corresponding source dataset, copy the content of the query and paste the content of the query in the **Query** field in the new dataset
- Close the dialog by clicking on **OK**.

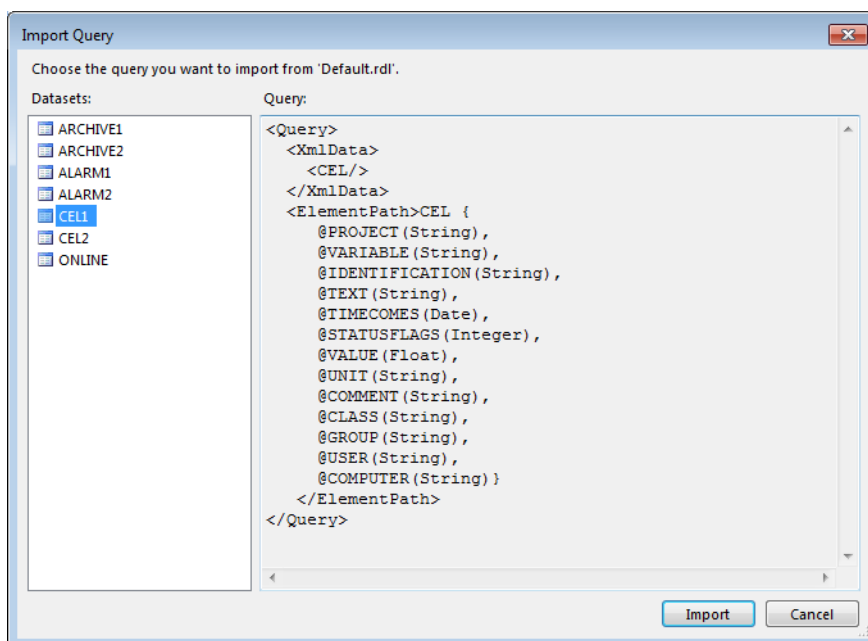
IMPORTING A QUERY

To import a query from an existing RDL file:

1. Click on the **Import** bin the dataset properties dialog
2. The file selection assistant is opened
3. Search for and open the desired RDL file
4. The import dialog is displayed

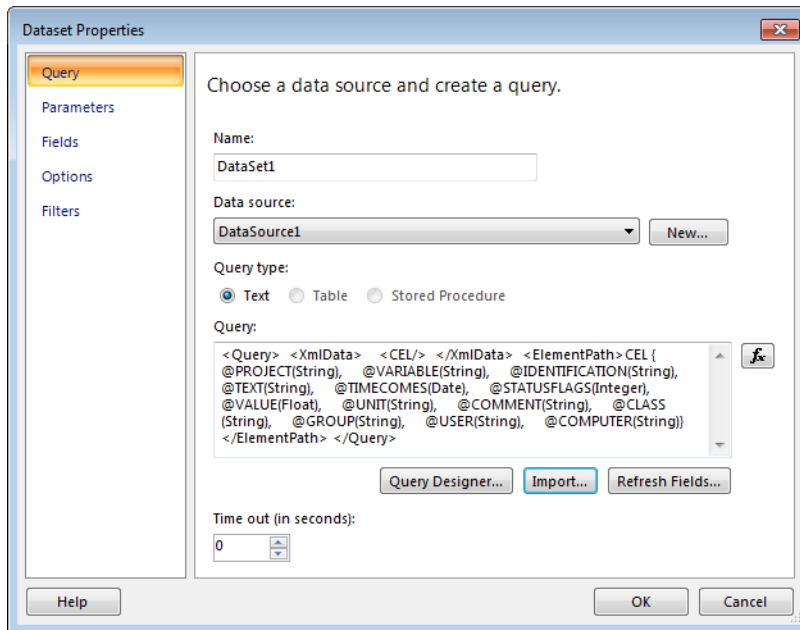


5. Highlight the desired dataset



6. click on **Import**

7. The query of the source data set is pasted to the dataset that is currently open



4.2.3 Create and edit RDL files with the help of Microsoft Business Intelligence Development Studio

The Microsoft Business Intelligence Development Studio is shipped and installed together with zenon.

To create and edit RDL files with the help of Microsoft Business Intelligence Development Studio, you basically act the same way as with the Report Builder 2.0 (on page 310).

The differences are primarily:

- ▶ For the report to be edited, you must first create a new project of type *Report Server Project - Solution* - in the Microsoft Business Intelligence Development Studio.
They are created automatically when you open the RDL file via double click. When closing the Business Intelligence Development Studios you can save the project and the solution in the temporary folder. If you do this, you are no longer requested to do so.
The datasets and the report can now be edited in Microsoft Business Intelligence Development Studio.
- ▶ There is no table wizard in the Microsoft Business Intelligence Development Studio; the tables of the datasets must be configured manually.
- ▶ The version is not checked:
This way, features from version 3 can be added to RDL files from version 2. These are not displayed in the Runtime however.
- ▶ In the Microsoft Business Intelligence Development Studio the datasets are separated from the data sources. The data source must not be changed.

INSTRUCTION

For a comprehensive guide about the use of the Microsoft Business Intelligence Development Studios see the Microsoft website in several languages:

Language	Link
English:	http://msdn.microsoft.com/en-en/library/ms173767.aspx (http://msdn.microsoft.com/en-en/library/ms173767.aspx)
German:	http://msdn.microsoft.com/de-de/library/ms173767.aspx (http://msdn.microsoft.com/de-de/library/ms173767.aspx)
French:	http://msdn.microsoft.com/fr-fr/library/ms173767.aspx (http://msdn.microsoft.com/fr-fr/library/ms173767.aspx)
Italian:	http://msdn.microsoft.com/it-it/library/ms173767.aspx (http://msdn.microsoft.com/it-it/library/ms173767.aspx)

DELETE DATASETS

Unused datasets must be deleted in Microsoft Business Intelligence Development Studio as they may cause errors in the Runtime.

To delete datasets:

1. click on **View**
2. select **Report Data**
3. navigate to **Datasets**
4. delete all unused datasets

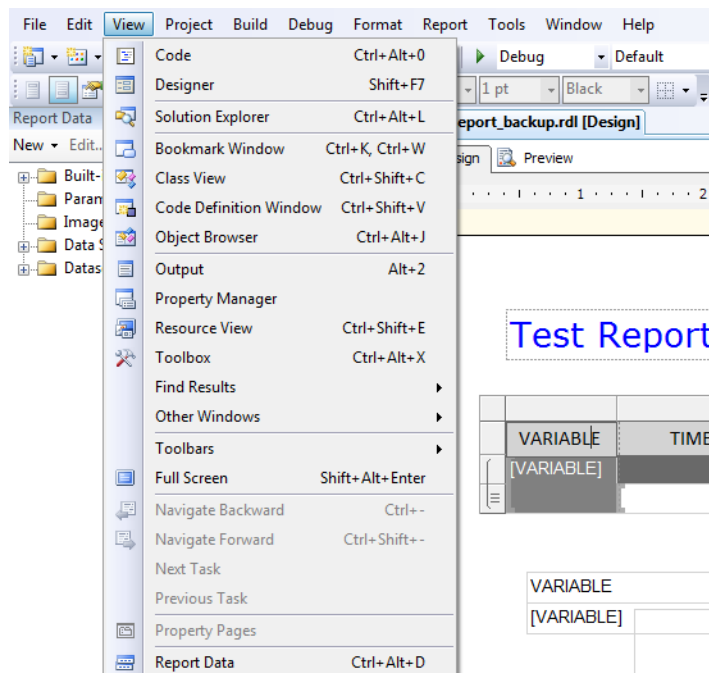
DISPLAY DATASET WINDOW

If the **Dataset** window is not displayed, it can be called up with the following steps:

- ▶ Select report
- ▶ Click on the **View** menu in the main menu
- ▶ Scroll to the end of the list
- ▶ Select **Report Data**

Note: If the menu item is not displayed, then no report was selected.

Alternatively, the key combination **Ctrl+ALT+D** can be pressed after selecting the report.



4.2.4 Definition of datasets

The columns of the dataset types are stipulated.

Definition of datasets for:

- ▶ AML (on page 323)
- ▶ CEL (on page 324)
- ▶ Archive (on page 325)
- ▶ Online (on page 326)
- ▶ Filter settings (on page 326)
- ▶ RGM
 - ▶ RGM recipe data (on page 327)
 - ▶ RGM recipe value (on page 328)
- ▶ Batch Control
 - ▶ Master recipe (on page 329)
 - ▶ Control recipe (on page 329)
 - ▶ Recipe screens (on page 331)
 - ▶ Matrix cells (on page 331)
 - ▶ PFC structure (on page 332)

- ▶ Phases (on page 333)
- ▶ Parameters (on page 334)
- ▶ Transitions (on page 335)
- ▶ Unit allocations (on page 335)
- ▶ Operation instance (on page 336)

Note: If zenon Analyzer reports are to be reused in the Report Viewer, the following applies:

- ▶ Language-switchable texts have already had the language switched
- ▶ Unit-switchable values are given in conversion units
- ▶ Time stamps correspond to the local time of the executing computer



Information

When the report is created for the first time, the sequence of data fields is checked using the naming. This establishes which dataset it might be. However the number of data fields may vary. This can lead to a dataset being interpreted incorrectly.

For example: A data set with just one field with the name **PROJECT** can be interpreted as a data set for AML, CEL, archive or online data, because all these data sets start with a field called **PROJECT**.

4.2.4.1 AML

Column name	Data type	Description
PROJECT	<i>STRING</i>	Name of the project.
VARIABLE	<i>STRING</i>	Name of the variable.
IDENTIFICATION	<i>STRING</i>	Identification of the variable.
TEXT	<i>STRING</i>	Entry text.
TIMECOMES	<i>DATE</i>	Time when the alarm occurs.
TIMEGOES	<i>DATE</i>	Time when the alarm is cleared.
TIMEACKN	<i>DATE</i>	Time of acknowledgment.
TIMEREACT	<i>DATE</i>	Time of reactivation.

Column name	Data type	Description
LATESTCHANGE	<i>DATE</i>	Value of the most recent time stamp of the TIMECOMES , TIMEGOES or TIMEREACT column.
COUNTREACT	<i>INTEGER</i>	Number of reactivations.
STATEREACT	<i>INTEGER</i>	State of reactivation.
STATUSFLAGS	<i>INTEGER</i>	Status bits.
VALUE	<i>FLOAT</i>	Value of the variables.
UNIT	<i>STRING</i>	Unit.
COMMENT	<i>STRING</i>	User comments.
CLASS	<i>STRING</i>	Alarm/Event class
GROUP	<i>STRING</i>	Alarm/Event group...
USER	<i>STRING</i>	name of the user.
USERID	<i>STRING</i>	Display of user identification.
COMPUTER	<i>STRING</i>	Name of the computer.
RESSOURCESLABEL	<i>STRING</i>	Resources label.
AREA	<i>STRING</i>	Alarm Areas. Several are separated with a comma.
ALARMCAUSELEVEL1	<i>STRING</i>	Alarm cause level 1.
ALARMCAUSELEVEL2	<i>STRING</i>	Alarm cause level 2.
ALARMCAUSELEVEL3	<i>STRING</i>	Alarm cause level 3.
ALARMCAUSELEVEL4	<i>STRING</i>	Alarm cause level 4.
ALARMCAUSELEVEL5	<i>STRING</i>	Alarm cause level 5.

4.2.4.2 CEL

Column name	Data type	Description
PROJECT	<i>STRING</i>	Name of the project.

Column name	Data type	Description
VARIABLE	<i>STRING</i>	Name of the variable.
IDENTIFICATION	<i>STRING</i>	Identification of the variable.
TEXT	<i>STRING</i>	Entry text.
TIMECOMES	<i>STRING</i>	Time when the event occurs.
STATUSFLAGS	<i>INTEGER</i>	Status bits.
VALUE	<i>FLOAT</i>	Value of the variables.
UNIT	<i>STRING</i>	Unit.
COMMENT	<i>STRING</i>	User comments.
CLASS	<i>STRING</i>	Alarm/Event class
GROUP	<i>STRING</i>	Alarm/Event group...
USER	<i>STRING</i>	name of the user.
USERID	<i>STRING</i>	Display of user identification.
COMPUTER	<i>STRING</i>	Name of the computer.
RESSOURCESLABEL	<i>STRING</i>	Resources label.
AREA	<i>STRING</i>	Alarm Areas. Several entries are separated by a comma.
CATEGORY	<i>STRING</i>	Categories. Several entries are separated by a comma.

4.2.4.3 Archive

Column name	Data Type	Description
PROJECT	<i>STRING</i>	Name of the project.
ARCHIVE	<i>STRING</i>	Name of the archive.
VARIABLE	<i>STRING</i>	Name of the variable.
IDENTIFICATION	<i>STRING</i>	Identification of the variable.
CHANNELSPEC	<i>STRING</i>	Variable including type of data reduction.

Column name	Data Type	Description
TIMESTAMP	<i>STRING</i>	Timestamp.
STATUSFLAGS	<i>INTEGER</i>	Status bits.
VALUE	<i>FLOAT</i>	Value of the variables.
UNIT	<i>STRING</i>	Unit.
STRVALUE	<i>STRING</i>	Value as string.
RESSOURCESLABEL	<i>STRING</i>	Resources label.

4.2.4.4Online

Column name	Data Type	Description
PROJECT	<i>STRING</i>	Name of the project.
VARIABLE	<i>STRING</i>	Name of the variable.
IDENTIFICATION	<i>STRING</i>	Identification of the variable.
TIMESTAMP	<i>STRING</i>	Timestamp.
STATUSFLAGS	<i>INTEGER</i>	Status bits.
VALUE	<i>FLOAT</i>	Value of the variables.
UNIT	<i>STRING</i>	Unit.
STRVALUE	<i>STRING</i>	Value as string.
RESSOURCESLABEL	<i>STRING</i>	Resources label.

4.2.4.5Filter settings

Column name	Data type	Description
DataSet	<i>STRING</i>	Data set used, such as AML .
FilterType	<i>STRING</i>	Type of filter, such as <i>time</i> or <i>lot</i> .
FilterData	<i>STRING</i>	Filter settings.

Column name	Data type	Description
		<i>FilterData (string) = [filter type] [filter parameter] [filter parameter] []</i>

FILTERDATA PARAMETER

If the **FilterType** is *time*, the time period is displayed in Runtime:

Example: *@FilterData(String) = Rel:0d, 1h, 0m, 0s;*

If the filter type is **FilterType** *Lot*, the following parameters are available for display in Runtime.

Example: *@FilterData(String) = LOT12345; 17.08.2017 15.50.00; 17.08.2017 16.50.00; OT 01:00:00*

Parameter	Data type	Description
Lot Name	<i>STRING</i>	Lot name
Lot Start Date	<i>STRING</i>	Start date of the lot.
Lot End Date	<i>STRING</i>	End date of the lot.
Lot Start Time	<i>STRING</i>	Starting time of the lot.
Lot End Time	<i>STRING</i>	End time of the lot.
Lot Duration	<i>STRING</i>	Lot duration.

4.2.4.6RGM recipe data

Column name	Data Type	Description
PROJECTNAME	<i>STRING</i>	Name of the project.
GROUPNAME	<i>STRING</i>	Name of the recipe group.
NAME	<i>STRING</i>	Recipe name.
NUMBER	<i>UINT</i>	Recipe number.
STATUSNUMBER	<i>UINT</i>	Status number
STATUSTEXT	<i>STRING</i>	Status text.
VERSION	<i>UINT</i>	Version.
COMMENT1	<i>STRING</i>	Comment 1

Column name	Data Type	Description
COMMENT2	STRING	Comment 2
COMMENT3	STRING	Comment 3
COMMENT4	STRING	Comment 4
COMMENT5	STRING	Comment 5
COMMENT6	STRING	Comment 6
COMMENT7	STRING	Comment 7
COMMENT8	STRING	Comment 8
USERLEVEL	UINT	User authorization.
CHANGETIME	DATETIME	Time of the change.
CHANGEUSER	STRING	User that was logged in when the change was made.

4.2.4.7 RGM recipe value

Column name	Data Type	Description
PROJECTNAME	STRING	Name of the project.
GROUPNAME	STRING	Name of the recipe group.
NAME	STRING	Recipe name.
VERSION	UINT	Version.
RESSOURCESLABEL	STRING	Resources label.
VARIABLENAME	STRING	Variable name.
VARIABLETAG	STRING	Variable identification.
SYMBOLVALUE	STRING	Symbolic address for variable.
VALUE	STRING	value.
UNIT	STRING	Unit.
MIN	DOUBLEWORD	Minimum value.
MAX	DOUBELWORD	Maximum value.

Column name	Data Type	Description
ACTION	<i>STRING</i>	RGM recipe action to be executed.
FILTER	<i>STRING</i>	Recipe variable filter.

4.2.4.8 Master recipe

Column name	Data Type	Description
MrId	<i>INTEGER</i>	ID of the recipe.
MrName	<i>STRING</i>	Name of the recipe.
MrDescription	<i>STRING</i>	Description of the recipe.
MrStatus	<i>STRING</i>	Status of the recipe
RecipeType	<i>STRING</i>	Type of the recipe.
ReeStatus	<i>STRING</i>	Status of the REE.
ReeModus	<i>STRING</i>	Mode of the REE.
ApprovalTime	<i>DATE</i>	Time when the recipe was approved.
ApprovalUserID	<i>STRING</i>	ID of the user who approved the master recipe.
ApprovalUserName	<i>STRING</i>	Name of the user who approved the master recipe.
OutdatedTime	<i>DATE</i>	Time when the recipe was set to "obsolete".
OutdatedUserID	<i>STRING</i>	ID of the user who set the recipe to "obsolete".
OutdatedUserName	<i>STRING</i>	Name of the user who set the recipe to "obsolete".
MrVersion	<i>STRING</i>	Version of the master recipe.
MrSourceVersion	<i>STRING</i>	Version of the template source recipe.

4.2.4.9 Control recipe

Column name	Data Type	Description
CrId	<i>INTEGER</i>	ID of the control recipe.

Column name	Data Type	Description
CrName	<i>STRING</i>	Name of the control recipe.
CrDescription	<i>STRING</i>	Description of the control recipe.
CrStatus	<i>STRING</i>	Status of the control recipe.
MrId	<i>INTEGER</i>	ID of the master recipe.
MrName	<i>STRING</i>	Name of the master recipe.
MrDescription	<i>STRING</i>	Description of the master recipe.
MrStatus	<i>STRING</i>	Status of the master recipe.
RecipeType	<i>STRING</i>	Type of the recipe.
ReeStatus	<i>STRING</i>	Status of the REE.
ReeModus	<i>STRING</i>	Mode of the REE.
CrJobID	<i>STRING</i>	Job ID of the control recipe
ApprovalTime	<i>DATE</i>	Time when the master recipe was approved
ApprovalUserID	<i>STRING</i>	ID of the user who approved the master recipe.
ApprovalUserName	<i>STRING</i>	Name of the user who approved the master recipe.
CreationTime	<i>DATE</i>	Time of creation of the control recipe.
CreationUserID	<i>STRING</i>	ID of the user who created the master recipe.
CreationUserName	<i>STRING</i>	Name of the user who created the master recipe.
StartingTime	<i>DATE</i>	Time when the recipe was started
StartingUserID	<i>STRING</i>	ID of the user who started the master recipe.
StartingUserName	<i>STRING</i>	Name of the user who started the recipe.
OutdatedTime	<i>DATE</i>	Time when the master recipe was set to "obsolete".
OutdatedUserID	<i>STRING</i>	ID of the user who set the master recipe to "obsolete".
OutdatedUserName	<i>STRING</i>	Name of the user who set the master recipe to "obsolete".
MrVersion	<i>STRING</i>	Version of the master recipe.
MrSourceVersion	<i>STRING</i>	Version of the template source recipe.

4.2.4.10 Recipe screens

Column name	Data Type	Description
Name	STRING	Name of the recipe.
Description	STRING	Description of the recipe.
RecipePart	STRING	Master recipe, control recipe or operation instance
OperationTemplateID	INTEGER	ID of the Operation template.
Type	STRING	Type of the recipe: PFC recipe or matrix recipe.
ImagePNG	STRING	Screenshot of the recipe Must be created especially.

CREATING A SCREEN

1. Insert a new screen in the Report Builder.
2. Set the source to *Database*.
3. For the **Use this field** property, enter: *ImagePNG* .
4. Enter, for the MIME type property: *image/png* .
5. Insert the screen using the Insert option or by dragging&dropping in the report.
6. In the **Size** property, adjust the size to *Original Size*.
7. If necessary, amend the **Padding** property for the distance from the screen to the cell borders.

4.2.4.11 Matrix cells

Column name	Data Type	Description
StepNr	INTEGER	Number of the Step.
StepDescr	STRING	Description of the Step.
ObjectID	INTEGER	ID of the object in the recipe.
ObjectName	STRING	Name of the object in the recipe.
ObjectDescr	STRING	Description of the object in the recipe.

Column name	Data Type	Description
ObjectType	<i>STRING</i>	Type of object in the recipe. (phase, transition, ...)
ObjectUnit	<i>STRING</i>	Unit of the object.
OperationTemplateID	<i>INTEGER</i>	ID of the Operation template. <i>0</i> = main recipe.
OperationTemplateName	<i>STRING</i>	Name of the Operation template. empty = main recipe.

4.2.4.12 PFC structure

Column name	Data Type	Description
ChartRow	<i>INTEGER</i>	Rung in the recipe.
ChartCol	<i>INTEGER</i>	Column in the recipe.
ObjectID	<i>INTEGER</i>	ID of the object in the recipe.
ObjectName	<i>STRING</i>	Name of the object in the recipe.
ObjectDescr	<i>STRING</i>	Description of the object in the recipe.
ObjectType	<i>STRING</i>	Type of object in the recipe. (phase, transition, ...)
ObjectUnit	<i>STRING</i>	Unit of the object.
PrevIds	<i>STRING</i>	IDs of the previous objects.
NextIds	<i>STRING</i>	IDs of the following objects.
PrevNames	<i>STRING</i>	Names of the previous objects.
NextNames	<i>STRING</i>	Names of the following objects.
PrevTypes	<i>STRING</i>	Types of the previous objects.
NextTypes	<i>STRING</i>	Types of the following objects.
CellsSpan	<i>STRING</i>	Number of columns used (width of the object).
OperationTemplateID	<i>INTEGER</i>	ID of the Operation template. <i>0</i> = main recipe.

Column name	Data Type	Description
OperationTemplateName	STRING	Name of the Operation template. empty = main recipe.

4.2.4.13 Phases

Column name	Data Type	Description
ObjectID	INTEGER	ID of the object in the recipe.
ChartRow	INTEGER	Lines in which the phase is located in the recipe.
ChartCol	INTEGER	Column in which the phase is located in the recipe.
PhaseName	STRING	Name of the phase.
PhaseDescr	STRING	Description of the phase.
UnitID	INTEGER	ID of the unit.
UnitName	STRING	Name of the unit.
UnitDescr	INTEGERSTRING	Description of the unit.
OperationInstID	INTEGER	ID of the operation instance in which the phase is located in the recipe.
OperationInstName	STRING	Name of the operation instance in which the phase is located in the recipe.
TOAllocation	STRING	Waiting period unit allocation.
TOInterlocking	STRING	Waiting period of the interlocking.
MinExecTime	STRING	Minimum execution time.
ExplanationMinExecTimeNeeded	BOOL	Reason for changing the minimum execution time necessary.
MaxExecTime	STRING	Maximum execution time.
TOFollowingCond	STRING	Waiting period for Following condition.
CondInterlocking	STRING	Interlocking condition.

Column name	Data Type	Description
CondDone	STRING	Condition for ended.
CondFailure	STRING	Condition for loss of communication.
CondPausing	STRING	Condition for pause.
CondHolding	STRING	Condition for holding.
CondStopping	STRING	Condition for stop.
CondAborting	STRING	Condition for abort.
CondRestarting	STRING	Condition for restart.
CondEscaping	STRING	Escape condition.
CondConnReconnect	STRING	Condition for communication reestablished.
CondPlcError	STRING	Condition for PLC error.
CSName	STRING	Name of the control strategy.
CSDescription	STRING	Description of the control strategy.
CSTag	STRING	Parameter of the control strategy.
ActiveCSNumber	INTEGER	Number of active control strategies.

4.2.4.14 Parameter

Column name	Data Type	Description
TagName	STRING	Name of the TAG.
TagDescr	STRING	Description of the tag.
TagType	STRING	Type of the tag.
TagValue	STRING	Value of the tag.
MeasUnit	STRING	Measuring unit
ValueMin	STRING	Minimum value.
ValueMax	STRING	Maximum value.

Column name	Data Type	Description
EditableInRecipe	<i>BOOL</i>	States if editable in the recipe.
EditableInCr	<i>BOOL</i>	States if editable in the control recipe.
ExplanationNeeded	<i>BOOL</i>	States if a reason for change is necessary.
TagModified	<i>BOOL</i>	States if a parameter was changed.
Variable	<i>STRING</i>	Name of the tag.
DataType	<i>STRING</i>	Data type of the variable.
PhaseID	<i>INTEGER</i>	ID of the phase.
PhaseName	<i>STRING</i>	Name of the phase.
OperationInstID	<i>INTEGER</i>	ID of the operation instance.
OperationInstName	<i>STRING</i>	Name of the operation instance.

4.2.4.15 Transitions

Column name	Data Type	Description
ObjectID	<i>INTEGER</i>	ID of the transition in the recipe.
ChartRow	<i>INTEGER</i>	Row of the recipe.
ChartCol	<i>INTEGER</i>	Column of the recipe.
Condition	<i>STRING</i>	Condition for the transition.
OperationInstID	<i>INTEGER</i>	ID of the operation instance in which the transition is located.
OperationInstName	<i>STRING</i>	name of the operation instance in which the transition is located.

4.2.4.16 Unit allocations

Column name	Data Type	Description
ObjectID	<i>INTEGER</i>	ID of the unit allocation in the recipe.

Column name	Data Type	Description
ChartRow	<i>INTEGER</i>	Row of the recipe.
ChartCol	<i>INTEGER</i>	Column of the recipe.
AllocationData	<i>STRING</i>	Unit allocation and number of the units allocated.
OperationInstID	<i>INTEGER</i>	ID of the operation instance in which the unit allocation is located.
OperationInstName	<i>STRING</i>	Name of the operation instance in which the unit allocation is located.

4.2.4.17 Operation instance

Column name	Data Type	Description
ObjectID	<i>INTEGER</i>	ID of the operation instance in the recipe.
ChartRow	<i>INTEGER</i>	Row of the recipe.
ChartCol	<i>INTEGER</i>	Column of the recipe.
OperationName	<i>STRING</i>	Name of the operation.
OperationDescr	<i>STRING</i>	Description of the operation.
OperationType	<i>STRING</i>	Recipe type: PFC recipe or matrix recipe.
OperationTemplateID	<i>INTEGER</i>	ID of the Operation template.

4.3 Operation in the Runtime

The **Report Viewer** screen is called up in the Runtime with a screen switching function. Depending on the configured report definition, reports for AML, CEL, archives and online values can be displayed. You can also do the following with these reports, if the corresponding functions are configured:

- ▶ Update: Reload report definition and data and display report
- ▶ Print: on the printer defined for values and logs

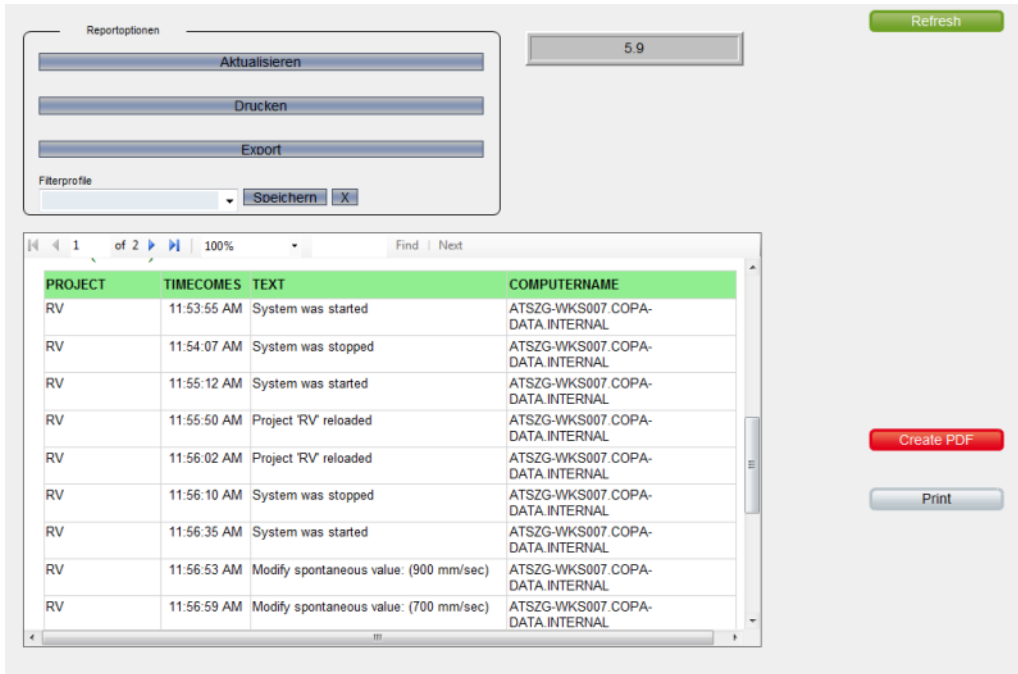
- Export: as a PDF file to the defined export folder



Parameters	Description
Refresh	<p>Reloads the report definition and the data and displays the report with the updated data.</p> <p>After the report file in the Editor has been changed, the screen must be called up again; a reload is not sufficient.</p>
Print	<p>Prints the report on the printer defined for values and logs.</p> <p>Note:</p> <p>The printout can also be evacuated to its own thread (on page 299). This ensures that Runtime can be operated during printing.</p>
Create PDF	<p>Saves the report currently being displayed as a PDF file in the folder defined for export.</p> <p>Standard path: <code>%PUBLIC%\Documents\zenon_Projects\[PROJECTNAME]>\Export</code></p> <p>Note:</p> <p>The PDF creation can also be evacuated to its own thread (on page 299). This ensures that Runtime can be operated during the creation and export.</p>
Report list	<p>Displays the reports defined in the screen switching function (on page 220). The list can be searched. Long lists are broken up into several</p>

Parameters	Description
	pages.

NAVIGATION, ZOOM AND SEARCH



The screenshot displays the 'Reportoptionen' (Report Options) panel on the left, which includes buttons for 'Aktualisieren' (Refresh), 'Drucken' (Print), and 'Export', along with a 'Filterprofile' dropdown and a 'Speichern' (Save) button. The main area shows a table with 4 columns: PROJECT, TIMECOMES, TEXT, and COMPUTERNAME. The table contains 9 rows of data. On the right side, there is a 'Refresh' button, a 'Create PDF' button, and a 'Print' button. The table data is as follows:

PROJECT	TIMECOMES	TEXT	COMPUTERNAME
RV	11:53:55 AM	System was started	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:54:07 AM	System was stopped	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:55:12 AM	System was started	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:55:50 AM	Project 'RV' reloaded	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:56:02 AM	Project 'RV' reloaded	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:56:10 AM	System was stopped	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:56:35 AM	System was started	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:56:53 AM	Modify spontaneous value: (900 mm/sec)	ATSZG-WKS007.COPA-DATA.INTERNAL
RV	11:56:59 AM	Modify spontaneous value: (700 mm/sec)	ATSZG-WKS007.COPA-DATA.INTERNAL

The report header offers elements for:

- ▶ Navigation
- ▶ Zoom
- ▶ Search

Parameters	Description
Page navigation	Displays number of pages and current page. Enables navigation in the document by means of <ul style="list-style-type: none"> ▶ Arrow keys ▶ Selection of a particular page
Zoom	Selection of a zoom level from a drop-down list: <ul style="list-style-type: none"> ▶ Page Width ▶ Whole Page ▶ 500% ▶ 200%

Parameters	Description
	<ul style="list-style-type: none"> ▶ 150% ▶ 100% (default) ▶ 75 % ▶ 50 % ▶ 25%
Search	<p>Input of a search term in the search field.</p> <ul style="list-style-type: none"> ▶ Find: Displays the first place of finding ▶ Next: Navigates to further places of finding <p>Wildcards cannot be used.</p>

4.4 Troubleshooting

ERROR MESSAGES IN POP-UPS

Error message	Meaning
DataTable missing for DataSet: <DatasetName>	A dataset is used in the report definition, but there is no table with this name in the configuration. The report cannot be displayed.
DataSet not used for DataTable: <TableName>	A table was defined, but the report definition does not use this name for a dataset. This message is only given after a missing table has been established.