zenon manual
Alarms administration

v.8.20

COPA·DATA

Contents

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.

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2 Alarms administration

Alarm administration informs you of faults that occur such as limit values being exceeded. It comprises:

1. Alarm status line:
   Information line that is always shown in the foreground in the Runtime and contains, depending on the configuration, the most recent or oldest unacknowledged alarm.

   The alarm status line can be activated in the project properties in the **alarm message list** group under **alarm status line** by means of the **Status line active**.

   Default: *inactive*

Note: With converted projects from older zenon versions, the pre-existing setting is applied. This is also applicable for the earlier default *active*.

2. Alarm Message List (AML) (on page 200):
   Administers the alarms in a list in the Runtime. The AML:

   ▶ Displays alarms and their causes in an unfiltered or filtered list

   ▶ Enables localization of the cause of the alarm

   ▶ Enables acknowledgment of alarms

   ▶ Enables deletion of alarms.

   ▶ Enables printing and saving of alarms

Configure (on page 37) alarms by means of:

▶ Setting limit values for variables

▶ With reaction matrices

▶ Properties of the alarms

3 Configuring alarms

Alarm administration is operated in the Runtime using *alarm message list* screens and *alarm message list filters* as well as the alarm status line. The alarm status line is automatically created as a template and can be activated manually (on page 5).

Default: *inactive*

EDITOR

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

▶ A screen of **alarm message list** type (on page 7) can be configured

▶ Limit value violations of variables or reaction matrixes are defined

In addition you can:

▶ Configure alarms using filters (on page 56)

▶ Grouping (on page 41) alarms

▶ Amend the filters available in the Runtime using an **Alarm Message List Filter** screen (on page 18)

RUNTIME

For the operation in the Runtime (on page 192) the following is used:

▶   AML screen switching (on page 151)

▶   AML filter screen switching (on page 154)

▶   The zenon alarm functions (on page 156)

▶   Using Alarm Message List screens (on page 216)

▶   Alarm status line (on page 197)

3.1   Creating an Alarm Message List screen

CREATING AN ALARM MESSAGE LIST FILTER SCREEN

The Alarm Message List screen is for displaying and logging current and past alarms in Runtime. The display can be changed using a filter. Functions make it possible to export and print the displayed alarms.

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 *Alarm Message List* 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.

3.1.1 Control elements

INSERT TEMPLATE

Parameter	Description
Insert template	Opens the dialog for selecting a template for the screen type. Templates are shipped together with zenon and can also be created by the user. Templates add pre-defined control elements to pre-defined position in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional

Parameter	Description
	elements are selected from the drop-down list and placed in the zenon screen. Elements can be moved on the screen and arranged individually.

Note: For *dynamic text* or switch control elements , the respective functionality is assigned using the **Screen type specific action** property.

CONTROL ELEMENTS

WINDOW

Control element	Description
Window	Display in the Runtime
Alarm Message List	Display of the alarms. The appearance is configurable (on page 13). Columns are set using the column settings (on page 104) filter in the screen switching. The **Column settings AML** property in the project properties in the **Alarm Message List** group are used to define the settings for export in CSV, XML and DBF. These also serve as a pre-setting for the screen switching function.
Set filter	Shortened display of the currently selected filter conditions in a compact filter line.
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.
State	Display if Alarm Message List is active or not (Project property **Alarm Message List active**).
Total number	Shows number of all alarms.
Number of unacknowledged	Displays number of unacknowledged alarms.

LIST FUNCTIONS

Control element	Description
List functions	Buttons to control the lists.
Filter	Opens the dialog for filter selection.

Control element	Description
Stop/Continue	Switch for filling the list: **Stop:** New elements are no longer added automatically. **Next:** New elements are added automatically. **Attention:** The labeling of the button can be changed in the Editor but is not carried over to the Runtime.
Print	Prints filtered list.
Print with dialog	Opens printer settings before printing.

ALARM FUNCTIONS

Control element	Description
Alarm functions	Buttons for acknowledging and deleting alarms.
Acknowledge	Acknowledging alarm messages in the Runtime.
Acknowledge page	All alarms displayed on the current page are acknowledged.
Acknowl. All	All alarms for the current filter criteria are acknowledged **Note for multi-user project:** Alarms are only acknowledged for projects for which the user has authorizations. (for details on multi-user projects, see Distributed engineering chapter)
Visual acknowledgment	The selected alarms are visually acknowledged (on page 209).
Visual acknowledgment and acknowledgment	The selected alarms are first visually acknowledged and then acknowledged (on page 209).
Confirm acknowledgment	Deletes alarm from the Alarm Message List in the Runtime. Alarm must already be acknowledged.
Confirm acknowledgement page	Deletes all acknowledged alarms that are displayed on the current page.
Confirm acknowledgement all	Deletes all acknowledged alarms that correspond to the current filter criteria.
Linked function (display)	Displays the function allocated to the alarm message.
Execute function	Executes the functions configured for the alarm in the Runtime. **Note:** With the **Start program** function, the variable name of

Control element	Description
	the selected alarm can be transferred as a parameter for the program to be started using the key word *@alarm.name*.
Open help...	Calls up configured Help.
Display	State and elements of alarm administration.
Comment field	Input of free text by the user for the selected alarm. Maximum length: *79 characters* This text can also be displayed in the list. To do this, the **comment** option in the **column settings** of the alarm administration is activated. The comment field is a *dynamic text* element. The **Write set value** property is automatically activated for this element during configuration. In addition, the **Write set value via** property is set to the *element* value. Changes to comments can be documented by activating the **Alarm comments** property.
Select alarm cause...	Opens the dialog for selecting an alarm cause. An alarm cause can be assigned to the alarm selected in the alarm message list using the dialog. **Note:** *Inactive* if no entry is selected in the alarm message list. See also chapter Alarm cause (on page 204).

NAVIGATION

Control element	Description
Navigation	Controls elements of the list.
Line up	Scrolls one line up.
Line down	Scrolls one line down.
Column right	Scrolls one column to the right.
Column left	Scrolls one column to the left.
Page up	Scrolls one page up.
Page down	Scrolls one page down.

Control element	Description
Page right	Scrolls one page to the right.
Page left	Scrolls one page to the left.

COMPATIBLE ELEMENTS

Control element	Description
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.
State	Static Win32 control element. Was replaced by a *dynamic text field*. For the description, see current element.
Total number	Static Win32 control element. Was replaced by a *dynamic text field*. For the description, see current element.
Number of unacknowledged	Static Win32 control element. Was replaced by a *dynamic text field*. For the description, see current element.
Linked function (display)	Static Win32 control element. Was replaced by a *dynamic text field*. For the description, see current element.
Set filter	Static Win32 control element. Was replaced by a *dynamic text field*. For the description, see current element.
Comment field	Static Win32 control element. Was replaced by a *dynamic text field*. For the description, see current element.
Close frame	Closes the frame on which the screen is based. **Recommendation:** Use the **Close frame** function to close frames In order that after the closing the screen which was opened before is displayed, you must engineer the screen of type AML with its own frame.

FILTER PROFILES

Control element	Description
Filter profiles	Buttons for filter settings in the Runtime.
Profile selection	Select profile from list.

Control element	Description
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

The filter currently being used is displayed with the **Set filter** control element.

With a:

▸ Text filter, the expression **[Txt]** is displayed

▸ Relative time filter: is displayed as a print-out with the following scheme:
  [T,Rel:%dd,%dh,%dm;%ds]
  Example: [T,Rel:1d,0h,0m,0s] equals one day.

▸

3.1.2 Customize the display of the AML in the Runtime

You can individually customize the tabular display of the Alarm Message List in the zenon Runtime:

SCROLL BARS, HEADERS AND GRIDS

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

1. Activate, in the **Representation** group, the **Extended graphical settings** property.
2. Define the desired properties in the groups **Scroll bars** and **Header and grid**.

   ### ⚡ Information

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

ENGINEERING IN THE EDITOR

You can configure the display of the entries in the AML in the Runtime in the project settings in the **Alarm Message List** property group.

You can use the **Alarm/event class color** property to stipulate whether and how the defined alarm/event class colors are used in the Runtime.

The following possibilities are available if the **Alarm Message List active** property has been activated:

- ▸ *do not use*: The colors of the **alarm/event classes** are not used in the Alarm Message List in the Runtime.

- ▸ *as text color*: The colors of the **alarm/event classes** are used as text colors for the corresponding entries in the Alarm Message List in the Runtime.

- ▸ *as line background*: The colors of the **alarm/event classes** are used as background colors for the corresponding entries in the Alarm Message List in the Runtime.

- ▸ *Use status-dependent text/background color*: The colors of the **alarm/event classes** are used as a text/background color for the corresponding entries in the Alarm Message List in the Runtime.

Default: *as text color*

There are different ways to display alarms, that:

- ▸ Occur for the first time: **Alarm received**
- ▸ Have already gone: **Alarm cleared**
- ▸ Occur again: **Alarm reactivated**
- ▸ Have already been acknowledged: **Alarm acknowledged**
- ▸ Have an already-confirmed alarm acknowledgment: **Confirm alarm acknowledgement**

For **Alarm received**, **Alarm cleared** and **Alarm reactivated** you can configure the display with the following properties:

- ▸ **Text / status color**
- ▸ **Background color**
- ▸ **Prefix**
- ▸ **Graphics file for alarm status**
- ▸ **Graphics file prefix**

For acknowledged alarms the display is configured with the following properties:

- ▸ **Text/status color - received**
- ▸ **Background color - received**

▶ **Text/status color - cleared**

▶ **Background color - cleared**

▶ **Text/status color - reactivated**

▶ **Background color - reactivated**

▶ **Prefix**

▶ **Graphic file alarm status**

▶ **Graphics file prefix**

You can configure the following settings for **Confirm alarm acknowledgement**:

▶ **Color**

▶ **Graphic file alarm status**

You can activate the following properties under **Alarm status line**:

▶ **Status line active**

▶ **move up next alarm**

You can define the following settings:

▶ **Display**

▶ **Font**

▶ **Text color**

▶ **Background color**

You can define the following settings for messages 1 to 4 respectively:

▶ **Message [n] number of alarms**

▶ **Message [n] text**

▶ **Message [n] text color**

All settings are stored in the *project.ini* file. You can find details in relation to this in the Editor AML [ALARM] chapter.
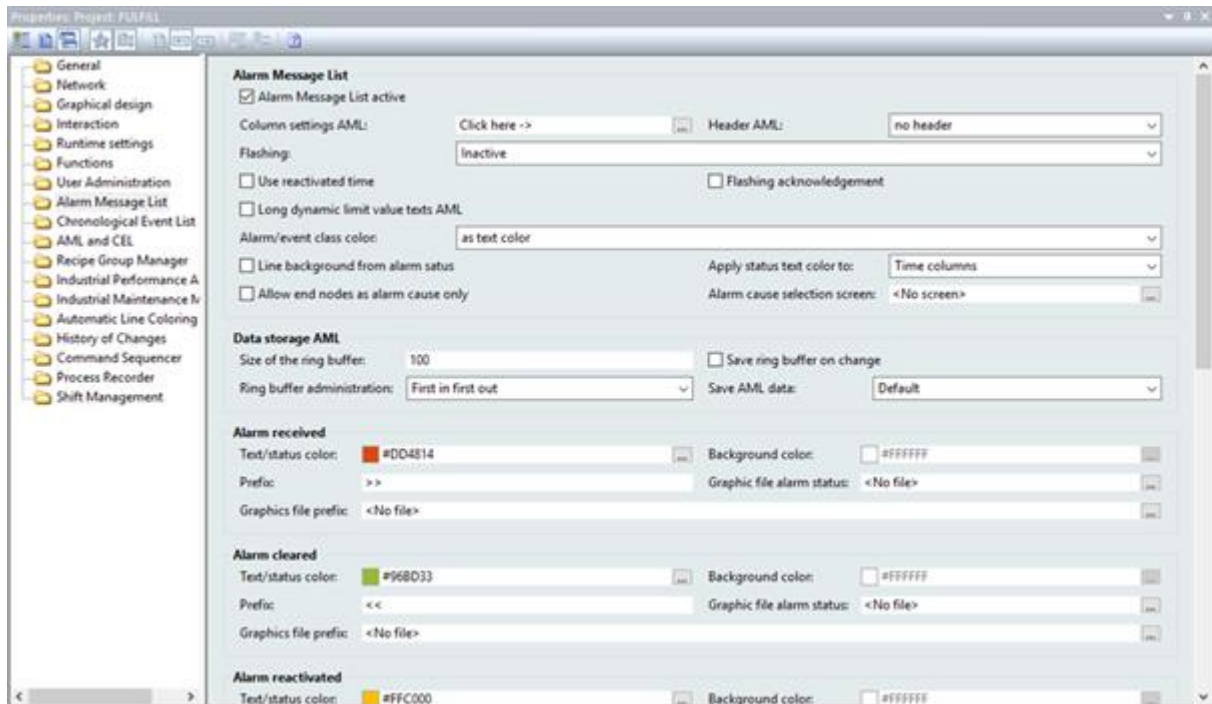
The following settings can be made for the respective alarm:

Parameter	Description

Color	Color selection for the respective alarm:
	
	  ▸ **Alarm received**
	
	  ▸ **Alarm cleared**
	
	  ▸ **Alarm reactivated**
	
	  ▸ **Alarm acknowledged**
	
	  ▸ **Alarm acknowledgment confirmed**
	
	The color selection made is applicable for the text of the corresponding time column of the status and for the graphics in the alarm status column.

Prefix	Possibility to enter a prefix in order to quickly detect the respective time stamp in the Runtime. Not available for **alarm acknowledgment confirmed**.
Graphics file for alarm status	Possibility to select a graphics file for display of the respective alarm in the Runtime.

Parameter	Description
Graphics file prefix	Possibility to select a graphics file that is to be displayed in the Runtime to the left in front of the time stamp of the cleared alarm instead of the prefix. Not available for **alarm acknowledgment confirmed**.

Note: if an older project is converted into a zenon version 8.00 project, the color and status indication of **Alarm received** are also used for **Alarm reactivated**. **Prefix** and **Graphics file prefix** remain empty. If older Runtime files are started with version 8.00 of the Runtime, the same effects occur.

SORT IN THE RUNTIME

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

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

2. Link the **Sort ascending** and **Sort descending** properties with a graphics file.

   The selected graphics for the respective sorting direction are displayed in the Runtime for the sorting of relevant columns

   ▸ Clicking on the graphic changes the sorting sequence.

   ▸ Clicking in the column title activates the column for sorting.

OPERATING THE HEADER IN RUNTIME

You can make it possible for users to operate the header in the Runtime. With this an individual customization of the look is possible in the Runtime:

▸ Move columns with Drag&Drop

▸ Change column width with the mouse

▸ Change sorting

To do this, use the following properties:

▸ **Freeze column location**: Controls the possibility to amend or move the width of table columns in the Runtime with mouse actions.

   ▸ *active*: The columns cannot be moved with Drag&Drop and the width cannot be amended.

   ▸ *Inactive*: The columns can be arranged by means of Drag&Drop and the width of the columns can be amended by dragging with the mouse

‣ **Disable sorting**: Controls the possibility to sort table columns in the Runtime.

    ‣ *active*: The table cannot be sorted.

    ‣ *Inactive*: The table can be sorted by clicking on the header.

Note: In order to be able to configure these properties, *Editable header* must be selected for the **Header AML** property in the project settings for the **Alarm Message List** group. Here, you can also generally switch the header to inoperable or invisible here. These settings apply for all headers in the project.

PREVIEW

The header and the scroll bars are shown as a preview in the Editor by activating the **Extended graphical settings** property. Details such as colors, fill effects, lighting effects or grids can thus be configured more easily.

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

3.2 Creating an Alarm Message List filter screen

It is possible to adjust filter settings for the Alarm Message List in the Runtime with the help of the Alarm Message List Filter screen. Only the filter elements that are actually required are configured and provided to the user. The appearance can also be freely defined and thus adapted to different end devices. All filter settings that are available in the filter (on page 56) for the function to switch the screen to the Chronological Event List screen (on page 151) can be configured.

Therefore:

‣ Only the filter elements that are actually required are configured and provided to the user.

‣ The user only has these filters displayed and has an overview

‣ The appearance can be freely defined and can, for example, ensure ease of use by means of a touch screen.

For details of use in the Runtime, see the Using the CEL Filter (on page 216) chapter.

For the definition of filter criteria, see Filter Alarm Message List Filter (on page 117) chapter.

> **⚠Attention**
>
> Screens of type **Alarm Message List Filter**, **Chronological Event List Filter** and **Time Filter** must be engineered with an own frame. If they use the same frame as other screens, all screens based on this frame are closed when the screen is closed 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.

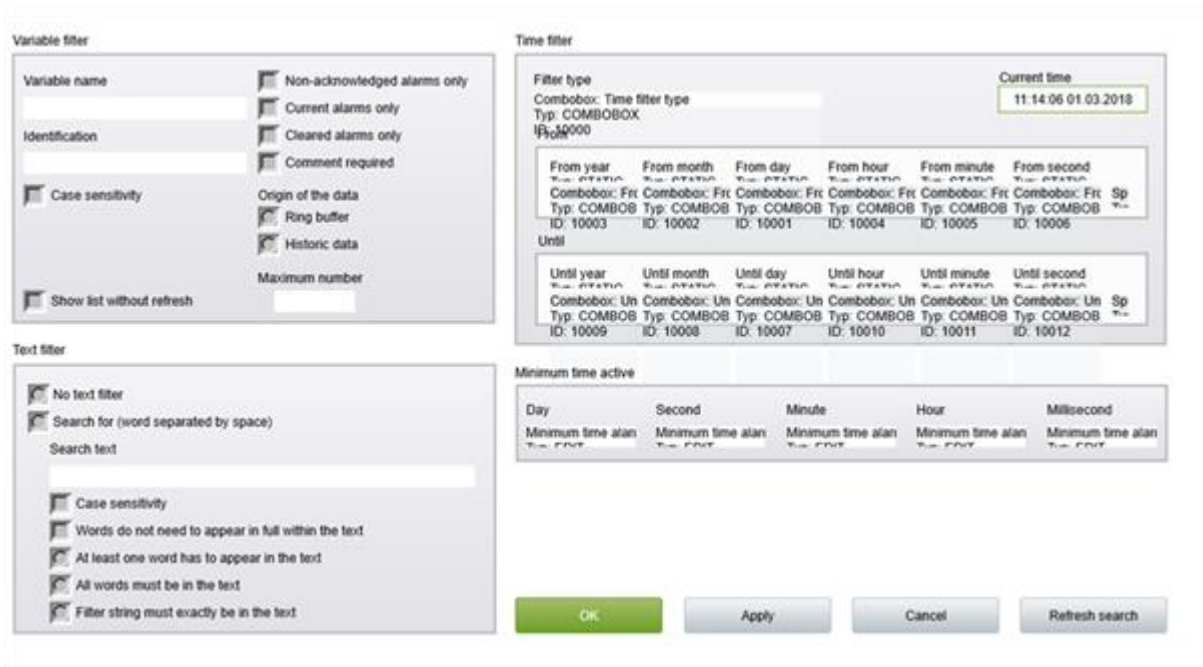2. Change the properties of the screen:

   a) Name the screen in the **Name** property.

   b) In the **Screen type** property, select *Alarm Message List filter*.

   c) Select the desired frame in the **Frame** property.
   Note: The *AML filter* screen must not be based on the same frame as other screens!

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.

3.2.1 Control elements

The following control and display elements are available for the screen type *alarm message filter list*.

INSERT TEMPLATE

Control element	Description
Insert template	Opens the dialog for selecting a template for the screen type. Templates are shipped together with zenon and can also be created by the user. Templates add pre-defined control elements to pre-defined 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. You can read more about templates for this screen type in the **Templates** (on page 34) chapter.

GENERAL FILTERS

Drop-down list of different general filters (on page 122).

Control element	Description
Insert all elements: General filters	Inserts all elements from the area of general filters into pre-defined places. Elements can be arranged individually.
Insert all elements: General filter (Touch)	Inserts all elements from the area of general filters into pre-defined places. Elements can be arranged individually. The elements were optimized for touch operation.
Variables	Display of the alarms of the selected variables.
▶ **Name**	Filter according to names of variables.
▶ **Identification**	Filter according to identification of variables.
▶ **Match case**	Note capitalization when filtering the variables.
Type of alarm	Which alarms are displayed:
▶ **Only non-acknowledged alarms**	Only non-acknowledged alarms.
▶ **Only cleared alarms**	Cleared alarms only.
▶ **Only current alarms**	Current alarms only
▶ **Comment required**	Alarms that require a comment when acknowledged.
▶ **Alarm cause required**	Alarms whose acknowledgment requires the linking of an alarm cause.
Minimum time active alarms	Time for which alarms must be active as a minimum.
▶ **Days**	Only alarms that have been current for at least the given number of days.
▶ **Hours**	Only alarms that have been current for at least the given number of hours.
▶ **Minutes**	Only alarms that have been current for at least the given number of minutes.
▶ **Seconds**	Only alarms that have been current for at least the given number of seconds.

Control element	Description
▶ **Milliseconds**	Only alarms that have been current for at least the given number of milliseconds.
Minimum time active alarms (touch)	Elements optimized for touch operation for configuration of the minimum time for pending alarms. ▶ *Button: Days (up)* ▶ *Touchbox: Days* ▶ *Button: Days (down)* ▶ *Button: Hours (up)* ▶ *Touchbox: Hours* ▶ *Button: Hours (down)* ▶ *Button: Minutes (up)* ▶ *Touchbox: Minutes* ▶ *Button: Minutes (down)* ▶ *Button: Seconds (up)* ▶ *Touchbox: Seconds* ▶ *Button: Seconds (down)* ▶ *Button: Milliseconds (up)* ▶ *Touchbox: Milliseconds* ▶ *Button: Milliseconds (down)*
Origin of the data	Where does the data come from:
▶ **Ring buffer**	From the ring buffer.
▶ **Historical data**	From an archive.
▶ **Maximum number (input field)**	Input of the maximum alarms to be displayed when historical alarms are displayed.
Alarm/event groups/alarm/event classes/alarm areas	List fields for grouped display (on page 41) and buttons for hiding deactivated alarms (on page 166).
▶ **Alarm/event groups**	Alarm/event groups
▶ **Alarm/event classes**:	Alarm/event classes

Control element	Description
▶ **Alarm areas**	Alarm areas **Note:** If the **Use hierarchical alarming of the Equipment Model** property is activated, the **Alarm area** column is empty. The checkbox is in the **alarm handling** item of the variable properties.
Hide deactivated alarm groups	Clicking on the button in Runtime hides all entries that are linked to deactivated alarm groups.
Hide deactivated alarm classes	Clicking on the button in Runtime hides all entries that are linked to deactivated alarm classes.

Compatible elements	Standard Win32 control elements that have been replaced or removed by zenon elements (*dynamic text*, *switch*) and continue to be available due to compatibility reasons. These elements are not taken into account with automatic insertion of templates.
	
	For the description, see current elements.
	
	Variables
	   ▶ **Name**
	   ▶ **Identification**
	
	Type of alarm
	   ▶ **Only non-acknowledged alarms**
	   ▶ **Only cleared alarms**
	   ▶ **Only current alarms**
	   ▶ **Comment required**
	
	Origin of the data
	   ▶ **Ring buffer**
	   ▶ **Historical data**
	   ▶ **Maximum number (input field)**

TIME FILTER

Elements for time filters.

Control element	Description
Insert all elements	Opens drop-down list to select pre-defined elements for certain time periods.
Absolute time period - classic display	Elements for the absolute time period in classic display.
Absolute time period - compact display	Elements for the absolute time period in compact display.
Relative time period	Elements for the relative time period.
Starting from HH:MM:SS	Elements for a time period from a defined time.
Starting from day at HH:MM:SS	Elements for a time period from a defined day at a defined time.
Starting from day, month - HH:MM:SS	Elements for a time period from a defined day in a defined month at a defined time.
Time period:15/30/60 minutes	Elements for a time period of 15, 30 or 60 minutes.
Time period - one day	Elements for a time period of one day.
Time period - 1 or 2 weeks	Elements for a time period over one or two weeks. Each week can be selected, both for the view for a week as well as for the view for two weeks. With the two-week view, a time period of 14 days is selected, depending on the week selected.
Time period - one month	Elements for a time period of one month.
Time period - one year	Elements for a time period of one year.
Insert all elements (Touch)	Opens the drop-down list to select pre-defined elements for certain time periods, which have been optimized for touch operation. Like **Insert all elements**, the following are available: ▸ Absolute time period - classic display ▸ Relative time period ▸ Starting from HH:MM:SS ▸ Starting from day at HH:MM:SS ▸ Starting from day, month - HH:MM:SS am/pm

Control element	Description
	▶ Time period - 15/30/60 minutes
	▶ Time period - one day
	▶ Time period - 1 or 2 weeks
	▶ Time period - one month
	▶ Time period - one year
Set filter type (Display)	*Dynamic text* element for the display of the set filter type.
Time filter type (label)	Labeling for time filter type.
Time filter type (combobox)	Combobox: Time filter type
Time filter type (radio group)	Switch elements that show or hide certain elements in the Runtime:
	▶ No filter
	▶ Absolute time filter
	▶ Relative time filter
	▶ Starting from day, month - HH:MM:SS am/pm
	▶ Starting from day at HH:MM:SS
	▶ Starting from HH:MM:SS
	▶ Time period 15 minutes
	▶ Time period 30 minutes
	▶ Time period 60 minutes
	▶ Time period 1 day
	▶ Time period 1 week
	▶ Time period 2 weeks
	▶ Time period 1 month
	▶ Time period 1 year
Time from	Fields and labeling for stating "from" time.
	▶ From year (label)
	▶ From year (combobox)
	▶ From month (label)

Control element	Description
	▸ From month (combobox)
	▸ From day (label)
	▸ From day (combobox)
	▸ From hour (label)
	▸ From hour (combobox)
	▸ From minute (label)
	▸ From minute (combobox)
	▸ From second (label)
	▸ From second (combobox)
	▸ From (spin control)
Time to	Fields and labeling for stating "to" time.
	▸ To year (label)
	▸ To year (combobox)
	▸ To month (label)
	▸ To month (combobox)
	▸ To day (label)
	▸ To day (combobox)
	▸ To hour (label)
	▸ To hour (combobox)
	▸ To minute (label)
	▸ To minute (combobox)
	▸ To second (label)
	▸ To second (combobox)
	▸ To (spin control)
Time from (Touch)	Fields and labeling for stating "from" time, optimized for touch operation.
	▸ From year (label)
	▸ From year (button: up)
	▸ From year (Touch box)
	▸ From year (button: down)

Control element	Description
	▶ From month (label)
	▶ From month (button: up)
	▶ From month (Touch box)
	▶ From month (button: down)
	▶ From day (label)
	▶ From day (button: up)
	▶ From day (Touch box)
	▶ From day (button: down)
	▶ From hour (label)
	▶ From hour (button: up)
	▶ From hour (touch box)
	▶ From hour (button: down)
	▶ From minute (label)
	▶ From minute (button: up)
	▶ From minute (touch box)
	▶ From minute (button: down)
	▶ From second (label)
	▶ From second (button: up)
	▶ From second (Touch box)
	▶ From second (button: down)
Time to (Touch)	Fields and labeling for stating "to" time, optimized for touch operation.
	▶ To year (label)
	▶ To year (button: up)
	▶ To year (touch box)
	▶ To year (button: down)
	▶ To month (label)
	▶ To month (button: up)
	▶ To month (touch box)
	▶ To month (button: down)

Control element	Description
	▸ To day (label)
	▸ To day (button: up)
	▸ To day (touch box)
	▸ To day (button: down)
	▸ To hour (label)
	▸ To hour (button: up)
	▸ To hour (touch box)
	▸ To hour (button: down)
	▸ To minute (label)
	▸ To minute (button: up)
	▸ To minute (touch box)
	▸ To minute (button: down)
	▸ To second (label)
	▸ To second (button: up)
	▸ To second (Touch box)
	▸ To second (button: down)
Absolute time filter	Fields and labeling for stating absolute time filter.
	▸ From (label)
	▸ From date (calendar display)
	▸ From date (date display)
	▸ From time (time display)
	▸ To (label)
	▸ To date (calendar display)
	▸ To date (date display)
	▸ To time (time display)
Time period	Fields and labeling for stating time periods.
	▸ From year (label)
	▸ From year (combobox)
	▸ From month (label)
	▸ From month (combobox)

Control element	Description
	▸ Week (label)
	▸ Week (combobox)
	▸ From day (label)
	▸ From day (combobox)
	▸ Start time (label)
	▸ Start time (combobox)
Time period (Touch)	Fields and labeling for stating "from" time, optimized for touch operation.
	▸ From year (label)
	▸ From year (button: up)
	▸ From year (Touch box)
	▸ From year (button: down)
	▸ From month (label)
	▸ From month (button: up)
	▸ From month (Touch box)
	▸ From month (button: down)
	▸ Week (label)
	▸ Week (button:up)
	▸ Week (touchbox)
	▸ Week (button: down)
	▸ From day (label)
	▸ From day (button: up)
	▸ From day (Touch box)
	▸ From day (button: down)
	▸ Start time (label)
	▸ Start time (button:up)
	▸ Start time (Touch box)
	▸ Start time (button:down)
Compatible elements	Control elements that are replaced or removed by newer versions and continue to be available for compatibility reasons. These elements are not

Control element	Description
	taken into account with automatic insertion of templates. ▶ Time filter type (radio group) Radiobutton Win32 control elements. Has been replaced by *switch elements*. For the description, see current elements. ▶ Set time filter type (display) Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.

LOT FILTER

Elements for lot selection in the Runtime.

Control element	Description
Insert all elements	Inserts all subelements into the screen.
Archive list	List of archives available in Runtime. If you want to edit the list directly using the monitor, activate the Multi-Touch functionality. You can find detailed information in relation to this in the Configure interactions chapter. Longer texts can also be displayed in the Runtime over several lines using the **Automatic word wrap** property. In the Editor, go to **Representation** in the properties of the respective list properties and activate the checkbox of the **Automatic word wrap** property. The line height must be amended manually.
Archive list status	Status of the archive list with number for: ▶ *available* ▶ *Filtered* ▶ *displayed*
Lot list	List of available lots.

Control element	Description
	If you want to edit the list directly using the monitor, activate the Multi-Touch functionality. You can find detailed information in relation to this in the Configure interactions chapter. Longer texts can also be displayed in the Runtime over several lines using the **Automatic word wrap** property. In the Editor, go to **Representation** in the properties of the respective list properties and activate the checkbox of the **Automatic word wrap** property. The line height must be amended manually.
Lot list status	Status of the lot list with number for: ▸ *available* ▸ *Filtered* ▸ *displayed*
Apply time filter to lot list	Applies the configured time filter to the selection in the lot list.
Lot name filter (Input field)	Entry of a character sequence for filtering the lot names in the lot list.
Lot name filter (Button)	Button to execute filtering for lot names. Deactivated if the **Lot name filter** element is not present.
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. The following Win32 elements were replaced by *dynamic text* elements. ▸ Archive list status ▸ Lot list status ▸ Lot name filter (Input field)

SHIFT FILTER

Drop-down list for element of the shift filter.

Control element	Description
Insert all elements	Inserts all subelements into the screen.
Shift list	List of available shifts.
Status of the shift list	Status of the shift list with number for: ▸ *Total* ▸ *Filtered* ▸ *Selected*
Update shift list	Clicking on the button updates the display of the **shift list**.

TEXT FILTER

Drop-down list of different text filters.

Control element	Description
Insert all elements: Text filter	Inserts all elements for text filters.
No text filter	Radio button to deselect text filter.
Search for (separate words by Space)	Radio button to activate the search
Label: Search text	Labeling for search field.
Input field: Search text	Field for input of search term.
Options	Search options
▸ **Match case**	Capitalization must be noted.
▸ **Words do not need to appear in full within the text**	Fragments can also be searched for.
▸ **At least one word should be in the text**	At least one search term from several must be in the result.
▸ **All words should be in the text**	All search terms must be included in the result.
▸ **Filter string has to appear exactly in the text**	Exact text from the input field must be contained in the result.
Compatible elements	Standard Win32 control elements that have been

Control element	Description
	replaced or removed by zenon elements (*dynamic text*, *switch*) and continue to be available due to compatibility reasons. These elements are not taken into account with automatic insertion of templates.
	For the description, see current elements.
	▶ **No text filter**
	▶ **Search for (separate words by Space)**
	▶ **Input field: Search text**
	▶ **Match case**
	▶ **Words do not need to appear in full within the text**
	▶ **At least one word should be in the text**
	▶ **All words should be in the text**
	▶ **Filter string has to appear exactly in the text**

BUTTONS

Buttons in the Runtime.

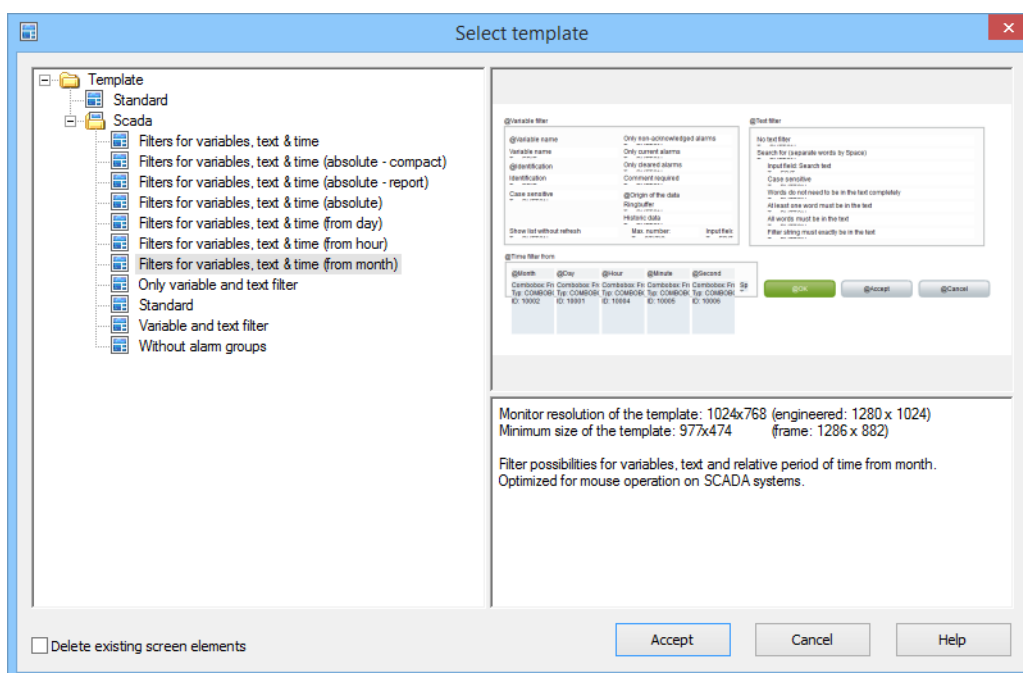| Option	Description
OK	Applies the filter settings and closes the screen. **Note on faceplates:** In faceplates, *AML filter*, *CEL filter* and *time/lot/shift filter* screens can be used. When configuring these in the Runtime, clicking on **OK** closes the complete faceplate. If the filter settings are to be saved and the faceplate is to stay open, click on **Accept**.
Cancel	Cancels the configuration of the filter settings.
Apply	Accepts the filter settings.
Refresh	Updates the filtered display.

Compatible elements	Standard Win32 control elements that have been replaced or removed by zenon elements (*dynamic text*, *switch*) and continue to be available due to compatibility reasons. These elements are not taken into account with automatic insertion of templates.
	Show list without refresh

3.2.2 Template

Template	Description
List field templates (left)	Displays all pre-defined and user-defined template.
Preview and description (right)	Shows preview and description of the selected template.
Standard	Inserts standard elements.
Scada	Special templates, optimized for mouse operation.
Only variable & text filter	Adds elements for filtering for variables and text.
Without alarm groups	Adds elements for filtering for variables, text and

Template	Description
	pending minimum time without alarm groups.
Standard	Inserts standard elements.
Filters for variables, text & time	Adds elements for filtering for variables, text and time.
Filters for variables, text & time (from month)	Adds variables for filtering for variables, text and relative time range *from month*.
Filters for variables, text & time (from hour)	Adds variables for filtering for variables, text and relative time range *from hour*.
Filters for variables, text & time (from day)	Adds variables for filtering for variables, text and relative time range *from day*.
Filters for variables, text & time (absolute - table)	Adds elements for filtering for variables, text and absolute time range.
Filters for variables, text & time (absolute - compact)	Adds elements for filtering for variables, text and absolute time range in compact form.
Filters for variables, text & time (absolute)	Adds elements for filtering for variables, text and absolute time range.

CLOSE DIALOG

Button	Description
Delete existing screen elements	*Active*: Pre-existing elements in the screen are deleted when the template is applied.
Apply	Adds the selected tempalte to the screen and closes the dialog.
Cancel	Closes dialog without inserting elements.
Help	Opens online help.

3.2.3 Pre-defined names

Pre-defined names are available for time filters.

Attention: The pre-defined names are not available under Windows CE.

To select a name:

1. In the detail view, define as a *time filter*, *chronological event list filter* or *alarm message list filter*

2. Click twice in the name field in the 'Name' column

3. Select the desired pre-defined name from the drop-down.

   ▶ AML_Filter

   ▶ TIMEFILTER_ABSOLUTE

   ▶ TIMEFILTER_DAY

   ▶ TIMEFILTER_HOUR

   ▶ TIMEFILTER_MONTH

   ▶ TIMEFILTER_PERIOD

   ▶ TIMEFILTER_PERIOD_DAY

   ▶ TIMEFILTER_PERIOD_MINUTE

   ▶ TIMEFILTER_PERIOD_MONTH

   ▶ TIMEFILTER_PERIOD_WEEK

   ▶ TIMEFILTER_PERIOD_YEAR

   ▶ TIMEFILTER_RELATIVE

3.2.4 Filter screens

FILTER SCREENS

Filter screens make it possible to transfer a preset filter from one screen to another. The filter of the source screen is set using the target screen. The screens can also be of a different screen type.

CALL DEFINITION

The following requirements must be met for the set filters to be used:

1. *Set filter for time filter type* is selected as a **time period** for the time filter.

2. The screen (**Alarm Message List Filter**, **Chronological Event List filter** or **Time/Lot/Shift Filter** screen types) is activated using a button or a combined element. Only in this way can the relationship between filter screen and source screen be maintained.

3. The source screen and filter screen must either be configured on different templates or on different monitors. The filter for the filter screen can only be updated if the source screen is open. This is only possible if both screens do not use the same frame or the same monitor.

4. The screen to be called up must be compatible with the filter screen to be called up (see table).

Source screen	AML filter	CEL filter	Time filter
Archive revision	T	T	T
Extended Trend	T	T	T
Time Filter	T	T	X
Alarm Message List Filter	X	C	T
Chronological Event List Filter	C	X	T
Alarm Message List	X	C	T
Chronological Event List	C	X	T

Key:

▶ C: Common settings are updated.

▶ T: Time settings are updated.

▶ X: All settings are updated.

> 💡 **Information**
>
> No filtering
>
> The filter screen is not filtered, but opened with the configured values, if:
>
> ▶ One of the conditions 1 to 3 is not met or
>
> ▶ The **Screen to call up** setting is not activated for the **Screen switching** function or
>
> ▶ The screen is not called up via a screen element
>
> In this case, the **Accept**, **Close** and **Update** buttons are grayed out in the Runtime and have no function.

3.3 Defining alarms

Define alarms using:

▶ Limit values and statuses with variables

▶ Reaction matrices

ALARMING USING VARIABLES

Define limit values for variables (see **Variables** manual, Limits chapter). If these are violated in the Runtime, an alarm is generated and displayed in the alarm status line (on page 197). You configure further properties for alarm configuration with:

▶ <u>**Variable properties of the group** Limit Values **and the subgroups for each limit value contained therein:**</u>

   ▶ **In Alarm Message List**: The alarm is incorporated into the AML. When it is there as displayed, control it in the Runtime using the alarm message list (on page 200) or an alarm message list filter (on page 216) screen.

   ▶ **In Chronological Event List**: The alarm is also included in the CEL. When it is there as displayed, control it in the Runtime using the Chronological Event List or a Chronological Event List Filter screen.

   ▶ **To acknowledge**: The alarm must be acknowledged before it is removed from the ring buffer (on page 39).

   ▶ **Two-stage acknowledgement**: the alarm must be deleted manually before it is removed from the ring buffer (on page 39).

   ▶ **Print**: Prints alarm to defined printer. Either the CEL or the AML is printed. You define which of the two lists is printed in project properties under **Printing for**.

   ▶ **Alarm cause required**: It is required to link an alarm cause (on page 208) in order to acknowledge the alarm.

   ▶ **Comment required**: You should enter a comment (on page 207) in order to acknowledge the alarm.

   ▶ **Alarm/event group**: allocation of an alarm/event group (on page 42).

   ▶ **Alarm/event class**: allocation of an alarm/event class (on page 45).

▶ <u>**Variable properties of the group** Alarm handling</u>:

   ▶ **Alarm area_n**: allocation of an alarm area (on page 49).

   ▶ **Acknowledgement variable**: Sets the value *0* or *1* for the variables defined here when an alarm is acknowledged.

   ▶ **Acknowledgement value**: Value that is written to the variable defined in **Acknowledgement variable**.

   ▶ **Save in IPA database**: Alarm is available in the Industrial Performance Analyzer for evaluation.

▶ <u>**Project properties of the group** AML and CEL</u>:

   ▶ **Selection with border**: Selected lines are emphasized by a frame in the Runtime.

   ▶ **Same comments**: Comments that are entered in the Runtime for an alarm are also transferred to the CEL.

▶ **Printing active**: activates online printing.

▶ **Printing for**: defines if AML or CEL is printed online.

▶ <u>**Project properties of the group** Alarm Message List</u>

There are many properties to configure alarms available here. Above all:

▶ AML activation

▶ Data storage AML

▶ Signalization of alarm states

▶ Activation of alarm status line

You can find details of the individual settings in the embedded help pages.

ALARMING VIA REACTION MATRIXES

You use a reaction matrix to evaluate defined limit value states and status bits (see **Variables** manual, Reaction matrixes). Violations of the established rules lead to an alarm. As with variables, you can also define the action to be carried out when an alarm is raised with reaction matrixes. To do this, activate the corresponding properties in the configuration dialog of the reaction matrixes.

3.4   Alarm handling

Alarms are saved in a ring buffer (alarm.bin) and in an alarm file (*.aml) in the Runtime folder as soon as they occur. The ring buffer is a volatile memory, from which alarms can be removed again according to certain rules. The AML saves alarms and important information in relation to these on a lasting basis.

RING BUFFER

The ring buffer includes all active alarms. At this the following things are managed:

▶ **Time received** in millisecond as unique signature

▶ Additional information such as cause, value, etc.

▶ Time cleared

▶ Time acknowledged

Behavior when removing from the ring buffer:

▶ As soon as the alarm is cleared, it is removed from the ring buffer.

▶ If the **To acknowledge** property has been activated, the alarm must be acknowledged by a user authorized to do this before it can be removed from the ring buffer. When acknowledging alarms, all alarms of a variable with the same limit value violation are removed from the ring buffer at the same time.

▸ If the **Two-stage acknowledgement** property is activated, the removal from the ring buffer must be specifically confirmed by a person authorized to do this.
Example: The alarm has cleared and was acknowledged by the user. It will remain in the ring buffer until removal has been confirmed.

Note: The entries are never deleted in the AML; it is always only their status that is documented.

SIZE OF THE RINGBUFFER

The size of the ring buffer must be set to an appropriated size in the project properties via property **Size of the ring buffer**.
Recommended: At least number of variables for which alarms can occur.

The ring buffer is automatically saved as file **alarm.bin** when the Runtime is closed. If the Runtime is closed due to an unexpected event, e.g. power outage, data will be lost. To prevent this the ring buffer can be saved manually via property **Save ring buffer on change** at every new entry or via function Save AML and CEL ring buffer (on page 184).

Attention: In the Runtime the ring buffer is handled dynamically in the memory. Alarms the do not have a cleared time stamp can be displayed by means of the defined number of alarms. Thus alarms are displayed which exceed the size of the ring buffer.

📄 **Example**

▸ Size of the ring buffer: 100 entries

▸ Active alarms in the Runtime without cleared time stamp: 120

▸ Display in the AML in the Runtime: 120

ALARM FILE

All alarms are written in an alarm file (*.aml) at the same time as in the ring buffer. This file is created for every calendar day automatically and is managed via property **Save AML data**. The name of the alarm file is put together by the letter *A*, followed by the date in form *JJMMDD* and the suffix *.aml*; e.g. **A100623.aml**. These files are created automatically for every day and must be evacuated or deleted by the user if the storage space is limited. **.aml files* are saved in the *...\Project folder\Computer name\Project name* folder.

SYNCHRONIZING RING BUFFER AND ALARM FILE

Ring buffer and alarm file are synchronized. This synchronization ensues from the ring buffer to the alarm file. All changes such as acknowledging are only carried out in the ring buffer and are then synchronized with the alarm file. Thus for example all unacknowledged alarms can be displayed in the alarm file and the acknowledge can be induced. The action however is taking place in the ring buffer.

SAVING PERIODS

The alarm file *.aml is saved each time a new entry is made.

The ring buffer (*.bin) is saved:

▶ when the Runtime is closed

▶ after every new entry if property **Save ring buffer on change** is active

▶ when function **Save AML and CEL ring buffer** is carried out

Note: If option **Save ring buffer on change** is deactivated, it is possible that the entries in the AML and in the ring buffer do not match after a power outage.

⚠**Attention**

If the ring buffer overflows because it is too small, unacknowledged entries remain in the alarm file. They are displayed during filtering but they cannot be acknowledged anymore. The attempt to acknowledge them can trigger the acknowledgment on the ring buffer if the alarms concern the same variable and the same limit value violation.

3.5   Grouping of alarms

Alarms can be grouped and prioritized by means of:

▶ Alarm/event groups (on page 42): Groups related alarms (or events) logically.

▶ Alarm/event classes (on page 45): Are used to prioritize alarms (or events) and to color-code alarms in the AML and events in the CEL

▶ Alarm Areas (on page 49): Allows the grouping of the alarms with a focus on the location in the equipment.

Each group or class can be assigned a name, a number, a color, a function and a status variable as well as a graphic and a equipment group.

Alarms can be exported and imported via XML using the context menu.

💡   **Information**

A maximum of 65536 alarm/event classes and 65536 alarm/event groups can be created.

PROJECT MANAGER ALARM CONTEXT MENU

Menu item	Action
Export all as XML	Exports all entries as an XML file.
Import XML...	Imports entries from an XML file.
Help	Opens online help.

☀ Information

Use clear and different IDs in the global project, integration project and sub-projects for alarm/event groups/classes and alarm areas. You avoid clashes this way. These can lead to incorrect displays.

3.5.1 Alarm/event groups

Alarm/event groups combine related messages.

CREATING ALARM/EVENT GROUPS

To create a new alarm/event group:

1. In the Project Manager, in **Variables** and **Alarm**, right-click on the **Alarm/event groups** sub-node

2. Select the command: **New alarm/event group**

   (alternatively select the corresponding symbol in the toolbar (on page 44) or press the **Ins** key.)

Each group can be allocated additional information via its properties:

Parameter	Description
Name	Name of alarm/event group. Is displayed in the filter condition of AML and CEL.
No.	Identifies the alarm/event group. The number is automatically given and cannot be changed. Minimum: *1* Maximum: *2147483647*

Parameter	Description
	Note: Within a project, each respective number can only be given once for the alarm/event group. Identical numbers can be given in other projects/areas.
	Synchronization: A check for conflicts is carried out when the Runtime files are created. If conflicts are found, these are displayed in the output window. However the creation of IDs that conflict one another is not prevented. Mode of checking.
	▸ The project is compared with the global project when checking individual projects.
	▸ In multi-project administration, the project is first compared with the uppermost project, then with all other projects of this multi-project administration. Synchronization with the global project is then carried out
	▸ Other, independent projects are not included in the synchronization.
Color	Color of alarm/event group. A click on the **...** button opens the palette for color selection
Description	Name of alarm/event group.
Status variable	Bit variable which the zenon Runtime indicates whether the group is active or whether the alarms of this group are ignored at the moment. Activation/deactivation is carried out via the Alarm/event group connection active/inactive (on page 156) function. The status of this group is logged in the Chronologic Event List (CEL). Clicking on the **...** button opens the dialog for variable selection.
Function	Function that is to be executed if an alarm of this group is activated. Click on the **...** button to open the dialog to select the function.
Graphics File	Selection of a graphic that represents the alarm/event group in the AML. To display the graphic in the AML, select in the AML filter, in the **Column settings** (on page 104) tab for the **Alarm/event group symbol** the *Graphics file* display type. **Note:** the column height in the AML depends on the selected font. The selected graphics are also scaled and adapted to the column height.
Equipment	Links equipment model to the alarm/event group.

Parameter	Description
Groups	Define the membership of an equipment group. Click on the **...** button to open the dialog to select the equipment group.

DELETING ALARM/EVENT GROUPS

To delete an alarm/event group:

1. Select the alarm/event group
2. Select **Delete** in the context menu or in the toolbar
3. confirm this when requested to do so

Note: All linked variables lose their group assignment when deleted.

3.5.1.1 Context menus and alarm/event-groups toolbar

PROJECT MANAGER CONTEXT MENU

The following entries are available in the context menu of the project tree under **Alarm** and **Alarm/event groups**:

Menu item	Description
New alarm/event group	Creates a new alarm/event group.
Export all as XML...	Allows the export of all existing alarm/event groups in XML format.
Import XML...	Allows the import of all existing alarm/event groups in XML format.
Editor profile	Opens the drop-down list to select a pre-defined Editor profile (*P1 - P10*). Default: *none*
Help	Opens online help.

DETAIL VIEW OF CONTEXT MENU AND TOOLBAR

Menu item	Action
New alarm/event group	Inserts a new alarm/event group into the list.
Jump back to starting element	Allows a jump to the starting element.

Menu item	Action
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.
Export selected as XML…	Allows the export of the selected files in XML format. **Note:** Export is only possible if at least one list entry has been highlighted. Multiple selection is possible.
Import XML…	Allows the import of files in XML format.
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.
Remove all filters	Removes all filter settings. **Note:** Only active if the current view is filtered.
Help	Opens online help.

3.5.2 Alarm/event classes

Alarm/event classes serve the following purpose:

▸ To prioritize alarms for the screen alarming

▸ To determine the alarm color in the alarm message list

▸ As a filter criterion in the alarm list and the Chronological Event List

▸ To trigger acoustic alarms

CREATING ALARM/EVENT CLASSES

To create a new alarm/event class:

1. In Project Manager, right click on the **Alarm/Event classes** subnode

2. Select the command: **New alarm/event class**

    (alternatively select the corresponding symbol in the toolbar (on page 44) or press the **Ins** key.)

Each can be allocated additional information via the properties:

Parameter	Description
Name	Name of alarm/event class. Is displayed in the filter condition of AML and CEL.
No.	Identifies the alarm/event class. The number is automatically given and cannot be changed. Minimum: *1* Maximum: *2147483647* **Note:** Within a project, each respective number can only be given once for the alarm/event class. Identical numbers can be given in other projects/areas. **Synchronization:** A check for conflicts is carried out when the Runtime files are created. If conflicts are found, these are displayed in the output window. However the creation of IDs that conflict one another is not prevented. Mode of checking. ▸ The project is compared with the global project when checking individual projects. ▸ In multi-project administration, the project is first compared with the uppermost project, then with all other projects of this multi-project administration. Synchronization with the global project is then carried out ▸ Other, independent projects are not included in the synchronization.
Color	Color of the alarm/event class can be used for labeling in the AML. A click on the **...** button opens the color palette. **Note:** Color is used for long description and status text in the AML and screen alarming
Description	Description of alarm/event class.
Status variable	Bit variable which the zenon Runtime indicates whether the class is active or whether the alarms of this class are ignored at the moment.

Parameter	Description
	Activation/deactivation is carried out via the Alarm/event group connection active/inactive (on page 156) function. The status of this group is logged in the Chronologic Event List (CEL).
	Clicking on the **...** button opens the dialog for variable selection.
Function	Function that is to be executed if an alarm of this class is activated.
	Click on the **...** button to open the dialog to select the function.
	Note: Not available for project configuration content in the global project.
Graphics File	Selection of graphics that represent the alarm/event class in the AML.
	To display the graphic in the AML, select in the AML filter, in the **Column settings** (on page 104) tab for the **Alarm/event class symbol** the *Graphics file* display type.
	Note: In the AML, the column height is aligned to the selected font; for this reason, the graphics selected are scaled if necessary and adjusted to suit the column height.
Equipment Groups	Links equipment model to the alarm/event class.
	Click on the **...** button to open the dialog to select the equipment group.

DELETING ALARM/EVENT CLASSES

To delete an alarm/event class:

1. Select the alarm/event class
2. Select **Delete** in the context menu or in the toolbar
3. confirm this when requested to do so

Note: All linked variables lose their class assignment when deleted.

3.5.2.1 Alarm/event classes context menus and alarm/event-groups toolbar

PROJECT MANAGER CONTEXT MENU

The following entries are available in the context menu of the project tree under **Alarm** and **Alarm/event classes**:

Menu item	Description
New alarm/event class	Creates a new alarm/event class.
Export all as XML...	Allows the export of all existing alarm/event classes in XML format.
Import XML...	Allows the import of all existing alarm/event classes in XML format.
Editor profile	Opens the drop-down list to select a pre-defined Editor profile (*P1 - P10*). Default: *none*
Help	Opens online help.

DETAIL VIEW OF CONTEXT MENU AND TOOLBAR

Menu item	Action
New alarm/event class	Inserts a new alarm/event class into the list.
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.
Export selected as XML...	Allows the export of the selected files in XML format. **Note:** Export is only possible if at least one list entry has been highlighted. Multiple selection is possible.
Import XML...	Allows the import of files in XML format.
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.
Remove all filters	Removes all filter settings.

Menu item	Action
	Note: Only active if the current view is filtered.
Help	Opens online help.

3.5.3 Alarm Areas

Alarm areas (on page 49) allow the combining of the alarms with a focus on the location in equipment. Alarm areas can be linked to alarm classes (on page 55). Further flexibility can be gained by linking to status variables. The individual bits of a status variable can be evaluated using a combined element for example.

CREATING ALARM AREAS

To create a new alarm area:

1. In Project Manager, right click on the **Alarm areas** subnode.

2. Select the command: **New Alarm area**.

   (Alternatively select the corresponding symbol in the toolbar (on page 44) or press on the **Ins** key.)

3. For the evaluation of an alarm area, link the corresponding variables by clicking on the ... button in the **General** node

4. Optional: Create a new area entry in the **Class linking** node by clicking on **{New class link}**. the number of possible area entries is limited to the number of existing alarm/event classes.

PROPERTIES FOR ALARM AREAS

Property	Description
General	
Name	Name of the alarm area. Is displayed in the filter condition of AML and CEL. **Note:** Empty if the **Use hierarchical alarming of the Equipment Model** property is active.
Status variable	Byte variable: First bit: Displays if the alarm area contains active alarms.

Property	Description
	Second bit: Displays if this alarm area contains unacknowledged alarms. For details, see "**Status variable bits**".
	The **...** button opens the dialog for variable selection.
Number of active alarms	Variables with a value that displays the number of active alarms in this alarm area.
	The **...** button opens the dialog to select variables.
Number of unacknowledged alarms	Variable that contains the number of unacknowledged alarms in this alarm area as a numerical value.

Property	Description
No.	Identifies the alarm area. The number is automatically given and cannot be changed. Minimum: *1* Maximum: *2147483647* **Note:** Within a project, each respective number can only be given once for the alarm area. Identical numbers can be given in other projects/areas. **Synchronization:** A check for conflicts is carried out when the Runtime files are created. If conflicts are found, these are displayed in the output window. However the creation of IDs that conflict one another is not prevented. Mode of checking. ▸ The project is compared with the global project when checking individual projects. ▸ In multi-project administration, the project is first compared with the uppermost project, then with all other projects of this multi-project administration. Synchronization with the global project is then carried out Other, independent projects are not included in the synchronization.**Note:** Empty if the **Use hierarchical alarming of the Equipment Model** property is active.
Equipment Groups	Links equipment model to the alarm area. Define the membership of an equipment group. Click on the **...** button to open the dialog to select the equipment group.
Class linking	Collects area entries. A **Class linking** summarizes the status variable and number of active and unacknowledged alarms for an alarm/event class. Area entries are created via the **{New class link}** property.
{New class link}	Creates a new area entry (on page 55).
Alarm/event class	Alarm class for the area entry.

Property	Description
{Delete class linking}	Deletes the area entry.
Alarm/event class	Selection of alarm/event class for area entry from drop-down list. Alarm/event class must already have been created.
Further entries are similar to general settings per area entry with: ▶ **Status variable** ▶ **Number of active alarms** ▶ **Number of unacknowledged alarms**	

STATUS VARIABLE BITS

Bit	Meaning
0	*1* = alarms are active *0* = no alarms are active
1	*1* = there are unacknowledged alarms *0* = no unacknowledged alarms
2	*1* = unacknowledged alarms active *0* = no unacknowledged alarm active or all active alarms have already been acknowledged

Note: All set values for status and counter variables which are linked to alarm areas are cumulated and sent to the driver in blocked form every 500 ms. In doing so, it is always only the last value that is used for each status variable. Transients that occur in the interim period are suppressed. As a result, the network and communication load is reduced considerably.

ASSIGN ALARM RANGES VARIABLES, STRUCTURES OR DATA TYPES

The assignment of variables, structures and simple data types to the alarm areas can be configured with two possibilities:

▶ Hierarchically with equipment modeling.

▶ Statically by linking up to four alarm areas.
   Note: If several alarm areas are linked, then a only the first linked area is taken into account in the Runtime when sorting according to areas.

The allocation is always configured at the respective element (variable or data type).

STATIC LINKING

The following properties are available in the **Alarm handling** group of properties for the static linking of alarm areas:

 ▸ **Alarm area 1**

 ▸ **Alarm area 2**

 ▸ **Alarm area 3**

 ▸ **Alarm area 4**

For each alarm area, the desired alarm area can be selected from drop-down list of the respective area of the desired alarm area and assigned to the object.

In the Runtime, the columns **Alarm area** and **Alarm area no.** of the alarm message lists contain all linked alarm areas that are displayed as separated by a comma (,).

In the **Message Control** module, the **Alarm area** field contains all linked alarm areas, displayed as separated by a comma (,).

LINKING TO THE EQUIPMENT MODEL

If the **Use hierarchical alarming of the Equipment Model** property is activated in the zenon Editor configuration, the configurations of the alarm areas are taken from the equipment model. Instead of the configuration of individual alarm areas 1 - 4 per variable, the alarm modeling in the equipment model is used in this case.

 You can also find further information in the chapter **Displaying active alarms** in the **Equipment Modeling**.manual.

3.5.3.1 Alarm area context menus and toolbar

PROJECT MANAGER CONTEXT MENU

The following entries are available in the context menu of the project tree under **Alarm** and **Alarm areas**:

Menu item	Description
New Alarm area	Creates a new alarm area.
Export all as XML...	Allows the export of all existing alarm areas in XML format.

Menu item	Description
Import XML...	Allows the import of alarm areas in XML format.
Editor profile	Opens the drop-down list to select a pre-defined Editor profile (*P1 - P10*). Default: *none*
Help	Opens online help.

DETAIL VIEW OF CONTEXT MENU AND TOOLBAR

Menu item	Action
New Alarm area	Inserts a new alarm area into the list.
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.
Export selected as XML...	Allows the export of the selected files in XML format. **Note:** Export is only possible if at least one list entry has been highlighted. Multiple selection is possible.
Import XML...	Allows the import of files in XML format.
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.
Remove all filters	Removes all filter settings. **Note:** Only active if the current view is filtered.
Help	Opens online help.

3.5.3.2 Configuring alarm areas

To link an alarm area to classes, carry out the following steps:

1. Click on **{New class link}**

2. Select the desired **Alarm/event class**

3. Define for the area

  ▶ **Status variable**

  ▶ Variable for **Number of active alarms** and

  ▶ Variable for **Number of unacknowledged alarms**

Note: Alarms are allocated to an alarm area in the **Alarmbereiche** properties of the variables in the **Alarm handling** group.

EXAMPLE ALARM AREA

This example shows alarm areas that are assigned to two alarm classes:

Alarm Area Name	Class linking to class...	Status variable	Number of active alarms	Number of unacknowledged alarms
1	Warning	Status_warn_1	Active_warn_1	Unackn_warn_1
	Disturbance	Status_error_1	Active_error_1	Unackn_error_1
2	Warning	Status_warn_2	Active_warn_2	Unackn_warn_2
	Disturbance	Status_error_2	Active_error_2	Unackn_error_2

EXAMPLE APPLICATION, ENERGY

An alarm area is a group of objects. These are summarized in one screen. For an energy supplier, each transformer station is represented by a screen. Transformer stations A to T are displayed in four sub-pages. All alarm areas are displayed in a joint overview.

  ▶ If a limit value is violated in transformer station A, the button for transformer stations flashes in the overview screen.

  ▶ The button flashes on the group screen, which leads to the page with the transformers stations A, B, C, D and E.

▸ The button for transformer station A flashes in the detailed screen.

3.6 Alarm classes, alarm groups and alarm areas in the global project and local projects

Each project saves its own IDs for alarm classes, alarm groups and alarm areas. When using global projects, there can be overlaps with integration projects and subprojects. If the same IDs are used in different projects, this can lead to entries being overwritten in the filter selection dialogs.

It often makes more sense to use both alarm classes, alarm groups and alarm areas from both the global project as well as local projects. To avoid overlaps, ensure that you use different IDs in all projects. To do this, it is best to create a separate group of numbers for each project. To do this, give a correspondingly high number for the first element. Newly-created elements are automatically created from this number.

EXAMPLE

▸ Global project: Elements start at ID: 1

▸ Integration project: Elements start at ID: 5000

    ▸ Subproject A: Elements start at ID: 10000

    ▸ Subproject B: Elements start at ID: 15000

3.7 Alarm engineering with filters

You can configure the display of the events in the Runtime using filters. For this you have several possibilities:

1. Define information that is displayed in the Runtime in the Alarm Message List:
   You thus define the information that is shown for an alarm.
   For details, see: Column setting for Alarm Message List (on page 57).

2. Filter alarms for the Alarm Message List when switching and modify them in the Runtime:
   You thus pre-define filters, giving the user at the machine the possibility to define their own filters.
   For details, see: Filter for Alarm Message List screen switching.　(on page 60)

3. Fixed filters for the Runtime:
   With this you create filters which are tailor-made for the actual use and hide unnecessary

filter criteria.
For details see: Filter Alarm Message List filters (on page 117).

3.7.1 Column setting for Alarm Message List

You define the information that is displayed and also exported in the Alarm Message List in the Runtime in the column settings. You configure these in the properties of the Alarm Message List in the project:

1. Open the **Alarm Message List** node in project settings.

2. Click on the **Column settings AML** property.

3. The dialog for the **column setting** (on page 104) is opened.

4. Configure the desired columns.
   Note: When configuring the screen switching, this configuration is accepted by default and can be individually adapted in the column settings (on page 104) tab.

Note: For calculating the column width the average character width of the selected font is used.

⭘ Information

In project settings, you can set a default setting for the sequence and size of columns using the **Column settings AML** property or the **Column settings CEL** property. If you create a new screen switching function from an Alarm Message List screen or Chronological Event List screen, this setting is used as a default and can be amended in the corresponding tab. The setting is stored in the **project.ini** file.

COLUMN CONFIGURATION

COLUMNS

In the list field of this tab all available column types are displayed.

You can change the sequence of column types by dragging & dropping in the list field:

▸ Click in the **Column type** column

▸ Move the individual entries as desired

Alternatively, you can adjust the sequence with the **Move selected entry up** and **Move selected entry down**.

Option	Description
Checkbox:	Select which column types are displayed.
Description	Free text entry for a description of the column. **Change description:** left-click on the corresponding area. Enter the desired value in the editing field. **Note:** for column descriptions, zenon language switching is available.
Column width	Defines the width of the column in characters. **Change column width:** left-click on the corresponding area. Enter the desired value in the editing field. *-1* Width is calculated in the Runtime using average character width **Note:** For compatibility reasons, columns with time indications (time columns), whose width could not be changed in earlier zenon versions, automatically receive the value *-1*.

Display	For column types
	
	   ▸ **Alarm/event class symbol**
	   ▸ **Alarm/event group symbol**
	   ▸ **Alarm status**
	
	Actual form of display can be selected in the Runtime. Select the desired form from the drop-down list.
	
	For the **equipment group** column type, an equipment model can be selected for the display. The drop-down menu for selection is then only visible if you click on the **Display** column at the height of the **Equipment Group** entry.

Move selected entry up	Moves selected entry up one place.
Move selected entry down	Moves selected entry down one place.
Preview field	Displays the columns defined in the list field in the width displayed there. Column types activated or deactivated by means of a checkbox are updated in real time in the preview.

Option	Description
	You can also amend the column widths in the preview field by left-clicking on the right end of a column, holding down the mouse button and moving the column edge to the left or right accordingly with the mouse button held down. In this case, the mouse pointer display switches from a mouse pointer to a cross symbol.

TABLE SETTINGS

Parameter	Description
Sort descending	Initially sorts the entries in the list according to the **Time received** column in descending order. This setting applies for calling up a screen. You can change the sorting order in Runtime by clicking on the column header. The sorting sequence currently being used is shown by an arrow on the column header. Default: *inactive*
Display grid	Shows a grid when the list is displayed in the Runtime. Default: *active*
Use alternating background colors	Uses **line color 1** and **line color 2** alternately as background colors for the list in Runtime. Default: *active*
Row color 1	Color that is used as a background color in in the list Runtime for all uneven numbers (1, 3, 5 etc.), if you have activated **Alternating Background Colors**.
Row color 2	Color that is used as a background color in in the list Runtime for all even numbers (2, 4, 6 etc.), if you have activated **Alternating Background Colors**.

SHOW IN THE TIME COLUMNS

Parameter	Description
Time	Displays the time for a list entry in the following form: *HH:MM:SS* Default: *active*

Parameter	Description
Date	Displays the date for a list entry in the following form: *TT:MM:YYYY*
	Default: *active*
Milliseconds	Expands the time entry by milliseconds. Milliseconds are shown as a decimal point percentage for the seconds.
	Default: *inactive*
	Note: Must be activated if milliseconds are to be provided in exports or print-outs.
Microseconds	Expands the time entry by microseconds. Microseconds are shown as a decimal point percentage for the seconds.
	Default: *inactive*
	Note: Only available if the **Milliseconds** option has been activated.

Hint: If you activate the automatic keyboard in Runtime, each time entry or selection from a drop-down list is necessary, a window with the keyboard is called up. You can thus also use the columns to configure the columns if you are using a computer without a keyboard.

⚠**Attention**

The column width is given in characters and is dependent on the font used. The value *-1* means that the width in the Runtime is calculated through the average character width.

If the column width is not a multiple of the character width of the used font, the actual column width can differ from the set column width. This can result in the text being cut of or an empty space being created.

Solution: Use fonts with a fixed character width.

3.7.2 Filter for Alarm Message List screen switching.

With filters, you define which events are to be displayed in the Runtime and which should be hidden. Filters can be defined in the editor and - depending on the requirements in the Editor - in the Runtime.

To tailor the filter selection to the requirements of the operator in the Runtime, use an *Alarm Message List filter* (on page 117) screen instead of an *Alarm Message List* screen.

To configure screen switching for an *Alarm Message List* (on page 7) screen:

1. If the column width is not a multiple of the character width of the used font, the actual column width can differ from the set column width.

2. the filter dialog is opened and offers several tabs with filter criteria:

    ▶   **General** (on page 62)

    ▶   Time (on page 68)

    ▶   Lots (on page 87)

    ▶   Shift (on page 96)

    ▶   Column settings (on page 104)

    ▶   text (on page 110)

    ▶   State (on page 112)

    ▶   **Project** (on page 114) (only available in the integration project of the multi-project administration.)

    ▶   **Equipment Modeling** (on page 115)

If linked variables or indexes are available, the following tabs can be displayed as an option.

    ▶   Replace links

    ▶   Replace indices

For details see in chapter **Screens** sections **Replace links of variables and functions** and **Symbols**.
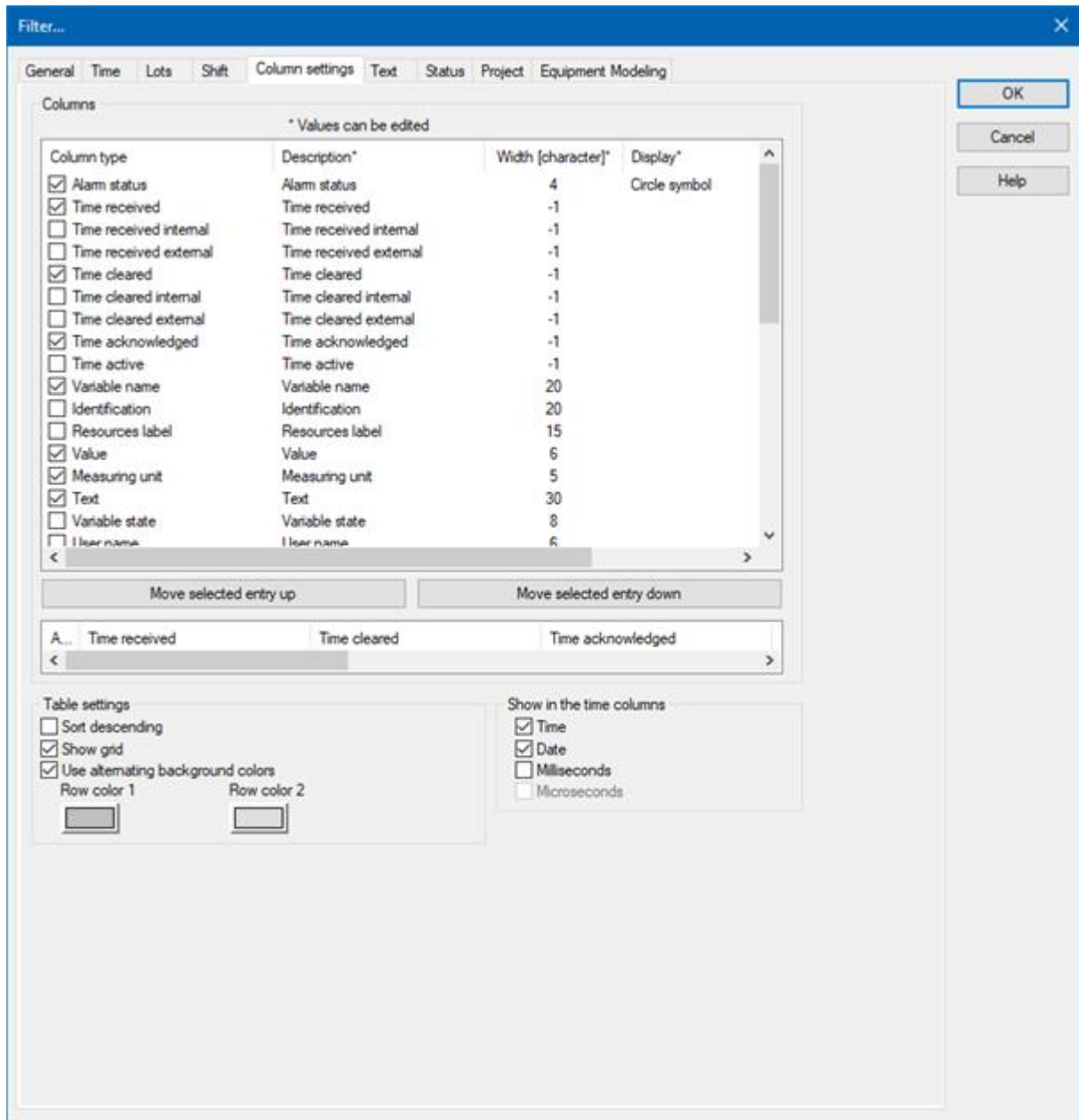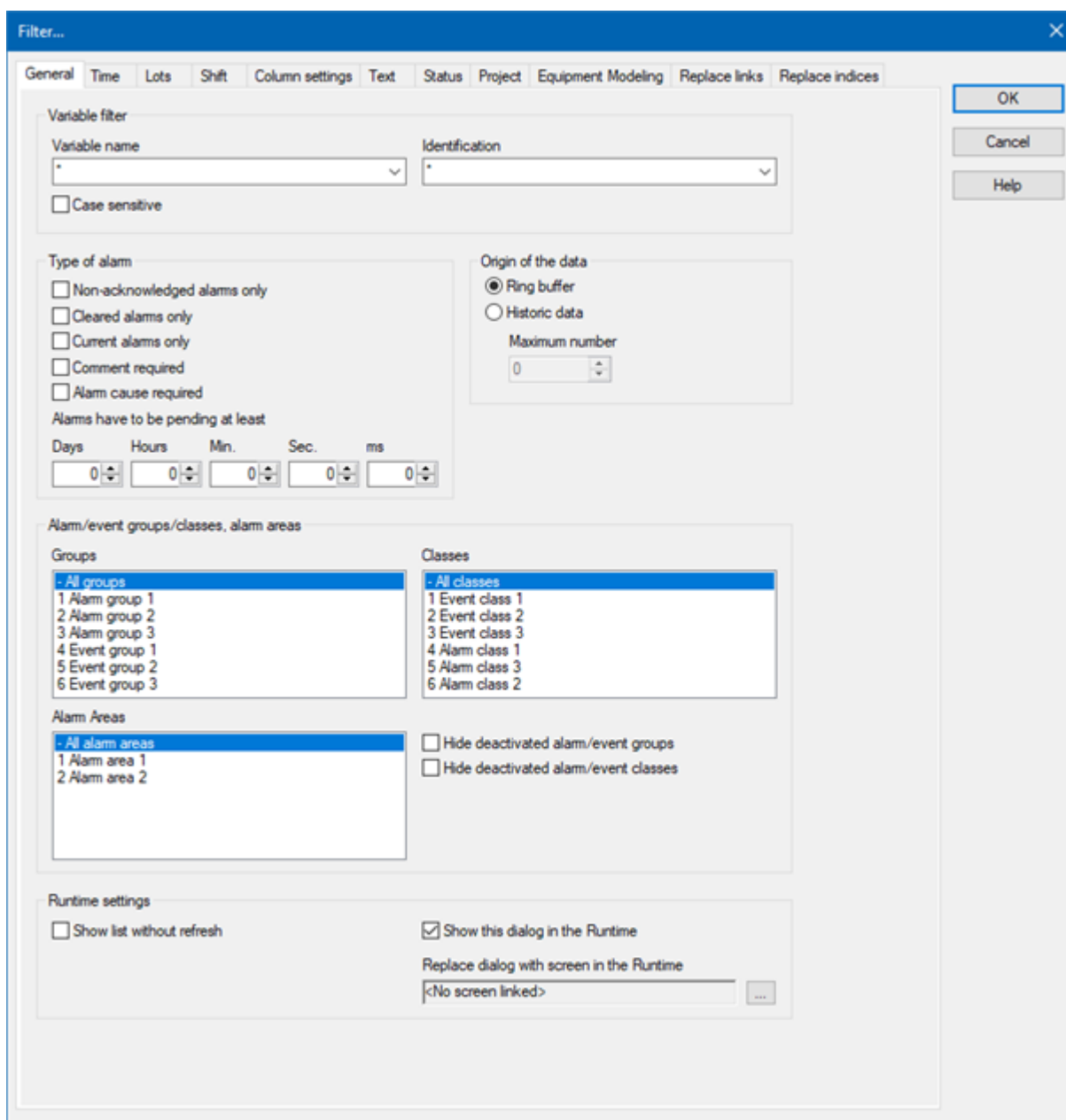
3.7.2.1 General

With the general filter, you define which alarms are shown and what access you have to the setting in the Runtime. To do this, alarms are classified according to:

▶   Type

▶   Origin of the data

▶ Variables

▶ Time active

▶ Alarm/event groups, classes and alarm areas

The following properties are available:

VARIABLE FILTER

Limitation to alarms of certain variables

Option	Description
Variable name	Enter the name or part of the name of the variable you want to filter. Use of the wild card ***** is possible. Wildcards are only permitted as a prefix or suffix; e.g. ***xxx** or **xxx***. **Note:** Filter terms entered in Runtime or in the Editor are automatically saved on the local computer in **zenon6.ini** and are available for selection in the drop-down list. **Attention:** The comma character (,) "only" serves as a separator between several variables to be filtered. However it is not possible to filter for a comma character in variables names! This results in the special filtering of array variables for **Dim 2** and **Dim 3** not being possible.
Identification	Enter the identification or part of the identification of the variables you want to filter. Wild card ***** is possible. Use of the wild card ***** is possible. Wildcards are only permitted as a prefix or suffix; e.g. ***xxx** or **xxx***. **Note:** Filter terms entered in Runtime or in the Editor are automatically saved on the local computer in **zenon6.ini** and are available for selection in the drop-down list.
Match case	*Active:* Capitalization is recognized when filtering for variable name or identification.

TYPE OF ALARM

Type of alarm that is displayed.

Option	Description
Only non-acknowledged alarms	*Active*: Only alarms that have not yet been acknowledged by the user are displayed.
Only cleared alarms	*Active*: Only alarms that have already passed, i.e. whose values no longer in the critical range, are displayed.

Option	Description
Only current alarms	*Active*: Only alarms that are still active, i.e. whose values are still in the critical range, are displayed.
Comment required	*Active*: Only alarms for which the entry of a comment (on page 207) is mandatory are displayed.
Alarm cause required	*Active*: Only alarms that are required for the linking of an alarm cause (on page 208) are displayed.
Alarms must be current for	Use the spin control to define the minimum time that an alarm should be active in order for it to be displayed. Possible settings: ▸ **Days** ▸ Hours (**hr.**) ▸ Minutes **(min.)** ▸ Seconds (**sec.**) ▸ Milliseconds (**ms**) **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.

ORIGIN OF THE DATA

Display of current or current and historical alarms.

Option	Description
Ring buffer	*Active*: Only data from the ring buffer (on page 39) are displayed.
Historical data **Maximum number**	*Active*: Data from the ring buffer and historical data from the AML are displayed. The maximum number of the data which should be displayed includes the data from the ring buffer.

ALARM/EVENT GROUPS/CLASSES, ALARM AREAS

Selection of groups, classes and alarm area.

Option	Description
Alarm/event groups	From the existing alarm/event groups (on page 42) select the one from which alarms should be displayed.
Alarm/event classes:	From the existing alarm/event classes (on page 45) select the one from which alarms should be displayed.
Hide deactivated alarm groups	Allows deactivated alarm groups to be excluded from the display in the list. ‣ *Active*: All entries that are linked to a deactivated alarm/event group in Runtime, are hidden during filtering. **Note**: Changes to the option made in Runtime are immediately accepted.
Hide deactivated alarm classes	Allows deactivated alarm classes to be excluded from the display in the list. ‣ *Active*: All entries that are linked to a deactivated alarm/event class in Runtime, are hidden during filtering. **Note**: Changes made in Runtime to the option are immediately accepted.

ALARM AREAS

Option	Description
Alarm areas	From the existing alarm areas (on page 49) select the one from which alarms should be displayed.

RUNTIME SETTINGS

Behavior of the AML in Runtime.

Option	Description
Show list without refresh	*Active*: As long as the list is displayed no new entries are added.

Option	Description
	(Not available for the **Export AML** (on page 171) function.)
Show this dialog in the Runtime	*Active*: 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. **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. **Notes for time range filters:** **Show this dialog in the Runtime** *active*: ▸ 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. **Show this dialog in Runtime** *inactive*: The screen is opened with the set time filter. ▸ **Use last finished time range** *active*: The last time period that has finished is always used ▸ **Use last finished time period** *inactive*: The current time period is used.
Replace in Runtime with screen	Definition of a screen that is to be called up in the Runtime instead of the dialog if the **Show this dialog in the Runtime** option is active. Only the screen type *AML Filter* or *Time filter* will be offered. Click the **...** button and a dialog opens to select a screen. If the linked screen is not found in the Runtime, a search is made for corresponding screens with specific names.

⚠Attention

Concerns zenon under Windows CE: CE systems on which the filter dialog should be displayed must have a screen resolution higher than 800*600 pixel for the dialog to be displayed completely.

3.7.2.2 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.
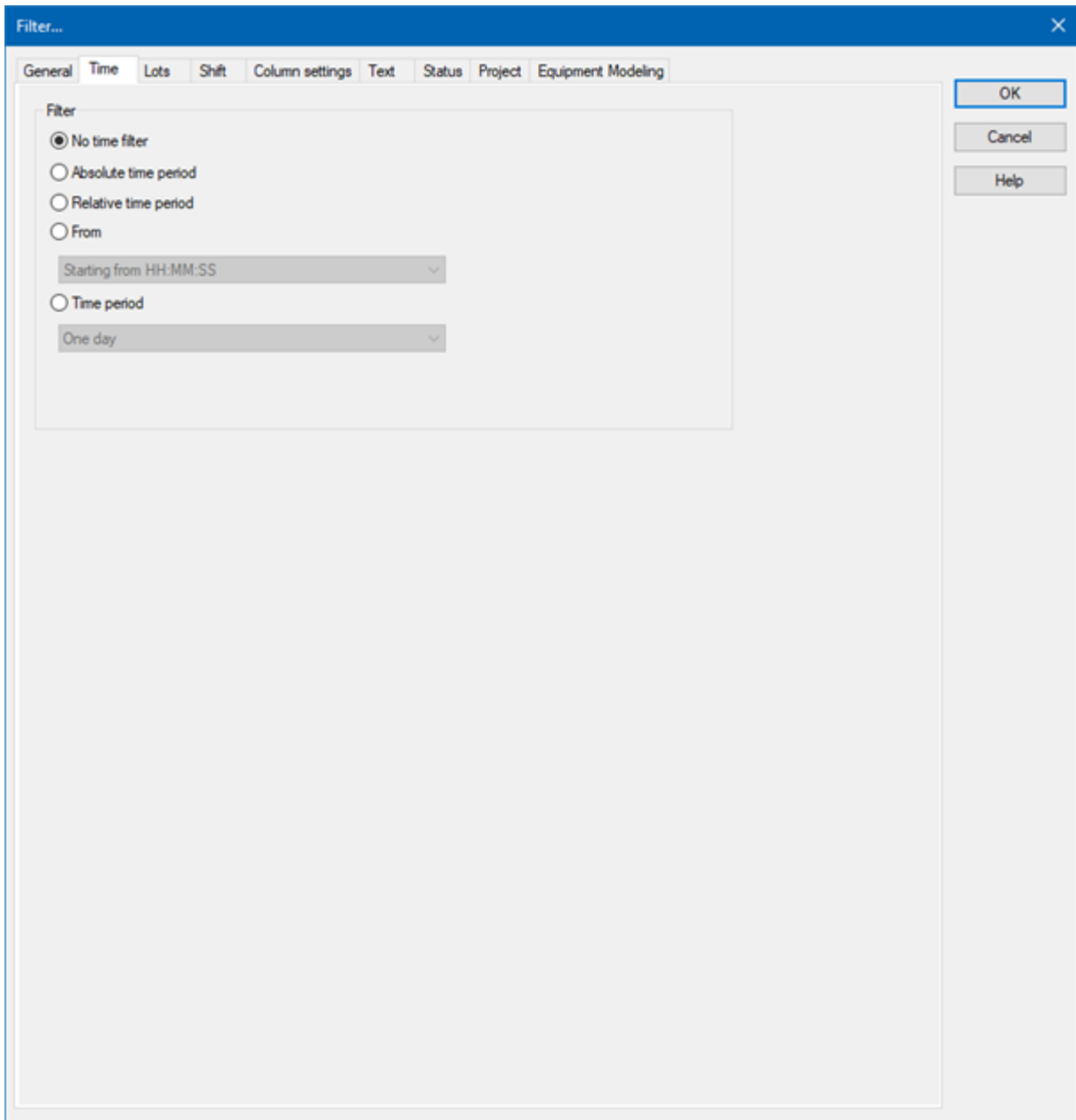
Time filters can both be pre-set in the Editor or amended in the Runtime for:

Time filtering can be carried out in two ways:

1.
   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.
   Pre-defined times are used. The time filter is defined in the Editor and can be changed in Runtime as desired.

TIME FILTER

FILTER

Selection of the filter.

Parameter	Description
No time filter	*Active*: No time filter is used. **Note:** In the Runtime, all entries since 1. 1. 1990 are displayed. Use of this filter setting is not supported by Extended Trend.

Parameter	Description
Absolute time period	*Active*: A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used. In the settings section, the corresponding options can be shown and configured there. **Note:** Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.
Relative time period	*Active*: A relative time period is entered. In the settings section, the corresponding options can be shown and configured there. **Attention:** this filter is constantly updated. **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.
From	*Active*: A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. Selection of the area mode from drop-down list: ▸ Starting from HH:MM:SS ▸ Starting from day at HH:MM:SS ▸ Starting from day, month - HH:MM:SS In the settings section, the corresponding options can be shown and configured there. **Attention:** The start point of this filter is not updated automatically. Only the existing times are used when shown. The end time point is not defined with this filter, it is carried over. **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.

Parameter	Description
Time period	*Active*: A fixed time period is entered. Selection of the area mode from drop-down list: ▸ One day ▸ One week ▸ Two weeks ▸ One month ▸ One Year ▸ 15 minutes ▸ 30 minutes ▸ 60 minutes In the settings section, the corresponding options can be shown and configured there. The following selection is also enabled on activation: ▸ **Offer selection dialog** ▸ **Use current date/time** The **Modify time period** property can be activated. The time period can be moved to the future. The time period can be amended. **Example:** Create a screen switch, for example to an *AML* 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**. Evaluation: today's date: 22.02.2018 Result of the time filter in the Runtime: 01.01.2018 - 31.01.2018

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.
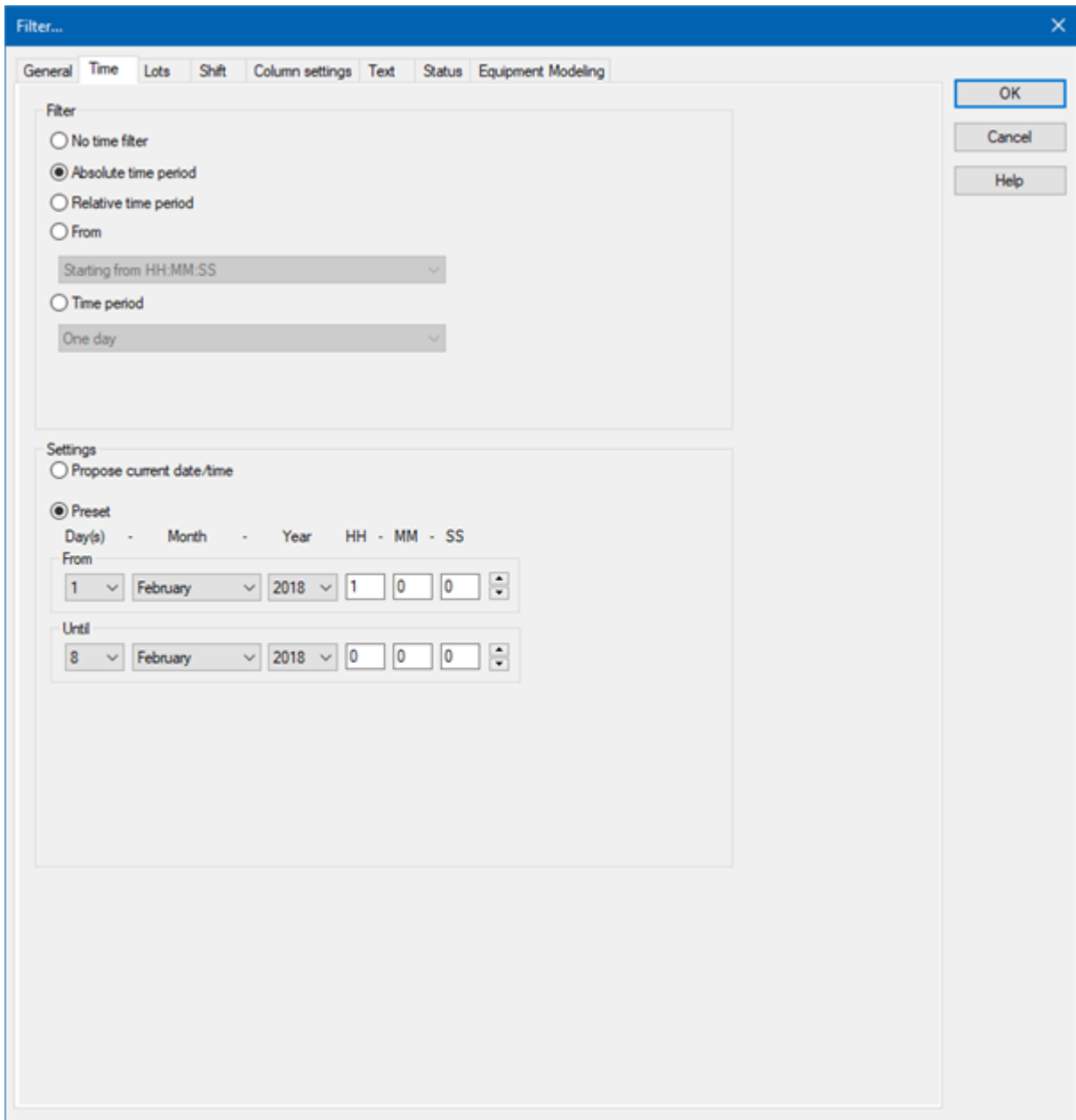
3.7.2.2.1Absolute time period

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.
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.

3.7.2.2.2 Relative period of time

A relative time period is entered.
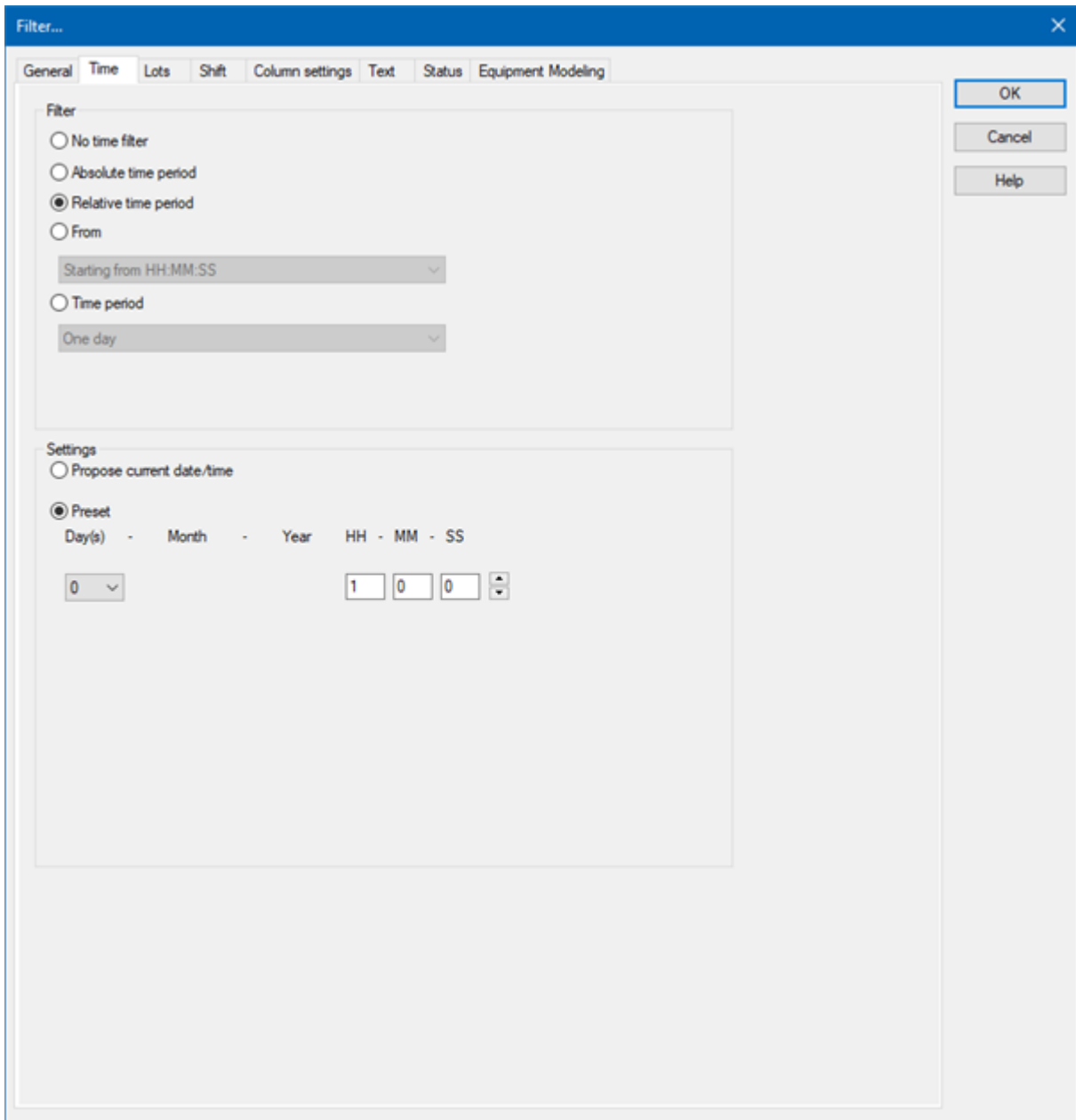
Attention: This filter is updated constantly and continues to run.
Example: You set a relative time of *10* minutes and switch to a screen with this time filter at *12:00*. You are then shown the data from *11:50* to *12:00* when switching. If the screen stays open, the filter is automatically updated. 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	*Active*: Time filter is configured in the Runtime.
Default	*Active*: The time filter is prescribed in the Editor. Only the start time can still be stipulated in the Runtime. Selection of the relative time period in days, hours, minutes and seconds.

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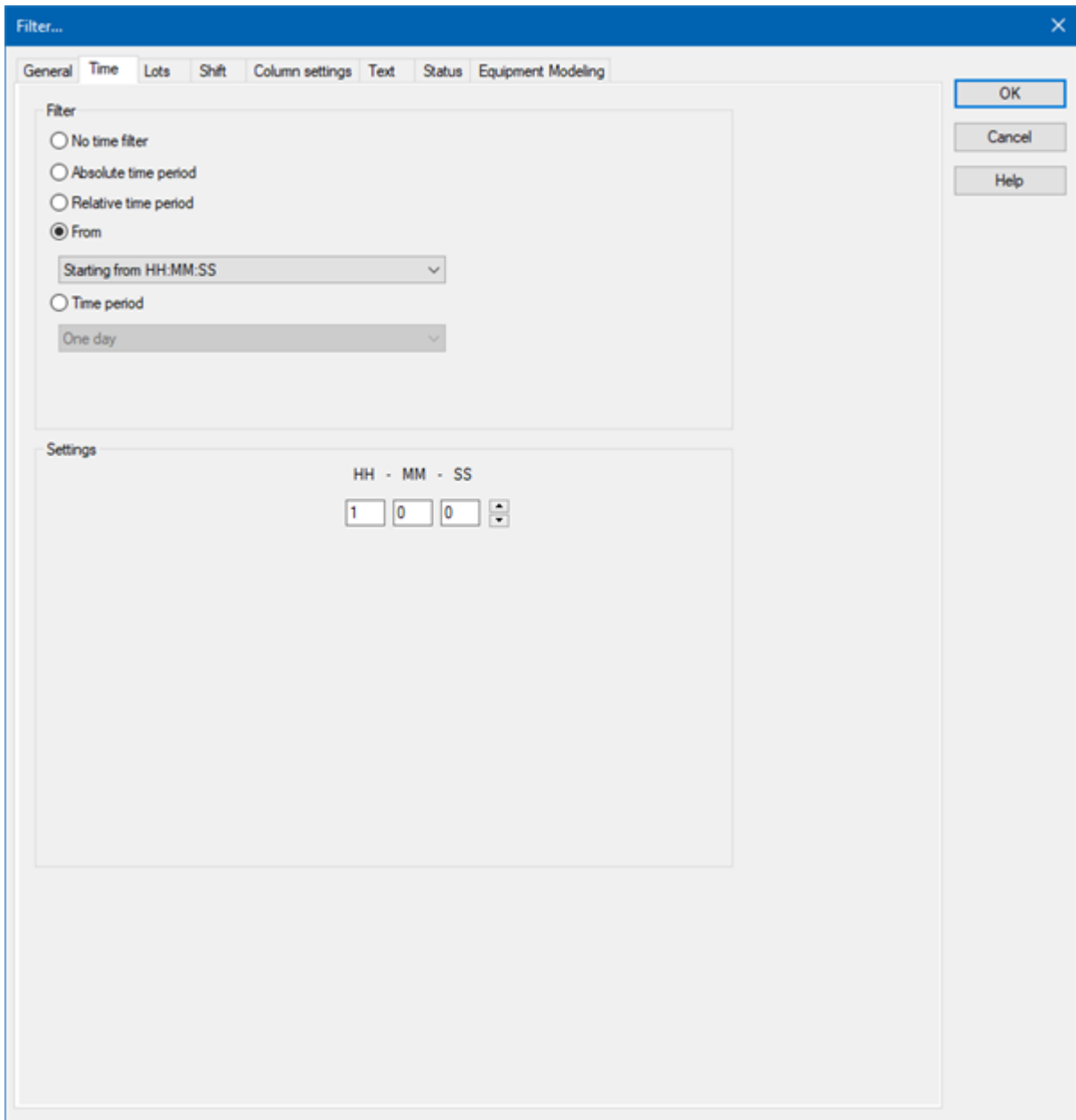
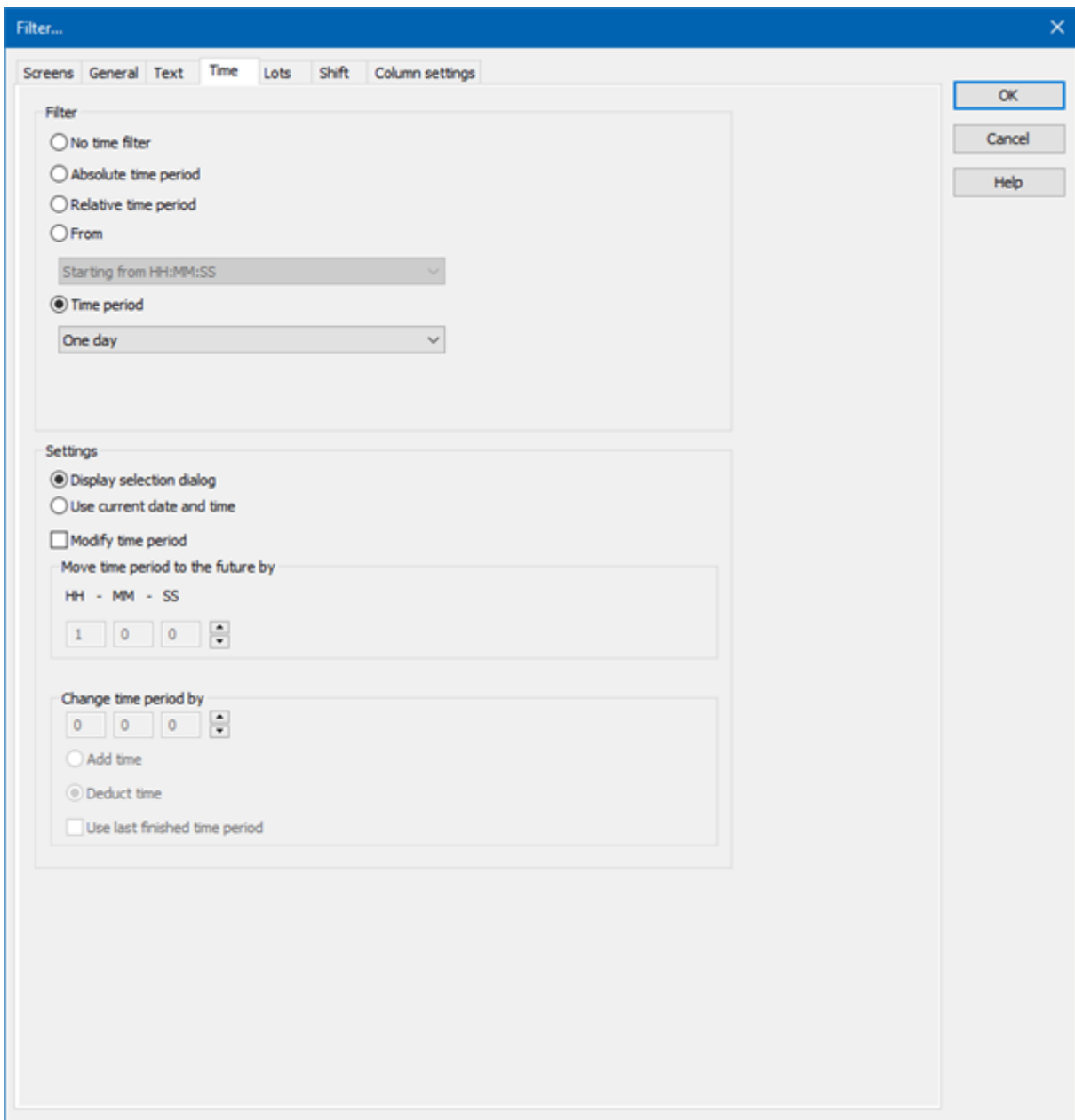| Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.7.2.2.3 From

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

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

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

   ▶ *Starting from HH:MM:SS*

   ▶ *Starting from day - HH:MM:SS*

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

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

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

Parameter	Description
	Attention! The start point of this filter is not updated automatically. Only the existing times are used when shown, even if the screen remains open and 23:00:00 is reached. The end time point is not defined with this filter, it is carried over.
▶ *Starting from HH:MM:SS*	A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. **Example:** You enter *11:00:00 PM*. 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.
▶ *Starting from day at HH:MM:SS*	A day and time for the start of the filter are entered. If the time given has not been reached in the current month, the corresponding time from the previous month is used. **Example:** You enter **day** *5 - 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.
▶ *Starting from day, month - HH:MM:SS*	A month, day and time for the start of the filter are entered. If the time stated has not been reached in the current year, the corresponding time from the previous year is used. **Example:** You enter **Day** *5*, **Month** *October - 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.

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.

3.7.2.2.4 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.

Option	Description
Time period	Selection of a time range from a drop-down list.
	In Runtime this time range is filtered. The filter starts with the fixed start time of its time period:
	▸ 15 minutes: *0*, *15*, *30*, *45* minutes of the hour

Option	Description
	▸ 30 minutes: *0, 30* minutes of the hour ▸ 60 minutes: *0* minutes of the hour **Example 1:** ▸ Time period: 60 minutes ▸ Current time: 8:50 AM ▸ Result: Display for 08:00 - 08:50 **Example 2:** ▸ Time period: 60 minutes ▸ Current time: 9:00 AM ▸ Result: Display for 08:00 - 9:00 AM **Example 3:** ▸ Time period: 15 minutes ▸ Current time: 8:35 AM ▸ Result: Display for 8:30 AM - 8:35 AM **Example 4:** ▸ Time period: 15 minutes ▸ Current time: 8:45 AM ▸ Result: Display for 8:30 AM - 8:45 AM Dialog in the Runtime: If this dialog is also offered in the Runtime, the start time of the time range can be selected. The following possibilities for selection are activated: ▸ **Offer selection dialog** ▸ **Use current date/time** The **Modify time period** property can be activated. ▸ 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	Allows amendments to cycles, postponements and extensions of time periods.

Active: Evaluation is carried out in accordance with the following rules:

▶ First, the **Use last finished time period** option is evaluated.

▶ After this, **Change time period by** is used.

▶ **Move time period to the future by** is then applied.

Inactive: No changes to the time period are made.

Attention: As of version 7.10, filter actions on the basis of this function lead to different results than in prior versions. |
| **Move time period to the future by** | *Active*: The time period defined in the filter is postponed to the future. The start and end time are moved by the set time span.

Given in *hours - minutes - seconds*.

If a postponement that is the same or greater than the selected **time period** is set, a note to check the configuration is displayed.

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*. |
| **Change time period to** | *Active*: The time period defined in the filter is modified. The end time is moved by the set time span. The start time remains unchanged.

Given in *hours - minutes - seconds*.

The time range can be added or deducted. Selection by means of radio buttons:

▶ **Add time:** The time stated in **Change time period by** is added to the time defined in the **Time range** option. |

Option	Description
	▸ **Deduct time:** The time stated in **Change time period by** is deducted from the time defined in the **Time range** option. 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. The following options are available: ▸ *Use current time period* ▸ *Use last finished time period* ▸ *Use next completed time period* Default: *Use current time period*
Use current time period	*Active*: The current time period is used for the filter process.
Use last finished time period	*Active*: The last selected and fully-completed time period in the **Time period** option is used. **Example:** For the **Time period** option, *One day* was selected. Filtering is thus carried out for "Yesterday", because this is the last day that was completed in full.
Use next completed time period	*Active*: The last selected and fully-completed time period in the **time period** option is used. **Example:** For the **Time period** option, *One day* was selected. Filtering is thus carried out for "tomorrow", because this is the next day that will be completed in full.

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.

3.7.2.2.5 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.
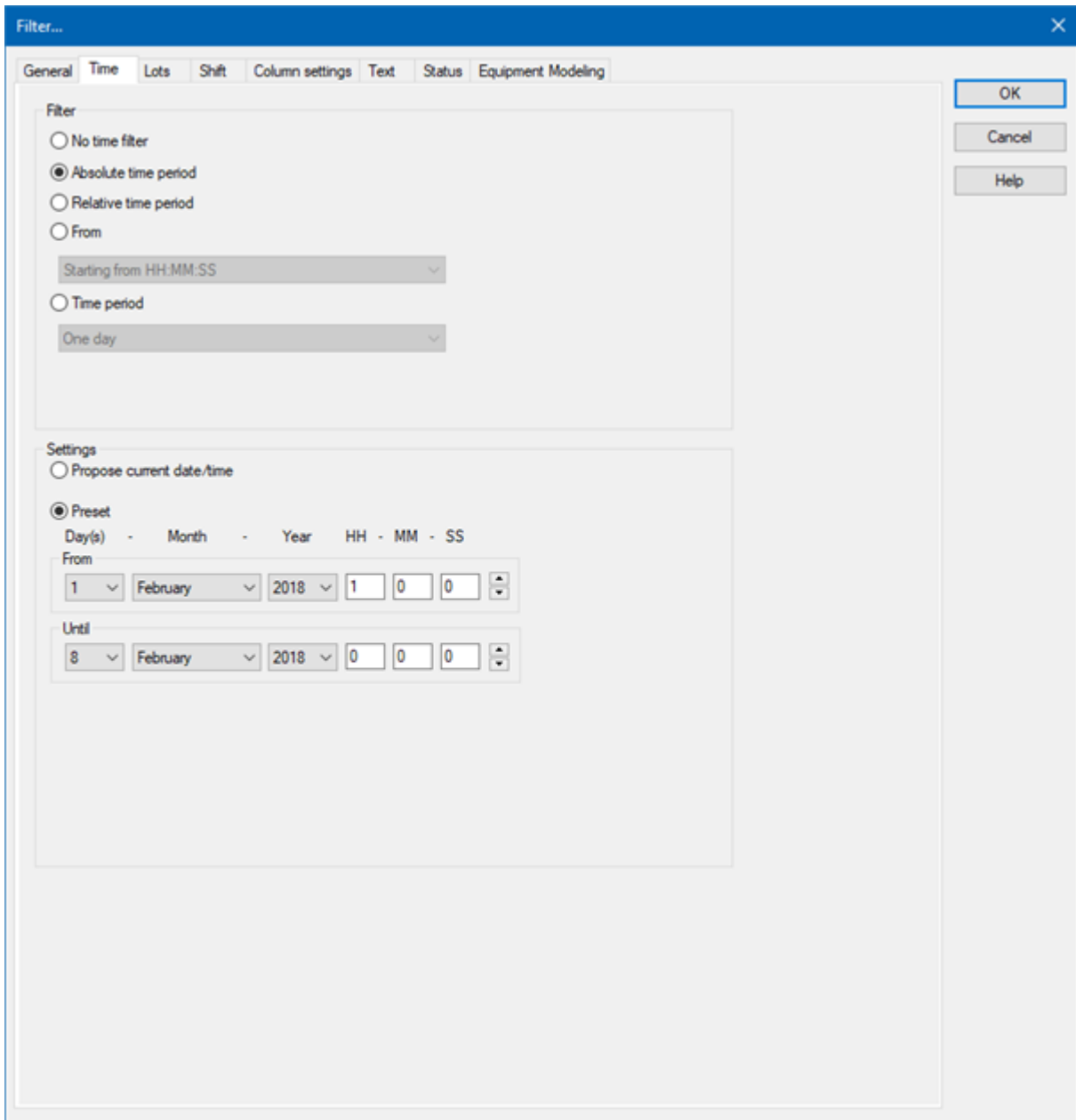
⚠Attention

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

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.

3.7.2.2.6 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
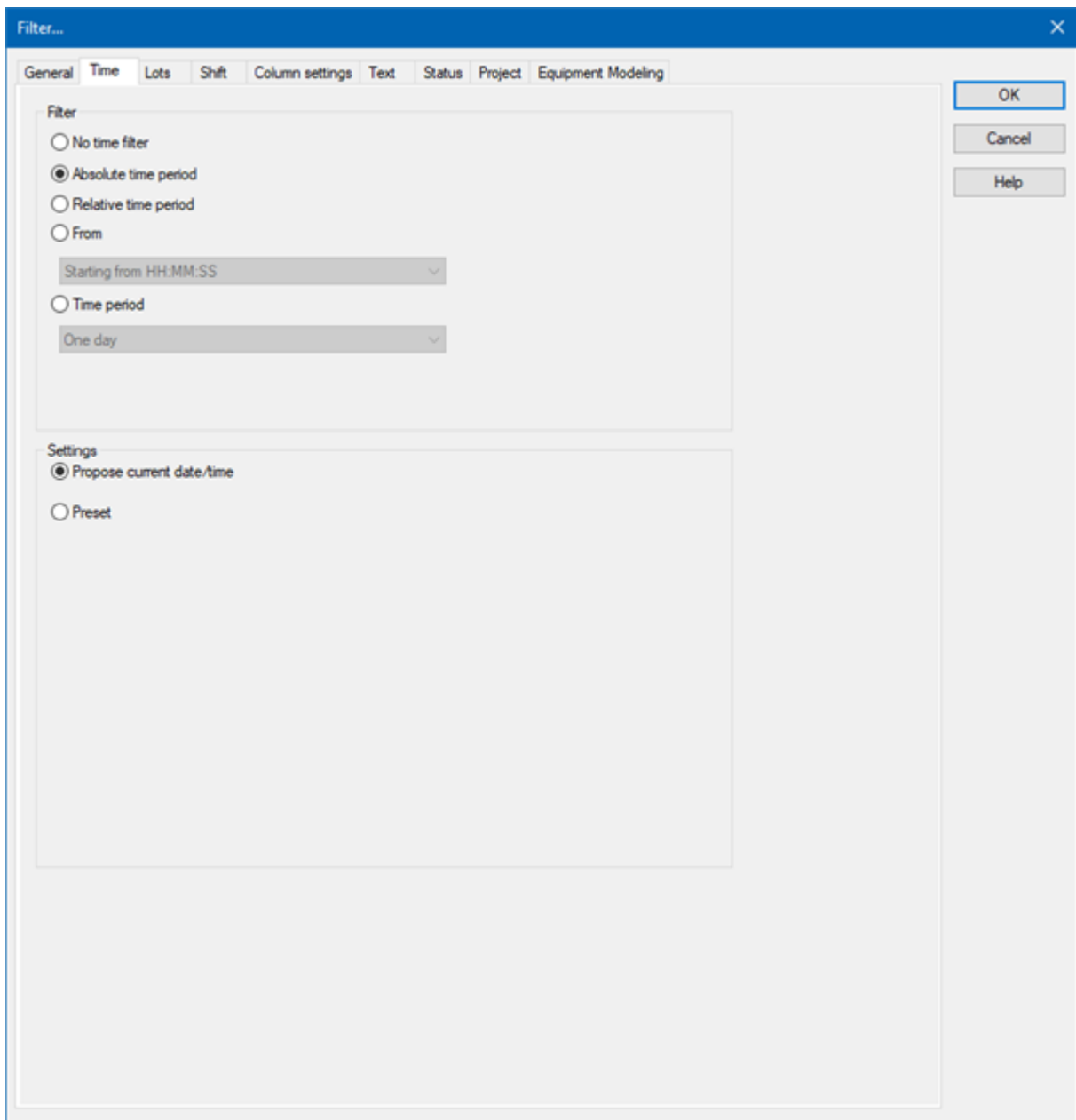
3.7.2.3 Lots

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 when the AML is loaded.

Note: If the lot filter is activated, the shift filter is automatically deactivated. Both filters mutually exclude one another.

Attention: All variables and archives that belong to an item of equipment and the lot archive must be linked to the same equipment in the equipment model.
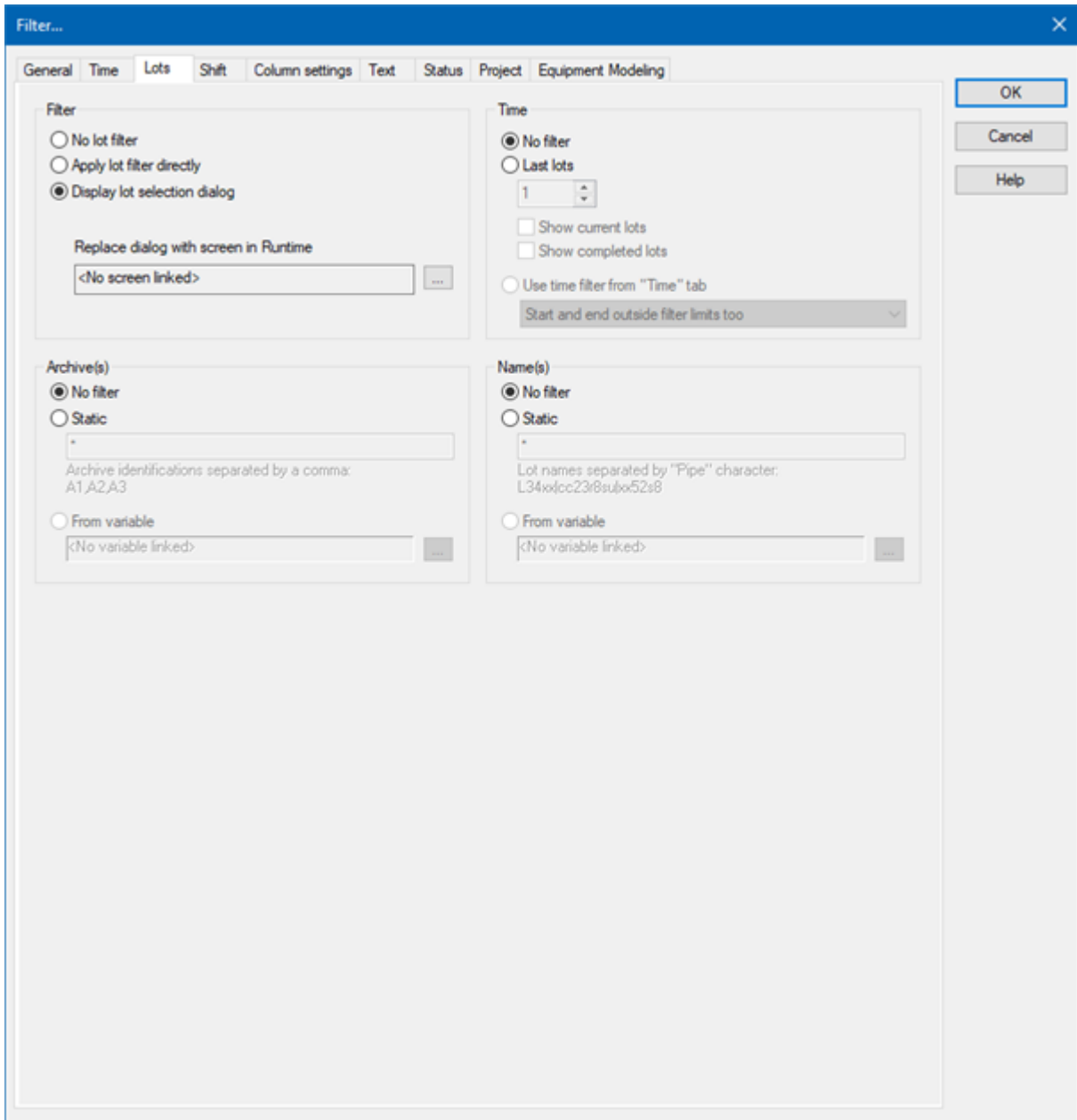
> ⚙️ **Information**
>
> Some filters in zenon can be configured independently of one another and then combined in the Runtime. This is only possible to a limited extent with the lot filter.
>
> The lot filter can offer a list of existing lots in the Runtime. It is Runtime data that is not available 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	‣ *Active*: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in the Runtime.
Apply lot filter directly	‣ *Active*: The filter configured here is applied in the Runtime directly. **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.
Display lot selection dialog	*Active*: The dialog for lot selection is shown in the Runtime when: ‣ Clicking on **Filter** or ‣ screen switching, if the **Show this dialog in Runtime** option has been activated (Not available for each function/screen type) **Note:** The dialog is not shown on reloading. Options can be pre-selected in the Editor.
Replace in Runtime with screen	Only available if the **Show lot selection dialog** option has been selected. **Note:** Only available in screen switching functions. Definition of a screen that is to be called up in the Runtime instead of the **lot selection dialog**. Only *time/lot/shift filter* screens are offered. Click the **...** button and the dialog opens to select a screen. If the linked screen is not found in the Runtime, a search is made for corresponding screens with specific names. **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

Option	Description
	position.
Display lot selection dialog	**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. **Configuration for ETM:** 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. ▸ *Active*: Enables several lots to be compared directly. Display always starts from the zero point. **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.

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	▶ *Active*: The time range set in the **Time** tab is not taken into account. All completed and current lots are displayed.
Last lots	**Attention:** Only works in conjunction with the **Apply lot filter directly** option. 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. ▶ *Active*: Input of the number of lots last concluded, according to what they should be filtered for. Input of the number in the number field or configuration via arrow keys. 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. **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. **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.
Display current lots	▶ *Active*: The current lots are displayed. **Note:** If the number of lots to be displayed is greater than the number of current lots, lots that have been completed are also shown until the set limit has been reached. Example: 3 lots are to be displayed. 1 lot is running, 5 have been completed. The one current lot and two completed lots are displayed.

Option	Description
Display completed lots	▸ *Active*: The completed lots are displayed. **Note:** If the number of lots to be displayed is greater than the number of completed lots, lots that have been completed are also shown until the set limit has been reached.
Use time filter from "Time" tab	▸ *Active*: Pre-filtering is carried out with the settings of the **Time** tab. The effective range of the filter can be amended within this time range. Select from drop-down list: ▸ *Start and end also outside filter limits*: (Default) Lots can start before the start time configured in the **Time** filter and end after the configured end time. ▸ *Start and end only outside filter limits*: Lots must start and end within the time points configured in the **Time** filter for the start and end. ▸ *Start also before filter limit*: Lots can start before the start time configured in the **Time** filter and end after the configured end time. ▸ *End also after the filter limit*: Lots can also end after the end time set in the **time** filter, but must start at or after the configured start time. ▸ *Adjust start and end to filter limits*: Lots are cut to the time points configured in the **Time** filter for the start and end.

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	▸ *Active*: Filtering for archive names is not carried out.
Static	▸ *Active*: Archives whose identification corresponds to the character string entered in the input field are filtered for. Input of the archive identifications in the input field: ▸ Several identifications are separated by a comma (,). ▸ * or empty: All archives, no filter.
From variable	▸ *Active*: The value of the variables linked here is applied as a filter for archive names in the Runtime. Click on button **…** in order to open the dialog for selecting a variable. Available for AML and CEL modules if the **Apply lot filter directly** option has been selected: Other modules use their own configurations. **Notes for variables in the Runtime:** ▸ 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. **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.

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	▸ *Active*: Filtering for lot names is not carried out.
Static	▸ *Active*: Lot names that correspond to the character string entered in the input field are filtered for. Input of the lot name in the input field: ▸ Several entries are separated by a pipe character (|). **Note:** Lot name must not contain a **|** character! ▸ * or empty: All lots of all displayed archives, no filter.
From variable	▸ *Active*: The value of the variable linked here is applied as a filter for lot names in the Runtime.

Option	Description
	Click on the **...** button to open the dialog for selecting a variable.
	Only available if the option **Apply lot filter directly** has been selected.
	Notes for variables in the Runtime:
	▸ 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.
	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.

3.7.2.4 Shift

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

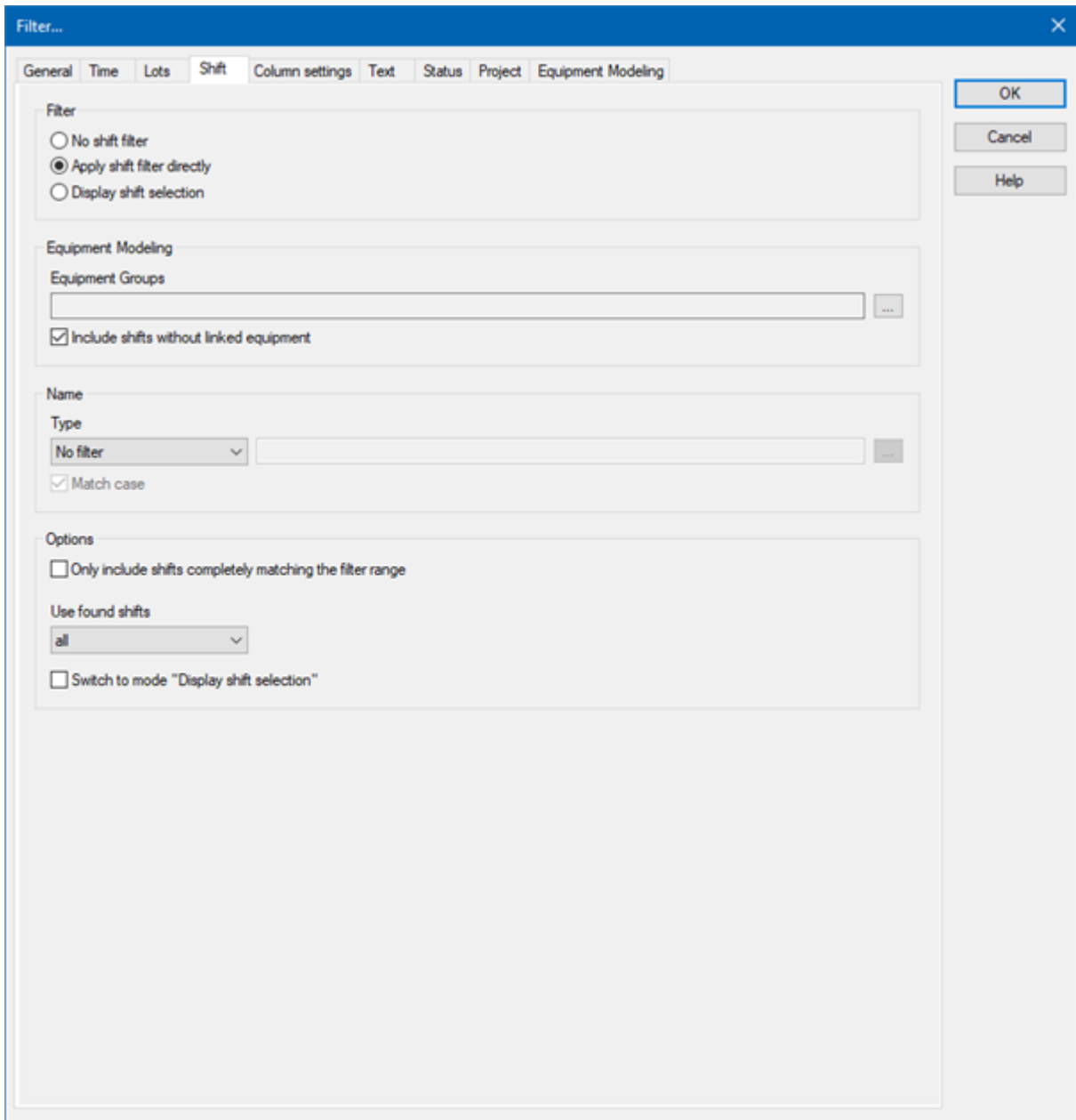### SCREEN SWITCHING TO A LINKED SCREEN

Screen switching to a linked filter screen can also be carried out. Shift filters can be used in the process.
To do this:

1. For screen switching, define the desired filter screen in the **General** tab (for Extended Trend **Display**) in the option **Replace dialog with screen in Runtime**.

2. Ensure that the filter screen contains the necessary control elements for the shift list.

3. Define the desired time filter.

4. Activate, in the **Shift** tab, the **Show shift selection** option.

5. Define the shift filter.

The linked filter screen is called up in Runtime during screen switching. The shifts are shown in the shift list as defined in the screen switching. Control elements for lots are not shown.

SHIFT DIALOG

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: ▸ *Active*: The shift filter is deactivated and cannot be configured. Filtering for shifts is not carried out in the Runtime.
Apply shift filter directly	Applying the shift filter in the Runtime: ▸ *Active*: The filter configured here is applied in the Runtime directly. Equipment groups and shift names can be preselected. The shift list and **Update** button are not shown in the Runtime.
Display shift selection	Display of the shift selection in the Runtime: ▸ *Active*: The dialog for shift selection is shown in the Runtime. The settings chosen in the Editor are applicable for the reading of the shifts in the Runtime. The dialog is shown in the Runtime when: ▸ Clicking on the **Filter** button. Or: ▸ Executing screen switching. **Note:** The dialog is not shown on reloading. **Attention:** At least 1 shift must be selected in the Runtime in order to call up the page or to be able to configure the filter. If, in the **General** tab, the **Show this dialog in the Runtime** option is activated at the same time, the complete configuration dialog is called up.

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

Option	Description
	the option separated by a semicolon (;).
Include shifts without linked equipment	Selection of whether linking to an equipment group is necessary.
	▸ *Active*: Shifts that are not linked to an equipment group are also taken into account.
	▸ *Inactive*: Only shifts that are linked to at least one equipment group are taken into account.
	Default: *active*

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	Selection of the filter type from a drop-down list when filtering according to name:
	▸ *No filter*: Filtering for names is not carried out.
	▸ *Name with wildcards*: A name with placeholder can be entered into the input field. All shifts whose name is applicable for the filter are included.
	▸ *Name from variable*: 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.
	Default: *No filter*
	Wildcards:
	▸ *****: 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
	Notes for variables in the Runtime: ▸ 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. **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.
Match case	Setting for filtering for upper/lower case ▸ *Active*: Capitalization is taken into account for names. Default: *active*

OPTIONS

Configuration of the options for filtering for shifts in the CEL.

Option	Description
Only include shifts that are fully in the filter range	Configuration of which shifts are displayed. ▸ Active: Only shifts that are fully in the time filter set are shown. ▸ Inactive: Shifts that start earlier and/or finish later are also shown. Default: *inactive* **Example:** ▸ Time filter: Today 08:00 – 12:00. ▸ Existing shift: Today 8:30 AM – 5:00 PM. Result for: ▸ Option *active*: The shift is not taken into account because it is not fully in the time filter. ▸ *Inactive* option: The shift is taken into account because it is

Option	Description
	partly in the time filter.
Use shifts found	Selection of shifts that are taken into account, from drop-down list: ▸ *All*: All shifts found are taken into account. ▸ *Earliest shift only*: 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. ▸ *Only last shift*: 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. Default: *All* **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. Example: __Configuration and shifts:__ ▸ **Only include shifts that are fully in the filter range** option: active. ▸ **Use found shifts** option: *Latest shift only* ▸ 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. __Result:__ ▸ Shift 2 is used
Switch to "Show shift selection" mode	▸ *Active*: The filter acts as with the **Show shift selection** option. The time filter is set to absolute; start and end

Option	Description
	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. Default: *inactive* **Behavior in the Runtime:** 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.

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.

FILTER BUTTON IN THE SCREEN IN RUNTIME

If the **Filter** button is pressed in the AML screen, depending on the configuration, the complete filter dialog including the shift selection list is shown. The filter settings can thus be amended and the shift list can be updated in order to select another shift.

3.7.2.5 Column settings

In this dialog, you define which columns you want to have displayed, including the form, sequence and sorting.

Note: All settings which you make in this tab are default settings for:

- *Alarm Message List* screen
- *Alarm Message List filter* screen
- Alarm status line
- Export (on page 171) to CSV, dBase or XML

These default settings can be changed when defining the individual alarm functions.

Note on "Time of Last Change" column: This column contains the value of the most recent time stamp from the columns **Time Received**, **Time Cleared** or **Reactivated Time**. With the same value
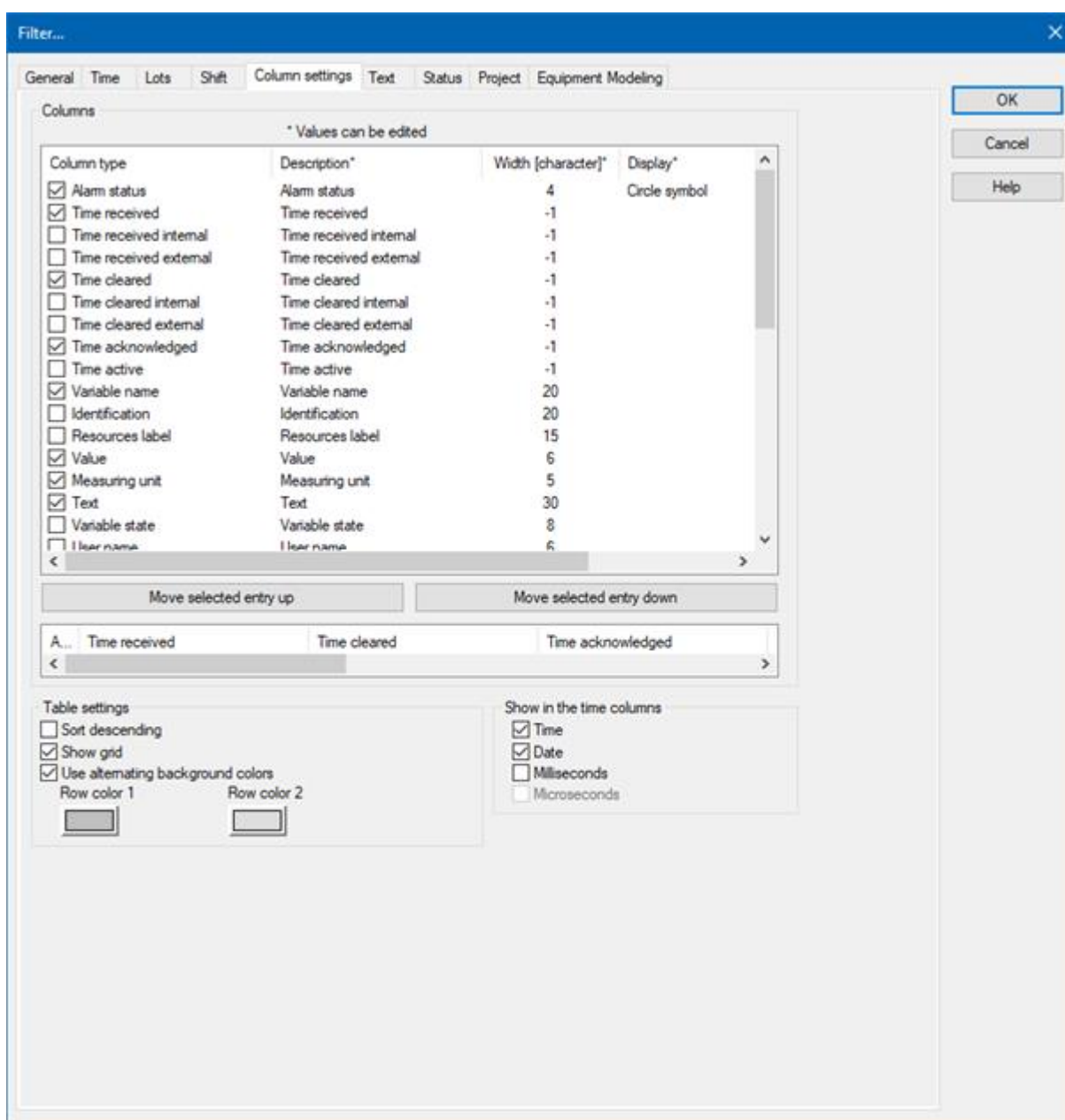
for received/cleared and reactivated, the **Reactivated Time** column takes precedence. The display of the column corresponds to the column from which the value is taken.

> ### 💡 Information
>
> In project settings, you can set a default setting for the sequence and size of columns using the **Column settings AML** property or the **Column settings CEL** property. If you create a new screen switching function from an Alarm Message List screen or Chronological Event List screen, this setting is used as a default and can be amended in the corresponding tab. The setting is stored in the **project.ini** file.

COLUMNS

In the list field of this tab all available column types are displayed.

You can change the sequence of column types by dragging & dropping in the list field:

▸ Click in the **Column type** column

▸ Move the individual entries as desired

Alternatively, you can adjust the sequence with the **Move selected entry up** and **Move selected entry down**.

Option	Description
Checkbox:	Select which column types are displayed.
Description	Free text entry for a description of the column. **Change description:** left-click on the corresponding area. Enter the desired value in the editing field. **Note:** for column descriptions, zenon language switching is available.
Column width	Defines the width of the column in characters. **Change column width:** left-click on the corresponding area. Enter the desired value in the editing field. *-1* Width is calculated in the Runtime using average character width **Note:** For compatibility reasons, columns with time indications (time columns), whose width could not be changed in earlier zenon versions, automatically receive the value *-1*.
Display	For column types ▸ **Alarm/event class symbol** ▸ **Alarm/event group symbol** ▸ **Alarm status** Actual form of display can be selected in the Runtime. Select the desired form from the drop-down list. For the **equipment group** column type, an equipment model can be selected for the display. The drop-down menu for selection is then only visible if you click on the **Display** column at the height of the **Equipment Group**

Option	Description
	entry.
Move selected entry up	Moves selected entry up one place.
Move selected entry down	Moves selected entry down one place.
Preview field	Displays the columns defined in the list field in the width displayed there.
	Column types activated or deactivated by means of a checkbox are updated in real time in the preview.
	You can also amend the column widths in the preview field by left-clicking on the right end of a column, holding down the mouse button and moving the column edge to the left or right accordingly with the mouse button held down. In this case, the mouse pointer display switches from a mouse pointer to a cross symbol.

TABLE SETTINGS

Parameter	Description
Sort descending	Initially sorts the entries in the list according to the **Time received** column in descending order. This setting applies for calling up a screen. You can change the sorting order in Runtime by clicking on the column header. The sorting sequence currently being used is shown by an arrow on the column header.
	Default: *inactive*
Display grid	Shows a grid when the list is displayed in the Runtime.
	Default: *active*
Use alternating background colors	Uses **line color 1** and **line color 2** alternately as background colors for the list in Runtime.
	Default: *active*
Row color 1	Color that is used as a background color in in the list Runtime for all uneven numbers (1, 3, 5 etc.), if you have activated **Alternating Background Colors**.
Row color 2	Color that is used as a background color in in the list Runtime for all even numbers (2, 4, 6 etc.), if you have

Parameter	Description
	activated **Alternating Background Colors**.

SHOW IN THE TIME COLUMNS

Parameter	Description
Time	Displays the time for a list entry in the following form: *HH:MM:SS* Default: *active*
Date	Displays the date for a list entry in the following form: *TT:MM:YYYY* Default: *active*
Milliseconds	Expands the time entry by milliseconds. Milliseconds are shown as a decimal point percentage for the seconds. Default: *inactive* **Note:** Must be activated if milliseconds are to be provided in exports or print-outs.
Microseconds	Expands the time entry by microseconds. Microseconds are shown as a decimal point percentage for the seconds. Default: *inactive* **Note:** Only available if the **Milliseconds** option has been activated.

Hint: If you activate the automatic keyboard in Runtime, each time entry or selection from a drop-down list is necessary, a window with the keyboard is called up. You can thus also use the columns to configure the columns if you are using a computer without a keyboard.

> **⚠️Attention**
>
> The column width is given in characters and is dependent on the font used. The value *-1* means that the width in the Runtime is calculated through the average character width.
>
> If the column width is not a multiple of the character width of the used font, the actual column width can differ from the set column width. This can result in the text being cut of or an empty space being created.
>
> Solution: Use fonts with a fixed character width.
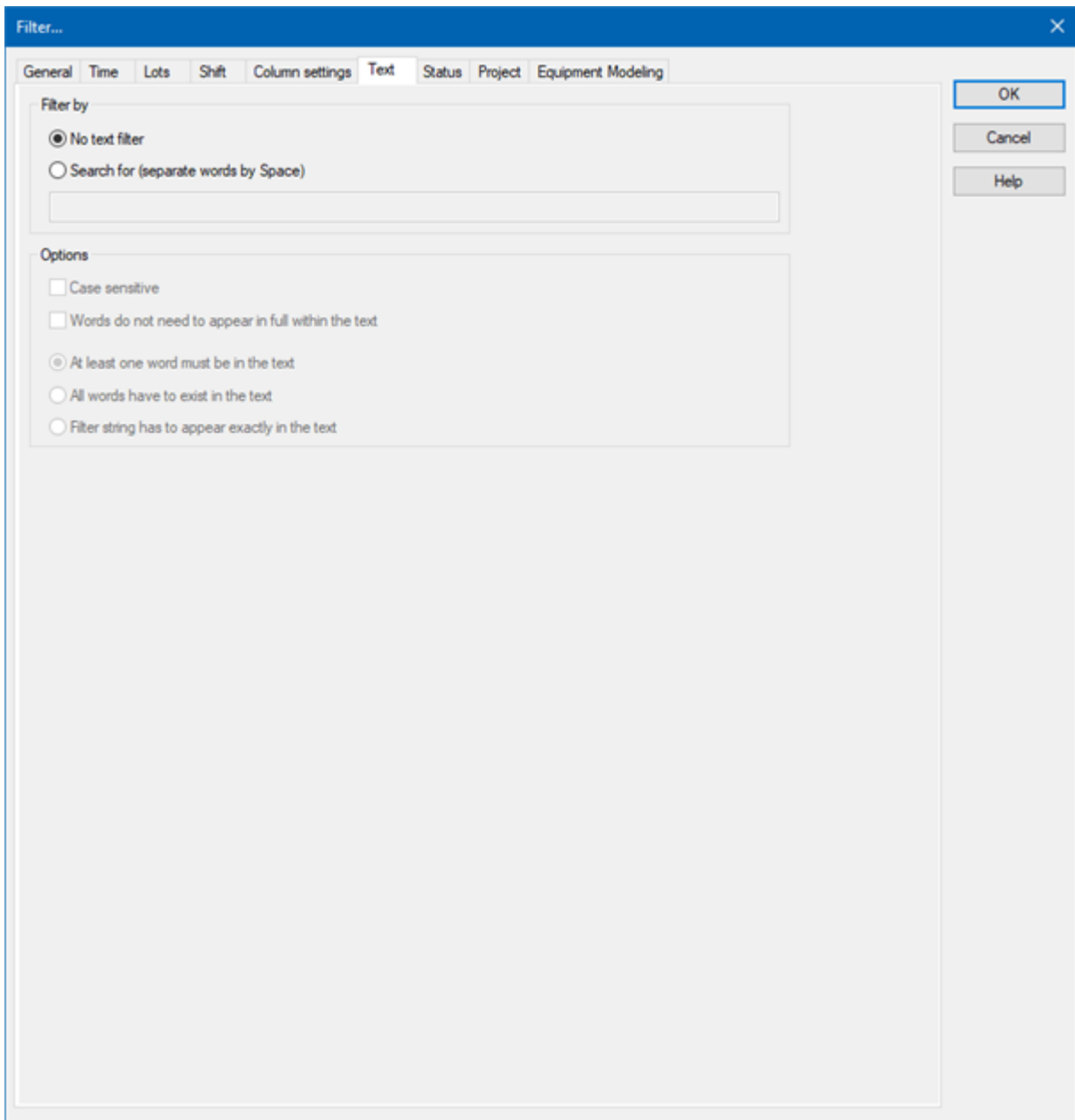
DISPLAY OF ALARM STATUS

The alarm status is displayed in the alarm message list by means of a circle symbol or configured graphics. The list can also be sorted according to the alarm status in the Runtime. To do this, click on the column title in the header.

Sorting of the alarms in the Runtime according to alarm status:

1. *occurred*
2. *reactivated*
3. *cleared*
4. *acknowledged*
5. *deleted*

3.7.2.6 Text

The text filter allows limitation of the display to messages that contain certain search terms.


FILTER BY

FILTER BY

Option	Description
No text filter	The text filter is not used.

Option	Description
Search for **(words separated by spaces)**	The text filter is used. Further options are activated.
Input field	Enter the corresponding words or character strings.

OPTIONS

Option	Description
Match case	*Active:* The filtering is case-sensitive.
Words do not need to appear in full within the text	*Active:* Parts of words can also be taken into account during filtering.
At least one word should be in the text	*Active: At least* one word from the search string has to be in the text.
All words should be in the text	*Active:* All words must be present in the search string. In doing so, the sequence plays no role.
Filter string has to appear exactly in the text	*Active:* The text must be exactly as defined in the search string.

3.7.2.7 Status
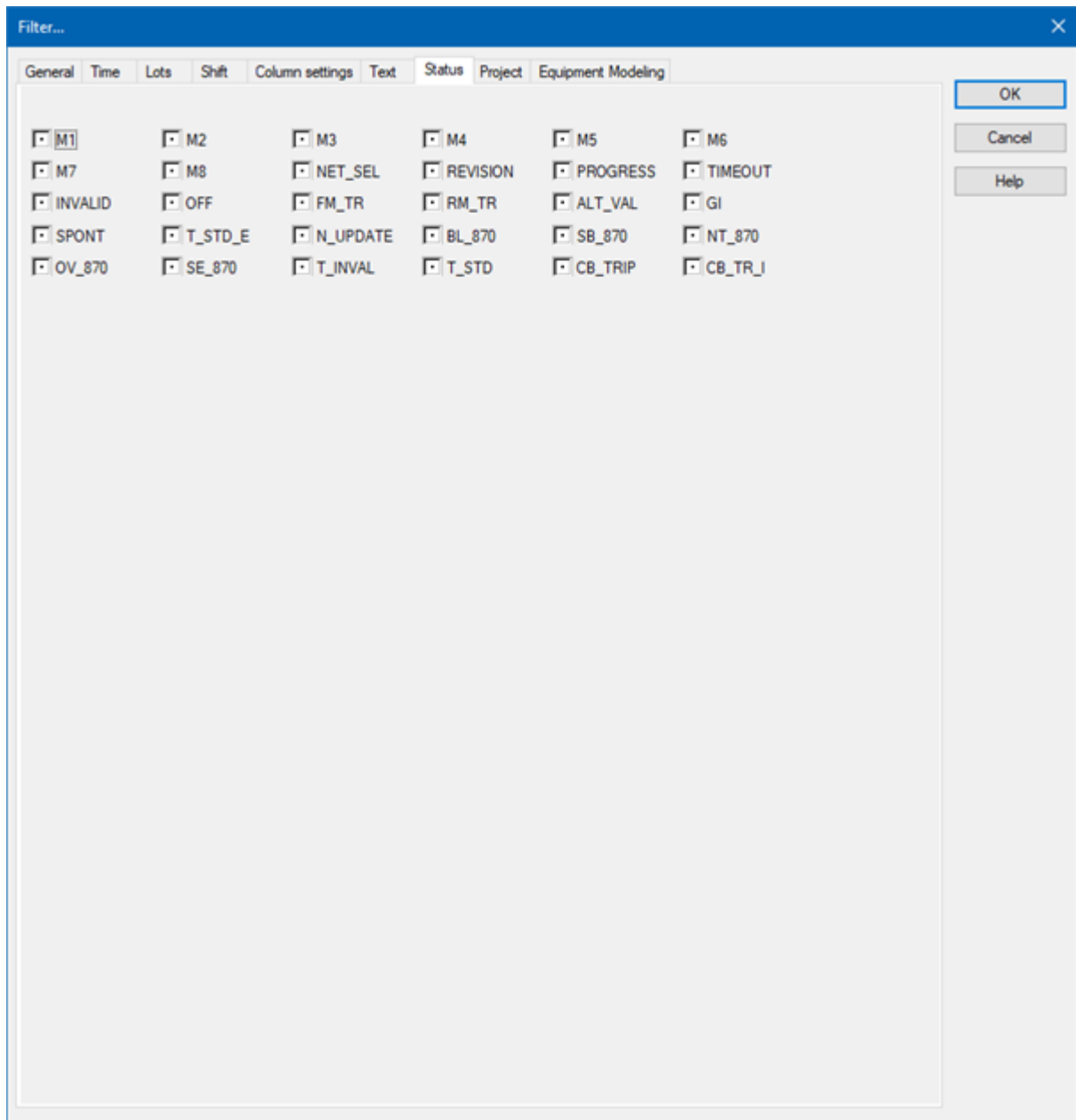
The status of the checkbox indicates if the status bit is to be evaluated.

| Status of checkbox	Description
Black dot	The status bit is not evaluated.
0	Only the entries where the status bit is set to *false* are displayed.
1	Only the entries where the status bit is set to *true* are displayed.

> **Example**
>
> If the checkbox **SPONT** is set to *1*, only the alarms are shown that are triggered by spontaneous values are displayed.

Note: You can read details on status bits in the Status processing chapter.

3.7.2.8 Project

Selection of projects that are to be taken into account for the AML. The filter for selecting sub projects is only available in the integration project of the multi-project administration.
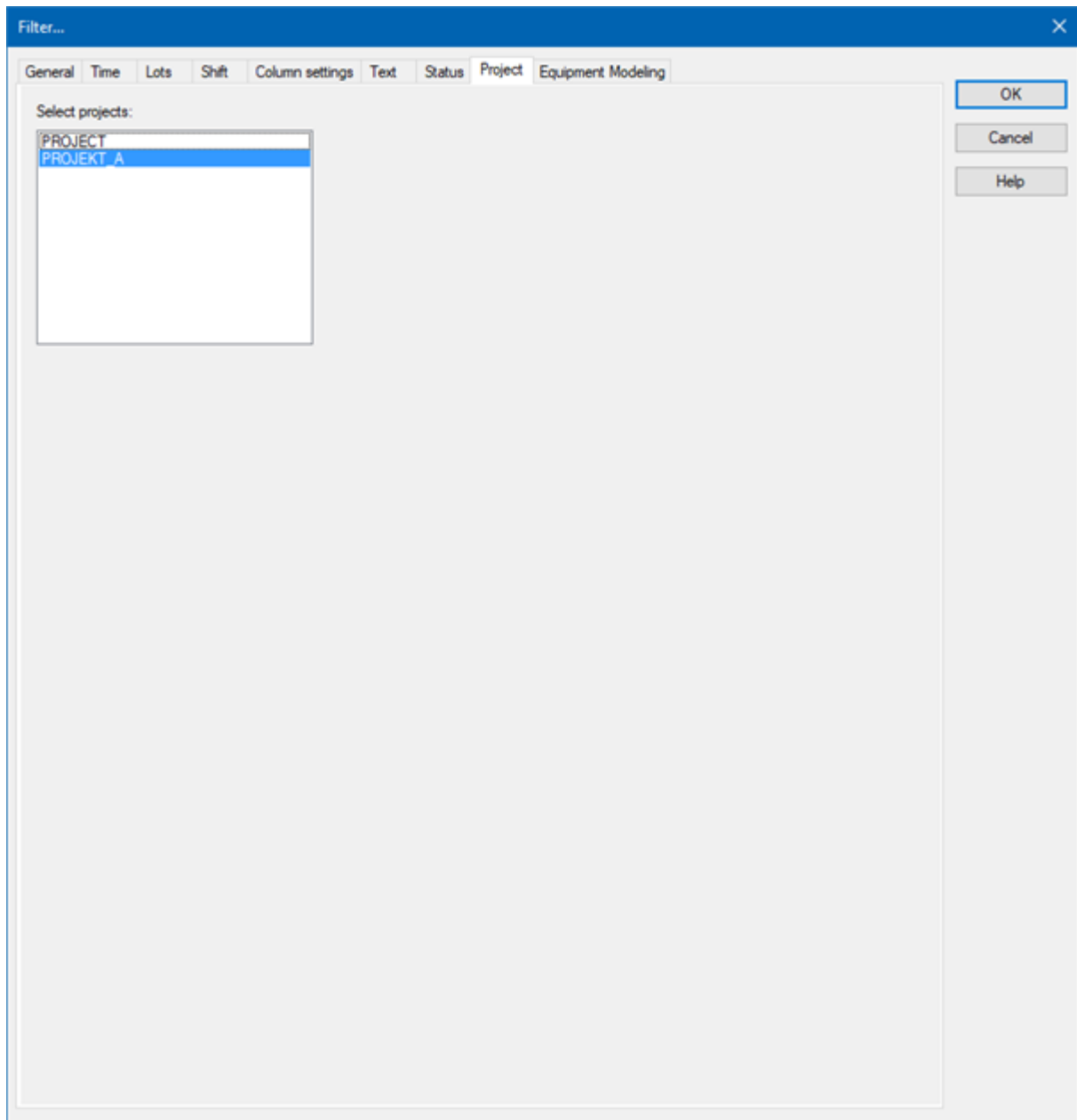
The selection from the integration project and all sub projects is carried out by means of multi-select, by pressing and holding the **Ctrl key** and clicking the mouse on the desired projects.

3.7.2.9 Equipment Modeling

In this dialog, you configure the filtering of the Alarm Message List according to equipment models. In the filter all already existing equipment models are displayed. The configuration of the equipment model can be enhanced and amended for a project (but not the global project however) directly using the tool bar in this dialog.

Note: To show the equipment group for Alarm Message List entries, in the **Column settings tab** (on page 104), activate the checkbox for the *equipment group* **column type** and select the desired equipment model for this entry in the **Display** column from the drop-down list.

To add groups to the filter:

1. Select the desired element.

2. Click on the **Add** button.

3. Repeat the process until all necessary groups are available in the list
   Multi-select is not possible

To remove groups from the filter:

1. Select the desired element
   (multiselect: Hold down the **Ctrl** key or **shift** key and click on the desired element.

2. Click the **Delete** button.

EQUIPMENT MODELING DIALOG
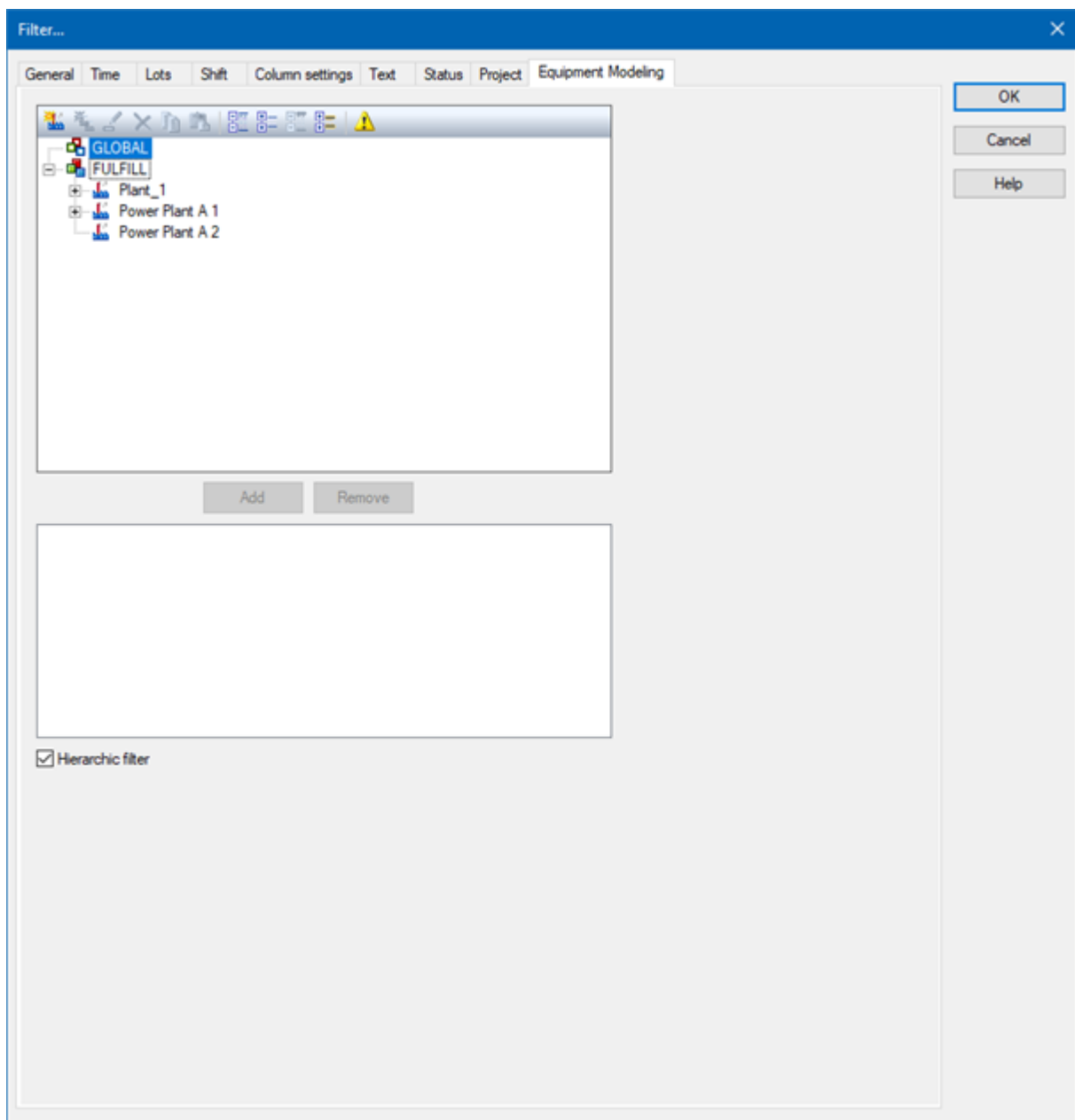
EQUIPMENT MODELING

Option	Description
Toolbar	Symbols to:
	‣ Edit local equipment models
	‣ Expand or collapse the display
	‣ Display of information

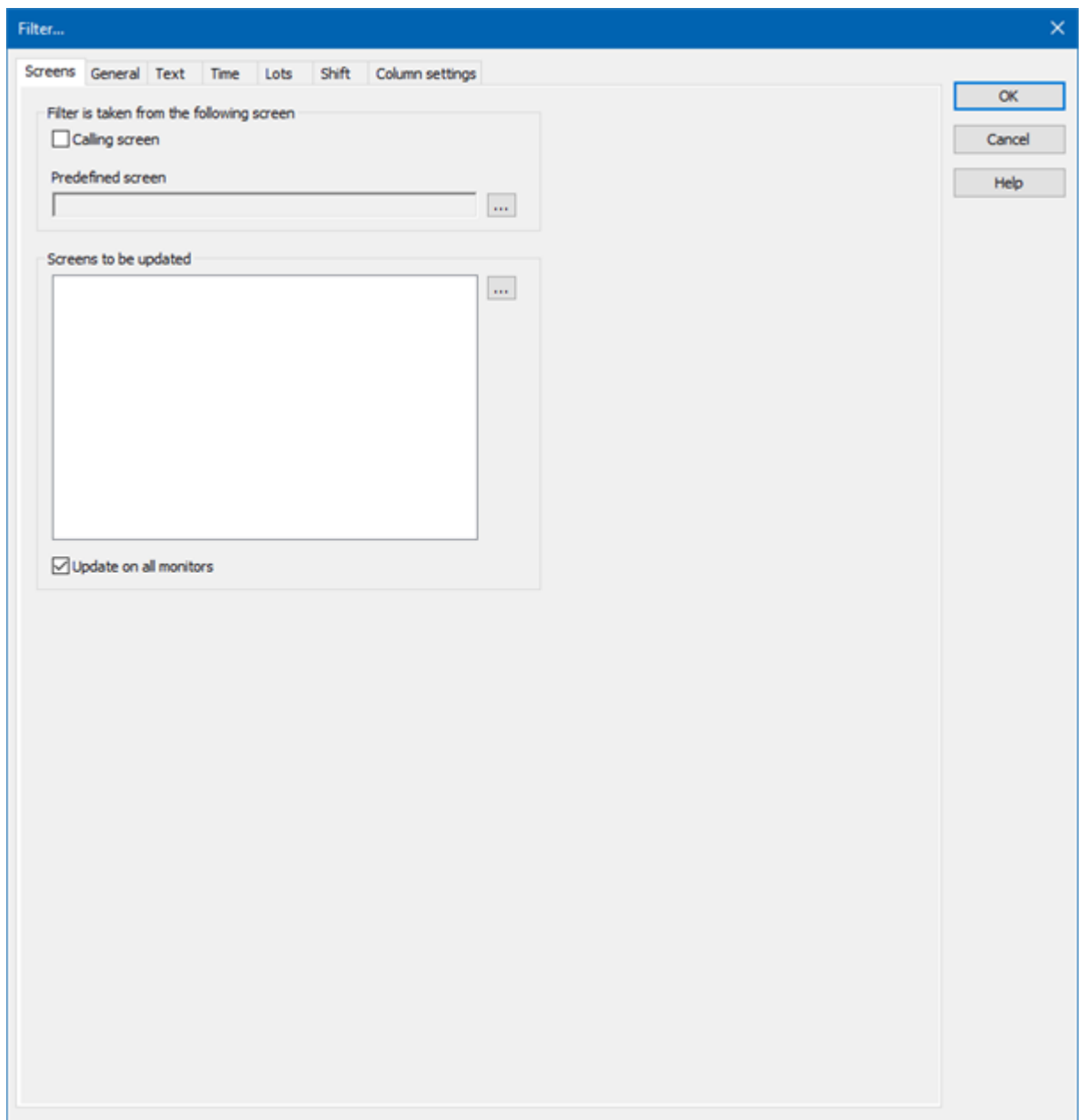| Option	Description
List of equipment models	provides models and groups for selection The list separates the display into equipment models from the global project and from local projects. Local equipment models can be created, edited or deleted. **Note:** Equipment models from the global project cannot be displayed if there are models with the same name from the local project. Affected models are displayed by clicking on the warning symbol (triangle with exclamation mark). For details, see the **Equipment modeling** manual, **Editing local equipment models** chapter.
Add	Adds the selected groups to the filter list.
Remove	Removes all selected groups from the filter list.
Filter list	Shows all equipment groups that are to be filtered.
Hierarchic filter	Checkbox for the activation of the hierarchical filtering of the equipment model ▸ *active*: Variables that are linked to a subhierarchy of the selected equipment group are taken into account when filtering and are contained in the display in the Runtime. ▸ *Inactive*: When filtering, only variables that are linked to the selected equipment group are taken into account. Default: *active*

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.

3.7.3 Filter for Alarm Message List screen switching filter.

To create an *Alarm Message List filter* (on page 18) screen:

1. Create a **Screen switching** function on an **Alarm Message List filter** screen

2. the filter is displayed with all tabs:

   ▶ **Screens (on page 119)**

   ▶ **General** (on page 122)

   ▶ Text (on page 126)

   ▶ Time (on page 127)

   ▶ Lots (on page 131)

   ▶ Shift (on page 137)

   ▶ Column settings (on page 144)

3.7.3.1 Screens

On this tab, you can define the screens that are to be updated by the screen filter.
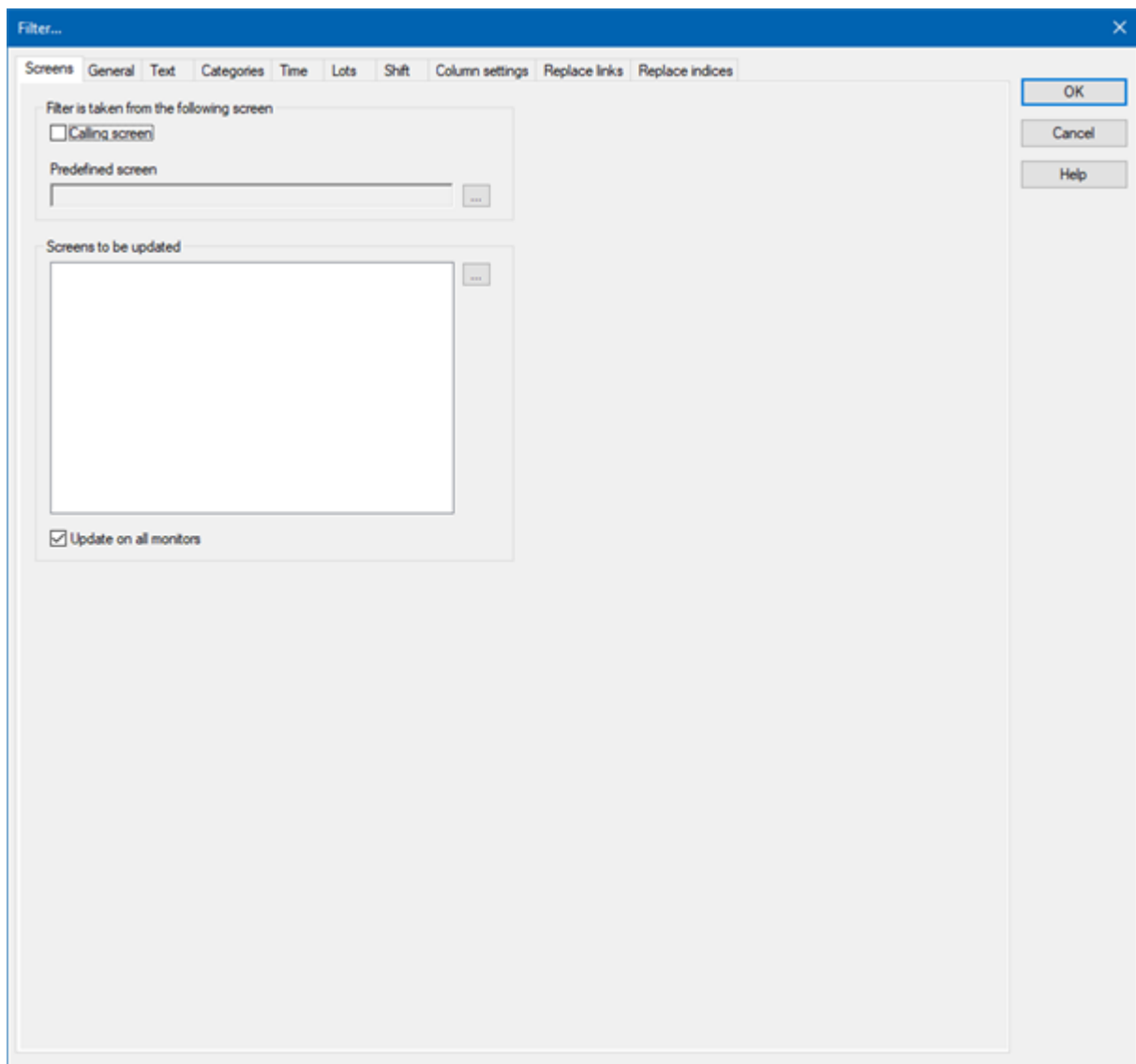
The following settings are available:

FILTER IS TAKEN FROM THE FOLLOWING SCREEN

Parameter	Description
Filter is taken from the following screen	Definition of the screen form which the filter is to be taken.
Calling screen	*Active*: The filter settings are take over from the screen from which the filter screen is called up. The **...** Button on the **predefined screen** option is greyed out. You cannot explicitly select a screen,

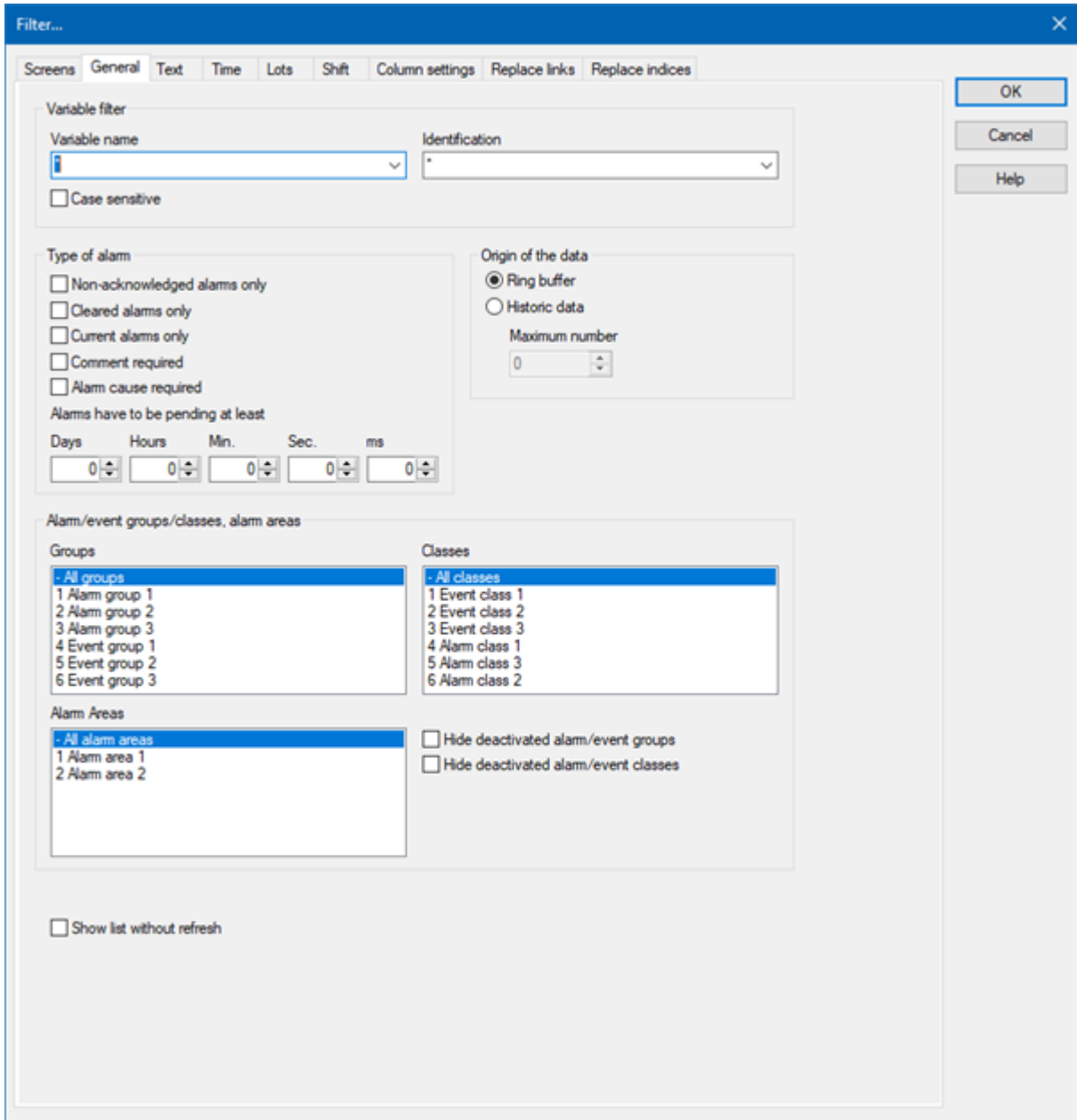| Parameter	Description

	because the filter is always updated from the calling screen with this setting.
	
	Note: Options in the **General**, **Text** and **Time** tabs are locked.
	
	Note:
	
	   ▸ All options are available if the option is updated and the project engineer changes to the tabs in the open dialog.
	
	   ▸ The lock only becomes active when the **Calling screen** option is already activated and the dialog is called again.
	
	   ▸ The configured contents of the **General**, **Text** and **Time** tabs are ignored in Runtime.

Predefined screen	Click on button opens the Screen selection dialog. Select the screen from which the filter - when clicking button **Update** during Runtime - should be read. Subscreens from Faceplates can also be selected for screen switching to AML filter, CEL filter, time filter, equipment model and shift management. For these screens, the name of the faceplate screen is placed in front of the subscreen in order to clearly distinguish them from other screens. **Attention:** When the filter screen is first called up using the function, the filter configured in the function is used, not the filter of the screen stated here! **Note:** It therefore only makes sense to select a screen that can adopt or fill the screen filter. The selected screen is entered into the list of screens to be updated. If you delete it from the list, the next selected screen from the list automatically takes its place. **Note:** Not available if you have activated the **Calling screen** checkbox.

SCREENS TO BE UPDATED

Parameter	Description
Screens to be updated	Selection of the screens that are to be updated. Subscreens from Faceplates can also be selected for screen

Parameter	Description
	switching to AML filter, CEL filter, time filter, equipment model and shift management. For these screens, the name of the faceplate screen is placed in front of the subscreen in order to clearly distinguish them from other screens.
Screen selection	Click on the **...** button to open the dialog Screen selection of the filter screens. Select the desired screen.
Update	Stipulation of where the filter should take effect.
Update on all monitors	*Active*: The screens from the list of the monitors that must be updated are updated on all accessible monitors.

3.7.3.2 General

VARIABLE FILTER

Limitation to alarms of certain variables.

Option	Description
Variable name	Enter the name or part of the name of the variable you want to filter. Use of the wild card * is possible. Wildcards are only

Option	Description
	permitted as a prefix or suffix; e.g. ***xxx** or **xxx***. **Note:** Filter terms entered in Runtime or in the Editor are automatically saved on the local computer in **zenon6.ini** and are available for selection in the drop-down list. **Attention:** The comma character (,) "only" serves as a separator between several variables to be filtered. However it is not possible to filter for a comma character in variables names! This results in the special filtering of array variables for **Dim 2** and **Dim 3** not being possible.
Identification	Enter the identification or part of the identification of the variables you want to filter. Wild card ***** is possible. Use of the wild card ***** is possible. Wildcards are only permitted as a prefix or suffix; e.g. ***xxx** or **xxx***. **Note:** Filter terms entered in Runtime or in the Editor are automatically saved on the local computer in **zenon6.ini** and are available for selection in the drop-down list.
Match case	*Active:* Capitalization is recognized when filtering for variable name or identification.

TYPE OF ALARM

Type of alarm that is displayed.

Option	Description
Only non-acknowledged alarms	*Active*: Only alarms that have not yet been acknowledged by the user are displayed.
Only cleared alarms	*Active*: Only alarms that have already passed, i.e. whose values no longer in the critical range, are displayed.
Only current alarms	*Active*: Only alarms that are still active, i.e. whose values are still in the critical range, are displayed.
Comment required	*Active*: Only alarms for which the entry of a comment (on page 207) is mandatory are

Option	Description
	displayed.
Alarm cause required	*Active*: Only alarms that are required for the linking of an alarm cause (on page 208) are displayed.
Alarms must be current for	Use the spin control to define the minimum time that an alarm should be active in order for it to be displayed. Possible settings: ▶ **Days** ▶ Hours (**hr.**) ▶ Minutes **(min.)** ▶ Seconds (**sec.**) ▶ Milliseconds (**ms**)

ORIGIN OF THE DATA

Display of current or current and historical alarms.

Option	Description
Ring buffer	*Active*: Only data from the ring buffer (on page 39) are displayed.
Historical data Maximum number	*Active*: Data from the ring buffer and historical data from the AML are displayed. The maximum number of the data which should be displayed includes the data from the ring buffer.

ALARM/EVENT GROUPS/CLASSES, ALARM AREAS

Selection of groups, classes and alarm area.

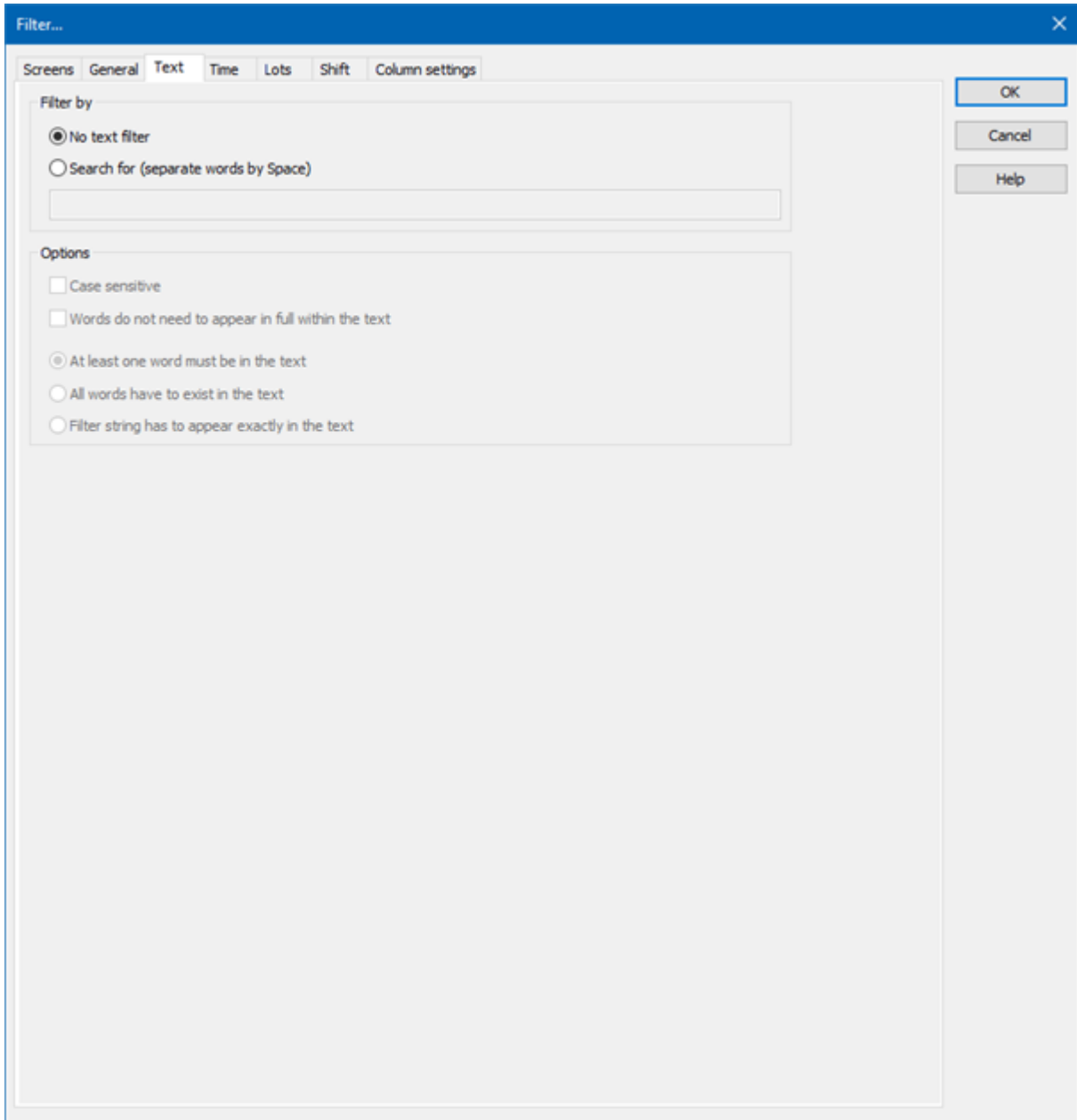| Option	Description
Alarm/event groups	From the existing alarm/event groups (on page 42) select the one from which alarms should be displayed.
Alarm/event classes:	From the existing alarm/event classes (on page 45) select the one from which alarms should be displayed.
Alarm areas	From the existing alarm areas (on page 49) select

Option	Description
	the one from which alarms should be displayed. **Note:** If the **Use hierarchical alarming of the Equipment Model** property is activated, the **Alarm area** column is empty. The checkbox is in the **alarm handling** item of the variable properties.
Hide deactivated alarm groups	Allows deactivated alarm groups to be excluded from the display in the list. ▸ *Active*: All entries that are linked to a deactivated alarm/event group in Runtime, are hidden during filtering. **Note**: Changes to the option made in Runtime are immediately accepted.
Hide deactivated alarm classes	Allows deactivated alarm classes to be excluded from the display in the list. ▸ *Active*: All entries that are linked to a deactivated alarm/event class in Runtime, are hidden during filtering. **Note**: Changes made in Runtime to the option are immediately accepted.

RUNTIME SETTINGS

Behavior of the AML in the Runtime

Option	Description
Show list without refresh	▸ *Active*: As long as the list is displayed no new entries are added.

3.7.3.3 Text

FILTER BY

Option	Description
No text filter	The text filter is not used.
Search for (words separated by spaces)	The text filter is used. Further options are activated.

Option	Description
Input field	Enter the corresponding words or character strings.
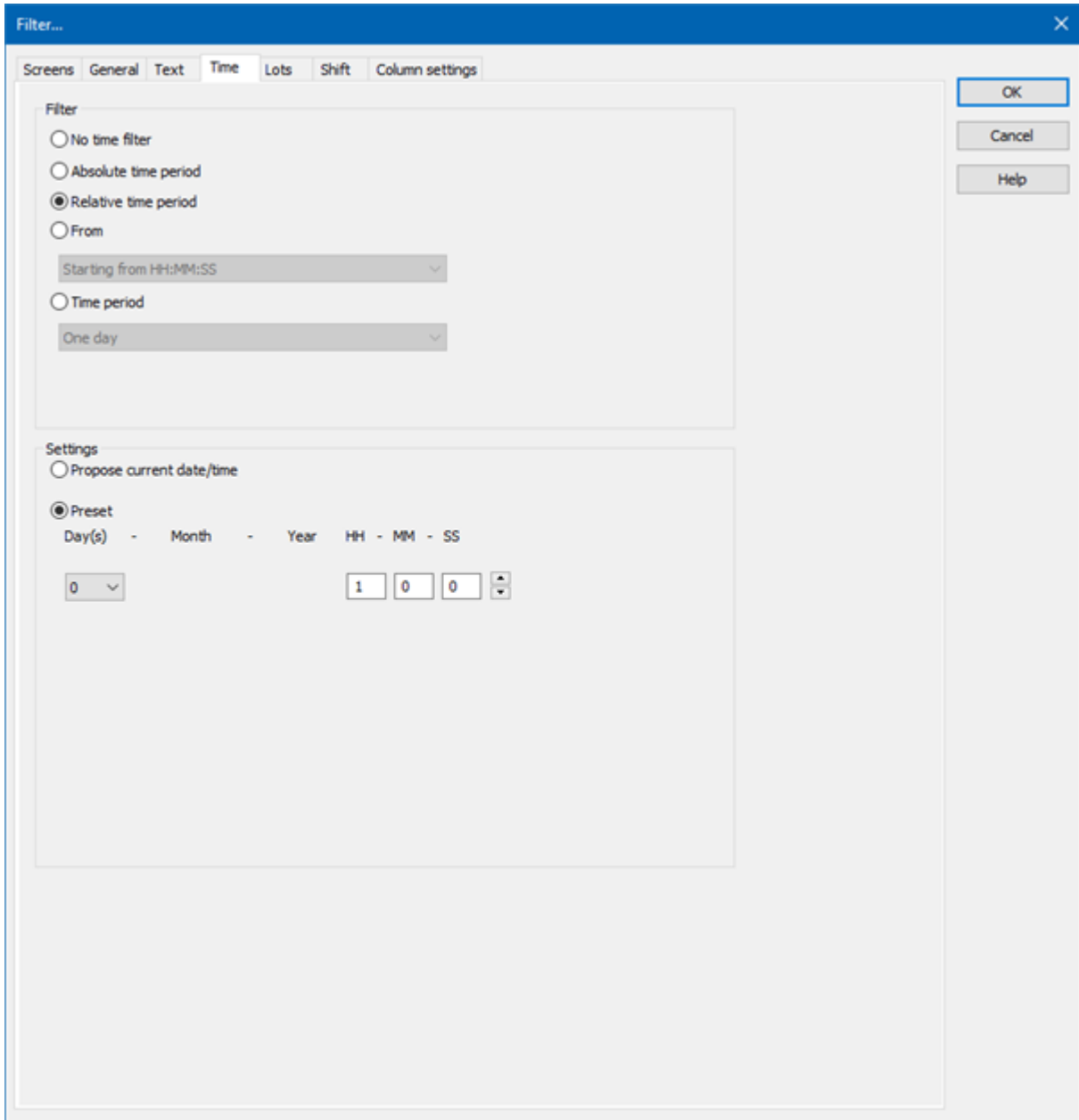
OPTIONS

Option	Description
Match case	*Active:* The filtering is case-sensitive.
Words do not need to appear in full within the text	*Active:* Parts of words can also be taken into account during filtering.
At least one word should be in the text	*Active: At least* one word from the search string has to be in the text.
All words should be in the text	*Active:* All words must be present in the search string. In doing so, the sequence plays no role.
Filter string has to appear exactly in the text	*Active:* The text must be exactly as defined in the search string.

3.7.3.4 Time

On this tab, you define the time period that is to be used when the filter screen is opened.

You can read details of the time filter options in the Filter for screen switching, Alarm Message List (on page 60)/time (on page 68) chapter.

FILTER

Selection of the filter.

Parameter	Description
No time filter	*Active*: No time filter is used. **Note:** In the Runtime, all entries since 1. 1. 1990 are displayed. Use of this filter setting is not supported by Extended Trend.
Absolute time period	*Active*: A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used. In the settings section, the corresponding options can be shown and configured there. **Note:** Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.
Relative time period	*Active*: A relative time period is entered. In the settings section, the corresponding options can be shown and configured there. **Attention:** this filter is constantly updated. **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.
From	*Active*: A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. Selection of the area mode from drop-down list: ‣ Starting from HH:MM:SS ‣ Starting from day at HH:MM:SS ‣ Starting from day, month - HH:MM:SS In the settings section, the corresponding options can be shown and configured there. **Attention:** The start point of this filter is not updated automatically. Only the existing times are used when shown. The end time point is not defined with this filter, it is carried over. **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

Parameter	Description
	reproduced data, and not at the time when the data is played back on the computer.
Time period	*Active*: A fixed time period is entered. Selection of the area mode from drop-down list:
	▸ One day
	▸ One week
	▸ Two weeks
	▸ One month
	▸ One Year
	▸ 15 minutes
	▸ 30 minutes
	▸ 60 minutes
	In the settings section, the corresponding options can be shown and configured there.
	The following selection is also enabled on activation:
	▸ **Offer selection dialog**
	▸ **Use current date/time**
	The **Modify time period** property can be activated.
	The time period can be moved to the future.
	The time period can be amended.
	Example: Create a screen switch, for example to an *AML* 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**.
	Evaluation: today's date: 22.02.2018
	Result of the time filter in the Runtime: 01.01.2018 - 31.01.2018

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.

3.7.3.5 Lots

On this tab, you can define the lots that are to be displayed.

Note: If the lot filter is activated, the shift filter is automatically deactivated. Both filters mutually exclude one another.

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	*Active*: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in the Runtime.
Apply lot filter directly	*Active*: The filter configured here is applied in the Runtime directly.
Display lot selection dialog	*Active*: The dialog for lot selection is shown in the Runtime when: ▶ Clicking on **Filter** or ▶ screen switching, if the **Show this dialog in Runtime** option has been activated (Not available for each function/screen type) **Note:** The dialog is not shown on reloading. Options can be pre-selected in the Editor.

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	▶ *Active*: The time range set in the **Time** tab is not taken into account. All completed and current lots are displayed.
Last lots	**Attention:** Only works in conjunction with the **Apply lot filter directly** option. 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. ▶ *Active*: Input of the number of lots last

Option	Description
	concluded, according to what they should be filtered for. Input of the number in the number field or configuration via arrow keys.

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.

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.

Note on compatibility:
If the project is compiled for a version before 7.11, the following is applicable: If the current lots are selected, or the combination of current and completed lots, then only the completed lots are shown in the Runtime. |
| **Display current lots** | ▸ *Active*: The current lots are displayed.

Note: If the number of lots to be displayed is greater than the number of current lots, lots that have been completed are also shown until the set limit has been reached.
Example: 3 lots are to be displayed. 1 lot is running, 5 have been completed. The one current lot and two completed lots are displayed. |
| **Display completed lots** | ▸ *Active*: The completed lots are displayed.

Note: If the number of lots to be displayed is greater than the number of completed lots, lots that have been completed are also shown until the set limit has been reached. |
| **Use time filter from "Time" tab** | ▸ *Active*: Pre-filtering is carried out with the settings of the **Time** tab.

The effective range of the filter can be amended within this time range. Select from drop-down list:

▸ *Start and end also outside filter limits*: (Default) Lots can start before the start time configured in the **Time** filter and end after the configured end time. |

Option	Description
	▸ *Start and end only outside filter limits*: Lots must start and end within the time points configured in the **Time** filter for the start and end. ▸ *Start also before filter limit*: Lots can start before the start time configured in the **Time** filter and end after the configured end time. ▸ *End also after the filter limit*: Lots can also end after the end time set in the **time** filter, but must start at or after the configured start time. ▸ *Adjust start and end to filter limits*: Lots are cut to the time points configured in the **Time** filter for the start and end.

ARCHIVE(S)

Configuration of filtering for archives. Selection of one of the following options:

▸ **No filter**

▸ **Static**

▸ **From variable**

Option	Description
No filter	*Active*: Filtering for archive names is not carried out.
Static	*Active*: Archives whose identification corresponds to the character string entered in the input field are filtered for. Input of the archive identifications in the input field: ▸ Several identifications are separated by a comma (**,**). ▸ ***** or empty: All archives, no filter.
From variable	*Active*: The value of the variables linked here is applied as a filter for archive names in the Runtime. Click on button **...** in order to open the dialog for selecting a variable. Only available for all modules if the **Apply lot filter**

Option	Description
	directly option has been selected:
	Notes for variables in the Runtime:
	▸ 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.
	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.

NAME(S)

Configuration of the filtering to names. Selection of one of the following options:

▸ **No filter**

▸ **Static**

▸ **From variable**

Option	Description
No filter	*Active*: Filtering for lot names is not carried out.
Static	*Active*: Lot names that correspond to the character string entered in the input field are filtered for.
	Input of the lot name in the input field:
	▸ Several entries are separated by a pipe character (|).
	▸ ***** or empty: All lots of all displayed archives, no filter.
From variable	*Active*: The value of the variable linked here is applied as a filter for lot names in the Runtime.
	Click on the **...** button to open the dialog for selecting a

Option	Description
	variable.
	Only available if the option **Apply lot filter directly** has been selected.
	Notes for variables in the Runtime:
	▶ 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.
	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.

3.7.3.6 Shift

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.

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:
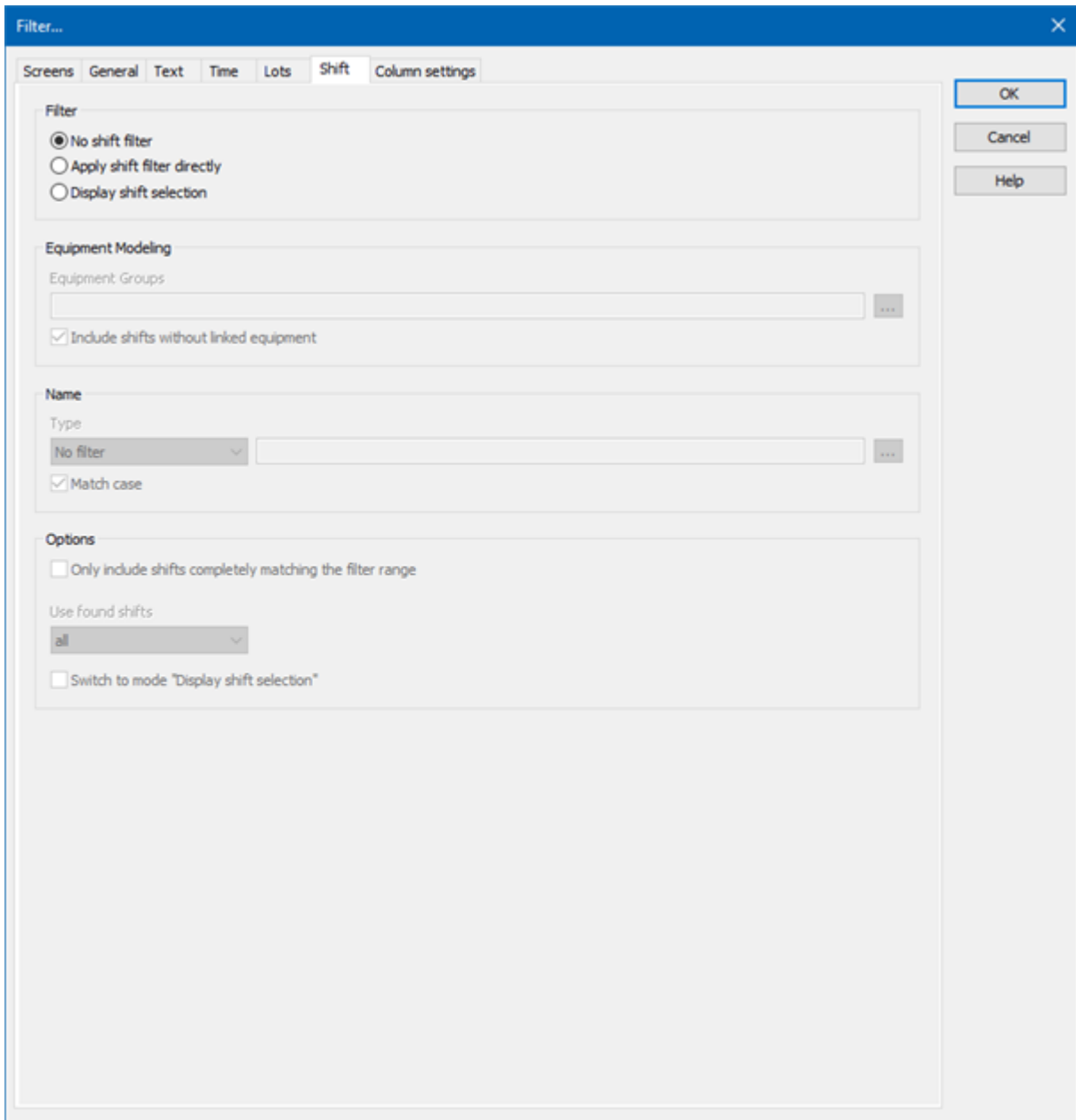
▶ Shifts are reconfigured

▶ 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

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: ▶ *Active*: The shift filter is deactivated and cannot be configured. Filtering for shifts is not carried out in the Runtime.
Apply shift filter directly	Applying the shift filter in the Runtime: ▶ *Active*: The filter configured here is applied in the Runtime directly. Equipment groups and shift names can be preselected.
Display shift selection	Display of the shift selection in the Runtime: ▶ *Active*: The dialog for shift selection is shown in the Runtime. The settings chosen in the Editor are applicable for the reading of the shifts in the Runtime. The dialog is shown in the Runtime when: ▶ Clicking on the **Filter** button. Or: ▶ Executing screen switching. **Note:** The dialog is not shown on reloading.

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 (;).
Include shifts without linked equipment	Selection of whether linking to an equipment group is necessary. ▶ *Active*: Shifts that are not linked to an equipment group are also taken into account. ▶ *Inactive*: Only shifts that are linked to at least one equipment group are taken into account.

Option	Description
	Default: *active*

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	Selection of the filter type from a drop-down list when filtering according to name: ▶ *No filter*: Filtering for names is not carried out. ▶ *Name with wildcards*: A name with placeholder can be entered into the input field. All shifts whose name is applicable for the filter are included. ▶ *Name from variable*: 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. Default: *No filter* <u>**Wildcards:**</u> ▶ *****: 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**, ... **Notes for variables in the Runtime:** ▶ 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

Option	Description
	which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable cannot be found in Runtime or the value of the variables cannot be determined, the filter is treated like the **No filter** setting.
Match case	Setting for filtering for upper/lower case ▸ *Active*: Capitalization is taken into account for names. Default: *active*

OPTIONS

Configuration of the options for filtering for shifts in the CEL.

Option	Description

Only include shifts that are fully in the filter range	Configuration of which shifts are displayed.
	
	  ▸ Active: Only shifts that are fully in the time filter set are shown.
	
	  ▸ Inactive: Shifts that start earlier and/or finish later are also shown.
	
	Default: *inactive*
	
	Example:
	
	  ▸ Time filter: Today 08:00 – 12:00.
	
	  ▸ Existing shift: Today 8:30 AM – 5:00 PM.
	
	Result for:
	
	  ▸ Option *active*: The shift is not taken into account because it is not fully in the time filter.
	
	  ▸ *Inactive* option: The shift is taken into account because it is partly in the time filter.

Use shifts found	Selection of shifts that are taken into account, from drop-down list:
	
	  ▸ *All*: All shifts found are taken into account.
	
	  ▸ *Earliest shift only*:
	Of the shifts found, only the earliest are taken into

Option	Description
	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.
	‣ *Only last shift*: 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.
	Default: *All*
	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.
	Example:
	Configuration and shifts:
	‣ **Only include shifts that are fully in the filter range** option: active.
	‣ **Use found shifts** option: *Latest shift only*
	‣ 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.
	Result:
	‣ Shift 2 is used
Switch to "Show shift selection" mode	‣ *Active*: The filter acts as with the **Show shift selection** option. The time filter is set to absolute; start and end 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.
	Default: *inactive*
	Behavior in the Runtime:
	If the shift management is set to **Show shift selection** in the Runtime, the filter options also have an effect on the shifts shown

Option	Description
	in the shift list. The shift list is filtered accordingly by clicking on the Update button.

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.

FILTER BUTTON IN THE SCREEN IN RUNTIME

If the **Filter** button is pressed in the CEL screen, the complete filter dialog including the shift selection list is shown depending on the configuration. The filter settings can thus be amended and the shift list can be updated in order to select another shift.
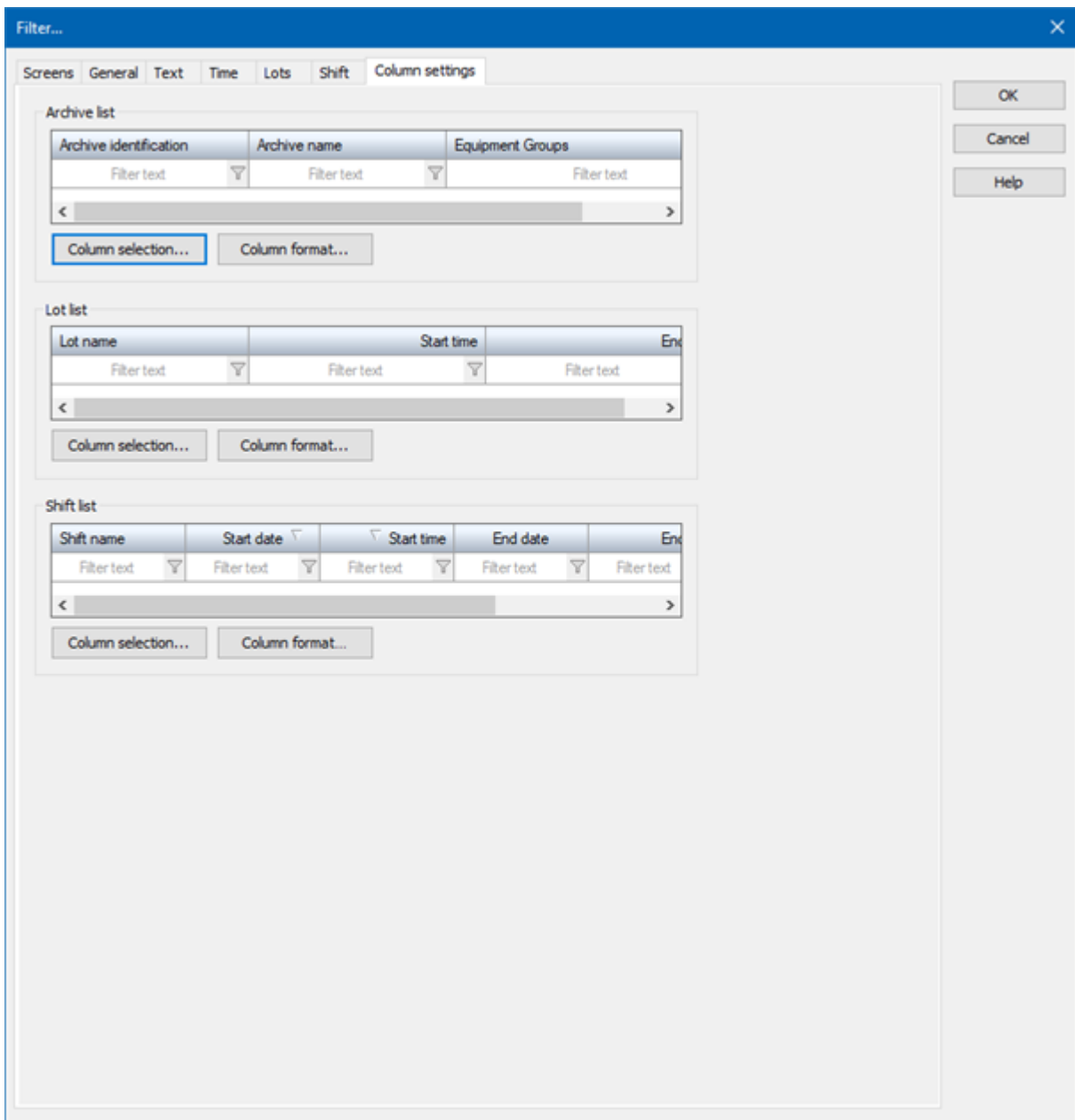
3.7.3.7 Column settings

In this tab, you define how the **archive list**, the **lot list** and the **shift list** are displayed in the Runtime:

- ▶ Selection of the columns to be displayed
- ▶ Sorting of the columns
- ▶ Formatting of columns:
  - ▶ Label
  - ▶ Width
  - ▶ Alignment

COLUMN SETTINGS DIALOG

ARCHIVE LIST

Option	Description
Archive list	Configuration of the archive list. Display of the configured columns. If you want to edit the list directly using the monitor, activate the Multi-Touch functionality. You can find detailed information in relation to this in the

Option	Description
	Configure interactions chapter.
	Longer texts can also be displayed in the Runtime over several lines using the **Automatic word wrap** property.
	In the Editor, go to **Representation** in the properties of the respective list properties and activate the checkbox of the **Automatic word wrap** property.
	The line height must be amended manually.
Column selection	Clicking on the button opens a dialog to select and sort the columns.
Column format	Clicking on the button opens a dialog to format the list.

LOT LIST

Option	Description
Lot list	Configuration of the lot list. Display of the configured columns.
	If you want to edit the list directly using the monitor, activate the Multi-Touch functionality. You can find detailed information in relation to this in the Configure interactions chapter.
	Longer texts can also be displayed in the Runtime over several lines using the **Automatic word wrap** property.
	In the Editor, go to **Representation** in the properties of the respective list properties and activate the checkbox of the **Automatic word wrap** property.
	The line height must be amended manually.
Column selection	Clicking on the button opens a dialog to select and sort the columns.
Column format	Clicking on the button opens a dialog to format the list.

SHIFT LIST

Option	Description
Shift list	Configuration of the shift list. Display of the configured

Option	Description
	columns.
	Longer texts can also be displayed in the Runtime over several lines using the **Automatic word wrap** property.
	In the Editor, go to **Representation** in the properties of the respective list properties and activate the checkbox of the **Automatic word wrap** property.
	The line height must be amended manually.
Column selection	Clicking on the button opens a dialog to select and sort the columns.
Column format	Clicking on the button opens a dialog to format the 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.

3.7.3.7.1 Column selection

Selection and sequence of the columns.
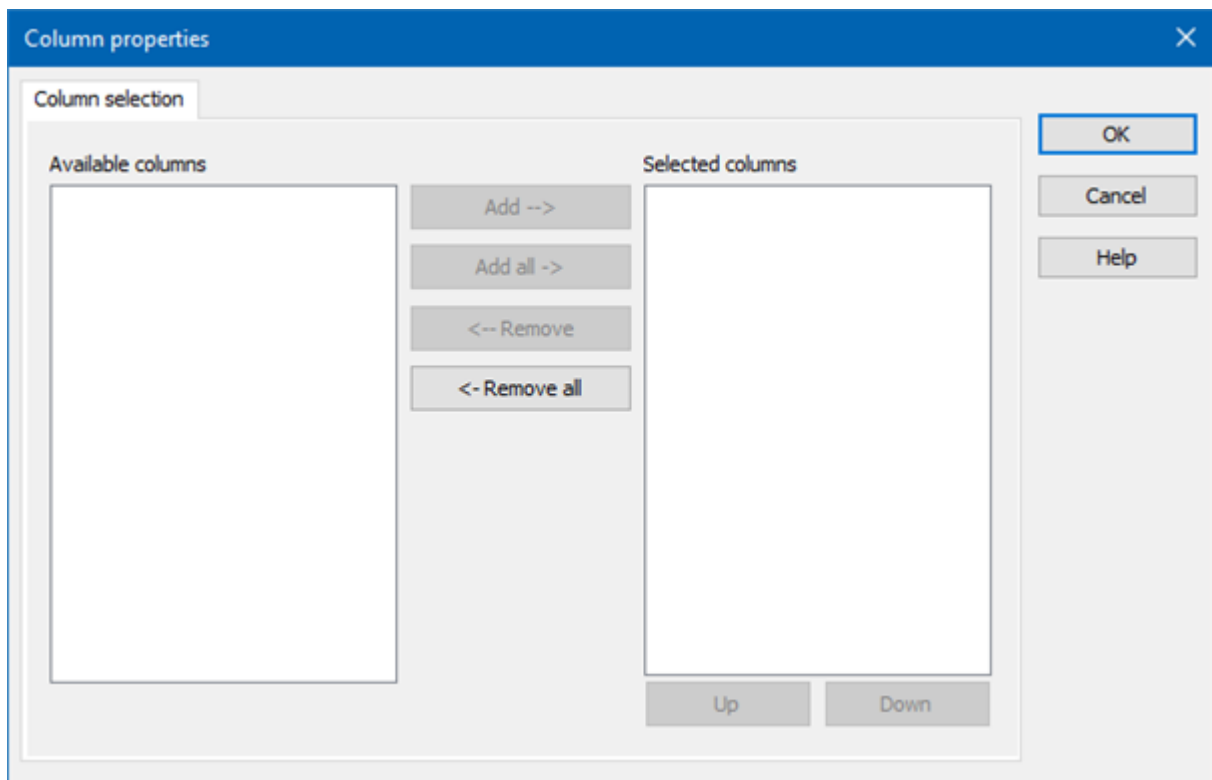
Option	Function
Available columns	List of columns that can be displayed in the table.
Selected columns	Columns that are displayed in the table.
Add ->	Moves the selected column from the available ones to the selected items. After you confirm the dialog with OK, they are shown in the detail view.
Add all ->	Moves all available columns to the selected columns.
<- Remove	Removes the marked columns from the selected items and shows them in the list of available columns. After you confirm the dialog with OK, they are removed from the detail view.
<- Remove all	All columns are removed from the list of the selected columns.
Up	Moves the selected entry upward. This function is only available for unique entries, multiple selection is not

Option	Function
	possible.
Down	Moves the selected entry downward. This function is only available for unique entries, multiple selection is not possible.

CLOSE DIALOG

Options	Description
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

3.7.3.7.2 Column Format

Configuration of the properties of the columns for configurable lists. The settings have an effect on the respective list in the Editor or - when configuring screen switching - in Runtime.
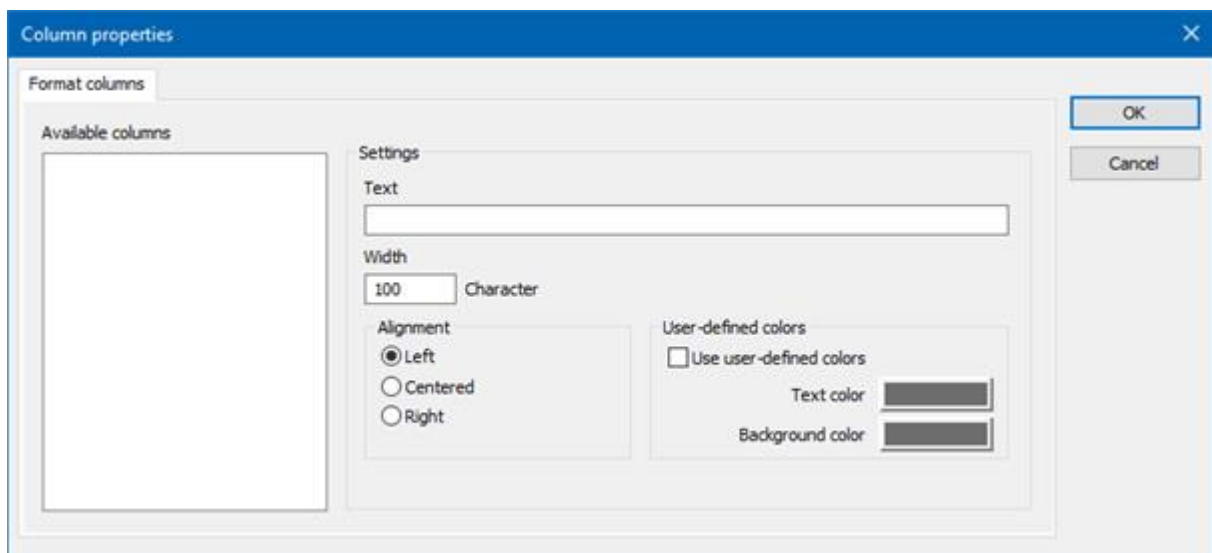
AVAILABLE COLUMNS

Option	Description
Available columns	List of the available columns via **Column selection**. The highlighted column is configured via the options in the **Settings** area.

SETTINGS

Option	Description
Settings	Settings for selected column.
Labeling	Name for column title. The column title is online language switchable. To do this, the **@** character must be entered in front of the name.
Width	Width of the column in characters. Calculation: Number time average character width of the selected font.

Alignment	Alignment. Selection by means of radio buttons.
	
	Possible settings:
	
	  ▸ **Left**: Text is justified on the left edge of the column.
	
	  ▸ **Centered**: Text is displayed centered in the column.
	
	  ▸ **Right**: Text is justified on the right edge of the column.

User-defined colors	Properties in order to define user-defined colors for text and background. The settings have an effect on the Editor and Runtime.
	
	Note:
	
	  ▸ These settings are only available for configurable lists.
	
	  ▸ In addition, the respective focus in the list can be signalized in the Runtime by means of different text and background colors. These are configured using the project properties.

User defined colors	*Active*: User-defined colors are used.
Text color	Color for text display. Clicking on the color opens the color palette to select a color.
Background color	Color for the display of the cell background. Clicking on the color opens the color palette to select a color.
Lock column filter in the Runtime	▸ *Active*: The filter for this column cannot be changed in the Runtime.

Option	Description
	Note: Only available for:
	▸ Batch Control
	▸ Extended Trend
	▸ Filter screens
	▸ Message Control
	▸ Recipegroup Manager
	▸ Shift Management
	▸ Context 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.

3.8 Functions

The display and handling of the Alarm Message List is controlled in the Runtime using functions.

⚠Attention

If functions are used in the network, regard their execution location.

3.8.1 AML screen switching

To open an *Alarm Message List filter* in the Runtime:

1. Create an Alarm Message List (on page 7) screen
2. create a screen switch function for this screen
3. define the desired filter properties (on page 56)

The filter properties can be modified in the Runtime. Exception: In the Editor fixed time filter (on page 84) was defined.

CONFIGURE SCREEN SWITCHING
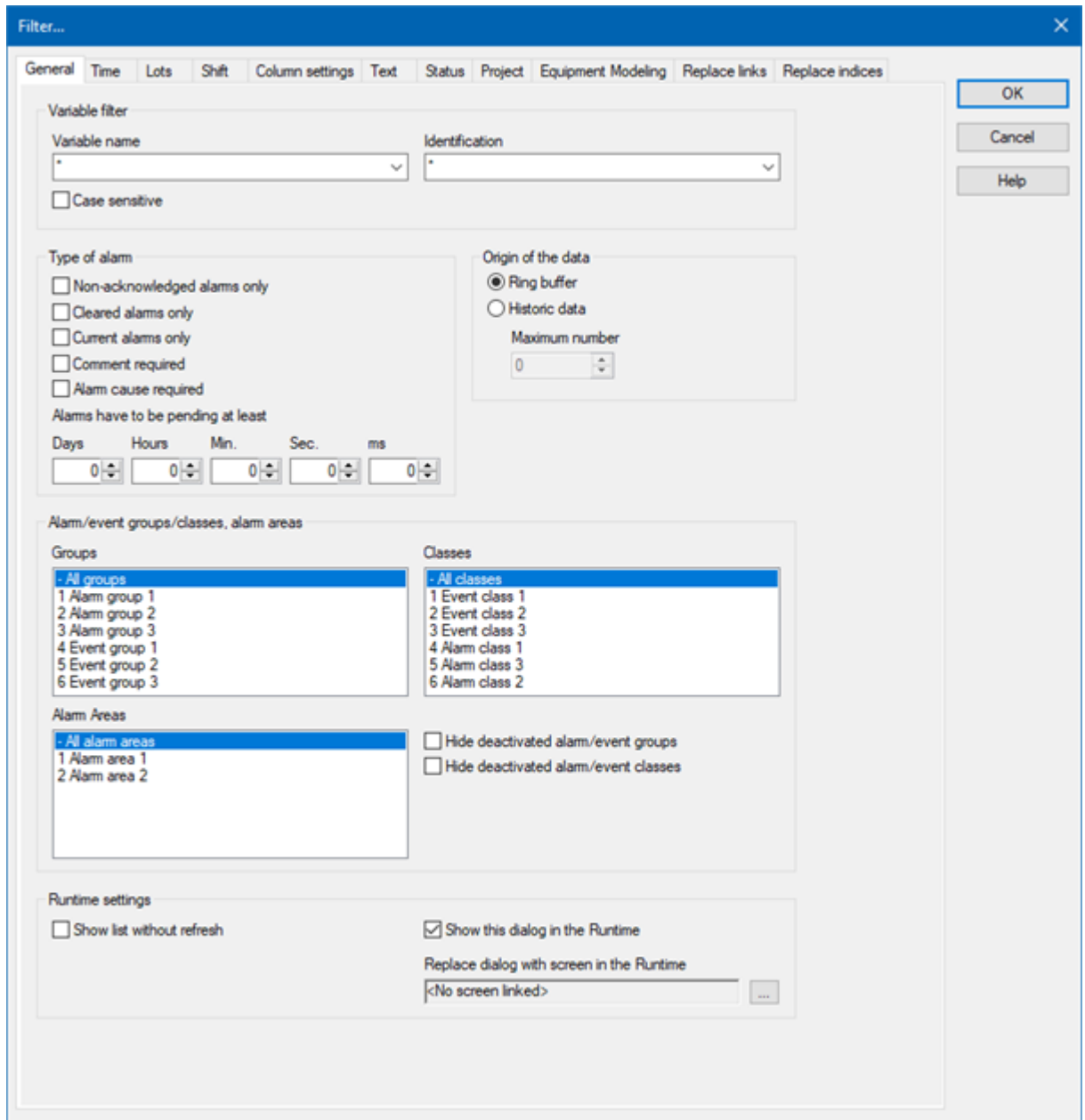
To create a screen switch to a screen of type *AML*:

1. In the context menu of the **Function** node, select the **New function** command.

2. Click on **Screen Switch**.

3. The dialog for the screen selection will be opened.

4. Select the screen of type **alarm**
   or create it in this dialog by clicking symbol **New screen**.

5. The filter is displayed with all tabs:

   ▶ General (on page 62)

   ▶ Time (on page 68)

   ▶ Lots (on page 131)

   ▶ Column settings (on page 104)

   ▶ text (on page 110)

   ▶ State (on page 112)

   ▶ Project (on page 114) (only available in the integration project of multi-project administration.)

   ▶ Equipment Modeling (on page 115)

   If linked variables or indexes are available, the following tabs can be displayed as an option.

   ▶ Replace links

▸ Replace indices

6. Define the filters that should be pre-defined in Runtime.

7. Confirm the settings and close the dialog by clicking on **OK**.

8. Link the function to a button in order to call up the screen and to display the filter properties in the Runtime.

💡 Information

If a screen that does not have a time filter is referenced, the time filters (on page 68) are deactivated.

3.8.1.1 AML screen switching filter

Several filters are offered when screen switching is created for an AML screen. For details, see the Alarm configuration using filters (on page 56) section, in the Filters for *Alarm Message List* screen switching (on page 60) chapter.

3.8.2 AML filter screen switching

To open an *Alarm Message List filter* screen in the Runtime:

1. Create an Alarm Message List filter (on page 18) screen.

2. Create a screen switch function to the screen.

3. Define the desired filter properties (on page 156)

The filter properties can only be controlled in the Runtime using the buttons defined in the screen.

CONFIGURE SCREEN SWITCHING

To create a screen switch to a screen of type **Alarm Message List Filter**:

1. In the context menu of the **Function** node, select the **New function** command.

2. Click on **screen switch**.

3. The dialog for the screen selection will be opened.

4. Select the **Alarm Message List Filter** screen
   or create it in this dialog by clicking the **New screen** symbol

5. The filter is displayed with all tabs:

   ▶ Screens (on page 119)

   ▶ General (on page 122)

   ▶ text (on page 126)

▶ Time (on page 127)
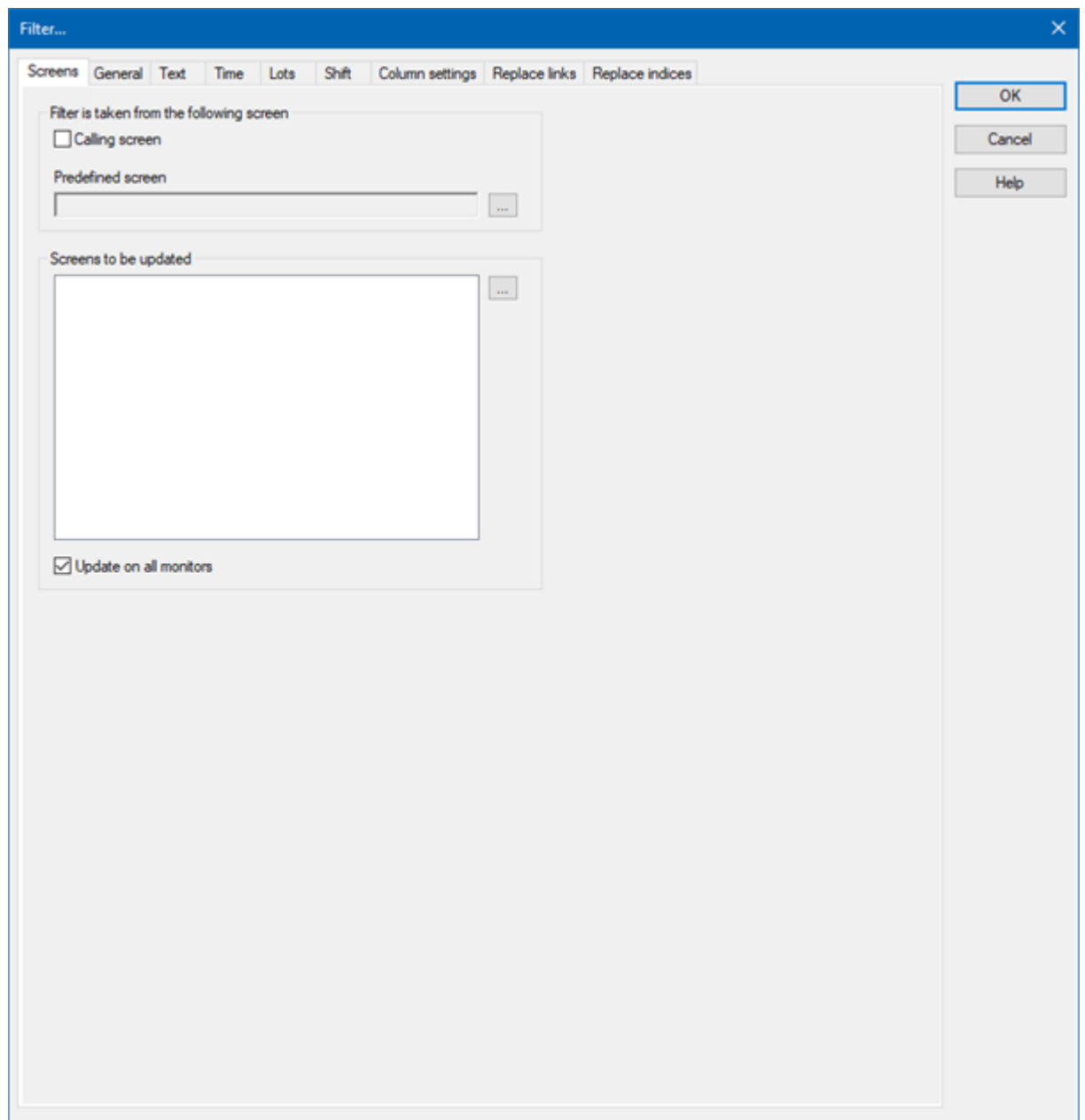
6. Define the filters that are to be pre-defined in the Runtime.

7. Confirm the settings and close the dialog by clicking on **OK**.

8. Link the function to a button in order to call up the screen and to display the filter properties in the Runtime.

3.8.2.1 AML filter screen switching filter

Several filters are offered when screen switching is created for an AML screen. For details, see Alarm configuration using filters (on page 56) section, Filters for *Alarm Message List filter* (on page 117) section.

3.8.3 Functions for alarm administration

Different functions make it possible to handle alarms in the Runtime.

To create a function for alarm administration:

1. navigate to the **Functions** node

2. select **New function** in the context menu or from the toolbar

3. the dialog for selecting functions is opened

4. navigate to the **AML/CEL** node
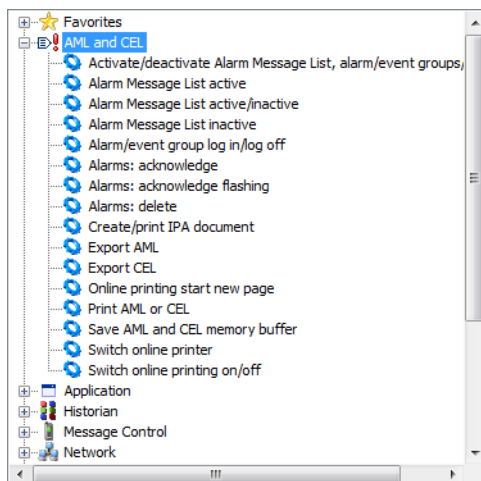
5. select the desired function

6. configure the function if necessary

7. link the function to a button

3.8.3.1 Alarm/event group log in/log off

To optimize the performance of the connection, alarm/event groups (on page 42) that are not required can be deactivated. Its variables are thus no longer requested from the driver if no other elements are linked to them. You can find detailed information on the signing-in and signing-out of variables in the Signing in variables in zenon chapter.

For the **Alarm/event group log in/log off** function, you must:

1. Define the action: logout or login

2. Define the alarm/event group.
   Only one group per function can be linked.
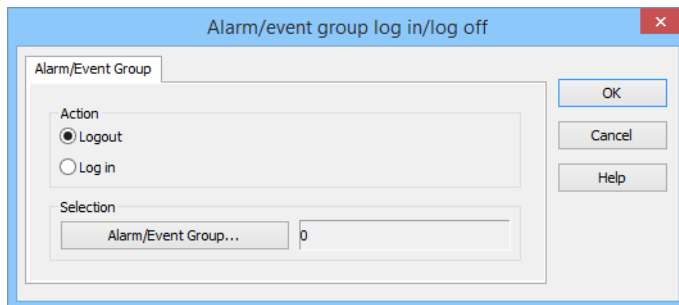
ALARM/EVENT GROUP

Option	Description
Action	Defines action. Available actions: ‣ *Logout*: Deactivates the alarm/event group ‣ *Login*: Activates the alarm/event group
Alarm/Event Group	Selection of alarm/event group. Click the button and a dialog opens to select the group.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

EXAMPLE

An alarm group bit is created in the PLC. If this bit is set, the **Alarm group active** function is called via the limit value administration. The variables are requested and the corresponding limit values in zenon are checked. The bit can be reset in the PLC. The alarm/event group can be deactivated again above a certain limit value. On program start all limit value variables are polled.

3.8.3.2 Alarms: acknowledge flashing

When flash-acknowledging (on page 210) in the Runtime, only the flash attribute of the process variables and the flashing of all graphic elements in all screens that use this variable are reset. The entry in the alarm list is not acknowledged - except if the **Flashing acknowledgement** property is active.

Note: This function is not identical to the **Use flashing from limit value** property that is defined for each element in the **Use flashing from limit value** group of the element properties. The function relates to the flashing of the element content, for example *text*. The **Use flashing from limit value** property relates to the whole element.

ENGINEERING OF A FUNCTION

To acknowledge the flashing of alarms in the Runtime:

1. Create a new function (on page 156).

2. Select the **Alarms: acknowledge flashing** function in the **AML and CEL** group.

3. Select the frame you wish to assign

4. Select the desired monitor for multi-monitor systems
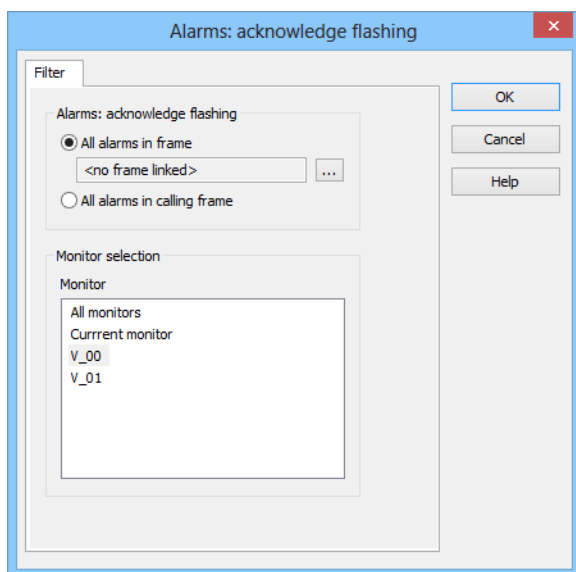
ALARMS: ACKNOWLEDGE FLASHING

Option	Description
Alarms blink acknowledgment	Configuration of which alarms are to be flash-acknowledged.
All alarms in the frame	All alarms on screens of a frame with the selected name are flash acknowledged, even if it is open several times. Click on the **...** button to open the dialog to select a frame. For details, see the **Frame selection dialog** (on page 159) section.
All alarms in the calling frame	The alarms on the screen of the calling frame are flash-acknowledged. With this option selected, the monitor selection cannot be configured

Option	Description
	manually.

MONITOR SELECTION

Option	Description
Monitor selection	Configuration of the monitor for which flash acknowledgment of the alarms is to be configured.
Monitor	Selection of the monitor from the list: ▸ **All monitors** ▸ **Current monitor** ▸ Selection of a virtual monitor Only available for Multi-monitor systems and only for the **All alarms in the frame** option.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

3.8.3.2.1 Frame selection dialog

In the **frame selection** dialog, frames can be selected for the execution of functions, from:

▸ Current project

▸ Subprojects

▶ All projects in the workspace with the **Keep project in memory** option active
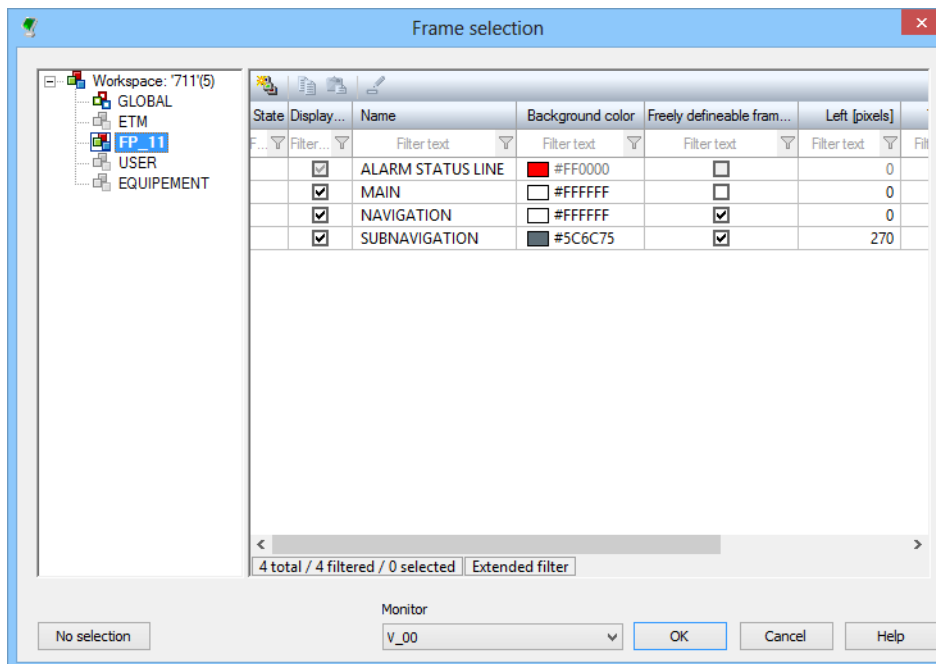
Parameter	Description
Project tree window	Displays all projects in the workspace. Frames can be selected from the current project and from all projects with the **Keep project in memory** option active.
Frames window	Selection of a frame. If several frames are selected, the frame at the top of the list is used to execute the function.
No selection	Removes selection and closes dialog.

Note: The size of this dialog can be adjusted. The position and size of the dialog window are saved in the Editor, Runtime and zenon Web Client independently of the project.

3.8.3.2.2 Examples of alarm acknowledgment in the Runtime

EXAMPLE 1

The following were configured:

▶ **Frame_1** (red) with the variables **Var_1**, **Var_2** and **Var_3**

▶ **Frame_2** (green) with the variables **Var_1** and **Var_2**

Monitor 1   Monitor2
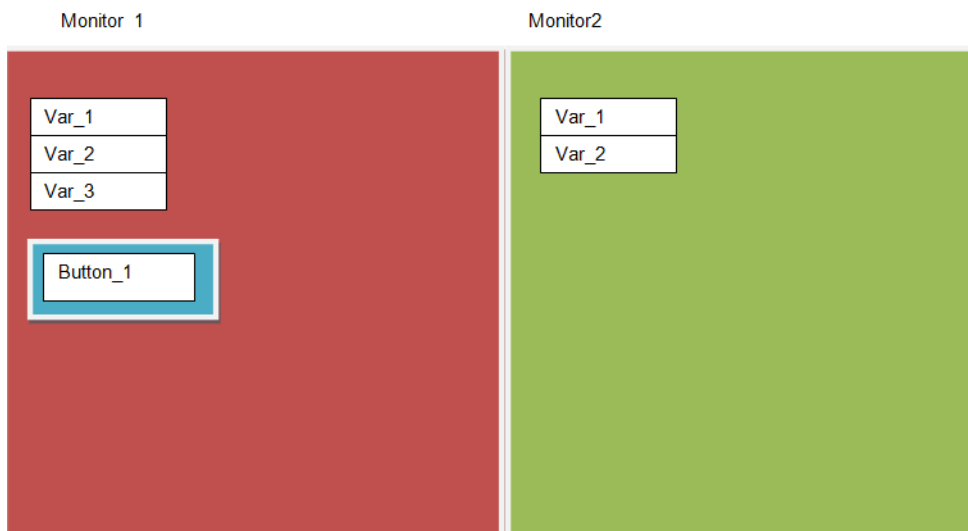
Initial situation:

▶ **Frame_1** is switched to **Bildschirm_1**.

▶ **Frame_2** is switched to **Bildschirm_2**.

▶ All three variables flash due to a limit value violation.

Reactions to the execution of the **Alarms: acknowledge flashing** function:

▶ Execution on **Frame_2** on **Bildschirm_1**: Nothing happens, because this frame is not present on **Bildschirm_1**.

▶ Execution on all monitors or on **Monitor_2**: All variables of the frame are flash-acknowledged. This means: **Var_1** and **Var_2** are flash-acknowledged. **Var_3** continues to flash

EXAMPLE 2

There is **Button_1** on **Frame_1**. This flash-acknowledges the calling frame. If this button is pressed, **Var_1**, **Var_2** and **Var_3** are flash-acknowledged.

EXAMPLE 3
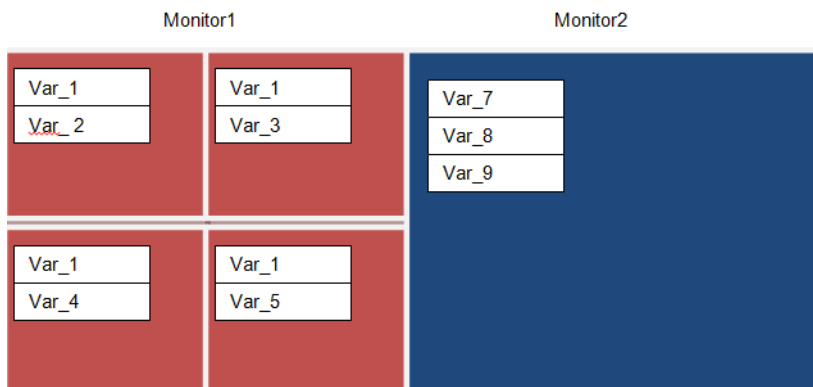
Initial situation:

▶ **Frame_1** (red) is switched to **Bildschirm_1** 4 times. This frame contains certain variables. However it contains other variables in each frame due to substitution. The only common one is **Var_1**.

▶ **Frame_2** (blue) is switched to **Bildschirm_2**. This frame contains different variables to **Frame_1**.

Reactions to the execution of the **Alarms: acknowledge flashing** function:

If Frame_1 is now flash-acknowledged on this monitor - or on all monitors - then:

▶ The command is flash-acknowledged on all frames on this monitor

▶ And thus on all variables of **Frame_1**

This means:
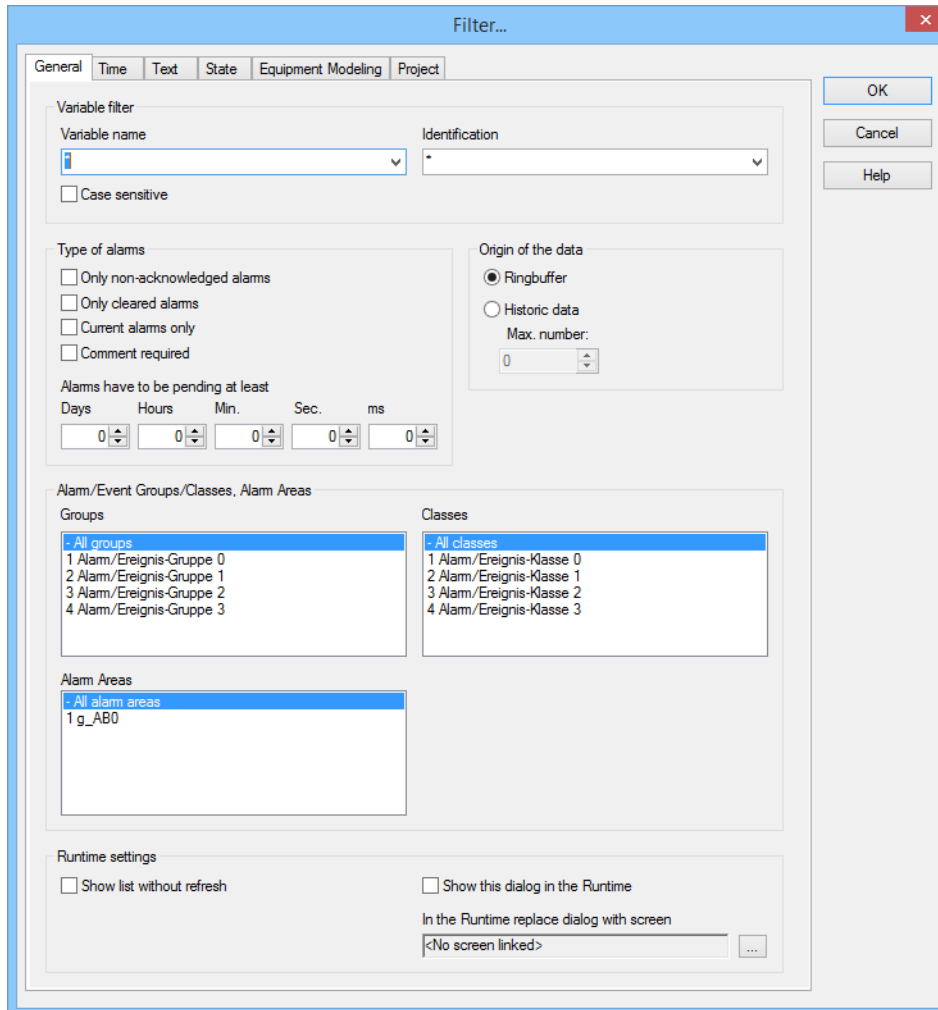
▶ **Var_1** to **Var_5** are flash acknowledged

▶ **Var_7** to **Var_9** continue to flash

3.8.3.3 Confirm alarm acknowledgment

Use the **Confirm alarm acknowledgement** function to confirm the acknowledgment of alarms jointly via filter criteria:

1. Create a new function (on page 156).

2. Select **Confirm alarm acknowledgement**.

The dialog for selecting filter criteria opens.

This corresponds to the filter criteria in the screen switching.

3. Define the criteria for:

   ▸ General (on page 62)

   ▸ Time (on page 68)

   ▸ Text (on page 110)

   ▸ Status (on page 112)

4. Link the function to a button.

USER AUTHORIZATION

The functions **Acknowledge alarms** (on page 164)and **Confirm alarm acknowledgment** (on page 162) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.

In addition, for the limit values, it is possible to use the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group to set an additional operating authorization. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.

If the **Two-stage acknowledgement** property is set, alarms are then only removed from the list of active alarms if their acknowledgment has been confirmed. Acknowledgment alone is not sufficient.

3.8.3.4 Acknowledge alarms

With this function, you acknowledge alarms from the Alarm Message List in the Runtime. Most importantly, global acknowledgment (on page 206) is possible with this.

When activating this function in Runtime, the flashing attribute of the variables and therefore screen alarming (only present for SICAM 230) will also be reset.
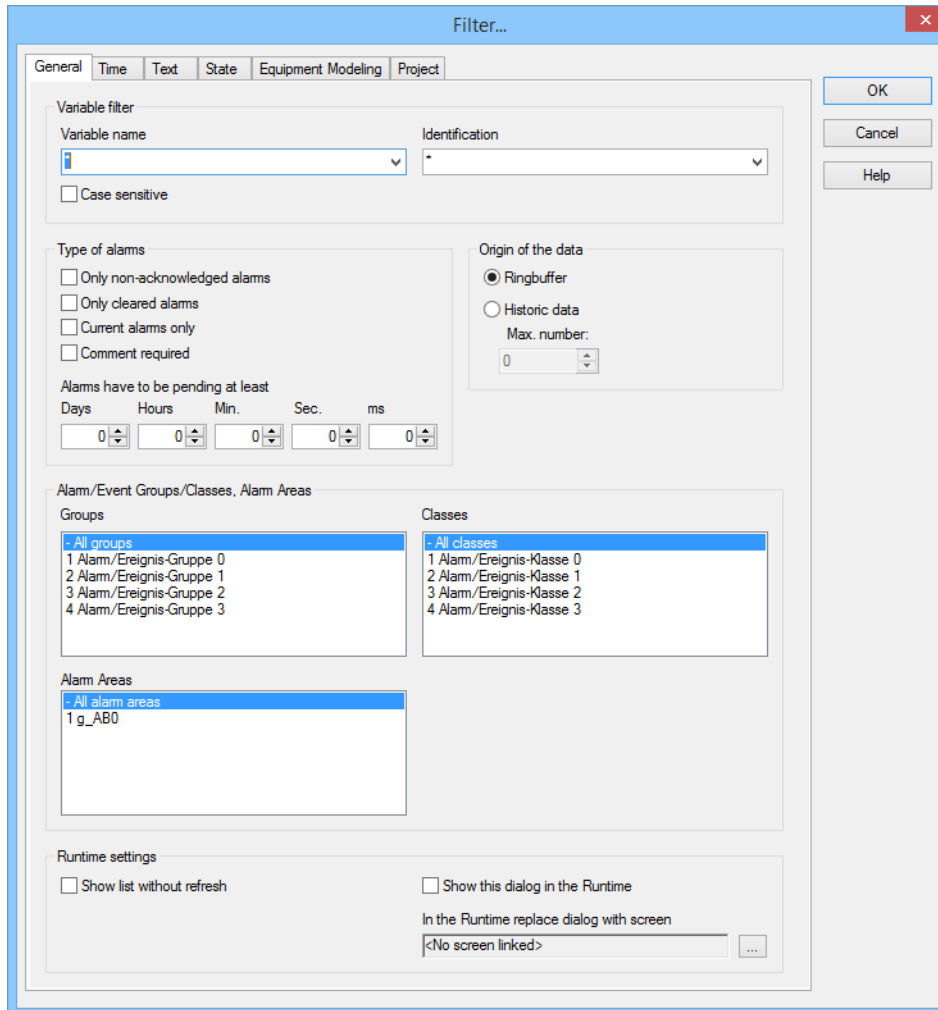
Note: All alarms of the linked variable are always acknowledged when acknowledging.

ENGINEERING

To acknowledge alarms with this function:

1. Create a new function (on page 156).
2. Select the **Acknowledge alarms** function in the **AML and CEL** group.

The dialog to select the filter criteria is opened.
(similar to filter criteria in screen switching)

3. Define the criteria for:

‣ General (on page 62)

‣ Time (on page 68)

‣ text (on page 110)

‣ State (on page 112)

‣ Equipment Modeling (on page 115)

‣ Project (on page 114) (only available in the integration project of multi-project administration)

4. Link the function to a button.

USER AUTHORIZATION

The functions **Acknowledge alarms** (on page 164)and **Confirm alarm acknowledgment** (on page 162) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.

In addition, for the limit values, it is possible to use the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group to set an additional operating authorization. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.

If the **Two-stage acknowledgement** property is set, alarms are then only removed from the list of active alarms if their acknowledgment has been confirmed. Acknowledgment alone is not sufficient.

3.8.3.5 Alarm Message List active

This function switches the status of the Alarm Message List in the Runtime to *active* when selected.

3.8.3.6 Alarm Message List active/inactive

This function switches the status of the Alarm Message List in the Runtime between *active* and *inactive* when selected.

3.8.3.7 Alarm Message List inactive

This function switches the status of the Alarm Message List in the Runtime to *inactive* when selected.

3.8.3.8 Activate/deactivate Alarm Message List, alarm/event groups/classes

The function makes it possible to activate or deactivate alarms of a certain group or class (on page 41) or all alarms of the AML or to switch between these two states.
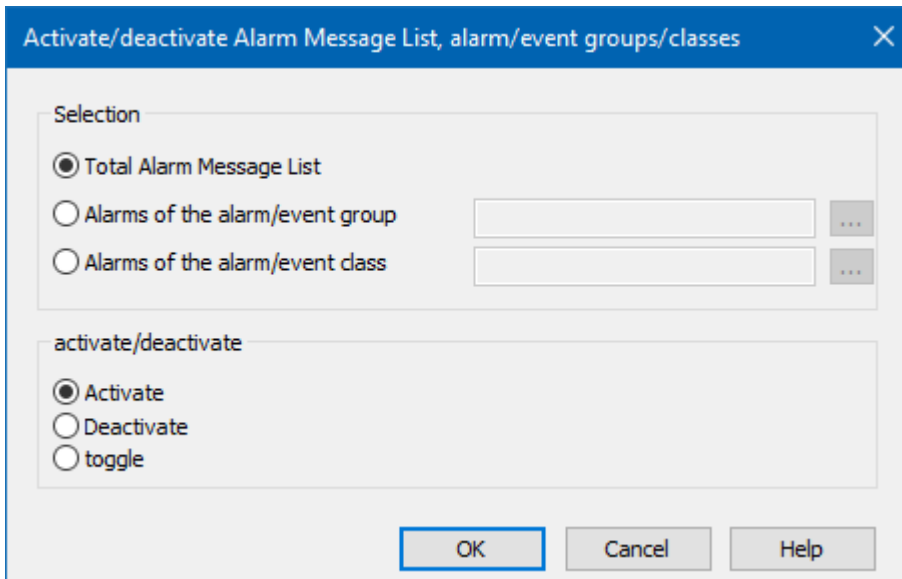
To activate or deactivate alarms:

1. Create a new function (on page 156).

2. Select, under **AML and CEL Alarm message list, Activate/deactivate alarm/event groups/classes**

   The dialog to select alarms opens

3. Define the criteria for the function

4. Link the function to a button.

SELECTION

Selection of alarm type.

Option	Description
Overall Alarm Message List	Function applies for the whole alarm message list.
Alarms of the alarm/event group	Function applies for a certain group. Selection: Click on the **...** button to open the selection dialog.
Alarms of the alarm/event class	Function applies for a certain class. Selection: Click on the **...** button to open the selection dialog.

ACTIVATE/DEACTIVATE

Selection of the desired action of the function.

Option	Description
activate	Activates selected element.
deactivate	Deactivates selected element.
toggle	Switches state (active/inactive).

3.8.3.8.1 Dialog to select alarm/event group

In this dialog, you can create, filter, edit and select alarm/event groups.

TOOL BAR, CONTEXT MENU AND DESCRIPTION OF THE DIALOG

Symbols	Description
New alarm/event group	Creation of a new alarm/event group
Remove all filters	Resetting of the filter settings
Edit selected cell	Editing of a highlighted cell
Replace text in selected column...	Finding and replacing of text in highlighted columns
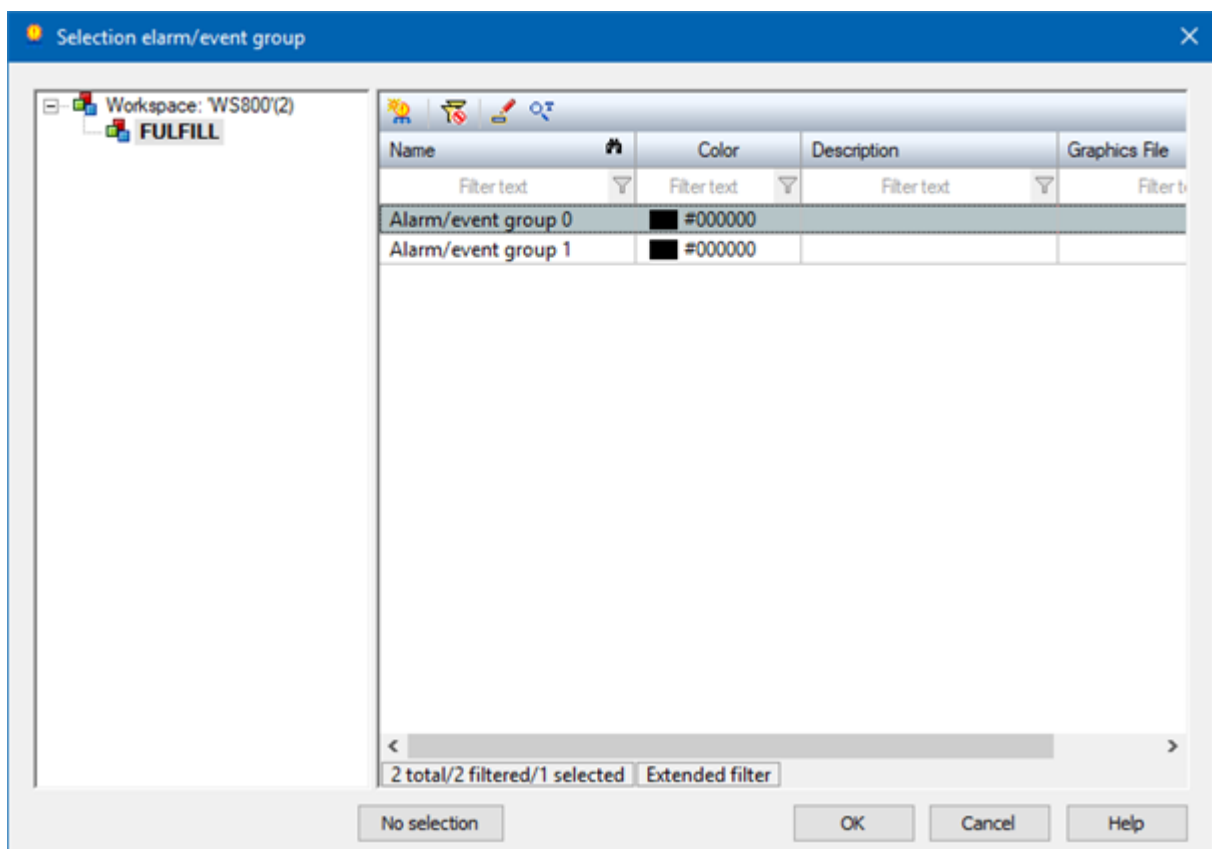
Option	Description
Project Manager	Shows the local project used.
Detail view	Details for the module selected in the Project Manager.

Option	Description
No selection	Allows the closing of the dialog, without previously having made a selection. If an alarm/event group has already been selected, this selection is deleted.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

Selection of an alarm/event group.

Configure using the **Alarm message list, Activate/deactivate alarm/event groups/classes** dialog

1. Select, under **Selection of alarms of the alarm/event group**.

2. Click on the **...** selection button.

   The **Selection of alarm/event group** dialog is opened.

3. Highlight the desired **alarm/event group**. You can also create a new entry if there is no entry present. To do this, click on the tool bar or in the context menu on the **New alarm/event group** symbol.

4. Confirm the selection by clicking on **OK**.

   The dialog is closed. The selected alarm/event group is entered into the text field.

   Note: If you open the selection dialog again and select **None**, the selection in the text field behind **Alarms of the alarm/event group** are deleted.

3.8.3.8.2 Dialog to select of alarm/event class

In this dialog, you can create, filter, edit and select alarm/event classes.

TOOL BAR, CONTEXT MENU AND DESCRIPTION OF THE DIALOG

Symbol	Description
New alarm/event class	Creation of a new alarm/event class
Remove all filters	Resetting of the filter settings
Edit selected cell	Editing of a highlighted cell
Replace text in selected column...	Finding and replacing of text in highlighted columns
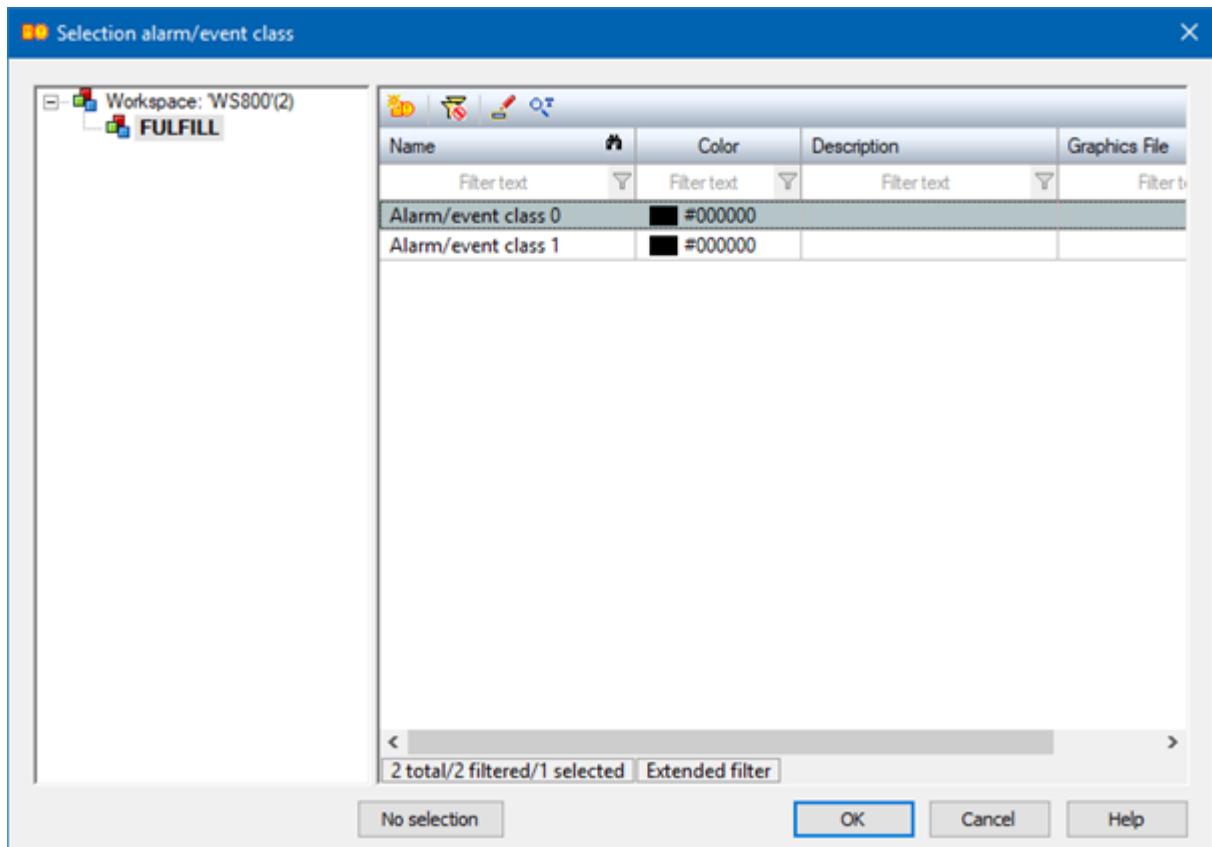
Option	Description
No selection	Allows the closing of the dialog, without previously having made a selection. If an alarm/event class has already been selected, this selection is deleted.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

Selection of an alarm/event class

Configure using the **Alarm message list, Activate/deactivate alarm/event groups/classes** dialog

1. Select, under **Selection of alarms of the alarm/event class**.

2. Click on the **...** selection button.

   The **Selection of alarm/event class** is opened.

3. Highlight the desired **alarm/event class**. You can also create a new entry if there is no entry present. To do this, click on the tool bar or in the context menu on the **New alarm/event class** symbol.

4. Confirm the selection by clicking on **OK**.

The dialog is closed. The selected alarm/event class is entered into the text field.

Note: If you open the selection dialog again and select **None**, the selection in the text field behind **Alarms of the alarm/event class** is deleted.
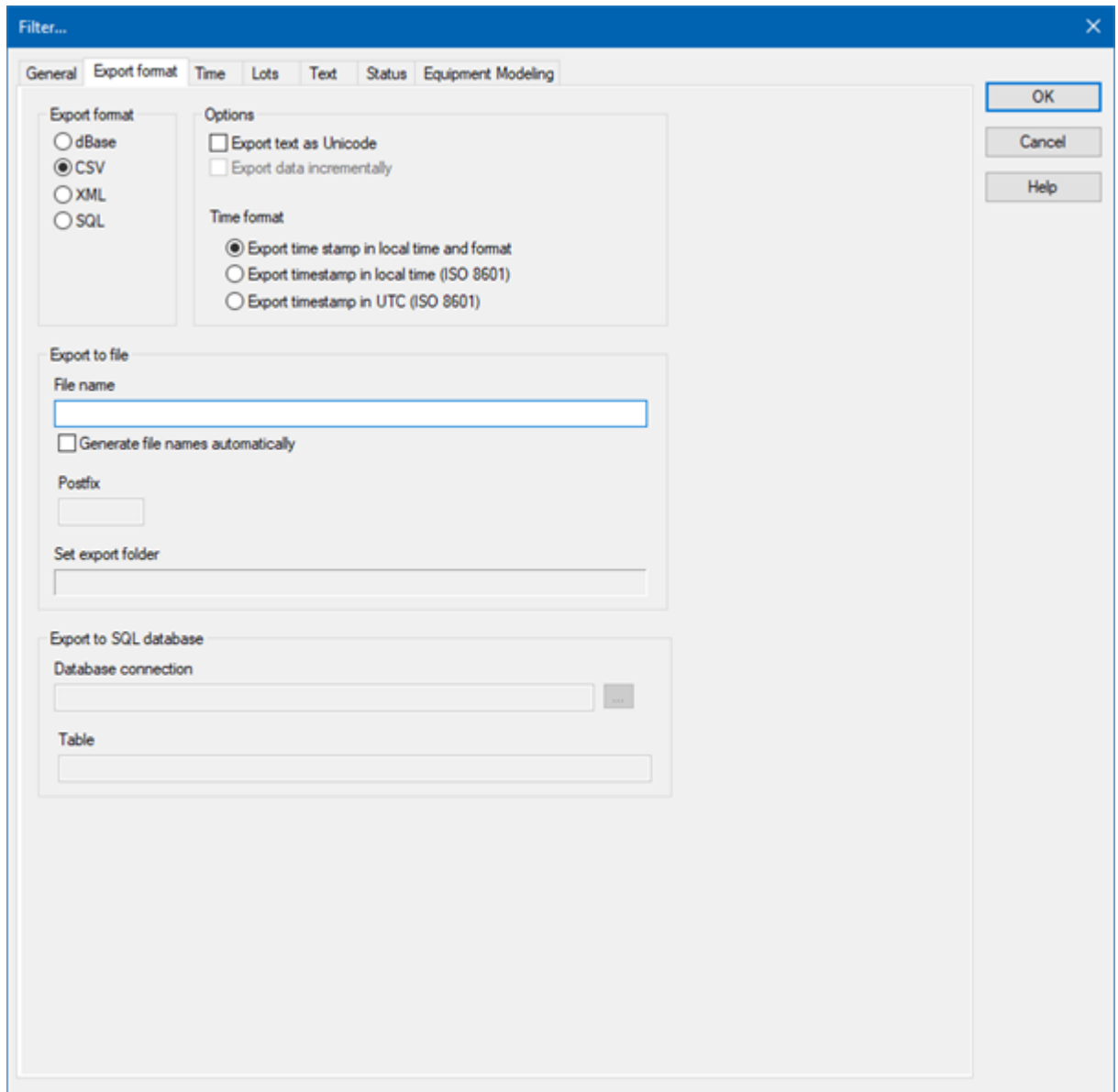
3.8.3.9 Export AML

With this function, you can export the alarms saved with filter conditions to a file or database in the Runtime.

To export alarms:

1. Create a new function (on page 156).

2. Select **Export AML.**

The dialog for selecting the filter criteria opens.

3. Define the criteria for:

▸ Export format (on page 173)
and configure the required filters. These correspond to those in the screen switch to AML:

▸ General (on page 62)

▸ Time (on page 68)

▸ text (on page 110)

▸ State (on page 112)

▸ Equipment Modeling (on page 115)

▶   Project (on page 114)

4.   Link the function to a button.

3.8.3.9.1 Export format

Exports can be carried out in different formats. Which columns are exported, and how, depends on the source (AML/CEL) and the export format:

Data is exported in different ways for:

▶   CSV (on page 178)

▶   dBase (on page 178)

▶   SQL (on page 181)

▶   XML (on page 178)
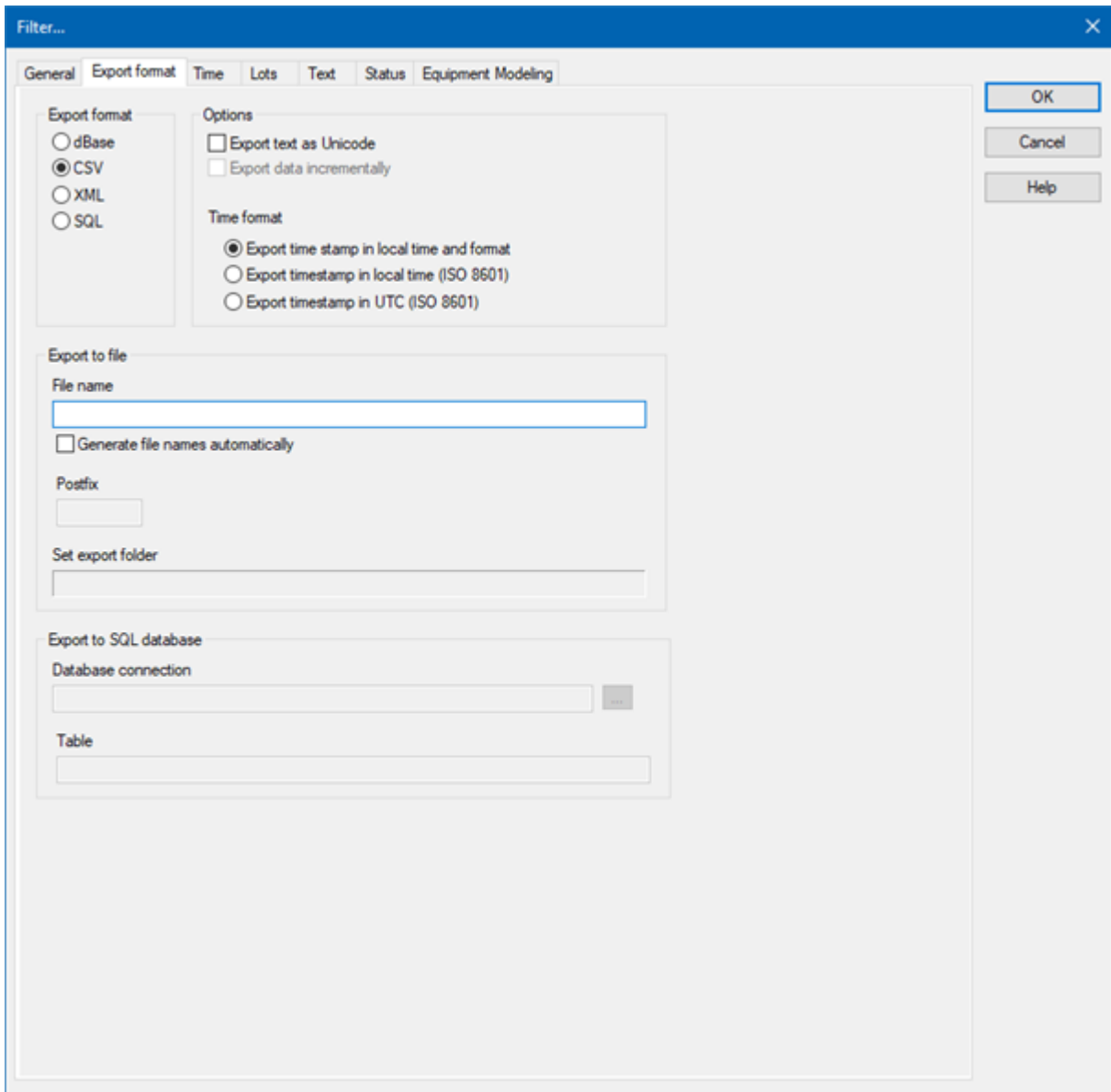
> 💡   **Information**
>
> The export to SQL is incremental. If there is data that has already been exported, only new and amended data is exported.

COLUMN SELECTION

The selection of the columns to be exported depends on the export format:

▶   *CSV*, *DBF* and *XML*: Selection using the dialog (on page 57) of the **Column settings AML** project property for the AML and **Column settings CEL** for the CEL.

▶   *SQL*: Pre-defined columns are exported.

CONFIGURE EXPORT

EXPORT FORMAT

Parameter	Description
Export format	Selection of the file type. Possible formats:
	▶ dBase: DBaseIV format (*.dbf):
	▶ CSV
	▶ XML
	▶ SQL

Parameter	Description
	Notes on dBase:
	▸ Filenames cannot be longer than eight characters.
	▸ Configured column width is used for export. If, for example, a value of 40 is set under **Column settings**, a maximum of 40 characters is then exported.
	▸ A maximum of 255 characters are exported.

OPTIONS

Parameter	Description
Options	
Export as unicode	An export to ASCII format is performed in Unicode
Incremental export	Only differences since the last backup are exported.

TIME FORMAT

Parameter	Description
Time format	Definition of the format in which time is saved.
Export time stamp in local time and format	Time stamp is exported in the local time and the local format.
Export time stamp in local time (ISO 8601)	Time stamp is exported in UTC time plus time lag.
Export time stamp in UTC (ISO 8601)	Time stamp is exported in Coordinated World Time (UTC). UTC is shown as a world time everywhere where a uniform time scale is needed.

EXPORT TO FILE

Parameter	Description
Export to file	Determining the file in which the export is saved.
File name	Define file name individually. A maximum of 32 alphanumeric characters including file suffix. **Note:** Existing files with the same names are overwritten.

Parameter	Description
Generate file name automatically	▸ *Active*: The file name will be generated automatically from a short identifier, a date key and an individual postfix. *Inactive*: The file name is entered by the user under **Filename**. For details, see the table: **Coding name for automatic naming** **Note:** Existing files with the same names are overwritten.
Postfix	Free, individual identification. Only available for **Generate filename automatically**. Possible entries: ▸ dBase: 1 alphanumeric character ▸ ASCII and XML: 32 alphanumeric characters
Example	Display of the complete file name with automatic generation.
Set export folder	Display of the current export path configured in Project Properties. (**Runtime folder** property in the **General**/**Name/Folder** node.)
Export to SQL database	Parameters for export into a SQL database
Database connection	Configuration of the database connection. A click on the **...** button opens the configuration dialog.
Table	Selection of the table that is to be written in.

CODING NAME FOR AUTOMATIC NAMING

Name	AJJMMTTP.XXX
A	Short identification of the Alarm Message List
YYMMDD	Date input: ▸ YY: Year, two-digits ▸ MM: Month, two-digits ▸ DD: Day, two-digits
P	Free, individual identification: ▸ dBase: 1 alphanumeric character ▸ ASCII and XML: 32 alphanumeric characters

Name	AJJMMTTP.XXX
XXX	File ending: ▸ DBF: dBase ▸ TXT: CSV ▸ XML: XML

FORMAL MATTERS

▸ Format of the line entries: Is taken from the settings of the **Column settings AML** or **Column settings CEL** property.

▸ Column separator: Semi-colon (**;**)

> **⚠ Attention**
>
> Milliseconds for printing or export
>
> If, when printing or exporting the AML or CEL to CSV, XML or dBase format, the time in milliseconds is to be given, this property must be activated in the dialog for the column settings (on page 104). To do this:
>
> ▸ Go to the **Alarm Message List** or **Chronological Event List** nodes in the project properties.
>
> ▸ Click on the **...** button of the **Column settings AML** or **Column settings CEL** property.
>
> ▸ The dialog for the column settings is opened.
>
> ▸ Activate the checkbox in front of the **Milliseconds** property.
>
> The additional setting must be made for both AML and CEL.

NOTES SQL

> **⚠Attention**
>
> Ensure that the provider configured in the connection is also available on the Runtime computer in the Runtime.
>
> **Note:** An SQL client is also installed with the zenon Editor. Because the zenon Runtime does not need an SQL Server, no SQL client is automatically installed. This can be downloaded from the Microsoft website and must be installed individually.
>
> Ensure you install the correct version when installing the provider. This must suit the zenon version being used. This means: If a 32-bit zenon Runtime is used, the provider must be a 32-bit version. This also applies if it is installed on a 64-bit operating system and also if the database itself is a 64-bit application.

> **⚠Attention**
>
> When using **Native Client 10** and **11**, the password is not automatically carried over to the provider string. It must be entered manually
>
> e.g.: ...;**User ID=sqlExampleUser1;Password=secretPassword;...**

3.8.3.9.2 CSV: Exported columns

Export to CSV is mostly for further processing in other applications. The data is exported according to the selection in **Column settings AML** or **Column settings CEL**:

▸ Only data from the selected columns is exported.

▸ The sequence in the export file corresponds to the one defined in the dialog.

▸ Separator: Semi-colon (**;**)

▸ Column titles are not exported.

3.8.3.9.3 dBase: Exported columns

For exporting to a dBase file, the data are exported according to the selection in the project properties **Column settings AML** or **Column settings CEL**. Only data from the selected columns is exported:

Column	Type	Size	Description
DATUM_KOMM	*Date*	8	Alarm occurred: Date.
ZEIT_KOMMT	*Character*	10	Alarm occurred: Time.
MILLI_KOMM	*Numeric*	3	Alarm occurred: Milliseconds.
DATUM_GEHT	*Date*	8	Alarm ended: Date.
ZEIT_GEHT	*Character*	10	Alarm ended: Time.
MILLI_GEHT	*Numeric*	3	Alarm ended: Milliseconds.
DATUM_OK	*Date*	8	Alarm acknowledged: Date.
ZEIT_OK	*Character*	10	Alarm acknowledged: Time.
ALARMTEXT	*Character*	40	Limit value text.
TAG_NR	*Character*	40	Variable identification.
KOMMENTAR	*Character*	45	Comment.
STATUS	*Character*	4	Status of variable.
DATUM_REA	*Date*	8	Alarm reactivated: Date.
ZEIT_REA	*Character*	10	Alarm reactivated: Time.
MILLI_REA	*Character*	3	Alarm reactivated: Milliseconds
ANZ_REA	*Character*	3	Alarm reactivated: Meter.
STAT_REA	*Character*	1	Alarm reactivated: Variable status.
WERT	*Character*	10	Variable value.
USER	*Character*	6	User identification.
COMPUTER	*Character*	48	Computer name.
VAR_NAME	*Character*	32	Variable name.
RESLABEL	*Character*	15	Resources label.
PROJ_NAME	*Character*	31	Project name
CLASS	*Character*	31	Name of the alarm class.
GROUP	*Character*	31	Name of the alarm group.
CAUSE	*Character*	255	Alarm cause text.

Column	Type	Size	Description
GROUPID	*Numeric*	3	ID of the group.
CLASSID	*Numeric*	3	Class ID
USERNAME	*Character*	3	Full user name.
ALARMAREA	*Character*	3	Alarm areas. Delimiter: Comma (,)
ALARMAREAN	*Character*	3	Number of alarm areas. Separator: Comma (,)
UNIT	*Character*	3	Measuring unit of affected variable.
D_GEHT_INT	*Date*	8	Internal leave time Date.
Z_GEHT_INT	*Character*	10	Internal leave time Time.
M_GEHT_INT	*Numeric*	3	Internal leave time Milliseconds.
D_GEHT_EXT	*Date*	8	External leave time Date.
Z_GEHT_EXT	*Character*	10	External leave time Time.
M_GEHT_EXT	*Numeric*	3	External leave time Milliseconds.
D_REA_INT	*Date*	8	Internal reactivate time Date.
Z_REA_INT	*Character*	10	Internal reactivate time Time.
M_REA_INT	*Numeric*	3	Internal reactivate time Milliseconds.
D_REA_EXT	*Date*	8	External reactivate time Date.
Z_REA_EXT	*Character*	10	External reactivate time Time.
M_REA_EXT	*Numeric*	3	External reactivate time Milliseconds.
D_KOMM_INT	*Date*	8	Internal Arrive Time Date.
Z_KOMM_INT	*Character*	10	Internal Arrival Time Time.
M_KOMM_INT	*Numeric*	3	Internal arrival time: Milliseconds.
D_KOMM_EXT	*Date*	8	External Arrival Time Date.
Z_KOMM_EXT	*Character*	10	External arrival time: Time.
M_KOMM_EXT	*Numeric*	3	External Arrival Time Milliseconds.

Column	Type	Size	Description
EQUIPMENT	*Character*	*3*	Equipment Model. Analogous to the column setting. Corresponds to the CEL/AM setting L.
D_LAST_MOD	*Date*	*8*	Time of last change: Date.
Z_LAST_MOD	*Character*	*10*	Time of last change: Time.
M_LAST_MOD	*Numeric*	*3*	Time of last change: Milliseconds.

☀ Information

The column description for export does not depend on the language in which Runtime was started. It always corresponds to the description stated in the table (**Column**).

3.8.3.9.4 SQL: Exported columns

For the SQL export, the files are exported incrementally in a fixed, clearly defined sequence.

Column	Type	Description
[VAR]	*varchar(128)*	Variable name.
[TAG]	*varchar(128)*	Variable identification.
[RESLABEL]	*varchar(255)*	Resources label.
[TEXT]	*varchar(1024)*	Limit value text.
[COMES_S]	*int*	Alarm occurred in Unix time (seconds since 01. 01. 1970).
[COMES_MS]	*int*	Alarm occurred: Milliseconds
[GOES_S]	*int*	Alarm ended in Unix time (seconds since 01. 01. 1970).
[GOES_MS]	*int*	Alarm ended: Milliseconds
[QUIT]	*int*	Alarm acknowledged in Unix-time (seconds since 01. 01. 1970).
[STATUS]	*int*	Status of variable.

Column	Type	Description
[VALUE]	*varchar(8000)*	Variable value.
[USERID]	*varchar(20)*	User identification.
[COMP]	*varchar(255)*	Computer name.
[REACT_S]	*int*	Alarm reactivated in Unix time (seconds since 01. 01. 1970).
[REACT_MS]	*int*	Alarm reactivated: Milliseconds
[REACT_COUNT]	*int*	Alarm reactivated: Meter.
[REACT_STAT]	*int*	Alarm reactivated: Variable status.
[ACT_TEXT]	*varchar(80)*	Alarm: Comment.
[PRJ]	*varchar(31)*	Project name
[CLASS]	*varchar(8000)*	Name of the alarm class.
[GROUP]	*varchar(8000)*	Name of the alarm group.
[LASTING_S]	*int*	Alarm active in seconds.
[LASTING_MS]	*int*	Alarm active: Milliseconds
[CLASS_NR]	*int*	Alarm Classes ID.
[GROUP_NR]	*int*	Alarm groups ID.
[USERNAME]	*varchar(120)*	User name.
[CAUSEID]	*varchar(36)*	Alarm cause ID.
[CAUSE]	*varchar(1279)*	Alarm cause text.
COMES_INTERNAL_S	*int*	Internal arrival time in Unix time.
COMES_INTERNAL_MS	*int*	Internal arrival time (Millisecond).
COMES_EXTERNAL_S	*int*	External arrival time in Unix time.
COMES_EXTERNAL_MS	*int*	External arrival time: Milliseconds.
GOES_INTERNAL_S	*int*	Internal time left in Unix time.
GOES_INTERNAL_MS	*int*	Internal time left. Milliseconds.

Column	Type	Description
GOES_EXTERNAL_S	*int*	External time left in Unix time.
GOES_EXTERNAL_MS	*int*	External time left. Milliseconds.
REACT_INTERNAL_S	*int*	Internal time reactivated in Unix-time.
REACT_INTERNAL_MS	*int*	Internal time reactivated Milliseconds.
REACT_EXTERNAL_S	*int*	External time reactivated in Unix-time.
REACT_EXTERNAL_MS	*int*	External time reactivated: Milliseconds.
LASTMODY_S	*int*	Time of last change in Unix time.
LASTMODY_MS	*int*	Time of last change: Milliseconds.
UNIT	*varchar(50)*	Measuring unit of the variable
AREA_NR	*varchar(4000)*	Numbers of alarm areas. Delimiter: Comma (,)
AREA	*varchar(4000)*	Alarm Areas. Separator: Comma (,)

3.8.3.9.5 XML: Exported columns

When exporting to an XML file, the data is exported in accordance with the selection in **Column settings AML** or **Column settings CEL**:

▶ Only data from the selected columns is exported.

▶ The sequence in the export file corresponds to the one defined in the dialog.

▶ Column titles are used as tags. All characters that are not permitted are removed and replaced in the process.
Rules for replacement:

   ▶ Space: Underscore (_).

   ▶ Other non-permitted characters: Hyphen (-).

3.8.3.10 Save AML and CEL ring buffer

With this function, the content of the ring buffer for alarms and events, as well as the values of mathematical variables (counters), can be saved. The entries are saved in the following files:

File	Contents	The size can be set in Properties
ALARM.BIN	Alarms	**Size of the ring buffer**
CEL.BIN	Chronological Event List entries	**Size of the ring buffer**
SY_MA32.BIN	Values of mathematical variables (e.g. counters)	

Example: Saving the AML ring buffer.

Engineering:

1. Create a new function (on page 156).
2. Select **Save AML and CEL ring buffer**.
3. Link the function to a button.

3.8.3.11 Print AML or CEL

The saved alarms and their filter conditions can be output to a printer in the Runtime with this function

To configure the function:

1. Create a new function (on page 156).
2. Select **Print AML or CEL**
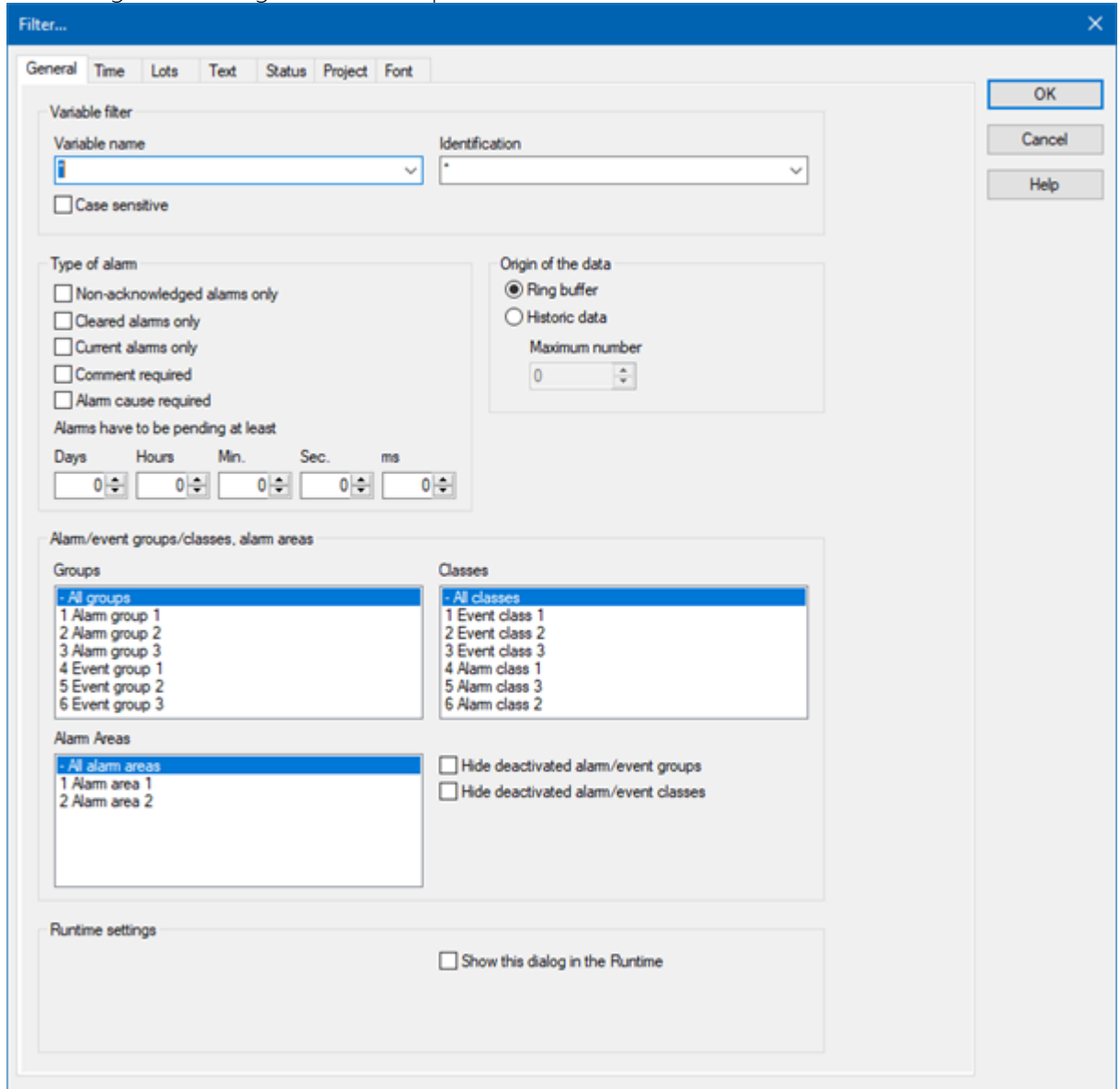
    The dialog for selecting the list opens:

3. Select **Alarm Message List**

The dialog for selecting filter criteria opens:

4. Define the criteria for the information to be printed.
   These correspond to the configuration of filters in the screen switching to AML:

   ▶ General (on page 62)

   ▶ Time (on page 68)

   ▶ text (on page 110)

   ▶ State (on page 112)

   ▶ Font: Selection from the fonts defined in zenon

5. Link the function to a button.

Information

It is not possible to switch between CEL and AML in the Runtime. To print both lists, you must engineer two functions.

LINE STRUCTURE

Date/Time received	Date/Time cleared	Date/Time acknowledged	Long text	Condition text

The keywords available for the formatting file (*ALAR.FRM for online printing and ALAR_G.FRM for offline printing*) and examples of these being used can be found in the FRM configuration file (on page 225) chapter in the Operation in the Runtime (on page 192) section.

The FRM file has three parts:

▶ Header: at the beginning of the page

▶ List part: cyclic per line

▶ Footer: at the end of the page

PRINCIPLES

When editing FRM files regard the following:

▶ **Separating the list parts:**

  ▶ Header and list part and list part and footer are separated by *%%*.

    The separation marking must be used only once for the list and the footer.

  ▶ **Attention:** The last line must be followed by at least two empty paragraphs. Otherwise the footer is not printed!

▶ **Positioning the individual entries:**
  You may only use space, no tabulators.

▶ **Editing the FRM file in a text editor:**
  Automatic line break must be deactivated otherwise undesired effects in the formatting may occur.

KEYWORDS

The setting for the page length is made in Project Properties under **AML and CEL** or via the *ALARM.frm or ALAR_G.frm* file for the AML or *BTB.frm and BTB_G.frm for the CEL.*

Note:

▸ The number of the alarm entries per page results from the predetermined number of lines (e.g. **Lines per page** *72*), less the lines used for header and footer text.

▸ The **Use reactivated time** option must be activated in order to be able to use the keywords that evaluate the reactivation (time, number).

▸ Free texts and keywords can be used in the formatting file. Key words can be used either in German or in English. The use of English key words is recommended.

▸ Not every key word is suitable for every kind of printing (AML, CEL, online, offline).

The following table contains key words in English and German and their field of application:

German	English	AML offline	CEL offline	AML online	CEL online	Description
Key words for the list part						
@BMKENNUNG	@RESOURCELABEL	X	X	X	X	**Resources label**
@DATZEITKOMMT	@DTRECEIVED	X	X	X	X	Time and Date when the alarm occurred
@DATZEITGEHT	@DTCLEARED	X	-	X	-	Time and Date when the alarm ended
@DATZEITOK	@DTACK	X	-	X	-	Time and Date when the alarm was acknowledged
@DATZEITREAKT	@DTREACTIVATE	X	-	X	-	Time and Date of reactivating: Property **Use reactivated time** in the project properties must be activated.
@DATZEIT	@DTLASTEVENT	-	-	X	-	Time and date of alarm received or cleared or acknowledged or reactivated
@ZEIT	@TLASTEVENT	-	-	X	X	Time of alarm received or cleared or acknowledged or reactivated
@ZEITOK	@TACK	X	-	X	-	only displays time of

German	English	AML offline	CEL offline	AML online	CEL online	Description
						acknowledging
@ZTKOMMT	@TRECEIVED	X	X	X	X	only displays time of alarm received
@ZTGEHT	@TCLEARED	X	-	X	-	only displays time of end of alarm
@ZTREAKT	@TREACTIVATE	X	-	X	-	only displays time of reactivating
@TIMELASTING	@TACTIVE	X	-	X	-	Time active (difference time received - time cleared)
@ANWENDUNG	@PROJECTNAME	X	X	X	X	Project name
@KANALNAME	@VARNAME	X	X	X	X	Variable name CEL: Only entries with variables
@AK	@ACLASSNR	X	X	X	X	Alarm/event class name
@AG	@AGROUPNR	X	X	X	X	Alarm/event group number
@AGNAME	@AGROUPNAME	X	X	X	X	Name of alarm/event group
@AKNAME	ACLASSNAME	X	X	X	X	Name of alarm/event class
@TAGNR	@IDENTIFICATION	X	X	X	X	Identification (company-specific label)
@AMELDUNG	@TEXT	X	X	X	X	Alarm message text
@REAKTANZ	@NRREACTIVATE	X	-	X	-	Number of reactivations
@STATUS	@STATUS	X	X	X	X	Status information as in Alarm Message List
@WERT	@VALUE	X	X	X	X	Variable value of alarm
@REAKTIONSTEX	@COMMENT	X	X	X	X	Commentary from the

German	English	AML offline	CEL offline	AML online	CEL online	Description
T						Alarm Message List. If dynamic limit value texts are used, this is only available if the **Long dynamic limit value texts AML** or **Long dynamic limit value texts CEL** properties have been activated.
@USER	@USERID	X	X	X	X	AML: User who acknowledged alarm.
@RECHNER	@COMPUTER	X	X	X	X	AML: Computer on which alarm was acknowledged.
Key words for header and footer						
@ANWENDUNG	@PROJECTNAME	X	X	X	X	Project name
@SEITE	@PAGE	X	X	X	X	Page number
@HEADDATZEIT	@DTSYSTEM	X	X	X	X	System date and system time
@HEADDATUM	@DSYSTEM	X	X	X	X	System date
@HEADZEIT	@TSYSTEM	X	X	X	X	System time
@USER	@USERID	X	X	X	X	User who prints
@USERNAME	@USERNAME	X	X	X	X	Full user name who triggered action
@RECHNER	@COMPUTER	X	X	X	X	Computer from which printing is carried out
[Text]	[Text]					Random text

⚠Attention

Between the key words there must be enough space so that entries are not overwritten. In doing so, you make sure that long limit value texts are also displayed correctly.

Example:

@TEXT (spaces up to here)

SETTING MILLISECONDS

⚠Attention

Milliseconds for printing or export

If, when printing or exporting the AML or CEL to CSV, XML or dBase format, the time in milliseconds is to be given, this property must be activated in the dialog for the column settings (on page 104). To do this:

▶ Go to the **Alarm Message List** or **Chronological Event List** nodes in the project properties.

▶ Click on the **...** button of the **Column settings AML** or **Column settings CEL** property.

▶ The dialog for the column settings is opened.

▶ Activate the checkbox in front of the **Milliseconds** property.

The additional setting must be made for both AML and CEL.

3.8.3.12 Switch online printing on/off

Online printing is set to a status when this function is used:

▶ *Switch on*: Switches online printing on

▶ *Switch off*: Switches online printing off

▶ *active/inactive*: Switches online printing

To configure the function:

1. Create a new function (on page 156).

2. Select **Switch online printing on/off**.
   The dialog for selecting an action is opened.

3. Select the desired action.

4. Link the function to a button.

3.8.3.13 Online printing start new page

With this function, you control the form feed in the Runtime when printing online:

The configured footer will be printed onto the current page of the printout, and then the printout will advance to the beginning of a new page. The page counter will be reset to *1* and the header will be printed out.

To configure the function:

1. Create a new function (on page 156)

2. select **Start online printing on a new page**

3. link the function to a button

3.8.3.14 Switch online printer

With this function, the printer for online printing can be changed in the Runtime.

> 💡 **Information**
>
> This function is not available under Windows CE.

To configure the function:
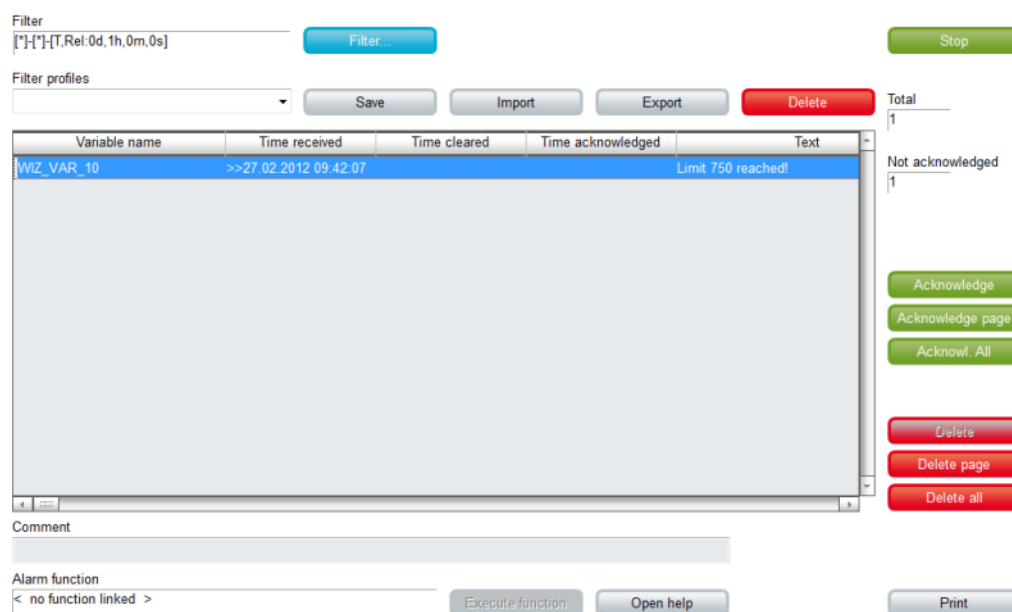
1. Create a new function (on page 156).

2. Select **Switch online printer**.

   The dialog for selection of the printer opens.

3. Select the desired printer from the drop-down list.

4. Link the function to a button.
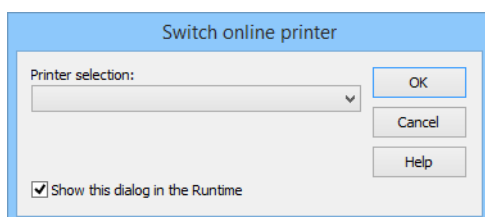
Parameter	Description
Printer selection	Selection of the desired printer from the drop-down list.
Show this dialog in the Runtime	*Active*: When this function is executed, the dialog is opened and the printer can be defined in the Runtime.

4 Operation in the Runtime

The Alarm Message List is called up in the Runtime via a screen switching function (on page 151).

The available control elements and the look are engineered in the Editor (on page 7).

WINDOW

Control element	Description
Window	Display in the Runtime
Alarm Message List	Display of the alarms. The appearance is configurable (on page 13). Columns are set using the column settings (on page 104) filter in the screen switching.

Control element	Description
	The **Column settings AML** property in the project properties in the **Alarm Message List** group are used to define the settings for export in CSV, XML and DBF. These also serve as a pre-setting for the screen switching function.
Set filter	Shortened display of the currently selected filter conditions in a compact filter line.
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.
State	Display if Alarm Message List is active or not (Project property **Alarm Message List active**).
Total number	Shows number of all alarms.
Number of unacknowledged	Displays number of unacknowledged alarms.

LIST FUNCTIONS

Control element	Description
List functions	Buttons to control the lists.
Filter	Opens the dialog for filter selection.
Stop/Continue	Switch for filling the list: **Stop:** New elements are no longer added automatically. **Next:** New elements are added automatically. **Attention:** The labeling of the button can be changed in the Editor but is not carried over to the Runtime.
Print	Prints filtered list.
Print with dialog	Opens printer settings before printing.

ALARM FUNCTIONS

Control element	Description
Alarm functions	Buttons for acknowledging and deleting alarms.
Acknowledge	Acknowledging alarm messages in the Runtime.

Control element	Description
Acknowledge page	All alarms displayed on the current page are acknowledged.
Acknowl. All	All alarms for the current filter criteria are acknowledged **Note for multi-user project:** Alarms are only acknowledged for projects for which the user has authorizations. (for details on multi-user projects, see Distributed engineering chapter)
Visual acknowledgment	The selected alarms are visually acknowledged (on page 209).
Visual acknowledgment and acknowledgment	The selected alarms are first visually acknowledged and then acknowledged (on page 209).
Confirm acknowledgment	Deletes alarm from the Alarm Message List in the Runtime. Alarm must already be acknowledged.
Confirm acknowledgement page	Deletes all acknowledged alarms that are displayed on the current page.
Confirm acknowledgement all	Deletes all acknowledged alarms that correspond to the current filter criteria.
Linked function (display)	Displays the function allocated to the alarm message.
Execute function	Executes the functions configured for the alarm in the Runtime. **Note:** With the **Start program** function, the variable name of the selected alarm can be transferred as a parameter for the program to be started using the key word *@alarm.name*.
Open help...	Calls up configured Help.
Display	State and elements of alarm administration.
Comment field	Input of free text by the user for the selected alarm. Maximum length: *79 characters* This text can also be displayed in the list. To do this, the **comment** option in the **column settings** of the alarm administration is activated. The comment field is a *dynamic text* element. The **Write set value** property is automatically activated for this element during configuration. In addition, the **Write set value via** property is set to the *element* value.

Control element	Description
	Changes to comments can be documented by activating the **Alarm comments** property.
Select alarm cause...	Opens the dialog for selecting an alarm cause. An alarm cause can be assigned to the alarm selected in the alarm message list using the dialog. **Note:** *Inactive* if no entry is selected in the alarm message list. See also chapter Alarm cause (on page 204).

NAVIGATION

Control element	Description
Navigation	Controls elements of the list.
Line up	Scrolls one line up.
Line down	Scrolls one line down.
Column right	Scrolls one column to the right.
Column left	Scrolls one column to the left.
Page up	Scrolls one page up.
Page down	Scrolls one page down.
Page right	Scrolls one page to the right.
Page left	Scrolls one page to the left.

COMPATIBLE ELEMENTS

Control element	Description
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.
State	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Total number	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.

Control element	Description
Number of unacknowledged	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Linked function (display)	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Set filter	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Comment field	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Close frame	Closes the frame on which the screen is based. **Recommendation:** Use the **Close frame** function to close frames. In order that after the closing the screen which was opened before is displayed, you must engineer the screen of type AML with its own frame.

FILTER PROFILES

Control element	Description
Filter profiles	Buttons for filter settings in the Runtime.
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.

CONFIGURATION OF THE DISPLAY

You configure which information is displayed in the alarm status line and Alarm Message List using the alarm configuration column setting. You can reach the column setting via:

▶ Project settings -> **Alarm Message List -> Column settings AML** (only tab **Column settings** (on page 104))

or

▶ Function screen switch to a screen of type **AML** (all tabs (on page 56))

DISPLAY IN THE VALUE COLUMN

Only values of numeric data types can be displayed in the **Value** column. The column remains empty for entries with a **String** data type.

FUNCTIONS FOR LIMIT VALUES AS ALARM

When Runtime starts, a check is made to see if the alarm for the limit value has already occurred before Runtime was ended. If this is the case, the linked function is not carried out again.
Note: If the limit is not an alarm, execution of the limit value function when Runtime starts may be influenced by the **Execute limit value function at RT start** project setting in the **Functions** group. This setting is only influences limit values that are not alarms.

COMMENT FIELD

Entries or changes in the comment field cause the following actions:

▶ The user authorization for the creation or amending of a comment is checked.

▶ An Event is created for the API (`AlarmUsertextChanged`).

▶ An entry is made in the CEL:

▶ With clients or the standby server, the comment is sent   to the primary server.

▶ If the **Alarm comments** property has been activated, an entry in the CEL that refers to a change is made when a change is made.

4.1   Alarm status line

ALARMS: STATUS MESSAGES IN RED STATUS LINE

The alarm status line displays alarms that cannot be acknowledged in the Runtime as a red line with black text. It contains information on the variables to be triggered and the time. The alarm status line is defined as the uppermost Windows window and thus covers all zenon screens, as well as all other applications.

Note: The alarm status line is *inactive* by default, but can be manually activated (on page 5) in the project properties in the alarm message list group.

`WIZ_VAR_12 >>25.11.2015 14:11:24 <<25.11.2015 14:11:50  Limit 750 reached!`

Alarms are acknowledged (on page 206) by double-clicking the right mouse button.

The appearance of the alarm status line can be amended in the project properties. The alarm status line can be covered by a further status line (blue as standard), by informing users of the number of alarms or the overrunning of the buffer.

WARNINGS: WARNING NOTICES IN THE BLUE STATUS LINE

You can define three status messages to inform the user that the number of alarms has exceeded a certain number, or that the ring buffer of the alarm information list is going to overflow soon. These are displayed in white text with a blue background by default. The appearance can be amended in the project properties.
The status messages cover the red alarm status line as long as they are not acknowledged. You can acknowledge them by double-clicking them with the right mouse button. For that, the user must be in the according authorization group. These can be set in the user administration using the function authorizations.

The following applies for opening up the alarm status line:

▶ The blue line has higher priority for the display than the red alarm status line.

▶ The blue line only reacts to the total number of entries in the list

▶ The maximums for the overall number of entries in the list can be defined using the properties of the **Alarm status line** group.

  ▶ **Message 1 number of alarms**

  ▶ **Message 2 number of alarms**

  ▶ **Message 3 number of alarms**

  Each maximum can be allocated a message that is displayed from the bottom when it is exceeded.

▶ The highest possible maximum is active at any time.

▶ The blue line can only be deactivated with a right mouse click. In doing so, the adjacent maximum is only then triggered if it has been explicitly reached.

▶ A deactivated maximum is only then reactivated again when it is exceeded again.

CONFIGURING THE ALARM STATUS LINE

To display the alarm status line in the Runtime, activate the **Status line active** property in the **Alarm Message List** group in product properties.

The actions of the alarm status line in the Runtime and the font to be used are defined in project properties of the **Alarm status line** in the **Alarm Message List** group:

▶ **move up next alarm**: defines the alarm status line as a ring. The **Size of the ring buffer** property is used as a ring size. If this property is deactivated, the alarm status line always contains only one alarm.

▶ **Display**: defines if the oldest filter or the most recent alarm is displayed. The selection is made from the drop-down list.

  ▶ *oldest alarm*: FIFO buffer

  ▶ *Most recent alarm*: LIFO buffer

⚠Attention

Behavior in multi-project administration:

The setting in the integration project defines the behavior for sub projects, regardless of the setting of the sub projects.

▶ If the alarm status line is deactivated in a subproject, but not in the integration as a start project, the alarm status line nevertheless continues to be displayed.

▶ If the alarm status line is activated in the superordinate project then it is also displayed in the sub project, even if it has been deactivated here.

▶ The alarm status line of the uppermost project is always used in the Runtime.

POSITIONING

By default, the alarm status line is displayed on the top border of the monitor (height=18 pixels with standard font). You can also change the size and position in the *frames*. In order to do this, select the alarm status bar and deactivated option **Use standard position**. After that you can position the alarm status bar - in the same way as a frame - anywhere on the screen.
For multi-project administration, the alarm status line of the integration project determines the position. The settings of the subprojects are ignored.

COLORS FOR ALARM STATUS LINE

The colors of the alarm status line can be amended using the properties of the **Alarm status line** group.

For Alarms:

▶ **Text color**

▶ **Background color**

For warnings of exceeding the defined number of alarms or the ring buffer exceeding capacity:

▸ **Message 1 text color**

▸ **Message 1 background color**

▸ **Message 2 text color**

▸ **Message 2 background color**

▸ **Message 3 text color**

▸ **Message 3 background color**

4.2 Alarm Message List

The alarm information list shows alarm messages line by line during runtime. Lines with unacknowledged alarms can be displayed as flashing (on page 206).

To create and display the AML, activate the **Alarm Message List active** property in the **Alarm Message List** group. You can configure the display format in the filter of the screen switch function in the Column settings (on page 104) tab.

Alarms are saved in a ring buffer (alarm.bin) and in an alarm file (*.aml) in the Runtime folder as soon as they occur. The ring buffer is a volatile memory, from which alarms can be removed again according to certain rules. The AML saves alarms and important information in relation to these on a lasting basis.

RING BUFFER

The ring buffer includes all active alarms. At this the following things are managed:

▸ **Time received** in millisecond as unique signature

▸ Additional information such as cause, value, etc.

▸ Time cleared

▸ Time acknowledged

Behavior when removing from the ring buffer:

▸ As soon as the alarm is cleared, it is removed from the ring buffer.

▸ If the **To acknowledge** property has been activated, the alarm must be acknowledged by a user authorized to do this before it can be removed from the ring buffer. When acknowledging alarms, all alarms of a variable with the same limit value violation are removed from the ring buffer at the same time.

▸ If the **Two-stage acknowledgement** property is activated, the removal from the ring buffer must be specifically confirmed by a person authorized to do this.

> **Example:** The alarm has cleared and was acknowledged by the user. It will remain in the ring buffer until removal has been confirmed.

Note: The entries are never deleted in the AML; it is always only their status that is documented.

SIZE OF THE RINGBUFFER

The size of the ring buffer must be set to an appropriated size in the project properties via property **Size of the ring buffer**.
Recommended: At least number of variables for which alarms can occur.

The ring buffer is automatically saved as file **alarm.bin** when the Runtime is closed. If the Runtime is closed due to an unexpected event, e.g. power outage, data will be lost. To prevent this the ring buffer can be saved manually via property **Save ring buffer on change** at every new entry or via function Save AML and CEL ring buffer (on page 184).

Attention: In the Runtime the ring buffer is handled dynamically in the memory. Alarms the do not have a cleared time stamp can be displayed by means of the defined number of alarms. Thus alarms are displayed which exceed the size of the ring buffer.

📄 **Example**

▸ Size of the ring buffer: 100 entries

▸ Active alarms in the Runtime without cleared time stamp: 120

▸ Display in the AML in the Runtime: 120

ALARM FILE

All alarms are written in an alarm file (*.aml) at the same time as in the ring buffer. This file is created for every calendar day automatically and is managed via property **Save AML data**. The name of the alarm file is put together by the letter *A*, followed by the date in form *JJMMDD* and the suffix *.aml*; e.g. **A100623.aml**. These files are created automatically for every day and must be evacuated or deleted by the user if the storage space is limited. **.aml files* are saved in the ...*Project folder\Computer name\Project name* folder.

SYNCHRONIZING RING BUFFER AND ALARM FILE

Ring buffer and alarm file are synchronized. This synchronization ensues from the ring buffer to the alarm file. All changes such as acknowledging are only carried out in the ring buffer and are then synchronized with the alarm file. Thus for example all unacknowledged alarms can be displayed in the alarm file and the acknowledge can be induced. The action however is taking place in the ring buffer.

SAVING PERIODS

The alarm file *.aml is saved each time a new entry is made.

The ring buffer (*.bin) is saved:

▶ when the Runtime is closed

▶ after every new entry if property **Save ring buffer on change** is active

▶ when function **Save AML and CEL ring buffer** is carried out

Note: If option **Save ring buffer on change** is deactivated, it is possible that the entries in the AML and in the ring buffer do not match after a power outage.

> ⚠**Attention**
>
> If the ring buffer overflows because it is too small, unacknowledged entries remain in the alarm file. They are displayed during filtering but they cannot be acknowledged anymore. The attempt to acknowledge them can trigger the acknowledgment on the ring buffer if the alarms concern the same variable and the same limit value violation.

AML IN THE RUNTIME

Alarms in the Alarm Message List can have three states:

▶ *Not cleared*

▶ *Not acknowledged*

▶ *Not deleted*

It is also possible to set for alarms that they:

▶ Must be acknowledged (**To acknowledge**)

▶ Must be acknowledged in two stages (**Two-stage acknowledgement**)

Acknowledgment resets the flashing attribute of the variables. The deletion of an entry can only be made with a prior acknowledgment of a gone alarm event. An obligation to acknowledge and two-stage acknowledgment are configured using the **To acknowledge** and **Two-stage acknowledgement** properties in the **Limit Values**/**AML/CEL** nodes of the variable configuration.

Example for the structure of the alarm information list in the runtime:

Variable	Date/Time received	Date/Time cleared	Date/Time acknowledged	Message text
Motor1_Störung	20.06.2011 1:00:04 PM	20.06.2011 1:05:35 PM	20.06.2011 1:05:40 PM	Motor's protective relay activated

Each row can be acknowledged (on page 206) by double-clicking it with the right mouse button. For that, the user must be in the according authorization group.

When the Alarm Message List is opened, the state of the alarm management is shown in the upper left corner (*active* or *inactive*).

> ## 💡 Information
>
> The variables for **not acknowledged alarms**, **acknowledged alarms** and **number of alarms** is stored in a local list in the memory.
>
> See variable **Not acknowledged alarms** in the chapter Definition of the alarm (on page 62) and CEL filters.

DISPLAY OF ALARM STATUS

The alarm status is displayed in the alarm message list by means of a circle symbol or configured graphics. The list can also be sorted according to the alarm status in the Runtime. To do this, click on the column title in the header.

Sorting of the alarms in the Runtime according to alarm status:

1. *occurred*
2. *reactivated*
3. *cleared*
4. *acknowledged*
5. *deleted*

4.2.1 Alm causes
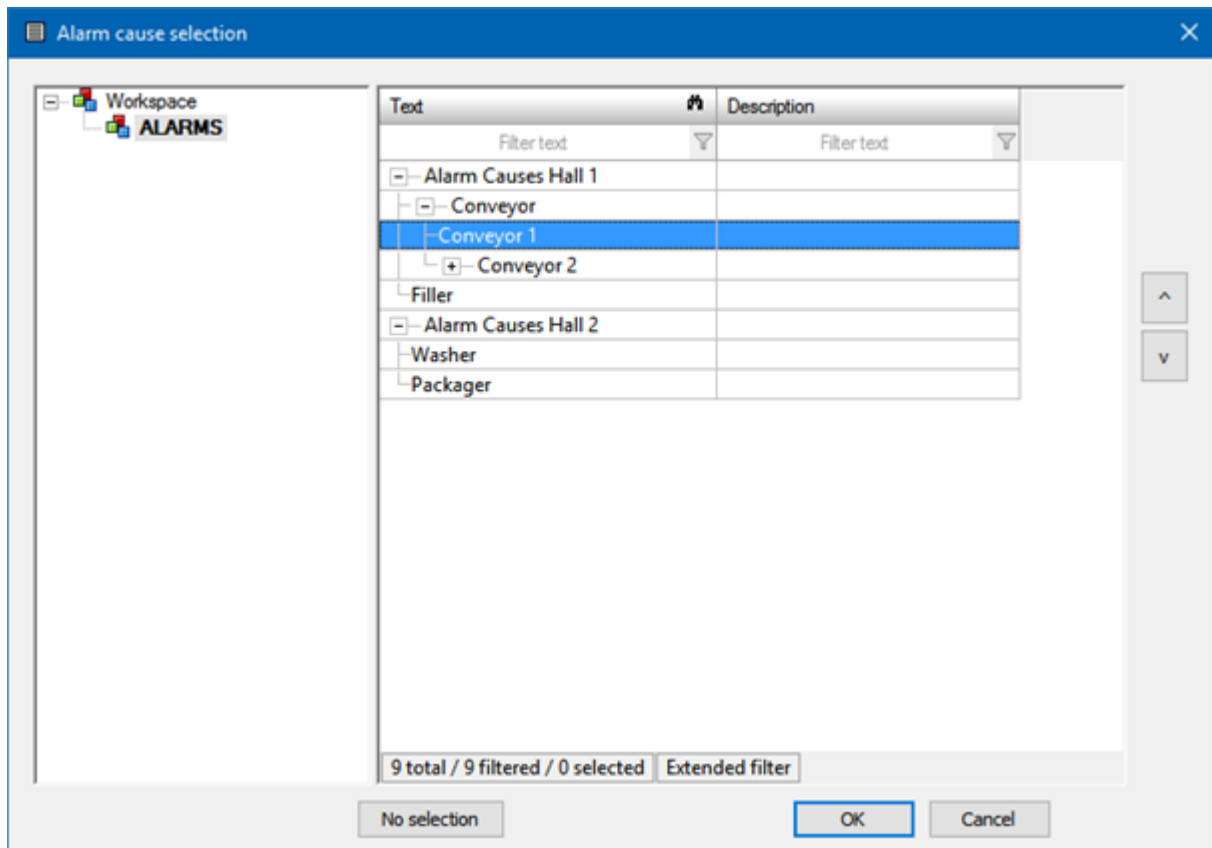
CONFIGURATION OF ALARM CAUSES

Alarm causes in the project are configured in the Runtime using a *Context List* screen.

ASSIGNMENT OF ALARM CAUSES

Alarm causes can be assigned in the Runtime.

To assign an alarm cause:

1. Select an entry in the alarm message list.

2. Click on the element with the **Screen type specific action** alarm cause....

3. Select an alarm cause and confirm the dialog with **OK**.

   Note: If a subnode is assigned, the higher-level nodes (texts) are inserted before the selected text with periods (.).

   Example: *Alarm Causes Hall 1.Conveyor.Conveyor 1*

The alarm causes can now be displayed in a separate column in the alarm message list.

> ☀ **Information**
>
> It is possible to use the **Allow end nodes as alarm cause only** project property in the **alarm message list** group to determine whether texts of all levels or only texts from end nodes can be selected as an alarm cause.
>
> By activating this property, it is possible for example to prevent a generic selection of alarm causes.

ALLOCATION OF ALARM CAUSES USING A CONTEXT LIST SCREEN

You can also allocate alarm causes to alarms using a *Context List* screen.

You can find detailed information on this in chapterUse of a *Context List* screen to select alarm causes.

LOGGING IN THE CEL

If an alarm is assigned to an alarm cause or the linking is changed, this is logged in the CEL. In doing so, if present, the old value and the new value are displayed. Linkings that are carried out using the API are also logged.

4.2.1.1 Cross-project use of alarm causes

Alarm causes can also be used throughout projects. In doing so, you can link alarm causes from the integration project for alarms from subprojects.

For this, the following applies:

▶ For the display of alarm causes in the alarm message list:

    ▶ If the alarm message list is opened in the integration project, the **Context List** from the subproject that belongs to the alarm is searched first and this entry is used.

    ▶ If no entry is found there, the **Context List** of the integration project is searched.

    ▶ If the alarm message list from the project to which the alarm belongs is opened, only the **Context List** of this project is searched.

    ▶ If an alarm cause from the integration project has been linked and the alarm message list is opened in the subproject, the *Alarm cause does not exist* entry is shown

▶ For the dialog to select alarm causes (from an integration project with subprojects):

    ▶ If, in the alarm message list, one or more alarms are selected from the same subproject, both the corresponding subproject and the integration project are offered in the alarm causes dialog.

▶ If several alarms from different projects are selected, only the integration project is offered for selection.

4.2.2 Display unacknowledged alarms as flashing

Unacknowledged alarms can be displayed as flashing in the AML.

With the **Unacknowledged alarms flash** property active, the foreground color and background color alternate in all unacknowledged and unselected lines in the Alarm Message List every second. Selected lines do not flash.

To do this:

1. In the Editor, navigate to the **Alarm Message List** section in Project Properties.
2. Activate the checkbox in front of the **Unacknowledged alarms flash** property.
3. Configure the desired colors (foreground) for **Alarm received**, **Alarm cleared**, **Alarm acknowledged**

   Hint: Set the **Alarm/event class color** property to *as line background*. The color of the alarm class is then used as a background color.

4.3 Acknowledge alarms

Alarms can be acknowledged via:

▶ double right-click on the alarm status bar
▶ double right-click on an entry in the Alarm Message List
▶ Function **Acknowledge alarms**
▶ **Acknowledge** button or **Visual acknowledge and Acknowledge** in the zenon *alarm message list* screen.

Acknowledged alarms are shown in the AML as "*Acknowledged*".

When acknowledging an alarm:

▶ All alarms of a variable with the same limit value are acknowledged together.
▶ Name and ID of the user who deletes the alarm are written in the Alarm Message List
▶ the name of the computer from which the alarm was acknowledged is written in the Alarm Message List
▶ acknowledging the alarm can be written in the Chronological Event List additionally

Alarms are saved in the ring buffer up to when they are acknowledged. At the same time they are written to a filterable alarm file (*.aml) and kept synchronized.

Attention: The **Size of the ring buffer** property must be chosen appropriately. If alarms are no longer saved in the ring buffer (on page 39) due to a buffer overflow, unacknowledged alarms remain in the alarm file. For details see chapter Alarm Message List (AML) (on page 5).

⚡ Information

If alarms require a comment (on page 207) or the linking of an alarm clause is required (on page 208), it can only be acknowledged if a comment has been entered or an alarm cause has been linked. The user must be authorized to carry out the necessary function.

Note: If there is an attempt to acknowledge an alarm without these conditions being met, a notice dialog is displayed.

FUNCTION ACKNOWLEDGE ALARMS

The **Acknowledge alarms** function allows:

▶ acknowledge alarms from the AML using a function call

▶ global acknowledgment

When using this function in the Runtime, the flashing attribute of the variables and therefore screen alarming (only SICAM 230) will also be reset. The selected alarms are acknowledged. For details, see Acknowledging alarms (on page 164) chapter.

USER AUTHORIZATION

The functions **Acknowledge alarms**   (on page 164)and **Confirm alarm acknowledgment** (on page 162) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.

In addition, for the limit values, it is possible to use the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group to set an additional operating authorization. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.

If the **Two-stage acknowledgement** property is set, alarms are then only removed from the list of active alarms if their acknowledgment has been confirmed. Acknowledgment alone is not sufficient.

4.3.1 Required comments for acknowledgment

Alarms that require acknowledgment can be configured in such a way that a comment must be entered before acknowledgment. To be able to enter a comment, the user needs to enter the corresponding function authorization   **alarm comment**.

To make an alarm require a comment, the corresponding option can be set at:

▶   The configuration of the Reaction matrixes

▶   The **Comment required** property in the **Limit Values** group of the variables or the data types

Comments that require alarms can subsequently only be amended by users with the **Change alarm comment** function authorization. If comments are changed, an entry into the CEL is made, stating the variable name and the original and amended comment.

Alarms that require a comment are checked for comments for all acknowledgment possibilities (including the API). The necessary authorization is also checked when changes are made. The Alarm Message List can be filtered for alarms that require a comment by means of:

▶   Alarm Message List (on page 62) filter

▶   Alarm Message List filter (on page 18) screen

4.3.2 Linking of an alarm cause for acknowledgment

Alarms that require acknowledgment can be configured in such a way that an alarm cause must be linked before acknowledgment.

The corresponding option can be set for:

▶   The configuration of the Reaction matrixes

▶   The **Alarm cause required** property in the **Limit Values** group of the variables and the data types

If an attempt is made to acknowledge the alarm without a linked alarm cause, a corresponding warning dialog is called up.

Alarm cause linkings can be subsequently amended.If an alarm is assigned to an alarm cause or the linking is changed, this is logged in the CEL. In doing so, if present, the old value and the new value are displayed. Linkings that are carried out using the API are also logged.

Alarms required for the linking of an alarm cause are, for all acknowledgment possibilities (including the API), checked to see whether there is a linked alarm cause. The alarm message list can be filtered for alarms for which an alarm cause is required by means of the:

▶   Alarm Message List (on page 62) filter

▶   Alarm Message List filter (on page 18) screen

You can find further information about alarm causes in the Driver variables (on page 204) chapter.

4.3.3 Visual acknowledgment

Visual acknowledgment makes it possible for the user to confirm that they have become aware of an alarm without resetting this immediately. For example, it is possible to visually acknowledge several alarms that are unrelated to one another first, and then acknowledge them and thus reset them later.

ELEMENTS FOR VISUAL ACKNOWLEDGMENT

There are two buttons available for visual acknowledgment in AML screens:

▸ **Visual acknowledgment**

▸ **Visual acknowledgment and acknowledgment**

The following properties are available for variables in the **Alarm handling** group:

▸ **Acknowledgement variable**

▸ **Visual acknowledgement variable**

▸ **Acknowledgement value**

USE VISUAL ACKNOWLEDGMENT

To confirm an alarm with visual acknowledgment:

1. Configure the buttons **Visual acknowledgment** and **Visual acknowledgment and acknowledgment** in the screen.

2. Configure the **Acknowledgement variable**, **Visual acknowledgement variable** and **Acknowledgement value** properties for the corresponding variables.

3. Click on the button in the Runtime

   a) **Visual acknowledgment**: The highlighted alarms are confirmed with visual acknowledgment. The **Acknowledgement value** is written to the **Visual acknowledgement variable**.

   b) **Visual acknowledgment and acknowledgment**: The highlighted alarms are only confirmed with visual acknowledgment and then acknowledged (on page 206). The **Acknowledgement value** is written to the **Visual acknowledgement variable** and to the **Acknowledgement variable**.

> **💡 Information**
>
> Visual acknowledgment and acknowledgment need different rights. For visual acknowledgment, operating authorization and keyboard authorization in the context of the user and the interlocking are necessary. For acknowledgment (on page 206), the corresponding rules including validation of the entries and rights are applicable. It is therefore possible that a user can visually acknowledge an alarm but not acknowledge it.
>
> Visual acknowledgment is always set but only if the variable already has this value.

4.4   Alarms: acknowledge flashing

In addition to acknowledging alarms (on page 164) from the alarm message list, screens with alarms can also be acknowledged by template. Flash acknowledgment is called up using the flash-acknowledge alarms (on page 157) function or by double clicking on the corresponding element with the right mouse button. In doing so, only the flash attribute of the variables and the flashing of all graphic elements on the screen is reset. The entries are not however acknowledged in the AML.

> **⚠Attention**
>
> The **Alarms: acknowledge flashing** function must not be mistaken for **Acknowledge alarms**.
>
> ▸ Function **Alarms: acknowledge flashing**: Only ends the flashing, does not acknowledge the alarm.
>
> ▸ Function **Acknowledge alarms**: Acknowledges the alarm and also ends the flashing.
>
> If the acknowledgment of the flashing should also acknowledge the alarm, the **Flashing acknowledgement** property must also be activated in the Editor in the in project properties in the **Alarm Message List** group. In this case, the alarm itself is also acknowledged when acknowledging the flashing in the AML.

FLASHING ACKNOWLEDGMENT IN AML

A flash-acknowledgment acknowledges the alarms in the AML if the **Flashing acknowledgement** option is also set in alarm administration.

Only for SICAM 230: The acknowledgment in the alarm message list or on the alarm line level at the upper screen edge also acknowledges the alarm in the screen and screen alarm guidance.

FLASH-ACKNOWLEDGING IN INTEGRATION PROJECTS

If alarms are to be acknowledged in integration projects using the **Alarms: acknowledge flashing** function, all affected screens must be opened.

If screens in superordinate and subordinate project templates have the same name, the screens in the subordinate project are not opened. If the template names are different, the screens of the sub project in the background are opened and can be flash-acknowledged.

FLASH ACKNOWLEDGMENT IN THE NETWORK

If flash-acknowledgment is used in the network, it is only executed locally at the respective client.

Behavior for flash acknowledgment of local variables:

▸ If an alarm is created by a local variable, this alarm is then created on the server. The alarm is also visible on the client however.

   ▸ If the alarm is acknowledged using the alarm message list or the status window, the alarm is acknowledged on the server.

   ▸ If the acknowledgment is only acknowledged using the control element in the screen, the alarm is only acknowledged if the acknowledgment is made on the server.

▸ If the limit value of a local variable is breached on a client, the local flash status is also local and is flash-acknowledged locally.

RENEWED FLASHING AFTER A NEW SIGN-IN OF VARIABLES

Variables that have already been flash-acknowledged start to flash again.
To do this, the following condition must be met:

1. The variable has flashed due to a limit value violation and the flashing has been acknowledged.

2. The variable was then signed out.

3. The variable was then signed in again.

4. The same limit value violation still occurs.

Result: The variable flashes again.

4.5 Confirm alarm acknowledgment

The following is required to confirm an alarm acknowledgment:

▸ A confirm alarm acknowledgment (on page 162) function is executed
   or

▸ the **Confirm acknowledgment** button on a screen of   type *Alarm Message List* is pressed

USER AUTHORIZATION

The functions **Acknowledge alarms**   (on page 164)and **Confirm alarm acknowledgment** (on page 162) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.

In addition, for the limit values, it is possible to use the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group to set an additional operating authorization. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.

If the **Two-stage acknowledgement** property is set, alarms are then only removed from the list of active alarms if their acknowledgment has been confirmed. Acknowledgment alone is not sufficient.

4.6   Filtering alarms

Alarms can be displayed with a filter in the Runtime using:

▶   Filter application in the Runtime

▶   Screen switching with pre-defined filter to a screen of alarm message list (on page 7) type

▶   Screen switching with filter when calling up a screen of alarm message list (on page 7) type

▶   Screen switching to a screen of alarm message list filter (on page 216) type

FILTERING IN THE RUNTIME

Filters can be used in the Runtime in alarm message list screens. To filter the alarms displayed in the AML:

1.   Configure the **Filter** in the Editor.

2.   Click on the button **Filter** in Runtime.

The alarm message list filter dialog (on page 56) is opened
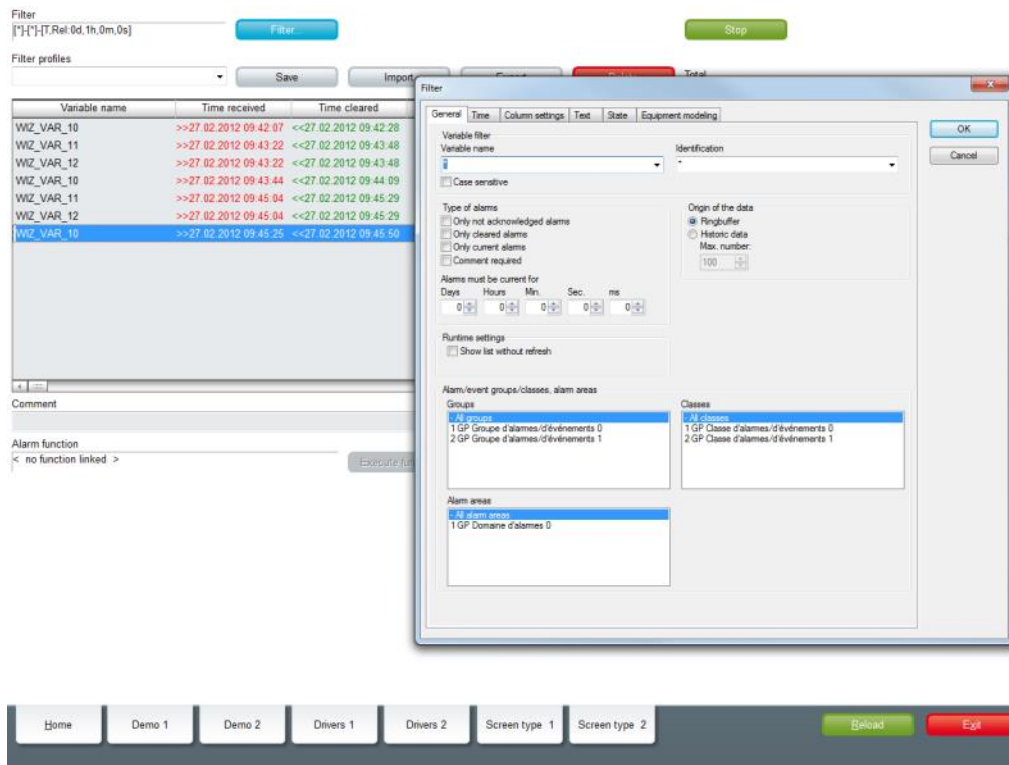
Set filter can be saved in profiles (on page 214).

SCREEN SWITCHING TO A SCREEN OF ALARM MESSAGE LIST TYPE

Alarms can be displayed after pre-filtering. To do this:

1. Configure a filter (on page 56) for the screen switching to an alarm message list screen (on page 151) function.

2. The alarm message list is displayed in a filtered state when called up.

3. If the option **Display dialog in the Runtime** is activated for the function, you can newly define the filter before the display.

4. Further filter settings are possible in the Runtime via the button filter.

SCREEN SWITCHING TO AN ALARM MESSAGE LIST FILTER SCREEN

In order to only offer users the filters they need in the Runtime, use an alarm message list filter (on page 216) screen.
To do this:

1. Configure screen switching to an alarm message list filter screen (on page 154)

2. Call up the AML in the Runtime using this function.

3.   The user has an Alarm Message List that is tailor-made (on page 117) to their requirements.

4.6.1 Filter profiles

Filter profiles are filter settings that the user can save and call up in Runtime in relation to a certain screen.

To be able to use filter profiles, the following control elements must be configured:

Control element	Description
Filter profiles	Profile administration in the Runtime
Profile selection	Selection of a saved profile from a drop-down list.
Save	Clicking on the button in the Runtime saves the filter settings as a profile. **Note:** The name can be a maximum of 31 characters long and must only contain valid characters. Prohibited are: ! \ / : * ? < > | ""
Delete	Clicking on button in Runtime deletes the selected profile.

You can thus do the following in the Runtime:

▶   save filters

▶   use saved filters

▶   delete filter profiles

Filter profiles can also be exported and imported with further control elements.

SAVE FILTER PROFILE

To create a filter profile:

1.   Define filter conditions

2.   Enter a name in the **Filter profiles** input field

3. Click the **Save** button.
   The filter profile is saved and can be selected in the drop-down list.

USE FILTER PROFILE

To use a filter profile:

1. Select a filter from the drop-down list **filter profiles**.

2. The filter is immediately applied.

DELETE FILTER PROFILE

To delete a filter profile:

1. Select a filter from the drop-down list **filter profiles**

2. Click on the **Delete** button.
   The filter profile is deleted.

3. The deleted filter is still applied as long as a new filter is defined or selected.

4.6.2 Use alarm message list filter

It is possible to adjust filter settings for the Alarm Message List in the Runtime with the help of an Alarm Message List Filter screen (on page 18). All filter settings that are available in the filter (on page 56) for the function to switch the screen to the Chronological Event List screen (on page 151) can be configured.

Therefore:

▶ Only the filter elements that are actually required are configured and provided to the user.

▶ The user only has these filters displayed and has an overview.

▶ The appearance can be freely defined and can, for example, also enable ease of use by means of a touch screen.

FILTER SCREENS

Filter screens make it possible to transfer a preset filter from one screen to another. The filter of the source screen is set using the target screen. The screens can also be of a different screen type.

CALL DEFINITION

The following requirements must be met for the set filters to be used:

1. *Set filter for time filter type* is selected as a **time period** for the time filter.

2. The screen (**Alarm Message List Filter**, **Chronological Event List filter** or **Time/Lot/Shift Filter** screen types) is activated using a button or a combined element. Only in this way can the relationship between filter screen and source screen be maintained.

3. The source screen and filter screen must either be configured on different templates or on different monitors. The filter for the filter screen can only be updated if the source screen is open. This is only possible if both screens do not use the same frame or the same monitor.

4. The screen to be called up must be compatible with the filter screen to be called up (see table).

Source screen	AML filter	CEL filter	Time filter
Archive revision	T	T	T
Extended Trend	T	T	T
Time Filter	T	T	X
Alarm Message List Filter	X	C	T
Chronological Event List Filter	C	X	T
Alarm Message List	X	C	T
Chronological Event List	C	X	T

Key:

▶ C: Common settings are updated.

▶ T: Time settings are updated.

▶ X: All settings are updated.

> 💡 **Information**
>
> No filtering
>
> The filter screen is not filtered, but opened with the configured values, if:
>
> ▶ One of the conditions 1 to 3 is not met or
>
> ▶ The **Screen to call up** setting is not activated for the **Screen switching** function or
>
> ▶ The screen is not called up via a screen element
>
> In this case, the **Accept**, **Close** and **Update** buttons are grayed out in the Runtime and have no function.

UPDATE

When a filter screen is called up (**Alarm Message List filter**, **Chronological Event List filter**, **time filter**), the screens configured in the **screen switching function** are updated in two ways:

▶ If the filter screen is called up using a screen element, the target screens that are on the same monitor as the source screen are updated.

▶ If the filter screen is called up in a different way or if the **Update on all monitors** setting is activated, all configured target screens are updated.

They are updated as soon as you click the **Accept** button or as soon as you closes the filter screen with the close **Close** button. The **Cancel** button discards the changes and closes the filter screen.

UPDATE FILTER SETTINGS

You update the current filter settings for the source screen using the **Update** button. If the filter screen is not called up by a screen element or if the **Calling screen** has not been activated, all monitors are searched for screens that can be used for updating. The first screen that is found is then this is used for updating.

4.7 Printing and exporting alarms

AML alarms can be documented and archived by:

▶ AML Print online (on page 218): each event is printed on a line printer when it is displayed in the list

▶ AML   (on page 218)offline printing: (on page 222)The AML is printed out as a list in its current state

▶ Export (on page 229) contents of AML (filtered)

The print used for printouts is defined via menu **File -> General configuration -> Standard**.

⚠**Attention**

A *.frm configuration file is used for the print-out:

▶ Online: ALARM.frm

▶ Offline: ALAR_G.frm.

This FRM file must be in the project tree in the **Files** section in the **Texts and formats** folder.

You can find templates for FRM files in the following folder:
%ProgramData%\COPA-DATA\zenon820

These can be added to the **Texts and formats** section using Add File and edited there.

You can find key words for FRM files in the FRM configuration file (on page 225).

4.7.1 Online printing

With online printing, any alarm that occurs is immediately sent to the printer.

Attention: The online printing takes place line by line, in accordance with the ESC/P (Epson Standard for Printers) and requires an Epson-compatible printer.

To print out alarms online:

1. Define a printer.

2. Navigate to the **AML and CEL** node in the project properties.

3. Activate the **Printing active** property.

4. Select the **Printing for** property in the *Alarm Message List* drop-down list.

5. With the help of property **Lines per page** define the line number (Default: *72*)

6. Configure ALARM.frm (on page 225).

7. Add **ALARM.frm** to the **Files/texts and formats** node.

> ### ☀ Information
>
> This function is not available under Windows CE.

CONTROL PRINTING AND PRINTER IN THE RUNTIME

PAGE CHANGE

Form feed is carried out if:

▶ a page is fully written

▶ the Runtime is closed and online printing is active

▶ The Funktion (on page 191) **Online printing start new page** is executed

HALT PRINTING

To halt or to continue online printing:

▶ Execute the Funktion (on page 190) **Switch online printing on/off** .

CHANGING AND SETTING UP A PRINTER

To change the printer in the Runtime:

▶ Execute the Funktion (on page 191) **Switch online printer**.

To set up the selected printer in the Runtime:

1. Configure a **Print with dialog** control element for the screen

2. Click on the **Print with dialog** button in the Runtime

3. The configuration dialog is opened.

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.
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:

Parameter	Description
	▸ *Portrait format* ▸ *Landscape*
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.

FORMATTING EXAMPLE

Configuration (on page 225) in *ALARM.FRM:*

Date: @DSYSTEM	Demo project Alarm Message List	Time @TSYSTEM o'clock	Text
Date/Time received	Time cleared	Message text	Condition text
%%			
@DTRECEIVED	@TCLEARED	@IDENTIFICATION	@TEXT
%%			
	Page	@PAGE	

Printout on the printer

Date: 3/20/2020	Alarm inf. list/demo proj.	Time: 12:00 PM	Text
Date/Time received	Time cleared	Message text	Condition text
3/20/2020 1:00:00 PM	3/20/2020 1:03:59 PM	Message 1	Limit exceeded
3/20/2020 1:00:00 PM	1:05:35 PM	Demo information	Limit 750 reached
3/20/2020 1:03:59 PM		Message 2	Limit value
3/20/2020 1:11:23 PM		Message 3	off
3/20/2020 1:03:59 PM	1:12:45 PM	Demo information	off

Date: 3/20/2020	Alarm inf. list/demo proj.	Time: 12:00 PM	Text
	Page	1	

4.7.2 Offline printing

Offline printing means that the Alarm Message List is printed out as it is displayed at the time in the Runtime. This print-out is a snapshot including all filters that have been set and their restrictions. The print out is carried out regardless of whether the variables concerned having option **print**.

PRINT

To print the Alarm Message List offline:

1. define a printer

2. Configure ALAR_G.frm (on page 225)

3. Add **ALAR_G.frm** to the **Files/texts and formats** node

4. In the Runtime, click on the Print button or Print with dialog button.

SET UP AND CHANGE PRINTER

CHANGING AND SETTING UP A PRINTER

To change the printer in the Runtime:

▸ Execute the Funktion (on page 191) **Switch online printer**.

To set up the selected printer in the Runtime:

1. Configure a **Print with dialog** control element for the screen

2. Click on the **Print with dialog** button in the Runtime

3. The configuration dialog is opened.

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.
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:

Parameter	Description
	▸ *Portrait format* ▸ *Landscape*
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.

FORMATTING EXAMPLE

Configuration in *ALAR_G.frm:*

Date: @DSYSTEM	Closed Alarm Message List Demo Project	Time @TSYSTEM o'clock	Text
Date/Time received	Time cleared	Message text	Condition text
%%			
@DTRECEIVED	@TCLEARED	@IDENTIFICATION	@TEXT
%%			
	Page	@PAGE	

Printout on the printer

Date: 3/20/2020	Closed Alarm Message List Demo Project	Time: 12:00 PM	Text
Date/Time received	Time cleared	Message text	Condition text
3/20/2020 1:00:00 PM	3/20/2020 1:03:59 PM	Message 1	Limit exceeded
3/20/2020 1:00:00 PM	1:05:35 PM	Demo information	Limit 750 reached
3/20/2020 1:03:59 PM		Message 2	Limit value
3/20/2020 1:11:23 PM		Message 3	off
3/20/2020 1:03:59 PM	1:12:45 PM	Demo information	off
	Page	1	

4.7.3 FRM configuration file

FRM files (format files) are configuration files for printing out lists.

The FRM file has three parts:

- ▶ Header: at the beginning of the page
- ▶ List part: cyclic per line
- ▶ Footer: at the end of the page

PRINCIPLES

When editing FRM files regard the following:

- ▶ **Separating the list parts:**

  - ▶ Header and list part and list part and footer are separated by *%%*.

    The separation marking must be used only once for the list and the footer.

  - ▶ **Attention:** The last line must be followed by at least two empty paragraphs. Otherwise the footer is not printed!

- ▶ **Positioning the individual entries:**
  You may only use space, no tabulators.

- ▶ **Editing the FRM file in a text editor:**
  Automatic line break must be deactivated otherwise undesired effects in the formatting may occur.

KEYWORDS

The setting for the page length is made in Project Properties under **AML and CEL** or via the *ALARM.frm or ALAR_G.frm* file for the AML or *BTB.frm and BTB_G.frm for the CEL*.

Note:

- ▶ The number of the alarm entries per page results from the predetermined number of lines (e.g. **Lines per page** *72*), less the lines used for header and footer text.

- ▶ The **Use reactivated time** option must be activated in order to be able to use the keywords that evaluate the reactivation (time, number).

- ▶ Free texts and keywords can be used in the formatting file. Key words can be used either in German or in English. The use of English key words is recommended.

- ▶ Not every key word is suitable for every kind of printing (AML, CEL, online, offline).

The following table contains key words in English and German and their field of application:

German	English	AML offline	CEL offline	AML online	CEL online	Description
Key words for the list part						
@BMKENNUNG	@RESOURCELABEL	X	X	X	X	**Resources label**
@DATZEITKOMMT	@DTRECEIVED	X	X	X	X	Time and Date when the alarm occurred
@DATZEITGEHT	@DTCLEARED	X	-	X	-	Time and Date when the alarm ended
@DATZEITOK	@DTACK	X	-	X	-	Time and Date when the alarm was acknowledged
@DATZEITREAKT	@DTREACTIVATE	X	-	X	-	Time and Date of reactivating: Property **Use reactivated time** in the project properties must be activated.
@DATZEIT	@DTLASTEVENT	-	-	X	-	Time and date of alarm received or cleared or acknowledged or reactivated
@ZEIT	@TLASTEVENT	-	-	X	X	Time of alarm received or cleared or acknowledged or reactivated
@ZEITOK	@TACK	X	-	X	-	only displays time of acknowledging
@ZTKOMMT	@TRECEIVED	X	X	X	X	only displays time of alarm received
@ZTGEHT	@TCLEARED	X	-	X	-	only displays time of end of alarm
@ZTREAKT	@TREACTIVATE	X	-	X	-	only displays time of reactivating
@TIMELASTING	@TACTIVE	X	-	X	-	Time active (difference

German	English	AML offline	CEL offline	AML online	CEL online	Description
						time received - time cleared)
@ANWENDUNG	@PROJECTNAME	X	X	X	X	Project name
@KANALNAME	@VARNAME	X	X	X	X	Variable name CEL: Only entries with variables
@AK	@ACLASSNR	X	X	X	X	Alarm/event class name
@AG	@AGROUPNR	X	X	X	X	Alarm/event group number
@AGNAME	@AGROUPNAME	X	X	X	X	Name of alarm/event group
@AKNAME	ACLASSNAME	X	X	X	X	Name of alarm/event class
@TAGNR	@IDENTIFICATION	X	X	X	X	Identification (company-specific label)
@AMELDUNG	@TEXT	X	X	X	X	Alarm message text
@REAKTANZ	@NRREACTIVATE	X	-	X	-	Number of reactivations
@STATUS	@STATUS	X	X	X	X	Status information as in Alarm Message List
@WERT	@VALUE	X	X	X	X	Variable value of alarm
@REAKTIONSTEXT	@COMMENT	X	X	X	X	Commentary from the Alarm Message List. If dynamic limit value texts are used, this is only available if the **Long dynamic limit value texts AML** or **Long dynamic limit value texts CEL** properties have been activated.

German	English	AML offline	CEL offline	AML online	CEL online	Description
@USER	@USERID	X	X	X	X	AML: User who acknowledged alarm.
@RECHNER	@COMPUTER	X	X	X	X	AML: Computer on which alarm was acknowledged.
Key words for header and footer						
@ANWENDUNG	@PROJECTNAME	X	X	X	X	Project name
@SEITE	@PAGE	X	X	X	X	Page number
@HEADDATZEIT	@DTSYSTEM	X	X	X	X	System date and system time
@HEADDATUM	@DSYSTEM	X	X	X	X	System date
@HEADZEIT	@TSYSTEM	X	X	X	X	System time
@USER	@USERID	X	X	X	X	User who prints
@USERNAME	@USERNAME	X	X	X	X	Full user name who triggered action
@RECHNER	@COMPUTER	X	X	X	X	Computer from which printing is carried out
[Text]	[Text]					Random text

⚠Attention

Between the key words there must be enough space so that entries are not overwritten. In doing so, you make sure that long limit value texts are also displayed correctly.

Example:

@TEXT (spaces up to here)

4.7.4 Exporting alarms

Alarms can be exported in different formats:

- ▶ dBase
- ▶ CSV
- ▶ XML
- ▶ SQL

EXPORT

To export alarms

1. Create an Export AML (on page 171) function.
2. Link the function to a button.
3. Execute the function in the Runtime.

   > ☀ **Information**
   >
   > The export to SQL is incremental. If there is data that has already been exported, only new and amended data is exported.