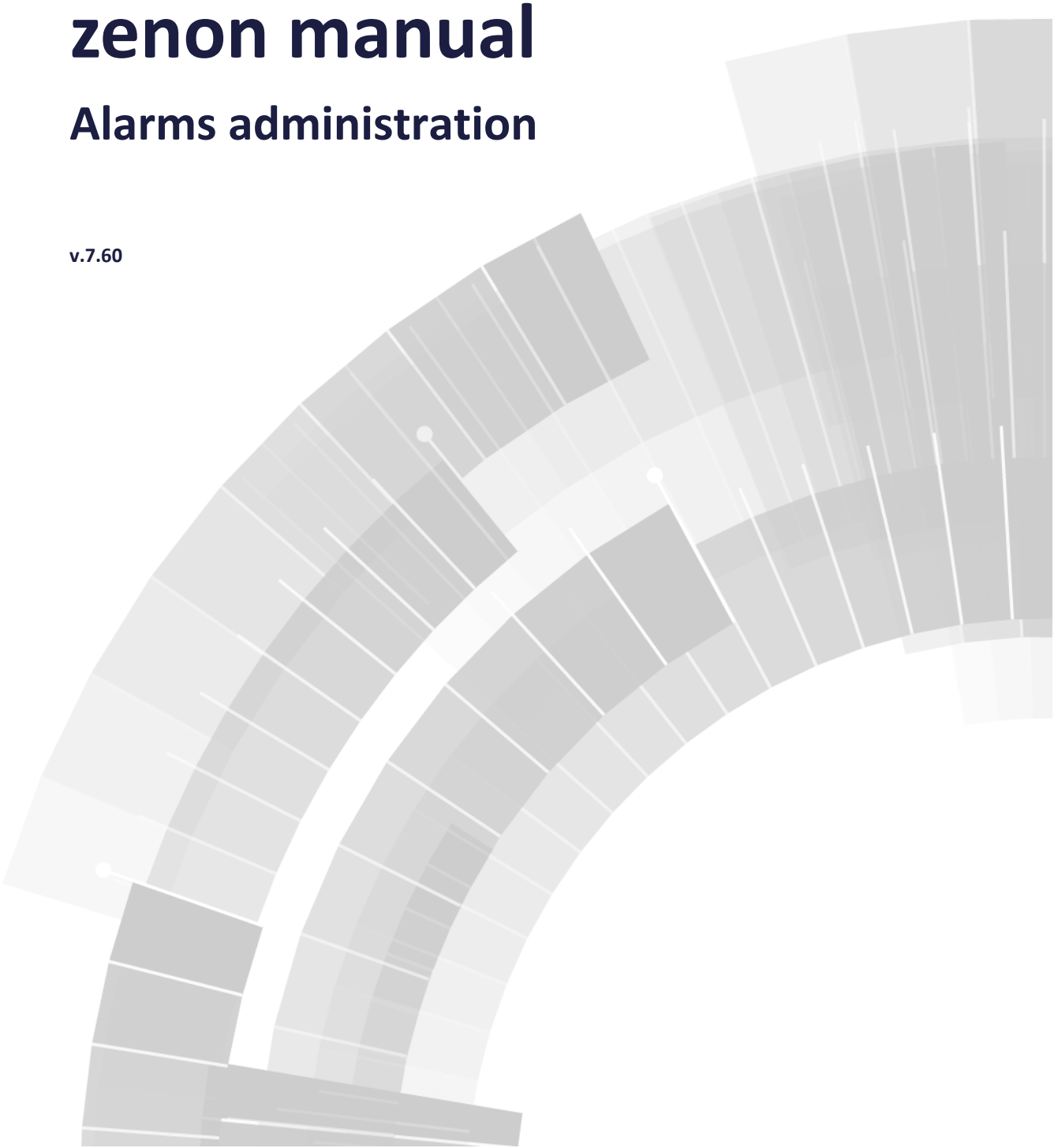
COPA-DATA
do it your way

zenon manual

Alarms administration

v.7.60



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.

GENERAL HELP

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

PROJECT SUPPORT

You can receive support for any real project you may have from our Support Team, who you can contact via email at support@copadata.com (mailto:support@copadata.com).

LICENSES AND MODULES

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

2. Alarms administration

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

1. Alarm status line: (on page 155)
   Information line that is always shown in the foreground in Runtime and contains, depending on the configuration, the most recent or oldest unacknowledged alarms.
2. Alarm Message List (AML) (on page 157):
   Administers the alarms in a list in 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 34) alarms by means of:

- Setting limit values for variables
- With reaction matrices
- Properties of the alarms

> **License information**
>
> *Part of the standard license of the Editor and Runtime.*

3. Configuring alarms

Alarm administration is operated in 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.

EDITOR

To be able to use alarms in 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 51)
- Grouping (on page 37) alarms
- Adapt the screens of **alarm message list** type (on page 14) that are available in Runtime

RUNTIME

For the operation in the Runtime (on page 150) the following is used:

- AML screen switching (on page 117)
- AML filter screen switching (on page 120)
- The zenon alarm functions (on page 122)
- Using Alarm Message List screens (on page 171)
- Alarm status line (on page 155)

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

Steps to create the screen:

1. Create a new screen:

   In the tool bar or the context menu of the **Screens**node, select the **New screen** command. An empty `Standard` screen is created.

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 menu item **Control elements** 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

Parameters	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.

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 Runtime
Alarm Message List	Display of the alarms. The appearance is configurable (on page 12). Columns are set using the column settings (on page 88) 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	Display of the currently-selected filter conditions.
Status	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 Runtime. You can configure changes to the font using Language switching.
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 Runtime.

Acknowledging 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 165).
Visual acknowledgment and acknowledgment	The selected alarms are first visually acknowledged and then acknowledged (on page 165).
Delete	Deletes alarm from the Alarm Message List in Runtime. Alarm must already be acknowledged.
Delete page	Deletes all acknowledged alarms that are displayed on the current page.
Delete all	Deletes all acknowledged alarms that correspond to the current filter criteria.
Linked function (display)	Displays the message allocated to the alarm message.
Execute function	Executes the functions configured for the alarm in 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	Status 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 160).

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.
Status	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 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.

Information

*The current filter is displayed with the **Show 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 Changing the appearance of the AML

The table view of the Alarm Message List can be adapted to individual requirements:

SCROLL BARS, HEADERS AND GRIDS

To define the size and appearance of scroll bars, the header or grids for the 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.*

SORTING IN RUNTIME

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

1. Select the `Graphics files` for the **Display style** property.
2. Link the **Sort ascending** and **Sort descending** properties with a graphics file.

   The selected graphic for the respective sorting direction is displayed in 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 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 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 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: As the size of the scroll bars equals their size in the Runtime, the total size of the list in the Editor can vary from the size in the Runtime. This is also true for the size of the header and the font of the header.

3.2 Creating an Alarm Message List filter screen

It is possible to adjust filter settings for the Alarm Message List in 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 51) for the function to switch the screen to the Chronological Event List screen (on page 117) 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 Runtime, see Using the Alarm Message List Filter (on page 171) chapter.

For the definition of filter criteria, see Filter Alarm Message List Filter (on page 97) 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.*

CREATE ALARM MESSAGE LIST FILTER SCREEN

The `Alarm Message List filter` screen is for [description].

ENGINEERING

Steps to create the screen:

1. Create a new screen:

   In the tool bar or the context menu of the **Screens**node, select the **New screen** command.
   An empty `Standard` screen is created.

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:

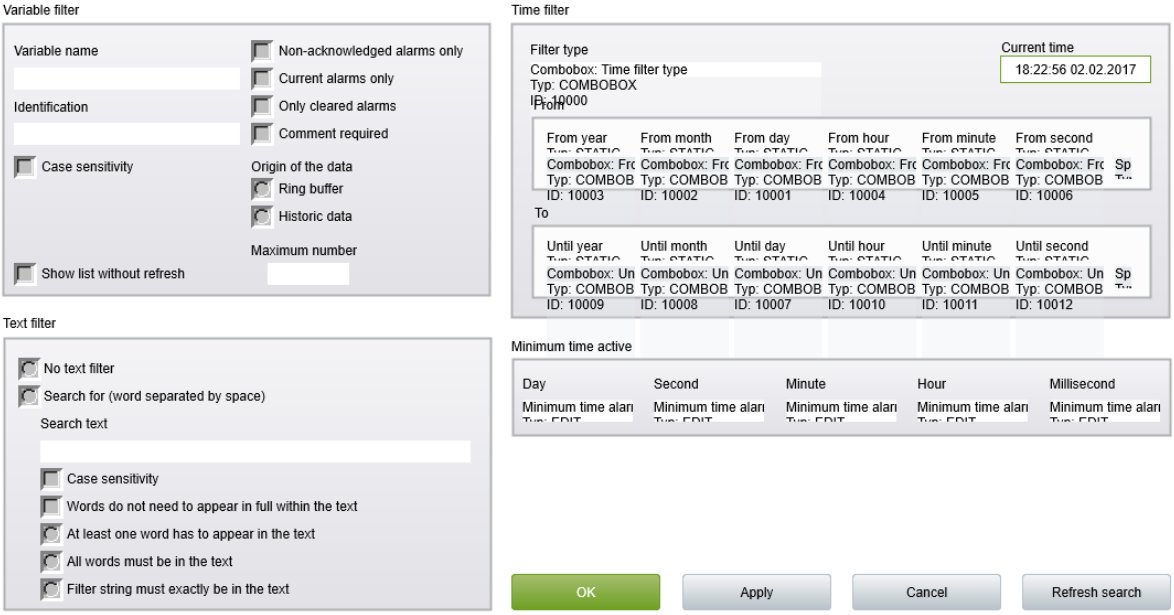
   a) select menu item **Control elements** from the menu bar

   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 Alarm Message filter screen can contain the following control and display elements.

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 30) chapter.

GENERAL FILTERS

Drop-down list of different general filters (on page 100).

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	Alarms of which variables are displayed:
▸ **Name**	Filter according to names of variables.
▸ **Identification**	Filter according to identification of variables.
▸ **Case sensitive**	Note capitalization when filtering the variables.
Type of alarms	Which alarms are displayed:
▸ **Only not 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.
▸ **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.

	`0`: displays all
Alarm/event groups/alarm/event classes/alarm areas	List field for grouped display (on page 37):
▸ **Alarm/event groups**	Alarm/event groups
▸ **Alarm/event classes**	Alarm/event classes
▸ **Alarm Areas**	Alarm areas Note: If **hierarchical alarming** via equipment model is activated, the alarm area column remains empty.
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** ▸ **Historic 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 - 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 - HH:MM:SS ▸ Starting from day, month - HH:MM:SS ▸ 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 Runtime: ▸ No filter ▸ Absolute time filter ▸ Relative time filter ▸ Starting from day, month - HH:MM:SS ▸ Starting from day - 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) ▸ 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 (combobox) ▸ From month (label) ▸ 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 (Touch)	Fields and labeling for stating "to" time, optimized for touch operation. ▸ 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)
Filter absolute time	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) ▸ 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 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 Runtime.

Control element	Description
Insert all elements	All elements.
Archive list	List of archives available in Runtime.
Archive list status	Status of the archive list with number for: ▸ available ▸ filtered ▸ displayed
Lot list	List of available lots.
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)

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
Text: Search text	Labeling for search field.
Input field: Search text	Field for input of search term.
Options	Search options
▸ **Case sensitive**	Capitalization must be noted.
▸ **Words do not need to be in the text completely**	Fragments can also be searched for.
▸ **At least one word must be in the text**	At least one search term from several must be in the result.
▸ **All words must be in the text**	All search terms must be included in the result.
▸ **Exact filter text must be in the text**	Exact text from the input field must be contained in the result.
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. ▸ **No text filter** ▸ **Search for (separate words by Space)** ▸ **Input field: Search text** ▸ **Case sensitivity** ▸ **Words do not need to appear in full within the text** ▸ **At least one word should be in the text** ▸ **All words must exist in the text** ▸ **Filter string has to appear exactly in the text**

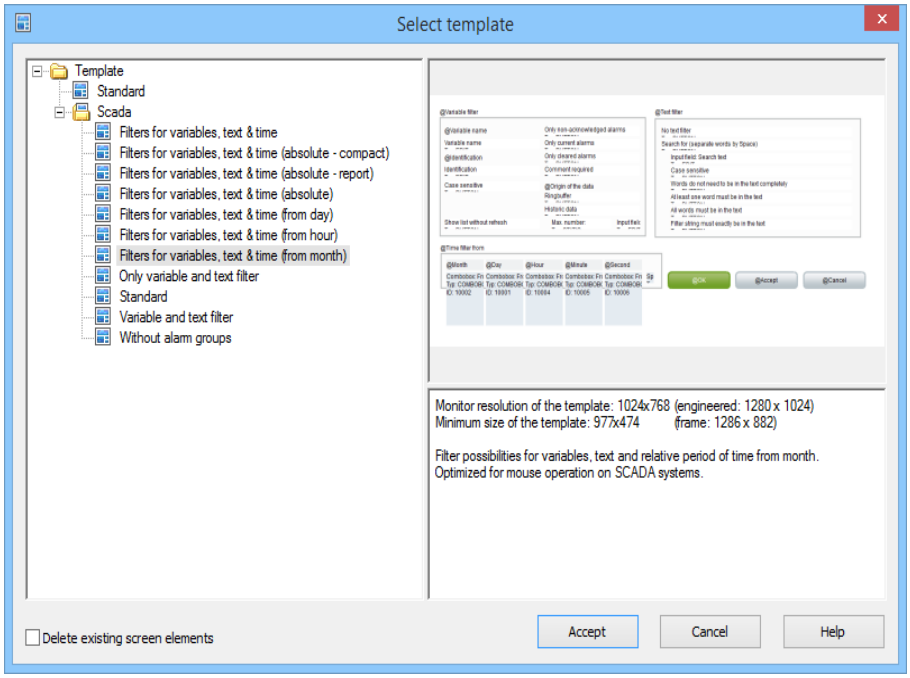
BUTTONS

Buttons in Runtime.

OK	Button: Applies the filter settings and closes the screen. Note on faceplates: In faceplates, `AML filter`, `CEL`

	`filter` and `time/lot filter` screens can be used. When configuring these in 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	Button: Cancels the configuration of the filter settings.
Apply	Button: Accepts the filter settings.
Refresh search	Button: 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 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`: Already existing elements in the screen are deleted when taking over the template.
Apply	Inserts the elements of the selected template in 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.

> **Attention**
>
> *In order for the time to be taken from the screen to be called up in Runtime, the following* ***time range*** *must be selected in the Editor for the screen switching function for the Alarm Message List or the Chronological Event List in the* ***time filter****:* `Set filter at time filter 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 Filter** screen) 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 be configured on different frames or 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 Runtime and have no function.*

3.3 Defining alarms

Define alarms using:

- Limit values and statuses with variables
- Reaction matrixes

ALARMING USING VARIABLES

Define the limit values for variables (see Variables manual, Limits chapter). If these are violated in Runtime, an alarm is generated and displayed in the alarm status line (on page 155). You configure further properties for alarm configuration with:

- Variable properties of the group **Limit Values** and the subgroups for each limit value contained therein:
  - **In Alarm Message List**: The alarm is incorporated into the AML. When it is there as displayed, control it in Runtime using the alarm message list (on page 157) or an alarm message list filter (on page 171).
  - **To acknowledge**: The alarm must be acknowledged before it is removed from the ring buffer (on page 35).
  - **Two-stage acknowledgement**: the alarm must be deleted manually before it is removed from the ring buffer (on page 35).
  - **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/Event Group**: allocation of an alarm/event group (on page 38).
  - **Alarm/Event Class**: allocation of an alarm/event class (on page 41).
- Variable properties of the group **Alarm handling**:
  - **Alarm area_n**: allocation of an alarm area (on page 44).
  - **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.
- Project properties of the group **AML and CEL**:
  - **Selection with border**: selected lines are emphasized by a frame in Runtime.
  - **Same comments**: comments that are entered in Runtime for an alarm are also accepted in the CEL.
  - **Printing active**: activates online printing.

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

- Project properties of the group **Alarm Message List**

  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 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, it must be specifically removed from the ring buffer by a person authorized to do this.
  Example: The alarm has cleared and was acknowledged by the operator. It continues to be retained 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 143).

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 38): group alarms (or events) together logically
- Alarm/event classes (on page 41): serve to prioritize alarms (or events) and are used to color-code alarms in the AML and by events in the CEL
- Alarm areas (on page 44): allow the combining of the alarms with a focus on the location in equipment.

Each group or class can be assigned a name, a number, a color, a function, a status variable, a graphic and an 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, different IDs in the global project, the integration project and subprojects for alarm/event groups, class 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, right click on the **Alarm/Event Groups** subnode
2. Select the command: **New alarm/event group**

   (alternatively select the corresponding symbol in the toolbar (on page 40) or press on the `Ins` button)

Each group can be allocated additional information via its properties:

Parameters	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` **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 122) 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 88) 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 Groups	Links equipment model to the alarm/event group. 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

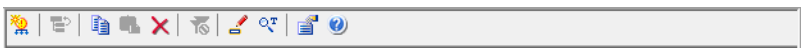
Note: All linked variables lose their group assignment when deleted.

Context menus and alarm/event-groups toolbar

PROJECT MANAGER CONTEXT MENU

Menu item	Action
New alarm/event group	Creates a new alarm/event group.
Editor profile	Opens the drop-down list to select a pre-defined Editor profile.
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.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the contents of 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.
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 for searching and replacing texts.
Properties	Opens the **Properties** window.
Remove all filters	Removes all filter settings.
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, for example

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 40) or press on the `Ins` button)

Each can be allocated additional information via the properties:

Parameters	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. Activation/deactivation is carried out via the Alarm/event group connection active/inactive (on page 122) 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 88) 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.

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

PROJECT MANAGER CONTEXT MENU

Menu item	Action
New alarm/event class	Creates a new alarm/event class.
Editor profile	Opens the drop-down list with predefined editor profiles.
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 contents of 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.
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 for searching and replacing texts.
Properties	Opens the **Properties** window.
Remove all filters	Removes all filter settings.
Help	Opens online help.

3.5.3 Alarm areas

Alarm areas (on page 44) allow the combining of the alarms with a focus on the location in equipment. Alarm areas can be linked to alarm classes (on page 49). 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 40) or press on the `Ins` button.)
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. 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.

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 49).

Alarm/Event Class	Alarm class for the area entry.
{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 = Unacknowledged alarms present 0 = No unacknowledged alarms

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 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 hierarchical alarming of equipment groups in the equipment modeling manual.

Alarm area context menus and toolbar

PROJECT MANAGER CONTEXT MENU

Menu item	Action
New Alarm area	Creates a new alarm area.
Editor profile	Opens the drop-down list with predefined editor profiles.
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 contents of 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.
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 for searching and replacing texts.
Properties	Opens the **Properties** window.
Remove all filters	Removes all filter settings.
Help	Opens online help.

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 number circle 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 configure the display of alarms using the filter. For this you have several possibilities:

1. Define information that is displayed in Runtime in the Alarm Message List:
   With this, you define the information that is shown for an alarm.
   For details, see: Column setting for Alarm Message List (on page 52).
2. Filter alarms for the Alarm Message List when switching and modify them in Runtime:
   With this, you 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 55)
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 97).

3.7.1 Column setting for Alarm Message List

You define the information that is displayed in the Alarm Message List in 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 the Project Properties.
2. Click on the **Column settings AML** property.
3. The dialog for the **column setting** (on page 88) 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 88) 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

Parameters	Description
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**.
▸ **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 Runtime using average character width

	Note: For compatibility reasons, the columns with widths that could not be changed in earlier zenon versions (date and time), have 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 Runtime. Select the desired form from the drop-down list.

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. You can also adjust the column widths here by left clicking on the right end of a column, holding down the mouse button and moving the mouse to the left or right accordingly.
Table settings	
Sort descending	Sorts the entries in the list according to the **Time received** column in decreasing 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.
Display grid	Shows a grid when the list is displayed in Runtime.
Use alternating background colors	Uses **line color 1** and **line color 2** alternately as background colors for the list in Runtime.
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**.

Display in the time columns	
Time	Displays the time for a list entry in the following form: `HH:MM:SS`
Date	Displays the date for a list entry in the following form: `TT:MM:YYYY`
Milliseconds	Expands the time entry by milliseconds. **Note:** Must be activated if milliseconds are to be provided in exports or print-outs.

Hint: If you activate the automatic keyboard in Runtime, it is turned on when an editing field appears. You can also use this 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.*
>
> *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.

You define which alarms are to be displayed in Runtime using filters and which are to be hidden. Filters can be defined in the editor and - depending on the requirements in the Editor - in Runtime.

To tailor the filter selection to the requirements of the operator in Runtime, use an `Alarm Message List filter` (on page 97) screen instead of an `Alarm Message List` screen.

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

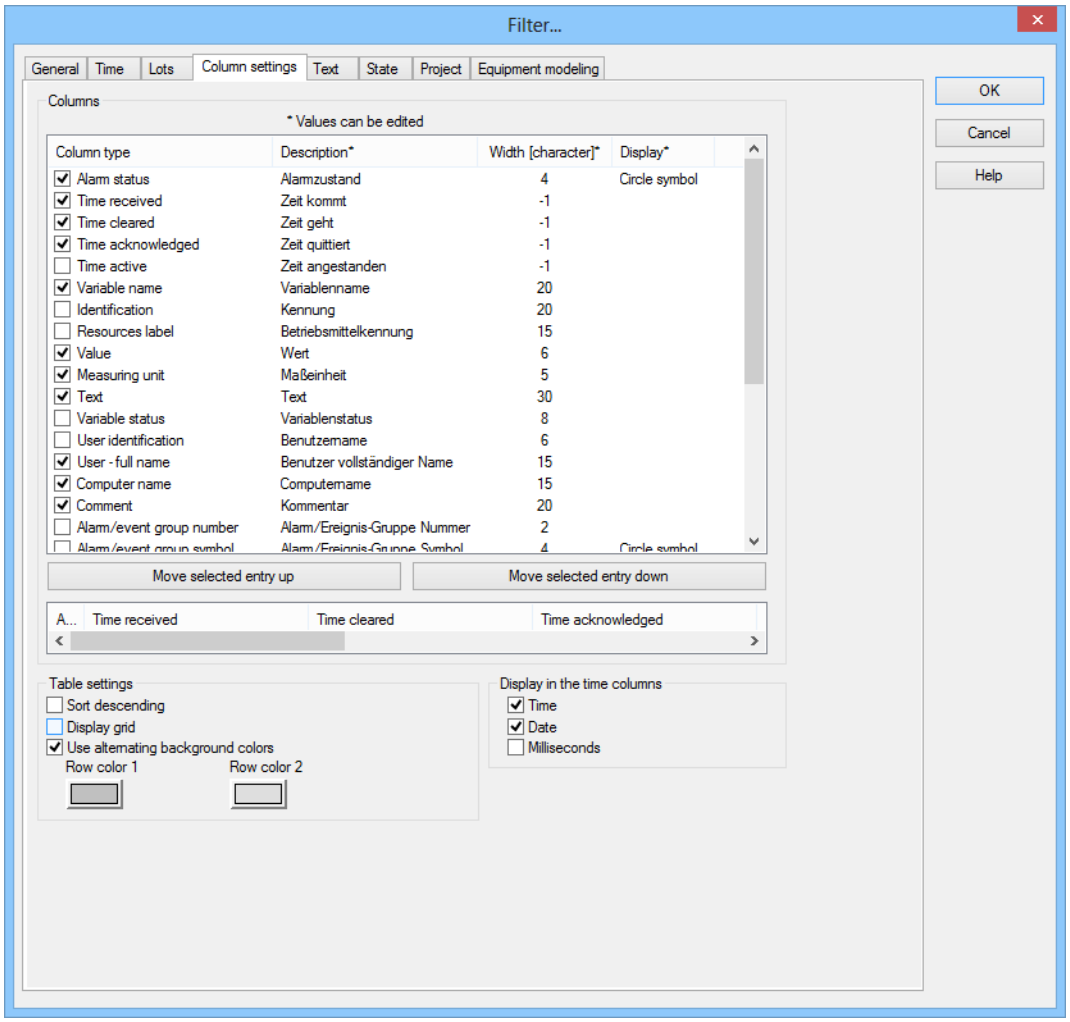
1. engineer a function screen switch to a screen of type Alarm Message List
2. the filter dialog is opened and offers several tabs with filter criteria:

- General (on page 57)
- Time (on page 62)
- Lots (on page 76)
- Column settings (on page 88)
- Text (on page 86)
- Status (on page 93)
- Project (on page 94) (only available in the integration project of the multi-project administration.)
- Equipment Modeling (on page 94)

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**.

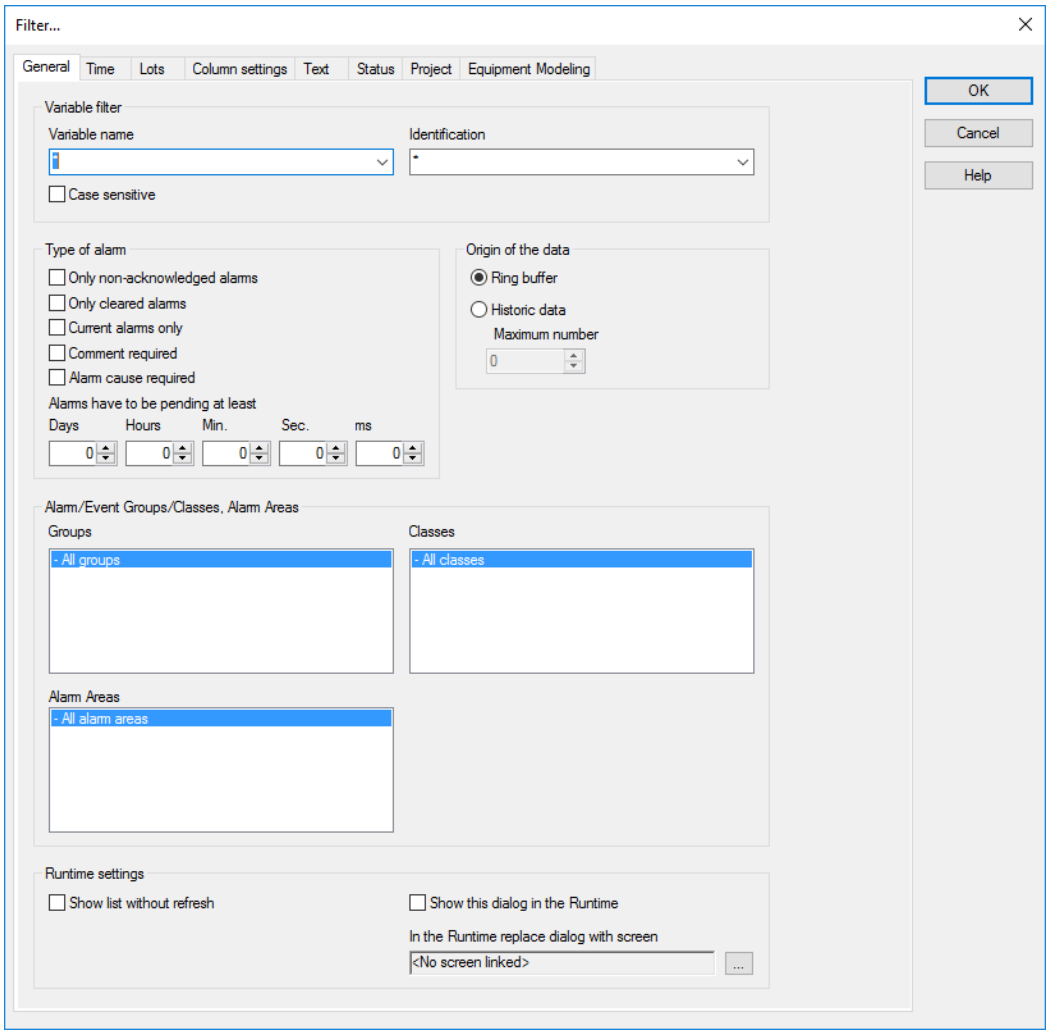


General

With the general filter, you define which alarms are shown and what access you have to the setting in 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

Parameters	Description
Variable filter	Limitation to alarms of certain variables
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 (,) is not permitted for the filtering of variable names! The comma can be entered as a filter text, but no entries are displayed. This means that special filtering of array variables for **Dim 2** and **Dim 3** is not 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.
Case sensitive	Active: Capitalization is recognized when filtering for variable name or identification.

TYPE OF ALARMS

Parameters	Description
Type of alarms	Type of alarm that is displayed.
Only not 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 are shown for which it is necessary to leave a comment (on page 164) are displayed.
Alarm cause required	Active: Only alarms that are required for the linking of an alarm cause (on page 164) are displayed.

Alarms have to be pending at least	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

Parameters	Description
Origin of the data	Display of current or current and historical alarms.
Ring buffer	`Active`: Only data from the ring buffer (on page 35) 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 AND ALARM AREAS

Parameters	Description
Alarm/Event Groups/Classes, Alarm Areas	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups (on page 38) select the one from which alarms should be displayed.
Alarm/event classes	From the existing alarm/event classes (on page 41) select the one from which alarms should be displayed.

ALARM AREAS

Parameters	Description
Alarm areas	From the existing alarm areas (on page 44) select the one from which alarms should be displayed.

RUNTIME SETTINGS

Parameters	Description
Runtime settings	Behavior of the AML in Runtime
Show list without refresh	`Active`: As long as the list is displayed no new entries are added. (Not available for **Export AML** (on page 133) 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 Runtime. This is no longer displayed after reloading. **Notes for time range filters:** **Show this dialog in the Runtime** `active`: ▸ The filter is opened in Runtime in screen switching. The filter is no longer offered on 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`: ▸ **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 dialog in Runtime with screen	Definition of a screen that is to be switched in Runtime instead of the dialog if the **Show this dialog in Runtime** option is active. Only screens of the 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 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.*

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 adjusted in Runtime.

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

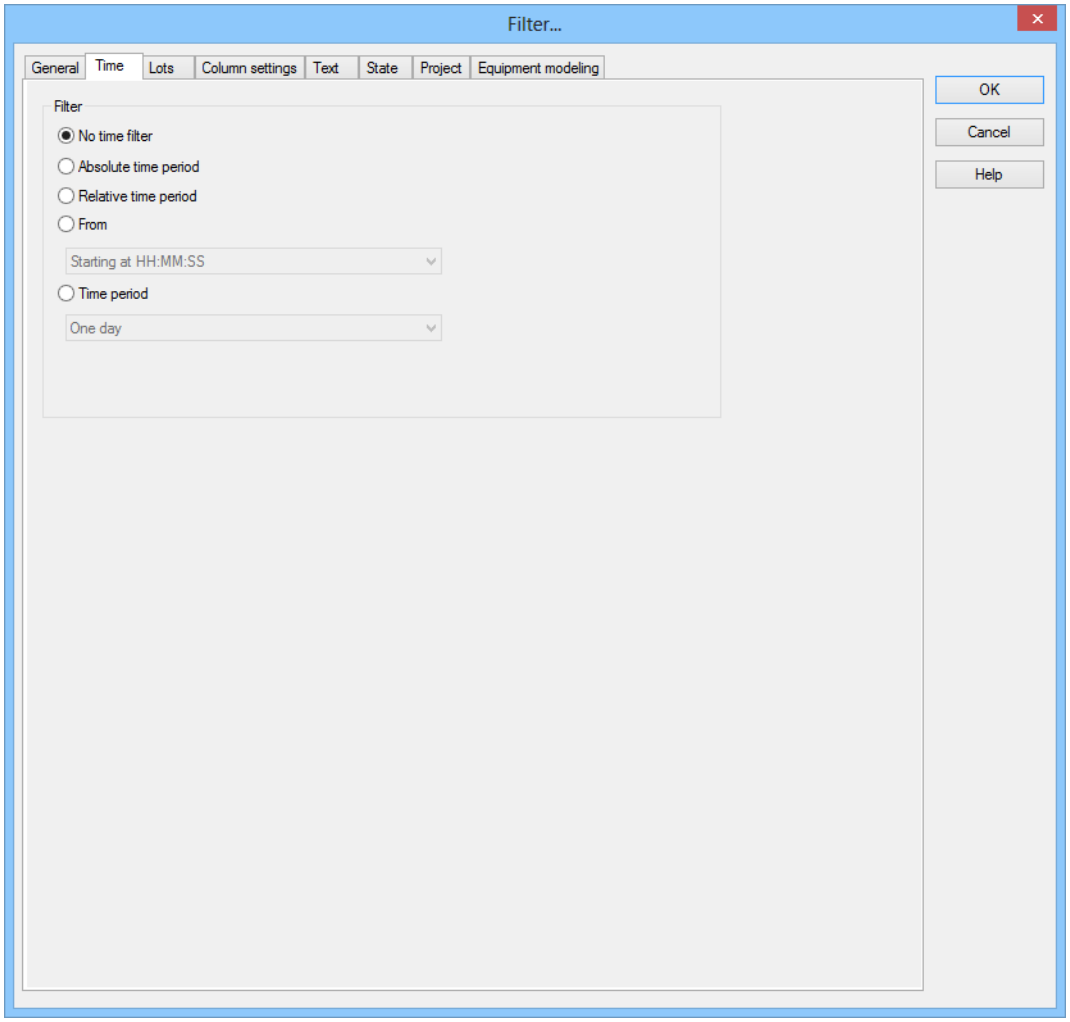
Time filters can be pre-set in both the Editor and in Runtime for:

- Absolute time period (on page 65)
- Relative period of time (on page 67)
- From (on page 69)
- Time period (on page 71)

Time filtering can be carried out in two ways:

1. Define time period in the Editor (on page 74)
   Fixed time areas are used. A time period is given in the editor. It is only possible to filter according to this time period in Runtime. Other filters - such as filtering according to variable name, alarm/event groups and alarm/event classes etc. can no longer be amended in Runtime.
2. Time filter amendable in Runtime (on page 75)
   Pre-defined times are used. The time filter is defined in the Editor and can be changed in Runtime as desired.

TIME FILTER


Filter...
General
Time
Lots
Column settings
Text
State
Project
Equipment modeling
Filter
No time filter
Absolute time period
Relative time period
From
Starting at HH:MM:SS
Time period
One day
OK
Cancel
Help

FILTER

Selection of the filter.

Parameters	Description
No time filter	`Active`: No time filter is used. **Note:** all Runtime entries since 1. 1. 1990 are displayed.
Absolute filter	`Active`: A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used. In the settings section, the corresponding options can be shown and configured there. **Note:** Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.
Relative period of time	`Active`: A relative time period is entered. In the settings section, the corresponding options can be shown and configured there. **Attention:** this filter is constantly updated.
From	`Active`: A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. Selection of the area mode from drop-down list: ▸ Starting from HH:MM:SS ▸ Starting from day - HH:MM:SS ▸ Starting from day, month - at 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.
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.

CLOSE DIALOG

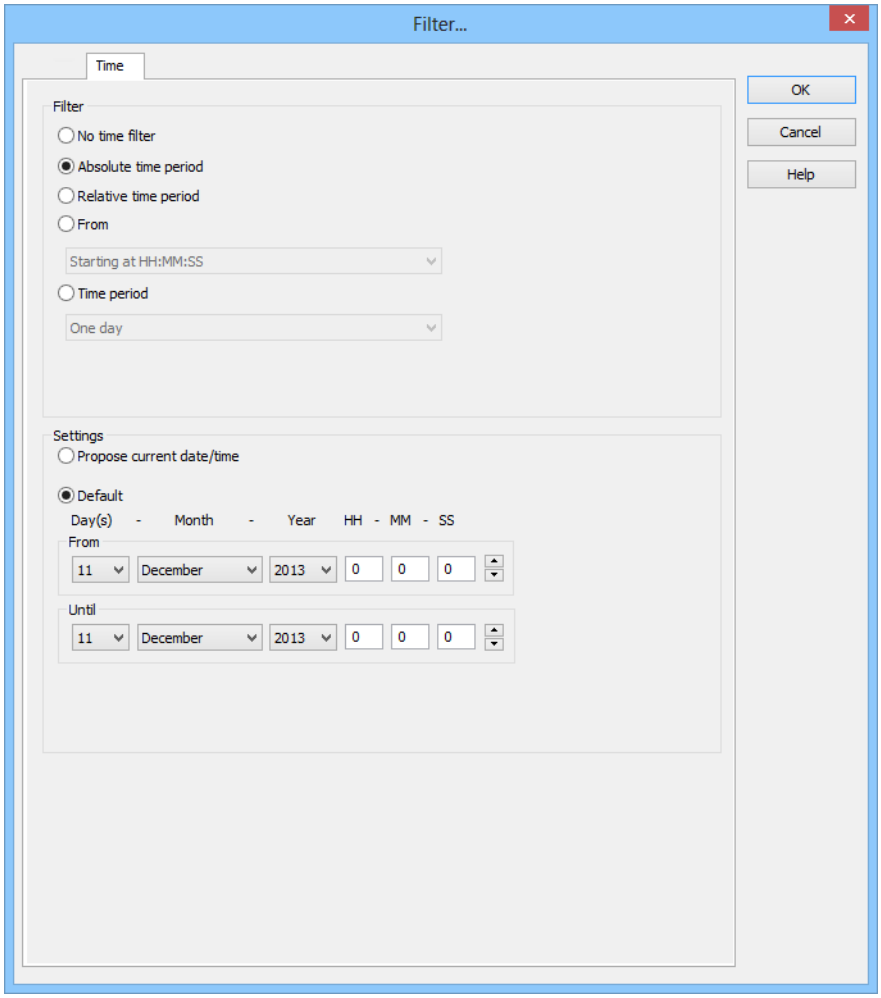
Parameters	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Absolute time period

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

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

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



Parameters	Description
Settings	Configuration of the time filter.
Propose current date/time	`Active`: Time filter is displayed in Runtime.
Preset	`Active`: The time filter is prescribed in the Editor. Only the start time can still be configured in Runtime.
From	Start time of the filter. Selection of day, month, year, hour, minute and second
Until	End time of the filter. Selection of day, month, year, hour, minute and second

CLOSE DIALOG

Options	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.

Relative period of time

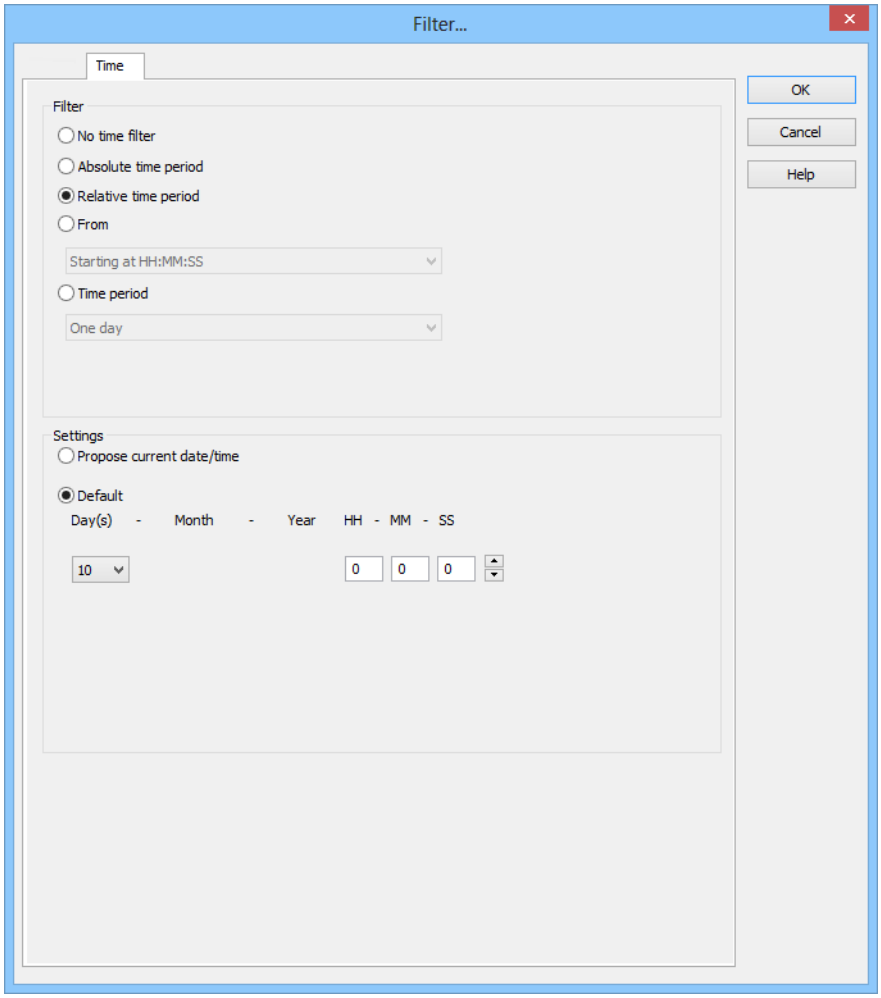
A relative time period is entered.

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

To set the filter:

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

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



Parameters	Description
Settings	Configuration of the time filter.
Propose current date/time	`Active`: Time filter is displayed in Runtime.
Preset	`Active`: The time filter is prescribed in the Editor. Only the start time can still be configured in Runtime. Selection of the relative time period in days, hours, minutes and seconds.

CLOSE DIALOG

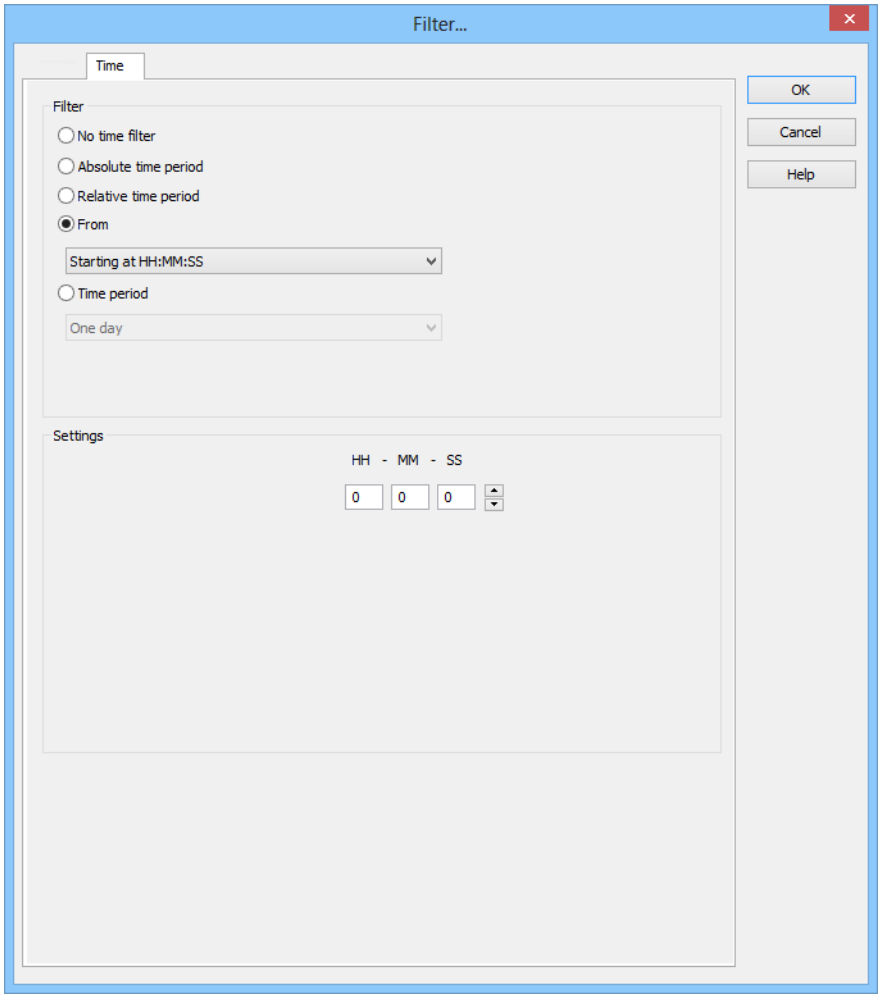
Options	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

From

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

1. Select, in the **Filter** section, the **Off** option
2. Select the desired filter from the drop-down list.
   - `From HH:MM:SS o'clock`
   - `From day - HH:MM:SS o'clock`
   - `Starting on day, month at HH:MM:SS`

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



Parameters	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 - HH:MM:SS` ▸ `Starting from day, month - at HH:MM:SS` **Warning!** 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 `23:00:00`. If it is then 23:30 when executing the function, then it is filtered from 23:00:00 up to the current point in time. If it is 22:30 however, then filtering takes place from 23:00:00 on the previous day to the current point in time.
▸ `Starting from day - 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 - 23:00:00`. If it is the 10th of the month at 23:30, then filtering takes place from the 5th of the month from 23:00:00 to the current time point. If, however, it is the 4th of the month, then filtering takes place from the 5th of the previous month to the current time point.
▸ `Starting from day, month - at 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 - 23:00:00`. If it is October 10th at 23:30, then filtering takes place from October 5th from 23:00:00 to the current time point. If, however, it is only October 4th, then filtering takes place from October 5th of the previous year from 23:00 to the current time point.

CLOSE DIALOG

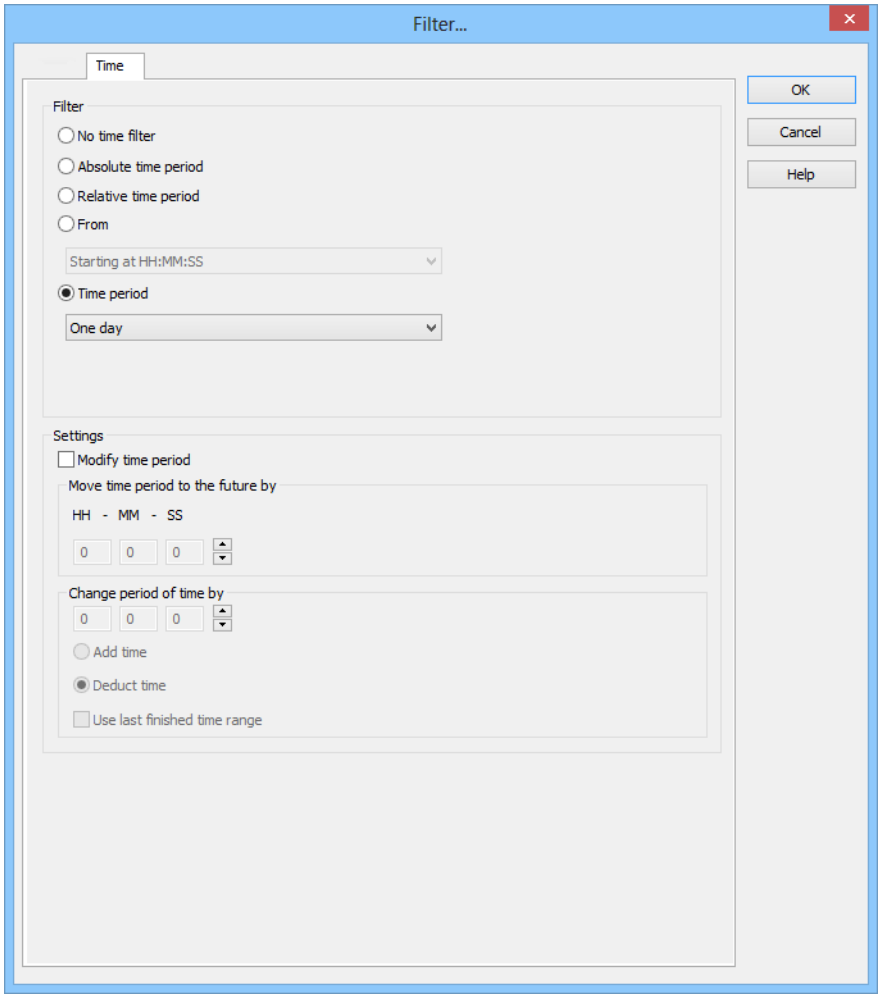
Options	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

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



Options	Description
Time period	Selection of a time range from a drop-down list. Filtering for this time range is carried out in Runtime. The filter relates to the time of screen switching. For example: The value `60 minutes` shows all archives of the last hour. If this dialog is offered in Runtime, the start time of the time range can be selected.
Settings	Optional setting for the time range.
Modify time period	Allows amendments to cycles, postponements and extensions of time periods. `Active`: Evaluation is carried out in accordance with the following rules: ▶ First, the **Use last finished time period** option is evaluated. ▶ After this, **Change time period by** is used. ▶ **Move time period to the future by** is then applied. `Inactive`: No changes to the time period are made. **Attention:** With version 7.10, filter actions on the basis of this function led to different results than those in the versions before.
Move time period to the future by	`Active`: The time period defined in the filter is postponed to the future. 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.
Change period of time by	`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. ▶ **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.
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.

CLOSE DIALOG

Options	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.

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 Runtime. You can then only define the start time in Runtime, but no further filter settings.

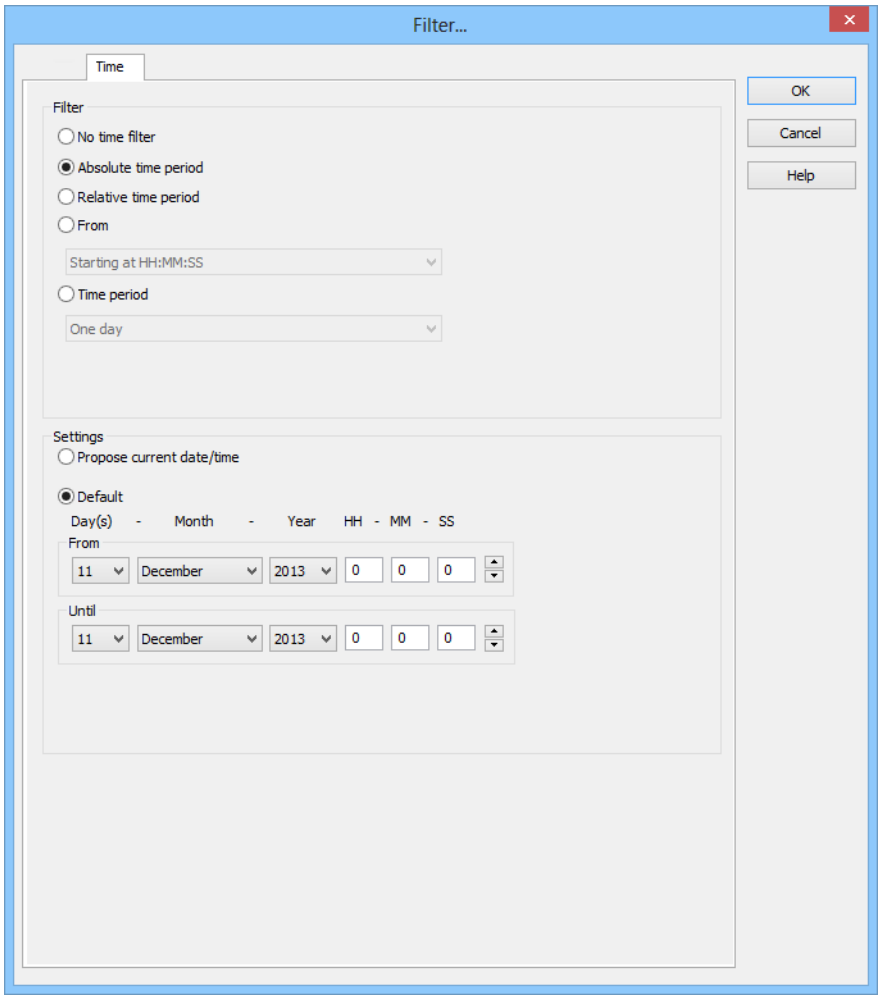
For example: You set a 30 minute time filter. In Runtime, you can now only set when this 30 minute time period is to start. However, you cannot change the filter to a day filter.

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

To create the filter:

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

3. Configure the selected time period



Tip for time period: Activate the `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.

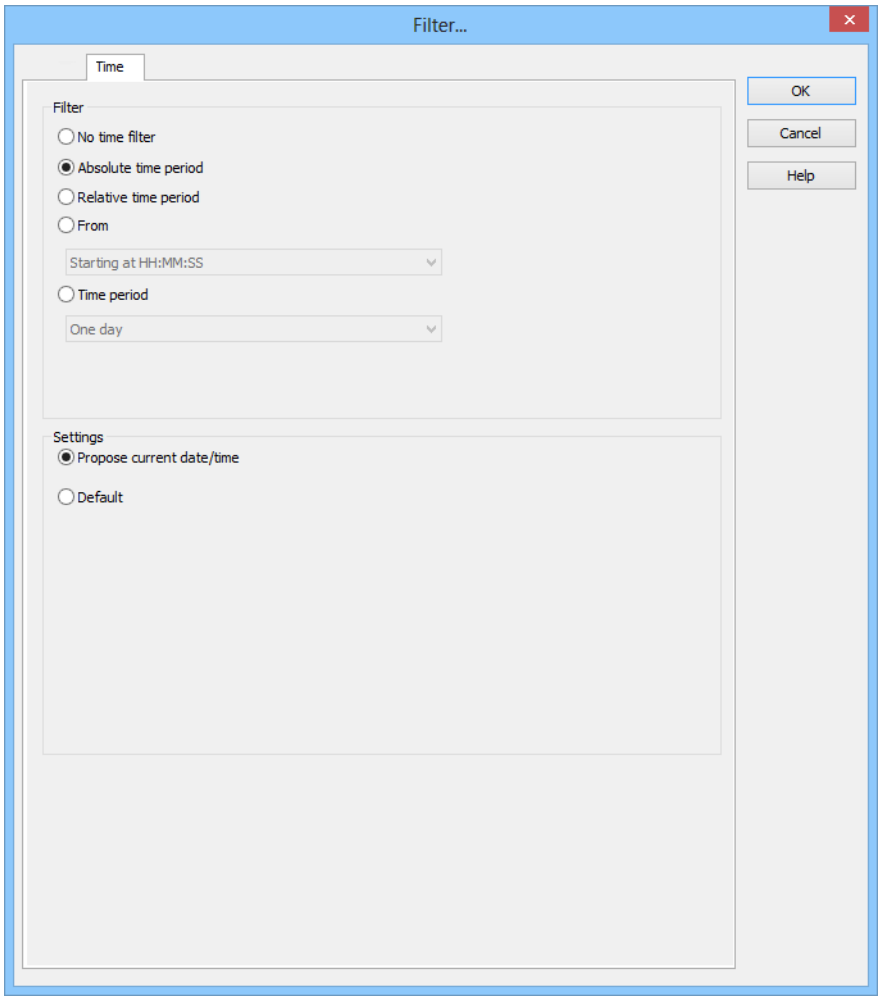
Time filter can be configured in Runtime

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

1. The screen must have **Filter** and **Display filter** buttons
2. select the desired filter:

- Absolute time period
- Relative period of time

3. Select, in the Settings section, the option **Propose current date/time**
4. The filter dialog is opened in Runtime with the current date and time



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 Runtime in advance when the AML is loaded.

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.

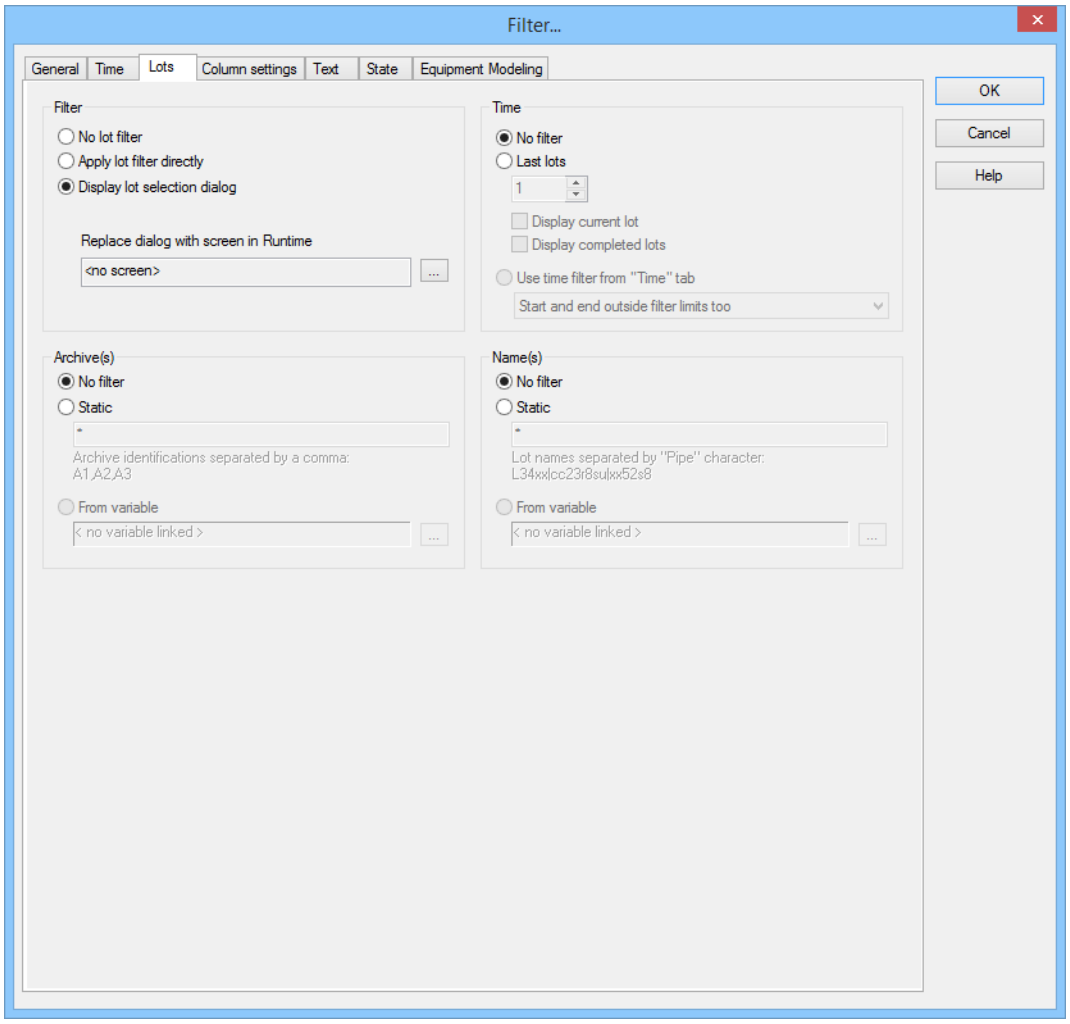
Information

Some filters in zenon can be configured independently of one another and then combined in Runtime. This is only possible to a limited extent with the lot filter.

The lot filter can offer a list of existing lots in 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 you then select a lot from this list in 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 Runtime and a lot is selected, the time filter displayed does not correspond to the one configured in the Editor.



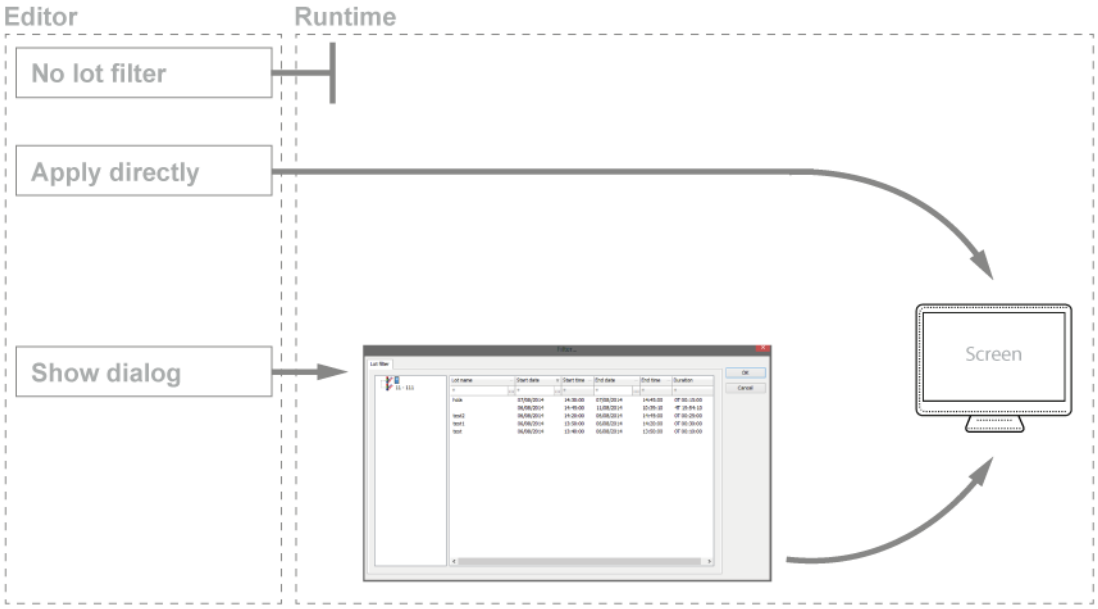
FILTER

Settings for the application of the lot filter. Selection of one of the 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.

Parameters	Description
No lot filter	▸ `Active`: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in Runtime.
Apply lot filter directly	▸ `Active`: The filter configured here is applied in Runtime directly. 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 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 dialog with screen in Runtime	Only available if the **Show lot selection dialog** option has been selected. Definition of a screen that is to be called up in Runtime instead of the **lot selection dialog**. Only `time/lot filter` screens are offered. Click the **...** button and the dialog opens to select a screen. If the linked screen is not found in 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 position.
Relative lot selection	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 Runtime. This also applies for the right-click functionality.

Overview of the implementation of configuration in Runtime:



TIME

Configuration of the time filter for lot selection. Selection of one of the options:

- **No filter**
- **Last lots**
- **Use time filter from "Time" tab**

Parameters	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 cursor 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 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. ▸ `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**

Parameters	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 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 Runtime:** ▸ The variable selection is only activated in Runtime if a valid variable has already been linked in Runtime. The **...** button is always deactivated in Runtime. The option can be selected, but no new variable can be linked. ▸ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable is not found in Runtime, there is no filtering for archive names. This also applies if the value of the 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 Runtime with the **relative lots** option. With this, the variables must be selected in Runtime, which is in turn stipulated by the possible selection of archives. The archive, once filtered, must be one of the archives that relate to the configured curves. No data is displayed if this is not the case. This setting can also be used to limit the displayed curves. However these remain shown in the curve list.

ETM example:

Configured curves	Data source	Archive prefiltering in the lot filter	Result in the screen
A	AR	AR	Is shown in the curve list and drawn in the trend.
B	EA		Is only shown in the curve list.
C	EP		Is only shown in the curve list.

Note archive revision: The archive for which the screen is opened is already selected in the screen switching function. Because only 1 archive can be selected, further limitation makes no sense.

Example of archive revision:

Configured archive	Archive prefiltering in the lot filter	Result in the screen
AR	EA	No data is displayed.

NAMES

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

- **No filter**
- **Static**
- **From variable**

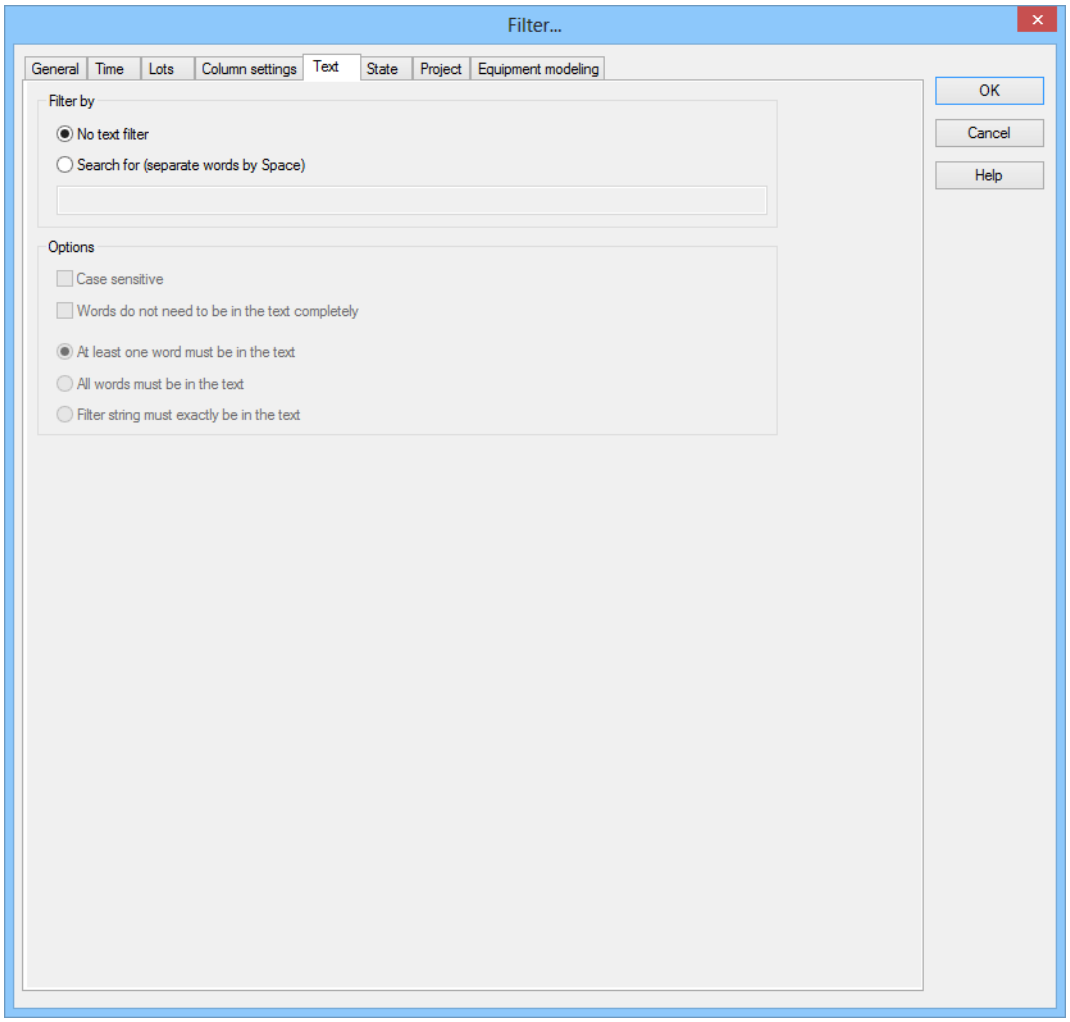
Parameters	Description
No filter	▸ `Active`: Filtering for lot names is not carried out.
Static	▸ `Active`: Lot names that correspond to the character string entered in the input field are filtered for. Input of the lot name in the input field: ▸ Several entries are separated by a pipe character (**|**). ▸ ***** 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 Runtime. 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 Runtime: ▸ The variable selection is only activated in Runtime if a valid variable has already been linked in Runtime. The **...** button is always deactivated in Runtime. The option can be selected, but no new variable can be linked. ▸ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. Attention: If the selected variable is not found in Runtime, there is no filtering for lot names. This also applies if the value of the variable cannot be determined. The filter then corresponds to the **No filter** setting.

CLOSE DIALOG

Parameters	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.

Text

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



FILTER BY

FILTER BY

Parameters	Description
Filter by	
No text filter	The text filter is not used.
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

Parameters	Description
Options	
Note capitalization	`Active`: The filtering is case-sensitive.
Words do not have to appear in the text in full	`Active`: Parts of words can also be taken into account during filtering.
At least one word must be in the text	`Active: At least` one word of the search string has to be in the text.
All words must be present in the text	`Active`: All words must be present in the search string. In doing so, the sequence plays no role.
Filter text must appear in the text exactly	`Active`: The text must be exactly as defined in the search string.

Column settings

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

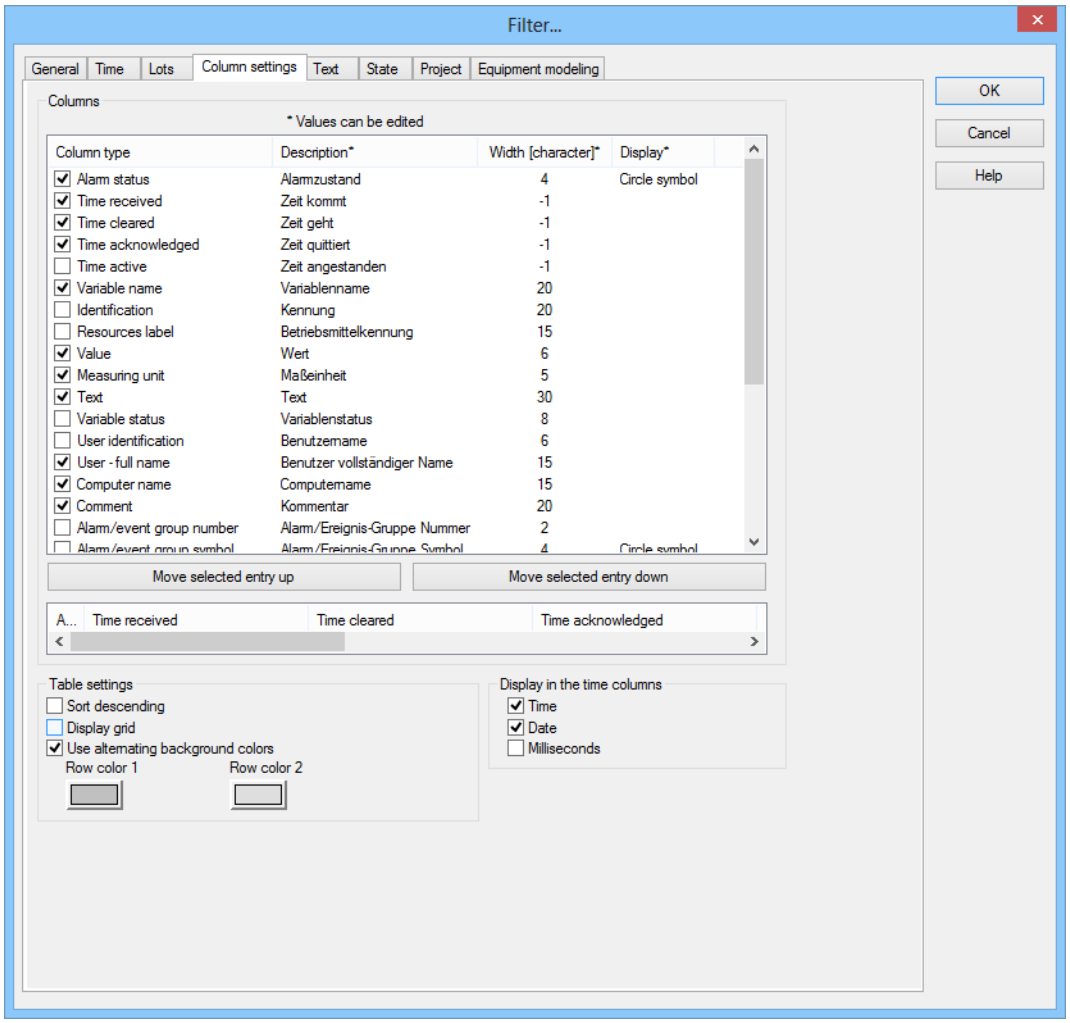
Note: All settings which you make in this tab are default settings for:

- Alarm Message List screen
- Alarm Message List filter screen
- Alarm status line
- Export (on page 133) to CSV, dBase or XML

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

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 Parameters	Description
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**.
▸ **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 Runtime using average character width **Note:** For compatibility reasons, the columns with widths that could not be changed in earlier zenon versions (date and time), have 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 Runtime. Select the desired form from the drop-down list.

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. You can also adjust the column widths here by left clicking on the right end of a column, holding down the mouse button and moving the mouse to the left or right accordingly.
Table settings	
Sort descending	Sorts the entries in the list according to the **Time received** column in decreasing 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.
Display grid	Shows a grid when the list is displayed in Runtime.
Use alternating background colors	Uses **line color 1** and **line color 2** alternately as background colors for the list in Runtime.
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**.

Display in the time columns	
Time	Displays the time for a list entry in the following form: `HH:MM:SS`
Date	Displays the date for a list entry in the following form: `TT:MM:YYYY`
Milliseconds	Expands the time entry by milliseconds. **Note:** Must be activated if milliseconds are to be provided in exports or print-outs.

Hint: If you activate the automatic keyboard in Runtime, it is turned on when an editing field appears. You can also use this to configure the columns if you are using a computer without a keyboard.

Attention

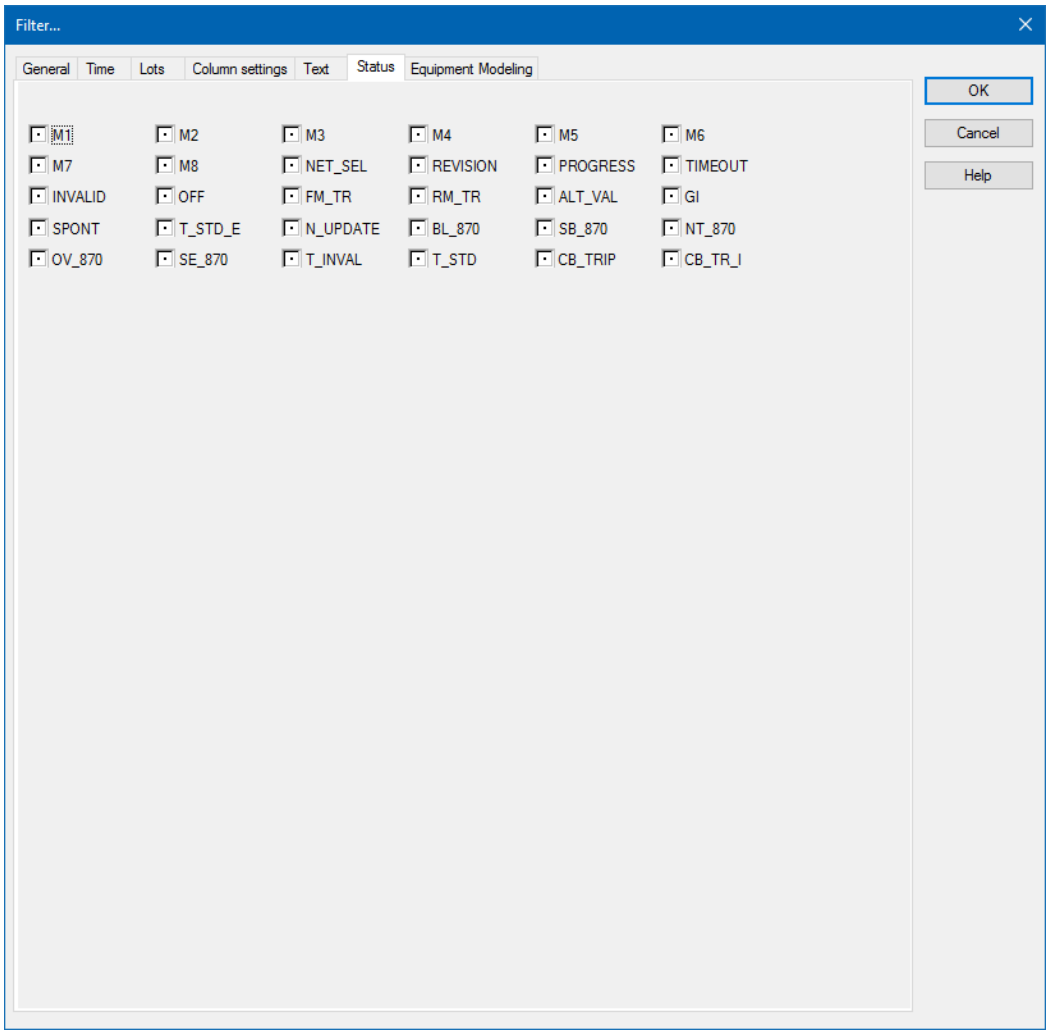
The column width is given in characters and is dependent on the font used.

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.

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.

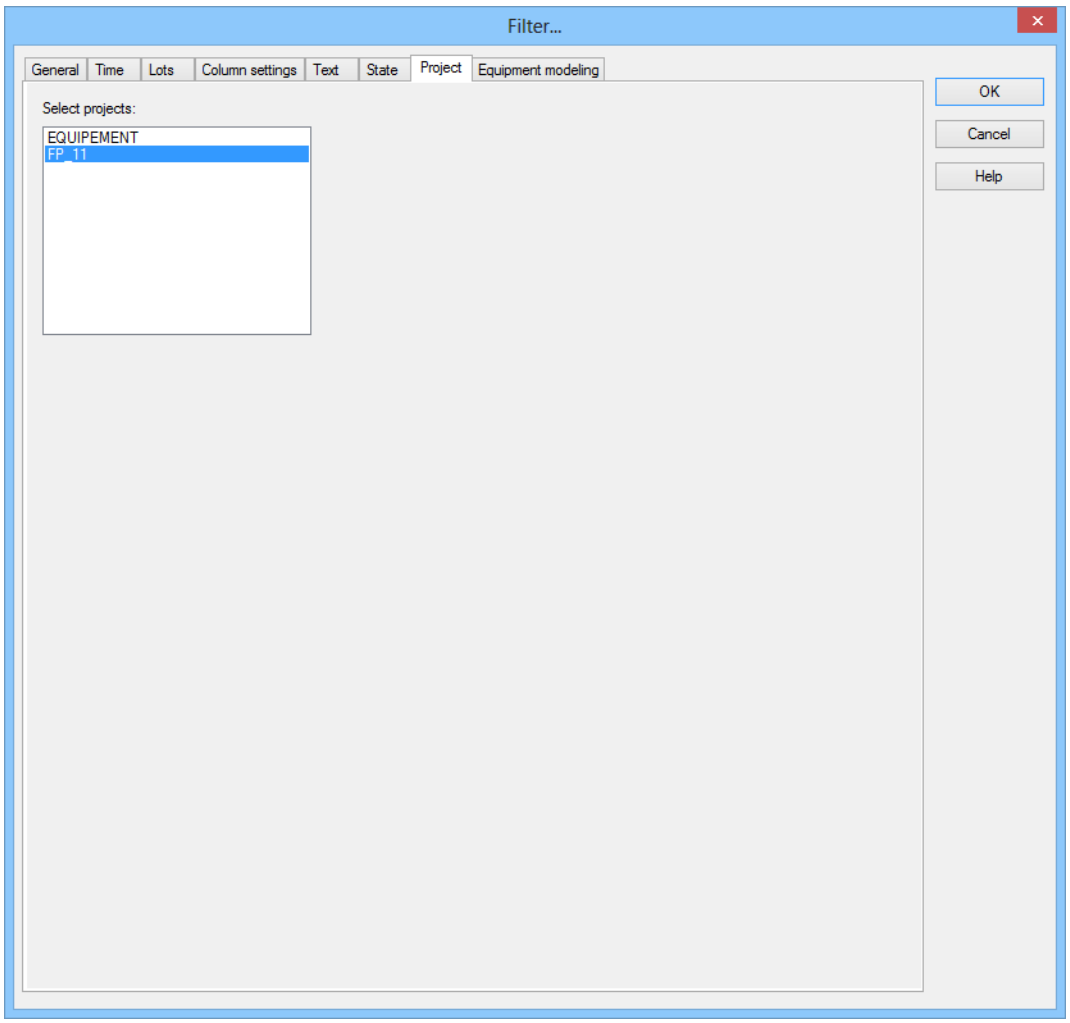
Example

*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.*

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 via multi-select by pressing and holding key `Ctrl` and mouse click on the desired projects.

Equipment Modeling

In the filter all already existing equipment models are displayed. Via the context menu or via toolbar, you can create new models and groups.

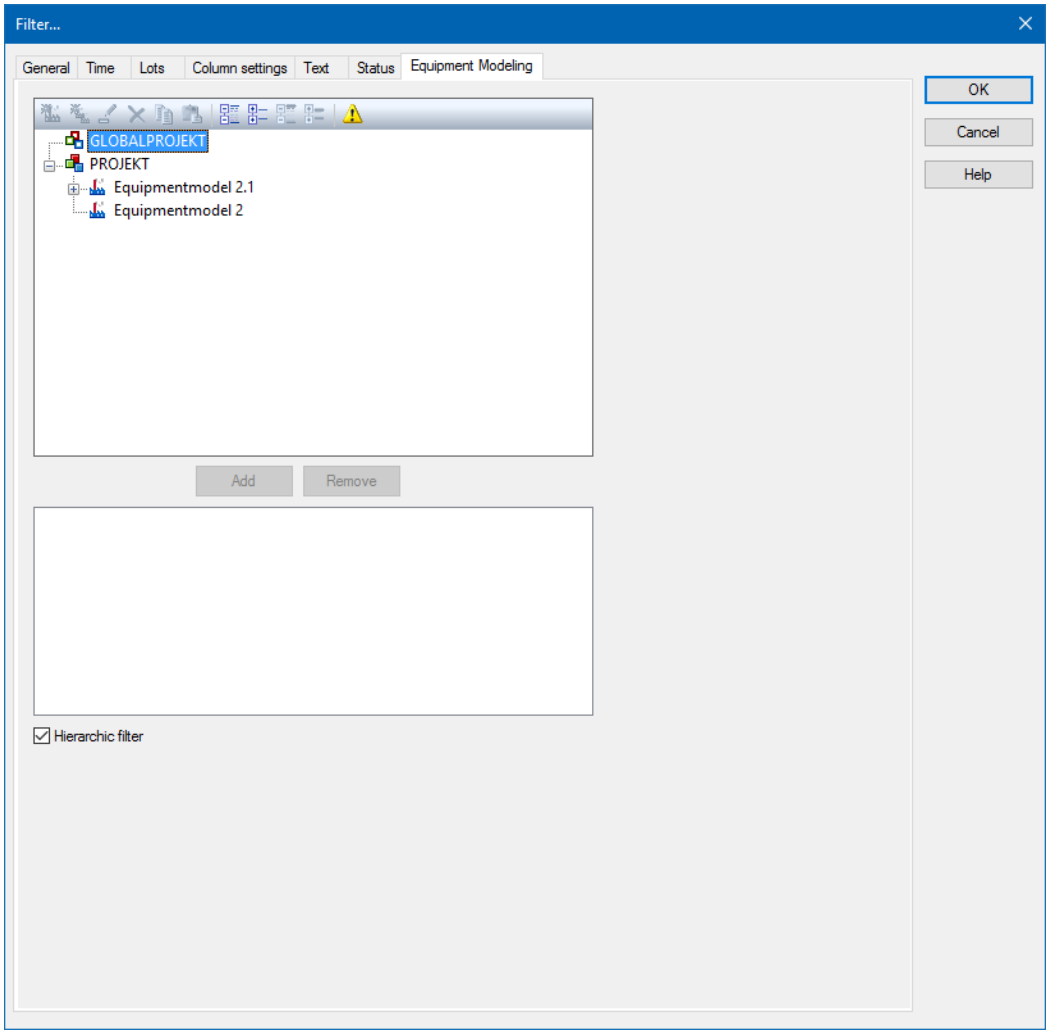
To add groups to the filter:

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
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.
Hierarchic filter	Checkbox for the activation of the hierarchical filtering of the equipment model ▸ `Activated`: 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 Runtime. ▸ `Inactive`: When filtering, only variables that are linked to the selected equipment group are taken into account.Default: `activated`
Filter list	Shows all equipment groups that are to be filtered.

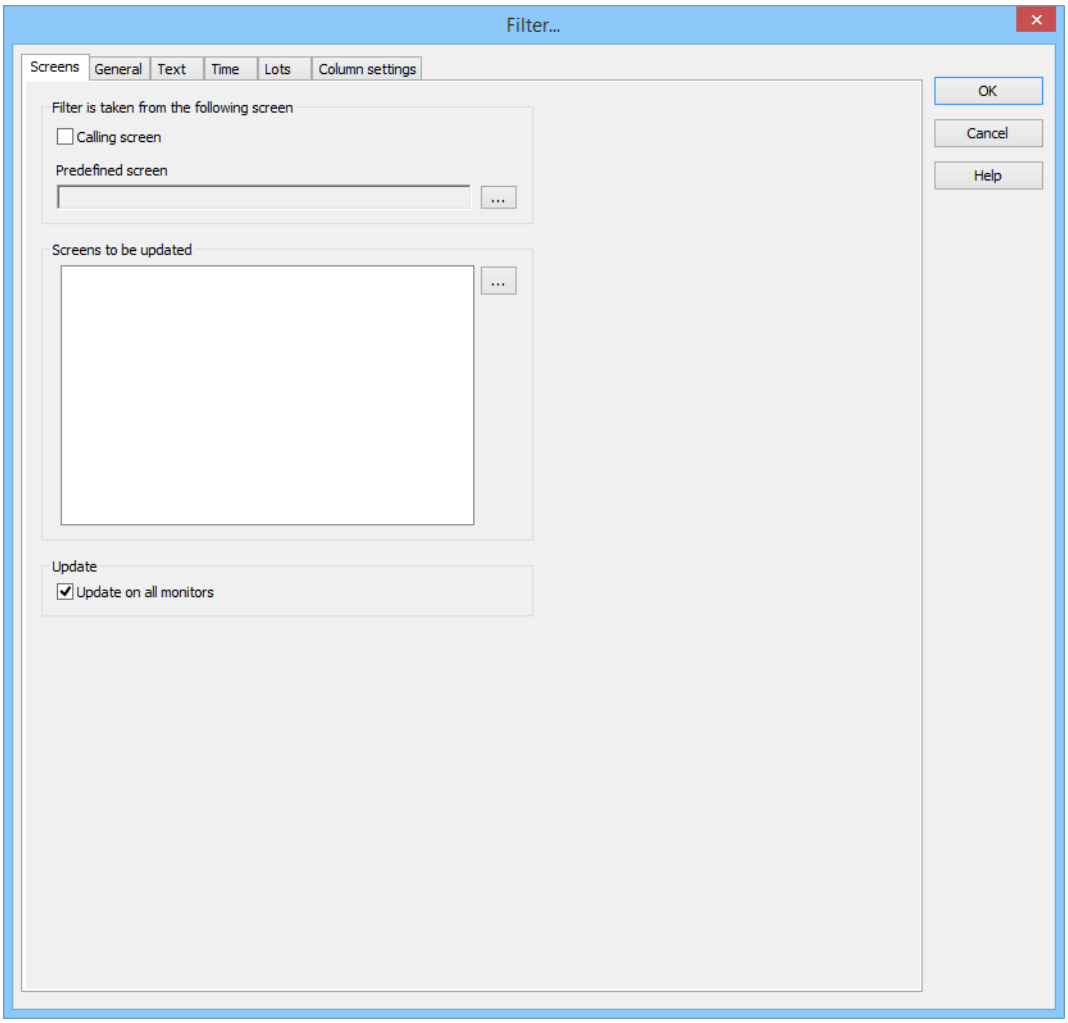
CLOSE DIALOG

Options	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.

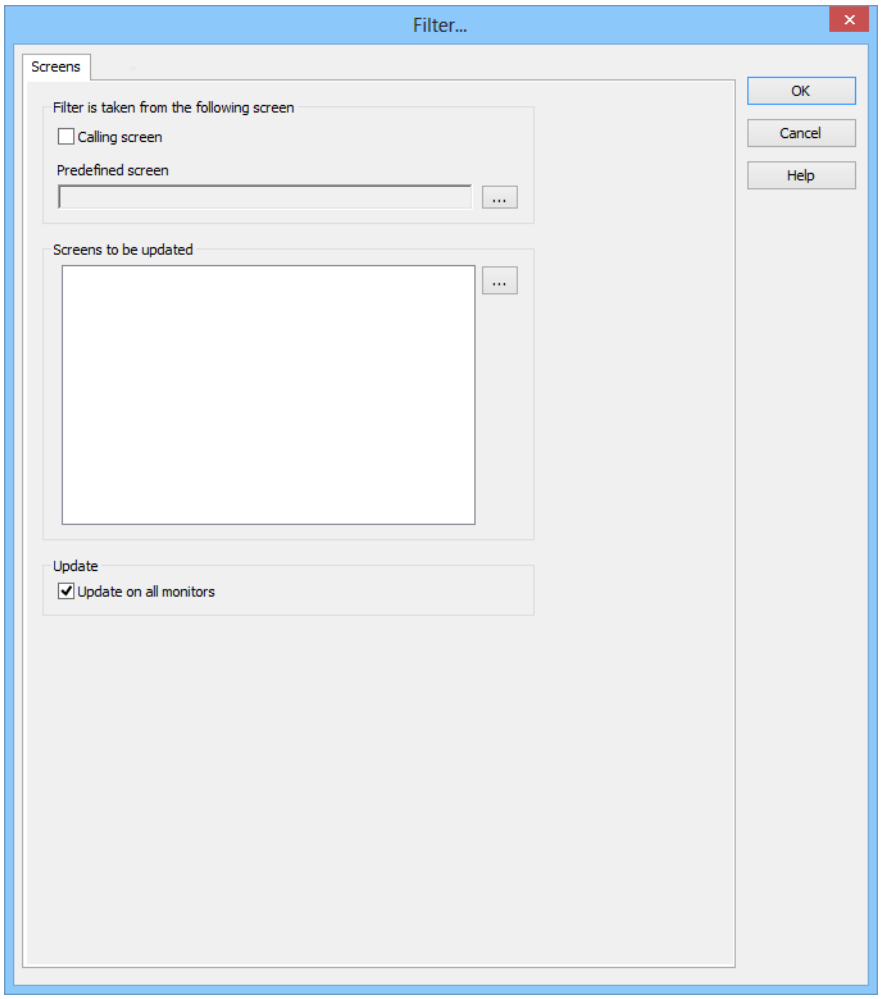
To create an `Alarm Message List filter` (on page 14) screen:

1. Create a **Screen switching** function on an **Alarm Message List filter** screen
2. the filter is displayed with all tabs:
    - Screens (on page 98)
    - General (on page 100)
    - Text (on page 103)
    - Time (on page 105)



Screens

On this tab, you can define the screens that are to be updated by the screen filter.



The following settings are available:

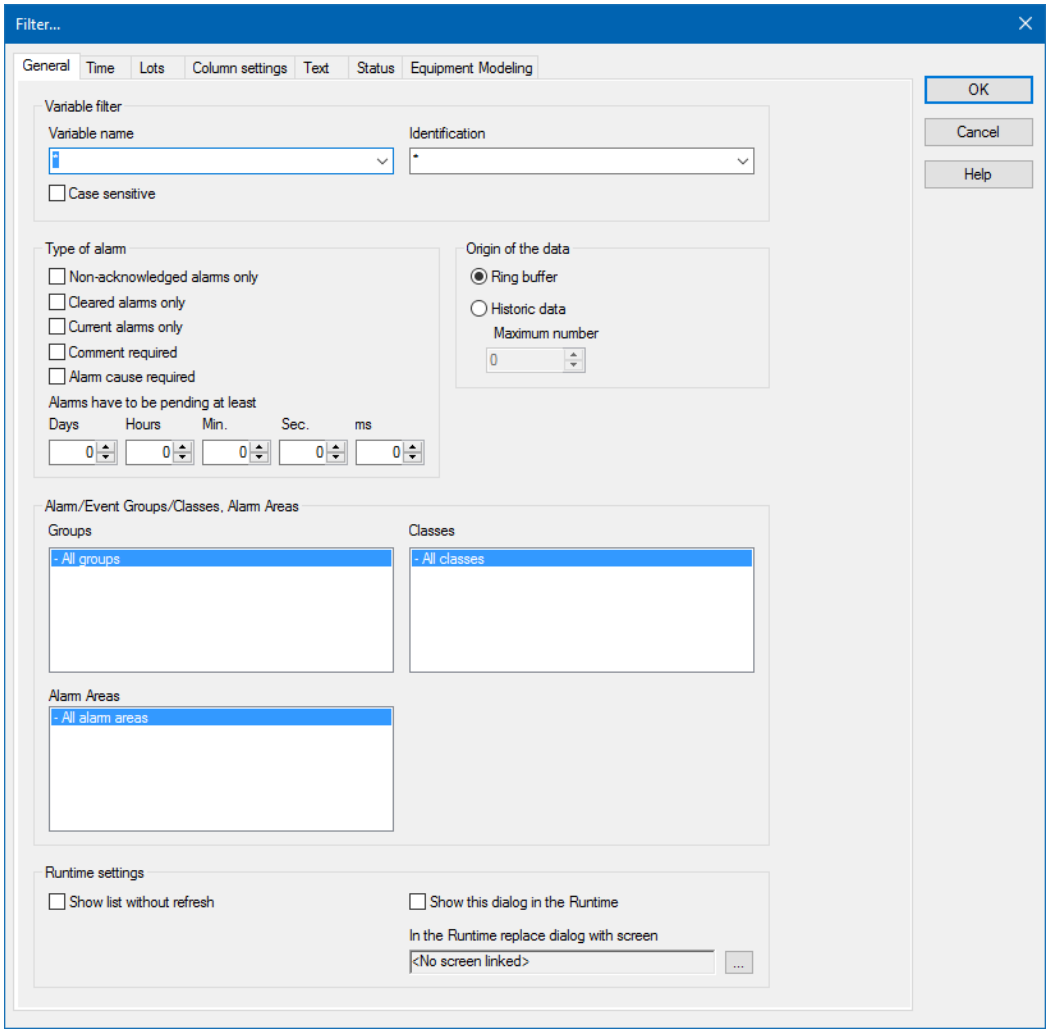
FILTER IS TAKEN FROM THE FOLLOWING SCREEN

Parameters	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 screen button is grayed out. You cannot explicitly select a screen, because the filter is always updated from the calling screen with this setting. Note: Settings in the **General**, **Text** and **Time** tabs are locked.
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 of faceplates can be selected for screen switching to AML filter, CEL filter, time filter and equipment model. 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 selcted screen is entered into the list of screens to be updated. If you delete it from the list, the next screen on the list is automatically entered here. Note: Not available if you have activated the **Calling screen** checkbox.

SCREENS TO BE UPDATED

Parameters	Description
Screens to be updated	Selection of the screens that are to be updated. Subscreens of faceplates can be selected for screen switching to AML filter, CEL filter, time filter and equipment model. 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 the button to open 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 screens which must be updated are updated on all accessible monitors.

General


Filter...
General
Time
Lots
Column settings
Text
Status
Equipment Modeling
OK
Cancel
Help
Variable filter
Variable name
*
Identification
*
Case sensitive
Type of alarm
Non-acknowledged alarms only
Cleared alarms only
Current alarms only
Comment required
Alarm cause required
Alarms have to be pending at least
Days
Hours
Min.
Sec.
ms
0
Origin of the data
Ring buffer
Historic data
Maximum number
0
Alarm/Event Groups/Classes, Alarm Areas
Groups
- All groups
Classes
- All classes
Alarm Areas
- All alarm areas
Runtime settings
Show list without refresh
Show this dialog in the Runtime
In the Runtime replace dialog with screen
<No screen linked>
...

VARIABLE FILTER

Parameters	Description
Variable filter	Limitation to alarms of certain variables
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 (,) is not permitted for the filtering of variable names! The comma can be entered as a filter text, but no entries are displayed. This means that special filtering of array variables for **Dim 2** and **Dim 3** is not 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.
Case sensitive	Active: Capitalization is recognized when filtering for variable name or identification.

TYPE OF ALARMS

Parameters	Description
Type of alarms	Type of alarm that is displayed.
Only not 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 are shown for which it is necessary to leave a comment (on page 164) are displayed.
Alarm cause required	Active: Only alarms that are required for the linking of an alarm cause (on page 164) are displayed.

Alarms have to be pending at least	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)**

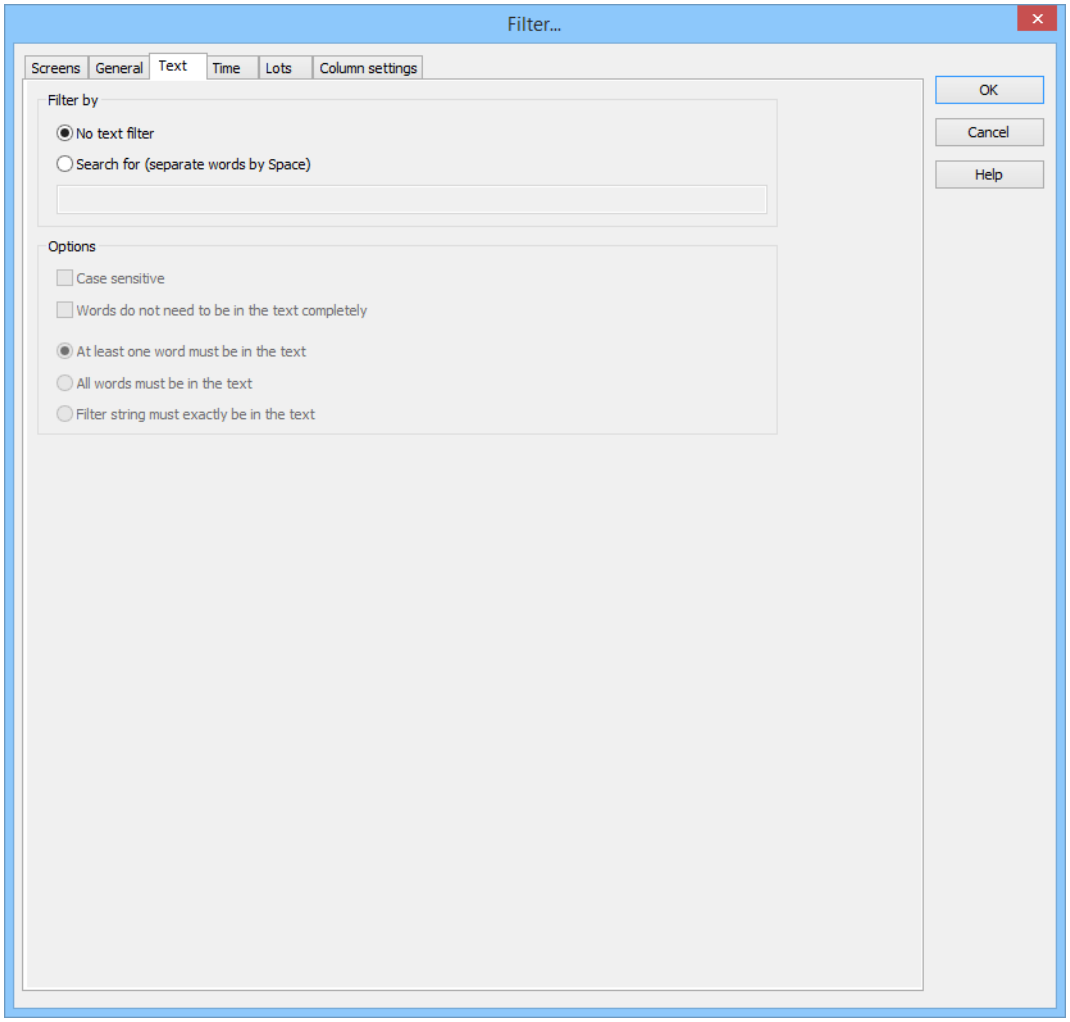
ORIGIN OF THE DATA

Parameters	Description
Origin of the data	Display of current or current and historical alarms.
Ring buffer	`Active`: Only data from the ring buffer (on page 35) 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 AND ALARM AREAS

Parameters	Description
Alarm/Event Groups/Classes, Alarm Areas	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups (on page 38) select the one from which alarms should be displayed.
Alarm/event classes	From the existing alarm/event classes (on page 41) select the one from which alarms should be displayed.
Alarm areas	From the existing alarm areas (on page 44) select the one from which alarms should be displayed. Note: If **hierarchical alarming** via equipment model is activated, the alarm area column remains empty.
Runtime settings	Behavior of the AML in Runtime
Show list without refresh	`Active`: As long as the list is displayed no new entries are added.

Text


Filter...
Screens
General
Text
Time
Lots
Column settings
Filter by
No text filter
Search for (separate words by Space)
Options
Case sensitive
Words do not need to be in the text completely
At least one word must be in the text
All words must be in the text
Filter string must exactly be in the text
OK
Cancel
Help

FILTER BY

Parameters	Description
Filter by	
No text filter	The text filter is not used.
Search for (words separated by spaces)	The text filter is used. Further options are activated.
Input field	Enter the corresponding words or character strings.

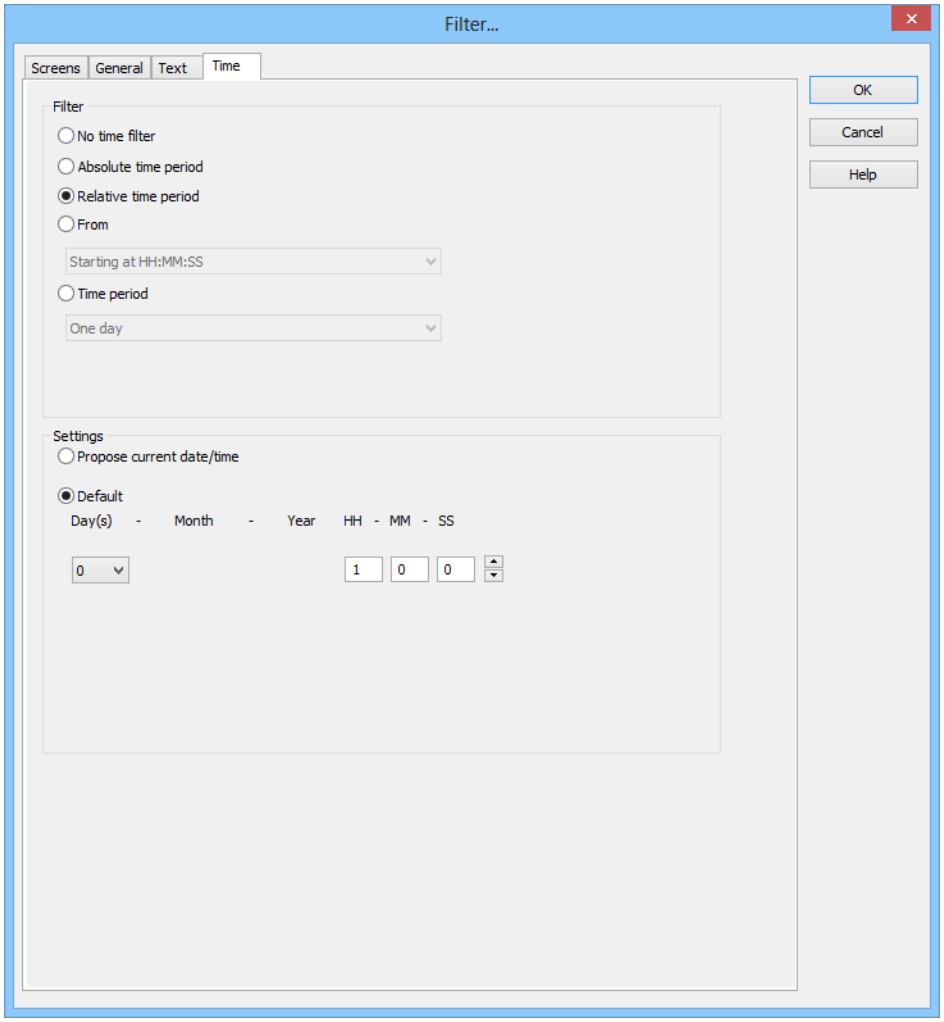
OPTIONS

Parameters	Description
Options	
Note capitalization	`Active`: The filtering is case-sensitive.
Words do not have to appear in the text in full	`Active`: Parts of words can also be taken into account during filtering.
At least one word must be in the text	`Active: At least` one word of the search string has to be in the text.
All words must be present in the text	`Active`: All words must be present in the search string. In doing so, the sequence plays no role.
Filter text must appear in the text exactly	`Active`: The text must be exactly as defined in the search string.

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 55)/time (on page 62) chapter.



FILTER

Selection of the filter.

Parameters	Description
No time filter	`Active`: No time filter is used. **Note:** all Runtime entries since 1. 1. 1990 are displayed.
Absolute filter	`Active`: A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used. In the settings section, the corresponding options can be shown and configured there. **Note:** Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.
Relative period of time	`Active`: A relative time period is entered. In the settings section, the corresponding options can be shown and configured there. **Attention:** this filter is constantly updated.
From	`Active`: A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. Selection of the area mode from drop-down list: ▸ Starting from HH:MM:SS ▸ Starting from day - HH:MM:SS ▸ Starting from day, month - at 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.
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

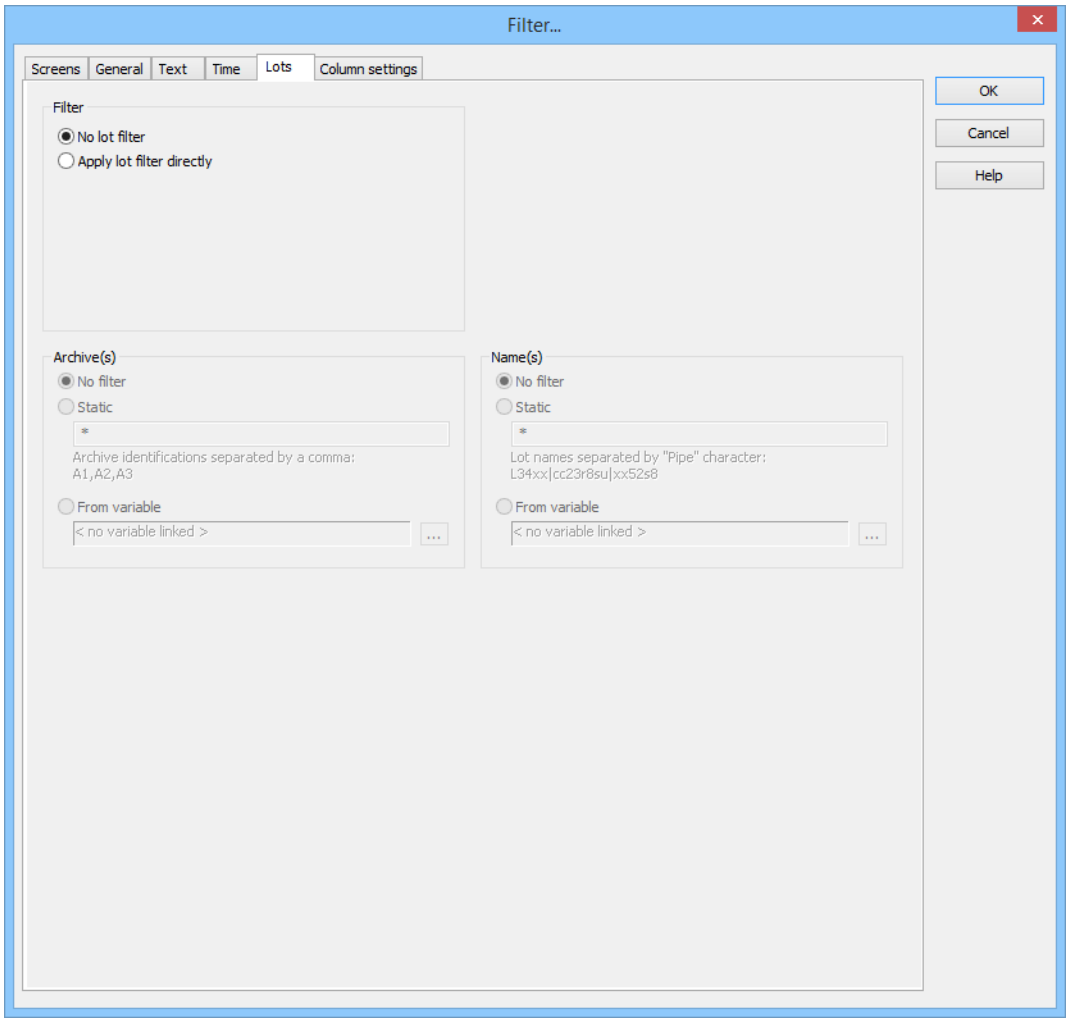
	In the settings section, the corresponding options can be shown and configured there.

CLOSE DIALOG

Parameters	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.

Lots

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



FILTER

Settings for the application of the lot filter. Selection of one of the options:

- **No lot filter**
- **Apply lot filter directly**

Parameters	Description
No lot filter	`Active`: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in Runtime.
Apply lot filter directly	`Active`: The filter configured here is applied in Runtime directly.

ARCHIVE(S)

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

- **No filter**
- **Static**
- **From variable**

Parameters	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 Runtime. Click on button **...** in order to open the dialog for selecting a variable. Only available for all modules if the **Apply lot filter directly** option has been selected: **Notes for variables in Runtime:** ▸ The variable selection is only activated in Runtime if a valid variable has already been linked in Runtime. The **...** button is always deactivated in Runtime. The option can be selected, but no new variable can be linked. ▸ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable is not found in Runtime, there is no filtering for archive names. This also applies if the value of the 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 options:

- **No filter**
- **Static**
- **From variable**

Parameters	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 Runtime. Click on the **...** button to open the dialog for selecting a variable. Not available if the option **Apply lot filter directly** has been selected. Notes for variables in Runtime: ▸ The variable selection is only activated in Runtime if a valid variable has already been linked in Runtime. The **...** button is always deactivated in Runtime. The option can be selected, but no new variable can be linked. If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. Attention: If the selected variable is not found in Runtime, there is no filtering for lot names. This also applies if the value of the variable cannot be determined. The filter then corresponds to the **No filter** setting.

CLOSE DIALOG

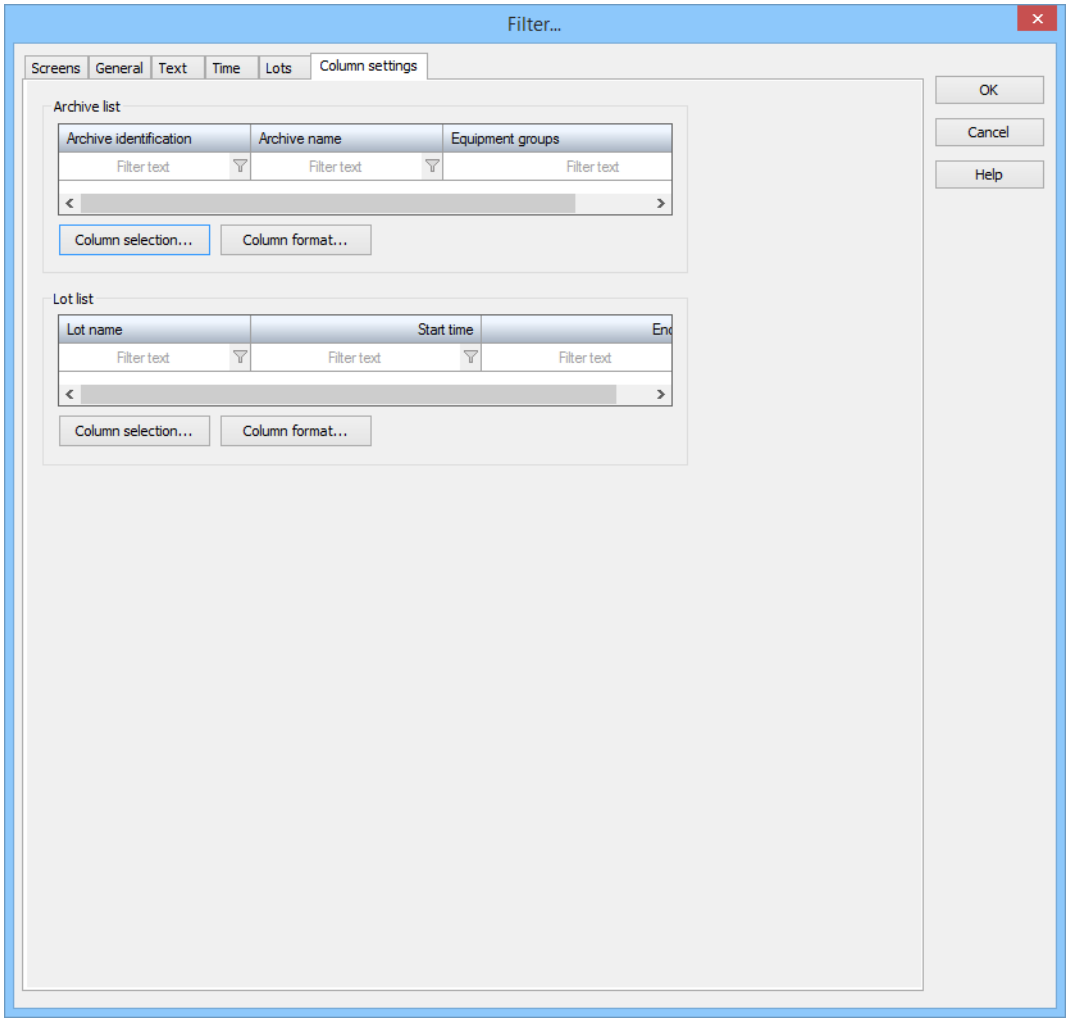
Parameters	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Column settings

In this tab, you define how the **archive list** and the **lot list** from the `time/lot filter screen` are displayed in Runtime:

- Selection of the columns to be displayed
- Sorting of the columns
- Formatting of columns:

- Labeling
- Width
- Alignment



ARCHIVE LIST

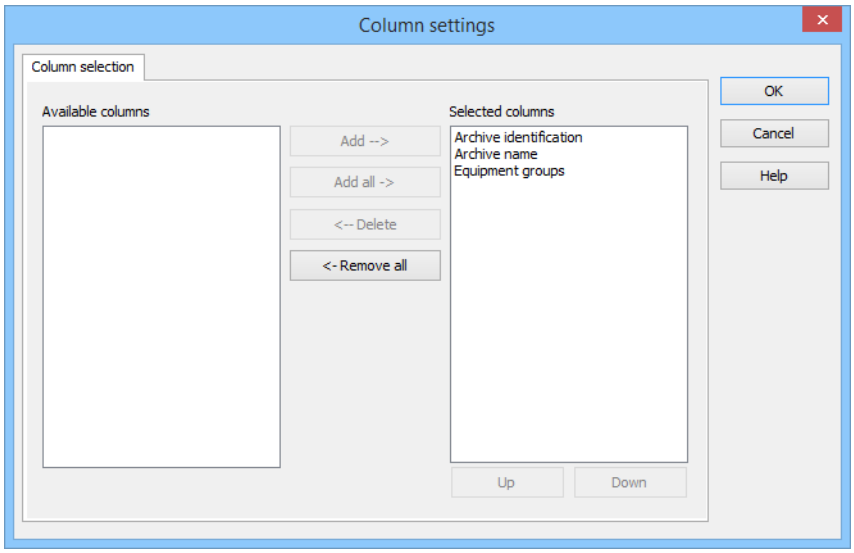
Parameters	Description
Archive list	Configuration of the archive list. Display of the configured columns.
Column selection	Clicking on the button opens a dialog to select and sort the columns.
Column Format	Clicking on the button opens a dialog to format the list.

LOT LIST

Parameters	Description
Lot list	Configuration of the lot list. Display of the configured columns.
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.
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.

Column selection

Selection and sequence of the columns.



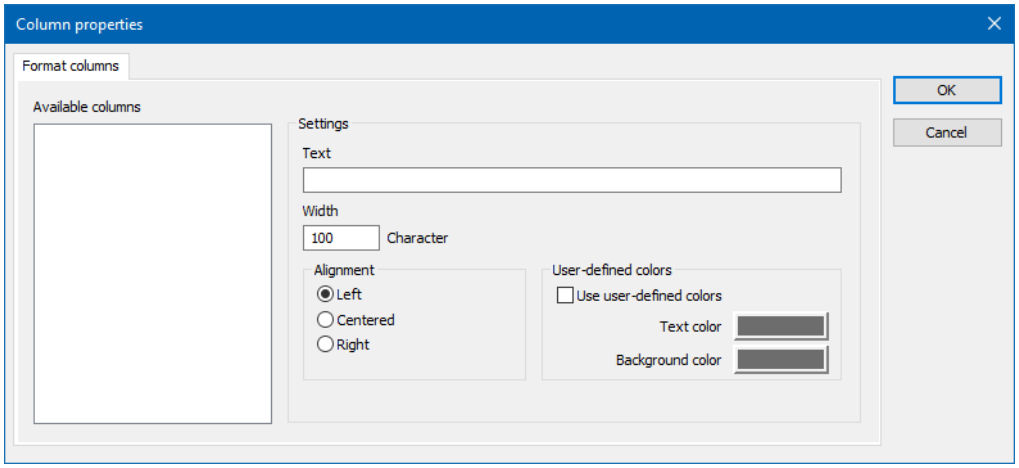
Options	Function
Available columns	List of columns that can be displayed in the table.
Selected columns	Columns that are displayed in the table.
Add ->	Moves the selected column from the available ones to the selected items. After you confirm the dialog with OK, they are shown in the detail view.
Add 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 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.

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

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

PARAMÈTRES

Option	Description
Paramètres	Paramètres de la colonne sélectionnée.
Intitulé	Nom de l'intitulé de colonne. Cet intitulé de colonne est compatible avec la fonction de changement de langue en ligne. Pour cela, le caractère @ doit être saisi devant le nom.
Largeur	Largeur de la colonne en caractères. Calcul : nombre de caractères multiplié par la largeur moyenne des caractères de la police sélectionnée.
Alignement	Alignement. La sélection de l'attribution s'effectue au moyen des cases d'option. Paramètres possibles : ▸ **Gauche** : Le texte est justifié contre le bord gauche de la colonne. ▸ **Centré** : Le texte est centré dans la colonne. ▸ **Droite** : Le texte est justifié contre le bord droit de la colonne.
Couleurs définies par l'utilisateur	Propriétés permettant de sélectionner des couleurs définies par l'utilisateur pour le texte et l'arrière-plan. Les paramètres ont une incidence dans Editor et dans le Runtime. **Remarque :** ▸ Ces paramètres sont uniquement disponibles pour les listes configurables. ▸ En outre, le focus correspondant dans la liste peut être indiqué par différentes couleurs de texte et d'arrière-plan dans le Runtime. Celles-ci sont configurées dans les propriétés du projet.
Couleurs définies par l'utilisateur	`Active` : Les couleurs définies par l'utilisateur sont appliquées.
Couleur du texte	Couleur d'affichage du texte. Cliquez sur la couleur pour la palette de sélection de couleurs.

Arrière-plan	Couleur d'affichage de l'arrière-plan de la cellule. Cliquez sur la couleur pour la palette de sélection de couleurs.
Désactiver le filtre de colonnes dans le Runtime	▸ `Active` : Le filtre de cette colonne ne peut pas être modifié dans le Runtime. **Remarque :** Uniquement disponible pour : ▸ Module Batch Control ▸ Extended Trend ▸ Synoptiques de filtre ▸ Module Message Control ▸ Recipe Group Manager ▸ Gestion d'équipes ▸ Liste contextuelle

CLOSE DIALOG

Options	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 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 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 51)

In the Runtime you can modify the filter properties. Exception: In the Editor fixed time filter (on page 74) was defined.

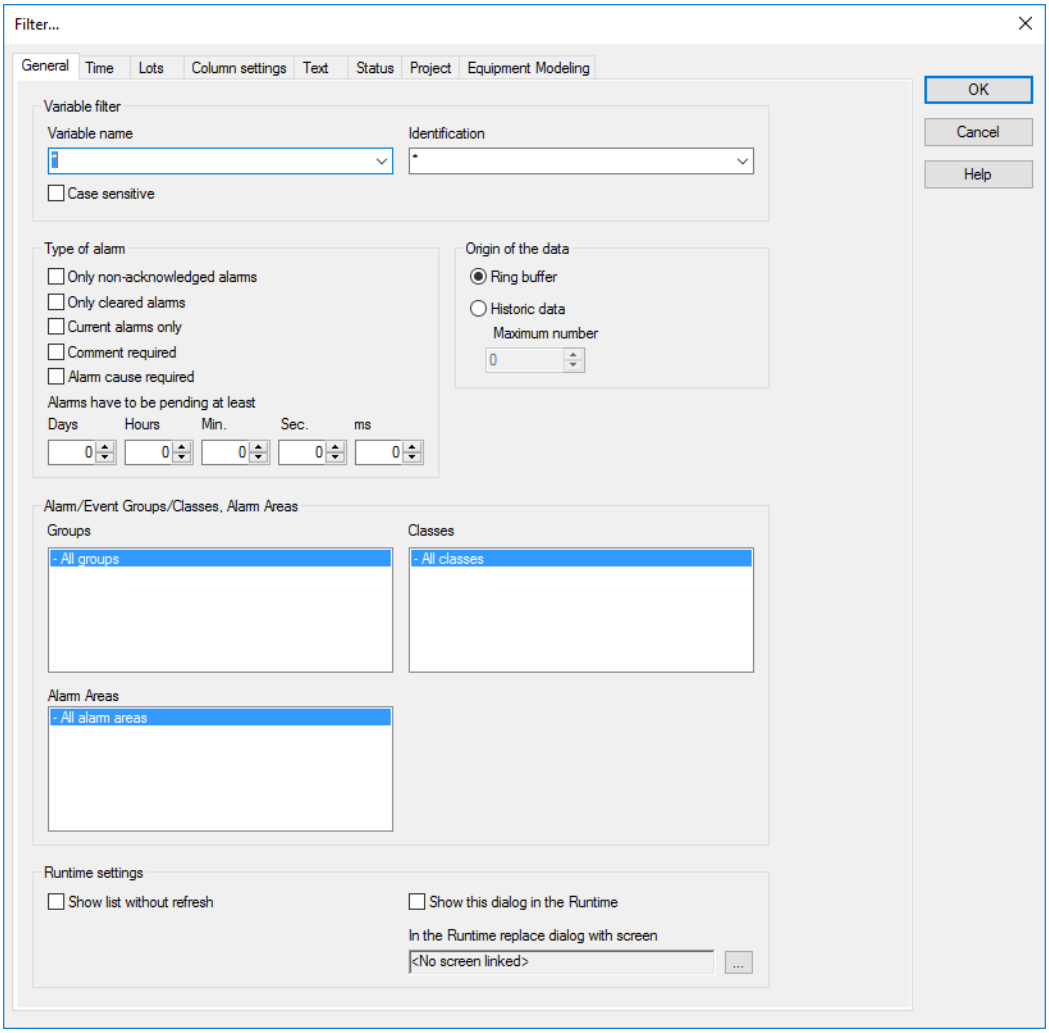
CONFIGURE SCREEN SWITCHING

To create a screen switch to a screen of type AML:

1. in the context menu of node **function** select command **New function**
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 57)
   - Time (on page 62)
   - Column settings (on page 88)
   - Text (on page 86)
   - Status (on page 93)
   - Project (on page 94) (only available in the integration project of the multi-project administration.)
   - Equipment Modeling (on page 94)

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

- Replace indices



6. define the filters which should be pre-defined in the Runtime
7. confirm the settings and close the dialog by clicking **OK**
8. link the function with 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 62) are deactivated.*

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 51) section, in the Filters for `Alarm Message List` screen switching (on page 55) chapter.

3.8.2 AML filter screen switching

To open an `Alarm Message List filter` screen in Runtime:

1. Create an Alarm Message List filter (on page 14) screen
2. create a screen switch function for this screen
3. define the desired filter properties (on page 121)

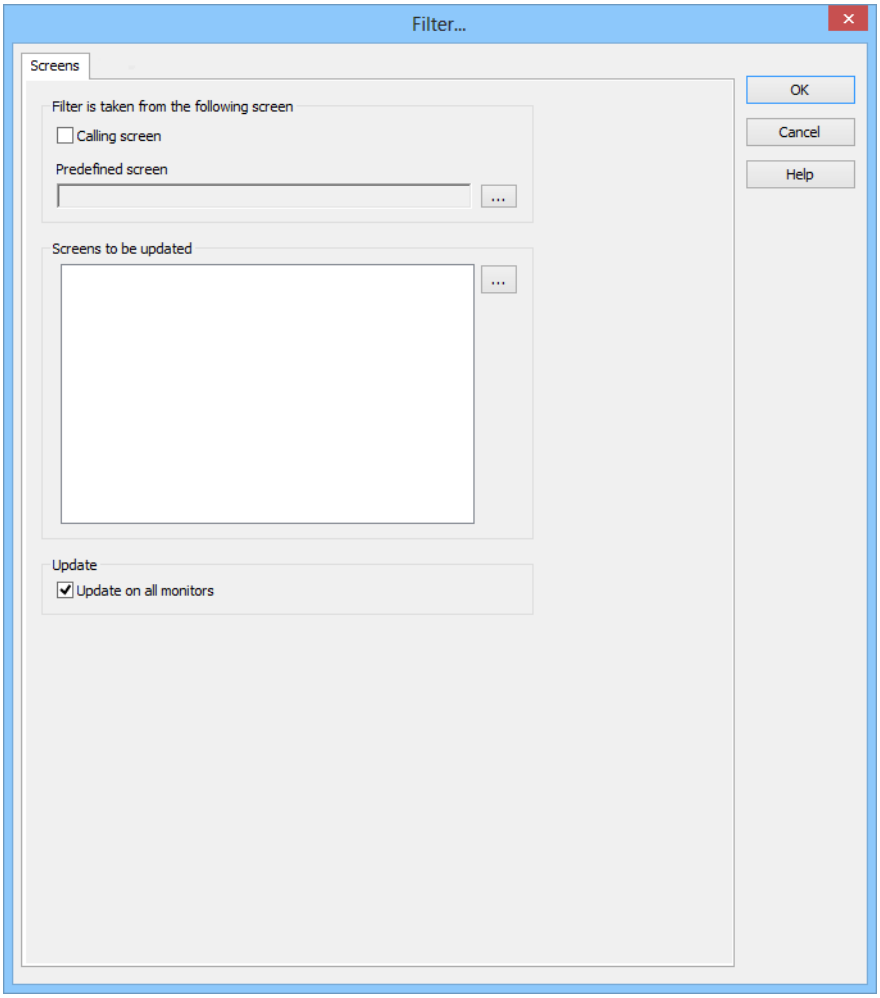
In the Runtime the filter properties can only be controlled via the buttons defined in the screen.

CONFIGURE SCREEN SWITCHING

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

1. in the context menu of node **function** select command **New function**
2. click on **screen switch**
3. the dialog for the screen selection will be opened
4. select the screen of type **Alarm Message List Filter**
   or create it in this dialog by clicking symbol **New screen**
5. the filter is displayed with all tabs:
   - Screens (on page 98)
   - General (on page 100)
   - Text (on page 103)

- Time (on page 105)



6. define the filters which should be pre-defined in the Runtime
7. confirm the settings and close the dialog by clicking **OK**
8. link the function with a button in order to call up the screen and to display the filter properties in the Runtime

AML filter screen switching filter

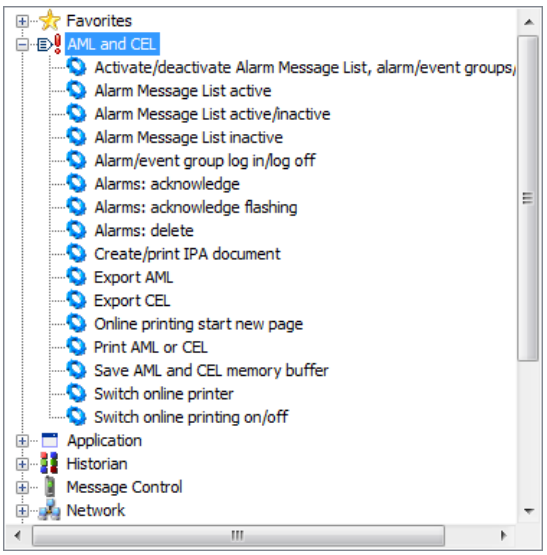
Several filters are offered when screen switching is created for an AML screen. For details, see Alarm configuration using filters (on page 51) section, Filters for `Alarm Message List filter` (on page 97) section.

3.8.3 Functions for alarm administration

Different functions make it possible to handle alarms in 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

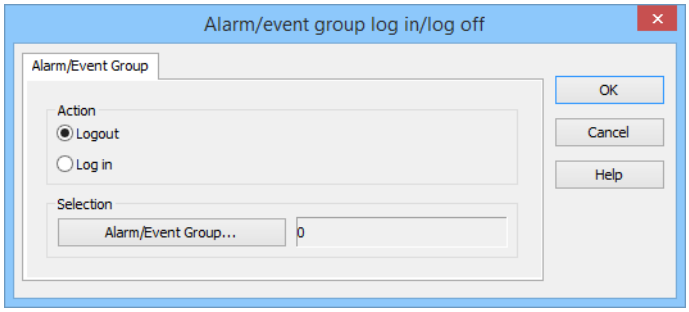
Alarm/event group log in/log off

To optimize the performance of the connection, alarm/event groups (on page 38) 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.

For this function, you must:

1. Define the action: logout or login

2. Define the alarm/event group
(Only one group per function can be defined)



ALARM/EVENT GROUP

Options	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.

Alarms: acknowledge flashing

When flash-acknowledging (on page 166) in 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.

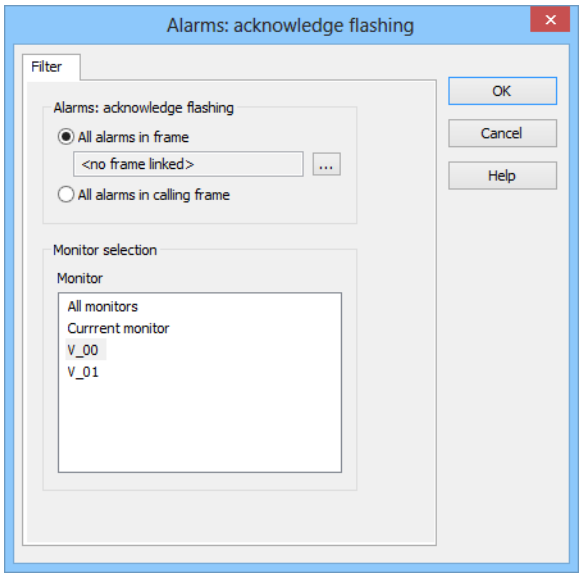
Note: This function is not identical to the **Adopt flashing from limit value** property that is defined for each element in the **Adopt flashing from limit value** group of the element properties. The function relates

to the flashing of the element content, for example `text`. The **Adopt flashing from limit value** property relates to the whole element.

CONFIGURING FUNCTIONS

To acknowledge the flashing of alarms in Runtime:

1. Create a new function (on page 122).
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

Parameters	Description
Alarms: acknowledge flashing	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 125) 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 manually.

MONITOR SELECTION

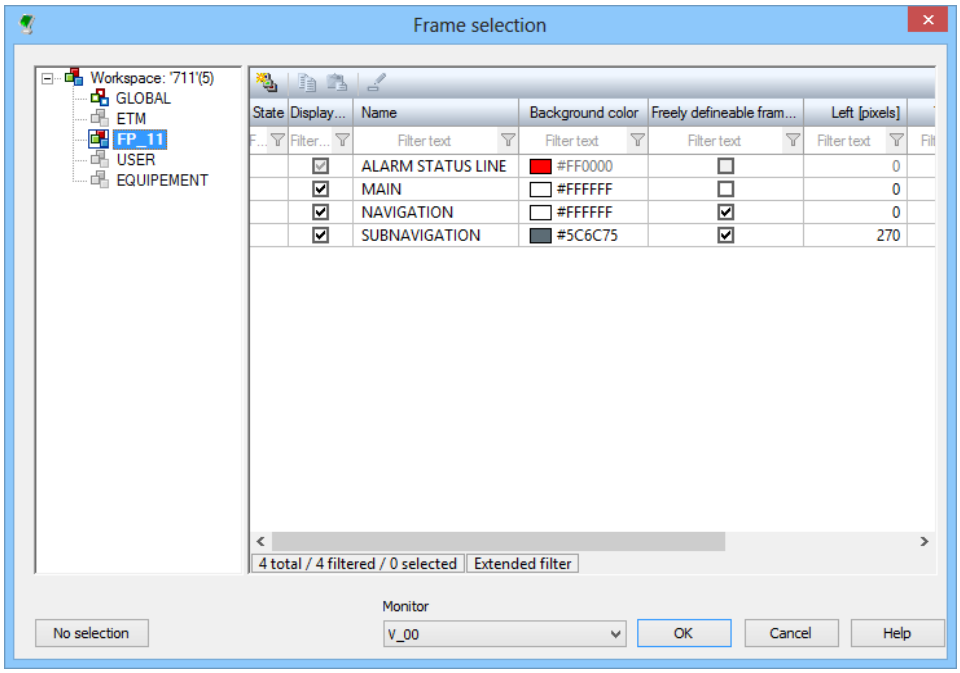
Parameters	Description
Monitor selection	Configuration of the monitor for which flash acknowledgment of the alarms is to be configured.
Monitor	Selection of the monitor from the list. ▸ **All monitors** ▸ **Current monitor** ▸ Selection of a virtual monitor Only available for Multi-monitor systems and 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.

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



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

Examples of alarm acknowledgment in 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**

Initial situation:

- **Frame_1** is switched to **Monitor_1**.
- **Frame_2** is switched to **Monitor_2**.
- All three variables flash due to a limit value violation.

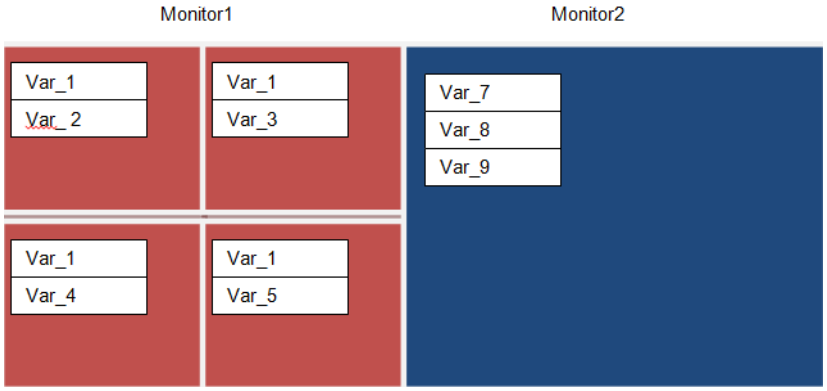
Reactions to the execution of the **Flash-acknowledge alarms** function:

- Execution on **Frame_2** on **Monitor_1**: Nothing happens, because this frame is not present on **Monitor_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 **Monitor_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 **Monitor_2**. This frame contains different variables to **Frame_1**.

Reactions to the execution of the **Flash-acknowledge alarms** 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:

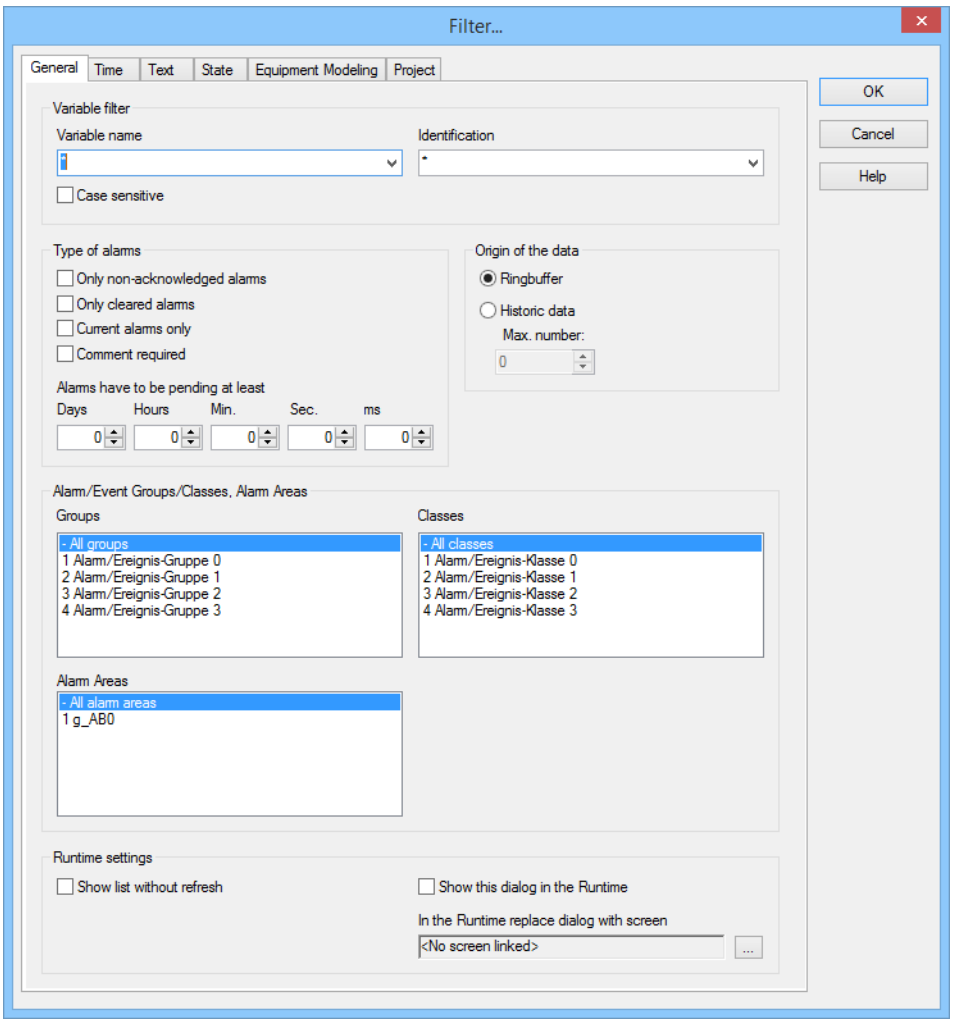
  - **Var_1** to **Var_5** are flash acknowledged
  - Var_7 to **Var_9** continue to flash

Alarms: delete

To delete (on page 167) alarms collectively using filter criteria, use the **Delete alarms** function:

1. Create a new function (on page 122)
2. Select **Delete alarms**.

3. The dialog to select the filter criteria opens
(similar to filter criteria in screen switching)



4. define the criteria for:
   - General (on page 57)
   - Time (on page 62)
   - Text (on page 86)
   - Status (on page 93)
5. link the function to a button

USER AUTHORIZATION

*The functions **Acknowledge alarms** (on page 130)and **Delete alarms** (on page 128) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.*

*In addition, an additional operating right can be set via the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group. 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 they are deleted. Acknowledgment alone is not sufficient.

Information

Alarms can only be deleted, if they have been acknowledged before.

Acknowledge alarms

With this function, you acknowledge Runtime alarms from the Alarm Message List. Most importantly, global acknowledgment (on page 163) 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.

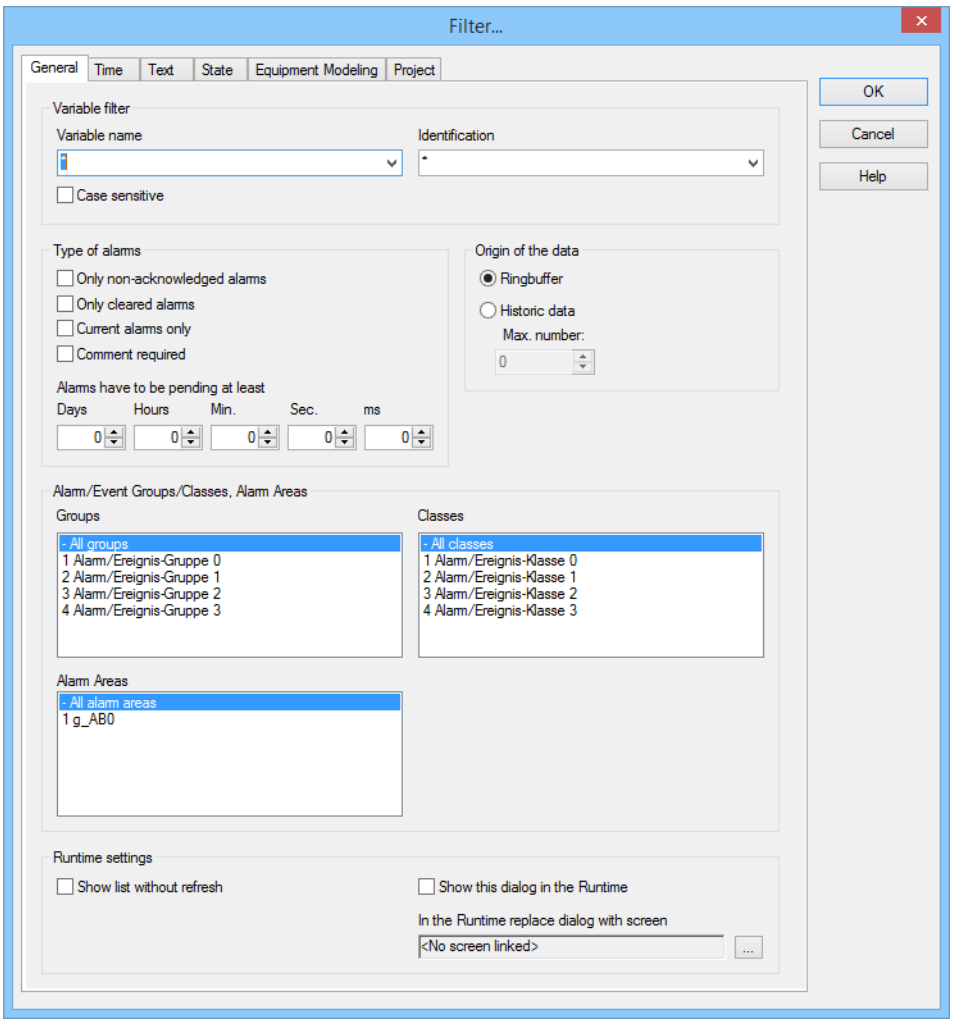
Note: All alarms of the linked variable are always acknowledged when acknowledging.

ENGINEERING

To acknowledge alarms with this function:

1. Create a new function (on page 122).
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 57)
   - Time (on page 62)
   - Text (on page 86)
   - Status (on page 93)
   - Equipment Modeling (on page 94)
   - Project (on page 94) (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 130)and **Delete alarms** (on page 128) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.*

*In addition, an additional operating right can be set via the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group. 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 they are deleted. Acknowledgment alone is not sufficient.

Information

Alarms can only be deleted, if they have been acknowledged before.

Alarm Message List active

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

Alarm Message List active/inactive

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

Alarm Message List inactive

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

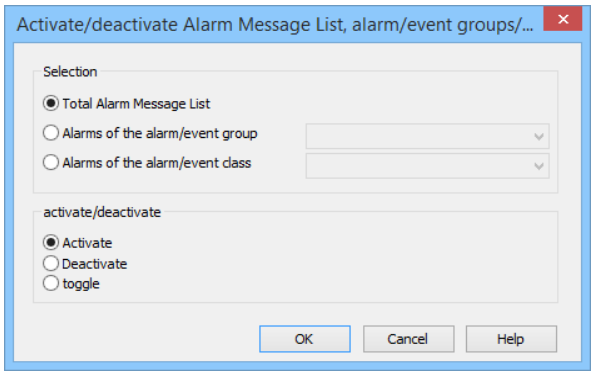
Activate/deactivate Alarm Message List, alarm/event groups/classes

The function makes it possible to activate or deactivate alarms of a certain group or class (on page 37) 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 122)
2. Select **Alarm message list, Activate/deactivate alarm/event groups/classes**
3. The dialog to select alarms opens
4. Define the criteria for the function

5. link the function to a button



SELECT

Parameters	Description
Select	Selection of the alarms.
Whole alarm message list	Function applies for the whole alarm message list.
Alarms of the alarm/event group	Function applies for a certain group. Selection: Clicking on the button opens a drop-down list.
Alarms of the alarm/event class	Function applies for a certain class. Selection: Clicking on the button opens a drop-down list.

ACTIVATE/DEACTIVATE

Parameters	Description
activate/deactivate	Action of the function.
Activate	Activates selected element.
deactivate	Deactivates selected element.
toggle	Switches status (active/inactive).

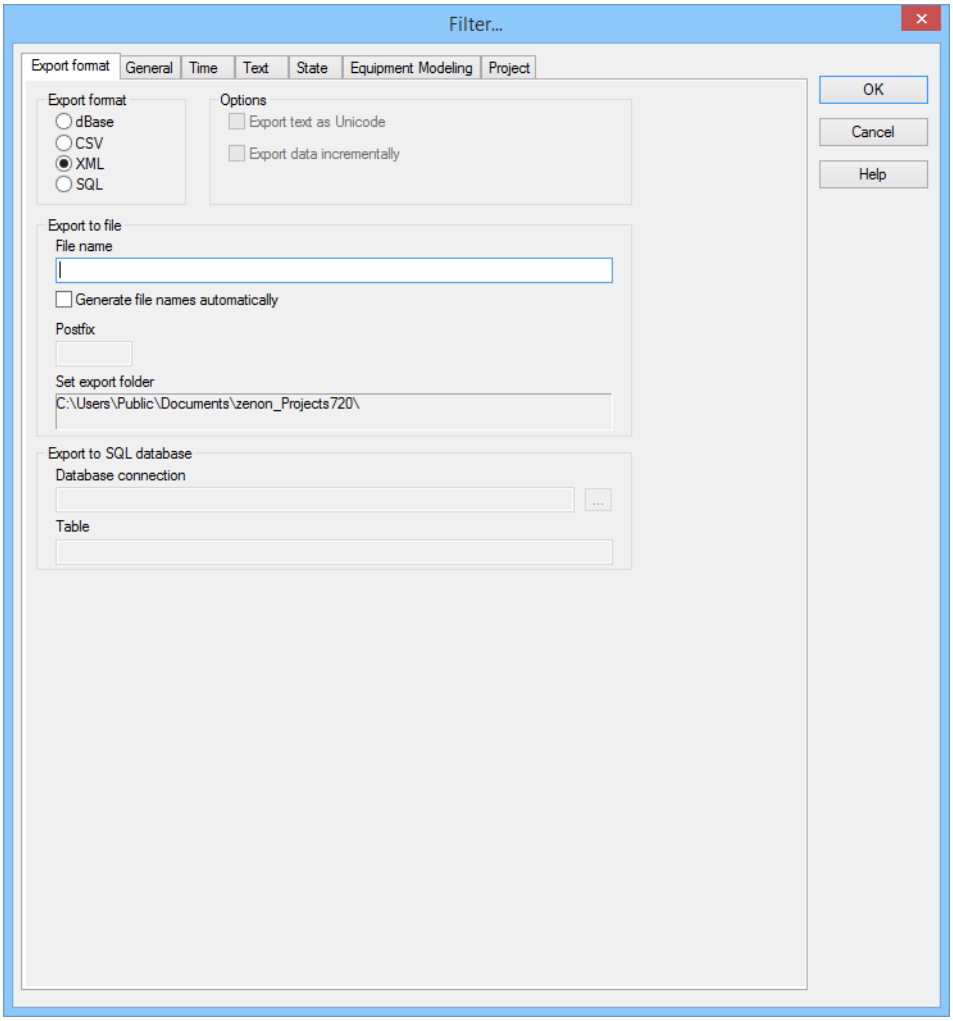
Export AML

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

To export alarms:

1. Create a new function (on page 122).

2. Select **Export AML.**
3. The dialog for selecting filter criteria opens.



4. Define the criteria for:
   - Export format (on page 135)
   - General (on page 57)
   - Time (on page 62)
   - Text (on page 86)
   - Status (on page 93)
   - Equipment Modeling (on page 94)
   - Project (on page 94)
5. Link the function to a button.

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 140)
- dBase (on page 140)
- SQL (on page 141)
- XML (on page 140)

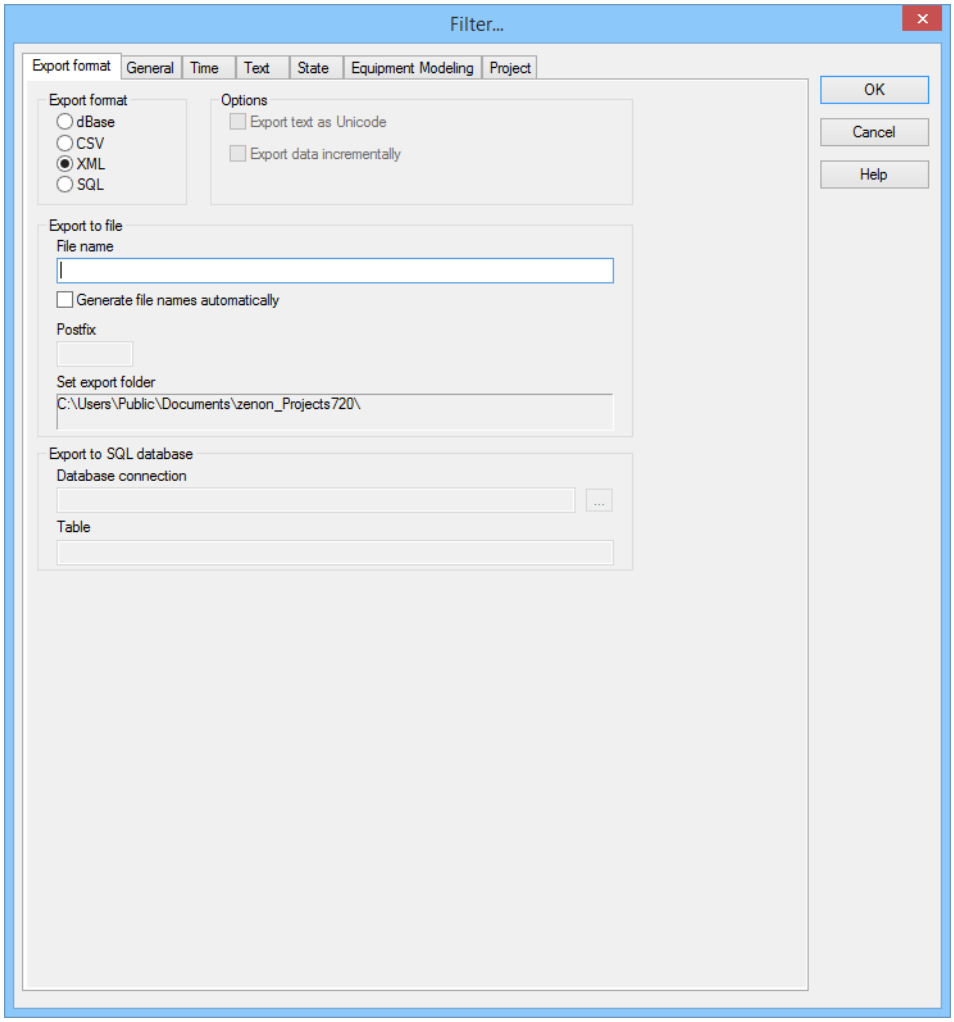
> **Information**
>
> *The export to SQL is incremental. If there is already exported data, only new and amended data is exported.*

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 52) of the **Column settings AML** project property for the AML and **Column settings CEL** for the CEL.
- `SQL`: All 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 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.

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.
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**. (existing files are not overwritten) For details, see the next table: **Coding name for automatic naming**
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
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 88). To do this:

- Navigate to the **Alarm Message List** or **Chronological Event List** nodes in 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 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;...**

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.

dBase: Exported columns

For export in to a dBase 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 is defined and cannot be changed.

Columns in exported sequence:

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: Fraction of a millisecond.
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.

SQL: Exported columns

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

Columns in exported 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: Fraction of a millisecond.
[GOES_S]	int	Alarm ended in Unix time (seconds since 01. 01. 1970).
[GOES_MS]	int	Alarm ended: Fraction of a millisecond.
[QUIT]	int	Alarm acknowledged in Unix time (seconds since 01. 01. 1970).
[STATUS]	int	Status of variable.
[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: Fraction of a millisecond.
[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: Fraction of a millisecond.
[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.

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 (**-**).

Save AML and CEL memory 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)	

To save the AML ring buffer:

1. Create a new function (on page 122)
2. Select **Save AML and CEL ring buffer**
3. link the function to a button

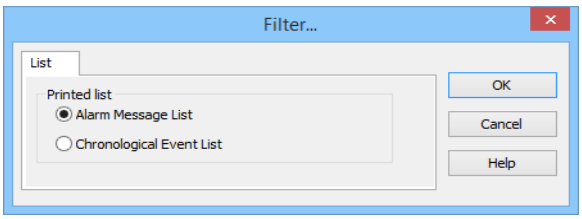
Print AML or CEL

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

To configure the function:

1. Create a new function (on page 122)
2. select **Print AML or CEL**

3. the dialog for selecting the list opens



4. Select **Alarm Message List**
5. the dialog for selecting filter criteria opens
6. define the criteria for:
   - General (on page 57)
   - Time (on page 62)
   - Text (on page 86)
   - Status (on page 93)
   - Font: Selection from the fonts defined in zenon
7. link the function to a button

> **Information**
>
> *In the Runtime you cannot switch between CEL and AML. To print both lists, you must engineer two functions.*

LINE STRUCTURE

Date/Time received	Date/Time cleared	Date/Time acknowledged	Long text	Status 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 180) chapter in the Operation in Runtime (on page 150) 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.

Please keep in mind:

- 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 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.
@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 88). To do this:

- Navigate to the **Alarm Message List** or **Chronological Event List** nodes in 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.

Switch online printing on/off

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

- on: Switches online printing on
- off: Switches online printing off
- active/inactive: Switches online printing

To configure the function:

1. Create a new function (on page 122)
2. Select **Switch online printing on/off**
3. the dialog for selecting the action opens
4. select the desired action
5. link the function to a button

Online printing start new page

With this function, you control the form feed in 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 122)
2. Select **Start online printing on a new page**
3. link the function to a button

Switch online printer

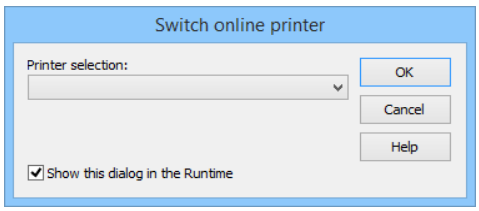
With this function, the printer for online printing can be changed in Runtime.

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

To configure the function:

1. Create a new function (on page 122).
2. Select **Switch online printer**.

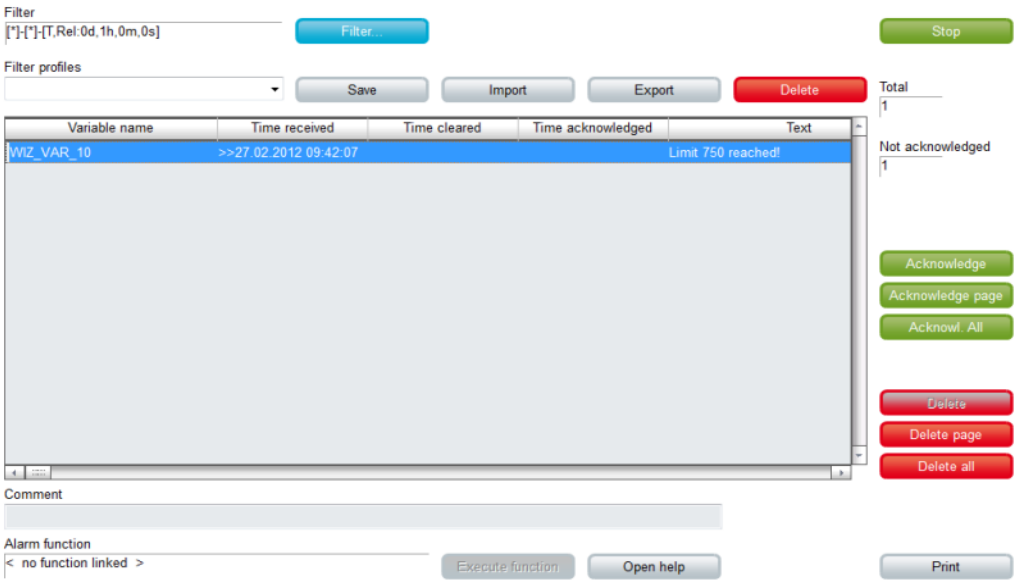
   The dialog for selection of the printer opens.
3. Select the desired printer from the drop-down list.
4. Link the function to a button.



Parameters	Description
select printer	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 Runtime.

4. Operating during Runtime

The Alarm Message List is called up in Runtime via a screen switching function (on page 117).



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

WINDOW

Control element	Description
Window	Display in Runtime
Alarm Message List	Display of the alarms. The appearance is configurable (on page 12). Columns are set using the column settings (on page 88) 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	Display of the currently-selected filter conditions.
Status	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 Runtime. You can configure changes to the font using Language switching.
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 Runtime.
Acknowledging 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 165).
Visual acknowledgment and acknowledgment	The selected alarms are first visually acknowledged and then acknowledged (on page 165).
Delete	Deletes alarm from the Alarm Message List in Runtime. Alarm must already be acknowledged.
Delete page	Deletes all acknowledged alarms that are displayed on the current page.
Delete all	Deletes all acknowledged alarms that correspond to the current filter criteria.
Linked function (display)	Displays the message allocated to the alarm message.
Execute function	Executes the functions configured for the alarm in 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	Status 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 160).

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.
Status	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 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 88))

  or

- Function screen switch to a screen of type **AML** (all tabs (on page 51))

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 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.

Alarms are acknowledged (on page 163) 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 Runtime, activate the **Status line active** property in the **Alarm Message List** group in product properties.

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

- **display next**: 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 Runtime.

POSITIONING

By default, the alarm status line is displayed on the top border of the screen (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 162).

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 88) 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, it must be specifically removed from the ring buffer by a person authorized to do this.
  Example: The alarm has cleared and was acknowledged by the operator. It continues to be retained 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 143).

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 RUNTIME

Alarms in the Alarm Message List can have three states:

- `Not cleared`
- `Not acknowledged`
- `Not deleted`

Alarms can require acknowledgment or require deletion.

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. Configuration of the acknowledgment or requirements for deletion is carried out via the **To acknowledge** and **Two-stage acknowledgement** properties in the **Limit Values/AML/CEL** nodes of variable configuration

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

Variable	Date/Time received	Date/Time goes	Date/Time acknowledged	Information text
Motor1_failure	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 163) by double-clicking it with the right mouse button. For that, the user must be in the according authorization group.

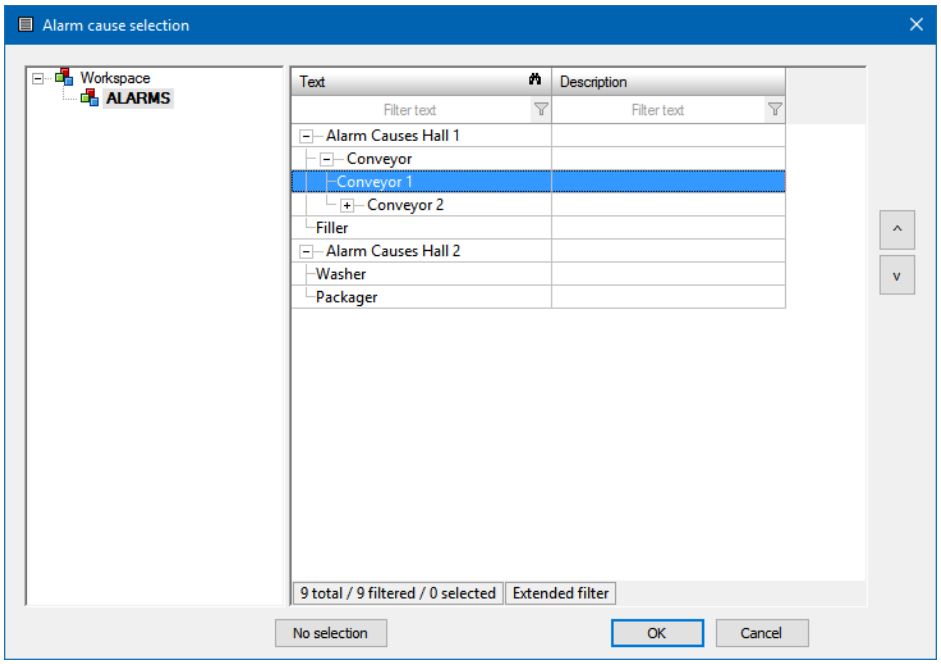
When the Alarm Message List is opened, the status of the alarm management is shown in the upper left corner (`active` or `inactive`).

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 57) and CEL filters.

4.2.1 Alarm causes



CONFIGURATION OF ALARM CAUSES

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

ASSIGNMENT OF ALARM CAUSES

Alarm causes can be assigned in Runtime.

To assign an alarm cause:

1. Select an entry in the alarm message list
2. Click on the element with the select alarm cause **Screen type specific action** ...
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 `Context List` screen.

You can find detailed information on this in chapter Use 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.

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 Alarm Message List

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 35) 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 164), these can only be acknowledged if a comment was entered. The user must be authorized to carry out the necessary function.*

FUNCTION ACKNOWLEDGE ALARMS

The **acknowledge alarm** (on page 130) function makes it possible to

- acknowledge alarms from the AML using a function call
- global acknowledgment

When using this function in 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 130) chapter.

USER AUTHORIZATION

*The functions **Acknowledge alarms** (on page 130)and **Delete alarms** (on page 128) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.*

*In addition, an additional operating right can be set via the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group. 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 they are deleted. Acknowledgment alone is not sufficient.

Information

Alarms can only be deleted, if they have been acknowledged before.

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 57) filter
- Alarm Message List filter (on page 14) 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 57) filter
- Alarm Message List filter (on page 14) screen

You can find further information about alarm causes in the Driver variables (on page 160) 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 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 163). 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 163), 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 130) 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 123) 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.

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 **flash-acknowledge** 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.

Information

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

4.5 Alarms: delete

The following is required to delete an alarm:

- A delete alarm (on page 128) function is executed
  or
- the **Delete** button on the screen of the alarm message list type is pressed

Alarms can only be deleted if they have been acknowledged (on page 163) beforehand.

*If the **Two-stage acknowledgement** property is set for **Limit values**, alarms are only removed from the list of active alarms if they are deleted. Acknowledgment alone is not sufficient.*

USER AUTHORIZATION

*The functions **Acknowledge alarms** (on page 130)and **Delete alarms** (on page 128) can be assigned to a user group via Function authorization. Only authorized user can acknowledge and delete alarms.*

*In addition, an additional operating right can be set via the **Two-stage acknowledgement** property in the respective subgroup of the **Limit Values** group. 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 they are deleted. Acknowledgment alone is not sufficient.

Information

Alarms can only be deleted, if they have been acknowledged before.

4.6 Filtering alarms

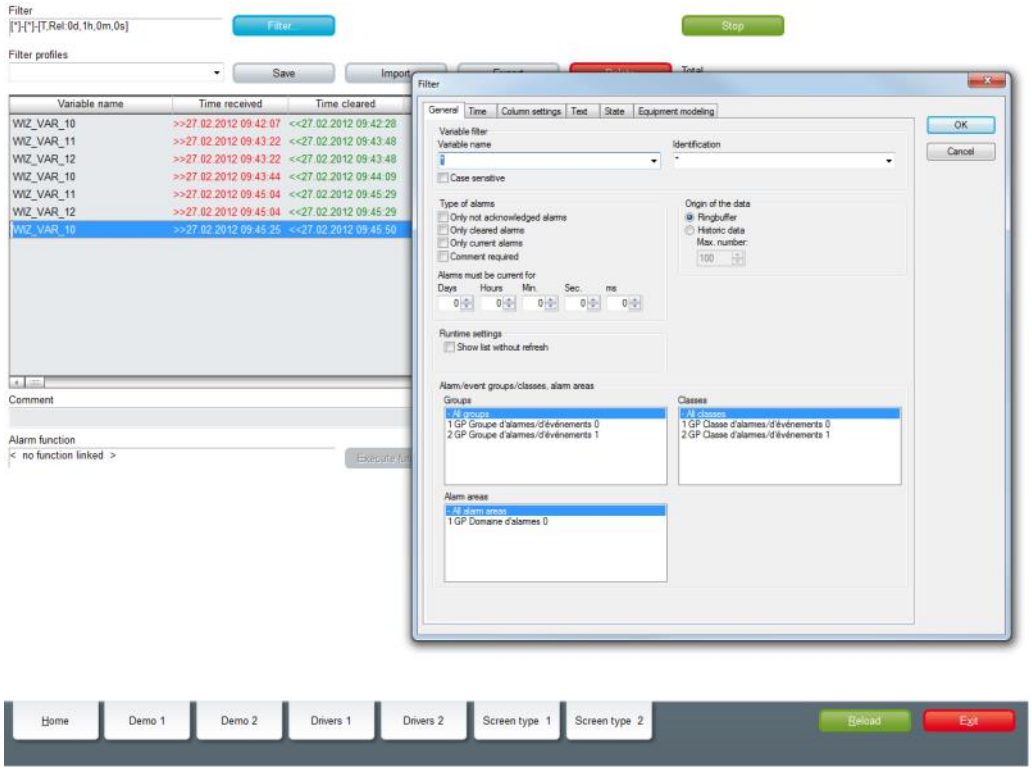
Alarms can be displayed with a filter in Runtime using:

- filter use 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 171) type

FILTERING IN THE RUNTIME

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

1. you must have engineered button **Filter**
2. click on the button
3. The alarm message list filter dialog (on page 51) is opened



Set filter can be saved in profiles (on page 169).

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 51) for the screen switching to an alarm message list screen (on page 117) 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. in the Runtime further filter settings are possible via button filter

SCREEN SWITCHING TO AN ALARM MESSAGE LIST FILTER SCREEN

In order to only offer users the filters they need in Runtime, use an alarm message list filter (on page 171) screen. To do this:

1. Configure screen switching to an alarm message list filter screen (on page 120)
2. Call up the AML in Runtime using this function
3. The user has an Alarm Message List that is tailor-made (on page 97) 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 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.

With this you can in the Runtime:

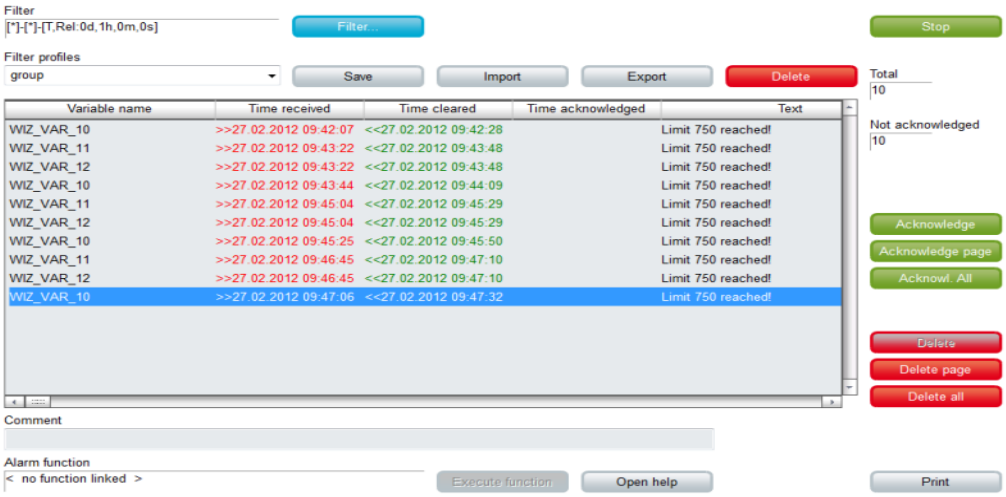
- save filters
- use saved filters
- delete filter profiles

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

SAVE FILTER PROFILE

To create a filter profile:

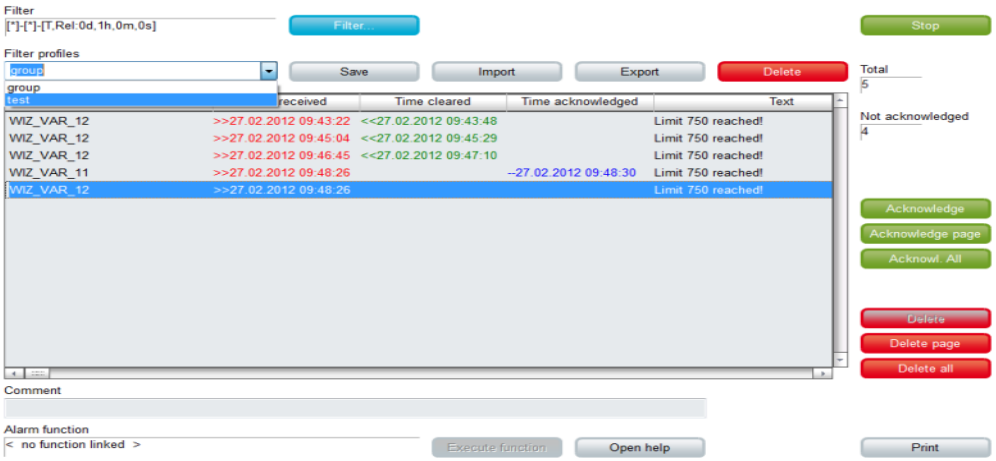
1. Define filter conditions
2. Enter a name in the **Filter profiles** input field
3. Click the **Save** button.
   The filter profile is saved and can be selected in the drop-down list.



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 Runtime with the help of the Alarm Message List Filter (on page 14) screen. All filter settings that are available in the filter (on page 51) for the function to switch the screen to the Chronological Event List screen (on page 117) 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.

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.

> **Attention**
>
> *In order for the time to be taken from the screen to be called up in Runtime, the following **time range** must be selected in the Editor for the screen switching function for the Alarm Message List or the Chronological Event List in the **time filter**: `Set filter at time filter 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 Filter** screen) 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 be configured on different frames or 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 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 via a screen element, the target screens on the same monitor as the source screen are updated.
- If the filter is called up in a different way or if the **Update on all monitors** setting is activated, all target screens configured 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 174): each event is printed on a line printer when it is displayed in the list
- AML (on page 174)offline printing: (on page 177)The AML is printed out as a list in its current state
- Export (on page 184) contents of AML (filtered)

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

Attention

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

- online: ALARM.frm
- offline: ALAR_G.frm.

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

Templates for FRM files can be found in the zenon installation folder in the `FRM_QRF` subfolder. These can be inserted via the file in the **Texts and formats** section and edited there.

You can kind the key words for FRM files in the FRM configuration file (on page 180) chapter.

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. Define the number of lines with the **Lines per page** property (default: `72`).
6. Configure ALARM.frm (on page 180).
7. Add **ALARM.frm** to the **Files/texts and formats** node.

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

CONTROL PRINT AND PRINTER IN RUNTIME

PAGE CHANGE

Form feed is carried out if:

- a page is fully written
- the Runtime is closed and online printing is active
- function Online printing start new page (on page 148) is executed

HALT PRINTING

To halt or to continue online printing:

- Carry out function Switch online printer on/off (on page 148).

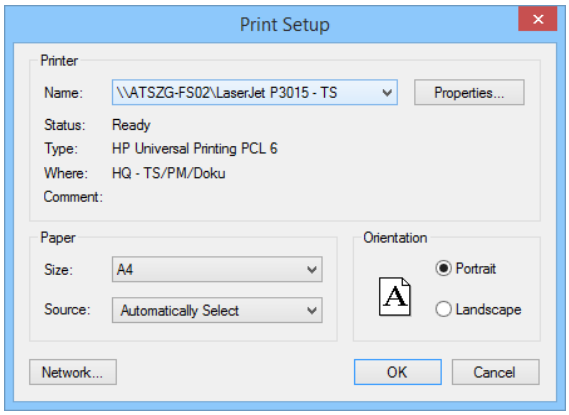
CHANGING AND SETTING UP A PRINTER

To change the printer in Runtime:

- Carry out the Switch online printer (on page 149) function

To set up the selected printer in Runtime:

1. Configure a **Print with dialog** control element for the screen
2. Click on the **Print with dialog** button in Runtime
3. The configuration dialog is opened



PRINTER

Parameters	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.
Status:	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

Parameters	Description
Paper	Configuration of the printout.
Size	Select paper format from drop-down list.
Source	Select paper feed from drop-down list.

ALIGNMENT

Parameters	Description
Alignment	Select paper alignment. Possible parameters: • `Portrait` • `Landscape`
Network	Opens dialog for selecting a printer in the network.
OK	Applies configuration and closes the dialog. With this printing is started in the Runtime.
Cancel	Discards configuration and closes the dialog. In the Runtime this also cancels the printout.

FORMATTING EXAMPLE

Configuration (on page 180) in `ALARM.FRM`:

Date: @DSYSTEM	Alarm inf. list/demo proj.	Time @TSYSTEM o'clock	Text
Date/Time received	**Time cleared**	**Information text**	**Status text**
%%			
@DTRECEIVED	@TCLEARED	@IDENTIFICATION	@TEXT
%%			
	Page	@PAGE	

Printout on the printer

Date: 20.03.2011	Alarm inf. list/demo proj.	Time: 12:00 PM:	Text
Date/Time received	**Time cleared**	**Information text**	**Status text**
20.03.2011 13:00:00	20.03.2011 1:03:59 PM	Message 1	Limit exceeded
20.03.2011 13:00:00	1:05:35 PM	Demo information	Limit 750 reached
20.03.2011 1:03:59 PM		Message 2	Limit value
20.03.2011 1:11:23 PM		Message 3	off
20.03.2011 1:03:59 PM	1:12:45 PM	Demo information	off
	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 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 180)
3. Add **ALAR_G.frm** to the **Files/texts and formats** node
4. In the Runtime click button print or print with dialog.

SET UP AND CHANGE PRINTER

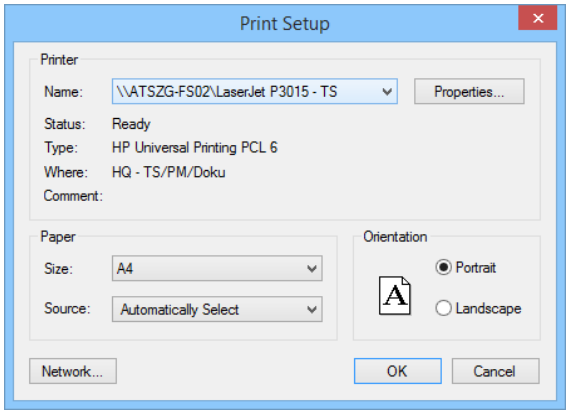
CHANGING AND SETTING UP A PRINTER

To change the printer in Runtime:

- Carry out the Switch online printer (on page 149) function

To set up the selected printer in Runtime:

1. Configure a **Print with dialog** control element for the screen
2. Click on the **Print with dialog** button in Runtime
3. The configuration dialog is opened



PRINTER

Parameters	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.
Status:	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

Parameters	Description
Paper	Configuration of the printout.
Size	Select paper format from drop-down list.
Source	Select paper feed from drop-down list.

ALIGNMENT

Parameters	Description
Alignment	Select paper alignment. Possible parameters: • `Portrait` • `Landscape`
Network	Opens dialog for selecting a printer in the network.
OK	Applies configuration and closes the dialog. With this printing is started in the Runtime.
Cancel	Discards configuration and closes the dialog. In the Runtime this also cancels the printout.

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**	**Information text**	**Status text**
%%			
@DTRECEIVED	@TCLEARED	@IDENTIFICATION	@TEXT
%%			
	Page	@PAGE	

Printout on the printer

Date: 20.03.2011	Closed Alarm Message List Demo Project	Time: 12:00 PM:	Text
Date/Time received	**Time cleared**	**Information text**	**Status text**
20.03.2011 13:00:00	20.03.2011 1:03:59 PM	Message 1	Limit exceeded
20.03.2011 13:00:00	1:05:35 PM	Demo information	Limit 750 reached
20.03.2011 1:03:59 PM		Message 2	Limit value
20.03.2011 1:11:23 PM		Message 3	off
20.03.2011 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.

Please keep in mind:

- 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 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.
@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 133) 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 already exported data, only new and amended data is exported.*