COPA-DATA
do it your way

zenon manual

Alarms administration

v.7.11

Contents

1. Welcome to COPA-DATA help

GENERAL HELP

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2. Alarms administration

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

1. Alarm status line: (on page 139)
   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 141):
   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 31) alarms by means of:

- Setting limits 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 breaches of variables or reaction matrixes are defined

In addition you can:

- Configure alarms using filters (on page 49)

- Grouping (on page 34) alarms
- Adapt the screens of **alarm message list** type (on page 13) that are available in Runtime

RUNTIME

For the operation in the Runtime (on page 136) the following is used:

- AML screen switching (on page 106)
- AML filter screen switching (on page 108)
- The zenon alarm functions (on page 110)
- Using Alarm Message List screens (on page 154)
- Alarm status line (on page 139)

3.1 Creating an Alarm Message List screen

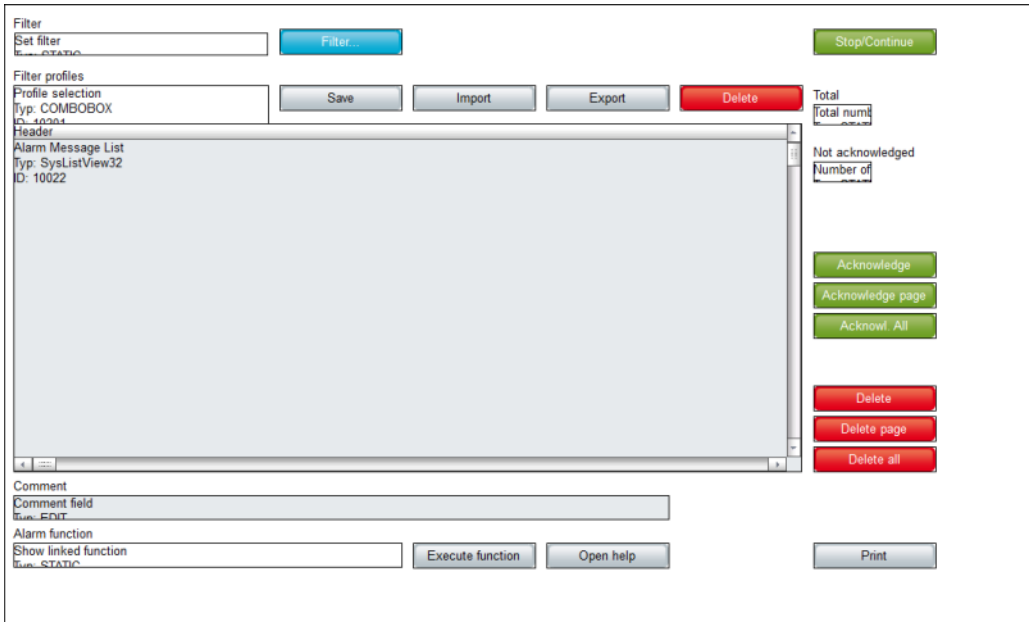
An **Alarm Message List** screen makes it possible to display and log current and past alarms. The display can be changed using a filter. Functions make it possible to export and print the displayed alarms.

CREATING AN ALARM MESSAGE LIST FILTER SCREEN

To create an Alarm Message List screen:

1. Select, in the toolbar or in the context menu of the **Screens** node, the **New Screen** command
2. An standard empty screen is opened
3. Change the screen type in the detail view; to do this:
   a) click on **Standard** in the **Screen type** column
   b) Select **Alarm Message List** from the drop down list
4. Click in the screen.
5. select menu item **Control elements** from the menu bar
6. Click on **Add template** in the drop-down list

7. The standard elements are inserted
8. Select additional elements as required and insert them into the desired place on the screen
9. Create a screen switch function (on page 106), in order to be able to call up the AML in Runtime



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 locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and palced in the screen. Elements can be moved in the screen and placed individually.
Windows	Display in Runtime
▸ **Alarm Message List**	Display of the alarms. The appearance is configurable (on page 11). Columns are defined via the Column settings (on page 81) filter in screen switching or via the `Column settings AML` property in the `Alarm Message List` group.
▸ **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`).

Control element	Description
Total number	Time number of all alarms.
Number unacknowledged	Displays number of unacknowledged alarms.
List functions	Buttons to control the lists.
Filter	Opens dialogs 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 font 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. Deletes alarm from the Alarm Message List in Runtime. Alarm must already be acknowledged.
Print	Prints filtered list.
Print with dialog	Opens printer settings before printing.
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.
Acknowledge 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 147).
Visual acknowledgment and acknowledgment	The selected alarms are first visually acknowledged and then acknowledged (on page 147).
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.
Close frame	Closes Alarm Message List

Control element	Description
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 (comment) by the user for the selected alarm. This text can be displayed in the list (**Comment** option in the **Column settings** of alarm administration.)
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.
Filter profiles	Buttons for filter settings in Runtime.
Profile selection	Select profile from list.
Save	Saves current setting as a profile.
Delete	Deletes selected profile.
Import	Imports filter profiles from export file.
Export	Exports filter profiles in the file.

Control element	Description

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.

3.1.1 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 the report:

1. Activate, in the Representation group, the Extended graphical settings property
2. Define the desired properties in the groups Scroll bars and Header and grid for the Alarm Message List screen element

Information

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

SORTING IN RUNTIME

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

1. Select the Graphics files for the Display style property

2. link properties `Sort ascending` and `Sort descending` each with a graphics file
3. in the Runtime the selected graphic for the corresponding sorting order is displayed in the column which is relevant for the sorting
4. Click on the graphic in order to change the sorting order
5. Click on header in order to activate the column for sorting

OPERATE HEADER IN THE RUNTIME

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

- Move columns
- Change size
- Change sorting order.

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

These settings apply for all headers in the project.

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

PREVIEW

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

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

3.2 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 49) for the function to switch the screen to the Chronological Event List screen (on page 106) 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 154) chapter.

For the definition of filter criteria, see Filter Alarm Message List Filter (on page 89) chapter.

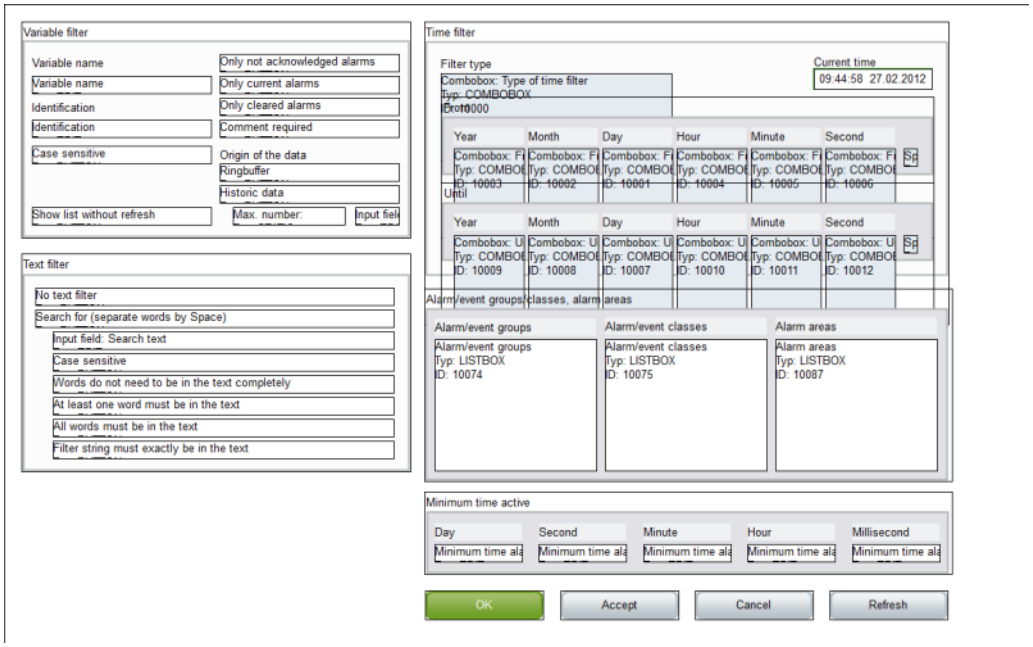
> **Attention**
>
> *Screens of type* ***Alarm Message List Filter****,* ***Chronological Event List Filter*** *and* ***Time Filter*** *must be engineered with an own frame. If they use the same frame as other screens, all screens based on this frame are closed when the screen is closed.*

CREATING AN ALARM MESSAGE LIST FILTER SCREEN

To create an `Alarm Message List filter` screen:

1. Select, in the toolbar or in the context menu of the **Screens** node, the **New Screen** command
2. An standard empty screen is opened
3. Change the screen type in the detail view; to do this:
   a) click on **Standard** in the **Screen type** column
   b) Select **Alarm Message List filter** from the drop down list
4. Select your own template
   (AML filter cannot be based on the same template as other screens)

5. Click in the screen.
6. Select the **Control elements** menu item in the menu bar
7. Click on **Add template** in the drop-down list
8. The dialog for selecting a template is opened
9. select the desired template
10. Select additional elements as required and insert them into the desired place on the screen
11. Name the screen according to the selected filter
    To do this:
    a) Click on the screen name in the detail view in the **name** column
    b) Select a suitable pre-defined name from the drop-down list it give it a name of your own
12. Create a screen switch function (on page 106) in order to be able to call up the screen in Runtime



ELEMENTS

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

Element	Description
Insert template	Opens the dialog for selecting a template for the screen type. Templates are shipped together with zenon and can also be created by the user. Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and palced in the screen. Elements can be moved in the screen and placed individually.
General filter	Drop-down list of different general filters (on page 93).
Insert all elements: General filter	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.
Variable filter	Alarms of which variables are displayed:
▸ Variable name	Filter according to names of variables.
▸ Identification	Filter according to identification of variables.
▸ Note capitalization	Note capitalization when filtering the variables.
Type of alarms	Which alarms are displayed:
▸ Only not acknowledged alarms	Only unacknowledged
▸ Only cleared alarms	Only historical
▸ Only current alarms	Only current
▸ Comment required	Alarms that require a comment when acknowledged
▸ Minimum time for current alarms - days	Only alarms that have been current for at least the given number of days.
▸ Minimum time for current	Only alarms that have been current for at least the given

alarms - hours	number of hours.
▸ Minimum time for current alarms - minutes	Only alarms that have been current for at least the given number of minutes.
▸ Minimum time for current alarms - seconds	Only alarms that have been current for at least the given number of seconds.
▸ Minimum time for current alarms - milliseconds	Only alarms that have been current for at least the given number of milliseconds.

Type of alarms (Touch)	Elements optimized for touch operation for the display of alarm type, along the lines of the `Alarm type` menu. ▸ `Only not acknowledged alarms` ▸ `Only cleared alarms` ▸ `Only current alarms` ▸ `Comment required` ▸ `Minimum time active alarms - Button: Days (up)` ▸ `Minimum time active alarms - Touch box: Days` ▸ `Minimum time active alarms - Button: Days (down)` ▸ `Minimum time active alarms - Button: Hours (up)` ▸ `Minimum time active alarms - Touch box: Hours` ▸ `Minimum time active alarms - Button: Hours (down)` ▸ `Minimum time active alarms - Button: Minutes (up)` ▸ `Minimum time active alarms - Touch box: Minutes` ▸ `Minimum time active alarms - Button: Minutes (down)` ▸ `Minimum time active alarms - Button: Seconds (up)` ▸ `Minimum time active alarms - Touch box: Seconds` ▸ `Minimum time active alarms -`

	Button: Seconds (down) ▸ Minimum time active alarms - Button: Milliseconds (up) ▸ Minimum time active alarms - Touch box: Milliseconds ▸ Minimum time active alarms - Button: Milliseconds (down)
Origin of the data	Where does the data come from:
▸ Ring buffer	From the ring buffer.
▸ Historical data	From an archive.
▸ Labeling: Maximum number	Text for **Maximum number** input field
▸ Input field: Maximum number	Input of the maximum alarms to be displayed when historical alarms are displayed. 0: displays all
Runtime settings	
▸ Show list without refresh	Switches the AML in stopped state. New alarms are not added.
Alarm/event groups/alarm/event classes/alarm areas	List field for grouped display (on page 34):
▸ Alarm/event groups	Alarm/event groups
▸ Alarm/event classes	Alarm/event classes
▸ Alarm areas	Alarm areas

Time filter	Selection of different time filters (on page 60).
Insert all elements	Opens drop-down list to select pre-defined elements for certain time periods.
Absolute period of time: classic display	Elements for the absolute time period in classic display.
Absolute period of time: compact display	Elements for the absolute time period in compact display.
Relative period of time	Elements for the relative time period.
From HH:MM:SS o' clock	Elements for a time period from a defined time.
From day - HH:MM:SS o' clock	Elements for a time period from a defined day at a defined time.
From day, month - HH:MM:SS o' clock	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 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 period of time: classic display ▸ Relative period of time ▸ From HH:MM:SS o' clock ▸ From day - HH:MM:SS o' clock ▸ From day, month - HH:MM:SS o' clock

	▸ Time period: 15/30/60 minutes ▸ Time period: one day ▸ Time period: 1 or 2 weeks ▸ Time period: one month ▸ Time period: one year

Time filter type (label)	Label for type of the time filter.
Time filter type (combobox)	Combobox: Time filter type
Time filter type (display)	Field for time filter type display.
Time filter type (radio group)	Radio buttons that show or hide certain elements in Runtime: ▸ No filter ▸ Absolute time filter ▸ Relative time filter ▸ From HH:MM:SS o' clock ▸ From day - HH:MM:SS o' clock ▸ From day, month - HH:MM:SS o' clock ▸ 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 labels for "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)
Absolute time filter	Fields and labels for 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 (up) ▸ From year (touchbox) ▸ From year (down) ▸ From month (label) ▸ From month (up) ▸ From month (touchbox) ▸ From month (down) ▸ Week (label) ▸ Week (up) ▸ Week (touchbox) ▸ Week (down) ▸ From day (label) ▸ From day (up) ▸ From day (touchbox) ▸ Button: From day (down) ▸ Start time (label) ▸ Start time (up) ▸ Start time (touchbox) ▸ Start time button (down)
Text filter	Drop-down list of different text filters.
`Insert all elements: Text filter`	Inserts all elements for text filters.
`No text filter`	Radio button to deselect text filter.
`Search for (words separated by spaces)`	Radio button to activate the search

Labeling: Search text	Labeling for search field.
Input field: Search text	Field for input of search term.
Options	Search options
▸ Note capitalization	Capitalization must be noted.
▸ Words do not have to appear in the text in full	Fragments can also be searched for.
▸ At least one word must be present in the text	At least one search term from several must be in the result.
▸ All words must be present in the text	All search terms must be included in the result.
▸ Filter text must appear in the text exactly	Exact text from the input field must be contained in the result.
OK	Accept inputs and close screen.
Cancel	Reject inputs and close screen.
Accept	Accept inputs and leave screen open for further inputs.
Refresh	Refresh 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 Filter screens`**) are 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 limits for variables (see Variables manual, Limits chapter). If these are breached in Runtime, an alarm is generated and displayed in the alarm status line (on page 139). You configure further properties for alarm configuration with:

- Variable properties of the group `Limits` 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 141) or an alarm message list filter (on page 154).
  - `To acknowledge`: The alarm must be acknowledged before it is removed from the ring buffer (on page 32).
  - `To delete`: the alarm must be deleted manually before it is removed from the ring buffer (on page 32).
  - `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 35).
  - `Alarm/event class`: allocation of an alarm/event class (on page 39).
- Variable properties of the group `Alarm handling`:
  - `Alarmbereiche`: allocation of an alarm area (on page 42).
  - `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
- AML data saving
- 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 states and status bits (see Variables manual, Reaction matrixes). Breaches 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.

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

When acknowledging alarms, all alarms of a variable with the same limit violation are deleted at the same time from the ring buffer.

As soon as the alarm is acknowledged, it is deleted from the ring buffer. Exception: If property `To delete` is set, the alarm must be deleted by the user decidedly.

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 ringbuffer`.
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 by an unexpected event such as a power outage, data loss occurs. To prevent this the ring buffer can be saved manually via property `Save ringbuffer on change` at every new entry or via function Save AML and CEL ring buffer (on page 127).

Attention: In the Runtime the ring buffer is handled dynamically in the memory. Via the defined number of alarms, even alarms which do not have a cleared time stamp can be displayed. 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 `...\Projektordner\Computername\Projektname` 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 ringbuffer on change` is active
- when function `Save AML and CEL memory buffer` is carried out

Note: If option `Save ringbuffer 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 violation.*

3.5 Grouping of alarms

Alarms can be grouped and prioritized by means of:

- Alarm/event groups (on page 35): group alarms (or events) together logically
- Alarm/event classes (on page 39): 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 42): Enable detailed evaluation of alarm/event classes by means of a combined element

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 XML all...	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 38) 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 conflicts 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 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 110) 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 81) 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 tool bar
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 for the selected entry.
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 38) or press on the `Ins` button)

Each can 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 conflicts 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 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 110) 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.
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 81) 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 tool bar
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 for the selected entry.
Remove all filters	Removes all filter settings.
Help	Opens online help.

3.5.3 Alarm areas

Alarm areas make flexible alarming possible using status variables. These can be evaluated using a combined element, for example.

Alarm areas are broken down into area entries. The number of possible area entries corresponds to the number of existing alarm/event classes.

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 38) or press on the Ins button)
3. Select the desired variables in the General node
4. 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

Parameters	Description
General	
Name	Name of the alarm area. Is displayed in the filter condition of AML and CEL.
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 conflicts 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.
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 48).

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

ASSIGN ALARM RANGES VARIABLES, STRUCTURES OR DATA TYPES

Variables, structures and simple data types can be linked to up to four alarm areas.

To do this, the following are available in the Alarm handling group:

- 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 Runtime, the columns **Alarm area** and **Alarm area no.** contain all linked alarm areas, separated by a comma (,). In the Message Control module, the Alarm area field contains all linked alarm areas, separated by a comma (,).

Alarm area context menus and tool bar

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 for the selected entry.
Remove all filters	Removes all filter settings.
Help	Opens online help.

Configuring alarm areas

To create an alarm area:

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

Class linking	Alarm/event 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 is breached 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.

3.5.4 Alarms in global project and integration projects

Each project saves its own IDs for alarm classes, alarm groups and alarm areas. There can therefore be overlaps with global projects, 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.

to avoid this, ensure that different IDs are used in all projects. To do this, create "dummy" groups/classes/areas, which you then delete again.

3.6 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 49).

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 89).

3.6.1 Column setting for Alarm Message List

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. These settings apply for showing 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.

Which pieces of information are displayed in the Alarm Message List in the Runtime, you can define in the column settings. You can define them at a screen switch function in the filter criteria or directly in the properties of the Alarm Message List in the project:

1. in the project properties open node Alarm Message List

2. click on property `Column settings AML`
3. the dialog for the **`column setting`** (on page 81) is opened

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. The setting is stored in the **`project.ini`** file.*

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. The setting is stored in the **`project.ini`** file.*

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. These settings apply for showing 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 proportional fonts, such as 'Courier New', for example.

3.6.2 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 89) screen instead of an `Alarm Message List` screen.

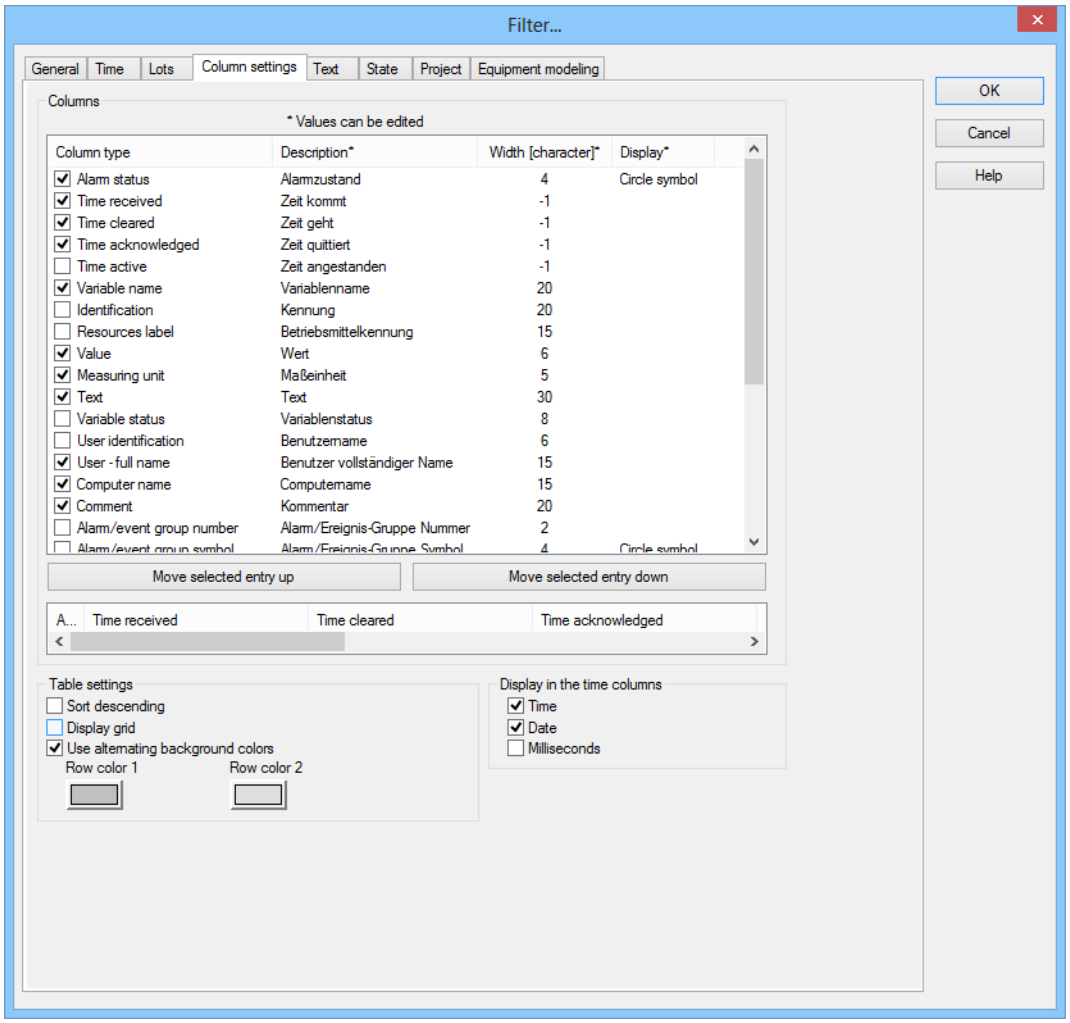
To configure screen switching for an `Alarm Message List` (on page 7) screen:

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 56)
   - Time (on page 60)
   - Lots (on page 74)
   - Column settings (on page 81)
   - Text (on page 80)
   - Status (on page 85)
   - Project (on page 87) (only available in the integration project of the multi-project administration.)
   - Equipment modeling (on page 87)

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

- Replacing links
- Replacing indexes

For details see in chapter **Screens** sections **Replace links of variables and functions** and **Linked symbols**.



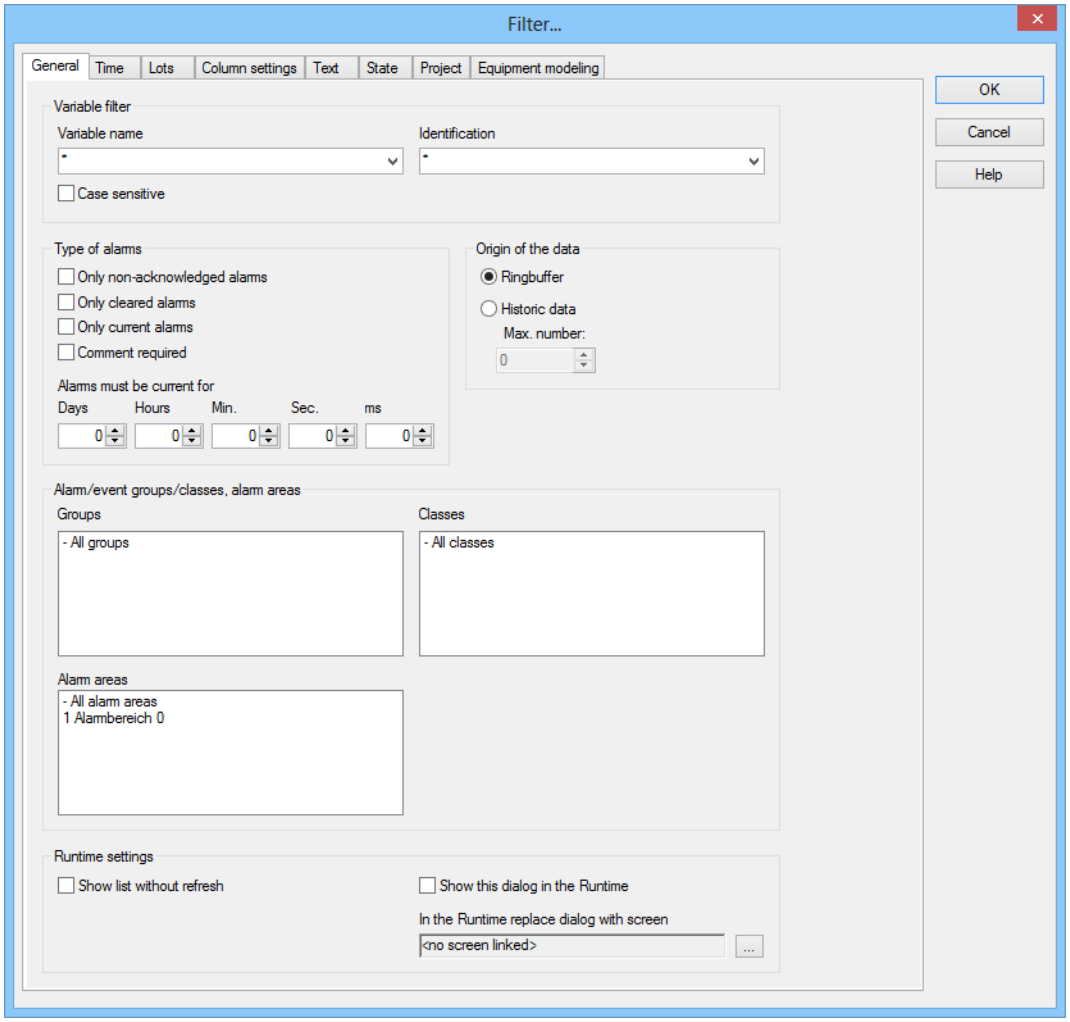
General

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
- Data origin
- Variables
- Time active

- Alarm/event groups, classes and alarm areas

The following properties are available:



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. Wild card * is possible. **Note:** Wild cards are only allowed as prefix or suffix, i.e. *xxx or xxx*
Identification	Enter the identification or part of the identification of the variables you want to filter. Wild card * is possible. **Note:** Wild cards are only allowed as prefix or suffix, i.e. *xxx or xxx*
Note capitalization	Active: Capitalization is recognized when filtering for variable name and/or identification.
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 146) are displayed.
Alarms must be current for	Use the spin control to define the minimum time that an alarm should be active in order for it to be displayed. Possible settings: ▸ Days ▸ Hours (hr.) ▸ Minutes (min.) ▸ Seconds (sec.) ▸ Milliseconds (ms)
Origin of the data	Display of current or current and historical alarms.
Ring buffer	Active: Only data from the ring buffer (on page 32) 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	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups (on page 35) select the one from which alarms should be displayed.
Alarm/event classes	From the existing alarm/event classes (on page 39) select the one from which alarms should be displayed.
Alarm areas	From the existing alarm areas (on page 42) select the one from which alarms should be displayed.
Runtime settings	Behavior of the AML in Runtime
Show this dialog in the Runtime	Active: Before every call of the screen the filter dialog is opened. The filter settings can be modified. **Note for time range filters:** Show this dialog in the Runtimeactive: ▸ The last-concluded time period is always used. Show this dialog in the Runtimenot active: ▸ Use last finished time rangeactive: The last-concluded time period is used ▸ Use last finished time rangenot active: The current time period is used.
Show list without refresh	Active: As long as the list is displayed no new entries are added. (not available for **Export AML** (on page 121) function.)
In the Runtime replace dialog with screen	Definition of a screen that is to be switched in Runtime instead of the dialog if the Offer 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.

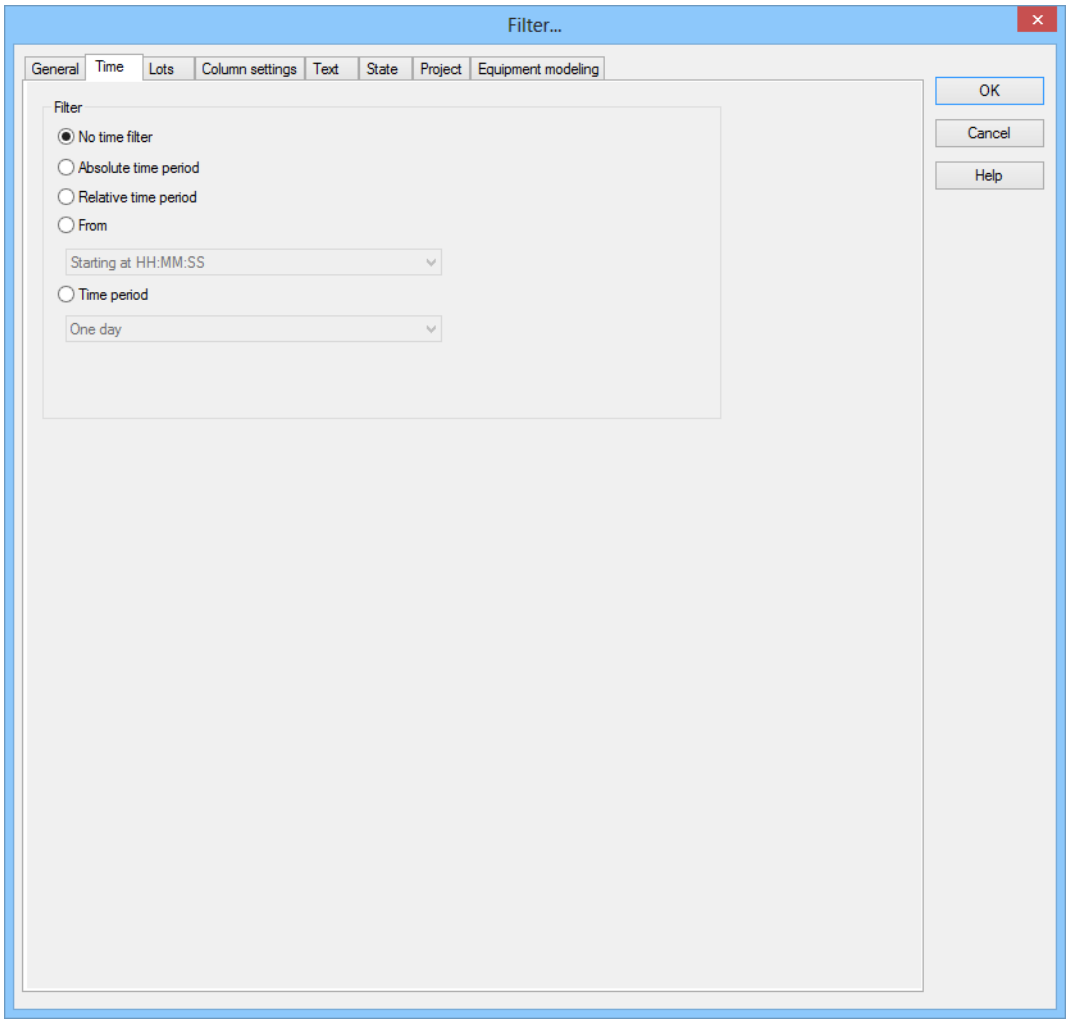
Time filters can be pre-set in both the Editor and in Runtime for:

- Absolute period of time (on page 63)
- Relative period of time (on page 65)
- From (on page 67)
- Time period (on page 70)

Time filtering can be carried out in two ways:

1. Define time period in the Editor (on page 72)
   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 73)
   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

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

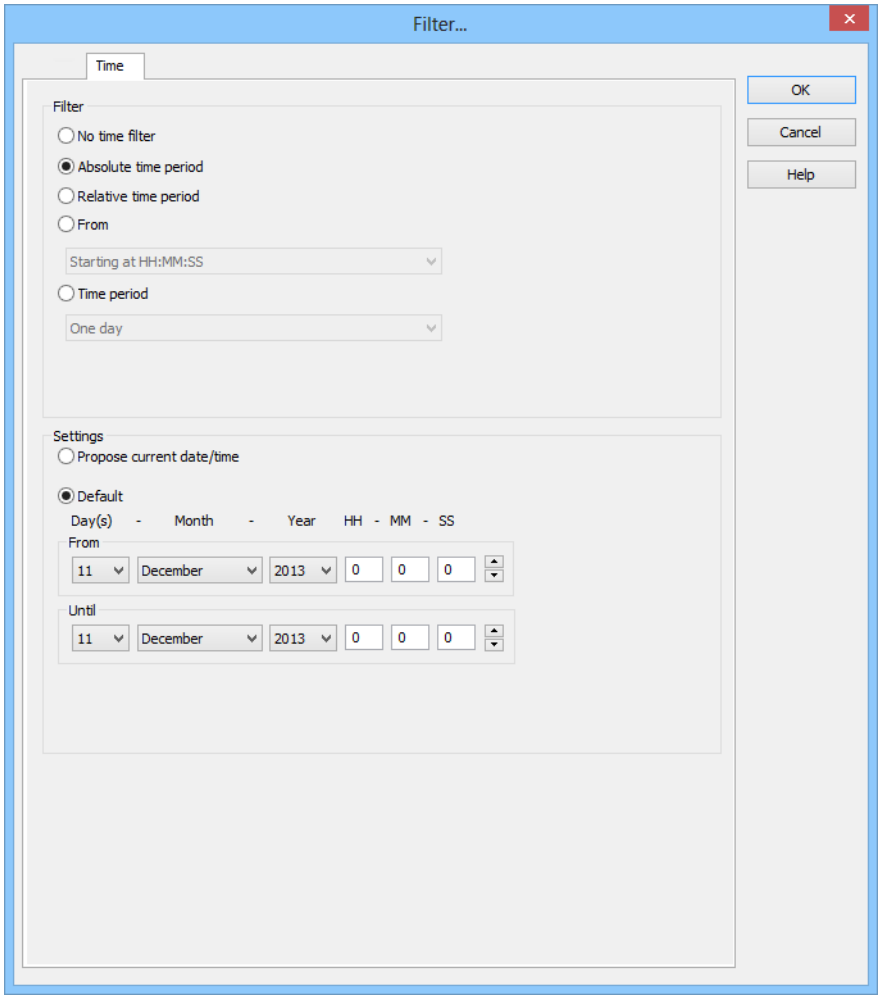
	▸ One month ▸ One Year ▸ 15 minutes ▸ 30 minutes ▸ 60 minutes In the settings section, the corresponding options can be shown and configured there.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Absolute time period

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

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

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



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

Relative period of time

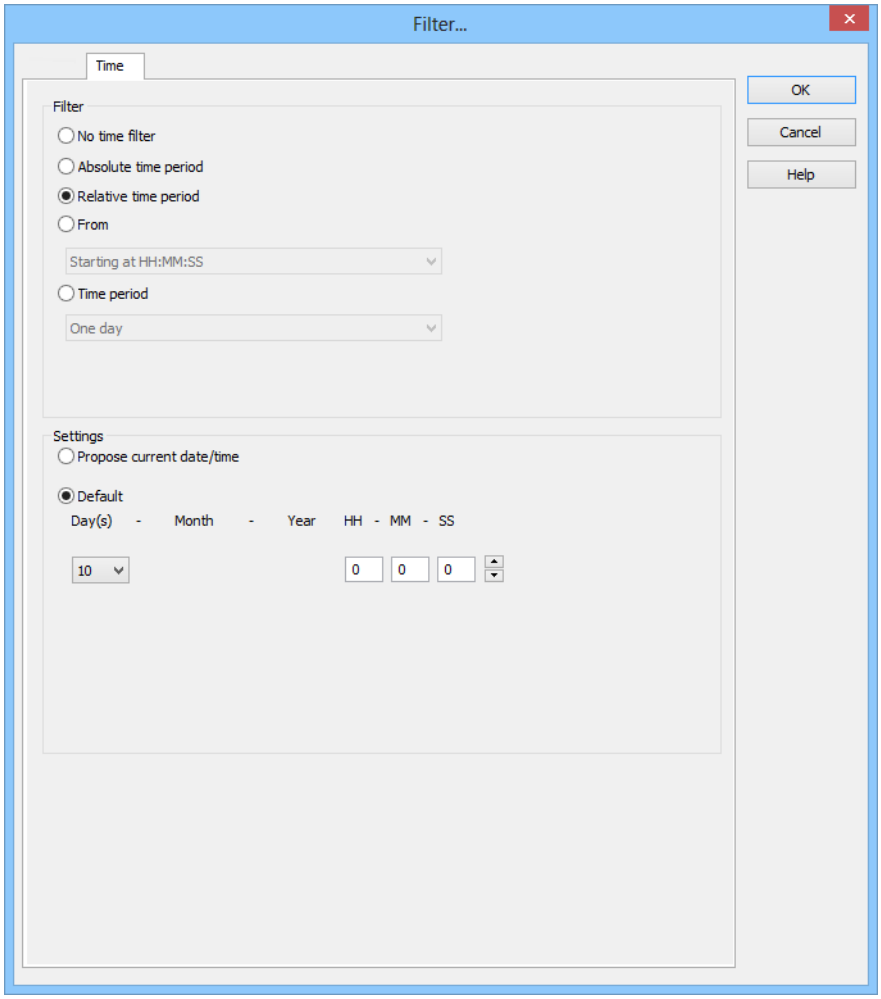
A relative time period is entered.

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

To set the filter:

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

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



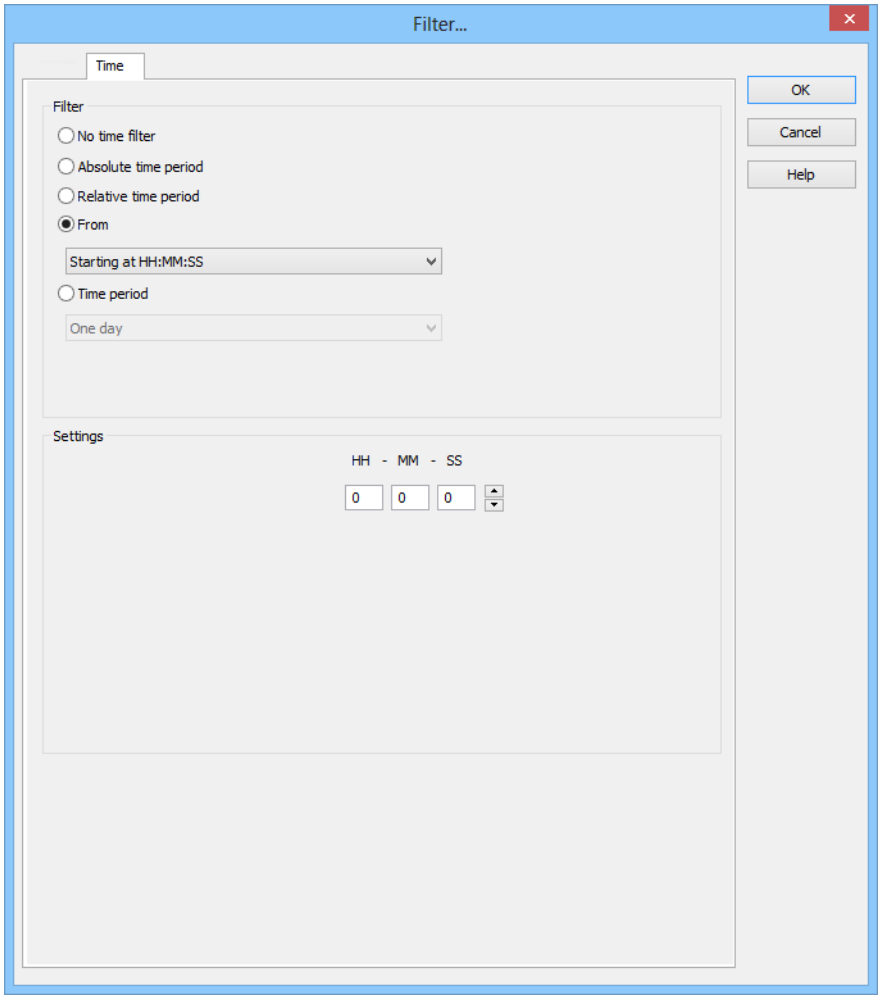
Parameters	Description
Options	Configuration of the time filter.
Propose current date/time	Active: Time filter is displayed in Runtime.
Default	Active: The time filter is prescribed in the Editor. Only the start time can still be configured in Runtime. Selection of the relative time period in days, hours,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

From

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

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

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

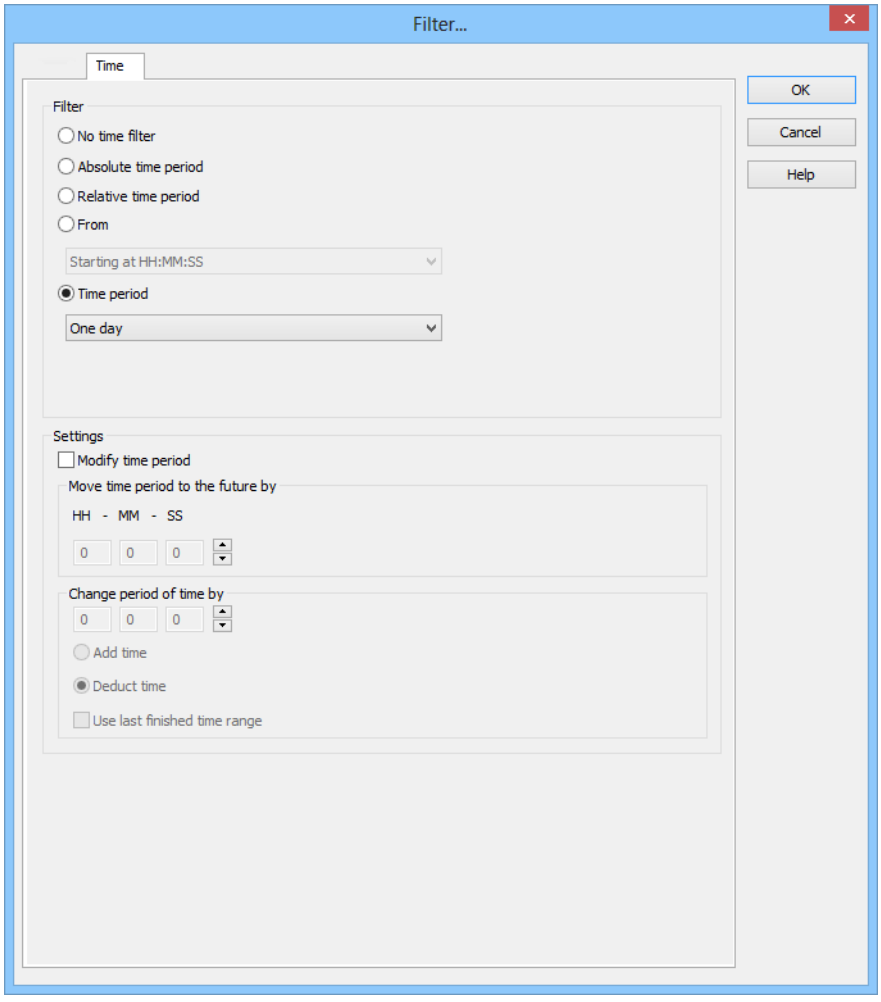


Parameters	Description
Options	Configuration of the time filter.
[Date/Time]	Depending on the settings of the Off option, the time from which the filter is effective is configured here: ▸ From HH:MM:SS o' clock ▸ From day - HH:MM:SS o' clock ▸ From day, month - HH:MM:SS o' clock **Attention!** The start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

Time period

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

1. Select, in the **`Filter`** section, the `Time period` option
2. Configure the desired time in the **`Settings`** section



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

Help	Opens online help.

Define time period in the Editor

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

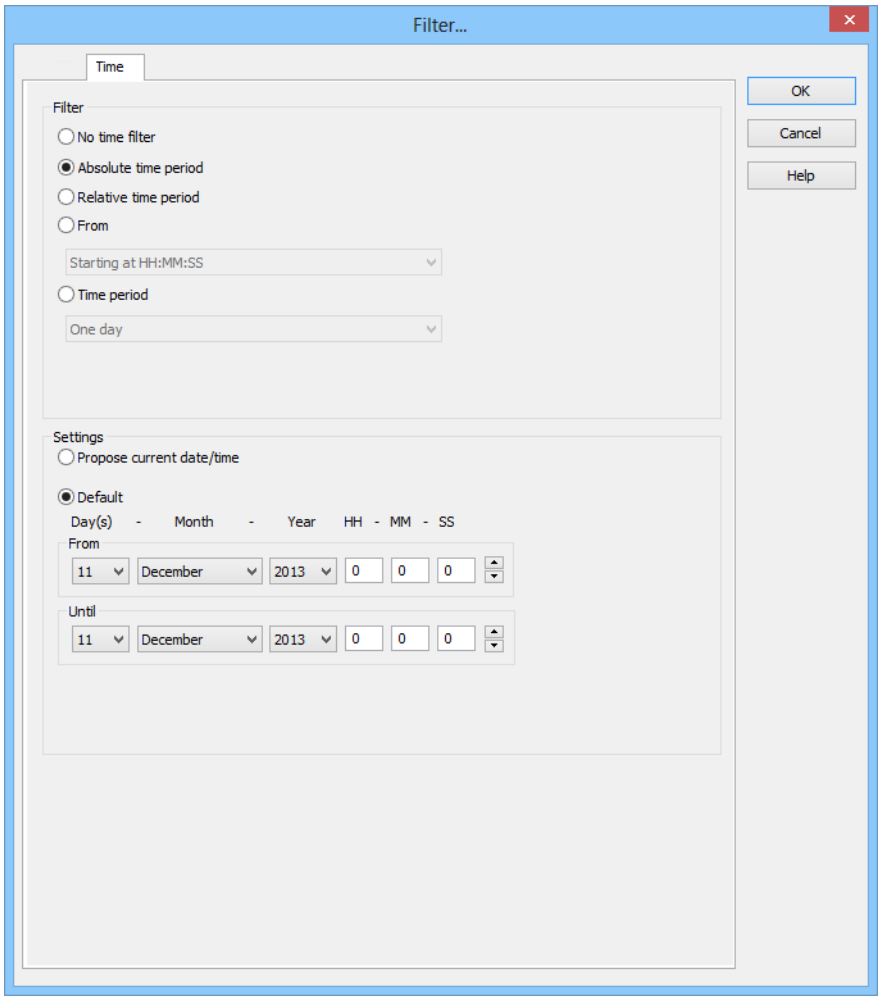
For example: You set a 30 minute time filter. In Runtime, you can now only set when this 30 minute time period is to start. However, you cannot change the filter to a day filter.

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

To create the filter:

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

3. Configure the selected time period

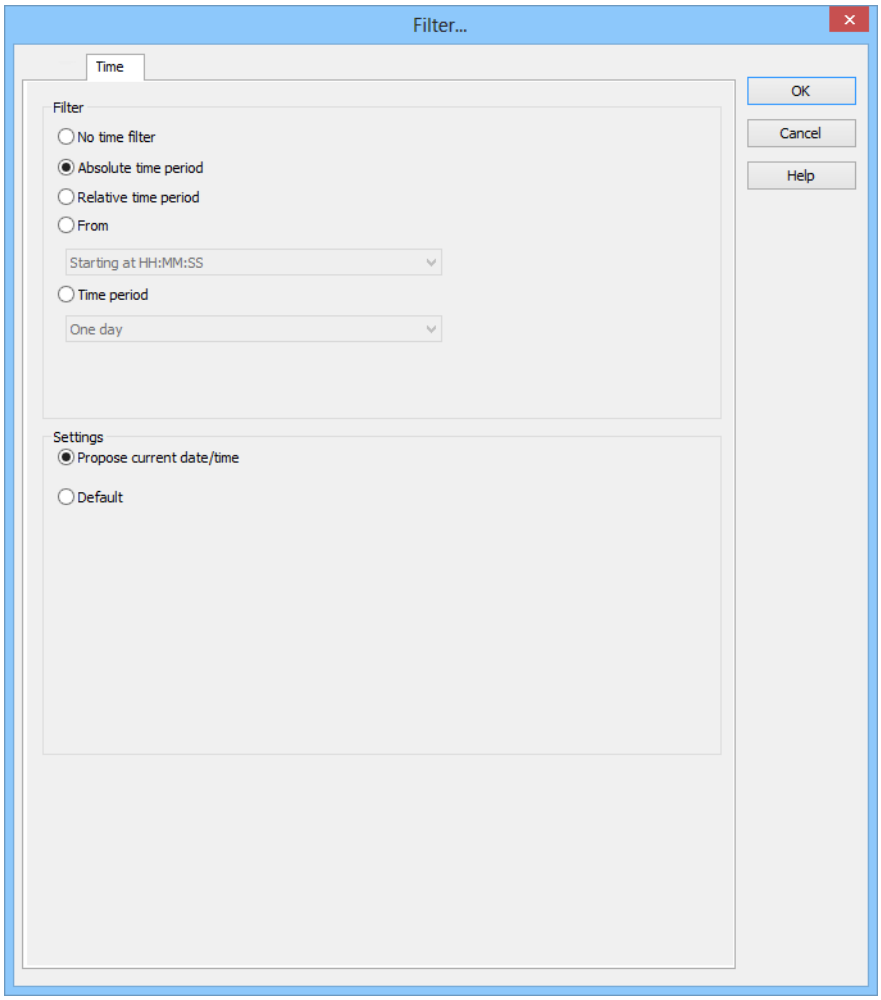


Tip for time period: Activate the `Offer this dialog in Runtime` option in the filter dialog. This way you can amend the start time before the function is carried out. Do not have the filter displayed in Runtime when the function is turned on; this way the current time period is always used. If you have activated the `Use last closed time period` option, the previous time period is shown.
For example: You have set a 30 minute filter. It is 10.45 when the function is activated. If the `Use last closed time period` option is deactivated, the filter is set to the current time period 10:30:00 to 10:59:59. If the option is activated, the filter is set to the previous time period of 10:00:00 to 10:29:59.

Time filter can be configured in Runtime

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

1. The screen must have **`Filter`** and **`Display filter`** buttons
2. select the desired filter:
   - Absolute time period
   - Relative period of time
3. Select, in the Settings section, the option **`Propose current date/time`**
4. The filter dialog is opened in Runtime with the current date and time

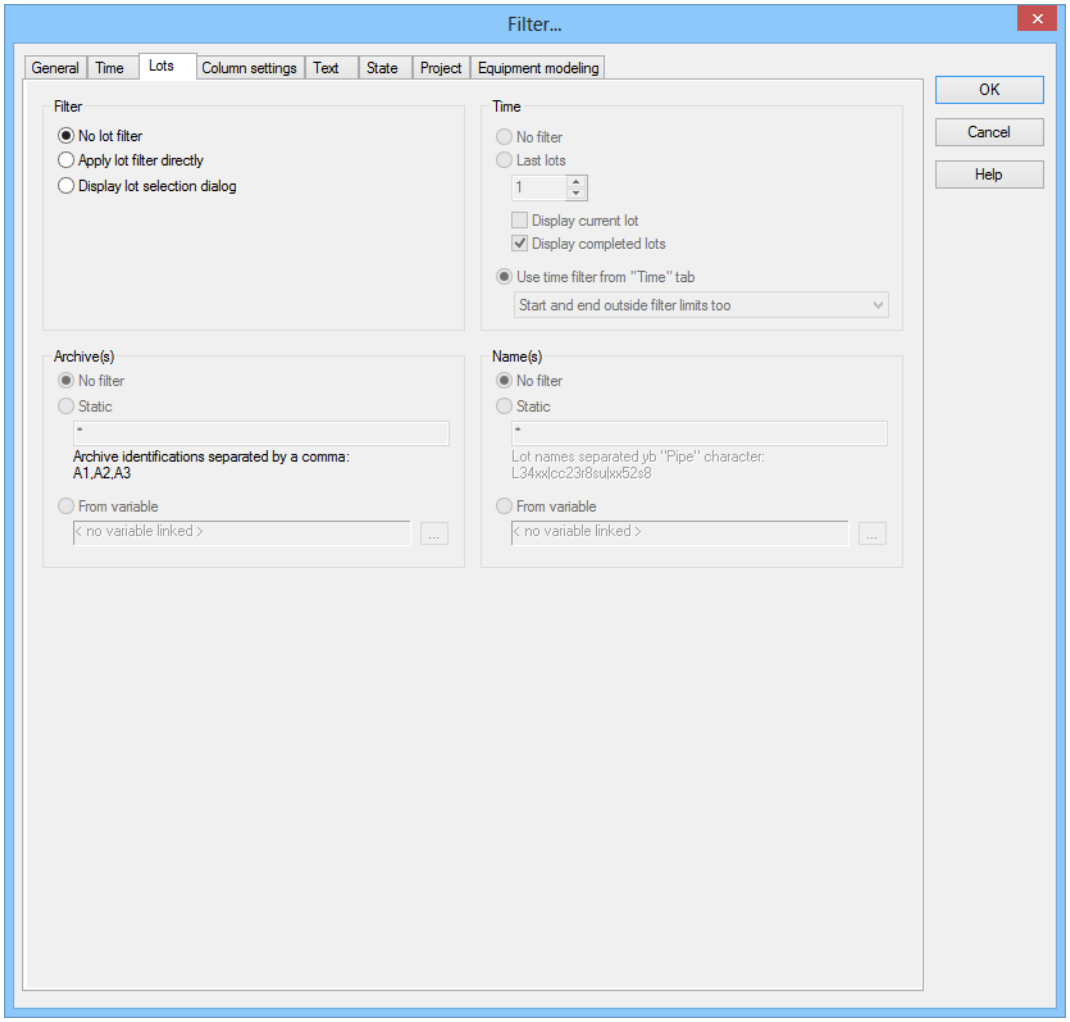


Lots

You configure the limitation of the display to certain lots in this tab.

The lot information is also applied to the existing AML 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.

Note: All variables and archives that belong to an item of equipment must be linked to the same equipment in the equipment model.



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

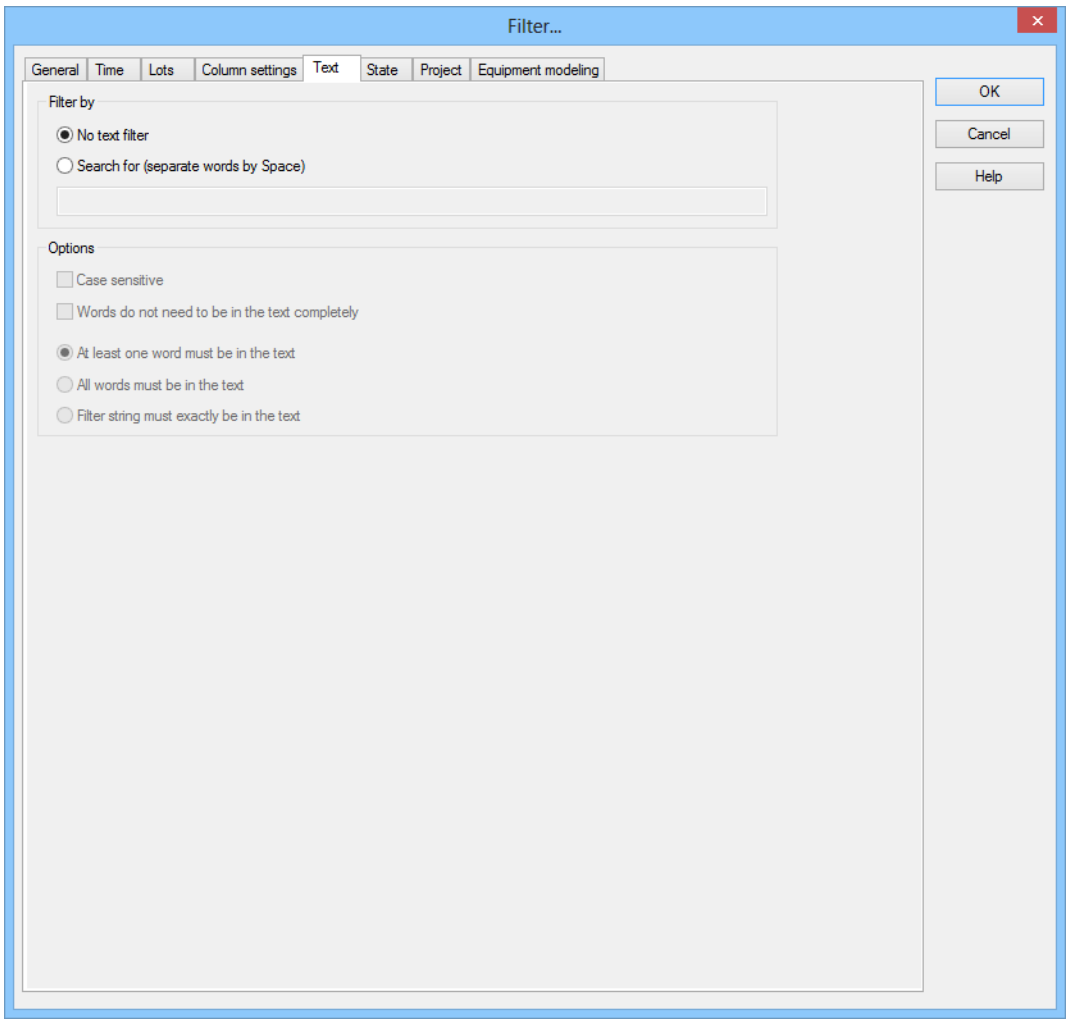
	has been completed. **Attention:** At least one of the two options `Display current lots` or `Display completed lots` must be activated. If both options have been deactivated, this corresponds to the `No filter` setting. **Note on compatibility:** If the current lots or the combination of current and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

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

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

Text

The text filter makes it possible to limit the display to messages that contain certain search terms.



Parameters	Description
Filter by	
No text filter	The text filter is not used.
Search for (words separated by spaces)	The text filter filter is used. Further options are activated.
Input field	Enter the corresponding words or character strings.
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 present 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 be 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 display in what form, succession and sort order.

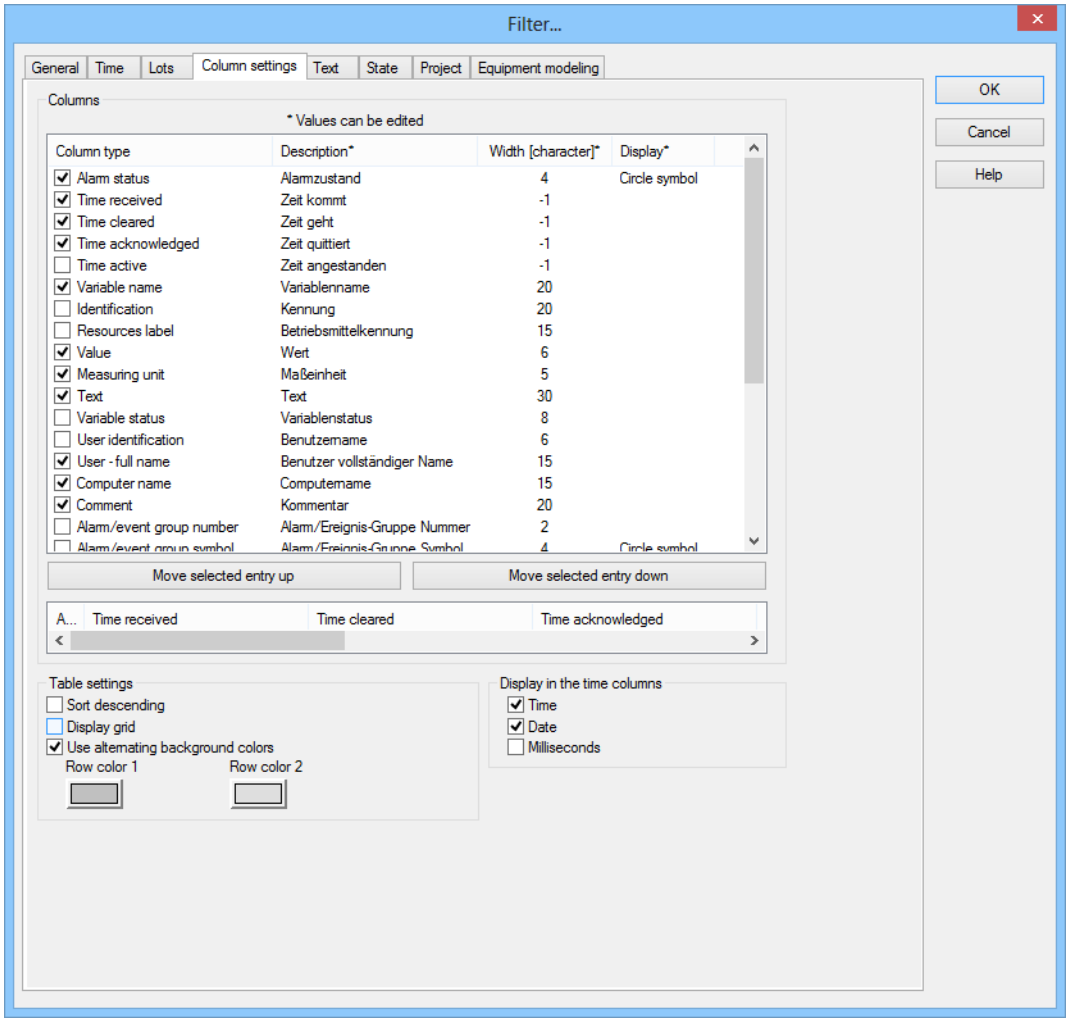
Note: All settings which you make in this tab are default settings for:

- Screen of type Alarm Message List
- Alarm Message List Screen
- Alarm status line
- Chronological Event List screen
- Screen Chronological Event List Filter

These default settings can be changed at the definition of each individual alarm function/CEL function.

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. The setting is stored in the* **`project.ini`** *file.*



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. These settings apply for showing 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.

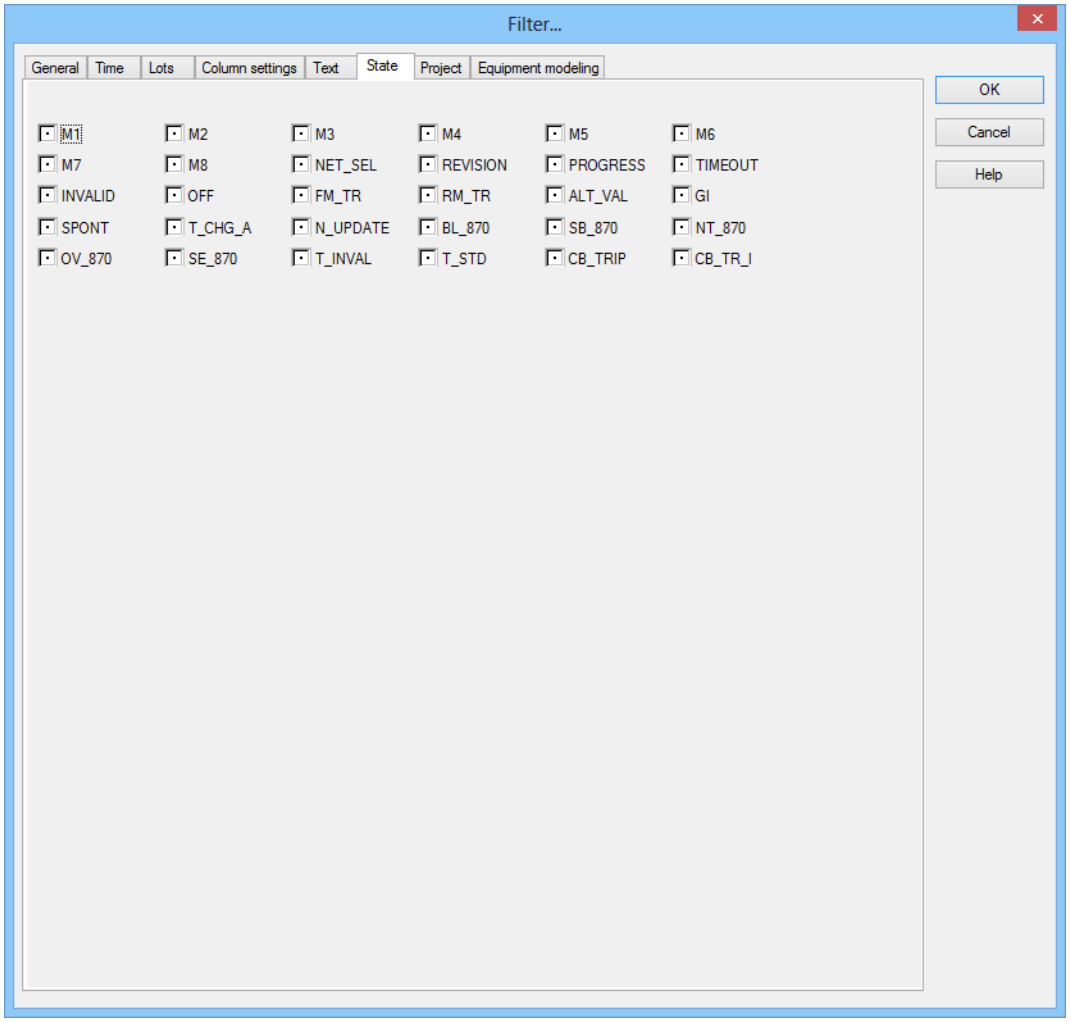
Attention

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 proportional fonts, such as 'Courier New', for example.

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.

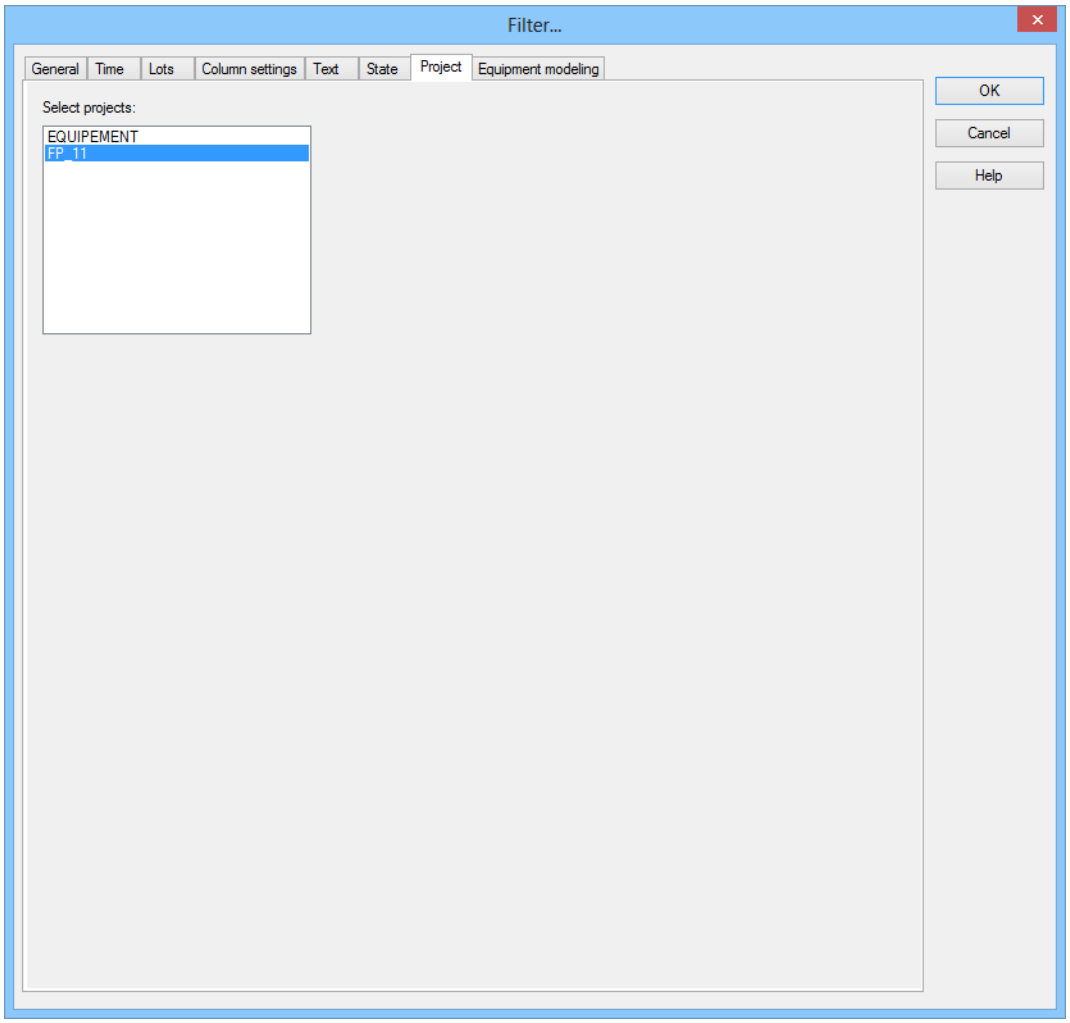
Example

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

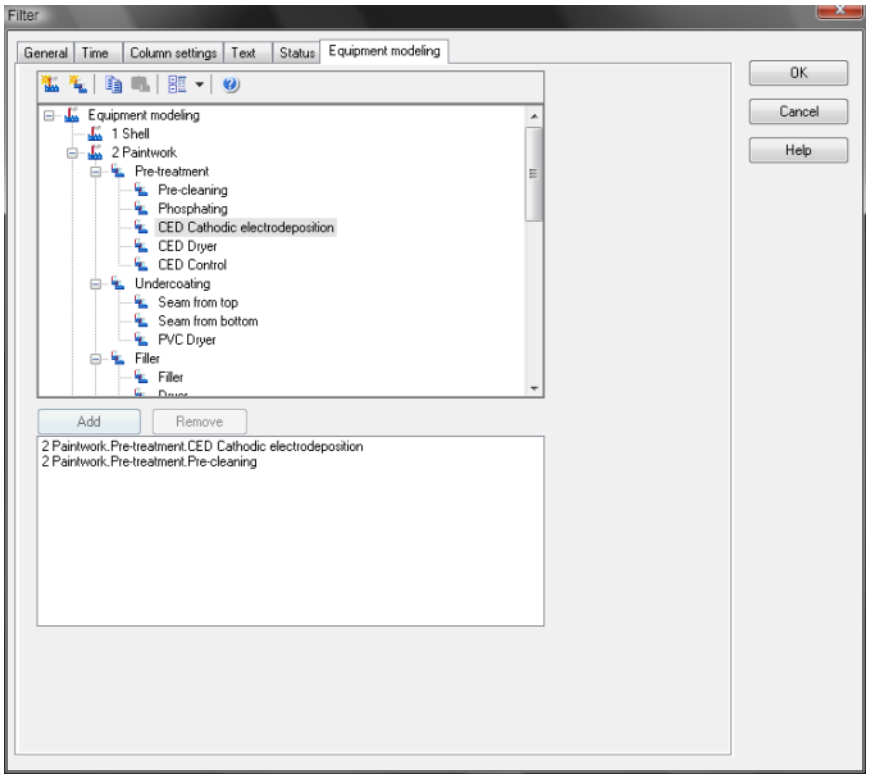
In the filter all already existing equipment models are displayed. Via the context menu or via tool bar, you can create new models and groups.

To add groups to the filter:

1. select the desired element
2. click on button **Add**
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: Ctrl button or hold down the shift key and click on the desired element)
2. click the **Delete** button



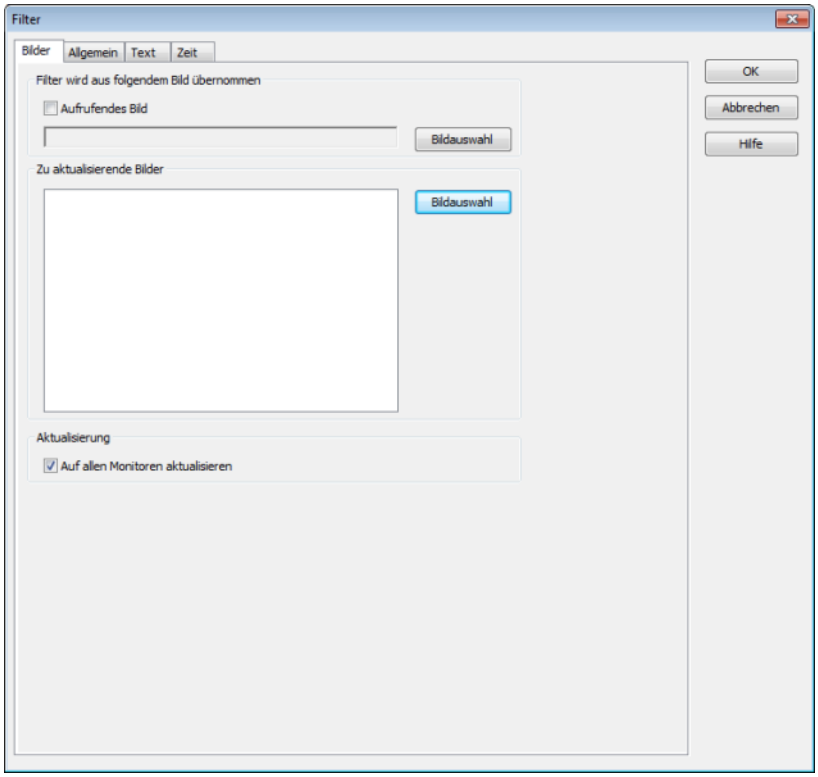
Element	Description
List of equipment models	provides models and groups for selection
Add	Adds selected groups to the filter list
Delete	removes selected groups from the filter list
Filter list	Shows all equipment groups that are to be filtered.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.6.3 Filter for Alarm Message List screen switching filter.

To create an `Alarm Message List filter` (on page 13) screen:

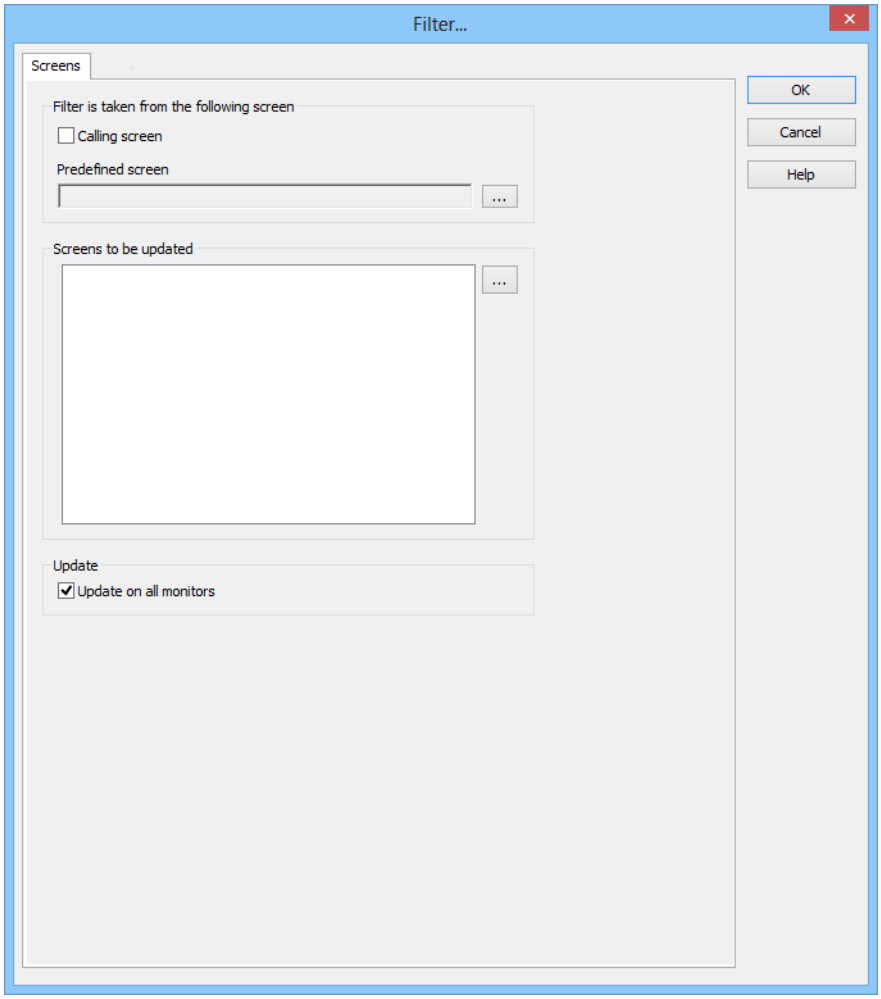
1. Create a `Screen switching` function on an **`Alarm Message List filter`** screen
2. the filter is displayed with all tabs:
   - Screens (on page 91)
   - General (on page 93)
   - Text (on page 95)

- Time (on page 96)



Screens

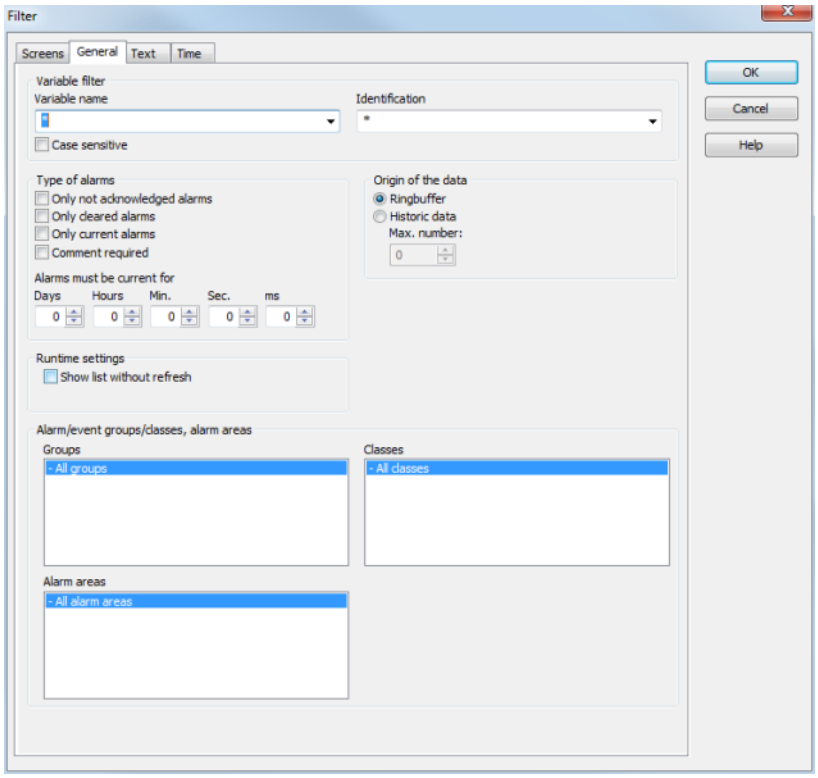
In this tab, you can define the screens that are to be updated by the screen filter.



The following settings are available:

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 which can adopt or fill the screen filter. The screen selected 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	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.

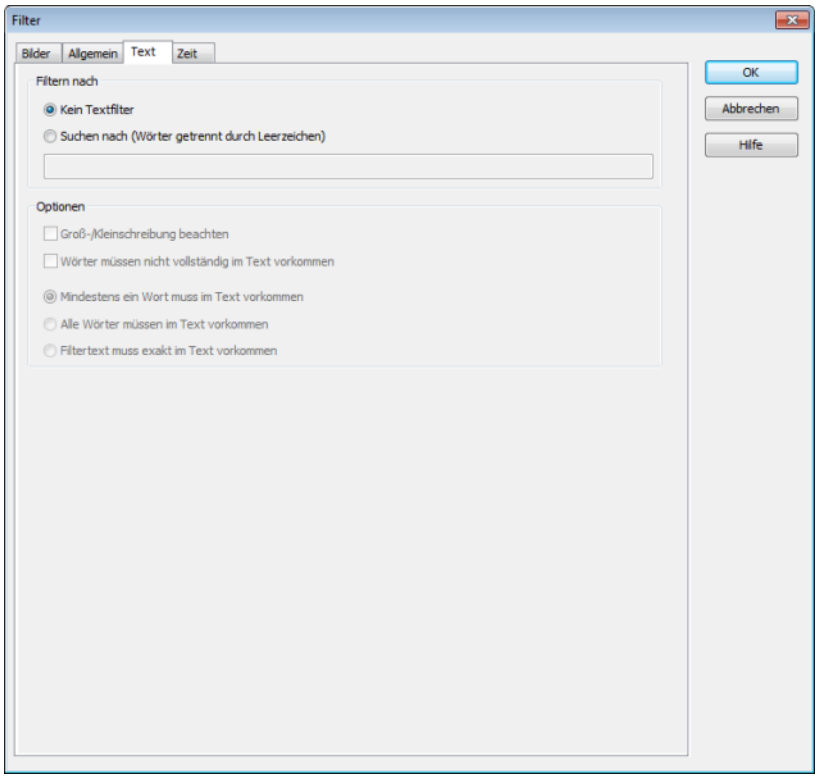
General


Filter
Screens
General
Text
Time
OK
Cancel
Help
Variable filter
Variable name
Identification
Case sensitive
Type of alarms
Only not acknowledged alarms
Only cleared alarms
Only current alarms
Comment required
Origin of the data
Ringbuffer
Historic data
Max. number:
Alarms must be current for
Days
Hours
Min.
Sec.
ms
Runtime settings
Show list without refresh
Alarm/event groups/classes, alarm areas
Groups
- All groups
Classes
- All classes
Alarm areas
- All alarm areas

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. Wild card * is possible. **Note:** Wild cards are only allowed as prefix or suffix, i.e. *xxx or xxx*
Identification	Enter the identification or part of the identification of the variables you want to filter. Wild card * is possible. **Note:** Wild cards are only allowed as prefix or suffix, i.e. *xxx or xxx*
Note capitalization	Active: Capitalization is recognized when filtering for variable name and/or identification.
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.
Alarms must be current for	Use the spin control to define the minimum time that an alarm should be active in order for it to be displayed. Possible settings: ▸ Days ▸ Hours (hr.) ▸ Minutes (min.) ▸ Seconds (sec.) ▸ Milliseconds (ms)
Origin of the data	Display of current or current and historical alarms.
Ring buffer	Active: Only data from the ring buffer (on page 32) are displayed.
Historical data	Active: Data from the ring buffer and historical data

Maximum number	from the AML are displayed. The maximum number of the data which should be displayed includes the data from the ring buffer.
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.
Alarm/event groups/classes and alarm areas	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups (on page 35) select the one from which alarms should be displayed.
Alarm/event classes	From the existing alarm/event classes (on page 39) select the one from which alarms should be displayed.
Alarm areas	From the existing alarm areas (on page 42) select the one from which alarms should be displayed.

Text

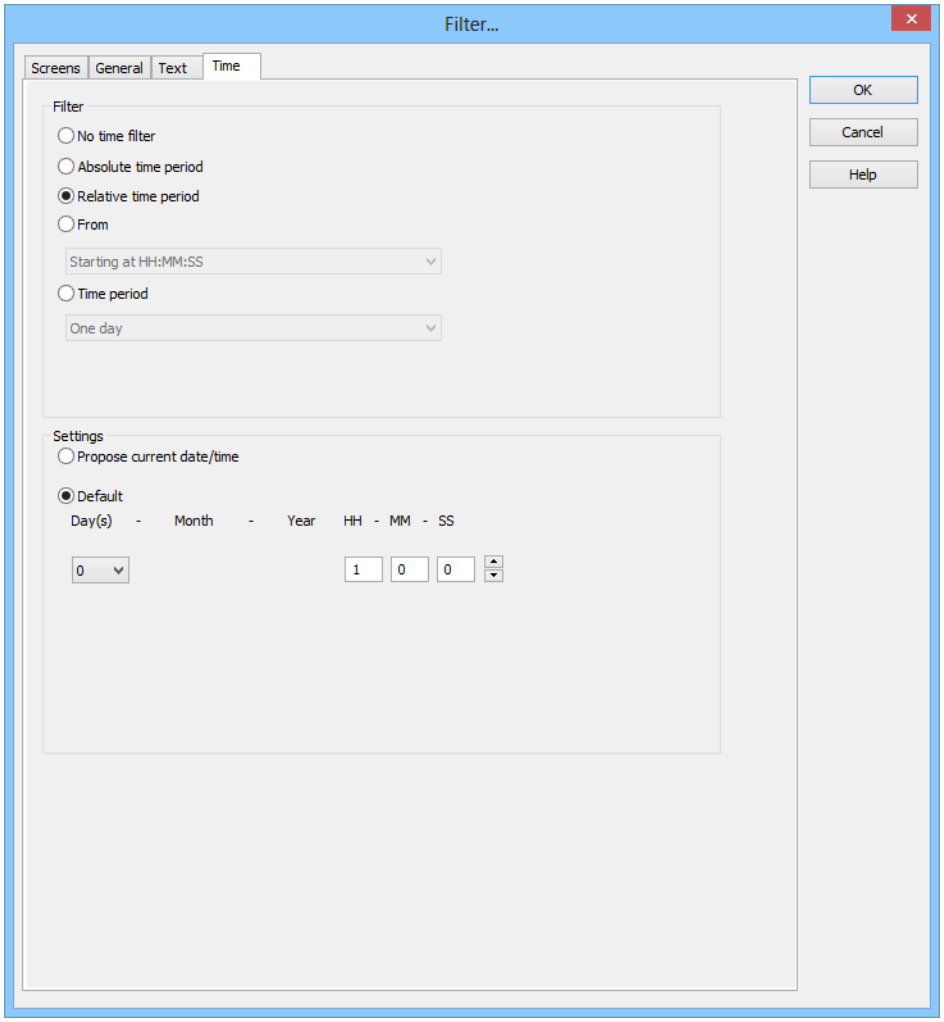


Parameters	Description
Filter by	
No text filter	The text filter is not used.
Search for (words separated by spaces)	The text filter filter is used. Further options are activated.
Input field	Enter the corresponding words or character strings.
Options	
Note capitalization	Active: The filtering is case-sensitive.
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 present 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 be in the text exactly	Active: The text must be exactly as defined in the search string.

Time

In 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 60) chapter.



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

	▸ One month ▸ One Year ▸ 15 minutes ▸ 30 minutes ▸ 60 minutes In the settings section, the corresponding options can be shown and configured there.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.7 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 (on page 99).*

3.7.1 Network functions

If network functions are used, the place of execution must be noted:

For functions that are used in the network:

- The place of execution can be freely configured in some cases
- The place of execution is stipulated in some cases

> **Information**
>
> *Scripts combine several functions. The place of execution then depends on the settings of the* ***Execute script*** *function. This setting overwrites the settings of the individual functions.*

CONFIGURE PLACE OF EXECUTION

For functions where the place of execution can be freely configured, the corresponding parameters are available in the properties of the function.

To define the place of execution:

1. navigate to the `Execution` group in the Properties.
2. Select the desired place of execution by checking the checkbox. Multiple selection is possible:
   - `Current computer`: Function will be executed on the current computer.
   - `Primary Server`: Function will be executed on the Primary Server.
   - `Standby Server`: Function will be executed on the Standby Server.
   - `Client`: Function will be executed on all clients.

OVERVIEW OF FUNCTIONS IN THE NETWORK

The following table shows which functions are executed and where they are executed.

Key:

- **`Adjustable:`** Behavior can be configured

+: Yes

-: No

O: Default

- If not adjustable, O identifies the place of execution:
  - Active computer
  - Primary Server
  - Standby Server
  - Client

Function	Adjustable	Current computer	Primary Server	Stand by Server	Client
AML and CEL					
Alarms: acknowledge flashing	-	O			
Alarms: delete	-		O	O	
Alarms: Acknowledge	-		O	O	
Alarm/event group log in/log off	-	O			
Activate/deactivate alarm message list / alarm/event groups / alarm/event classes	-		O	O	
Alarm Message List active	-		O		
Alarm Message List active/inactive	-		O		
Alarm message list inactive	-		O		
Export AML	+	O			
Save AML and CEL ring buffer	-		O	O	
Export CEL	+	O			
Print AML or CEL	+	O			
Create/print IPA document	-		O		
Switch online printing on/off	-		O	O	
Start online printing on a new page	+	O			
Switch online printer	-		O		
Application					
Select printer	+	O			
Start EMS	-		O		
Stop EMS	-		O		
Print Extended Trend diagram	+	O			
Switch color palette	+	O			

Function at limit active	-		O	O	
Functions active/inactive at limit	-		O	O	
Function at limit inactive	-		O	O	
Open Help	+	O			
Reload	+	O			
Determine open maintenances	-		O		
PFS - execute user-defined event	+	O			
Activate/deactivate project simulation	-	O			
Simulate right mouseclick	+	O			
Save remanent data	+	O			
Stop Runtime	+	O			
Analyze S7 Graph heuristics	+	O			
Execute SAP function	+	O			
Language switch	+	O			
Topology - Search for ground fault	-		O		
Topology - LoadShedding	-		O		
Historian					
Archive: Stop	-		O	O	
Index Archive	-		O		
Archive: Start	-		O	O	
Export archives	-	O			
Display open archives	-		O	O	
User administration					
Change user	+	O			
Login with dialog	+	O			
Login without password	+	O			

Logout	+	O			
Change password	-	O			
Screens					
Change ALC source color	+	O			
Indexed screen	-	O			
Close screen	+	O			
Screen: Return to last	-	O			
Screen: Move center	+	O			
Screen switch	+	O			
Activate input to the element with the focus	+-	O			
Set focus to frame	+	O			
Move focus	-	O			
Take focus away from frame	+	O			
Show menu	+	O			
Monitor assign	+	O			
Runtime profiles	+	O			
Close frame	+	O			
Set point input for screen keyboard	-	O			
Displaying the overview window	+	O			
Error detection in electric grids					
Acknowledge ground fault message	+	O			
Stop search for ground fault	+	O			
Start search for ground fault	+	O			
Acknowledge ground fault message	+	O			
Message Control					
Save current queue	-		O		

Suppress groups/classes/areas/equipment	-		O		
Send a Message	-		O		
Send Message: activate	-		O		
Send Message: deactivate	-		O		
Network					
Authorization in network	+	O			
Redundancy switch	-			O	
Report Generator					
Print report	+				
Execute report	+				
Export Report	+				
Recipes					
Recipegroup Manager	-	O			
Standard Recipe	-	O			
Standard recipe single directly	+	O	O	O	O
Standard recipe single with dialog	-	O			
Standard recipe single with online dialog	-	O			
Script					
Execute script	+	O			
Script: select online	+	O			
Variable					
Export data	-		O		
Read dBase file	+	O			
Print current values	+	O			
Unit conversion	+	O			
HD administration active	-		O	O	

HD administration inactive	-		O	O	
HD administration inactive/active	-		O	O	
Write set value	-		O		
Driver commands	-	O			
Transfer driver simulation image to the standby	-				O
Write time to variable	+	O			
Read time from variable	+	O			
VBA					
Open PCE editor	-		O		
Open VBA Editor	+	O			
Execute VBA Macro	+	O			
Show VBA macro dialog	+	O			
VSTA					
Open VSTA editor	+	O			
Execute VSTA macro	+	O			
Show VSTA macro dialog	+	O			
Windows					
Play audio file	+	O			
File operations	+	O			
Start continuous tone	+	O			
Stop continuous tone	+	O			
Window to the background	-	O			
To the foreground	-	O			
Print screenshot	+	O			
Start program	+	O			

3.7.2 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 49)

In the Runtime you can modify the filter properties. Exception: In the Editor fixed time filter (on page 72) was defined.

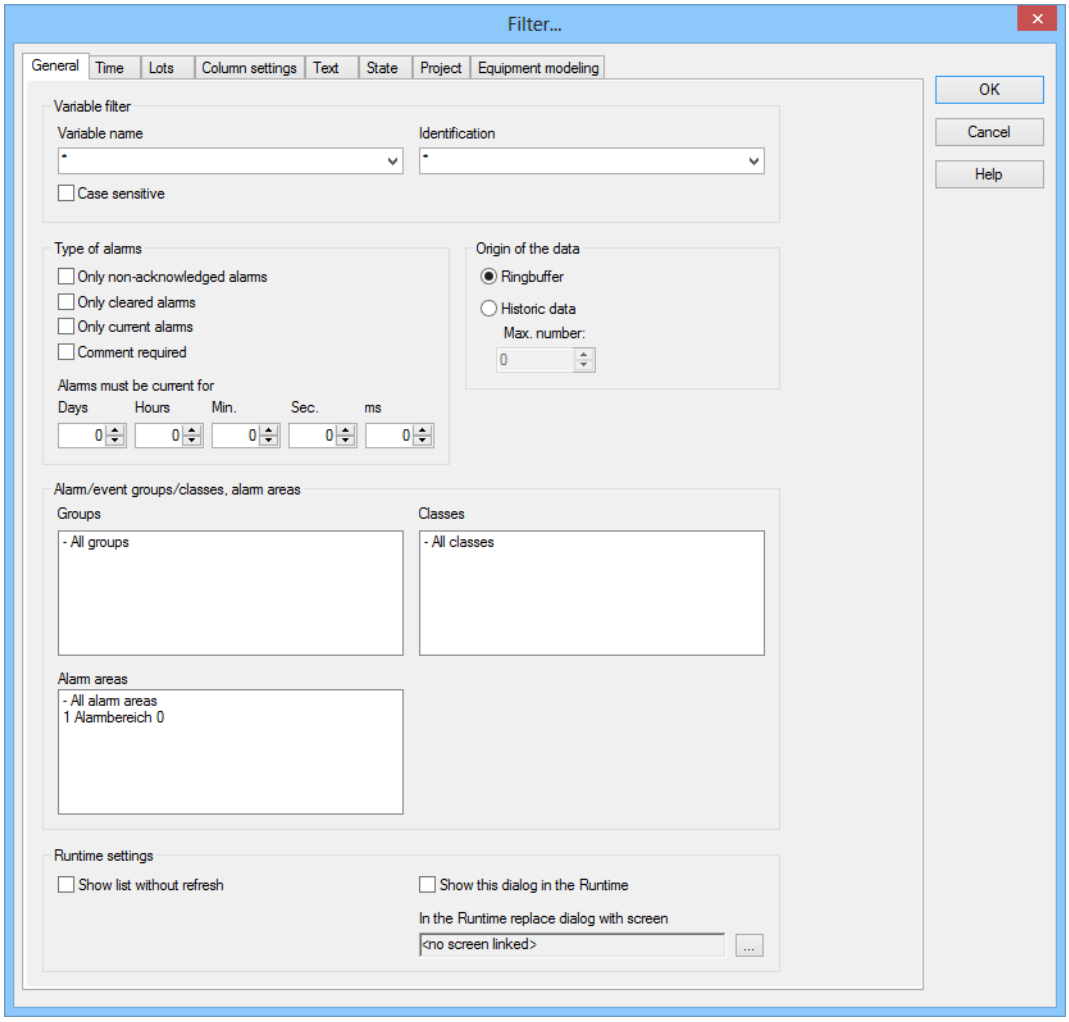
ENGINEER SCREEN SWITCH

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 56)
   - Time (on page 60)
   - Column settings (on page 81)
   - Text (on page 80)
   - Status (on page 85)
   - Project (on page 87) (only available in the integration project of the multi-project administration.)
   - Equipment modeling (on page 87)

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

- Replacing indexes



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 there is a reference to a screen which does not have a time filter, the time filter (on page 60) 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 49) section, in the Filters for `Alarm Message List` screen switching (on page 55) chapter.

3.7.3 AML filter screen switching

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

1. Create an Alarm Message List filter (on page 13) screen
2. create a screen switch function for this screen
3. define the desired filter properties (on page 109)

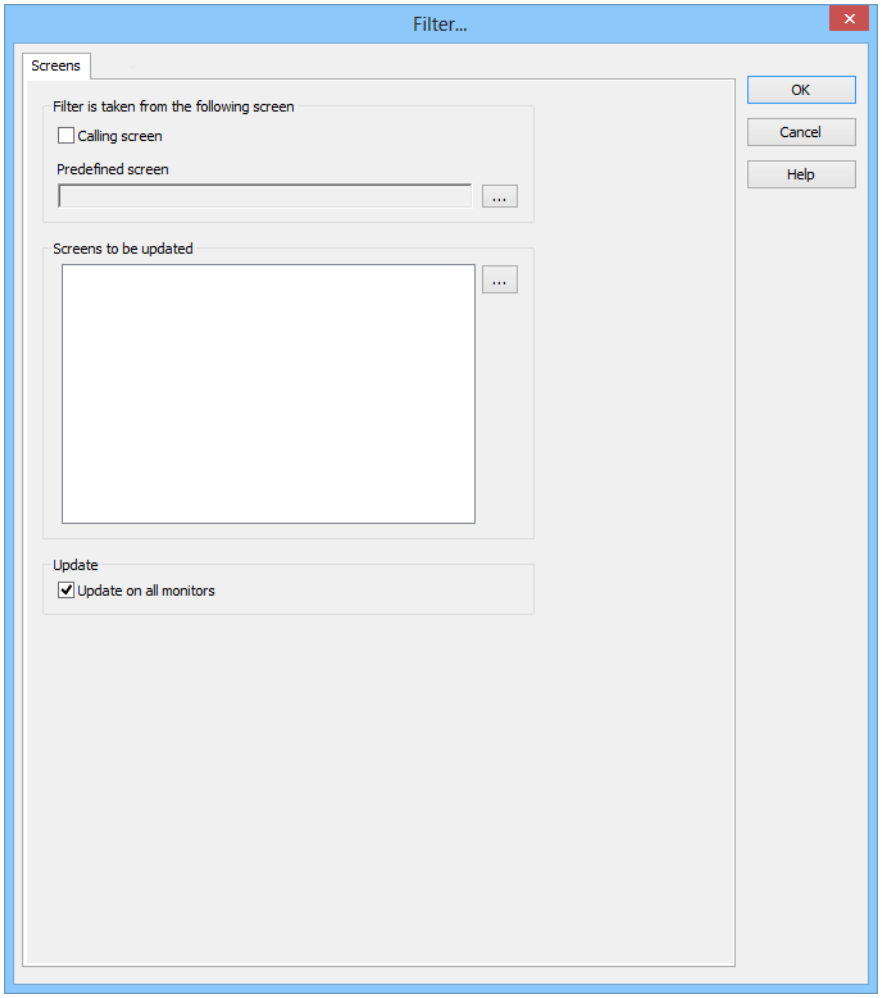
In the Runtime the filter properties can only be controlled via the buttons defined in the screen.

ENGINEER SCREEN SWITCH

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 91)
   - General (on page 93)
   - Text (on page 95)

- Time (on page 96)



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

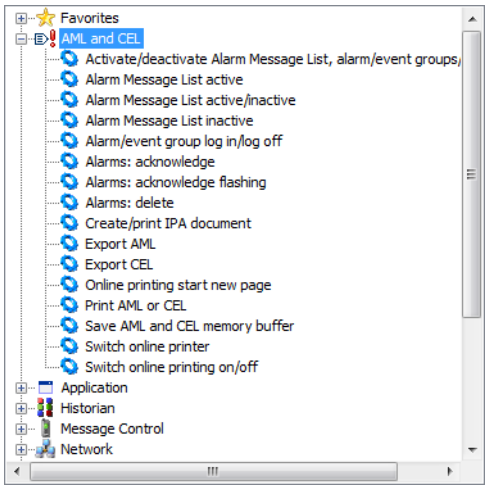
Several filters are offered when screen switching is created for an AML screen. For details, see Alarm configuration using filters (on page 49) section, Filters for `Alarm Message List filter` (on page 89) section.

3.7.4 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 tool bar
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

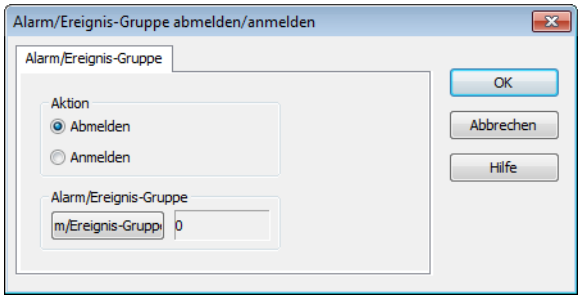
To optimize the performance of the connection, alarm/event groups (on page 35) that are not required can be deactivated. Their variables are then no longer required by the driver.

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)



Parameters	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	Confirms inputs and closes dialog.
Cancel	Discards 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 administration. The variables are requested and the corresponding limits 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 variables are polled.

Alarms: acknowledge flashing

When flash-acknowledging (on page 148) 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.

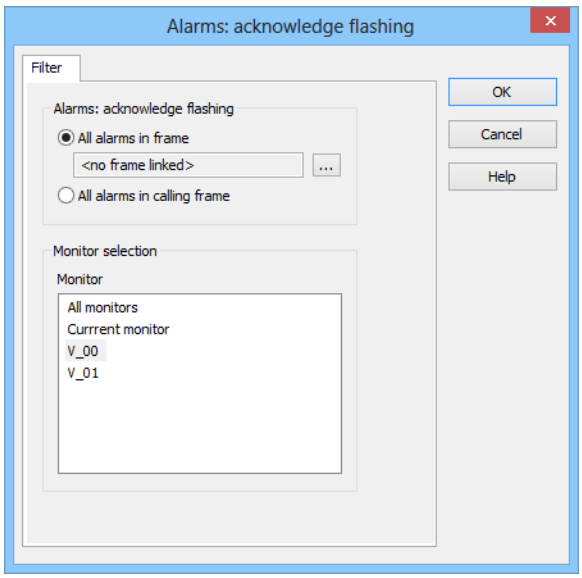
Note: This function is not identical to the Take over flashing from limit property that is defined for each element in the Take over flashing from limit group of the element

properties. The function relates to the flashing of the element content, for example text. The `Take over flashing from limit` property relates to the whole element.

CONFIGURING FUNCTIONS

To acknowledge the flashing of alarms in Runtime:

1. Create a new function (on page 110)
2. in group `AML and CEL` select the function `Alarms: acknowledge flashing`
3. select the frame you wish to assign
4. Select the desired monitor for multi-monitor systems



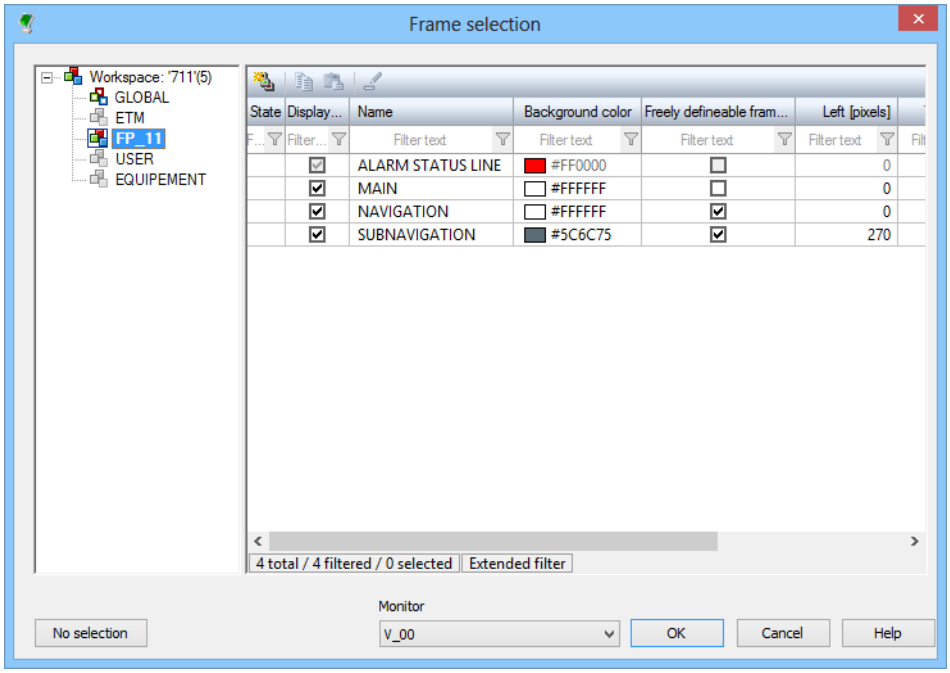
Parameters	Description
`Alarms: acknowledge flashing`	Configuration of which alarms are to be flash-acknowledged.
`All alarms in the frame`	All alarms on screens of a frame with the selected name are flash acknowledged, even if it is open several times. Clicking on the `...` button opens the dialog to select a frame. For details, see the **`Frame selection dialog`** (on page 113) 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`	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`** 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 being breached.

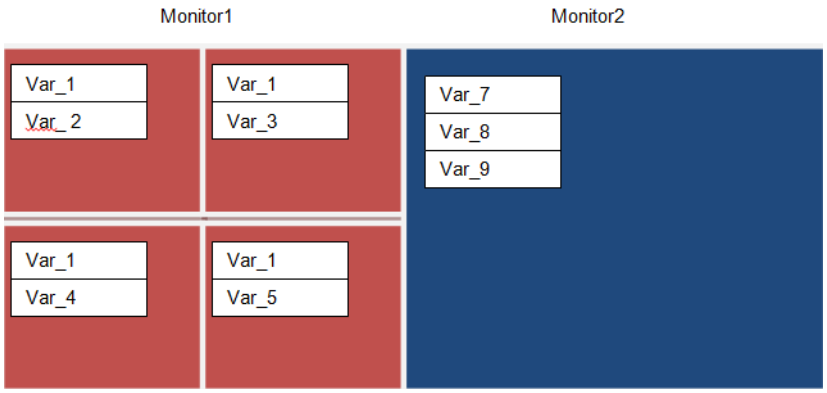
Reactions to the execution of the **Flash-acknowledge alarms** function:

- 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:

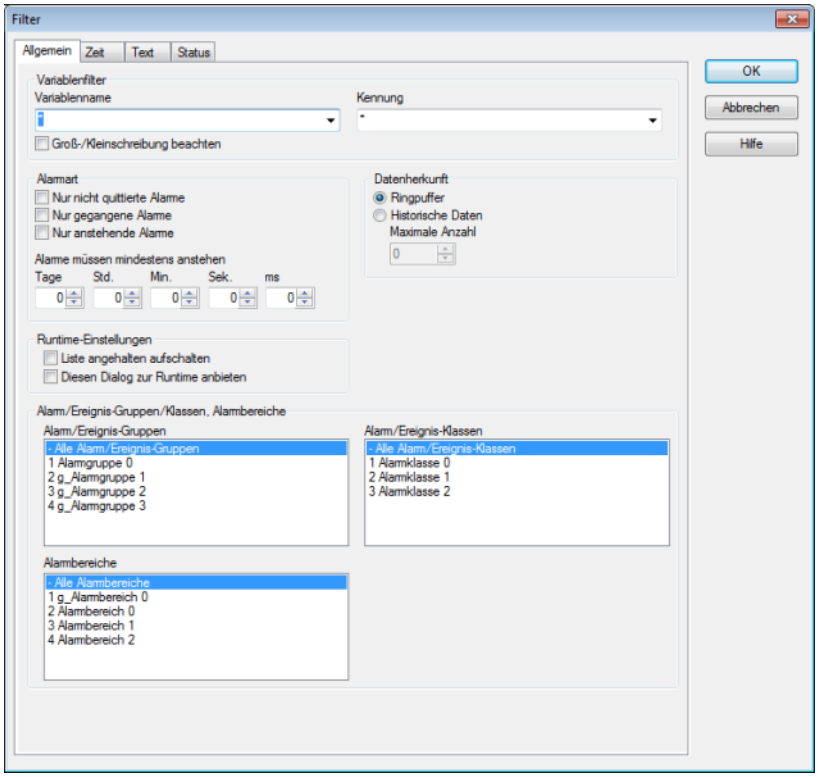
- **Var_1** to **Var_5** are flash acknowledged
- Var_7 to **Var_9** continue to flash

Alarms: delete

To delete (on page 149) alarms collectively using filter criteria, use the **Delete alarms** function:

1. Create a new function (on page 110)
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 56)
   - Time (on page 60)
   - Text (on page 80)
   - Status (on page 85)
5. link the function to a button

USER AUTHORIZATION

The functions ***Acknowledge alarms*** *(on page 118)and* ***Delete alarms*** *(on page 116) 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 `To delete` *property in the respective subgroup of the* `Limits` *group. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.*

If the `To delete` 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.*

Alarms: Acknowledge

With this function, you acknowledge Runtime alarms from the Alarm Message List. Most importantly, global acknowledgment (on page 145) is possible with this.

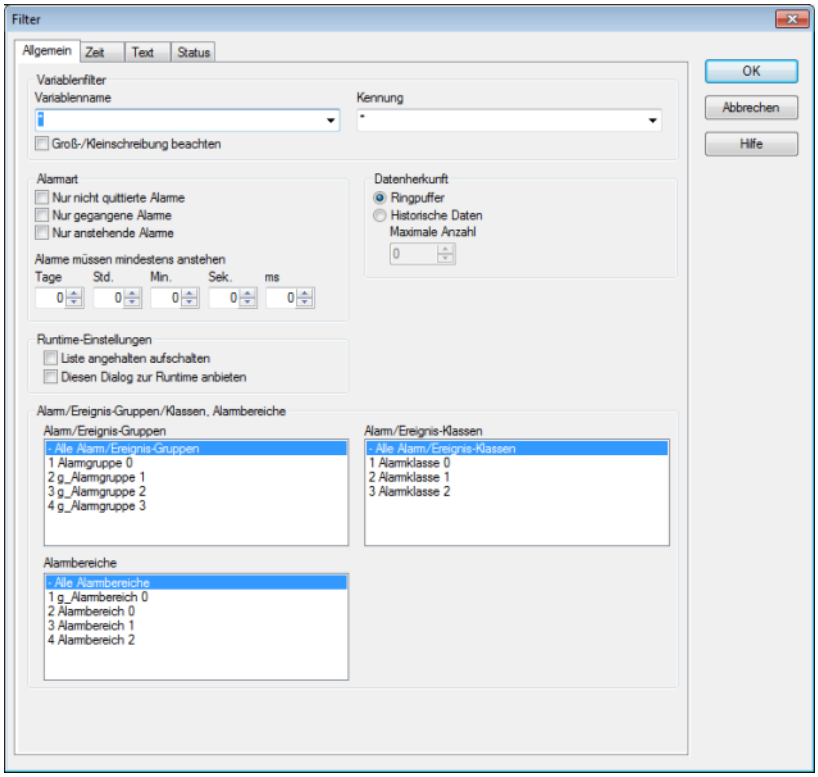
When executing this function in Runtime, the flashing attribute of the variables and therefore screen alarming (only SICAM 230) will also be reset. The selected alarms are acknowledged.

For transfer parameters see chapter Alarm engineering with filters (on page 49).

To acknowledge alarms with this function:

1. Create a new function (on page 110)
2. Select **`acknowledge 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 56)
   - Time (on page 60)
   - Text (on page 80)
   - Status (on page 85)
5. link the function to a button

USER AUTHORIZATION

The functions ***Acknowledge alarms*** *(on page 118)and* ***Delete alarms*** *(on page 116) 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 `To delete` *property in the respective subgroup of the* `Limits` *group. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.*

If the `To delete` 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.

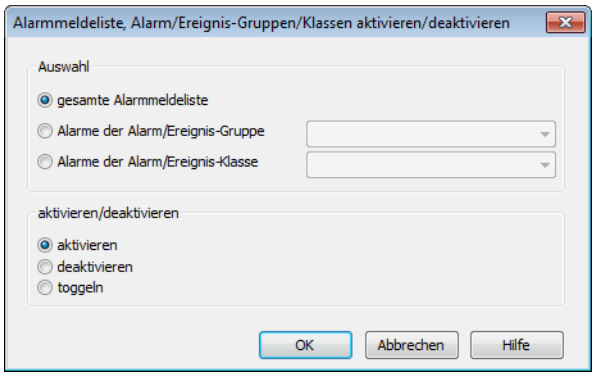
Activate/deactivate Alarm Message List, alarm/event groups/classes

The function makes it possible to activate or deactivate alarms of a certain group or class (on page 34) 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 110)
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



Parameters	Description
Selection	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	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 110)
2. Select **Export AML**

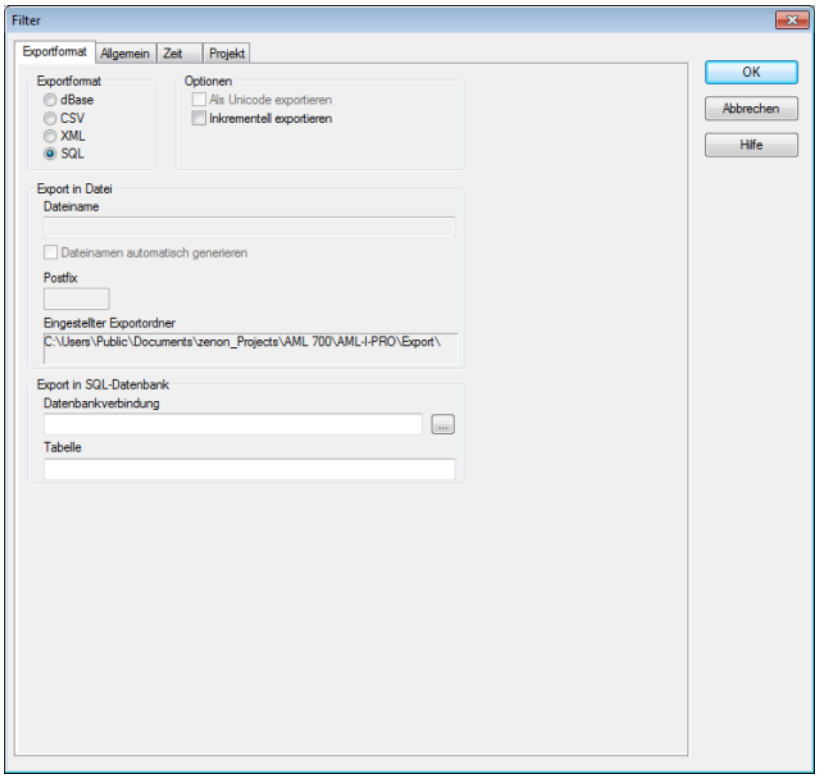
3. the dialog for selecting filter criteria opens
4. define the criteria for:
   - Export format (on page 122)
   - General (on page 56)
   - Time (on page 60)
   - Text (on page 80)
   - Status (on page 85)
   - Project (on page 87)
5. link the function to a button

Export format

Exports are possible in various formats:

- dBase
- CSV
- XML
- SQL

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


Filter
Exportformat
Allgemein
Zeit
Projekt
Exportformat
dBase
CSV
XML
SQL
Optionen
Als Unicode exportieren
Inkrementell exportieren
OK
Abbrechen
Hilfe
Export in Datei
Dateiname
Dateinamen automatisch generieren
Postfix
Eingestellter Exportordner
C:\Users\Public\Documents\zenon_Projects\AML 700\AML-I-PRO\Export\
Export in SQL-Datenbank
Datenbankverbindung
Tabelle

Parameters	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	
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	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 automatic 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 in 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.
General tab	General filter. See Alarm configuration using filters (on page 49) chapter, General (on page 56) section
Time tab	Time filter. See Alarm configuration using filters (on page 49) chapter, Time (on page 60) section.
Project	Project filter. Only available in the Integration project of multi-project administration. For configuration, see Alarm configuration using filters (on page 49) chapter, Project (on page 87) section.

CODING NAME FOR AUTOMATIC NAMING

Name	AJJMMTTP.XXX
A	Short identification of the Alarm Message List
JJMMTT	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` and `Column settings CEL` property.
- Column separator: Semi-colon (`;`)

> **Attention**
>
> **Milliseconds for printing or export**
>
> *If, when printing or exporting the AML or CEL, the time in milliseconds is to be given, this property must be activated in the dialog for the column settings (on page 81). 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 Download Area 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 32-bit version, even if it is installed on a 64-bit operating system and even if the database itself is a 64-bit application.

Save AML and CEL ring buffer

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

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

To save the AML ring buffer:

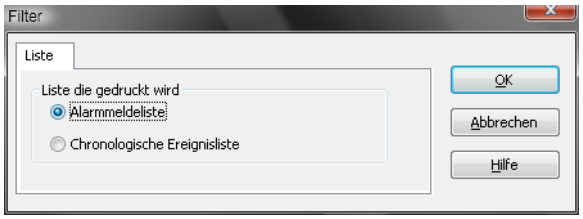
1. Create a new function (on page 110)
2. Select **Save AML and CEL ring buffer**
3. link the function to a button

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 110)
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 56)
   - Time (on page 60)
   - Text (on page 80)
   - Status (on page 85)
   - 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 164) chapter in the Operation in Runtime (on page 136) 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 list 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	@AGROUPNAM	X	X	X	X	Name of alarm/event group

	E					
@AKNAME	ACLASSNAME	X	X	X	X	Name of alarm/event class
@TAGNR	@IDENTIFICATIO N	X	X	X	X	Identification (company-specific label)
@AMELDUNG	@TEXT	X	X	X	X	Alarm message text
@REAKTANZ	@NRREACTIVAT E	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 you use dynamic limit texts, this is only available if properties `Long dynamic limit texts AML` or `Long dynamic limit texts CEL` are 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 it is

						printed
[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 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, the time in milliseconds is to be given, this property must be activated in the dialog for the column settings (on page 81). 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

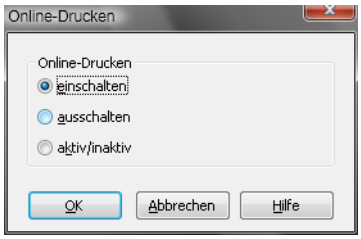
Online printing is set to a status when this function is used:

- 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 110)
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

Start online printing on a 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:

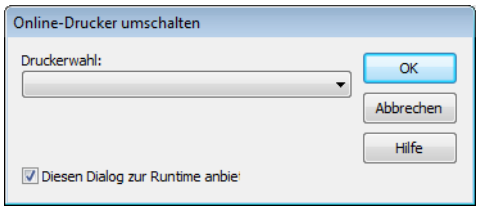
1. create a new function (on page 110)
2. Select **`Start online printing on a new page`**
3. link the function to a button

Switch online printer

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

To configure the function:

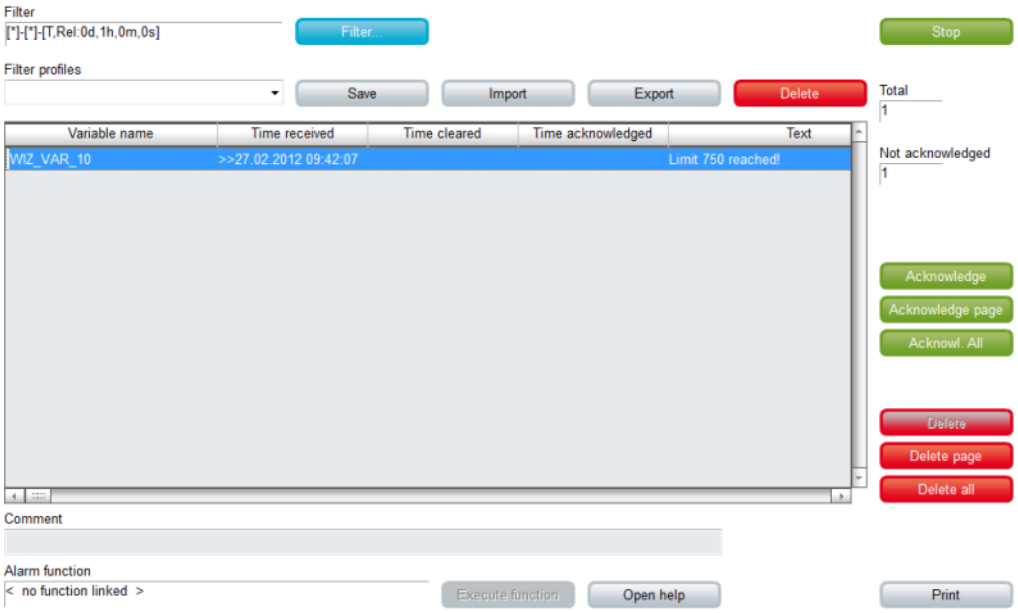
1. create a new function (on page 110)
2. Select **`Switch online printer`**
3. The dialog for selection of the user opens
4. Select the desired screen printer from the drop-down list
5. link the function to a button



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 106).



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

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 locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and palced in the screen. Elements can be moved in the screen and placed individually.
Windows	Display in Runtime
▸ **Alarm Message List**	Display of the alarms. The appearance is configurable (on page 11). Columns are defined via the Column settings (on page 81) filter in screen switching or via the `Column settings AML` property in the `Alarm Message List` group.
▸ **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	Time number of all alarms.
Number unacknowledged	Displays number of unacknowledged alarms.
List functions	Buttons to control the lists.
Filter	Opens dialogs 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 font 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. Deletes alarm from the Alarm Message List in Runtime. Alarm must already be acknowledged.
Print	Prints filtered list.
Print with dialog	Opens printer settings before printing.
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.
Acknowledge 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 147).
Visual acknowledgment and acknowledgment	The selected alarms are first visually acknowledged and then acknowledged (on page 147).
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.

Close frame	Closes Alarm Message List
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 (comment) by the user for the selected alarm. This text can be displayed in the list (**Comment** option in the **Column settings** of alarm administration.)
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.
Filter profiles	Buttons for filter settings in Runtime.
Profile selection	Select profile from list.
Save	Saves current setting as a profile.
Delete	Deletes selected profile.
Import	Imports filter profiles from export file.
Export	Exports filter profiles in the file.

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 81))

or

- Function screen switch to a screen of type **`AML`** (all tabs (on page 49))

FUNCTIONS FOR LIMITS 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 function at RT start` project setting in the `Functions` group. This setting is only influences limits that are not alarms.

4.1 Alarm status line

The alarm status line display alarms that cannot be acknowledged during runtime as a red bar 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 145) by double-clicking the right mouse button.

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 ringbuffer` 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 form 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 change its 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.

STATUS MESSAGES IN 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.
The status messages cover the red alarm status line until they are 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 blue status bar:

- 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. 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.

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 144).

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 81) 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.

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

When acknowledging alarms, all alarms of a variable with the same limit violation are deleted at the same time from the ring buffer.

As soon as the alarm is acknowledged, it is deleted from the ring buffer. Exception: If property `To delete` is set, the alarm must be deleted by the user decidedly.

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 ringbuffer`.
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 by an unexpected event such as a power outage, data loss occurs. To prevent this the ring buffer can be saved manually via property `Save ringbuffer on change` at every new entry or via function Save AML and CEL ring buffer (on page 127).

Attention: In the Runtime the ring buffer is handled dynamically in the memory. Via the defined number of alarms, even alarms which do not have a cleared time stamp can be displayed. 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 `...\Projektordner\Computername\Projektname` 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 ringbuffer on change` is active
- when function `Save AML and CEL memory buffer` is carried out

Note: If option `Save ringbuffer 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 violation.*

AML IN RUNTIME

Alarms in the Alarm Message List can have three states:

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

Alarms can require acknowledgment and/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 and/or requirements for deletion is carried out via the `To acknowledge` and `To delete`properties in the `Limits/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 145) 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 56) and CEL filters.

4.2.1 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 Alarms: Acknowledge

For the information "`acknowledged`" to be displayed in the AML, the following must apply:

1. The `To acknowledge` property must be activated for the variables
2. the alarm must be acknowledged

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 and **`Visual acknowledge and acknowledge`** in the Alarm Message List

When acknowledging an alarm:

- All alarms of a variable with the same limit 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 ringbuffer` property must be chosen appropriately. If alarms are no longer saved in the ring buffer (on page 32) 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 146), 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 118) 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 118) chapter.

USER AUTHORIZATION

The functions ***Acknowledge alarms*** *(on page 118)and* ***Delete alarms*** *(on page 116) 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 `To delete` *property in the respective subgroup of the* `Limits` *group. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.*

If the `To delete` 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 acknowledgement

It is possible to make it necessary to enter a comment for alarms that require acknowledgement before the alarm can be acknowledged. 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 `Limits` group of the variables

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 with all acknowledgment possibilities (including VBA). 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 56) filter
- Alarm Message List filter (on page 13) screen

4.3.2 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 acknowledgment 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 acknowledgment 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 acknowledgment variable`.

b) **`Visual acknowledgment and acknowledgment`**: The highlighted alarms are only confirmed with visual acknowledgment and then acknowledged (on page 145). The `Acknowledgement value` is written to the `Visual acknowledgment 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 145), 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 118) 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 111) 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.

FLASH-ACKNOWLEDGMENT WITH 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 116) 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 145) beforehand.

*If the `To delete` property is set for **Limits**, 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 118)and **Delete alarms** (on page 116) 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 `To delete` property in the respective subgroup of the `Limits` group. Selected alarms can only be removed from the Alarm Message List by users with the necessary rights.

If the `To delete` 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:

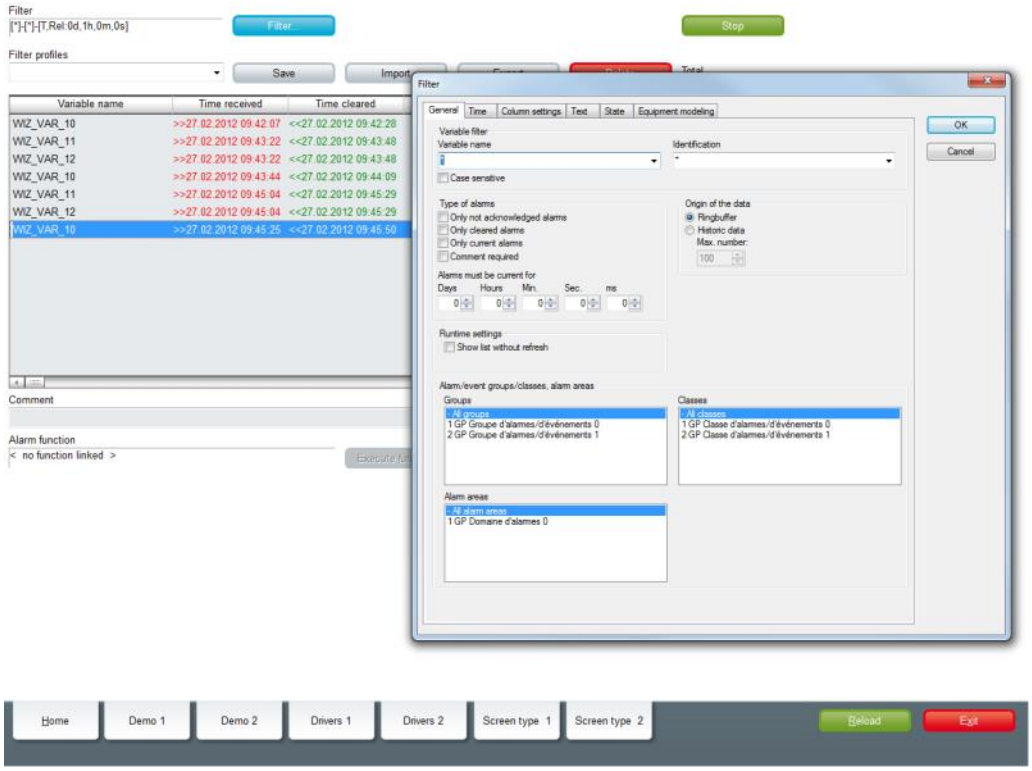
- filter use in the Runtime
- Screen switching with pre-defined filter to a screen of alarm message list (on page 7) type
- Screen switching with with filter when calling up a screen of alarm message list (on page 7) type
- Screen switching to a screen of alarm message list filter (on page 154) type

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 49) is opened



Set filter can be saved in profiles (on page 152).

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 49) for the screen switching to an alarm message list screen (on page 106) 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 SWITCH TO A SCREEN OF TYPE ALARM MESSAGE LIST FILTER

In order to only offer users the filters they need in Runtime, use an alarm message list filter (on page 154) screen. To do this:

1. Configure screen switching to an alarm message list filter screen (on page 108)
2. Call up the AML in Runtime using this function
3. the user has a tailor-made (on page 89) Alarm Message List

4.6.1 Filter profiles

Filter profiles are filter settings which can be saved and called up by the user in the Runtime.

To use filter profiles, you must engineer the following control elements:

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

With this you can in the Runtime:

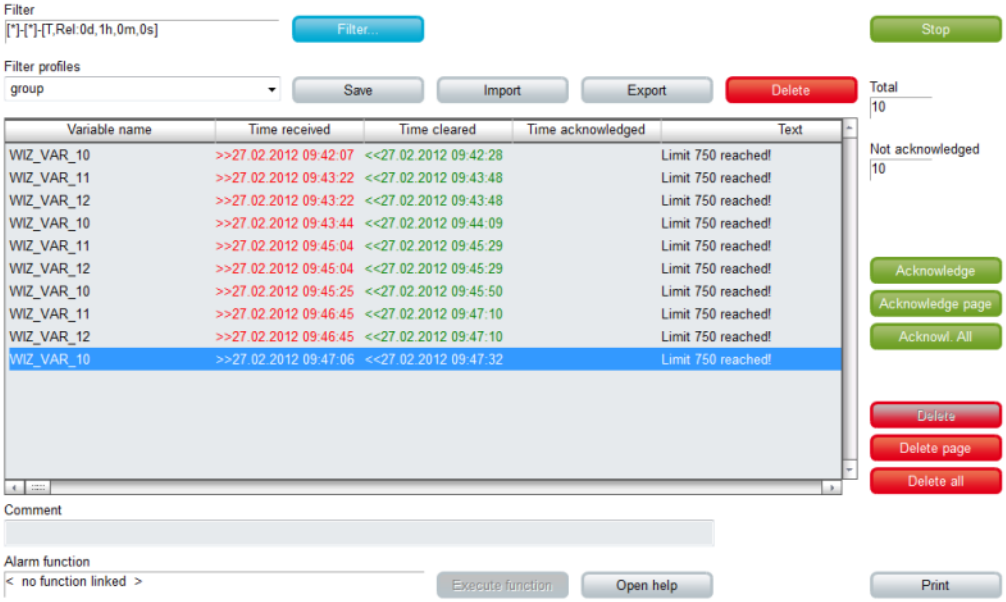
- save filters
- use saved filters
- delete filter profiles

SAVE A FILTER PROFILE

To create a filter profile:

1. define filter conditions in the Runtime
2. assign a name using property `filter profiles`

3. click on **save**

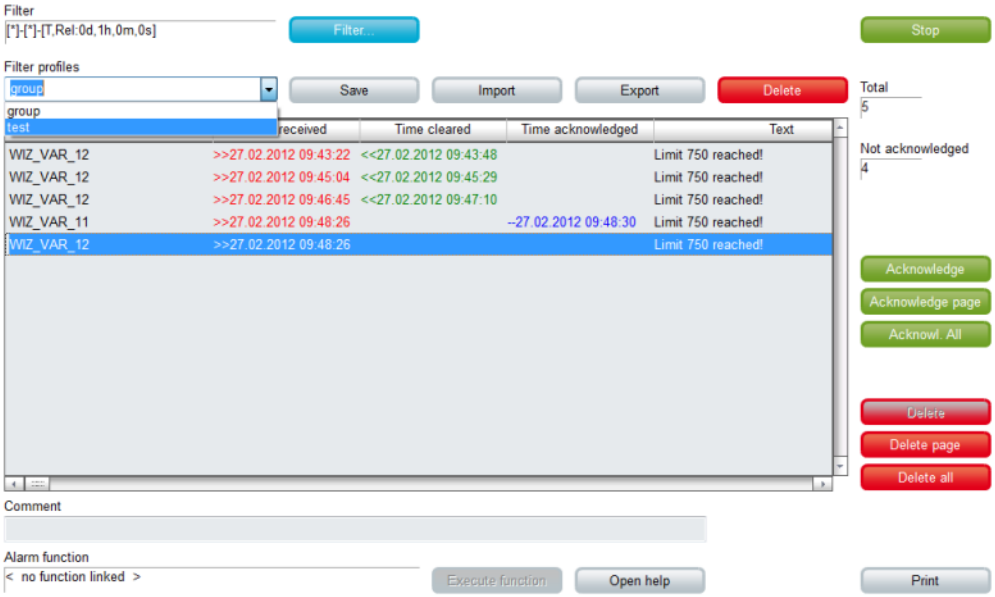


USE FILTER PROFILE

To use a filter profile:

1. select a filter from the drop-down list property `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 property `filter profiles`
2. click on button **x**
3. the profile is deleted
4. 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 13) screen. All filter settings that are available in the filter (on page 49) for the function to switch the screen to the Chronological Event List screen (on page 106) 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 Filter screens`**) are 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 158): each event is printed on a line printer when it is displayed in the list
- AML (on page 158)offline printing: (on page 161)The AML is printed out as a list in its current state
- Export (on page 169) 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 164) 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 demands an Epson compatible printer.

To print out alarms online:

1. define a printer
2. navigate to the AML and CEL node in properties
3. Activate the property Printing active
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) 72)
6. Configure ALARM.frm (on page 164)
7. Add **ALARM.frm** to the **Files/texts and formats** node

CONTROL PRINT AND PRINTER IN THE RUNTIME

PAGE CHANGE

Form feed is carried out if:

- a page is fully written
- the Runtime is closed and online printing is active
- function Online printing start new page (on page 134) is executed

HALT PRINTING

To halt or to continue online printing:

- carry out function Switch online printer on/off (on page 133).

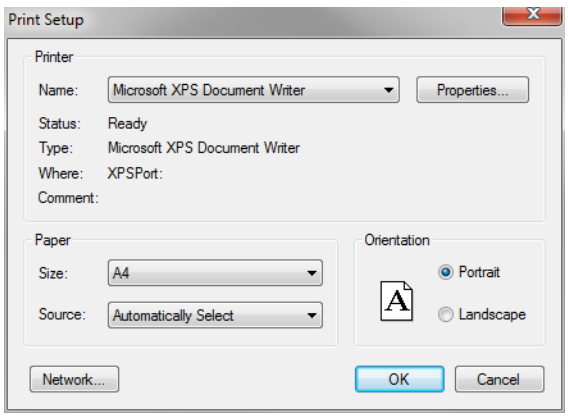
CHANGING AND SETTING UP A PRINTER

To change the printer in Runtime:

- Carry out the Switch online printer (on page 134) 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



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	Configuration of the printout.
Size	Select paper format from drop-down list.
Source	Select paper feed from drop-down list.
Alignment	Select paper alignment. Possible parameter: • Portrait Format • Landscape format
Network	Opens dialog for selecting a printer in the network.
OK	Accepts configuration and closes 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 164) 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 o'clock**	**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
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 set filters 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 164)
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

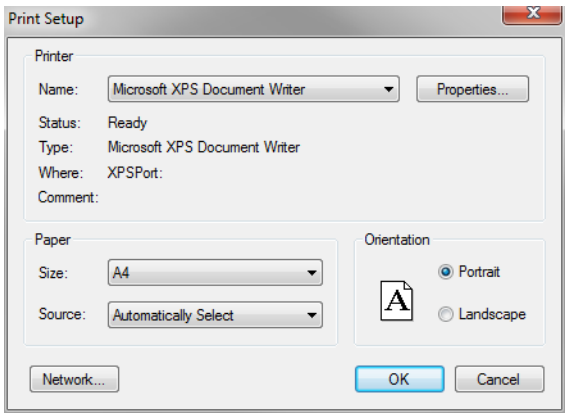
CHANGING AND SETTING UP A PRINTER

To change the printer in Runtime:

- Carry out the Switch online printer (on page 134) 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



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	Configuration of the printout.
Size	Select paper format from drop-down list.
Source	Select paper feed from drop-down list.
Alignment	Select paper alignment. Possible parameter: • Portrait Format • Landscape format
Network	Opens dialog for selecting a printer in the network.
OK	Accepts configuration and closes 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 o'clock	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
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 list 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	@AGROUPNAM	X	X	X	X	Name of alarm/event group

	E					
@AKNAME	ACLASSNAME	X	X	X	X	Name of alarm/event class
@TAGNR	@IDENTIFICATIO N	X	X	X	X	Identification (company-specific label)
@AMELDUNG	@TEXT	X	X	X	X	Alarm message text
@REAKTANZ	@NRREACTIVAT E	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 you use dynamic limit texts, this is only available if properties `Long dynamic limit texts AML` or `Long dynamic limit texts CEL` are 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 it is

						printed
[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 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 121) 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.