zenon manual
Chronological Event List

v.8.20

Contents

1 Welcome to COPA-DATA help

ZENON VIDEO TUTORIALS

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

GENERAL HELP

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

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2 Chronological Event List (CEL)

In the Chronological Event List (CEL) system events and user inputs can be logged, e.g.:

- ▸ Alarm acknowledgment
- ▸ Delete alarms
- ▸ Set value
- ▸ Send recipes
- ▸ Change recipe
- ▸ Archive data

- ▶ User action
- ▶ Network action

The entries are made in the language in which the zenon Runtime runs.

3 Engineer CEL

The handling of the Chronological Event List is carried out via screens of type *Chronological Event List* and *Chronological Event List Filter* in the Runtime.

EDITOR

To display and filter events in the Runtime, you must do the following in the Editor:

- ▶ A **chronological event list** screen (on page 6) can be configured

In addition you can:

- ▶ control the display of events via filter (on page 38)
- ▶ with a screen of type **Chronological Event List** Filter (on page 14) adapt the available filter in the Runtime

RUNTIME

For the operation in the Runtime (on page 164) the following is used:

- ▶ Screen switch CEL (on page 140)
- ▶ Screen switch CEL filter (on page 142)
- ▶ die zenon CEL functions (on page 139)
- ▶ Use screen of type CEL Filter (on page 177)

3.1 Creating a screen of the type CEL

CREATE A SCREEN OF TYPE CHRONOLOGICAL EVENT LIST

A **Chronological Event List** screen makes it possible to log and display system events and user operations in the Runtime. Which entries are displayed is defined via the engineering. The display can

be changed by filters (on page 38) in the engineering and in the Runtime. Functions make it possible to export and print the displayed events.

ENGINEERING

Two procedures are available to create a screen:

▶ The use of the screen creation dialog

▶ The creation of a screen using the properties

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

1. Create a new screen.

   To do this, select the **New screen** command in the tool bar or in the context menu of the **Screens** node.

2. Change the properties of the screen:

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

   b) Select *Chronological Event List* in the **Screen type** property.

   c) Select the desired frame in the **Frame** property.

3. Configure the content of the screen:

   a) Select the **Elements (screen type)** menu item from the menu bar.

   b) Select *Insert template* in the drop-down list.
   The dialog to select pre-defined layouts is opened. Certain control elements are inserted into the screen at predefined positions.

   c) Remove elements that are not required from the screen.

   d) If necessary, select additional elements in the **Elements** drop-down list. Place these at the desired position in the screen.

4. Create a screen switch function.

3.1.1 Control elements

INSERT TEMPLATE

Entry	Description
Insert template	Opens the dialog for selecting a template for the screen type.

Templates are shipped together with zenon and can also be created by the user.

Templates add pre-defined control elements to pre-defined position in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the zenon screen. Elements can be moved on the screen and arranged individually. |

CONTROL ELEMENTS

WINDOW

Parameter	Description
Chronological Event List	Display field for the list with its events. The appearance is configurable (on page 12). Columns are set using the column settings (on page 87) filter in the screen switching. The **Column settings CEL** property in the project properties in the **Chronological Event List** group are used to define the settings for export in CSV, XML and DBF. These also serve as a pre-setting for the screen switching function.
Set filter	Shortened display of the currently selected filter conditions in a compact filter line.
Set filter (detail list)	Detailed display of the currently selected filter conditions in a text window. Details can be found in the **Runtime** manual in the **Filter** section.
Status of Chronological Event List	Displays the status of the CEL in the Runtime. ▸ *Active*: Events are logged depending of the settings (on page 33) in the project ▸ *Inactive*: Events are not logged The status is stipulated in the project properties of the **Chronological Event List** group using the **CEL active** property. Changes take effect after the Runtime has been restarted.
Total number	Number of all events in the list

LIST FUNCTIONS

Parameter	Description
Filter...	Opens the filter dialog (on page 38).
Stop/Continue	Controls adding new events to the list while it is displayed: **Stop**: No new entries are added to the list. The button changes its caption to **Continue**. **Continue**: New entries are added to the list. The button changes its caption to **Stop**. To sort the new entries chronologically, you must click on button **Sort**.

Parameter	Description
	Attention: The labeling of the button can be changed in the editor but is not carried over to the Runtime.
Sort	After calling up the CEL in the Runtime, new entries are not sorted in chronological order but added to the bottom of the list. Click on the button to newly sort the list. To help you differentiate between sorted and unsorted entries you can assigned different colors via properties **sorted text** and **unsorted text**.
Show relative times	*Active*: The relative times are displayed without the focus being lost in the selected entry.
Print	Prints list (on page 183) as it is currently displayed.
Print with dialog...	Opens printer settings before printing.

COMMENT FIELD

Parameter	Description
Comment field	Entry of freely-definable text by the user for the selected event. The text is adopted immediately after entry. The entry is rejected with the **Esc key**. Maximum length: *79 characters* To display the text in the CEL, you must activate the **Comment** column in the column definition (on page 87). **Note:** To change comments, the **CEL comments** property must be activated.

NAVIGATION

Parameter	Description
Navigation	Controls elements of the list.
Line up	Scrolls one line up.
Line down	Scrolls one line down.
Column right	Scrolls one column to the right.

Parameter	Description
Column left	Scrolls one column to the left.
Page up	Scrolls one page up.
Page down	Scrolls one page down.
Page right	Scrolls one page to the right.
Page left	Scrolls one page to the left.

COMPATIBLE ELEMENTS

Parameter	Description
Compatible elements	Control elements that are replaced or removed by newer versions and continue to be available for compatibility reasons. These elements are not taken into account with automatic insertion of templates.
Set filter	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Total number	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Status of Chronological Event List	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Comment field	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Close frame	Closes the frame on which the screen is based. **Recommendation:** Use the **Close frame** function to close frames In order that after the closing the screen which was opened before is displayed, you must engineer the screen of type CEL with its own frame.
Show relative times	Static Win32 control element. Was replaced by a *switch* element. For the description, see new element.

FILTER PROFILES

Filter profiles	Filter settings that can be saved by the user in Runtime.
Profile selection	Select profile from list.
Save	Saves an online setting in a profile.
Delete	Deletes selected profile.

> ### Information
>
> The filter currently being used is displayed with the **Set filter** control element.
>
> With a:
>
> ▸ Text filter, the expression **[Txt]** is displayed
>
> ▸ Relative time filter: is displayed as a print-out with the following scheme:
> **[T,Rel:%dd,%dh,%dm;%ds]**
> **Example:** [T,Rel:1d,0h,0m,0s] equals one day.
>
> ▸

3.1.2 Customize CEL look

The table view of the Chronological Event List can be customized individually: The following properties of the CEL are available for this.

Note: The text color of the entries in the CEL is configured project properties using the properties of the **Chronological Event List**/**Colors CEL entries** group.

SCROLL BARS, HEADERS AND GRIDS

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

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

2. Define the desired properties in the groups **Scroll bars** and **Header and grid**.

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

SORT IN RUNTIME

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

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

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

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

   ▸ Clicking on the graphic changes the sorting sequence.

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

Note: In the case of sorting according to time stamp, entries with the same time stamp are also sorted according to the time of creation.

OPERATING THE HEADER IN RUNTIME

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

▸ Move columns with Drag&Drop

▸ Change column width with the mouse

▸ Change sorting

To do this, use the following properties:

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

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

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

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

   ▸ *active*: The table cannot be sorted.

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

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

PREVIEW

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

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

3.2   Create a screen of the type CEL Filter

It is possible to adjust filter settings for the Chronological Event List in the Runtime with the help of the *Chronological Event 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 also available in the filter (on page 38) for the function to switch the screen to the Chronological Event List screen (on page 140) can be configured.

Therefore:

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

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

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

For details of use in the Runtime, see Using the CEL Filter (on page 177) chapter.

For the definition of filter criteria, see Filter screen switch CEL Filter (on page 101) chapter.

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

CREATE A SCREEN OF TYPE CHRONOLOGICAL EVENT LIST FILTER

ENGINEERING

Two procedures are available to create a screen:

▶   The use of the screen creation dialog

▶   The creation of a screen using the properties

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

1. Create a new screen.

   To do this, select the **New screen** command in the tool bar or in the context menu of the **Screens** node.

2. Change the properties of the screen:

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

   b) Select *Chronological Event List Filter* in the **Screen type** property.

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

3. Configure the content of the screen:

   a) Select the **Elements (screen type)** menu item from the menu bar.

   b) Select *Insert template* in the drop-down list.
      The dialog to select pre-defined layouts is opened. Certain control elements are inserted into the screen at predefined positions.

   c) Remove elements that are not required from the screen.

   d) If necessary, select additional elements in the **Elements** drop-down list. Place these at the desired position in the screen.

4. Create a screen switch function.

3.2.1 Control elements

For the screen type *Chronological Event List Filter* the following control and display elements are available for removal.

INSERT TEMPLATE

Control element	Description
Insert template	Opens the dialog for selecting a template for the screen type.
	Templates are shipped together with zenon and can also be created by the user.
	Templates add pre-defined control elements to pre-defined position in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the zenon screen. Elements can be moved on the screen and arranged individually.
	You can read more about templates for this screen type in the **Templates** (on page 30) chapter.

GENERAL FILTERS

Drop-down list of different general filters.

Control element	Description
Exclude system messages from filter	Shows a checkbox in Runtime to display or filter system messages. System messages are messages that do not relate to a variable.
	Operation in Runtime:
	▸ *Active*: System messages are always displayed in the Runtime. This also applies if they are to be filtered out by the text or variable filter. **Exception:** However system messages are not shown despite the checkbox being activated if they are filtered out by the **time filter** or the filters for **data origin** (*ring buffer* or *historic data*).

Control element	Description
	Example: Only messages with the text "XY" are to be displayed. However if the option is active, system messages that do not contain the term are also displayed.
Insert all elements: General filters	Inserts all elements from the area of general filters into pre-defined places. Elements can be arranged individually.
Variables	Alarms of which variables are displayed:
▶ **Name**	Filter according to names of variables.
▶ **Identification**	Filter according to identification of variables.
▶ **Match case**	Note capitalization when filtering the variables.
Origin of the data	Where does the data come from:
▶ **Ring buffer**	From the ring buffer (on page 138).
▶ **Historical data**	From an archive.
▶ **Maximum number (description)**	Text for **Maximum number** input field
▶ **Maximum number (input field)**	Input of the maximum alarms to be displayed when historical alarms are displayed.
Alarm/event groups/classes, alarm areas	List field for grouped display:
▶ **Alarm/event groups**	Alarm/event groups
▶ **Alarm/event classes**	Alarm/event classes
▶ **Alarm areas**	Alarm areas
Hide deactivated alarm groups	Clicking on the button in Runtime hides all entries that are linked to a deactivated alarm group.
Hide deactivated alarm classes	Clicking on the button in Runtime hides all entries that are linked to a deactivated alarm class.
Categories	Management of categories for the display of entries in the filtered list. For details on categorization, see the **Categorization** manual, especially in the **Categories** section.

Control element	Description
▶ Categories to be included	List: Contains all categories that are taken into account in the filter. They are linked with **or**.
▶ Available categories	List: Contains all categories that can be used for the filter.
▶ Categories to be excluded	List: Contains all categories that are not taken into account in the filter. They are linked with **and not**.
▶ Add to categories to be included	Button: Clicking adds the selected category to the list of **categories to be included**.
▶ Remove from categories to be included	Button: Click removes the selected category from the list of **categories to be included**.
▶ Add to categories to be excluded	Button: Clicking adds the selected category to the list of **categories to be excluded**.
▶ Remove from categories to be excluded	Button: Clicking removes the selected category from the list of **categories to be excluded**.
Compatible elements	Standard Win32 control elements that have been replaced or removed by zenon elements (*dynamic text*, *switch*) and continue to be available due to compatibility reasons. These elements are not taken into account with automatic insertion of templates.

For the description, see current elements.

Exclude system messages from filter

Variables

    ▶ **Name**

    ▶ **Identification**

    ▶ **Match case**

Origin of the data

    ▶ **Ring buffer**

    ▶ **Historical data**

    ▶ **Maximum number (input field)** |

TIME FILTER

Elements for time filters.

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

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

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

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

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

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

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

LOT FILTER

Elements for lot selection in the Runtime.

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

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

SHIFT FILTER

Drop-down list for element of the shift filter.

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

TEXT FILTER

Drop-down list of different text filters.

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

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

RUNTIME SETTINGS

| Control element	Description
▸ **Show list without refresh**	Switches the CEL in stopped state. New alarms are not added.
▸ **Show relative times**	Switches between the normal display and the relative-time display, without the selected entry losing focus.
	Relative time: All entries are displayed in the time distance to the selected entry.
	The displayed time is the difference time passed since the selected entry. The selected entry automatically gets the time stamp *0*. The other events have a:
	▸ positive time difference to the selected entry if they occurred later
	▸ negative time difference to the selected entry if they occurred earlier

BUTTONS
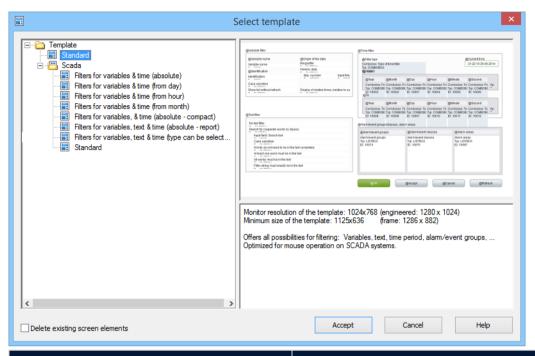
Buttons in the Runtime.

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

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

3.2.2 Template

Template	Description
List field templates (left)	Displays all pre-defined and user-defined template.
Preview and description (right)	Shows preview and description of the selected template.
Standard	Inserts standard elements.
Scada	Special templates, optimized for mouse operation.
Standard	Inserts standard elements.
Filters for variables, text & time (absolute - compact)	Adds elements for filtering for variables, text and absolute time range in compact form.
Filters for variables, text & time (absolute)	Adds elements for filtering for variables, text and absolute time range.
Filters for variables, text & time (from month)	Adds variables for filtering for variables, text and relative time range *from month*.
Filters for variables, text & time (from hour)	Adds variables for filtering for variables, text and relative time range *from hour*.
Filters for variables, text & time (from day)	Adds variables for filtering for variables, text and relative time range *from day*.

Template	Description
Filters for variables, text & time (absolute - table)	Adds elements for filtering for variables, text and absolute time range.
Filters for variables, text & time (type can be selected)	Adds elements for filtering for variables, text and selectable time range.

CLOSE DIALOG

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

3.2.3 Pre-defined names

Pre-defined names are available for time filters.

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

To select a name:

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

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

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

   ‣ CEL_Filter

   ‣ TIMEFILTER_ABSOLUTE

   ‣ TIMEFILTER_DAY

   ‣ TIMEFILTER_HOUR

   ‣ TIMEFILTER_MONTH

   ‣ TIMEFILTER_PERIOD

   ‣ TIMEFILTER_PERIOD_DAY

▶ TIMEFILTER_PERIOD_MINUTE

▶ TIMEFILTER_PERIOD_MONTH

▶ TIMEFILTER_PERIOD_WEEK

▶ TIMEFILTER_PERIOD_YEAR

▶ TIMEFILTER_RELATIVE

3.2.4 Filter screens

FILTER SCREENS

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

CALL DEFINITION

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

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

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

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

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

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

Key:

▶ C: Common settings are updated.

▶ T: Time settings are updated.

▶ X: All settings are updated.

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

3.3 Define events for CEL

You define which events are logged in the Chronological Event List via:

1. Properties of group **Logging** in node **Chronological Event List** in the project settings

    ▶ **Confirm alarm acknowledgement**

    ▶ **Alarm acknowledgement**

    ▶ **Function Write set value**

    ▶ **Send recipes**

    ▶ **Change recipes**

    ▶ **Archive data**

    ▶ **Archive evacuation [h]**

2. Properties of the variables

    ▶ **AML/CEL** in group **Limit Values**

    ▶ Group **Logging in CEL** in node **Write set value**

LOG SET VALUE CHANGES

Set value changes are possible via different mechanisms. These are logged in the CEL according to the setting and the module.

Parameter	Description
Logging of Write set value	You can define the logging of set value changes for every variable. to do this, the following options are available in the **Logging** property in the **Write set value** group: *All*: All changes via dynamic elements and the function **Write/modify set value** are logged. *Nothing*: Changes are not logged. *Via dynamic element only:* Logs only write set value via dynamic elements but not via function Write set value **Write/modify set value**.
Old and new value	With property **Old and new value** you define whether only new or also old values are written in the protocol. This property affects write set value via: ‣ dynamic element ‣ function Write set value ‣ Write set value via VBA
Write set value via VBA	If the **Write set value via API** checkbox is activated, set value changes via VBA are logged in the CEL.
Standard recipes and Recipegroup Manager	For the standard recipes and the Recipegroup Manager the logging is controlled via the properties of group **Logging** in node **Chronological Event List**.
PFS/Scheduler	The Production & Facility Scheduler and the Scheduler log all set value changes in the CEL. This setting cannot be changed. Note: Only *new value* is logged. Property **Chronological Event List** is not considered.

3.3.1 Check write set value

When writing values, the value receives a status bit that is has been written. If the writing process is successful, the corresponding status bit is set:

> ▶ **WR-ACK**
>
> The driver received a value for writing.
>
> ▶ **WR-SUC**
>
> Value *1*: Writing successful.
>
> Value *0*: Writing not successful. The value could not be written.
>
> > ▶ 💡 Information
> >
> > In case of reload or Server-Standby switch, the currently active responses or writing affirmations are discarded.

This status combination are active until the next value change is triggered. Then both states are set to *0* until the writing action is finished. For evaluation the following bit combination must be requested in the reaction matrix:

WR-ACK, WR-SUC

Result:

> ▶ WR-ACK *1*, WR-SUC *1*: Writing action successful.
>
> ▶ WR-ACK *1*, WR-SUC *0*: Writing action not successful.

> ⚠**Attention**
>
> The mechanism only shows, that the writing action was successful (or not successful) to the PLC. This does not mean, that the value has indeed been changed in the PLC, since the PLC can reset/overwrite the value immediately. (For example for writing the outputs or the transient bits which are only set for a short time.)

MODULES

This mechanism can be used in the following modules:

> ▶ function **Write set value**: Activate option **Wait for writing confirmation** in the configuration dialog of the function.
>
> ▶ **Standard recipes**: Activate property **Write synchronously**.
>
> ▶ **Recipe Group Manager** Activate property **Write synchronously**.

ENTRY IN CEL

You can find the following properties in the project properties under **Chronological Event List**:

> ▶ **Function Write set value**

For the entry in the CEL you must activate property **Function Write set value** in node **Chronological Event List** in the project settings. After this the positive or negative response the execution of the function is written to the CEL.

▶ **Log set value for set value changes only**

If the function is activated, there is no entry in the CEL if the same value is placed again or received. Only value changes are logged. The execution of the property does not depend on the **Old and new value** variable setting.

▶ **Text on set value change**

Allows the creation of free text for the display of the new value. You can find information on the necessary requirements and the use of placeholders in the Use of placeholders for changes to a set value (on page 36).

▶ **Text on set value change (old/new value)**

Allows the creation of free text for the display of the old value and the new value. You can find information on the necessary requirements and the use of placeholders in the Use of placeholders for changes to a set value (on page 36).

If a recipe or a recipe group is saved again or duplicated under another name, the process is depicted in the corresponding CEL entry.

The following will be displayed in the CEL entry:

▶ The name of the original recipe or the recipe group

▶ The name of the new recipe or the recipe group

▶ The Recipe version

Note: This information is relevant when a recipe or recipe group has been copied and saved again. Changes can easily be retraced via the CEL entry.

Standard recipes and Recipegroup Manager

For the entry in the CEL a system driver variable is used which is set to *1* when a recipe is written successfully. A global variable is evaluated on the Server, a local variable on every Client in order to determine when the recipe executed last was written completely.
With this variables a CEL entry can be created via limit value or reaction matrix. The query is carried out via a multi analog or a multi binary reaction matrix.

3.3.1.1 Use of placeholders in the event of set value changes

The **Text on set value change** and **Text on set value change (old/new value)** properties allow the creation of free texts to display the respective value changes in the Runtime.

Text on set value change

▶ Default:*%a: (%v)*

Text on set value change (old/new value)

▸ Default: *%a: @Alt@: (%o) @Neu@: (%v)*

The properties for creating the desired texts use placeholders. There are the following possibilities for setting the parameters of the placeholder.

SYNTAX

The following nomenclature is valid for the setting of the parameters:

Parameter	Description
;	Separator of commands. Is used in order to separate the constant text from the dynamic text. When separating variables, no space must be left between the separator and the variable.
@Text	Text from the currently loaded language table.

Use the following parameters:

▸ *%a*: Action type

The following texts are currently predefined for this action type (= **%a**) in the zenon release languages:

  ▸ **@Umschalten auf Spontanwert@**

  ▸ **@Modifizieren Spontanwert@**

  ▸ **@Umschalten u. modi. Spontanwert@**

  ▸ **@Umschalten auf Ersatzwert@**

  ▸ **@Modifizieren Ersatzwert@**

  ▸ **@Umschalten u. modi. Ersatzwert@**

  ▸ **@Spontanwert abschalten**

  ▸ **@Spontanwert einschalten**

▸ *%v*: new value of the variable

▸ *%o*: old value of the variable

▸ *%u*: Unit of the variable

▸ **%r** or **%R**: Resources label

▸ **%l** or **%L**: Identification

▸ **%n** or **%N**: Variable names

▸ **%t** or **%T**: Timestamp

You can use your own translated text for the action types.
The key word in the language table must be defined in the set Runtime language.

EXAMPLES

Text on set value change:

Change of the throughflow through a pipeline to 50 liters per second.

Entry in the property: *$%a;: @Testtext@ (;%v;%u;)*

Output in the CEL: *Modify spontaneous value: Testtext (50 L / sec)*

Text on set value change (old/new value):

Change of the throughflow through a pipeline from 50 liters per second to 75 liters per second.

Entry in the property: *$%a;: @Age:@ (;%o;%u;) @New:@ (;%v;%u;)*

Output in the CEL: *Modify spontaneous value: Old (50 L / sec) New (75 L / sec)*

3.3.2 Length static limit value text CEL

Via property **Length static limit value texts CEL** you define how many characters may be used for the message text in the CEL. For each CEL file the allowed number of characters of the message texts is saved in the header. The change of this property take effect when a new CEL file is created.

Note: With dBase export the length is restricted to 254 characters.

CEL.BIN AND NETWORK

In file CEL.BIN message texts are saved as variables with variable length and are transferred as such in the network. This means that CEL entries from the ring buffer are not limited in the length independent of property **Length static limit value texts CEL**.

3.4 CEL engineering via filter

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

1. Define information that is displayed in Runtime in the CEL:
    This way you can determine which information is displayed for an event.
    For details, see: Column settings for Chronological Event List (on page 39)

2. Filter event for CEL at call up and modify in the Runtime:
    With this you define filter and give the operator at the machine the possibility to create own filters.
    For details see: Filters for screen switch CEL (on page 43).

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: Filters for screen switch CEL filter (on page 101).

Attention: The comma character (,) "only" serves as a separator between several variables to be filtered. However it is not possible to filter for a comma character in variables names!
This results in the special filtering of array variables for **Dim 2** and **Dim 3** not being possible.

3.4.1 Column settings for Chronological Event List

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

1. Open the **Chronological Event List** node in project settings.

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

3. The dialog for the **column settings** is opened.
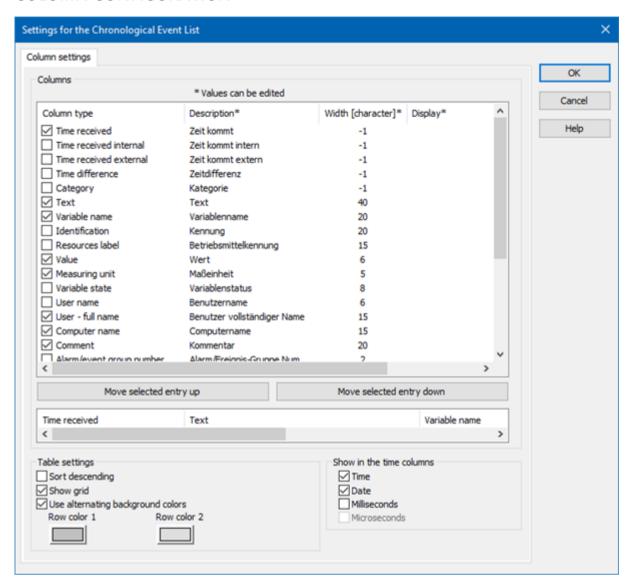

4. Configure the desired columns.
    Note: When configuring the screen switching, this configuration is accepted by default and can be individually adapted in the column settings (on page 87) tab.

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

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

COLUMN CONFIGURATION

COLUMNS

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

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

▸ Click in the **Column type** column

▸ Move the individual entries as desired

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

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

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

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

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

TABLE SETTINGS

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

SHOW IN THE TIME COLUMNS

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

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

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

⚠**Attention**

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

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

Solution: Use fonts with a fixed character width.

3.4.2 Filters for screen switch CEL

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

To tailor the filter selection in the Runtime to the needs of the operator, use a Chronological Event List Filter (on page 14) screen instead of Chronological Event List (on page 6).

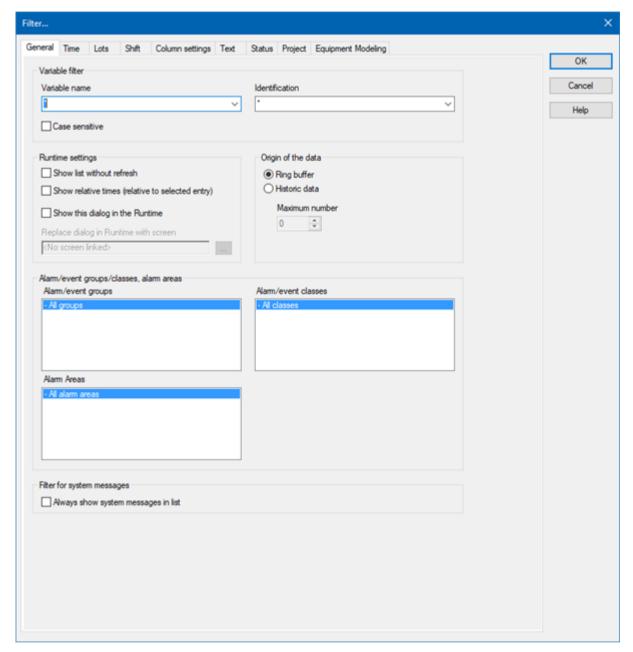To create a screen switch to a screen of type Chronological Event List:

1. engineer a function screen switch to a screen of type Chronological Event List

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

   ▶ **General** (on page 45)

   ▶ **Time** (on page 51)

   ▶ **Lots (on page 70)**

   ▶ **Shift** (on page 79)(cannot be used with a lot filter at the same time)

   ▶ **Column settings** (on page 87)

   ▶ **Text** (on page 93)

   ▶ Categories (on page 94)

   ▶ **Status** (on page 98)

   ▶ **Project** (on page 152) (only available in the integration project of the multi-project administration.)

   ▶ **Equipment Modeling** (on page 99)

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

   ▶ Replace links

   ▶ Replace indices

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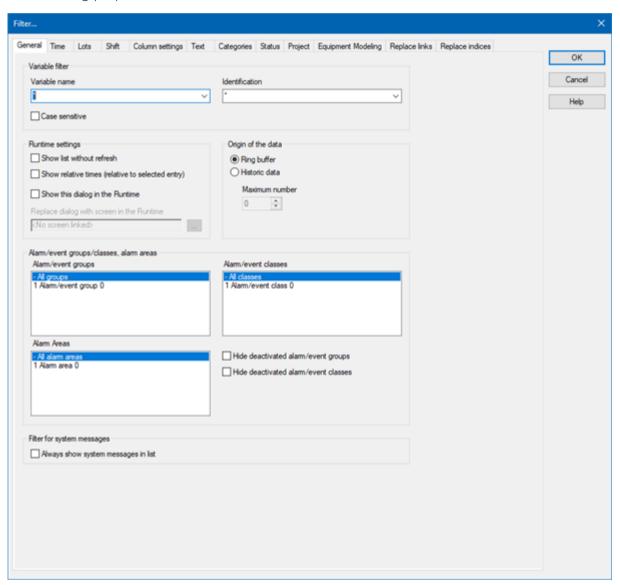

3.4.2.1 General

With the general filter, you define which events are displayed and what access you have to the settings in the Runtime. To this you differentiate events according to:

▸ Type

▸ Origin of the data

- ▸ Variables
- ▸ Alarm/event groups, classes and alarm areas

The following properties are available:

VARIABLE FILTER

Parameter	Description
Variable filter	Restrictions to events of certain variables
Variable name	Enter the name or part of the name of the variable you want to filter.
	Use of the wild card ***** is possible. Wildcards are only permitted as a prefix or suffix; e.g. ***xxx** or **xxx***.

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

RUNTIME SETTINGS

Parameter	Description
Runtime settings	Behavior of the CEL in the Runtime
Show list without refresh	*Active*: As long as the list is displayed no new entries are added. (Not available for function **Export CEL** (on page 145).)
Show relative time (relative to selected entry)	All entries are displayed in the time distance to the selected entry. The displayed time is the difference time passed since the selected entry. The selected entry automatically gets the time stamp *0*. The other events have a: ▸ positive time difference to the selected entry if they occurred later

Parameter	Description
	▸ negative time difference to the selected entry if they occurred earlier
Show this dialog in the Runtime	*Active*: Before every call of the screen the filter dialog is opened. The filter settings can be modified. This option is not available with Windows CE. **Note:** If, in the **Lots** tab, the **Show lot selection dialog** option is also selected, then the lot selection dialog is called up in the Runtime. This is no longer displayed after reloading. ### Notes for time range filters: **Show this dialog in the Runtime** *active*: ▸ The dialog with the filter settings is opened in Runtime when switching screens. The filter is no longer offered when reloading. This behavior can differ for individual screen types if the dialog was displayed in screen switching and canceled. ▸ The last time period that has finished is always used. **Show this dialog in Runtime** *inactive*: The screen is opened with the set time filter. ▸ **Use last finished time range** *active*: The last time period that has finished is always used ▸ **Use last finished time period** *inactive*: The current time period is used.
Replace in Runtime with screen	Definition of a screen that is to be called up in the Runtime instead of the dialog if the **Show this dialog in the Runtime** option is active. Only screen types *CEL Filter* or *Time filter* will be offered. Click the **...** button and a dialog opens to select a screen. If the linked screen is not found in the Runtime, a search is made for corresponding screens with specific names.

Parameter	Description
Origin of the data	Display current or current and historical events.
Ring buffer	*Active*: Only data from the ring buffer (on page 138) are displayed.
Historical data Maximum number	*Active*: Only historical data from the CEL is displayed. The maximum number includes the data from the ring buffer. The most recent X entries correspond to the entries in the ring buffer. X is the size defined for the ring buffer.

ALARM/EVENT GROUPS/CLASSES, ALARM AREAS

Parameter	Description
Alarm/event groups/classes, alarm areas	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups select the one from which alarms should be displayed.
Alarm/event classes	From the existing alarm/event classes select the one from which alarms should be displayed.
Alarm areas	From the existing alarm areas select the one from which alarms should be displayed.
Hide deactivated alarm groups	Allows deactivated alarm groups to be excluded from the display in the list. ▸ *Active*: All entries that are linked to a deactivated alarm/event group in Runtime, are hidden during filtering. **Note**: Changes to the option made in Runtime are immediately accepted.
Hide deactivated alarm classes	Allows deactivated alarm classes to be excluded from the display in the list. ▸ *Active*: All entries that are linked to a deactivated alarm/event class in Runtime, are hidden during filtering. **Note**: Changes made in Runtime to the option are immediately accepted.

FILTER FOR SYSTEM MESSAGES

Parameter	Description
Filter for system messages	Filter settings for system messages. System messages are messages that do not relate to a variable.
Always show system messages in list	Setting for the display of system messages regardless of the filter settings.
	▸ *Active*: System messages are always displayed in the Runtime. The following filters are thus suppressed as a result: Variable name Identification Status Equipment modeling Alarm/event groups Alarm/event classes Lots
	Special features:
	▸ System messages are not shown despite the checkbox being activated if they are filtered out by the **time filter** or the filters for **data origin** (*ring buffer* or *historic data*).
	▸ System messages are always shown regardless of this setting if there is filtering for equipment models.
	System messages and shift filter (on page 79)
	▸ *Active*: When using a shift filter, the system messages whose time stamp is within one of the selected shifts is shown.
	▸ *Inactive*: No system messages are shown when a shift filter is applied. **Note:** System messages whose time stamp is not within one of the selected shifts are never shown.

CLOSE DIALOG

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

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

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

3.4.2.2 Time

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

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

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

- Absolute time period (on page 55)
- Relative time period (on page 57)
- From (on page 59)
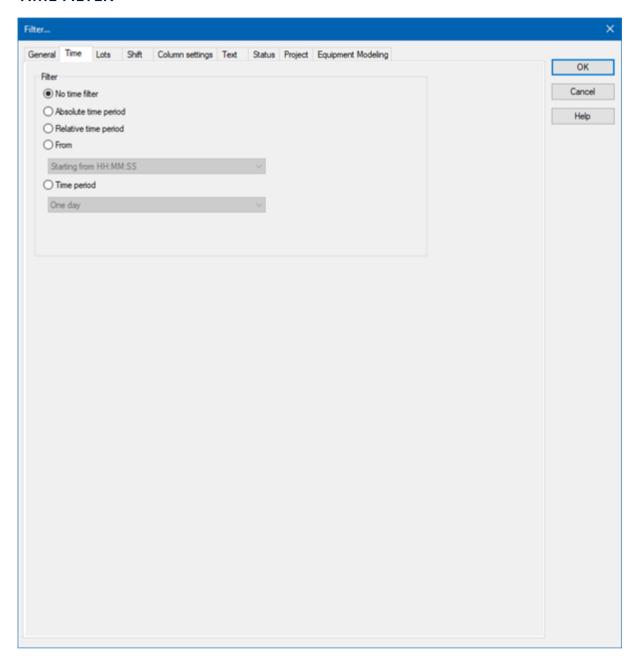- Time period (on page 62)

Time filtering can be carried out in two ways:

1. Define time period in the Editor (on page 67)
   Fixed time areas are used. A time period is given in the editor. It is only possible to filter according to this time period in Runtime. Other filters - such as filtering according to variable name, alarm/event groups and alarm/event classes etc. can also no longer be amended in the Runtime.

2. Time filter amendable in Runtime (on page 69)
   Pre-defined times are used. The time filter is defined in the Editor and can be changed in the Runtime as desired.

Attention: If the **No time filter** option is selected, no shifts (on page 79) can be configured.

TIME FILTER

FILTER

Selection of the filter.

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

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

Parameter	Description

Time period	*Active*: A fixed time period is entered. Selection of the area mode from drop-down list:
	
	    ▸ One day
	
	    ▸ One week
	
	    ▸ Two weeks
	
	    ▸ One month
	
	    ▸ One Year
	
	    ▸ 15 minutes
	
	    ▸ 30 minutes
	
	    ▸ 60 minutes
	
	In the settings section, the corresponding options can be shown and configured there.
	
	The following selection is also enabled on activation:
	
	    ▸ **Offer selection dialog**
	
	    ▸ **Use current date/time**
	
	The **Modify time period** property can be activated.
	
	The time period can be moved to the future.
	
	The time period can be amended.
	
	Example: Create a screen switch, for example to an *AML* screen. In the screen switching filter dialog in the **Time** tab, set the filter to **time period** and select **One Month** in the drop-down list. Select **Use current date/time** under **Settings**. Activate the checkbox option **Modify time period**. Enter the following setting under **Move time period to the future**: **HH** = *0*. Activate, under **Change time period by**, the checkbox option **Use the last completed time period**.
	
	Evaluation: today's date: 22.02.2018
	
	Result of the time filter in the Runtime: 01.01.2018 - 31.01.2018

CLOSE DIALOG

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

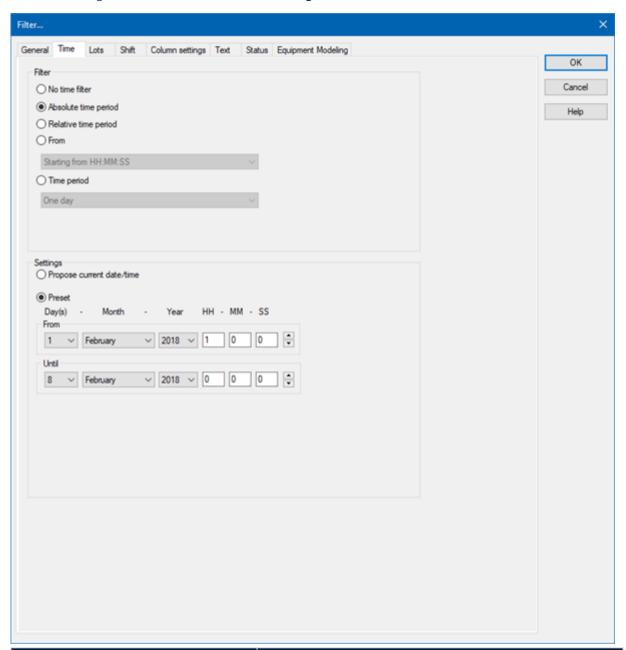| Option	Description
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.4.2.2.1 Absolute time period

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

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

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

Parameter	Beschreibung
Einstellungen	Konfiguration des Zeitfilters.
Aktuelles Datum/Uhrzeit vorschlagen	*Aktiv*: Zeitfilter wird zur Runtime konfiguriert.
Vorgabe	*Aktiv*: Zeitfilter wird im Editor vorgegeben. Zur Runtime kann nur noch der Startzeitpunkt festgelegt werden.
Von	Startzeitpunkt des Filters. Auswahl von Tag, Monat, Jahr,

Parameter	Beschreibung
	Stunde, Minute und Sekunde.
Bis	Endzeitzeitpunkt des Filters. Auswahl von Tag, Monat, Jahr, Stunde, Minute und Sekunde.

CLOSE DIALOG

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

3.4.2.2.2 Relative period of time

A relative time period is entered.

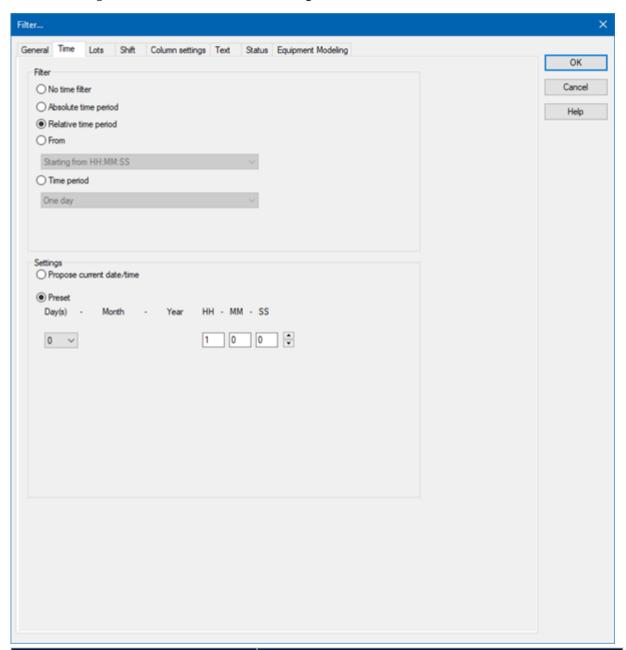**Attention:** This filter is updated constantly and continues to run.
Example: You set a relative time of *10* minutes and switch to a screen with this time filter at *12:00*. You are then shown the data from *11:50* to *12:00* when switching. If the screen stays open, the filter is automatically updated.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

To set the filter:

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

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

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

CLOSE DIALOG

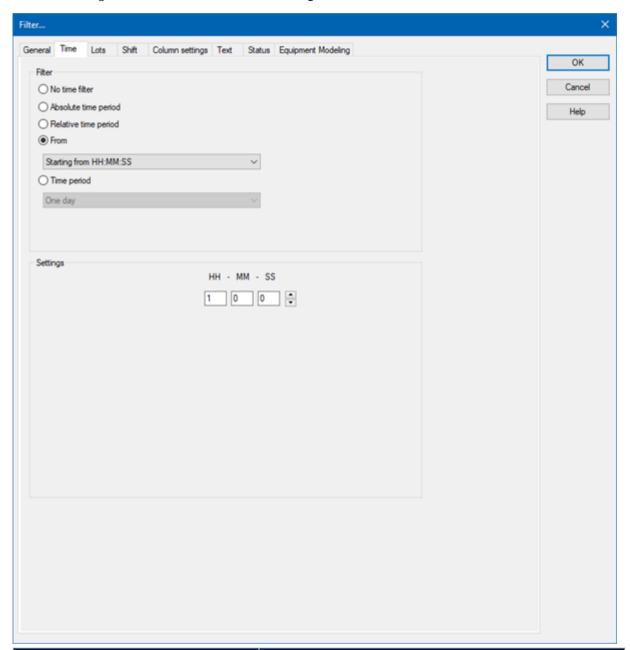| Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.4.2.2.3 From

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

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

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

   ▶ *Starting from HH:MM:SS*

   ▶ *Starting from day - HH:MM:SS*

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

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

Parameter	Description
Settings	Configuration of the time filter.
[Date/Time]	Depending on the settings of the **Off** option, the time from which the filter is effective is configured here: ▸ *Starting from HH:MM:SS* ▸ *Starting from day at HH:MM:SS* ▸ *Starting from day, month - HH:MM:SS*

Parameter	Description
	Attention! The start point of this filter is not updated automatically. Only the existing times are used when shown, even if the screen remains open and 23:00:00 is reached. The end time point is not defined with this filter, it is carried over.
▸ *Starting from HH:MM:SS*	A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. **Example:** You enter *11:00:00 PM*. If it is then 23:30 when executing the function, then it is filtered from 23:00:00 up to the current point in time. If it is 22:30 however, then filtering takes place from 23:00:00 on the previous day to the current point in time.
▸ *Starting from day at HH:MM:SS*	A day and time for the start of the filter are entered. If the time given has not been reached in the current month, the corresponding time from the previous month is used. **Example:** You enter **day** *5 - 11:00:00 PM*. If it is the 10th of the month at 23:30, then filtering takes place from the 5th of the month from 23:00:00 to the current time point. If, however, it is the 4th of the month, then filtering is carried out from 23:00 on the 5th of the previous month to the current time point.
▸ *Starting from day, month - HH:MM:SS*	A month, day and time for the start of the filter are entered. If the time stated has not been reached in the current year, the corresponding time from the previous year is used. **Example:** You enter **Day** *5,* **Month** *October - 11:00:00 PM*. If it is October 10th at 23:30, then filtering takes place from October 5th from 23:00:00 to the current time point. If, however, it is only October 4th, then filtering takes place from 23:00 on the 5th of the previous year to the current time point.

CLOSE DIALOG

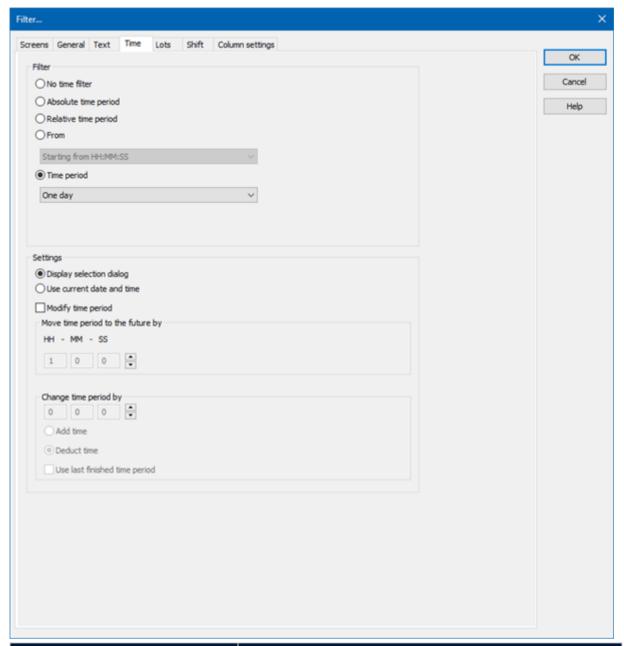| Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

3.4.2.2.4 Time period

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

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

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

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

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

Option	Description
	▶ 30 minutes: *0, 30* minutes of the hour
	▶ 60 minutes: *0* minutes of the hour
	Example 1:
	▶ Time period: 60 minutes
	▶ Current time: 8:50 AM
	▶ Result: Display for 08:00 - 08:50
	Example 2:
	▶ Time period: 60 minutes
	▶ Current time: 9:00 AM
	▶ Result: Display for 08:00 - 9:00 AM
	Example 3:
	▶ Time period: 15 minutes
	▶ Current time: 8:35 AM
	▶ Result: Display for 8:30 AM - 8:35 AM
	Example 4:
	▶ Time period: 15 minutes
	▶ Current time: 8:45 AM
	▶ Result: Display for 8:30 AM - 8:45 AM
	Dialog in the Runtime:
	If this dialog is also offered in the Runtime, the start time of the time range can be selected.
	The following possibilities for selection are activated:
	▶ **Offer selection dialog**
	▶ **Use current date/time**
	The **Modify time period** property can be activated.
	▶ The time period can be moved to the future.
	▶ The time period can be amended.
Settings	Optional setting for the time range.
Offer selection dialog	The selection dialog for the start time of the filter is offered

Option	Description
	in the Runtime.
Use current date/time	The current date/time is set for the filter.

Modify time period	Allows amendments to cycles, postponements and extensions of time periods.
	
	Active: Evaluation is carried out in accordance with the following rules:
	
	  ▸ First, the **Use last finished time period** option is evaluated.
	
	  ▸ After this, **Change time period by** is used.
	
	  ▸ **Move time period to the future by** is then applied.
	
	Inactive: No changes to the time period are made.
	
	Attention: As of version 7.10, filter actions on the basis of this function lead to different results than in prior versions.

Move time period to the future by	*Active*: The time period defined in the filter is postponed to the future. The start and end time are moved by the set time span. Given in *hours - minutes - seconds*. If a postponement that is the same or greater than the selected **time period** is set, a note to check the configuration is displayed. **Note:** The default value for **HH** is *1*. If, for example, an evaluation of the last month is to be undertaken, this value must be set to *0*.
Change time period to	*Active*: The time period defined in the filter is modified. The end time is moved by the set time span. The start time remains unchanged. Given in *hours - minutes - seconds*. The time range can be added or deducted. Selection by means of radio buttons: ▸ **Add time:** The time stated in **Change time period by** is added to the time defined in the **Time range** option.

Option	Description
	▶ **Deduct time:** The time stated in **Change time period by** is deducted from the time defined in the **Time range** option. If a change and a postponement that are the same or greater than the selected **time period** is set, a note to check the configuration is displayed next to the control element for time configuration. The following options are available: ▶ *Use current time period* ▶ *Use last finished time period* ▶ *Use next completed time period* Default: *Use current time period*
Use current time period	*Active*: The current time period is used for the filter process.
Use last finished time period	*Active*: The last selected and fully-completed time period in the **Time period** option is used. **Example:** For the **Time period** option, *One day* was selected. Filtering is thus carried out for "Yesterday", because this is the last day that was completed in full.
Use next completed time period	*Active*: The last selected and fully-completed time period in the **time period** option is used. **Example:** For the **Time period** option, *One day* was selected. Filtering is thus carried out for "tomorrow", because this is the next day that will be completed in full.

CLOSE DIALOG

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

3.4.2.2.5 Specify time period in the Editor

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

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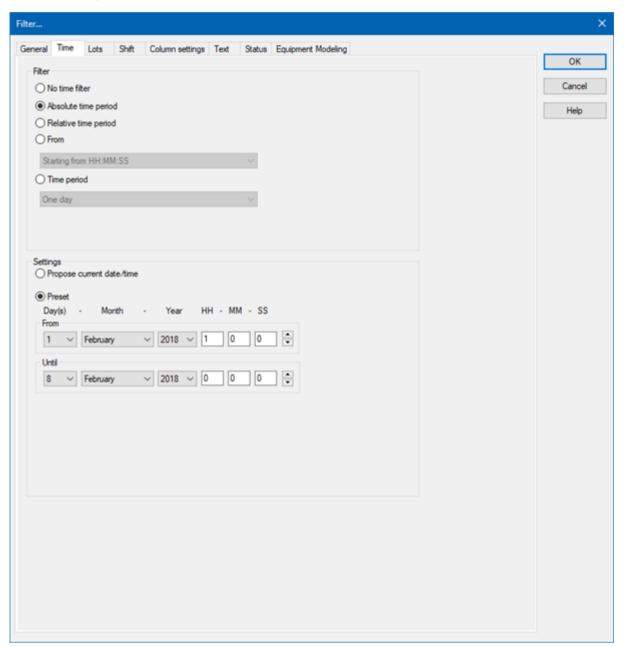
⚠Attention

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

To create the filter:

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

2. select the desired filter

3. Configure the selected time period

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

For example: You have set a 30 minute filter. It is 10.45 when the function is activated. If the **Use last closed time period** option is deactivated, the filter is set to the current time period 10:30:00 to 10:59:59. If the option is activated, the filter is set to the previous time period of 10:00:00 to 10:29:59.
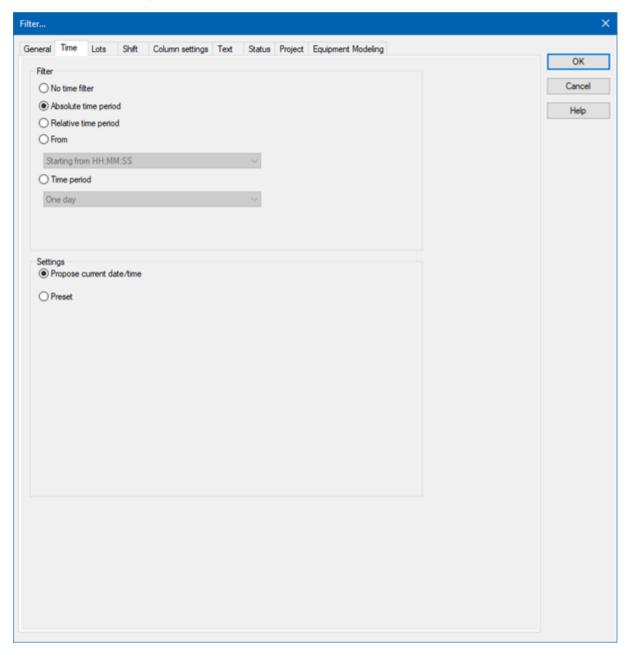
3.4.2.2.6 Time filter can be configured in Runtime

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

To create the filter:

1. select the desired filter:

   ▶ Absolute time period

   ▶ Relative time period

   ▶ Time period

2. Select, in the Settings section, the option **Propose current date/time**

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

3.4.2.3 Lots

You configure the limitation of the display to certain lots in this tab. The lot information is also applied to the existing filter.If the lot filter is activated, a list of all configured lots that correspond to the configured time period is obtained from the archive server in the Runtime in advance when the CEL is loaded.

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

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

> ### 💡 Information
>
> Some filters in zenon can be configured independently of one another and then combined in the Runtime. This is only possible to a limited extent with the lot filter.
>
> The lot filter can offer a list of existing lots in the Runtime. It is Runtime data that is not available in the Editor.
>
> When configuring the screen switching in the Editor, the **time filter** tab can only be used in conjunction with the lot filter as a prefilter for the lot selection dialog. If a lot from this list is then selected in the Runtime, the time filter is overwritten with the data from the selected lot, in order to achieve precise filtering for the selected lot.
>
> That means: If the lot selection dialog is used in the Runtime and a lot is selected, the time filter displayed does not correspond to the one configured in the Editor.
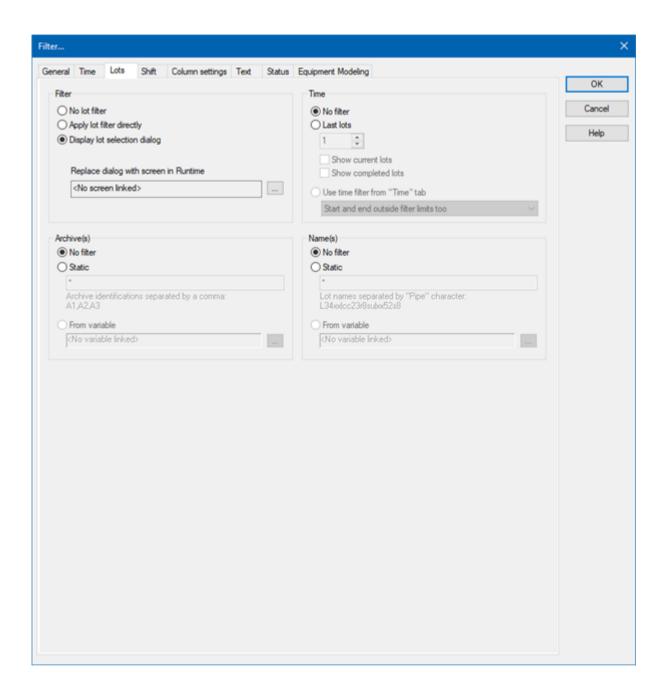
FILTER

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

- ▶ **No lot filter**

- ▶ **Apply lot filter directly**

- ▶ **Display lot selection dialog**
  Note: If the lot filter is shown as a dialog, it can be prefiltered for archive identifications. It is expressly recommended that you use this prefiltering for performance improvements.
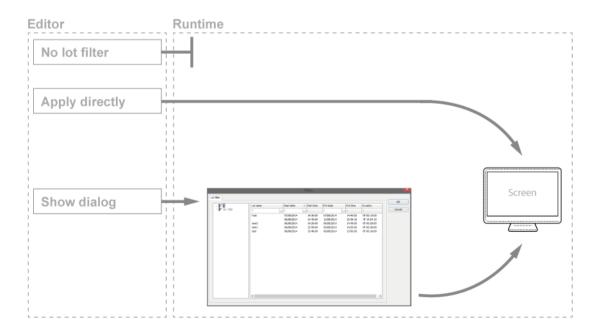
Option	Description
No lot filter	▸ *Active*: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in the Runtime.
Apply lot filter directly	▸ *Active*: The filter configured here is applied in the Runtime directly. **Note:** There is no possibility to have all lots in a list displayed and to select one manually. If a certain lot is to be shown, the filter for the archives, name and time must be configured accordingly. This requires the existing data to be known very well. Alternatively, it is recommended that the **Show lot selection dialog** option is selected.
Display lot selection dialog	*Active*: The dialog for lot selection is shown in the Runtime when: ▸ Clicking on **Filter** or ▸ screen switching, if the **Show this dialog in Runtime** option has been activated (Not available for each function/screen type) **Note:** The dialog is not shown on reloading. Options can be pre-selected in the Editor.
Replace in Runtime with screen	Only available if the **Show lot selection dialog** option has been selected. **Note:** Only available in screen switching functions. Definition of a screen that is to be called up in the Runtime instead of the **lot selection dialog**. Only *time/lot/shift filter* screens are offered. Click the **...** button and the dialog opens to select a screen. If the linked screen is not found in the Runtime, a search is made for corresponding screens with specific names. **Note:** A lot filter screen can also be selected using the **Show this dialog in Runtime** option. However this is not used as a lot filter here, but as a time filter screen. The lot filter options are not correctly applied at this

Option	Description
	position.
Display lot selection dialog	**Attention:** This option is only available for **Extended Trend**. With faceplates, it is displayed for all screen types, but here it is also only available for ETM.
	<u>**Configuration for ETM:**</u>
	In order for the option to be available, the **Show lot selection dialog** option must be activated and the **Windows CE project** property must be deactivated in the project properties.
	▶ *Active*: Enables several lots to be compared directly. Display always starts from the zero point.
	Note: If the option is activated, the **Diagram** and **X-axis** buttons are not available in the Runtime. This also applies for the right-click functionality.

Overview of the implementation of the configuration in the Runtime:

TIME

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

▶ **No filter**

▶ **Last lots**

▶ **Use time filter from "Time" tab**

Option	Description
No filter	▶ *Active*: The time range set in the **Time** tab is not taken into account. All completed and current lots are displayed.
Last lots	**Attention:** Only works in conjunction with the **Apply lot filter directly** option. The option allows the combination of both options **Display current lots** and **Display completed lots**. At least one of the two options must be activated. If both options have been deactivated, this corresponds to the **No filter** setting. ▶ *Active*: Input of the number of lots last concluded, according to what they should be filtered for. Input of the number in the number field or configuration via arrow keys. Example: *3* was entered as a value for the option. 2 lots run and 10 have been ended. The following is shown: the two that are current and one that has been completed. **Note:** The setting of the time filter is not used as a time period for the current lots, but the last year. This filter will not be executed as a prefilter and can therefore not be used to improve performance. **Note on compatibility:** If the project is compiled for a version before 7.11, then: If the current lots are selected, or the combination of current and completed lots, then only the completed lots are shown in the Runtime.
Display current lots	▶ *Active*: The current lots are displayed. **Note:** If the number of lots to be displayed is greater than the number of current lots, lots that have been completed are also shown until the set limit has been reached. Example: 3 lots are to be displayed. 1 lot is running, 5 have been completed. The one current lot and two completed lots are displayed.

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

ARCHIVES

Configuration of filtering for archives. This filter is applied as a prefilter for the lot selection dialog.

Selection of one of the following options:

▶ **No filter**

▶ **Static**

▶ **From variable**

Option	Description
No filter	▸ *Active*: Filtering for archive names is not carried out.
Static	▸ *Active*: Archives whose identification corresponds to the character string entered in the input field are filtered for. Input of the archive identifications in the input field: ▸ Several identifications are separated by a comma (,). ▸ * or empty: All archives, no filter.
From variable	▸ *Active*: The value of the variables linked here is applied as a filter for archive names in the Runtime. Click on button **…** in order to open the dialog for selecting a variable. Available for AML and CEL modules if the **Apply lot filter directly** option has been selected: Other modules use their own configurations. **Notes for variables in the Runtime:** ▸ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The **…** button is always deactivated in the Runtime. The option can be selected, but no new variable can be linked. ▸ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable is not found in Runtime, there is no filtering for archive names. This also applies if the value of the variable cannot be determined. The filter then corresponds to the **No filter** setting.

Note for ETM: In the ETM, the archives are established by the curves configured in screen switching. This is only possible in the Runtime with the **relative lots** option. With this, the variables must be selected in the Runtime, which is in turn stipulated by the possible selection of archives. The archive, once filtered, must be one of the archives that relate to the configured curves. No data is

displayed if this is not the case. This setting can also be used to limit the displayed curves. However these remain shown in the curve list.

ETM example:

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

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

Example of archive revision:

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

NAMES

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

▸ **No filter**

▸ **Static**

▸ **From variable**

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

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

CLOSE DIALOG

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

3.4.2.4 Shift

You configure the limitation of the display to certain shifts in this tab. The shift information is also applied to the existing filter.

Note:

▸ The shift filter requires a configured time filter. If the time filter is set to the **No time filter** option, the shift filter is deactivated. A notice of the cause of the deactivation is shown.

▶   If the lot filter is activated, the shift filter is automatically deactivated. Both filters mutually exclude one another. A notice of the cause of the deactivation is shown.

CONFIGURATION

To filter for shifts:

1.   Configure the time filter.

 ▶   **Absolute time filter**: Shifts from the absolute defined time period are shown.

 ▶   **Relative time filter**: Shifts from the relative defined time range are shown.
 The upper limit is set at 1440 minutes by default.

 ▶   **From**: Shifts from a certain time point are shown.

 ▶   **Time period**: Shifts within a certain time range are shown.

2.   Configure the shift filter.
 To do this, select one of the options:

 ▶   **Apply shift filter directly**:
 The configured time filter is used to filter the shifts in the Runtime. In doing so, all shifts that are at least partly in the time filter range are taken into account. Even if the time filter is defined in the Runtime, the shift filter is applied after selecting the time period. If there is no suitable shift, no data is shown in the CEL screen.
 The set filter continues to have an effect on the CEL data. If a shift is only partially within the set time range, only the CEL entries that are both in the time filter and the shift are shown.

 ▶   **Show shift selection**:
 The shift filter is configured and applied when called up in the Runtime when the screen is called up. All shifts that are at least partly in the time filter range are offered in a list for selection. After selecting one or more shifts, the time filter is overwritten and set to the times of the selected shifts. It is thus ensured that the complete shift is always included in the filter.
 Note: If, in the **General** tab, the **Show this dialog in Runtime** option is activated at the same time, the complete configuration dialog with all tabs is called up instead of the shift selection. The user can then redefine all options.

3.   Configure **Name** and **Options** if required.

With the Apply shift filter directly option, the shifts are permanently monitored by the filter and the filter is amended if necessary.
The shifts for filtering the data are redetermined if:

 ▶   Shifts are reconfigured

 ▶   Shifts are newly-created in the filter time period

 ▶   The time period is reconfigured

The following are not taken into account in the filter:

- ▶ Deleted shifts
- ▶ Shifts that are removed from the time filter due to a change of the time period

SCREEN SWITCHING TO A LINKED SCREEN

Screen switching to a linked filter screen can also be carried out. Shift filters can be used in the process.
To do this:
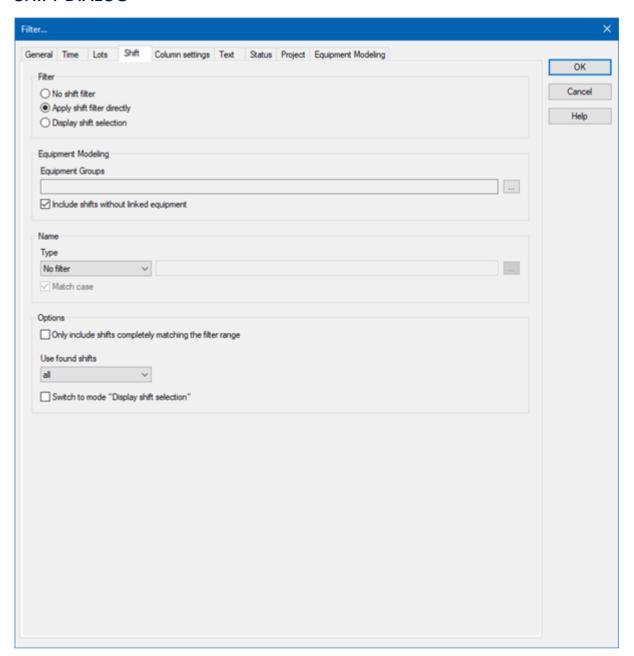
1. For screen switching, define the desired filter screen in the **General** tab (for Extended Trend Display) in the option **Replace dialog with screen in Runtime**.

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

3. Define the desired time filter.

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

5. Define the shift filter.

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

SHIFT DIALOG

FILTER

Settings for the application of the shift filter. Selection of one of the following options:

- ▶ **No shift filter**
- ▶ **Apply shift filter directly**
- ▶ **Display shift selection**

Option	Description
No shift filter	Shift filter selection: ▸ *Active*: The shift filter is deactivated and cannot be configured. Filtering for shifts is not carried out in the Runtime.
Apply shift filter directly	Applying the shift filter in the Runtime: ▸ *Active*: The filter configured here is applied in the Runtime directly. Equipment groups and shift names can be preselected. The shift list and **Update** button are not shown in the Runtime.

Display shift selection	Display of the shift selection in the Runtime:
	
	   ▸ *Active*: The dialog for shift selection is shown in the Runtime.
	
	The settings chosen in the Editor are applicable for the reading of the shifts in the Runtime.
	
	The dialog is shown in the Runtime when:
	
	   ▸ Clicking on the **Filter** button.
	       Or:
	
	   ▸ Executing screen switching.
	       Note: The dialog is not shown on reloading.
	
	Attention: At least 1 shift must be selected in the Runtime in order to call up the page or to be able to configure the filter.
	If, in the **General** tab, the **Show this dialog in the Runtime** option is activated at the same time, the complete configuration dialog is called up.

EQUIPMENT MODELING

Configuration of the equipment groups for filtering for shifts.

Option	Description
Equipment groups	Selection of equipment groups to which shifts must be linked. Clicking on the **…** button opens the dialog to select equipment groups. If several equipment groups are selected, they are displayed in

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

NAME

Configuration of the shift names for which filtering is to take place.
Selection of one of the following options:

▸ **No filter**

▸ **Name with wildcards**

▸ **Name from variable**

Option	Description
Type	Selection of the filter type from a drop-down list when filtering according to name:
	▸ *No filter*: Filtering for names is not carried out.
	▸ *Name with wildcards*: A name with placeholder can be entered into the input field. All shifts whose name is applicable for the filter are included.
	▸ *Name from variable*: The name of the shift is defined by a variable in the Runtime. Click on the **...** Button to open the dialog to select a variable.
	Default: *No filter*
	<u>**Wildcards:**</u>
	▸ *****: Replaces desired characters in the desired quantity. Can be used as a search term at any desired place. **red*** finds all texts that start with **red**.
	▸ **?**: Replaces precisely one character. **r?d** finds **red**, **rad**, ...

Option	Description
	Notes for variables in the Runtime:
	‣ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The **...** button is always deactivated in the Runtime. The option can be selected, but no new variable can be linked.
	‣ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols.
	Attention: If the selected variable cannot be found in Runtime or the value of the variables cannot be determined, the filter is treated like the **No filter** setting.
Match case	Setting for filtering for upper/lower case
	‣ *Active*: Capitalization is taken into account for names.
	Default: *active*

OPTIONS

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

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

Option	Description
	partly in the time filter.
Use shifts found	Selection of shifts that are taken into account, from drop-down list:
	▸ *All*: All shifts found are taken into account.
	▸ *Earliest shift only*: Of the shifts found, only the earliest are taken into account. The earliest shift is the shift with the earliest start time. If several shifts have the same start time, one of these shifts is selected randomly.
	▸ *Only last shift*: Of the shifts found, only the latest shift is taken into account. The latest shift is the shift with the latest end time. If several shifts have the same end time, one of these shifts is selected randomly.
	Default: *All*
	Attention: The **Only include shifts that are fully in the filter range** influences the evaluation of this option. If it is active, only shifts that are fully in the time range can be found. If it is inactive, shifts that start earlier or end later can be found.
	Example:
	<u>**Configuration and shifts:**</u>
	▸ **Only include shifts that are fully in the filter range** option: active.
	▸ **Use found shifts** option: *Latest shift only*
	▸ Time filter: Today 08:00 – 10:00 AM.
	▸ Shift 1: Today 08:00 – 8:30 AM.
	▸ Shift 2: Today 8:30 AM – 9:00 AM.
	▸ Shift 3: Today 10:00 AM – 11:00 AM.
	<u>**Result:**</u>
	▸ Shift 2 is used
Switch to "Show shift selection" mode	▸ *Active*: The filter acts as with the **Show shift selection** option. The time filter is set to absolute; start and end

Option	Description
	correspond to the start time and end time of the shifts. If no shift is found, the times are set to 0 for the time filter. Default: *inactive* **Behavior in the Runtime:** If the shift management is set to **Show shift selection** in the Runtime, the filter options also have an effect on the shifts shown in the shift list. The shift list is filtered accordingly by clicking on the Update button.

CLOSE DIALOG

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

SYSTEM MESSAGES

System messages (on page 45) are configured in the **General** (on page 45) tab.
They also have an effect on the shift filter:

▸ *Active*: When applying a shift filter, the system messages whose time stamp is within one of the selected shifts are shown.

▸ *Inactive*: No system messages are shown when a shift filter is applied.

Note: System messages whose time stamp is not within one of the selected shifts are never shown.

FILTER BUTTON IN THE SCREEN IN THE RUNTIME

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

3.4.2.5 Column settings

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

Note: All settings which you make in this tab are default settings for:
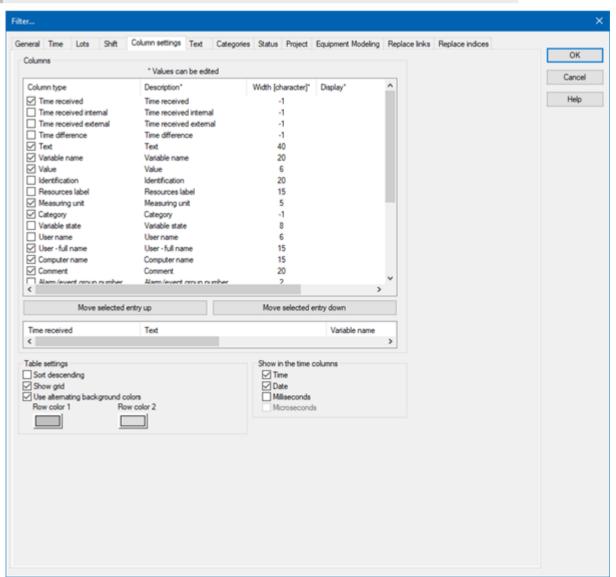
▶ *Chronological event list* screen

▶ *Chronological event list filter* screen

▶ Export (on page 145) to CSV, dBase or XML

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

💡 Information

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

COLUMNS

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

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

▸ Click in the **Column type** column

▸ Move the individual entries as desired

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

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

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

TABLE SETTINGS

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

Parameter	Description
	activated **Alternating Background Colors**.

SHOW IN THE TIME COLUMNS

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

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

⚠**Attention**

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

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

Solution: Use fonts with a fixed character width.

> ⚡ **Information**
>
> If you engineered variables with measuring units, the measuring unit of the variable is displayed in the Chronological Event List. Prerequisite for this is that column type **Unit** is displayed.

3.4.2.6 Text

FILTER BY

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

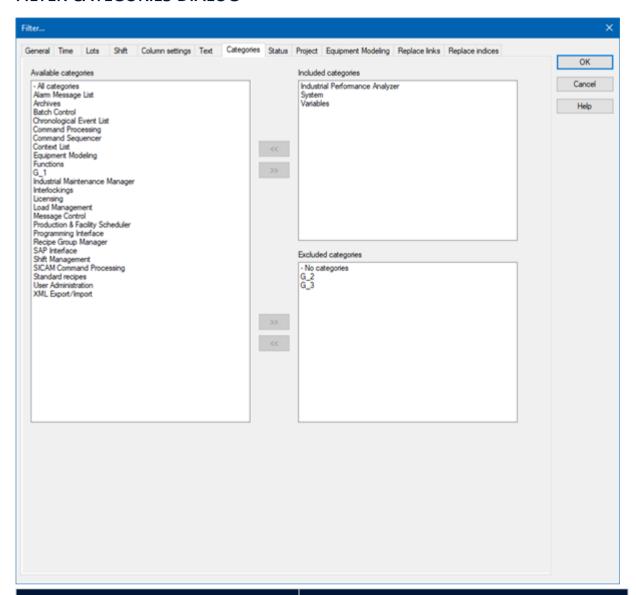| Option	Description
Input field	Enter the corresponding words or character strings.

OPTIONS

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

3.4.2.7 Categories

In this tab you will configure which categories should be considered in the CEL.

FILTER CATEGORIES DIALOG

Option	Description
Linked categories	Contains all categories that can be used for the filter.
Included categories	Contains all categories that are taken into account in the filter. They are linked with **or**.
Excluded categories	Contains all categories that are not taken into account in the filter. They are linked with **and not**.
Arrow keys	Move highlighted categories to the other respective list.
OK	Applies all changes in all tabs and closes the

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

CONFIGURING THE FILTER

To configure the filter:

1. Decide which categories are to be applied in the filter.

2. Move all categories that should be used in the list, **Included Categories**.

3. Move all categories that are explicitly not allowed to be used in the filter to the **Excluded Categories** list.
   This setting is handled with priority.   Categories that are included here always lead to exclusion.
   For example: The **All Categories** entry is included in **Included Categories**. **Archives** in included in **Excluded Categories**. All entries that are linked to a category are shown in the Runtime. With the exception of entries that are linked with **Archive**.

4. Leave all categories that should not be used in the **Available Categories** list.

Note: You move categories by selecting the desired categories and moving them by clicking on the corresponding arrow key between the columns. Multiple selection via **Ctrl key+ click**.

GENERAL ENTRIES: "ALL CATEGORIES" AND "NO CATEGORIES"

In addition to the defined categories, the filter offers the entries **All Categories** and **No Categories**.

▶ **All Categories**: CEL entries with as many categories as you want are displayed.
  This is shown with the character * in the parameters of the detail view.

▶ **No categories**: CEL entries without a linked category are displayed.
  This is shown with the character X **X** in the parameters of the detail view.

Examples:Output in the Runtime

Included categories	Excluded categories	Result
All categories No categories		All entries are displayed.
All categories	No categories	Entries that are linked to a category are displayed.

Included categories	Excluded categories	Result
No categories	All categories	Entries that are not linked to any category are displayed.
	All categories No categories	No entry is displayed.
All categories No categories	A	All entries are displayed. With the exception of entries that are linked to the **A** category.
A	All categories No categories	No entry is displayed.

3.4.2.8 Status

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

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

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

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

3.4.2.9 Equipment Modeling

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

Note: To show the equipment group for Chronological Event List entries, in the **Column settings tab** (on page 87), activate the checkbox for the *equipment group* **column type** and select the desired equipment model for this entry in the **Display** column from the drop-down list.

> 💡 **Information**
>
> When applying an equipment model filter, all system messages are always included too. This also applies if, in screen switching, in the **General** tab, the **Always show system messages in a list** option has been deactivated.

To add groups to the filter:
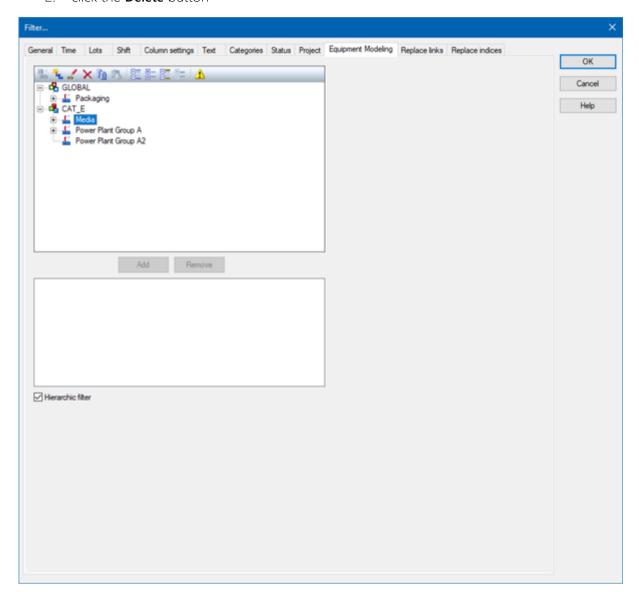
1. select the desired element
2. Click on the **Add** button
3. Repeat the process until all necessary groups are included in the list (Multi-select is not possible)

To remove groups from the filter:

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

2. click the **Delete** button

EQUIPMENT MODELING

Option	Description

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

List of equipment models	provides models and groups for selection The list separates the display into equipment models from the global project and from local projects.

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

CLOSE DIALOG

Option	Description
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.
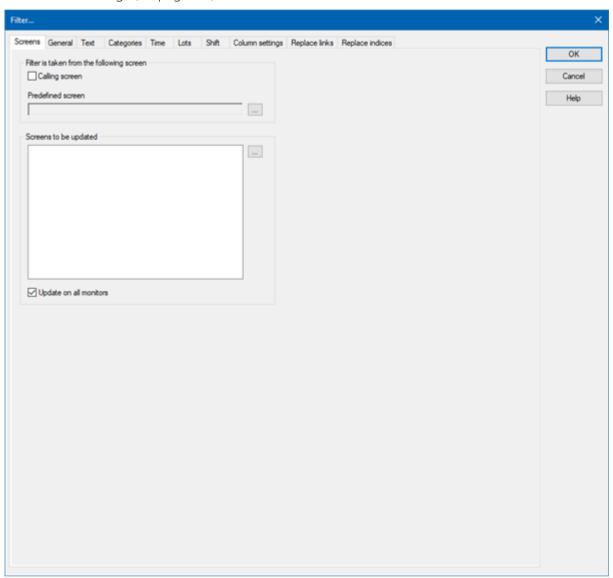
3.4.3 Filter for screen switch CEL filter

To create a screen switch to a *Chronological Event List filter* screen:

1. Create a function to **switch screens** to a *Chronological Event List Filter* (on page 14) screen.

   The filter is displayed with all tabs:

   ‣ **Screens (on page 103)**

   ‣ **General** (on page 105)

▹   text

▹   **Categories** (on page 111)

▹   Time (on page 114)

▹   Lots (on page 118)

▹   Shift (on page 124)

▹   Column settings (on page 131)
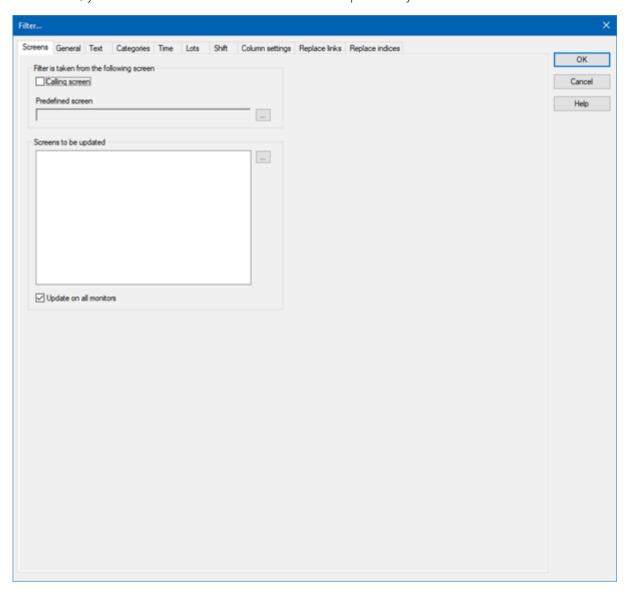
2.   Configure the required filter.

3.4.3.1 Screens

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

The following settings are available:

FILTER IS TAKEN FROM THE FOLLOWING SCREEN

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

Parameter	Description
	because the filter is always updated from the calling screen with this setting.
	Note: Options in the **General**, **Text** and **Time** tabs are locked.
	Note:
	‣ All options are available if the option is updated and the project engineer changes to the tabs in the open dialog.
	‣ The lock only becomes active when the **Calling screen** option is already activated and the dialog is called again.
	‣ The configured contents of the **General**, **Text** and **Time** tabs are ignored in Runtime.
Predefined screen	Click on button opens the Screen selection dialog.
	Select the screen from which the filter - when clicking button **Update** during Runtime - should be read.
	Subscreens from Faceplates can also be selected for screen switching to AML filter, CEL filter, time filter, equipment model and shift management. For these screens, the name of the faceplate screen is placed in front of the subscreen in order to clearly distinguish them from other screens.
	Attention: When the filter screen is first called up using the function, the filter configured in the function is used, not the filter of the screen stated here!
	Note: It therefore only makes sense to select a screen that can adopt or fill the screen filter.
	The selected screen is entered into the list of screens to be updated. If you delete it from the list, the next selected screen from the list automatically takes its place.
	Note: Not available if you have activated the **Calling screen** checkbox.

SCREENS TO BE UPDATED

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

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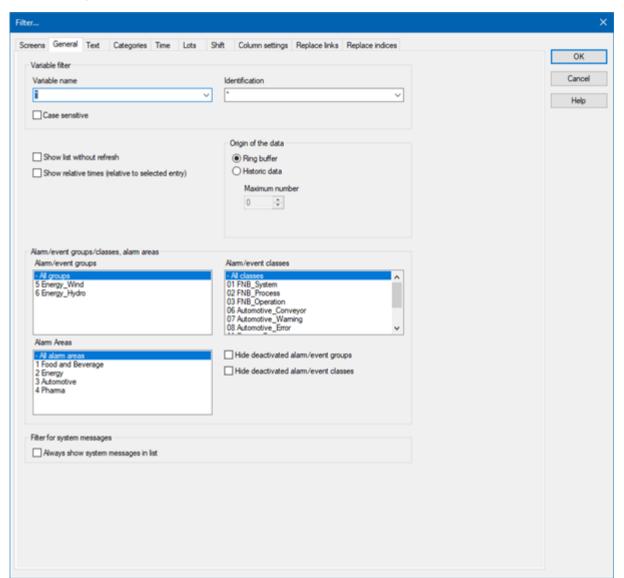
3.4.3.2 General

With the general filter, you define which events are displayed and what access you have to the settings in the Runtime. To this you differentiate events according to:

▶ Type

▶ Origin of the data

▶ Variables

▶ Alarm/event groups, classes and alarm areas

The following options are available:

VARIABLE FILTER

Parameter	Description
Variable filter	Restrictions to events of certain variables
Variable name	Enter the name or part of the name of the variable you want to filter. Use of the wild card * is possible. Wildcards are only permitted as a prefix or suffix; e.g. ***xxx** or **xxx***. **Note:** Filter terms entered in Runtime or in the Editor are automatically saved on the local computer in

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

ORIGIN OF THE DATA

Parameter	Description
Origin of the data	Display current or current and historical events.
Ring buffer	*Active*: Only data from the ring buffer (on page 138) are displayed.
Historical data **Maximum number**	*Active*: Data from the ring buffer and historical data from the CEL are displayed. The maximum number of the data which should be displayed includes the data from the ring buffer.
Runtime settings	Behavior of CEL in Runtime
Show list without refresh	*Active*: As long as the list is displayed no new entries are added. (Not available for function **Export CEL**.)
Show relative time	All entries are displayed in the time distance to the

Parameter	Description
(relative to selected entry)	selected entry. The displayed time is the difference time passed since the selected entry. The selected entry automatically gets the time stamp *0*. The other events have a: ▸ positive time difference to the selected entry if they occurred later ▸ negative time difference to the selected entry if they occurred earlier

ALARM/EVENT GROUPS/CLASSES, ALARM AREAS

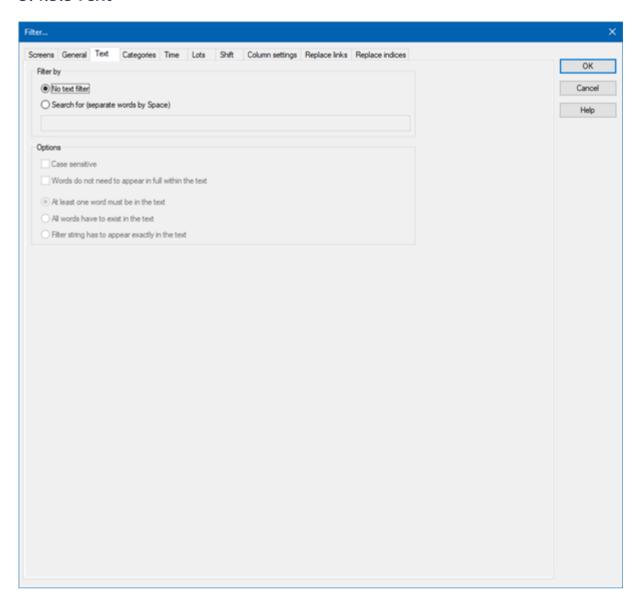| Parameter	Description
Alarm/event groups/classes, alarm areas	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups select the one from which alarms should be displayed.
Alarm/event classes	From the existing alarm/event classes select the one from which alarms should be displayed.
Alarm areas	From the existing alarm areas select the one from which alarms should be displayed.
Hide deactivated alarm groups	Allows deactivated alarm groups to be excluded from the display in the list. ▸ *Active*: All entries that are linked to a deactivated alarm/event group in Runtime, are hidden during filtering. **Note**: Changes to the option made in Runtime are immediately accepted.
Hide deactivated alarm classes	Allows deactivated alarm classes to be excluded from the display in the list. ▸ *Active*: All entries that are linked to a deactivated alarm/event class in Runtime, are hidden during filtering. **Note**: Changes made in Runtime to the option are immediately accepted.

FILTER FOR SYSTEM MESSAGES

Parameter	Description
Filter for system messages	Filter settings for system messages. System messages are messages that do not relate to a variable.
Always show system messages in list	Setting for the display of system messages regardless of the filter settings.
	▶ *Active*: System messages are always displayed in the Runtime. The following filters are thus suppressed as a result: Variable name Identification Status Equipment modeling Alarm/event groups Alarm/event classes Lots
	<u>Special features:</u>
	▶ System messages are not shown despite the checkbox being activated if they are filtered out by the **time filter** or the filters for **data origin** (*ring buffer* or *historic data*).
	▶ System messages are always shown regardless of this setting if there is filtering for equipment models.

CLOSE DIALOG

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

3.4.3.3 Text

FILTER BY

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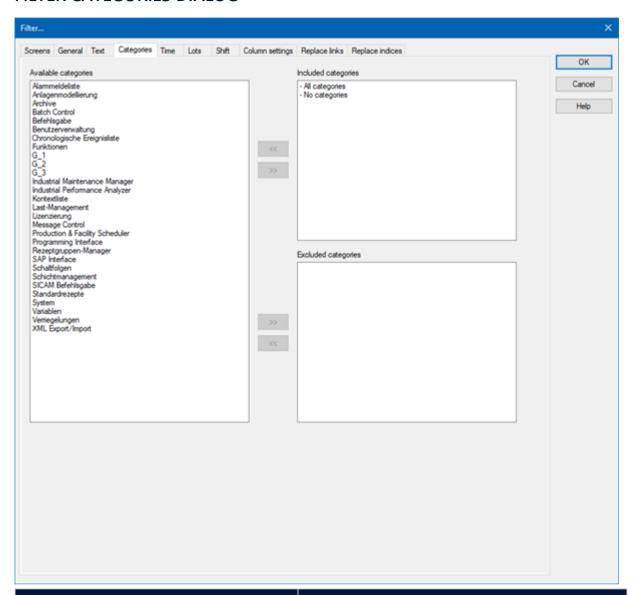
OPTIONS

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

3.4.3.4 Categories

In this tab, you configure which categories should be considered in the CEL Filter screen.

FILTER CATEGORIES DIALOG

Option	Description
Linked categories	Contains all categories that can be used for the filter.
Included categories	Contains all categories that are taken into account in the filter. They are linked with **or**.
Excluded categories	Contains all categories that are not taken into account in the filter. They are linked with **and not**.
Arrow keys	Move highlighted categories to the other respective list.
OK	Applies all changes in all tabs and closes the

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

CONFIGURING THE FILTER

To configure the filter:

1. Decide which categories are to be applied in the filter.

2. Move all categories that should be used in the list, **Included Categories**.

3. Move all categories that are explicitly not allowed to be used in the filter to the **Excluded Categories** list.
   This setting is handled with priority.   Categories that are included here always lead to exclusion.
   For example: The **All Categories** entry is included in **Included Categories**. **Archives** in included in **Excluded Categories**. All entries that are linked to a category are shown in the Runtime. With the exception of entries that are linked with **Archive**.

4. Leave all categories that should not be used in the **Available Categories** list.

Note: You move categories by selecting the desired categories and moving them by clicking on the corresponding arrow key between the columns. Multiple selection via **Ctrl key+ click**.

GENERAL ENTRIES: "ALL CATEGORIES" AND "NO CATEGORIES"

In addition to the defined categories, the filter offers the entries **All Categories** and **No Categories**.

▸ **All Categories**: CEL entries with as many categories as you want are displayed.
   This is shown with the character * in the parameters of the detail view.

▸ **No categories**: CEL entries without a linked category are displayed.
   This is shown with the character X **X** in the parameters of the detail view.

Examples:Output in the Runtime

Included categories	Excluded categories	Result
All categories No categories		All entries are displayed.
All categories	No categories	Entries that are linked to a category are displayed.

Included categories	Excluded categories	Result
No categories	All categories	Entries that are not linked to any category are displayed.
	All categories No categories	No entry is displayed.
All categories No categories	A	All entries are displayed. With the exception of entries that are linked to the **A** category.
A	All categories No categories	No entry is displayed.

3.4.3.5 Time

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

You can read details of the time filter options in the Filter for screen switching, CEL (on page 43)/time (on page 51) chapter.

FILTER

Selection of the filter.

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

Parameter	Description
	reproduced data, and not at the time when the data is played back on the computer.
Time period	*Active*: A fixed time period is entered. Selection of the area mode from drop-down list:

<div style="margin-left:2em">

▸ One day

▸ One week

▸ Two weeks

▸ One month

▸ One Year

▸ 15 minutes

▸ 30 minutes

▸ 60 minutes

</div>

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

The following selection is also enabled on activation:

▸ **Offer selection dialog**

▸ **Use current date/time**

The **Modify time period** property can be activated.

The time period can be moved to the future.

The time period can be amended.

Example: Create a screen switch, for example to an *AML* screen. In the screen switching filter dialog in the **Time** tab, set the filter to **time period** and select **One Month** in the drop-down list. Select **Use current date/time** under **Settings**. Activate the checkbox option **Modify time period**. Enter the following setting under **Move time period to the future**: **HH** = *0*. Activate, under **Change time period by**, the checkbox option **Use the last completed time period**.

Evaluation: today's date: 22.02.2018

Result of the time filter in the Runtime: 01.01.2018 - 31.01.2018

CLOSE DIALOG

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

3.4.3.6 Lots

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

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

FILTER

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

▸ **No lot filter**

▸ **Apply lot filter directly**

▸ **Display lot selection dialog**
Note: If the lot filter is shown as a dialog, it can be prefiltered for archive identifications. It is expressly recommended that you use this prefiltering for performance improvements.

Option	Description
No lot filter	*Active*: The lot filter is deactivated and cannot be configured. Filtering for lots is not carried out in the Runtime.
Apply lot filter directly	*Active*: The filter configured here is applied in the Runtime directly.
Display lot selection dialog	*Active*: The dialog for lot selection is shown in the Runtime when: ▶ Clicking on **Filter** or ▶ screen switching, if the **Show this dialog in Runtime** option has been activated (Not available for each function/screen type) **Note:** The dialog is not shown on reloading. Options can be pre-selected in the Editor.

TIME

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

▶ **No filter**

▶ **Last lots**

▶ **Use time filter from "Time" tab**

Option	Description
No filter	▶ *Active*: The time range set in the **Time** tab is not taken into account. All completed and current lots are displayed.
Last lots	**Attention:** Only works in conjunction with the **Apply lot filter directly** option. The option allows the combination of both options **Display current lots** and **Display completed lots**. At least one of the two options must be activated. If both options have been deactivated, this corresponds to the **No filter** setting. ▶ *Active*: Input of the number of lots last concluded, according to what they should be filtered for. Input of the number in the number field or configuration via arrow keys.

Option	Description
	Example: *3* was entered as a value for the option. 2 lots run and 10 have been ended. The following is shown: the two that are current and one that has been completed.

Note: The setting of the time filter is not used as a time period for the current lots, but the last year. This filter will not be executed as a prefilter and can therefore not be used to improve performance.

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

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

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

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

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

▶ *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 |

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

ARCHIVE(S)

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

‣ **No filter**

‣ **Static**

‣ **From variable**

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

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

NAME(S)

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

▸ **No filter**

▸ **Static**

▸ **From variable**

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

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

CLOSE DIALOG

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

3.4.3.7 Shift

You configure the limitation of the display to certain shifts in this tab. The shift information is also applied to the existing filter.

Note:

▸ The shift filter requires a configured time filter. If the time filter is set to the **No time filter** option, the shift filter is deactivated. A notice of the cause of the deactivation is shown.

▸ If the lot filter is activated, the shift filter is automatically deactivated. Both filters mutually exclude one another. A notice of the cause of the deactivation is shown.

CONFIGURATION

To filter for shifts:

1. Configure the time filter.

   ▶ **Absolute time filter**: Shifts from the absolute defined time period are shown.

   ▶ **Relative time filter**: Shifts from the relative defined time range are shown.
   The upper limit is set at 1440 minutes by default.

   ▶ **From**: Shifts from a certain time point are shown.

   ▶ **Time period**: Shifts within a certain time range are shown.

2. Configure the shift filter.
   To do this, select one of the options:

   ▶ **Apply shift filter directly**:
   The configured time filter is used to filter the shifts in the Runtime. In doing so, all shifts that are at least partly in the time filter range are taken into account. Even if the time filter is defined in the Runtime, the shift filter is applied after selecting the time period. If there is no suitable shift, no data is shown in the CEL screen.
   The set filter continues to have an effect on the CEL data. If a shift is only partially within the set time range, only the CEL entries that are both in the time filter and the shift are shown.

   ▶ **Show shift selection**:
   The shift filter is configured and applied when called up in the Runtime when the screen is called up. All shifts that are at least partly in the time filter range are offered in a list for selection. After selecting one or more shifts, the time filter is overwritten and set to the times of the selected shifts. It is thus ensured that the complete shift is always included in the filter.

3. Configure **Name** and **Options** if required.

With the Apply shift filter directly option, the shifts are permanently monitored by the filter and the filter is amended if necessary.
The shifts for filtering the data are redetermined if:

▶ Shifts are reconfigured

▶ Shifts are newly-created in the filter time period

▶ The time period is reconfigured

The following are not taken into account in the filter:

▶ Deleted shifts
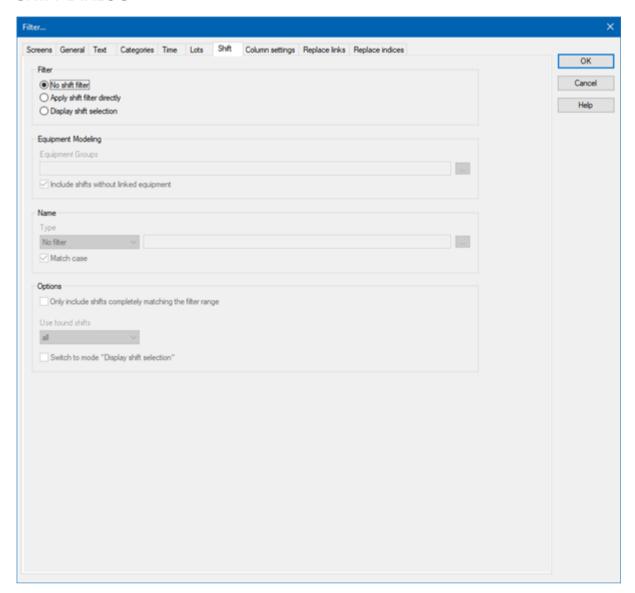
▶ Shifts that are removed from the time filter due to a change of the time period

SHIFT DIALOG

FILTER

Settings for the application of the shift filter. Selection of one of the following options:

- ▸ **No shift filter**
- ▸ **Apply shift filter directly**
- ▸ **Display shift selection**

Option	Description
No shift filter	Shift filter selection: ▸ *Active*: The shift filter is deactivated and cannot be configured. Filtering for shifts is not carried out in the

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

EQUIPMENT MODELING

Configuration of the equipment groups for filtering for shifts.

Option	Description
Equipment groups	Selection of equipment groups to which shifts must be linked. Clicking on the **...** button opens the dialog to select equipment groups. If several equipment groups are selected, they are displayed in the option separated by a semicolon (**;**).
Include shifts without linked equipment	Selection of whether linking to an equipment group is necessary. ▸ *Active*: Shifts that are not linked to an equipment group are also taken into account. ▸ *Inactive*: Only shifts that are linked to at least one equipment group are taken into account. Default: *active*

NAME

Configuration of the shift names for which filtering is to take place.
Selection of one of the following options:

▸ **No filter**

▸ **Name with wildcards**

▸ **Name from variable**

Option	Description
Type	Selection of the filter type from a drop-down list when filtering according to name: ▸ *No filter*: Filtering for names is not carried out. ▸ *Name with wildcards*: A name with placeholder can be entered into the input field. All shifts whose name is applicable for the filter are included. ▸ *Name from variable*: The name of the shift is defined by a variable in the Runtime. Click on the **...** Button to open the dialog to select a variable. Default: *No filter* **Wildcards:** ▸ *****: Replaces desired characters in the desired quantity. Can be used as a search term at any desired place. **red*** finds all texts that start with **red**. ▸ **?**: Replaces precisely one character. **r?d** finds **red**, **rad**, ... **Notes for variables in the Runtime:** ▸ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The **...** button is always deactivated in the Runtime. The option can be selected, but no new variable can be linked. ▸ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable cannot be found in Runtime

Option	Description
	or the value of the variables cannot be determined, the filter is treated like the **No filter** setting.
Match case	Setting for filtering for upper/lower case ‣ *Active*: Capitalization is taken into account for names. Default: *active*

OPTIONS

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

Option	Description
Only include shifts that are fully in the filter range	Configuration of which shifts are displayed. ‣ Active: Only shifts that are fully in the time filter set are shown. ‣ Inactive: Shifts that start earlier and/or finish later are also shown. Default: *inactive* **Example:** ‣ Time filter: Today 08:00 – 12:00. ‣ Existing shift: Today 8:30 AM – 5:00 PM. Result for: ‣ Option *active*: The shift is not taken into account because it is not fully in the time filter. ‣ *Inactive* option: The shift is taken into account because it is partly in the time filter.
Use shifts found	Selection of shifts that are taken into account, from drop-down list: ‣ *All*: All shifts found are taken into account. ‣ *Earliest shift only*: Of the shifts found, only the earliest are taken into account. The earliest shift is the shift with the earliest start time. If several shifts have the same start time, one of these shifts is selected randomly. ‣ *Only last shift*:

Option	Description

	Of the shifts found, only the latest shift is taken into account.
	The latest shift is the shift with the latest end time. If several shifts have the same end time, one of these shifts is selected randomly.
	
	Default: *All*
	
	Attention: The **Only include shifts that are fully in the filter range** influences the evaluation of this option. If it is active, only shifts that are fully in the time range can be found. If it is inactive, shifts that start earlier or end later can be found.
	
	Example:
	
	Configuration and shifts:
	
	  ▸ **Only include shifts that are fully in the filter range** option: active.
	
	  ▸ **Use found shifts** option: *Latest shift only*
	
	  ▸ Time filter: Today 08:00 – 10:00 AM.
	
	  ▸ Shift 1: Today 08:00 – 8:30 AM.
	
	  ▸ Shift 2: Today 8:30 AM – 9:00 AM.
	
	  ▸ Shift 3: Today 10:00 AM – 11:00 AM.
	
	Result:
	
	  ▸ Shift 2 is used

Switch to "Show shift selection" mode	▸ *Active*: The filter acts as with the **Show shift selection** option. The time filter is set to absolute; start and end correspond to the start time and end time of the shifts. If no shift is found, the times are set to 0 for the time filter. Default: *inactive* **Behavior in the Runtime:** If the shift management is set to **Show shift selection** in the Runtime, the filter options also have an effect on the shifts shown in the shift list. The shift list is filtered accordingly by clicking on the Update button.

CLOSE DIALOG

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

SYSTEM MESSAGES

System messages (on page 45) are configured in the **General** (on page 45) tab.
They also have an effect on the shift filter:

▶   *Active*: When applying a shift filter, the system messages whose time stamp is within one of the selected shifts are shown.

▶   *Inactive*: No system messages are shown when a shift filter is applied.

Note: System messages whose time stamp is not within one of the selected shifts are never shown.

FILTER BUTTON IN THE SCREEN IN THE RUNTIME

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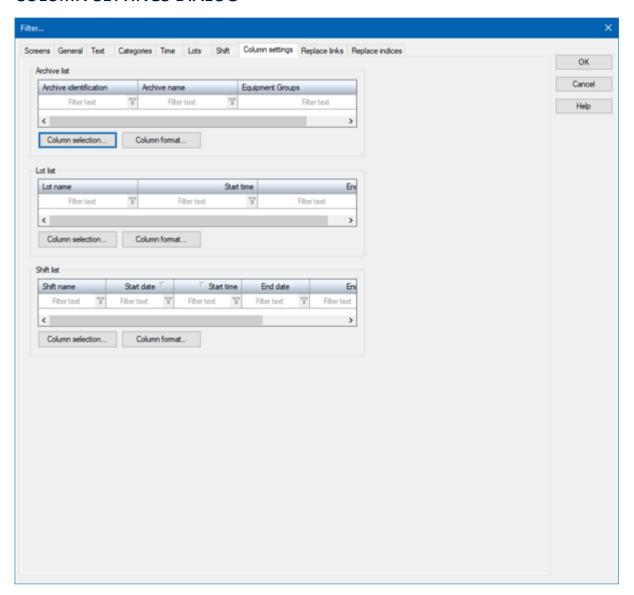
3.4.3.8 Column settings

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

▶   Selection of the columns to be displayed

▶   Sorting of the columns

▶   Formatting of columns:

    ▶   Label

    ▶   Width

    ▶   Alignment

COLUMN SETTINGS DIALOG

ARCHIVE LIST

Option	Description
Archive list	Configuration of the archive list. Display of the configured columns.
	If you want to edit the list directly using the monitor, activate the Multi-Touch functionality. You can find detailed information in relation to this in the Configure interactions chapter.
	Longer texts can also be displayed in the Runtime over

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

LOT LIST

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

SHIFT LIST

Option	Description
Shift list	Configuration of the shift list. Display of the configured columns.
	Longer texts can also be displayed in the Runtime over

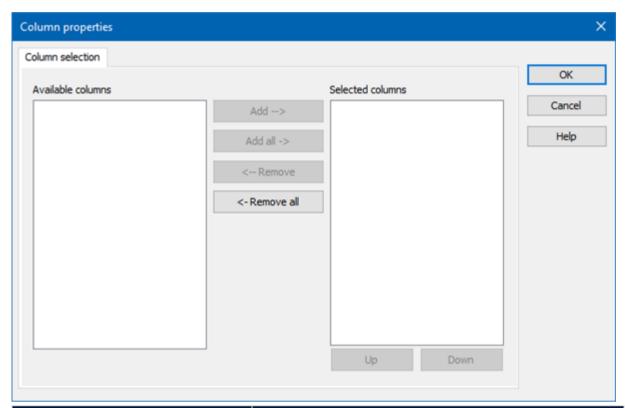| Option	Description
	several lines using the **Automatic word wrap** property.
	In the Editor, go to **Representation** in the properties of the respective list properties and activate the checkbox of the **Automatic word wrap** property.
	The line height must be amended manually.
Column selection	Clicking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

CLOSE DIALOG

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

3.4.3.8.1 Column selection

Selection and sequence of the columns.

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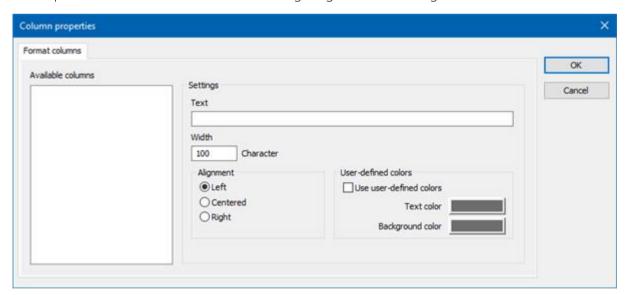
Option	Function
	possible.
Down	Moves the selected entry downward. This function is only available for unique entries, multiple selection is not possible.

CLOSE DIALOG

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

3.4.3.8.2 Column Format

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

AVAILABLE COLUMNS

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

SETTINGS

Option	Description
Settings	Settings for selected column.
Labeling	Name for column title. The column title is online language switchable. To do this, the **@** character must be entered in front of the name.
Width	Width of the column in characters. Calculation: Number time average character width of the selected font.
Alignment	Alignment. Selection by means of radio buttons. Possible settings: ▸ **Left**: Text is justified on the left edge of the column. ▸ **Centered**: Text is displayed centered in the column. ▸ **Right**: Text is justified on the right edge of the column.
User-defined colors	Properties in order to define user-defined colors for text and background. The settings have an effect on the Editor and Runtime. **Note:** ▸ These settings are only available for configurable lists. ▸ In addition, the respective focus in the list can be signalized in the Runtime by means of different text and background colors. These are configured using the project properties.
User defined colors	*Active*: User-defined colors are used.
Text color	Color for text display. Clicking on the color opens the color palette to select a color.
Background color	Color for the display of the cell background. Clicking on the color opens the color palette to select a color.
Lock column filter in the Runtime	▸ *Active*: The filter for this column cannot be changed in the Runtime.

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

CLOSE DIALOG

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

3.5   CEL ring buffer

Events are saved in a ring buffer (cel.bin) and in an event file (*.cel) in the Runtime folder as soon as they occur.

RING BUFFER

The ring buffer contains all active events. These are managed via:

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

SIZE OF THE RINGBUFFER

The size of the ring buffer must be set to an appropriated size in the project properties via property **Size of the ring buffer**.

In Runtime, old entries are left in the list when the CEL screen is called up. As soon as new entries are added the number of the displayed entries can exceed the engineered size of the ring buffer. When the list is then called up again, the old entries are removed and the engineered size is adhered to. This behavior makes sure that no data is lost when the list is displayed.

Attention: The display of entries which exceed the defined values occupies additional memory. If the screen is called up again, the occupied memory is not freed but remains at the last peak.

SAVE RING BUFFER

The ring buffer is automatically saved as **cel.bin** when the Runtime is closed. If the Runtime is closed due to an unexpected event, e.g. power outage, data will be lost. To prevent this the ring buffer can be saved manually via property **Save ring buffer on change** at every new entry or via function Save AML and CEL ring buffer (on page 144).

RESULT FILE

All alarms are written together with the ring buffer in a separate CEL file (*.cel) at the same time. This file is created for every calendar day automatically and is managed via property **Save CEL data**. The name of the file consists of the letter **C**, followed by the date in form *YYMMDD* and the suffix *.cel*, e.g. **C100623.cel**. These files are created automatically for every day and must be evacuated or deleted by the user if the storage space is limited. **.cel files* are saved in the folder ...*\Project folder\Computer name\Project name.*

SYNCHRONIZING RING BUFFER AND RESULT FILE

Ring buffer and CEL file are synchronized. This synchronization is always carried out from the ring buffer to the CEL file.

SAVING PERIODS

The Chronological Event List *.cel is saved each time a new entry is made.

The ring buffer (*.bin) is saved:

 ▸   when the Runtime is closed

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

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

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

4 Functions

The display and the handling of the CEL are controlled in Runtime by means of functions.

> ⚠**Attention**
>
> If functions are used in the network, regard their execution location.

4.1   Screen switch CEL

To call up a *Chronological Event List* screen:

1.   Create a *Chronological Event List* screen (on page 6):

2.   Create a screen switch function to the screen.

3.   Define the desired filter properties (on page 43)

The filter properties can be modified in Runtime. Exception: In the Editor fixed time filter was defined.

CONFIGURE SCREEN SWITCHING

To create a screen switch to a screen of type *CEL*:

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

2.   Click on **screen switch**.

     The dialog for the screen selection will be opened.

3.   Select the *CEL* screen.
     Or: Create this dialog by clicking on the **New screen** symbol.

     The filter is displayed with all tabs:
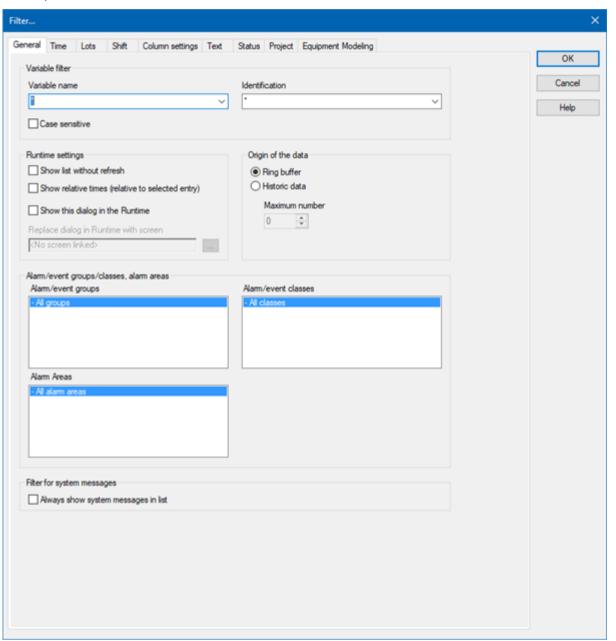
     ▶   General (on page 45)

     ▶   Time (on page 51)

     ▶   Lots (on page 70)

     ▶   Shift (on page 79) (cannot be used with a lot filter at the same time)

     ▶   Column settings (on page 87)

     ▶   Text (on page 93)

     ▶   Status (on page 98)

     ▶   Project (on page 152) (only available in the integration project of the multi-project administration.)

     ▶   Equipment Modeling (on page 99)

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

     ▶   Replace links

▸ Replace indices

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

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

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

> 💡 **Information**
>
> If a screen that does not have a time filter is referenced, the time filters are deactivated.

4.2   CEL filter screen switching

In order to call up a *Chronological Event List Filter* screen in Runtime:

1. create a screen of type Chronological Event List Filter (on page 14):

2. create a screen switch function for this screen

3. define the desired filter properties (on page 101)

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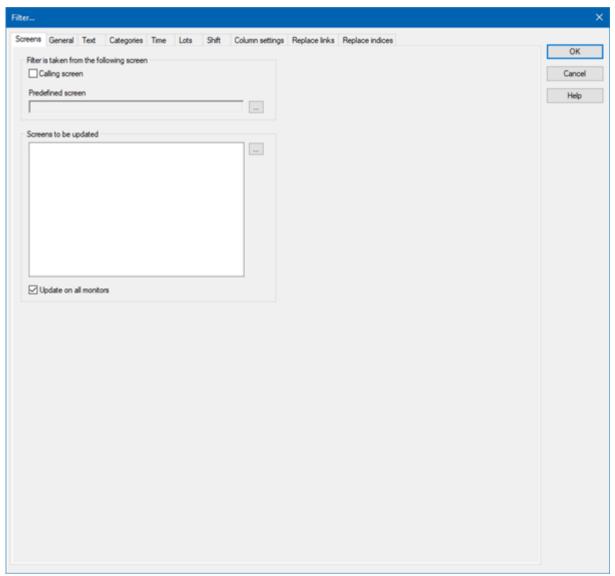
CONFIGURE SCREEN SWITCHING

To create a screen switch to a *Chronological Event List Filter* screen type:

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

2. Click on **Screen Switch**

3. The dialog for screen selection is opened.

4. Select the *Chronological Event List Filter* screen
   or create it in this dialog by clicking on the **New Screen** symbol

5. The filter is displayed with all tabs:

   ▶ **Screens (on page 103)**

   ▶ General (on page 105)

   ▶ text

   ▶ Categories (on page 94)

   ▶ Time (on page 114)

   ▶ Lots (on page 118)

   ▶ Shift (on page 124)

▸   Column settings (on page 131)

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

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

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

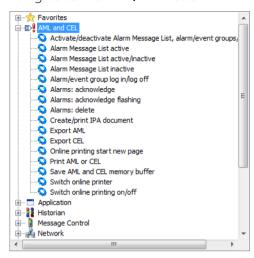## 4.3   Functions for Chronological Event List

Different functions enable the handling of events in Runtime.

To create a function for the Chronological Event List:

1.   navigate to the **Functions** node

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

3. the dialog for selecting functions is opened

4. navigate to the **AML/CEL** node

5. select the desired function

6. configure the function if necessary

7. link the function to a button

4.3.1 Save AML and CEL ring buffer

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

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

Example: Saving the AML ring buffer.

Engineering:

1. Create a new function.

2. Select **Save AML and CEL ring buffer**.

3. Link the function to a button.
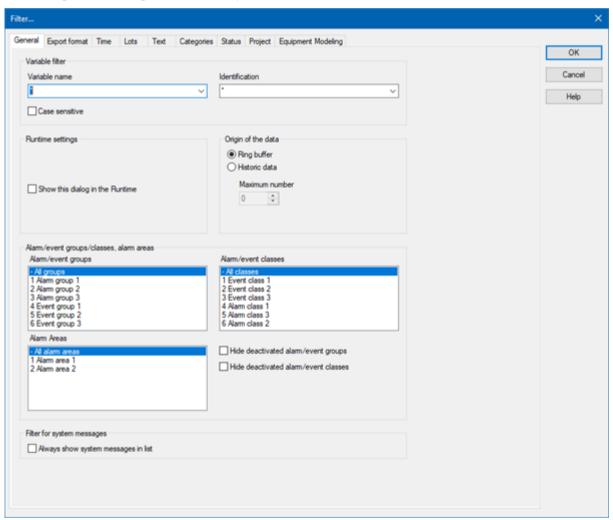
4.3.2 Export CEL

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

To export CEL entries:

1. Create a new function.

2. Select **Export CEL.**

   The dialog for selecting filter criteria opens:

3. Define the criteria for:

   ▶ Exportformat
   and configure the required filters. These correspond to those in the screen switch to CEL:

   ▶ General (on page 45)

   ▶ Time (on page 51)

▶ Lots (on page 70)

▶ text (on page 93)

▶ Categories (on page 94)

▶ State   (on page 98)

▶ Equipment Modeling (on page 99)

▶ Project (on page 152)

4. Link the function to a button.

4.3.2.1 Export format

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

Data is exported in different ways for:

▶ CSV (on page 152)

▶ dBase (on page 153)

▶ SQL (on page 154)

▶ XML (on page 156)

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

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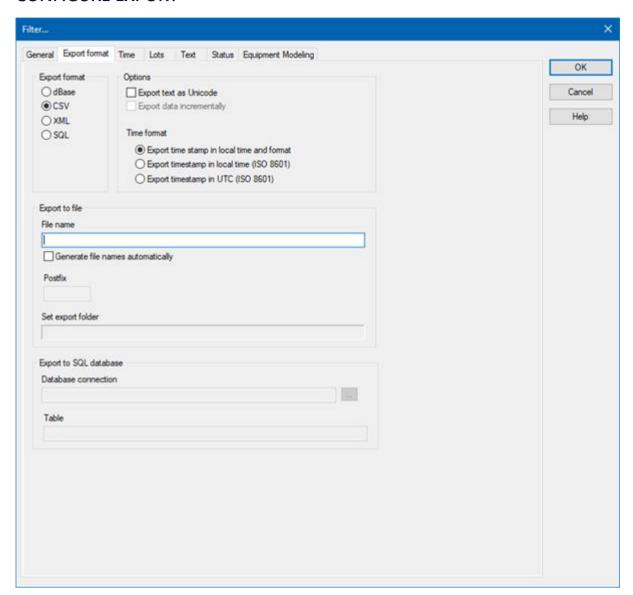
The selection of the columns to be exported depends on the export format:

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

▶ *SQL*: Fixed settings for the incremental export, which cannot be configured further.
Note: The RESLABEL column for the **Resources label** was added in version 7.20. Export tables that already exist can thus no longer be used. The table must be renamed for correct export.

CONFIGURE EXPORT

EXPORT FORMAT

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

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

OPTIONS

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

TIME FORMAT

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

EXPORT TO FILE

Parameter	Description
Export to file	Determining the file in which the export is saved.
File name	Define file name individually. A maximum of 32 alphanumeric characters including file suffix. **Note:** Existing files with the same names are overwritten.
Generate file name	*Active*: The file name will be generated automatically from a

Parameter	Description
automatically	short identifier, a date key and an individual postfix. *Inactive*: The file name is entered by the user under **Filename**. (existing files are not overwritten) For details, see the next table: **Coding name for automatic naming**
Postfix	Free, individual identification. Only available for **Generate filename automatically**. Possible entries: ▸ dBase: 1 alphanumeric character ▸ ASCII and XML: 32 alphanumeric characters
Example	Display of the complete file name with automatic generation.
Set export folder	Display of the current export path configured in Project Properties. (**Runtime folder** property in the **General**/**Name**/**Folder** node.)
Export to SQL database	Parameters for export into a SQL database
Database connection	Configuration of the database connection. A click on the **...** button opens the configuration dialog.
Table	Selection of the table that is to be written in.

CODING NAME FOR AUTOMATIC NAMING

Example for the coding of the automatic name issuing of an AML export:

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

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

Note: The identifier for the Chronological Event List is **C**. Otherwise the coding of the name follows the procedure described in the example.

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

NOTES SQL

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

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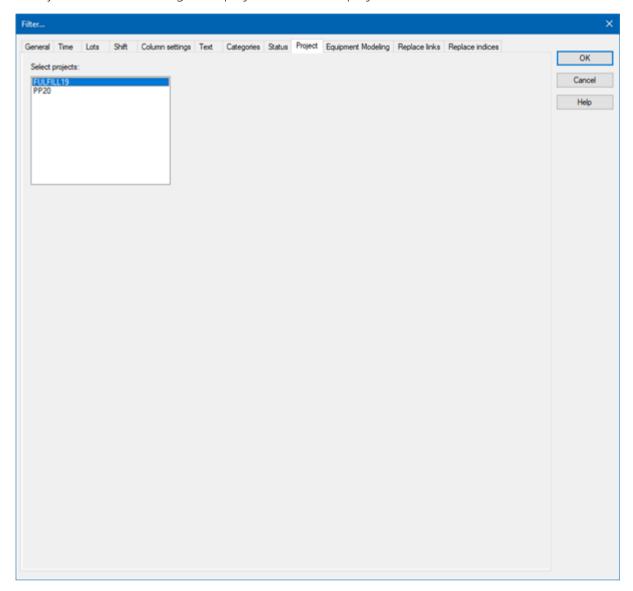
4.3.2.2 Project

Selection of the projects which should be considered for the CEL. The filter for selecting sub projects is only available in the integration project of the multi-project administration.

The selection from the integration project and all sub projects is carried out by means of multi-select, by pressing and holding the **Ctrl key** and clicking the mouse on the desired projects.

4.3.2.3 CSV: Exported columns

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

▸ Only data from the selected columns is exported.

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

▸ Separator: Semi-colon (;)

▸ Column titles are not exported.

4.3.2.4 dBase: Exported columns

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

Column	Type	Size	Description
DATUM_KOMM	*Date*	*8*	Alarm occurred: Date.
ZEIT_KOMMT	*Character*	*10*	Alarm occurred: Time.
ALARMTEXT	*Character*	*40*	Limit value text.
TAG_NR	*Character*	*40*	Variable identification.
KOMMENTAR	*Character*	*45*	Comment.
STATUS	*Character*	*4*	Status of variable.
WERT	*Character*	*10*	Variable value.
USER	*Character*	*6*	User identification.
COMPUTER	*Character*	*48*	Computer name.
VAR_NAME	*Character*	*32*	Variable name.
RESLABEL	*Character*	*15*	Resources label.
PROJ_NAME	*Character*	*31*	Project name
CLASS	*Character*	*31*	Name of the alarm class.
GROUP	*Character*	*31*	Name of the alarm group.
GROUPID	*Numeric*	*3*	ID of the group.
CLASSID	*Numeric*	*3*	Class ID
USERNAME	*Character*	*3*	Full user name.
ALARMAREA	*Character*	*3*	Alarm areas. Separator: Comma (,)
ALARMAREAN	*Character*	*3*	Numbers of the alarm areas

Column	Type	Size	Description
			Separator: Comma (,)
UNIT	*Character*	*3*	Measuring unit of the affected variable.
D_KOMM_INT	*Date*	*8*	Internal arrival time: Date.
Z_KOMM_INT	*Character*	*10*	Internal arrival time: Time.
M_KOMM_INT	*Numeric*	*3*	Internal arrival time: Milliseconds.
D_KOMM_EXT	*Date*	*8*	External arrival time: Date.
Z_KOMM_EXT	*Character*	*10*	External arrival time: Time.
M_KOMM_EXT	*Numeric*	*3*	External arrival time: Milliseconds.
EQUIPMENT	*Character*	*3*	Equipment model. Analogous to column setting. Corresponds to the setting for CEL / AML.
CATEGORY	*Character*	*8*	Assigned categories. Separator: Comma (,)

☀ Information

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

4.3.2.5 SQL: Exported columns

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

Columns in exported sequence:

Column	Type	Description
[VAR]	*varchar(128)*	Variable name.
[TAG]	*varchar(128)*	Variable identification.
[RESLABEL]	*varchar(128)*	Resources label.
[TEXT]	*varchar(1024)*	Limit value text.

Column	Type	Description
[COMES_S]	*int*	Alarm occurred in Unix time (seconds since 01. 01. 1970).
[COMES_MS]	*int*	Alarm occurred: Milliseconds
[STATUS]	*int*	Status of variable.
[VALUE]	*varchar(128)*	Variable value.
[USERID]	*varchar(128)*	User identification.
[COMP]	*varchar(128)*	Computer name.
[ACT_TEXT]	*varchar(128)*	Alarm: Comment.
[PRJ]	*varchar(128)*	Project name
[CLASS]	*varchar(128)*	Name of the alarm class.
[GROUP]	*varchar(128)*	Name of the alarm group.
[CLASS_NR]	*int*	Alarm Classes ID.
[GROUP_NR]	*int*	Alarm groups ID.
[USERNAME]	*varchar(120)*	User name.
COMES_INTERNAL_S	*int*	Internal arrival time in Unix time.
COMES_INTERNAL_MS	*int*	Internal arrival time (Millisecond).
COMES_EXTERNAL_S	*int*	External arrival time in Unix time.
COMES_EXTERNAL_MS	*int*	External arrival time: Milliseconds.
UNIT	*varchar(50)*	Measuring unit of the variable
AREA_NR	*varchar(4000)*	Numbers of the alarm areas. Separator: Comma (‚)
AREA	*varchar(4000)*	Alarm Areas. Separator: Comma (‚)
CATEGORIES	*varchar(4000)*	Assigned categories. Separator: Comma (‚)

4.3.2.6 XML: Exported columns

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

▶ Only data from the selected columns is exported.

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

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

  ▶ Space: Underscore (_).

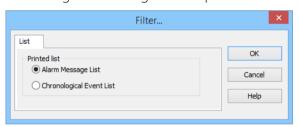 ▶ Other non-permitted characters: Hyphen (-).

4.3.3 Print AML or CEL

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

To configure the function:

1. Create a new function.

2. Select **Print AML or CEL**.
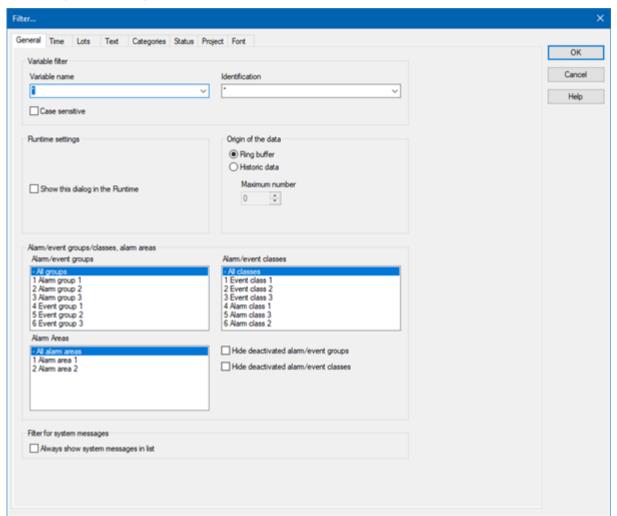
   The dialog for selecting the list opens:

3. Select **Chronological Event List**

The dialog for selecting filter criteria opens.

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

   ▸ General (on page 45)

   ▸ Time (on page 51)

   ▸ Lots (on page 70)

   ▸ text (on page 93)

   ▸ Categories (on page 94)

   ▸ State   (on page 98)

   ▸ Project   (on page 152)

   ▸ Font: Selection from the fonts defined in zenon

5. Link the function to a button.

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

LINE STRUCTURE

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

The keywords that are available for the format file (*BTB.FRM for online print and BTB_G.FRM for offline print*) and examples for their use can be found in the FRM configuration file (on page 186) chapter and in the Operation in the Runtime (on page 164) section.

The FRM file has three parts:

▶ Header: at the beginning of the page

▶ List part: cyclic per line

▶ Footer: at the end of the page

PRINCIPLES

When editing FRM files regard the following:

▶ **Separating the list parts:**

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

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

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

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

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

KEYWORDS

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

Note:

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

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

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

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

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

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

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

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

> **⚠Attention**
>
> Between the key words there must be enough space so that entries are not overwritten. In doing so, you make sure that long limit value texts are also displayed correctly.
>
> Example:
>
> @TEXT (spaces up to here)

SETTING MILLISECONDS

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

4.3.4 Switch online printing on/off

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

▸ *Switch on*: Switches online printing on

▸ *Switch off*: Switches online printing off

▸ *active/inactive*: Switches online printing

To configure the function:

1. Create a new function.

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

3. Select the desired action.

4. Link the function to a button.

4.3.5 Online printing start new page

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

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

To configure the function:

1. Create a new function

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

3. link the function to a button

4.3.6 Switch online printer

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

💡 **Information**

This function is not available under Windows CE.

To configure the function:

1. Create a new function.

2. Select **Switch online printer**.

   The dialog for selection of the printer opens.

3. Select the desired printer from the drop-down list.
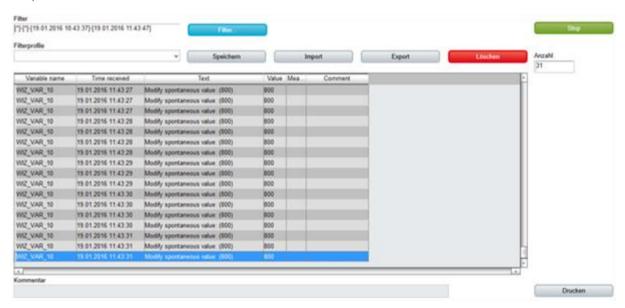
4. Link the function to a button.

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

5 Operation in Runtime

In Runtime, the Chronological Event List is called up by means of a screen switch function (on page 140).

The available control elements and the look are engineered in the Editor (on page 6).

WINDOW

Parameter	Description
Chronological Event List	Display field for the list with its events. The appearance is configurable (on page 12). Columns are set using the column settings (on page 87) filter in the screen switching. The **Column settings CEL** property in the project properties in the **Chronological Event List** group are used to define the settings for export in CSV, XML and DBF. These also serve as a

Parameter	Description
	pre-setting for the screen switching function.
Set filter	Shortened display of the currently selected filter conditions in a compact filter line.
Set filter (detail list)	Detailed display of the currently selected filter conditions in a text window. Details can be found in the **Runtime** manual in the **Filter** section.
Status of Chronological Event List	Displays the status of the CEL in the Runtime. ▸ *Active*: Events are logged depending of the settings (on page 33) in the project ▸ *Inactive*: Events are not logged The status is stipulated in the project properties of the **Chronological Event List** group using the **CEL active** property. Changes take effect after the Runtime has been restarted.
Total number	Number of all events in the list

LIST FUNCTIONS

Parameter	Description
Filter...	Opens the filter dialog (on page 38).
Stop/Continue	Controls adding new events to the list while it is displayed: **Stop**: No new entries are added to the list. The button changes its caption to **Continue**. **Continue**: New entries are added to the list. The button changes its caption to **Stop**. To sort the new entries chronologically, you must click on button **Sort**. **Attention:** The labeling of the button can be changed in the editor but is not carried over to the Runtime.
Sort	After calling up the CEL in the Runtime, new entries are not sorted in chronological order but added to the bottom of the list. Click on the button to newly sort the list. To help you differentiate between sorted and unsorted entries you can assigned different colors via properties **sorted text**

Parameter	Description
	and **unsorted text**.
Show relative times	*Active*: The relative times are displayed without the focus being lost in the selected entry.
Print	Prints list (on page 183) as it is currently displayed.
Print with dialog...	Opens printer settings before printing.

COMMENT FIELD

Parameter	Description
Comment field	Entry of freely-definable text by the user for the selected event. The text is adopted immediately after entry. The entry is rejected with the **Esc key**. Maximum length: *79 characters* To display the text in the CEL, you must activate the **Comment** column in the column definition (on page 87). **Note:** To change comments, the **CEL comments** property must be activated.

NAVIGATION

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

COMPATIBLE ELEMENTS

Parameter	Description
Compatible elements	Control elements that are replaced or removed by newer versions and continue to be available for compatibility reasons. These elements are not taken into account with automatic insertion of templates.
Set filter	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Total number	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Status of Chronological Event List	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Comment field	Static Win32 control element. Was replaced by a *dynamic text* field. For the description, see current element.
Close frame	Closes the frame on which the screen is based. **Recommendation:** Use the **Close frame** function to close frames In order that after the closing the screen which was opened before is displayed, you must engineer the screen of type CEL with its own frame.
Show relative times	Static Win32 control element. Was replaced by a *switch* element. For the description, see new element.

FILTER PROFILES

Filter profiles	Filter settings that can be saved by the user in Runtime.
Profile selection	Select profile from list.
Save	Saves an online setting in a profile.
Delete	Deletes selected profile.

> ### ☀ Information
>
> The filter currently being used is displayed with the **Set filter** control element.
>
> With a:
>
> ▸ Text filter, the expression **[Txt]** is displayed
>
> ▸ Relative time filter: is displayed as a print-out with the following scheme:
> **[T,Rel:%dd,%dh,%dm;%ds]**
> **Example:** [T,Rel:1d,0h,0m,0s] equals one day.

CONFIGURATION OF THE DISPLAY

The type of information which is displayed in the Runtime, you can configure via the column setting of the CEL. You can reach the column setting via:

▸ Project settings -> Chronological Event List -> Column settings CEL (only **Column settings** (on page 39) tab)
or

▸ Function screen switch to a screen of type **CEL** (all tabs (on page 43))

UPDATING THE ENTRIES

If, in the **Chronological Event List** group, the **Update automatically** property has been activated, new events are added immediately as soon as they occur. Otherwise the values are obtained once before writing a value to the PLC. In doing so, the value that was in the PLC before writing is entered as the actual value in the CEL.

DISPLAY IN THE VALUE COLUMN

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

COMMENT FIELD

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

▸ An Event is created for the API (`CelItemCommentChanged`).

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

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

Syntax: <**TimeStamp**> - **old value "<Old Value>" - new value: "<New Value>";**

5.1   Filter CEL

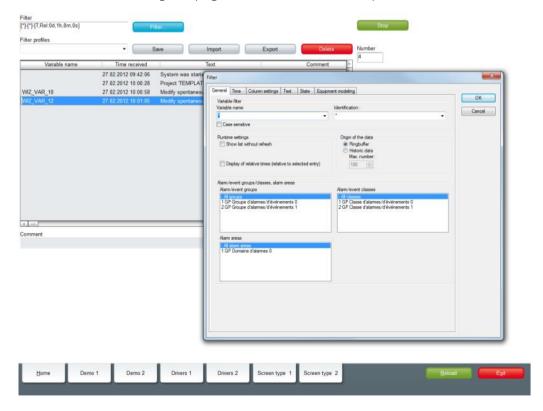Events can be filtered and displayed in the Runtime via:

▶   Filter application in Runtime

▶   screen switch with pre-defined filter to a screen of type CEL (on page 6)

▶   screen switch with filter for call up of a screen of type CEL (on page 6)

▶   screen switch to a screen of type Chronological Event List Filter (on page 14)

FILTERING IN THE RUNTIME

Filters can be applied in Runtime in CEL screens. To filter the results displayed in the CEL:

1.   The **Filter** must be present.

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

     The filter dialog (on page 43) of the CEL will be opened

Set filter can be saved in profiles (on page 175).

SCREEN SWITCH TO A SCREEN OF TYPE CHRONOLOGICAL EVENT LIST

Results can be displayed in a pre-filtered way. To do this:

1. Engineer a filter   (on page 38)for function screen switch to a screen of type CEL (on page 140)

   The CEL is displayed in a filtered way when called.

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

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

SCREEN SWITCH TO A CHRONOLOGICAL EVENT LIST FILTER SCREEN

To make only the filters that the user needs available in the Runtime, you can use the Chronological Event List screen filter (on page 14). To do this:

1. Configure a screen switch to a screen type CEL Filter (on page 142).

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

   The user has a chronological event list that is tailor-made (on page 101) to their requirements.
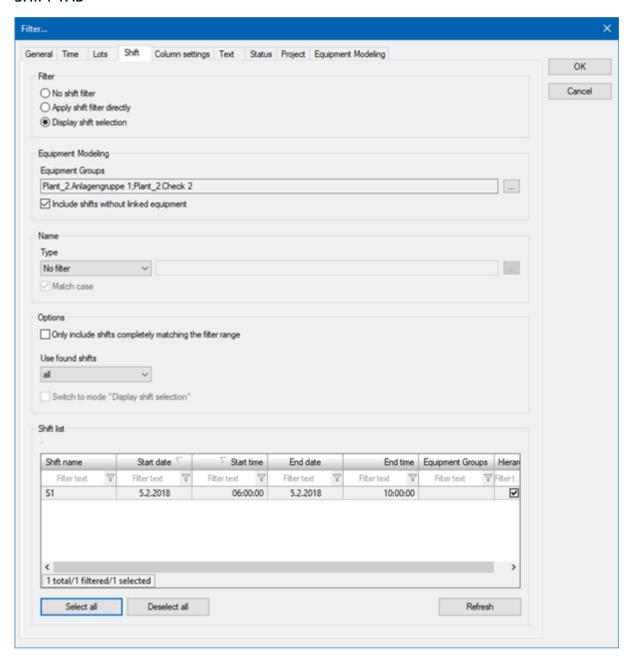
5.1.1 Filter dialog

If configured in the Editor, the filter dialog for configuration is offered for screen switching. This dialog is also called up if the **Filter** button is activated. The options generally correspond to those that are also available in the editor (on page 43). Settings that can no longer be changed in the Runtime are hidden. Additional information may be shown.

FILTER DIALOG

SHIFT TAB

FILTER

Settings for the application of the shift filter. Selection of one of the following options:

- ▸ **No shift filter**

- ▸ **Apply shift filter directly**

▸ **Display shift selection**

Option	Description
No shift filter	Shift filter selection: ▸ *Active*: The shift filter is deactivated and cannot be configured. Filtering for shifts is not carried out in the Runtime.
Apply shift filter directly	Applying the shift filter in the Runtime: ▸ *Active*: The filter configured here is applied in the Runtime directly. Equipment groups and shift names can be preselected. The shift list and **Update** button are not shown in the Runtime.
Display shift selection	Display of the shift selection in the Runtime: ▸ *Active*: The dialog for shift selection is shown in the Runtime. The settings chosen in the Editor are applicable for the reading of the shifts in the Runtime. The dialog is shown in the Runtime when: ▸ Clicking on the **Filter** button. Or: ▸ Executing screen switching. **Note:** The dialog is not shown on reloading. **Attention:** If, in the **General** tab, the **Show this dialog in Runtime** option is activated at the same time, the complete configuration dialog is called up.

EQUIPMENT MODELING

Configuration of the equipment groups for filtering for shifts.

Option	Description
Equipment groups	Selection of equipment groups to which shifts must be linked. Clicking on the **...** button opens the dialog to select equipment groups. If several equipment groups are selected, they are displayed in the option separated by a semicolon (**;**).

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

NAME

Configuration of the shift names for which filtering is to take place.
Selection of one of the following options:

▸ **No filter**

▸ **Name with wildcards**

▸ **Name from variable**

Option	Description
Type	Selection of the filter type from a drop-down list when filtering according to name: ▸ *No filter*: Filtering for names is not carried out. ▸ *Name with wildcards*: A name with placeholder can be entered into the input field. All shifts whose name is applicable for the filter are included. ▸ *Name from variable*: The name of the shift is defined by a variable in the Runtime. Click on the **...** Button to open the dialog to select a variable. Default: *No filter* **Wildcards:** ▸ *****: Replaces desired characters in the desired quantity. Can be used as a search term at any desired place. **red*** finds all texts that start with **red**. ▸ **?**: Replaces precisely one character. **r?d** finds **red**, **rad**, ...

Option	Description
	Notes for variables in the Runtime: ▸ The variable selection is only activated in the Runtime if a valid variable has already been linked in the Runtime. The **...** button is always deactivated in the Runtime. The option can be selected, but no new variable can be linked. ▸ If the variable is not signed into the driver at the time at which the lot filter is applied, the variable is signed in and read. This can lead to delays with slow driver connections/protocols. **Attention:** If the selected variable cannot be found in Runtime or the value of the variables cannot be determined, the filter is treated like the **No filter** setting.
Match case	Setting for filtering for upper/lower case ▸ *Active*: Capitalization is taken into account for names. Default: *active*

SHIFT LIST

Display of the filtering of available shifts in a list.
Only available if the **Show shift selection dialog** option has been selected.

Option	Description
Shift list	Display of all available shifts. Selection of the shifts to be used for filtering by means of a mouse click. Multiple selection is possible.
Select all	Selects all displayed shifts.
Deselect all	Deselects all displayed shifts.
Refresh	Clicking on the button updates the display in the list.

CLOSE DIALOG

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

5.1.2 Filter profiles

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

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

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

You can thus do the following in the Runtime:

- ▶ save filters
- ▶ use saved filters
- ▶ delete filter profiles

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

SAVE FILTER PROFILE
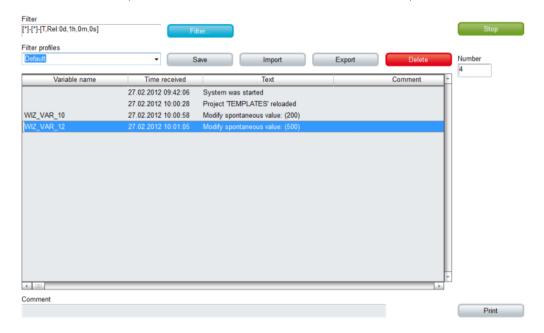
To create a filter profile:

1. Define filter conditions
2. Enter a name in the **Filter profiles** input field

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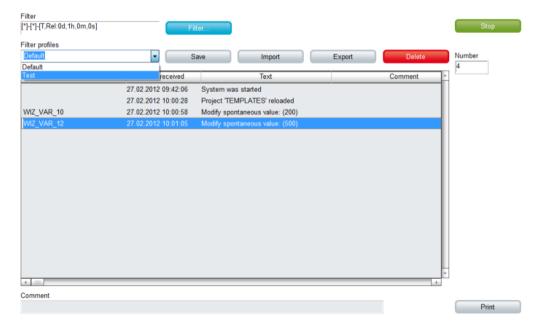   The filter profile is saved and can be selected in the drop-down list.

USE FILTER PROFILE

To use a filter profile:

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

2. The filter is immediately applied.

DELETE FILTER PROFILE

To delete a filter profile:

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

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

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

5.1.3 Use CEL filter

It is possible to adjust filter settings for the Chronological Event List in the Runtime with the help of the Chronological Event List Filter (on page 14) screen. You can configure all filter settings which are also available in the filter (on page 38) for screen switch to the screen of type CEL (on page 140) function.

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.

CALL DEFINITION

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

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

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

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

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

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

Key:

▶ C: Common settings are updated.

▶ T: Time settings are updated.

▶ X: All settings are updated.

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

UPDATE

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

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

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

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

UPDATE FILTER SETTINGS

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

5.2 Print and export events

Entries in the CEL can be documented and archived via:

▶ CEL Print online (on page 179): each event is printed on a line printer when it is displayed in the list

▶ CEL Print offline (on page 183): the CEL is printed in the current state as completed list

▶ Export (on page 190) content of the CEL (filtered)

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

> ⚠ **Attention**
>
> A *.frm configuration file is used for the print-out:
>
> ▶ Online: ALARM.frm
>
> ▶ Offline: ALAR_G.frm.
>
> This FRM file must be in the project tree in the **Files** section in the **Texts and formats** folder.
>
> You can find templates for FRM files in the following folder:
> *%ProgramData%\COPA-DATA\zenon820*
>
> These can be added to the **Texts and formats** section using Add File and edited there.
>
> You can find key words for FRM files in the FRM configuration file (on page 186).

5.2.1 Online printing

With online printing, each event with an entry in the CEL is immediately sent to the printer.

Attention: The online printing takes place line by line, in accordance with the ESC/P (Epson Standard for Printers) and requires an Epson-compatible printer.

To online print entries from the CEL

1. Define a printer.

2. Navigate to the **AML and CEL** node in the project properties.

3. Activate property **Printing active**.

4. For the **Printing for** property, select *Chronological Event List* in the drop-down list.

5. With the help of property **Lines per page** define the line number (Default: *72*)

6. Configure **BTB.frm (on page 186).**

7. Add the **BTB.frm** file to the **Files/texts and formats** node.

> ### ✲ Information
>
> This function is not available under Windows CE.

CONTROL PRINTING AND PRINTER IN THE RUNTIME

PAGE CHANGE

Form feed is carried out if:

▶ a page is fully written

▶ the Runtime is closed and online printing is active

▶ function Online printing start new page (on page 163) is executed

HALT PRINTING

To halt or to continue online printing:

▶ Execute the function **Switch online printing on/off**.

CHANGING AND SETTING UP A PRINTER
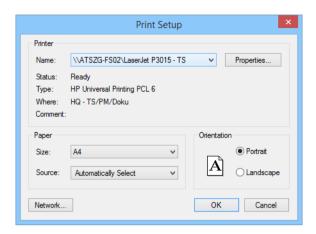
To change the printer in the Runtime:

▶ Execute the Funktion (on page 163) **Switch online printer**.

To set up the selected printer in the Runtime:

1. Configure a **Print with dialog** control element for the screen

2. Click on the **Print with dialog** button in the Runtime

3. The configuration dialog is opened.

PRINTER

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

PAPER

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

ALIGNMENT

Parameter	Description
Alignment	Select paper alignment. Possible parameters: ▶ *Portrait format* ▶ *Landscape*
Network	Opens dialog for selecting a printer in the network.
OK	Applies configuration and closes the dialog. Printing is thus started in the Runtime.
Cancel	Discards configuration and closes the dialog. This also cancels the printout in the Runtime.

FORMATTING EXAMPLE

Engineering (on page 186) in BTB.*FRM:*

Date: @DSYSTEM	Chronological Event 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	Chronological Event List demo project	Time: 12:00 PM	Text
Date/Time received	Time cleared	Information text	Status text
20.03.2011 13:00:00	20.03.2011 1:03:59 PM	Message 1	Limit exceeded
20.03.2011 13:00:00	1:05:35 PM	Demo information	Limit 750 reached
20.03.2011 1:03:59 PM		Message 2	Limit value
20.03.2011 1:11:23 PM		Message 3	off
20.03.2011 1:03:59 PM	1:12:45 PM	Demo	off

Date: 20.03.2011	Chronological Event List demo project	Time: 12:00 PM	Text
		information	
	Page	1	

5.2.2 Offline printing

Offline printing means that the CEL is printed our as it is displayed at the current moment in the Runtime. This print-out is a snapshot including all filters that have been set and their restrictions. The print out is carried out regardless of whether the variables concerned having option **print**.

PRINT

To print the CEL offline:

1. define a printer

2. configure **BTB_G.frm** (on page 186)

3. add file **BTB_G.frm** to node **Files/texts and formats**

4. In the Runtime, click the Print button or Print with Dialog button.

SET UP AND CHANGE PRINTER
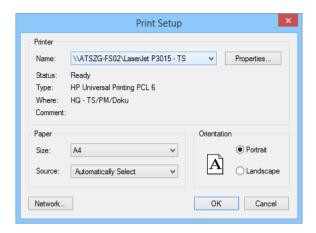
CHANGING AND SETTING UP A PRINTER

To change the printer in the Runtime:

▸   Execute the Funktion (on page 163) **Switch online printer**.

To set up the selected printer in the Runtime:

1. Configure a **Print with dialog** control element for the screen

2. Click on the **Print with dialog** button in the Runtime

3. The configuration dialog is opened.

PRINTER

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

PAPER

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

ALIGNMENT

Parameter	Description
Alignment	Select paper alignment. Possible parameters:

Parameter	Description
	▸ *Portrait format* ▸ *Landscape*
Network	Opens dialog for selecting a printer in the network.
OK	Applies configuration and closes the dialog. Printing is thus started in the Runtime.
Cancel	Discards configuration and closes the dialog. This also cancels the printout in the Runtime.

FORMATTING EXAMPLE

Configuration in **BTB_G.FRM**:

Date: @DSYSTEM	Closed Alarm Message List Demo Project	Time @TSYSTEM o'clock	Text
Date/Time received	Time cleared	Information text	Status text
%%			
@DTRECEIVED	@TCLEARED	@IDENTIFICATION	@TEXT
%%			
	Page	@PAGE	

Printout on the printer

Date: 20.03.2011	Closed Alarm Message List Demo Project	Time: 12:00 PM	Text
Date/Time received	Time cleared	Information text	Status text
20.03.2011 13:00:00	20.03.2011 1:03:59 PM	Message 1	Limit exceeded
20.03.2011 13:00:00	1:05:35 PM;	Demo information	Limit 750 reached
20.03.2011 1:03:59 PM		Message 2	Limit value
20.03.2011 1:11:23 PM		Message 3	off
20.03.2011 1:03:59 PM	1:12:45 PM;	Demo information	off
	Page	1	

5.2.3 FRM configuration file

FRM files (format files) are configuration files for printing out lists.

The FRM file has three parts:

- ▸ Header: at the beginning of the page
- ▸ List part: cyclic per line
- ▸ Footer: at the end of the page

PRINCIPLES

When editing FRM files regard the following:

- ▸ **Separating the list parts:**
    - ▸ Header and list part and list part and footer are separated by *%%*.

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

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

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

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

KEYWORDS

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

Note:

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

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

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

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

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

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

German	English	AML offline	CEL offline	AML online	CEL online	Description
						time received - time cleared)
@ANWENDUNG	@PROJECTNAME	X	X	X	X	Project name
@KANALNAME	@VARNAME	X	X	X	X	Variable name CEL: Only entries with variables
@AK	@ACLASSNR	X	X	X	X	Alarm/event class name
@AG	@AGROUPNR	X	X	X	X	Alarm/event group number
@AGNAME	@AGROUPNAME	X	X	X	X	Name of alarm/event group
@AKNAME	ACLASSNAME	X	X	X	X	Name of alarm/event class
@TAGNR	@IDENTIFICATION	X	X	X	X	Identification (company-specific label)
@AMELDUNG	@TEXT	X	X	X	X	Alarm message text
@REAKTANZ	@NRREACTIVATE	X	-	X	-	Number of reactivations
@STATUS	@STATUS	X	X	X	X	Status information as in Alarm Message List
@WERT	@VALUE	X	X	X	X	Variable value of alarm
@REAKTIONSTEXT	@COMMENT	X	X	X	X	Commentary from the Alarm Message List. If dynamic limit value texts are used, this is only available if the **Long dynamic limit value texts AML** or **Long dynamic limit value texts CEL** properties have been activated.

German	English	AML offline	CEL offline	AML online	CEL online	Description
@USER	@USERID	X	X	X	X	AML: User who acknowledged alarm.
@RECHNER	@COMPUTER	X	X	X	X	AML: Computer on which alarm was acknowledged.
Key words for header and footer						
@ANWENDUNG	@PROJECTNAME	X	X	X	X	Project name
@SEITE	@PAGE	X	X	X	X	Page number
@HEADDATZEIT	@DTSYSTEM	X	X	X	X	System date and system time
@HEADDATUM	@DSYSTEM	X	X	X	X	System date
@HEADZEIT	@TSYSTEM	X	X	X	X	System time
@USER	@USERID	X	X	X	X	User who prints
@USERNAME	@USERNAME	X	X	X	X	Full user name who triggered action
@RECHNER	@COMPUTER	X	X	X	X	Computer from which printing is carried out
[Text]	[Text]					Random text

⚠Attention

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

Example:

@TEXT (spaces up to here)

5.2.4 Export events

Entries in the CEL can be exported to different formats:

- ▶ dBase
- ▶ CSV
- ▶ XML
- ▶ SQL

EXPORT

To export entries from the CEL

1. Create an export CEL function (on page 145)
2. Link the function to a button.
3. Execute the function in the Runtime.

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